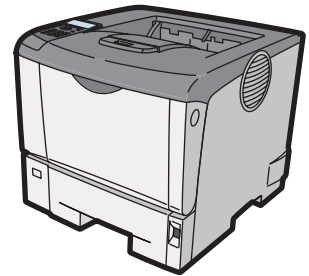




Operating Instructions

Hardware Guide



-
- 1** Guide to the Printer
 - 2** Setting Up the Printer
 - 3** Installing Options
 - 4** Connecting the Printer
 - 5** Configuration
 - 6** Loading Paper
 - 7** Maintaining the Printer
 - 8** Adjusting the Printer
 - 9** Troubleshooting
 - 10** Removing Misfed Paper
 - 11** Appendix

Introduction

This manual contains detailed instructions and notes on the operation and use of this machine. For your safety and benefit, read this manual carefully before using the machine. Keep this manual in a handy place for quick reference.

Do not copy or print any item for which reproduction is prohibited by law.

Copying or printing the following items is generally prohibited by local law:

bank notes, revenue stamps, bonds, stock certificates, bank drafts, checks, passports, driver's licenses.

The preceding list is meant as a guide only and is not inclusive. We assume no responsibility for its completeness or accuracy. If you have any questions concerning the legality of copying or printing certain items, consult with your legal advisor.

Important

Contents of this manual are subject to change without prior notice.

In no event will the company be liable for direct, indirect, special, incidental, or consequential damages as a result of handling or operating the machine.

For good print quality, the manufacturer recommends that you use genuine toner from the manufacturer.

The manufacturer shall not be responsible for any damage or expense that might result from the use of parts other than genuine parts from the manufacturer with your office products.

Some illustrations in this manual might be slightly different from the machine.

Certain options might not be available in some countries. For details, please contact your local dealer.

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How to Read This Manual

Symbols

This manual uses the following symbols:

Important

Indicates points to pay attention to when using the machine, and explanations of likely causes of paper misfeeds, damage to originals, or loss of data. Be sure to read these explanations.

Note

Indicates supplementary explanations of the machine's functions, and instructions on resolving user errors.

Reference

This symbol is located at the end of sections. It indicates where you can find further relevant information.

[]

Indicates the names of keys on the machine's display or control panels.

 **Region A** (mainly Europe and Asia)

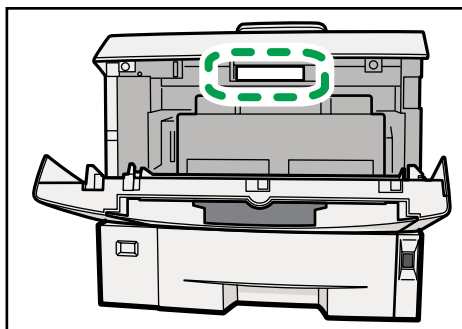
 **Region B** (mainly North America)

Differences in the functions of Region A and Region B models are indicated by two symbols. Read the information indicated by the symbol that corresponds to the region of the model you are using. For details about which symbol corresponds to the model you are using, see p.7 "Model-Specific Information".

Model-Specific Information

This section explains how you can identify the region your machine belongs to.

There is a label on the front cover of the printer, and it is located in the position shown below. The label contains details that identify the region your machine belongs to. Read the label.



The following information is region-specific. Read the information under the symbol that corresponds to the region of your machine.

 **Region A** (mainly Europe and Asia)

If the label contains the following, your machine is a region A model:

- CODE XXXX -22, -27
- 220-240V

 **Region B** (mainly North America)

If the label contains the following, your machine is a region B model:

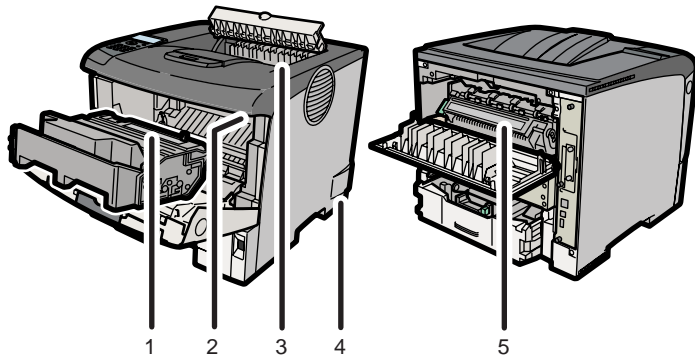
- CODE XXXX -11, -17
- 120V

Note

- Dimensions in this manual are given in two units of measure: metric and inch. If your machine is a Region A model, refer to the metric units. If your machine is a Region B model, refer to the inch units.

Positions of WARNING and CAUTION Labels

This machine has labels for ⚠WARNING and ⚠CAUTION at the positions shown below. For safety, please follow the instructions and handle the machine as indicated.



CEE060

1

<p>WARNING ATTENTION WARNUNG AVVISO AVISO ADVERTENCIA</p>		● Do not incinerate toner or toner containers.
		● Toner dust may cause flashback when exposed to an open flame.
		● Ne pas incinérer les cartouches ni les boîtes de cartouches de toner.
		● Exposée à une flamme nue, la cendre de toner peut provoquer un retour de flamme.
		● Verbrennen Sie keinen Toner oder Tonerkartusche. Tonerstaub kann beim Kontakt mit offenem Feuer explodieren.
● Non gettare il toner o i contenitori del toner sul fuoco. La polvere del toner si può incendiare dalla fiamma.		
● Non incinerare el tóner ni los contenedores de tóner. El polvo de tóner puede inflamarse al ser expuesto al fuego.		
● Não exponha o Toner ou a sua embalagem ao fogo. O pó de Toner poderá explodir quando exposto a chama viva.		
● トナー又はトナーの入った容器を直接焼却炉等の火中に投入しないでください。火傷をするおそれがあります。		

CEE129

Do not incinerate toner or toner containers. Toner dust may cause flashback when exposed to open flames.

2



3



CEE130

The inside of this printer becomes very hot. Do not touch parts with this label (indicates a hot surface). Touching these parts may result in burns.

4



CEE131

The printer weights about 17.5 kg (38.6 lb.). When moving the printer, detach the optional paper feed and duplex units first, and then use the inset grips on both sides to lift the printer. Otherwise the printer could break or cause injury if dropped.

5



CEE132

The inside of this printer becomes very hot. Do not touch parts with this label (indicates a hot surface). Touching these parts may result in burns.

Power Switch Symbols

The meanings of the symbols for the switches on this machine are as follows:

- I : POWER ON
- O : POWER OFF

Manuals for This Printer

Read this manual carefully before you use this printer.

Refer to the manuals that are relevant to what you want to do with the printer.

★ Important

- Media differ according to manual.
- The printed and electronic versions of a manual have the same contents.
- Adobe® Acrobat® Reader® /Adobe Reader® must be installed in order to view the manuals as PDF files.
- A Web browser must be installed in order to view the html manuals.

Safety Information

Contains information about safe usage of this printer.

To avoid injury and prevent damage to the printer, be sure to read this.

Quick Installation Guide

Contains procedures for removing the printer from its box, and connecting it to a computer.

Hardware Guide (This manual)

Contains information about paper; names and functions of the parts of this printer; and procedures such as installing options, replacing consumables, responding to error messages, and resolving jams.

Driver Installation Guide

Contains procedures for installing the printer driver. This manual is included on the driver CD-ROM.

Software Guide

Contains information about using this printer, its software, and its security functions.

Security Guide

This manual is for administrators of the printer. It explains security functions that you can use to prevent unauthorized use of the printer, data tampering, or information leakage. Be sure to read this manual when setting the enhanced security functions, or user and administrator authentication.

VM Card Extended Feature Settings Web Reference

Contains information about setting up the extended features settings using Web Image Monitor.

UNIX Supplement

Contains information about the usage of commands to operate this printer.

To obtain the "UNIX Supplement", visit our Web site or consult an authorized dealer.

This manual includes explanations of functions and settings that might not be available on this printer.





This manual is provided in English only.

↓ Note

- In this manual, "Enhanced Locked Print NX" is abbreviated as "ELP-NX".
- Manuals provided are specific to printer types.

List of Options

This section provides a list of options for this printer, and how they are referred to as in this manual.

Option List	Referred to as
Paper Feed Unit TK1030	Paper feed unit
Duplex Unit AD 1000	Duplex Unit
Envelope Feeder Type 400	Envelope feeder
Hard Disk Drive Type 4310	Hard disk
Memory Unit Type G 128MB	SDRAM module
Memory Unit Type G 256 MB	SDRAM module
 Region A Gigabit Ethernet Board Type A	Gigabit Ethernet board
 Region B Gigabit Ethernet Board Type C	Gigabit Ethernet board
 Region B IEEE 802.11a/g Interface Unit Type L	Wireless LAN interface unit
 Region A IEEE 802.11a/g Interface Unit Type M	Wireless LAN interface unit
IEEE 1284 Interface Board Type A	IEEE 1284 interface board
SD card for NetWare printing Type G	NetWare card
VM CARD Type O	VM card
IPDS Unit Type 4310	IPDS card

 **Note**

- For details about the specifications of each option, see p.235 "Specifications".

Operating Instructions

This section explains how to use HTML format manuals.

Reading the HTML Manuals on the CD-ROMs

1. Insert the CD-ROM into the CD-ROM drive of your computer.
2. Select a language and a product, and then click [OK].
3. Click [Read HTML manuals].
4. Click the title of manual you want to read.

↓ Note

- The browsers we recommend are Internet Explorer 6 or later, Firefox 3.5 or later, and Safari 4.0 or later.
- Non-recommended browsers can display the simplified manual only.
- If you are using an earlier or non-recommended browser and the simplified version of the documentation does not appear automatically, open index.htm, which can be found in the following folder on the CD-ROM: MANUAL_HTML\LANG\{language}\{manual}\unv
- Depending on your computer's operating environments, you can select the HTML manual from the following two versions:
 - Standard version
 - Simplified version
- If you want to read the HTML manuals on a Macintosh, insert the CD-ROM into the CD-ROM drive, and then click [Read HTML manuals].
- If JavaScript is disabled or unavailable in your browser, you will not be able to search or use certain buttons in the HTML documentation.

Reading the HTML Manuals That You Install on the Computer

For easy access, we recommend you install the manuals on your computer.

1. Insert the CD-ROM into the CD-ROM drive of your computer.
2. Select a language and a product, and then click [OK].
3. Click [Install manuals].
4. Install the HTML manuals following the on-screen instructions.
5. When the installation is complete, click [Finish].
6. Click [Exit].

7. Open the HTML manuals that you installed.

When opening the manuals from an icon, double-click the manual icon on the desktop. When opening the manuals from the [Start] menu, point to [All Programs], and then [Product Name].

8. Click the title of the manual you want to read.

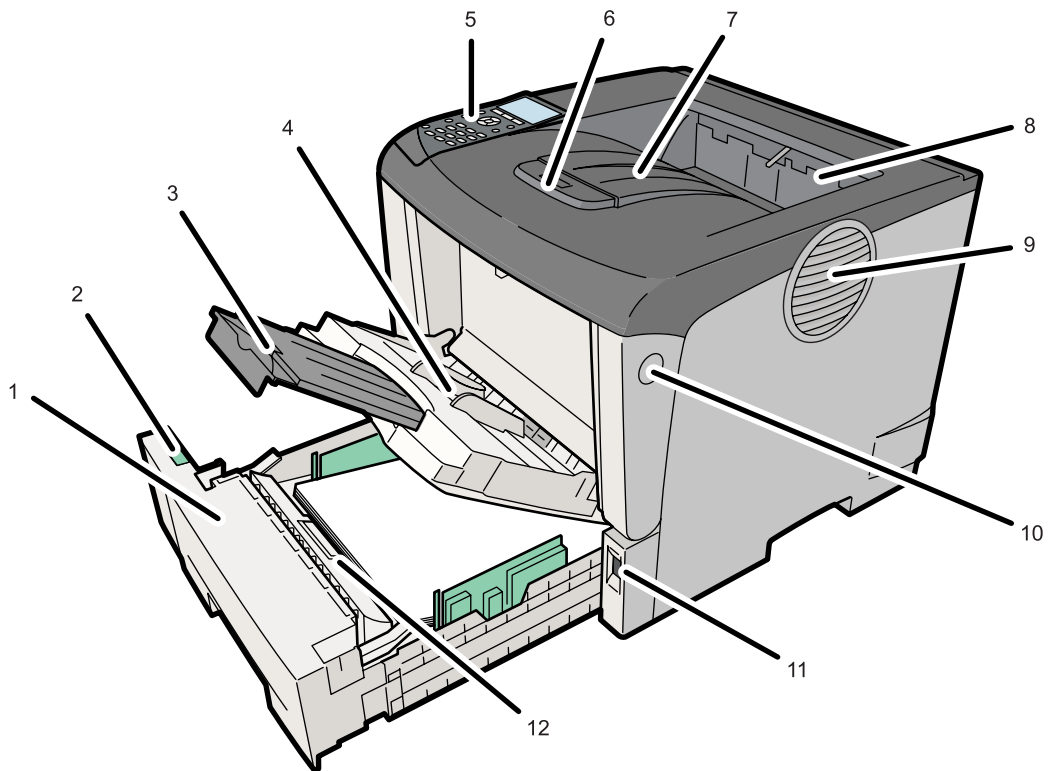
Note

- You need administrator permissions to install the manuals. Log in as an Administrators group member.
- The system requirements for installing the manuals are as follows:
 - Operating system: Windows XP/Vista/7, Windows Server 2003/2003 R2/2008/2008 R2
 - Minimum display resolution: 800 × 600 pixels
- If you cannot install a manual, copy the "MANUAL_HTML" folder to your computer's hard drive, and then run "Setup.exe".
- To delete an installed manual, on the [Start] menu, click [All Programs], then [Product Name], and then uninstall the data.
- Depending on the settings made during installation, menu folder names may differ.

1. Guide to the Printer

This chapter explains the names and functions of the printer's components.

Exterior: Front View



CEE001

1. Standard Paper Feed Tray (Tray 1)

Up to 500 sheets of plain paper can be loaded.

2. Paper Size Dial

Adjust this dial according to the size and feed direction of the paper loaded in the paper tray.

3. Bypass Tray Extension

Pull this out when loading a sheet that is longer than B5[□] on the Bypass Tray.

4. Bypass Tray

Up to 100 sheets of plain paper can be loaded.

See p.111 "Supported Paper for Each Tray" and p.111 "Loading Paper".

5. Control Panel

Contains keys for printer control and a display that shows the printer status.

6. Tray Extension

Pull this out if the paper you are loading is longer than B5.

7. Standard Tray

Prints are delivered here printed side facing down.

8. Paper Exit Cover

Open this cover to remove jammed paper.

9. Vents

To prevent overheating, heat from internal components is released through these vents. Malfunctions and failure can result if these vents are blocked or obstructed.

10. Front Cover Release Button

Press this to open the front cover.

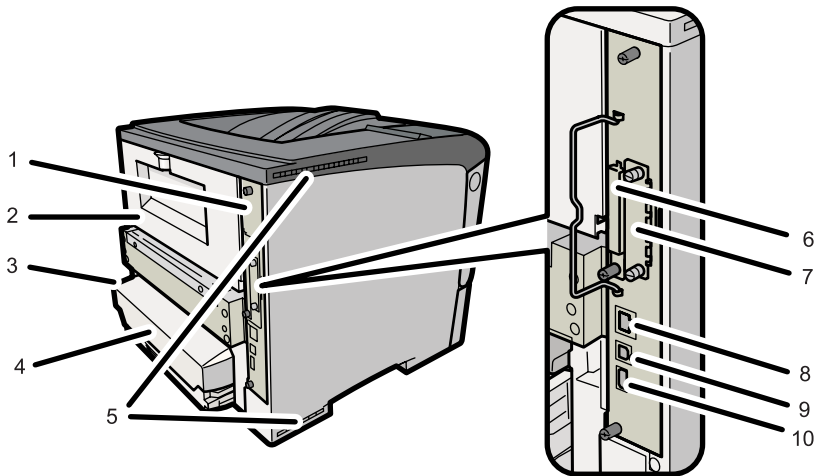
11. Power Switch

Press this to turn the printer's power on and off.

12. Friction Pad

This ensures only one sheet of paper is fed in at a time. If multi-sheet feeds occur, clean the friction pad carefully. If the message "Replacmnt Requird:Maint. Kit" is displayed, replace the friction pad with a new one.

Exterior: Rear View



CEE003

1. Controller Board

Slide this out to install options such as the SDRAM module or printer hard disk. Plug cables such as a USB cable and Ethernet cable into their connectors.

2. Rear Cover

Remove this to replace the fusing unit.

3. Power Connector

Connect the power cord to the printer here. Insert the other end of the cable into a nearby wall outlet.

4. Paper Tray Cover

Keeps paper in the tray free of dust.

5. Intake Vent

Prevents the printer's internal components overheating by letting in cool air through this vent.

Do not block or obstruct the ventilator areas. Doing so can result in malfunctions caused by build up of heat inside the printer.

6. SD Card Slots

Remove the cover and install SD cards here.

7. Optional Interface Board Slot

Insert an optional Wireless LAN interface unit, Gigabit Ethernet board, or 1284 interface board in this slot.

8. Ethernet Port

Use a network interface cable to connect the printer to the network.

9. USB Port B

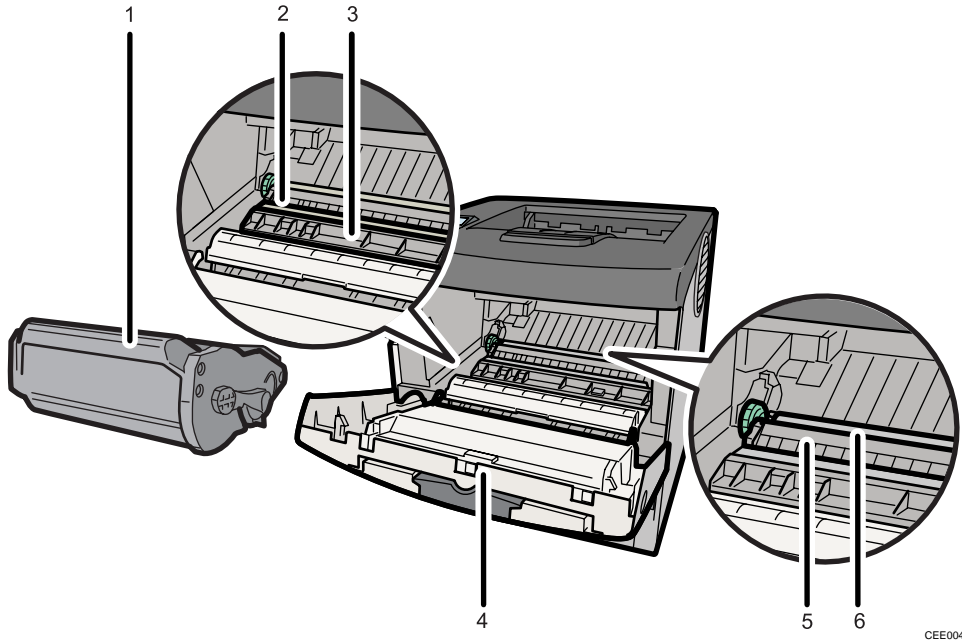
Use a USB cable to connect the printer to a computer.

10. USB Port A

Use a USB cable to connect the optional USB devices such as the authentication card reader.

Interior

Front view



1. Print Cartridge

Contains toner and the photo conductor unit.

When "Replace Print Cartridge." appears on the display, replace this unit.

See p.155 "Replacing the Print Cartridge".

2. Registration Roller

Feeds in sheets of paper for printing. Be sure to clean this roller if it becomes dirty.

See p.182 "Cleaning the Registration Roller".

3. Guide Board

Open this to remove jammed paper.

4. Front Cover

Open this to access the printer's interior.

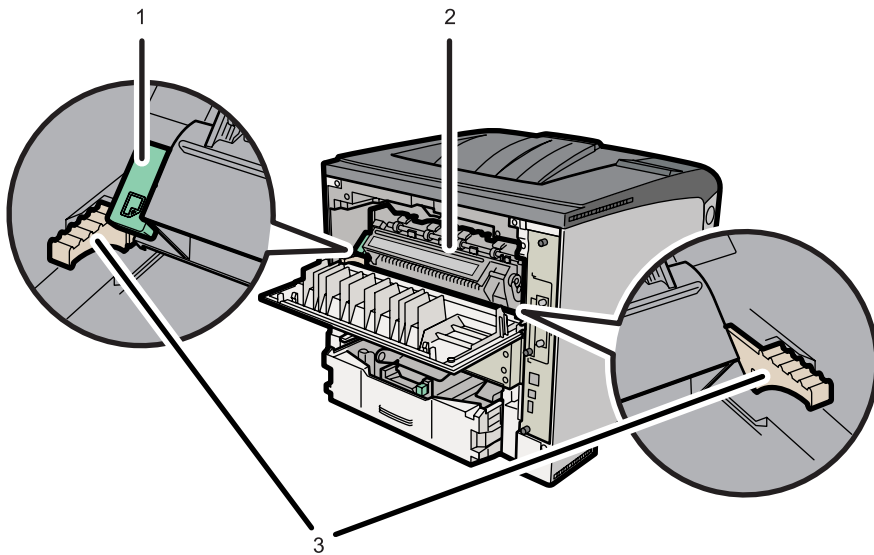
5. Transfer Roller Cover

Open this to replace the transfer roller.

6. Transfer Roller

When "Replacmnt Requd:Maint. Kit" appears on the display, replace this roller.

Rear view



CEE100

1. Envelope lever

Use this lever if envelopes become wrinkled during printing. Raising or lowering the envelope lever according to the thickness of the paper you are printing on can improve print quality.

2. Fusing Unit

Fuses print images onto paper.

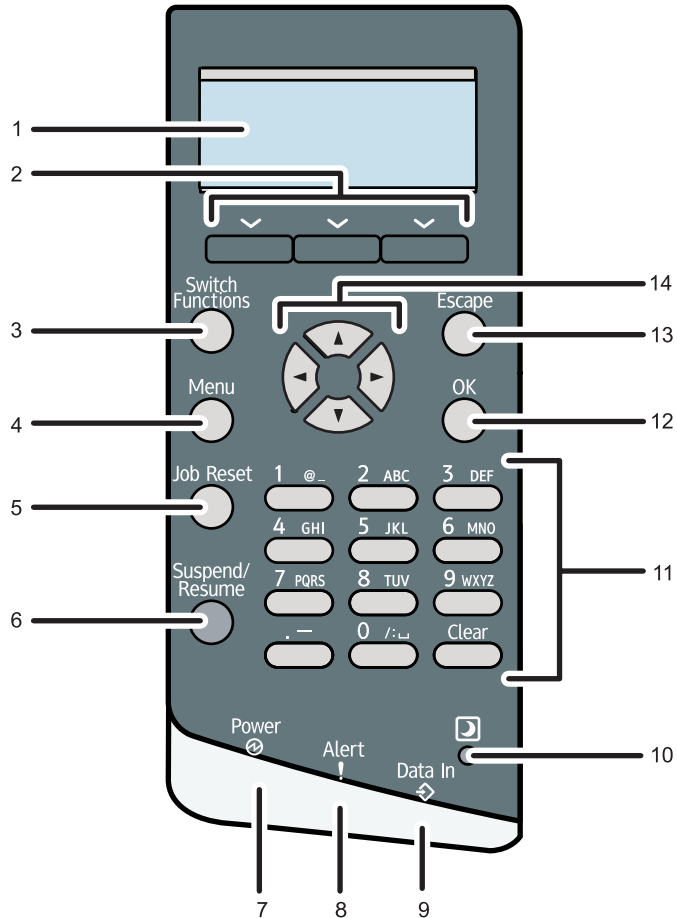
When "Replacmnt Requir:Maint. Kit" appears on the display, replace this unit.

3. Fusing Unit Lock Levers

Lift these levers to replace the fusing unit.

Control Panel

1



GEE121

1. Display

Displays current printer status and error messages.

Entering energy saver mode turns off the back light. For details about energy saver mode, see Software Guide.

2. Selection Keys

Correspond to the function items at the bottom line on the display.

Example: When this manual instructs you to press [Option], press the selection key on the left below the initial screen.

3. [Switch Functions] Key

Press this key to switch between the operation screen of the printer function and the function screens of the extended features currently in use.

4. [Menu] Key

Press this key to configure and check the current printer settings.

5. [Job Reset] Key

When the printer is online, press this key to cancel an ongoing print job.

6. [Suspend/Resume] Key

Press this to suspend the print job currently being processed. The indicator remains lit as long as the job is suspended.

To resume the job, press this key again. Resumption of a suspended job will occur automatically when the time specified in [Auto Reset Timer] elapses (default: **60 seconds**).

For details about the [Auto Reset Timer] setting, see "Making Printer Settings Using the Control Panel", Software Guide.

7. Power Indicator

Lights up when the printer is ready to receive data from a computer. Flashes when the printer is warming up or receiving data. It is unlit when the power is off or while the printer is in energy saver mode.

8. Alert Indicator

Lights up or flashes when a printer error occurs.

Steady red: printing is not possible.

Flashing yellow: the printer will soon require maintenance or a replacement consumable such as a print cartridge. Printing is possible, but print quality cannot be ensured.

Follow the instructions that appear on the display.

9. Data In Indicator

Flashes when the printer is receiving data from a computer. The data in indicator is lit if there is data to be printed.

10. Light Sensor

The sensor that detects the ambient light level when the ECO Night Sensor function is enabled.

11. Number Keys

Use these to enter characters or numbers.

12. [OK] Key

Use this key to confirm settings, or setting values, or move to the next menu level.

13. [Escape] Key

Press this key to cancel an operation or return to the previous display.

14. Scroll Keys

Press these keys to move the cursor in each direction.

When the [▲] [▼] [◀] [▶] keys appear in this manual, press the scroll key of the same direction.

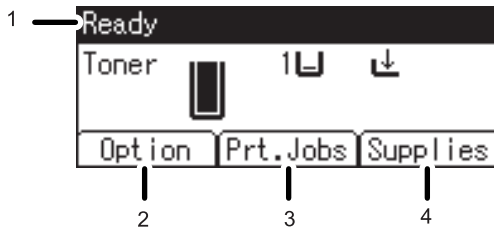
Display Panel

The items are highlighted when selected.

★ Important

- Do not touch the display panel.

The following screen appears when you turn on the printer.



CEC235

1. Operational Status or Messages

Displays the printer status or the messages.

2. [Option]

Press to display the following items:

- Form Feed
- Error Log

3. [Prt.Jobs]

Press to display print jobs sent from a computer.

4. [Supplies]

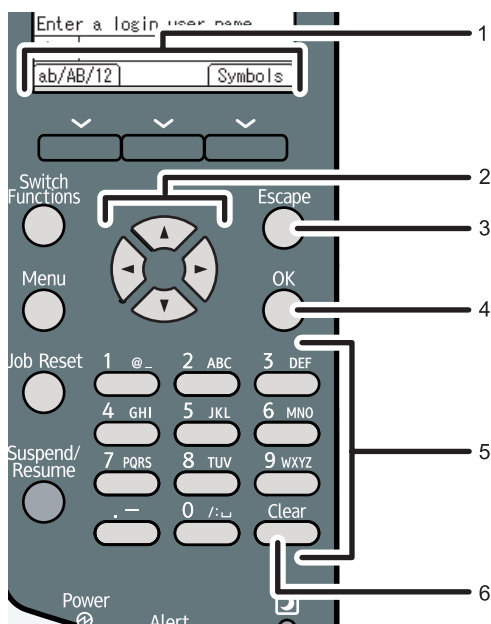
Press to display the information of supplies for the printer.

↓ Note

- [Prt.Jobs] is displayed only when the hard disk is installed in the printer.
- By default, the remaining amount of toner is displayed. To not display the remaining amount of toner, press the [Menu] key, and then select [Maintenance] on the display. Select [General Settings], then [Display Supply Info], and then select [Off].
- Adjust the brightness if the screen is dark. To adjust the display contrast, press the [Menu] key, and then select [Maintenance] on the display. Select [General Settings] and then [Display Contrast].

Entering Characters

When you enter a character, it will be displayed at the position indicated by the cursor. If a character is already displayed at the cursor position, the entered character will be displayed before that.



CEE122

1. Selection Keys

Correspond to the function items on the bottom line of the display.

Example: When this manual instructs you to press [ab/AB/12], press the selection key on the left below the text input screen.

Press the left selection key to switch the input mode between lowercase, uppercase, and numeric characters.

Press the right selection key to display a list of the symbols that you can enter.

2. Scroll Keys

Press to move the cursor in each direction.

When the [▲] [▼] [◀] [▶] keys appear in this manual, press the scroll key showing the same direction.

3. [Escape] Key

Clears the entered text and numbers, and returns the display to its previous state.

4. [OK] Key

Confirms the entered text and numbers, and displays the next menu.

5. Number Keys

To enter text using the number keys, select text input mode by pressing [ab/AB/12].

When you press a number key repeatedly, the character changes in the order indicated above the key you are pressing.

6. [Clear] Key

Deletes the character at the cursor position. You can delete a character at the far right side of a line even if the cursor is placed to the right of the character.

1

How to Enter Characters

Use the following procedure to enter text in the text input screen. ("User#2" is the text entered in this example.)

1. Press [ab/AB/12] to change the input mode to uppercase.

Login:	[OK]
Enter a login user name.	
abc	_
ab/AB/12	Symbols

2. Press the [8 TUV] two more times, and then press the [▶] key. A letter "U" is entered.

Login:	[OK]
Enter a login user name.	
ABC	U
ab/AB/12	Symbols

3. Press [ab/AB/12] two more times to change the input mode to lowercase.

Login:	[OK]
Enter a login user name.	
abc	U
ab/AB/12	Symbols

4. Press the [7 PQRS] key four times, and then press the [▶] key. A letter "s" is entered.

Login:	[OK]
Enter a login user name.	
abc	Us
ab/AB/12	Symbols

5. Press the [3 DEF] two more times, and then press the [▶] key. A letter "e" is entered.

Login:	[OK]
Enter a login user name.	
abc Use	
ab/AB/12	Symbols

6. Press the [7 PQRS] key three times, and then press the [▶] key. A letter "r" is entered.

Login:	[OK]
Enter a login user name.	
abc User	
ab/AB/12	Symbols

7. Press [Symbols] to display a list of the symbols you can enter.

Login:	[OK]
Enter a login user name.	
abc User	
ab/AB/12	Symbols

8. Use the scroll keys to select "#", and then press the [OK] key.

Symbols:	1/2	↔	[OK]
! " # \$ % & ' ()			
* + , - . / : ; <			
= > ? @ [\] ^ _			

The list of symbols disappears and a "#" symbol is entered.

Login:	[OK]
Enter a login user name.	
abc User#	
ab/AB/12	Symbols

9. Press [ab/AB/12] two more times to change the input mode to numeric.

Login:	[OK]
Enter a login user name.	
123 User#_	
ab/AB/12	Symbols

10. Press the [2 ABC] key. A number "2" is entered.

Login:	[OK]
Enter a login user name.	
123	User#2_
ab/AB/12	Symbols

11. Press the [OK] key to proceed to the next menu.

2. Setting Up the Printer

This chapter explains how to set up and configure the printer for operation.

Printer Setup Procedure

Use the following procedure to set up the printer.

2

1. Select a suitable location for your printer.

For details, see p.30 "Place to Install".

2. Take the printer out of its box, and then remove the protective materials and adhesive tape.

For details, see p.34 "Unpacking".

3. Load paper in the standard paper feed tray.

For details, see p.124 "Loading Paper in Trays".

4. Turn the printer power on.

For details, see p.40 "Turning the Printer's Power On and Off".

5. Select the language used on the display.

For details, see p.44 "Selecting the Display Language".

6. Print a test page.

For details, see p.45 "Test Printing".

7. Connect the printer to your network.

For details, see p.77 "Connecting the Printer".

8. Configure the printer's network settings.

For details, see p.85 "Configuration".

9. Install the printer driver.

For details, see Driver Installation Guide.

Place to Install

The printer's location should be carefully chosen because environmental conditions greatly affect its performance.

WARNING

- Do not use any frequencies other than those that match the specifications shown. Doing so could result in fire or electric shock.

WARNING

- Do not use any power sources other than those that match the specifications shown in "Safety Information". Doing so could result in fire or electric shock.

WARNING

- Do not use multi-socket adaptors. Doing so could result in fire or electric shock.

WARNING

- Do not use extension cords. Doing so could result in fire or electric shock.

WARNING

- Do not use power cords that are damaged, broken, or modified. Also, do not use power cords that have been trapped under heavy objects, pulled hard, or bent severely. Doing so could result in fire or electric shock.

WARNING

- Touching the prongs of the power cable's plug with anything metallic constitutes a fire and electric shock hazard.

WARNING

- The supplied power cord is for use with this machine only. Do not use it with other appliances. Doing so could result in fire, electric shock, or injury.

WARNING

- It is dangerous to handle the power cord plug with wet hands. Doing so could result in electric shock.

⚠ WARNING

- If the power cord is damaged and its inner wires are exposed or broken, contact your service representative for a replacement. Use of damaged power cords could result in fire or electric shock.

⚠ WARNING

- Be sure to locate the machine as close as possible to a wall outlet. This will allow easy disconnection of the power cord in the event of an emergency.

⚠ WARNING

- Do not use flammable sprays or solvents in the vicinity of this machine. Doing so could result in fire or electric shock.

⚠ CAUTION

- Keep the machine away from humidity and dust. Otherwise a fire or an electric shock might occur.

⚠ CAUTION

- Do not place the machine on an unstable or tilted surface. If it topples over, an injury might occur.

⚠ CAUTION

- Make sure the room where you are using the machine is well ventilated and spacious. Good ventilation is especially important when the machine is used heavily.

⚠ CAUTION

- Keep the machine away from salt-bearing air and corrosive gases. Also, do not install the machine in places where chemical reactions are likely (laboratories, etc.), as doing so will cause the machine to malfunction.

⚠ CAUTION

- Be sure to disconnect the plug from the wall outlet and clean the prongs and the area around the prongs at least once a year. Allowing dust to build up on the plug constitutes a fire hazard.

⚠ CAUTION

- Machine sound levels exceeding [Sound Power Level (Black and White)] > 63 dB (A) are not suitable for desk work environments, so place the machine in another room.

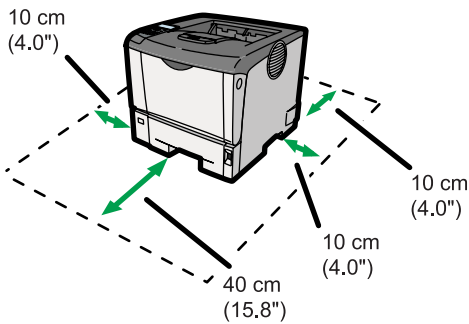
⚠ CAUTION

- When new, electrical devices containing volatile materials will normally release emissions into the air of their vicinity. For this reason, for the first few days after installation of a new device, strong ventilation inside the room where it is placed is necessary.

2

Space Required for Installation

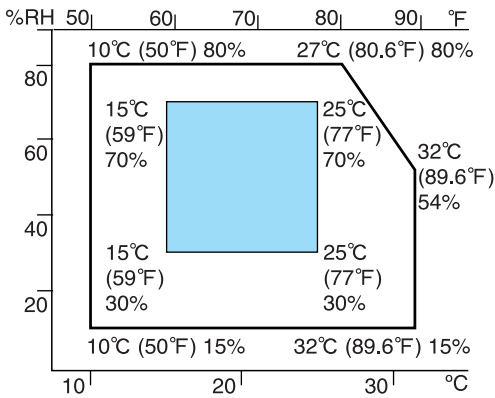
The recommended (or minimum) space requirements are as follows:



CEE094

Optimum Environmental Conditions

Permissible and recommended temperature and humidity ranges are as follows:



CBK019

- White area: Permissible Range
- Blue area: Recommended Range

↓ Note

- The printer must be level within 5 mm, 0.2" from both front to rear and left to right.

- When you use this printer for a long time in a confined space without good ventilation, you may detect an odd smell. To keep the workplace comfortable, we recommend you keep it well ventilated.

Ventilation

When you use this machine in a confined space without good ventilation for a long time or print large quantities, you might detect an odd smell.

This might cause the output paper to also have an odd smell.

When you detect an odd smell, regularly ventilate in order to keep the workplace comfortable.

- Set up the machine so that it does not directly ventilate towards people.
- Ventilation should be more than 30 m³/hr/person.

New machine smell

When a machine is new, it might have a unique smell. This smell will subside in about one week.

When you detect an odd smell, sufficiently ventilate and circulate the air in the room.

Environments to Avoid


Do not use the printer in the following environments:


★ Important

- Areas exposed to direct sunlight or strong light
- Dusty areas
- Areas with corrosive gases
- Areas that are excessively cold, hot, or humid
- Areas directly exposed to currents of hot, cold, or room-temperature air from air conditioners
- Areas directly exposed to radiant heat from heaters
- Locations near air conditioners, heaters, or humidifiers
- Locations near other electronic equipment
- Locations subject to frequent strong vibration

Power Source

Connect the power cord to a power source of the following specification:

 **Region A** (mainly Europe and Asia)
220 - 240 V, 50/ 60 Hz, 4.3 A or more

 **Region B** (mainly North America)
120 V, 60 Hz, 8 A or more

Unpacking

To protect it from shock and vibration during transit, this printer comes packaged in cushioning foam and secured with tape. Remove these protective materials after bringing the machine to where it will be installed.

WARNING

- Keep the polythene materials (bags, etc.) supplied with this machine away from babies and small children at all times. Suffocation can result if polythene materials are brought into contact with the mouth or nose.

WARNING

- Do not incinerate toner (new or used) or toner containers. Doing so risks burns. Toner will ignite on contact with naked flame.

CAUTION

- Do not crush or squeeze toner containers. Doing so can cause toner spillage, possibly resulting in dirtying of skin, clothing, and floor, and accidental ingestion.

CAUTION

- Store toner (new or used), toner containers, and components that have been in contact with toner out of reach of children.

CAUTION

- If toner or used toner is inhaled, gargle with plenty of water and move into a fresh air environment. Consult a doctor if necessary.

CAUTION

- If toner or used toner gets into your eyes, flush immediately with large amounts of water. Consult a doctor if necessary.

CAUTION

- If toner or used toner is swallowed, dilute by drinking a large amount of water. Consult a doctor if necessary.

CAUTION

- When lifting the machine, use the inset grips on both sides. The printer could break or cause an injury if dropped.

★ Important

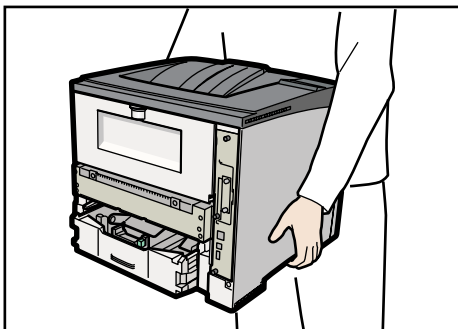
- Removed tape is dirty. Be careful not to let it touch your hands or clothes.
- Do not grip on the tray area when lifting the printer.
- Do not allow paper clips, staples, or other small metallic objects to fall inside the printer.
- Keep the uncovered print cartridge away from direct sunlight.
- When you use this printer for the first time, use the print cartridge packaged with the printer.
- Be sure to remove the tape completely before installing the print cartridge. Otherwise, the printer might be damaged.
- If you pull out the strips when the print cartridge is slant or standing on its side, the cartridge might cause trouble with the printer.
- Be sure to pull the tape horizontally. Pulling it upward or downward may cause the toner to scatter.
- After pulling the tape out of the cartridge, toner scatters easily. Do not shake the cartridge.

↓ Note

- Print cartridge (consumables) are not covered by warranty. However, if there is problem, contact the store where they were purchased.

1. Remove the plastic bag.**2. Lift the printer by using the inset grips on both sides of the printer.**

Leave the tape holding the paper feed tray and cover in place while moving the printer. Lower the machine slowly and carefully to prevent trapping your hands.

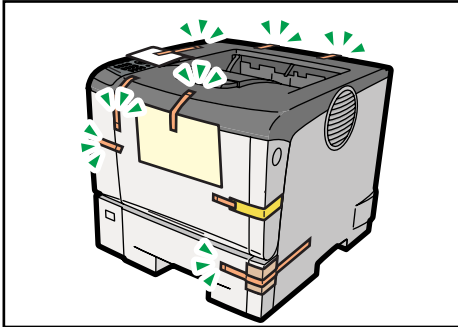


CEE039

When moving the printer, do not hold on the following parts as doing so could cause a malfunction:

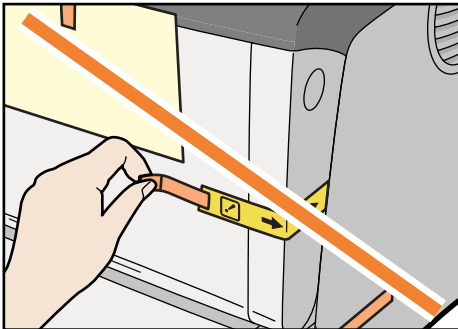
- The handle onto the standard paper feed tray.
- The underside of the bypass tray.

3. Remove the adhesive tape.



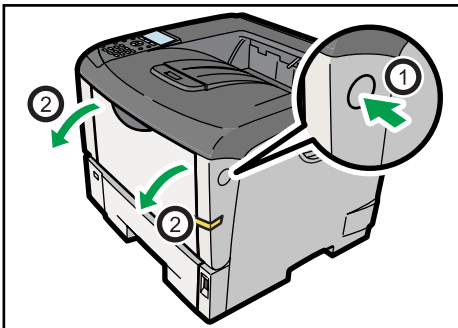
CEE112

Do not remove the tape shown in the illustration.



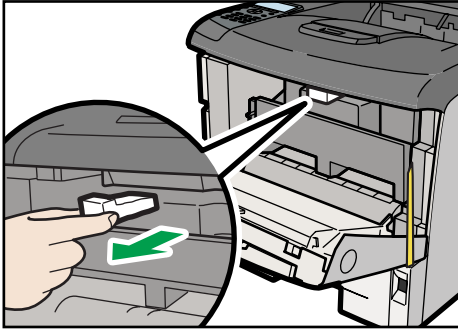
CEE113

4. Open the front cover by pushing the front cover release button.



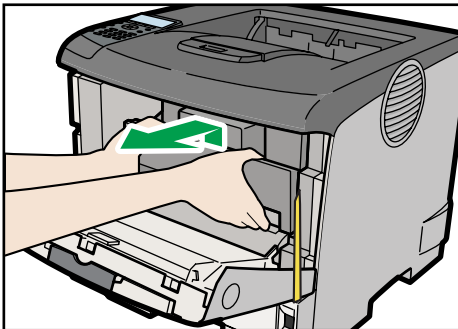
CEE019

5. Remove the packing material inserted between the print cartridge and the printer.



CEE114

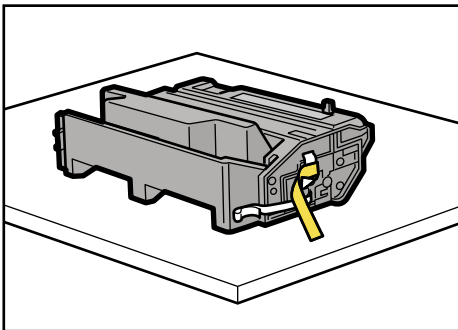
6. Lift the front side of the print cartridge, and then pull it out of the printer.



CEE021

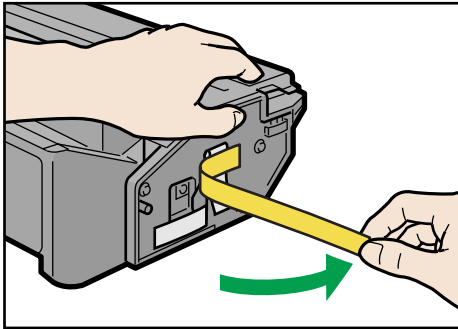
↓ Note

- Do not hold the print cartridge upside down or stand it vertically.
- Do not place the print cartridge on an unstable or tilted surface.



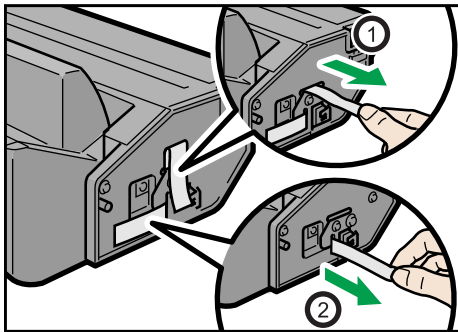
CEE118

7. Place the print cartridge on a flat surface. Remove the tape as shown in the illustration.



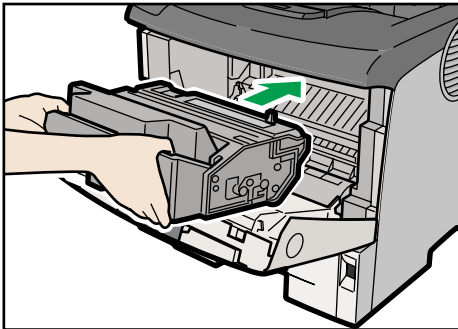
CEE072

8. Pull out the tape from inside the unit horizontally while holding the cartridge with one hand as shown in the illustration.



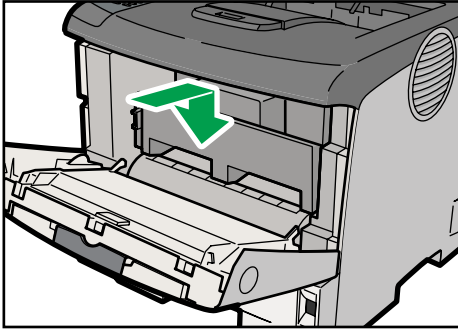
CEE115

9. Hold the grips of the print cartridge, and then insert it into the printer until it stops.



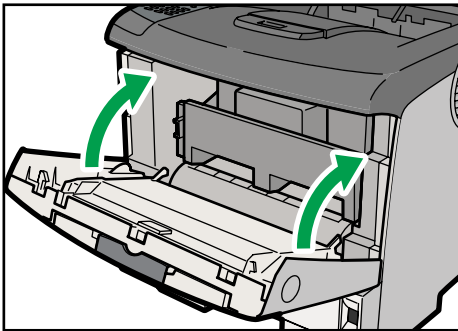
CEE009

10. Push down the print cartridge to secure it in the appropriate position.



CEE007

11. Close the front cover.



CEE005

↓ **Note**

- Do not close the front cover with force. If you cannot close the cover easily, pull out the print cartridge from the printer and insert it again. After that, close the front cover again.
- Dispose of removed fixing material and tape in the same manner as ordinary plastic waste.

Turning the Printer's Power On and Off

⚠ WARNING

- It is dangerous to handle the power cord plug with wet hands. Doing so could result in electric shock.

★ Important

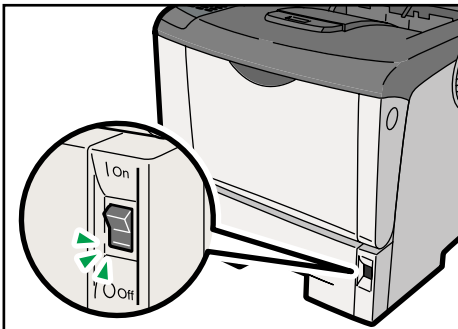
- Do not turn off the power switch before following the shutdown procedure shown here. Doing so can result in damage to the hard disk or memory, leading to malfunction.
- Do not physically disturb the printer while printing is in progress. Doing so may damage the printer.

Turning on the Power

★ Important

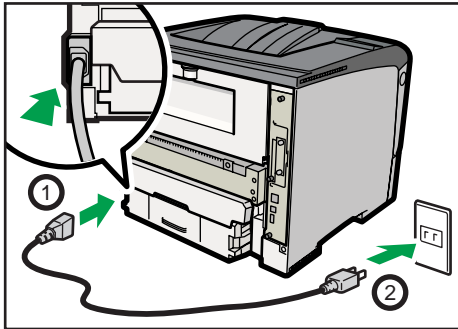
- Make sure the power cord is plugged securely into the wall outlet.
- Turn the power switch off when plugging and unplugging the power plug.
- Do not turn off the power switch until initializing is completed. Doing so results in malfunction.

1. Make sure the power switch is set to "○ Off".



CEE101

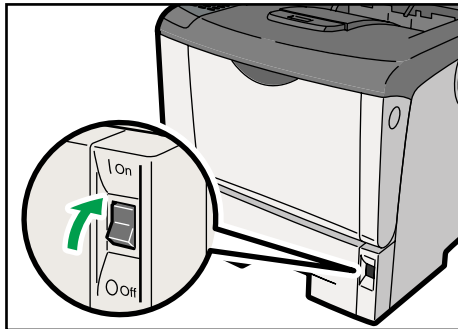
2. Plug in the power cable, and securely insert the plug of the power cord into the wall socket.



CEE079

3. Turn the power switch to "I On".

The power indicator on the control panel lights up.



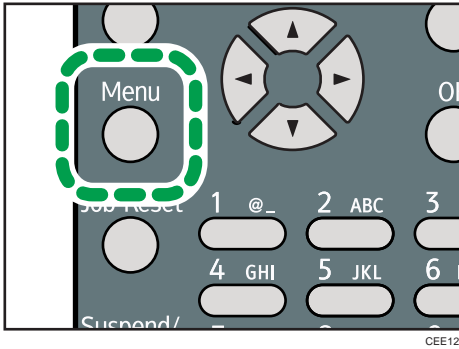
CEE015

Note

- Wait until "Ready" appears on the display panel.
- The printer may make a noise while initializing. This noise does not indicate a malfunction.

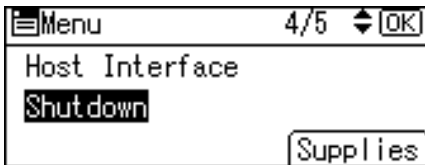
Turning off the Power

1. Press the [Menu] key.

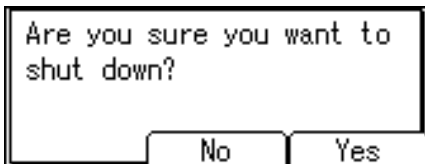


CEE128

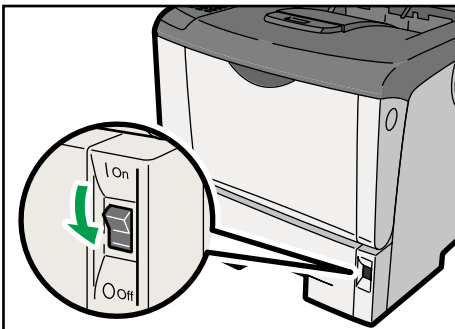
2. Press the [▼] or [▲] key to select [Shutdown], and then press the [OK] key.



3. Press [Yes].



4. Wait until a screen prompting you to turn off the main power appears, and then turn the power switch to "O Off".



CEE016

↓ Note

- Even if you follow the shutdown procedure, the printer might not shutdown in the following cases:
 - If it is communicating with external devices.

- If the hard disk is active.
- If the printer's cover is opened.

Saving Energy

This printer has energy saving functions to reduce electrical power consumption. While in Auto Off mode, the printer uses less electricity than usual. The following are descriptions of this printer's three energy saving functions:

2

Auto Off

The printer will automatically go into Auto Off mode when a certain period of time elapses following the last operation or print.

Auto Off Scheduler

The printer goes into Auto Off mode based on the user-specified timing such as time and day of the week.

ECO Night Sensor

The printer will automatically go into Auto Off mode if it detects a low ambient brightness around it such as at night.

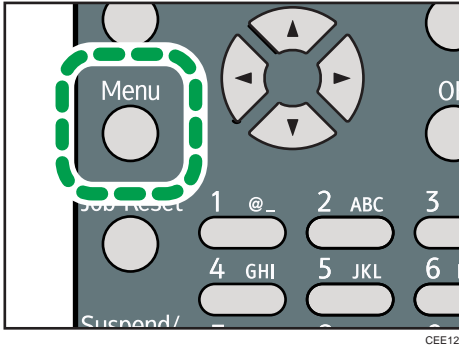
Note

- When the printer is in Auto Off mode, almost no electrical power is used, but it takes longer for the printer to start printing. For details about the printer's power consumption while in Auto Off mode, see p.235 "Specifications".
- "Energy Saver Mode" appears on the control panel while the printer is in Auto Off mode. Auto Off mode is released when you operate the control panel of the printer, or a print job is received.
- The printer does not go into Auto Off mode if it detects a paper jam or an error, or a cover is open.
- When more than one power saving function is enabled simultaneously, the one whose activation requirement is met the earliest will be activated.
- The settings can be configured in [System] that appears by pressing the [Menu] key on the control panel. For details, see "System Menu", Software Guide.
- The default value for each setting item is as follows:

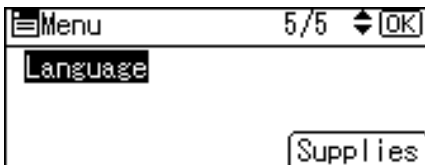
Configurable Items	Default
Auto Off	On (1 minute)
Auto Off Scheduler	Inactive
ECO Night Sensor	Inactive

Selecting the Display Language

1. Press the [Menu] key.



2. Press the [▼] or [▲] key to select [Language], and then press the [OK] key.



3. Press the [▼] or [▲] key to select the preferred language, and then press the [OK] key.



4. Press the [Menu] key to return to the initial screen.

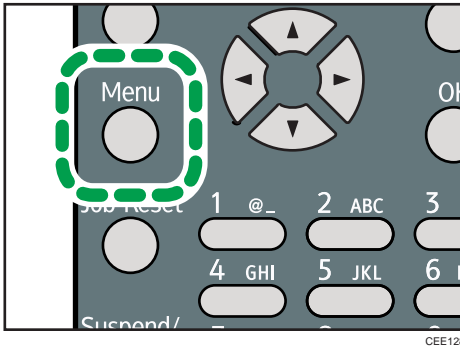
↓ Note

- The default setting is English.

Test Printing

Print a test print in order to verify that the printer is working normally. Test printing checks printer performance only; it does not test the connection to the computer.

1. Press the [Menu] key.



2

2. Press the [▼] or [▲] key to select [List/Test Print], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Config. Page], and then press the [OK] key.



4. Press the [Menu] key to return to the initial screen.

↓ Note

- If printing is not normal, check to see if an error message appears on the display. If there is an error message, see p.191 "Troubleshooting".

3. Installing Options

This chapter explains how to install various options for this printer.

Available Options

By installing options, you can improve printer performance and expand the available features.

CAUTION

- Before installing or removing options, always disconnect the power cord plugs from the wall outlet and allow time for the main unit to fully cool. Failing to take these precautions could result in burns.

3

Order of Option Installation

When installing multiple options, the following order is recommended:

1. Attach the paper feed unit.

Attach the paper feed unit to the bottom of the printer.

You can attach up to two paper feed unit. Up to 1,600 sheets of paper can be loaded in total.

2. Attach the envelope feeder.

Replace the paper tray for the optional feeder with the envelope feeder.

3. Install the SDRAM module.

Install the expansion memory in the controller board slot.

There are two types of SDRAM module, 128 MB and 256 MB.

4. Install the hard disk.

5. Install the optional interface board.

Install the optional Gigabit Ethernet board, Wireless LAN interface unit, or IEEE 1284 interface board in the slot.

6. Insert SD card options.

If you want to use three or more SD cards simultaneously, consult your service representative.

Insert these units into the SD card slot.

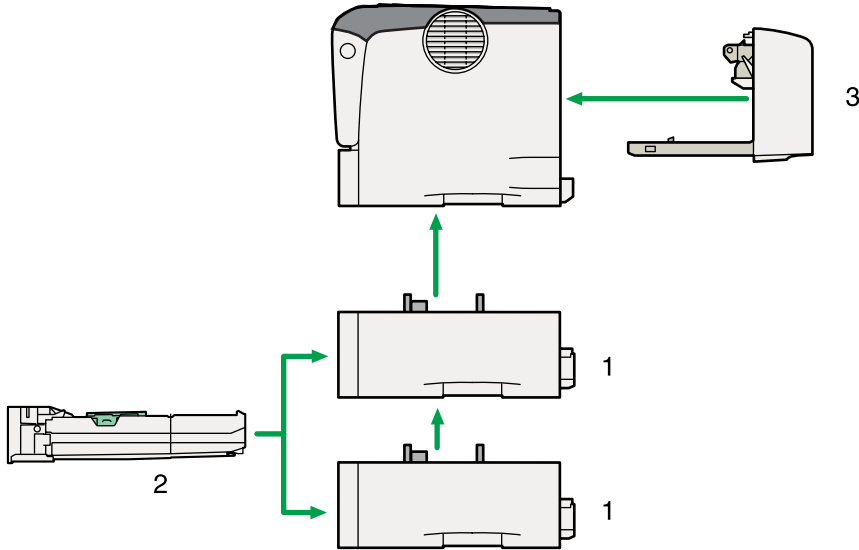
If you want to use two or more SD cards that can be inserted in the same slot, contact your sales and service representative.

7. Attach the duplex unit.

Attach the duplex unit to the rear of the printer.

Where to Install Options

External options



CEE098

1. Paper feed unit (Tray 2 or Tray 3)

Loads up to 500 sheets of paper. Up to two paper feed unit can be installed on the printer.

Installed tray unit is identified as "Tray 2" and "Tray 3".

See p.51 "Attaching the Paper Feed Unit".

2. Envelope feeder

Loads up to 60 sheets of envelopes. Up to two envelope feeder unit can be installed on the printer.

Installed envelope feeder unit is identified as "Tray 2" and "Tray 3".

See p.54 "Attaching the Envelope Feeder".

3. Duplex unit

You can print on both sides of paper.

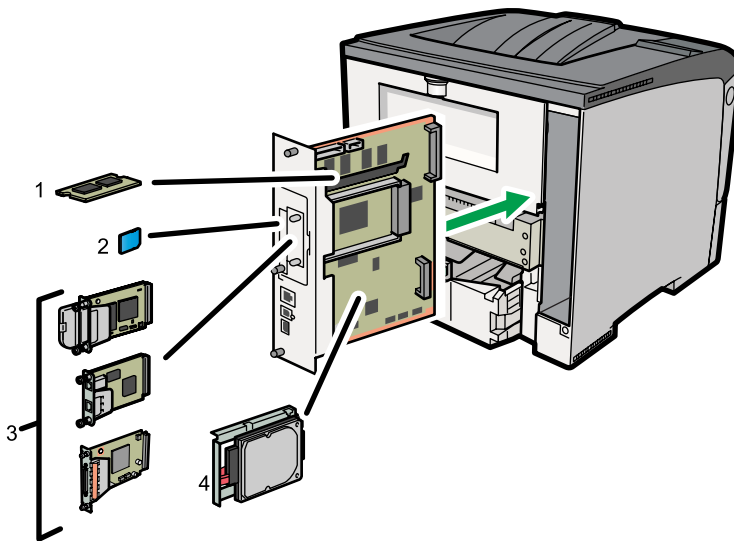
Remove the rear cover of the printer to attach the duplex unit.

See p.74 "Attaching the Duplex Unit".

↓ Note

- The envelope feeder is a tray that slides into the optional paper feed unit. Without the optional paper feed unit, the envelope feeder cannot be used.

Internal options



CEE104

1. SDRAM module

For details about this option, see p.60 "Installing the SDRAM Module".

2. SD card options

For details about installing these options, see p.71 "Installing the SD Memory Card Options".

3. Optional interface boards

- Wireless LAN interface unit
- Gigabit Ethernet board
- IEEE 1284 interface board

For details about installing these options, see p.64 "Installing the Interface Units".

4. Hard disk

For details about this option, see p.56 "Installing the Hard Disk".

↓ Note

- For details about the specifications of each option, see p.235 "Specifications".

Caution When Re-installing the Controller Board

This section describes how to handle the controller board when installing options.

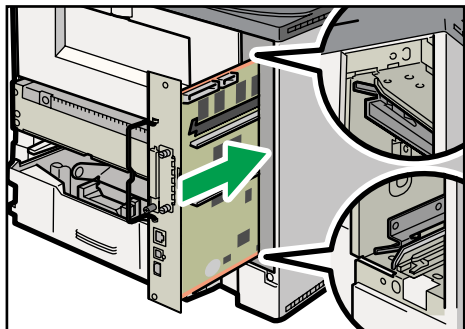
If you slide out the controller board to install units, carefully read the instructions about re-installing the controller board.

★ Important

- The following may occur if the controller board is not properly installed:

- All control panel indicators light up.
- No control panel indicators light up.
- An error message appears on the display.

Push the bottom center area of the board to re-install the controller board in the printer.



CEE059

Attaching the Paper Feed Unit

WARNING

- If the machine topples, or if a cover or other part gets broken, you must turn the power switch to off and disconnect the power cord plug from the wall outlet. Then contact your service representative and report the problem. Do not use the machine. Doing so could result in fire or electric shock.

CAUTION

- The printer weighs approximately 17.5 kg (38.6 lb.). When moving the printer, use the inset grips on both sides, and lift slowly. The printer will break or cause injury if dropped.

CAUTION

- Unplug the power cord from the wall outlet before you move the machine. While moving the machine, take care that the power cord is not damaged under the machine. Failing to take these precautions could result in fire or electric shock.

CAUTION

- Do not place the machine on an unstable or tilted surface. If it topples over, an injury might occur.

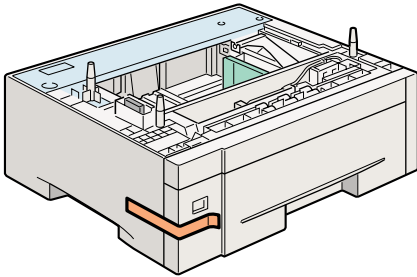
CAUTION

- Lifting the paper feed unit carelessly or dropping it may cause injury.

Important

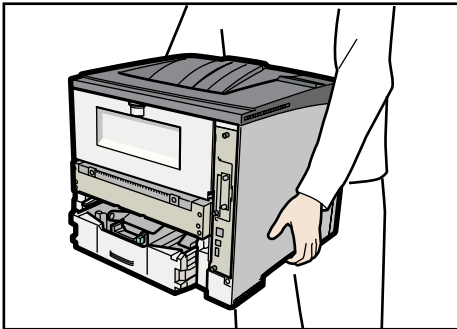
- Do not grip on the tray area when lifting the printer.
- When four paper feed units are installed, they are detected as "Tray 2" and "Tray 3", starting from the upper unit.
- Tray 1 is required to print using the optional paper feed unit. Without Tray 1, paper jams will occur.
- Do not grip on the tray area when lifting the printer.

1. Check the package contains the following:



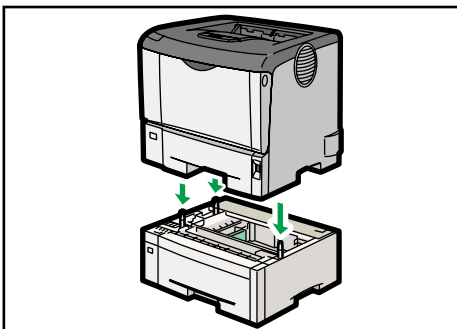
BMU107S

2. Turn off the printer's power switch, and then unplug the printer's power cord from the wall outlet.
3. Remove the adhesive tape from the optional paper feed unit.
4. Lift the printer using the inset grips on both sides of the printer.



CEE039

5. There are three upright pins on the optional paper feed unit. Align them with the holes on the underside of the printer, and then carefully lower the printer.



CEE080

6. After installing the option, print the configuration page to confirm the installation.

Note

- When moving the printer, remove the paper feed unit.

- After finishing the installation, you can check whether the paper feed unit is properly installed by printing the configuration page from the [List/Test Print] menu. If the paper feed unit is properly installed, "Tray 2" and "Tray 3" will appear for "Attached Equipment" on the configuration page.
- If the paper feed unit is not installed properly, reinstall it following this procedure. If you cannot install it properly even after attempting reinstallation, contact your sales or service representative.
- If the print area is not centered correctly, adjust the printing position for the optional paper feed unit. For details, see Adjusting Tray Registration.
- For details about printing the configuration page, see p.45 "Test Printing".
- For details about loading paper onto the paper tray, see p.124 "Loading Paper in Trays".
- After a new paper feed unit has been installed, the driver settings might need to be reconfigured. For details, see "Making Option Settings for the Printer", Driver Installation Guide.
- To attach two paper feed units at the same time, first stack them one upon the other, and then attach them as a single unit.

Attaching the Envelope Feeder

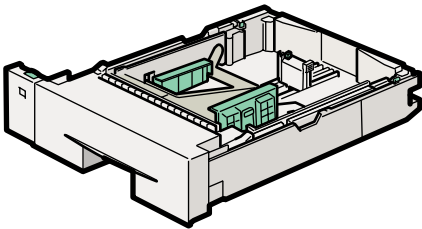
★ Important

- Pull out only one paper tray at a time. Having multiple paper trays fully extended could cause the printer to fall over.
- The printer can accommodate two optional paper feed units. The envelope feeder can be used with "Tray 2" and "Tray 3". The main unit's feed tray (Tray 1) cannot be used for this purpose.

3

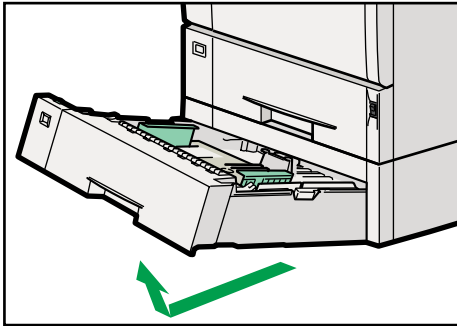
This section describes the procedure to install the envelope feeder unit using Tray 2 as an example.

1. Check the package contains the following:



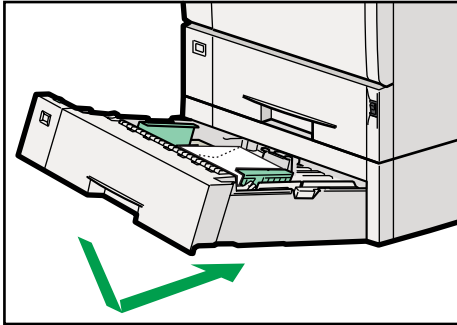
CEE034

2. Pull out the optional paper tray (Tray 2) from the optional paper feed unit until it stops. Then lift the front slightly and pull it out completely.



CEE075

3. Lift the front of the envelope feeder, and slide it carefully into the paper feed until it stops.



CEE073

Note

- This unit is a tray that slides into the optional paper feed unit. Without the optional paper feed unit, this envelope feeder cannot be used.
- Keep the removed paper tray with paper in a cool dark place.
- For details about loading paper onto the envelope feeder, see p. 124 "Loading Paper in Trays".

Installing the Memory Expansion Units

⚠ CAUTION

- Do not touch the inside of the controller board compartment. Doing so may cause a machine malfunction or a burn.

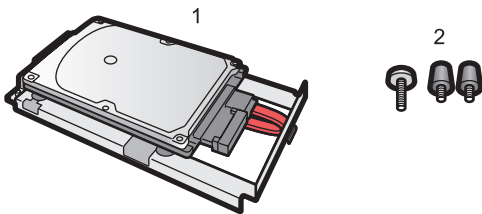
3

Installing the Hard Disk

★ Important

- Before touching the hard disk, touch something metal to discharge any static electricity. Static electricity can damage the hard disk.
- Do not subject the hard disk to physical shocks.

1. Check the package contains the following:

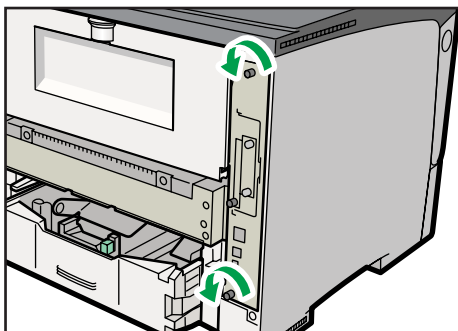


CEC015

1. Hard disk

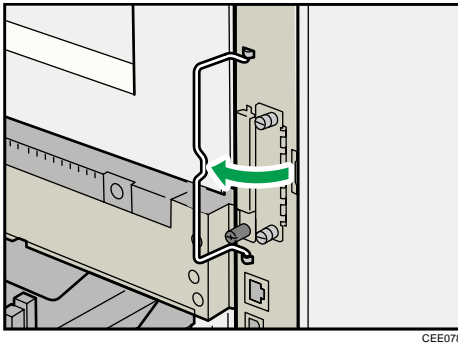
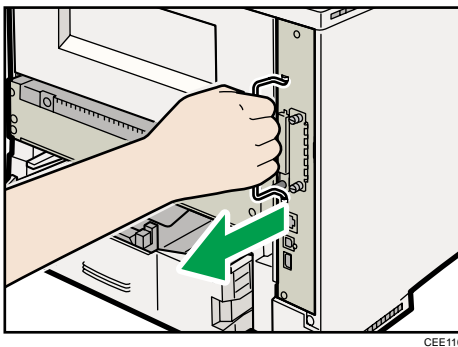
2. Screws

2. Turn off the power to the printer, and then unplug the power cable and interface cable.
3. Remove the two screws holding the controller board in place.

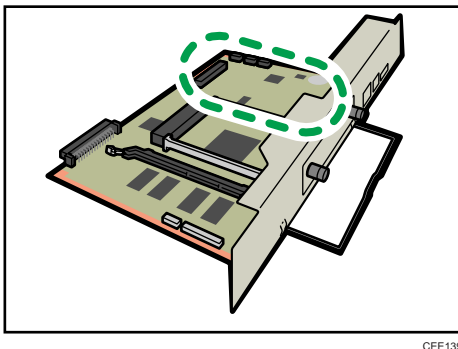


CEE137

The removed screws are required to fasten the controller board.

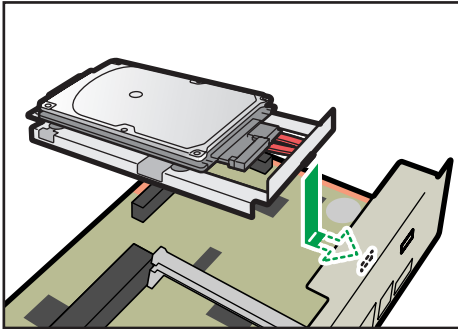
4. Pull out the handle of the controller board.**5. Pull the handle, and then slide the controller board out.****6. Place the controller board on a flat surface.**

The hard disk is installed in the slot shown in the illustration below.

**7. Insert the protrusion on the front end of the hard disk board into the notch on the back panel of the controller board.**

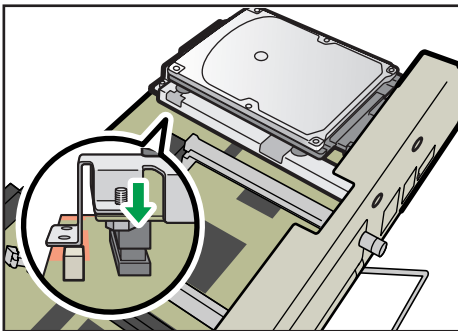
Be sure to set the hard disk board parallel with the controller board.

3



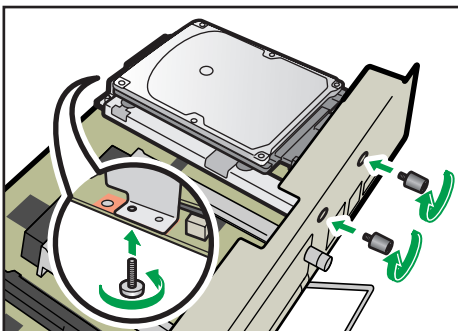
CEE105

8. Fit the hard disk on the connector of the controller board carefully until it stops.



CEE140

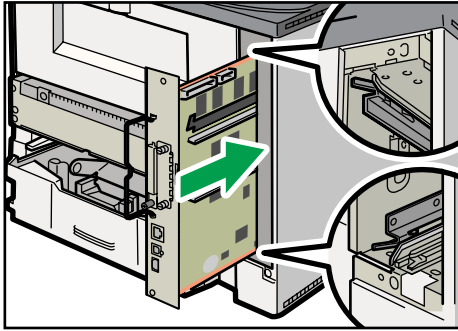
9. Tighten the two screws by turning them clockwise with a coin, and then secure the hard disk board by tightening the third screw from the under side of the controller board.



CEE141

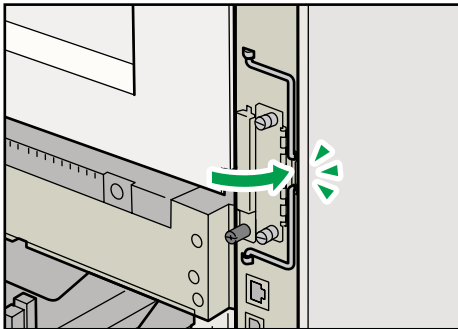
10. To install other options on the controller board, follow the installation procedure shown in the documentation provided with the option.
11. Match the controller board to the top and bottom rail using the "▼" mark, and then slide it into the printer slowly until it stops.

The printer may malfunction if the controller board is not properly installed.



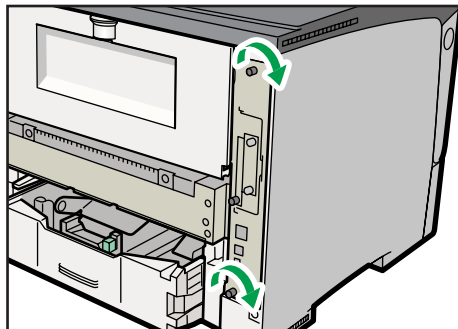
CEE059

12. Push the handle of the controller board until it clicks.



CEE106

13. Fasten the controller board to the printer with the two screws.



CEE138

First install the optional hard disk, and then install the SD card provided with the hard disk. For details about the installation procedure, see p.71 "Installing the SD Memory Card Options".

↓ **Note**

- After finishing installation, you can check whether the hard disk is properly installed: Print the configuration page from the [List/Test Print] menu. If it is installed properly, you will see "Hard Disk" will appear for "Device Connection" on the configuration page.
- If the Hard disk is not properly installed, repeat this procedure. If you cannot install it properly even after reinstallation, contact your sales or service representative.

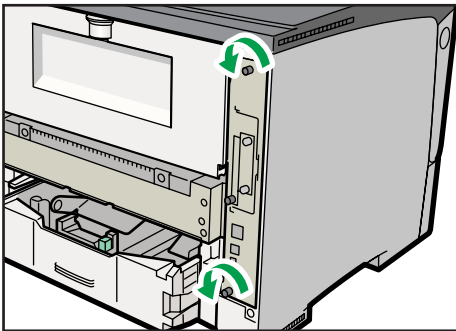
- For details on printing the configuration page, see p.45 "Test Printing".

Installing the SDRAM Module

★ Important

- Before touching the SDRAM module, ground yourself by touching something metal to discharge any static electricity. Static electricity can damage the SDRAM module.
- Do not subject the SDRAM module to physical shocks.
- The printer comes equipped with 256 MB of memory. This can be expanded to a maximum of 512 MB.

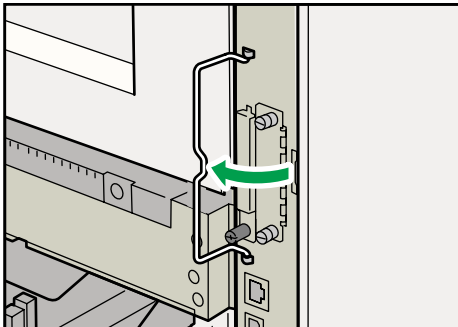
1. Turn off the power of the printer, and then unplug the power cable and interface cable.
2. Remove the two screws holding the controller board in place.



CEE137

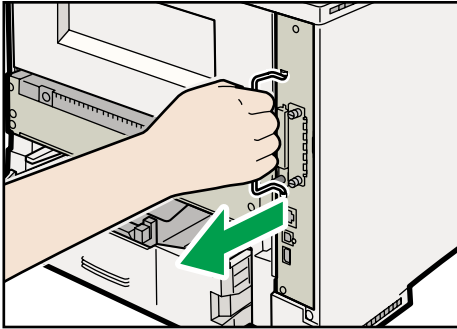
The removed screws are required to fasten the controller board.

3. Pull out the handle of the controller board.



CEE078

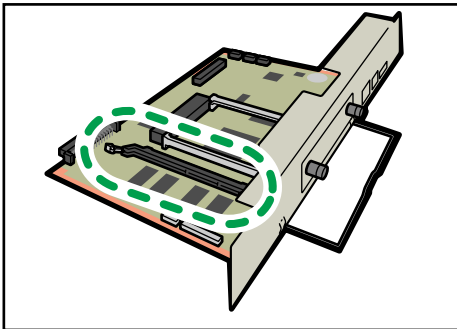
4. Pull the handle, and then slide the controller board out.



CEE110

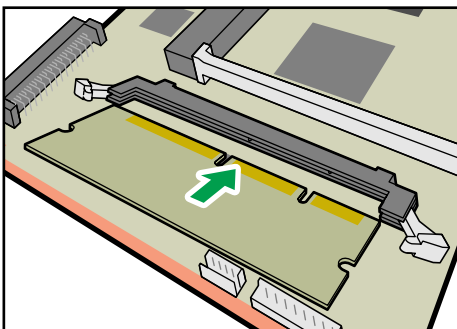
5. Place the controller board on a flat surface.

The SDRAM module is installed in the slot shown in the illustration below.



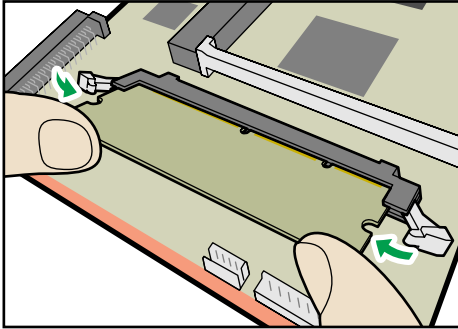
CEE142

6. To install the recommended memory, align the notch of the recommended memory with the protruding part of the vacant slot, and then carefully insert the module at an angle.



CEC013

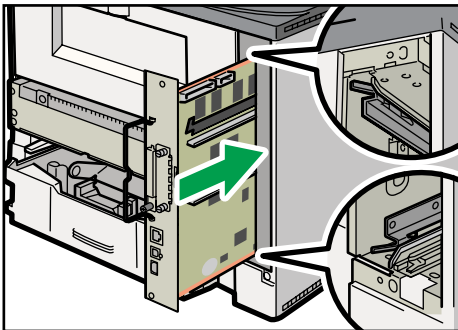
7. Keeping the module at an angle, press it down until it clicks into place.



CEE014

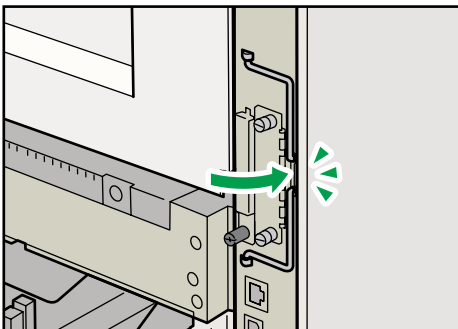
8. Match the controller board to the top and bottom rail using the "▼" mark, and then slide it into the printer slowly until it stops.

The printer may malfunction if the controller board is not properly installed.



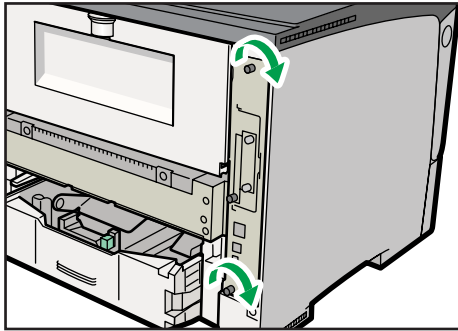
CEE059

9. Push the handle of the controller board until it clicks.



CEE106

10. Fasten the controller board to the printer with the two screws.



CEE138

3

↓ Note

- After finishing the installation, you can check the SDRAM module is properly installed: Print the configuration page from the [List/Test Print] menu. If it is installed properly, the memory capacity will appear under "Total Memory" on the configuration page.
- The table below shows the total SDRAM module capacities.

Standard	Extended	Total
256 MB	128 MB	384 MB
256 MB	256 MB	512 MB

- If the SDRAM module is not properly installed, repeat this procedure. If you cannot install it properly even after reinstallation, contact your sales or service representative.
- Install the controller board carefully to prevent any malfunction.
- For details on printing the configuration page, see p.45 "Test Printing".

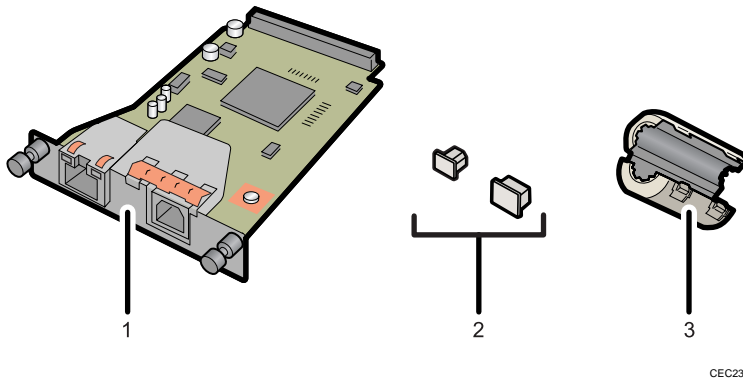
Installing the Interface Units

Installing the Gigabit Ethernet Board

★ Important

- The printer's Ethernet and USB ports are not available when the Gigabit Ethernet board is installed in to the printer. Use the Ethernet and USB ports on the Gigabit Ethernet board.
- Before beginning work, ground yourself by touching something metal to discharge any static electricity. Static electricity can damage the Gigabit Ethernet board.
- Do not subject the Gigabit Ethernet board to physical shocks.

1. Check the contents of the package.

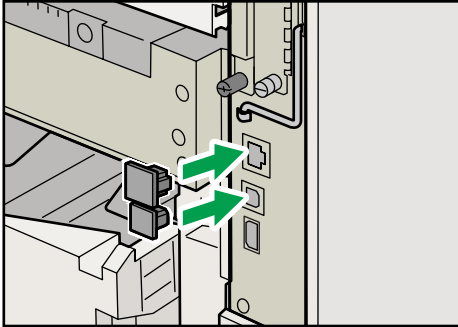


1. Gigabit Ethernet Board
2. Protective caps (one each for the Ethernet port and the USB port)
3. Ferrite core

Design of the ferrite core varies according to printer model.

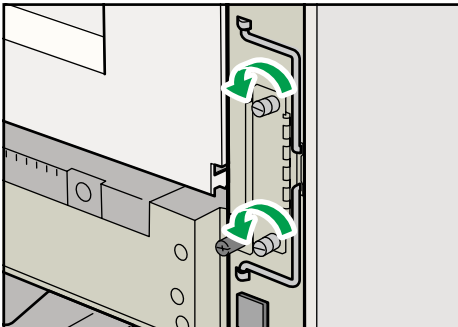
2. Turn off the power, and then unplug the power cord.

3. Disconnect the cables from the Ethernet port and the USB port of the printer, and cover each port with its protective cap.



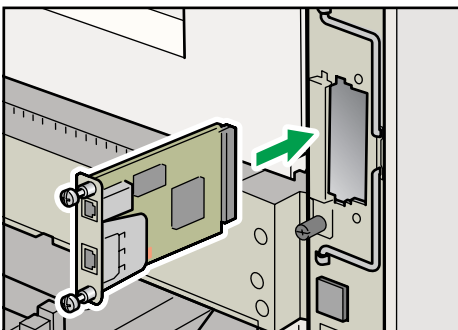
CEE143

4. Remove the two screws and remove the cover of the slot in which the Gigabit Ethernet board is installed.



CEE144

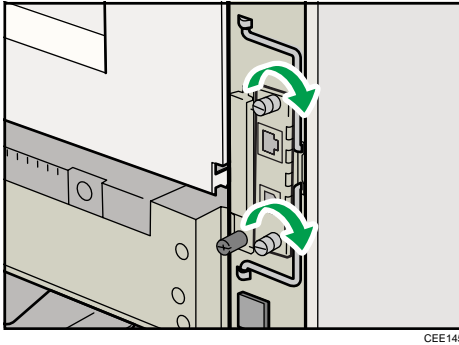
5. Fully insert the Gigabit Ethernet board.



CEE146

6. Tighten the two screws to secure the Gigabit Ethernet board.

Check the Gigabit Ethernet board is connected firmly to the interface board slot.



3

Connect the cable to the Gigabit Ethernet board. For details see p.77 "Ethernet Cable Connection" or p.81 "USB Cable Connection".

Note

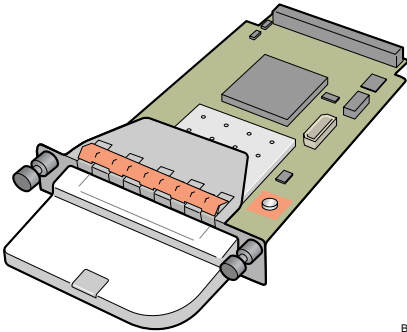
- Confirm that the Gigabit Ethernet board was correctly installed by printing the configuration page. If it is correctly installed, "Gigabit Ethernet" will appear for "Device Connection" on the configuration page.
- If the board was not installed properly, repeat the procedure from step 4. If it cannot be installed correctly even after reattempting installation, contact your sales or service representative.
- For details about printing the configuration page, see p.45 "Test Printing".
- Before using the Gigabit Ethernet board, you must configure settings from the printer control panel. For details, see p.85 "Ethernet Configuration".

Installing the Wireless LAN Interface Board

Important

- Before beginning work, ground yourself by touching something metal to discharge any static electricity. Static electricity can damage the unit.
- Do not subject the unit to physical shocks.

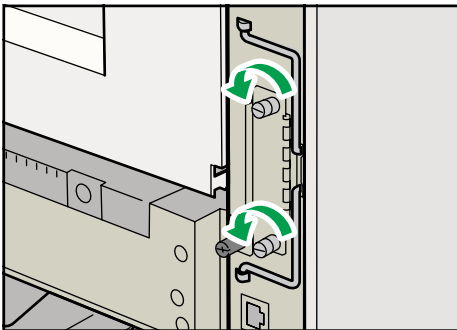
1. Check the contents of the package.



BFL301S

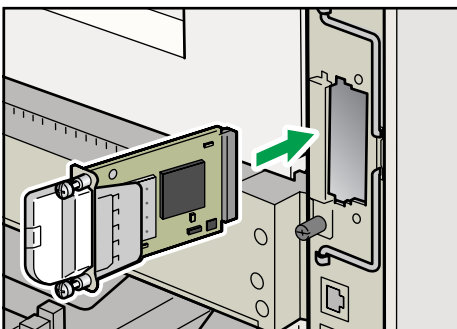
3

2. Turn off the power, and then unplug the power cord.
3. Remove the two screws and remove the cover of the slot in which the Wireless LAN interface board is installed.



CEE147

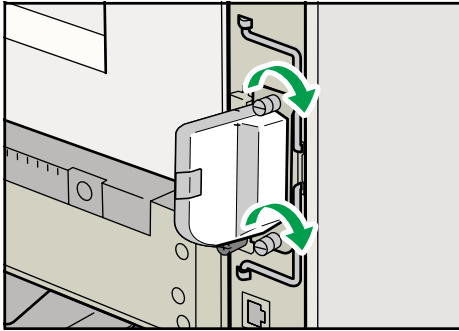
4. Fully insert the Wireless LAN interface board.



CEE148

5. Tighten the two screws to secure the interface board.

Check the Wireless LAN interface board is connected firmly to the interface board slot.



CEE149

3

Note

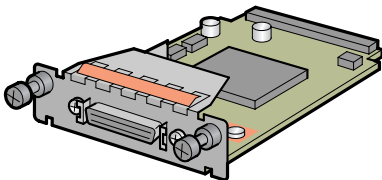
- Confirm that the interface board was correctly installed by printing the configuration page. If it is correctly installed, "Wireless LAN" will appear for "Device Connection" on the configuration page.
- If the board was not installed properly, repeat the procedure from step 3. If it cannot be installed correctly even after reattempting installation, contact your sales or service representative.
- For details about printing the configuration page, see p.45 "Test Printing".
- Before using the Wireless LAN interface board, you must configure settings from the printer control panel. For details, see p.94 "Wireless LAN Configuration".

Installing the IEEE 1284 Interface Board

Important

- Before beginning work, ground yourself by touching something metal to discharge any static electricity. Static electricity can damage the IEEE 1284 interface board.
- Do not subject the IEEE 1284 interface board to physical shocks.
- For connection to the IEEE 1284 interface board, use a half pitch 36-pin interface cable.

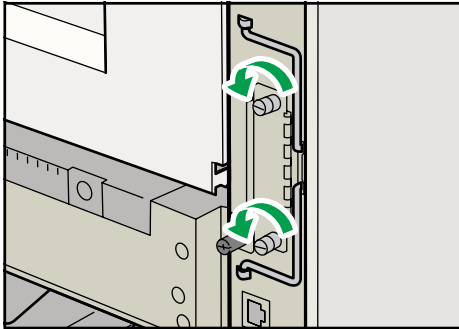
1. Check the contents of the package.



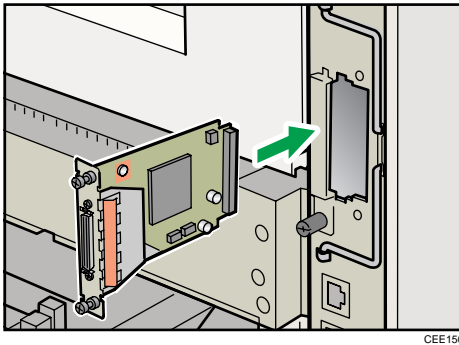
BFL302S

2. Turn off the power, and then unplug the power cord.

3. Remove the two screws and remove the cover of the slot in which the 1284 interface board is installed.

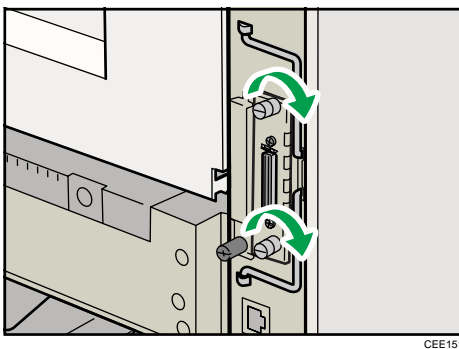


4. Fully insert the IEEE 1284 interface board.



5. Tighten the two screws to secure the interface board.

Check the IEEE 1284 interface board is connected firmly to the interface board slot.



Note

- Confirm that the IEEE 1284 interface board was correctly installed by printing the configuration page. If it is correctly installed, "Parallel Interface" will appear for "Device Connection" on the configuration page.

- If the board was not installed properly, repeat the procedure from step 3. If it cannot be installed correctly even after reattempting installation, contact your sales or service representative.
- For details about printing the configuration page, see p.45 "Test Printing".

Installing the SD Memory Card Options

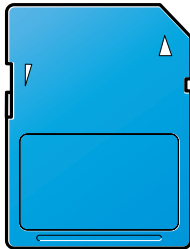
⚠ CAUTION

- Keep SD memory cards out of reach of children. If a child swallows an SD memory card, consult a doctor immediately.

★ Important

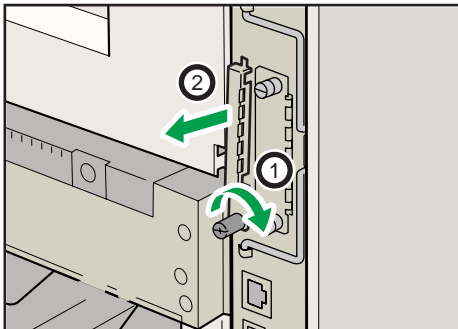
- Do not subject the card to physical shocks.
- To use the following functions, the optional 256 MB SDRAM module must be installed.
 - VM card
 - ELP-NX card
- The optional SDRAM module must be installed to use the IPDS card.

1. Check the contents of the package.



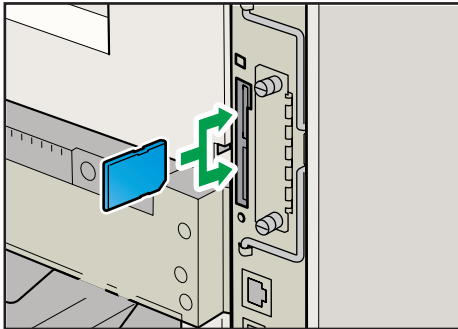
BFL308S

2. Turn off the power, and then unplug the power cord.
3. Remove the one screw, and then carefully remove the cover of the SD card slot.



CEE135

4. Carefully push in the SD card (notched corner downward and leading), it clicks into place.



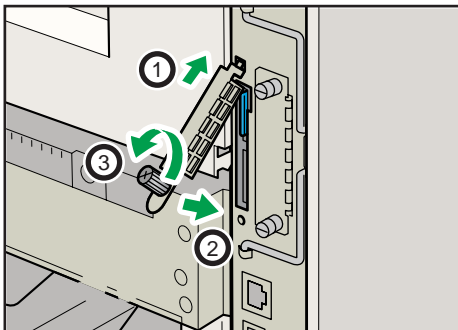
CEE152

If you insert only one SD card, use the upper slot. If you insert two SD cards simultaneously, use both slots. If you insert the optional VM card, use only the lower slot.

The SD card supplied with the optional hard disk can be used in either of the two slots.

If you want to use three or more SD cards simultaneously, consult your service representative.

5. Reattach the cover over the SD card. Fasten the one screw to secure the cover.



CEE077

If ELP-NX card is inserted in the printer, the installation automatically starts when the printer is turned on. After the installation is completed, restart the printer.

↓ Note

- Do not touch the card while the printer is in use. It may come loose, even if pushed only slightly. The slot cover must be reattached.
- You can confirm that the SD card was installed correctly by checking the control panel menu. Depending on the SD card, certain menu items appear on the display.
 - SD card supplied with the optional hard disk: Make sure [Machine Data Encryption] appears in [Security Options]. Depending on settings, [Machine Data Encryption] might not appear. For details about how to confirm this setting, consult your administrator.
 - IPDS card: Make sure [IPDS Menu] appears under [Print Settings].
 - NetWare card: Make sure [NetWare] appears in [Effective Protocol] under [Network].

- ELP-NX card: Press the [Switch Functions] key, and then confirm the name of ELP-NX appears in [JavaTM/X].
- If the card is not installed properly, repeat the procedure from the beginning. If it cannot be installed correctly even after reattempting installation, contact your sales or service representative.
- For details about printing the configuration page, see p.45 "Test Printing".

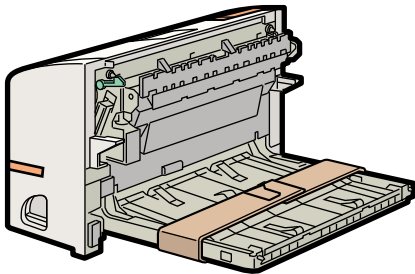
Attaching the Duplex Unit

★ Important

- If you attach the duplex unit and the paper feed unit, the paper feed unit must be attached prior to attaching the duplex unit.
- Check the printer nameplate to confirm the model code.

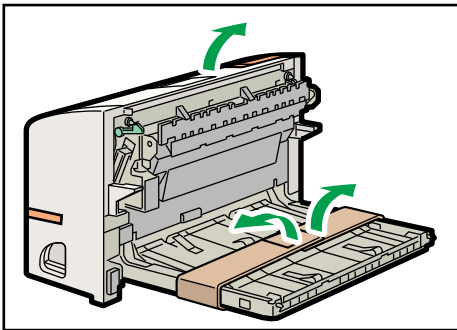
1. Check the contents of the box for the following items:

3

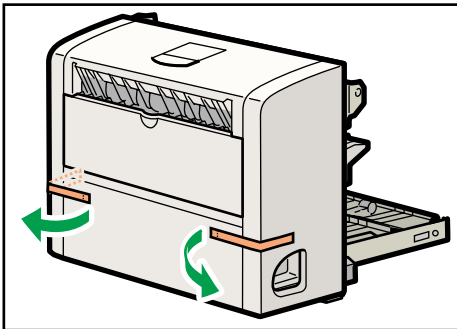


CEE092

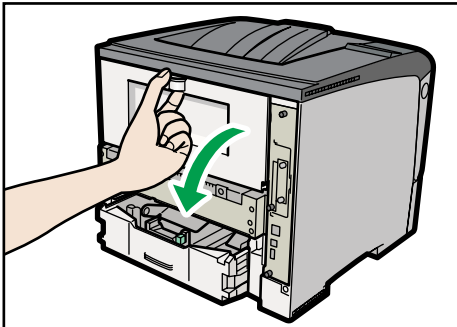
2. Turn off power to the printer, and then unplug the power cable.
3. Remove the adhesive tape and paper.



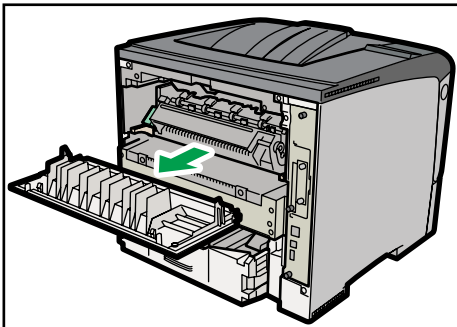
CEE093



CEE081

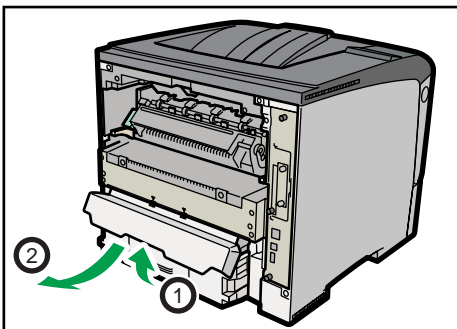
4. Open the rear cover.

CEE040

5. Lower the rear cover until it is horizontal, and then pull it away.

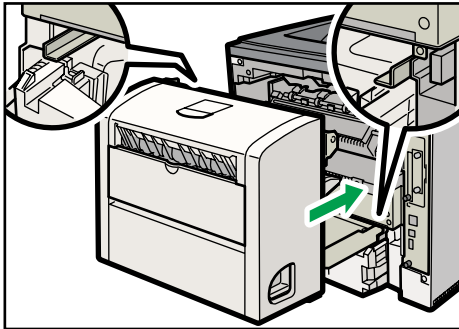
CEE041

Proceed to step 7 if the paper tray cover is not installed.

6. Pull the bottom of the paper tray cover (①) up slightly, and then remove the paper tray cover (②), in the order shown in the illustration.

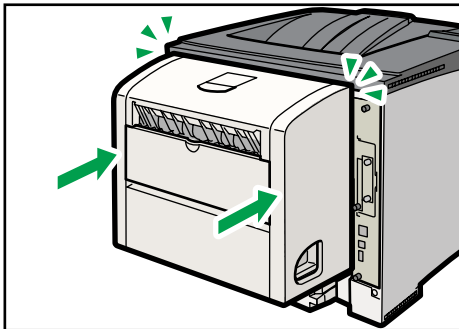
CEE043

7. Push in the duplex unit along the rails at the back of the printer.



CEE057

8. Push the duplex unit securely into the printer.



CEE050

Note

- After finishing installation, you can check whether the duplex unit is properly installed by printing the configuration page from the [List/Test Print] menu. If it is installed properly, you will see "Duplex Unit" as "Attached Equipment" on the configuration page.
- If the duplex unit is not installed properly, repeat the procedure from the start. If you cannot install it properly even after reinstallation, contact your sales or service representative.
- If the printing position is not correct, adjust the registration of the trays. For more information about adjusting the registration of the trays, see p.187 "Adjusting Printing Position".
- When the duplex unit is installed, the rear cover is no longer required. However, we recommend you keep the cover for future use.
- For details on printing the configuration page, see p.45 "Test Printing".

4. Connecting the Printer

This chapter explains how to connect network and USB cables.

Ethernet Cable Connection

Prepare a hub and other network devices, and connect the Ethernet cable to the printer.


Connect 10BASE-T or 100BASE-TX cable to the printer's Ethernet port. For 1000BASE-T, the optional Gigabit Ethernet board is required.

 **Region A** (mainly Europe and Asia)

CAUTION

- A network interface cable with a ferrite core must be used for RF interference suppression.

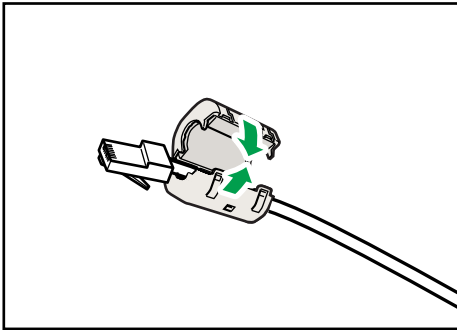
Important

- An Ethernet cable is not supplied with this printer. Select your cable according to the network environment.
- The printer's Ethernet and USB ports are not available when the Gigabit Ethernet board is attached to the printer.
-  **Region B** (mainly North America)
 - For users in the United States of America: When using the optional Gigabit Ethernet board, properly shield twisted pair cable (STP cable) must be used for connections to host computer (and/or peripheral) in order to meet FCC emission limits.

Connecting to the standard Ethernet port

1. Attach the supplied ferrite core at the printer end of the Ethernet cable.

 **Region A** (mainly Europe and Asia)



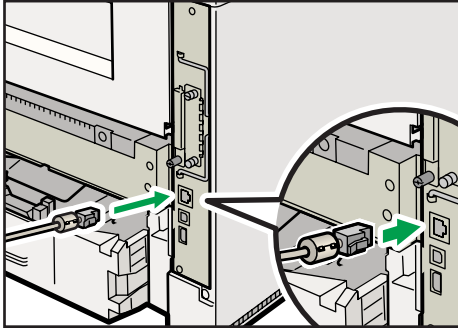
CEE163

 **Region B** (mainly North America)

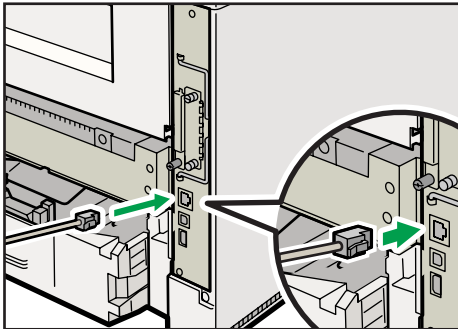
Do not attach the ferrite core.

2. Connect the Ethernet cable to the Ethernet port.

 **Region A** (mainly Europe and Asia)



 **Region B** (mainly North America)



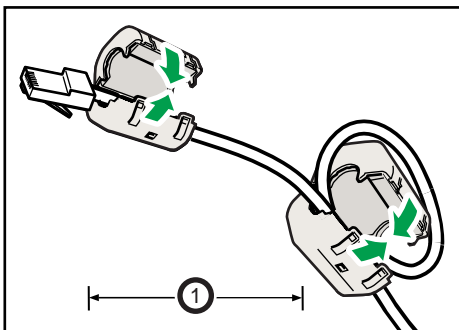
3. Connect the other end of the cable to the network, such as a hub.

Connecting to the Ethernet port of the Gigabit Ethernet board

1. Attach the ferrite core at the Gigabit Ethernet cable.

 **Region A** (mainly Europe and Asia)

Attach one ferrite core at the printer end of the Ethernet cable, and attach the other ferrite core about 10 cm (4.00 inches) (①) from this core making a loop as shown.

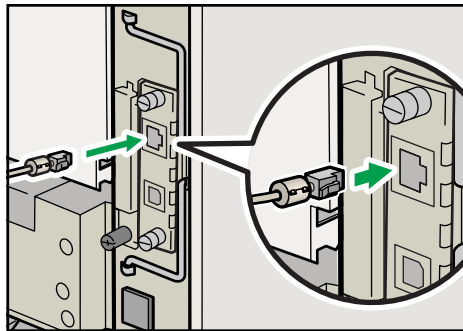


 **Region B** (mainly North America)

Do not attach the ferrite core. Use the shield twisted pair cable (STP cable) instead.

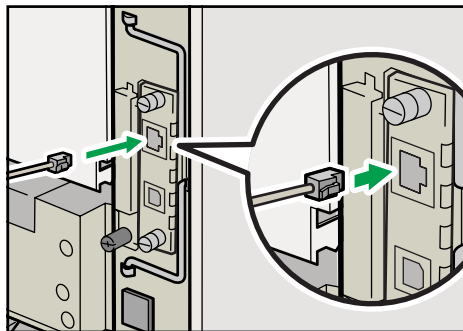
2. Connect the Ethernet cable to the Gigabit Ethernet board.

 **Region A** (mainly Europe and Asia)



CEE155

 **Region B** (mainly North America)



CEE174

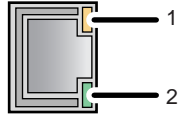
3. Connect the other end of the cable to the network, for example using a hub.

 **Note**

- For details about configuring the network environment, see p.85 "Ethernet Configuration".
- For details about installing the Gigabit Ethernet board, see p.64 "Installing the Interface Units".

Reading the LED Lamps

Standard Ethernet port



CBK090

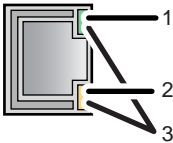
1. Yellow indicator

If the printer is connected to a 100BASE-TX Ethernet, the yellow indicator will be lit. This indicator will be unlit if the printer is connected to a 10BASE-T Ethernet.

2. Green indicator

If the printer is connected to a 10BASE-T Ethernet or 100BASE-TX Ethernet, the green indicator will be lit.

Optional Gigabit Ethernet board



CBK091

1. Green indicator

If the printer is connected to a 10BASE-T Ethernet, the green indicator will be lit. This indicator will be unlit if the printer is connected to a 100BASE-TX Ethernet.

2. Yellow indicator

If the printer is connected to a 100BASE-TX Ethernet, the yellow indicator will be lit. This indicator will be unlit if the printer is connected to a 10BASE-T Ethernet.

3. Green and yellow indicators

If the printer is connected to a 1000BASE-T Ethernet, both indicators will be lit.

USB Cable Connection

⚠ CAUTION

- For users outside the United States of America: properly shielded and grounded cables and connectors must be used for connections to a host computer (and/or peripheral) in order to meet emission limits.

⚠ CAUTION

- For users in the United States of America: properly shielded and grounded cables and connectors must be used for connections to a host computer (and/or peripheral) in order to meet FCC emission limits.

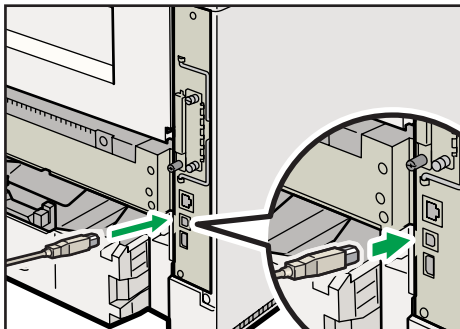
★ Important

- USB connection is possible under Windows XP/Vista/7, Windows Server 2003/2003 R2/2008/2008 R2, and Mac OS X 10.3.3 or later.
- A USB cable is not supplied with this printer. Select your cable according to the computer.

1. Connect the USB cable to the printer.

- **Connecting the USB cable to the standard USB port B**

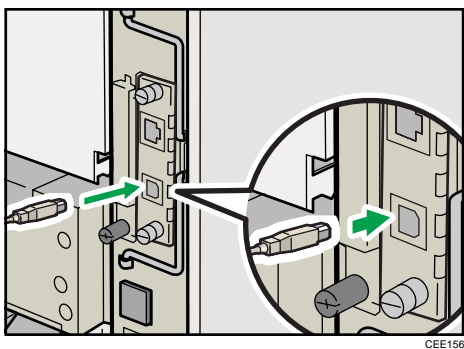
Connect the smaller connector of the USB cable to the standard USB port B on the left side of the printer.



GEE102

- **Connecting the USB cable to the Gigabit Ethernet board USB port**

Connect the smaller connector of the USB cable to the USB port of the Gigabit Ethernet board.



- 2. Connect the opposite end's flat connector to the desired device such as your computer's USB interface, or a USB hub.**

4

The printer is now connected to the computer. The Plug and Play screen appears on the computer display. For details, see "Installing the Printer Driver Using USB", Driver Installation Guide.

Parallel Cable Connection

The type of cable required varies depending on the computer you are using. Make sure to use the interface cable compliant with your computer.

⚠ CAUTION

- For users outside the United States of America: properly shielded and grounded cables and connectors must be used for connections to a host computer (and/or peripheral) in order to meet emission limits.

⚠ CAUTION

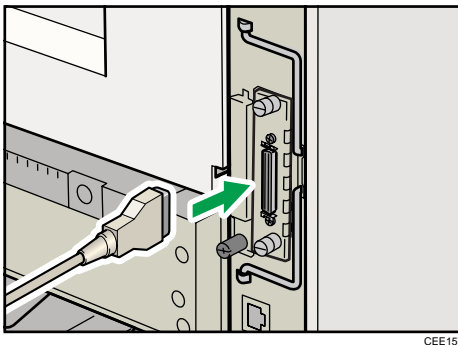
- For users in the United States of America: properly shielded and grounded cables and connectors must be used for connections to a host computer (and/or peripheral) in order to meet FCC emission limits.

4

★ Important

- The printer's parallel connection is a standard bidirectional interface that requires an IEEE 1284-compliant half pitch 36-pin parallel cable and host computer parallel port.
- Use shielded interface cable. Unshielded cables create electromagnetic interference.

1. Turn off the printer and computer.
2. Connect the interface cable to the IEEE 1284 interface board.



3. Connect the other end of the interface cable to your computer, and then secure the cable.

The printer is now connected to the computer. Install the printer driver. For details, see "Installing the Printer Driver Using Parallel Cable", Driver Installation Guide.

↓ Note

- For details about installing the 1284 interface board, see p.64 "Installing the Interface Units".

5. Configuration

This chapter explains supported network connections, and settings for the IP addresses and the Wireless LAN security.

Ethernet Configuration

★ Important

- Configure the printer for the network using the control panel.
- The following table shows the control panel settings and their default values. These items appear in the [Network] under [Host Interface] menu.

Setting Name	Default
Machine IPv4 Address	<ul style="list-style-type: none">• Auto-Obtain (DHCP): On• IPv4 Address: 11.22.33.44• Subnet Mask: 0.0.0.0• Gateway Address: 0.0.0.0
IPv6 Stateless Setting	Active
IPsec	Inactive
NW Frame Type	Auto Select
Effective Protocol	<ul style="list-style-type: none">• IPv4: Active• IPv6: Inactive• NetWare: Inactive• SMB: Active
Ethernet Speed	Auto Select
IEEE802.1X Auth.(Ethernet)	Inactive
Restr.IEEE802.1X Auth.Def.	-
LAN Type	Ethernet
Permit SSL/TLS Comm.	Ciphertext Priority

↓ Note

- If DHCP is in use on your network, the IP address, subnet mask, and gateway address are all set automatically.

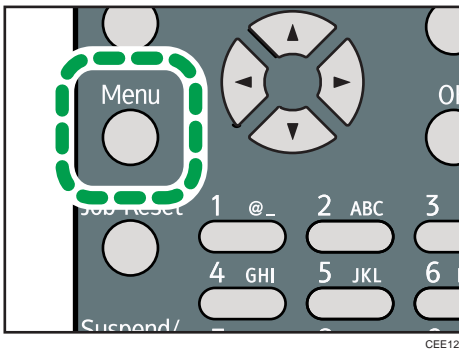
- If the printer is already placed on a TCP/IP-capable environment, you can also use a Web browser to configure the IP address-related settings.
- Configure these setting as necessary. See Software Guide for details.

Specifying an IP Address (No DHCP)

Follow this procedure to assign a specific IP address to the printer. This is only necessary when you will use the printer on a network without DHCP, or want to prevent the printer's IP address from changing.

Before beginning, make sure that you know the IP address, subnet mask and gateway address that the printer will use.

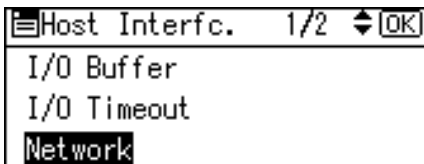
1. Press the [Menu] key.



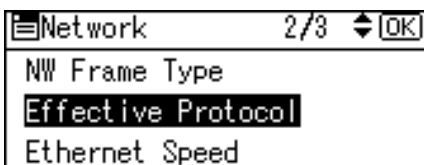
2. Press the [▼] or [▲] key to select [Host Interface], and then press the [OK] key.



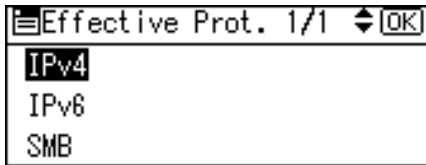
3. Press the [▼] or [▲] key to select [Network], and then press the [OK] key.



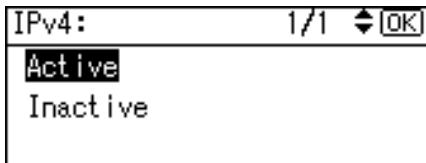
4. Press the [▼] or [▲] key to select [Effective Protocol], and then press the [OK] key.



5. Press the [▼] or [▲] key to select the appropriate network protocol, and then press the [OK] key.



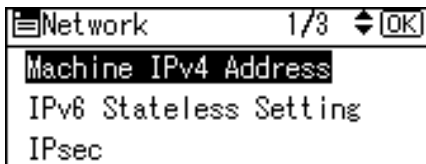
6. Press the [▼] or [▲] key to select [Active] or [Inactive], and then press the [OK] key.



Set other protocols you need to set in the same way.

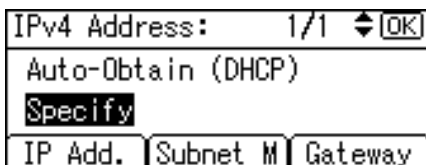
- Select [Inactive] for unused protocols.
- Enable IPv4 to use the pure IPv4 environment of NetWare5/5.1, NetWare 6/6.5.

7. Press the [Escape] key until the screen returns to the [Network] menu.
8. If you use IPv4, assign the IPv4 address to the printer. Press the [▼] or [▲] key to select [Machine IPv4 Address], and then press the [OK] key.



To get the IP address for the printer, consult your network administrator.

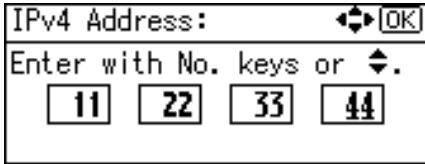
9. To specify the IP Address, press [IP Add.].



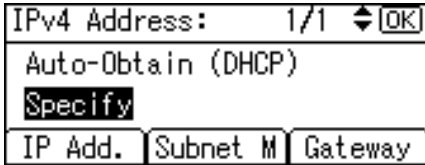
If you use IPv4, also assign the subnet mask and gateway address. To assign these, press [Subnet M] or [Gateway].

10. Enter the address, and then press the [OK] key.

Change the IP address from "1.1.22.33.44" to an IP address supported by your network.



11. Use the same method to assign the subnet mask and gateway address.
12. Press the [▼] or [▲] key to select [Specify], and then press the [OK] key.



13. Press the [Menu] key to return to the initial screen.
14. Print a configuration page to confirm the settings.

5

↓ Note

- For details about printing the configuration page, see p.45 "Test Printing".

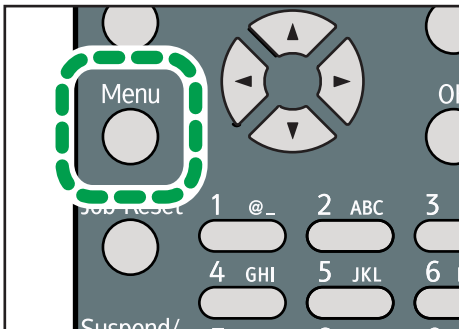
Receiving an IP Address Automatically (DHCP)

Follow this procedure to set the printer to receive an IP address automatically using DHCP. The DHCP feature is active by default, so this procedure is only required if you have changed the default settings.

★ Important

- When [Auto-Obtain (DHCP)] is selected, you cannot configure the IP address, subnet mask, or gateway address.
- Consult your network administrator for information about configuring network settings.

1. Press the [Menu] key.

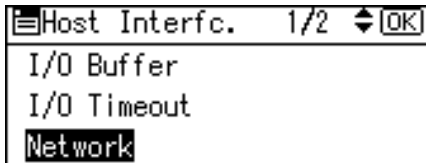


CEE128

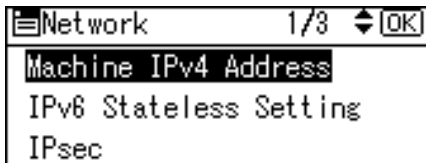
- Press the [▼] or [▲] key to select [Host Interface], and then press the [OK] key.



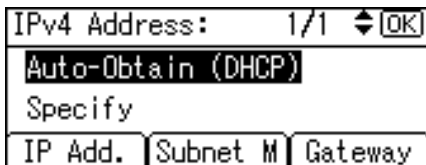
- Press the [▼] or [▲] key to select [Network], and then press the [OK] key.



- Press the [▼] or [▲] key to select [Machine IPv4 Address], and then press the [OK] key.



- Press the [▼] or [▲] key to select [Auto-Obtain (DHCP)], and then press the [OK] key.



To check the detected addresses, press the followings:

- [IP Add.]: IP address
- [Subnet M]: Subnet Mask
- [Gateway]: Default Gateway

- Press the [Menu] key to return to the initial screen.
- Print a configuration page to confirm the settings.

↓ Note

- For details about printing the configuration page, see p.45 "Test Printing".

Configuring Network Settings When Using NetWare

To use NetWare, select the appropriate NetWare frame type from the following.

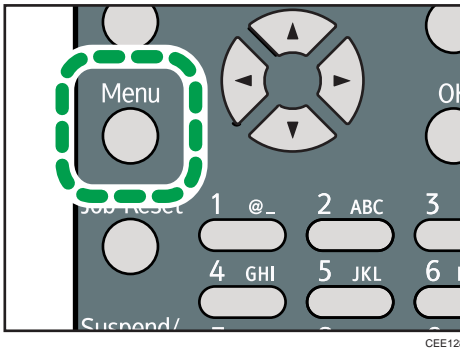
- Auto Select

- Ethernet II
- Ethernet 802.2
- Ethernet 802.3
- Ethernet SNAP

★ Important

- Usually, you can use the default (Auto Select). When you first select [Auto Select], the frame type detected by the printer is adopted. However, if your network can use more than two frame types, the printer may fail to select the correct frame type with [Auto Select] selected. In this case, select the preferred frame type.

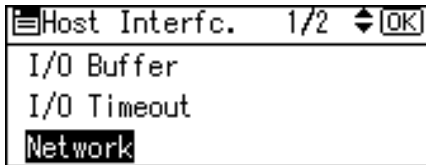
1. Press the [Menu] key.



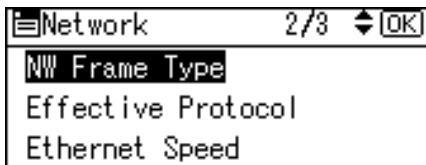
2. Press the [▼] or [▲] key to select [Host Interface], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Network], and then press the [OK] key.



4. Press the [▼] or [▲] key to select [NW Frame Type], and then press the [OK] key.



5. Press the [▼] or [▲] key to select the frame type to use, and then press the [OK] key.

```
NW Frame Type:  1/2  ⏏ [OK]
Auto Select
Ethernet II
Ethernet 802.2
```

6. Press the [Menu] key to return to the initial screen.
7. Print a configuration page to confirm the settings.

Note

- For details about printing the configuration page, see p.45 "Test Printing".

Setting the Ethernet Speed

You can set the speed that the printer will use for Ethernet communications. In most cases, this should be left on the default setting, [Auto Select]. This setting allows two interfaces to automatically determine the optimum speed when they are connected.

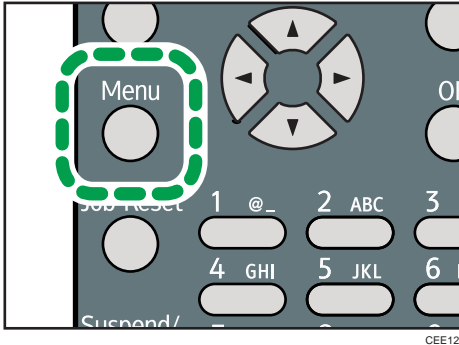
Router/HUB	Printer				
	[10Mbps Half Duplex]	[10Mbps Full Duplex]	[100Mbps Half Duplex]	[100Mbps Full Duplex]	[Auto Select]
10 Mbps half duplex	<input type="radio"/>	-	-	-	<input type="radio"/>
10 Mbps full duplex	-	<input type="radio"/>	-	-	-
100 Mbps half duplex	-	-	<input type="radio"/>	-	<input type="radio"/>
100 Mbps full duplex	-	-	-	<input type="radio"/>	-
auto-negotiation (auto selection)	<input type="radio"/>	-	<input type="radio"/>	-	<input type="radio"/>

★ Important

- Connection cannot be established if the selected Ethernet speed does not match your network's transmission speed.

- The use of this feature is recommended. To use it, select [Auto Select].

1. Press the [Menu] key.

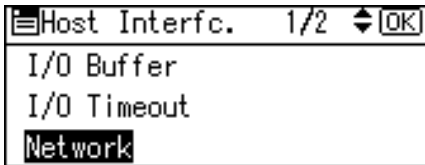


2. Press the [▼] or [▲] key to select [Host Interface], and then press the [OK] key.

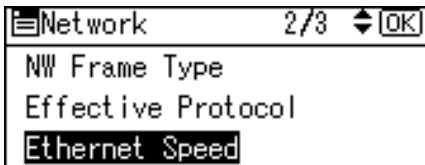
5



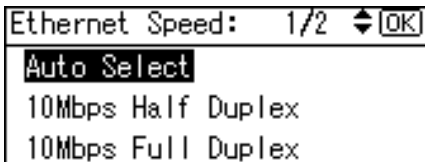
3. Press the [▼] or [▲] key to select [Network], and then press the [OK] key.



4. Press the [▼] or [▲] key to select [Ethernet Speed], and then press the [OK] key.



5. Press the [▼] or [▲] key to select the Ethernet speed, and then press the [OK] key.



6. Press the [Menu] key to return to the initial screen.

7. Print a configuration page to confirm the settings.

↓ Note

- For details about printing the configuration page, see p.45 "Test Printing".

Wireless LAN Configuration

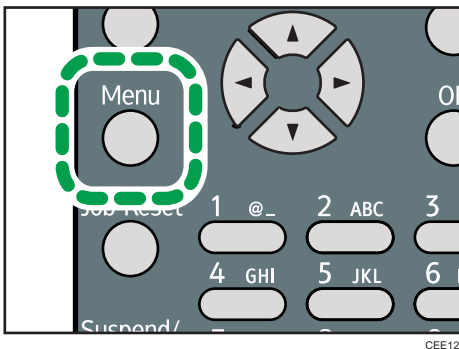
★ Important

- Ethernet and Wireless LAN cannot be used at the same time.
- To use Wireless LAN, set as follows using the control panel: press the [Menu] key, select [Host Interface], [Network], [LAN Type], and then select [Wireless LAN]. In addition, you must set the IP address, subnet mask, gateway address, DHCP, Frame Type (NW), and active protocol as explained in p.85 "Ethernet Configuration".
- The following table shows the control panel settings and their defaults. These items appear in the [Wireless LAN] under [Host Interface] menu.

Setting Name	Default
Communication Mode	Infrastructure Mode
SSID Setting	blank
Ad-hoc Channel	11
Security Method	Off
Wireless LAN Signal	-
Restore Defaults	-

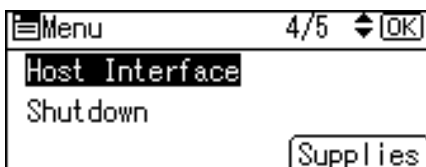
5

1. Press the [Menu] key.

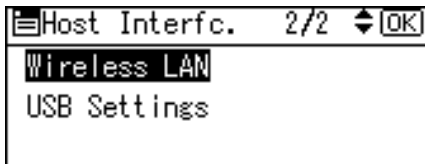


CEE128

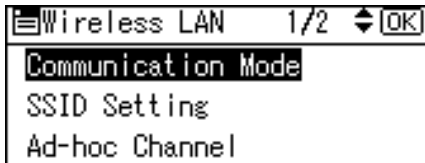
2. Press the [▼] or [▲] key to select [Host Interface], and then press the [OK] key.



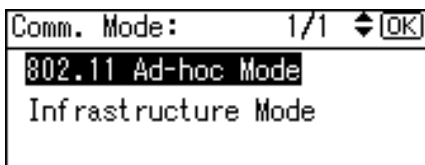
3. Press the [▼] or [▲] key to select [Wireless LAN], and then press the [OK] key.



4. Press the [▼] or [▲] key to select [Communication Mode], and then press the [OK] key.

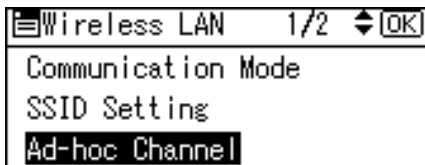


5. Press the [▼] or [▲] key to select the transmission mode of Wireless LAN, and then press the [OK] key.

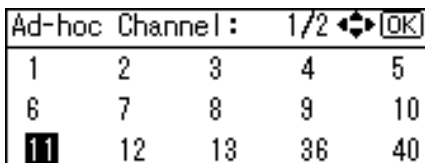


The transmission mode of the Wireless LAN can also be set using Web Image Monitor.



6. If [802.11 Ad-hoc Mode] is selected for [Communication Mode], confirm the channel to use for transmission.
7. Press the [▼] or [▲] key to select [Ad-hoc Channel], and then press the [OK] key.



8. Press the scroll keys to select the Ad-hoc channel, and then press the [OK] key.



Select an Ad-hoc channel according to the IEEE 802.11 standard you are using.

- When using IEEE 802.11 b/g:
 -  **Region A** (mainly Europe and Asia)
Channels 1 to 13
 -  **Region B** (mainly North America)

Channels 1 to 11

- When using IEEE 802.11 a:
Channels 36,40,44,48

9. Press the [Menu] key to return to the initial screen.
10. Print a configuration page to confirm the settings.

Note

- For details, see Web Image Monitor Help, and "Using Web Image Monitor", Software Guide.
- For details about printing the configuration page, see p.45 "Test Printing".

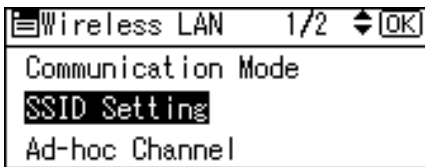
Setting the SSID

5

When [Communication Mode] is set to [Infrastructure Mode] or [802.11 Ad-hoc Mode], you must specify the Service Set Identifier (SSID) of the wireless access point that the printer will connect to for network access.

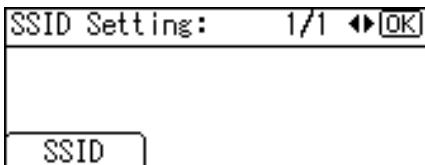
Ask your network administrator for the SSID to use.

1. In the [Wireless LAN] menu, press the [▼] or [▲] key to select [SSID Setting], and then press the [OK] key.

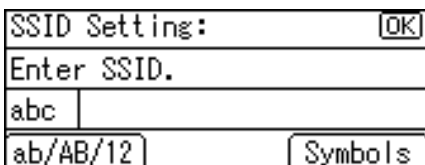


If an SSID has been set, you can check the current SSID setting.

2. Press [SSID], and then press [Enter].



3. Enter the characters, and then press the [OK] key.



You can switch among lower /upper cases and numeric characters by pressing [ab/AB/12].

The characters that can be used are ASCII 0 × 20-0 × 7e (32 bytes).

4. Press the [Menu] key to return to the initial screen.

5. Print a configuration page to confirm the settings.

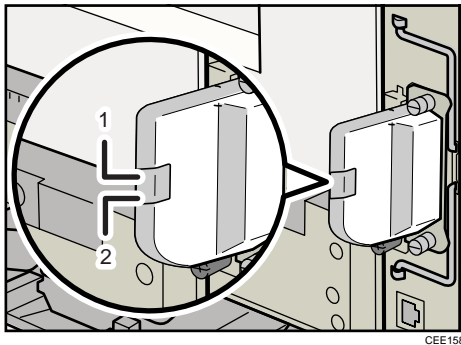
Note

- The SSID can also be set using a Web browser. For details, see Web Image Monitor Help.
- For details about printing the configuration page, see p.45 "Test Printing".

Confirming Wireless Network Connectivity

After you have installed the Wireless LAN interface unit, use the following procedure to check for Wireless LAN connectivity.

Make sure the LED on the Wireless LAN interface unit is lit.



1. If the Wireless LAN unit is receiving power, the upper indicator will be lit green.
2. If the printer is connected to an operational network and is communicating normally, the lower indicator will be lit orange.

Cautions When Using a Wireless LAN

A Wireless LAN uses radio waves instead of cables to send and receive data. Because radio waves usually pass through walls and other obstructions, the following problems may arise if you do not configure wireless security settings.

Information leakage

Information such as IDs, passwords, credit card numbers, and e-mail content may be seen by an unauthorized 3rd party.

Unauthorized network access

- Damage to or alteration of data and/or system configurations by viruses or other malware.
- Impersonation of legitimate network users, resulting in data theft.
- Theft of sensitive or confidential data.

To minimize the possibility of these threats, it is recommended that you check the available features of this printer, wireless access points, and other equipment that uses the Wireless LAN, and configure security settings for the Wireless LAN.

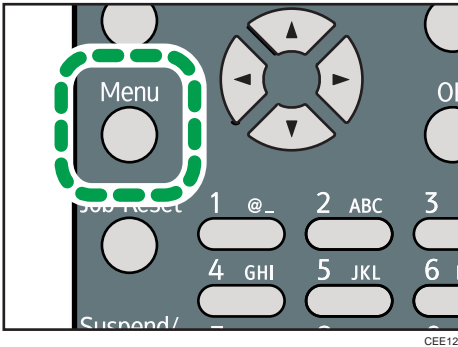
Setting Security Method of Wireless LAN

Setting a WEP Key

If the wireless network uses WEP to encrypt transmitted data, the corresponding WEP key must be set to the printer to allow communications with other network devices.

Ask your network administrator for the WEP key to use.

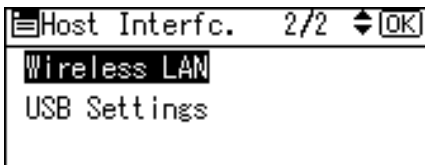
1. Press the [Menu] key.



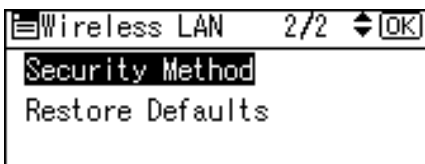
2. Press the [▼] or [▲] key to select [Host Interface], and then press the [OK] key.



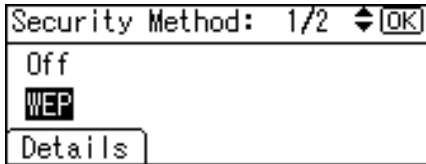
3. Press the [▼] or [▲] key to select [Wireless LAN], and then press the [OK] key.



4. Press the [▼] or [▲] key to select [Security Method], and then press the [OK] key.

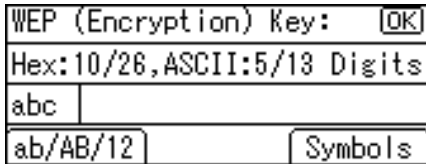


5. Press the [▼] or [▲] key to select [WEP], and then press [Details].



When activating the WEP setting, you will need to enter the WEP key.

6. Enter the characters, and then press the [OK] key.



5

- When entering a character, pressing the [OK] key will mask it with an asterisk for security reasons.
- When using 64-bit WEP, up to 10 hexadecimal characters or five ASCII characters can be entered. When using 128-bit WEP, up to 26 hexadecimal characters or 13 ASCII characters can be used.
- Up to 10 or 26 hexadecimal characters and 5 or 13 ASCII characters can be entered.
- For ASCII character strings, uppercase and lowercase letters are differentiated, so be sure to enter characters in the required case.

7. Press the [▼] or [▲] key to select [WEP], and then press the [OK] key.

8. Press the [Menu] key to return to the initial screen.

9. Print a configuration page to confirm the settings.

↓ Note

- The WEP key can also be set using a Web browser. For details, see Web Image Monitor Help.
- For details about printing the configuration page, see p.45 "Test Printing".

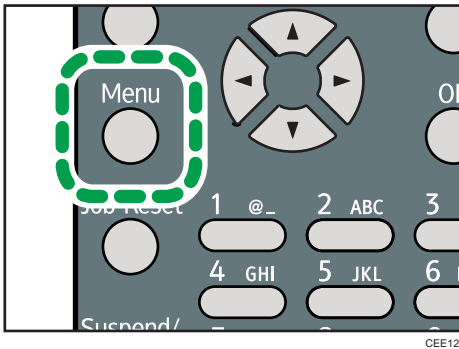
Setting WPA

In the case of using WPA on a network, activate the WPA setting to be used for communication along with WPA. Consult your network administrator for information about making authentication settings.

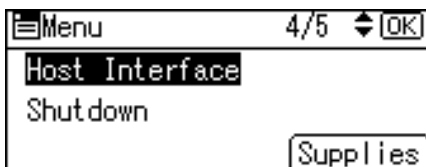
★ Important

- For setting WPA, installing the optional Hard disk is required.

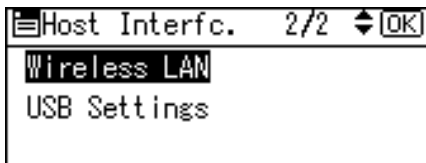
1. Press the [Menu] key.



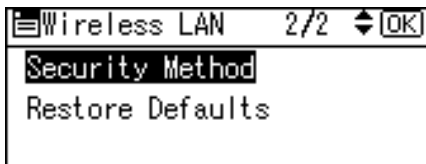
2. Press the [▼] or [▲] key to select [Host Interface], and then press the [OK] key.



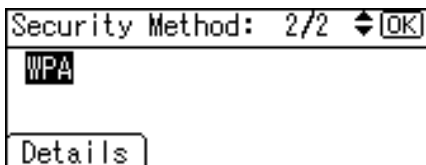
3. Press the [▼] or [▲] key to select [Wireless LAN], and then press the [OK] key.



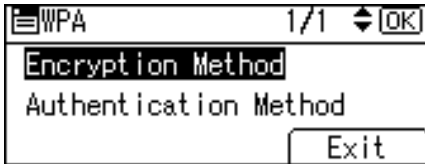
4. Press the [▼] or [▲] key to select [Security Method], and then press the [OK] key.



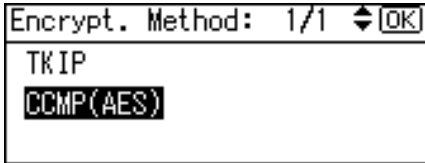
5. Press the [▼] or [▲] key to select [WPA], and then press [Details].



6. Press the [▼] or [▲] key to select [Encryption Method], and then press the [OK] key.



7. Press the [▼] or [▲] key to select encryption method, and then press the [OK] key.



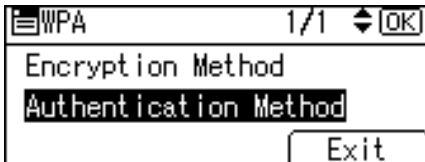
Consult your network administrator for information about making encryption settings.

Encryption settings are as follows:

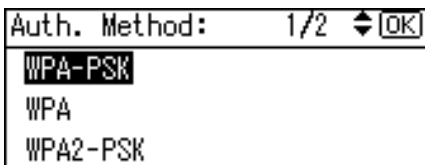
- [TKIP]
 - Uses the same algorithm as RC4, but further reduces vulnerability using methods such as key mixing.
- [CCMP(AES)]
 - Increases security using AES (Advanced Encryption Standard).

The display returns to the [WPA] menu.

8. Press the [▼] or [▲] key to select [Authentication Method], and then press the [OK] key.



9. Press the [▼] or [▲] key to select authentication settings, and then press the [OK] key.



Authentication settings are as follows:

- [WPA-PSK]
 - Performs authentication using an encryption key (a Pre-Shared Key) that is shared by the access point and client.
- [WPA]

WPA uses CA certificates and a RADIUS server to provide secure wireless communication.

- [WPA2-PSK]

As with WPA-PSK, authenticate using the encryption key (a Pre-Shared Key) shared by the access point and client. Enter Pre-Shared Key using between 8 and 63 ASCII characters.

- [WPA2]

WPA2 is an expanded version of WPA that fully supports IEEE 802.11i.

Wait for two seconds, the display returns to the [WPA] menu.

10. If [WPA] or [WPA2] is selected in step 9, a confirmation message appears. Press [OK].

Wait for two seconds. The display returns to the [WPA] menu, proceed to step 15.

11. If [WPA-PSK] or [WPA2-PSK] is selected in step 9, enter the Pre-Shared Key, and then press the [OK] key.

- When entering a character, pressing the [OK] key will mask it with an asterisk for security reasons.
- Enter the Pre-Shared Key using between 8 and 63 ASCII characters.
- Uppercase and lowercase letters are differentiated, so be sure to enter characters in the required case.
- Wait for two seconds. The display returns to the [Authentication Method] menu.

12. Press the [Escape] key.

13. Press [Exit].

14. Press the [▼] or [▲] key to select [WPA], and then press the [OK] key.

15. Press the [Menu] key to return to the initial screen.

16. Print a configuration page to confirm the settings.

Note

- For details about printing the configuration page, see p.45 "Test Printing".

Configuring IEEE 802.1X

IEEE 802.1X can be configured using Web Image Monitor's administrator mode. You can select four types of EAP authentication method: EAP-TLS, LEAP, EAP-TTLS and PEAP. Note that each EAP authentication method has different configuration settings and authentication procedures.

Types and requirements of certificates are as follows:

EAP Types Requiring a "Site Certificate"

EAP-TLS, EAP-TTLS, PEAP (Necessary except LEAP)

EAP Types Requiring a "Site Certificate" and a "Device Certificate"

EAP-TLS, PEAP (Phase 2 is for TLS only)

If a certificate is required, configure all settings after installing the certificate.

5

Installing a Site Certificate

Access the authentication server and obtain the CA certificate.

Methods of obtaining certificates differ according to the operating system you are using.

1. Log in to Web Image Monitor as an administrator.
2. In the menu area, click [Configuration].
3. Under "Security", click [Site Certificate].
4. Click [Browse] on the "Site Certificate to Import" window, and then select the CA certificate you obtained.
5. Click [Import].
6. Check that the imported certificate's [Status] shows "Trustworthy".
If [Site Certificate Check] shows [Active], and the [Status] of the certificate shows [Untrustworthy], communication might not be possible.
7. Click [OK].
8. Click [Logout].
9. Quit the Web Image Monitor.

Installing Device Certificate

1. Log in to Web Image Monitor as an administrator.
2. In the menu area, click [Configuration].
3. Under "Security", click [Device Certificate].
4. Click [Certificate 2] on the "Device Certificate" window, and then click [Request].

5. Enter appropriate "Common Name" and "Country Code" on "Certificate Information" page, and then click [OK].
6. "Updating..." appears. Wait for about 2 minutes, and then click [OK].
7. Click [Details], shown in the "Device Certificate" window as the memo pad icon for "Requesting".
8. Select all, and then copy the entire "Text for Requested Certificate" text that is displayed in the "Certificate Status" window.
9. Access the certificate authority server, and then obtain the CA signified certificate using the text copied into "Text for Requested Certificate" windows.

Obtaining the certificate differs depending on the environment you want to use.

10. Click [Certificate 2] on "Device Certificate" window, and then click [Install].
11. Using a text editor, open the CA signified certificate downloaded in step 9, and then copy over all the text.
12. In the [Enter Certificate Request] window, paste all the text copied into the CA signified certificate.
13. Click [OK].
14. "Updating..." appears. Wait for about one or two minutes, and then click [OK].
15. Check that the "Device Certificate" shows "Installed".
16. Click [Certificate 2] on "Certification", and then click [OK].
17. Click [Logout].
18. Quit Web Image Monitor.

Note

- If you request two certificates simultaneously, the certificate authority might not display either certificate. Click [Cancel Request] to cancel the request.
- You can select [Certificate 1-4] in the "Device Certificate" window. Note that if you select [Certificate 1] in the "Device Certificate" window, you must select "Certificate 1" in the "IEEE 802.1X" drop down menu in the "Certification" window.
- Click [Cancel Request] to cancel the request for the server certificate.
- If "Not found" appears after clicking [OK] in steps 6 and 14, wait one or two minutes, and then click [Refresh].

Setting Items of IEEE 802.1X for Ethernet

1. Log in to Web Image Monitor as an administrator.
2. In the menu area, click [Configuration].
3. Under "Security", click [IEEE 802.1X].

4. In "User Name", enter the user name set in the RADIUS server.

5. Enter the domain name in "Domain Name".

6. Select "EAP Type". Configurations differ according to the EAP Type.

EAP-TLS

- Make the following settings according to the operating system you are using:
 - Select [On] or [Off] in "Authenticate Server Certificate".
 - Select [On] or [Off] in "Trust Intermediate Certificate Authority".
 - Enter the host name of the RADIUS server on "Server ID".
 - Select [On] or [Off] in "Permit Sub-domain".

LEAP

- Click [Change] in "Password", and then enter the password set in the RADIUS server.

EAP-TTLS

- Click [Change] in "Password", and then enter the password set in the RADIUS server.
- Click [Change] in "Phase 2 User Name", and then enter the user name set in the RADIUS server.
- Select [CHAP], [MSCHAP], [MSCHAPv2], [PAP], or [MD5] in "Phase 2 Method".
Certain methods might not be available, depending on the RADIUS server you want to use.
- Make the following settings according to the operating system you are using:
 - Select [On] or [Off] in "Authenticate Server Certificate".
 - Select [On] or [Off] in "Trust Intermediate Certificate Authority".
 - Enter the host name of the RADIUS server in "Server ID".
 - Select [On] or [Off] in "Permit Sub-domain".

PEAP

- Click [Change] in "Password", and then enter the password set in the RADIUS server.
If [TLS] is selected for "Phase 2 Method", you do not need to specify a password.
- Click [Change] on "Phase 2 User Name", and then enter the user name set in the RADIUS server.
- Select [MSCHAPv2] or [TLS] in "Phase 2 Method".
When you select [TLS], you must install "IEEE 802.1X Client Certificate".
- Make the following settings according to the operating system you are using:
 - Select [On] or [Off] in "Authenticate Server Certificate".
 - Select [On] or [Off] in "Trust Intermediate Certificate Authority".
 - Enter the host name of the RADIUS server on "Server ID".
 - Select [On] or [Off] in "Permit Sub-domain".

7. Click [OK].

8. "Updating..." appears. Wait for about one or two minutes, and then click [OK].
9. Under "Interface", click [Interface Settings].
10. Select [Active] in "Ethernet Security".
11. Click [OK].
12. "Updating..." appears. Wait for about one or two minutes, and then click [OK].
13. Click [Logout].
14. Quit the Web Image Monitor.

↓ Note

- If there is a problem with settings, you might not be able to communicate with the printer. To identify the problem, print a network summary.
- If you cannot identify the problem, reset the printer interface to normal, and then repeat the procedure from the beginning.

Setting Items of IEEE 802.1X for Wireless LAN

1. Log in to Web Image Monitor as an administrator.
2. In the menu area, click [Configuration].
3. Under "Security", click [IEEE 802.1X].
4. In "User Name", enter the user name set in the RADIUS server.
5. Enter the domain name in "Domain Name".
6. Select "EAP Type". Configurations differ according to the EAP Type.

EAP-TLS

- Make the following settings according to the operating system you are using:
 - Select [On] or [Off] in "Authenticate Server Certificate".
 - Select [On] or [Off] in "Trust Intermediate Certificate Authority".
 - Enter the host name of the RADIUS server on "Server ID".
 - Select [On] or [Off] in "Permit Sub-domain".

LEAP

- Click Change in "Password", and then enter the password set in the RADIUS server.

EAP-TTLS

- Click [Change] in "Password", and then enter the password set in the RADIUS server.
- Click [Change] in "Phase 2 User Name", and then enter the user name set in the RADIUS server.
- Select [CHAP], [MSCHAP], [MSCHAPv2], [PAP], or [MD5] in "Phase 2 Method".

Certain methods might not be available, depending on the RADIUS server you want to use.

- Make the following settings according to the operating system you are using:
 - Select [On] or [Off] in "Authenticate Server Certificate".
 - Select [On] or [Off] in "Trust Intermediate Certificate Authority".
 - Enter the host name of the RADIUS server in "Server ID".
 - Select [On] or [Off] in "Permit Sub-domain".

PEAP

- Click [Change] in "Password", and then enter the password set in the RADIUS server.
If [TLS] is selected for "Phase 2 Method", you do not need to specify a password.
- Click [Change] on "Phase 2 User Name", and then enter the user name set in the RADIUS server.
- Select [MSCHAPv2] or [TLS] in "Phase 2 Method".
When you select [TLS], you must install "IEEE 802.1X Client Certificate".
- Make the following settings according to the operating system you are using:
 - Select [On] or [Off] in "Authenticate Server Certificate".
 - Select [On] or [Off] in "Trust Intermediate Certificate Authority".
 - Enter the host name of the RADIUS server on "Server ID".
 - Select [On] or [Off] in "Permit Sub-domain".

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7. Click [OK].
8. "Updating..." appears. Wait for about one or two minutes, and then click [OK].
9. Under "Interface", click [Wireless LAN Settings].
10. Select [Wireless LAN] in "LAN Type".
11. Select [Infrastructure Mode] in "Communication Mode".
12. Enter the alphanumeric characters (a-z, A-Z, or 0-9) in [SSID] according to the access point you want to use.
13. Select [WPA] in "Security Method".
14. Select [TKIP] or [CCMP (AES)] in "WPA Encryption Method" according to the access point you want to use.
15. Select [WPA] or [WPA2] in "WPA Authentication Method".
16. Click [OK].
17. "Updating..." appears. Wait for about one or two minutes, and then click [OK].
18. Click [Logout].
19. Quit the Web Image Monitor.

↓ Note

- If there is a problem with settings, you might not be able to communicate with the printer. To identify the problem, print a network summary.

- If you cannot identify the problem, reset the printer interface to normal, and then repeat the procedure from the beginning.



6. Loading Paper

This chapter explains the paper sizes and types supported by this printer, and how to load paper into the paper trays.

Supported Paper for Each Tray

The tables in this section provide details of the sizes, types, feed directions, and maximum number of sheets of paper that can be loaded in each of the printer's trays.

Symbols

	In this manual	On the display
Short-edge feed direction	 (Feed direction)	A4 8 1/2 " × 11 "
Long-edge feed direction	 (Feed direction)	A5 8 1/2 " × 5 1/2 "

Note

- Be careful of the paper feed direction. The direction is determined for each paper size.

Standard Paper Feed Tray

Paper types	Plain Paper, Thick Paper, Letterhead, Label Paper, Special Paper, Preprinted Paper, Color Paper, Recycled Paper
Selectable paper sizes on the paper size dial	The following sizes can be selected using the paper size dial: A4, B5 JIS, A5, 8 1/2 × 14 (Legal), 8 1/2 × 11 (Letter), 5 1/2 × 8 1/2 (Half Letter)
Selectable paper sizes on the control panel	The following sizes are supported but not specified on the paper size dial. You should set the paper size dial to "✳", and select the paper size with the control panel, see p.128 "Specifying standard size paper for a standard or optional paper feed tray". A5, 8 1/2 × 13 (Foolscap), 8 1/4 × 13 (Folio), 8 × 13 (F/GL), 5 1/2 × 8 1/2 (Half Letter), 16K, Custom Size

Custom paper size	<p>The following custom sizes are supported, but they must be selected using the control panel. For details about custom size paper settings, see p. 130 "Specifying custom size paper for a standard or optional paper feed tray".</p> <ul style="list-style-type: none"> • Approximately 139.7 - 216 mm (5.50 - 8.50 inches) in width • Approximately 139.7 - 356 mm (5.50 - 14.01 inches) in length
Paper weight	60 to 162 g/m ² (16 to 43 lb.)
Paper capacity	<p>500 sheets (80 g/m², 20 lb.)</p> <p>Do not load the paper so that the top of the stack exceeds the limit mark inside the tray.</p>

Optional Paper Feed Tray

Paper types	Plain Paper, Thick Paper, Letterhead, Label Paper, Special Paper, Preprinted Paper, Color Paper, Recycled Paper
Selectable paper sizes on the paper size dial	<p>The following sizes can be selected using the paper size dial:</p> <p>A4, B5 JIS, A5, 8¹/₂ × 14(Legal), 8¹/₂ × 11(Letter), 5¹/₂ × 8¹/₂(Half Letter)</p>
Selectable paper sizes on the control panel	<p>The following sizes are supported but not specified on the paper size dial. You should set the paper size dial to "✖", and select the paper size with the control panel, See p. 128 "Specifying standard size paper for a standard or optional paper feed tray".</p> <p>8¹/₂ × 13(Foolscap), 8¹/₄ × 13(Folio), 8 × 13(F/GL), 7¹/₄ × 10¹/₂(Executive), 16K, Custom Size</p>
Custom paper size	<p>The following custom sizes are supported, but they must be selected using the control panel. For details about custom size paper settings, see p. 130 "Specifying custom size paper for a standard or optional paper feed tray".</p> <ul style="list-style-type: none"> • Approximately 139.7 - 216 mm (5.50 - 8.50 inches) in width • Approximately 160 - 356 mm (6.30 - 14.01 inches) in length
Paper weight	60 to 162 g/m ² (16 to 43 lb.)
Paper capacity	<p>500 sheets (80 g/m², 20 lb.)</p> <p>Do not load the paper so that the top of the stack exceeds the limit mark inside the tray.</p>

Bypass Tray

Paper types	Plain Paper, Thick Paper, Letterhead, Label Paper, Special Paper, Preprinted Paper, Color Paper, Recycled Paper, OHP (Transparency), Envelope
Paper sizes requiring manual settings	The following sizes are supported, but they must be selected using the control panel. For details about paper size settings, see p.135 "Specifying standard size paper for the bypass tray". A4, A5, A6, B5 JIS, B6, 8 1/2" x 14" (Legal), 8 1/2" x 13" (Foolscap), 8 1/2" x 11" (Letter), 8 1/4" x 13" (Folio), 8" x 13" (F/GL), 7 1/4" x 10 1/2" (Executive), 5 1/2" x 8 1/2" (Half Letter), 4 1/8" x 9 1/2" (Com 10), 3 7/8" x 7 1/2" (Monarch), C5 Env., C6 Env., DL Env., 16K, Custom Size
Custom paper size	The following custom sizes are supported, but they must be selected using the control panel. For details about custom size paper settings, see p.136 "Specifying custom size paper for the bypass tray". <ul style="list-style-type: none"> Approximately 64 - 216 mm (2.52 - 8.50 inches) in width Approximately 139.7 - 432 mm (5.50 - 17.00 inches) in length
Paper weight	60 to 162 g/m ² (16 to 43 lb.)
Paper capacity	100 sheets (80 g/m ² , 20 lb.) Do not load the paper so that the top of the stack exceeds the paper guides on the bypass tray.

Envelope Feeder

Paper types	Envelope
Paper sizes requiring manual settings	The following sizes are supported, but they must be selected using the control panel. For details about paper size settings, see p.146 "Loading Envelopes into the Envelope Feeder Unit". 4 1/8" x 9 1/2" (Com 10), 3 7/8" x 7 1/2" (Monarch), C5 Env., C6 Env., DL Env.
Paper weight	60 to 130 g/m ² (16 to 35 lb.)

Paper capacity	<p>60 sheets (80 g/m², 20 lb.)</p> <p>Do not load the paper so that the top of the stack exceeds the limit mark inside the tray.</p>
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Duplex Unit

Paper types	Plain Paper, Letterhead, Recycled Paper
Paper sizes	<p>A4, A5, B5 JIS, 8 1/2" x 14" (Legal), 8 1/2" x 13" (Foolscap), 8 1/2" x 11" (Letter), 8 1/4" x 13" (Folio), 8" x 13" (F/GL), 5 1/2" x 8 1/2" (Half Letter), 16K</p>
Paper weight	60 to 130 g/m ² (16 to 35 lb.)

Supported Paper Types

The tables in this section provide details of the paper types supported by this printer. Use these tables when specifying a tray's paper settings and take note of the information under "Note".

Plain Paper

Paper weight	60 to 130 g/m ² (16 to 35 lb.)
Paper type setting using the control panel	The [Menu] key > [Paper Input] > [Paper Type: (tray name)] > [No Display (Plain Paper)] > the [OK] key
Paper type setting using the printer driver	[Plain & Recycled] or [Plain (60 to 130 g/m ²)]
Supported input tray	Any input tray can be used.
Duplex printing	Supported
Note	<ul style="list-style-type: none"> • Tray 1: 500 • Tray 2 (Paper feed unit): 500 • Tray 3 (Paper feed unit): 500 • Bypass Tray: 100

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Thick Paper

Paper weight	131 to 162 g/m ² (35 to 43 lb.)
Paper type setting using the control panel	The [Menu] key > [Paper Input] > [Paper Type: (tray name)] > [Thick Paper] > the [OK] key
Paper type setting using the printer driver	[Thick (131 to 162 g/m ²)]
Supported input tray	Any input tray can be used.
Duplex printing	Not supported
Note	Printing is slightly slower than when using plain paper.

Letterhead

Paper type setting using the control panel	The [Menu] key > [Paper Input] > [Paper Type: (tray name)] > [Letterhead] > the [OK] key
Paper type setting using the printer driver	[Letterhead]
Supported input tray	Any input tray can be used.
Duplex printing	Supported

Label Paper

Paper type setting using the control panel	The [Menu] key > [Paper Input] > [Paper Type: (tray name)] > [Label Paper] > the [OK] key
Paper type setting using the printer driver	[Labels]
Supported input tray	Any input tray can be used.
Duplex printing	Not supported

Special Paper

Paper type setting using the control panel	The [Menu] key > [Paper Input] > [Paper Type: (tray name)] > [Special Paper] > the [OK] key
Paper type setting using the printer driver	[Special]
Supported input tray	Any input tray can be used.
Duplex printing	Not supported
Note	When you cannot print successfully with other paper type settings, set special paper.

Preprinted Paper

Paper type setting using the control panel	The [Menu] key > [Paper Input] > [Paper Type: (tray name)] > [Preprinted Paper] > the [OK] key
Paper type setting using the printer driver	[Preprinted]
Supported input tray	Any input tray can be used.
Duplex printing	Not supported

Color Paper

Paper type setting using the control panel	The [Menu] key > [Paper Input] > [Paper Type: (tray name)] > [Color Paper] > the [OK] key
Paper type setting using the printer driver	[Color]
Supported input tray	Any input tray can be used.
Duplex printing	Not supported

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Recycled Paper

Paper type setting using the control panel	The [Menu] key > [Paper Input] > [Paper Type: (tray name)] > [Recycled Paper] > the [OK] key
Paper type setting using the printer driver	[Recycled] or [Plain & Recycled]
Supported input tray	Any input tray can be used.
Duplex printing	Supported

OHP transparencies

Paper type setting using the control panel	The [Menu] key > [Paper Input] > [Paper Type: Bypass Tray] > [OHP (Transparency)] > the [OK] key
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Paper type setting using the printer driver	[Transparency]
Supported input tray	This paper type can be printed only from the bypass tray.
Duplex printing	Not supported

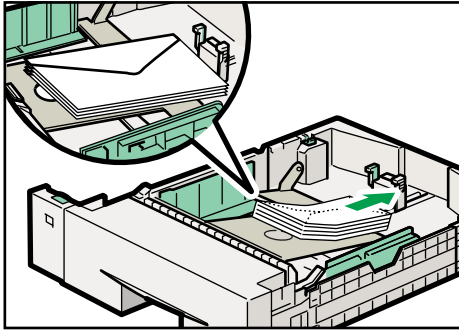
Envelopes

Paper type setting using the control panel	The [Menu] key > [Paper Input] > [Paper Type: Tray2] or [Paper Type: Tray3], or [Paper Type: Bypass Tray] > [Envelope] > the [OK] key
Paper type setting using the printer driver	[Envelope]
Supported input tray	This paper type can be printed only from the tray 2 and tray 3, and bypass tray. To print on envelopes from Tray 2 or Tray 3, use the envelope feeder unit.
Duplex printing	Not supported

Note	<ul style="list-style-type: none"> • Check there is no air in the envelopes before loading. • Load only one size and type of envelope at a time. • Some kinds of envelope might cause misfeeds, wrinkles or print poorly. • Print quality on envelopes may be uneven if parts of an envelope have differing thicknesses. Print one or two envelopes to check print quality. • In a hot and humid environment, the envelope might be output creased or improper printing quality. • The number of envelopes that can be printed in one minute is approximately half that of Plain Paper 1. • Paper can be loaded only up to the lower of the two paper limit marks of the bypass tray. • If printed envelopes come out badly creased, load the envelopes in the opposite direction. Also, configure the printer driver to rotate the print object 180 degrees. • Environmental factors can degrade the print quality on both recommend and non-recommended envelopes. • Up to 60 envelopes can be loaded on the envelope feeder unit. • After printing, envelopes sometimes have creases along their long edges and toner smear on their unprinted sides. Their print images might also be blurred. When printing large, black-solid areas, striping can occur as a result of the envelopes overlapping. If this occurs, use the envelope lever to resolve this problem. For more information about the envelope lever, see p.140 "Loading Envelopes".
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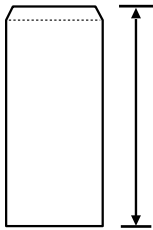
↓ Note

- Load envelopes with the print side down in the envelope feeder.
- Load envelopes with flaps closed to the left side of the tray. Also, configure the printer driver to rotate the print object 180 degrees.



CEE033

- Load envelopes with the print side facing up on the bypass tray.
- Load envelopes with flaps closed to the left side of the tray. Also, configure the printer driver to rotate the print object 180 degrees.
- To correctly specify the length of an envelope whose flap opens along its short edge, be sure to include the open flap when measuring.



ASH125S

Storing Paper

Take care when storing paper. Improperly stored paper might result in poor print quality, paper misfeeds, or printer damage. Recommendations are as follows:

- Avoid storing paper in humid areas.
- Avoid exposing paper to direct sunlight.
- Store on a flat surface.
- Keep paper in its original package until time to use it.

Non-Recommended Paper Types

★ Important

- Do not use the following types of paper:
 - Ink-jet printer paper
 - GelJet special paper
 - Bent, folded, or creased paper
 - Curled or twisted paper
 - Wet paper
 - Paper that is dry enough to emit static electricity
 - Paper that has already been printed onto, except a preprinted letterhead paper.
Malfunctions are especially likely when using paper printed on by other than a laser printer (e.g. monochrome and color copiers, ink-jet printers, etc.)
 - Surface-processed paper (excluding specified paper)
 - Special paper, such as thermal paper and carbon paper
 - Paper whose weight is heavier or lighter than the limitation
 - Perforated paper
 - Adhesive label paper on which glue or base paper is exposed
 - Paper with clips or staples
 - Dirty or damaged paper

↓ Note

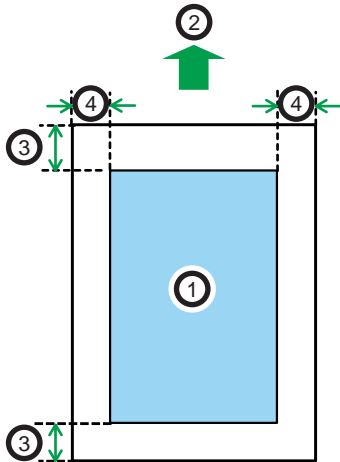
- Even if paper is adequate for the printer, poorly stored paper can cause paper misfeeds, print quality degradation, or malfunctions.

Print Area

Be sure to set the print margins correctly by the application.

The following diagram shows the print area for this printer.

Paper



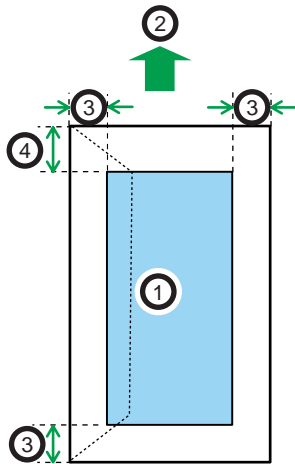
OEC244

- ① Print area
- ② Feed direction
- ③ Approx. 4.2 mm (0.20 inches)
- ④ Approx. 4.2 mm (0.20 inches)

↓ Note

- The print area may vary depending on the paper size, printer language and printer driver settings.

Envelope



CEC245

- ① Print area
- ② Feed direction
- ③ Approx. 10 mm (0.40 inches)
- ④ Approx. 15 mm (0.60 inches)

↓ Note

- The print area may vary depending on the paper size, printer language and printer driver settings.

Loading Paper in Trays

Loading Paper into a Standard or Optional Paper Feed Tray

WARNING

- Do not put your hands inside the printer when the input tray is removed. Some internal parts become hot and are a burn hazard.

CAUTION

- Do not pull out the paper tray forcefully. If you do, the tray might fall and cause an injury.

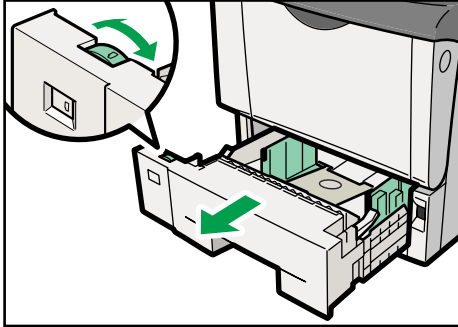
CAUTION

- Take care to avoid cutting your hands when loading paper.

Important

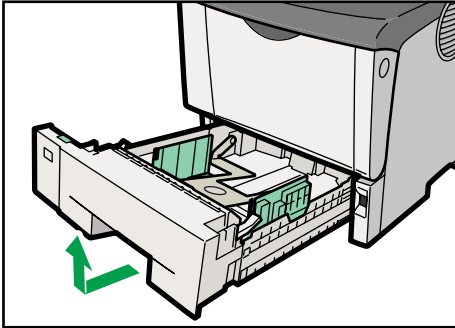
- Confirm that the setting of the paper size dial matches the paper size and feed direction of the paper in the tray, otherwise the printer might be damaged, or printing problems might occur.
- If you want to use the paper size and feed direction that are not indicated on the paper size dial, set the dial to "✖". In this case, you should set the paper size using the control panel.
- Make sure paper is not stacked higher than the upper limit mark inside the paper feed tray. Excessive stacking can cause paper jams.
- Do not mix different types of paper in the same paper tray.
- Specify the paper size using the control panel or paper size dial, and paper type using the control panel, according to the loaded paper. When printing a document, specify the same paper size and type in the printer driver as the settings specified on the printer.
- For details about the supported paper sizes and types, see p.111 "Supported Paper for Each Tray".
- Do not move the side paper guides and end paper guide forcefully. Doing so can damage the tray.
- Curled paper may jam, straighten curled paper before loading.
- When loading paper, take care not to touch the surface of the paper.

1. Lift the paper tray slightly, and then pull it out until it stops. Adjust the paper size dial to match the size and feed direction of paper in the paper tray.



CEE013

2. Lift the front side of the tray, and then pull it out of the printer.

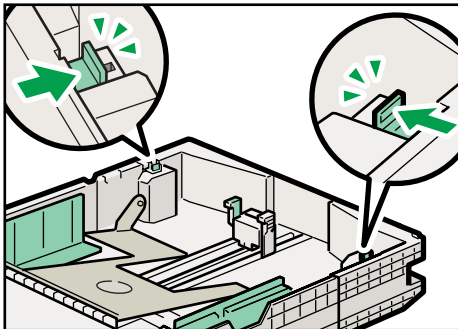


CEE011

Place the tray on a flat surface.

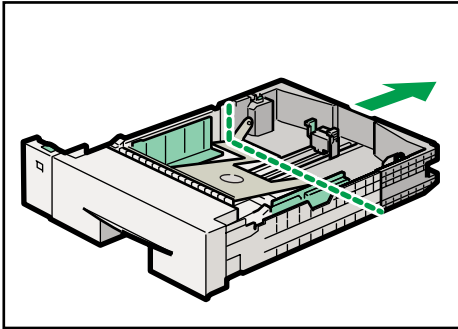
3. If you load paper larger than A4[□], you should extend the tray as follows:

1. Slide the catches inwards to unlock the tray.



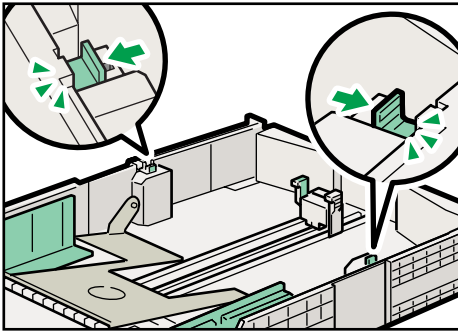
CEE029

2. Slide the tray until it stops.



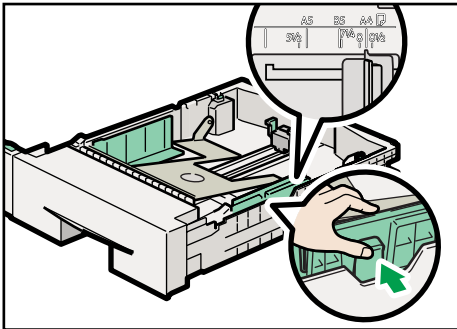
CEE028

3. Return the catches to their original positions.



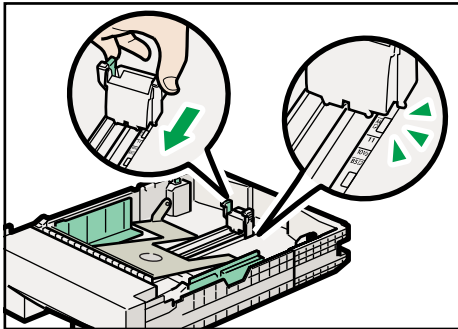
CEE030

4. Pinch the clip on the side paper guide and slide it to match the standard size.



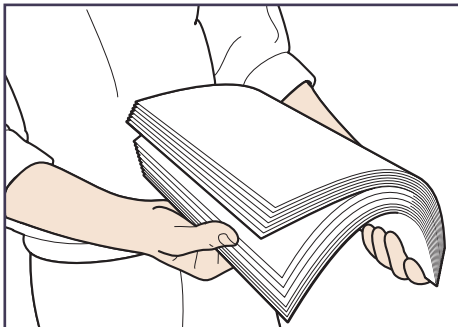
CEE096

5. Pinch the end guide and slide it inward to match the standard size.



CEE097

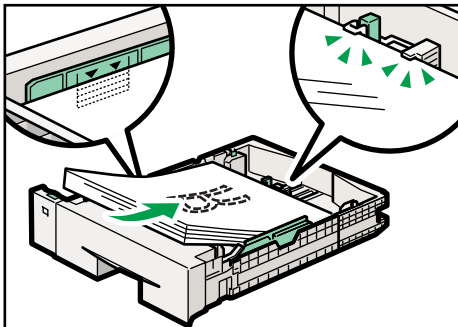
6. Fan the paper before loading paper in the tray.



CBK254

7. Load the new paper stack print side down.

Make sure paper is not stacked higher than the upper limit (upper line) marked inside the tray.



CEE116

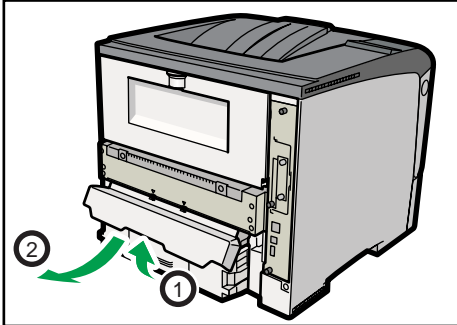
Slide the guides inward, until they are flush against the paper's sides.

8. Adjust the paper guides to close any gaps.

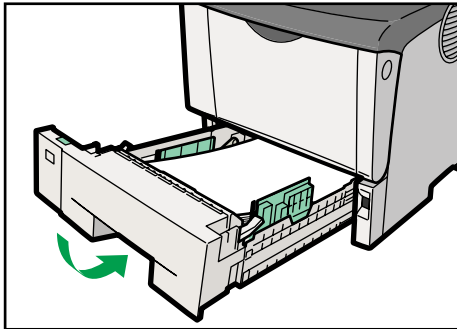
Do not move paper loaded in the tray more than a few millimeters.

Moving the loaded paper excessively can cause damage to paper edges on the openings of the tray's lifting plate, resulting in sheets being folded or becoming jammed.

9. If you extended the tray in Step 3, pull the bottom of the paper tray cover (①) up slowly, and then remove the paper tray cover (②), as shown in the illustration.



10. Hold the tray with both hands, slide it along the rails of the printer body, and then push it straight in.



To avoid paper jams, make sure the tray is securely inserted.

Note

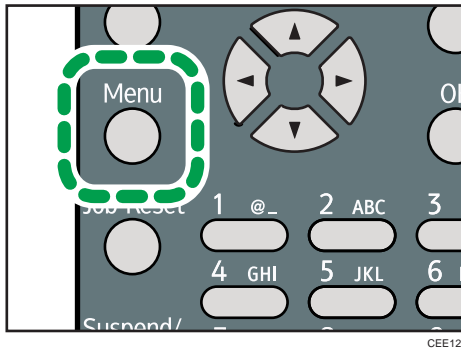
- You cannot load paper smaller than A4[□], if the tray is extended. In this case, return the tray to its standard length.

Specifying standard size paper for a standard or optional paper feed tray

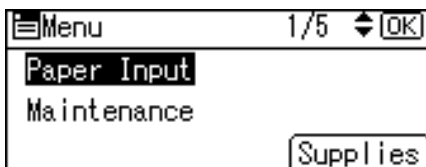
★ Important

- If you want to use the paper size and feed direction that are not indicated on the paper size dial, set the dial to "✖". In this case, you should set the paper size using the control panel. Follow the procedure described below to set the paper size.

1. Press the [Menu] key.



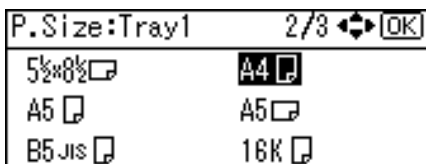
2. Press the [▼] or [▲] key to select [Paper Input], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Paper Size: (tray name)], and then press the [OK] key.



4. Select the paper size you want to set using the scroll keys, and then press the [OK] key.



5. Press the [Menu] key to return to the initial screen.

Note

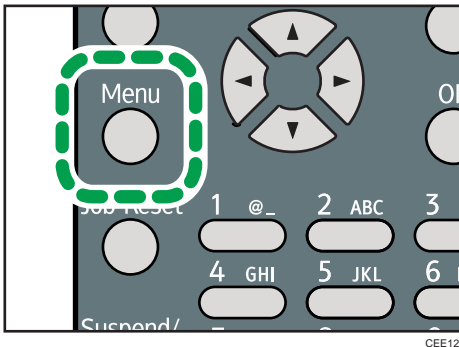
- For details about the available paper size, see p.111 "Supported Paper for Each Tray".
- After specifying the paper size, specify a paper type using the control panel and printer driver. For details on specifying a paper type using the control panel, see p.131 "Specifying a paper type for standard or optional paper feed tray".
- For details about the printer driver, see the printer driver Help.

Specifying custom size paper for a standard or optional paper feed tray

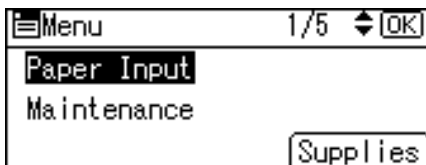
★ Important

- If you want to use the paper size and feed direction that are not indicated on the paper size dial, set the dial to "✱". In this case, you should set the paper size using the control panel. Follow the procedure described below to set the paper size.
- The printer cannot print from applications that do not support custom size paper.

1. Press the [Menu] key.



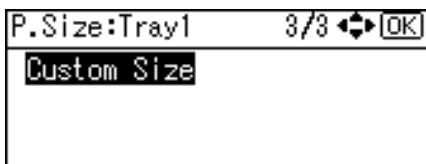
2. Press the [▼] or [▲] key to select [Paper Input], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Paper Size: (tray name)], and then press the [OK] key.
In the illustration below, [Paper Size:Tray 1] is selected for Tray 1.



4. Select [Custom Size] using the scroll keys, and then press the [OK] key.



5. Enter the horizontal value, and then press the [OK] key.

 Region **A** (mainly Europe and Asia)

Custom:Tray1	↕ [OK]
Enter with No. keys or ↕.	
Horiz.	<input type="text" value="215.9"/> mm
<139.7to216.0 by 0.1>	

 **Region B** (mainly North America)

Custom:Tray1	↕ [OK]
Enter with No. keys or ↕.	
Horiz.	<input type="text" value="8.50"/> inch
<5.50to8.50 by 0.01>	

6. Enter the vertical value, and then press the [OK] key.

 **Region A** (mainly Europe and Asia)

Custom:Tray1	↕ [OK]
Enter with No. keys or ↕.	
Vert.	<input type="text" value="279.4"/> mm
<139.7to356.0 by 0.1>	

 **Region B** (mainly North America)

Custom:Tray1	↕ [OK]
Enter with No. keys or ↕.	
Vert.	<input type="text" value="11.00"/> inch
<5.50to14.01 by 0.01>	

7. Press the [Menu] key to return to the initial screen.

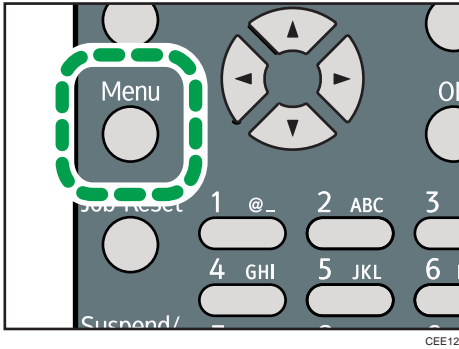
Note

- For details about the available paper size, see p.111 "Supported Paper for Each Tray".
- After specifying the paper size, specify a paper type using the control panel and printer driver. For details on specifying a paper type using the control panel, see p.131 "Specifying a paper type for standard or optional paper feed tray".
- For details about the printer driver, see the printer driver Help.

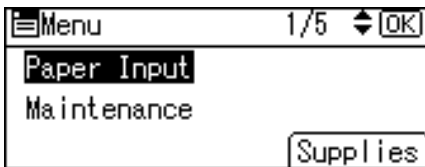
Specifying a paper type for standard or optional paper feed tray

You can improve printer performance by selecting the optimum paper type for the tray.

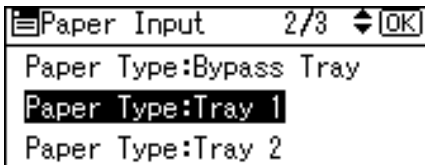
1. Press the [Menu] key.



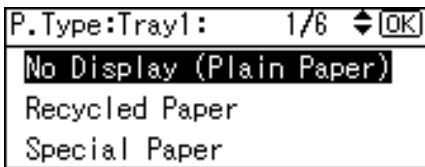
2. Press the [▼] or [▲] key to select [Paper Input], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Paper Type: (tray name)], and then press the [OK] key.
In the illustration below, [Paper Type:Tray 1] is selected for Tray 1.



4. Press the [▼] or [▲] key to select the paper type that is loaded, and then press the [OK] key.



About two seconds later, the display returns to the Paper Input screen.

5. Press the [Menu] key to return to the initial screen.

Note

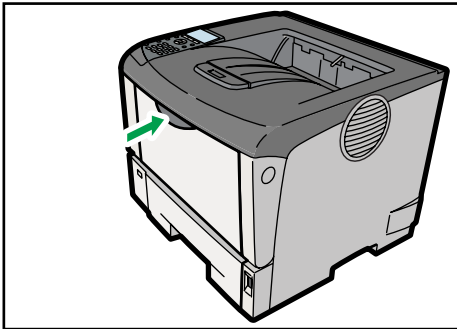
- If the printing result is badly smudged, change the setting on the printer's control panel. For details, see p.111 "Supported Paper for Each Tray".

Loading Paper onto Bypass Tray

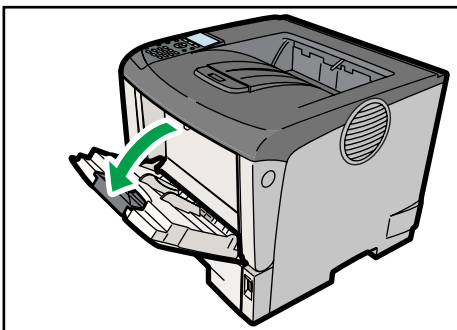
★ Important

- Shuffle paper before loading the stack onto the tray, so multiple sheets are not fed in together.
- Set the size and direction of the loaded paper on the control panel or in the printer driver. Make sure the settings do not conflict. Otherwise, the paper may jam or the print quality may be affected.
- Load paper with the print side up.
- Specify the paper size and type using the control panel. This printer does not automatically detect the size of paper loaded in a bypass tray. Make sure the paper size and type is selected using the control panel.
- During printing, do not open or close the printer covers or bypass tray, or pull out or push in the paper tray.

1. Press the mark in the center of the Bypass Tray.

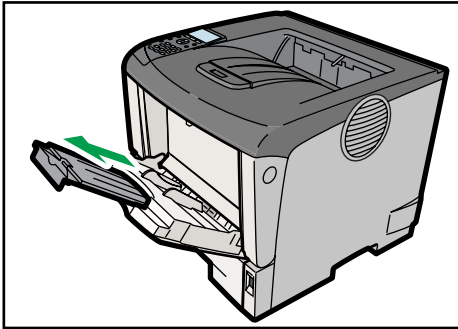


CEE002



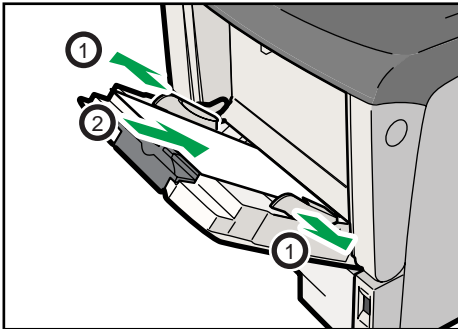
CEE006

If you load B5[□] or longer size paper, pull out the bypass tray extension.



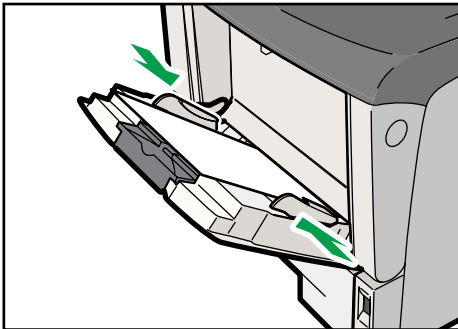
CEE024

2. Slide the paper guide both sides outward, and then load paper print side up, until it stops.



CEE025

3. Adjust the paper guide both sides to fit the paper width.



CEE076

Note

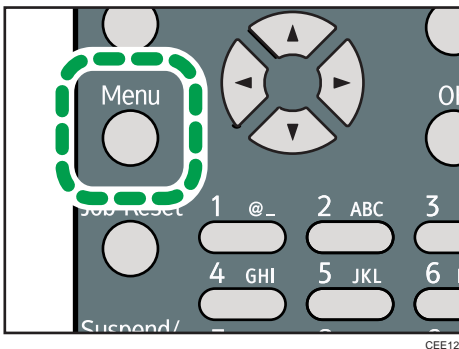
- When loading paper on the bypass tray, make sure the stack does not exceed the limit mark on the inner side of the paper guides. For details about the thicknesses of different paper types, see p.115 "Supported Paper Types".

Specifying standard size paper for the bypass tray

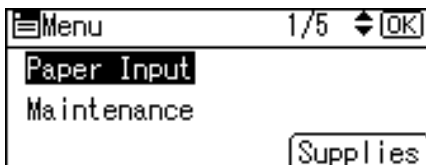
★ Important

- The standard size paper selected using the printer driver overrides that selected using the control panel, so do not make settings using the control panel if you have already made settings using the printer driver.
- When [Machine Setting(s)] is selected for [Tray Setting Priority] under [Machine Modes] in [Print Settings], any settings made using the printer's control panel have priority over any settings made using the printer driver.
- For details about the printer driver, see the printer driver Help.

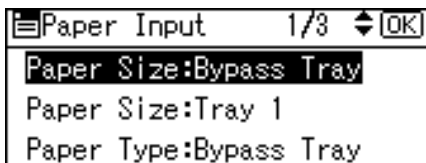
1. Press the [Menu] key.



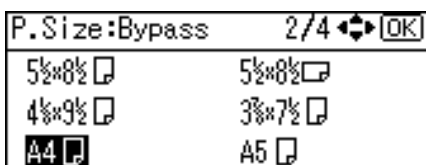
2. Press the [▼] or [▲] key to select [Paper Input], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Paper Size:Bypass Tray], and then press the [OK] key.



4. Select the paper size you want to set using the scroll keys, and then press the [OK] key.



5. Press the [Menu] key to return to the initial screen.

↓ Note

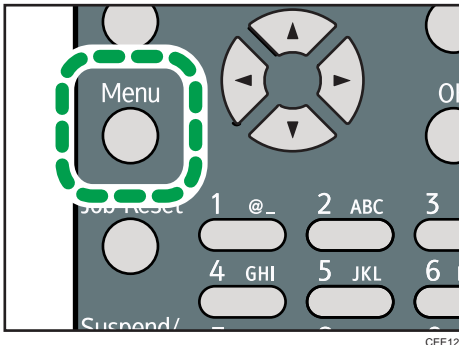
- After specifying the paper size, specify a paper type using the control panel or printer driver. For details on specifying a paper type using the control panel, see p. 138 "Specifying a paper type for the bypass tray".
- The number of pages that can be loaded on the bypass tray differs depending on paper type.
- For details about the printer driver, see the printer driver Help.

Specifying custom size paper for the bypass tray

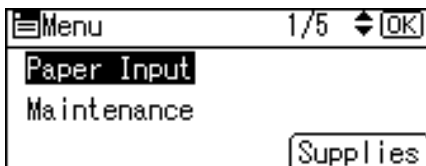
★ Important

- The custom size paper selected using the printer driver overrides that selected using the control panel, so do not make settings using the control panel if you have already made settings using the printer driver.
- When [Machine Setting(s)] is selected for [Tray Setting Priority] under [Machine Modes] in [Print Settings], any settings made using the printer's control panel have priority over any settings made using the printer driver.
- You cannot print on custom size paper with an application that does not support the custom size setting.
- For details about the printer driver, see the printer driver Help.

1. Press the [Menu] key.



2. Press the [▼] or [▲] key to select [Paper Input], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Paper Size:Bypass Tray], and then press the [OK] key.

☰ Paper Input	1/3	↕ [OK]
Paper Size:Bypass Tray		
Paper Size:Tray 1		
Paper Type:Bypass Tray		

4. Select [Custom Size] using the scroll keys, and then press the [OK] key.

P.Size:Bypass	4/4	↔ [OK]
16K		Custom Size

5. Enter the horizontal value, and then press the [OK] key.

🌐 Region **A** (mainly Europe and Asia)

Custom:Bypass	↕ [OK]
Enter with No. keys or ↕.	
Horiz.	215.9 mm
<64.0to216.0 by 0.1>	

🌐 Region **B** (mainly North America)

Custom:Bypass	↕ [OK]
Enter with No. keys or ↕.	
Horiz.	8.50 inch
<2.52to8.50 by 0.01>	

6. Enter the vertical value, and then press the [OK] key.

🌐 Region **A** (mainly Europe and Asia)

Custom:Bypass	↕ [OK]
Enter with No. keys or ↕.	
Vert.	279.4 mm
<139.7to432.0 by 0.1>	

🌐 Region **B** (mainly North America)

Custom:Bypass	↕ [OK]
Enter with No. keys or ↕.	
Vert.	11.00 inch
<5.50to17.00 by 0.01>	

7. Press the [Menu] key to return to the initial screen.

↓ Note

- After specifying the paper size, specify a paper type using the control panel or printer driver. For details on specifying a paper type using the control panel, see p. 138 "Specifying a paper type for the bypass tray".
- For details about the printer driver, see the printer driver Help.

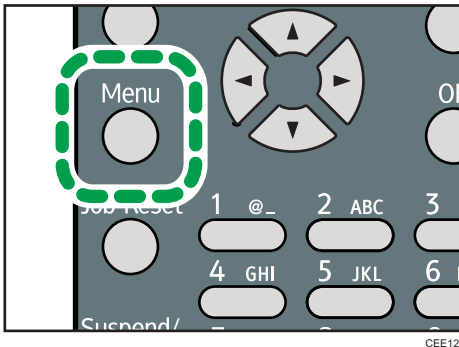
Specifying a paper type for the bypass tray

★ Important

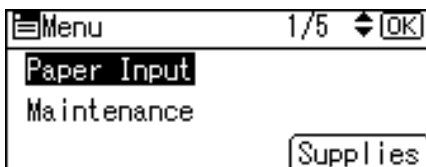
- After loading paper on the tray, specify the paper type using the control panel or printer driver.
- The paper type selected using the printer driver overrides that selected using the control panel, so do not make settings using the control panel if you have already made settings using the printer driver.
- When [Machine Setting(s)] is selected for [Tray Setting Priority] under [Machine Modes] in [Print Settings], any settings made using the printer's control panel have priority over any settings made using the printer driver.
- For details about the printer driver, see the printer driver Help.

6

1. Press the [Menu] key.



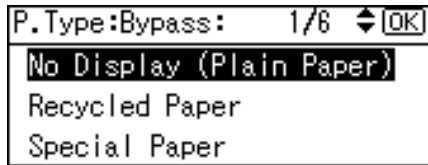
2. Press the [▼] or [▲] key to select [Paper Input], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Paper Type:Bypass Tray] and then press the [OK] key.



4. Press the [▼] or [▲] key to select the paper type you want to use, and then press the [OK] key.



5. Press the [Menu] key to return to the initial screen.

Note

- If the printing result is badly smudged, change the setting on the printer's control panel. For details, see p.111 "Supported Paper for Each Tray".

Loading Envelopes

⚠ CAUTION

- The inside of the machine could be very hot. Do not touch the parts with a label indicating the "hot surface". Otherwise, an injury might occur.

⚠ CAUTION

- Some of this machine's internal components get very hot. For this reason, take care when removing misfed paper. Not doing so could result in burns.

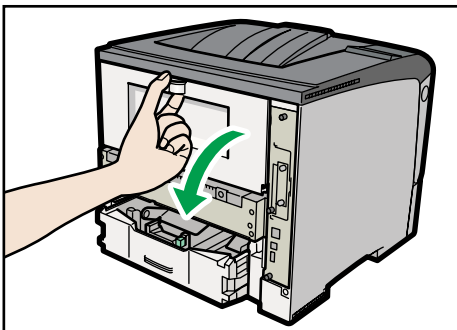
★ Important

- Check there is no air in the envelopes before loading.
- Load only one size and type of envelope at a time.
- Before loading envelopes, flatten their leading edges (the edge going into the printer) by running a pencil or ruler across them.
- Some kinds of envelope might cause misfeeds, wrinkles or print poorly.
- Print quality on envelopes may be uneven if parts of an envelope have differing thicknesses. Print one or two envelopes to check print quality.
- In a hot and humid environment, the envelope might be output creased or improper printing quality.

6

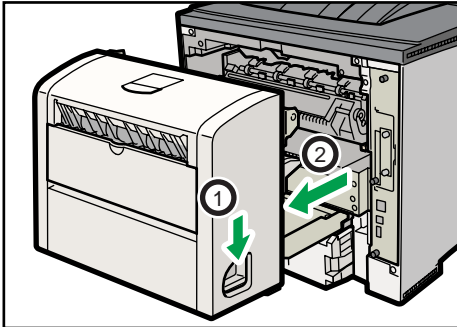
Loading Envelopes into the Bypass Tray

1. Open the rear cover.



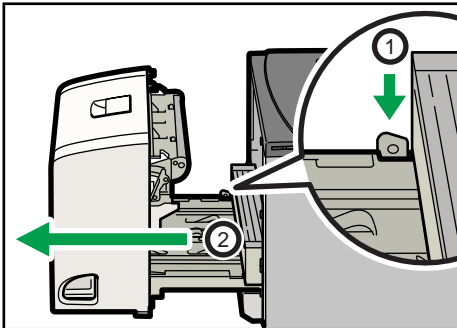
CEE040

2. If the optional duplex unit is attached, push down the lever on the right side of the duplex unit (①), and then pull it out until it stops (②).



CEE056

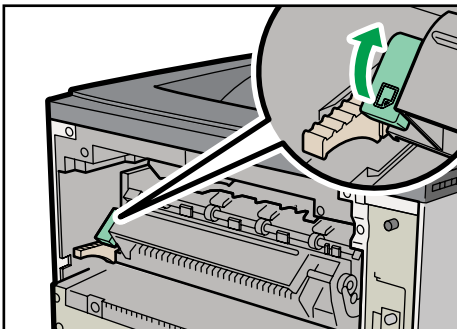
3. Push the under board levers (①) and then pull the duplex unit out of the printer (②).



CEE083

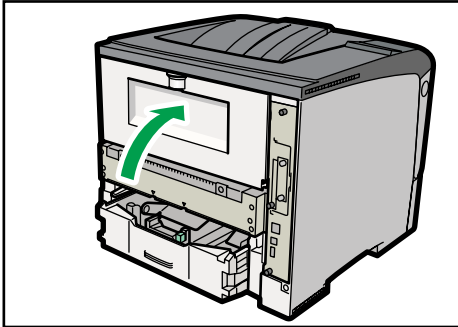
4. Use the envelope lever.

Raising the envelope lever reduces roller pressure.



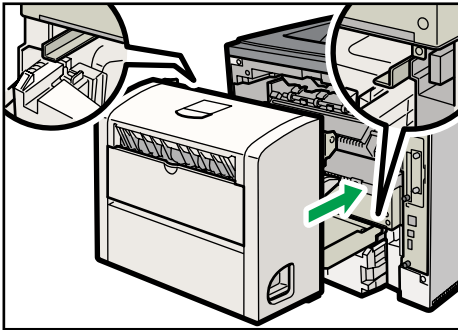
CEE058

5. Close the rear cover.



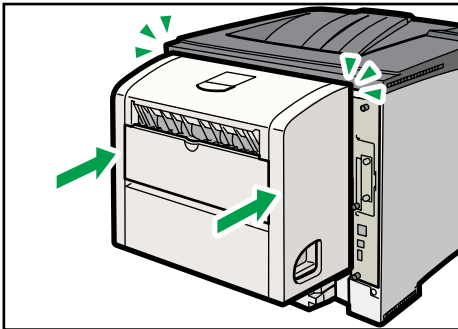
CEE045

6. If the optional duplex unit was removed, re-install it in the printer by pushing it along the rails on the inside of the printer.

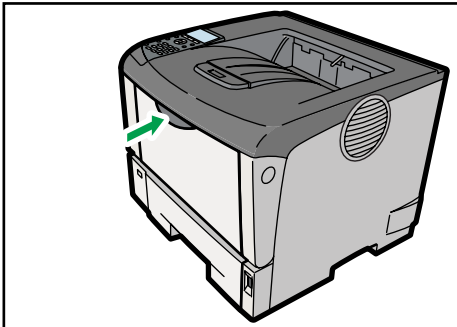


CEE057

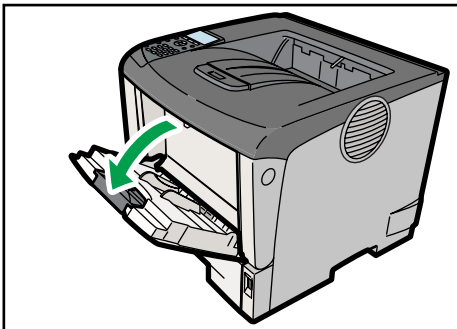
7. Securely push the duplex unit into the printer.



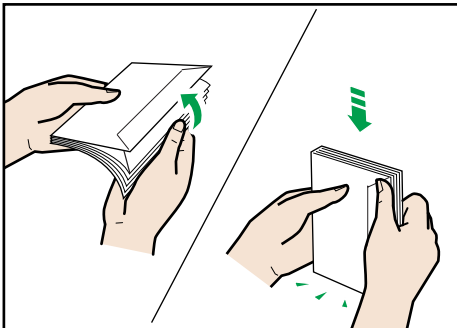
CEE050

8. Press the mark in the center of the Bypass Tray.

CEE002



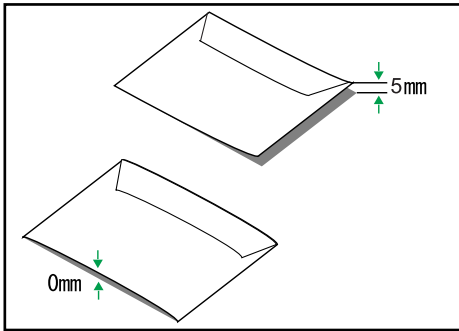
CEE006

9. Fan envelopes, and then align their edges before loading.

CBK239

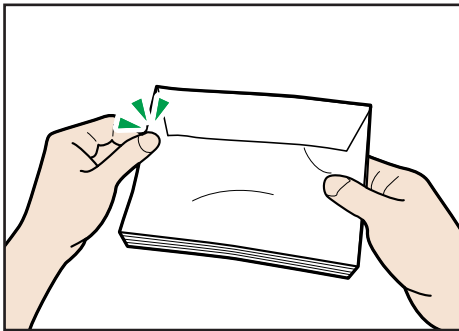
When fanning envelopes, make sure the envelope flaps are not stuck together. If they are stuck together, separate them.

Before loading envelopes, flatten them out so that their curl does not exceed that shown in the illustration below.



CBK240

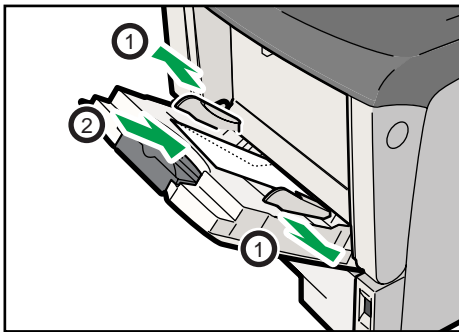
If the curl is severe, flatten out the envelopes using your fingers, as shown in the illustration below.



CBK241

If envelopes are severely curled after printing, flatten them by bending them back against the curl.

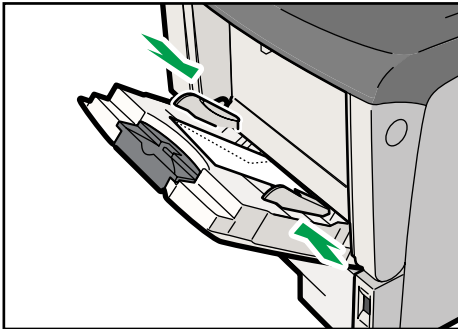
10. Set the envelope in the bypass tray with the printing side facing up.



CEE160

When loading envelopes, be sure to load envelopes in the tray with their closed flaps facing the left side of the tray.

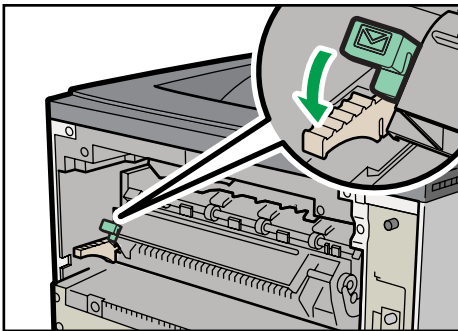
11. Adjust the paper guide both sides to fit the envelope width.



CEE161

↓ Note

- Keep the envelope lever lowered when printing normally.



CEE162

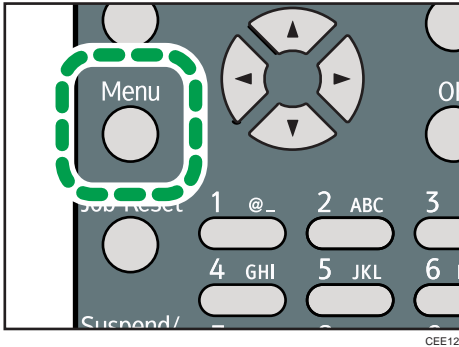
- Confirm that the top of the stack is not higher than the limit mark on the side guides.
- Do not push the stack of envelopes with too much force.
- Confirm that the edges of envelopes fit under the side guides.

Specifying envelope size for the bypass tray

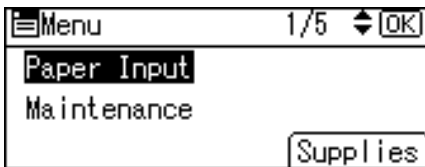
★ Important

- The envelope size selected using the printer driver overrides that selected using the control panel, so do not make settings using the control panel if you have already made settings using the printer driver.
- When [Machine Setting(s)] is selected for [Tray Setting Priority] under [Machine Modes] in [Print Settings], any settings made using the printer's control panel have priority over any settings made using the printer driver.
- For details about the printer driver, see the printer driver Help.

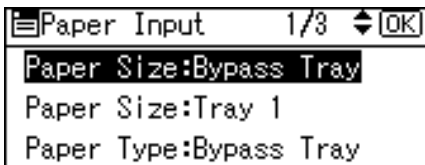
1. Press the [Menu] key.



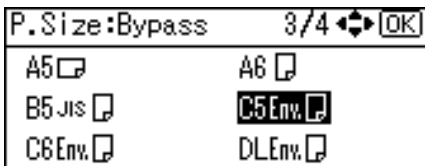
2. Press the [▼] or [▲] key to select [Paper Input], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Paper Size:Bypass Tray], and then press the [OK] key.



4. Select the envelope type using the scroll keys, and then press the [OK] key.



5. Press the [Menu] key.

↓ Note

- After specifying the paper size, specify a paper type such as [Envelope] using the control panel or printer driver. For details on specifying a paper type using the control panel, see p.138 "Specifying a paper type for the bypass tray".
- For details about the printer driver, see the printer driver Help.

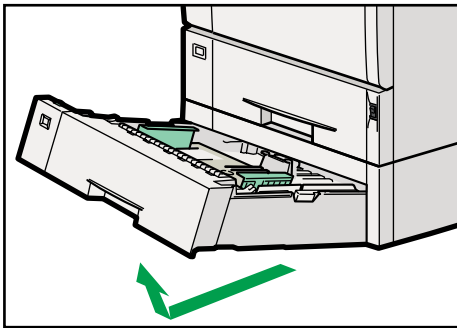
Loading Envelopes into the Envelope Feeder Unit

The following explanation uses the example of installing the envelope feeder unit in "Tray 2".

★ Important

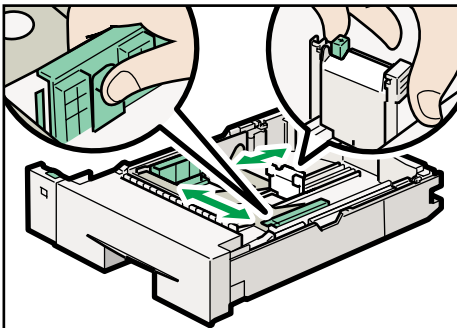
- Even if the envelope feeder is not installed, you can select envelope sizes for Tray 2 using the control panel. However, you cannot load envelopes until the envelope feeder unit is installed.
- With the envelope feeder unit, you can load up to 60 envelopes at the same time.
- Confirm that the envelope flaps are securely folded down, and that there is no air inside the envelopes.
- Do not slide the paper tray in with force. If you do the front and side guides might move.
- Select "✳" on the paper size dial.
- Using the control panel, specify the paper size according to the size of the envelope. When printing, match the paper size setting in the printer driver to the size selected on the printer.
- For details about the printer driver, see the printer driver Help.

1. Pull the optional paper feed unit (Tray 2) out until it stops. Then, lift it slightly, and then slide it out.



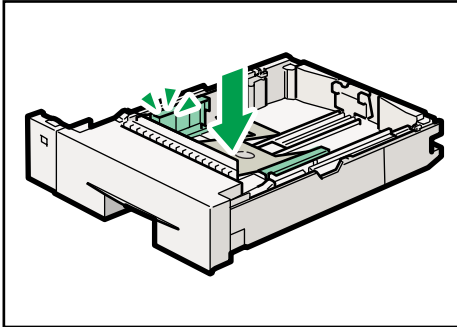
CEE075

2. Prepare the envelope feeder unit.
3. Pinch the side guides, and then slide them outward until they stop. Pinch the rear guide, and then slide it toward the back.



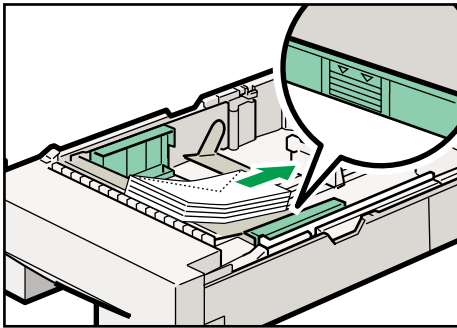
CEE036

4. Push the bottom plate down until it locks into place.



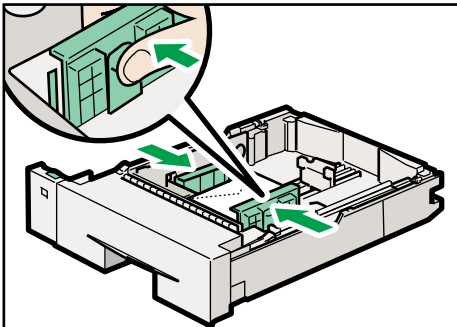
CEE035

5. Load envelopes into the envelope feeder unit, with the print side down and the flap on the left as shown in the illustration.



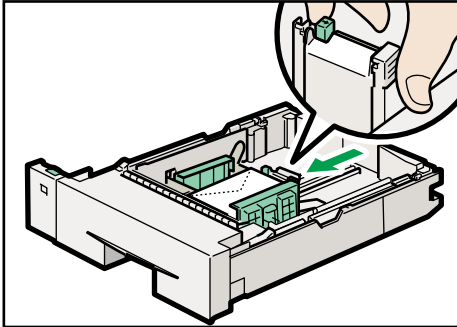
CEE163

6. Pinch the side guides, and then slide them along the edge of the envelope stack.



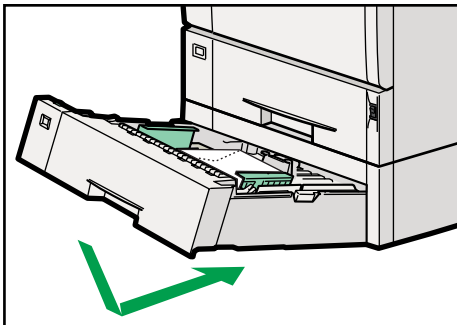
CEE037

7. Pinch the rear guide, and then slide it along the edge of the envelope stack.



CEE038

8. Lift the front of the tray, and then slide it carefully into the printer until it stops.

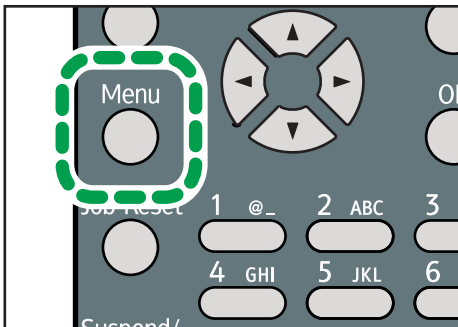


CEE073

6

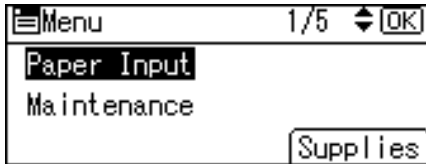
Specifying envelope size for the envelope feeder unit

1. Press the [Menu] key.



CEE128

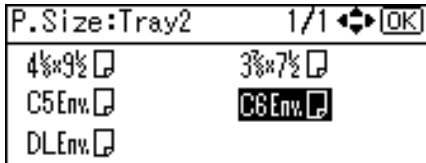
2. Press the [▼] or [▲] key to select [Paper Input], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Paper Size: (tray name)], and then press the [OK] key.



4. Select the paper size you want to set using the scroll keys, and then press the [OK] key.



5. Press the [Menu] key to return to the initial screen.

Note

- For details about the available paper size, see p.111 "Supported Paper for Each Tray".

Printing on Fixed-Orientation Paper

This section explains how to print on paper whose orientation and printing side are unchangeable (letterhead paper, for example).

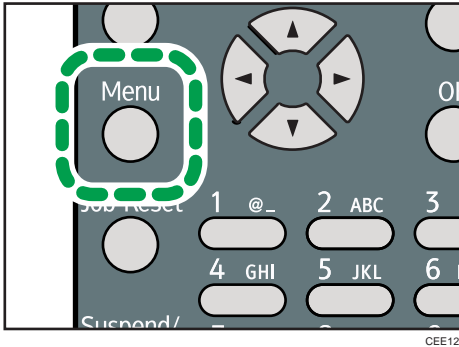
When loading paper with a fixed orientation, such as letterhead or letter paper, misprints may occur.

The following table shows the printout result according to the combination of paper feed direction and letterhead settings in the control panel and PCL printer driver.

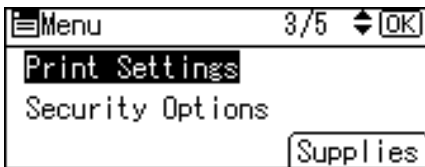
Paper Orientation	Paper trays 1-3		Bypass Tray	
	Letterhead Setting [On]	Letterhead Setting [Off]	Letterhead Setting [On]	Letterhead Setting [Off]
1-sided print ☞				
2-sided print ☞				
1-sided print ☜				
2-sided print ☜				

To make sure documents are printed correctly, follow the procedure to configure the print settings.

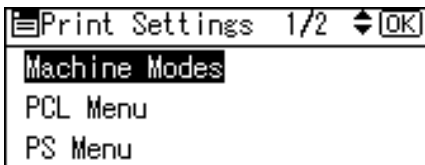
1. Press the [Menu] key.



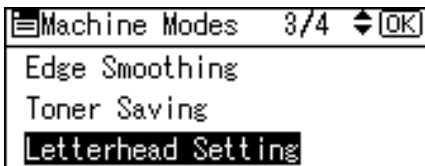
2. Press the [▼] or [▲] key to select [Print Settings], and then press the [OK] key.



3. Press the [▼] or [▲] key to select [Machine Modes], and then press the [OK] key.



4. Press the [▼] or [▲] key to select [Letterhead Setting], and then press the [OK] key.



5. Select one of the following settings, and then press the [OK] key.

On (Always)	The printer always prints on paper that has a fixed orientation
Auto Detect	The printer will print on paper that has a fixed orientation only if [Letterhead] or [Preprinted] is specified as the paper type in the printer driver's settings.
Off	The printer will print on paper in a fixed orientation, regardless of the specified paper type or the printer driver's settings.

6. Press the [Menu] key to return to the initial screen.

Registering Unique Names to Paper Types

You can register a unique name to a paper type using Web Image Monitor. The name you register should reflect the paper's type or usage, as this will make recognizing the paper type easier.

★ Important

- This function can be used when the printer is operating in a network, and bidirectional communication is enabled.
- This function cannot be used with the printer driver's [Manage Preset List...] function.
- The printer's logs do not record names of user paper types.

Registering Names to Paper Types

★ Important

- The printer driver might not display the paper type name correctly if it is registered using an unsupported language.
- The control panel might not display the paper type name correctly if it is registered using non-alphanumeric characters (i.e., other than a-z, A-Z, or 0-9).

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration].
3. Click [User Paper Type] in the [Device Settings] area, and then change the settings as necessary.

The screen for selecting [User Paper Type] appears.

4. Enter a descriptive name for easier recognition in Paper Name.
5. Select a suitable paper type from the Paper Type list.
6. Click [OK].
7. Click [Logout].
8. Quit the Web Image Monitor.

↓ Note

- You can register up to eight user paper types.

Setting User Paper Types to Trays

Before printing, set the paper registered on the user paper type to the paper tray, and then set the paper type already registered. Paper types can be set either from Web Image Monitor or from the printer's control panel.

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration].
3. Click [Paper] in the [Device Settings] area.
4. Set the paper tray you want to use as a user paper type, and then select the registered paper type.
5. Click [OK].
6. Click [Logout].
7. Quit the Web Image Monitor.

Printing Using Registered Paper Types

1. Select your application's print command.
2. On the tab in the properties dialog box that appears, select a registered paper type under [Paper Type:].
3. Execute the print command.

The preregistered settings are applied and print is performed.

Note

- For details about printer driver settings, see the printer driver Help.

7. Maintaining the Printer

This chapter explains how to replace consumables, and clean the printer.

Replacing the Print Cartridge

WARNING

- Do not incinerate toner (new or used) or toner containers. Doing so risks burns. Toner will ignite on contact with naked flame.

WARNING

- Keep the polythene materials (bags, gloves, etc.) supplied with this machine away from babies and small children at all times. Suffocation can result if polythene materials are brought into contact with the mouth or nose.

CAUTION

- Store toner (new or used), toner containers, and components that have been in contact with toner out of reach of children.

CAUTION

- If toner or used toner is inhaled, gargle with plenty of water and move into a fresh air environment. Consult a doctor if necessary.

CAUTION

- If toner or used toner gets into your eyes, flush immediately with large amounts of water. Consult a doctor if necessary.

CAUTION

- If toner or used toner is swallowed, dilute by drinking a large amount of water. Consult a doctor if necessary.

CAUTION

- When removing jammed paper or replacing toner, avoid getting toner (new or used) on your clothing. If toner comes into contact with your clothing, wash the stained area with cold water. Hot water will set the toner into the fabric and make removing the stain impossible.

CAUTION

- When removing jammed paper or replacing toner, avoid getting toner (new or used) on your skin. If toner comes into contact with your skin, wash the affected area thoroughly with soap and water.

Important

- Actual printable numbers vary depending on image volume and density, number of pages printed at a time, paper type and size, and environmental conditions such as temperature and humidity. Toner quality degrades over time. Early replacement of the print cartridge might be necessary. Therefore, we recommend you always keep a new print cartridge ready.
- The print cartridge might need to be replaced even if there is toner remaining in it. This is due to depletion or wear of other components.
- Do not allow paper clips, staples, or other small metallic objects to fall inside the printer.
- Do not expose the print cartridge without its cover to direct sunlight for a long time.
- When removing print cartridge, be careful not to drop it.
- Store print cartridges in a cool dark place.

Note

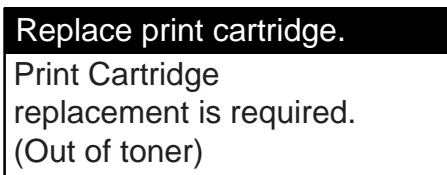
- If print cartridge are not changed when necessary, printing will become impossible. We recommend keeping a stock of print cartridge.
- Print cartridge (consumables) are not covered by warranty. However, if there is problem, contact the store where they were purchased.

Replace the print cartridge if the following message appears on the display:

"Replace print cartridge."

- This message appears when the toner has run out.

"Replace print cartridge. /Print Cartridge replacement is required.(Out of toner)"



CEE107

- This message appears when the waste toner bottle is full.

"Replace print cartridge. /Print Cartridge replacement is required.(Waste Toner Bottle full)"



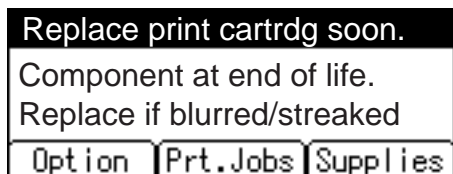
CEE108

When the following message appears on the display, the print cartridge should be replaced soon. Prepare a new print cartridge.

"Replace print cartrdg soon."



CEE109

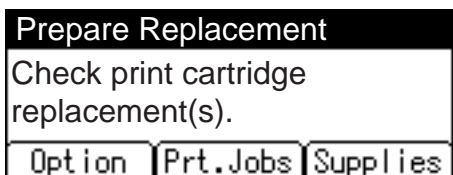


CEE133

The print cartridge must be replaced when the life of the photoconductor unit is ending.

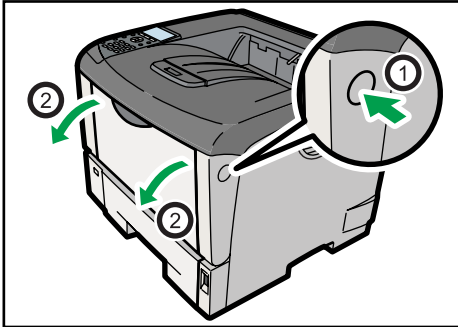
When the printer detects this condition, it will display the following message on the control panel.

"Prepare Replacement"



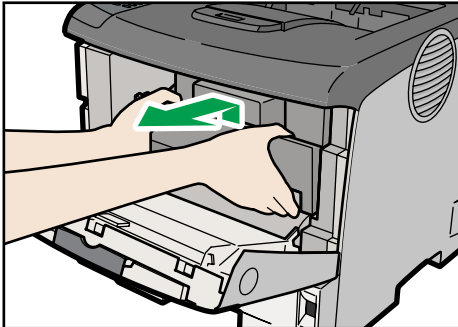
CEE134

1. Open the front cover by pushing the front cover release button.



CEE008

2. Lift the front side of the print cartridge, and then pull it out of the printer.



CEE017

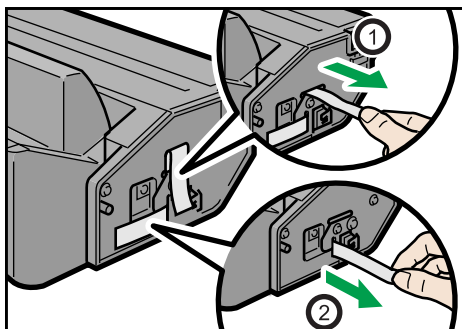
3. Be sure to put the print cartridge on a stable, flat surface.
4. Wipe around the metallic registration roller by turning with a soft damp cloth.



CEE040

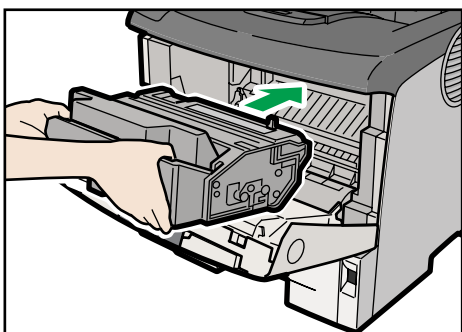
5. Take the new print cartridge from the box.

- Place the print cartridge on a flat surface. Pull out the tape from inside the unit horizontally while holding the cartridge with one hand as shown in the illustration.



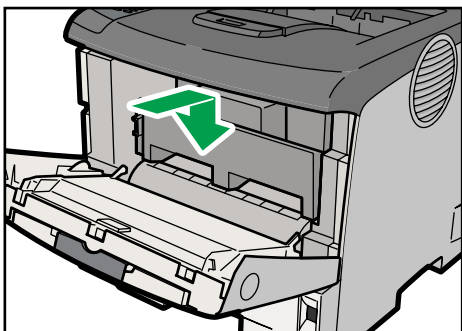
CEE115

- Hold the grips of the print cartridge, and then insert it into the printer until it stops.



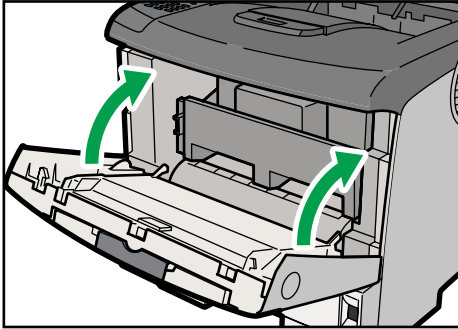
CEE009

- Push down the print cartridge to secure it in the appropriate position.



CEE007

9. Close the front cover.



CEE005

10. Wait while the toner loads.

To avoid malfunction, do not turn off the power until "Ready" appears on the display.

Note

- Do not shake or shock the print cartridge after pulling out the toner seal to avoid soiling paper surfaces, toner spillage, or printer failure.
- Comply with the print cartridge recycling program, whereby used print cartridges are collected for processing. For details, ask your sales or service representative.
- Do not close the front cover with excessive force. If you cannot close the cover easily, pull out the print cartridge from the printer and reinsert it again. After that, close the front cover again.

Replacing the Maintenance Kit

⚠ CAUTION

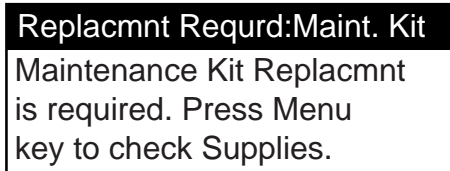
- The inside of the machine could be very hot. Do not touch the parts with a label indicating the "hot surface". Otherwise, an injury might occur.
- Grip the plug, not the cord, when pulling the plug from the socket. Pulling the cord causes wear and tear that can result in fire or electric shock.
- Wait at least one hour after power off before replacing parts. Not allowing the printer to cool may result in burns.

When to replace the Maintenance Kit.

The maintenance kit contains parts for maintaining the printer.

Replace the maintenance kit if the following message appears on the display:

"Replacmnt Requd:Maint. Kit"

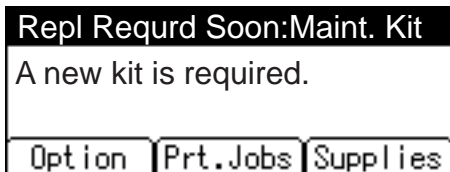


Replacmnt Requd:Maint. Kit
Maintenance Kit Replacmnt
is required. Press Menu
key to check Supplies.

CEE120

When the following message appears on the display, the maintenance kit contains parts should be replaced soon. Prepare a new maintenance kit.

"Repl Requd Soon:Maint. Kit"



Repl Requd Soon:Maint. Kit
A new kit is required.
Option | Prt.Jobs | Supplies

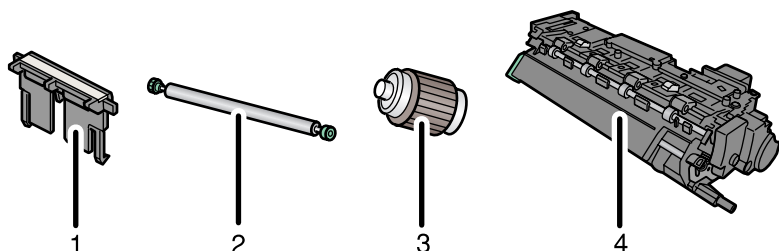
CEE119

Before Replacing

Replace all the parts included in the Maintenance Kit at the same time. To replace them, follow the procedure below:

1. Turn off the power, and then unplug the power cable.

2. Check the box contains the following items:



CEE111

1. Friction Pad × 3

See p.164 "Replacing the Transfer Roller".

2. Transfer Roller (with gloves)

See p.162 "Replacing the Friction Pad".

3. Paper Feed Roller × 3

See p.168 "Replacing the Paper Feed Roller".

4. Fusing Unit

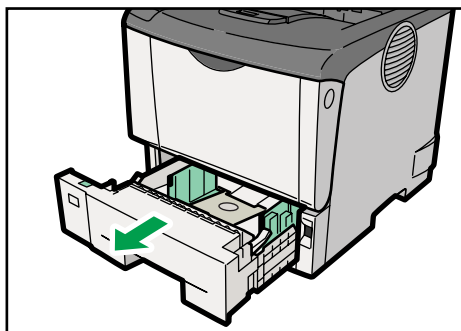
See p.171 "Replacing the Fusing Unit".

7

Replacing the Friction Pad

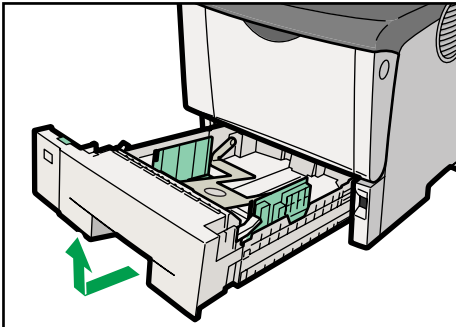
Replace all the friction pads in the tray. The following procedure shows how to replace the tray's friction pad (Tray 1) and the other are for the paper feed unit(s) (Tray 2, 3).

1. Pull out the paper tray until it stops.



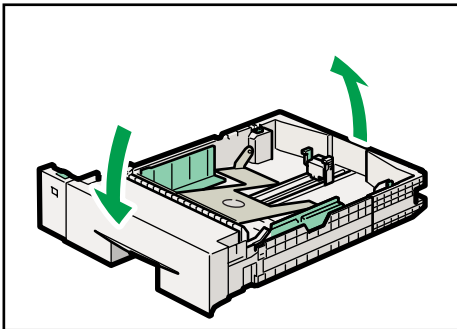
CEE010

2. Lift the front side of the tray, and then pull it out of the printer.



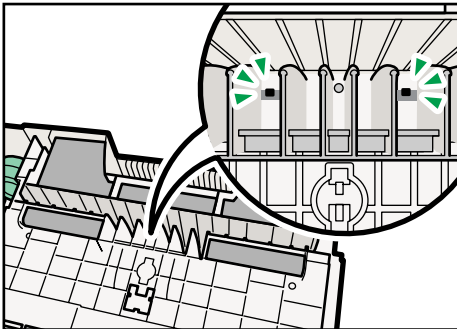
CEE011

3. Remove paper from the paper tray. Place the tray upside down on a flat surface.



CEE027

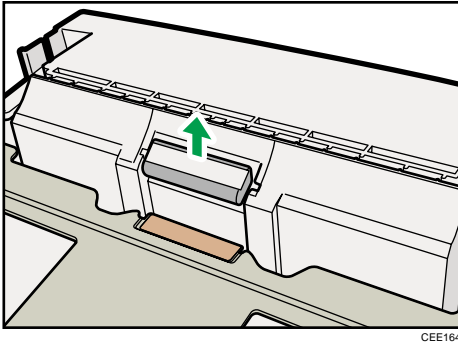
4. Use a sharp-pointed item like a ball point pen, to release the two catches that lock the friction pad.



CEE082

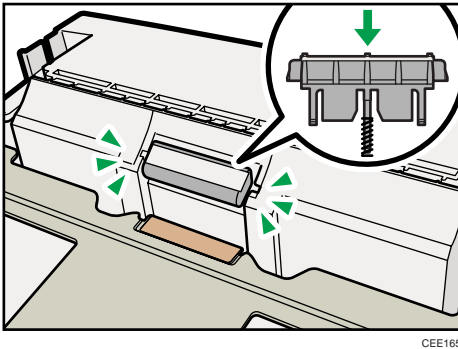
The friction pad may fall off when the catches are released. Place your hand over the friction pad while releasing the catches.

- Return the paper tray to its original position, and then remove the friction pad from the tray.



- Insert the new friction pad in the paper tray.

Attach the central projection of the new friction pad to the spring, and then align the projections on both sides of the friction pad with the holes in the paper tray. Then push the friction pad as shown in the illustration until it clicks.



After pushing in the friction pad, press on it several times to check it is properly installed. If it jumps back into position due to the force of the spring, it is properly installed.

- Push the friction pad until it locks securely.
- Repeat the replacement procedure for any optional paper feed units that are installed.

Note

- The friction pad spring may come off. Be careful not to lose the friction pad spring.
- The catches that lock the friction pad are located at the very back.

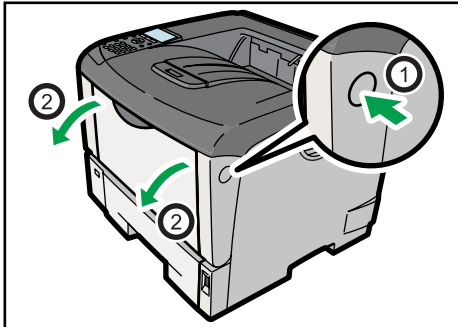
Replacing the Transfer Roller

★ Important

- Do not insert the roller on the back of the socket. Doing so can damage the printer.

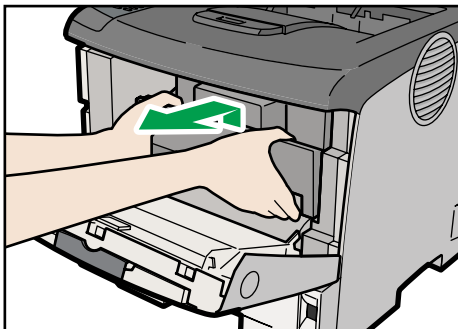
- Insert the metallic part of the roller on the socket. If you insert the sponge part of the roller, the roller might be damaged.

1. Open the front cover by pushing the front cover release button.



CEE008

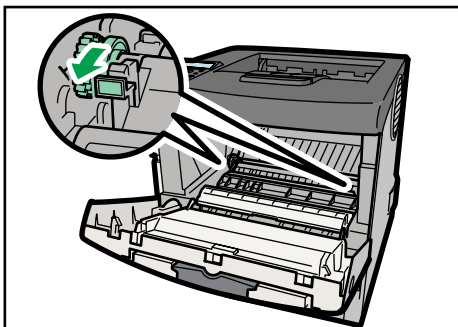
2. Pull the print cartridge out of the printer by holding the grips of the cartridge.



CEE017

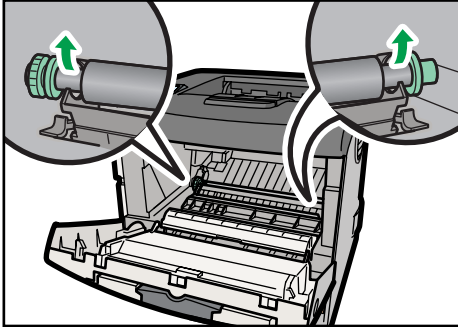
3. To avoid dirtying your hands with toner from the transfer roller, wear the gloves included in the Maintenance Kit.

4. Hold the lock levers, and then pull them.



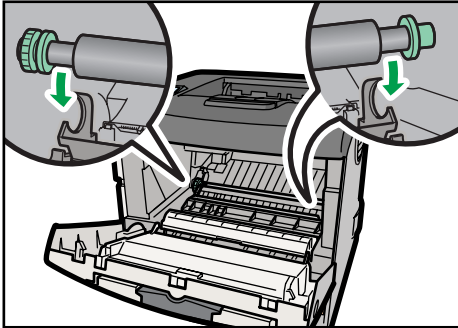
CEE064

5. Hold the green parts of the roller on both sides, and remove the roller from the printer, as shown in the illustration.



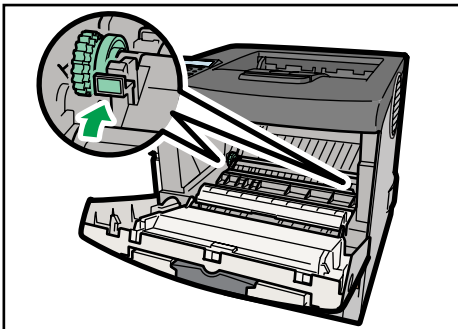
CEE066

6. Insert the new transfer roller on the socket with the gear of the roller positioned to the left.



CEE067

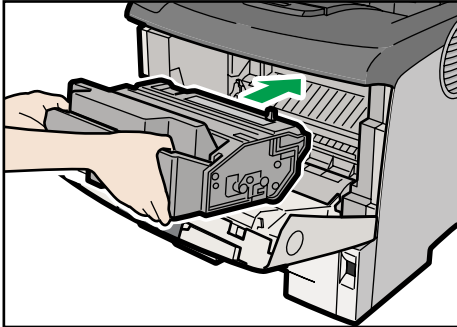
7. Push down the lock levers on both ends of the printer as shown in the illustration, until they click into place.



CEE065

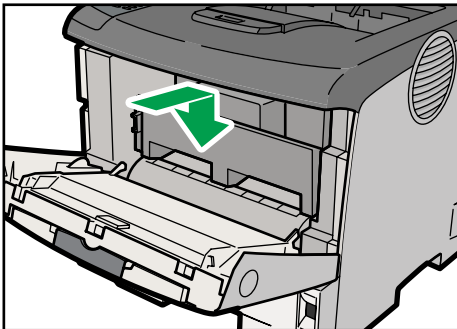
8. Take the gloves off.

9. Hold the grips of the print cartridge, and then insert it into the printer until it stops.



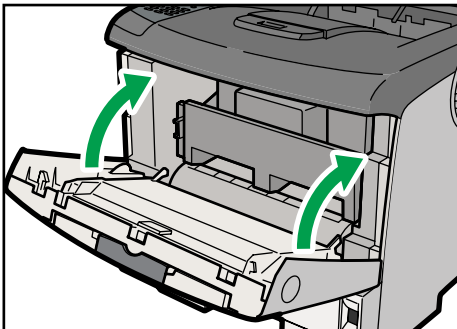
CEE009

10. Push down the print cartridge to secure it in the appropriate position.



CEE007

11. Close the front cover.



CEE005

Note

- Be sure to place the used cartridge on a level surface.
- When the transfer roller is set, the transfer roller cover will return to its original position automatically.

Replacing the Paper Feed Roller

Replace all feed rollers the feed rollers for the printer and the optional paper feed unit(s). The following procedure shows how to replace the paper feed rollers for the printer and the optional paper feed units.

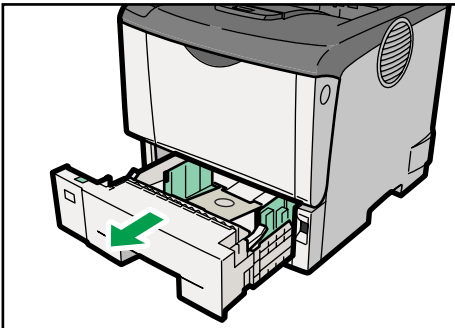
CAUTION

- When lifting the machine, use the inset grips on both sides. Otherwise the printer could break or cause injury if dropped.
- When lifting the paper feed unit, hold the bottom of it, and then lift it slowly. Lifting it carelessly or dropping it may cause an injury.

Important

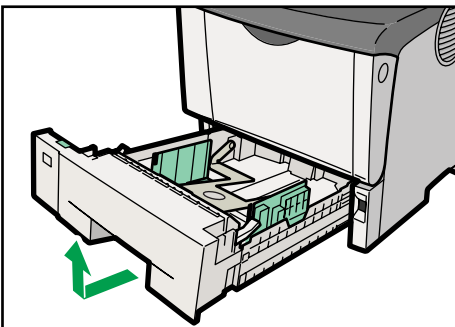
- Always move the printer horizontally. Turning the printer sideways or tilting it backward or forward while moving will result in toner leakage.
- Do not put the printer on an unstable or sloping surface.
- Be sure to move the printer horizontally. Moving the printer up and down may cause toner to scatter.

1. Lift the paper tray slightly, and then pull it out until it stops.



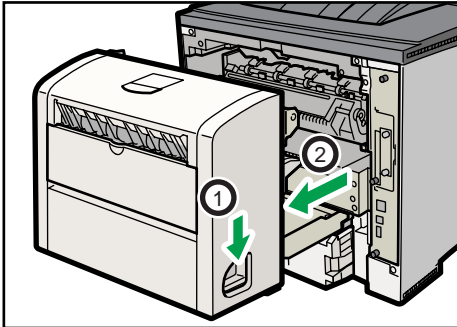
CEE010

2. Lift the front side of the tray, and then pull it out of the printer.



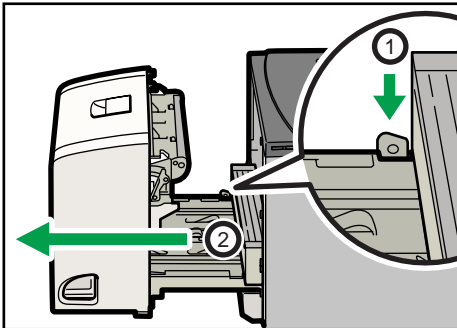
CEE011

3. If the optional duplex unit is attached, push down the lever on the right side of the duplex unit (①), and then pull it out until it stops (②).



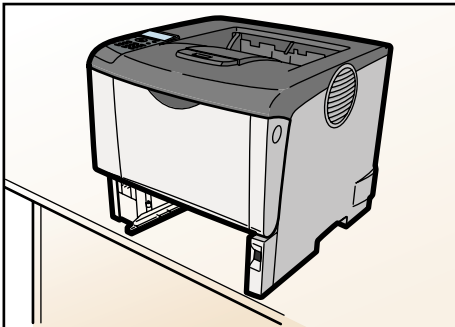
CEE056

4. Push the under board levers (①), and then pull the duplex unit out of the printer (②).



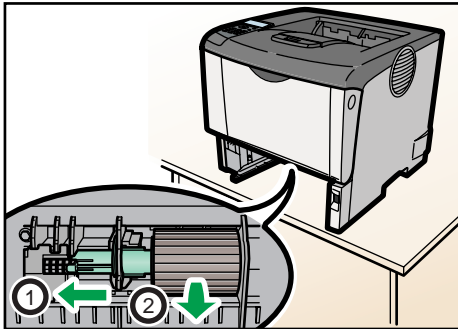
CEE083

5. Move the printer to the edge of a sturdy and stable table or desk.



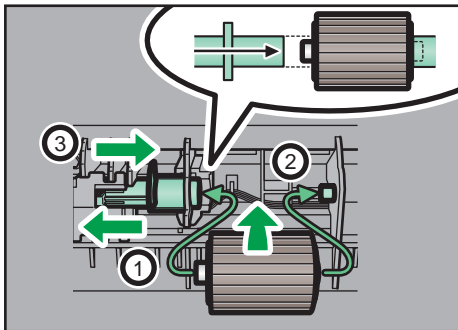
CEE022

- Slide the green lock lever to the left (①), and then remove the paper feed roller (②).



CEE026

- While sliding the green lock lever is slid to the left (①), install the new roller (②). Then, return the green lock lever to its original position (③).



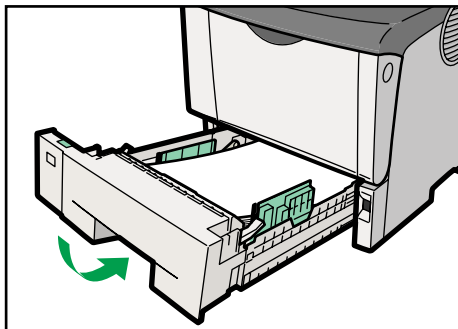
CEC037

Confirm the green lock lever secures the roller correctly by checking that sure the new roller rotates smoothly.

- If the printer is equipped with the optional paper feed unit(s), follow the same procedure to replace its paper feed roller.

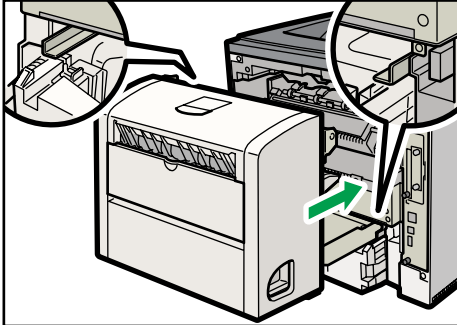
If you installed two paper feed units, also replace both their paper feed rollers.

- Place paper in the removed paper trays. Lift the front of the tray, and then slide it carefully into the printer until it stops.

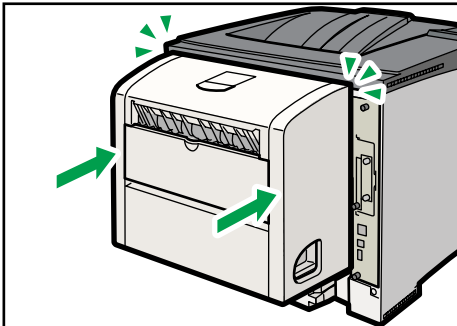


CEE012

10. If the optional duplex unit was removed, re-install it in the printer by pushing it along the rails on the inside of the printer.



11. Push the duplex unit securely into the printer.



Note

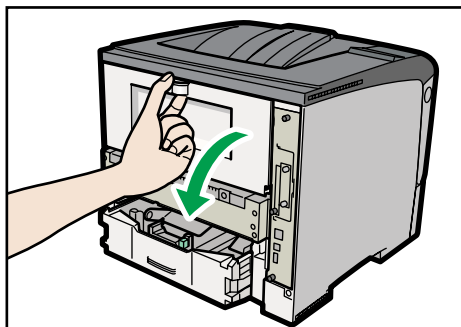
- If the printer is equipped with the optional paper feed unit, do not move the printer and the unit together, because they are not securely attached.

Replacing the Fusing Unit

CAUTION

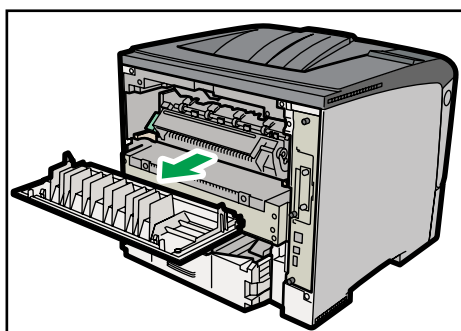
- The fusing unit becomes very hot. When installing a new fusing unit, turn off the printer and wait at least an hour before replacing the old fusing unit. Not allowing the unit to cool may result in burns.

1. Open the rear cover.



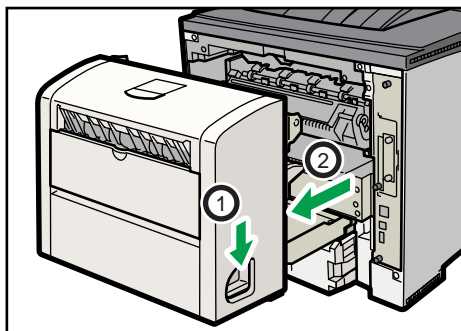
CEE040

2. Lower the rear cover until it is horizontal, and then pull it away.



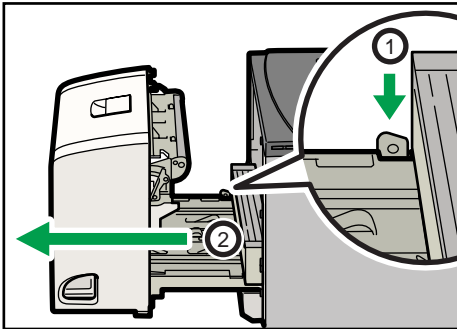
CEE041

3. If the optional duplex unit is attached, push down the lever on the right side of the duplex unit (①), and then pull it out until it stops (②).



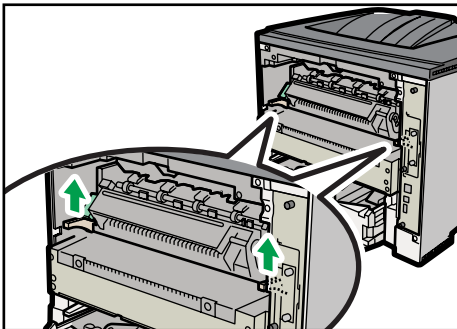
CEE056

4. Push the under board levers (①), and then pull the duplex unit out of the printer (②).



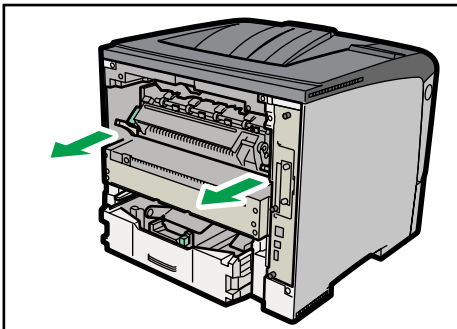
CEE083

5. Lift the lock levers of the fusing unit as shown in the illustration.



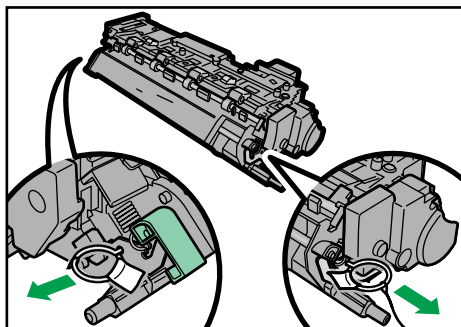
CEE046

6. Pull the fusing unit out.



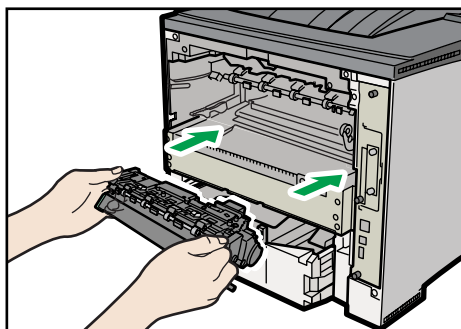
CEE048

7. Pull out the pins on both sides of the new fusing unit.



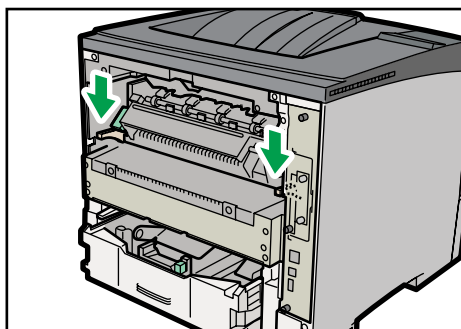
CEE061

8. Push the new fusing unit into the printer.



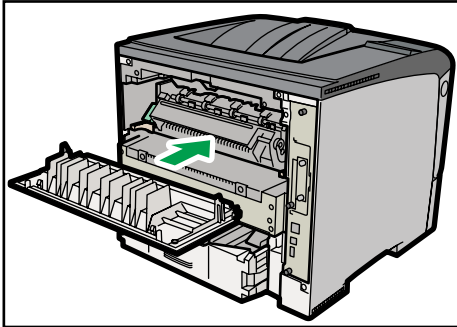
CEE049

9. Push the lock levers of the fusing unit down until they click.



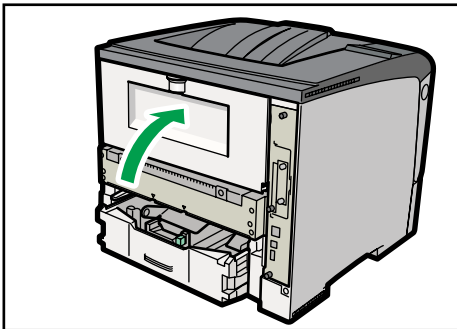
CEE047

10. Position the rear cover horizontally and align it with the grooves in the printer's interior.



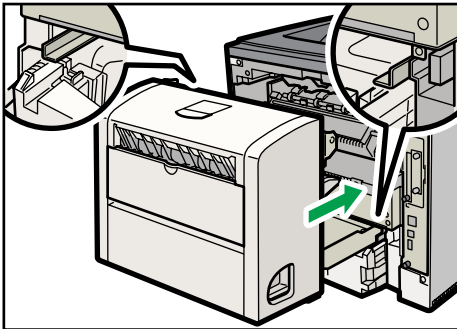
CEE044

11. Close the rear cover.



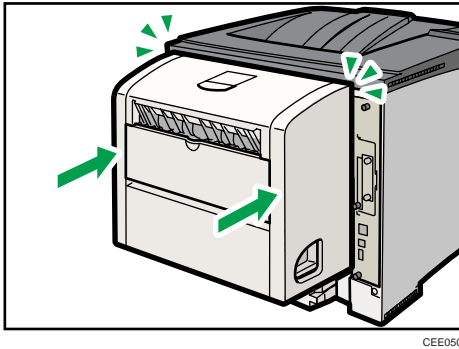
CEE045

12. If the optional duplex unit was removed, re-install it in the printer by pushing it along the rails on the inside of the printer.



CEE057

13. Securely push the duplex unit into the printer.



14. Print a configuration page to confirm that the printer works properly.

↓ Note

- For details on printing the configuration page, see p.45 "Test Printing".

Cautions When Cleaning

WARNING

- Do not remove any covers or screws other than those explicitly mentioned in this manual. Inside this machine are high voltage components that are an electric shock hazard and laser components that could cause blindness. Contact your sales or service representative if any of the machine's internal components require maintenance, adjustment, or repair.
- Do not attempt to disassemble or modify this machine. Doing so risks burns and electric shock. Note again that exposure to the laser components inside this machine risks blindness.

CAUTION

- The inside of the machine could be very hot. Do not touch the parts with a label indicating the "hot surface". Otherwise, an injury might occur.

CAUTION

- Be sure to disconnect the plug from the wall outlet and clean the prongs and the area around the prongs at least once a year. Allowing dust to build up on the plug constitutes a fire hazard.

CAUTION

- If the machine's interior is not cleaned regularly, dust will accumulate. Fire and breakdown can result from heavy accumulation of dust inside this machine. Contact your sales or service representative for details about and charges for cleaning the machine's interior.

Clean the printer periodically to maintain fine printing.

Dry wipe the exterior with a soft cloth. If dry wiping is not enough, wipe with a soft, wet cloth that is wrung out well. If you still cannot remove the stain or dirt, apply a neutral detergent, and then wipe over with a well-wrung wet cloth, dry wipe, and then let it dry.

Important

- To avoid deformation, discoloration, or cracking, do not use volatile chemicals, such as benzine and thinner, or spray insecticide on the printer.
- If there is dust or grime inside the printer, wipe with a clean, dry cloth.
- You must disconnect the plug from the wall outlet at least once a year. Clean away any dust and grime from the plug and outlet before reconnecting. Accumulated dust and grime pose a fire hazard.
- Do not allow paper clips, staples, or other small metallic objects to fall inside the printer.

Cleaning the Friction Pad and the Paper Feed Roller

If the friction pad or paper feed roller is dirty, a multi-feed or misfeed might occur.

In this case, clean the friction pad and paper feed roller as follows:

CAUTION

- When moving the machine, hold the inset grips at both sides, and then lift the printer slowly. Lifting it carelessly or dropping it may cause an injury.

CAUTION

- When performing maintenance on the machine, always disconnect the power cord from the wall outlet.

CAUTION

- When disconnecting the power cord from the wall outlet, always pull the plug, not the cord. Pulling the cord can damage the power cord. Use of damaged power cords could result in fire or electric shock.

7

CAUTION

- Do not pull out the paper tray forcefully. If you do, the tray might fall and cause an injury.

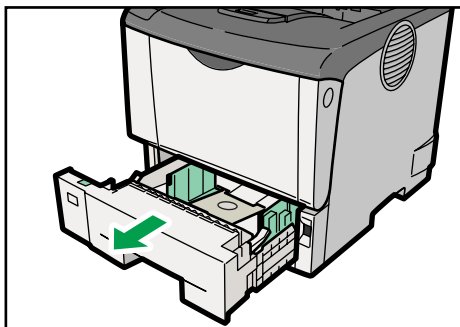
CAUTION

- Do not put your hands inside the printer when the input tray is removed. Some internal parts become hot and are a burn hazard.

Important

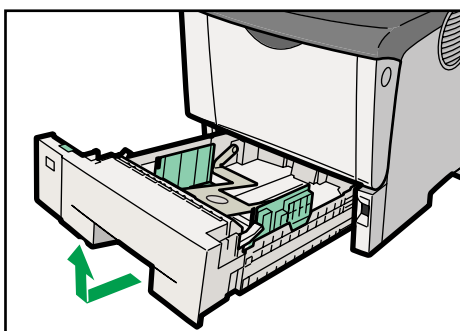
- Do not use chemical cleaners or organic solvents such as thinners or benzene.
1. Turn off the power switch.
 2. Pull out the plug from the socket. Remove all the cables from the printer.

3. Lift the paper tray slightly, and then pull it out until it stops.



CEE010

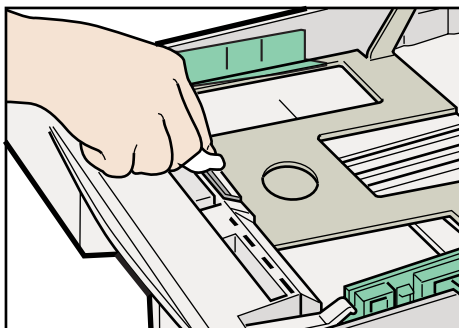
4. Lift the front side of the tray, and then pull it out of the printer.



CEE011

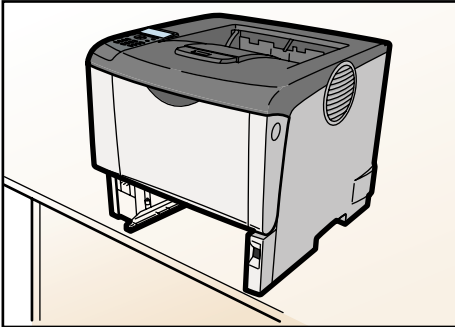
Place the tray on a flat surface. When there is paper in the tray, remove paper.

5. Wipe the friction pad with a damp cloth.



CEE166

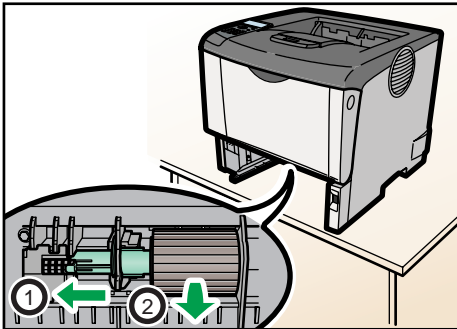
6. Move the printer to the edge of a stable table or desk.



CEE022

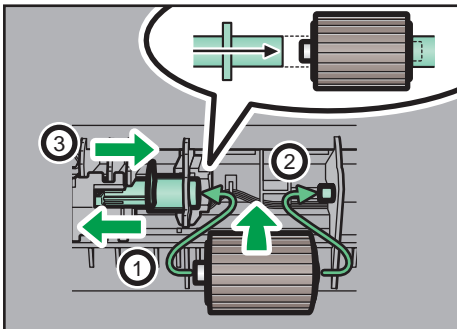
Do not put the printer on an unstable or tilted surface.

7. Slide the green lock lever to the left (①), so that the paper feed roller can be released (②).



CEE026

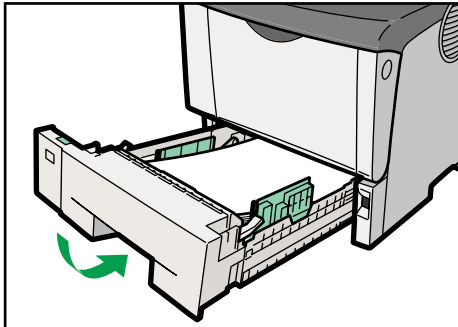
8. Wipe the rubber part of the roller with a soft damp cloth. Then, wipe it with a dry cloth to remove the water.
9. While sliding the green lock lever to the left (①), set the paper feed roller to its original position (②). After that, return the green lock lever to its original position (③).



CEC037

Check the green lock lever secures the roller correctly by making sure the new roller rotates smoothly.

10. Slide Tray 1 along the rails, and push it carefully all the way into the printer.



CEE012

Do not slide the paper tray in with force. If you do, the front and side guides might move.

11. Insert the plug of the power cord into the wall socket securely. Connect all the interface cables that were removed.
12. Turn the power switch on.

Note

- If misfeeds or multi-feeds of paper occur after cleaning the friction pad and paper feed roller, contact your sales or service representative.
- If the optional paper feed unit is installed, clean its friction pad and paper feed roller in the same way as those of the main paper feed unit.

Cleaning the Registration Roller

If the registration roller is dirty, a misfeed might occur. In this case, clean the roller as follows:

⚠ WARNING

- Be sure to turn off the power switch and wait for about 15 minutes before cleaning the Registration roller. Not waiting for the printer to cool down can result in a burn.

⚠ CAUTION

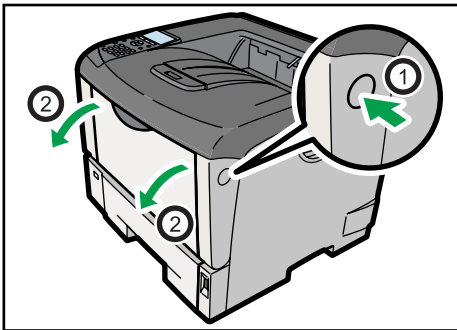
- The inside of the machine could be very hot. Do not touch the parts with a label indicating the "hot surface". Otherwise, an injury might occur.

Clean the registration roller if dots (caused by specks of paper stuck to the roller) appear on printed OHP transparencies.

★ Important

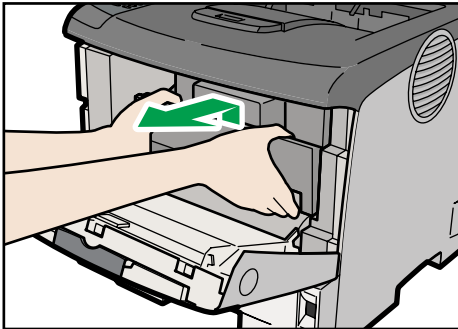
- Do not hold the print cartridge upside down or stand it vertically.
- Do not place the print cartridge on an unstable or tilted surface.
- Do not use chemical cleaners or organic solvents such as thinners or benzene.

1. Turn off the power, and then unplug the power cable.
2. Open the front cover by pushing the front cover release button.



CEE008

3. Lift the front side of the print cartridge, and then pull it out of the printer.



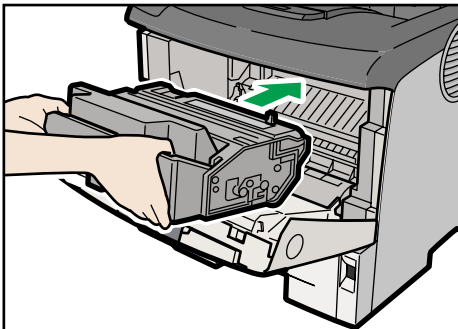
CEE017

4. Wipe around the metallic registration roller by turning with a soft damp cloth.



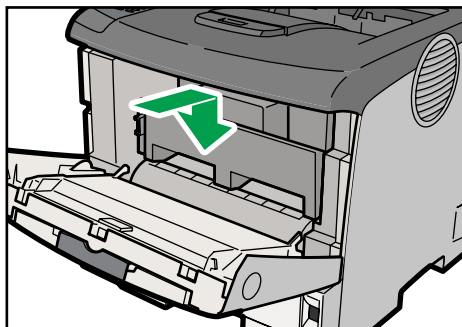
CEC040

5. Hold the grips of the print cartridge, and then insert it into the printer until it stops.



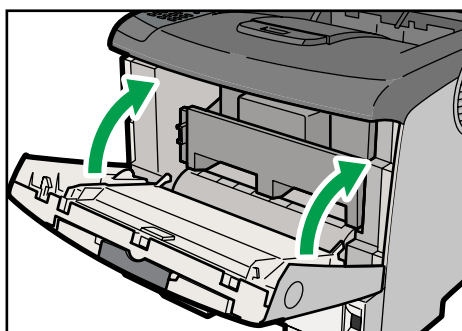
CEE009

6. Push down the print cartridge to secure it in the appropriate position.



CEE007

7. Close the front cover.



CEE005

Note

- Carefully close the front cover. If you cannot close the cover easily, pull the print cartridge out of the printer and insert it again. After that, close the front cover again.

8. Adjusting the Printer

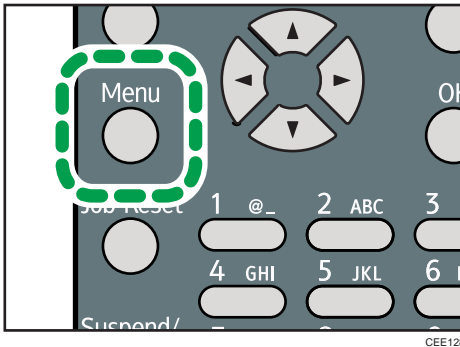
This chapter explains how to adjust the image density and print position.

Adjusting the Image Density

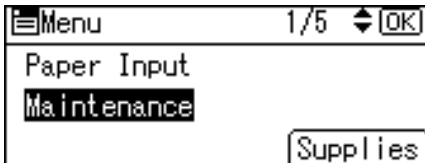
★ Important

- Maximized settings may produce smudged printouts.
- Image Density settings should be made from the application or the printer driver whenever possible.

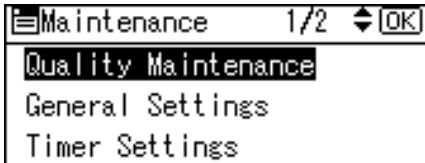
1. Press the [Menu] key.



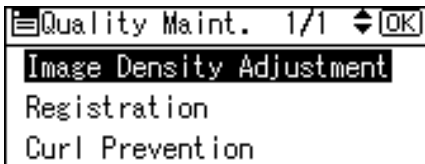
2. Press the [▼] or [▲] key to select [Maintenance], and then press the [OK] key.



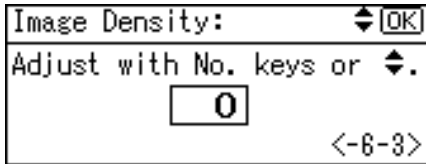
3. Press the [▼] or [▲] key to select [Quality Maintenance], and then press the [OK] key.



4. Press the [▼] or [▲] key to select [Image Density Adjustment], and then press the [OK] key.



5. Press the [▼] or [▲] key to specify the image density, and then press the [OK] key.



You can specify the image density in the range from -6 to +3.

6. Press the [Menu] key.

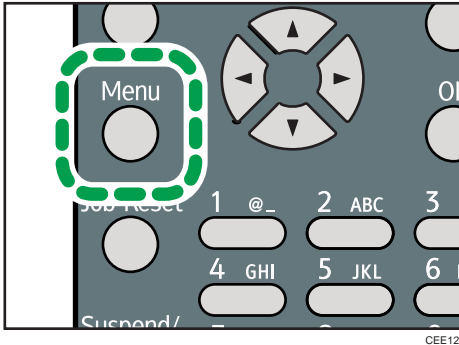
Note

- To maintain a darker image under high volume printing conditions, Selecting 3 from the control panel is highly recommended.
- You can adjust the image density in seven steps from -6 to +3. Increasing the value makes the printouts darker and decreasing the value makes the printouts lighter.

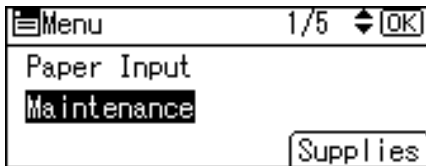
Adjusting Printing Position

You can adjust the printing position for each tray. "Horizontal" means perpendicular to the feed direction. "Vertical" means it's parallel to the paper feed direction. Normally you do not need to update the printing position. However, updating is useful in some cases when the optional paper feed unit is installed.

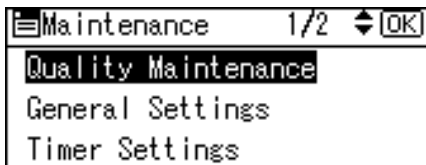
1. Press the [Menu] key.



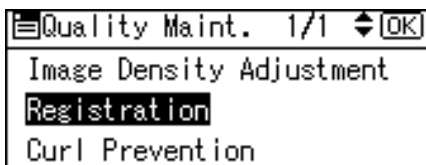
2. Press the [▼] or [▲] key to select [Maintenance], and then press the [OK] key.



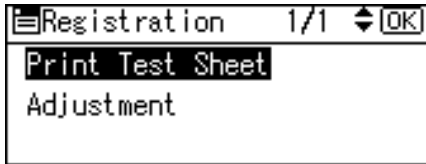
3. Press the [▼] or [▲] key to select [Quality Maintenance], and then press the [OK] key.



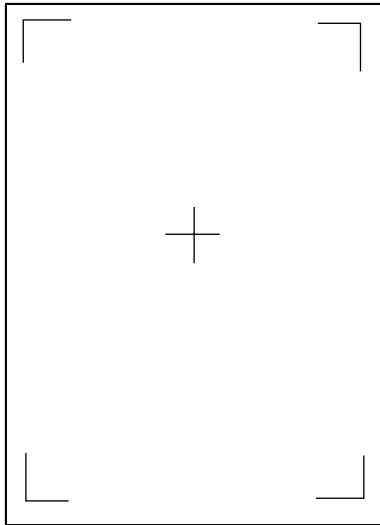
4. Press the [▼] or [▲] key to select [Registration], and then press the [OK] key.



- 5. Press the [▼] or [▲] key to select [Print Test Sheet], and then press the [OK] key.



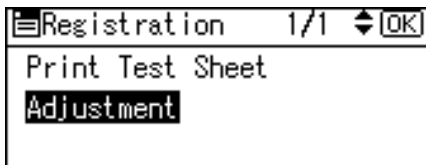
- 6. Press the [▼] or [▲] key to select the tray you want to adjust, and then press the [OK] key.
- 7. Confirm the position of the image on the test sheet, and then adjust the registration value.



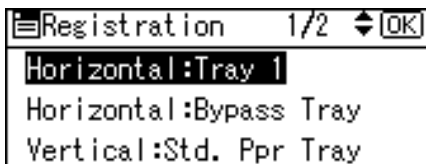
8

Use this sheet to confirm the current print position.

- 8. Press the [Escape] key until the screen returns to the [Registration] menu.
- 9. Press the [▼] or [▲] key to select [Adjustment], and then press the [OK] key.



- 10. Press the [▼] or [▲] key to select the parameter you want to adjust, and then press the [OK] key.

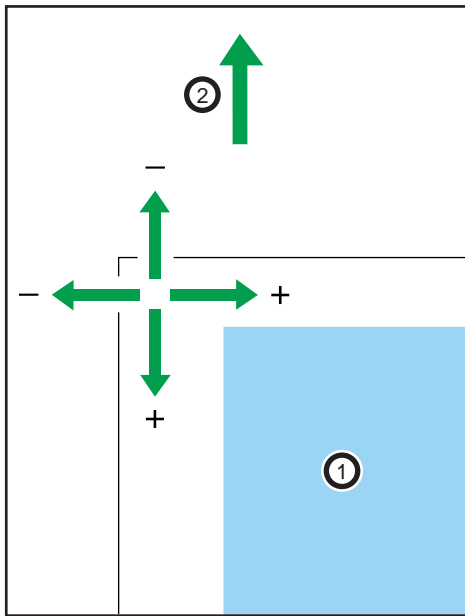


11. Enter the value (mm), and then press the [OK] key.

```

Reg.:Horiz.:Tray 1:  ⬆️⬆️ [OK]
Adjust with No. keys or ⬆️⬆️.
    0.0
    <-4.0to4.0 by 0.1>
  
```

Increase the value to shift the print area in the direction indicated by the "+" symbol in the diagram below. Decrease the value to shift the print area in the direction indicated by the "-" symbol.



CEC241

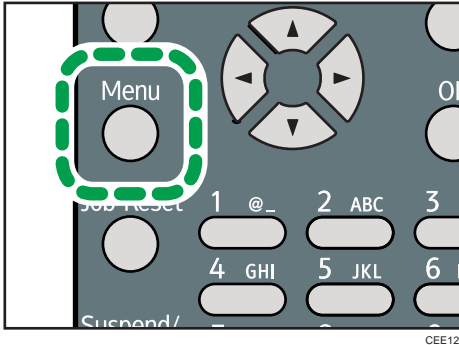
- ①: Print Area
 ②: Paper Feed Direction

Pressing the [▼] or [▲] key adjusts the value up or down in 0.1 mm increments.

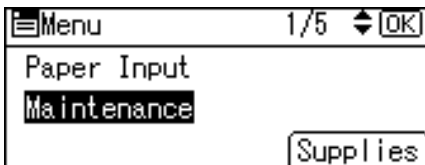
12. Press the [OK] key to return to the [Registration] menu.
 13. Print the test sheet to confirm the adjustment result.
 14. Press the [Menu] key to return to the initial screen.

Reducing Paper Curl

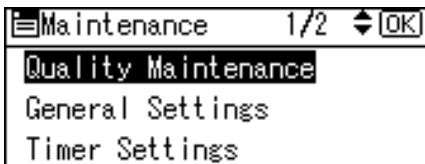
1. Push the [Menu] key.



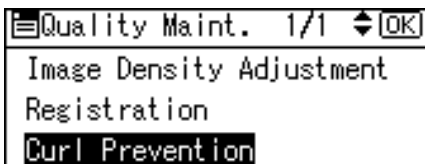
2. Press the [▼] or [▲] key to select [Maintenance], and then press the [OK] key.



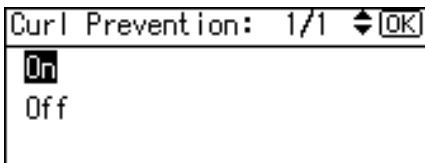
3. Press the [▼] or [▲] key to select [Quality Maintenance], and then press the [OK] key.



4. Press the [▼] or [▲] key to select [Curl Prevention], and then press the [OK] key.



5. Press the [▼] or [▲] key to select [On] or [Off], and then press the [OK] key.



About two seconds later, the display returns to the [Maintenance] menu.

6. Press the [Menu] key.

9. Troubleshooting

This chapter provides solutions to common problems and it also explains how to correct unwanted print results.

Error and Status Messages Appear on the Control Panel

This section explains what the messages that appear on the control panel mean and what to do when a particular message appears.

Status Messages (in alphabetical order)

@Remote Certif. updating...

The printer is updating the @Remote certificate.

Energy Saver Mode

The printer is in Energy Saver mode. Press any key to recover to the normal mode.

Hex Dump Mode

In Hex Dump mode, the printer receives data in hexadecimal format. Turn off the printer after printing, and then turn back on.

Job Suspended

All jobs are suspended. Turn off the printer, and turn it on again to recover.

Offline

The printer is offline and cannot print.

Please wait...

This message may appear for a few seconds. It means the printer is initializing, replenishing toner, or executing maintenance operations. Wait a while.

Printing...

The printer is printing. Wait a while.

Printing Suspended

Printing is suspended. To resume printing, press the [Suspend/Resume] key.

Ready

This is the default ready message. The printer is ready for use. No action is required.

Resetting Job...

The printer is resetting the print job. Wait a while.

Setting change...

The printer is applying the changes made to its settings. Wait a while.

Waiting for print data...

The printer is waiting for the next data to print. Wait a while.

Alert Messages (in alphabetical order)

Ⓜ(A) Remove misfeed in Trays. Opn & cls Frt. Cov.

Remove the jammed paper in the source tray, and then load the paper again. To reset the error, open the front cover and then close it. For details, see p.213 "Paper Misfeed Message (A)".

Ⓜ(B) Open Paper Exit Cover and remove misfeed.

Open the paper exit cover and remove jammed paper. For details, see p.218 "Paper Misfeed Message (B)".

Ⓜ(C) Open Rear Cover and remove misfeed.

Open the rear cover and remove the jammed paper inside the fusing unit. For details, see p.220 "Paper Misfeed Message (C)".

Ⓜ(Y1) Remove misfeed in Tray 2. Opn & cls Frt. Cov.

Remove the jammed paper in the source tray, and then load the paper again. For details, see p.225 "Paper Misfeed Message (Y1)(Y2)".

Ⓜ(Y2) Remove misfeed in Tray 3. Opn & cls Frt. Cov.

Remove the jammed paper in the source tray, and then load the paper again. For details, see p.225 "Paper Misfeed Message (Y1)(Y2)".

Ⓜ(Z) Remove paper from the Duplex Unit.

Detach the duplex unit and remove the jammed paper inside the duplex unit. For details, see p.227 "Paper Misfeed Message (Z)".

@Remote Cert. update failed

Updating the @Remote certificate failed. Contact your sales or service representative.

Cannot connect=>Comm.Serv. Check proxy user/password.

The proxy user name or password is incorrect. Check the proxy server settings, and change the user name and/or password if they are incorrect.

Cannot connect with DHCP server.(101/201)

Cannot obtain IP address from DHCP server. Consult your network administrator.

Cannot connect with NetWare print server. (107/207)

Connection with NetWare print server is unavailable.

Cannot connect with NetWare server.(106/206)

Connection with NetWare server is unavailable. Consult your network administrator.

Cannot print.

Check the file you want to print is a supported file type. Check for misfeeds and ask your network administrator for help.

Check network settings.(103/203)

The IP address setting is incorrect. Check the IP address, subnet mask, and gateway address. For details, see p.85 "Ethernet Configuration".

Classification Code Error

A classification code is not specified for the print job. Enter a classification code using the printer properties and print the document again.

For details, see "Registering Classification Codes", Software Guide.

Connect failed:WirelessCard Turn power off, check card.

Check there is a Wireless LAN board installed.

Check that it is a supported board. If it is, check it is installed correctly.

Install the correct board properly. For details, see p.64 "Installing the Interface Units".

Cover Open. Please close the indicated cover.

Close the cover indicated on the control panel.

Duplex mode is in off position for (tray name)

The duplex mode for the indicated tray is off; you can only use one-sided printing. Press [Change] to change the tray's settings, press [JobReset] to reset the job, or press [Form Feed] to force printing.

Ethernet Board Error

An error on the Ethernet board is detected. Pull out and then re-install the controller board. If the problem persists, contact your sales or service representative.

Exceeded max. print size. Press [FormFeed] or [JobReset].

The specified paper size exceeds the maximum size supported by this printer. Press [Form Feed] to force printing or [JobReset] to cancel printing.

Exceeded max. print size. Press [JobReset].

The specified paper size exceeds the maximum size supported by this printer. Press [JobReset] to cancel printing.

Prepare Replacement/ Check print cartridge replacement(s).

The printer cartridge is approaching the end of its life time. Prepare a new print cartridge.

Failed to connect to server for Remote Diagnostics.

The printer cannot communicate with Remote Communication Gate. Check the connection to the Remote Server Gate.

Independent-supply toner

Independent-supply toner is set. Use toner recommended for this printer.

IPDS font error. Turn power switch off then on. Select Reset IPDS Fonts in Maintenance.

IPDS font error has occurred. Perform the shutdown procedure, and then turn off the power of the printer. Turn on the power again, and then execute [Reset IPDS Fonts].

IPv6 Address already exists Link-local Address(109/209)

The same IPv6 address already exists. Consult your network administrator.

IPv6 Address already exists Stateless Address(109/209)

The same IPv6 address already exists. Consult your network administrator.

IPv6 Address already exists Manual Config. Address(109/209)

The same IPv6 address already exists. Consult your network administrator.

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Load paper in (tray name) or [Cancel] to FormFeed.

There is no paper in the specified tray. Load the specified paper in the tray, press [JobReset] to reset the job.

Option RAM Error

The printer cannot detect an optional SDRAM module. It may be incorrectly installed.

Check if it is installed properly.

For details about installing the unit, see p.56 "Installing the Memory Expansion Units".

Output tray is full.

The output trays are full. Remove the paper.

Parallel I/F Error

The printer's self diagnostic test failed due to a loopback error. Replace the IEEE 1284 board that caused the error. For details, see p.64 "Installing the Interface Units".

Prepare Replacement Check print cartridge replacement(s).

The toner has run out, or the photo conductor unit has reached the end of its service life. Prepare a new print cartridge.

Printer Font Error.

There are problems with the printer's font file.

Contact your sales or service representative.

Problem with Hard Disk Please call service.

The printer cannot detect a hard disk. It may be incorrectly installed.

Check if it is installed properly or contact your sales or service representative.

For details about installing the unit, see p.56 "Installing the Memory Expansion Units".

Problem:Wireless card Please call service.

The printer cannot detect a Wireless LAN board. It may be incorrectly installed.

Check if it is installed properly or contact your sales or service representative.

For details about installing the unit, see p.64 "Installing the Interface Units".

Repl Requird Soon:Maint. Kit

You will need to replace the maintenance kit soon. Contact your sales or service representative to obtain a new maintenance kit. For details, see p.161 "Replacing the Maintenance Kit".

Replace print cartridge. /Print Cartridge replacement is required.(Out of toner)

The toner has run out. Replace the print cartridge. For details, see p.155 "Replacing the Print Cartridge".

Replace print cartridge. /Print Cartridge replacement is required.(Waste Toner Bottle full)

The waste toner bottle is full. Replace the print cartridge. For details, see p.155 "Replacing the Print Cartridge".

Replacmnt Requird:Maint. Kit /Maintenance Kit Replacmnt is required. Press Menu key to check Supplies.

You need to replace the Maintenance Kit. Contact your sales or service representative to obtain a new unit. For details, see p.161 "Replacing the Maintenance Kit".

Replace print cartrdg soon./ Component at end of life. Replace if blurred/streaked

Some parts inside the print cartridge have reached their end of life. Contact your sales or service representative to obtain a new print cartridge.

Replace print cartrdg soon./ Toner is almost empty. Contact your local vendor.

The toner is almost depleted. Contact your sales or service representative to obtain a new print cartridge.

SD Card authentication failed Error recurs, call service.

Authentication from the SD card failed. Turn the power off, and then back on. If the error recurs, contact your sales or service representative.

Set the Fusing Unit correctly.

The fusing unit may not be installed correctly. Turn the printer off and re-install the fusing unit.

If the message is still displayed after re-installation, contact your sales or service representative.

For details, see p.161 "Replacing the Maintenance Kit" for fusing unit installation.

Set the Print Cartridge correctly.

The print cartridge may not be installed correctly. Turn the printer off and re-install the print cartridge.

If this message is still displayed after re-installation, contact your sales or service representative.

For details, see the procedure for removing the Fusing unit in p.218 "Paper Misfeed Message (B)" or p.220 "Paper Misfeed Message (C)" or the unit replacement procedure manual provided with the Fusing unit.

Supply order has failed.

The automatic supply order failed. The message indicates the supplies that the printer tried to order.

This NetBIOS name is already in use.(108/208)

The NetBIOS name specified for the printer is already in use by another device on the network. Consult your network administrator.

The same IPv4 Address already exists.(102/202)

The IPv4 address specified for the printer is already in use by another device on the network. Consult your network administrator.

The selected job has already been printed or deleted.

This message might appear if you print or delete a job from Web Image Monitor. Press Exit on the message screen.

USB has a problem. Please call service.

The printer has detected a USB board failure. Turn the power off, and then on again. If the problem persists, contact your sales or service representative.

Values set for IPv6/Gateway addresses are invalid.(110/210)

The IPv6 address or gateway address is invalid. Check the network settings.

WPA Auth. incomplete.(211)

WPA authentication could not complete. Consult your network administrator.

Note

- Confirm error details by printing the Error Log. For details, see p.45 "Test Printing".

Panel Tones

The following table explains the meaning of the various tone patterns that the printer emits to alerts users about its condition.

Tone pattern	Meaning	Cause
Two long beeps.	Printer ready.	After cooling or being switched on, the printer has fully warmed up and is ready for use.
Single short beep.	Panel/screen input accepted.	A valid control panel or screen key was pressed. Single short beeps are produced only when valid keys are pressed.
Single long beep.	Job completed.	A Printer job has finished.
Four long beeps.	Printer initialized.	The screen is changing back to the initial screen after the printer came out of the energy-saving mode or was reset.
Five short beeps repeated five times.	Printer alert.	Printer requires user attention. Paper may have jammed or print cartridge may need replenishing.

↓ Note

- Users cannot mute the printer's tone alerts. When the printer beeps to alert users of a paper jam or toner request, if the printer's covers are opened and closed repeatedly within a short space of time, the tone alert might continue, even after normal status has resumed.

Printer Does Not Print

Is the power on?

Confirm that the cable is securely plugged into both the power outlet and the printer.
Turn on the power.

Does the Alert indicator stay red?

If so, check the error message on the display and take the required action.
For details, see p.191 "Error and Status Messages Appear on the Control Panel".

Is paper loaded?

Load paper into the paper tray or onto the bypass tray.
For details, see p.111 "Supported Paper for Each Tray".

Can you print a configuration page?

If you cannot print a configuration page, it probably indicates a printer malfunction. Contact your sales or service representative.
For details, see p.45 "Test Printing".

Is the interface cable connected securely to the printer and the computer?

Connect the interface cable securely. If it has a fastener, fasten it securely as well.

Are you using the correct interface cable?

The type of interface cable you should use depends on the computer you use. Be sure to use the correct one.

If the cable is damaged or worn, replace it with a new one.
For details, see p.235 "Specifications".

Is the Data In indicator blinking or lit after starting a print job?

If not blinking or lit, the data is not being sent to the printer.

- If the printer is connected to the computer using the interface cable
Check the port connection setting is correct. For details about checking the port connection, see p.199 "Checking the Port Connection".
- Network Connection
Consult your network administrator.

How is the signal strength when using the Wireless LAN?

- 802.11 Ad hoc Mode
Either move to a location where the signal is good, or remove obstructions.

- Infrastructure Mode

Check the signal status in the [Wireless LAN] menu on the control panel. If the signal is poor, either move to a location where it is good, or remove obstructions.

Checking the Port Connection

When the Data in indicator does not flash or light up, check the port connection as shown below to confirm the setting.

- For a parallel port connection, the port must be set to LPT 1 or LPT 2.
 - For a USB port connection, the port must be set to USB00(n)*.
- * (n) varies depending on the number of printers connected.

Windows

Windows XP Professional or Windows Server 2003/2003 R2

1. Click the [Start] button, and then click [Printers and Faxes].
2. Click the icon of the printer. On the [File] menu, click [Properties].
3. Click the [Ports] tab.
4. In the [Print to the following port(s)] list, confirm the correct port is selected.

Windows XP Home Edition

1. Click the [Start] button, and then click [Control Panel].
2. Click [Printers and Other Hardware].
3. Click [Printers and Faxes].
4. Click the icon of the printer. On the [File] menu, click [Properties].
5. Click the [Ports] tab.
6. In the [Print to the following port(s)] list, confirm the correct port is selected.

Windows Vista or Windows Server 2008

1. Click the [Start] button, and then click [Control Panel].
2. Click [Printer].
3. Click the icon of the printer. On the [File] menu, click [Properties].
4. Click the [Ports] tab.
5. In the [Print to the following port(s)] list, confirm the correct port is selected.

Windows 7 or Windows Server 2008 R2

1. Click the [Start] button, and then click [Devices and Printers].
2. Right-click the printer icon you want to check, and then click [Printer Properties].
3. Click the [Ports] tab.
4. In the [Print to the following port(s)] list, confirm the correct port is selected.

Mac OS X

When the printer is connected to Mac OS X and the Ready indicator does not flash or light up, try the following procedures to check the port connection.

- Use [About This Mac] to check the USB information.
- Use the printer browser to check if the printer is displayed.

Using [About This Mac]

1. Click Apple Menu, and then select [About This Mac].
2. Click [More Info].
3. Under [Contents], for [Hardware], Select [USB].

Using the printer browser

1. Start [Printer Setup Utility] or [Printer Center] utility.

Under Mac OS X 10.5 or 10.6, start System Preferences and click [Print & Fax].

2. Click [Add] or [+] button.

The printer browser starts.

Confirm the printer is displayed on the browser.

Other Printing Problems

When You Cannot Print Properly

Toner smears appear on the print side of the page.

- The paper setting may not be correct. For example, you are using thick paper but the setting for thick paper might not be set.
- Check the paper settings.
- Check the printer driver's paper settings. See the printer driver Help.
- Check that the paper is not curled or bent. Envelopes can easily become curled. For details, see p.115 "Supported Paper Types".

Photo images are coarse.

- Some applications lower the resolution for making prints.
Raise the resolution in the settings of the application.

Fine dot patterns do not print.

- Change the [Dithering:] setting in the PostScript® 3™ printer driver's dialog box.
For details, see the printer driver Help.

Solid lines are printed as broken lines.

- Change the [Dithering:] setting in the PostScript 3 printer driver's dialog box.
For details, see the printer driver Help.

The whole printout is blurred.

- The paper is damp, probably due to improper storage. Use dry paper that has been stored properly.
For details, see p.115 "Supported Paper Types".
- Toner is almost depleted. When the "Replace print cartridge." message appears on the display, replace the print cartridge. For details, see p.155 "Replacing the Print Cartridge".
- Condensation may have collected. If rapid change in temperature or humidity occurs, use this printer only after it has acclimatized.

White streaks or color streaks appear.

- Toner is almost depleted. When the "Replace print cartridge." message appears on the display, replace the print cartridge. For details, see p.155 "Replacing the Print Cartridge".

Images are not printed in the right position.



- Adjust the printing position.

Adjust the printing position for each tray by specifying the adjustment values for [Registration] in [Quality Maintenance] under [Maintenance] using the control panel. For details, see p. 187 "Adjusting Printing Position".

- Adjust the end guide and both side paper guides to match the paper size. See p. 124 "Loading Paper in Trays".

Images are printed at an angle.



- Adjust the end guide and both side paper guides to match the paper size. See p. 124 "Loading Paper in Trays".

White lines appear.

Toner is almost depleted. When the "Replace print cartridge." message appears on the display, replace the print cartridge. For details, see p. 155 "Replacing the Print Cartridge".



The backs of printed sheets are blemished.

- When removing a jammed sheet, the inside of the printer may have become dirtied. Print several sheets until they come out clean.
- If document size is larger than paper size, e.g. A4 document on B5 paper, the back of the next printed sheet may be dirtied.

If rubbed with your finger, it smears out.

- The setting of the paper may not be correct. For example, although thick paper is used, the setting for thick paper may not be set.
 - Check the paper settings of this printer.
For details, see p.115 "Supported Paper Types".
 - Check the paper settings of the printer driver.
For details, see the printer driver Help.
- The fusing unit is deteriorated or damaged. Replace the unit.
For details, see p.161 "Replacing the Maintenance Kit".

When printing on OHP transparencies, black or white dots are obvious.

The registration roller is dirty. Clean the registration roller. Contact your sales/service representatives. Image quality varies when printing on thick paper or on OHP transparencies. Switch to Thick Paper mode. For details, see "Making Printer Settings Using the Control Panel", Software Guide.

When printing on plain paper, white dots are obvious.

- The registration roller or the paper tray is dirty. Clean the registration roller or the paper tray.
For details, see p.182 "Cleaning the Registration Roller".

Paper Misfeeds Occur Frequently**Paper jams occur frequently.**

- Number of paper set in the tray exceeds the limit. Confirm that the top of the stack is not higher than the limit mark inside the tray.
For details, see p.111 "Supported Paper for Each Tray".
- There may be a gap between the front guide and the paper, or between the side guides and the paper in the paper tray. Make sure there are no gaps.
For details, see p.111 "Supported Paper for Each Tray".
- Paper is either too thick or too thin.
For details, see p.115 "Supported Paper Types".
- Paper is bent or wrinkled. Use paper that have no bents or wrinkles.

For details, see p. 115 "Supported Paper Types".

- Paper has already been printed on.

For details, see p. 115 "Supported Paper Types".

- Paper is damp. Use paper that has been stored properly.

For details, see p. 115 "Supported Paper Types".

- When loading paper, separate paper from each other.
- The friction pad or paper feed roller or registration roller may be dirty. Clean the pertinent section as necessary. See p. 178 "Cleaning the Friction Pad and the Paper Feed Roller" and p. 182 "Cleaning the Registration Roller".
- The paper setting may not be correct. For example, although you are using thick paper, the setting for thick paper may not be set.

Check the printer driver's paper settings. See the printer driver Help.

Multiple pages are fed at once.

- There may be a gap between the end guide and the paper, or between the paper guides on both sides and the paper in the paper tray. Be sure to close any gaps by repositioning the guides. See p. 124 "Loading Paper in Trays".

- Paper is either too thick or too thin.

For details, see p. 115 "Supported Paper Types".

- Paper has already been printed on.

For details, see p. 115 "Supported Paper Types".

- Number of paper set in the tray exceeds the limit. Confirm that the top of the stack is not higher than the limit mark inside the tray.

For details, see p. 111 "Supported Paper for Each Tray".

- Paper is static. Use paper that has been stored properly.

For details, see p. 115 "Supported Paper Types".

- When loading paper, separate paper from each other.
- The friction pad or paper feed roller may be dirty. Clean the pertinent section as necessary. See p. 178 "Cleaning the Friction Pad and the Paper Feed Roller".

- Check that paper has not been added while there is still some left in the tray.

Only add paper when there is none left in the tray.

Paper gets wrinkles.

- Paper is damp. Use paper that has been stored properly.

For details, see p. 115 "Supported Paper Types".

- Paper is either too thick or too thin.

For details, see p.115 "Supported Paper Types".

- There may be a gap between the front guide and the paper, or between the side guides and the paper in the paper tray. Make sure there are no gaps.

For details, see p.111 "Supported Paper for Each Tray".

- The fusing unit is deteriorated or damaged. Replace the unit.
For details, see p.161 "Replacing the Maintenance Kit".

The printed image is different from the image on the computer

A printed image is different from the image on the computer's display.

- When you use some functions, such as enlargement or reduction, the layout of the image might be different from that displayed on the computer display.

Images are cut off, or excess pages are printed.

- If you are using paper smaller than the paper size selected in the application, use the same size paper as that selected in the application. If you cannot load paper of the correct size, use the reduction function to reduce the image, and then print.

For details, see the printer driver Help.

PDF Direct Print is not executed (PDF file is not printed).

- You must install an optional hard disk drive or set the value of [RAM Disk] in the System Menu to 2 MB or higher.

For details about [RAM Disk], see "System Menu", Software Guide.

- After adding a SDRAM module and setting the value of [RAM Disk] in the System Menu to 8 MB, value of [RAM Disk] returns to 0 MB if the SDRAM module is removed. If this happens, reset the value of [RAM Disk] to 2MB or higher.

For details about [RAM Disk], see "System Menu", Software Guide.

- When printing a PDF with a password set, set the password of the PDF file using the [Change PDF Password] menu in [PDF Menu] or Web Image Monitor. For details about [Change PDF Password], see "Print Settings Menu", Software Guide.

For details about Web Image Monitor, see Web Image Monitor Help.

- PDF files not allowed to be printed by the PDF file security setting cannot be printed.
- Highly compressed PDFs cannot be printed using PDF Direct Print.

Open the relevant application and print the PDF file using the printer driver.

Set the file format to standard PDF.

As a result of printing using PDF Direct Printing, characters are missing or misshapen.

- Before printing, embed the font in the PDF file to be printed.

The paper size appears on the control panel and printing is not performed with PDF Direct Print.

- When using PDF Direct Print, printout requires paper set within the PDF file. When a message indicating a paper size appears, either place the indicated size in the paper tray, or perform Form Feed.
Also, if [Sub Paper Size] in the [System] Menu is set to [Auto], printing is performed assuming letter size and A4 size to be the same size. For example, When a PDF file set to A4 size paper is printed using PDF Direct Print and letter size paper is loaded in the paper tray, the file will be printed out. This applies similarly to the opposite case.

When Printer is Not Functioning Properly

Paper is not fed from the selected tray.

- When you are using a Windows operating system, the printer driver settings override those set using the control panel. Set the desired input tray using the printer driver.
For details, see the printer driver Help.

Prints do not stack properly.

- Paper is damp. Use paper that has been stored properly. See p. 115 "Supported Paper Types".
- Pull out the extender.

It takes too much time to turn on the printer.

- If the printer is turned off while it is still accessing the hard disk (for example: during file deletion), the printer will require more time to power-up the next time it is turned on. To avoid this time delay, do not turn the power off while it is in operation.

It takes too much time to resume printing.

- The data is so large or complex that it takes time to process it. If the data in indicator is blinking, the data is being processed. Just wait until it resumes.
- The printer was in the Energy Saver mode. To resume from the Energy Saver mode, the printer has to warm up, and this takes time until printing starts. To disable the Energy Saver mode, select [Off] for [Auto Off On/Off] in the [System], [Auto Off] menu.

It takes too much time to complete the print job.

- Photographs and other data intensive pages take a long time for the printer to process, so simply wait when printing such data.

Changing the settings with printer driver may help to speed up printing.

For details, see the printer driver Help.

- The data is so large or complex that it takes time to process it. If the data in indicator is blinking, the data is being processed. Just wait until it resumes.
- If "Waiting for print data..." appears on the display, the printer is now warming up. Wait for a while.

Attached options are not detected in the printer properties.

- The computer and printer are not in two-way communication. You must configure attached options in the printer properties.

For details, see the printer driver Help.

If the problem cannot be solved, contact your sales or service representative.

When doing aggregate prints or bound prints.

- Check that the paper size and direction set in the printer driver are the same as those set in the application.

If the settings are not the same, change the settings of the printer driver.

An empty tray is selected by Auto Tray Select, and the document does not print out due to out of paper error.

- If a paper tray is opened and closed while the printer is in Energy Saver mode, the printer will initialize the tray upon recovery, but the tray will not be selectable by Auto Tray Select.

To print from a paper tray that you have opened and closed while the printer was in Energy Saver mode, you must manually specify the tray as the source paper tray before printing. When the printer recovers from Energy Saver mode and completes initialization, it will then print the document from the tray you have specified.

Additional Troubleshooting

Strange noise is heard.

- If a supply was recently replaced or an option attached in the area the strange noise is coming from, check the supply or option is properly attached. If the strange noise persists, contact your sales or service representative.

No e-mail is received when an Alert occurs, and after resolving an Alert.

- Confirm [Auto E-mail Notify] is active in the [System] Menu on the Control Panel. See "System Menu", Software Guide.
- Access the printer through a Web browser, log in as an Administrator on Web Image Monitor, and then confirm the following settings in [Auto E-mail Notification]:
 - Device E-mail Address
 - Groups to Notify
 - Select Groups/Items to Notify

For details about the settings, see Web Image Monitor Help.

- Access the printer through the Web browser, log in as an Administrator on the Web Image Monitor, and then confirm the settings of the SMTP server in [E-mail]. For details about the settings, see Web Image Monitor Help.
- When the power is turned off before the e-mail is transmitted, the e-mail will not be received.
- Check the e-mail address set for the destination. Confirm the printer's operation history using Web Image Monitor's System Log menu in [Network]. If the e-mail was sent but not received, it is possible the destination was incorrect. Also check the information concerning error mail from the e-mail server.

9

The setting for [Auto E-mail Notify] on the System Menu was changed from [Off] to [On], but e-mail is not arriving.

- After changing the setting, turn the printer's power off and then back on again.

Error notification e-mail was received, but no error-solved e-mail is received.

- Check e-mail is set for sending using Web Image Monitor's [Auto E-mail Notification] at the time the error was fixed. You must click the [Edit] button of [Detailed Settings of Each Item] in [Auto E-mail Notification], and set [Notify when error:] to [Occurs & Fixed] on the displayed screen.

For details about the settings, see Web Image Monitor Help.

Alert Resolving is set for sending e-mail, but no Alert-resolved e-mail is sent.

- If the power of the printer is turned off after an alert occurs, and the alert is resolved during the time the power is off, no Alert-resolved e-mail is sent.

Alert Occurrence and Alert Resolving are set for sending e-mail, but while no Alert Occurrence mail is received, Alert-resolved e-mail is received.

- Alert-notification e-mail is not sent if the problem is resolved before sending. However, an Alert-resolved e-mail is sent.

Alert-notification level was changed, and e-mail stopped arriving.

- If an Alert-notification e-mail, set with the earlier notification level, arrives, later e-mail will not be sent, even if the notification level is changed after.

When no date information is included in sent e-mail, the mail server has a malfunction.

- Configure the setting for obtaining time information from the SNTP server. Refer to Web Image Monitor's Help to the settings.

Note

- If the printer is still not operating satisfactorily, contact your sales or service representative. Consult with the store where the printer was purchased for information about the location of sales or service representatives.

10. Removing Misfed Paper

This chapter explains how to remove misfed paper.

When Paper is Jammed

An error message appears if a paper misfeed occurs. The error message gives the location of the misfeed. Check the location and remove the paper.

CAUTION

- The inside of the machine could be very hot. Do not touch the parts with a label indicating the "hot surface". Otherwise, an injury might occur.

CAUTION

- Some of this machine's internal components get very hot. For this reason, take care when removing misfed paper. Not doing so could result in burns.

CAUTION

- When removing jammed paper or replacing toner, avoid getting toner (new or used) on your clothing. If toner comes into contact with your clothing, wash the stained area with cold water. Hot water will set the toner into the fabric and make removing the stain impossible.

CAUTION

- When removing jammed paper or replacing toner, avoid getting toner (new or used) on your skin. If toner comes into contact with your skin, wash the affected area thoroughly with soap and water.

Important

- Forcefully removing misfed paper may cause paper to tear and leave scraps of paper in the printer. This might cause a misfeed and damage the printer.
- When paper is misfed a number of times, the following are possible causes.
 - The control panel settings do not match the size or orientation of the loaded paper.
 - The paper feed roller is dirty.
- For details about cleaning the paper feed roller, see p.178 "Cleaning the Friction Pad and the Paper Feed Roller".
- Misfed paper may be covered with toner. Be careful not to get toner on your hands or clothes.
- Toner on prints made after removing misfed paper may be loose (inadequately fused). Make a few test prints until smudges no longer appear.

- Paper jams can cause pages to be lost. Check your print job for missing pages and reprint any pages that did not print out.
- If paper is still misfed after you have checked the above-mentioned causes, contact your sales or service representative.

Paper Misfeed Message (A)

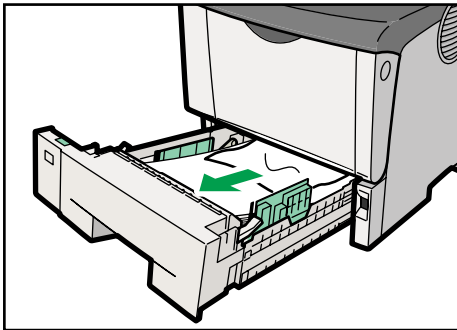
The "⚠ (A) Remove misfeed in Trays. Opn & cls Frt. Cov." error message appears when a paper misfeed occurs in the standard paper feed tray or paper feed section.

Removing Misfed Tray 1

★ Important

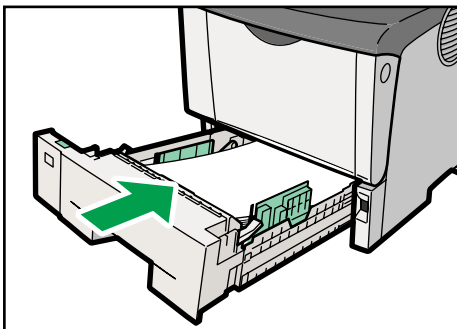
- Forcefully removing misfed paper may cause paper to tear and leave scraps of paper in the printer. This might cause a misfeed and damage the printer.

1. Pull out the paper tray until it stops, and then remove misfed paper.



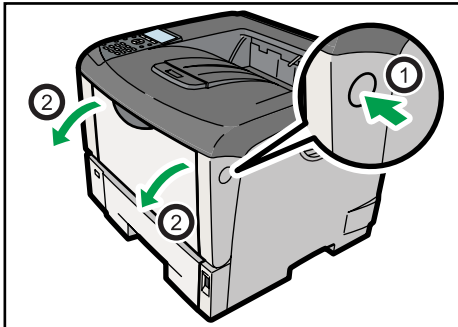
CEE014

2. Carefully slide the paper tray into the printer until it stops.



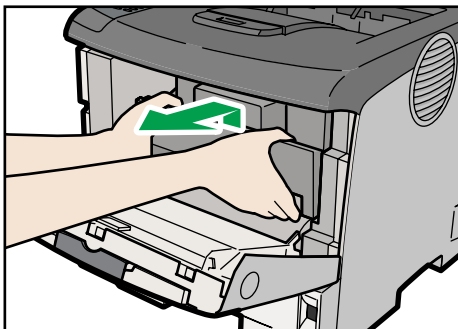
CEE074

3. Open the front cover by pushing the front cover release button.



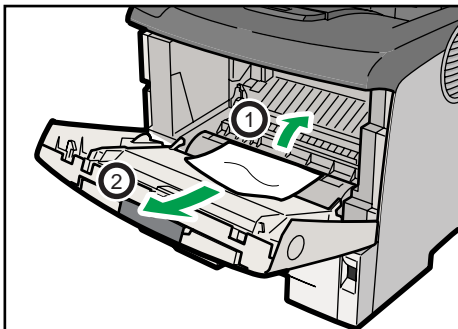
CEE008

4. Lift the front side of the print cartridge, and then pull it out of the printer.



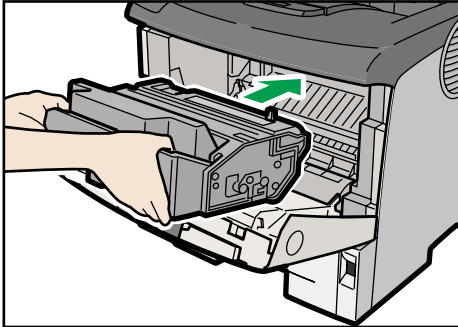
CEE017

5. Pull out the misfed paper by holding both sides of paper. Be careful not to get toner dust on your hands or clothes.



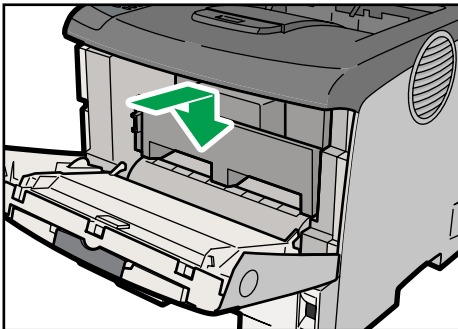
CEE167

6. Hold the grips of the print cartridge, and then insert it into the printer until it stops.



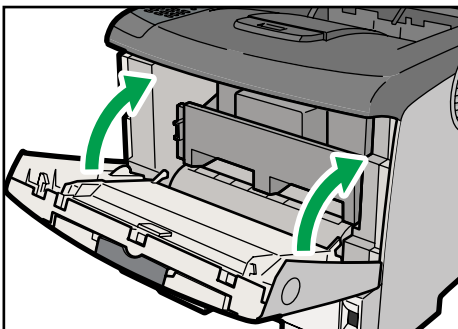
CEE009

7. Push down the print cartridge to secure it in the appropriate position.



CEE007

8. Close the front cover.



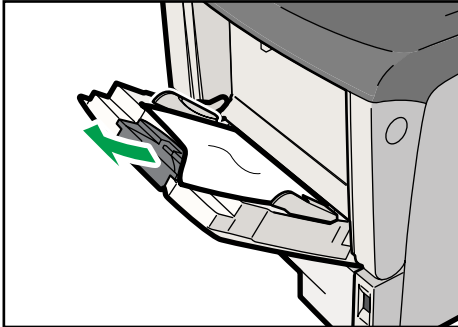
CEE005

Removing Misfed Bypass Tray

★ Important

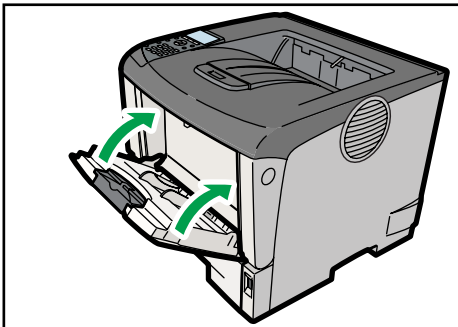
- Remove the paper from the bypass tray before opening the front cover.
- Forcefully removing misfed paper may cause paper to tear and leave scraps of paper in the printer. This might cause a misfeed and damage the printer.

1. Remove the misfed paper.



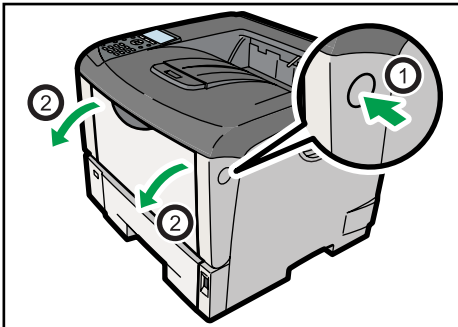
CEE087

2. Close the bypass tray.

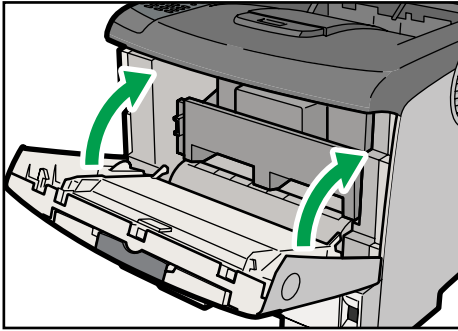


CEE088

3. Open the front cover by pushing the front cover release button, and then close it to reset the misfeed condition.



CEE008



CCE005

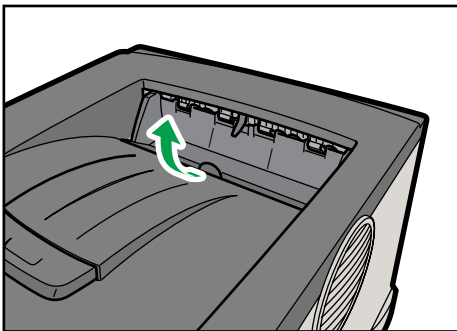
Paper Misfeed Message (B)

The "⚠️ (B)Open Paper Exit Cover and remove misfeed." error message appears if a paper jam occurs in the paper exit section.

★ Important

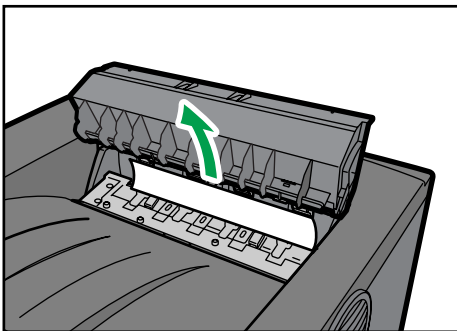
- Forcefully removing misfed paper may cause paper to tear and leave scraps of paper in the printer. This might cause a misfeed and damage the printer.
- Be sure to put the print cartridge on a stable, flat surface.
- Do not hold the print cartridge upside down or stand it vertically.

1. Open the paper exit cover.



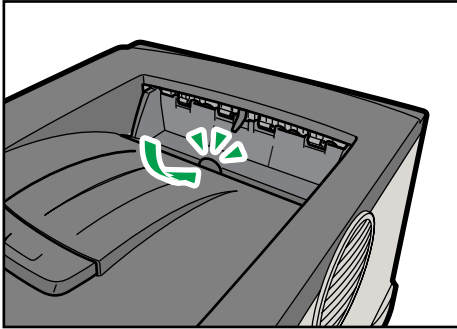
CEE084

2. Remove the misfed paper.



CEE086

3. Close the paper exit cover until it clicks.



CEE085

Note

- Once all misfed paper is removed, the error message will disappear and printing will continue.

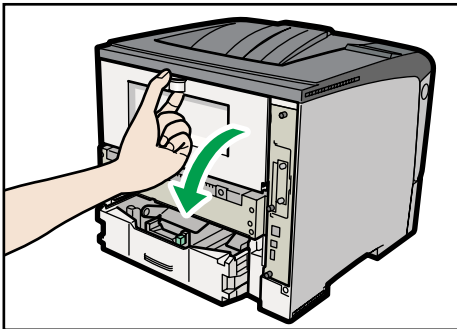
Paper Misfeed Message (C)

The "⚠(C)Open Rear Cover and remove misfeed." error message appears when a paper misfeed occurs in the paper feed section.

★ Important

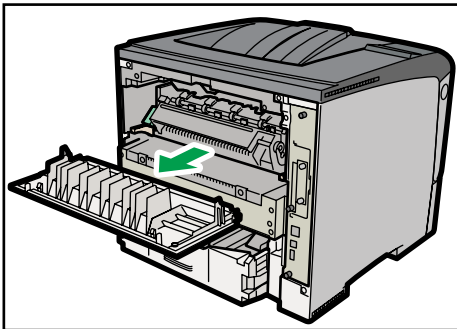
- Forcefully removing misfed paper may cause paper to tear and leave scraps of paper in the printer. This might cause a misfeed and damage the printer.
- Do not touch the metal part of the fusing unit. It becomes very hot. Touching it could result in a burn.

1. Open the rear cover.



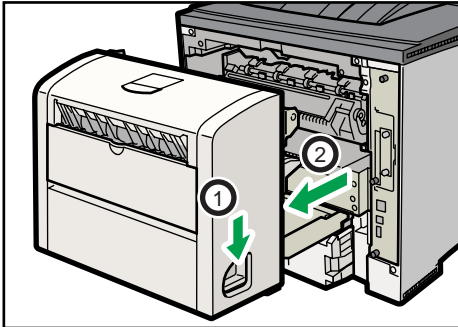
CEE040

2. Lower the rear cover until it is horizontal, and then pull it away.



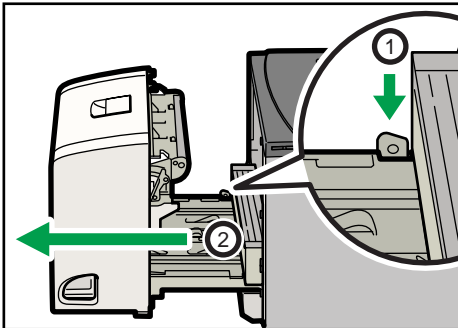
CEE041

3. If the optional duplex unit is attached, push down the lever on the right side of the duplex unit (①), and then pull it out until it stops (②).



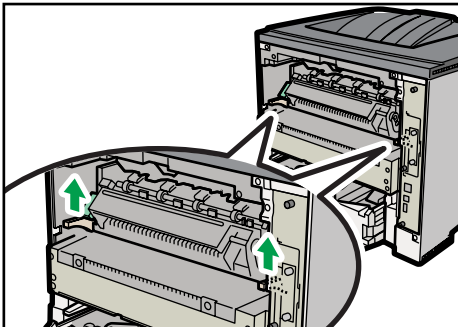
CEE056

4. Push the under board levers (①) and then pull the duplex unit out of the printer (②).



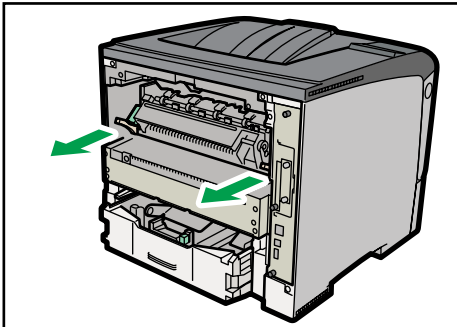
CEE083

5. Lift the lock levers of the fusing unit as shown in the illustration.



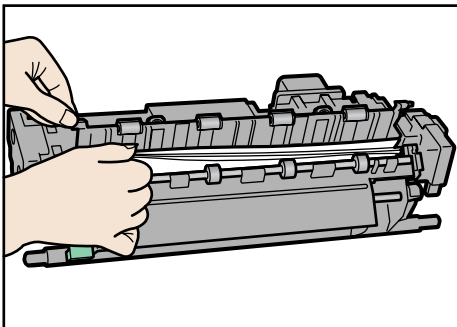
CEE046

6. Pull the fusing unit out.



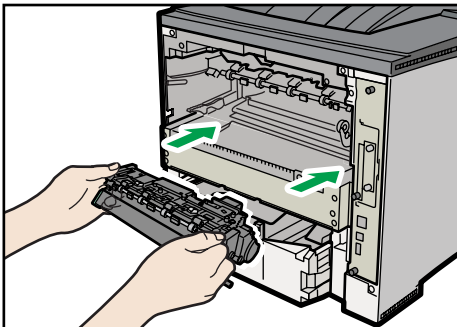
CEE048

7. Hold the tab, and then remove the misfed paper.



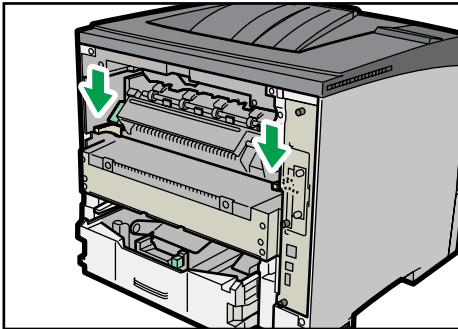
CEE091

8. Push the fusing unit until it stops.



CEE049

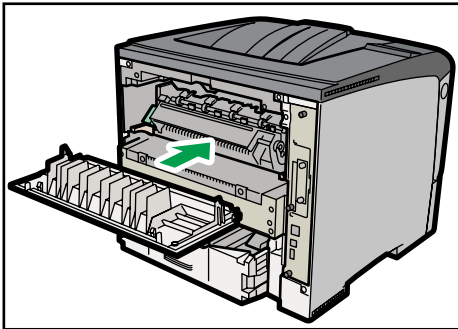
9. Push the lock levers of the fusing unit down until they click.



CEE047

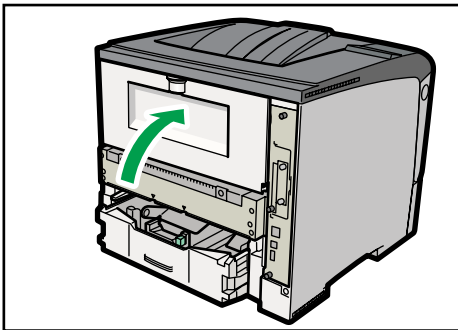
Proceed to step 12 if the optional duplex unit is installed.

10. Position the rear cover horizontally and align it with the grooves in the printer's interior.



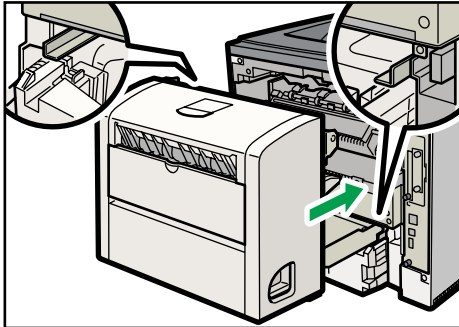
CEE044

11. Close the rear cover.



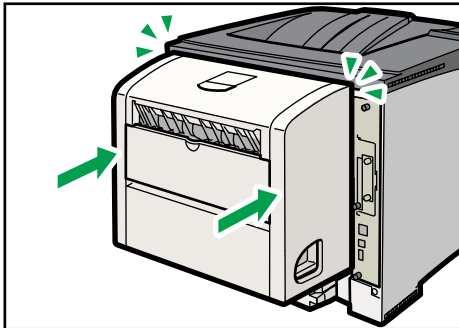
CEE045

12. If the optional duplex unit was removed, re-install it in the printer by pushing it along the rails on the inside of the printer.



CEE057

13. Securely push the duplex unit into the printer.



CEE050

Paper Misfeed Message (Y1)(Y2)

When a paper jam has occurred in one of the optional paper trays, "Tr (Y1) (Y2) Remove misfeed in (Tray name). Opn & cls Frt. Cov." message appears. The optional paper trays to which this message applies to are as follow:

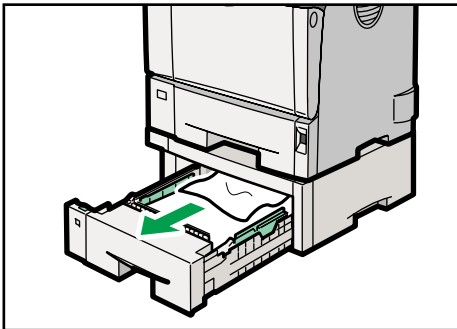
- (Y1): Tray 2
- (Y2): Tray 3

This section explains how to remove the jammed paper using tray 2 as an example. The same procedure can be used for the other optional trays.

★ Important

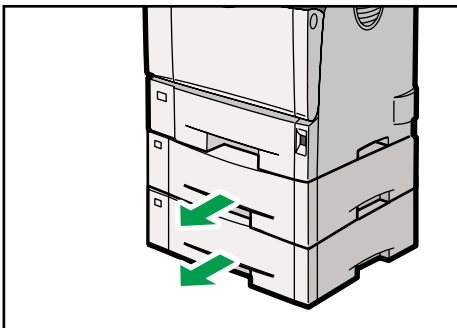
- Forcefully removing misfed paper may cause paper to tear and leave scraps of paper in the printer. This might cause a misfeed and damage the printer.

1. Pull out the paper tray until it stops, and then remove misfed paper.

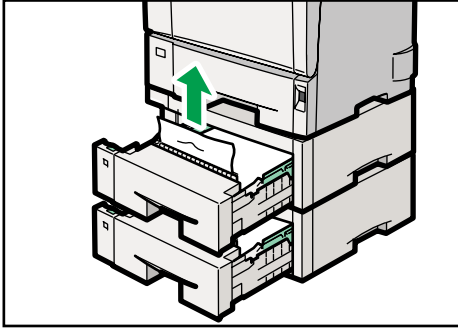


CEE168

If paper jams occur in multiple trays, a message indicating multiple trays such as "(Y2)" appears. Open all the trays indicated on the control panel, and then remove the jammed paper.

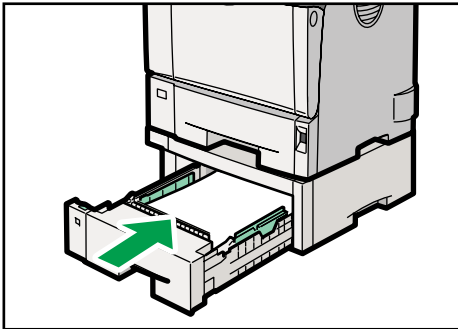


CEE170



CEE169

2. Carefully slide the paper tray into the printer until it stops.



CEE171

Paper Misfeed Message (Z)

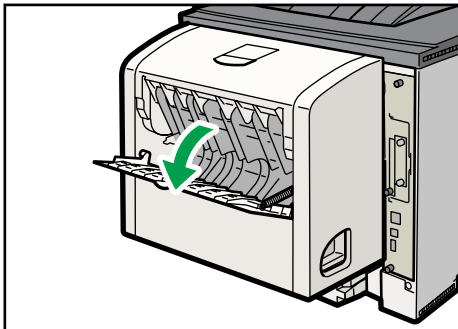
The "⌘(Z)Remove paper from the Duplex Unit." error message appears when a paper misfeed occurs inside the duplex section.

★ Important

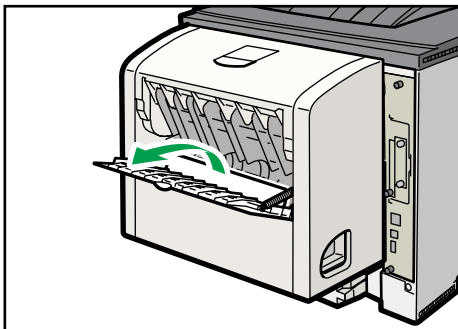
- Forcefully removing misfed paper may cause paper to tear and leave scraps of paper in the duplex unit. This might cause a misfeed and damage the printer.

Removing Misfed Paper Inside the Cover

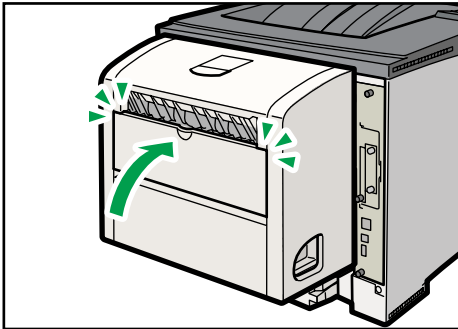
1. Open the rear cover of the duplex unit.



2. Remove the misfed paper.

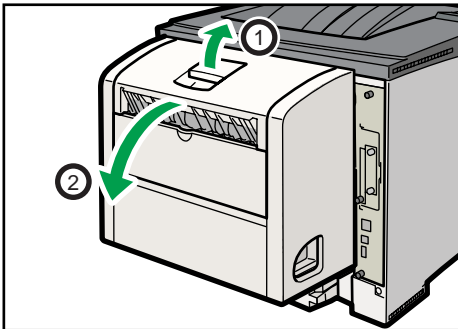


3. Close the rear cover of the duplex unit.



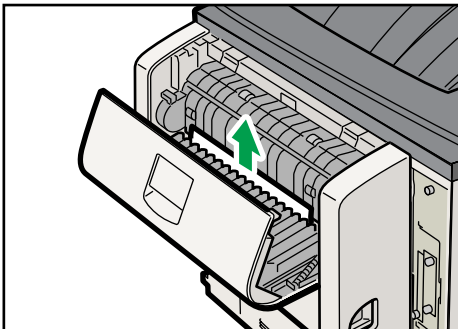
CEE052

4. Lift the lever (①), open the cover of the duplex unit (②).



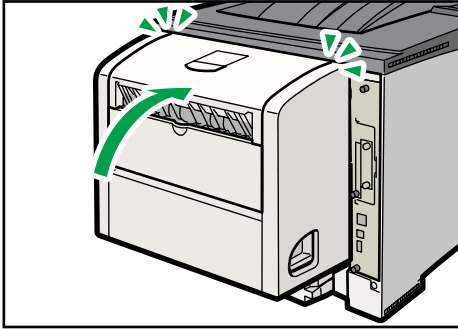
CEE054

5. Remove the misfed paper.



CEE062

6. Close the cover of the duplex unit.



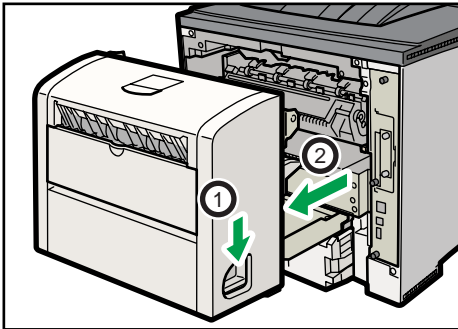
CEE055

Removing Misfed Paper Inside the Duplex Unit

★ Important

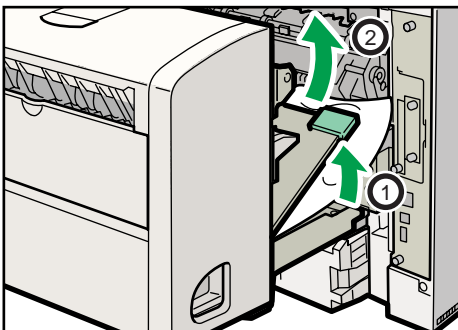
- When A5□ paper misfeeds, you might not be able to remove it by pulling the duplex unit out. In this case, pull the paper tray out and remove the paper.

1. Push down the lever on the right side of the duplex unit (①), and then pull it out until it stops (②).



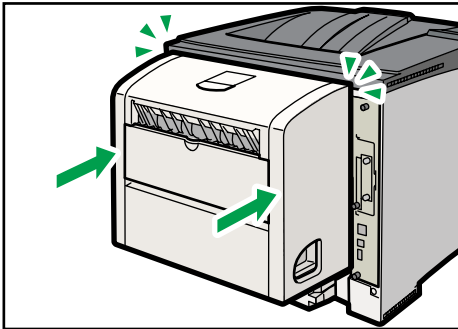
CEE056

2. Lift the guide board inside the duplex unit, and remove the misfed paper.



CEE063

3. Push in the duplex unit along the rails in the back of the printer.



CEE050

Note

- If the error message appears again, the misfed paper might be left in the printer. Confirm that any torn paper scraps are not in the inside of the printer. For more information, see p.213 "Paper Misfeed Message (A)" or p.218 "Paper Misfeed Message (B)".

11. Appendix

This section explains maintenance and operation procedures for this printer. It also describes the specifications of the printer and its options.

Moving and Transporting the Printer

WARNING

- If the machine topples, or if a cover or other part gets broken, you must turn the power switch to off and disconnect the power cord plug from the wall outlet. Then contact your service representative and report the problem. Do not use the machine. Doing so could result in fire or electric shock.

CAUTION

- The printer weighs approximately 17.5 kg (38.6 lb.). When moving the printer, use the inset grips on both sides, and lift slowly in pairs. The printer will break or cause injury if dropped.

CAUTION

- When disconnecting the power cord from the wall outlet, always pull the plug, not the cord. Pulling the cord can damage the power cord. Use of damaged power cords could result in fire or electric shock.

CAUTION

- Unplug the power cord from the wall outlet before you move the machine. While moving the machine, take care that the power cord is not damaged under the machine. Failing to take these precautions could result in fire or electric shock.

Important

- **Be sure to disconnect all cables from the printer before transporting it.**
- **The printer is a piece of precision machinery. Take care to avoid damage during transportation.**
- **If optional paper feed units are attached, remove them from the printer and move them separately.**

Moving the Printer in a Short Distance

1. Be sure to check the following points:

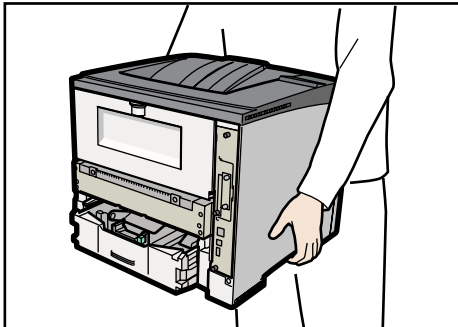
- The power switch is turned off.
- The power cord is unplugged from the wall outlet.

- The interface cable is unplugged from the printer.

2. If any external options are attached, remove them.

See the relevant sections in this manual and reverse the steps to remove options.

3. Lift the printer by using the inset grips on both side of the printer, and then move it horizontally to the place where you want to install it.



CEE039

4. If you removed options, reattach them.

For details, see the relevant sections in this manual.

↓ Note

- Be sure to move the printer horizontally. To prevent toner from scattering, move the printer slowly.

Consumables

★ Important

- Our products are engineered to meet the highest standards of quality and functionality. When purchasing expendable supplies, we recommend using only those specified by an authorized dealer.

Print Cartridge

Print cartridge	Average printable number of pages
Black	15,000 pages

↓ Note

- The printable number of pages is based on pages that are compliant with ISO/IEC 19752 with the image density set as the factory default. ISO/IEC 19752 is an international standard for measurement of printable pages, set by the International Organization for Standardization.
- If print cartridges are not changed when necessary, printing will become impossible. We recommend keeping a stock of cartridges or purchasing them soon.
- The actual number of printable pages varies depending on the image volume and density, number of pages to be printed at a time, paper type and paper size used, and environmental conditions such as temperature and humidity.
- Print cartridges may need to be changed sooner than indicated above due to deterioration over the period of use.
- Print cartridges (consumables) are not covered by warranty. However, if there is problem, contact the store where they were purchased.
- When you first use this printer, use the print cartridges packaged with the printer.
- Numbers of pages that can be printed using the print cartridges supplied with this printer are as follows:

Name	Average printable number of pages
Print Cartridge	6,000 pages

Maintenance Kit

Maintenance Kit SP 4100

Name	Average printable number of pages
Paper Feed Roller × 3	90,000 pages

Name	Average printable number of pages
Fusing Unit	90,000 pages
Transfer Roller	90,000 pages
Friction Pad × 3	90,000 pages

↓ Note

- The actual number of printable pages varies depending on the image volume and density, number of pages to be printed at a time, paper type and paper size used, and environmental conditions such as temperature and humidity.
- The maintenance kit (consumables) are not covered by warranty. However, if there is problem, contact the store where they were purchased.

Specifications

WARNING

- The supplied power cord is for use with this machine only. Do not use it with other appliances. Doing so could result in fire, electric shock, or injury.

Mainframe

Configuration:

Desktop

Print Process:

Laser beam scanning & Electrophotographic printing

First Print Speed:

6.9 sec or less (A4 \square or 8 $\frac{1}{2}$ " \times 11" (Letter) \square)

Note that if the printer has not been used for some time, there may be a short delay before the first page starts printing.

Printing Speed:

Maximum 36 pages per minute (A4 \square), 37 pages per minute (8 $\frac{1}{2}$ " \times 11" (Letter) \square)

Resolution:

300 \times 300 dpi

600 \times 600 dpi

1200 \times 600 dpi

Paper Size:

For details, see p.111 "Supported Paper for Each Tray".

Paper Weight:

For details, see p.111 "Supported Paper for Each Tray".

Media Type:

For details, see p.115 "Supported Paper Types".



Paper Output Capacity:

Standard 250 sheets (80 g/m², 20 lb.)

Paper Input Capacity

For details, see p.111 "Supported Paper for Each Tray".

Power Source:

-  **Region A** (mainly Europe and Asia)
220-240 V, 50/ 60 Hz, 4.3 A or less
-  **Region B** (mainly North America)
120 V, 60 Hz, 8 A or less

Power Consumption:

-  **Region A** (mainly Europe and Asia)

Printing	990 W or less
Auto Off mode (sleep mode)	3.9 W or less

-  **Region B** (mainly North America)

Printing	960 W or less
Auto Off mode (sleep mode)	3.9 W or less

Warm-up Time:

Less than 19 seconds ^{*1}

^{*1} 23 °C, 71.6 °F (When no error is occurred.)

Dimensions (W × D × H):

Printer only (tray not extended): 388 × 450 × 345 mm (15.80 × 13.80 × 17.20 inches)

Weight:

Approximately 17.5 kg (38.6 lb.) ^{*1}

^{*1} The print cartridge included.

Noise Emission: ^{*1}

- Sound Power Level
 - Main unit only

Stand-by	Less than 42.0 dB (A)
Printing	Less than 67.0 dB (A)

- Sound Pressure Level ^{*2}
 - Main unit only

Stand-by	Less than 36 dB (A)
Printing	Less than 61 dB (A)

^{*1} The preceding measurements made in accordance with ISO 7779 are actual values.

*2 Measured at the position of a bystander.

Memory:

Standard 256 MB, up to 512 MB (with the optional SDRAM module)

Hard disk:

80 GB (Optional)

Interfaces:

Standard:

- Ethernet (10BASE-T/100BASE-TX)
- USB 2.0

To use USB 2.0, a USB computer port and cable that support USB 2.0 are required.

- USB Host

Optional:

- IEEE 802.11 a/b/g (Wireless LAN)
- Parallel (Bidirectional IEEE 1284)
- Gigabit Ethernet (1000BASE-T)

Printer Language:

PCL5e/PCL6, PostScript 3/PDF

Fonts:

PCL 5e/PCL 6:

45 fonts, 13 International fonts

PostScript 3, PDF:

136 fonts

Network:

Topology: The physical or logical layout of the nodes (devices) in a network. (10BASE-T/100BASE-TX/1000BASE-T)

Protocol: TCP/IP, IPX/SPX

Options

Paper Feed Unit TK1030

Paper Size:

For details, see p. 111 "Supported Paper for Each Tray".

Dimensions (W × D × H):

388 × 486 × 135 mm (15.30 × 19.10 × 5.40 inches)

Paper weight:

60 - 160 g/m² (14 - 34 lb.)

Weight:

Less than 4 kg (8.8 lb.)

Envelope Feeder Type 400

Paper Size:

For details, see p.111 "Supported Paper for Each Tray".

Dimensions (W × D × H):

359.4 × 427 × 101 mm (14.15 × 16.80 × 3.98 inches)

Paper weight:

72 - 90 g/m² (19 - 24 lb.)

Weight:

Less than 1.6 kg (3.6 lb.)

Duplex Unit AD1000

Paper Size:

For details, see p.111 "Supported Paper for Each Tray".

Dimensions (W × D × H):

305.5 × 336.6 × 216.4 mm (12.00 × 13.30 × 8.50 inches)

Paper weight:

60 - 105 g/m² (16 - 28 lb.)

Weight:

Less than 5 kg (11.1 lb.)

Hard Disk Drive Type 4310

Storage Capacity (Formatted):

80 GB

Specifications:

- Spooling print data to collate

- Spooling Sample Print/Locked Print/Hold Print/Stored Print data
- Storing log data

↓ Note

- Storage capacity is subject to change without prior notice.
- The optional hard disk is provided with an SD card to enhance the security features. By using the provided SD card, the following security features to prevent data leaks become available: overwriting data on the optional hard disk, and encrypting the address book data, authentication information, and the data for stored prints.

Memory Unit Type G 128MB/256 MB

Module Type:

DIMM (Dual-in-line Memory Module)

Memory Type:

DDR-SDRAM (Double Data Rate Synchronous Dynamic RAM)

Number of Pins:

200 pins

Gigabit Ethernet Board Type A/C

Interface Connector:

Ethernet (10BASE-T, 100BASE-TX, 1000BASE-T)

USB 2.0

To use USB 2.0, a USB computer port and cable that support USB 2.0 are required.

Data Transmission Speed: Ethernet: 10 Mbps, 100 Mbps, 1000 Mbps

USB: 480 Mbps (High speed: USB 2.0), 12Mbps (Full speed)

Protocol:

TCP/IP, IPX/SPX, AppleTalk

Maximum Length of Cable Between Devices:

Ethernet: 100 m

USB: 5 m

IEEE 802.11a/g Interface Unit Type M Region A (mainly Europe and Asia)

Transmission Specification:

Based on IEEE 802.11a/b/g (Wireless LAN)

Data Transfer Speed:

Auto select from the following speed:

1 Mbps, 2 Mbps, 5.5 Mbps, 6 Mbps, 9 Mbps, 11 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps

Frequency Range:

2412 to 2472 Mhz (1 to 13 Channels)

5180 to 5240 Mhz (36, 40, 44 and 48 Channels)

The channel in use might differ depending on the country.

The following channels are available : 2412 - 2462 Mhz (1-11 Channels)

Transmission Mode:

- Ad hoc
- infrastructure mode

IEEE 802.11a/g Interface Unit Type L  (mainly North America)

Transmission Specification:

Based on IEEE 802.11a/b/g (Wireless LAN)

Data Transfer Speed:

Auto select from the following speed:

1 Mbps, 2 Mbps, 5.5 Mbps, 6 Mbps, 9 Mbps, 11 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps

Frequency Range:

2412 to 2472 Mhz (1 to 13 Channels)

5180 to 5240 Mhz (36, 40, 44 and 48 Channels)

Transmission Mode:

- Ad hoc
- infrastructure mode

IEEE 1284 Interface Board Type A

Transmission Specification:

IEEE 1284

Required Cable:

Standard IEEE 1284-compliant Micro Centronics 36-pin cable

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The proper names of the Windows operating systems are as follows:

- The product names of Windows XP are as follows:
 - Microsoft® Windows® XP Professional Edition
 - Microsoft® Windows® XP Home Edition
- The product names of Windows Vista are as follows:
 - Microsoft® Windows Vista® Ultimate
 - Microsoft® Windows Vista® Business
 - Microsoft® Windows Vista® Home Premium
 - Microsoft® Windows Vista® Home Basic
 - Microsoft® Windows Vista® Enterprise
- The product names of Windows 7 are as follows:
 - Microsoft® Windows® 7 Home Premium
 - Microsoft® Windows® 7 Professional
 - Microsoft® Windows® 7 Ultimate
 - Microsoft® Windows® 7 Enterprise
- The product names of Windows Server 2003 are as follows:
 - Microsoft® Windows Server® 2003 Standard Edition

Microsoft® Windows Server® 2003 Enterprise Edition

- The product names of Windows Server 2003 R2 are as follows:

Microsoft® Windows Server® 2003 R2 Standard Edition

Microsoft® Windows Server® 2003 R2 Enterprise Edition

- The product names of Windows Server 2008 are as follows:

Microsoft® Windows Server® 2008 Standard

Microsoft® Windows Server® 2008 Enterprise

Microsoft® Windows Server® 2008 Standard without Hyper-V™

Microsoft® Windows Server® 2008 Enterprise without Hyper-V™

- The product names of Windows Server 2008 R2 are as follows:

Microsoft® Windows Server® 2008 R2 Standard

Microsoft® Windows Server® 2008 R2 Enterprise

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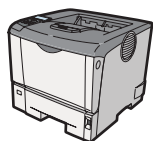
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MEMO

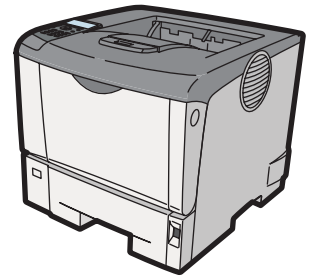
MEMO

MEMO





Operating Instructions Software Guide



-
- 1** Preparing for Printing
 - 2** Printing Documents
 - 3** Printing Stored Documents
 - 4** Making Printer Settings Using the Control Panel
 - 5** Monitoring and Configuring the Printer
 - 6** Using a Printer Server
 - 7** Mac OS X Configuration
 - 8** Appendix

Introduction

This manual contains detailed instructions and notes on the operation and use of this machine. For your safety and benefit, read this manual carefully before using the machine. Keep this manual in a handy place for quick reference.

Do not copy or print any item for which reproduction is prohibited by law.

Copying or printing the following items is generally prohibited by local law:

bank notes, revenue stamps, bonds, stock certificates, bank drafts, checks, passports, driver's licenses.

The preceding list is meant as a guide only and is not inclusive. We assume no responsibility for its completeness or accuracy. If you have any questions concerning the legality of copying or printing certain items, consult with your legal advisor.

Important

Contents of this manual are subject to change without prior notice.

In no event will the company be liable for direct, indirect, special, incidental, or consequential damages as a result of handling or operating the machine.

For good print quality, the manufacturer recommends that you use genuine toner from the manufacturer.

The manufacturer shall not be responsible for any damage or expense that might result from the use of parts other than genuine parts from the manufacturer with your office products.

Some illustrations in this manual might be slightly different from the machine.

Certain options might not be available in some countries. For details, please contact your local dealer.

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How to Read This Manual

Symbols

This manual uses the following symbols:

 **Important**

Indicates points to pay attention to when using the machine, and explanations of likely causes of paper misfeeds, damage to originals, or loss of data. Be sure to read these explanations.

 **Note**

Indicates supplementary explanations of the machine's functions, and instructions on resolving user errors.

 **Reference**

This symbol is located at the end of sections. It indicates where you can find further relevant information.

[]

Indicates the names of keys on the machine's display or control panels.

 **Region A** (mainly Europe and Asia)

 **Region B** (mainly North America)

Differences in the functions of Region A and Region B models are indicated by two symbols. Read the information indicated by the symbol that corresponds to the region of the model you are using. For details about which symbol corresponds to the model you are using, see p.9 "Model-Specific Information".

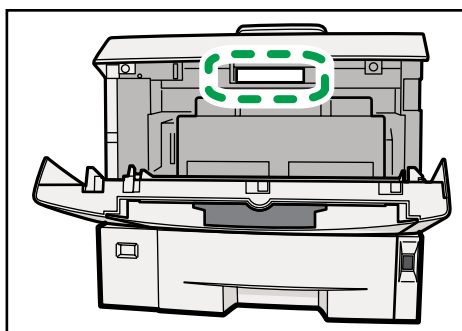
About IP Address

In this manual, "IP address" covers both IPv4 and IPv6 environments. Read the instructions that are relevant to the environment you are using.

Model-Specific Information

This section explains how you can identify the region your machine belongs to.

There is a label on the front cover of the printer, and it is located in the position shown below. The label contains details that identify the region your machine belongs to. Read the label.



CEE070

The following information is region-specific. Read the information under the symbol that corresponds to the region of your machine.

 **Region A** (mainly Europe and Asia)

If the label contains the following, your machine is a region A model:

- CODE XXXX -22, -27
- 220-240V

 **Region B** (mainly North America)

If the label contains the following, your machine is a region B model:

- CODE XXXX -11, -17
- 120V

Note

- Dimensions in this manual are given in two units of measure: metric and inch. If your machine is a Region A model, refer to the metric units. If your machine is a Region B model, refer to the inch units.

Manuals for This Printer

Read this manual carefully before you use this printer.

Refer to the manuals that are relevant to what you want to do with the printer.

★ Important

- Media differ according to manual.
- The printed and electronic versions of a manual have the same contents.
- Adobe® Acrobat® Reader® /Adobe Reader® must be installed in order to view the manuals as PDF files.
- A Web browser must be installed in order to view the html manuals.

Safety Information

Contains information about safe usage of this printer.

To avoid injury and prevent damage to the printer, be sure to read this.

Quick Installation Guide

Contains procedures for removing the printer from its box, and connecting it to a computer.

Hardware Guide

Contains information about paper; names and functions of the parts of this printer; and procedures such as installing options, replacing consumables, responding to error messages, and resolving jams.

Driver Installation Guide

Contains procedures for installing the printer driver. This manual is included on the driver CD-ROM.

Software Guide (This manual)

Contains information about using this printer, its software, and its security functions.

Security Guide

This manual is for administrators of the printer. It explains security functions that you can use to prevent unauthorized use of the printer, data tampering, or information leakage. Be sure to read this manual when setting the enhanced security functions, or user and administrator authentication.

VM Card Extended Feature Settings Web Reference

Contains information about setting up the extended features settings using Web Image Monitor.

UNIX Supplement

Contains information about the usage of commands to operate this printer.

To obtain the "UNIX Supplement", visit our Web site or consult an authorized dealer.

This manual includes explanations of functions and settings that might not be available on this printer.

This manual is provided in English only.

Note



- Manuals provided are specific to printer types.
- The following software products are referred to as using general names:

Product name	General name
DeskTopBinder Lite and DeskTopBinder Professional ^{*1}	DeskTopBinder
SmartDeviceMonitor for Client 2	SmartDeviceMonitor for Client
Enhanced Locked Print NX	ELP-NX

* 1 Optional

List of Options

This section provides a list of options for this printer, and how they are referred to as in this manual.

Option List	Referred to as
Hard Disk Drive Type 4310	Hard disk
Memory Unit Type G 128MB	SDRAM module
Memory Unit Type G 256 MB	SDRAM module
 Region B IEEE 802.11a/g Interface Unit Type L	Wireless LAN interface unit
 Region A IEEE 802.11a/g Interface Unit Type M	Wireless LAN interface unit
IEEE 1284 Interface Board Type A	IEEE 1284 interface board
SD card for NetWare printing Type G	NetWare card
VM CARD Type O	VM card
IPDS Unit Type 4310	IPDS card

 **Note**

- For details about the specifications of each option, see "Specifications", Hardware Guide.

1. Preparing for Printing

This chapter explains the preparation procedure to use this printer.

Before Using the Printer

This section explains the settings, procedures, items, and other information on which the user is recommended to check before you can use this printer.

Drivers and Utilities

To use this printer, you must install its driver on your computer.

For details about the procedure for installing the printer driver, see Driver Installation Guide on the driver CD-ROM.

This printer comes with two CD-ROMs: a driver CD-ROM and a manual CD-ROM.

For details about the contents of the drivers CD-ROM, see p.15 "Software Included on the CD-ROM".

Besides drivers, there are other useful utilities available for this printer.

For details about these utilities, see p.17 "Downloading Utility Software".

Using User Authentication

Using authentication, administrators manage the printer and its users. To enable authentication, information about both administrators and users must be registered in order to authenticate users via their login user names and passwords.

There are four kinds of administrator. Each administrator manages a specific area of printer usage, such as settings or user registration.

Access limits for each user are specified by the administrator responsible for user access to printer functions and documents and data stored in the printer.

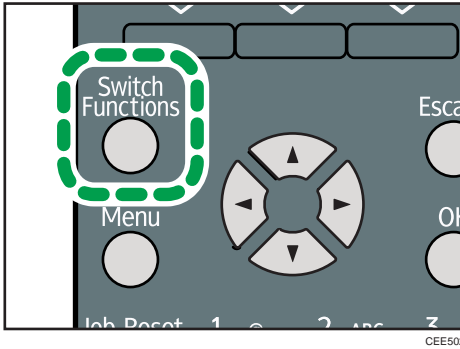
When authentication is set on the printer, see p.19 "If User Authentication is Specified".

Accessing the Extended Features

Various functions besides printing can be accessed using the [Switch Functions] key on this printer.

Use the following procedure to switch between applications.

1. Press the [Switch Functions] key.



2. Press the [▼] or [▲] key to select the [JavaTM/X].

3. Press the [OK] key.

4. If more than one extended feature is installed, use the [▼] or [▲] key to select the extended feature you want to access.

5. Press the [OK] key.

Note

- Function switching is possible only when the VM card is installed.
- This manual explains the procedure for changing settings when 'Printer' is selected as the application.

Software Included on the CD-ROM

This section explains the software included on the "Printer Drivers and Utilities" CD-ROM that comes with this printer.

Viewing the Contents of the CD-ROM

This section explains how to view the contents of the CD-ROM.

1. Insert the CD-ROM into the CD-ROM drive.
2. Select a language, and then click [OK].
3. Click [Browse This CD-ROM].

Explorer starts and displays the contents of the CD-ROM.

Printer Drivers for This Printer

This section explains printer drivers for this printer.

Important

- You can install the PCL printer drivers (PCL 5e and PCL 6), and the PostScript® 3™ printer driver from the CD-ROM provided with this printer or download them from the manufacturer's Web site.

Printing requires installation of the printer driver that is correct for your operating system. The following drivers are included on the CD-ROM labeled "Printer Drivers and Utilities".

Operating System	PCL 5e	PCL 6	PostScript 3
Windows XP ^{*1}	OK	OK	OK
Windows Vista ^{*2}	OK	OK	OK
Windows 7 ^{*3}	OK	OK	OK
Windows Server 2003 ^{*4}	OK	OK	OK
Windows Server 2008 ^{*5}	OK	OK	OK
Mac OS X ^{*6}	—	—	OK

*1 Microsoft Windows XP Professional Edition/Microsoft Windows XP Home Edition

*2 Microsoft Windows Vista Ultimate/Microsoft Windows Vista Enterprise/Microsoft Windows Vista Business/
Microsoft Windows Vista Home Premium/Microsoft Windows Vista Home Basic

- *3 Microsoft Windows 7 Home Premium/Microsoft Windows 7 Professional/Microsoft Windows 7 Ultimate/Microsoft Windows 7 Enterprise
- *4 Microsoft Windows Server 2003 Standard Edition/Microsoft Windows Server 2003 Enterprise Edition/Microsoft Windows Server 2003 R2 Standard Edition/Microsoft Windows Server 2003 R2 Enterprise Edition
- *5 Microsoft Windows Server 2008 Standard /Microsoft Windows Server 2008 Enterprise/Microsoft Windows Server 2008 Standard without Hyper-V/Microsoft Windows Server 2008 Enterprise without Hyper-V/Microsoft Windows Server 2008 R2 Standard/Microsoft Windows Server 2008 R2 Enterprise
- *6 Mac OS X 10.2 later

PCL Printer Drivers

Two kinds of PCL printer drivers (PCL 5e and PCL 6) are included. These drivers allow your computer to communicate with this printer using a printer language.

PostScript 3 Printer Driver

PostScript 3 printer driver allows the computer to communicate with the printer using a printer language.

PPD files

PPD files allow the printer driver to enable specific printer functions.

Font Manager

For installing new screen fonts, or organizing and managing fonts already in the system. For details about Font Manager, see the manual on the CD-ROM labeled "Printer Drivers and Utilities".

Note

- Some applications may require installation of the PCL 5e printer driver.
- For details about installation procedure, see Driver Installation Guide.

Downloading Utility Software

This section explains the utility software for this printer.

1

SmartDeviceMonitor for Admin

This section describes the functions available with SmartDeviceMonitor for Admin.

SmartDeviceMonitor for Admin is an application that monitors network printers. It can monitor multiple network printers using IP address. We recommend that network administrators use this application.

SmartDeviceMonitor for Admin has the following functions:

- Group management for the machines
- Monitoring the machines
- Operation restriction
- Managing the Address Book
- Per-user counters
- User restriction

SmartDeviceMonitor for Admin with full functionality can be purchased from your local dealer. Contact your local dealer for information on purchasing the software.

SmartDeviceMonitor for Admin with limited functionality is available as a free download. Contact your local dealer for information on downloading the software.

Note

- For details about the functionality, see the manual for SmartDeviceMonitor for Admin.

DeskTopBinder

This section describes the functions available with DeskTopBinder.

DeskTopBinder is to be installed on the client computers for integration and management of various kinds of files such as scan files, files created with applications, and existing scan files. This software allows you to use various functions for stored scan files such as viewing stored files. Also, with the ScanRouter delivery software, you can view the files stored in in-trays of the delivery server, or use other functions for stored files.

DeskTopBinder Professional provides the full functionality of the software. Contact your local dealer for information on purchasing the software.

DeskTopBinder Lite with limited functionality is available as a free download. Contact your local dealer for information on downloading the software.

Note

- For details about the functionality, see Help of DeskTopBinder.

1

SmartDeviceMonitor for Client

This section describes the functions available with SmartDeviceMonitor for Client.

SmartDeviceMonitor for Client allows you to manage and print various data such as files created with an application, images scanned with a scanner, and existing images as one document.

SmartDeviceMonitor for Client has the following functions:

- Checking printer supplies such as paper or toner
- Checking results of print jobs executed from the computer

SmartDeviceMonitor for Client is available as a free download. Contact your local dealer for information on downloading the software.

Note

- For details about the functionality, see Help of SmartDeviceMonitor for Client.

If User Authentication is Specified

When user authentication (User Code Authentication, Basic Authentication, Windows Authentication, LDAP Authentication, or Integration Server Authentication) is specified, an authentication screen appears whenever a user attempts to use the printer. The printer is usable only if the user enters a valid login user name and password on this screen.

When authentication is specified, users must log in to use the printer and log out when they have finished using it. Logging out prevents unauthorized usage of the printer, so users must be sure to log out.

Note

- Consult the User Administrator about your login user name, password, and user code.
- For user code authentication, enter a number registered in the Address Book as User Code.

User Code Authentication (Using the Printer Driver)

To specify User Code using the printer driver, you must specify a user code in the printer Printing Preference of the printer driver. The following procedure explains how to configure the printer driver settings under Windows XP. If you are using another operating system, the procedure might vary slightly.

1. On the [Start] menu, click [Printers and Faxes].
2. Click the icon of the printer you want to use.
3. On the [File] menu, click [Printing Preferences...].
4. Click the [Detailed Settings] tab.
5. In the [Menu:] box, click the [Job Setup] icon.
6. Enter the user code in [User Code:], using up to 8 numeric characters.
7. Click [OK].

Log in (Using the Control Panel)

Use the following procedure to log in when Basic Authentication, Windows Authentication, LDAP Authentication, or Integration Server Authentication is enabled.

1. Press the [Menu] key.
2. Press [Login].
3. Enter the login user name, and then press the [OK] key.
4. Enter the login password, and then press the [OK] key.

When the user is authenticated, the screen for the function you are using appears.

Log out (Using the Control Panel)

Use the following procedure to log out when Basic Authentication, Windows Authentication, or LDAP Authentication is set.

1. Press the [Menu] key.
2. Press [Logout].
3. Press [Yes].

↓ Note

- Users who log in using the printer driver do not have to log out.

Log in (Using the Printer Driver)

When Basic Authentication, Windows Authentication, or LDAP Authentication is set, users must enter a login user name and password to use the printer and/or print an individual job. The following procedure explains how to configure the printer driver settings under Windows XP. If you are using another operating system, the procedure might vary slightly.

Setting Authentication

1. On the [Start] menu, click [Printers and Faxes].
2. Click the icon of the printer you want to specify authentication for.
3. On the [File] menu, click [Properties].
4. Click the [Advanced Options] tab.
5. On the [Authentication] menu, select [User Authentication].
6. Click [OK].

Setting Authentication for individual print jobs

1. On the [Start] menu, click [Printers and Faxes].
2. Click icon of the printer you want to specify authentication for.
3. On the [File] menu, click [Printing Preferences...].
4. Click the [Detailed Settings] tab.
5. In the [Menu:] box, click the [Job Setup] icon.
6. Click [Authentication...].
7. In [Login User Name:], enter a login user name using up to 32 characters.
8. In [Login Password:], enter a login password using up to 128 characters. Then, in [Reenter the confirmation password:], enter the login password again, and then click [OK].

Log in (Using Web Image Monitor)

Use the following procedure to log in to the printer via Web Image Monitor.

1. Click **[Login]** in the Header area of Web Image Monitor.
2. Enter a login user name and password, and then click **[Login]**.

Depending on the configuration of your Web browser, the login user name and password might be saved. If you do not want to save them, configure your Web browser's settings so that this information is not saved.

↓ Note

- If User Code Authentication is used, Web Image Monitor cannot be used to log in to the printer.
- The procedure may differ depending on Web Image Monitor used.
- For details about the login user name and password, consult your network administrator.

Log out (Using Web Image Monitor)

Use the following procedure to log out of Web Image Monitor.

1. Click **[Logout]** to log out.

↓ Note

- Delete the cache memory in Web Image Monitor after logging out.

2. Printing Documents

This chapter explains how to print documents using the printer driver. It also describes the procedure for configuring PDF Direct Print and other printing functions.

Displaying the Printer Driver Settings Screen

2

This section explains how to open and configure the printer driver properties.

The following procedure explains how to configure the printer driver settings under Windows XP. If you are using another operating system, the procedure might vary slightly.

Making Printer Default Settings - The Printer Properties

★ Important

- To change the printer's default settings (including settings for options), log on using an account that has Manage Printers permission. Members of the Administrators group have Manage Printers permission by default.
- You cannot change the printer default settings for individual users. Settings made in the [Printer Properties] dialog box are applied to all users.

1. On the [Start] menu, click [Printers and Faxes].
2. Click the icon of the printer you want to use.
3. On the [File] menu, click [Properties].
4. Make the settings you require, and then click [OK].

↓ Note

- Depending on the applications, the settings you make here may not be used as the default settings.
- For details, see the printer driver Help.

Making Printer Default Settings - Printing Preferences

★ Important

- When the printer driver is distributed from the print server, the setting values specified by the server are displayed as the default for [Printing Defaults...].
1. On the [Start] menu, click [Printers and Faxes].
 2. Click the icon of the printer you want to use.
 3. On the [File] menu, click [Printing Preferences...].

4. Make the settings you require, and then click [OK].

The setting is temporarily registered as [Unregistered] in the [One Click Preset List:] area.

↓ Note

- Depending on the applications, the settings you make here may not be used as the default settings.
- The [Unregistered] setting is invalid if the other [One Click Presets] icon is selected. If you wish to confirm the [Unregistered] setting, click [Register Current Settings...]. For details about confirming the setting, see p.24 "Making Printer Settings - One Click Presets".
- For details, see the printer driver Help.

Making Printer Settings from an Application

You can make printer settings for a specific application.

To make printer settings for a specific application, open the [Printing Preferences] dialog box from that application. The following procedure explains how to make printer settings for a specific application using Windows XP WordPad as an example.

1. On the [File] menu, click [Print...].
2. In the [Select Printer] list, select the printer you want to use.
3. Click [Preferences].
4. Make the settings you require, and then click [OK].

↓ Note

- Procedures for opening the [Printing Preferences] dialog box vary depending on the application. For details, see the manuals provided with the application.
- Any settings you make using this procedure apply to the current application only.
- General users can change the properties displayed in the print dialog box of an application. Settings made here are used the defaults when printing from the application.
- For details, see the printer driver Help.

Making Printer Settings - One Click Presets

This section explains how to register and use one click presets.

Each function explained in this section is preconfigured and registered under [One Click Preset List:] on the [One Click Presets] tab.

You can apply the relevant setting simply by clicking on the one click preset name. This helps to avoid incorrect settings and misprints.

One click presets can be added, modified, and deleted as required. By using registered one click presets, users without in-depth knowledge of the printer driver can utilize advanced printing functions easily.

Follow the procedure to register one click presets.

1. In the application, on the [File] menu, click [Print].
2. Select the printer, and then open the [Printing Preferences] dialog box in the document's native application.
3. Make the settings you require.
4. Click [Register Current Settings...].

Enter a name and comment that describe the setting, and then click [OK]. The newly registered icon appears with its registered name in the [One Click Preset List:] area.

5. Click [OK].

 **Note**

- Under Windows operating systems, this function is available through the PCL 6 or PostScript 3 printer driver.
- For details about modifying and deleting one click presets, see the printer driver Help.

Frequently Used Print Methods

This section explains how to use the various printing functions including normal printing, duplex printing, and combine printing.

Each function described in this section is configured and registered under "One Click Presets". You can also change the parameters for each function by modifying "One Click Presets". For details about custom settings, see p.24 "Making Printer Settings - One Click Presets".

Standard Printing

Use the following procedure to print documents using the normal printing function with the printer driver.

★ Important

- If you are using a printer with ELP-NX installed, all print jobs for which "Normal Print" or "Locked Print" is specified are stored in ELP-NX when user authentication is set. After issuing the print command from the printer driver, log in to ELP-NX and print the job.
- If you are using a printer with ELP-NX installed, all print jobs for which "Locked Print" is specified are stored in ELP-NX when user authentication is not set. Also note that any jobs for which "Locked Print" is not specified will be deleted according to the default setting of ELP-NX.
- For details about how to print using ELP-NX, see the manuals provided with the application.
- For details about the option settings of ELP-NX, consult your administrator.
- Before printing, make sure that the settings for the installed options and loaded paper are correctly configured.

For the PCL 6 printer driver:

1. In the application, on the [File] menu, click [Print].
2. Select the printer, and then open the [Printing Preferences] dialog box in the document's native application.
3. Click the [One Click Presets] tab, if it is not already selected.
4. In the [Job Type:] list, select [Normal Print].
If you want to print multiple copies, specify a number of sets in the [Copies:] box.
5. In the [Document Size:] list, select the size of the original to be printed.
6. In the [Orientation:] list, select [Portrait] or [Landscape] as the orientation of the original.
7. In the [Input Tray] list, select the paper tray that contains the paper you want to print onto.

If you select [Auto Tray Select] in the [Input Tray] list, the source tray is automatically selected according to the paper size and type specified.

8. In the [Paper Type:] list, select the type of paper that is loaded in the paper tray.
9. To save current setting in the One Click Preset List, click [Register Current Settings...].
Enter a name and comment that describe the setting, and then click [OK]. The newly registered icon appears in the [One Click Preset List:] area.
10. Click [OK] to close the Printing Preferences dialog box.
11. Print the document using the print function in the document's native application.

For the PCL 5e printer driver:

1. In the application, on the [File] menu, click [Print].
2. Select the printer, and then open the [Printing Preferences] dialog box in the document's native application.
3. In the [Job Type:] list, select [Normal Print].
If you want to print multiple copies, specify a number of sets in the [Copies:] box.
4. In the [Orientation:] list, select [Portrait] or [Landscape] as the orientation of the original.
5. Click the [Paper] tab.
6. In the [Document Size:] list, select the size of the original to be printed.
7. In the [Input Tray:] list, select the paper tray that contains the paper you want to print onto.
If you select [Auto Tray Select] in the [Input Tray:] list, the source tray is automatically selected according to the paper size and type specified.
8. In the [Type:] list, select the type of paper that is loaded in the paper tray.
9. Click [OK] to close the Printing Preferences dialog box.
10. Print the document using the print function in the document's native application.

Note

- The types of paper loaded in the paper trays are indicated on the printer's display. This allows you to see which tray the selected paper type is loaded in. However, the paper type setting available in the printing preference dialog box might be different from the type indicated on the printer's display.
- If a warning message appears notifying you of a paper type or size mismatch see p.58 "If Errors Occur with the Specified Paper Size and Type".

Performing Duplex or Booklet Printing

This section explains how to print on both sides of each page using the printer driver.

For the PCL 6 printer driver:

1. In the application, on the [File] menu, click [Print].
2. Select the printer, and then open the [Printing Preferences] dialog box in the document's native application.
3. To use an existing One Click Presets, click the [One Click Presets] tab, and then click the icon in the [One Click Preset List:] box.

If you do not wish to modify a custom setting that is already registered in the printer driver, change settings such as paper size and source tray as required, and then proceed to step 9.

4. Click the [Detailed Settings] tab.
5. In the [Menu:] box, click the [Edit] icon.
6. Select duplex or booklet printing.

When duplex printing is specified, select the method for binding the output pages in the [2 sided:] list. For details, see p.29 "Types of duplex printing".

When booklet printing is specified, select the method for binding the output pages in the [Booklet:] list. For details, see p.30 "Types of booklet printing".

7. Change any other print settings if necessary.
8. To save current setting in the One Click Preset List, click [Register Current Settings...].
Enter a name and comment that describe the setting, and then click [OK]. The newly registered icon appears in the [One Click Preset List:] area.
9. Click [OK] to close the Printing Preferences dialog box.
10. Print the document using the print function in the document's native application.

For the PCL 5e printer driver:

1. In the application, on the [File] menu, click [Print].
2. Select the printer, and then open the [Printing Preferences] dialog box in the document's native application.
3. Select duplex or booklet printing in the [Duplex:] list.
For details about the different methods of binding that can be selected, see p.29 "Types of duplex printing" or p.30 "Types of booklet printing".
4. Change any other print settings if necessary.
5. Click [OK] to close the Printing Preferences dialog box.
6. Print the document using the print function in the document's native application.

Note

- If the document contains pages with different original sizes, page breaks may occur.

Paper sizes and types supported by duplex printing function

This section explains the paper sizes and types that can be used with the duplex printing function.

Paper sizes supported by duplex printing function

- A4
- A5
- B5
- 8¹/₂ " × 14 "
- 8¹/₂ " × 13 "
- 8¹/₂ " × 11 "
- 8¹/₄ " × 13 "
- 8 " × 13 "
- 5¹/₂ " × 8¹/₂ "
- 16K

Note

- Duplex printing on A5 or 5¹/₂ " × 8¹/₂ " is supported only by Tray 1 and the bypass tray.

Paper types supported by duplex printing function

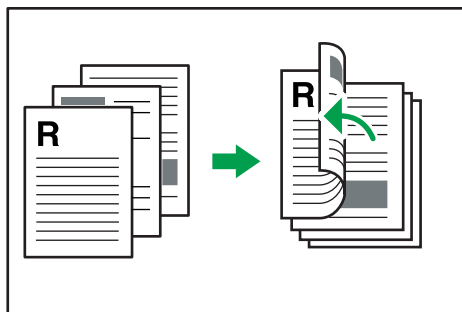
- Plain
- Letterhead
- Recycled

Types of duplex printing

This section explains the page binding methods available when using the duplex printing function. When using the duplex printing function, you can select whether to bind pages by the left or top edge.

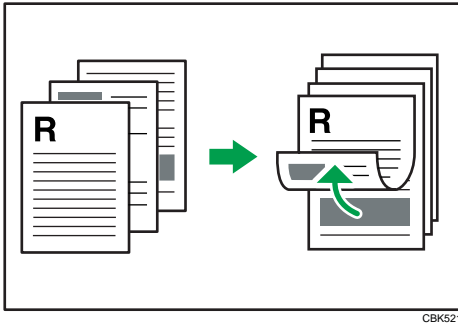
2 sided:

- Open to Left



CBK520

- Open to Top



Note

- To specify duplex printing in the PCL 5e printer driver, select [Open to Left] or [Open to Top] in the [Duplex:] list in the printer properties dialog box.

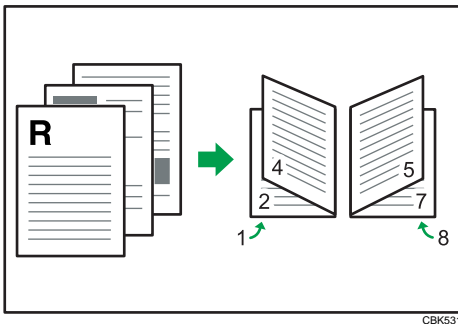
Types of booklet printing

This section explains the page binding methods available when using the booklet printing function. When using the booklet printing function, you can select the direction to which the pages open.

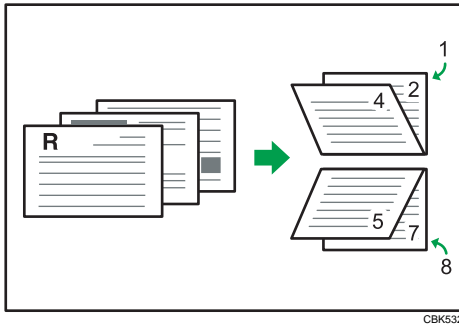
Booklet:

- Magazine

When [Portrait] is selected in the [Orientation:] list in the printer properties dialog box. For details, see the printer driver Help.



When [Landscape] is selected in the [Orientation:] list in the printer properties dialog box. For details, see the printer driver Help.



↓ Note

- To specify booklet printing in the PCL 5e printer driver, select [Booklet] in the [Duplex:] list in the printer properties dialog box.

Combining Multiple Pages into Single Page

This section explains how to print multiple pages onto a single sheet. The combine printing function allows you to economize on paper by printing multiple sheets at reduced size onto a single sheet.

★ Important

- The combine printing function is not available on a custom size paper. To use the combine printing function, specify a standard size paper.

For the PCL 6 printer driver:

- In the application, on the [File] menu, click [Print].
- Select the printer, and then open the [Printing Preferences] dialog box in the document's native application.
- To use an existing One Click Presets, click the [One Click Presets] tab, and then click the icon in the [One Click Preset List:] box.

If you do not wish to modify a custom setting that is already registered in the printer driver, change settings such as paper size and source tray as required, and then proceed to step 9.

- Click the [Detailed Settings] tab.
- In the [Menu:] box, click the [Edit] icon.
- Select the combination pattern in the [Layout:] list, and then specify the method for combining pages in the [Page Order:] list.

To draw a border line around each page, select [Draw Frame Border].

- Change any other print settings if necessary.

8. To save current setting in the One Click Preset List, click [Register Current Settings...].

Enter a name and comment that describe the setting, and then click [OK]. The newly registered icon appears in the [One Click Preset List:] area.

9. Click [OK] to close the Printing Preferences dialog box.

10. Print the document using the print function in the document's native application.

For the PCL 5e printer driver:

1. In the application, on the [File] menu, click [Print].

2. Select the printer, and then open the [Printing Preferences] dialog box in the document's native application.

3. Select the combination pattern in the [Layout:] list, and then specify the method for combining pages in the [Page Order:] list.

To draw a border line around each page, select [Draw Frame Border].

4. Change any other print settings if necessary.

5. Click [OK] to close the Printing Preferences dialog box.

6. Print the document using the print function in the document's native application.

Note

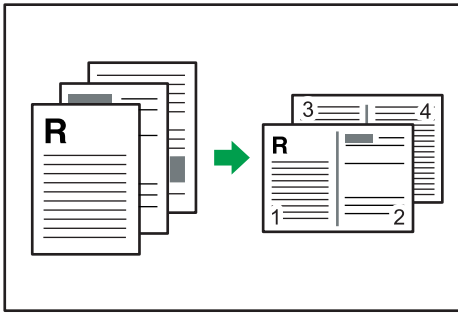
- If the document contains pages with different original sizes, page breaks may occur.
- If the application you are using also has a combine function, disable it. If the application's combine function is also enabled when the driver's combine function enabled, incorrect printing is likely.
- For details about combining pages with different orientations and other advanced functions, see the printer driver Help.

Types of combine printing

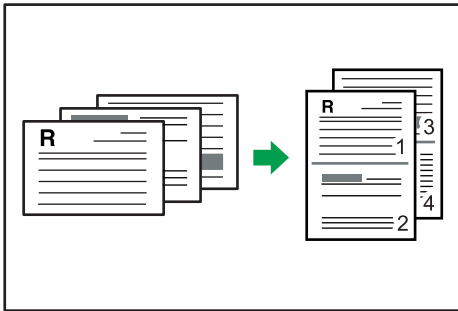
This section explains the different methods of combine printing that are available. Combine printing allows you to print 2, 4, 6, 9, or 16 pages at reduced size onto a single sheet and to specify a page ordering pattern for the combination. For 2 pages per sheet combine, you can select from two patterns. When combining 4 or more pages onto a single sheet of paper, four patterns are available. The following illustrations show example page ordering patterns for 2- and 4-page combinations.

2 Pages per Sheet

- From Left to Right/Top to Bottom

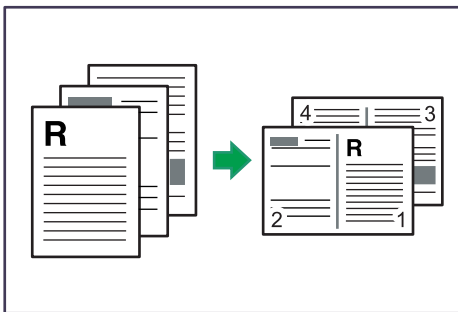


CBK522

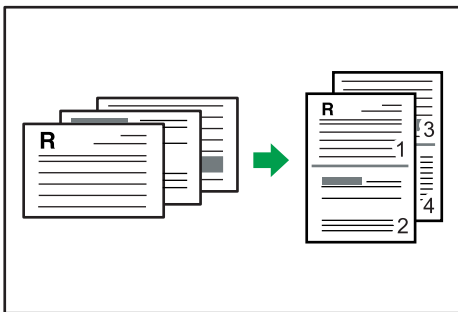


CBK528

- From Right to Left/Top to Bottom



CBK527

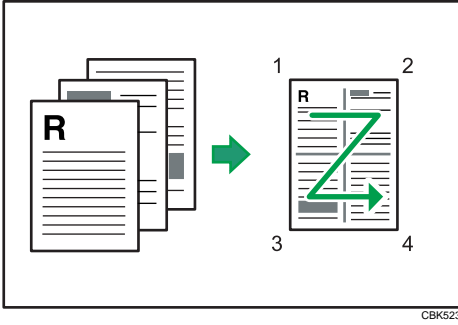


CBK528

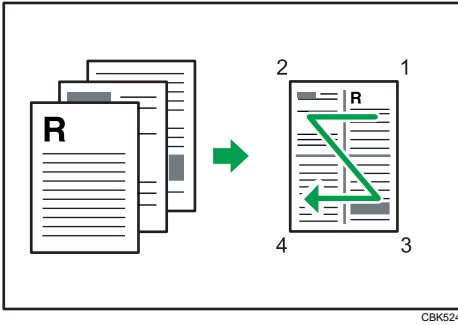
When using the PCL 5e printer driver, select one of the following four patterns:
 [Right, then Down], [Left, then Down], [Down, then Right], [Down, then Left]

4 Pages per Sheet

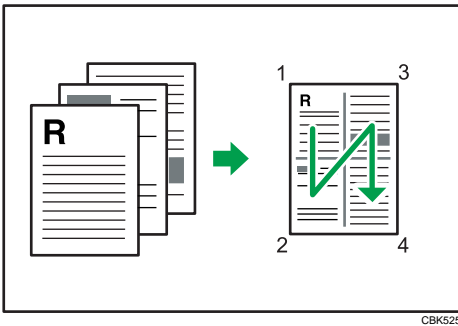
- Right, then Down



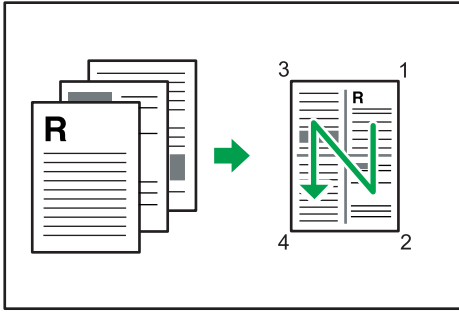
- Left, then Down



- Down, then Right



- Down, then Left



Advanced Printing

This section explains the printer's advanced printing functions.

Other than the functions that can be configured in the [One Click Presets] tab, various print functions can be setup from each [Menu:] icon in the [Detailed Settings] tab. The settings for each function described in this section can be changed by using the following menus.

2

Using the PCL6 printer driver as an example, the following procedure explains how to configure the printer's advanced printing functions.

Menu Names and Brief Overview of Each Function

The following is an overview of the settings that are available on the [Basic], [Paper], and [Effects] menus.

[Basic] menu

You can specify the type of the paper you want to print on.

- Document Size:

If the printer's trays do not contain paper matching the settings of the print job, you can proceed with printing by using the bypass tray.

For details about this function, see p.37 "Specifying Printer Driver or Print Command Priority".

[Paper] menu

You can enable/disable the cover and slip sheets function.

- Paper Type:

You can specify the type of the paper you want to print on. If the printer's trays do not contain paper matching the settings of the print job, you can proceed with printing by using the bypass tray.

For details about this function, see p.37 "Specifying Printer Driver or Print Command Priority".

- Front Cover

Using this function, you can insert cover sheets fed from a different tray to that of the main paper, and print on them. For details, see p.39 "Printing on Cover Sheet".

- Slip Sheet

Using this function, you can insert slip sheets fed from a different tray to that of the main paper, and print on them. For details, see p.40 "Inserting Slip Sheets".

[Effects] menu

You can enable/disable the Watermark function.

The Watermark function prints text under the main content of every page of a document. For details about this function, see p.42 "Printing with Watermarks".

↓ Note

- For details about the menu items not explained in this section, see the printer driver Help.

Specifying Printer Driver or Print Command Priority

2

If you select [Any Size/Type] or [Any Custom Size/Type] for [Bypass Tray] in [Tray Setting Priority] under [Print Settings] using the control panel, you can print onto a specified paper without changing or confirming the paper settings for print jobs.

If the printer's trays do not contain paper matching the settings of the print job, you can proceed with printing by applying the paper settings specified in the print job to paper fed from the bypass tray. You do not need to change the paper settings using the control panel, even if you frequently use paper of different sizes, or if you are printing onto an unusual type of paper.

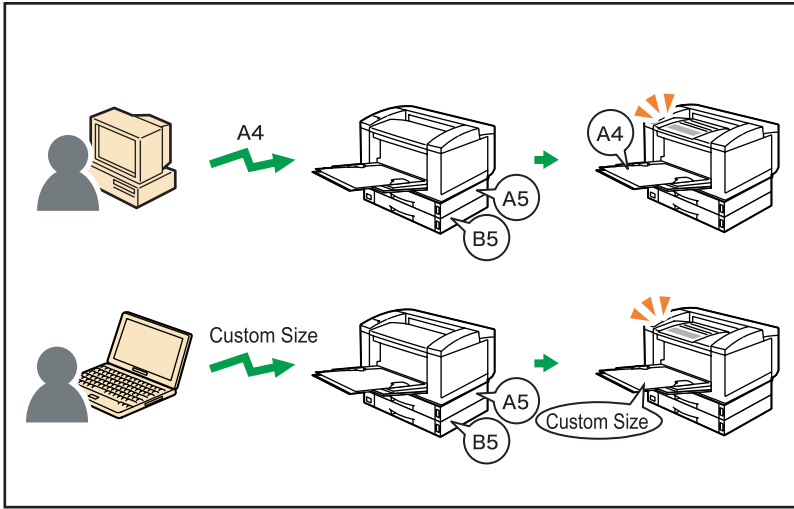
★ Important

- To continue printing from the bypass tray onto all paper sizes, select [Any Size/Type] for [Bypass Tray] in [Tray Setting Priority] under [Print Settings]. To continue printing from the bypass tray onto custom size paper only, select [Any Custom Size/Type] for [Bypass Tray] in [Tray Setting Priority] under [Print Settings]. For details about each setting on the Print Settings menu, see p.108 "Print Settings Menu Parameters".
- Select [Auto Tray Select] in the printer driver. If [Auto Tray Select] is specified when a job is sent to the printer, the matching tray will be detected in the order specified in [Tray Priority] under [Paper Input]. If you select [Bypass Tray] for [Tray Priority], paper will always be fed from the bypass tray, as long as paper is loaded there. For details about printer driver settings, see p.36 "Menu Names and Brief Overview of Each Function". For details about the [Tray Priority] setting, see p.89 "Paper Input Menu Parameters".

If you select [Any Size/Type] or [Any Custom Size/Type] for the bypass tray, jobs will be printed in the following manner.

Any Size/Type

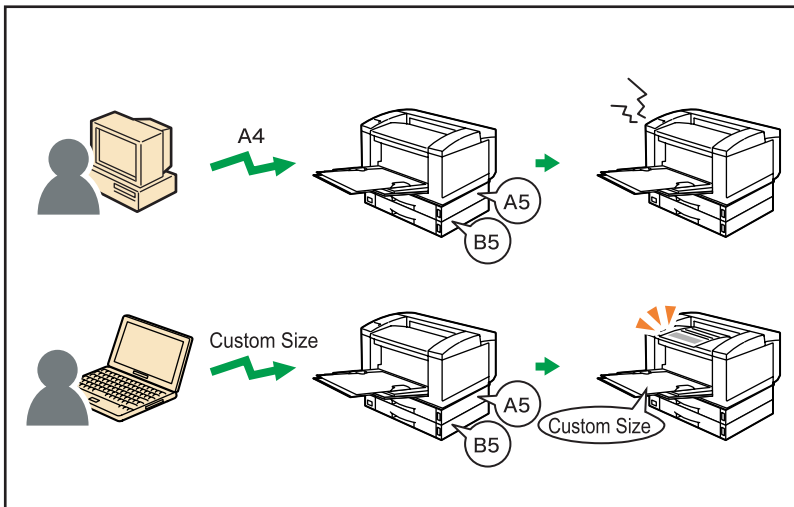
If the printer's trays do not contain paper matching the settings of the print job, printing can proceed from the bypass tray with the job's settings applied.



CBK507

Any Custom Size/Type

If the printer's trays do not contain paper matching the settings of the print job but custom paper was specified using the printer driver or by print command, printing can proceed from the bypass tray with the job's settings applied.



CBK508

Note

- When this function is enabled, printing may be slower than usual.
- If paper is not loaded in the bypass tray when a job is received, a message prompting you to load paper will appear on the control panel. When this message appears, load paper of the indicated size and type print side down on the bypass tray.

- When printing a job that consists of pages of different sizes and the sheets of corresponding sizes are not loaded in any of the printer's paper trays, each of these pages will be printed on the sheets fed from the bypass tray. Only the pages for which the matching paper sizes are loaded in the printer's paper trays will be printed on the sheets fed from the printer's paper trays.
- If the paper size or type specified for the print job does not match the paper loaded on the bypass tray, a message warning you of the mismatch will appear on the control panel. For the procedure to resolve this problem, see p.60 "Proceeding with Printing Using the Bypass Tray".

Printing on Cover Sheet

Using this function, you can insert cover sheets fed from a different tray to that of the main paper, and print on them.

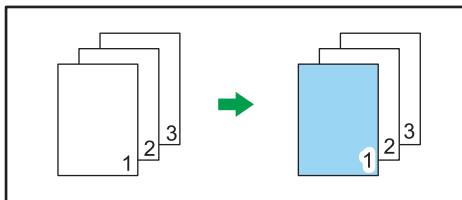
★ Important

- To use this function, **Collate must be set**.

Prints the first page of the document on the sheet for the cover page.

Print on one side

Prints on one side of the cover sheet only, even when duplex printing is selected.

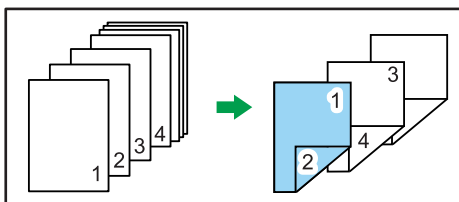


CBK512

Print on both sides

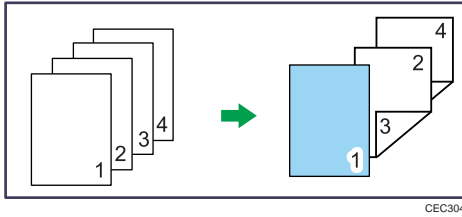
Prints on both sides of the cover sheet when duplex printing is selected.

- Cover sheet printed on both sides



CBK513

- Cover sheet printed on one side

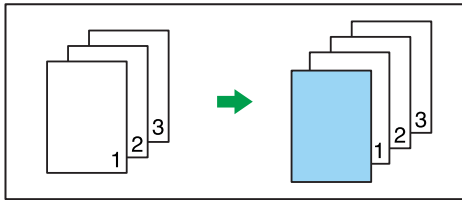


CEC304

2

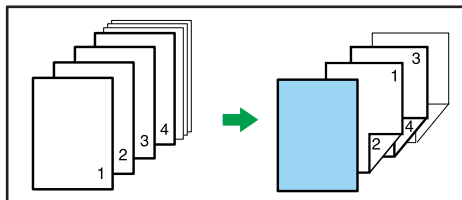
Blank

- When printing one side



CEC303

- When printing both side



CEC305

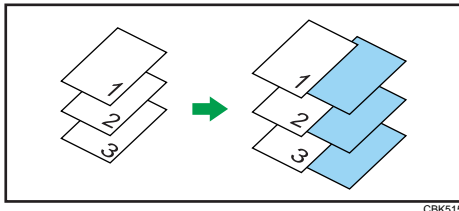
Note

- The cover sheets should be the same size and orientation as the body of the paper.
- If "Auto Tray Select" is set for the body paper feed tray, body paper will be delivered from a tray that contains paper set in portrait orientation. Therefore, if the cover paper is set to landscape orientation, the orientation of the cover and body paper will be different.
- For printing methods, see the printer driver Help.

Inserting Slip Sheets

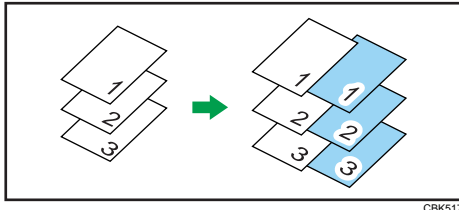
Inserting a slip sheet between each page

- Leave Blank



CBK515

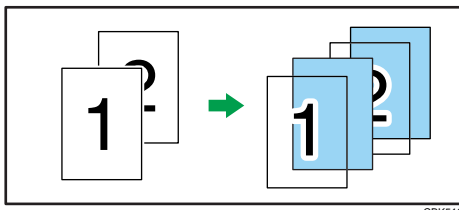
- Print on Slip Sheet



CBK517

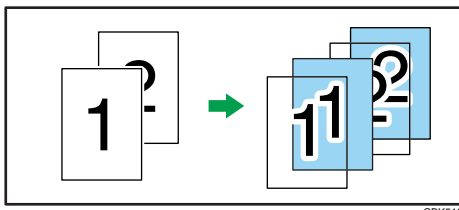
Inserting a slip sheet between OHP transparencies

- Leave Blank





CBK516

- Print on Slip Sheet



CBK518

↓ Note

- Collate cannot be set when using slip sheets.
- When the duplex printing or cover printing is set, you cannot insert slip sheets.
- The slip sheet should be the same size and orientation as the body paper.
- If "Auto Tray Select" has been set as the paper feed tray for the body paper, the paper will be delivered from a tray containing paper in  orientation. Therefore, when the slip sheet has been set to  orientation, the orientation of the output slip sheet and body paper will be different.
- The same paper feed tray cannot be set for the body of the document and slip sheets.

Printing with Watermarks

Using this function, you can print documents with text watermarks.

This function increases a document's security and identifiability by embedding a specified text (watermark) on every page. You can specify only one type of watermark at a time.

2

Note

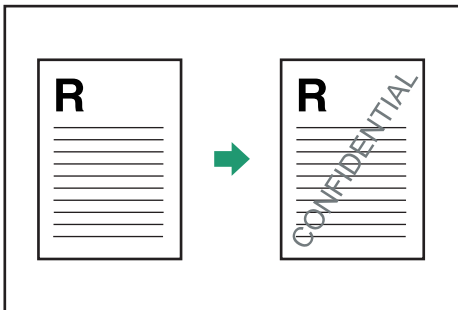
- You can create and apply custom watermarks. For details about creating original watermarks, see the printer driver Help.

Types of watermarks

This section explains the types of watermarks available.

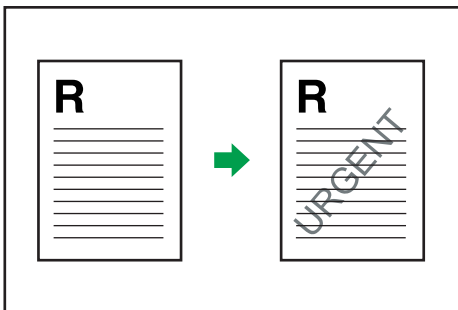
Following are the pre-registered text watermarks that are available:

- CONFIDENTIAL



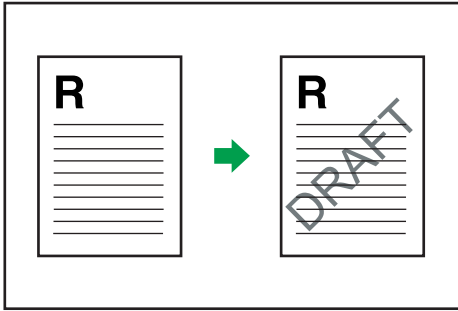
CBK503

- URGENT



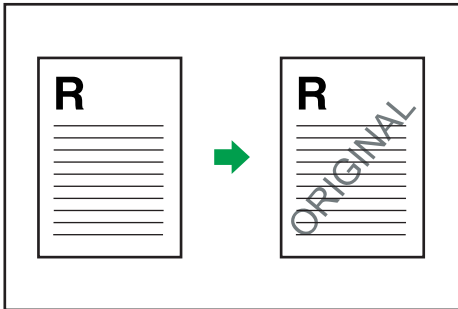
CBK502

- DRAFT



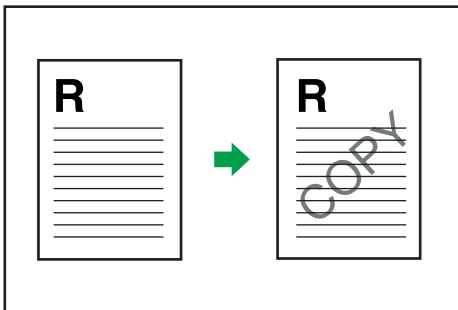
CBK504

- ORIGINAL



CBK505

- COPY



CBK501

Collate Function

This section explains the printer's Collate function.

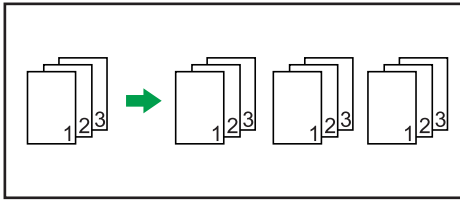
The Collate function allows you to print while sorting printouts into page-ordered sets, such as when printing multiple copies of meeting materials.

2

★ Important

- Up to 150 pages can be stored in the printer's RAM. If the hard disk is installed, up to 1,000 pages can be stored.
- Collate will be canceled if an error occurs during printing of the first set.

Output can be assembled as sets in sequential order.



CBK511

↓ Note

- For printing methods, see the printer driver Help.

Spool Printing

Spool Printing allows print jobs transferred from a computer to be temporarily stored, and then prints them after they are transferred. This shortens printing time as it maximizes printer efficiency.

With Spool Printing, the print data is saved in the hard disk before printing.

★ Important

- This function is available only if the hard disk is installed on the printer.
- Use the "spoolsw clear job" telnet command to clear a spooled print job. Do not turn off the printer or computer while a print job is being spooled and the Data In is flashing. Print jobs that are interrupted in this way remain on the printer's hard disk and will finish printing out when the printer is turned back on.
- The Spool Printing function is available for data received using "diprint", "lpr", "ipp", "ftp", "sftp (TCP/IP (IPv6))", and "wsd (printer)".
- When using diprint, the Spool Printing function cannot be used with bi-directional communication.
- The domain reserved for spool printing is about 1 GB.
- When Spool Printing is on, the size of a single print job cannot exceed 500 MB.
- When receiving jobs from multiple computers, the printer can spool a maximum of ten lpr jobs, and only one "diprint", "ipp", "ftp", "sftp", "smb", or "wsd (printer)" job. If the printer's spooling capacity is exceeded, newer jobs cannot be printed. You must wait before sending further jobs.

↓ Note

- Printing the first page with Spool Printing will be slow.
- The computer requires less print processing time when large amounts of data are spooled.
- Stored spool jobs can be viewed or deleted using Web Image Monitor.
- The list of spool jobs cannot be viewed from the printer's control panel.
- For information about the "spoolsw clear job" command on the telnet, see UNIX Supplement.

Setting Spool Printing

Spool printing settings can be made using control panel or telnet or Web Image Monitor.

- Using control panel
In [System] menu, select [On] in [Spool Printing]. For details about control panel, see p. 102 "System Menu".
- Using Web Image Monitor
Click [Configuration] in the menu area, and then set [Spool Printing] in [System] under "Device Settings" to [Active].

- Using telnet
Enter "spoolsw spool on".

Note

- For details about Web Image Monitor, see Web Image Monitor Help.
- For details about "Using telnet", see UNIX Supplement.

2

Viewing or Deleting Spooled Jobs Using Web Image Monitor

Follow the procedure below to check or delete spooled jobs using Web Image Monitor.

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p. 139 "Access in the Administrator Mode".

2. In the menu area, click [Job].

3. On the [Printer] menu, click [Spool Printing].

4. To delete a job, select the check box of the job you want to delete, and then click [Delete].

The selected job is deleted.

5. Click [Logout].

6. Quit Web Image Monitor.

Note

- For details about Web Image Monitor, see Web Image Monitor Help.

Printing a PDF File Directly

This section explains how to print PDF files directly without having to open a PDF application by using DeskTopBinder or UNIX commands.

Using DeskTopBinder

2

This section explains how to print PDF files directly without having to open a PDF application by using DeskTopBinder. To use this function, you must first download DeskTopBinder from the manufacturer's Website and install it on your computer. Contact your local dealer for information on downloading DeskTopBinder.

★ Important

- This function is possible for genuine Adobe PDF files only.
- PDF files that are Version 1.7 or earlier are compatible.
- PDF files created using PDF version 1.5 Crypt Filter functions or more than eight DeviceN Color Space components cannot be printed.
- PDF files created using PDF version 1.6 watermark note functions, or extended optional contents cannot be printed.
- AcroForm is a function specific to PDF version 1.7 and is not supported.
- If the document contains transparency function data, it may fail to print. When this happens, use the printer driver to print the document.
- Large PDF files might not be printable using the PDF direct print function.

↓ Note

- Paper size errors may occur when printing on custom size paper.

Expanding DeskTopBinder features

This section explains how to extending the features of DeskTopBinder.

To extend a feature, click on its icon in the [Type:] list.

The following procedure explains how to use the extended features Wizard to print PDF files directly.

1. On the [Start] menu, point to [All Programs], [DeskTopBinder], and then click [Extended Features Wizard].
2. Select [Easy settings], then click [Start] and then, click [Next] repeatedly until the [Printing Function2] dialog box appears.

If you have selected [All function settings], click [Start], and then click the [Output] icon in the [Type:] list. Select [PDF Direct Print] in [Selectable function(s):], and then click [Add].

3. In the [Printing Function2] dialog box, click [Add...].
4. Click [Specify...], and then enter the IP address or host name of the printer.
5. Click [OK].
6. Click [OK].
7. Click [Next] repeatedly until [Finish] appears.
8. Click [Finish].

Function palette

The Function Palette contains buttons for functions that are already configured through expanded DeskTopBinder functions. Using these buttons, you can print Windows files, preview printouts, convert images, and register scanners for documents without having to open DeskTopBinder. You can also use these functions simply by dragging a target file to the button corresponding to the required function and dropping it there.

1. On the [Start] menu, point to [All Programs], [DeskTopBinder], and then click [Function Palette].

An icon for the Function palette is added to the task tray displayed at the bottom right of the screen.

2. Right-click the new icon that has been added to the task tray, and then click [Properties...].
3. Click the [Contents] tab, select the [PDF Direct Print] check box at the center, and then click [OK].

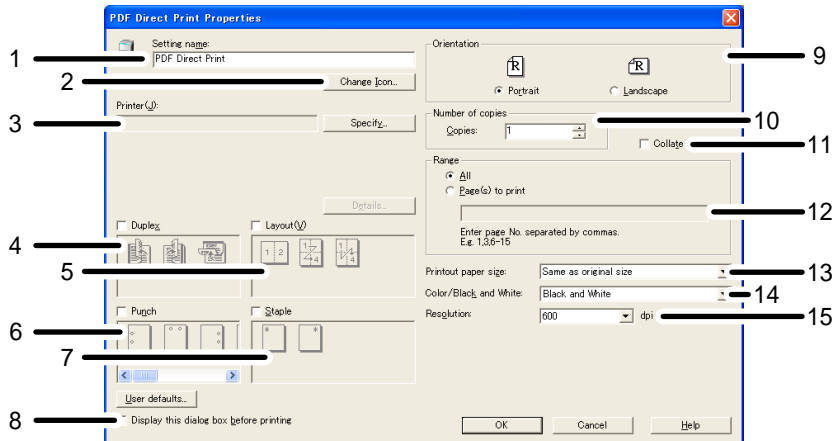
The [Properties] screen closes and the [PDF Direct Print] icon is added to the palette.

PDF Direct Printing Using Function Palette

Follow the procedure below to print PDF files directly.

1. Drag the PDF file you want to print to the PDF Direct Printing icon on the Function Palette and drop it there.
2. Highlight the PDF file you want to print, and then click [OK].

PDF Direct Print Properties



CEC306

1. Setting name:

Displays the plug-in configuration name (up to 63 single byte characters)

2. Change Icon...

Changes the icon displayed on the tool bar.

3. Printer:

Displays printer's IP address or hostname.

4. Duplex

Prints on both sides of sheets.

5. Layout

Prints multiple pages on a single sheet.

6. Punch (not supported for this printer)

Punches holes in printed sheets.

7. Staple (not supported for this printer)

Staples together printed sheets.

8. Display this dialog box before printing

Appears in PDF direct printing mode if this check box is selected.

9. Orientation:

Specify the original's orientation.

10. Number of copies

Specify the number of copies to print.

11. Collate

Sorts printed sheets.

12. Range:

Specify which paper to print.

13. Printout paper size:

Specify the paper size you want copies to be printed onto.

14. Color/Black and White:

Specify [Black and White] printing for this printer.

15. Resolution:

Specify a print resolution.

Using Commands to Print

This section explains how to print PDF files directly using printing commands, such as "lpr", "rcp", "ftp", and "sttp".

Sending a PDF file

Use the following procedure to send a PDF file to this printer using printing commands.

Following is an example when using the "lpr" command to print a PDF file by specifying the printer's IP address.

```
c:\> lpr -S printer's IP address -P printer name [-o l] \path\ PDF file name
```

 **Note**

- Entering the text enclosed in brackets [] is optional.
- For details about printing PDF files directly, see UNIX Supplement.

Entering the PDF password

Use the following procedure to print a password protected PDF file directly.

To print a PDF file that is protected by a password, enter the password using the control panel or Web Image Monitor.

Using the Control Panel

To enter a PDF password using the control panel, select [Change PDF Password] on [PDF Menu] under [Print Settings].

Using Web Image Monitor

To enter a PDF password using Web Image Monitor, click [Configuration] in the menu area, and then select [PDF Temporary Password] under "Printer".

 **Note**

- For details about Web Image Monitor, see Web Image Monitor Help.

Specifying the Classification Code for a Print Job

When printing in an environment where classification codes are required, a classification code must be specified for each print job.

★ Important

2

- The PostScript 3 printer driver does not support the classification codes and it cannot be used to print under environment which the classification codes are required.

For the PCL 6 printer driver:

1. In the application, on the [File] menu, click [Print].
2. Select the printer, and then open the [Printing Preferences] dialog box in the document's native application.
3. Click the [Detailed Settings] tab.
4. In the [Menu:] box, click the [Job Setup] icon.
5. Enter the classification code in the [Classification Code:] box.
This code identifies the user. The classification code can contain up to 32 alphanumeric (a-z, A-Z, 0-9, "-") characters.
6. Make any other necessary print settings, and then click [OK].
7. Execute the print command.
8. The print job is sent to the printer.

For the PCL 5e printer driver:

1. In the application, on the [File] menu, click [Print].
2. Select the printer, and then open the [Printing Preferences] dialog box in the document's native application.
3. Click the [Valid Access] tab.
4. Enter the classification code in the [Classification Code:] box.
This code identifies the user. The classification code can contain up to 32 alphanumeric (a-z, A-Z, 0-9, "-") characters.
5. Make any other necessary print settings, and then click [OK].
6. Execute the print command.
7. The print job is sent to the printer.

↓ Note

- The specified classification code is stored in the printer driver.

- To switch between different classification codes, install the printer driver under different names, and specify different classification code for each driver.
- For details about how to view the log collected using Classification Code, see the manual for the external log collection system.

Using the Virtual Printer

A virtual printer is a pseudo printer that can only be recognized on a network. The virtual printer has various print options, such as feeding tray selection and duplex printing, which you can set in advance. You can also use the interrupt printing function. This function suspends the ongoing job and gives priority to a new job.

This function is available only if the hard disk is installed on the printer.

If you use the virtual printer under UNIX, Solaris, and other operating systems, various print functions are possible without having you manually enter usual print commands.

Adding a Virtual Printer

★ Important

- Adding a virtual printer requires Administrators privilege. Log in using an account that has Administrators privilege.
- The following Virtual Printer protocols are available: "TCP/IP (Unspecified, Normal)", "TCP/IP (Unspecified, Priority)", "TCP/IP (DIPRINT)", "TCP/IP (RHPP)", "TCP/IP (IPDS)", and "NetWare".

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p. 139 "Access in the Administrator Mode".

2. In the menu area, click [Configuration], and then click [Virtual Printer Settings] in the "Printer" category.

3. Click [Add].

4. In [Virtual Printer Name], enter a name for the new printer, and then select the protocol in the [Protocol] list.

5. Click [OK].

↓ Note

- If you select [TCP/IP (DIPRINT)], [TCP/IP (IPDS)], or [NetWare] in the [Protocol] list, you cannot specify a virtual printer name.
- You can specify a virtual printer name using up to 47 characters.
- You can add up to 50 virtual printers. After 50 virtual printers have been added, [Add] will no longer be displayed.

Changing a Virtual Printer Configuration

★ Important

- You must have Administrators privilege to change the configuration of a virtual printer. Log in using an account that has Administrators privilege.
1. Log in to Web Image Monitor as an administrator.
For details about logging in, see p.139 "Access in the Administrator Mode".
 2. In the menu area, click [Configuration], and then click [Virtual Printer Settings] in the "Printer" category.
 3. Select the virtual printer whose configuration you want to change, and then click [Change].
If you want to configure this virtual printer for an interrupt printer, select [TCP/IP (Unspecified, Priority)] in the protocol list.
 4. Change the configuration as required.
 5. Click [OK].

↓ Note

- For details about virtual printer configuration, see Web Image Monitor Help.

Confirming a Virtual Printer Configuration

1. Start Web Image Monitor.
2. In the menu area, click [Configuration], and then click [Virtual Printer Settings] in the "Printer" category.
3. Select the virtual printer whose configuration details you want to confirm, and then click [Details].

↓ Note

- [Details] is not displayed if you log in to Web Image Monitor as an administrator. To confirm a virtual printer configuration, click [Change].
- When the virtual printer function is disabled, the list of virtual printers is not displayed if you are using Web Image Monitor in guest mode. For details about enabling the virtual printer function, see p.56 "Printing Using a Virtual Printer".

Deleting a Virtual Printer

★ Important

- You must have Administrators privilege to delete a virtual printer. Log in using an account that has Administrators privilege.

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. In the menu area, click [Configuration], and then click [Virtual Printer Settings] in the "Printer" category.

3. Select the virtual printer that you want to delete, and then click [Delete].

4. Click [OK].

↓ Note

- You cannot delete this printer's default virtual printer.
- [Delete] appears only if you have already added a virtual printer.

Printing Using a Virtual Printer

To print directly from a specified virtual printer, assign the virtual printer in the print command. If you use the interrupt printing function, enter the name of the virtual printer that you configured for interrupt printing. Before printing for the first time, specify the virtual printer you want to use.

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. In the menu area, click [Configuration], and then click [Basic Settings] in the "Printer" category.

3. Select [Active] in [Virtual Printer], and then click [OK].

4. Send a command from your computer.

Following is an example when using the "lpr" command to print a file.

```
c:\> lpr -S printer's IP address -P virtual printer name [-o l] \path\file name
```

↓ Note

- When the ongoing job meets any of the following conditions, interrupt printing is not possible even if you print with the virtual printer that is configured for interrupt printing. The printer waits to print a new job until it finishes printing the current job.
 - When the ongoing print job is performed using the bypass tray
 - When a function related to cover or slip paper is specified for the ongoing print job

- If a large amount of memory is used for the ongoing print job or a large number of sheets are being printed, there may not be enough memory to process an interrupt print job, or only part of the interrupt job may be printed. If this happens, certain functions for the interrupt job, such as stapling or storing data onto the printer, can be canceled or sheets can be sorted in a number smaller than the standard maximum capacity.
- For details about printing PDF files directly, see UNIX Supplement.

If Errors Occur with the Specified Paper Size and Type

If the paper size or type specified for the print job does not match the paper loaded in the paper tray or on the bypass tray, a message warning you of the mismatch will appear on the control panel. Resolve the mismatch by following the instructions in the message.

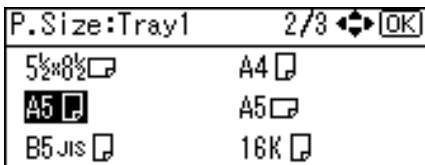
Changing the Paper Tray Settings

Use the following procedure to change the paper size and type specified for a tray and continue printing.

1. On the warning screen, press [Change].



2. Press the [▼] or [▲] key to select the tray whose paper size setting you want to change, and then press the [OK] key.
3. Select the paper size you want to set using the scroll keys, and then press the [OK] key.



4. Press the [▼] or [▲] key to select the tray whose paper type you want to change, and then press the [OK] key.
5. Press the [▼] or [▲] key to select the paper type you require, and then press the [OK] key.
6. Press the [Escape] key

Printing starts if the selected tray contains paper matching the size and type settings specified in the print job.

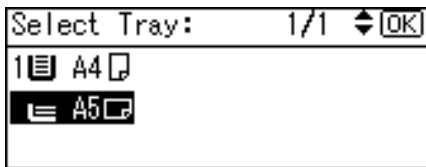
Printing from a Selected Tray

If the printer does not have a tray for the selected paper size or paper type, or if the selected paper loaded in the printer has run out, a caution message appears. If this message appears, do the following procedure.

1. When the caution message appears, press [FormFeed].



2. Press the [OK] key.
3. Select the tray for form feed using the [▼] or [▲] key from those that appear on the display panel, and then press the [OK] key.



↓ Note

- If a tray with a smaller paper size is selected, the print job may be cut short, or other problems may occur.

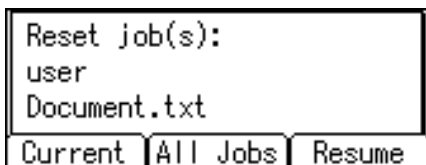
Canceling a Print Job

Follow this procedure for canceling the print job if the message prompting form feed appears.

1. Press [JobReset].

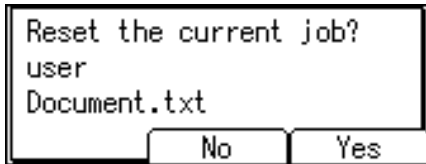


2. Press [Current].



To resume printing jobs, press [Resume].

3. Press [Yes] to cancel the print job.



4. Press [No] to return to the previous display.

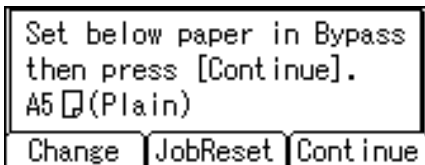
↓ Note

- If the printer is shared by multiple computers, be careful not to accidentally cancel someone else's print job.
- Under Windows, if the printer is connected to the computer using a parallel cable, sent print jobs may be canceled if the [Job Reset] key is pressed while "Please wait..." is displayed on the control panel. After the interval set in [I/O Timeout] in [Host Interface] has passed, the next print job can be sent. A print job sent from a different client computer will not be canceled in this case.
- You cannot stop printing data that has already been processed. For this reason, printing may continue for a few pages after you press the [Job Reset] key.
- A print job containing a large volume of data may take considerable time to stop.
- To stop data printing, see p.79 "Canceling a Print Job".

Proceeding with Printing Using the Bypass Tray

If you select [Any Size/Type] or [Any Custom Size/Type] for the bypass tray, a warning message will appear whenever the paper fed from the source tray does not match the size specified in the print job.

When this warning message appears, check the size of the loaded paper and do the following.



1. Load paper of the size/type indicated in the message onto the bypass tray.
2. Press [Continue].

Printing resumes from the page in which the error occurred.

↓ Note

- For details about [Any Size/Type] or [Any Custom Size/Type], see p.37 "Specifying Printer Driver or Print Command Priority" and p.108 "Print Settings Menu".

3. Printing Stored Documents

This chapter explains how to print documents stored in the printer.

Using the Print Job Function

This describes how to print or delete files stored in the printer. There are following types of print files: Sample Print, Locked Print, Hold Print, and Stored Print.

Print files sent from computers can be stored in the hard disk of the printer. Using the Print Job function, you can print or delete the print files.

3

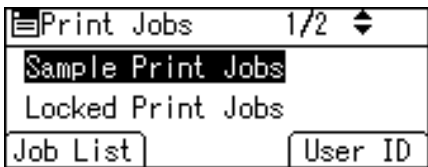
★ Important

- This function is available only if the hard disk is installed on the printer.

Print Job Screen



If you press [Prt.Jobs] on the initial screen, a screen prompting to select the type of print job appears.

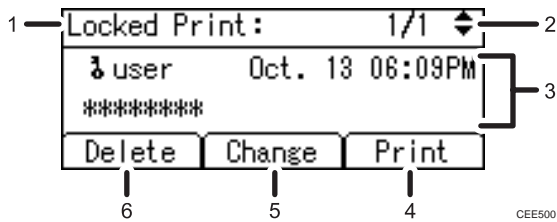


After selecting a type, you can select print files in the list by pressing:

- [Job List]
Displays the Job List screen.
- [User ID]
Displays the User ID screen.

If you select Sample Print, Locked Print, or Hold Print, the print files saved in the printer are deleted after printing is completed. If you select Stored Print, the files remain in the printer even after printing is finished.

Job List Screen



3

1. The type of print jobs

Displays the type of the print job you select.

2. Page number

Displays the current page number. Each time pressing the [▼] or [▲] key, the screen switches.

3. User ID, Date/Time, and File Name display

- User ID shows the user's ID set by the printer driver.
- Date and Time show the time at which the print job was stored in the printer.
- File name shows the name of the file. However, "*****" is shown instead of the file name for a Locked Print file.

4. [Print]

Prints a selected file.

5. [Change]

Changes or clears the password of a file if a password is set. To change the password of a Locked/Stored Print job, press [Change], enter the current password, and then enter the new password on the confirmation screen. To clear the password for the Stored Print Job, press [Change], enter the current password, and then press the [OK] key in the confirmation screen without entering anything in the new password box.

You can also set passwords to the Stored Print files that do not currently have passwords.

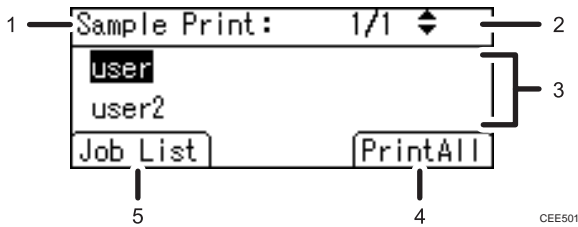
6. [Delete]

Deletes a selected file.

↓ Note

- When you press [Change] to change or clear a password, you must first enter the existing password. If the password you entered is incorrect, you cannot change or clear any current passwords.
- You can use [Change] to set or clear passwords only when Stored Print files are stored in the printer.

User ID Screen



1. The type of print jobs

Displays the type of the print job you select.

2. Page number

Displays the current page number. Each time pressing the [▼] or [▲] key, the screen switches.

3. User ID

- User ID shows the ID of the user who stored the selected type of files.
- User ID set by the printer driver is shown.

4. [PrintAll]

Prints all files stored by the user whose user ID has been selected.

5. [Job List]

Switches the screen to the [Job List] screen.

Displays the print jobs of the selected user only.

↓ Note

- To cancel selecting a file, press the [Escape] key.
- The display is not updated if a new file is stored while the list of stored files is displayed. To update the display, press the [Menu] or [Escape] key to return to the initial screen, and then press [Prt.Jobs] again.
- If a large number of print jobs are stored in the printer, processing may slow temporarily, depending on which functions are used.

Printing from the Print Job Screen

This section gives instruction about Sample Print, Locked Print, Hold Print, and Stored Print.

★ Important

- If you are using a printer with ELP-NX installed, all print jobs for which "Normal Print" or "Locked Print" is specified are stored in ELP-NX when user authentication is set. After issuing the print command from the printer driver, log in to ELP-NX and print the job.
- If you are using a printer with ELP-NX installed, all print jobs for which "Locked Print" is specified are stored in ELP-NX when user authentication is not set. Also note that any jobs for which "Locked Print" is not specified will be deleted according to the default setting of ELP-NX.
- For details about how to print using ELP-NX, see the manuals provided with the application.
- For details about the option settings of ELP-NX, consult your administrator.
- This function is available only if the hard disk is installed on the printer.

Sample Print

Use this function to print only the first set of a multiple-set print job. After you have checked the result, remaining sets can be printed or canceled using the printer's control panel. This can reduce misprints due to mistakes in content or settings.

★ Important

- A Sample Print file cannot be stored if:
 - the hard disk is not installed in the printer.
 - the total number of Sample Print, Locked Print, Hold Print, and Stored Print files in the printer is over 100. (The maximum number varies depending on the volume of data in files.)
 - the file contains over 1,000 pages.
 - sent or stored files in the printer contain over 9,000 pages in total.

↓ Note

- If a Sample Print file has not been stored properly, check the error log in the control panel.
- Even after you turn off the printer, stored documents in the printer remain. However, the [Auto Delete Temporary Jobs] or [Auto Delete Stored Jobs] settings are applied first.
- If the application has a collate option, make sure it is not selected before sending a print job. By default, Sample Print jobs are automatically collated by the printer driver. If a collate option is selected from the application's print dialog box, more prints than intended may be produced.
- If the first set of the Sample Print files is not as you expected and you do not want to print remaining sets, delete the Sample Print file using the display panel. If you print the remaining sets of the Sample Print file, the job in the printer is deleted automatically.

- Sample Print files printed or deleted using Web Image Monitor, after you select [Sample Print] using the control panel will appear on the display panel. However, an error message will appear if you try to print or delete those Sample Print files.
- If stored files have similar and long file names, recognizing the file you want to print on the display panel may be difficult. Print the file you want to print either by checking the user ID or the time the file is sent, or by changing the file name to something that can be recognized easily.
- For details about the error log in the display panel, see p.133 "Checking the Error Log".
- For details about [Auto Delete Temporary Jobs] and [Auto Delete Stored Jobs], see p.92 "Maintenance Menu".

Sending a Sample Print file

The following procedure describes how to print a Sample Print file with the PCL 6/PCL 5e or PostScript 3 printer driver.

★ Important

- Applications with their own drivers, such as PageMaker[®], do not support this function.
1. **Configure the Sample Print in the printer driver's properties.**
For details about configuring the printer drivers, see the relevant Help files.
 2. **Click [Details...], and then enter a user ID in the [User ID:] box.**
 3. **Click [OK] to close [Details...], and then click [OK] to close the printer driver's properties.**
 4. **Start printing from the application's print dialog box.**

Make sure to set more than two copies.

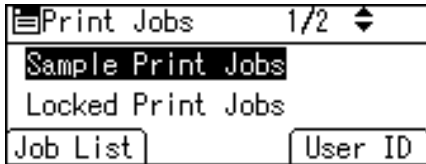
The Sample Print job is sent to the printer, and the first set is printed.

Printing a Sample Print file using the control panel

1. On the printer's control panel, press [Prt.Jobs].



2. Select [Sample Print Jobs] using the [▼] or [▲] key, and then press [Job List].

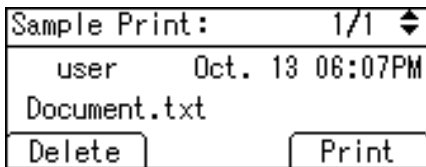


Depending on the security settings, certain print jobs may not be displayed.

You can print files also by pressing [User ID].

3

3. Select the file you want to print using the [▼] or [▲] key, and then press [Print].



If you want to print multiple copies, specify a number of sets in the [Quantity] box. Press the [Clear] key to correct any entry mistakes.

4. Press [Print].

To cancel printing, press [Cancel].

↓ Note

- If the set quantity is changed when [User ID] is pressed in step 2, the changed quantity is applied to all selected files.
- When printing is completed, the stored file will be deleted.
- To stop printing after printing has started, press the [Job Reset] key. The file will be deleted.
- For details about [User ID], see p.77 "Printing from the User ID Screen".

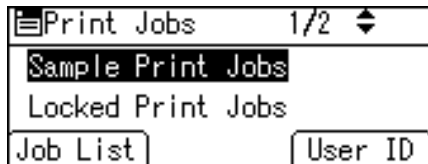
Deleting Sample Print files

If you are not satisfied with the Sample printout, you can delete the Sample Print file, revise it and print it again until the settings are suitable.

1. Press [Prt.Jobs].

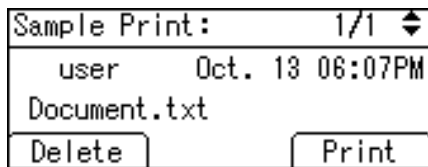


2. Select [Sample Print Jobs] using the [▼] or [▲] key, and then press [Job List].



Depending on the security settings, certain print jobs may not be displayed.

3. Select the file you want to delete using the [▼] or [▲] key, and then press [Delete].



4. Press [Delete].

To cancel deleting, press [Cancel].

Locked Print

Use this function to maintain privacy when printing confidential documents on the printer over a shared network. Usually, it is possible to print data using the display panel once it is stored in this printer. When using Locked Print, it is not possible to print unless a password is entered on the printer's display panel. Your confidential documents will be safe from being viewed by other people.

★ Important

- If you are using a printer with ELP-NX installed, all print jobs for which "Normal Print" or "Locked Print" is specified are stored in ELP-NX when user authentication is set. After issuing the print command from the printer driver, log in to ELP-NX and print the job.
- If you are using a printer with ELP-NX installed, all print jobs for which "Locked Print" is specified are stored in ELP-NX when user authentication is not set. Also note that any jobs for which "Locked Print" is not specified will be deleted according to the default setting of ELP-NX.
- For details about how to print using ELP-NX, see the manuals provided with the application.
- For details about the option settings of ELP-NX, consult your administrator.
- A Locked Print file cannot be stored if:
 - the hard disk is not installed in the printer.
 - the total number of Sample Print, Locked Print, Hold Print, and Stored Print files in the printer is over 100. (The maximum number varies depending on the volume of data in files.)
 - the file contains over 1,000 pages.
 - sent or stored files in the printer contain over 9,000 pages in total.

↓ Note

- If a Locked Print file has not been stored properly, check the error log in the control panel.
- Even after you turn off the printer, stored documents remain. However, the [Auto Delete Temporary Jobs] or [Auto Delete Stored Jobs] settings are applied first.
- If the application has a collate option, make sure it is not selected before sending a print job. Locked Print jobs are automatically collated by the printer driver as default. If a collate option is selected in the application print dialog box, more sets than intended may be printed.
- After the Locked Print file is printed, the job is automatically deleted.
- Locked Print files printed or deleted using Web Image Monitor, after you select [Locked Print] using the control panel will appear on the display panel. However, an error message will appear if you try to print or delete those Locked Print files.
- For details about the error log in the display panel, see p.133 "Checking the Error Log".
- For details about [Auto Delete Temporary Jobs] and [Auto Delete Stored Jobs], see p.92 "Maintenance Menu".

3

Sending a Locked Print file

The following procedure describes how to print a Locked Print file with the PCL 6/PCL 5e or PostScript 3 printer driver.

★ Important

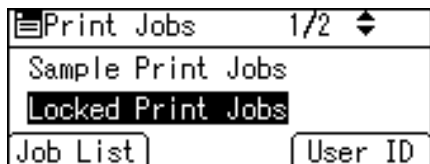
- Applications with their own drivers, such as PageMaker, do not support this function.
1. **Configure the Locked Print in the printer driver's properties.**
For details about configuring the printer drivers, see the relevant Help files.
 2. **Click [Details...], and then enter a user ID in the [User ID:] box, and then enter a password in the [Password:] box.**
 3. **Click [OK] to close [Details...], and then click [OK] to close the printer driver's properties.**
 4. **Start printing from the application's print dialog box.**
The Locked Print job is sent to the printer and stored.

Printing a Locked Print file using the control panel

1. On the printer's control panel, press [Prt.Jobs].



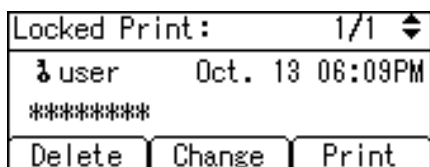
2. Select [Locked Print Jobs] using the [▼] or [▲] key, and then press [Job List].



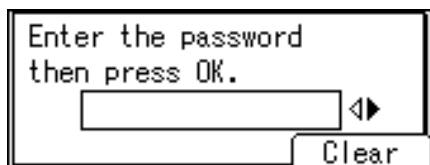
Depending on the security settings, certain print jobs may not be displayed.

You can print files also by pressing [User ID].

3. Select the file you want to print using the [▼] or [▲] key, and then press [Print].



4. Enter the password, and then press the [OK] key.



A confirmation screen will appear if the password is not entered correctly. Press [Clear] or the [Clear] key to enter the password again.

If you forget your password, contact your administrator for help.

5. Press [Print].

To cancel printing, press [Cancel].

Note

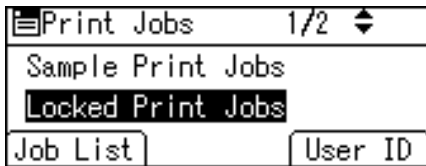
- When printing is completed, the stored file will be deleted.
- To stop printing after printing has started, press the [Job Reset] key. The file will be deleted.
- For details about [User ID], see p.77 "Printing from the User ID Screen".

Deleting Locked Print files

1. Press [Prt.Jobs].

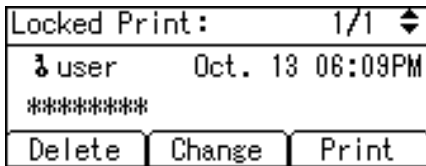


2. Select [Locked Print Jobs] using the [▼] or [▲] key, and then press [Job List].

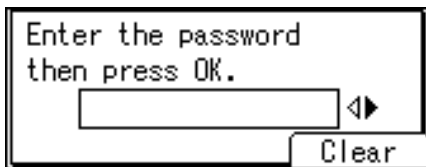


Depending on the security settings, certain print jobs may not be displayed.

3. Select the file you want to delete using the [▼] or [▲] key, and then press [Delete].



4. Enter the password, and then press the [OK] key.



A confirmation screen will appear if the password is not entered correctly. Press [Clear] or the [Clear] key to enter the password again.

If you forget your password, contact your administrator for help.

5. Press [Delete].

To cancel deleting, press [Cancel].

Hold Print

Use this function to temporarily hold a file in the printer, and print it from the computer or the printer's control panel later.

★ Important

- A Hold Print file cannot be stored if:
 - the hard disk is not installed in the printer.
 - the total number of Sample Print, Locked Print, Hold Print, and Stored Print files in the printer is over 100. (The maximum number varies depending on the volume of data in files.)
 - the file contains over 1,000 pages.
 - sent or stored files in the printer contain over 9,000 pages in total.

Note

- If a Hold Print file has not been stored properly, check the error log in the control panel.
- Even after you turn off the printer, stored documents in the printer remain. However, the [Auto Delete Temporary Jobs] or [Auto Delete Stored Jobs] settings are applied first.
- If the application has a collate option, make sure it is not selected before sending a print job. By default, Hold Print jobs are automatically collated by the printer driver. If a collate option is selected from the application's print dialog box, more prints than intended may be produced.
- Hold Print files printed or deleted using Web Image Monitor, after you select [Hold Print] using the control panel will appear on the display panel. However, an error message will appear if you try to print or delete those Hold Print files.
- If stored files have similar and long file names, recognizing the file you want to print on the display panel may be difficult. Print the file you want to print either by checking the user ID or the time the file is sent, or by changing the file name to something that can be recognized easily. If you enter the document name on the printer driver's [Details...], that name appears on the display panel.
- It is possible, but not required, to set a file name or a password to a Hold Print file.
- For details about the error log in the display panel, see p.133 "Checking the Error Log".
- For details about [Auto Delete Temporary Jobs] and [Auto Delete Stored Jobs], see p.92 "Maintenance Menu".

Sending a Hold Print file

The following procedure describes how to print a Hold Print file with the PCL 6/PCL 5e or PostScript 3 printer driver.

★ Important

- **Applications with their own drivers, such as PageMaker, do not support this function.**
- 1. Configure the Hold Print in the printer driver's properties.**
For details about configuring the printer drivers, see the relevant Help files.
 - 2. Click [Details...], and then enter a user ID in the [User ID:] box.**
A file name can also be entered arbitrarily.
 - 3. Click [OK] to close [Details...], and then click [OK] to close the printer driver's properties.**
 - 4. Start printing from the application's print dialog box.**
The Hold Print job is sent to the printer and stored.

Printing a Hold Print file using the control panel

1. On the printer's control panel, press [Prt.Jobs].



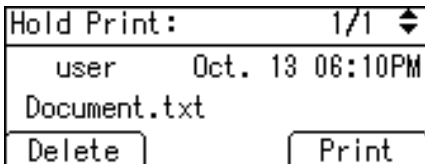
2. Select [Hold Print Jobs] using the [▼] or [▲] key, and then press [Job List].



Depending on the security settings, certain print jobs may not be displayed.

You can print files also by pressing [User ID].

3. Select the file you want to print using the [▼] or [▲] key, and then press [Print].



4. Press [Print].

To cancel printing, press [Cancel].

↓ Note

- When printing is completed, the stored file will be deleted.
- To stop printing after printing has started, press the [Job Reset] key. The file will be deleted.
- For details about setting printer drivers, see the printer driver Help. You can also print or delete a Hold Print file from Web Image Monitor. For details, see Web Image Monitor Help.
- For details about [User ID], see p.77 "Printing from the User ID Screen".

Deleting Hold Print files

1. Press [Prt.Jobs].

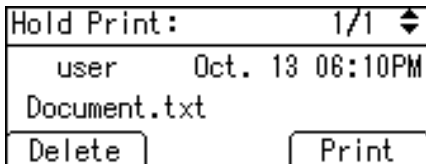


2. Select [Hold Print Jobs] using the [▼] or [▲] key, and then press [Job List].



Depending on the security settings, certain print jobs may not be displayed.

3. Select the file you want to delete using the [▼] or [▲] key, and then press [Delete].



4. Press [Delete].

To cancel deleting, press [Cancel].

Stored Print

Use this function to store a file in the printer, and then print it from the computer or the printer's control panel later.

Jobs are not deleted after they are printed, so the same job need not be resent in order to print multiple copies.

★ Important

- A Stored Print file cannot be stored if:
 - the hard disk is not installed in the printer.
 - the total number of Sample Print, Locked Print, Hold Print, and Stored Print files in the printer is over 100. (The maximum number varies depending on the volume of data in files.)
 - the file contains over 1,000 pages.
 - sent or stored files in the printer contain over 9,000 pages in total.

Note

- If a Stored Print file has not been stored properly, check the error log in the control panel.
- Even after you turn off the printer, stored documents in the printer remain. However, the [Auto Delete Temporary Jobs] or [Auto Delete Stored Jobs] settings are applied first.
- If the application has a collate option, make sure it is not selected before sending a print job. By default, Stored Print jobs are automatically collated by the printer driver. If a collate option is selected from the application's print dialog box, more prints than intended may be produced.
- Stored Print files printed or deleted using Web Image Monitor, after you select [Stored Print] using the control panel will appear on the display panel. However, an error message will appear if you try to print or delete those Stored Print files.
- If stored files have similar and long file names, recognizing the file you want to print on the display panel may be difficult. Print the file you want to print either by checking the user ID or the time the file is sent, or by changing the file name to something that can be recognized easily.
- If you enter the document name on the printer driver's [Details...], that name appears on the display panel.
- For details about the error log in the display panel, see p.133 "Checking the Error Log".
- For details about [Auto Delete Temporary Jobs] and [Auto Delete Stored Jobs], see p.92 "Maintenance Menu".

3

Sending a Stored Print file

The following procedure describes how to print a Stored Print file with the PCL 6/ PCL 5e or PostScript 3 printer driver.

★ Important

- **Applications with their own drivers, such as PageMaker, do not support this function.**

1. Configure the Stored Print in the printer driver's properties.

You can select two ways for Stored Print:

- [Stored Print]
Stores the file in the printer and print it later using the control panel.
- [Store and Print] (or [Store and Normal Print])
Prints the file at once and also stores the file in the printer.

For details about configuring the printer drivers, see the relevant Help files.

2. Click [Details...], and then enter a user ID in the [User ID:] box.

You can also set a file name and a password. The same password must be entered when printing or deleting.

3. Click [OK] to close [Details...], and then click [OK] to close the printer driver's properties.

4. Start printing from the application's print dialog box.

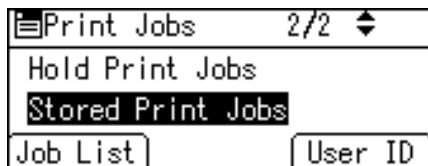
The Stored Print job is sent to the printer and stored.

Printing a Stored Print file using the control panel

1. On the printer's control panel, press [Prt.Jobs].

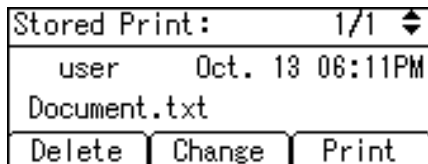


2. Select [Stored Print Jobs] using the [▼] or [▲] key, and then press [Job List].



You can print files also by pressing [User ID].

3. Select the file you want to print using the [▼] or [▲] key, and then press [Print].



If you set a password in the printer driver, a password confirmation screen appears. Enter the password.

If you want to print multiple copies, specify a number of sets in the [Quantity] box. Press the [Clear] key to correct any entry mistakes.

4. Press [Print].

To cancel printing, press [Cancel].

↓ Note

- When multiple files are selected without setting a quantity, one set less than the minimum number of all settings is applied. If the least number of settings is one set, all selected files will be printed at one set.
- If the number of set quantity is changed when [User ID] is pressed in step 2, the changed quantity is applied to all selected files.
- To stop printing after printing has started, press the [Job Reset] key. A Stored Print file is not deleted even if the [Job Reset] key is pressed.

- The Stored Print file that sent to the printer is not deleted unless you delete a file or select [Auto Delete Stored Jobs].
- You can set or delete a password after sending files to the printer. Select the file and press [Change] in the Print Job List screen. To set a password, enter the new password. To delete the password, leave the password box blank on entering or confirming the new password, and press the [OK] key.
- For details about the [Auto Delete Stored Jobs], see p.92 "Maintenance Menu".
- For details about [User ID], see p.77 "Printing from the User ID Screen".

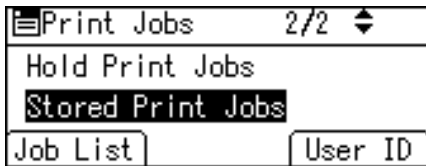
3

Deleting Stored Print files

1. Press [Prt.Jobs].

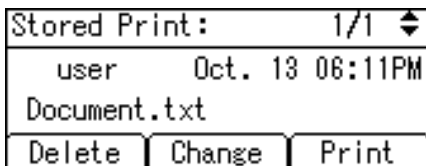


2. Select [Stored Print Jobs] using the [▼] or [▲] key, and then press [Job List].



Depending on the security settings, certain print jobs may not be displayed.

3. Select the file you want to delete using the [▼] or [▲] key, and then press [Delete].



If you set the password in the printer driver, enter the password to delete.

If you forget your password, contact your administrator for help.

4. Press [Delete].

To cancel deleting, press [Cancel].

Printing from the User ID Screen

This describes how to print the files saved in the printer from the User ID screen.

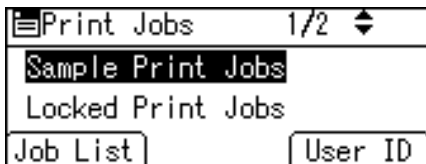
Printing the Selected Print Job

1. On the initial screen, press [Prt.Jobs].

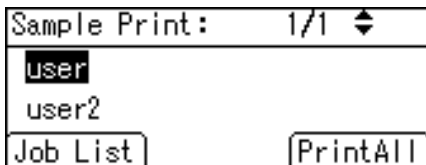


3

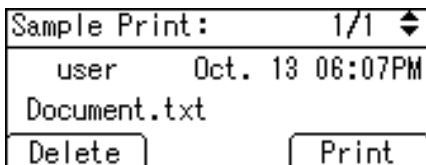
2. Press [User ID].



3. Select the user ID whose file you want to print using the [▼] or [▲] key, and then press [Job List].



4. Select the file you want to print using the [▼] or [▲] key, and then press [Print].



5. Press [Print].

To cancel printing, press [Cancel].

↓ Note

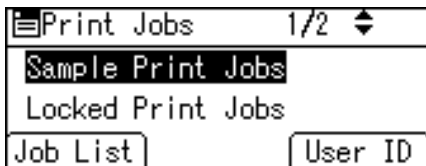
- If you print a Sample, Locked, or Hold Print file, the print file saved in the printer is deleted after printing is completed.

Printing All Print Jobs

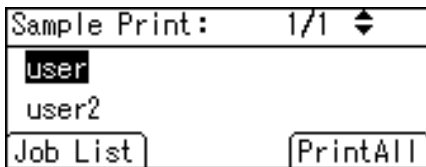
1. On the initial screen, press [Prt.Jobs].



2. Select a type of print jobs you want to print using the [▼] or [▲] key, and then press [User ID].



3. Select the user ID whose file you want to print using the [▼] or [▲] key, and then press [PrintAll].



4. Press [Print].

To cancel printing, press [Cancel].

Note

- If you print a Sample, Locked, or Hold Print file, the print file saved in the printer is deleted after printing is completed.
- You cannot select a print job that is not stored under the selected user ID.
- When printing multiple Sample Print files without specifying the number of sets on the confirmation screen, one set less than the least number of set specified on the computer is applied for every selected document. If the number of sets specified on the computer is "1", one set each is printed for every document.
- When printing multiple Stored Print files without specifying the number of sets on the confirmation screen, the least number of set specified on the computer is applied for every selected document.
- If you select [Locked Print Jobs], enter the correct password. If there are multiple passwords, the printer prints only files that correspond to the entered password.
- If you select Stored Print files, and some of these require a password, the printer prints files that correspond to the entered password and files that do not require a password.

Canceling a Print Job

You can cancel printing from either the printer or a client computer. Since canceling procedures vary depending on the print job status, check the job status and cancel printing according to the following procedure.

If Printing Has Not Yet Started

You can cancel a print job from the computer.

 **Note**

- If the printer is shared by multiple computers, be careful not to accidentally cancel someone else's print job.
- A print job containing a large volume of data may take considerable time to stop.

Windows

1. Double-click the printer icon on the Windows task tray.

A window appears, showing all print jobs currently queued for printing. Check the current status of the job you want to cancel.

- 2. Select the name of the job you want to cancel.**
- 3. On the [Document] menu, click [Cancel].**

Mac OS X

1. Click the printer icon on the dock.

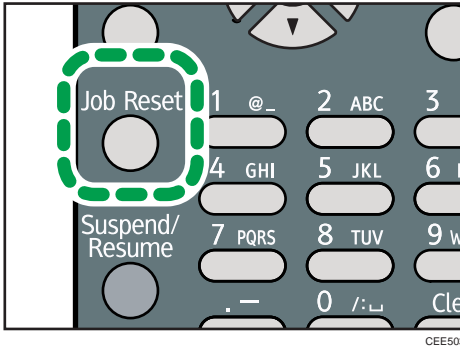
A window appears showing all print jobs that are currently queuing to be printed. Check the current status of the job you want to cancel.

- 2. Select the name of the job you want to cancel.**
- 3. In the application, on the [Jobs] menu, click [Delete Job].**

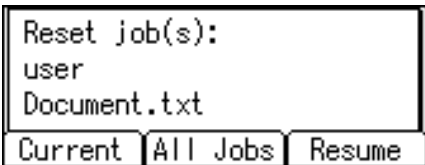
If Printing Has Already Started

You can cancel a print job from the printer's control panel.

1. Press the [Job Reset] key.

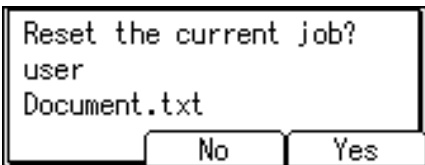


2. Press [Current].



To resume printing jobs, press [Resume].

3. Press [Yes] to cancel the print job.



Press [No] to return to the previous display.

Note

- If the printer is connected to the computer using a parallel cable, sent print jobs may be canceled if the [Job Reset] key is pressed while "Please wait..." is displayed on the control panel. After the interval set in [I/O Timeout] in Printer Features has passed, the next print job can be sent. A print job sent from a different client computer will not be canceled in this case.
- You cannot stop printing data that has already been processed. For this reason, printing may continue for a few pages after you press the [Job Reset] key.

4. Making Printer Settings Using the Control Panel

This chapter explains the menu displayed on the control panel and how to change the printer's settings.

Menu Chart

This section explains how to change the default settings of the printer and provides information about the parameters included in each menu.

Memory Erase Status

Displays data status inside the memory.

This menu can be displayed only if all the following conditions are met:

- The optional hard disk and the SD card provided with the hard disk are installed.
- [Auto Erase Memory Setting] is enabled.

Paper Input

Menu
Paper Size: Bypass Tray
Paper Size: Tray 1
Paper Size: Tray 2
Paper Size: Tray 3
Paper Type: Bypass Tray
Paper Type: Tray 1
Paper Type: Tray 2
Paper Type: Tray 3
Duplex Tray
Auto Tray Select
Tray Priority

Note

- Only installed trays appear on the display panel.

Maintenance

Menu
Quality Maintenance
General Settings
Timer Settings
HDD Management
Machine Settings Export

4

↓ Note

- [HDD Management] appears only when the hard disk is installed.

List/Test Print

Menu
Multiple Lists
Config. Page
Error Log
Network Summary
Supply Info List
Menu List
PCL Config./Font Page
PS Config./Font Page
PDF Config./Font Page
IPDS Font List
Hex Dump

System

Menu
Print Error Report

Menu
Auto Continue
Memory Overflow
Printer Language
Sub Paper Size
Default Printer Lang.
Auto Off
Auto Off Scheduler
ECO Night Sensor
Print Compressed Data
Memory Usage
Spool Printing
RAM Disk
Auto E-mail Notify

Note

- [Spool Printing] appears only when the hard disk is installed.
- [RAM Disk] appears only when the hard disk is not installed.

Print Settings

Menu
Machine Modes
PCL Menu
PS Menu
PDF Menu
IPDS Menu

Security Options

Menu
Extended Security
Service Mode Lock
Firmware Version
Network Security Level
Auto Erase Memory Setting
Erase All Memory
Transfer Log Setting
Machine Data Encryption

4

Note

- [Service Mode Lock] may not appear depending on the setting of the printer.
- [Auto Erase Memory Setting] and [Erase All Memory] will appear when the optional hard disk and the SD card provided with the hard disk are installed.
- [Machine Data Encryption] will appear when the optional hard disk and the SD card provided with the hard disk are installed, and you have logged on as the machine administrator.

Host Interface

Menu
I/O Buffer
I/O Timeout
Network
Parallel Interface
Wireless LAN
USB Settings

Note

- [Parallel Interface] appears when the optional IEEE 1284 interface board is installed.
- [Wireless LAN] appears when the optional Wireless LAN interface unit is installed.

Shutdown

Prepares the printer for power off. To prevent damage to the hard disk or memory leading to malfunction, be sure to shutdown the printer properly before turning off the power switch.

↓ Note

- For details about shutting down the printer, see "Turning off the Power", Hardware Guide.

Language

Menu
English
French
German
Italian
Spanish
Dutch
Norwegian
Danish
Swedish
Polish
Portuguese
Hungarian
Czech
Finnish
Russian

Extended Features

This menu is not available on the printer you are using.

Applying the Machine Settings to Other Printers

About the Machine Settings Export Function

Use this function to store the printer's configuration settings on an SD card. Information stored on the card can be used to restore the printer's configuration. The card can also be used to export this printer's configuration settings to other printers of the same manufacturer.

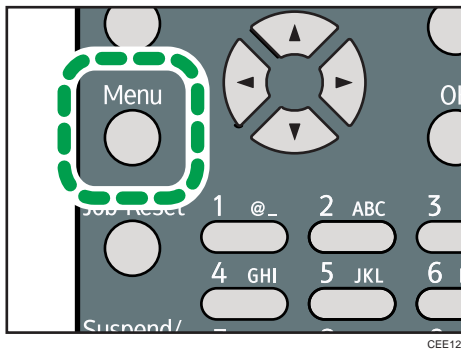
The following settings are exportable:

- All settings under the [System] menus
- All settings under the [Print Settings] menus
- [Machine IPv4 Address] under [Network] on the [Host Interface] menu
- [Fixed USB Port] under [USB Settings] on the [Host Interface] menu

4

Exporting the Machine Settings to a SD Card

1. Make sure the printer is turned off.
2. Insert the SD card in the SD card slot.
3. Turn the printer on.
4. Press the [Menu] key.



5. Press the [▼] or [▲] key to select [Maintenance], and then press the [OK] key.
6. Press the [▼] or [▲] key to select [Machine Settings Export], and then press the [OK] key.
7. When the confirmation screen appears, press [Yes].
8. Make sure the message regarding that the exporting process being successfully completed appears, and then press [Exit].
9. Turn the printer off, and then remove the SD card on which the exported settings are stored.

Note

- For details about inserting the SD card and the slot location, see "Installing the SD Memory Card Options", Hardware Guide.

Importing the Machine Settings Stored on the SD Card into Other Printers

1. Make sure the printer to which the settings will be imported is turned off.
2. Insert the SD card in the SD card slot.
3. Turn the printer on while pressing and holding down the [Job Reset] key.
4. When the confirmation screen appears, press [Yes].
5. When the message regarding the completion of the import process appears, turn off the printer.
6. Remove the SD card.
7. Turn on the printer.
8. Make sure the settings have been imported properly. Modify the settings if necessary.

Note

- The SD card installation procedure and the SD card slot location differ depending on the machine you are using.

Memory Erase Status Menu

Displays data status inside the memory.

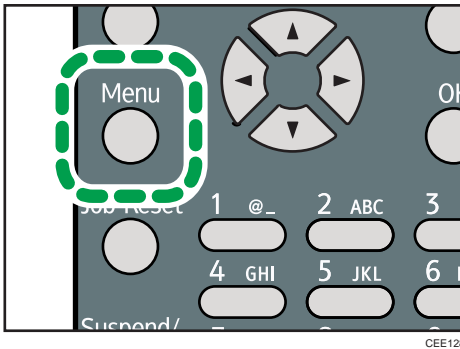
★ Important

- The Memory Erase Status menu can be displayed only if all the following conditions are met:
 - The optional hard disk and the SD card provided with the hard disk are installed.
 - [Auto Erase Memory Setting] is enabled.

Viewing the Status of Remaining Data in Memory

4

1. Press the [Menu] key.



2. Press the [▼] or [▲] key to select [Memory Erase Status], and then press the [OK] key.
3. The current memory status is displayed.
 - [Data to erase remaining.] : Data remain inside the memory.
 - [Currently no data to erase.] : No data remain inside the memory.
 - [Erasing Data...] : Data are being deleted.
4. Press the [OK] key.
5. Press the [Menu] key.

Paper Input Menu

This section explains about paper settings on the paper input menu such as paper sizes and types on each tray.

Paper Input Menu Parameters

This section explains about parameters that can be set on the paper input menu.



★ Important



- Only installed trays appear on the display panel.
- Be sure to set a paper type using the control panel. If you do not set it, the printing result might not be proper.

Paper Size: Bypass Tray

You can specify the paper size for Bypass Tray.

Default:



 **Region A** (mainly Europe and Asia)
A4 



 **Region B** (mainly North America)
8 1/2 × 11 

Paper Size: Tray 1 to 3

You can specify the paper size for Tray 1 to 3.

Default:

 **Region A** (mainly Europe and Asia)
A4 

 **Region B** (mainly North America)
8 1/2 × 11 

Paper Type: Bypass Tray

You can specify the paper type for Bypass Tray.

Default: [No Display (Plain Paper)]

Paper Type: Tray 1 to 3

You can specify the paper type for Tray 1 to 3.

Default: [No Display (Plain Paper)]

Duplex Tray

You can set each tray for duplex printing. Only installed trays appear on the display panel.

- Tray 1 to 3, Bypass Tray

Default: **[On]**

- On
- Off

Auto Tray Select

You can select whether to assign each tray to automatically print the paper size and type set by printer driver.

When using custom size paper, if automatic tray selection is enabled, the size selected on the control panel has priority. If this setting is disabled, the size selected from the printer driver has priority.

You can select multiple trays.

If you need to have a tray locked, you must select the tray using both printer driver and control panel.

- Tray 1 to 3, Bypass Tray

Default: **[On]**

- On
- Off

Tray Priority

You can set a tray to be checked first when automatic tray selection is enabled from the printer driver. The tray selected here is used when no tray is selected for a print job.

It is recommended that you load paper of the size and orientation you use most frequently in the tray selected in this setting.

Default: **[Tray 1]**

- Tray 1
- Tray 2
- Tray 3
- Bypass Tray

Note

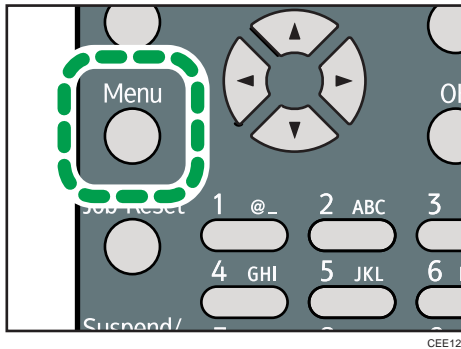
- For details about which paper sizes can be specified, see "Supported Paper for Each Tray", Hardware Guide.
- For details about which paper types can be specified, see "Supported Paper Types", Hardware Guide.

Changing the Paper Input Menu

Automatic tray selection

Follow the procedure below to change the automatic tray selection setting.

1. Press the [Menu] key.



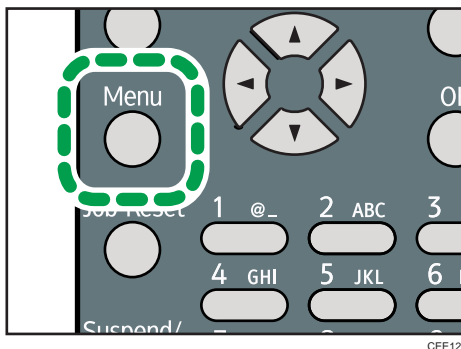
2. Press the [▼] or [▲] key to select [Paper Input], and then press the [OK] key.
3. Press the [▼] or [▲] key to select [Auto Tray Select], and then press the [OK] key.
4. Press the [▼] or [▲] key to select the tray you want to print from, and then press the [OK] key.
5. Press the [▼] or [▲] key to select [On], and then press the [OK] key.
6. Press the [Menu] key.

4

Tray priority

Follow the procedure below to change the tray priority.

1. Press the [Menu] key.



2. Press the [▼] or [▲] key to select [Paper Input], and then press the [OK] key.
3. Press the [▼] or [▲] key to select [Tray Priority], and then press the [OK] key.
4. Press the [▼] or [▲] key to select a tray you want to use, and then press the [OK] key.
5. Press the [Menu] key.

Maintenance Menu

You can set printing conditions such as density and calibration, and printer management such as deleting temporary print jobs from the hard disk.

Maintenance Menu Parameters

This section explains about parameters that can be set on the maintenance menu.

Quality Maintenance

4

Image Density Adjustment

Adjusting the print image density can prevent faint spots or smears appearing on printed pages. You can specify a density value between **-6** and **+3**.

Only change this setting from its default value if necessary. For details about adjusting the print image density, see "Adjusting the Image Density", Hardware Guide.

Registration

You can adjust the starting position of the printing page. For details, see "Adjusting Printing Position", Hardware Guide.

- Print Test Sheet

You can print the registration test sheet.

Only the installed trays appear on the display panel.

- Tray 1
- Tray 2
- Tray 3
- Bypass Tray
- Duplex Unit

- Adjustment

You can select the start position for printing on a page.

Only the installed trays appear on the display panel.

- Horizontal: Tray 1
- Horizontal: Tray 2
- Horizontal: Tray 3
- Horizontal: Bypass Tray
- Horizontal: Back Side

- Vertical: Std. Ppr Tray
- Vertical: Opt. Ppr Tray
- Vertical: Bypass Tray
- Vertical: Back Side

Curl Prevention

You can control the fuser temperature to prevent paper from curling. Use this mode only when paper misfeed occurs frequently during duplex printing.

Default: **[Off]**

- On
- Off

General Settings

Replacement Alert

Use this function to specify the timing of when the Alert Indicator will light up to prompt the user to replace supplies.

- Fusing Unit

Default: **[Normal]**

- Notify Sooner
- Normal
- Notify Later

Supply End Option

You can specify whether or not to continue printing after the following components have exceeded their recommended service life.

Default: **[Continue Printing]**

- Continue Printing
- Stop Printing

Display Supply Info

You can select whether or not the amount of toner is displayed on the initial screen.

Default: **[On]**

- On
- Off

Menu Protect

You can select whether or not to protect the menu settings. If you enable this setting, you must specify a protection level.

If you would like to lower the protection level, disable this setting or select [Level 1].

You may not be able to change this setting depending on the setting of the printer.

Default: [Level 2]

- Level 1
- Level 2
- Off

List/Test Print Lock

You can select whether or not to prohibit List/Test printing.

You may not be able to change this setting depending on the setting of the printer.

Default: [Off]

- On
- Off

Unit of measure

You can specify the unit for measurement.

Default:

 Region **A** (mainly Europe and Asia)

[mm]

 Region **B** (mainly North America)

[inch]

- mm
- inch

Panel Key Sound

You can select whether or not to enable the panel key sound.

Default: [On]

- On
- Off

Warm-up Beeper

You can select whether or not to sound the beeper when the printer has completed a warm-up process.

Default: [Off]

- On
- Off

Display Contrast

You can specify the density of the display by selecting one of seven levels.

Key Repeat

You can specify whether or not to scroll the display panel when the [▼] or [▲] key is held down. When you enable this setting, specify the scroll speed. (If repeat time is set to "Long", scroll speed becomes slow.)

Default: **[Normal]**

- Do not Repeat
- Normal
- Repeat Time: Medium
- Repeat Time: Long

Function Priority

Specify the function that is selected by default whenever the printer is turned on or leaves Energy Saver mode.

The order of the items on this menu reflects the order of the functions that appear when [Switch Functions] is pressed.

Default: **[Printer]**

- Printer
- Extended Features 1
- Extended Features 2
- Extended Features 3

Timer Settings

Auto Reset Timer

Specify how long the printer waits before it displays the initial screen following last usage (auto resets). This function will be active when the printer is in the following conditions:

- Performing normal menu operations.
- When displaying a warning message regarding authentication.

If you suspend printing by pressing the [Suspend/Resume] key, the machine will resume printing when the period of time specified by this setting has passed.

If you enable this setting, you can specify the number of seconds the printer waits before it auto resets. Specify a wait time of between 10 and 999 seconds (in steps of one second). The default wait time is 60 seconds.

Default: **[On]**

- On
- Off

Set Date

Set the date for the printer's internal clock.

Set Time

Set the time for the printer's internal clock.

HDD Management

Specify the settings related to deletion of data saved on the hard disk. This menu appears only if the hard disk is installed.

Delete All Temporary Jobs

Use this function to delete all temporary documents saved on the hard disk (Sample Print, Locked Print, and Hold Print data) at once.

Delete All Stored Jobs

Use this function to delete all Stored Print data saved on the hard disk at once.

Auto Delete Temporary Jobs

Specify whether or not to automatically delete temporary documents saved on the hard disk (Sample Print, Locked Print, and Hold Print data). If you enable this setting, you can specify the number of hours the printer waits before it deletes documents. Specify a wait time of between one and 200 hours (in steps of one hour). The default wait time is eight hours.

Default: [Off]

- On
- Off

Auto Delete Stored Jobs

Specify whether or not to automatically delete Stored Print data saved on the hard disk. If you enable this setting, you can specify the number of days the printer waits before it deletes documents. Specify a wait time of between one and 180 days (in steps of one day). The default wait time is three days.

Default: [On]

- On
- Off

Reset IPDS Fonts

Use this function to delete all IPDS captured fonts. This menu appears only when the optional IPDS card is installed.

Machine Settings Export

Use this function to store the settings of this printer on an SD card. The stored information can then be used to restore the settings of this printer, or carried over to other printers of the same manufacturer. For details, see p.86 "Applying the Machine Settings to Other Printers".

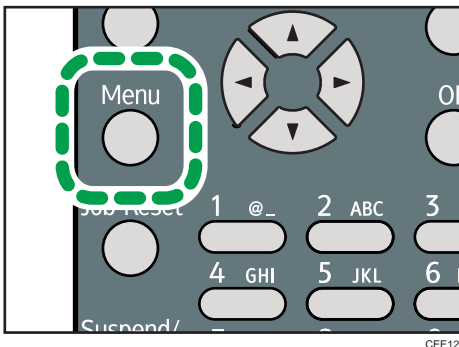
Changing the Maintenance Menu

This section explains changing the maintenance menu using examples.

Automatic deletion of temporary jobs in the hard disk

Follow the procedure below to set automatic deletion of temporary jobs stored in the hard disk.

1. Press the [Menu] key.



2. Press the [▼] or [▲] key to select [Maintenance], and then press the [OK] key.
3. Press the [▼] or [▲] key to select [HDD Management], and then press the [OK] key.
4. Press the [▼] or [▲] key to select [Auto Delete Temporary Jobs], and then press the [OK] key.
5. Press the [▼] or [▲] key to select [On], and then press the [OK] key.
6. Press the [▼] or [▲] key to set automatic deletion timer in hours between 1 through 200.
7. Press the [OK] key.
8. Press the [Menu] key.

List/Test Print Menu

The list/test print menu allows you to print lists showing the printer configuration and the setting status of print-related conditions.

List/Test Print Menu Parameters

This section explains about parameters that can be set on the list/test print menu.

Multiple Lists

You can print the configuration page and error log, network summary and supply list.

Config. Page

You can print the current configuration of the printer. For details, see p.99 "Interpreting the Configuration Page".

Error Log

You can print an error report.

Network Summary

You can print the network device status.

Supply Info List

You can print the supply status.

Menu List

You can print a menu list showing all available menus.

PCL Config./Font Page

You can print the current configuration and installed PCL font list.

PS Config./Font Page

You can print the current configuration and installed PostScript font list.

PDF Config./Font Page

You can print the current configuration and installed PDF font list.

IPDS Font List

You can print a list of IPDS-supported fonts. This menu appears only when the optional IPDS card is installed.

Hex Dump

You can print the data sent by the computer using Hex Dump.

Test Printing

Follow the procedure below to print the configuration page.

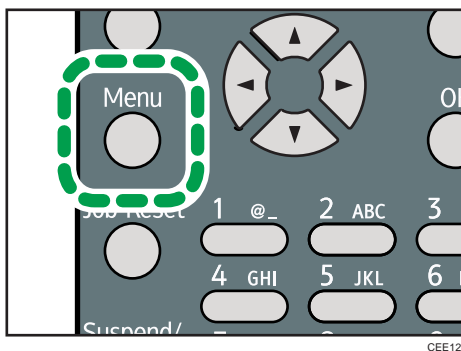
★ Important

- The configuration page is printed on A4 or Letter (8 1/2"×11") size paper, so load them in the same paper tray.

Printing a Configuration Page

Use the following procedure to print the Configuration Page.

1. Press the [Menu] key.



2. Press the [▼] or [▲] key to select [List/Test Print], and then press the [OK] key.
3. Press the [▼] or [▲] key to select [Config. Page], and then press the [OK] key.
After the configuration page is printed out, the screen returns to List/Test print menu.
4. Press the [Menu] key.

Interpreting the Configuration Page

The meanings of the items on the Configuration Page are as follows:

System Reference

Machine ID

Shows the serial number assigned to the board by its manufacturer.

Total Memory

Shows the total memory status.

Total Counter

Shows the total number of pages printed by the printer to date.

Firmware Version

- **Printer**
Shows the version number of the printer controller firmware.
- **System**
Displays the version number of the system firmware.
- **Engine**
Shows the version number of the printer engine firmware.
- **NIB**
Shows the version number of the network interface board.

Device Connection

Shows the names of device options installed in the printer.

HDD: Font/Macro Download

Shows the hard disk status.

Printer Language

Shows the version number of the printer language.

Attached Equipment

Shows the options attached to the printer.

Paper Input

Shows the current Paper Input settings. For details, see p.89 "Paper Input Menu".

Maintenance

Shows the current Maintenance settings. For details, see p.92 "Maintenance Menu".

System

Shows the current System settings. For details, see p.102 "System Menu".

Machine Modes

Shows the current machine modes settings. For details, see p.108 "Print Settings Menu".

PCL Menu

Shows the current PCL settings. For details, see p.108 "Print Settings Menu".

PS Menu

Shows the current PS settings. For details, see p.108 "Print Settings Menu".

PDF Menu

Shows the current PDF settings. For details, see p.108 "Print Settings Menu".

IPDS Menu

Shows the current IPDS settings. For details, see p.108 "Print Settings Menu".

Host Interface

Shows the current Host Interface settings. When DHCP is active on the network, the IPv4 address, subnet mask, and gateway address appear in parentheses. For details, see p.125 "Host Interface Menu".

Interface Information

Interface information is displayed.

User Paper Type

Registered user paper types are displayed.

System Menu

The system menu allows you to set the printer's basic functions. Although you can operate the printer using the default settings, you can also change its settings to better suit your printing needs. Changes made to settings remain effective after power off.

System Menu Parameters

This section explains about parameters that can be set on the system menu.

Print Error Report

Select whether or not to print an error report when a printer error or memory error occurs.

Default: **[Off]**

- On
- Off

Auto Continue

Specify whether or not to continue printing after a system error. When you enable this setting, specify how long the printer is to display error before resuming print.

When **[Auto Continue]** is set to on, and a certain error occurs in the printer while printing, the job might be cancelled, or printing will not be as intended. When a job is cancelled due to error, the printer automatically begins the next job in the queue.

Default: **[Off]**

- Off
- Immediate
- 1 minute
- 5 minutes
- 10 minutes
- 15 minutes

Memory Overflow

You can specify whether or not to print a memory overflow error report.

Default: **[Do not Print]**

- Do not Print
- Error Information

Printer Language

You can specify the printer language.

Default: **[Auto]**

- Auto
- PCL
- PS
- PDF

Sub Paper Size

Specify whether or not the paper size switches automatically when if paper of the specified size is not loaded in the tray.

This feature supports automatic switching between A4 and Letter (8 1/2" x 11") size paper only.

Paper switching can cause page edges to be cropped and other undesirable print results. This is due to the difference between A4 and Letter (8 1/2" x 11") in maximum printable area.

Default: **[Auto]**

- Auto
- Off

Default Printer Lang.

Select the printer language to use when the printer fails to detect the printer language.

Default: **[PCL]**

- PCL
- PS
- PDF

Auto Off

Use this function to reduce the power consumption of the printer when the printer is not in use.

Auto Off On/Off

You can select whether or not to enable Auto Off Mode.

Default: **[On]**

- On
- Off

Auto Off Timer

You can specify the duration the printer waits before entering Auto Off Mode. The printer enters Auto Off Mode if no user input has been made during the specified duration. When the printer is in Auto Off Mode, it takes longer for the printer to start printing.

Default: **[1 minute]**

- 1 minute
- 5 minutes
- 15 minutes

- 30 minutes
- 45 minutes
- 60 minutes

Auto Off Scheduler

Specify when the printer enters Auto Off Mode. You can specify the time of the day and the day of the week.

If a print job is sent to the printer or a user uses the control panel while the printer is in Auto Off Mode, the printer will return to Auto Off Mode right after the sent job is printed, or one minute after the user finishes using the control panel.

This function can also be enabled or disabled from Web Image Monitor. For details, see Web Image Monitor Help.

Default: [**Inactive**]

- Daily (Web Preset Time)
Specify the time of the day that the printer enters Auto Off Mode each day of the week. Use Web Image Monitor to specify the time of the day. For details, see Web Image Monitor Help.
- Day of Week(Preset Time)
Specify the time for each specific day that the printer enters Auto Off Mode. Use Web Image Monitor to specify the time of the day and the day of the week. For details, see Web Image Monitor Help.
- Inactive

ECO Night Sensor

Specify whether or not the printer uses the ECO Night Sensor (ambient light sensor) to automatically enter Auto Off Mode.

Auto Off Setting

Select whether to enable or disable the ECO Night Sensor.

Default: [**Inactive**]

- Active
- Inactive

Auto Off Timer

Specify how long the printer waits to enter Auto Off Mode after the ECO Night Sensor has detected that the lights have been turned off.

The Auto Off Timer will reset if any of the following occurs:

- If the sensor detects an increase in ambient brightness before the specified duration elapses.
- If a key is pressed, or a print is made.

Default: [**30 minutes**]

- 5 minutes
- 15 minutes
- 30 minutes
- 60 minutes
- 120 minutes

Brightness Sensor Level

Specify the ambient light sensor's brightness sensitivity level (trigger threshold).

You can set the light sensor to one of five sensitivity thresholds. "Level 5 (Dim)" is the highest sensitivity threshold. Selecting this level will cause the sensor to trigger at the smallest decrease in ambient light.

Selecting a lower level will cause the sensor to trigger at progressively lower levels of ambient light.

Default: [**Level 3 (Dark)**]

- Level 1 (Very Dark)
(equivalent to a moonlit night: approximately 0.4 lx)
- Level 2
- Level 3 (Dark)
(equivalent to a cinema during a screening: approximately 2.4 lx)
- Level 4
- Level 5 (Dim)
(equivalent to a building interior at sunset: approximately 75.0 lx)

Print Compressed Data

Specify whether or not to print compressed data. The supported compression format is GZIP.

Default: [**Off**]

- On
- Off

Memory Usage

Select memory to be used from Font Priority or Frame Priority.

Default: [**Frame Priority**]

- Font Priority
Allocates more memory to the PDL work area. Select this setting if printing fails due to insufficient memory.
- Frame Priority

Allocates more memory for image processing. Select this setting to increase print speed. Depending on the document you are printing, this setting might not be effective.

Spool Printing

Specify whether or not to complete spooling before starting to print. Spooling stores a sent print job temporarily in the printer, and then prints it. This function is available only if the hard disk is installed on the printer.

Default: [Off]

- On
- Off

RAM Disk

If the hard disk is not installed for PDF Direct Print, select a value of 2 MB or higher. This function is displayed only if no hard disk is installed. For details about the optional SDRAM module, see Hardware Guide.

Default: [4 MB]

- 0 MB
- 2 MB
- 4 MB
- 8 MB

Auto E-mail Notify

Specify whether or not to send an error message to a preset e-mail address when an error occurs in the printer. After changing the setting, turn off the power of the printer briefly, and then turn it on again. For information, see Web Image Monitor Help.

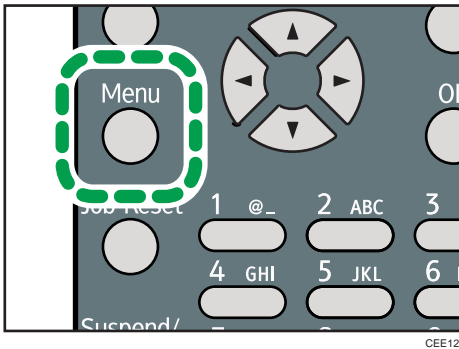
Default: [On]

- On
- Off

Changing the System Menu

Follow the procedure below to change the settings for Auto Off.

1. Press the [Menu] key.



2. Press the [▼] or [▲] key to select [System], and then press the [OK] key.
3. Press the [▼] or [▲] key to select [Auto Off], and then press the [OK] key.
4. Press the [▼] or [▲] key to select [Auto Off Timer], and then enter the [OK] key.
5. Press the [▼] or [▲] key to select the lead time needed to switch to Auto Off Mode.
6. Press the [OK] key.
7. Press the [Menu] key.

Print Settings Menu

The System Menu allows you to set conditions for printing.

Print Settings Menu Parameters

This section explains about parameters that can be set on the print settings menu.

Machine Modes

Copies

Specify the number of copies to print.

If the number of copies to print is specified by command or the printer driver, this setting is overridden.

Default: 1

- 1 to 999

Page Size

Specify the default paper size. The default paper size is used when the paper size is not specified in the print data.



Default:

 **Region A** (mainly Europe and Asia)

A4

 **Region B** (mainly North America)

8¹/₂ × 11

-  **Region A** (mainly Europe and Asia)
A4, A5, A6, B5 JIS, B6 JIS, C5 Env., C6 Env., DL Env., 8¹/₂ × 14, 8¹/₂ × 13, 8¹/₂ × 11, 8¹/₄ × 13, 8 × 13, 7¹/₄ × 10¹/₂, 5¹/₂ × 8¹/₂, 4¹/₈ × 9¹/₂, 3⁷/₈ × 7¹/₂, 16K, Custom Size
-  **Region B** (mainly North America)
8¹/₂ × 14, 8¹/₂ × 13, 8¹/₂ × 11, 8¹/₄ × 13, 8 × 13, 7¹/₄ × 10¹/₂, 5¹/₂ × 8¹/₂, 4¹/₈ × 9¹/₂, 3⁷/₈ × 7¹/₂, A4, A5, A6, B5 JIS, B6 JIS, C5 Env., C6 Env., DL Env., 16K, Custom Size

Edge to Edge Print

Select to whether or not to print using the whole area of paper, leaving no edge borders.

Default: [Off]

- On
- Off

Duplex

Select whether or not to print on both sides of a sheet. If you specify duplex printing, you must also specify the binding method. This menu appears only when the optional duplex unit is installed.

Default: [**Off**]

- Off
- Long Edge Bind
- Short Edge Bind

Rotate by 180 Degrees

Select whether or not to rotate the print image by 180 degrees.

Default: [**Off**]

- On
- Off

Blank Page Print

Select whether or not to print blank pages.

Default: [**On**]

- On
- Off

Edge Smoothing

Select whether or not to smooth the edges of texts and images when printing. When this setting is enabled, gradation in images may be degraded.

Default: [**On**]

- On
- Off

Toner Saving

Reduces toner consumption when printing. When this setting is enabled, print quality may be degraded.

Default: [**Off**]

- On
- Off

Letterhead Setting

Select whether or not to print on paper that has a fixed print side or print direction (letterhead paper, for example). For details, see "Printing on Fixed-Orientation Paper", Hardware Guide.

Default: [**Auto Detect**]

- Off
Not printing with the letterhead printing mode.
- Auto Detect
Select whether or not to print using letterhead mode whenever a page that has a fixed print side or print direction is specified as the first page.
- On (Always)
Print with the letterhead printing mode regularly.

Tray Setting Priority

Specify whether the paper size and type settings that are applied are those specified using the control panel, printer driver, or print command.

- Bypass Tray
Specify whether the paper size and type settings applied for bypass Tray are those specified using the control panel, printer driver, or print command.

Default: **[Driver/Command]**

- Driver/Command
When the source paper tray is specified for a print job, the paper settings specified using the printer driver or by print command are applied, regardless of any settings specified using the control panel.
- Machine Setting(s)
The paper settings specified on the printer's control panel are applied to all print jobs. An error will occur if the paper settings specified using the printer driver or by print command do not match those specified using the control panel.
- Any Size/Type
If the printer's trays do not contain paper matching the settings of the print job, printing can proceed from the bypass tray with the job's settings applied.
- Any Custom Size/Type
If the printer's trays do not contain paper matching the settings of the print job but custom paper was specified using the printer driver or by print command, printing can proceed from the bypass tray with the job's settings applied.
- Tray 1 to 3
Specify whether the paper size and type settings applied for Tray 1 to 3 are those specified using the control panel, printer driver, or print command.

Default: **[Machine Setting(s)]**

- Driver/Command
- Machine Setting(s)

Tray Switching

You can specify whether or not the printer automatically switches paper trays if paper of the specified size and type is not loaded in the driver-designated tray.

Default: [Off]

- On
- Off

Extend Auto Tray Switching

This setting enables the printer to switch paper trays automatically, regardless of whether the tray is manually or automatically selected.

Default: [Off]

- On
- Off

PCL Menu

You can set conditions when using PCL for printing.

Orientation

Select the page orientation.

Default: [Portrait]

- Portrait
- Landscape

Form Lines

Specify the number of lines per page between 5 to 128. The default paper size is used when the paper size is not specified in the print data.

Default:

 Region **A** (mainly Europe and Asia)

64

 Region **B** (mainly North America)

60

Font Source

Specify the location of the default font.

When you select [RAM], you can select only fonts downloaded to the printer RAM.

When you select [HDD], you can select only fonts downloaded to the hard disk.

When you select [SD Font Download], you can select only fonts downloaded to the SD card.

Default: [Resident]

- Resident

- RAM
- HDD
- SD
- SD Font Download

Font Number

Specify the ID of the default font you want to use.

Default: **0**

- 0 to 63 (Resident)
- 1 to X (Download; "X" is the number of downloaded fonts)

Point Size

Specify the point size you want to use for the default font between 4 to 999.75 in 0.25 increments. This setting is effective only for a variable-space font.

Default: **12.00 points**

Font Pitch

Specify the number of characters per inch you want to use for the default font between 0.44 to 99.99 in 0.01 increments. This setting is effective only for fixed-space fonts.

Default: **10.00 pitches**

Symbol Set

You can specify the character set for the default font.

Default: **[PC-8]**

Available sets are as follows:

Roman-8, Roman-9, ISO L1, ISO L2, ISO L5, ISO L6, ISO L9, PC-775, PC-8, PC-8 D/N, PC-850, PC-852, PC-858, PC8-TK, PC-1004, Win L1, Win L2, Win L5, Win Baltic, Desktop, PS Text, MS Publ, Math-8, PS Math, Pifont, Legal, ISO 4, ISO 6, ISO 11, ISO 15, ISO 17, ISO 21, ISO 60, ISO 69, Win 3.0, MC Text, UCS-2, PC-864, Arabic-8, Win Arabic, PC-866, PC-866U, ISO Cyrillic, Win Cyrillic, PC-851, Greek-8, ISO Greek, PC-8 Greek, Win Greek, PC-862, Hebrew-7, Hebrew-8, ISO Hebrew

Courier Font

Select the type of courier font.

Default: **[Regular]**

- Regular
- Dark

Ext. A4 Width

Select whether or not to extend the width of the printable area of A4 sheets, by reducing side margins.

Default: [**Off**]

- On
- Off

Append CR to LF

Select whether or not to append a CR code to each LF code to print text data clearly.

Default: [**Off**]

- On
- Off

Resolution

You can specify the print resolution in dots per inch.

Default: [**600dpi**]

- 300dpi
- 600dpi

PS Menu

You can set conditions when using PostScript for printing.

Job Timeout

You can specify how long the printer waits (in seconds) before canceling the current job when the job is interrupted while being processed. If you select Use Machine Setting(s), enter a value between 0 to 999. (Default: 0)

Default: [**Use Driver/Command**]

- Use Driver/Command
- Use Machine Setting(s)

Wait Timeout

You can specify how long the printer waits (in seconds) before it cancels receiving a job when the printer cannot detect the end of the job. If you select Use Machine Setting(s), enter a value between 0 to 999. (Default: 300)

Default: [**Use Driver/Command**]

- Use Driver/Command
- Use Machine Setting(s)

Data Format

Select the data format from Binary Data or TBCP.

This setting is ineffective when using a parallel or EtherTalk connection.

When using a parallel or USB connection, the print job is canceled if binary data is sent from the printer driver.

Default: **[TBCP]**

When using an Ethernet connection, the print job is canceled if:

- The printer driver data format is TBCP and the data format selected using the control panel is Binary Data.
- The printer driver data format is binary and the data format selected using the control panel is TBCP.

Resolution

Select the resolution.

Default: **[600dpi Fast]**

- 300dpi
- 600dpi Fast
- 600dpi Standard

Orientation Auto Detect

Specify the orientation auto detect.

Default: **[On]**

- On
- Off

PDF Menu

You can set conditions when using PDF for printing.

Change PDF Password

Specify the password for the PDF file executing PDF Direct Print. If you do not set a PDF password, this menu does not appear. The password can be set using Web Image Monitor, but must be sent through the network. For increased security, use this menu on the control panel to set the password directly.

PDF Group Password

This setting is not available on this printer.

Reverse Order Printing

This setting enables printing to start from the last page of the document. Use this function when prints come out face up in the output tray. This allows a printed document to be assembled in page order.

Default: **[Off]**

- On
- Off

Resolution

Specify the resolution for the PDF file executing PDF Direct Print.

Default: [600dpi Fast]

- 300dpi
- 600dpi Fast
- 600dpi Standard

Orientation Auto Detect

Specify the orientation auto detect for the PDF file executing PDF Direct Print.

Default: [On]

- On
- Off

IPDS Menu

You can set conditions when using IPDS for printing.

Tray Form

Specify an IPDS form for each paper tray. For each paper tray, select the IPDS form you want to allocate to it. Only installed trays appear on the display panel.

- Tray 1
- Tray 2
- Tray 3
- Bypass Tray

Emulation Mode

Specify the emulation mode.

Default: [Native]

- Native
- 4028

Print Mode

Specify the print mode.

Default: [Enhanced]

- Standard
- Enhanced

Def. Code Page

Specify the default code page.

Default: 37

37, 38, 260, 273, 274, 276, 277, 278, 280, 281, 284, 285, 286, 287, 288, 290, 297, 420, 423, 424, 500, 870, 871, 875, 880, 892, 893, 905, 1025, 1026, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149

Default FGID

Specify the default FGID (Font Typeface Global Identifier), which identifies the printer's default resident font.

Default: **416**

3, 11, 12, 18, 19, 46, 85, 86, 92, 111, 112, 159, 164, 203, 221, 223, 254, 256, 281, 283, 290, 304, 305, 306, 318, 319, 400, 404, 416, 420, 424, 428, 432, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 5687, 5707, 5815, 5835, 20224

Chara. Per Inch

Specify the number of characters per inch (pitch) for the default font. Valid values are 5.0 to 30.0 in units of one tenth of an inch.

Default: **10.0**

Valid Prnt.Area

Enable or disable valid printable area checking.

Default: **[On]**

- On
- Off

Page

Specify how data is positioned on the page.

Default: **[Whole]**

- Whole
- Comp1
- Comp2
- Print

Edge to Edge

Enable or disable "Edge to Edge" printing.

Default: **[Off]**

- On
- Off

Font Substitution

Enables or disables font substitution.

Default: **[Off]**

- On
- Off

Caching

Specify whether or not to apply caching for repeated overlays.

Default: [**Off**]

- On
- Off

Font Capture

Enable or disable font capturing. This menu appears only when the hard disk is installed.

Default: [**On**]

- On
- Off

Resolution

Specify the resolution reported to the host in the "IPDS XOAOPC" command for raster coded fonts and IM1 image support.

Default: [**Auto**]

- Auto
- 240dpi
- 300dpi
- 600dpi

Graph.Char.Str.

Specify the Graphic Character String (Graphic Character Sizing) processing method.

Default: [**Auto**]

- Auto
- Character Scale
- Font Activation

Bar Code

Specify the barcode level protocol.

Default: [**Auto**]

- Auto
- 4028
- Native

Box Draw

Specify the Box Draw processing.

Default: [**Off**]

- On
- Off

Clr. Simulation

Specify how color specification controls are processed on a monochrome printer.

Default: **[Fidelity]**

- Fidelity
- Legacy

Text Color Simulation

Specify how text color specification controls are processed on a monochrome laser printer.

Default: **[On]**

- On
- Off

Tray Mapping

Map the media source (input tray) to an ID the host uses for the media source.

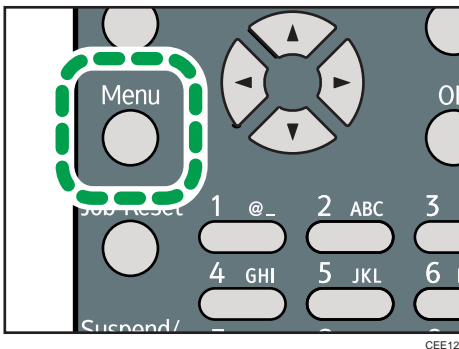
Default: **[Auto]**

- IPDS Tray
- Auto

Changing the Print Settings Menu

Follow the procedure below to change Tray Setting Priority.

1. Press the **[Menu]** key.



2. Press the **[▼]** or **[▲]** key to select **[Print Settings]**, and then press the **[OK]** key.
3. Press the **[▼]** or **[▲]** key to select **[Machine Modes]**, and then press the **[OK]** key.
4. Press the **[▼]** or **[▲]** key to select **[Tray Setting Priority]**, and then enter the **[OK]** key.

5. Press the [▼] or [▲] key to select the tray whose paper type or size you want to change, and then press the [OK] key.
6. Press the [▼] or [▲] key to select the desired setting item, and then press the [OK] key.
7. Press the [Menu] key.

Security Options Menu

The system menu allows you to set conditions for printing.

Security Options Menu Parameters

This section explains about parameters that can be set on the security options menu.

Extended Security

Depending on the setting of the printer, some of the settings listed below may not appear.

Driver Encryption Key

Specify the driver encryption key.

Encrypt Address Book

Select whether or not to encrypt the printer's address book data.

Default: [Off]

- On
- Off

Restrict User Info.Display

Select whether or not to display user information as "*****" when checking job information without being authenticated through user authentication.

Default: [Off]

- On
- Off

Enhance File Protection

Select whether or not to automatically lock password-protected print files if an invalid password is entered ten times. When a file is locked, you cannot select them even if the correct password is entered.

Default: [Off]

- On
- Off

Settings by SNMPv1 and v2

Select whether or not to prohibit changes to the printer settings through access using SNMPv1, v2 protocol.

Default: [Do not Prohibit]

- Prohibit

- Do not Prohibit

Simple Encryption

Select whether or not to use apply simple encryption (restrict usage) when enhanced encryption cannot be used.

Default: **[Do not Restrict]**

- Restrict
- Do not Restrict

Authenticate Current Job

Select whether or not authentication is required for operations such as canceling jobs. If set to [Login Privilege], only authorized users or your administrator can operate the printer. If set to [Access Privilege], users who sent a print job or your administrator can operate the printer.

Default: **[Off]**

- Login Privilege
- Access Privilege
- Off

Password Policy

Specify the format of passwords: types of characters to be used and minimum length.

Valid characters for passwords are upper-case letters, lower-case letters, decimal numbers, and symbols such as #. If complexity is set to [Level 1], passwords must use two types of these characters; if set to [Level 2], three types.

- Complexity Setting

Default: **[Do not Restrict]**

- Level 2
- Level 1
- Do not Restrict

- Minimum Character No.

If set to 0, minimum length is not specified.

Default: **0**

- Between 0 to 32

@Remote Service

Select whether or not to prohibit @Remote Service. If you would like to set to Prohibit, contact your service representative.

Default: **[Do not Prohibit]**

- Prohibit
- Do not Prohibit

Update Firmware

Select whether or not to prohibit Update Firmware. If you would like to set to Prohibit, contact your service representative.

Default: [**Do not Prohibit**]

- Prohibit
- Do not Prohibit

Change Firmware Structure

Select whether or not to prohibit Change Firmware Structure. If you would like to set to Prohibit, contact your service representative.

Default: [**Do not Prohibit**]

- Prohibit
- Do not Prohibit

Service Mode Lock

Select whether or not to prohibit entering service mode. This setting appears only when the user has logged in as the machine administrator.

Default: [**Off**]

- On
- Off

Firmware Version

Display the firmware version of the printer.

Network Security Level

Specify the network security level.

Default: [**Level 0**]

- Level 0
- Level 1
- Level 2

Auto Erase Memory Setting

Select whether or not to automatically delete memory. When set to on, specify the overwrite times. To specify the number of memory overwrites, select [Random Numbers]. This setting appears only when the optional hard disk and the SD card provided with the hard disk are installed.

Default: [**Off**]

- On
- HDD Erase
- NSA

- DoD
- Random Numbers
Number of Erase: Between 1 to 9
- Off

Erase All Memory

Select to delete all data inside the memory. When deleting memory, specify the overwrite times. To specify the number of memory overwrites, select [Random Numbers]. This setting appears only when the optional hard disk and the SD card provided with the hard disk are installed.

Default: [Random Numbers]

HDDErase

- NSA
- DoD
- Random Numbers
Number of Erase: Between 1 to 9

Transfer Log Setting

You can select whether or not to send log information to the log collection server.

Default: [Off]

- On (Only available from the log collection server.)
- Off

Machine Data Encryption

Encrypt data stored on the hard disk. Once you encrypt the data, the following menus appear on the control panel display. This setting appears only when the optional hard disk and the SD card provided with the hard disk are installed.

- Update Encryption Key
Update the encryption key.
- Cancel Encryption
Cancel the encryption settings.
- Print Encryption Key
Print the encryption key.

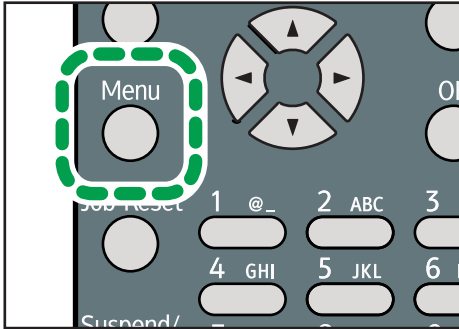
Changing the Security Options Menu

Follow the procedure below to erase data inside memory.

★ Important

- This setting appears only when the optional hard disk and the SD card provided with the hard disk are installed.

1. Press the [Menu] key.



2. Press the [▼] or [▲] key to select [Security Options], and then press the [OK] key.
3. Press the [▼] or [▲] key to select [Extended Security], and then press the [OK] key.
4. Press the [▼] or [▲] key to select [Erase All Memory], and then press the [OK] key.
5. Press the [▼] or [▲] key to select [On], and then press [EraseNo.].
6. Press the [▼] or [▲] key to enter overwrite times, and then press the [OK] key.
7. Press the [▼] or [▲] key to select [On], and then press the [OK] key.
8. Press the [Menu] key.

Host Interface Menu

You can set configurations about network connections and communication when using parallel connection between the printer and the computer. The changed configuration holds even if the printer is turned off.

Host Interface Menu Parameters

This section explains parameters that can be set on the host interface menu.

I/O Buffer

Select the size of I/O Buffer. Normally it is not necessary to change this setting.

Default: [128 KB]

- 128 KB
- 256 KB

I/O Timeout

Specify how many seconds the printer should wait before ending a print job. If printing operation is frequently interrupted by data from other ports, you can increase the timeout period.

Default: [15 seconds]

- 10 seconds
- 15 seconds
- 20 seconds
- 25 seconds
- 60 seconds

Network

You can make network-related settings. For details, see "Configuration", Hardware Guide.

Machine IPv4 Address

Select whether to set the IPv4 address automatically or manually.

Default: [Auto-Obtain (DHCP)]

- Auto-Obtain (DHCP)

When DHCP is set to on, the IPv4 address, subnet mask address, and gateway address cannot be changed. To change them, set DHCP to off. Contact your administrator for information about the network configuration.

- Specify

- IP Add.

Manually specify the IPv4 address.

Default: **11.22. 33.44**

- Subnet M

Manually specify the subnet mask.

Default: **0.0.0.0**

- Gateway

Manually specify the gateway address.

Default: **0.0.0.0**

IPv6 Stateless Setting

Select whether to enable or disable stateless IPv6 address auto configuration.

Default: [**Active**]

- Active
- Inactive

IPsec

This is a security function. For details, contact your administrator.

Default: [**Inactive**]

- Active
- Inactive

NW Frame Type

Specify the frame type for NetWare.

Default: [**Auto Select**]

- Auto Select
- Ethernet II
- Ethernet 802.2
- Ethernet 802.3
- Ethernet SNAP

Effective Protocol

Specify the effective protocol.

- IPv4

Default: [**Active**]

- Active
- Inactive

- IPv6

Default: [**Inactive**]

- Active
- Inactive
- NetWare
Default: [**Inactive**]
 - Active
 - Inactive
- SMB
Default: [**Active**]
 - Active
 - Inactive

Ethernet Speed

Specify the network speed to operate the printer.

Default: [**Auto Select**]

- Auto Select
- 10Mbps Half Duplex
- 10Mbps Full Duplex
- 100Mbps Half Duplex
- 100Mbps Full Duplex

IEEE802.1X Auth.(Ethernet)

Specify IEEE 802.1X Ethernet authentication. For details about IEEE 802.1X authentication, see "Configuration", Hardware Guide.

Default: [**Inactive**]

- Active
- Inactive

Restr.IEEE802.1X Auth.Def.

Restore the default IEEE 802.1X setting.

LAN Type

Select Ethernet or Wireless LAN. This menu appears only when the optional Wireless LAN interface unit is installed.

Default: [**Ethernet**]

- Ethernet
- Wireless LAN

Permit SSL/TLS Comm.

Set the encrypted communication for SSL/TLS. If you set to [Ciphertext Only], you need to install the SSL certificate for the printer.

Default: [**Ciphertext Priority**]

- Ciphertext Only
- Ciphertext Priority
- Ciphertext/Cleartext

Parallel Interface

Specify parallel interface settings. This menu appears when the IEEE 1284 interface board is installed.

Parallel Timing

Specify the parallel interface timing.

Default: [**ACK outside**]

- ACK inside
- ACK outside
- STB down

Parallel Comm. Speed

Specify whether or not to use DMA transfer for receiving data.

Default: [**High Speed**]

- High Speed
- Standard

Selection Signal Status

Specify the selection signal level of the parallel interface.

Default: [**High**]

- High
- Low

Input Prime

You usually do not need to change this setting.

Default: [**Inactive**]

- Active
- Inactive

Bidirectional Comm.

Specify whether to enable or disable bi-directional communication.

Default: [**On**]

- On
- Off

Wireless LAN

Configure settings for Wireless LAN. This menu appears only when the optional Wireless LAN interface unit is installed.

Communication Mode

Specify the transmission mode for Wireless LAN.

Default: [Infrastructure Mode]

- 802.11 Ad-hoc Mode
- Infrastructure Mode

SSID Setting

Specifies SSID to distinguish the access point in [Infrastructure Mode] or [802.11 Ad-hoc Mode].

The characters that can be used are ASCII 0x20-0x7e (32 bytes).

If blank is specified in [802.11 Ad-hoc Mode], "ASSID" appears.

Ad-hoc Channel

Specify the channel to use when [802.11 Ad-hoc Mode] has been selected. Set the channel that matches the type of wireless LAN being used. The channel in use might differ depending on the country.

The following channels are available:

 **Region A** (mainly Europe and Asia)

- IEEE 802.11a/b/g Wireless LAN

Frequency range:

2412 - 2472 MHz (1 - 13 channels)

5180 - 5240 MHz (36, 40, 44, and 48 channels)

In some countries, only the following channels are available:

- IEEE 802.11b/g Wireless LAN

Frequency range:

2412 - 2462 MHz (1 - 11 channels)

Default: [11]

 **Region B** (mainly North America)

- IEEE 802.11a/b/g Wireless LAN

Frequency range:

2412 - 2462 MHz (1 - 11 channels)

5180 - 5240 MHz (36, 40, 44, and 48 channels)

Default: [11]

Security Method

Select whether to enable encryption and specify the security type when the encryption is enabled. WPA appears only when the optional Wireless LAN interface unit is installed.

Default: [Off]

- Off
- WEP

Press [Details], and then enter the WEP key using hexadecimal and ASCII characters.

- WPA

Press [Details], and then select the Encryption and Authentication Methods.

Select one of the following Encryption Methods:

TKIP, CCMP(AES)

Select one of the following Authentication Methods:

WPA-PSK, WPA, WPA2-PSK, WPA2

Wireless LAN Signal

You can check the signal strength when using Wireless LAN.

Restore Defaults

Reset the Wireless LAN to default.

USB Settings

Configure the communication parameters for computer-to-printer connection via USB.

USB Speed

Default: [Auto Select]

- Auto Select
- Full Speed

Fixed USB Port

Default: [Off]

- Level 1
- Level 2
- Off

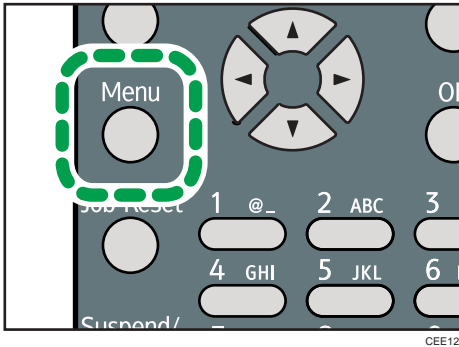
↓ Note

- For details about how to configure the settings using Web Image Monitor, see p.135 "Using Web Image Monitor" and Web Image Monitor Help.

Changing the Host Interface Menu

Follow the procedure below to change the I/O Timeout setting.

1. Press the [Menu] key.



2. Press the [▼] or [▲] key to select [Host Interface], and then press the [OK] key.
3. Press the [▼] or [▲] key to select [I/O Timeout], and then press the [OK] key.
4. Press the [▼] or [▲] key to select the lead time needed to end a printing operation, and then press the [OK] key.
5. Press the [Menu] key.

Language Menu

You can set a language to be displayed on the menu.

Language Menu Parameters

You can select the language you use.

Default: [English]

Available languages are as follows:

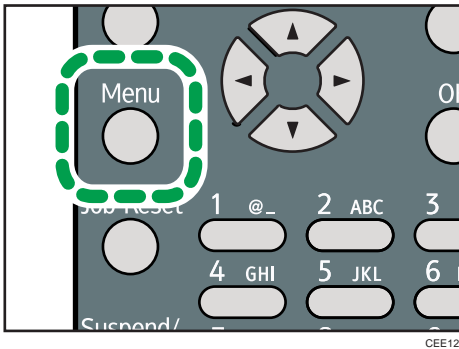
English, French, German, Italian, Spanish, Dutch, Norwegian, Danish, Swedish, Polish, Portuguese, Hungarian, Czech, Finnish, Russian.

4

Changing the Language Menu

Follow the procedure below to change the interface language.

1. Press the [Menu] key.



2. Press the [▼] or [▲] key to select [Language], and then press the [OK] key.
3. Press the [▼] or [▲] key to select the language, and then press the [OK] key.
4. Press the [Menu] key.

Options Menu

Using the options menu, you can configure settings related to form feeding and error logs. This section provides a list of the configurable settings and explains how to check error logs.

Options Menu Parameters

Form Feed

Outputs data that are unprintable, due to errors such as the absence of a line-feed code.

Error Log

If a document cannot be printed due to errors or other reasons, an error log is created. You can check the error log using the control panel.

- All
- Sample Print Jobs
- Locked Print Jobs
- Hold Print Jobs
- Stored Print Jobs

4

Checking the Error Log

If a document could not be printed due to a printing error, identify the cause of the error by checking the error log in the control panel.

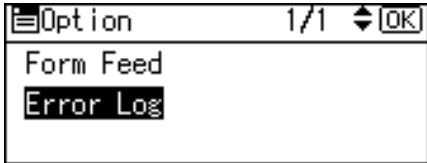
★ Important

- The most recent 30 errors are stored in the error log. If a new error is added when there are 30 errors already stored, the oldest error is deleted. However, if the oldest error belongs to one of the following print jobs, it is not deleted. The error is stored separately until the number of those errors reaches 30. You can check any of these print jobs for error log information.
 - Sample Print Jobs
 - Locked Print Jobs
 - Hold Print Jobs
 - Stored Print Jobs
- If the power switch is turned off, the log is deleted.

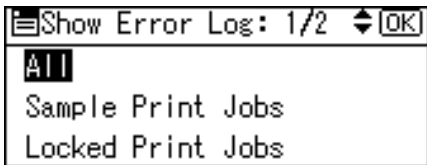
1. Press [Option].



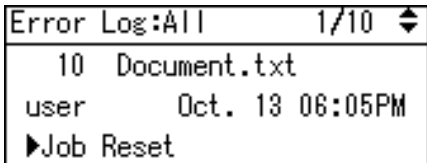
2. Select [Error Log] using the [▼] or [▲] key, and then press the [OK] key.



3. Select a type of print jobs using the [▼] or [▲] key, and then press the [OK] key.
If you select [All], all error logs appears.



4. Select the error log you want to check using the [▼] or [▲] key.
Press the [Menu] key until the initial screen appears after checking the log.



Note

- To print files that appear in the error log, resend them after stored files have been printed or deleted.

5. Monitoring and Configuring the Printer

This chapter explains how to use Web Image Monitor and other applications to monitor the printer or change its settings.

Using Web Image Monitor

Using Web Image Monitor, you can check the printer status and change settings.

Introduction to Web Image Monitor

Available operations

The following operations can be remotely performed using Web Image Monitor from a client computer.

- Displaying printer status or settings
- Checking the print job status or history
- Interrupting currently printing jobs
- Resetting the printer
- Managing the Address Book
- Making printer settings
- Making network protocol settings
- Making security settings

Configuring the printer

To perform the operations from Web Image Monitor, TCP/IP is required. After the printer is configured to use TCP/IP, operations from Web Image Monitor become available.

Recommended Web browser

- Windows:
 - Internet Explorer 6.0 or higher
 - Firefox 2.0 or higher
- Mac OS X:
 - Firefox 2.0 or higher
 - Safari 3.0 or higher

Web Image Monitor supports screen reader software. We recommend JAWS 7.0 or a later version.

Note

- Web Image Monitor does not support Safari running under Mac OS X 10.4.1.
- Display and operation problems can occur if you do not enable JavaScript and cookies, or if you are using a non-recommended Web Browser.
- If you are using a proxy server, change the Web browser settings. Contact your administrator for information about the settings.
- If you click your browser's back button but the previous page does not appear, click the browser's refresh button and try again.
- Printer information is not automatically updated. To perform an update, click [Refresh] in the display area.
- We recommend using Web Image Monitor in the same network.
- If the printer is firewall-protected, it cannot be accessed from computers outside the firewall.
- When using the printer under DHCP, the IP address may be automatically changed by the DHCP server settings. Enable DDNS setting on the printer, and then connect using the printer's host name. Alternatively, set a static IP address to the DHCP server.
- If the HTTP port is disabled, connection to the printer using the printer's URL cannot be established. SSL setting must be enabled on this printer. For details, contact your administrator.
- When using the SSL encryption protocol, enter "https://(printer's IP address)/".
- When you are using Firefox, fonts and colors may be different, or tables may be out of shape.
- When using a host name under Windows Server 2003/2003 R2/2008/2008 R2 with IPv6 protocol, perform host name resolution using an external DNS server. The host file cannot be used.
- To use JAWS 7.0 under Web Image Monitor, you must be running Windows OS and Microsoft Internet Explorer 5.5 SP2, or a later version.
- If you are using Internet Explorer 8, downloading will be slower than with other browsers. To download faster with Internet Explorer 8, open the browser's [Internet Options] menu and register the printer's URL as a trusted site. Then disable SmartScreen filter for trusted sites. For details about these settings, see the Internet Explorer 8 Help files.
- The process of opening Web Image Monitor can be simplified by adding the URL of Web Image Monitor to the bookmarks of your Web browser. When adding a bookmark, do so in the top page before logging in to Web Image Monitor. If the bookmark is added after the user has logged in the top page, it may not display correctly.

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Displaying Top Page

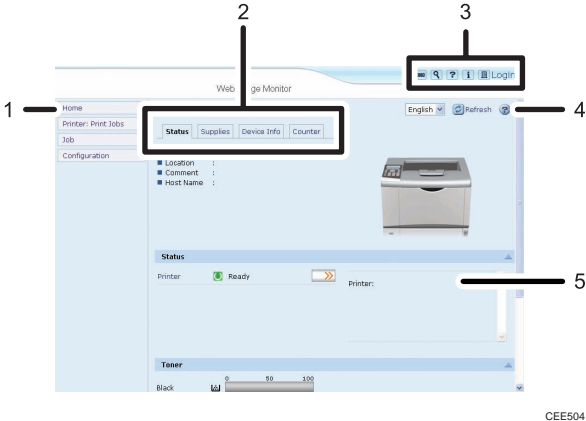
This section explains the Top Page and how to display Web Image Monitor.

1. Start your Web browser.

2. Enter "http://(printer's IP address or host name)/" in your Web browser's URL bar.

If the printer's host name has been registered on the DNS or WINS server, you can enter it. When setting SSL, a protocol for encrypted communication, under environment which server authentication is issued, enter "https://(printer's IP address or host name)/".

Every Web Image Monitor page is divided into the following areas:



1. Menu area

If you select menu, its content will be shown on the work area, or the sub area.

2. Tab area

Details about each menu appear.

3. Header area

The dialog box for switching to the user mode and administrator mode appears, and each mode's menu will be displayed.

The link to help and dialog box for keyword search appears.

4. Help

Use Help to view or download Help file contents.

5. Display area

Displays the contents of the item selected in the menu area.

Printer information in the display area is not automatically updated. Click [Refresh] at the upper right in the display area to update the printer information. Click the Web browser's [Refresh] button to refresh the entire browser screen.

When User Authentication is Set

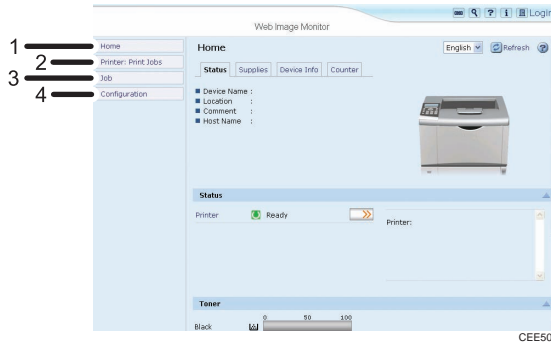
For details about logging in to and out of Web Image Monitor, see p.19 "If User Authentication is Specified".

About Menu and Mode

There are two modes available with Web Image Monitor: guest mode and administrator mode.

Guest mode

In the guest mode, printer status, settings, and print job status can be viewed, but the printer settings cannot be changed.



1. Home

The [Status], [Supplies], [Device Info], and [Counter] tab are displayed. Details of the tab menu are displayed on the work area.

2. Printer: Print Jobs

Allows you to display a list of Sample Print, Locked Print, Hold Print, and Stored Print jobs.

3. Job

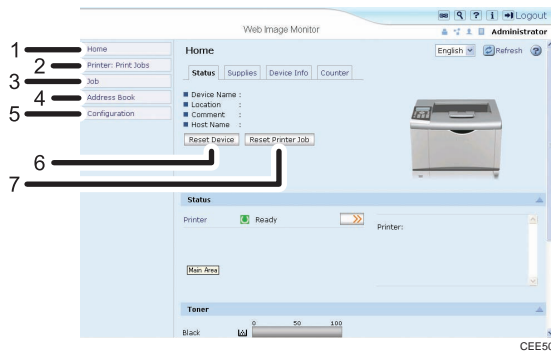
Display all print files.

4. Configuration

Display current printer and network settings.

Administrator mode

In the administrator mode, you can configure various printer settings.



1. Home

The [Status], [Supplies], [Device Info], and [Counter] tab are displayed. Details of the tab menu are displayed on the work area.

2. Printer: Print Jobs

Allows you to display a list of Sample Print, Locked Print, Hold Print, and Stored Print jobs.

3. Job

Display all print files.

4. Address Book

User information can be registered, displayed, changed, and deleted.

5. Configuration

Make system settings for the printer, interface settings, and security.

6. Reset Device

Click to reset the printer. If a print job is being processed, the printer will be reset after the print job is completed. This button is located on Top Page.

7. Reset Printer Job

Click to reset current print jobs and print jobs in queue. This button is located on Top Page.

Note

- For details about messages and settings, see Web Image Monitor Help.

Access in the Administrator Mode

Follow the procedure below to access Web Image Monitor in the administrator mode.


1. Click [Login] in the Header area of Web Image Monitor.

2. Enter a login user name and password, and then click [Login].

For details about the login user name and password, consult your network administrator.

Depending on the configuration of your Web browser, the login user name and password might be saved. If you do not want to save them, configure your Web browser's settings so that this information is not saved.

Displaying Web Image Monitor Help

When using Help for the first time, clicking the icon marked "?" () makes the following screen appear, in which you can view Help in two different ways, as shown below:

Viewing Help on our Web site

Viewing Help to your computer.

Downloading and checking Help

You can download Help to your computer. As the Help URL, you can specify the path to the local file to view the Help without connecting to the Internet.

↓ Note

- By clicking "?" (🔍) in the header area, the contents of Help appear.
- By clicking "?" (🔍), the Help icon in the display area, Help for the setting items in the display area appears.

Downloading Help

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1. In the [OS] list, select the operating system.
2. In the [Language] list, select the language.
3. Click [Download].
4. Download Help by following the instructions on the screen.
5. Store the downloaded compressed file in a given location, and then decompress the file.

To create a link for the Help button (🔍🔍), save the downloaded Help files on a Web server.

Linking the URL of the downloaded Help

You can link the URL of the help file on a Web server to the "?" button.

1. Log in to Web Image Monitor as an administrator.
For details about logging in, see p.139 "Access in the Administrator Mode".
2. In the menu area, click [Configuration].
3. Click [Webpage].
4. In the [Set Help URL Target] box, enter the URL of the help file.
If you saved the help file to "C:\HELP\EN", enter "file://C:/HELP/". For example, if you saved the file to a Web server, and the URL of the index file is "http:// a.b.c.d/HELP/EN/index.html", enter "http://a.b.c.d/HELP/".
5. Click [OK].

↓ Note

- If you save the Help files on your hard disk, you must access them directly - you cannot link to them using the Help button (🔍🔍).

Registering Classification Codes

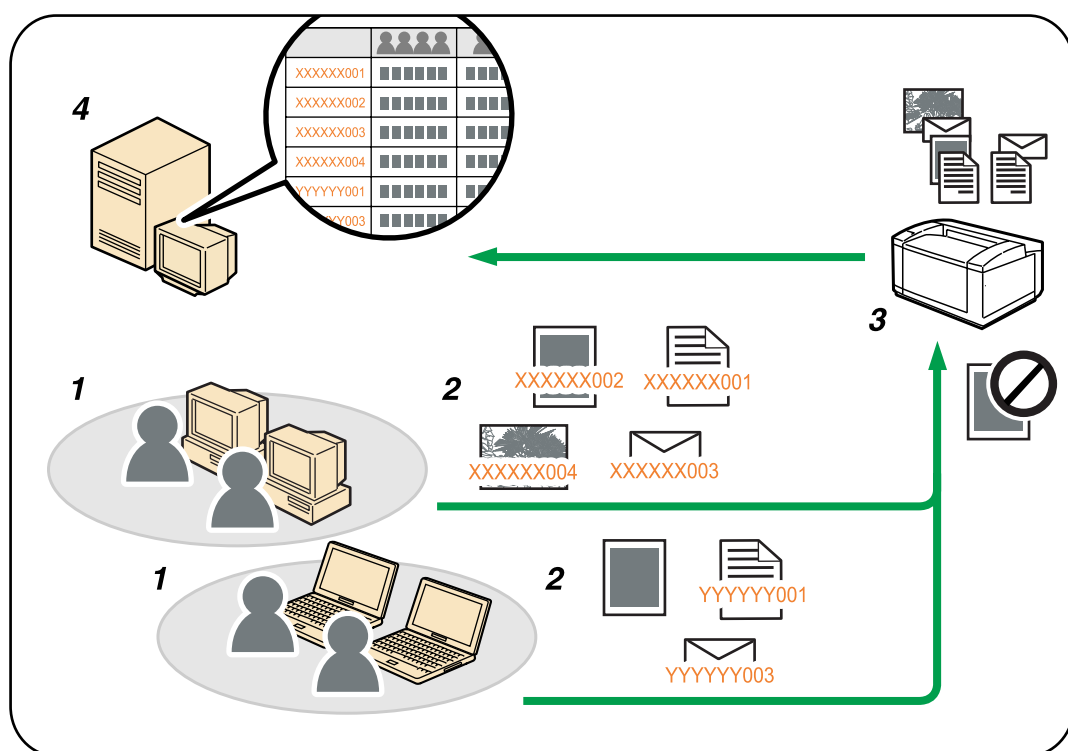
This section explains classification codes.

If you register classification codes, the printer logs the number of prints made under each code.

You can register classification codes to individual users and specified purposes, enabling you to monitor printer usage by each.

For example, you can manage accounts according to individual clients or account titles.

Classification Code - Based Process (example)



CBK519

1. Divisions, sections, departments, project teams, users, etc., to be managed.
2. The appropriate classification code for the print job is entered.
3. The job is printed.
4. Classification codes are collected and managed by an external log collection system.

Note

- For details about how to enter classification codes, see p.52 "Specifying the Classification Code for a Print Job".

- When printing in an environment where classification codes are required, print jobs that do not have a classification code cannot be printed. For details, see p.142 "Configuring Classification Codes".

Configuring Classification Codes

Use Web Image Monitor to specify whether or not to apply classification code requirement to print jobs.

 **Important**

- The configuration page can be printed at any time.
- The default setting for classification code requirement is "Optional".

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. Click [Configuration] in the menu area, and then click [Logs].

3. Select that [Required] or [Optional] is selected for [Classification Code] in the [Common Settings for All Logs] column.

If "Required" is selected for the classification code requirement setting in Web Image Monitor, any print job without a classification code specified will not be printed.

4. Click [OK].

5. Click [Logout].

6. Quit Web Image Monitor.

Address Book Backup and Restore

Using Web Image Monitor, you can save or restore the printer's address book data.

Backing Up Address Book Data

Follow the procedure below to save a copy of the printer's address book data.

1. **Log in to Web Image Monitor as an administrator.**

For details about logging in, see p. 139 "Access in the Administrator Mode".

2. **Click [Address Book].**

3. **Click [Maintenance].**

4. **Enter the encryption key and click [Backup].**

Enter the encryption key that was set when the address book was encrypted. For details, contact your administrator.

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Restoring Address Book Data

Follow the procedure below to restore previously saved address book data to the printer.

1. **Log in to Web Image Monitor as an administrator.**

For details about logging in, see p. 139 "Access in the Administrator Mode".

2. **Click [Address Book].**

3. **Click [Maintenance].**

4. **Click [Restore].**

5. **Select the file to be restored by following the on-screen instructions.**

6. **Click [OK].**

7. **Confirm the message, and then click [OK].**

8. **Click [Back].**

9. **Click [Logout].**

 **Note**

- The restore will overwrite any address data currently on the printer. The restore will also reset all user counters.
- For details about restoring the address book data, see Web Image Monitor Help.

Using SmartDeviceMonitor for Admin

Using SmartDeviceMonitor for Admin, you can monitor and manage multiple devices connected to the network. Use of this software is recommended for administrators only.

You can download SmartDeviceMonitor for Admin from the manufacturer's Web site.

For details about SmartDeviceMonitor for Admin, see the manual supplied with the software.

When Using IPP with SmartDeviceMonitor for Client

When using IPP with SmartDeviceMonitor for Client, note the following:

- To use this function, you must first download SmartDeviceMonitor for Client from the manufacturer's Web site and install it on your computer. Contact your local dealer for information on downloading SmartDeviceMonitor for Client.
- Documents cannot be printed if the user logs on to Windows using a user name that has characters other than single byte alphanumeric letters.
- The names of the IPP port for SmartDeviceMonitor for Client and the standard IPP port for the operating system must be different from each other.
- When setting SSL, a protocol for encrypted communication, under the environment where the device certificate is installed, enter "https://(printer's IP address)/ ". Internet Explorer must be installed on your computer. Use the highest version. Internet Explorer 6.0 or higher is recommended.
- If the [Security Alert] dialog box appears when accessing the printer using IPP to create or configure an IPP port, or when printing, install the certificate. To select the certificate store location when using Certificate Import Wizard, click [Place all certificates in the following store], and then click [Local Computer] under [Trusted Root Certification Authorities].

↓ Note

- For details about SSL settings, consult your network administrator.

Printer Status Notification by E-Mail

Whenever a paper tray becomes empty or paper is jammed, an e-mail alert is issued to the registered addresses to notify the printer status.

For this notification, you can make the e-mail notification settings.

Notification timing and e-mail content can be set.

★ Important

- **Depending on your e-mail application, a phishing warning might appear after you receive an e-mail message. To prevent phishing warnings appearing after you receive e-mail from a specified sender, you must add the sender to your e-mail application's exclusion list. For details about how to do this, see your e-mail application's Help.**

The e-mail notification functions you can set are as follows:

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- Auto e-mail notification

Information including the printer status is automatically sent by e-mail. Before you use this function, register the e-mail address to be used.

- On-demand e-mail notification

Information including the printer status is sent by e-mail when a request e-mail from the administrator is received.

The information that can be notified by auto e-mail notification is as follows:

- Call Service
- Out of Toner
- Toner Almost Empty
- Paper Misfeed
- Cover Open
- Out of Paper
- Almost Out of Paper
- Paper Tray Error
- Output Tray Full
- Unit Connection Error
- Waste Toner Bottle is Full
- File Storage Memory Full Soon
- Device Access Violation
- Replacement Required: Unit
- Replacement Required Soon: Unit

- Replacement Required: Print Cartridge
 - Replacement Required Soon: Print Cartridge
 - Check Replacement: Print Cartridge
 - Toner Almost Empty (Remaining Level Selectable)
1. Under **[System] Menu**, set **[Auto E-mail Notify]** to **[On]**, using the printer's control panel. (The default setting is **[On]**.)
 2. **Log in to Web Image Monitor as an administrator.**
For details about logging in, see p.139 "Access in the Administrator Mode".
 3. **In the menu area, click [Configuration].**
 4. **Under "Device Settings", click [E-mail].**
 5. **Make the following settings:**
 - Items in the Reception column: Make the necessary settings for sending and receiving e-mail.
 - Items in the SMTP column: Configure the SMTP server. Check your mailing environment, and then specify the necessary items. You can also perform mail authentication for the SMTP server.
 - Items in the POP before SMTP column: Configure the POP server. Check your mailing environment, and then specify the necessary items. You can also perform mail authentication for the POP server.
 - Items in the POP3/IMAP4 column: Configure the POP3 or IMAP4 server. Check your mailing environment, and then specify the necessary items.
 - Items in the E-mail Communication Port column: Configure the port to be used for access to the mail server.
 - Items in the E-mail Notification Account column: Specify these items If you want to use e-mail notification.
 6. Click **[OK]**.
 7. Click **[Logout]**.
 8. **Quit Web Image Monitor.**

Note

- For details about Web Image Monitor, see p.135 "Using Web Image Monitor".
- For details about the settings, see Web Image Monitor Help.

Setting the Account for E-mail Notification

Before you use Auto E-mail Notification or On-demand E-mail notification, setup an e-mail account to be used for the function. Perform the following configuration task in Web Image Monitor.

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. In the menu area, click [Configuration].

3. Under "Device Settings", click [E-mail].

4. Make the following settings in E-mail Notification Account:

- E-mail Notification E-mail Address: Enter the address using alphanumeric characters. This will appear as the sender (From:) of the e-mail notification. Send requests for e-mail notification to this address.
- Receive E-mail Notification: Specify whether to use on-demand e-mail notification.
- E-mail Notification User Name: Enter the specified user name for the e-mail account in "E-mail Notification E-mail Address".
- E-mail Notification Password: Enter the specified password for the e-mail account in "E-mail Notification E-mail Address".

5. Click [OK].

6. Click [Logout].

7. Quit Web Image Monitor.

Note

- The user name and e-mail address that is already registered as e-mail destination cannot be specified as the recipient of e-mail notification.

Mail Authentication

You can configure mail authentication to prevent illegal use of the mail server.

SMTP Authentication

Specify SMTP authentication.

When mail is sent to the SMTP server, authentication is performed using the SMTP AUTH protocol by prompting the mail originator to enter the user name and password. This prevents illegal use of the SMTP server.

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. In the menu area, click [Configuration].

3. Under "Device Settings", click [E-mail].

4. Make the following settings in SMTP column:

- SMTP Server Name: Enter the IP address or host name of the SMTP server.
- SMTP Port No.: Enter the port number used when sending e-mail to the SMTP server.

- SMTP Authentication: Enable or disable SMTP authentication.
 - SMTP Auth. E-mail Address: Enter the e-mail address.
 - SMTP Auth. User Name: Enter the SMTP account name.
 - SMTP Auth. Password: To set or change the password for SMTP AUTH.
 - SMTP Auth. Encryption: Select whether to encrypt the password or not.
 [Auto Select]: If the authentication method is PLAIN, LOGIN, CRAM-MD5, or DIGEST-MD5.
 [Active]: If the authentication method is CRAM-MD5 or DIGEST-MD5.
 [Inactive]: If the authentication method is PLAIN or LOGIN.
5. Click [OK].
 6. Click [Logout].
 7. Quit Web Image Monitor.

POP before SMTP Authentication

Select whether to log in to the POP3 server before sending e-mail.

1. Log in to Web Image Monitor as an administrator.
 For details about logging in, see p.139 "Access in the Administrator Mode".
2. In the menu area, click [Configuration].
3. Under "Device Settings", click [E-mail].
4. Make the following settings in POP before SMTP column:
 - POP before SMTP: Enable or disable POP before SMTP.
 - POP E-mail Address: Enter the e-mail address.
 - POP User Name: Enter the POP account name.
 - POP Password: To set or change the POP password.
 - Timeout setting after POP Auth.: Enter the time available before connecting to the SMTP server after logging in to the POP server.
5. Click [OK].
6. Click [Logout].
7. Quit Web Image Monitor.

Auto E-mail Notification

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. In the menu area, click [Configuration].

3. Under "Device Settings", click [Auto E-mail Notification].

The dialog box for making notification settings appears.

4. Make the following settings:

- Notification Message: You can set this according to your needs, for example, the printer's location, service representative contact information.
- Items in the Groups to Notify column: E-mail notification addresses can be grouped as required.
- Items in the Select Groups/Items to Notify column: Select groups for each notification type, such as printer status and error.

To make detailed settings for these items, click [Edit] next to "Detailed Settings of Each Item".

5. Click [OK].

6. Click [Logout].

7. Quit Web Image Monitor.

5

↓ Note

- For details about Web Image Monitor, see p.135 "Using Web Image Monitor".
- For details about the settings, see Web Image Monitor Help.

On-demand E-mail Notification

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. In the menu area, click [Configuration].

3. Under "Device Settings", click [On-demand E-mail Notification].

4. Make the following settings:

- Notification Subject: Enter a text string to be added to the subject line of return e-mails.
- Notification Message: You can set this according to your needs, for example, the printer's location, service representative contact information.
- Restriction to Device Status Info.: Select whether or not to allow access to the information such as the printer settings and status.
- Items in the Receivable E-mail Address/Domain Name Settings column: Enter an e-mail address or domain name to use for requesting information by e-mail and to receive its return e-mail.

5. Click [OK].

6. Click [Logout].

7. Quit Web Image Monitor.

Note

- For details about Web Image Monitor, see p.135 "Using Web Image Monitor".
- For details about the settings, see Web Image Monitor Help.

Format of On-demand E-mail Messages

To use "on-demand e-mail notification", you need to send a request e-mail with a particular format to the printer.

Using your mail software, enter the following:

Format of the request e-mail

Item	Description
To	Enter the specified e-mail address in "E-mail Notification E-mail Address".
Subject	Enter "requeststatus".
From	Specify a valid mail address. The device information will be sent to the address specified here.

Note

- A mail message must be within 1 MB in size.
- E-mail may be incomplete if sent immediately after power on.
- The subject is not case sensitive.
- The body of a request e-mail has no meaning. Any text written in the e-mail body is ignored.

6. Using a Printer Server

This chapter explains how to configure this printer to work as a network printer.

Preparing Printer Server

This section explains how to configure the printer as a Windows network printer. The printer is configured to enabling network clients to use it. When the network printer is connected via SmartDeviceMonitor for Client, you can set the printing notification function to notify clients of the results of their print jobs.

★ Important

- Under Windows XP Professional or Windows Server 2003/2003 R2/2008/2008 R2, to change printer properties in the [Printer] folder, you need Printer Management access authentication; under Windows Vista/7, Full Control access authentication. Log on to the file server as an Administrator group.

1. Open the [Printers and Faxes] window from the [Start] menu.
2. Click the icon of the printer you want to use. On the [File] menu, click [Properties].
3. On the [Sharing] tab, click [Share this printer].
4. To share the printer with users using a different version of Windows, click [Additional Drivers...].

If you have installed an alternative driver by selecting [Share As:] during the printer driver installation, this step can be ignored.

5. On the [Advanced] tab, click the [Printing Defaults...] button. Specify the default values for the printer driver that will be distributed to client computers, and then click [OK].
6. Click [OK], and then close the printer properties.

Using NetWare

This section describes the setting procedure for network printers in the NetWare environment. In the NetWare environment, you can connect the printer as a "print server" or "remote printer".

★ Important

- IPv6 cannot be used on this function.

↓ Note

- This procedure assumes an environment is already prepared for normal NetWare running the printing service setting.
- The procedure is explained with the following example settings:
 - File server name ...CAREE
 - Print server name ...PSERV
 - Printer name ...R-PRN
 - Queue name ...R-QUEUE

6

Setting Up as a Print Server (NetWare 3.x)

Follow the procedure below to connect the printer as a print server using NetWare 3.x.

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p. 139 "Access in the Administrator Mode".

2. Click [Configuration] in the menu area, and then click [NetWare Print Settings].

- Print Server Name: Enter the NetWare print server name. To use the interface board as a print server, enter the name of a print server that is not active on the file server. Use up to 47 characters.
- Logon Mode: Specify whether to designate a file server or NDS tree when logging in to NetWare.
- File Server Name: When a file server name is entered here, only the specified file server is searched for. This item is mandatory. Use up to 47 characters.
- NDS Tree: To enable NDS mode, enter the name of the NDS tree you want to log in to. Use up to 32 alphanumeric characters.
- NDS Context Name: To enable NDS mode, enter the print server context. Use up to 127 characters.
- Operation Mode: Specify whether to use the interface board as a print server or a remote printer.
- Remote Printer No.: This item is effective when the interface board is specified as a remote printer. Enter the same number as the number of the printer to be created on the print server (0 to 254 characters).

- **Job Timeout:** When the interface board is used as a NetWare remote printer, the printer cannot detect when a print job ends. Therefore, the printer terminates printing when a certain period of time has elapsed since it last received print data (i.e., when it has not received print data for a certain period of time). Specify here this period of time (3 to 255 seconds). The initial value is 15 (seconds).
- **Frame Type:** Select the frame type from the drop-down menu.
- **Print Server Protocol:** Select the protocol for NetWare from the drop-down menu.
- **NCP Delivery Protocol:** Select the protocol for NCP delivery.

3. Confirm the settings, and then click [Device Name].

Configuration is now complete. Wait several before restarting Web Image Monitor.

4. Click [Logout].

↓ Note

- To check the configuration is correct, enter the following from the command prompt:
F:> USERLIST
- If the printer works as configured, the name of the print server appears as a connected user.
- If you cannot identify the printer you want to configure, check the printer name against the configuration page printed from the printer. For details about printing a configuration page, see p.99 "Test Printing".
- If no printer names appear in the list, match the frame types of IPX/SPX for the computer and printer. Use the [Network] dialog box of Windows to change the frame type of the computer.
- For details about Web Image Monitor, see p.135 "Using Web Image Monitor".

Setting Up as a Print Server (NetWare 4.x, 5 / 5.1, 6 / 6.5)

Follow the procedure below to connect the printer as a print server using NetWare 4.x, NetWare 5 / 5.1, or NetWare 6 / 6.5.

★ Important

- When using the printer as a print server in NetWare 4.x, NetWare 5 / 5.1, or NetWare 6 / 6.5, set it to the NDS mode.
- When using NetWare 5 / 5.1 or NetWare 6 / 6.5, set the printer as a print server.

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. Click [Configuration] in the menu area, and then click [NetWare Print Settings].

3. Confirm the settings, and then click [Device Name].

4. Click [Logout].

5. Quit Web Image Monitor.

↓ Note

- To check the configuration is correct, enter the following from the command prompt:
F:> USERLIST
- If the printer works as configured, the name of the print server appears as a connected user.
- If you cannot identify the printer you want to configure, check the printer name against the configuration page printed from the printer. For details about printing a configuration page, see p.99 "Test Printing".
- If no printer names appear in the list, match the frame types of IPX/SPX for the computer and printer. Use the [Network] dialog box of Windows to change the frame type of the computer.
- For details about Web Image Monitor, see p.135 "Using Web Image Monitor".

Using Pure IP in the NetWare 5 / 5.1 or 6 / 6.5 Environment

6

Follow the procedure below to connect the printer as a print server in a pure IP environment of NetWare 5 / 5.1 or NetWare 6 / 6.5.

★ Important

- When creating a queued print server in a pure IP environment of NetWare 5 / 5.1 or NetWare 6 / 6.5, create a print queue on the file server using NetWare Administrator.
- This printer is not available as a remote printer for use in a pure IP environment.
- To use the printer in a pure IP environment, set it to IPv4.

Setting up using NWadmin

1. From Windows, start NWadmin.

For details about NWadmin, see the NetWare manuals.

2. Select the object in which the print queue is located in the directory tree, and then click [Create] on the [Object] menu.
3. In the [Class of new object] box, click [Print Queue], and then click [OK].
4. In the [Print Queue Name] box, enter the name of the print queue.
5. In the [Print Queue Volume] box, click [Browse].
6. In the [Available objects] box, click the volume in which the print queue is created, and then click [OK].
7. Check the settings, and then click [Create].
8. Select the object in which the printer is located, and then click [Create] on the [Object] menu.
9. In the [Class of new object] box, click [Printer], and then click [OK]. For NetWare 5, click [Printer (Non NDPS)].

10. In the [Printer name] box, enter the printer name.
11. Select the [Define additional properties] check box, and then click [Create].
12. Click [Assignments], and then click [Add] in the [Assignments] area.
13. In the [Available objects] box, click the queue you created, and then click [OK].
14. Click [Configuration], click [Parallel] in the [Printer type] list, and then click [Communication].
15. Click [Manual load] in the [Communication type] area, and then click [OK].
16. Check the settings, and then click [OK].
17. Select a context specified, and then click [Create] on the [Object] menu.
18. In the [Class of new object] box, click [Print Server], and then click [OK]. For NetWare 5, click [Print Server (Non NDPS)].
19. In the [Print Server Name] box, enter the print server name.
20. Select the [Define additional properties] check box, and then click [Create].
21. Click [Assignments], and then click [Add] in the [Assignments] area.
22. In the [Available objects] box, click the queue you created, and then click [OK].
23. Check the settings, and then click [OK].
24. Start the print server by entering the following from the console of the NetWare server.

If the print server is in operation, quit and restart it.

To quit

```
CAREE: unload pserver
```

To start

```
CAREE: load pserver print_server_name
```

Setting up using Web Image Monitor

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. Click [Configuration] in the menu area, and then click [NetWare Print Settings].
3. Confirm the settings, and then click [Device Name].
4. Click [Logout].
5. Quit Web Image Monitor.

Note

- If you cannot identify the printer you want to configure, check the printer name against the configuration page printed from the printer. For details about printing a configuration page, see p.99 "Test Printing".

- If no printer names appear in the list, match the frame types of IPX/SPX for the computer and printer. Use the [Network] dialog box of Windows to change the frame type of the computer.
- For details about Web Image Monitor, see p.135 "Using Web Image Monitor".

Setting Up as a Remote Printer (NetWare 3.x)

Follow the procedure below to use the printer as a remote printer under NetWare 3.x.

Setting up using PCONSOLE

1. Enter "PCONSOLE" from the command prompt.

```
F:> PCONSOLE
```

2. Create a print queue.

When using the existing print queue, go to the procedure for creating a printer.

3. From the [Available Options] menu, select [Print Queue Information], and then press the [Enter] key.
4. Press [Insert] key, and then enter a print queue name.
5. Press [Esc] key to return to the [Available Options] menu.
6. Set up the network connection to a printer.
7. On the [Available Options] menu, click [Print Server Information], and then press the [Enter] key.
8. To create a new print server, press the [Insert] key, and then enter a print server name.
For a currently defined print server, select a print server in the [Print Server] list.
9. From the [Print Server Information] menu, select [Print Server Configuration].
10. From the [Print Server Configuration] menu, select [Printer Configuration].
11. Select the printer indicated as [Not Installed].
12. To change the printer name, enter a new name.
A name "printer x" is assigned to the printer. The "x" stands for the number of the selected printer.
13. As type, select [Remote Parallel, LPT1].
The IRQ, Buffer size, Starting form, and Queue service mode are automatically configured.
14. Press the [Esc] key, and then click [Yes] on the confirmation message.
15. Press the [Esc] key to return to [Print Server Configuration Menu].
16. Assign print queues to the created printer.
17. From [Print Server Configuration Menu], select [Queues Serviced By Printer].
18. Select the printer created.

19. Press the [Insert] key to select a queue serviced by the printer.

You can select several queues.

20. Follow the instructions on the screen to make other necessary settings.

Following these steps, check that the queues are assigned.

21. Press the [Esc] key until "Exit?" appears, and then select [Yes] to exit PCONSOLE.**22. Start the print server by entering the following from the console of the NetWare server.**

If the print server is in operation, quit and restart it.

To quit

```
CAREE: unload pserver
```

To start

```
CAREE: load pserver print_server_name
```

If the printer works as configured, the message "Waiting for job" appears.

Setting up using Web Image Monitor**1. Log in to Web Image Monitor as an administrator.**

For details about logging in, see p.139 "Access in the Administrator Mode".

2. Click [Configuration] in the menu area, and then click [NetWare Print Settings].**3. Confirm the settings, and then click [Device Name].**

Configuration is now complete. Wait several minutes before restarting Web Image Monitor.

4. Click [Logout].**5. Quit Web Image Monitor.****Note**

- If you cannot identify the printer you want to configure, check the printer name against the configuration page printed from the printer. For details about printing a configuration page, see p.99 "Test Printing".
- If no printer names appear in the list, match the frame types of IPX/SPX for the computer and printer. Use the [Network] dialog box of Windows to change the frame type of the computer.
- For details about Web Image Monitor, see p.135 "Using Web Image Monitor".

Setting Up as a Remote Printer (NetWare 4.x, 5 / 5.1, 6 / 6.5)

Follow the procedure below to use the printer as a remote printer under NetWare 4.x, 5 / 5.1 and 6 / 6.5.

★ Important

- To use the printer as a remote printer under NetWare 4.x, 5 / 5.1, 6 / 6.5, set it to NDS mode.

- Do not use the printer as a remote printer when Pure IP is used.

Setting up using NWadmin

1. From Windows, start NWadmin.

For details about NWadmin, see the NetWare manuals.

2. Set up the network connection to a print queue. Select the object in which the print queue is located in the directory tree, and then click [Create] on the [Object] menu.
3. In the [Class of new object] box, click [Print Queue], and then click [OK].
4. In the [Print Queue Name] box, enter the name of the print queue.
5. In the [Print Queue Volume] box, click [Browse].
6. In the [Available objects] box, click the volume in which the print queue is created, and then click [OK].
7. Check the settings, and then click [Create].
8. Set up the network connection to a printer. Select the object in which the printer is located, and then click [Create] on the [Object] menu.
9. In the [Class of new object] box, click [Printer], and then click [OK]. For NetWare 5, click [Printer (Non NDPS)].
10. In the [Printer name] box, enter the printer name.
11. Select the [Define additional properties] check box, and then click [Create].
12. Assign print queues to the created printer. Click [Assignments], and then click [Add] in the [Assignments] area.
13. In the [Available objects] box, click the queue you created, and then click [OK].
14. Click [Configuration], click [Parallel] in the [Printer type] list, and then click [Communication].
15. Click [Manual load] in the [Communication type] area, and then click [OK]. Check the settings, and then click [OK].
16. Set up the network connection to a print server. Select a context specified, and then click [Create] on the [Object] menu.
17. In the [Class of new object] box, click [Print Server], and then click [OK]. For NetWare 5, click [Print Server (Non NDPS)].
18. In the [Print Server Name:] box, enter the print server name.
19. Select the [Define additional properties] check box, and then click [Create].
20. Assign the printer to the created print server. Click [Assignments], and then click [Add] in the [Assignments] area.
21. In the [Available objects] box, click the queue you created, and then click [OK].
22. In the [Printers] area, click the printer you assigned, and then click [Printer Number].

23. Enter the printer number, and then click [OK]. Check the settings, and then click [OK].
24. Start the print server by entering the following from the console of the NetWare server.
If the print server is in operation, quit and restart it.

To exit

```
CAREE: unload pserver
```

To start

```
CAREE: load pserver print_server_name
```

25. Enter the printer server name as the context name, and then press the [Enter] key.
26. Select the printer name on the context menu, and then press the [Enter] key.

Setting up using Web Image Monitor

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. Click [Configuration] in the menu area, and then click [NetWare Print Settings].
3. Confirm the settings, and then click [Device Name].

Configuration is now complete. Wait several minutes before restarting Web Image Monitor.

4. Click [Logout].
5. Quit Web Image Monitor.

Note

- If you cannot identify the printer you want to configure, check the printer name against the configuration page printed from the printer. For details about printing a configuration page, see p.99 "Test Printing".
- If no printer names appear in the list, match the frame types of IPX/SPX for the computer and printer. Use the [Network] dialog box of Windows to change the frame type of the computer.
- For details about Web Image Monitor, see p.135 "Using Web Image Monitor".

7. Mac OS X Configuration

This chapter explains how to use this printer with PostScript 3.

Using PostScript 3

The following section explains how to use the PostScript 3 printer driver.

For details about installing the PostScript 3 printer driver, see Driver Installation Guide.

Job Type

Use this to select the type of print job.

★ Important

- If you are using a printer with ELP-NX installed, all print jobs for which "Locked Print" is specified are stored in ELP-NX when user authentication is not set. Also note that any jobs for which "Locked Print" is not specified will be deleted according to the default setting of ELP-NX.
- For details about how to print using ELP-NX, see the manuals provided with the application.
- For details about the option settings of ELP-NX, consult your administrator.

The following shows the tabs or menus where you can select this function.

[Job Type:] on [Job Log] in the print dialog box.

You can select the following items:

Normal Print

Select this for normal printing. The print job starts immediately after the print command is given.

Sample Print

Use this function to print only one set of a multiple print jobs.

The other sets are saved in the printer. The saved job can be printed from the printer's control panel. You can also delete the saved job.

↓ Note

- The user ID can contain up to eight alphanumeric characters (a-z, A-Z, 0-9). The password can contain 4-8 digits.
- Entering a user ID helps you distinguish your print jobs from others.

Locked Print

Use this function to save documents in the printer memory with a password, and then edit and print them as you want.

Note

- The user ID can contain up to eight alphanumeric characters (a-z, A-Z, 0-9). The password can contain 4-8 digits.
- Entering a user ID helps you distinguish your print jobs from others.

Hold Print

Use this function to temporarily hold a file in the printer, and print it from the computer or the printer's control panel later.

Note

- "User ID:" can contain up to eight alphanumeric (a-z, A-Z, 0-9) characters.
- "File Name:" can contain up to 16 alphanumeric (a-z, A-Z, 0-9) characters.
- Entering a user ID helps you distinguish your print jobs from others.

Stored Print

Use this function to store a file in the printer, and then print it from the computer or the printer's control panel later.

Note

- The user ID can contain up to eight alphanumeric characters (a-z, A-Z, 0-9). The password can contain 4-8 digits.
- The File Name can contain up to 16 alphanumeric characters (a-z, A-Z, 0-9).
- You can assign a password to a saved document, but password assignment is not mandatory.
- Entering a user ID helps you distinguish your print jobs from others.

Store and Print

Use this function to print the file at once and also stores the file in the printer.

Note

- The user ID can contain up to eight alphanumeric characters (a-z, A-Z, 0-9). The password can contain 4-8 digits.
- The File Name can contain up to 16 alphanumeric characters (a-z, A-Z, 0-9).
- You can assign a password to a saved document, but password assignment is not mandatory.
- Entering a user ID helps you distinguish your print jobs from others.

Using Sample Print

Important

- You need Mac OS X 10.2 or higher to use this function.
- This function is available only if the hard disk is installed on the printer.

- The number of pages the printer can save varies depending on the contents of the print images. At most, the printer can save 100 jobs or 9,000 pages for Sample Print, Locked Print, Hold Print, and Stored Print.
- Sample Print files will not appear on the display panel if they have already been executed or deleted using the Web browser before you select [Sample Print] from the control panel.
- Sample Print files printed or deleted using Web Image Monitor after you select [Sample Print] using the control panel will appear on the display panel. However, an error message will appear if you try to print or delete those Sample Print files.
- If the application has a collate option, be sure to disable it before you send a print job. By default, sample print jobs are automatically collated by the printer driver. If the collate option is selected in the application's print dialog box, more prints than intended may be printed.
- Print jobs are not saved on the hard disk in the following cases. You can check the error log for jobs not saved.
 - When there are 100 Sample Print, Locked Print, Hold Print, and Stored Print jobs saved on the hard disk.
 - When the total number of pages saved on the hard disk exceeds 9,000 pages.

Sending a Sample Print file

1. In the application, on the [File] menu, click [Print].
2. Set the number of copies to two or more.
The sample print job is sent to the printer, and one set is printed.
3. In the pop-up menu, click [Job Log].
4. On the [Job Type:] pop-up menu, select [Sample Print].
5. In the [User ID:] box, enter a user ID using up to eight alphanumeric (a-z, A-Z, 0-9) characters.

The user ID associates the user with his/her jobs.

6. Check the printed output to make sure the settings are correct.

If the settings are correct, perform the following steps to print the remaining sets.

Printing a selected Sample Print file

To print a saved job, use the printer's control panel. For details, see p.65 "Printing a Sample Print file using the control panel".

Deleting a selected Sample Print file

If you want to delete a saved job, see p.66 "Deleting Sample Print files".

Using Locked Print

★ Important

- You need Mac OS X 10.2 or higher to use this function.
- This function is available only if the hard disk is installed on the printer.
- The number of pages the printer can save varies depending on the contents of the print images. At most, the printer can save 100 jobs or 9,000 pages for Sample Print, Locked Print and Hold Print.
- Locked Print files will not appear on the display panel if they have already been printed or deleted using Web Image Monitor before you select [Locked Print] using the control panel.
- Locked Print files printed or deleted using Web Image Monitor after you have selected [Locked Print] using the control panel will still appear on the display panel. However, an error message will appear if you try to print or delete those Locked Print files.
- If the application has a collate option, be sure to disable it before you send a print job. By default, locked print jobs are automatically collated by the printer driver. If the collate option is selected in the application's print dialog box, more prints than intended may be printed.
- Print jobs are not saved on the hard disk in the following cases. You can check the error log for jobs not saved.
 - When there are 100 Sample Print, Locked Print, Hold Print, and Stored Print jobs saved on the hard disk.
 - When the total number of pages saved on the hard disk exceeds 9,000 pages.

7

Sending a Locked Print file

1. In the application, click [Print] on the [File] menu.
2. In the pop-up menu, click [Job Log].
3. On the [Job Type:] pop-up menu, click [Locked Print].
4. In the [User ID:] box, enter a user ID using up to eight alphanumeric (a-z, A-Z, 0-9) characters, and then enter a 4-8 digit password in the Password: box.

The user ID associates the user with his/her jobs.

5. After making the necessary settings, click [Print].

The document file is saved in the printer.

To print the document, perform the following steps.

Printing a selected Locked Print file

To print a saved job, use the printer's control panel. For details, see p.68 "Printing a Locked Print file using the control panel".

Deleting a selected Locked Print file

If you want to delete a saved job, see p.69 "Deleting Locked Print files".

Using Hold Print

★ Important

- You need Mac OS X 10.2 or higher to use this function.
- This function is available only if the hard disk is installed on the printer.
- The number of pages the printer can save varies depending on the contents of the print images. At most, the printer can save 100 jobs or 9,000 pages for Sample Print, Locked Print and Hold Print.
- Hold Print files will not appear on the display panel if they have already been printed or deleted using Web Image Monitor before you select [Hold Print] using the control panel.
- Hold Print files printed or deleted using Web Image Monitor after you have selected [Hold Print] using the control panel will still appear on the display panel. However, an error message will appear if you try to print or delete those Hold Print files.
- If the application has a collate option, be sure to disable it before you send a print job. By default, Hold print jobs are automatically collated by the printer driver. If the collate option is selected in the application's print dialog box, more prints than intended may be printed.
- Print jobs are not saved on the hard disk in the following cases. You can check the error log for jobs not saved.
 - When there are 100 Sample Print, Locked Print, Hold Print, and Stored Print jobs saved on the hard disk.
 - When the total number of pages saved on the hard disk exceeds 9,000 pages.

Sending a Hold Print file

1. In the application, click [Print] on the [File] menu.
2. In the pop-up menu, click [Job Log].
3. On the [Job Type:] pop-up menu, click [Hold Print].
4. In the [User ID:] box, enter a user ID using up to eight alphanumeric (a-z, A-Z, 0-9) characters. [File Name] can also be set.

The user ID associates the user with his/her jobs.

5. After making the necessary settings, click [Print].

The document file is saved in the printer.

To print the document, perform the following steps.

Printing a selected Hold Print file

To print a saved job, use the printer's control panel. For details, see p.72 "Printing a Hold Print file using the control panel".

Deleting a selected Hold Print file

If you want to delete a saved job, see p.73 "Deleting Hold Print files".

Using Stored Print

★ Important

- You need Mac OS X 10.2 or higher to use this function.
- This function is available only if the hard disk is installed on the printer.
- Stored Print files will not appear on the display panel if they have already been printed or deleted using Web Image Monitor before you select [Stored Print] using the control panel.
- Stored Print files printed or deleted using Web Image Monitor after you have selected [Stored Print] using the control panel will still appear on the display panel. However, an error message will appear if you try to print or delete those Stored Print files.
- If the application has a collate option, be sure to disable it before you send a print job. By default, Stored print jobs are automatically collated by the printer driver. If the collate option is selected in the application's print dialog box, more prints than intended may be printed.
- Print jobs are not saved on the hard disk in the following cases. You can check the error log for jobs not saved.
 - When there are 100 Sample Print, Locked Print, Hold Print, and Stored Print jobs saved on the hard disk.
 - When the total number of pages saved on the hard disk exceeds 9,000 pages.

7

Sending a Stored Print file

1. In the application, click [Print] on the [File] menu.
2. In the pop-up menu, click [Job Log].
3. On the [Job Type:] pop-up menu, click [Stored Print] or [Store and Print].
 - [Stored Print]
Stores the file in the printer and print it later using the control panel.
 - [Store and Print]
Prints the file at once and also stores the file in the printer.
4. In the [User ID:] box, enter a user ID using up to eight alphanumeric (a-z, A-Z, 0-9) characters, and then enter a 4-8 digit password in the [Password:] box. [File Name] can also be set.

The user ID associates the user with his/her jobs.

You can assign a password to a saved document, but password assignment is not mandatory.

The password must be entered when printing or deleting.
5. After making the necessary settings, click [Print].

The document file is saved in the printer.

To print the document, perform the following steps.

Printing a selected Stored Print file

To print a saved job, use the printer's control panel. For details, see p.75 "Printing a Stored Print file using the control panel".

Deleting a selected Stored Print file

If you want to delete a saved job, see p.76 "Deleting Stored Print files".

Paper Type

Use this to select the paper type.

The following shows where you can select this function.

[Paper Type] is displayed under [General 1] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

Fit to Paper

When the size of the document and paper size differ, set whether or not to print according to paper size.

The following shows where you can select this function.

[Fit to Paper] is displayed under [General 1] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

Prompt User

Print is performed with the size of document to be printed unchanged.

Nearest Size and Scale

If the paper size is smaller than the selected paper size, the driver reduces the print size.

If the paper size is larger than the size of document to be printed, print is not to fit the paper size.

Nearest Size and Crop

Print is performed regardless of any differences between selected and actual paper size. However, the print output is not adjusted to fit the paper size.

Print Mode

Use this mode to select the print mode you want to use.

[Print Mode] is displayed under [General 1] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

Off

Prints in normal quality.

Edge Smoothing

Select whether or not to smooth the edges of texts and images when printing. If this setting is enabled, gradation in images might be degraded.

Toner Saving 1

Reduces toner consumption when printing. If this setting is enabled, print quality might be degraded.

Toner Saving 2

Further reduces toner consumption when printing. If this setting is enabled, print quality might be degraded.

Image Smoothing

Use this to select the image smoothing type.

The following shows where you can select this function.

[Image Smoothing] is displayed under [General 1] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

You can select from the following items:

Off

Disables image smoothing.

On

Performs image smoothing unconditionally.

Auto

Performs image smoothing automatically for images that have a resolution less than 25% of supported printer resolution.

Less than 90 ppi to Less than 300 ppi

Performs image smoothing only when the image has an image resolution (pixels per inch) less than the respective value you have selected in the list.

↓ Note

- When [Auto] is selected, data processing may take a long time.
- When Image Smoothing is used for a mask image, this function may have an undesired effect on the print result.

Gradation

Use this to select a type of gradation based on your purpose.

The following shows where you can select this function.

[Gradation] is displayed under [General 1] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

↓ Note

- For details about the gradation types, see the printer driver Help.

Dithering

Use this to set the Image Rendering mode.

The following shows where you can select this function.

[Dithering] is displayed under [General 1] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

You can select from the following items:

Auto

Use this setting to configure the best dithering method automatically depending on the appearance of the document to be printed.

Photographic

Performs dithering using an appropriate pattern for photographs.

Text

Performs dithering using an appropriate pattern for text.

User Setting

Use this setting to print images set in halftones in your application.

Rotate by 180 degrees

Use this to rotate the print image by 180 degrees.

The following shows where you can select this function.

[Rotate by 180 degrees] is displayed under [General 2] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

Orientation Override

Use this to set the paper orientation.

The following shows where you can select this function.

[Orientation Override] is displayed under [General 2] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

You can select from the following items:

- Off
- Landscape
- Portrait

Watermark

Set the Watermark function.

The following shows where you can select this function.

[Watermark] is displayed under [General 2] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

Watermark Text

Select the Watermark Text type.

The following shows where you can select this function.

[Watermark Text] is displayed under [General 2] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

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Watermark Font

Select the Watermark Font type.

The following shows where you can select this function.

[Watermark Font] is displayed under [General 2] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

Watermark Size

Select the Watermark size.

The following shows where you can select this function.

[Watermark Size] is displayed under [General 2] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

Watermark Angle

Select the Watermark angle.

The following shows where you can select this function.

[Watermark Angle] is displayed under [General 3] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

Watermark Style

Select the Watermark style.

The following shows where you can select this function.

[Watermark Style] is displayed under [General 3] in the [Feature Sets:] list on [Printer Features] in the print dialog box.

8. Appendix

When Using Windows Terminal Service/Citrix Presentation Server/Citrix XenApp

The following explains how to use Windows Terminal Service and Maintenance.

Operating Environment

The following operating systems and Citrix Presentation Server/Citrix XenApp versions are supported.

Citrix Presentation Server 4.5/ Citrix XenApp 5.0

- Windows Server 2003/2003 R2
- Windows Server 2008/2008 R2

Supported Printer Drivers

When Windows Terminal Service is operating

- PCL printer drivers
- PostScript 3 printer driver

Limitations

The following limitations apply to the Windows Terminal Service environment.

These limitations are built in Windows Terminal Service or Citrix Presentation Server/Citrix XenApp.

Citrix Presentation Server/Citrix XenApp [Auto-creating client printers]

Using [Auto-creating client printers] can select a logical printer created by copying the client's local printer data to the Citrix Presentation Server/Citrix XenApp. We strongly recommend testing this function in your network environment before using it for your work.

- The settings for optional equipment will not be stored in the server after the equipment is disconnected. The settings for optional equipment will be restored to its defaults each time the client computer logs on to the server.
- When printing a large number of bitmap images or using the server in a WAN environment over dial-up lines such as ISDN, printing may not be possible or errors may occur, depending on data transfer rates.

Citrix Presentation Server/Citrix XenApp [Printer driver replication]

Using [Printer driver replication] can distribute printer drivers across all servers in a server farm. We strongly recommend testing this function in your network environment before using it for your work.

- If the printer drivers are not properly copied, install them directly onto each server.

Using DHCP

You can use the printer in a DHCP environment. You can also register the printer NetBIOS name on a WINS server when it is running.

- Printers that register the printer NetBIOS name on a WINS server must be configured for the WINS server.
- Supported DHCP servers are Microsoft DHCP Server included with Windows Server 2003/2003 R2/2008/2008 R2, and the DHCP server included with NetWare and UNIX.
- If you do not use the WINS server, reserve the printer's IP address in the DHCP server so the same IP address is assigned every time.
- To use the WINS server, change the WINS server setting to "active" using the control panel.
- Using the WINS server, you can configure the host name via the remote network printer port.
- DHCP relay-agent is not supported. If you use DHCP relay-agent on a network via ISDN, it will result in increased line charges. This is because your computer connects to the ISDN line whenever a packet is transferred from the printer.
- If there is more than one DHCP server, use the same setting for all servers. The printer operates using data from the DHCP server that responds first.
- DHCP servers can operate in an IPv6 environment, but they cannot be configured to allocate IPv6 addresses or obtain host names.

Using AutoNet

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If the printer IPv4 address is not automatically assigned by the DHCP server, a temporary IP address starting with 169.254 and not used on the network can be automatically selected by the printer.

↓ Note

- The IP address assigned by the DHCP server is given priority over that selected by AutoNet.
- You can confirm the current IPv4 address on the configuration page. For more information about the configuration page, see p.99 "Test Printing".
- When AutoNet is running, the NetBIOS name is not registered on the WINS server.
- The printer cannot communicate with devices that do not have the AutoNet function. However, this printer can communicate with Macintosh computers running Mac OS X 10.2.3. or higher.

Configuring the WINS Server

The printer can be configured to register its NetBIOS name with a WINS server when the power is turned on. This enables the NetBIOS name of the printer to be specified from Web Image Monitor even in a DHCP environment.

This section explains configuring the WINS server.

↓ Note

- WINS servers are supported by Windows Server 2003 or later.
- For details about the WINS server settings, see Windows Help.
- If there is no reply from the WINS server, the NetBIOS name is registered by broadcast.
- The NetBIOS name can be entered using up to 13 alphanumeric characters.

Using Web Image Monitor

1. Log in to Web Image Monitor as an administrator.

For details about logging in, see p.139 "Access in the Administrator Mode".

2. In the menu area, click [Configuration].

3. Click [Network] and then click [IPv4].

4. Check that [Active] is selected for [WINS] in the [Ethernet + Wireless LAN] column, and then enter the WINS server IPv4 address in [Primary WINS Server] and [Secondary WINS Server].

5. Click [OK].

6. Quit Web Image Monitor.

Using telnet

Use the telnet "wins" command to configure WINS.

↓ Note

- For details, see "Using telnet", UNIX Supplement.

Using the Dynamic DNS Function

Dynamic DNS is a function which dynamically updates (registers and deletes) records (A record, AAAA record, CNAME, and PTR record) managed by the DNS server. When a DNS server is part of the network environment to which this printer, a DNS client, is connected, records can be dynamically updated using this function.

Updating

Updating procedure varies depending on whether the printer IP address is static or acquired by DHCP.

★ Important

- **Dynamic update using message authentication (TSIG, SIG(0)) is not supported.**

For a static IPv4 setting

If the IP address or host name is changed, the A and PTR records are updated. If the A record is registered, CNAME is also registered. CNAMEs that can be registered are as follows:

- Ethernet and Wireless LAN
RNPXXXXXX (XXXXXX represents the last 3 hexadecimal bytes of the MAC address)
However, if CNAME (RNPXXXXXX) overlaps with the host name, CNAME will not be registered.

For DHCPv4 settings

As a substitute for the printer, the DHCP server updates the record, and one of the following occurs:

- When the printer acquires the IP address from the DHCP server, the DHCP server updates the A and PTR records.
- When the printer acquires the IP address from the DHCP server, the printer updates the A record, and the DHCP server updates the PTR record.

If the A record is registered, CNAME is also registered. CNAMEs that can be registered are as follows:

- Ethernet and Wireless LAN
RNPXXXXXX (XXXXXX represents the last 3 hexadecimal bytes of the MAC address)

For IPv6 settings

This printer updates the AAAA record and PTR record.

It also registers CNAME when the AAAA record is updated.

When a stateless address is newly set, it is automatically registered on the DNS server also.

↓ Note

- When the dynamic DNS function is not used, records managed by the DNS server must be updated manually, if the printer's IP address is changed.
- To update the record using the printer, the DNS server has to have one of the following:

- No security settings made.
- If security settings are made, an IP-specified client (this printer) permits updating.

DNS Servers Targeted for Operation

For static IP setting

- Microsoft DNS servers with standard Windows Server 2003/2003 R2/2008/2008 R2 features
- BIND 8.2.3 or higher

For DHCP setup, when the printer updates the A record

- Microsoft DNS servers with standard Windows Server 2003/2003 R2/2008/2008 R2 features
- BIND 8.2.3 or higher

For DHCP setup, when the DHCP server updates records

- Microsoft DNS servers with standard Windows Server 2003/2003 R2/2008/2008 R2 features
- BIND 8.2.3 or higher
- DNS servers with standard NetWare 5 (or a higher version) features

For IPv6 setting

- Microsoft DNS servers with standard Windows Server 2003/2003 R2/2008/2008 R2 features
- BIND 9.2.3 or higher

DHCP Servers Targeted for Operation

As a substitute for the printer, DHCP servers capable of updating the A record and PTR record are as follows:

- Microsoft DHCP servers with standard Windows Server 2003/2003 R2/2008 features
- ISC DHCP 3.0 or higher
- DHCP server with standard NetWare 5 features

Setting the Dynamic DNS Function

Use the telnet "dns" command to configure DNS.

 **Note**

- For details, see "Using telnet", UNIX Supplement.

Precautions

Please pay attention to the following when using the network interface board. When configuration is necessary, follow the appropriate procedures below.

Connecting a Dial-Up Router to a Network

When using NetWare (file server)

If the NetWare file server and printer are on opposite sides of a router, packets are sent back and forth continuously, possibly incurring communications charges. Because packet transmission is a feature of NetWare, you need to change the configuration of the router. If the network you are using does not allow you to configure the router, configure the printer instead.

Configuring the router

Filter packets so they do not pass over the dial-up router.

Configuring the printer with NetWare

1. Following the setup method described earlier in this manual, configure the file server.
2. Set the frame type for NetWare environment.

Configuring the printer without NetWare

1. When not printing, the network interface board sends packets over the network. Set NetWare to "inactive".

Note

- The MAC address of the filtering printer is printed on the printer configuration page. For more information about printing a configuration page, see p.99 "Test Printing".
- For more information about configuring the printer if the router cannot be configured, see the following instructions.
- For more information about selecting a frame type, see "Ethernet Configuration", Hardware Guide.
- For more information about selecting a protocol, see "Ethernet Configuration", Hardware Guide.

When the Wireless LAN Interface Unit is Installed

When using the Wireless LAN interface on the network, note the following:

If the network area provides poor radio environment

Where radio wave conditions are bad, the network may not function due to interrupted or failed connections. When checking the Wireless LAN signal and the access point, follow the procedure below to improve the situation:

- Position the access point nearer to the printer.
- Clear the space between access point and printer of obstructions.
- Move radio wave generating appliances, such as microwaves, away from the printer and access point.

Note

- For information about how to check radio wave status, see "Wireless LAN Configuration", Hardware Guide.
- For more information about access point radio wave conditions, refer to the access point manual.

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expat

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Note

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Samba

For SMB transmission, this machine uses Samba.

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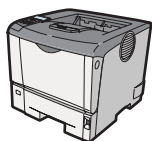
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MEMO

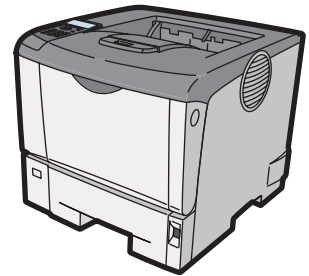
MEMO





Operating Instructions

Security Guide



-
- 1 Getting Started
 - 2 Configuring Administrator Authentication
 - 3 Configuring User Authentication
 - 4 Protecting Data from Information Leaks
 - 5 Securing Information Stored on the Hard Disk
 - 6 Managing Access to the Printer
 - 7 Enhanced Network Security
 - 8 Specifying the Extended Security Functions
 - 9 Troubleshooting
 - 10 Appendix

Introduction

This manual contains detailed instructions and notes on the operation and use of this machine. For your safety and benefit, read this manual carefully before using the machine. Keep this manual in a handy place for quick reference.

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<p>If security settings are not made, there is a risk of damage resulting from malicious activity. For this reason, be sure to make the security settings shown in this manual.</p>

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How to Read This Manual

Symbols

This manual uses the following symbols:

 **Important**

Indicates points to pay attention to when using the machine, and explanations of likely causes of paper misfeeds, damage to originals, or loss of data. Be sure to read these explanations.

 **Note**

Indicates supplementary explanations of the machine's functions, and instructions on resolving user errors.

 **Reference**

This symbol is located at the end of sections. It indicates where you can find further relevant information.

[]

Indicates the names of keys on the machine's display or control panels.

IP Address

In this manual, "IP address" covers both IPv4 and IPv6 environments. Read the instructions that are relevant to the environment you are using.

List of Options

This section provides a list of options for this printer, and how they are referred to as in this manual.

Option List	Referred to as
Hard Disk Drive Option Type 4310	Hard disk
IEEE 802.11a/g Interface Unit *1	Wireless LAN interface unit
IEEE 1284 Interface Board Type A	IEEE 1284 interface board
SD card for NetWare printing Type G	NetWare card

*1 The type of IEEE 802.11a/g Interface Unit may differ depending on which country you are in.

↓ Note

- For details about the specifications of each option, see "Specifications", Hardware Guide.

Manuals for This Printer

Read this manual carefully before you use this printer.

Refer to the manuals that are relevant to what you want to do with the printer.

★ Important

- Media differ according to manual.
- The printed and electronic versions of a manual have the same contents.
- Adobe® Acrobat® Reader®/Adobe Reader® must be installed in order to view the manuals as PDF files.
- A Web browser must be installed in order to view the html manuals.
- For enhanced security, we recommend that you first make the following settings. For details, see p.12 "Setting Up the Printer".
 - Install the Device Certificate.
 - Enable SSL (Secure Sockets Layer) Encryption.
- Change the user name and password of the administrator using Web Image Monitor.

Safety Information

Contains information about safe usage of this printer.

To avoid injury and prevent damage to the printer, be sure to read this.

Quick Installation Guide

Contains procedures for removing the printer from its box, and connecting it to a computer.

Hardware Guide

Contains information about paper; names and functions of the parts of this printer; and procedures such as installing options, replacing consumables, responding to error messages, and resolving jams.

Driver Installation Guide

Contains procedures for installing the printer driver. This manual is included on the driver CD-ROM.

Software Guide

Contains information about using this printer, its software, and its security functions.

Security Guide (This manual)

This manual is for administrators of the printer. It explains security functions that you can use to prevent unauthorized use of the printer, data tampering, or information leakage. Be sure to read this manual when setting the enhanced security functions, or user and administrator authentication.

VM Card Extended Feature Settings Web Reference

Contains information about setting up the extended features settings using Web Image Monitor.

UNIX Supplement

Contains information about the usage of commands to operate this printer.

To obtain the "UNIX Supplement", visit our Web site or consult an authorized dealer.

This manual includes explanations of functions and settings that might not be available on this printer.

This manual is provided in English only.

↓ Note

- The following software products are referred to as using general names:

Product name	General name
DeskTopBinder Lite and DeskTopBinder Professional * ¹	DeskTopBinder
Remote Communication Gate S Pro * ¹ and Remote Communication Gate S * ¹	Remote Communication Gate S
ScanRouter EX Professional * ¹ and ScanRouter EX Enterprise * ¹	The ScanRouter delivery software
SmartDeviceMonitor for Client 2	SmartDeviceMonitor for Client

*¹ Optional



1. Getting Started

This chapter describes the printer's security features and how to specify initial security settings.

Before Using the Security Functions

★ Important

- **If the security settings are not configured, the data in the printer is vulnerable to attack.**
 1. To prevent this printer being stolen or willfully damaged, etc., install it in a secure location.
 2. Purchasers of this printer must make sure that people who use it do so appropriately, in accordance with operations determined by the machine administrator. If the administrator does not make the required security settings, there is a risk of security breaches by users.
 3. Before setting this printer's security features and to ensure appropriate operation by users, administrators must read the Security Reference completely and thoroughly, paying particular attention to the section entitled "Before Using the Security Functions".
 4. Administrators must inform users regarding proper usage of the security functions.
 5. Administrators should routinely examine the printer's logs to check for irregular and unusual events.
 6. If this printer is connected to a network, its environment must be protected by a firewall or similar.
 7. For protection of data during the communication stage, apply the printer's communication security functions and connect it to devices that support security functions such as encrypted communication.

Setting Up the Printer

1

This section explains how to enable encryption of transmitted data and configure the administrator account. If you want higher security, make the following setting before using the printer:

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Host Interface], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Network], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [Machine IPv4 Address], and then press the [OK] key.
5. Specify IPv4 Address.
6. Be sure to connect the printer to a network that only administrators can access.
7. Start the Web Image Monitor, and then log in to the printer as the administrator.

For details about logging in to Web Image Monitor as an administrator, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

8. Install the server certificate.

For details, see p.94 "Protection Using Encryption".

9. Enable secure sockets layer (SSL).

10. Enter the administrator's user name and password.

Firmware Update Cautions

If "IPsec" is enabled, all information on the network will be encrypted. This allows you to perform firmware updates securely.

If "IPsec" is not enabled, the information on the network may not be encrypted depending on the protocol. If you want to perform a firmware update when "IPsec" is not enabled, be sure to do so only if your network environment is protected against electronic eavesdropping and similar security threats.

↓ Note

- For details on how to specify the IPv4 address, see "Ethernet Configuration", Hardware Guide.

Enhanced Security

This printer's security functions can be enhanced by managing the printer and its users using the improved authentication functions.

By specifying access limits for the printer's functions and the documents and data stored in the printer, information leaks and unauthorized access can be prevented.

Data encryption also prevents unauthorized data access and tampering via the network.

This printer also automatically checks the configuration and manufacturer of the firmware each time the main power is switched on and whenever firmware is installed.

Authentication and Access Limits

Using authentication, administrators manage the printer and its users. To enable authentication, information about both administrators and users must be registered in order to authenticate users via their login user names and passwords.

Four types of administrators manage specific areas of printer usage, such as settings and user registration.

Access limits for each user are specified by the administrator responsible for user access to printer functions and documents and data stored in the printer.

For details about the administrator and user roles, see p.19 "Administrators".

Encryption Technology

This printer can establish secure communication paths by encrypting transmitted data and passwords.

Glossary

Administrator

There are four types of administrators according to administrative function: machine administrator, network administrator, file administrator, and user administrator. We recommend that only one person takes each administrator role.

In this way, you can spread the workload and limit unauthorized operation by a single administrator.

Basically, administrators make printer settings and manage the printer; but they cannot perform normal operation including printing.

Supervisor

The Supervisor can reset the administrator's passwords in cases such as they are lost or there is a change in the administrators.

The supervisor can neither perform normal operations nor specify default settings.

User

A user performs normal operations on the printer, such as printing.

File Creator (Owner)

This is a user who can store files in the printer and authorize other users to view, edit, or delete those files.

Registered User

Any user whose personal information is registered in the Address Book, and has a login user name and login password.

Administrator Authentication

Administrators are authenticated by their login user name and login password, supplied by the administrator, when specifying the printer's settings or accessing the printer over the network.

User Authentication

To access the printer's settings or use the printer over a network, users must be authenticated. Users are authenticated after they correctly enter their pre-registered login user name and password.

The user's login user name and password are stored in the printer's Address Book. Personal information can be obtained from the Windows domain controller (Windows authentication), LDAP Server (LDAP authentication), or Integration Server (Integration Server authentication) connected to the printer via the network. The "Integration Server" is the computer on which Authentication Manager is installed.

Login

This action is required for administrator authentication and user authentication. Enter your login user name and login password on the printer's control panel. A login user name and login password may also be required when accessing the printer over the network or using such utilities as Web Image Monitor.

Logout

This action is required with administrator and user authentication. This action is required when you have finished using the printer or changing the settings.

Security Measures Provided by this Printer

1

Using Authentication and Managing Users

Enabling Authentication

To control administrators' and users' access to the printer, perform administrator authentication and user authentication using login user names and login passwords. To perform authentication, the authentication function must be enabled. For details about authentication settings, see p.22 "Enabling Administrator Authentication".

Specifying Authentication Information to Log in

Users are managed using the personal information registered in the printer's Address Book.

By enabling user authentication, you can allow only people registered in the Address Book to use the printer. Users can be managed in the Address Book by the user administrator. For information on specifying information to log in, see p.33 "Basic Authentication".

Specifying Which Functions are Available

This can be specified by the user administrator. Specify the functions available to registered users. By making this setting, you can limit the functions available to users. For information on how to specify which functions are available, see p.75 "Limiting Available Functions".

Ensuring Information Security

Printing confidential files

Using the Locked Print function, you can store files in the printer as confidential files and then print them. You can print a file using the printer's control panel and collect it on the spot to prevent others from seeing it. For details about printing confidential files, see p.57 "Printing a Confidential Document".

Protecting Registered Information in the Address Book

You can specify who is allowed to access the data in the Address Book. You can prevent the data in the Address Book being used by unregistered users.

To protect the data from unauthorized reading, you can also encrypt the data in the Address Book. For details about protecting registered information in the Address Book, see p.61 "Protecting the Address Book".

Managing Log Files

You can improve data security by deleting log files stored in the printer. By transferring the log files, you can check the history data and identify unauthorized access.

To transfer the log data, Remote Communication Gate S is required. For details about managing log files, see p.76 "Managing Log Files".

Encrypting Data on the Hard Disk

Encrypt data stored on the hard disk to prevent information leakage. To encrypt the stored data, the hard disk and the SD card supplied with the hard disk are required. For details, see p.63 "Encrypting Data on the Hard Disk".

Overwriting the Data on the Hard Disk

Before disposing of the printer, make sure all data on the hard disk is deleted. Prevent data leakage by automatically deleting transmitted printer jobs from the memory.

To overwrite the hard disk data, the hard disk and the SD card supplied with the hard disk are required. For details, see p.68 "Deleting Data on the Hard Disk".

Limiting and Controlling Access

Preventing Changes to Printer Settings

The printer settings that can be modified depend on the type of administrator account.

Register the administrators so that users cannot change the administrator settings. For details about Preventing Changes to Printer Settings, see p.73 "Preventing Changes to Printer Settings".

Limiting Available Functions

To prevent unauthorized operation, you can specify who is allowed to access each of the printer's functions. For details about limiting available functions for users and groups, see p.75 "Limiting Available Functions".

Enhanced Network Security

Preventing Unauthorized Access

You can limit IP addresses or disable ports to prevent unauthorized access over the network and protect the Address Book, stored files, and default settings. For details about preventing unauthorized access, see p.81 "Preventing Unauthorized Access".

Encrypting Transmitted Passwords

We recommend you use one or more of the following security protocols: IPsec, SNMPv3, and SSL. Using these protocols can enhance your printer's security to make login and IPP authentication passwords harder to break.

Also, encrypt the login password for administrator authentication and user authentication. For details about encrypting transmitted passwords, see p.92 "Encrypting Transmitted Passwords".

Safer Communication Using SSL, SNMPv3 and IPsec

You can encrypt this printer's transmissions using SSL, SNMPv3, and IPsec. By encrypting transmitted data and safeguarding the transmission route, you can prevent sent data from being intercepted,

analyzed, and tampered with. For details about safer communication using SSL, SNMPv3 and IPsec, see p.94 "Protection Using Encryption".

2. Configuring Administrator Authentication

This chapter describes authentication for administrators and its application.

Administrators

2

Administrators manage user access to the printer and various other important functions and settings.

When controlling access using the authentication method specified by an administrator, select the printer's administrator, enable the authentication function, and then use the printer.

The administrators manage access to the allocated functions, and users can use only the functions they are permitted to access. When the authentication function is enabled, the login user name and login password are required in order to use the printer. The roles of user administrator, machine administrator, network administrator, and file administrator can be assigned to separate administrators. Sharing administrator tasks eases the burden on individual administrators while also reducing the possibility of unauthorized access and operations. Multiple administrator roles can be assigned to one administrator, and one role can also be shared by more than one administrator. You can also specify a supervisor who can change each administrator's password. Administrators are limited to managing the printer's settings and controlling user access, so they cannot use normal functions such as printing. To use such functions, the administrator must be registered as an ordinary user in the Address Book and log in as that user.

For details about specifying a login user name and password, see p.35 "Specifying Login User Name and Login Password".

For instructions on registering the administrator, see p.24 "Registering the Administrator", and for instructions on changing the administrator's password, see p.143 "Supervisor Operations". For details on Users, see p.27 "Users".

★ Important

- **If user authentication is not possible because of a problem with the hard disk or network, you can use the printer by accessing it using administrator authentication and disabling user authentication. Do this if, for instance, you need to use the printer urgently.**

User Administrator

This is the administrator who manages personal information in the Address Book.

A user administrator can register/delete users in the Address Book or change users' personal information.

Users registered in the Address Book can also change and delete their own information.

If any of the users forget their password, the user administrator can delete it and create a new one, allowing the user to access the printer again.

For instructions on registering the user administrator, see p.24 "Registering the Administrator".

Machine Administrator

2

This administrator mainly manages the printer's default settings. You can set the printer so that the default for each function can only be specified by the machine administrator. By making this setting, you can prevent unauthorized people from changing the settings and allow the printer to be used securely by its many users.

For instructions on registering the machine administrator, see p.24 "Registering the Administrator".

Network Administrator

This administrator manages the network settings. You can set the printer so that network settings such as the IP address can only be specified by the network administrator.

By making this setting, you can prevent unauthorized users from changing the settings and disabling the printer, and thus ensure correct network operation.

For instructions on registering the network administrator, see p.24 "Registering the Administrator".

File Administrator

This administrator manages stored files and can specify and delete passwords for locked print and other files.

For instructions on registering the file administrator, see p.24 "Registering the Administrator".

Supervisor

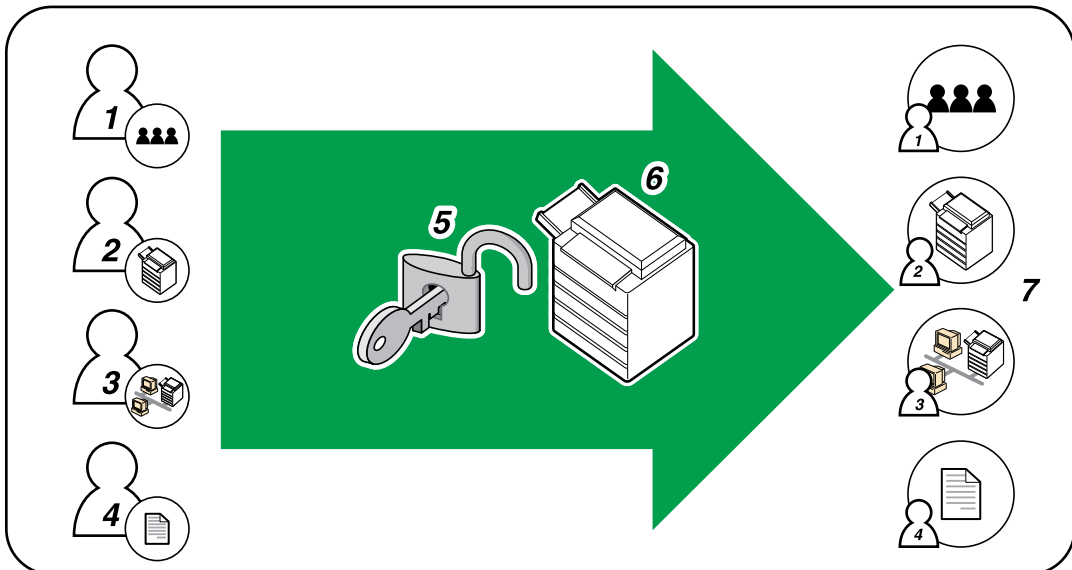
The supervisor can delete an administrator's password and specify a new one. The supervisor cannot specify defaults or use normal functions. However, if any of the administrators forget their password and cannot access the printer, the supervisor can provide support.

For instructions on registering the supervisor, see p.143 "Supervisor Operations".

About Administrator Authentication

There are four types of administrators: user administrator, machine administrator, network administrator, and file administrator.

For details about each administrator, see p.19 "Administrators".



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1. User Administrator

This administrator manages personal information in the Address Book. You can register/delete users in the Address Book or change users' personal information.

2. Machine Administrator

This administrator manages the printer's default settings. It is possible to enable only the machine administrator to set data security for Printing, log deletion and other defaults.

3. Network Administrator

This administrator manages the network settings. You can set the printer so that network settings such as the IP address and settings for sending and receiving e-mail can be specified by the network administrator only.

4. File Administrator

This administrator manages permission to access stored files. You can specify or delete passwords for stored files.

5. Authentication

Administrators must enter their login user names and passwords to be authenticated.

6. This Printer

7. Administrators manage the printer's settings and access limits.

2

Enabling Administrator Authentication

To control administrators' access to the printer, perform administrator authentication using login user names and passwords. When registering an administrator, you cannot use a login user name already registered in the Address Book. Administrators are handled differently from the users registered in the Address Book. Windows Authentication, LDAP Authentication and Integration Server Authentication are not performed for an administrator, so an administrator can log in even if the server is unreachable due to a network problem. Each administrator is identified by a login user name. One person can act as more than one type of administrator if multiple administrator authorities are granted to a single login user name. For instructions on registering the administrator, see p.24 "Registering the Administrator".

You can specify the login user name, login password, and encryption password for each administrator. The encryption password is used for encrypting data transmitted via SNMPv3. It is also used by applications that use SNMPv3 such as Web Image Monitor and SmartDeviceMonitor for Admin.

Administrators are limited to managing the printer's settings and controlling user access, so they cannot use normal functions including printing.

To use these functions, the administrator must register as a user in the Address Book and then be authenticated as the user. Specify administrator authentication, and then specify user authentication. For details about specifying authentication, see p.29 "Configuring User Authentication".

Note

- Administrator authentication can be specified via Web Image Monitor. For details see Web Image Monitor Help.

Using Web Image Monitor to Configure Administrator Authentication

Using Web Image Monitor, you can log in to the printer and change the administrator settings. This section describes how to access Web Image Monitor.

For details about using Web Image Monitor, see "Using Web Image Monitor", Software Guide.

Logging in (Administrator mode)

1. Start your Web browser.
2. Enter "http://(printer's IP address)/" in the address bar of a Web browser.

If the printer's host name has been registered on the DNS or WINS server, you can enter it.

When setting SSL, a protocol for encrypted communication, under environment which server authentication is issued, enter "https://(printer's IP address)/".

3. Click [Login].

4. Enter a login user name and password, and then click [Login].

The Web browser might be configured to auto complete login dialog boxes by retaining user names and passwords. This function reduces security. To prevent the browser retaining user names and passwords, disable the browser's auto complete function.

To use the default account, enter "admin" as the user name, and leave the password blank.

↓ Note

- The procedure may differ depending on the Web browser used.

Logging out (Administrator mode)

1. Click [Logout] to log out.

↓ Note

- After you have made the settings you require, always click [Logout].

Specifying Administrator Privileges

To specify administrator authentication, set Administrator Authentication Management to [On]. In addition, if enabled in the settings, you can choose how the initial settings are divided among the administrators as controlled items.

To log in as an administrator, use the default login user name and login password.

By default, the login name is "admin" and the password is empty. For details about changing the administrator password using the supervisor's authority, see p.143 "Supervisor Operations".

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

★ Important

- If you have enabled [Administrator Authentication Management], make sure not to forget the administrator login user name and login password. If an administrator login user name or login password is forgotten, a new password must be specified using the supervisor's authority.
- Be sure not to forget the supervisor login user name and login password. If you do forget them, a service representative will have to return the printer to its default state. This will result in all data in the printer being lost. Charges may also apply to the service call.

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area.
3. Click [Administrator Authentication Management] in the "Device Settings" category.

4. Select [User Administrator Authentication], [Machine Administrator Authentication], [Network Administrator Authentication], or [File Administrator Authentication], and then Click [OK].
5. Click [Logout].
6. Close Web Image Monitor.

2

Registering the Administrator

If administrator authentication has been specified, we recommend only one person take each administrator role.

The sharing of administrator tasks eases the burden on individual administrators while also limiting unauthorized operation by a single administrator. You can register up to four login user names (Administrators 1-4) to which you can grant administrator privileges.

Administrator authentication can also be specified via Web Image Monitor. For details, see Web Image Monitor Help.

If administrator authentication has already been specified, log in using a registered administrator name and password.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area.
3. Click [Program/Change Administrator] in the "Device Settings" category.
4. Select the administrator type and administrator number.
5. Enter the [Login User Name] of the selected administrator number.
6. Click [Change] in the "Login Password" area.
7. Enter the password.
8. Re-enter the same password, and then click [OK].
9. Click [Change] in the "Encryption Password" area.
10. Enter the password.
11. Re-enter the same password, and then click [OK].
12. Click [OK].
13. Click [Logout].
14. Close Web Image Monitor.

Note

- You can use up to 32 alphanumeric characters and symbols when registering login user names and login passwords. Keep in mind that passwords are case-sensitive.
- User names cannot contain numbers only, a space, colon (:), or quotation mark ("), nor can they be left empty.
- Do not use Japanese, Traditional Chinese, Simplified Chinese, or Hangul double-byte characters when entering the login user name or password. If you use multi-byte characters when entering the login user name or password, you cannot authenticate using Web Image Monitor.

Logging in Using Administrator Authentication

If administrator authentication has been specified, log in using an administrator's user name and password.

1. Press the [Menu] key.
2. Press [Login].
3. Enter the login user name, and then press the [OK] key.

When you log in to the printer for the first time as the administrator, enter "admin".

4. Enter the login password, and then press the [OK] key.

If assigning the administrator for the first time, press the [OK] key. without entering login password.

[Authenticating... Please wait.] appears, followed by the screen for specifying the default.

Logging out Using Administrator Authentication

If administrator authentication has been specified, be sure to log out after completing settings.

1. Press the [Menu] key.
2. Press [Logout].
3. Press [Yes].

Changing the Administrator

Change the administrator's login user name and login password. You can also assign administrator authority to the login user names [Administrator 1] to [Administrator 4]. To combine the authorities of multiple administrators, assign multiple administrators to a single administrator.

For example, to assign machine administrator authority and user administrator authority to [Administrator 1], select [Administrator 1] in the lines for the machine administrator and the user administrator.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area.
3. Click [Program/Change Administrator] in the "Device Settings" category.
4. Select [Administrator 1], [Administrator 2], [Administrator 3], or [Administrator 4], and then click [OK].

If you would like to have one administrator to carry out multiple administrative works, select a single account for different types of administrator.

5. Click [Logout].
6. Close Web Image Monitor.

↓ Note

- An administrator's privileges can only be changed by an administrator with the relevant privileges.
- Administrator privileges cannot be revoked by any single administrator.

3. Configuring User Authentication

This chapter describes authentication for users and its application.

Users

A user performs normal operations on the printer, such as printing. Users are managed using the personal information in the printer's Address Book, and can use only the functions they are permitted to access by administrators.

By enabling user authentication, you can restrict usage of the printer to users who are registered in the Address Book only. The user administrator can manage user permissions through the Address Book.

For details about administrator capabilities, see p.19 "Administrators". For details about registering users in the Address Book, see Web Image Monitor Help.

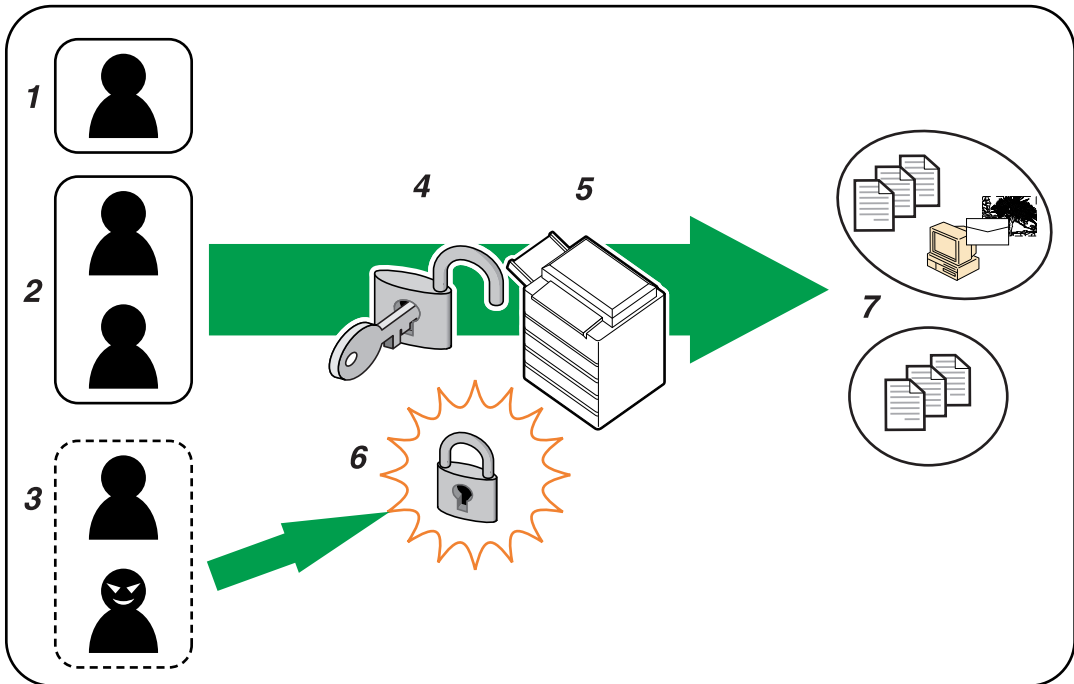
Important

- If user authentication is not possible because of a problem with the hard disk or network, you can use the printer by accessing it using administrator authentication and disabling user authentication. Do this if, for instance, you need to use the printer urgently.

About User Authentication

This printer has an authentication function to prevent unauthorized access.

By using login user name and login password, you can specify access limits for individual users and groups of users.



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1. User

A user performs normal operations on the printer including printing.

2. Group

A group performs normal operations on the printer including printing.

3. Unauthorized User

4. Authentication

Using a login user name and password, user authentication is performed.

5. This Printer

6. Access Limit

Using authentication, unauthorized users are prevented from accessing the printer.

7. Authorized users and groups can use only those functions permitted by the administrator.

Configuring User Authentication

Specify administrator authentication and user authentication according to the following chart:

Administrator authentication	<p>p.23 "Specifying Administrator Privileges"</p> <p>p.24 "Registering the Administrator"</p>
User authentication	<p>p.30 "Enabling User Authentication"</p> <p>Specifying User Authentication</p> <ul style="list-style-type: none"> • p.31 "User Code Authentication" • p.33 "Basic Authentication" • p.36 "Windows Authentication" • p.43 "LDAP Authentication" • p.47 "Integration Server Authentication"

↓ Note

- To specify Basic Authentication, Windows Authentication, LDAP Authentication, or Integration Server Authentication, you must first specify administrator authentication.
- You can specify User Code Authentication without specifying administrator authentication.

Enabling User Authentication

To control users' access to the printer, perform user authentication using login user names and passwords. There are five types of user authentication methods: User Code authentication, Basic authentication, Windows authentication, LDAP authentication, and Integration Server authentication. To use user authentication, select an authentication method using Web Image Monitor, and then make the required settings for the authentication. The settings depend on the authentication method. Specify administrator authentication, and then specify user authentication.

★ Important

- **To perform Basic Authentication, Windows Authentication, LDAP Authentication, and Integration Server Authentication, the optional hard disk must be installed.**

↓ Note

- Up to 200 users can be registered for authentication.
- User Code authentication is used for authenticating on the basis of a user code, and Basic authentication, Windows authentication, LDAP authentication, and Integration Server authentication are used for authenticating individual users.
- A user code account, that has no more than eight digits and is used for User Code authentication, can be carried over and used as a login user name even after the authentication method has switched from User Code authentication to Basic authentication, Windows authentication, LDAP authentication, or Integration Server authentication. In this case, since the User Code authentication does not have a password, the login password is empty.
- When authentication switches to an external authentication method (Windows authentication, LDAP authentication, or Integration Server authentication), authentication will not occur, unless the external authentication device has the carried over user code account previously registered. However, the user code account will remain in the Address Book of the printer despite an authentication failure. From a security perspective, when switching from User Code authentication to another authentication method, we recommend that you delete accounts you are not going to use, or set up a login password. For details about deleting accounts, see Web Image Monitor Help. For details about changing passwords, see p.35 "Specifying Login User Name and Login Password".
- You cannot use more than one authentication method at the same time.

User Code Authentication

This is an authentication method for limiting access to functions according to a user code. The same user code can be used by more than one user. For details about specifying user codes, see Web Image Monitor Help.

For details about specifying the user code for the printer driver, see Software Guide or the printer driver Help.

★ Important

- To control the use of DeskTopBinder for the delivery of files stored in the printer, select Basic Authentication, Windows Authentication, LDAP Authentication, or Integration Server Authentication.

3

Specifying User Code Authentication

This can be specified by the machine administrator.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area.
3. Click [Administrator Authentication Management] in the "Device Settings" category.
4. Click [On] in the "Machine Administrator Authentication" area, and then click [OK].
5. Click [User Authentication Management] in the "Device Settings" category.
6. Select [User Code] in the "User Authentication Management" list.
7. Select the "Printer Job Authentication" level.

If you select [Entire] or [Simple (All)], proceed to "Selecting Entire or Simple (All)".

If you select [Simple (Limitation)], proceed to "Selecting Simple (Limitation)".

For a description of the printer job authentication levels, see p.50 "Printer Job Authentication".

↓ Note

- You can specify User Code Authentication without specifying administrator authentication.
- [Parallel Interface (Simple)] menu only appears when the optional IEEE 1284 interface board is installed.

Selecting Entire or Simple (All)

If you select [Entire], you cannot print using a printer driver or a device that does not support authentication. To print under an environment that does not support authentication, select [Simple (All)] or [Simple (Limitation)].

If you select [Simple (All)], you can print even with unauthenticated printer drivers or devices. Specify this setting if you want to print with a printer driver or device that cannot be identified by the printer or if you do not require authentication for printing. However, note that, because the printer does not require authentication in this case, it may be used by unauthorized users.

1. Select [Available Functions].

Select [Black & White] or [PC Control] when enabling printing.

2. Click [OK].

3. Click [Logout].

4. Close Web Image Monitor.

3

Selecting Simple (Limitation)

If you select [Simple (Limitation)], you can specify clients for which printer job authentication is not required. Specify [Parallel Interface (Simple)], [USB (Simple)] and the clients' IPv4 address range in which printer job authentication is not required. Specify this setting if you want to print using unauthenticated printer drivers or without any printer driver. Authentication is required for printing with non-specified devices.

1. Select [Simple (Limitation)], and enter [Limitation Range].

Specify the range in which [Simple (Limitation)] is applied to "Printer Job Authentication".

If you specify IPv4 or IPv6 address range, proceed to step 2.

If you specify [Parallel Interface (Simple)], proceed to step 3.

If you specify [USB (Simple)], proceed to step 4.

2. Select [IPv4 Address 1], [IPv4 Address 2], [IPv4 Address 3], [IPv4 Address 4], or [IPv4 Address 5] and then enter the IPv4 address on the "Limitation Range (IPv4)" area.

Be sure the number you enter for End IPv4 Address is larger than that for Start IPv4 Address.

If you want to use IPv6, specify the IPv6 address in the "Limitation Range (IPv6)" area.

3. Select [Apply] in the "Parallel Interface (Simple)" area.

4. Select [Apply] in the "USB (Simple)" area.

5. Click [OK].

6. Click [Logout].

7. Close Web Image Monitor.

Basic Authentication

Specify this authentication method when using the printer's Address Book to authenticate each user. Using Basic authentication, you cannot only manage the printer's available functions but also limit access to stored files and to the personal data in the Address Book. Under Basic authentication, the administrator must specify the functions available to each user registered in the Address Book.

To perform Basic Authentication, the optional hard disk must be installed.

Specifying Basic Authentication

3

This can be specified by the machine administrator.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Configuration] in the Menu area.**
3. **Click [Administrator Authentication Management] in the "Device Settings" category.**
4. **Click [On] in the "User Administrator Authentication" area, and then click [OK].**
5. **Click [User Authentication Management], and then select [Basic Authentication] in the "User Authentication Management" list.**
6. **Select the "Printer Job Authentication" level.**

If you select [Entire] or [Simple (All)], proceed to "Selecting Entire or Simple (All)".

If you select [Simple (Limitation)], proceed to "Selecting Simple (Limitation)".

For a description of the printer job authentication levels, see p.50 "Printer Job Authentication".

↓ Note

- [Parallel Interface (Simple)] menu only appears when the optional IEEE 1284 interface board is installed.

Selecting Entire or Simple (All)

If you select [Entire], you cannot print using a printer driver or a device that does not support authentication. To print under an environment that does not support authentication, select [Simple (All)] or [Simple (Limitation)].

If you select [Simple (All)], you can print even with unauthenticated printer drivers or devices. Specify this setting if you want to print with a printer driver or device that cannot be identified by the printer or if you do not require authentication for printing. However, note that, because the printer does not require authentication in this case, it may be used by unauthorized users.

1. Select [Available Functions].

Clear the [Black & White] check box when you want to limit printing.

2. Click [OK].

3. Click [Logout].

4. Close Web Image Monitor.

Selecting Simple (Limitation)

3

If you select [Simple (Limitation)], you can specify clients for which printer job authentication is not required. Specify [Parallel Interface (Simple)], [USB (Simple)] and the clients' IPv4 address range in which printer job authentication is not required. Specify this setting if you want to print using unauthenticated printer drivers or without any printer driver. Authentication is required for printing with non-specified devices.

1. Select [Simple (Limitation)], and enter [Limitation Range].

Specify the range in which [Simple (Limitation)] is applied to "Printer Job Authentication".

If you specify IPv4 or IPv6 address range, proceed to step 2.

If you specify [Parallel Interface (Simple)], proceed to step 3.

If you specify [USB (Simple)], proceed to step 4.

2. Select [IPv4 Address 1], [IPv4 Address 2], [IPv4 Address 3], [IPv4 Address 4], or [IPv4 Address 5] and then enter the IPv4 address on the "Limitation Range (IPv4)" area.

Be sure the number you enter for End IPv4 Address is larger than that for Start IPv4 Address.

If you want to use IPv6, specify the IPv6 address in the "Limitation Range (IPv6)" area.

3. Click [Apply] in the "Parallel Interface (Simple)" area.

4. Click [Apply] in the "USB (Simple)" area.

5. Click [OK].

6. Click [Logout].

7. Close Web Image Monitor.

Authentication Information Stored in the Address Book

This can be specified by the user administrator.

For details about logging in and logging out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

If you have specified User Authentication, you can specify access limits for individual users and groups of users. Specify the setting in the Address Book for each user.

For details about specifying available functions for individuals or groups, see p.75 "Limiting Available Functions".

Users must have a registered account in the Address Book in order to use the printer when User Authentication is specified. For details about user registration, see Web Image Monitor Help.

Specifying Login User Name and Login Password

In Address Book Management, specify the login user name and login password to be used for User Authentication Management.

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Address Book] in the Menu area.**
3. **Select the user you want to specify, and then click [Change].**
You can search using "Name", "Registration No.", or "User Code".
4. **Enter the "Login User Name" in the "Authentication Info at Login" area in the "Authentication Information" area.**
5. **Click [Change] in the "Login Password" area.**
6. **Enter the login password, and then click [OK].**
7. **Specify "Available Function".**
The initial value is set at Basic Authentication. If the value is reset, the previous value will be overwritten.
8. **Click [Change] in "Access Privilege" in the "Protect Destination" area in the "Protection" area.**
9. **Select the usable level on both "Public" and "User/Group", and then click [OK].**
To add the changed user to the group, click [Change] in the "Add User" area, and then click [OK].
10. **Click [Back].**
11. **Click [Logout].**
12. **Close Web Image Monitor.**

↓ Note

- Login user names and passwords can contain both alphanumeric characters and symbols.
- Login user names can contain up to 32 characters; passwords can contain up to 128 characters.
- Login user names cannot contain spaces, colons or quotation marks, and cannot be left blank.

Windows Authentication

Specify this authentication when using the Windows domain controller to authenticate users who have their accounts on the directory server. Users cannot be authenticated if they do not have their accounts in the directory server. Under Windows authentication, you can specify the access limit for each group registered in the directory server. The Address Book stored in the directory server can be registered to the printer, enabling user authentication without first using the printer to register individual settings in the Address Book.

Windows authentication can be performed using one of two authentication methods: NTLM or Kerberos authentication. The operational requirements for both methods are listed below.

To perform Windows Authentication, the optional hard disk must be installed.

3

Operational Requirements for NTLM authentication

To specify NTLM authentication, the following requirements must be met:

- This machine supports NTLMv1 authentication and NTLMv2 authentication.
- A domain controller must be set up in a designated domain.
- This function is supported by the operating systems listed below. To obtain user information when running Active Directory, use LDAP. If SSL is being used, a version of Windows that supports TLS v1, SSL v2, or SSL v3 is required.
 - Windows Server 2003/2003 R2/2008/2008 R2

Operational Requirements for Kerberos authentication

To specify Kerberos authentication, the following requirements must be met:

- A domain controller must be set up in a designated domain.
- The operating system must be able to support KDC (Key Distribution Center). To obtain user information when running Active Directory, use LDAP. If SSL is being used, a version of Windows that supports TLSv1, SSLv2, or SSLv3 is required. Compatible operating systems are listed below.
 - Windows Server 2003/2003 R2/2008/2008 R2
 - To use Kerberos authentication under Windows Server 2008, Service Pack 2 or later must be installed.

★ Important

- During Windows Authentication, data registered in the directory server, such as the user's name, is automatically registered in the printer. If user information on the server is changed, information registered in the printer may be overwritten when authentication is performed.
- Users managed in other domains are subject to user authentication, but they cannot obtain items such as user's name.
- If you have created a new user in the domain controller and selected "User must change password at next logon", log in to the printer from the computer to change the password before logging in from the printer's control panel.

- If the authenticating server only supports NTLM when Kerberos authentication is selected on the printer, the authenticating method will automatically switch to NTLM.

↓ Note

- Enter the login password correctly; keeping in mind that it is case-sensitive.
- The first time you access the printer, you can use the functions available to your group. If you are not registered in a group, you can use the functions available under [*Default Group]. To limit which functions are available to which users, first make settings in advance in the Address Book.
- When accessing the printer subsequently, you can use all the functions available to your group and to you as an individual user.
- Users who are registered in multiple groups can use all the functions available to those groups.
- A user registered in two or more global groups can use all the functions available to members of those groups.
- If the "Guest" account on the Windows server is enabled, even users not registered in the domain controller can be authenticated. When this account is enabled, users are registered in the Address Book and can use the functions available under [*Default Group].
- To enable Kerberos authentication, you must first register a Kerberos realm. The realm name can contain capital letters only. For details about registering a Kerberos realm, see Web Image Monitor Help.

Specifying Windows Authentication

Before beginning to configure the printer, make sure that administrator authentication is properly configured under "Administrator Authentication Management".

This can be specified by the machine administrator.

To enable Kerberos authentication, a realm must be registered. The realm name must be registered in capital letters.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area.
3. Click [Administrator Authentication Management] in the "Device Settings" category.
4. Click [On] in the "Machine Administrator Authentication" area, and then click [OK].
5. Click [User Authentication Management] in the "Device Settings" category.
6. Select "Windows Authentication" in the "User Authentication Management" list.
7. If you want to use Kerberos authentication, click [On].

If you want to use NTLM authentication, click [Off] and proceed to step 9.

8. Select Kerberos authentication realm and proceed to step 10.

To enable Kerberos authentication, a realm must be registered beforehand. The realm name must be registered in capital letters. For details about registering a realm, see Web Image Monitor Help.

Up to 5 realms can be registered and selected.

9. Enter the name of the domain controller to be authenticated in the [Domain Name] box.

When you specify the domain name in the Fully Qualified Domain Name format, enter "." at the end of the character string.

In addition, depending on your environment, you can enter the group name in the blank area of the "Group Settings for Windows Authentication" box, and then specify the printer functions available.

10. Select the "Printer Job Authentication" level.

If you select [Entire] or [Simple (All)], proceed to "Selecting Entire or Simple (All)".

If you select [Simple (Limitation)], proceed to "Selecting Simple (Limitation)".

For a description of the printer job authentication levels, see p.50 "Printer Job Authentication".

3

Selecting Entire or Simple (All)

If you select [Entire], you cannot print using a printer driver or a device that does not support authentication. To print in an environment that does not support authentication, select [Simple (All)] or [Simple (Limitation)].

If you select [Simple (All)], you can print even with unauthenticated printer drivers or devices. Specify this setting if you want to print with a printer driver or device that cannot be identified by the printer or if you do not require authentication for printing. However, note that, because the printer does not require authentication in this case, it may be used by unauthorized users.

1. Click [On] in the "SSL" area.

If you are not using secure sockets layer (SSL) for authentication, press [Off].

If global groups have been registered under Windows server, you can limit the use of functions for each global group.

You need to create global groups in the Windows server in advance and register in each group the users to be authenticated.

You also need to register in the printer the functions available to the global group members.

Create global groups in the printer by entering the names of the global groups registered in the Windows Server. (Keep in mind that group names are case sensitive.) Then specify the printer functions available to each group.

If global groups are not specified, users can use the available functions specified in "*Default Group". If global groups are specified, users not registered in global groups can use the available functions specified in "*Default Group". By default, all functions are available to "*Default Group" members. Specify the limitation on available functions according to user needs.

2. Click [On] in the "Windows Authentication Settings" area.

In addition, depending on your environment, you can enter the group name in the blank area of the "Group Settings for Windows Authentication" box, and then specify the printer functions.

Windows Authentication will be applied to the selected functions.

Users can use the selected functions only.

3. Click [OK].

4. Click [Logout].

5. Close Web Image Monitor.

↓ Note

- Under Windows Authentication, you can select whether or not to use secure sockets layer (SSL) authentication.
- To automatically register user information under Windows authentication, it is recommended that communication between the printer and domain controller be encrypted using SSL.
- Under Windows Authentication, you do not have to create a server certificate unless you want to automatically register user information using SSL.

Selecting Simple (Limitation)

If you select [Simple (Limitation)], you can specify clients for which printer job authentication is not required. Specify [Parallel Interface (Simple)], [USB (Simple)] and the clients' IPv4 address range in which printer job authentication is not required. Specify this setting if you want to print using unauthenticated printer drivers or without any printer driver. Authentication is required for printing with non-specified devices.

1. Select [Simple (Limitation)] in the "Printer Job Authentication" area in the "Printer Job Authentication Settings" area.

Specify the range in which [Simple (Limitation)] is applied to Printer Job Authentication.

If you specify IPv4 or IPv6 address range, proceed to step 2.

If you specify [Parallel Interface (Simple)], proceed to step 3.

If you specify [USB (Simple)], proceed to step 4.

2. Select [IPv4 Address 1], [IPv4 Address 2], [IPv4 Address 3], [IPv4 Address 4], or [IPv4 Address 5] and then enter the IPv4 address on the "Limitation Range (IPv4)" area.

Be sure the number you enter for End IPv4 Address is larger than that for Start IPv4 Address.

If you want to use IPv6, specify the IPv6 address in the "Limitation Range (IPv6)" area.

3. Click [Apply] in the "Parallel Interface (Simple)" area.

4. Click [Apply] in the "USB (Simple)" area.

5. Click [On] in the "SSL" area.

If you are not using secure sockets layer (SSL) for authentication, click [Off].

3

If global groups have been registered under Windows server, you can limit the use of functions for each global group.

You need to create global groups in the Windows server in advance and register in each group the users to be authenticated.

You also need to register in the printer the functions available to the global group members.

Create global groups in the printer by entering the names of the global groups registered in the Windows Server. (Keep in mind that group names are case sensitive.) Then specify the printer functions available to each group.

If global groups are not specified, users can use the available functions specified in "*Default Group". If global groups are specified, users not registered in global groups can use the available functions specified in "*Default Group". By default, all functions are available to "*Default Group" members. Specify the limitation on available functions according to user needs.

In addition, depending on your environment, you can enter the group name in the blank area of the "Group Settings for Windows Authentication" box, and then specify the printer functions.

Windows Authentication will be applied to the selected functions.

Users can use the selected functions only.

6. Click [OK].

7. Click [Logout].

8. Close Web Image Monitor.

Note

- Under Windows Authentication, you can select whether or not to use secure sockets layer (SSL) authentication.
- To automatically register user information under Windows authentication, it is recommended that communication between the printer and domain controller be encrypted using SSL.
- Under Windows Authentication, you do not have to create a server certificate unless you want to automatically register user information using SSL.

Installing Internet Information Services (IIS) and Certificate services

Specify this setting if you want the printer to automatically obtain user information registered in Active Directory.

We recommended you install Internet Information Services (IIS) and Certificate services as the Windows components.

Install the components, and then create the server certificate.

If they are not installed, install them as follows:

Windows Server 2008 R2 is used to illustrate the procedure.

1. On the [Start] menu, point to [Administrator Tools], and then click [Server Manager].

2. Click [Roles] in the left column, click [Add Roles] from the [Action] menu.
3. Click [Next>].
4. Select the "Web Server (IIS)" and "Active Directory Certificate Services" check boxes, and then click [Next>].
5. Read the content information, and then click [Next>].
6. Confirm that [Certification Authority] is checked, and then click [Next>].
7. Select [Enterprise], and then click [Next>].
8. Select [Root CA], and then click [Next>].
9. Select [Create a new private key], and then click [Next>].
10. Select a cryptographic service provider, key length, and hash algorithm to create new private key, and then click [Next>].
11. In "Common name for this CA:", enter the Certificate Authority name, and then click [Next>].
12. Select the validity period, and then click [Next>].
13. Leave the "Certificate database location:" and the "Certificate database log location:" settings set to their defaults, and then click [Next>].
14. Read the notes, and then click [Next>].
15. Select the role service you want to use, and then click [Next>].
16. Click [Install].
17. When the installation is complete, click [Close].
18. Close [Server Manager].

Creating the Server Certificate

After installing Internet Information Services (IIS) and Certificate services Windows components, create the Server Certificate as follows:

Windows Server 2008 R2 is used to illustrate the procedure.

1. On the [Start] menu, point to [Administrator Tools], and then click [Internet Information Services (IIS) Manager].
2. In the left column, click the server name, and then double-click [Server Certificates].
3. In the right column, click [Create Certificate Request...].
4. Enter all the information, and then click [Next].
5. In "Cryptographic service provider:", select a server, and then click [Next].
6. Click [...], and then specify a file name for the certificate request.
7. Specify a location in which to store the file, and then click [Open].
8. Close [Internet Information Services (IIS) Manager] by clicking [Finish].

Installing the Device Certificate (Certificate Issued by a Certificate Authority)

This can be specified by the network administrator.

Enter the device certificate contents issued by the certificate authority. Installation of the certificate is especially necessary for users who want to print via IPP -SSL from Windows Vista/7 or Windows Server 2008/2008 R2.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

3

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area, and then click [Device Certificate] under "Security" category.
3. Check the radio button next to the number of the certificate you want to install.
4. Click [Install].
5. Enter the contents of the device certificate.

In the Certificate box, enter the contents of the device certificate issued by the certificate authority.

6. Click [OK].
7. Wait a moment for the device to restart, and then click [OK].

"Installed" appears under "Certificate Status" to show that a device certificate for the printer has been installed.

8. Click [Logout].
9. Close Web Image Monitor.

↓ Note

- If a certificate authority issues a certificate that must be authenticated by an intermediate certificate authority, and the certificate is installed on this printer, an intermediate certificate must be installed on the client computer. Otherwise, validation by the certificate authority will not be performed correctly. If validation cannot be performed properly, a warning message informing you that installation is not possible might appear when you try to add a printer using IPP-SSL under Windows Vista/7 or Windows Server 2008/2008 R2. A warning message might also appear if you attempt to access this printer through Web Image Monitor with SSL enabled. To enable authentication from the client computer, install the intermediate certificate on the client computer, and then reestablish connection.
- Intermediate certificates cannot be installed on this printer.

LDAP Authentication

Specify this authentication method when using the LDAP server to authenticate users who have their accounts on the LDAP server. Users cannot be authenticated if they do not have their accounts on the LDAP server. The Address Book stored in the LDAP server can be registered to the printer, enabling user authentication without first using the printer to register individual settings in the Address Book. When using LDAP authentication, to prevent the password information being sent over the network unencrypted, it is recommended that communication between the printer and LDAP server be encrypted using SSL. You can specify on the LDAP server whether or not to enable SSL. To do this, you must create a server certificate for the LDAP server.

Using Web Image Monitor, you can specify whether or not to check the reliability of the connecting SSL server. For details about specifying LDAP authentication using Web Image Monitor, see Web Image Monitor Help.

To perform LDAP Authentication, the optional hard disk must be installed.

★ Important

- During LDAP authentication, the data registered in the LDAP server, such as the user's name, is automatically registered in the printer. If user information on the server is changed, information registered in the printer may be overwritten when authentication is performed.
- Under LDAP authentication, you cannot specify access limits for groups registered in the LDAP server.
- Enter the user's login user name using up to 128 characters, and then enter the user's login password using up to 128 characters. Make sure the first 32 characters of the login user name are unique.
- Do not use double-byte Japanese, Traditional Chinese, Simplified Chinese, or Hangul characters when entering the login user name or password. If you use double-byte characters, you cannot authenticate using Web Image Monitor.

Operational Requirements for LDAP Authentication

To specify LDAP authentication, the following requirements must be met:

- The network configuration must allow the printer to detect the presence of the LDAP server.
- When SSL is being used, TLSv1, SSLv2, or SSLv3 can function on the LDAP server.
- The LDAP server must be registered in the printer.
- When registering the LDAP server, the following setting must be specified.
 - Server Name
 - Search Base
 - Port Number
 - SSL Communication
 - Authentication
Select Kerberos, DIGEST, or Cleartext authentication.

- User Name

You do not have to enter the user name if the LDAP server supports "Anonymous Authentication".

- Password

You do not have to enter the password if the LDAP server supports "Anonymous Authentication".

Note

- When you select Cleartext authentication, LDAP Simplified authentication is enabled. Simplified authentication can be performed with a user attribute (such as cn, or uid), instead of the DN.
- In LDAP simple authentication mode, authentication will fail if the password is left blank. To allow blank passwords, contact your service representative.
- Under LDAP Authentication, if "Anonymous Authentication" in the LDAP server's settings is not set to Prohibit, users who do not have an LDAP server account might still be able to gain access.
- If the LDAP server is configured using Windows Active Directory, "Anonymous Authentication" might be available. If Windows authentication is available, we recommend you use it.
- The first time an unregistered user accesses the printer after LDAP authentication has been specified, the user is registered in the printer and can use the functions available under "Available Functions" during LDAP Authentication. To limit the available functions for each user, register each user and corresponding "Available Functions" setting in the Address Book, or specify "Available Functions" for each registered user. The "Available Functions" setting becomes effective when the user accesses the printer subsequently.
- To enable Kerberos for LDAP authentication, you must first register a Kerberos realm. The realm name can contain capital letters only. For details about registering a Kerberos realm, see Web Image Monitor Help.

Specifying LDAP Authentication

This can be specified by the machine administrator.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Configuration] in the Menu area.**
3. **Click [Administrator Authentication Management] in the "Device Settings" category.**
4. **Click [On] in the "Machine Administrator Authentication" area, and then click [OK].**
5. **Click [User Authentication Management] in the "Device Settings" category.**
6. **Select [LDAP Authentication] in the "User Authentication Management" list.**

7. Select the "Printer Job Authentication" level.

If you select [Entire] or [Simple (All)], proceed to "Selecting Entire or Simple (All)".

If you select [Simple (Limitation)], proceed to "Selecting Simple (Limitation)".

For a description of the printer job authentication levels, see p.50 "Printer Job Authentication".

Selecting Entire or Simple (All)

If you select [Entire], you cannot print using a printer driver or a device that does not support authentication. To print under an environment that does not support authentication, select [Simple (All)] or [Simple (Limitation)].

If you select [Simple (All)], you can print even with unauthenticated printer drivers or devices. Specify this setting if you want to print with a printer driver or device that cannot be identified by the printer or if you do not require authentication for printing. However, note that, because the printer does not require authentication in this case, it may be used by unauthorized users.

1. Enter the "Login Name Attribute" in the "LDAP Authentication Settings" area.

You can use the Login Name Attribute as a search criterion to obtain information about an authenticated user. You can create a search filter based on the Login Name Attribute, select a user, and then retrieve the user information from the LDAP server so it is transferred to the printer's address book. The method for selecting the user name depends on the server environment. Check the server environment and enter the user name accordingly.

2. Enter the "Unique Attribute".

Specify Unique Attribute on the printer to match the user information in the LDAP server with that in the printer. By doing this, if the Unique Attribute of a user registered in the LDAP server matches that of a user registered in the printer, the two instances are treated as referring to the same user. You can enter an attribute such as "serialNumber" or "uid". Additionally, you can enter "cn" or "employeeNumber", provided it is unique. If you do not specify the Unique Attribute, an account with the same user information but with a different login user name will be created in the printer.

3. Click [OK].

4. Click [Logout].

5. Close Web Image Monitor.

Selecting Simple (Limitation)

If you select [Simple (Limitation)], you can specify clients for which printer job authentication is not required. Specify [Parallel Interface (Simple)], [USB (Simple)] and the clients' IPv4 address range in which printer job authentication is not required. Specify this setting if you want to print using unauthenticated printer drivers or without any printer driver. Authentication is required for printing with non-specified devices.

1. Select [Simple (Limitation)] in the "Printer Job Authentication" list in the "Printer Job Authentication Settings" area.

Specify the range in which [Simple (Limitation)] is applied to Printer Job Authentication.

If you specify IPv4 or IPv6 address range, proceed to step 2.

If you specify [Parallel Interface (Simple)], proceed to step 3.

If you specify [USB (Simple)], proceed to step 4.

2. Select [IPv4 Address 1], [IPv4 Address 2], [IPv4 Address 3], [IPv4 Address 4], or [IPv4 Address 5], and then enter the IPv4 address in the "Limitation Range (IPv4)" area.

Be sure the number you enter for End IPv4 Address is larger than that for Start IPv4 Address.

If you want to use IPv6, specify the IPv6 address in the "Limitation Range (IPv6)" area.

3. Click [Apply] in the "Parallel Interface (Simple)" area.

4. Click [Apply] in the "USB (Simple)" area.

5. Enter the "Login Name Attribute" in the "LDAP Authentication Settings" area.

You can use the Login Name Attribute as a search criterion to obtain information about an authenticated user. You can create a search filter based on the Login Name Attribute, select a user, and then retrieve the user information from the LDAP server so it is transferred to the printer's address book. The method for selecting the user name depends on the server environment. Check the server environment and enter the user name accordingly.

6. Enter the "Unique Attribute".

Specify Unique Attribute on the printer to match the user information in the LDAP server with that in the printer. By doing this, if the Unique Attribute of a user registered in the LDAP server matches that of a user registered in the printer, the two instances are treated as referring to the same user. You can enter an attribute such as "serialNumber" or "uid". Additionally, you can enter "cn" or "employeeNumber", provided it is unique. If you do not specify the Unique Attribute, an account with the same user information but with a different login user name will be created in the printer.

7. Click [OK].

8. Click [Logout].

9. Close Web Image Monitor.

Integration Server Authentication

To use Integration Server authentication, you need a server on which The ScanRouter delivery software that supports authentication is installed.

For external authentication, the Integration Server authentication collectively authenticates users accessing the server over the network, providing a server-independent, centralized user authentication system that is safe and convenient.

For example, if the delivery server and the printer share the same Integration Server authentication, single sign-on is possible using DeskTopBinder.

To perform Integration Server authentication, the optional hard disk must be installed.

To use Integration Server authentication., access to a server on which ScanRouter System or Remote Communication Gate S and Authentication Manager are installed, other than the printer, is required. For details about the software, contact your sales representative.

Using Web Image Monitor, you can specify that the server reliability and site certificate are checked every time you access the SSL server.

★ Important

- During Integration Server authentication, the data registered in the server, such as the user's name, is automatically registered in the printer.
- If user information on the server is changed, information registered in the printer may be overwritten when authentication is performed.

↓ Note

- The default administrator name for ScanRouter System or Remote Communication Gate S, "Admin," differs from the server, "admin".

Specifying Integration Server Authentication

This can be specified by the machine administrator.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area.
3. Click [Administrator Authentication Management] in the "Device Settings" category.
4. Click [On] in the "Machine Administrator Authentication" area, and then click [OK].
5. Click [User Authentication Management] in the "Device Settings" category in the "Configuration" area.
6. Select "Integration Server Authentication" in the "User Authentication Management" list.

7. Select the "Printer Job Authentication" level.

If you select [Entire] or [Simple (All)], proceed to "Selecting Entire or Simple (All)".

If you select [Simple (Limitation)], proceed to "Selecting Simple (Limitation)".

For a description of the printer job authentication levels, see p.50 "Printer Job Authentication".

Selecting Entire or Simple (All)

3

If you select [Entire], you cannot print using a printer driver or a device that does not support authentication. To print in an environment that does not support authentication, select [Simple (All)] or [Simple (Limitation)].

If you select [Simple (All)], you can print even with unauthenticated printer drivers or devices. Specify this setting if you want to print with a printer driver or device that cannot be identified by the printer or if you do not require authentication for printing. However, note that, because the printer does not require authentication in this case, it may be used by unauthorized users.

1. Select [Entire] or [Simple (All)].

2. Click [On] in the "Integration Server Authentication Settings" area.

To not use secure sockets layer (SSL) for authentication, click [Off].

3. Enter the [Integration Server Name] box.

4. Select "Authentication Type" in the list.

If you set "Authentication Type" to [Windows Authentication (NT Compatible)] or [Windows Authentication (Native)], you can use the global group. If you set "Authentication Type" to [Notes Authentication], you can use the Notes group. If you set "Authentication Type" to [Basic Authentication (Integration Server)], you can use the groups created using the Authentication Manager.

5. Enter the [Domain Name] box.

6. When setting a new group, enter the group name in the blank area of the "Group Settings for Integration Server Authentication" box, and then specify the function.

7. Click [OK].

8. Click [Logout].

9. Close Web Image Monitor.

Selecting Simple (Limitation)

If you select [Simple (Limitation)], you can specify clients for which printer job authentication is not required. Specify [Parallel Interface (Simple)], [USB (Simple)] and the clients' IPv4 address range in which printer job authentication is not required. Specify this setting if you want to print using unauthenticated printer drivers or without any printer driver. Authentication is required for printing with non-specified devices.

- 1. Select [Simple (Limitation)] in the "Printer Job Authentication" list in the "Printer Job Authentication Settings" area.**

Specify the range in which [Simple (Limitation)] is applied to Printer Job Authentication.

If you specify IPv4 or IPv6 address range, proceed to step 2.

If you specify [Parallel Interface (Simple)], proceed to step 3.

If you specify [USB (Simple)], proceed to step 4.

- 2. Select [IPv4 Address 1], [IPv4 Address 2], [IPv4 Address 3], [IPv4 Address 4], or [IPv4 Address 5], and then enter the IPv4 address on the "Limitation Range (IPv4)" area.**

Be sure the number you enter for End IPv4 Address is larger than that for Start IPv4 Address.

If you want to use IPv6, specify the IPv6 address in the "Limitation Range (IPv6)" area.

- 3. Click [Apply] in the "Parallel Interface (Simple)" area.**

- 4. Click [Apply] in the "USB (Simple)" area.**

- 5. Click [On] in the "Integration Server Authentication Settings" area.**

To not use secure sockets layer (SSL) for authentication, click [Off].

- 6. Enter the [Integration Server Name] box.**

- 7. Select "Authentication Type" in the list.**

If you set "Authentication Type" to [Windows Authentication (NT Compatible)] or [Windows Authentication (Native)], you can use the global group. If you set "Authentication Type" to [Notes Authentication], you can use the Notes group. If you set "Authentication Type" to [Basic Authentication (Integration Server)], you can use the groups created using the Authentication Manager.

- 8. Enter the [Domain Name] box.**

- 9. When setting a new group, enter the group name in the blank area of the "Group Settings for Integration Server Authentication" box, and then specify the function.**

- 10. Click [OK].**

- 11. Click [Logout].**

- 12. Close Web Image Monitor.**

Printer Job Authentication

This section explains Printer Job Authentication.

Printer Job Authentication Levels and Printer Job Types

This section explains the relationship between printer job authentication levels and printer job types.

Depending on the combination of printer job authentication level and printer job type, the printer may not print properly. Set an appropriate combination according to the operating environment.

The PCL drivers support user authentication.

When User Authentication is set to "Off", printing is possible for all job types.

A: Printing is possible regardless of user authentication.

B: Printing is possible if user authentication is successful. If user authentication fails, the print job is reset.

C: Printing is possible if user authentication is successful and [Driver Encryption Key] for the printer driver and printer match.

X: Printing is not possible regardless of user authentication, and the print job is reset.

User Authentication Management	Specified	Specified	Specified	Specified
Printer Job Authentication	Simple (All)	Simple (All)	Entire	Entire
Simple Encryption	Off	On	Off	On
Printer Job Type 1	C	C	C	C
Printer Job Type 2	B	X	B	X
Printer Job Type 3	X	X	X	X
Printer Job Type 4	A	A	B	B
Printer Job Type 5	A	A	X	X
Printer Job Type 6	A	A	X	X
Printer Job Type 7	B	B	B	B

Printer Job Authentication

- Entire

The printer authenticates all printer jobs and remote settings, and cancels jobs and settings that fail authentication.

Printer Jobs: Job Reset

Settings: Disabled

- Simple (All)

The printer authenticates printer jobs and remote settings that have authentication information, and cancels the jobs and settings that fail authentication.

Printer jobs and settings without authentication information are performed without being authenticated.

- Simple (Limitation)

You can specify the range to apply [Simple (Limitation)] to by specifying [Parallel Interface (Simple)], [USB (Simple)], and the client's IPv4 address.

3

Printer Job Types

1. If the "User Authentication" and "With Encryption" check boxes are both selected in the PCL driver dialog box: Personal authentication information is added to the printer job. The printer driver applies advanced encryption to the login passwords. The printer driver encryption key enables driver encryption and prevents the login password from being stolen.
For details about prohibiting the use of simple encryption using "Simple Encryption", see p. 129 "Specifying the Extended Security Functions".
2. If the "User Authentication" and "With Encryption" check boxes are both selected in the PCL driver dialog box: Personal authentication information is added to the printer job. The printer driver applies simple encryption to login passwords.
For details about turning off "Simple Encryption" and allowing the use of simple encryption, see p. 129 "Specifying the Extended Security Functions".
3. If the "User Authentication" check box is not selected in the PCL driver dialog box: Personal authentication information is added to the printer job and the printer job is cancelled.
4. When using the PostScript 3 printer driver, the printer job contains user code information. Personal authentication information is not added to the printer job but the user code information is. This also applies to recovery/parallel printing using a PCL printer driver that does not support authentication.
5. When using the PostScript 3 printer driver, the printer job does not contain user code information. Neither personal authentication information nor user code information is added to the printer job. This also applies to recovery/parallel printing using a PCL printer driver that does not support authentication.
6. A printer job or PDF file is sent from a host computer without a printer driver and is printed via LPR. Personal authentication information is not added to the printer job.
7. A PDF file is printed via ftp. Personal authentication is performed using the user ID and password used for logging in via ftp. However, the user ID and password are not encrypted.

User Lockout Function

If an incorrect password is entered several times, the User Lockout function prevents further login attempts under the same user name. Even if the locked out user enters the correct password later, authentication will fail and the printer cannot be used until the lockout period elapses or an administrator or supervisor disables the lockout.

To use the lockout function for user authentication, the authentication method must be set to Basic authentication. Under other authentication methods, the lockout function protects supervisor and administrator accounts only, not general user accounts.

3

Lockout setting items

The lockout function settings can be made using Web Image Monitor.

Setting Item	Description	Setting Values	Default Setting
Lockout	Specify whether or not to enable the lockout function.	<ul style="list-style-type: none"> Active Inactive 	<ul style="list-style-type: none"> Inactive
Number of Attempts before Lockout	Specify the number of authentication attempts to allow before applying lockout.	1-10	5
Lockout Release Timer	Specify whether or not to cancel lockout after a specified period elapses.	<ul style="list-style-type: none"> Active Inactive 	<ul style="list-style-type: none"> Inactive
Lock Out User for	Specify the number of minutes after which lockout is canceled.	1-9999 min.	60 min.

Lockout release privileges

Administrators with unlocking privileges are as follows.

Locked out User	Unlocking administrator
general user	user administrator
user administrator, network administrator, file administrator, machine administrator	supervisor

Locked out User	Unlocking administrator
supervisor	machine administrator

Specifying the user lockout function

This function can be specified by the machine administrator using Web Image Monitor.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

3

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area, and then click [User Lockout Policy] under "Security" category.
3. Set "Lockout" to [Active].
4. In the drop-down menu, select the number of login attempts to permit before lockout is applied.
5. If you want to disable lockout after a specified time elapses, set the "Lockout Release Timer" to [Active].
6. In the "Lock Out User for" field, enter the number of minutes that must elapse before lockout is disabled.
7. Click [OK].
8. Click [Logout].
9. Close Web Image Monitor.

Unlocking a locked user account

A locked-out user account can be unlocked by the user administrator or a supervisor using Web Image Monitor. The following procedure explains this process.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Address Book] in the Menu area.
3. Select the account of the locked out user.
4. Click [Change].
5. Set "Lockout" to [Inactive].
6. Click [OK].

7. Click [Logout].

8. Close Web Image Monitor.

 **Note**

- To unlock a locked-out administrator or supervisor account, turn the printer's power switch off and then on again, or select [Program/Change Administrator] under [Configuration] in Web Image Monitor.

Auto Logout Function

This can be specified by the machine administrator.

When user authentication is enabled, the printer automatically logs out the current user if the control panel is not used for a specified time. This feature is called "Auto Logout". Use the following procedure to specify how long the printer waits before it logs off the user.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Configuration] in the Menu area.**
3. **Click [Timer] in the "Device Settings" category.**
4. **Select [On] in the "Auto Logout Timer" category.**

Enter "60" to "999" (seconds) using the number keys, and then click [OK].

If you do not want to specify [Auto Logout Timer], select [Off].

5. **Click [OK].**
6. **Click [Logout].**
7. **Close Web Image Monitor.**

↓ Note

- The Auto Logout Timer might not function if printing stops due to error or paper/toner shortage.

Authentication Using an External Device

To authenticate using an external device, see the device manual.

For details, contact your sales representative.

4. Protecting Data from Information Leaks

This chapter describes how to protect document data.

Printing a Confidential Document

Depending on the location of the printer, it is difficult to prevent unauthorized persons from viewing prints lying in the printer's output trays. When printing confidential documents, use the Locked Print function.

To use the Locked Print function, the optional hard disk must be installed.

Locked Print

- Using the printer's Locked Print function, store files in the printer as Locked Print files and then print them from the control panel and retrieve them immediately, preventing others from viewing them.
- Confidential documents can be printed regardless of the User Authentication settings.

Note

- To store files temporarily, select [Stored Print] in the printer driver. If you select Share stored print files, you can also share these files.

Specifying a Locked Print File

Using the printer driver, specify a Locked Print file.

If user authentication has been enabled, you must enter the login user name and login password using the printer driver. For details about logging in, see the printer driver Help.

Word Pad is used in this procedure.

1. **Open the printer driver dialog box.**
2. **Set "Job Type:" to [Locked Print] under the Printer Settings tab.**
3. **Click [Details...].**
4. **Enter the user ID and password.**

Enter the user ID using up to 8 alphanumeric characters.

Enter the password using 4 to 8 numbers.

The password entered here lets you use the Locked Print function.

To print a Locked Print file, enter the same password on the control panel.

The password is encrypted during data transmission.

5. **Click [OK].**

6. Click [OK].
7. Print the locked document.

Printing a Locked Print File

To print a Locked Print file, you must be at the printer and print the file using the control panel.

To print Locked Print files, the password is required. If you do not enter the correct password, you cannot print the files. The file administrator can change the user password if it is forgotten.

This can also be specified via Web Image Monitor. For details, see Web Image Monitor Help.

1. On the printer's control panel, press [Prt.Jobs].
2. Press the [▲] or [▼] key to select [Locked Print Jobs], and then press [Job List].
3. Press the [▲] or [▼] key to select the file you want to print, and then press [Print].
4. Enter the password, and then press the [OK] key.

Enter the password specified in step 4 of "Specifying a Locked Print File".

A confirmation screen will appear if the password is not entered correctly. Press [Exit] to enter the password again.

If multiple print files are selected, the printer prints files that correspond to the entered password. The number of files to be printed is displayed on the confirmation screen.

5. Press [Print].

Deleting Locked Print Files

This can be specified by the file creator (owner).

To delete Locked Print files, you must enter the password for the files. If the password has been forgotten, ask the file administrator to change the password.

This can also be specified via Web Image Monitor. For details, see Web Image Monitor Help.

1. Press [Prt.Jobs].
2. Press the [▲] or [▼] key to select [Locked Print Jobs], and then press [Job List].
3. Press the [▲] or [▼] key to select the file you want to delete, and then press [Delete].
4. Enter the password, and then press the [OK] key.

A confirmation screen will appear if the password is not entered correctly. Press [Exit] to enter the password again.

If multiple print files are selected, the printer deletes files that correspond to the entered password. The number of files to be deleted is displayed on the confirmation screen.

5. Press [Delete].

Note

- To delete the Locked Print files, enable "Auto Delete Temporary Jobs". For details about how to configure "Auto Delete Temporary Jobs", see Software Guide.
- Locked Print files can also be deleted by the file administrator.

Changing Passwords of Locked Print Files

This can be specified by the file creator (owner) or file administrator.

If the password has been forgotten, the file administrator changes the password to restore access.

This can also be specified via Web Image Monitor. For details, see Web Image Monitor Help.

1. Press [Prt.Jobs].
2. Press the [▲] or [▼] key to select [Locked Print Jobs], and then press [Job List].
3. Press the [▲] or [▼] key to select the file you want to change the password, and then press [Change].
4. Enter the password, and then press the [OK] key.
The file administrator does not need to enter the password.
5. Press the [▲] or [▼] key to select [Change Password], and then press the [OK] key.
6. Enter the password, and then press the [OK] key.
7. Re-enter the password, and then press the [OK] key.

Unlocking Locked Print Files

If you specify [On] for [Enhance File Protection], the file will be locked and become inaccessible if an invalid password is entered ten times. This section explains how to unlock files.

[Enhance File Protection] is one of the extended security functions. For details about this and other extended security functions, see p.129 "Specifying the Extended Security Functions".

Only the file administrator can unlock files. For details about logging in and logging out with administrator authentication, see p.25 "Logging in Using Administrator Authentication", p.25 "Logging out Using Administrator Authentication".

This can also be specified via Web Image Monitor. For details, see Web Image Monitor Help.

1. Press [Prt.Jobs].
2. Press the [▲] or [▼] key to select [Locked Print Jobs], and then press [Job List].
3. Press the [▲] or [▼] key to select the file you want to unlock, and then press [Change].
4. Press the [▲] or [▼] key to select [Unlock Files], and then press the [OK] key.
5. Press [Unlock].

 **Note**

- You can use the same procedure to unlock stored print files also.

5. Securing Information Stored on the Hard Disk

This chapter describes how to prevent unauthorized viewing, access, or modification of information stored on the hard disk by using the security options of the printer.

Protecting the Address Book

If user authentication is specified, the user who has logged in will be designated as the sender to prevent data from being sent by an unauthorized person masquerading as the user.

To protect the data from unauthorized reading, you can also encrypt the data in the Address Book.

Address Book Access Permission

5

This can be specified by the registered user. Access permission can also be specified by a user granted full control or the user administrator.

You can specify who is allowed to access the data in the Address Book.

By making this setting, you can prevent the data in the Address Book being used by unregistered users.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Address Book] in the Menu area.
3. Click the user you want to specify in the address list, and then click [Change].
You can search using [Name], [Registration No.], or [User Code].
4. Click [Change] under "Access Privilege" in the "Protect Destination" section of the "Protection" area.
5. Specify the access permission, and then click [OK].
6. Click [OK].
7. Click [Back].
8. Click [Logout].
9. Close Web Image Monitor.

↓ Note

- "Access Privilege" appears only when Basic Authentication, Windows Authentication, LDAP Authentication, or Integration Server Authentication is enabled.

Encrypting Data in the Address Book

This can be specified by the user administrator.

You can encrypt the data in the Address Book using the extended security function, "Encrypt Address Book". For details about this and other extended security functions, see p.129 "Specifying the Extended Security Functions".

For details about logging in and logging out with administrator authentication, see p.25 "Logging in Using Administrator Authentication", p.25 "Logging out Using Administrator Authentication".

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Extended Security], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [Encrypt Address Book], and then press the [OK] key.
5. Press the [▲] or [▼] key to select [On], and then press [Enc.Key].
6. Enter the encryption key, and then press the [OK] key.

Enter the encryption key using up to 32 alphanumeric characters.

7. Re-enter the encryption key, and then press the [OK] key.
8. Press [OK].

Do not switch the main power off during encryption, as doing so may corrupt the data.

Encrypting the data in the address book may take a long time.

The time it takes to encrypt the data in the address book depends on the number of registered users.

The printer cannot be used during encryption.

Normally, once encryption is complete, [Exit] appears.

If you press the [Escape] key during encryption, the data is not encrypted.

If you press the [Escape] key during decryption, the data stays encrypted.

9. Press [Exit].
10. Press the [Menu] key.

↓ Note

- If you register additional users after encrypting the data in the Address Book, those users are also encrypted.

Encrypting Data on the Hard Disk

This function can be specified by the machine administrator only.

This function is available only when the optional hard disk and the SD card supplied with the hard disk are installed.

Prevent information leakage by encrypting the Address Book, authentication information, and stored documents as the data is written. In addition, if the printer malfunctions or needs to be replaced, your service representative can easily transfer existing data to a new printer.

When data encryption is enabled, an encryption key is generated and used to restore the data. This key can be changed at any time.

Data that is Encrypted

This function encrypts data that is stored in the printer's NVRAM (memory that remains even after the printer has been turned off) and on the Hard Disk.

The following data is encrypted:

- Address Book data
- User authentication information
- Temporary stored documents
- Logs
- Network I/F setting information
- System settings information

Note

- For details about installing the SD memory card options, see "Installing the SD Memory Card Options", Hardware Guide.

Enabling the Encryption Settings

This can be specified by the machine administrator.

If you specify [Format] to enable encryption when first setting up the printer, the encryption setting procedure will take only several minutes. Note that all data stored on the hard disk will be initialized when this setting is specified.

The table below describes which data will be kept and which data will be initialized when [Format], [File Sys], or [All Data] is specified.

Setting	Data to be kept	Data not kept (Data to be initialized)	Required time
Format	None	All Data: Both the data to be kept and data not kept when [File Sys] is specified	Several minutes
File Sys	<ul style="list-style-type: none"> • Embedded Software Architecture applications' program/log • Address Book • Registered fonts • Job logs/access logs 	<ul style="list-style-type: none"> • Stored documents (Locked Print files / Sample Print files / Stored Print files / Hold Print files) 	Approximately 1 hour
All Data	All Data: Both the data to be kept and data not kept when [File Sys] is specified	None	Approximately 3 hours

5

Things to note when enabling encryption settings

- If you use Embedded Software Architecture application, be sure to specify [File Sys] or [All Data].
- Note that the printer's settings will not be initialized to their system defaults even if [Format], [File Sys], or [All Data] is specified.

Use the following procedure to enable the encryption settings when first setting up the machine, or after encryption settings have been canceled and settings must be made again.

★ Important

- The printer cannot be operated while data is being encrypted.
- Once the encryption process begins, it cannot be stopped. Make sure that the printer's main power is not turned off while the encryption process is in progress. If the printer's main power is turned off while the encryption process is in progress, the hard disk will be damaged and all data on it will be unusable.
- The encryption key is required for data recovery if the printer malfunctions. Be sure to store the encryption key safely for retrieving backup data.
- To specify encryption, first finish the control panel settings, and then turn the printer's power off. Then, after a few moments, turn the power back on. This will reset the printer and make the encryption settings available.

- If there is unencrypted data on the hard disk that must be both transferred and encrypted, rebooting will take about three hours. If there is encrypted data on the hard disk that must be re-encrypted, rebooting will take about six hours.
- If encryption and hard disk overwrite erasure are specified at the same time, when the overwrite erasure is complete, turn the printer's power off. Then, after a few moments, turn the power back on. Encryption will then begin.
- You can start the printer in less time by setting encryption to [Format] but data will not be carried over to the hard disk and will be reset back to the default states, so make sure to backup all necessary data beforehand.
- If you want to specify encryption of unencrypted data with erase-by-overwrite, select [Random Numbers] as the overwrite method, and set the number of overwrites to 3 times. The entire process will take about four hours. If you specify re-encryption of encrypted data, the entire process will take about seven hours.
- The "Erase All Memory" function also clears the printer's security settings, with the result that afterward, neither printer nor user administration will be effective. Ensure that users do not save any data on the printer after "Erase All Memory" has completed.

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Machine Data Encryption], and then press the [OK] key.
4. Make sure [Encrypt] is displayed on the control panel, and then press the [OK] key.
5. Select the data to be carried over to the hard disk and not be reset.

To carry all of the data over to the hard disk, press [All Data]. To carry over only the printer settings data, press [File Sys]. To reset all of the data, press [Format].

6. Press [Print].
7. Press [Continue].
8. Press [Exit].
9. Press the [Menu] key.

Turn off the main power switch, and then turn the main power switch back on.

For details about turning off the power, see "Turning the Printer's Power On and Off", Hardware Guide.

Printing the Encryption Key

This can be specified by the machine administrator.

Use the following procedure to print the key again if it has been lost or misplaced.

★ Important

- The encryption key is required for data recovery if the printer malfunctions. Be sure to store the encryption key safely for retrieving backup data.
1. Press the [Menu] key.
 2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
 3. Press the [▲] or [▼] key to select [Machine Data Encryption], and then press the [OK] key.
 4. Press the [▲] or [▼] key to select [Print Encryption Key], and then press the [OK] key.
 5. Press [Print].
 6. Press [Exit].

Updating the Encryption Key

5

This can be specified by the machine administrator.

You can update the encryption key and create a new key. Updating the encryption key is possible only when the printer is functioning normally and data encryption is enabled.

★ Important

- The encryption key is required for recovery if the printer malfunctions. Be sure to store the encryption key safely for retrieving backup data.
 - When the encryption key is updated, encryption is performed using the new key. After completing the procedure on the printer's control panel, turn off the power and restart the printer to enable the new settings. Restarting can be slow when there is data to be carried over to the hard disk.
1. Press the [Menu] key.
 2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
 3. Press the [▲] or [▼] key to select [Machine Data Encryption], and then press the [OK] key.
 4. Make sure [Encrypt] is displayed on the control panel, and then press the [OK] key.
 5. Select the data to be carried over to the hard disk and not be reset.
To carry all of the data over to the hard disk, press [All Data]. To carry over only the printer settings data, press [File Sys]. To reset all of the data, press [Format].
 6. Press [Print].
 7. Press [Continue].
 8. Press [Exit].
 9. Press the [Menu] key.

Turn off the main power switch, and then turn the main power switch back on.

For details about turning off the power, see "Turning the Printer's Power On and Off", Hardware Guide.

Canceling Data Encryption

This can be specified by the machine administrator.

Use the following procedure to cancel the encryption settings when encryption is no longer necessary.

★ Important

- After completing this procedure on the printer's control panel, turn off the power and restart the printer to enable the new settings. Restarting can be slow when there is data to be carried over to the hard disk.

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Machine Data Encryption], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [Cancel Encryption], and then press the [OK] key.
5. Select the data to be carried over to the hard disk and not be reset.

To carry all of the data over to the hard disk, press [All Data]. To carry over only the printer settings data, press [File Sys]. To reset all of the data, press [Format].

6. Press [Print].

The encryption key for backup data is printed.

7. Press [Continue].

8. Press [Exit].

9. Press the [Menu] key.

Turn off the main power switch, and then turn the main power switch back on.

For details about turning off the power, see "Turning the Printer's Power On and Off", Hardware Guide.

Deleting Data on the Hard Disk

This can be specified by the machine administrator.

This function is available only when the optional hard disk and the SD card supplied with the hard disk are installed.

To use this function, the optional Data overwrite security unit must be installed.

The printer's hard disk stores all the data of documents processed using the printer function. It also stores code counter, and Address Book data.

Overwriting Data on the Hard Disk

You can prevent data leakage by automatically overwriting temporarily saved data (Auto Erase Memory) or overwriting all the data stored on the hard disk (Erase All Memory).

5

Auto Erase Memory Setting

To erase data on the hard disk by job type, specify [Auto Erase Memory Setting].

Erase All Memory

To erase all the data on the hard disk at once, specify [Erase All Memory].

Methods of Erasing the Data

You can select the method of erasing the data from the following:

The factory default is ""Random Numbers"" with the number of overwrites set to 3 times.

NSA (National Security Agency)	Overwrites the data on the hard disk twice with random numbers and once with zeros.
DoD (Department of Defense)	Overwrites the data with a number, its complement, and random numbers, and then checks the result.
Random Numbers	Overwrites the data with random numbers the specified number of times. You can specify between 1 and 9 as the number of times the data is overwritten with random numbers.

↓ Note

- Depending on the amount of data and the erasure method, full erasure might take several hours.
- Once in progress, the Erase All Memory function can be paused, but not stopped. No other operations are possible until all data is erased.

- Even if there are hold print, stored print, confidential print, or test print jobs remaining on the hard disk, the "No Remaining Data" icon will still be lit after erasure is completed.
- For details about installing the SD memory card options, see "Installing the SD Memory Card Options", Hardware Guide.

Auto Erase Memory

A print data sent from a printer driver is temporarily stored on the printer's hard disk. Even after the job is completed, it remains in the hard disk as temporary data. Auto Erase Memory erases the temporary data on the hard disk by writing over it.

Overwriting starts automatically once the job is completed.

If a print job is in progress, overwriting will only be done after the job is completed.

Using Auto Erase Memory

This can be specified by the machine administrator.

For details about logging in and logging out with administrator authentication, see p.25 "Logging in Using Administrator Authentication", p.25 "Logging out Using Administrator Authentication".

★ Important

- When Auto Erase Memory is set to [On], temporary data that remained on the hard disk when Auto Erase Memory was set to [Off] might not be overwritten.
- If the main power switch is turned off before Auto Erase Memory is completed, overwriting will stop and data will be left on the hard disk.
- Do not stop the overwrite mid-process. Doing so will damage the hard disk.
- Should the main power switch be turned off before Auto Erase Memory is completed, overwriting will continue once the main power switch is turned back to [On].

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Auto Erase Memory Setting], and then press the [OK] key.

4. Press the [▲] or [▼] key to select [On], and then press [HDD Erase].

Select the method of erasing the data from [NSA], [DoD], or [Random Numbers].

If you select [Random Numbers], proceed to step 5.

If you select [NSA], proceed to step 7.

If you select [DoD], proceed to step 8.

5. Press the [▲] or [▼] key to select [Random Numbers], and then press the [OK] key.

6. Enter the number of times that you want to overwrite using the [▲] or [▼] keys, and then press the [OK] key.

Proceed to step 9.

7. Press the [▲] or [▼] key to select [NSA], and then press the [OK] key.

Proceed to step 9.

8. Press the [▲] or [▼] key to select [DoD], and then press the [OK] key.

9. Press the [Menu] key.

↓ Note

- If an error occurs before overwriting is completed, turn off the main power. Turn it on again, and then repeat from step 1.
- If you specify both overwrite and encryption, all the data will be encrypted.

5

Canceling Auto Erase Memory

This can be specified by the machine administrator.

Use the following procedure to disable the Auto Erase Memory function.

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Auto Erase Memory Setting], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [Off], and then press the [OK] key.

Types of Data that can or cannot be overwritten

The following table shows the types of data that can or cannot be overwritten by "Auto Erase Memory".

Data Overwritten by Auto Erase Memory

- Print Jobs
- Sample Print / Locked Print / Stored Print Jobs

A Sample Print, Locked Print, or Stored Print job can only be overwritten after printing is completed. Stored print jobs can be overwritten by Auto Erase Memory only if they have been deleted in advance.

- Spool Printing jobs

Data not Overwritten by Auto Erase Memory

- Information registered in the Address Book

Data stored in the Address Book can be encrypted for security. For details, see p.61 "Protecting the Address Book".

- Counters stored under each user code

Erase All Memory

This can be specified by the machine administrator.

You can erase all the data on the hard disk by writing over it. This is useful if you relocate or dispose of your printer.

★ Important

- If you select [Erase All Memory], the following are also deleted: user codes, counters under each user code, user stamps, data stored in the Address Book, printer fonts downloaded by users, applications using Embedded Software Architecture, and the printer's network settings.
- If the main power switch is turned off before Auto Erase Memory is completed, overwriting will be stopped and data will be left on the hard disk.
- Do not stop the overwrite mid-process. Doing so will damage the hard disk.
- We recommend that before you erase the hard disk, you use SmartDeviceMonitor for Admin to back up the user codes, the counters for each user code, and the Address Book. The Address Book can also be backed up using Web Image Monitor. For details, see SmartDeviceMonitor for Admin Help or Web Image Monitor Help.
- Other than pausing, no operations are possible during the [Erase All Memory] process. If [Random Numbers] is specified and the number of overwrites set to "3", the erase process will take about three hours.

5

Using Erase All Memory

This can be specified by the machine administrator.

For details about logging in and logging out with administrator authentication, see p.25 "Logging in Using Administrator Authentication", p.25 "Logging out Using Administrator Authentication".

1. Disconnect communication cables connected to the printer.
2. Press the [Menu] key.
3. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [Erase All Memory], and then press the [OK] key.
5. Select the method of erasing the data.

Select the method of erasing the data from [NSA], [DoD], or [Random Numbers].

If you select [Random Numbers], proceed to step 6.

If you select [NSA], proceed to step 8.

If you select [DoD], proceed to step 9.

6. Press the [▲] or [▼] key to select [Random Numbers], and then press the [OK] key.
7. Press the [▲] or [▼] key to enter the number of times that you want to overwrite, and then press the [OK] key.

Proceed to step 10.

8. Press the [▲] or [▼] key to select [NSA], and then press the [OK] key.

Proceed to step 10.

9. Press the [▲] or [▼] key to select [DoD], and then press the [OK] key.

10. When overwriting is completed, press [Exit], and then turn off the power.

↓ Note

- Should the main power switch be turned Off before Auto Erase Memory is completed, overwriting will continue once the main power switch is turned back to [On].
- If an error occurs before overwriting is completed, turn off the main power. Turn it on again, and then repeat from step 2.
- If you specify both overwrite and encrypt the data, the data will all be encrypted.

5

Suspending Erase All Memory

This can be specified by the machine administrator.

The overwriting process can be suspended temporarily.

★ Important

- Erase All Memory cannot be cancelled.
1. Press [Suspend] while Erase All Memory is in progress.
 2. Press [Yes].
 3. Turn off the main power.

↓ Note

- To resume overwriting, turn on the main power.

6. Managing Access to the Printer

This chapter describes how to prevent unauthorized access to and modification of the printer's settings.

Preventing Changes to Printer Settings

The administrator type determines which printer settings can be modified. Users cannot change the administrator settings.

Register the administrators before using the printer. For instructions on registering the administrator, see p.21 "About Administrator Authentication".

Type of Administrator

Register the administrator on the printer, and then authenticate the administrator using the administrator's login user name and password. Administrator type determines which printer settings can be modified. The following administrator types are available:

- User Administrator

For a list of settings that the user administrator can specify, see p.145 "User Administrator Settings".

- Machine Administrator

For a list of settings that the machine administrator can specify, see p.146 "Machine Administrator Settings".

- Network Administrator

For a list of settings that the network administrator can specify, see p.150 "Network Administrator Settings".

- File Administrator

For a list of settings that the file administrator can specify, see p.153 "File Administrator Settings".

Menu Protect

Use this function to specify permission levels limiting user access to menu settings.

For a list of settings that users can specify according to the Menu Protect level, see p.157 "User Settings-Control Panel Settings", p.160 "User Settings-Web Image Monitor Settings".

Menu Protect

The administrator can also limit users' access permission to the printer's settings. The printer's regular menus can be locked so they cannot be changed. This function is also effective when management is not based on user authentication. For a list of settings that users can specify according to the Menu Protect level, see p.157 "User Settings-Control Panel Settings".

Specifying Menu Protect

This can be specified by the machine administrator.

For details about logging in and logging out with administrator authentication, see p.25 "Logging in Using Administrator Authentication", p.25 "Logging out Using Administrator Authentication".

You can set menu protect to [Level 1] or [Level 2]. To limit access to the fullest extent, select [Level 2].

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Maintenance], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [General Settings], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [Menu Protect], and then press the [OK] key.
5. Press the [▲] or [▼] key to select the menu protect level, and then press the [OK] key.
6. Press the [Menu] key.

Disabling Menu Protect

This can be specified by the machine administrator.

Use the following procedure to disable menu protection. Note that if you disable menu protection (by specifying Off for this setting), all menu settings will become available to all users.

For details about how to log in and out with administrator authentication, see p.25 "Logging in Using Administrator Authentication" and p.25 "Logging out Using Administrator Authentication".

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Maintenance], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [General Settings], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [Menu Protect], and then press the [OK] key.
5. Press the [▲] or [▼] key to select [OFF], and then press the [OK] key.
6. Press the [Menu] key.

Limiting Available Functions

To prevent unauthorized operation, you can specify who is allowed to access each of the printer's functions.

Specifying Which Functions Are Available

This can be specified by the user administrator.

Specify the functions available to registered users. By making this setting, you can limit the functions available to users.

For details about logging in and logging out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Address Book].**
3. **Click the user you want to specify in the address list, and then click [Change].**
You can search using [Name], [Registration No.], or [User Code].
4. **Specify the [Available Functions], and then click [OK].**
5. **Click [Logout].**
6. **Close Web Image Monitor.**

Managing Log Files

The printer stores log information in its memory or on the hard disk.

Log information can be checked using Remote Communication Gate S.

Here are some primary examples of stored log information:

- Job log
Stores information about workflow related to user files.
- Access log
Stores information about access, such as logging in and out, creating and deleting files, administrator procedures, and service representative procedures.
Administrator procedures include deleting all log information, changing the Job Log function settings, changing the Access Log function settings, and changing the Log Encryption settings.
Service representative procedures include formatting the hard disk and specifying whether or not to store job logs and access logs.

6

Using the Control Panel to Specify Log Files Settings

This can be specified by the machine administrator.

For details about logging in and logging out with administrator authentication, see "Logging in Using Administrator Authentication" and "Logging out Using Administrator Authentication".

You can specify settings such as whether or not to transfer logs to Remote Communication Gate S and whether or not to delete all logs.

Disabling log transfer to Remote Communication Gate S

The machine administrator can select [On] from Remote Communication Gate S only.

When using the printer's control panel, you can change the setting to [Off] only if it is set to [On].

You can check and change the transfer log setting. This setting lets you transfer log files to Remote Communication Gate S to check the history data and identify unauthorized access.

For details about Remote Communication Gate S, contact your sales representative.

For details about the transfer log setting, see Remote Communication Gate S Help.

For details about logging in and logging out with administrator authentication, see p.25 "Logging in Using Administrator Authentication", p.25 "Logging out Using Administrator Authentication".

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Transfer Log Setting], and then press the [OK] key.

4. Press the [▲] or [▼] key to select [Off], and then press the [OK] key.

5. Press the [Menu] key.

↓ Note

- The machine administrator can enable the setting again through the log collection server. In addition, the machine administrator can check or change the transfer log setting. For details about the transfer log setting, see log collection server help.
- When this setting is enabled, the printer transfers log information to the log collection server. Using this information, it becomes possible to identify unauthorized access.
- It is not possible to enable this setting from the printer's control panel or Web Image Monitor.
- For details about log collection server, contact your local dealer.

Using Remote Communication Gate S to Manage Log Files

For details about using Remote Communication Gate S to manage log files, see the manual supplied with Remote Communication Gate S.

6

Using Web Image Monitor to Manage Log Files

This can be specified by the machine administrator.

You can specify the types of log recording and collection level, perform log encryption, and delete all logs.

Specifying log collect settings

This can be specified by the machine administrator.

Specify collection log settings. The collection log levels are listed below.

Job Log Collect Level

Level 1

User Settings

Access Log Collect Level

Level 1

Level 2

User Settings

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.

2. Click **[Configuration]** in the Menu area, and then click **[Logs]** under "Device Settings" category.
3. Select "Collect Job Logs" to specify Job Log settings, or select "Collect Access Logs" to specify Access Log settings, and then select **[Active]**.
4. Specify the recording levels for either "Job Log Collect Level" or "Access Log Collect Level".

The settings shown for Job Log Collect Settings Listed by Function Type or Access Log Collect Settings Listed by Function Type vary depending on the collection level selected.

If you change the setting in the list, the setting for "Job Log Collect Level" or "Access Log Collect Level" automatically changes to [User Settings].

5. Click **[OK]** twice.

Changes are also reflected in related log settings.

6. Click **[Logout]**.

7. Close Web Image Monitor.

Note

- The greater the Access Log Collect setting value, the more logs are collected.

Disabling log transfer to Remote Communication Gate S

This can be specified by the machine administrator.

Select to disable log transfer.

When log transfer is inactive, [Inactive] is displayed and this setting cannot be changed. When log transfer is active, log records can be transferred to the log collection system.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click **[Configuration]** in the Menu area, and then click **[Logs]** under "Device Settings" category.
3. Select **[Inactive]** under "Transfer Logs".
4. Click **[OK]**.
5. Click **[OK]**.
6. Click **[Logout]**.
7. Close Web Image Monitor.

Specifying log encryption

This can be specified by the machine administrator.

Use the following procedure to enable the log encryption function.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Configuration] in the Menu area, and then click [Logs] under "Device Settings" category.**
3. **Select [Active] under "Encrypt Logs".**

To disable log encryption, select [Inactive].

4. **Click [OK].**

The log is encrypted. If other changes have been made in related log settings, they will occur at the same time.

5. **Click [OK].**

6. **Click [Logout].**

7. **Close Web Image Monitor.**

Note

- In order to enable encryption, either "Collect Job Logs" or "Collect Access Logs", or both must be set to [Active].

Deleting all logs

This can be specified by the machine administrator.

Use the following procedure to enable the log delete function.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Configuration] in the Menu area, and then click [Logs] under "Device Settings" category.**
3. **Click [Delete] under "Delete All Logs".**
4. **Click [Back].**
5. **Click [OK].**
6. **Click [Logout].**
7. **Close Web Image Monitor.**

Note

- On this page, "Delete All Logs" does not appear if either "Collect Job Logs" or "Collect Access Logs" are not set to [Active].

Downloading logs

This can be specified by the machine administrator.

Use the following procedure to convert the logs stored in the machine into a CSV file for simultaneous batch download.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Configuration] in the Menu area, and then click [Download Logs].**
3. **Click [Download].**
4. **Specify the folder in which you want to save the file.**
5. **Click [OK].**
6. **Click [Logout].**
7. **Close Web Image Monitor.**

↓ Note

- Downloaded logs contain data recorded up till the time you click the [Download] button. Any logs recorded after the [Download] button is clicked will not be downloaded. The "Result" field of the log entry for uncompleted jobs will be blank.
- Download time may vary depending on the number of logs.
- If an error occurs while the CSV file is downloading or being created, the download is cancelled and details of the error are included at the end of the file.
- If a log is downloaded successfully, "Download completed." will appear in the last line of the log file.
- For details about saving CSV log files, see your browser's Help.
- Downloaded log files use UTF-8 character encoding. To view a log file, open it using an application that supports UTF-8.
- To collect logs, set "Collect Job Logs" and "Collect Access Logs" to [Active]. This setting can be specified in [Logs] under [Configuration] in Web Image Monitor.

7. Enhanced Network Security

This chapter describes how to increase security over the network using the printer's functions.

Preventing Unauthorized Access

You can limit IP addresses, disable ports and protocols, or use Web Image Monitor to specify the network security level to prevent unauthorized access over the network and protect the Address Book, stored files, and default settings.

Access Control

This can be specified by the network administrator using Web Image Monitor.

For details, see Web Image Monitor Help.

The printer can control TCP/IP access.

Limit the IP addresses from which access is possible by specifying the access control range.

For example, if you specify the access control range as [192.168.15.16]-[192.168.15.20], the client PC addresses from which access is possible will be from [192.168.15.16] to [192.168.15.20].

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

Important

- Using access control, you can limit access involving LPR, RCP/RSH, FTP, SSH/SFTP, Bonjour, SMB, WSD (Device), WSD (Printer), IPP, DIPRINT, RHPP, IPDS, Web Image Monitor, SmartDeviceMonitor for Client or DeskTopBinder.
- You cannot limit the monitoring of SmartDeviceMonitor for Client.
- You cannot limit access involving telnet, or SmartDeviceMonitor for Admin, when using the SNMPv1 monitoring.

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area, and then click [Access Control] under "Security" category.
3. To specify the IPv4 Address, enter an IP address that has access to the printer in "Access Control Range".

To specify the IPv6 Address, enter an IP address that has access to the printer in "Range" under "Access Control Range", or enter an IP address in "Mask" and specify the "Mask Length".

4. Click [OK].
5. Click [OK].

6. Click [Logout].

7. Close Web Image Monitor.

Enabling and Disabling Protocols

This can be specified by the network administrator.

Specify whether to enable or disable the function for each protocol. By making this setting, you can specify which protocols are available and so prevent unauthorized access over the network.

Network settings can be specified on the control panel, or using Web Image Monitor, telnet, SmartDeviceMonitor for Admin or Remote Communication Gate S. If you use SmartDeviceMonitor for Admin, start Web Image Monitor from SmartDeviceMonitor for Admin and configure the settings from there. For details about making settings using SmartDeviceMonitor for Admin or Remote Communication Gate S, see the Help for each application. For details about making settings using telnet, see "Remote Maintenance Using telnet", UNIX Supplement.

To disable SMTP on Web Image Monitor, in E-mail settings, set the protocol to anything other than SMTP. For details, see Web Image Monitor Help.

For details about logging in and logging out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication", p.25 "Logging in Using Administrator Authentication", p.25 "Logging out Using Administrator Authentication".

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Protocol	Port	Setting Method	Disabled Condition
IPv4	-	<ul style="list-style-type: none"> Control Panel Web Image Monitor telnet SmartDeviceMonitor for Admin Remote Communication Gate S 	<p>All applications that operate over IP cannot be used.</p> <p>If you are using IPv4, it cannot be disabled on Web Image Monitor.</p>
IPv6	-	<ul style="list-style-type: none"> Control Panel Web Image Monitor telnet SmartDeviceMonitor for Admin Remote Communication Gate S 	<p>All applications that operate over IPv6 cannot be used.</p>

Protocol	Port	Setting Method	Disabled Condition
IPsec	-	<ul style="list-style-type: none"> Control Panel Web Image Monitor telnet 	Encrypted transmission using IPsec is disabled.
FTP	TCP:21	<ul style="list-style-type: none"> Web Image Monitor telnet SmartDeviceMonitor for Admin Remote Communication Gate S 	<p>Functions that require FTP cannot be used.</p> <p>You can restrict personal information from being displayed by making settings on the control panel using "Restrict User Info.Display". *1</p>
ssh/sftp	TCP:22 (variable)	<ul style="list-style-type: none"> Web Image Monitor telnet SmartDeviceMonitor for Admin Remote Communication Gate S 	<p>Functions that require sftp cannot be used.</p> <p>You can restrict personal information from being displayed by making settings on the control panel using "Restrict User Info.Display". *1</p>
telnet	TCP:23	<ul style="list-style-type: none"> Web Image Monitor SmartDeviceMonitor for Admin 	Commands using telnet are disabled.
SMTP	TCP:25 (variable)	<ul style="list-style-type: none"> Web Image Monitor SmartDeviceMonitor for Admin Remote Communication Gate S 	E-mail notification functions that require SMTP reception cannot be used.
HTTP	TCP:80	<ul style="list-style-type: none"> Web Image Monitor telnet SmartDeviceMonitor for Admin 	<p>Functions that require HTTP cannot be used.</p> <p>IPP printing through TCP port 80 will be disabled.</p>

Protocol	Port	Setting Method	Disabled Condition
HTTPS	TCP:443	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin 	<p>Functions that require HTTPS cannot be used.</p> <p>@Remote functions are unavailable.</p> <p>You can also make settings to require SSL transmission using the control panel or Web Image Monitor.</p>
SMB	TCP:139	<ul style="list-style-type: none"> • Control Panel • Web Image Monitor • SmartDeviceMonitor for Admin • telnet • Remote Communication Gate S 	<p>SMB printing functions cannot be used.</p>
NBT (NetBIOS over TCP/IPv4)	UDP:137 UDP:138	<ul style="list-style-type: none"> • telnet 	<p>SMB printing functions via TCP/IP, as well as NetBIOS designated functions on the WINS server cannot be used.</p>
SNMPv1,v2	UDP:161	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin • Remote Communication Gate S 	<p>Functions that require SNMPv1, v2 cannot be used.</p> <p>Using the control panel, Web Image Monitor or telnet, you can specify that SNMPv1, v2 settings are read-only, and cannot be edited.</p>

Protocol	Port	Setting Method	Disabled Condition
SNMPv3	UDP:161	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin • Remote Communication Gate S 	<p>Functions that require SNMPv3 cannot be used.</p> <p>You can also make settings to require SNMPv3 encrypted transmission and restrict the use of other transmission methods using the control panel, Web Image Monitor, or telnet.</p>
RSH/RCP	TCP:514	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin • Remote Communication Gate S 	<p>Functions that require RSH/RCP cannot be used.</p> <p>You can restrict personal information from being displayed by making settings on the control panel using "Restrict User Info.Display". *1</p>
LPR	TCP:515	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin • Remote Communication Gate S 	<p>LPR functions cannot be used.</p> <p>You can restrict personal information from being displayed by making settings on the control panel using "Restrict User Info.Display". *1</p>
IPP	TCP:631	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin • Remote Communication Gate S 	<p>IPP functions cannot be used.</p>

Protocol	Port	Setting Method	Disabled Condition
SSDP	UDP:1900	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin 	Device discovery using UPnP from Windows cannot be used.
Bonjour	UDP:5353	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin 	Bonjour functions cannot be used.
@Remote	TCP:7443 TCP:7444	<ul style="list-style-type: none"> • telnet 	@Remote cannot be used.
DIPRINT	TCP:9100	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin • Remote Communication Gate S 	DIPRINT functions cannot be used.
RFU	TCP:10021	<ul style="list-style-type: none"> • telnet 	Printer firmware can be updated via FTP.
NetWare	(IPX/SPX)	<ul style="list-style-type: none"> • Control Panel • Web Image Monitor • telnet • SmartDeviceMonitor for Admin • Remote Communication Gate S 	Print jobs cannot be sent using NetWare. SNMP over IPX cannot be used.
AppleTalk	(PAP)	<ul style="list-style-type: none"> • Control Panel • Web Image Monitor 	Print jobs cannot be sent using AppleTalk.

Protocol	Port	Setting Method	Disabled Condition
WSD (Device)	TCP:53000 (variable)	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin • Remote Communication Gate S 	WSD (Device) functions cannot be used.
WSD (Printer)	TCP:53001 (variable)	<ul style="list-style-type: none"> • Web Image Monitor • telnet • SmartDeviceMonitor for Admin • Remote Communication Gate S 	WSD (Printer) functions cannot be used.
RHPP	TCP:59100 (variable)	<ul style="list-style-type: none"> • Web Image Monitor • telnet 	RHPP functions cannot be used.

* 1 "Restrict User Info.Display" is one of the Extended Security features. For details about making this setting, see p.129 "Specifying the Extended Security Functions".

Enabling and disabling protocols using the control panel

This can be specified by the network administrator.

Use the following procedure to enable or disable each protocol using the control panel.

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Host Interface], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Network], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [Effective Protocol], and then press the [OK] key.
5. Select the protocol you want to disable, and then press the [OK] key.
6. Press the [▲] or [▼] key to select [Inactive], and then press the [OK] key.
7. Press the [Menu] key.

Enabling and disabling protocols using Web Image Monitor

This can be specified by the network administrator.

Use the following procedure to enable or disable each protocol from Web Image Monitor.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area, and then click [Network Security] under "Security" category.
3. Set the desired protocols to active/inactive (or open/close).
4. Click [OK].
5. Click [OK].
6. Click [Logout].
7. Close Web Image Monitor.

Specifying Network Security Level

This can be specified by the network administrator.

This setting lets you change the security level to limit unauthorized access. You can make network security level settings on the control panel, as well as Web Image Monitor. However, the protocols that can be specified differ.

7

Set the security level to [Level 0], [Level 1], or [Level 2].

Select [Level 2] for maximum security to protect confidential information. Make this setting when it is necessary to protect confidential information from outside threats.

Select [Level 1] for moderate security to protect important information. Use this setting if the printer is connected to the office local area network (LAN).

Select [Level 0] for easy use of all the features. Use this setting when you have no information that needs to be protected from outside threats.

For details about logging in and logging out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication", p.25 "Logging in Using Administrator Authentication", p.25 "Logging out Using Administrator Authentication".

Specifying Network Security Level using the control panel

This can be specified by the network administrator.

Use the following procedure to specify the Network Security Level settings using the control panel.

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Network Security Level], and then press the [OK] key.

4. Press the [▲] or [▼] key to select [Level 0], [Level 1], or [Level 2], and then press the [OK] key.
5. Press the [Menu] key.

Specifying Network Security Level using Web Image Monitor

This can be specified by the network administrator.

Use the following procedure to specify the Network Level setting from Web Image Monitor.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area, and then click [Network Security] under "Security" category.
3. Select the network security level in "Security Level".
4. Click [OK].
5. Click [OK].
6. Click [Logout].
7. Close Web Image Monitor.

Status of functions under each Network Security Level

The following tables show the effects the different network security levels have on each function.

TCP/IP*1

Function	Level 0	Level 1	Level 2
TCP/IP*2	Active	Active	Active
HTTP> Port 80	Open	Open	Open
IPP> Port 80	Open	Open	Open
IPP> Port 631	Open	Open	Close
SSL> Port 443	Open	Open	Open
SSL> Permit SSL/TLS Communication	Ciphertext Priority	Ciphertext Priority	Ciphertext Only
SSL/TLS version> SSL2.0*2	Active	Active	Active

Function	Level 0	Level 1	Level 2
SSL/TLS version> SSL3.0 ^{*2}	Active	Active	Active
SSL/TLS version> TLS ^{*2}	Active	Active	Active
Encryption Strength Setting> AES ^{*2}	Active	Active	Active
Encryption Strength Setting> 3DES ^{*2}	Active	Active	Active
Encryption Strength Setting> DES ^{*2}	Active	Active	Active
Encryption Strength Setting> RC4 ^{*2}	Active	Active	Active
Encryption Strength Setting> RC2 ^{*2}	Active	Active	Active
DIPRINT	Active	Active	Inactive
LPR	Active	Active	Inactive
FTP	Active	Active	Active
sftp	Active	Active	Active
ssh	Active	Active	Active
RSH/RCP	Active	Active	Inactive
TELNET	Active	Inactive	Inactive
Bonjour	Active	Active	Inactive
SSDP	Active	Active	Inactive
SMB	Active	Active	Inactive
NetBIOS over TCP/IPv4	Active	Active	Inactive
WSD (Device)	Active	Active	Inactive
WSD (Printer)	Active	Active	Inactive
RHPP	Active	Active	Inactive

NetWare^{*3}

Function	Level 0	Level 1	Level 2
NetWare	Active	Active	Inactive

AppleTalk

Function	Level 0	Level 1	Level 2
AppleTalk	Active	Active	Inactive

SNMP

Function	Level 0	Level 1	Level 2
SNMP	Active	Active	Active
Permit Settings by SNMPv1 and v2	On	Off	Off
SNMPv1,v2 Function	Active	Active	Inactive
SNMPv3 Function	Active	Active	Active
Permit SNMPv3 Communication	Encryption/ Cleartext	Encryption/ Cleartext	Encryption Only

- *1 The same settings are applied to IPv4 and IPv6.
- *2 This setting is not governed by the security level. Manually specify whether to activate or inactivate this setting.
- *3 If NetWare is not used on your network, the above settings are not applicable.

Encrypting Transmitted Passwords

We recommend you use one or more of the following security protocols: IPsec, SNMPv3, and SSL. Using these protocols can enhance your machine's security to make login and IPP authentication passwords harder to break.

Also, encrypt the login password for administrator authentication and user authentication.

Driver Encryption Key

Encrypt the password transmitted when specifying user authentication.

To encrypt the login password, specify the driver encryption key on the printer and on the printer driver installed in the user's computer.

Password for IPP Authentication

To encrypt the IPP Authentication password on Web Image Monitor, set "Authentication" to [DIGEST], and then specify the IPP Authentication password set on the printer.

Specifying a Driver Encryption Key

This can be specified by the network administrator.

7

Specify the driver encryption key on the printer.

You can enhance security to make login passwords harder to break.

For details about logging in and logging out with administrator authentication, see p.25 "Logging in Using Administrator Authentication", p.25 "Logging out Using Administrator Authentication".

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Extended Security], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [Driver Encryption Key], and then press the [OK] key.
5. Enter the driver encryption key, and then press the [OK] key.

Enter the driver encryption key using up to 32 alphanumeric characters.

For details about specifying the encryption key on the printer driver, see the printer driver Help.

6. Enter the driver encryption key again to confirm it, and then press the [OK] key.
7. Press the [Menu] key.

Specifying an IPP Authentication Password

This can be specified by the network administrator.

Specify the IPP authentication passwords for the printer using Web Image Monitor.

You can enhance security to make login passwords harder to break.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area under "Security" category, and then click [IPP Authentication].
3. Select [DIGEST] from the "Authentication" list.
4. Enter the user name in the "User Name" box.
5. Enter the password in the "Password" box.
6. Click [OK].
7. Click [OK].
8. Click [Logout].
9. Close Web Image Monitor.

 **Note**

- When using the IPP port under Windows XP/Vista/7 or Windows Server 2003/2003 R2/2008/2008 R2, you can use the operating system's standard IPP port.

Protection Using Encryption

Establish encrypted transmission on this printer using SSL, SNMPv3, and IPsec. By encrypting transmitted data and safeguarding the transmission route, you can prevent sent data from being intercepted, analyzed, and tampered with.

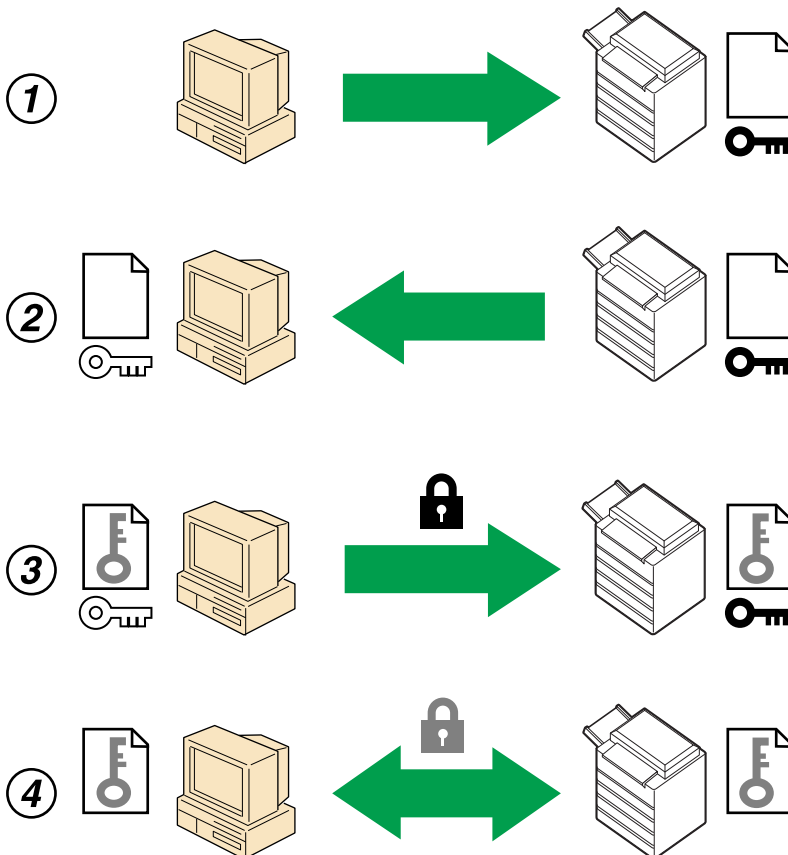
SSL (Secure Sockets Layer) Encryption

This can be specified by the network administrator.

To protect the communication path and establish encrypted communication, create and install the device certificate.

There are two ways of installing a device certificate: create and install a self-signed certificate using the printer, or request a certificate from a certificate authority and install it.

SSL (Secure Sockets Layer)



BZM006

1. To access the printer from a user's computer, request the SSL device certificate and public key.

2. The device certificate and public key are sent from the printer to the user's computer.
3. The shared key created with the computer is encrypted using the public key, sent to the printer, and then decrypted using the private key in the printer.
4. The shared key is used for data encryption and decryption, thus achieving secure transmission.

Configuration flow (self-signed certificate)

1. Creating and installing the device certificate
Install the device certificate using Web Image Monitor.
2. Enabling SSL
Enable the "SSL/TLS" setting using Web Image Monitor.

Configuration flow (certificate issued by a certificate authority)

1. Creating the device certificate
Create the device certificate using Web Image Monitor.
The application procedure after creating the certificate depends on the certificate authority.
Follow the procedure specified by the certificate authority.
2. Installing the device certificate
Install the device certificate using Web Image Monitor.
3. Enabling SSL
Enable the "SSL/TLS" setting using Web Image Monitor.

Note

- To confirm whether SSL configuration is enabled, enter "https://(the printer's IP address or host name)/" in your Web browser's address bar to access this printer. If the "The page cannot be displayed" message appears, check the configuration because the current SSL configuration is invalid.

Creating and Installing the Self-Signed Certificate

This can be specified by the network administrator.

Create and install the device certificate using Web Image Monitor. For details about the displayed items and selectable items, see Web Image Monitor Help.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area, and then click [Device Certificate] under "Security" category.
3. Click [Certificate1].
4. Click [Create].

5. Make the necessary settings.

6. Click [OK].

7. Click [OK].

A security warning dialog box appears.

8. Check the details, and then click [OK].

"Installed" appears under "Certificate Status" to show that a device certificate for the printer has been installed.

9. Click [Logout].

10. Close Web Image Monitor.

Note

- Click [Delete] to delete the device certificate from the printer.

Creating the Device Certificate (Certificate Issued by a Certificate Authority)

This can be specified by the network administrator.

Create the device certificate using Web Image Monitor. For details about the displayed items and selectable items, see Web Image Monitor Help.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.

2. Click [Configuration] in the Menu area, and then click [Device Certificate] under "Security" category.

3. Click [Certificate 1].

4. Click [Request].

5. Make the necessary settings.

6. Click [OK].

"Requesting" appears under "Certificate Status".

7. Click [Logout].

8. Apply to the certificate authority for the device certificate.

The application procedure depends on the certificate authority. For details, contact the certificate authority.

For the application, click Web Image Monitor Details icon and use the information that appears in "Certificate Details".

↓ Note

- The issuing location may not be displayed if you request two certificates at the same time. When you install a certificate, be sure to check the certificate destination and installation procedure.
- Using Web Image Monitor, you can create the contents of the device certificate but you cannot send the certificate application.
- Click [Cancel Request] to cancel the request for the device certificate.

Installing the Device Certificate (Certificate Issued by a Certificate Authority)

This can be specified by the network administrator.

Install the device certificate using Web Image Monitor. For details about the displayed items and selectable items, see Web Image Monitor Help.

Enter the device certificate contents issued by the certificate authority. Installation of the certificate is especially necessary for users who want to print via IPP -SSL from Windows Vista/7 or Windows Server 2008/2008 R2.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Configuration] in the Menu area, and then click [Device Certificate] under "Security" category.**
3. **Click [Certificate1].**
4. **Click [Install].**
5. **Enter the contents of the device certificate.**
In the Certificate box, enter the contents of the device certificate issued by the certificate authority.
6. **Click [OK].**
7. **Wait a moment for the device to restart, and then click [OK].**

"Installed" appears under "Certificate Status" to show that a device certificate for the printer has been installed.

8. **Click [Logout].**
9. **Close Web Image Monitor.**

↓ Note

- If a certificate authority issues a certificate that must be authenticated by an intermediate certificate authority, and the certificate is installed on this printer, an intermediate certificate must be installed on the client computer. Otherwise, validation by the certificate authority will not be performed correctly. If validation cannot be performed properly, a warning message informing you that installation is not possible might appear when you try to add a printer using IPP-SSL under Windows Vista/7 or

Windows Server 2008/2008 R2. A warning message might also appear if you attempt to access this printer through Web Image Monitor with SSL enabled. To enable authentication from the client computer, install the intermediate certificate on the client computer, and then reestablish connection.

- Intermediate certificates cannot be installed on this printer.

Enabling SSL

This can be specified by the network administrator.

After installing the device certificate in the printer, enable the SSL setting.

This procedure is used for a self-signed certificate or a certificate issued by a certificate authority.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Configuration] in the Menu area, and then click [SSL/TLS] under "Security" category.**
3. **Click [Active] for the protocol version used in "SSL/TLS".**
4. **Select the encryption communication mode for "Permit SSL/TLS Communication".**
5. **If you want to disable a protocol, click [Inactive] next to "SSL2.0", "SSL3.0", or "TLS".**

Note that if you have selected [Active] in step 3, at least one of these protocols must be enabled.

6. **In "Encryption Strength Setting", check the encryption strength (key length) for AES, 3DES, DES, RC4, and RC2.**

You must check at least 1 key length for each encryption standard.

Depending on whether "SSL2.0", "SSL3.0", and "TLS" is set to "Active" or "Inactive", the items you can check vary.

7. **Click [OK].**
8. **Click [OK].**
9. **Click [Logout].**
10. **Close Web Image Monitor.**

Note

- If you set "Permit SSL/TLS Communication" to [Ciphertext Only], enter "http://(the printer's IP address or host name)/" to access the printer.
- Depending on the states you specify for "SSL2.0", "SSL3.0", and "TLS", the machine might not be able to connect to an external LDAP server.
- Communication via @Remote and Integration Server authentication is always encrypted by SSL 3.0.

User Settings for SSL (Secure Sockets Layer)

We recommend that after installing the self-signed certificate or device certificate from a private certificate authority on the main unit and enabling SSL (communication encryption), you instruct users to install the certificate on their computers. Installation of the certificate is especially necessary for users who want to print via IPP-SSL from Windows Vista/7 or Windows Server 2008/2008 R2. The network administrator must instruct each user to install the certificate.

↓ Note

- Take the appropriate steps when you receive a user's inquiry concerning problems such as an expired certificate.
- For details about how to install the certificate and about where to store the certificate when accessing the printer using IPP, see Web Image Monitor Help.
- If a certificate issued by a certificate authority is installed in the printer, confirm the certificate store location with the certificate authority.
- Printing via the standard IPP port under Windows Vista/7 or Windows Server 2008/2008 R2 is possible only after the hostname or IP address is specified in the device certificate's [Common Name] setting. If the host name or IP address has changed, the user must delete the printer installed on the client computer. The printer must be reinstalled if the client computer's device certificate has been updated. Also, if a user's authentication information (login user name and password) has changed, the printer must be deleted, then the user's information settings must be updated, and then the printer must be reinstalled.

Setting the SSL/TLS Encryption Mode

By specifying the SSL/TLS encrypted communication mode, you can change the security level.

Encrypted Communication Mode

Using the encrypted communication mode, you can specify encrypted communication.

Ciphertext Only	Allows encrypted communication only. If encryption is not possible, the printer does not communicate.
Ciphertext Priority	Performs encrypted communication if encryption is possible. If encryption is not possible, the printer communicates without it.
Ciphertext/Cleartext	Communicates with or without encryption, according to the setting.

Setting the SSL/TLS encryption mode

This can be specified by the network administrator.

After installing the device certificate, specify the SSL/TLS encrypted communication mode. By making this setting, you can change the security level.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Configuration] in the Menu area.**
3. **Click [SSL/TLS] in the "Security" category.**
4. **Select the encryption communication mode in the "Permit SSL/TLS Communication" list, and then click [OK].**

Select [Ciphertext Only], [Ciphertext Priority], or [Ciphertext/Cleartext] as the encrypted communication mode.

5. **Click [OK].**
6. **Click [Logout].**
7. **Close Web Image Monitor.**

7 Note

- The SSL/TLS encrypted communication mode can also be specified using Web Image Monitor. For details, see Web Image Monitor Help.

SNMPv3 Encryption

This can be specified by the network administrator.

When using SmartDeviceMonitor for Admin or another application to make various settings, you can encrypt the data transmitted.

By making this setting, you can protect data from being tampered with.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. **Log in to Web Image Monitor as an administrator.**
2. **Click [Configuration] in the Menu area.**
3. **Click [Network Security] in the "Security" category.**
4. **Click [Encryption Only] in the "Permit SNMPv3 Communication" area of the "SNMP" section, and then click [OK].**
5. **Click [OK].**
6. **Click [Logout].**

7. Close Web Image Monitor.

↓ Note

- To use SmartDeviceMonitor for Admin, you need to download SmartDeviceMonitor for Admin from the manufacturer's Website and install it on your computer. Contact your local dealer for information on downloading SmartDeviceMonitor for Admin.
- To use SmartDeviceMonitor for Admin for encrypting the data for specifying settings, you need to specify the network administrator's [Encryption Password] setting and [Encryption Key] in [SNMP Authentication Information] in SmartDeviceMonitor for Admin, in addition to specifying [Permit SNMPv3 Communication] on the printer. For details about specifying [Encryption Key] in SmartDeviceMonitor for Admin, see SmartDeviceMonitor for Admin Help.
- If network administrator's [Encryption Password] setting is not specified, the data for transmission may not be encrypted or sent. For details about specifying the network administrator's [Encryption Password] setting, see "Registering the Administrator".

Transmission Using IPsec

This can be specified by the network administrator.

For communication security, this printer supports IPsec. IPsec transmits secure data packets at the IP protocol level using the shared key encryption method, where both the sender and receiver retain the same key. This printer has two methods that you can use to specify the shared encryption key for both parties: encryption key auto exchange and encryption key manual settings. Using the auto exchange setting, you can renew the shared key exchange settings within a specified validity period, and achieve higher transmission security.

★ Important

- When "Inactive" is specified for "Exclude HTTPS Communication", access to Web Image Monitor can be lost if the key settings are improperly configured. In order to prevent this, you can specify IPsec to exclude HTTPS communication by selecting "Active". When you want to include HTTPS transmission, we recommend that you select "Inactive" for "Exclude HTTPS Communication" after confirming that IPsec is properly configured. When "Active" is selected for "Exclude HTTPS Communication", even though HTTPS transmission is not targeted by IPsec, Web Image Monitor might become unusable when TCP is targeted by IPsec from the computer side. If you cannot access Web Image Monitor due to IPsec configuration problems, disable IPsec on the control panel, and then access Web Image Monitor. For details about disabling IPsec using the control panel, see p.126 "Deactivating IPsec Using the Control Panel".
- IPsec is not applied to data obtained through DHCP, DNS, or WINS.
- IPsec compatible operating systems are Windows XP SP2, Windows Vista/7, Windows Server 2003/2003 R2, 2008/2008 R2, Mac OS X 10.4 and later, Red Hat Enterprise Linux WS 4.0, and Solaris 10. However, some setting items are not supported depending on the operating system. Make sure the IPsec settings you specify are consistent with the operating system's IPsec settings.

Encryption and Authentication by IPsec

IPsec consists of two main functions: the encryption function, which ensures the confidentiality of data, and the authentication function, which verifies the sender of the data and the data's integrity. This printer's IPsec function supports two security protocols: the ESP protocol, which enables both of the IPsec functions at the same time, and the AH protocol, which enables only the authentication function.

ESP Protocol

The ESP protocol provides secure transmission through both encryption and authentication. This protocol does not provide header authentication.

- For successful encryption, both the sender and receiver must specify the same encryption algorithm and encryption key. If you use the encryption key auto exchange method, the encryption algorithm and encryption key are specified automatically.

- For successful authentication, the sender and receiver must specify the same authentication algorithm and authentication key. If you use the encryption key auto exchange method, the authentication algorithm and authentication key are specified automatically.

AH Protocol

The AH protocol provides secure transmission through authentication of packets only, including headers.

- For successful authentication, the sender and receiver must specify the same authentication algorithm and authentication key. If you use the encryption key auto exchange method, the authentication algorithm and authentication key are specified automatically.

AH Protocol + ESP Protocol

When combined, the ESP and AH protocols provide secure transmission through both encryption and authentication. These protocols provide header authentication.

- For successful encryption, both the sender and receiver must specify the same encryption algorithm and encryption key. If you use the encryption key auto exchange method, the encryption algorithm and encryption key are specified automatically.
- For successful authentication, the sender and receiver must specify the same authentication algorithm and authentication key. If you use the encryption key auto exchange method, the authentication algorithm and authentication key are specified automatically.

↓ Note

- Some operating systems use the term "Compliance" in place of "Authentication".

Encryption Key Auto Exchange Settings and Encryption Key Manual Settings

This printer provides two key setting methods: manual and auto exchange. Using either of these methods, agreements such as the IPsec algorithm and key must be specified for both sender and receiver. Such agreements form what is known as an SA (Security Association). IPsec communication is possible only if the receiver's and sender's SA settings are identical.

If you use the auto exchange method to specify the encryption key, the SA settings are auto configured on both parties' printers. However, before setting the IPsec SA, the ISAKMP SA (Phase 1) settings are auto configured. After this, the IPsec SA (Phase 2) settings, which allow actual IPsec transmission, are auto configured.

Also, for further security, the SA can be periodically auto updated by applying a validity period (time limit) for its settings. This printer only supports IKEv1 for encryption key auto exchange.

If you want to specify the encryption key manually, the SA settings must be shared and specified identically by both parties. To ensure the security of your SA settings, do not exchange them over a network.

Note that for both the manual and auto method of encryption key specification, multiple settings can be configured in the SA.

Settings 1-4 and Default Setting

Using either the manual or auto exchange method, you can configure four separate sets of SA details (such as different shared keys and IPsec algorithms). In the default settings of these sets, you can include settings that the fields of sets 1 to 4 cannot contain.

When IPsec is enabled, set 1 has the highest priority and 4 has the lowest. You can use this priority system to target IP addresses more securely. For example, set the broadest IP range at the lowest priority (4), and then set specific IP addresses at a higher priority level (3 and higher). This way, when IPsec transmission is enabled for a specific IP address, the higher level security settings will be applied.

IPsec Settings

IPsec settings for this printer can be made on Web Image Monitor. The following table explains individual setting items.

Encryption Key Auto Exchange / Manual Settings - Shared Settings

Setting	Description	Setting Value
IPsec	Specify whether to enable or disable IPsec.	<ul style="list-style-type: none"> Active Inactive
Exclude HTTPS Communication	Specify whether to enable IPsec for HTTPS communication.	<ul style="list-style-type: none"> Active Inactive <p>Specify "Active" if you do not want to use IPsec for "HTTPS communication".</p>
Encryption Key Manual Settings	Specify whether to enable Encryption Key Manual Settings, or use Encryption Key Auto Exchange Settings only.	<ul style="list-style-type: none"> Active Inactive <p>Specify "Active" if you want to use "Encryption Key Manual Settings".</p>

Encryption Key Auto Exchange Security Level

When you select a security level, certain security settings are automatically configured. The following table explains security level features.

Security Level	Security Level Features
Authentication Only	Select this level if you want to authenticate the transmission partner and prevent unauthorized data tampering, but not perform data packet encryption. Since the data is sent in clear text, data packets are vulnerable to eavesdropping attacks. Do not select this if you are exchanging sensitive information.
Authentication and Low Level Encryption	Select this level if you want to encrypt the data packets as well as authenticate the transmission partner and prevent unauthorized packet tampering. Packet encryption helps prevent eavesdropping attacks. This level provides less security than "Authentication and High Level Encryption".
Authentication and High Level Encryption	Select this level if you want to encrypt the data packets as well as authenticate the transmission partner and prevent unauthorized packet tampering. Packet encryption helps prevent eavesdropping attacks. This level provides higher security than "Authentication and Low Level Encryption".

The following table lists the settings that are automatically configured according to the security level.

Setting	Authentication Only	Authentication and Low Level Encryption	Authentication and High Level Encryption
Security Policy	Apply	Apply	Apply
Encapsulation Mode	Transport	Transport	Transport
IPsec Requirement Level	Use When Possible	Use When Possible	Always Require
Authentication Method	PSK	PSK	PSK
Phase 1 Hash Algorithm	MD5	SHA1	SHA1

Setting	Authentication Only	Authentication and Low Level Encryption	Authentication and High Level Encryption
Phase 1 Encryption Algorithm	DES	3DES	3DES
Phase 1 Diffie-Hellman Group	2	2	2
Phase 2 Security Protocol	AH	ESP	ESP
Phase 2 Authentication Algorithm	HMAC-MD5-96/ HMAC-SHA1-96	HMAC-MD5-96/HMAC-SHA1-96	HMAC-SHA1-96
Phase 2 Encryption Algorithm	Cleartext (NULL encryption)	DES/3DES/AES-128/ AES-192/AES-256	3DES/AES-128/ AES-192/AES-256
Phase 2 PFS	Inactive	Inactive	2

Encryption Key Auto Exchange Setting Items

When you specify a security level, the corresponding security settings are automatically configured, but other settings, such as address type, local address, and remote address must still be configured manually.

After you specify a security level, you can still make changes to the auto configured settings. When you change an auto configured setting, the security level switches automatically to "User Setting".

Setting	Description	Setting Value
Address Type	Specify the address type for which IPsec transmission is used.	<ul style="list-style-type: none"> • Inactive • IPv4 • IPv6 • IPv4/IPv6 (Default Settings only)

Setting	Description	Setting Value
Local Address	Specify the printer's address. If you are using multiple addresses in IPv6, you can also specify an address range.	The printer's IPv4 or IPv6 address. If you are not setting an address range, enter 32 after an IPv4 address, or enter 128 after an IPv6 address.
Remote Address	Specify the address of the IPsec transmission partner. You can also specify an address range.	The IPsec transmission partner's IPv4 or IPv6 address. If you are not setting an address range, enter 32 after an IPv4 address, or enter 128 after an IPv6 address.

Setting	Description	Setting Value
Security Policy	<p>Specify whether or not to apply security functions to IPsec transmissions.</p> <p>If you select "Apply", you must then select from the following the security function(s) you require.</p> <ul style="list-style-type: none"> • Encapsulation Mode • IPsec Requirement Level • Authentication Method • PSK Text • Phase 1 Hash Algorithm • Phase 1 Encryption Algorithm • Phase 1 Diffie-Hellman Group • Phase 1 Validity Period • Phase 2 Security Protocol • Phase 2 Authentication Algorithm • Phase 2 Encryption Algorithm Permissions • Phase 2 PFS • Phase 2 Validity Period 	<ul style="list-style-type: none"> • Apply • Bypass • Discard
Encapsulation Mode	<p>Specify the encapsulation mode.</p> <p>(auto setting)</p>	<ul style="list-style-type: none"> • Transport • Tunnel <p>(Tunnel beginning address - Tunnel ending address)</p> <p>If you specify "Tunnel", you must then specify the "Tunnel End Point", which are the beginning and ending IP addresses. Set the same address for the beginning point as you set in "Local Address".</p>

Setting	Description	Setting Value
IPsec Requirement Level	Specify whether to only transmit using IPsec, or to allow clear text transmission when IPsec cannot be established. (auto setting)	<ul style="list-style-type: none"> • Use When Possible • Always Require
Authentication Method	Specify the method for authenticating transmission partners. (auto setting)	<ul style="list-style-type: none"> • PSK • Certificate <p>If you specify "PSK", you must then set the PSK text (using ASCII characters).</p> <p>If you are using "PSK", specify a PSK password using up to 32 ASCII characters.</p> <p>If you specify "Certificate", the certificate for IPsec must be installed and specified before it can be used.</p>
Phase 1 Hash Algorithm	Specify the Hash Algorithm to be used in phase 1. (auto setting)	<ul style="list-style-type: none"> • MD5 • SHA1
Phase 1 Encryption Algorithm	Specify the encryption algorithm to be used in phase 1. (auto setting)	<ul style="list-style-type: none"> • DES • 3DES
Phase 1 Diffie-Hellman Group	Specify the Diffie-Hellman group number. (auto setting)	<ul style="list-style-type: none"> • 1 • 2 • 14
Phase 1 Validity Period	Specify the time period for which the SA settings in phase 1 are valid.	Set in seconds from 300 sec. (5 min.) to 172800 sec. (48 hrs.).
Phase 2 Security Protocol	Specify the security protocol to be used in Phase 2. (auto setting)	<ul style="list-style-type: none"> • ESP • AH • ESP+AH

Setting	Description	Setting Value
Phase 2 Authentication Algorithm	Specify the authentication algorithm to be used in phase 2. (auto setting)	<ul style="list-style-type: none"> • HMAC-MD5-96 • HMAC-SHA1-96
Phase 2 Encryption Algorithm Permissions	Specify the encryption algorithm to be used in phase 2. (auto setting)	<ul style="list-style-type: none"> • Cleartext (NULL encryption) • DES • 3DES • AES-128 • AES-192 • AES-256
Phase 2 PFS	Specify whether to activate PFS. Then, if PFS is activated, select the Diffie-Hellman group. (auto setting)	<ul style="list-style-type: none"> • Inactive • 1 • 2 • 14
Phase 2 Validity Period	Specify the time period for which the SA settings in phase 2 are valid.	Specify a period (in seconds) from 300 (5min.) to 172800 (48 hrs.).

Encryption Key Manual Settings Items

Setting	Description	Setting Value
Address Type	Specify the address type for which IPsec transmission is used.	<ul style="list-style-type: none"> • Inactive • IPv4 • IPv6 • IPv4/IPv6 (Default Settings only)
Local Address	Specify the printer's address. If you are using multiple IPv6 addresses, you can also specify an address range.	The printer's IPv4 or IPv6 address. If you are not setting an address range, enter 32 after an IPv4 address, or enter 128 after an IPv6 address.

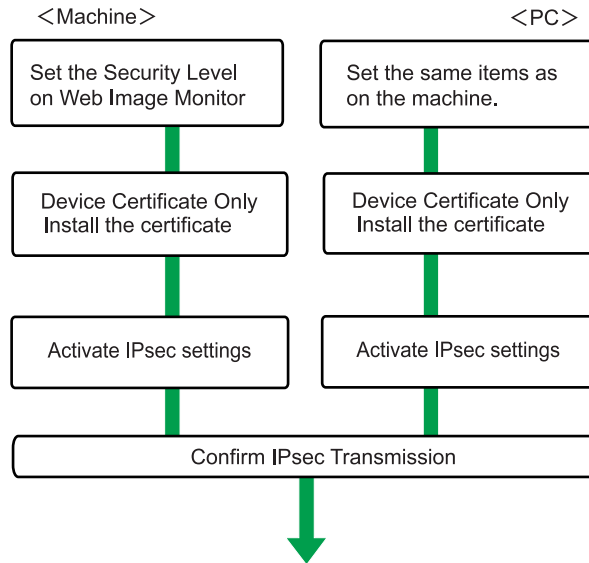
Setting	Description	Setting Value
Remote Address	Specify the address of the IPsec transmission partner. You can also specify an address range.	The IPsec transmission partner's IPv4 or IPv6 address. If you are not setting an address range, enter 32 after an IPv4 address, or enter 128 after an IPv6 address.
Encapsulation Mode	Select the encapsulation mode.	<ul style="list-style-type: none"> • Transport • Tunnel (Tunnel beginning address - Tunnel ending address) If you select "Tunnel", set the "Tunnel End Point", the beginning and ending IP addresses. In "Tunnel End Point", set the same address for the beginning point as you set in "Local Address".
SPI (Output)	Specify the same value as your transmission partner's SPI input value.	Any number between 256 and 4095
SPI (Input)	Specify the same value as your transmission partner's SPI output value.	Any number between 256 and 4095
Security Protocol	To use encryption data only, select ESP. To use authentication data only, select AH. To use encryption and authentication data, select ESP+AH.	<ul style="list-style-type: none"> • ESP • AH • ESP+AH
Authentication Algorithm	Specify the authentication algorithm.	<ul style="list-style-type: none"> • HMAC-MD5-96 • HMAC-SHA1-96

Setting	Description	Setting Value
Authentication Key	Specify the key for the authentication algorithm.	<p>Specify a value within the ranges shown below, according to the encryption algorithm.</p> <p>hexadecimal value</p> <ul style="list-style-type: none"> • 0-9, a-f, A-F • If HMAC-MD5-96, set 32 digits • If HMAC-SHA1-96, set 40 digits <p>ASCII</p> <ul style="list-style-type: none"> • If HMAC-MD5-96, set 16 characters • If HMAC-SHA1-96, set 20 characters
Encryption Algorithm	Specify the encryption algorithm.	<ul style="list-style-type: none"> • Cleartext (NULL encryption) • DES • 3DES • AES-128 • AES-192 • AES-256

Setting	Description	Setting Value
Encryption Key	Specify the key for the encryption algorithm.	<p>Specify a value within the ranges shown below, according to the encryption algorithm.</p> <p>hexadecimal value</p> <ul style="list-style-type: none"> • 0-9, a-f, A-F • DES, set 16 digits • 3DES, set 48 digits • AES-128, set 32 digits • AES-192, set 48 digits • AES-256, set 64 digits <p>ASCII</p> <ul style="list-style-type: none"> • DES, set 8 characters • 3DES, set 24 characters • AES-128, set 16 characters • AES-192, set 24 characters • AES-256, set 32 characters

Encryption Key Auto Exchange Settings Configuration Flow

This can be specified by the network administrator.



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↓ Note

- To use a certificate to authenticate the transmission partner in encryption key auto exchange settings, a device certificate must be installed.
- After configuring IPsec, you can use "ping" command to check if the connection is established correctly. However, you cannot use "ping" command when ICMP is excluded from IPsec transmission on the computer side. Also, because the response is slow during initial key exchange, it may take some time to confirm that transmission has been established.

Specifying encryption key auto exchange settings

This can be specified by the network administrator.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area, and then click [IPsec] under "Security" category.
3. Click [Edit] under "Encryption Key Auto Exchange Settings".
4. Make encryption key auto exchange settings in [Settings 1].
If you want to make multiple settings, select the settings number and add settings.
5. Click [OK].
6. Select [Active] for "IPsec" in "IPsec".

7. Set "Exclude HTTPS Communication" to [Active] if you do not want to use IPsec for HTTPS transmission.
8. Click [OK].
9. Click [OK].
10. Click [Logout].
11. Close Web Image Monitor.

↓ Note

- To change the transmission partner authentication method for encryption key auto exchange settings to "Certificate", you must first install and assign a certificate.

Selecting the certificate for IPsec

This can be specified by the network administrator.

Using Web Image Monitor, select the certificate to be used for IPsec. You must install the certificate before it can be used.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area, and then click [Device Certificate] under "Security" category.
3. Select the certificate to be used for IPsec from the drop down box in "IPsec" under "Certification".
4. Click [OK].
5. Click [OK].
6. Click [Logout].
7. Close Web Image Monitor.

7

Specifying IPsec settings on the computer

Specify exactly the same settings for IPsec SA settings on your computer as are specified by the printer's security level on the printer. Setting methods differ according to the computer's operating system. The example procedure shown here uses Windows XP when the Authentication and Low Level Encryption Security level is selected.

1. On the [Start] menu, click [Control Panel], [Performance and Maintenance], and then click [Administrative Tools].
2. Double-click [Local Security Policy].

3. Click [IP Security Policies on Local Computer].
4. In the "Action" menu, click [Create IP Security Policy].
5. Click [Next].
6. Enter a security policy name in "Name", and then click [Next].
7. Clear the "Activate the default response rule" check box, and then click [Next].
8. Select "Edit properties", and then click [Finish].
9. In the "General" tab, click [Advanced].
10. In "Authenticate and generate a new key after every", enter the same validity period (in minutes) that is specified on the printer in Encryption Key Auto Exchange Settings Phase 1, and then click [Methods].
11. Confirm that the hash algorithm ("Integrity"), encryption algorithm ("Encryption") and "Diffie-Hellman Group" settings in "Security method preference order" all match those specified on the printer in Encryption Key Auto Exchange Settings Phase 1.
If the settings are not displayed, click [Add].
12. Click [OK] twice.
13. Click [Add] in the "Rules" tab.
The Security Rule Wizard appears.
14. Click [Next].
15. Select "This rule does not specify a tunnel", and then click [Next].
16. Select the type of network for IPsec, and then click [Next].
17. Select the authentication method, and then click [Next].
If you select "Certificate" for authentication method in Encryption Key Auto Exchange Settings on the machine, specify the device certificate. If you select "PSK", enter the same PSK text specified on the printer with the pre-shared key.
18. Click [Add] in the IP Filter List.
19. In [Name], enter an IP Filter name, and then click [Add].
20. Click [Next].
21. Select "My IP Address" in "Source address", and then click [Next].
22. Select "A specific IP Address" in "Destination address", enter the printer's IP address, and then click [Next].
23. For the IPsec protocol type, select "Any", and then click [Next].
24. Click [Finish].
25. Click [OK].
26. Select the IP filter that you have just created, and then click [Next].
27. Select the IPsec security filter, and then click [Edit].

28. In the "Security Methods" tab, check "Negotiate security" and then click [Add].
29. Select "Custom" and click [Settings].
30. In "Integrity algorithm", select the authentication algorithm that was specified on the printer in Encryption Key Auto Exchange Settings Phase 2.
31. In "Encryption algorithm", select the encryption algorithm that specified on the printer in Encryption Key Auto Exchange Settings Phase 2.
32. In Session key settings, select "Generate a new key every", and enter the validity period (in seconds) that was specified on the printer in Encryption Key Auto Exchange Settings Phase 2.
33. Click [OK] three times.
34. Click [Next].
35. Click [Finish].

If you are using IPv6 under Windows Vista or a newer version of Windows, you must repeat this procedure from step 13 and specify ICMPv6 as an exception. When you reach step 23, select [58] as the protocol number for the "Other" target protocol type, and then set [Negotiate security] to [Permit].

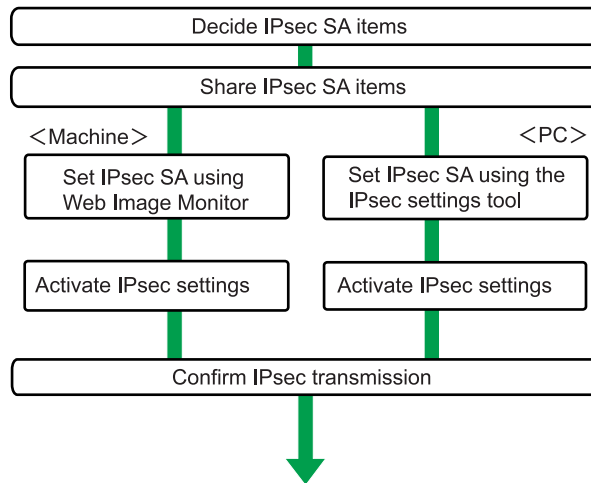
36. Click [OK].
37. Click [Close].
38. Select the security policy that you have just created, right click on it, and then click [Assign].

Note

- To disable the computer's IPsec settings, select the security policy, right click, and then click [Unassign].
- If you specify the "Authentication and High Level Encryption" security level in encryption key auto exchange settings, you must also select the "Master key perfect forward secrecy (PFS)" check box in the Security Filter Properties screen (which appears in step 27). When using PFS in Windows XP, the PFS group number used in phase 2 is automatically negotiated in phase 1 from the Diffie-Hellman group number (set in step 11). Consequently, if you change the security level-specified automatic settings on the printer and "User Setting" appears, you must then specify the same the group number for "Phase 1 Diffie-Hellman Group" and "Phase 2 PFS" on the printer to establish IPsec transmission.

Encryption Key Manual Settings Configuration Flow

This can be specified by the network administrator.



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↓ Note

- Before transmission, SA information is shared and specified by the sender and receiver. To prevent SA information leakage, we recommend that this exchange is not performed over the network.
- After configuring IPsec, you can use "ping" command to check if the connection is established correctly. However, you cannot use "ping" command when ICMP is excluded from IPsec transmission. Also, because the response is slow during initial key exchange, it may take some time to confirm that transmission has been established.

7

Specifying encryption key manual settings

This can be specified by the network administrator.

For details about logging in and out with administrator authentication, see p.22 "Using Web Image Monitor to Configure Administrator Authentication".

1. Log in to Web Image Monitor as an administrator.
2. Click [Configuration] in the Menu area, and then click [IPsec] under "Security" category.
3. Select [Active] for "Encryption Key Manual Settings".
4. Click [Edit] under "Encryption Key Manual Settings".
5. Set items for encryption key manual settings in [Settings 1].
If you want to make multiple settings, select the settings number and add settings.
6. Click [OK].
7. Select [Active] for "IPsec:" in "IPsec".

8. Set "Exclude HTTPS Communication" to [Active] if you do not want to use IPsec for HTTPS communication.
9. Click [OK].
10. Click [OK].
11. Click [Logout].
12. Close Web Image Monitor.

telnet Setting Commands

You can use telnet to confirm IPsec settings and make setting changes. This section explains telnet commands for IPsec. The default login name for administrator login is "admin" and the password is empty. For details about logging in to telnet and telnet operations, see "Remote Maintenance Using telnet", UNIX Supplement.

↓ Note

- If you are using a certificate as the authentication method in encryption key auto exchange settings (IKE), install the certificate using Web Image Monitor. A certificate cannot be installed using telnet.

ipsec

To display IPsec related settings information, use the "ipsec" command.

Display current settings

```
msh> ipsec
```

Displays the following IPsec settings information:

- IPsec shared settings values
- Encryption key manual settings, SA setting 1-4 values
- Encryption key manual settings, default setting values
- Encryption key auto exchange settings, IKE setting 1-4 values
- Encryption key auto exchange settings, IKE default setting values

Display current settings portions

```
msh> ipsec -p
```

- Displays IPsec settings information in portions.

ipsec manual mode

To display or specify encryption key manual settings, use the "ipsec manual_mode" command.

Display current settings

```
msh> ipsec manual_mode
```

- Displays the current encryption key manual settings.

Specify encryption key manual settings

```
msh> ipsec manual_mode {on|off}
```

- To enable encryption key manual settings, set to [on]. To disable settings, set to [off].

ipsec exclude

To display or specify protocols excluded by IPsec, use the "ipsec exclude" command.

Display current settings

```
msh> ipsec exclude
```

- Displays the protocols currently excluded from IPsec transmission.

Specify protocols to exclude

```
msh> ipsec exclude {https|dns|dhcp|wins|all} {on|off}
```

- Specify the protocol, and then enter [on] to exclude it, or [off] to include it for IPsec transmission. Entering [all] specifies all protocols collectively.

7**ipsec manual**

To display or specify the encryption key manual settings, use the "ipsec manual" command.

Display current settings

```
msh> ipsec manual {1|2|3|4|default}
```

- To display the settings 1-4, specify the number [1-4].
- To display the default setting, specify [default].
- Not specifying any value displays all of the settings.

Disable settings

```
msh> ipsec manual {1|2|3|4|default} disable
```

- To disable the settings 1-4, specify the setting number [1-4].
- To disable the default settings, specify [default].

Specify the local/remote address for settings 1-4

```
msh> ipsec manual {1|2|3|4} {ipv4|ipv6} local address remote address
```

- Enter the separate setting number [1-4] or [default] and specify the local address and remote address.

- To specify the local or remote address value, specify masklen by entering [/] and an integer 0-32 if you are specifying an IPv4 address. If you are specifying an IPv6 address, specify masklen by entering [/] and an integer 0-128.
- Not specifying an address value displays the current setting.

Specify the address type in default setting

```
msh> ipsec manual default {ipv4|ipv6|any}
```

- Specify the address type for the default setting.
- To specify both IPv4 and IPv6, enter [any].

Security protocol setting

```
msh> ipsec manual {1|2|3|4|default} proto {ah|esp|dual}
```

- Enter the separate setting number [1-4] or [default] and specify the security protocol.
- To specify AH, enter [ah]. To specify ESP, enter [esp]. To specify AH and ESP, enter [dual].
- Not specifying a protocol displays the current setting.

SPI value setting

```
msh> ipsec manual {1|2|3|4|default} spi SPI input value SPI output value
```

- Enter the separate setting number [1-4] or [default] and specify the SPI input and output values.
- Specify a decimal number between 256-4095, for both the SPI input and output values.

Encapsulation mode setting

```
msh> ipsec manual {1|2|3|4|default} mode {transport|tunnel}
```

- Enter the separate setting number [1-4] or [default] and specify the encapsulation mode.
- To specify transport mode, enter [transport]. To specify tunnel mode, enter [tunnel].
- If you have set the address type in the default setting to [any], you cannot use [tunnel] in encapsulation mode.
- Not specifying an encapsulation mode displays the current setting.

Tunnel end point setting

```
msh> ipsec manual {1|2|3|4|default} tunneladdr beginning IP address ending IP address
```

- Enter the separate setting number [1-4] or [default] and specify the tunnel end point beginning and ending IP address.
- Not specifying either the beginning or ending address displays the current settings.

Authentication algorithm and authentication key settings

```
msh> ipsec manual {1|2|3|4|default} auth {hmac-md5|hmac-sha1} authentication key
```

- Enter the separate setting number [1-4] or [default] and specify the authentication algorithm, and then set the authentication key.
- If you are setting a hexadecimal number, attach 0x at the beginning.

- If you are setting an ASCII character string, enter it as is.
- Not specifying either the authentication algorithm or key displays the current setting. (The authentication key is not displayed.)

Encryption algorithm and encryption key setting

```
msh> ipsec manual {1|2|3|4|default} encrypt {null|des|3des|aes128|aes192|aes256}
encryption key
```

- Enter the separate setting number [1-4] or [default], specify the encryption algorithm, and then set the encryption key.
- If you are setting a hexadecimal number, attach 0x at the beginning. If you have set the encryption algorithm to [null], enter an encryption key of arbitrary numbers 2-64 digits long.
- If you are setting an ASCII character string, enter it as is. If you have set the encryption algorithm to [null], enter an encryption key of arbitrary numbers 1-32 digits long.
- Not specifying an encryption algorithm or key displays the current setting. (The encryption key is not displayed.)

Reset setting values

```
msh> ipsec manual {1|2|3|4|default|all} clear
```

- Enter the separate setting number [1-4] or [default] and reset the specified setting. Specifying [all] resets all of the settings, including default.

7

ipsec ike

To display or specify the encryption key auto exchange settings, use the "ipsec ike" command.

Display current settings

```
msh> ipsec ike {1|2|3|4|default}
```

- To display the settings 1-4, specify the number [1-4].
- To display the default setting, specify [default].
- Not specifying any value displays all of the settings.

Disable settings

```
msh> ipsec manual {1|2|3|4|default} disable
```

- To disable the settings 1-4, specify the number [1-4].
- To disable the default settings, specify [default].

Specify the local/remote address for settings 1-4

```
msh> ipsec manual {1|2|3|4} {ipv4|ipv6} local address remote address
```

- Enter the separate setting number [1-4], and the address type to specify local and remote address.

- To set the local or remote address values, specify masklen by entering [/] and an integer 0-32 when settings an IPv4 address. When setting an IPv6 address, specify masklen by entering [/] and an integer 0-128.
- Not specifying an address value displays the current setting.

Specify the address type in default setting

```
msh> ipsec manual default {ipv4|ipv6|any}
```

- Specify the address type for the default setting.
- To specify both ipv4 and ipv6, enter [any].

Security policy setting

```
msh> ipsec ike {1|2|3|4|default} proc {apply|bypass|discard}
```

- Enter the separate setting number [1-4] or [default] and specify the security policy for the address specified in the selected setting.
- To apply IPsec to the relevant packets, specify [apply]. To not apply IPsec, specify [bypass].
- If you specify [discard], any packets that IPsec can be applied to are discarded.
- Not specifying a security policy displays the current setting.

Security protocol setting

```
msh> ipsec ike {1|2|3|4|default} proto {ah|esp|dual}
```

- Enter the separate setting number [1-4] or [default] and specify the security protocol.
- To specify AH, enter [ah]. To specify ESP, enter [esp]. To specify AH and ESP, enter [dual].
- Not specifying a protocol displays the current setting.

IPsec requirement level setting

```
msh> ipsec ike {1|2|3|4|default} level {require|use}
```

- Enter the separate setting number [1-4] or [default] and specify the IPsec requirement level.
- If you specify [require], data will not be transmitted when IPsec cannot be used. If you specify [use], data will be sent normally when IPsec cannot be used. When IPsec can be used, IPsec transmission is performed.
- Not specifying a requirement level displays the current setting.

Encapsulation mode setting

```
msh> ipsec ike {1|2|3|4|default} mode {transport|tunnel}
```

- Enter the separate setting number [1-4] or [default] and specify the encapsulation mode.
- To specify transport mode, enter [transport]. To specify tunnel mode, enter [tunnel].
- If you have set the address type in the default setting to [any], you cannot use [tunnel] in encapsulation mode.
- Not specifying an encapsulation mode displays the current setting.

Tunnel end point setting

```
msh> ipsec ike {1|2|3|4|default} tunneladdr beginning IP address ending IP address
```

- Enter the separate setting number [1-4] or [default] and specify the tunnel end point beginning and ending IP address.
- Not specifying either the beginning or ending address displays the current setting.

IKE partner authentication method setting

```
msh> ipsec ike {1|2|3|4|default} auth {psk|rsasig}
```

- Enter the separate setting number [1-4] or [default] and specify the authentication method.
- Specify [psk] to use a shared key as the authentication method. Specify [rsasig] to use a certificate at the authentication method.
- You must also specify the PSK character string when you select [psk].
- Note that if you select "Certificate", the certificate for IPsec must be installed and specified before it can be used. To install and specify the certificate use Web Image Monitor.

PSK character string setting

```
msh> ipsec ike {1|2|3|4|default} psk PSK character string
```

- If you select PSK as the authentication method, enter the separate setting number [1-4] or [default] and specify the PSK character string.
- Specify the character string in ASCII characters. There can be no abbreviations.

ISAKMP SA (phase 1) hash algorithm setting

```
msh> ipsec ike {1|2|3|4|default} ph1 hash {md5|sha1}
```

- Enter the separate setting number [1-4] or [default] and specify the ISAKMP SA (phase 1) hash algorithm.
- To use MD5, enter [md5]. To use SHA1, enter [sha1].
- Not specifying the hash algorithm displays the current setting.

ISAKMP SA (phase 1) encryption algorithm setting

```
msh> ipsec ike {1|2|3|4|default} ph1 encrypt {des|3des}
```

- Enter the separate setting number [1-4] or [default] and specify the ISAKMP SA (phase 1) encryption algorithm.
- To use DES, enter [des]. To use 3DES, enter [3des].
- Not specifying an encryption algorithm displays the current setting.

ISAKMP SA (phase 1) Diffie-Hellman group setting

```
msh> ipsec ike {1|2|3|4|default} ph1 dhgroup {1|2|14}
```

- Enter the separate setting number [1-4] or [default] and specify the ISAKMP SA (phase 1) Diffie-Hellman group number.

- Specify the group number to be used.
- Not specifying a group number displays the current setting.

ISAKMP SA (phase 1) validity period setting

```
msh> ipsec ike {1|2|3|4|default} ph1 lifetime validity period
```

- Enter the separate setting number [1-4] or [default] and specify the ISAKMP SA (phase 1) validity period.
- Enter the validity period (in seconds) from 300 to 172800.
- Not specifying a validity period displays the current setting.

IPsec SA (phase 2) authentication algorithm setting

```
msh> ipsec ike {1|2|3|4|default} ph2 auth {hmac-md5|hmac-sha1}
```

- Enter the separate setting number [1-4] or [default] and specify the IPsec SA (phase 2) authentication algorithm.
- Separate multiple encryption algorithm entries with a comma (.). The current setting values are displayed in order of highest priority.
- Not specifying an authentication algorithm displays the current setting.

IPsec SA (phase 2) encryption algorithm setting

```
msh> ipsec ike {1|2|3|4|default} ph2 encrypt {null|des|3des|aes128|aes192|aes256}
```

- Enter the separate setting number [1-4] or [default] and specify the IPsec SA (phase 2) encryption algorithm.
- Separate multiple encryption algorithm entries with a comma (.). The current setting values are displayed in order of highest priority.
- Not specifying an encryption algorithm displays the current setting.

IPsec SA (phase 2) PFS setting

```
msh> ipsec ike {1|2|3|4|default} ph2 pfs {none|1|2|14}
```

- Enter the separate setting number [1-4] or [default] and specify the IPsec SA (phase 2) Diffie-Hellman group number.
- Specify the group number to be used.
- Not specifying a group number displays the current setting.

IPsec SA (phase 2) validity period setting

```
msh> ipsec ike {1|2|3|4|default} ph2 lifetime validity period
```

- Enter the separate setting number [1-4] or [default] and specify the IPsec SA (phase 2) validity period.
- Enter the validity period (in seconds) from 300 to 172800.
- Not specifying a validity period displays the current setting.

Reset setting values

```
msh> ipsec ike {1|2|3|4|default|all} clear
```

- Enter the separate setting number [1-4] or [default] and reset the specified setting. Specifying [all] resets all of the settings, including default.

Initialize IPsec settings

```
msh> ipsec clear_init
```

- Use this command to reset the IPsec settings to their default values. Note however that the IPsec mode settings will be retained.

Deactivating IPsec Using the Control Panel

To specify this setting, you must log in as a network administrator. For details about how to log in and out with administrator authentication, see p.25 "Logging in Using Administrator Authentication" and p.25 "Logging out Using Administrator Authentication".

Use the following procedure to deactivate IPsec on this printer.

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Host Interface], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Network], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [IPsec], and then press the [OK] key.
5. Press the [▲] or [▼] key to select [Inactive], and then press the [OK] key.
6. Press the [Menu] key.

Authentication by telnet

This section explains Authentication by telnet. When using telnet, the default login name for administrator login is "admin" and the password is empty. For details on how to login to telnet, see "Remote Maintenance Using telnet", UNIX Supplement.

"authfree" Command

Use the "authfree" command to display and configure authentication exclusion control settings. If you use the "authfree" command in telnet, you can exclude printer job authentication and specify an IP address range. The authentication exclusion control display and setting methods are explained below.

View Settings

```
msh> authfree
```

If print job authentication exclusion is not specified, authentication exclusion control is not displayed.

IPv4 address settings

```
msh> authfree "ID" range_addr1 range_addr2
```

IPv6 address settings

```
msh> authfree "ID" range6_addr1 range6_addr2
```

IPv6 address mask settings

```
msh> authfree "ID" mask6_addr1 masklen
```

Parallel/USB settings

```
msh> authfree [parallel|usb] [on|off]
```

- To enable authfree, specify "on". To disable authfree, specify "off".
- Always specify the interface.
- The factory default setting is "off".
- "parallel" can be selected when the IEEE 1284 interface board is installed.

Authentication exclusion control initialization

```
msh> authfree flush
```

↓ Note

- In both IPv4 and IPv6 environments, up to five access ranges can be registered and selected.

Authentication by IEEE 802.1X

IEEE 802.1X enables authentication in an Ethernet or Wireless LAN environment. For details, see "Configuring IEEE 802.1X", Hardware Guide.

8. Specifying the Extended Security Functions

This chapter describes the printer's extended security features and how to specify them.

Specifying the Extended Security Functions

In addition to providing basic security through user authentication and administrator specified access limits on the printer, security can also be increased by encrypting transmitted data and data in the Address Book. If you need extended security, specify the printer's extended security functions before using the printer.

This section outlines the extended security functions and how to specify them.

For details about when to use each function, see the corresponding chapters.

Changing the Extended Security Functions

Administrators can change the extended security functions according to their role.

For details about logging in and logging out with administrator authentication, see p.25 "Logging in Using Administrator Authentication" and p.25 "Logging out Using Administrator Authentication".

To change the extended security functions, display the extended security screen as follows.

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Extended Security], and then press the [OK] key.
4. Press the [▲] or [▼] key to select the setting you want to change, and then press the [OK] key.
5. Change the setting, and then press the [OK] key.
6. Press the [Menu] key.

Extended Security Settings

This section explains the setting items under the Extended Security menu.

Driver Encryption Key

This can be specified by the network administrator.

Encrypt the password transmitted when specifying user authentication. If you register the encryption key specified with the printer in the driver, passwords are encrypted. For details, see the printer driver Help.

Encrypt Address Book

This can be specified by the user administrator.

Encrypt the data in the printer's Address Book.

For details on protecting data in the Address Book, see p.61 "Protecting the Address Book".

Default : [Off]

- On
- Off

Restrict User Info.Display

This can be specified by the machine administrator.

When the job history is checked using a network connection for which authentication is not available, all personal information can be displayed as "*****". For example, when someone not authenticated as an administrator checks the job history using SNMP in SmartDeviceMonitor for Admin, personal information can be displayed as "*****" so that users cannot be identified. Because information identifying registered users cannot be viewed, unauthorized users are prevented from obtaining information about the registered files.

Default : [Off]

- On
- Off

Enhance File Protection

This can be specified by the file administrator.

By specifying a password, you can limit operations such as printing, deleting, and sending files, and can prevent unauthorized people from accessing the files. However, it is still possible for the password to be cracked.

By specifying [Enhance File Protection], files are locked and so become inaccessible if an invalid password is entered ten times. This can protect the files from unauthorized access attempts in which a password is repeatedly guessed.

When files are locked, you cannot select them even if the correct password is entered.

Default : [Off]

- On
- Off

Settings by SNMPv1 and v2

This can be specified by the network administrator.

When the printer is accessed using the SNMPv1, v2 protocol, authentication cannot be performed, allowing machine administrator settings such as the paper setting to be changed. If you select [Prohibit], the setting can be viewed but not specified with SNMPv1, v2.

Default : [Do not Prohibit]

- Prohibit
- Do not Prohibit

Simple Encryption

This can be specified by the network administrator.

When a sophisticated encryption method cannot be enabled, simple encryption can be applied. For example, SSL/TLS is unavailable when you are editing the Address Book with User Management Tool or using the ScanRouter delivery software to send documents from DeskTopBinder. In such cases, selecting [Do not Restrict] applies simple encryption, which will help maintain the security of your data. When SSL/TLS can be enabled, select [Restrict] for this function.

For details about specifying SSL/TLS, see "Setting the SSL/TSL Encryption Mode".

If you select [Restrict], specify the encryption setting using the printer driver.

Default : [Do not Restrict]

- Restrict
- Do not Restrict

Authenticate Current Job

This can be specified by the machine administrator.

This setting lets you specify whether or not authentication is required for operations such as canceling jobs under the printer function.

If you select [Login Privilege], authorized users and the machine administrator can operate the printer. When this is selected, authentication is not required for users who logged in to the printer before [Login Privilege] was selected.

If you select [Access Privilege], users who canceled a print job in progress and the machine administrator can operate the printer.

Even if you select [Login Privilege] and log in to the printer, you cannot cancel a print job in progress if you are not authorized to use the printer function.

You can specify [Authenticate Current Job] only when [User Authentication Management] is already specified.

Default : [Off]

- Login Privilege
- Access Privilege
- Off

Password Policy

This can be specified by the user administrator.

The password policy setting is effective only if Basic Authentication is specified.

This setting lets you specify [Complexity Setting] and [Minimum Character No.] for the password. By making this setting, you can limit the available passwords to only those that meet the conditions specified in [Complexity Setting] and [Minimum Character No.].

If you select [Level 1], specify the password using a combination of two types of characters selected from upper-case letters, lower-case letters, decimal numbers, and symbols such as #.

If you select [Level 2], specify the password using a combination of three types of characters selected from upper-case letters, lower-case letters, decimal numbers, and symbols such as #.

Default : [Do not Restrict]

Default : [0]

- Complexity Setting
 - Level 2
 - Level 1
 - Do not Restrict
- Minimum Character No. (0-32)

@Remote Service

This can be specified by the machine administrator.

Communication via HTTPS for [@Remote Service] is disabled if you select [Prohibit].

Default : [Do not Prohibit]

- Prohibit
- Do not Prohibit

Update Firmware

This can be specified by the machine administrator.

Specify whether to allow firmware updates on the printer. Firmware update means having the service representative update the firmware or updating the firmware via the using FTP, Web Image Monitor, or the control panel.

If you select [Do not Prohibit], there are no restrictions on firmware updates.

Default : [Do not Prohibit]

- Prohibit
- Do not Prohibit

Change Firmware Structure

This can be specified by the machine administrator.

Specify whether to prevent changes in the firmware structure. The Change Firmware Structure function detects updating, adding or deleting firmware using the SD card, FTP, Web Image Monitor or the control panel, or inserting or removing the SD card, or an SD card for a different printer model has been inserted.

If you select [Prohibit], the printer stops during startup when a firmware structure change is detected and a message requesting administrator login is displayed. After the machine administrator logs in, the printer finishes startup with the updated firmware.

The administrator can confirm whether the structure change is necessary or not by checking the firmware version displayed on the control panel screen. If the firmware structure change is unnecessary, contact your service representative.

When [Change Firmware Structure] is set to [Prohibit], administrator authentication must be enabled.

After [Prohibit] is specified, turn off administrator authentication once, and the next time administrator authentication is specified, the setting will return to the default [Do not Prohibit].

If you select [Do not Prohibit], firmware structure change detection is disabled.

Default : [**Do not Prohibit**]

- Prohibit
- Do not Prohibit

Limiting Printer Operation to Customers Only

The printer can be set so that operation is impossible without administrator authentication.

The printer can be set to prohibit operation without administrator authentication and also prohibit remote registration in the Address Book by a service representative.

We maintain strict security when handling customers' data. Administrator authentication prevents us from operating the printer without administrator permission.

Use the following settings.

- Service Mode Lock

Settings

To specify this setting, you must be logged in as a machine administrator. For details about how to log in and out with administrator authentication, see p.25 "Logging in Using Administrator Authentication" and p.25 "Logging out Using Administrator Authentication".

Service Mode Lock

Service mode is used by a service representative for inspection or repair. If you set the service mode lock to [On], service mode cannot be used unless the machine administrator logs on to the printer and cancels the service mode lock to allow the service representative to operate the printer for inspection and repair. This ensures that the inspection and repair are done under the supervision of the machine administrator.

8

Specifying Service Mode Lock Preparation

Use the following procedure to specify the Service Mode Lock setting. To specify this setting, you must be logged in as a machine administrator.

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Service Mode Lock], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [On], and then press the [OK] key.
5. Press [Yes].
6. Press the [Menu] key.

Canceling Service Mode Lock

For a service representative to carry out inspection or repair in service mode, the machine administrator must log in to the printer and cancel the service mode lock.

1. Press the [Menu] key.
2. Press the [▲] or [▼] key to select [Security Options], and then press the [OK] key.
3. Press the [▲] or [▼] key to select [Service Mode Lock], and then press the [OK] key.
4. Press the [▲] or [▼] key to select [Off], and then press the [OK] key.
5. Press the [Menu] key.

9. Troubleshooting

This chapter describes what to do if the printer does not function properly.

If Authentication Fails

This section explains what to do if a user cannot operate the printer because of a problem related to user authentication. Refer to this section if a user comes to you with such a problem.

If a Message is Displayed

This section explains how to deal with problems if a message appears on the screen during user authentication.

The most common messages are explained. If some other message appears, deal with the problem according to the information contained in the message.

Messages	Cause	Solutions
Privileges are required to use this function.	The authority to use the function is not specified.	<ul style="list-style-type: none">• If this appears when trying to use a function: The function is not specified in the Address Book management setting as being available. The user administrator must decide whether to authorize use of the function and then assign the authority.• If this appears when trying to specify a default setting: The administrator differs depending on the default settings you wish to specify. Using the list of settings, the administrator responsible must decide whether to authorize use of the function.

Messages	Cause	Solutions
Failed to obtain URL.	The printer cannot connect to the server or cannot establish communication.	Make sure the server's settings, such as the IP address and host name, are specified correctly on the printer. Make sure the host name of the UA Server is specified correctly.
Failed to obtain URL.	The printer is connected to the server, but the UA service is not responding properly.	Make sure the UA service is specified correctly.
Failed to obtain URL.	SSL is not specified correctly on the server.	Specify SSL using Authentication Manager.
Failed to obtain URL.	Server authentication failed.	Make sure server authentication is specified correctly on the printer.
Authentication failed.	The entered login user name or login password is incorrect.	Ask the user administrator for the correct login user name and login password.
Authentication failed.	Authentication failed because no more users can be registered. (The number of users registered in the Address Book has reached capacity.)	Delete unnecessary user addresses.
Authentication failed.	Cannot access the authentication server when using Windows Authentication, LDAP Authentication, or Integration Server Authentication.	A network or server error may have occurred. Confirm the network in use with the LAN administrator.

Messages	Cause	Solutions
Set User Management in Admin. Auth. to on to use this setting.	Administrator Authentication is disabled in the administrator authentication management setting.	To use Basic Authentication, Windows Authentication, LDAP Authentication, and Integration Server Authentication, enable Administrator Authentication in the administrator authentication management setting beforehand. For the administrator authentication setting, see p.22 "Enabling Administrator Authentication".
File(s) without the privilege to delete have been selected. Such files will not be shown below.	You have tried to delete files without the authority to do so.	Files can be deleted by the file creator (owner) or file administrator. To delete a file which you are not authorized to delete, contact the file creator (owner).

↓ Note

- If a message prompting you to make a service call appears, contact your service representative.

If the Printer Cannot Be Operated

If the following conditions arise while users are operating the printer, provide the instructions on how to deal with them.

Condition	Cause	Solution
Cannot print using the printer driver.	User authentication has been rejected.	<p>Confirm the user name and login name with the administrator of the network in use if using Windows Authentication, LDAP Authentication, or Integration Server Authentication.</p> <p>Confirm with the user administrator if using basic authentication.</p>

Condition	Cause	Solution
Cannot print using the printer driver.	The encryption key specified in the driver does not match the printer's driver encryption key.	Specify the driver encryption key registered in the printer. See p.92 "Specifying a Driver Encryption Key".
After starting "User Management Tool" or "Address Management Tool" in SmartDeviceMonitor for Admin and entering the correct login user name and password, a message that an incorrect password has been entered appears.	"Restrict Use of Simple Encryption" is not set correctly. Alternatively, "SSL/TLS" has been enabled although the required certificate is not installed in the computer.	Set "Simple Encryption" to [Restrict]. Alternatively, enable "SSL/TLS", install the server certificate in the printer, and then install the certificate in the computer. See p.99 "Setting the SSL/TLS Encryption Mode".
User authentication is disabled, yet destinations specified using the printer do not appear.	User authentication may have been disabled while All Users is not specified.	Re-enable user authentication, and then enable All Users for the destinations that did not appear. For details about enabling All Users, see p.61 "Protecting the Address Book".
Cannot print when user authentication has been specified.	User authentication may not be specified in the printer driver.	Specify user authentication in the printer driver. For details, see the printer driver Help.
After you execute Encrypt Address Book, the Exit message does not appear.	The hard disk may be faulty. The file may be corrupt.	Contact your service representative.
The Overwriting Data function is disabled.	The SD card has been configured by another printer.	Do not insert an SD card that was configured by another printer. The Overwriting Data function is available only if the SD card was configured by this printer. Enable the function using the printer's control panel.

Condition	Cause	Solution
The Encrypting Data function is disabled.	The SD card has been configured by another printer.	Insert an SD card that was configured by this printer. Enable the function using the printer's control panel.

10. Appendix

This chapter describes supervisor operations, administrator settings, user access to settings and log settings.

Supervisor Operations

The supervisor can delete an administrator's password and specify a new one.

If any of the administrators forget their passwords or if any of the administrators change, the supervisor can assign a new password. If logged in using the supervisor's user name and password, you cannot use normal functions or specify defaults.

Log in as the supervisor only to change an administrator's password.

★ Important

- The default login user name is "supervisor" and the login password is blank. We recommend changing the login user name and login password.
- When registering login user names and login passwords, you can specify up to 32 alphanumeric characters and symbols. Keep in mind that user names and passwords are case-sensitive.
- Be sure not to forget the supervisor login user name and login password. If you do forget them, a service representative will have to return the printer to its default state. This will result in all data in the printer being lost and the service call may not be free of charge.

↓ Note

- You cannot specify the same login user name for the supervisor and the administrators.
- Using Web Image Monitor, you can log in as the supervisor and delete an administrator's password or specify a new one.

Logging in as the Supervisor

1. Log in to Web Image Monitor as an administrator.
2. Enter the login user name and password, and then click [Login].

When you assign the administrator for the first time, enter "supervisor", and leave the password empty.

The Web browser might be configured to auto complete login dialog boxes by retaining user names and passwords. This function reduces security. To prevent the browser retaining user names and passwords, disable the browser's auto complete function.

Logging out as the Supervisor

If administrator authentication has been specified, be sure to log out after completing settings.

1. Click [Logout].
2. Close Web Image Monitor.

Changing the Supervisor

1. Log in to Web Image Monitor in the supervisor mode.
2. Click [Configuration] in the Menu area.
3. Click [Program/Change Administrator] in the "Device Settings" category.
4. Enter the "Login User Name" in the "Supervisor" box.
5. Click [Change] in the "Login Password" area.
6. Enter the password, and then click [OK].
7. Click [Logout].
8. Close Web Image Monitor.

Resetting an Administrator's Password

1. Log in to Web Image Monitor in the supervisor mode.
2. Click [Configuration] in the Menu area.
3. Click [Program/Change Administrator] in the "Device Settings" category.
4. Select the Administrator whose password you want to change.
5. Click [Change] in the "Login Password" area.
6. Enter the password, and then click [OK].
7. Click [Logout].
8. Close Web Image Monitor.

User Administrator Settings

The user administrator settings that can be specified are as follows:

Control Panel

Security Options

- Extended Security
 - Encrypt Address Book
 - Password Policy

Language

All the settings can be specified.

Settings via Web Image Monitor

Address Book

All the settings can be specified.

Device Settings

- System
 - Display Panel Language
- Administrator Authentication Management
 - User Administrator Authentication
- Program/Change Administrator
 - You can specify the following administrator settings for the user administrator.
 - Login User Name
 - Login Password
 - Encryption Password

Webpage

- Webpage
 - Download Help File

Machine Administrator Settings

The machine administrator settings that can be specified are as follows:

Control Panel

Paper Input

All settings can be specified.

Maintenance

- Quality Maintenance
All settings can be specified.
- General Settings
All settings can be specified.
- Timer Settings
All settings can be specified.
- Machine Settings Export
Export the machine settings to a SD card.

List/Test Print

All settings can be specified.

System

All settings can be specified.

Print Settings

All settings can be specified.

Security Options

- Extended Security
 - Encrypt Address Book
 - Restrict User Info.Display
 - Authenticate Current Job
 - @Remote Service
 - Update Firmware
 - Change Firmware Structure
- Service Mode Lock
- Auto Erase Memory Setting *1
- Erase All Memory *1

- Transfer Log Setting
- Machine Data Encryption ^{*1}

*1 The SD card supplied with the hard disk is required.

Host Interface

- I/O Buffer
- I/O Timeout
- USB Settings
- Parallel Interface ^{*2}

*2 The IEEE 1284 interface board option must be installed.

Settings via Web Image Monitor

Home

- Reset Device
- Reset Printer Job

Job

- Job List
 - Current/Waiting Jobs
- Printer
 - Spool Printing

Device Settings

- System
 - Spool Printing
 - Protect Printer Display Panel
 - Display Panel Language
 - Permit Firmware Update
 - Permit Firmware Structure Change
 - Display IP Address on Device Display Panel
 - Paper Tray Priority
- Paper
 - All the settings can be specified.
- User Paper Type
 - All the settings can be specified.
- Date/Time

All the settings can be specified.

- Timer

All the settings can be specified.

- Logs

All the settings can be specified.

- Download Logs

All the settings can be specified.

- E-mail

All the settings can be specified.

- Auto E-mail Notification

All the settings can be specified.

- On-demand E-mail Notification

All the settings can be specified.

- User Authentication Management

All the settings can be specified.

- Administrator Authentication Management

Machine Administrator Authentication

- Program/Change Administrator

You can specify the following administrator settings for the machine administrator.

Login User Name

Login Password

Encryption Password

- LDAP Server

All the settings can be specified.

- Firmware Update

All the settings can be specified.

- Program/Change Realm

All the settings can be specified.

Printer

- Basic Settings

All the settings can be specified.

- Tray Parameters (PCL)

All the settings can be specified.

- Tray Parameters (PS)
All the settings can be specified.
- Virtual Printer Settings
All the settings can be specified.
- PDF Group Password
This setting is not available on this printer.
- PDF Fixed Password
All the settings can be specified.

Interface

- USB

Network

- SNMPv3
Access Type (Machine Administrator)

Security

- User Lockout Policy
All the settings can be specified.

RC Gate

- All the settings can be specified.

Webpage

- Webpage
Download Help File

Extended Feature Settings

- All the settings can be specified.

Network Administrator Settings

The network administrator settings that can be specified are as follows:

Control Panel

System

- Print Compressed Data

Security Options

- Extended Security
 - Driver Encryption Key
 - Settings by SNMPv1 and v2
 - Simple Encryption
- Network Security Level
 - All settings can be specified.

Host Interface

If DHCP is set to On, the settings that are automatically obtained via DHCP cannot be specified.

- Network
 - All settings can be specified.
- Wireless LAN *1
 - All settings can be specified.

*1 Wireless LAN interface unit option must be installed.

Settings via Web Image Monitor

Device Settings

- System
 - Device Name
 - Comment
 - Location
 - Display Panel Language
- E-mail
 - All the settings can be specified.
- Administrator Authentication Management

Network Administrator Authentication

- Program/Change Administrator

You can specify the following administrator settings for the network administrator.

Login User Name

Login Password

Encryption Password

Printer

- Basic Settings
 - Print Compressed Data

Interface

- Interface Settings
 - Ethernet Security
 - Ethernet Speed
- Wireless LAN Settings *1
 - All the settings can be specified.
 - * 1 Wireless LAN interface unit option must be installed.

Network

- IPv4
 - All the settings can be specified.
- IPv6
 - All the settings can be specified.
- NetWare
 - All the settings can be specified.
- AppleTalk
 - All the settings can be specified.
- SMB
 - All the settings can be specified.
- SNMP
 - All the settings can be specified.
- SNMPv3
 - All settings except for "Account" (Network Administrator) can be specified.
- SSDP
 - All the settings can be specified.

- Bonjour
All the settings can be specified.

Security

- Network Security
All the settings can be specified.
- Access Control
All the settings can be specified.
- IPP Authentication
All the settings can be specified.
- SSL/TLS
All the settings can be specified.
- ssh
All the settings can be specified.
- Site Certificate
All the settings can be specified.
- Device Certificate
All the settings can be specified.
- IPsec
All the settings can be specified.
- IEEE 802.1X
All the settings can be specified.

Webpage

All the settings can be specified.

File Administrator Settings

The file administrator settings that can be specified are as follows:

Control Panel

Maintenance

- HDD Management
 - Delete All Temporary Jobs
 - Delete All Stored Jobs
 - Auto Delete Temporary Jobs
 - Auto Delete Stored Jobs

Security Options

- Extended Security
 - Enhance File Protection

Language

All settings can be specified.

Settings via Web Image Monitor

Printer: Print Jobs

The file administrator can Edit/Delete the Print Job List and Unlock the print job.

Device Settings

- System
 - Display Panel Language
- Administrator Authentication Management
 - File Administrator Authentication
- Program/Change Administrator
 - You can specify the following administrator settings for the file administrator.
 - Login User Name
 - Login Password
 - Encryption Password

Printer

- Basic Settings

Auto Delete Temporary Print Jobs

Auto Delete Stored Print Jobs

Webpage

- Webpage

Download Help File

The Privilege for User Account Settings in the Address Book

The authority designations in the list indicate users with the following authorities.

- Abbreviations in the table heads

Read-only (User) = This is a user assigned "Read-only" authority.

Edit (User) = This is a user assigned "Edit" authority.

Edit / Delete (User) = This is a user assigned "Edit / Delete" authority.

User Admin. = This is the user administrator.

Registered User = This is a user that has personal information registered in the Address Book and has a login password and user name.

Full Control = This is a user granted full control.

- Abbreviations in the table columns

A = You can view and change the setting.

B = You can view the setting.

C = You cannot view or specify the setting.

Settings	Read-only (User)	Edit (User)	Edit / Delete (User)	Full Control	Registered User	User Admin.
Registration No.	B	A	A	A	A	A
Name	B	A	A	A	A	A

Authentication Information

Settings	Read-only (User)	Edit (User)	Edit / Delete (User)	Full Control	Registered User	User Admin.
User Code	C	C	C	C	C	A
Login User Name	C	C	C	C	B	A
Login Password	C	C	C	C	A *1	A *1
Available Functions	C	C	C	C	B	A
Lockout	C	C	C	C	C	A

*1 You can only enter the password.

Protection

Settings	Read-only (User)	Edit (User)	Edit / Delete (User)	Full Control	Registered User	User Admin.
Protect Destination	C	C	C	A	A	A

Add to Group

Settings	Read-only (User)	Edit (User)	Edit / Delete (User)	Full Control	Registered User	User Admin.
Details of Group	C	A	A	A	A	A

User Settings-Control Panel Settings

If you have specified administrator authentication, the available functions and settings depend on the menu protect setting.

The following settings can be specified by ordinary users (non-administrators).

- Abbreviations in the table columns
R/W (Read and Write) = Both reading and modifying the setting are available.
R (Read) = Reading only.

↓ Note

- Settings that are not in the list can only be viewed, regardless of the menu protect level setting.

Panel Menu

The default for menu protect level is 2.

Paper Input

Settings	Off	Level 1	Level 2
All Settings	R/W	R/W	R

Maintenance

Settings	Off	Level 1	Level 2
Image Density Adjustment	R/W	R	R
Registration	R/W	R	R
Replacement Alert	R/W	R	R
Supply End Option	R/W	R	R
Display Supply Info	R/W	R	R
Unit of Measure	R/W	R	R
Panel Key Sound	R/W	R	R
Warm-up Beeper	R/W	R	R
Display Contrast	R/W	R	R
Key Repeat	R/W	R	R

Settings	Off	Level 1	Level 2
Auto Reset Timer	R/W	R	R
Set Date	R/W	R	R
Set Time	R/W	R	R
Auto Delete Temporary Jobs	R/W	R	R
Auto Delete Stored Jobs	R/W	R	R
Reset IPDS Fonts	R/W	R	R

List/Test Print

Settings	Off	Level 1	Level 2
All Settings	R/W	R/W	R/W

System

Settings	Off	Level 1	Level 2
Print Error Report	R/W	R	R
Auto Continue	R/W	R	R
Memory Overflow	R/W	R	R
Printer Language	R/W	R	R
Sub Paper Size	R/W	R	R
Default Printer Lang.	R/W	R	R
Auto Off	R/W	R	R
ECO Night Sensor	R/W	R	R
Print Compressed Data	R/W	R	R
Memory Usage	R/W	R	R
Spool Printing	R/W	R	R
RAM Disk ^{*1}	R/W	R	R
Auto E-mail Notify	R/W	R	R

*1 This setting does not appear when a hard disk is installed.

Print Settings

Settings	Off	Level 1	Level 2
Copies	R/W	R	R
Page Size	R/W	R/W	R
Edge to Edge Print	R/W	R	R
Duplex	R/W	R	R
Rotate by 180 Degrees	R/W	R	R
Blank Page Print	R/W	R	R
Edge Smoothing	R/W	R	R
Toner Saving	R/W	R	R
Letterhead Setting	R/W	R	R
Tray Setting Priority	R/W	R	R
Tray Switching	R/W	R	R
Extend Auto Tray Switching	R/W	R	R
PCL Menu	R/W	R	R
PS Menu	R/W	R	R
PDF Menu	R/W	R	R
IPDS Menu	R/W	R	R

Host Interface

Settings	Off	Level 1	Level 2
All Settings	R/W	R	R

User Settings-Web Image Monitor Settings

The following settings can be specified when [Menu Protect] is set to [Off].

Printer: Print Jobs

Print

Delete

Printer

- PDF Temporary Password

Webpage

- Webpage
Download Help File

Functions That Require Options

To use the following security functions, specific options are required.

When an option is installed on this printer, corresponding setting items appear on the control panel, or in Web Image Monitor.

Security Function	Required Options	Corresponding Setting Items
Data Overwrite Security	Hard disk ^{*1}	<ul style="list-style-type: none"> Control Panel Auto Erase Memory Setting Erase All Memory
HDD Encryption	Hard disk ^{*1}	<ul style="list-style-type: none"> Control Panel Machine Data Encryption
Basic Authentication	Hard disk	<ul style="list-style-type: none"> Web Image Monitor Basic Authentication
Windows Authentication	Hard disk	<ul style="list-style-type: none"> Web Image Monitor Windows Authentication
LDAP Authentication	Hard disk	<ul style="list-style-type: none"> Web Image Monitor LDAP Authentication
Integration Server Authentication	Hard disk	<ul style="list-style-type: none"> Web Image Monitor Integration Server Authentication
Locked Print	Hard disk	<ul style="list-style-type: none"> Control Panel Locked Print Delete All Temporary Jobs Auto Delete Temporary Jobs Web Image Monitor Locked Print Auto Delete Temporary Print Jobs

* 1 The SD card supplied with the hard disk is required.

Trademarks

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The proper names of the Windows operating systems are as follows:

- The product names of Windows XP are as follows:

Microsoft[®] Windows[®] XP Professional Edition

Microsoft[®] Windows[®] XP Home Edition

- The product names of Windows Vista are as follows:

Microsoft[®] Windows Vista[®] Ultimate

Microsoft[®] Windows Vista[®] Business

Microsoft[®] Windows Vista[®] Home Premium

Microsoft[®] Windows Vista[®] Home Basic

Microsoft[®] Windows Vista[®] Enterprise

- The product names of Windows 7 are as follows:

Microsoft[®] Windows[®] 7 Home Premium

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Microsoft® Windows Server® 2008 Enterprise without Hyper-V™

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Microsoft® Windows Server® 2008 R2 Standard

Microsoft® Windows Server® 2008 R2 Enterprise

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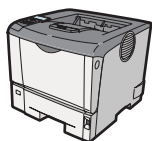
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MEMO

MEMO





Operating Instructions

Driver Installation Guide

-
- 1 About Quick Install
 - 2 Network Connection
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 - 4 When Using the Printer under Mac OS X
 - 5 Appendix

Introduction

This manual contains detailed instructions and notes on the operation and use of this machine. For your safety and benefit, read this manual carefully before using the machine. Keep this manual in a handy place for quick reference.

Do not copy or print any item for which reproduction is prohibited by law.

Copying or printing the following items is generally prohibited by local law:

bank notes, revenue stamps, bonds, stock certificates, bank drafts, checks, passports, driver's licenses.

The preceding list is meant as a guide only and is not inclusive. We assume no responsibility for its completeness or accuracy. If you have any questions concerning the legality of copying or printing certain items, consult with your legal advisor.

Important

Contents of this manual are subject to change without prior notice.

In no event will the company be liable for direct, indirect, special, incidental, or consequential damages as a result of handling or operating the machine.

For good print quality, the manufacturer recommends that you use genuine toner from the manufacturer.

The manufacturer shall not be responsible for any damage or expense that might result from the use of parts other than genuine parts from the manufacturer with your office products.

Some illustrations in this manual might be slightly different from the machine.

Certain options might not be available in some countries. For details, please contact your local dealer.

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Installing the Printer Drivers

This section provides a brief overview of the procedures for installing the printer drivers under Windows and Mac OS X.

Important

- You can install the printer driver from the CD-ROM provided with this printer or download it from the manufacturer's Web site.

Windows Installation

- Quick Install

This method allows you to install the printer drivers easily from the CD-ROM provided.

If you select this installation method, the standard TCP/IP port will be automatically specified, and the PCL 6 driver will be installed across the network environment.

- Installation according to environment

You can manually specify which port you want to use, based on the configuration of your environment.

This method also allows you to configure the PCL and PostScript® 3™ printer drivers to print over a network or through a local connection.

If you install SmartDeviceMonitor for Client on your computer, the SmartDeviceMonitor for Client port will also be available. This port allows you to monitor the printer's status and check the results of its jobs.

Choose the installation method that is most appropriate for your environment, intended purpose, and connection type.

Mac OS X Installation

If you install the PPD file for this printer into a Mac OS X, you can print over a network (using Bonjour) or through a local connection.

Note

- The printer drivers included on the provided CD-ROM differ depending on the model of your printer.
- In this manual, "SmartDeviceMonitor for Client 2" is referred to as "SmartDeviceMonitor for Client".
- To use SmartDeviceMonitor for Client, download the printer driver from the manufacturer's website, and install it on your computer.

How to Read This Manual

Symbols

This manual uses the following symbols:

Important

Indicates points to pay attention to when using the machine, and explanations of likely causes of paper misfeeds, damage to originals, or loss of data. Be sure to read these explanations.

Note

Indicates supplementary explanations of the machine's functions, and instructions on resolving user errors.

Reference

This symbol is located at the end of sections. It indicates where you can find further relevant information.

[]

Indicates the names of keys on the machine's display or control panels.

1. About Quick Install

This chapter explains the "Quick Install" procedure. This installation method allows users to install the drivers easily, and requires minimal manual settings.

Quick Install

You can install the printer drivers easily from the CD-ROM provided with this printer.

Using Quick Install, the PCL 6 printer driver is installed under network environment, and the Standard TCP/IP port will be set.

★ Important

- **Manage Printers permission is required to install the drivers. Log on as an Administrators group member.**
- **If you connect using USB, see p.33 "Installing the Printer Driver Using USB" and install the printer driver.**

- 1. Close all applications except this manual.**
- 2. Insert the CD-ROM into the CD-ROM drive.**

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

- 3. Select an interface language, and then click [OK].**

The default interface language is English.

- 4. On the CD-ROM menu, click [Quick Install].**

The software license agreement appears in the [License Agreement] window.

- 5. After reading the agreement, click [I accept the agreement.] and then click [Next].**

- 6. Select the printer model you want to use in the [Select Printer] window.**

For network connection via TCP/IP, select the printer whose IP address is displayed in [Connect To].

For parallel connection, select the printer whose printer port is displayed in [Connect To].

- 7. Click [Install].**

The printer driver installation starts.

The PCL 6 printer driver is installed in the language specified by your operating system.

- 8. Click [Finish].**

When you are prompted to restart your computer, restart it by following the instructions that appear.

- 9. Click [Exit] in the first window of the installer, and then take out the CD-ROM.**

 **Note**

- To stop installation of the selected software, click [Cancel] before the installation is complete.
- Quick Install is not available unless bidirectional communication between the printer and computer is enabled via parallel connection. For details about bidirectional communication between the printer and computer, see p.51 "Making Option Settings for the Printer".

2. Network Connection

This chapter explains how to install the printer driver under Windows for a network-connected printer.

Before installing the printer driver, check how the printer is connected. Follow the driver installation procedure that is appropriate for the connection method.

Confirming the Connection Method

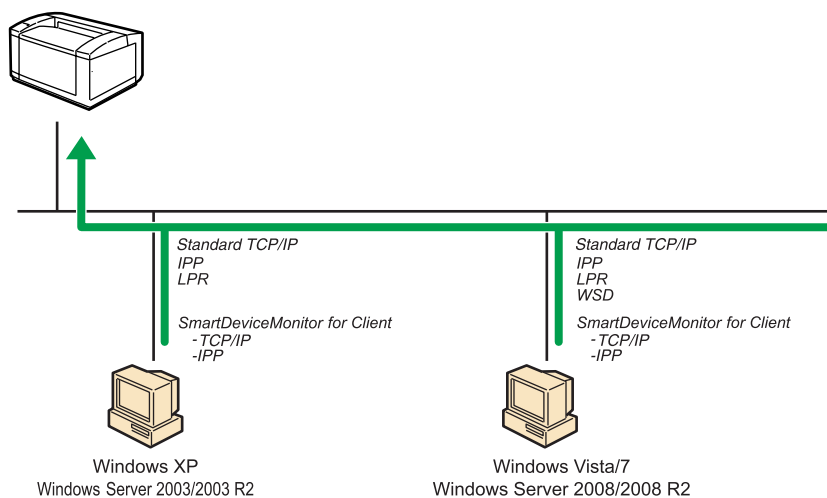
2

This printer can be used as the Windows printing port or network printer.

Using This Printer as the Windows Printing Port

Network connections can be established through Ethernet and Wireless LAN.

Available ports are determined based on the combination of the Windows operating system version and connection method used.



CEC320

Windows XP, Windows Server 2003/2003 R2

Connection Method	Available Ports
<ul style="list-style-type: none">• Ethernet• Wireless LAN	<ul style="list-style-type: none">• Standard TCP/IP port• IPP port• LPR port• SmartDeviceMonitor for Client port

Windows Vista/7, Windows Server 2008/2008 R2

Connection Method	Available Ports
<ul style="list-style-type: none">• Ethernet• Wireless LAN	<ul style="list-style-type: none">• Standard TCP/IP port• IPP port• LPR port• WSD port• SmartDeviceMonitor for Client port

Note

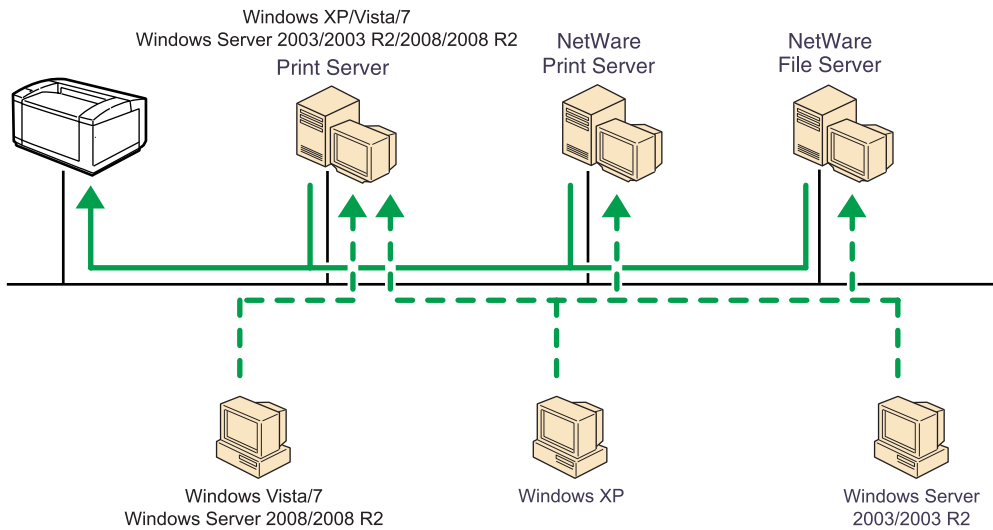
- See the explanation about how to install the printer driver for each type of ports.
- For details about the Standard TCP/IP port, see p.10 "Using the Standard TCP/IP Port".
- For details about the IPP port, see p.12 "Using the IPP Port".
- For details about the LPR port, see p.14 "Using the LPR Port".
- For details about the WSD port, see p.17 "Using the WSD Port".
- For details about the SmartDeviceMonitor for Client port, see p.20 "Using the SmartDeviceMonitor for Client Port".

Using as the Network Printer

This printer can be used as the Windows network printer, a NetWare print server, or a NetWare remote printer.

Important

- IPX/SPX (NetWare) cannot be used under Windows XP x64/Vista/7 and Windows Server 2003 x64/2003 R2 x64/2008/2008 R2.



Note

- In an IPv6 environment, NetWare servers cannot be used.
- See the explanation about how to install the printer driver for each type of network printers.
- For details about Windows network printer, see p.27 "Using as the Windows Network Printer".
- For details about a NetWare print server and remote printer, see p.30 "Using as the NetWare Print Server/Remote Printer".

CEC321

Installing the Printer Driver for the Selected Port

You can install the appropriate driver according to the port you want to use.

2

Using the Standard TCP/IP Port

This describes how to install the PCL or PostScript 3 printer drivers using the Standard TCP/IP port.

★ Important

- **Manage Printers permission is required to install the drivers. Log on as an Administrators group member.**
- **In an IPv6 environment, you cannot use the Standard TCP/IP Port. Use the SmartDeviceMonitor for Client port.**

Installing the PCL printer driver

1. **Close all applications except this manual.**
2. **Insert the CD-ROM into the CD-ROM drive.**

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

3. **Select an interface language, and then click [OK].**

The default interface language is English.

4. **Click [PCL Printer Drivers].**

The software license agreement appears in the [License Agreement] window.

5. **After reading the agreement, select the [I accept the agreement.] check box, and then click [Next].**

6. **In the [Select Program] window, select the check box of the printer driver you want to use.**

You can select several printer drivers.

The PCL 6 printer driver is installed in the language specified by your operating system.

7. **Click [Next].**

8. **Select the check box of the printer model you want to use.**

The printer name can be changed in the Change settings for 'Printer Name' box.

9. **Double-click the printer name to display the printer settings.**

The details shown in [Comment], [Driver], and [Port] vary depending on the operating system, printer model, and port.

10. Click **[Port]**, and then click **[Add]**.

11. Click **[Standard TCP/IP Port]**, and then click **[OK]**.

See Windows Help if [Standard TCP/IP Port] does not appear.

12. Click **[Next]**.

13. Enter the printer name or IP address in the **[Printer Name or IP Address]** box.

The [Port Name] text box automatically obtains a port name. Change this name if necessary.

When the device type selection appears, select "RICOH Network Printer C model".

14. Click **[Next]**.

15. Click **[Finish]**.

16. Check that the port of the selected printer is displayed in **[Port]**.

17. Configure the user code, default printer, and shared printer as necessary.

18. Click **[Continue]**.

19. Click **[Finish]**.

20. Click **[Finish]**.

When you are prompted to restart your computer, restart it by following the instructions that appear.

↓ Note

- To stop installation of the selected driver, click **[Cancel]** before installation is complete.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use **[Add Printer]**. See p.49 "Messages Displayed When Installing the Printer Driver".

Installing the PostScript 3 printer driver

1. Close all applications except this manual.

2. Insert the CD-ROM into the CD-ROM drive.

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

3. Select an interface language, and then click **[OK]**.

The default interface language is English.

The printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

4. Click **[PostScript 3 Printer Driver]**.

Under Windows Vista/7, and Windows Server 2008, proceed to step 6.

5. Click **[Next]**.

6. Click **[Local printer attached to this computer]**, and then click **[Next]**.

Under Windows Vista/7, and Windows Server 2008, click **[Add a local printer]**.

7. Click **[Create a new port:]**.

8. Select **[Standard TCP/IP Port]** and then click **[Next]**.

Under Windows Vista/7, and Windows Server 2008, proceed to step 10.

9. Click **[Next]** in the **[Add Standard TCP/IP Printer Port Wizard]** window.

10. Enter the printer name or IP address in the **[Printer Name or IP Address]** or **[Hostname or IP address]** box, and then click **[Next]** .

The **[Port Name]** text box automatically obtains a port name. Change this name if necessary.

When screen for device type selection appears, select "RICOH Network Printer C model".

Under Windows Vista/7, and Windows Server 2008, proceed to step 12.

11. Click **[Finish]**.

12. Make sure the brand name and model name of the printer whose driver you want to install are selected, and then click **[Next]**.

13. Follow the instructions that appear. Modify settings such as printer name, default printer, and printer sharing configuration, as necessary. You can also print the test page.

14. Click **[Finish]**.

Note

- To stop installation of the selected driver, click **[Cancel]** before installation is complete.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use **[Add Printer]**. See p.49 "Messages Displayed When Installing the Printer Driver".

Using the IPP Port

This describes how to install the PCL or PostScript 3 printer driver using the IPP port.

★ Important

- **Manage Printers permission is required to install the drivers. Log on as an Administrators group member.**
- **In an IPv6 environment, you cannot use the IPP Port. Use the SmartDeviceMonitor for Client port.**
- **Installation of the certificate is especially necessary for users who want to print via IPP-SSL from Windows Vista/7 or Windows Server 2008/2008 R2. For details, consult your administrator.**
- **If a certificate authority issues a certificate that must be authenticated by an intermediate certificate authority, and the certificate is installed on this printer, an intermediate certificate must be installed on the client computer. Otherwise, validation by the certificate authority will not be performed correctly. If validation cannot be performed properly, a warning message informing you that installation is not**

possible might appear when you try to add a printer using IPP-SSL under Windows Vista/7 or Windows Server 2008/2008 R2. To enable authentication from the client computer, install the intermediate certificate on the client computer, and then reestablish connection.

- Intermediate certificates cannot be installed on this printer.
- To print via IPP-SSL, use the SmartDeviceMonitor for Client port.

1. Close all applications except this manual.
2. Open the window for configuring printers. For details, see your operating system's Help.
3. Click [Add a printer] or double-click the [Add Printer] icon.

Under Windows Vista/7, and Windows Server 2008, proceed to step 5.

4. Click [Next].
5. Select the [A network printer, or a printer attached to another computer] check box, and then click [Next].

Under Windows Vista/7, Windows Server 2008, click [Add a network, wireless or Bluetooth printer], and click [The printer that I want isn't listed].

6. Select [Browse for a printer], and then click [Next].
7. In the [Printer:] or [URL:] box, enter "http://(printer's IP address or host name)/printer (or ipp)" as the printer's address, and then click [Next] or [Select].
8. Click [Have Disk...].
9. Insert the provided CD-ROM into the computer's CD-ROM drive.

If the [AutoPlay] window appears, click the [Close] button.

10. Click [Browse...], and then specify the location of the INF file.

If the CD-ROM drive is D, the source files of the printer driver are stored in the following locations:

- PCL 5e
 - 32bit-driver
D:\X86\DRIVERS\PCL5E\XP_VISTA\(\language)\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL5E\X64\(\language)\DISK1
- PCL 5c
 - 32bit-driver
D:\X86\DRIVERS\PCL5C\XP_VISTA\(\language)\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL5C\X64\(\language)\DISK1
- PCL 6
 - 32bit-driver

D:\X86\DRIVERS\PCL6\XP_VISTA\MUI\DISK1

- 64bit-driver

D:\X64\DRIVERS\PCL6\X64\MUI\DISK1

- PostScript 3

- 32bit-driver

D:\X86\DRIVERS\PS\XP_VISTA\MUI\DISK1

- 64bit-driver

D:\X64\DRIVERS\PS\X64\MUI\DISK1

If the file path of the printer driver contains the word "MUI", the driver will be installed in the language of the operating system.

The PostScript 3 printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

11. Click [OK] to close the [Install From Disk] window.

12. Select the brand name and model name of the printer you want to use, and then click [OK].

13. Check the printer name.

Under Windows 7, click [Next].

14. Configure the default printer as necessary, and then click [Next].

If the [Windows can't verify the publisher of this driver software] message appears, click [Install this driver software anyway].

Under Windows 7, configure the default printer as necessary.

15. Click [Finish].

If installation is successful, the icon of the printer connected to the LPP port will appear in the window for configuring printers.

Note

- To stop installation of the selected driver, click [Cancel] before installation is complete.

Using the LPR Port

This describes how to install the PCL or PostScript 3 printer drivers using the LPR port.

Important

- **Manage Printers permission is required to install the drivers. Log on as an Administrators group member.**

Installing the PCL printer driver

1. **Close all applications except this manual.**
2. **Insert the CD-ROM into the CD-ROM drive.**

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

3. **Select an interface language, and then click [OK].**

The default interface language is English.

4. **Click [PCL Printer Drivers].**

The software license agreement appears in the [License Agreement] window.

5. **After reading the agreement, select the [I accept the agreement.] check box, and then click [Next].**

6. **In the [Select Program] window, select the check box of the printer driver you want to use.**

You can select several printer drivers.

The PCL 6 printer driver is installed in the language specified by your operating system.

7. **Click [Next].**

8. **Select the check box of the printer model you want to use.**

The printer name can be changed in the Change settings for 'Printer Name' box.

9. **Double-click the printer name to display the printer settings.**

The details shown in [Comment], [Driver], and [Port] vary depending on the operating system, printer model, and port.

10. **Click [Port], and then click [Add].**

11. **Click [LPR Port], and then click [OK].**

If [LPR Port] does not appear, see Windows Help and install it.

12. **Enter the printer's IP address in the [Name or address of server providing lpd] box.**

13. **Enter "lp" in the [Name of printer or print queue on that server] box, and then click [OK].**

The port is added.

14. **Check that the port of the selected printer is displayed in [Port].**

15. **Configure the user code, default printer, and shared printer as necessary.**

16. **Click [Continue].**

17. **Click [Finish].**

18. **Click [Finish].**

When you are prompted to restart your computer, restart it by following the instructions that appear.

Note

- To stop installation of the selected driver, click [Cancel] before installation is complete.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use [Add Printer]. See p.49 "Messages Displayed When Installing the Printer Driver".

2

Installing the PostScript 3 printer driver

1. Close all applications except this manual.
2. Insert the CD-ROM into the CD-ROM drive.

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

3. Select an interface language, and then click [OK].

The default interface language is English.

The printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

4. Click [PostScript 3 Printer Driver].

Under Windows Vista/7, and Windows Server 2008, proceed to step 6.

5. Click [Next].

6. Click [Local printer attached to this computer], and then click [Next].

Under Windows Vista/7, and Windows Server 2008, click [Add a local printer].

7. Click [Create a new port:].

8. Select [LPR Port], and then click [Next].

9. Enter the printer's IP address in the [Name or address of server providing lpd] box.

10. Enter "lp" in the [Name of printer or print queue on that server] box, and then click [OK].

11. Select the brand name and model name of the printer you want to use, and then click [Next].

12. Follow the instructions that appear. Modify settings such as printer name, default printer, and printer sharing configuration, as necessary. You can also print the test page.

13. Click [Finish].

Note

- To stop installation of the selected software, click [Cancel] before the installation is complete.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use [Add Printer]. See p.49 "Messages Displayed When Installing the Printer Driver".

Using the WSD Port

This describes how to install the PCL or PostScript 3 printer drivers using the WSD port.

Important

- The WSD port can be used only under Windows Vista/7 or Windows Server 2008/2008 R2.
- Manage Printers permission is required to install the drivers. Log on as an Administrators group member.
- You can connect to the printer only if both the printer and computer are on the same network segment, or "Network discovery" is enabled. For details, see Windows Help.

2

Windows Vista, Windows Server 2008 - WSD port

1. Close all applications except this manual.
2. On the [Start] menu, click [Network].
The [Network] window appears, and the device search begins automatically.
3. Right-click the icon of the printer model you want to use, and then click [Install].
If the [User Account Control] window appears, click [Continue].
The [Found New Hardware] window appears.
4. Click [Locate and install driver software (Recommended)].
If the [User Account Control] window appears, click [Continue].
5. Click [Browse my computer for driver software (advanced)].
6. Insert the provided CD-ROM into the computer's CD-ROM drive.
If the [AutoPlay] window appears, click the [Close] button.
7. Click [Browse...], and then specify the location of the INF file.

If the CD-ROM drive is D, the source files of the printer driver are stored in the following locations:

- PCL 5e
 - 32bit-driver
D:\X86\DRIVERS\PCL5E\XP_VISTA\((language)\DISK 1
 - 64bit-driver
D:\X64\DRIVERS\PCL5E\X64\((language)\DISK 1
- PCL 5c
 - 32bit-driver
D:\X86\DRIVERS\PCL5C\XP_VISTA\((language)\DISK 1
 - 64bit-driver

D:\X64\DRIVERS\PCL5C\X64\(\language)\DISK1

- PCL 6

- 32bit-driver

D:\X86\DRIVERS\PCL6\XP_VISTA\MUI\DISK1

- 64bit-driver

D:\X64\DRIVERS\PCL6\X64\MUI\DISK1

- PostScript 3

- 32bit-driver

D:\X86\DRIVERS\PS\XP_VISTA\MUI\DISK1

- 64bit-driver

D:\X64\DRIVERS\PS\X64\MUI\DISK1

If the file path of the printer driver contains the word "MUI", the driver will be installed in the language of the operating system.

The PostScript 3 printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

8. Click [Next].

If the [Windows can't verify the publisher of this driver software] message appears, click [Install this driver software anyway].

9. Click [Close].

If installation is successful, the icon of the printer connected to the WSD port will appear in the window for configuring printers.

↓ Note

- The port name that follows "WSD" uses random character strings. It cannot be changed freely.
- To stop the installation, click [Cancel] before the installation is complete. When re-installing the WSD Port, right-click the printer's icon in the [Network] window, and then click [Uninstall].

Windows 7, Windows Server 2008 R2 - WSD port

1. Close all applications except this manual.
2. On the [Start] menu, click [Computer].
3. Click [Network].
4. Right-click the icon of the printer model you want to use, and then click [Install].

Installation begins automatically. If the "Device driver software was not successfully installed" message appears, close the message and proceed to step 5.

5. On the [Start] menu, click [Devices and Printers].
6. Click [Add a printer].
7. Click [Add a local printer].
8. Select the [Use an existing port:] check box, and select the WSD port.
9. Click [Next].
10. Click [Have Disk...].
11. Insert the provided CD-ROM into the computer's CD-ROM drive.

If the [AutoPlay] window appears, click the [Close] button.

12. Click [Browse...], and then specify the location of the INF file.

If the CD-ROM drive is D, the source files of the printer driver are stored in the following locations:

- PCL 5e
 - 32bit-driver
D:\X86\DRIVERS\PCL5E\XP_VISTA\((language)\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL5E\X64\((language)\DISK1
- PCL 5c
 - 32bit-driver
D:\X86\DRIVERS\PCL5C\XP_VISTA\((language)\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL5C\X64\((language)\DISK1
- PCL 6
 - 32bit-driver
D:\X86\DRIVERS\PCL6\XP_VISTA\MUI\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL6\X64\MUI\DISK1
- PostScript 3
 - 32bit-driver
D:\X86\DRIVERS\PS\XP_VISTA\MUI\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PS\X64\MUI\DISK1

If the file path of the printer driver contains the word "MUI", the driver will be installed in the language of the operating system.

The PostScript 3 printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

13. Click [OK] to close the [Install From Disk] window.
14. Select the brand name and model name of the printer you want to use, and then click [OK].
15. Follow the instructions that appear. Modify settings such as printer name, default printer, and printer sharing configuration, as necessary. You can also print the test page.
16. Click [Finish].

If installation is successful, the icon of the printer connected to the WSD port will appear in the window for configuring printers.

 **Note**

- The port name that follows "WSD" uses random character strings. It cannot be changed freely.
- To stop the installation, click [Cancel] before the installation is complete. When re-installing the WSD Port, right-click the printer's icon in the [Network] window, and then click [Uninstall].

Using the SmartDeviceMonitor for Client Port

This describes how to install the printer driver using the SmartDeviceMonitor for Client port.

To use this function, you must first download SmartDeviceMonitor for Client from the manufacturer's Web site and install it on your computer. Contact your local dealer for information on downloading SmartDeviceMonitor for Client.

 **Important**

- **Manage Printers permission is required to install the drivers. Log on as an Administrators group member.**

Installing the PCL printer driver (TCP/IP)

1. Close all applications except this manual.
2. Insert the CD-ROM into the CD-ROM drive.

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

3. Select an interface language, and then click [OK].

The default interface language is English.

4. Click [PCL Printer Drivers].

The software license agreement appears in the [License Agreement] window.

5. After reading the agreement, select the [I accept the agreement.] check box, and then click [Next].

6. In the [Select Program] window, select the check box of the printer driver you want to use.

You can select several printer drivers.

The PCL 6 printer driver is installed in the language specified by your operating system.

7. Click [Next].

8. Select the check box of the printer model you want to use.

The printer name can be changed in the Change settings for 'Printer Name' box.

9. Double-click the printer name to display the printer settings.

The details shown in [Comment], [Driver], and [Port] vary depending on the operating system, printer model, and port.

10. Click [Port], and then click [Add].

11. Select [SmartDeviceMonitor for Client 2], and then click [OK].

12. Click [TCP/IP], and then click [Search].

A list of printers using TCP/IP appears.

13. Select the printer you want to use, and then click [OK].

Only printers that respond to a broadcast from the computer appear. To use a printer not listed here, click [Specify Address], and then enter the IP address or host name of the printer.

14. Configure the user code, default printer, and shared printer as necessary.

15. Click [Continue].

16. Click [Finish].

17. Click [Finish].

↓ Note

- To stop installation of the selected software, click [Cancel] before the installation is complete.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use [Add Printer]. See p.49 "Messages Displayed When Installing the Printer Driver".
- A user code can be set after the printer driver installation. For information about user code, see the printer driver Help.

Installing the PostScript 3 printer driver (TCP/IP)

1. Close all applications except this manual.

2. Insert the CD-ROM into the CD-ROM drive.

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

3. Select an interface language, and then click [OK].

The default interface language is English.

The printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

4. Click [PostScript 3 Printer Driver].

Under Windows Vista/7, and Windows Server 2008, proceed to step 6.

5. Click [Next].

6. Click [Local printer attached to this computer], and then click [Next].

Under Windows Vista/7, and Windows Server 2008, click [Add a local printer].

7. Click [Create a new port:].

8. Click [SmartDeviceMonitor for Client 2], and then click [Next].

9. Click [TCP/IP], and then click [Search].

A list of printers using TCP/IP appears.

10. Select the printer you want to use, and then click [OK].

Only printers that respond to a broadcast from the computer appear. To use a printer not listed here, click [Specify Address], and then enter the IP address or host name of the printer.

11. Select the brand name and model name of the printer you want to use, and then click [Next].

12. Follow the instructions that appear. Modify settings such as printer name, default printer, and printer sharing configuration, as necessary. You can also print the test page.

13. Click [Finish].

Note

- To stop installation of the selected software, click [Cancel] before the installation is complete.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use [Add Printer]. See p.49 "Messages Displayed When Installing the Printer Driver".
- A user code can be set after the printer driver installation. For information about user code, see the printer driver Help.

Installing the PCL printer driver (IPP)

- 1. Close all applications except this manual.**
- 2. Insert the CD-ROM into the CD-ROM drive.**

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

3. Select an interface language, and then click [OK].

The default interface language is English.

4. Click [PCL Printer Drivers].

The software license agreement appears in the [License Agreement] window.

5. After reading the agreement, select the [I accept the agreement.] check box, and then click [Next].

6. In the [Select Program] window, select the check box of the printer driver you want to use.

The PCL 6 printer driver is installed in the language specified by your operating system.

7. Click [Next].

8. Select the check box of the printer model you want to use.

The printer name can be changed in the Change settings for 'Printer Name' box.

9. Double-click the printer name to display the printer settings.

The details shown in [Comment], [Driver], and [Port] vary depending on the operating system, printer model, and port.

10. Click [Port], and then click [Add].

11. Click [SmartDeviceMonitor for Client 2], and then click [OK].

12. Click [IPP].

13. In the [Printer URL] box, enter "http://(printer's IP address or host name)/printer (or ipp)" as the printer's address.

If the server authentication is issued, to enable SSL (a protocol for encrypted communication), enter "https://printer's IP address/printer" (Internet Explorer 5.01, or a higher version must be installed). (example IP address: 192.168.15.16)

http://192.168.15.16/printer

https://192.168.15.16/printer

You can enter "http://printer's IP address/ipp" as the printer's address.

14. Enter a name for identifying the printer in [IPP Port Name]. Use a name different from the one of any existing ports.

If a name is not specified here, the address entered in the [Printer URL] box becomes the IPP port name.

15. Click [Detailed Settings] to make necessary settings.

For details about the settings, see SmartDeviceMonitor for Client Help.

16. Click [OK].

17. Check that the port of the selected printer is displayed in [Port].

18. Configure the user code, default printer, and shared printer as necessary.

19. Click [Continue].

20. Click [Finish].

21. Click [Finish].

When you are prompted to restart your computer, restart it by following the instructions that appear.

Note

- To stop installation of the selected software, click [Cancel] before the installation is complete.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use [Add Printer]. See p.49 "Messages Displayed When Installing the Printer Driver".

Installing the PostScript 3 printer driver (IPP)

1. Close all applications except this manual.

2. Insert the CD-ROM into the CD-ROM drive.

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

3. Select an interface language, and then click [OK].

The default interface language is English.

The printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

4. Click [PostScript 3 Printer Driver].

Under Windows Vista/7, and Windows Server 2008, proceed to step 6.

5. Click [Next].

6. Click [Local printer attached to this computer], and then click [Next].

Under Windows Vista/7, and Windows Server 2008, click [Add a local printer].

7. Click [Create a new port:].

8. Click [SmartDeviceMonitor for Client 2], and then click [Next].

9. Click [IPP].

10. In the [Printer URL] box, enter "http://(printer's IP address or host name)/printer (or ipp)" as the printer's address.

(example IP address: 192.168.15.16)

http://192.168.15.16/printer

If the server authentication is issued, to enable SSL (a protocol for encrypted communication), enter "https://(printer's IP address or host name)/printer" (Internet Explorer 5.01, or a higher version must be installed).

https://192.168.15.16/printer

You can enter "http://printer's IP address or host name/ipp" as the printer's address.

- 11. Enter a name for identifying the printer in [IPP Port Name]. Use a name different from the one of any existing port.**

If a name is not specified here, the address entered in the [Printer URL] box becomes the IPP port name.

- 12. Click [Detailed Settings] to make necessary settings.**
- 13. Click [OK].**
- 14. Select the brand name and model names of the printer you want to use, and then click [Next].**
- 15. Follow the instructions that appear. Modify settings such as printer name, default printer, and printer sharing configuration, as necessary. You can also print the test page.**
- 16. Click [Finish].**

Note

- To stop installation of the selected software, click [Cancel] before the installation is complete.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use [Add Printer]. See p.49 "Messages Displayed When Installing the Printer Driver".

Changing the port settings for SmartDeviceMonitor for Client

Follow the procedure below to change the SmartDeviceMonitor for Client settings, such as TCP/IP protocol.

Windows XP, Windows Server 2003/2003 R2:

- 1. On the [Start] menu, click [Printers and Faxes].**
The [Printers and Faxes] window appears.
- 2. Click the icon of the printer you want to use. On the [File] menu, click [Properties].**
- 3. Click the [Ports] tab, and then click [Configure Port].**
The [Port Configuration:] window appears.

Windows Vista, Windows Server 2008:

- 1. On the [Start] menu, click [Control Panel].**
The [Control Panel] window appears.

2. Click [Printer].

The [Printers] window appears.

3. Right-click the icon of the printer you want to use, and then click [Properties].

4. Click the [Ports] tab, and then click [Configure Port].

The [Port Configuration:] window appears.

2

Windows 7, Windows Server 2008 R2:

1. On the [Start] menu, click [Devices and Printers].

The [Devices and Printers] window appears.

2. Right-click the icon of the printer you want to use, and then click [Printer Properties].

3. Click the [Ports] tab, and then click [Configure Port].

The [Port Configuration:] window appears.

↓ Note

- User, proxy, and timeout settings can be configured for IPP.
- For details about these settings, see p.20 "Using the SmartDeviceMonitor for Client Port", or SmartDeviceMonitor for Client Help.

Using as the Windows Network Printer

This describes how to install the PCL or PostScript 3 printer driver when using the printer as the Windows network printer.

To use the print server, install the printer driver by selecting "Network printer server", and then select the Windows shared printer.

This section assumes that the client has already been configured to communicate with a Windows print server. Do not begin the following procedure before the client is set up and configured correctly.

★ Important

- **Manage Printers permission is required to install the drivers. Log on as an Administrators group member.**

Installing the PCL printer driver

1. **Close all applications except this manual.**
2. **Insert the CD-ROM into the CD-ROM drive.**

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

If the [User Account Control] window appears, click [Continue] or [Yes].

3. **Select an interface language, and then click [OK].**

The default interface language is English.

4. **Click [PCL Printer Drivers].**

The software license agreement appears in the [License Agreement] window.

5. **After reading the agreement, select the [I accept the agreement.] check box, and then click [Next].**

6. **In the [Select Program] window, select the check box of the printer driver you want to use.**

You can select several printer drivers.

The PCL 6 printer driver is installed in the language specified by your operating system.

7. **Click [Next].**

8. **Select the check box of the printer model you want to use.**

The printer name can be changed in the Change settings for 'Printer Name' box.

9. **Double-click the printer name to display the printer settings.**

The details shown in [Comment], [Driver], and [Port] vary depending on the operating system, printer model, and port.

10. Click [Port], and then click [Add].
11. Click [Network Printer], and then click [OK].
12. Double-click the computer name you want to use as the print server in the [Browse for Printer] window.
13. Select the printer you want to use, and then click [OK].
14. Check that the port of the selected printer is displayed in [Port].
15. Configure the user code, default printer, and shared printer as necessary.
16. Click [Continue].
17. Click [Finish].
18. Click [Finish].

When you are prompted to restart your computer, restart it by following the instructions that appear.

 **Note**

- A user code can be set after the printer driver installation. For information about user code, see the printer driver Help.
- To stop installation of the selected software, click [Cancel] before the installation is complete.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use [Add Printer]. See p.49 "Messages Displayed When Installing the Printer Driver".

Installing the PostScript 3 printer driver

1. Close all applications except this manual.
2. Insert the CD-ROM into the CD-ROM drive.

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

If the [User Account Control] window appears, click [Continue] or [Yes].

3. Select an interface language, and then click [OK].

The default interface language is English.

The printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

4. Click [PostScript 3 Printer Driver].

Under Windows Vista/7, and Windows Server 2008, proceed to step 6.

5. Click [Next].

6. Select the [A network printer, or a printer attached to another computer] check box, and then click [Next].

Under Windows Vista/7, Windows Server 2008, click [Add a network, wireless or Bluetooth printer], and click [The printer that I want isn't listed].

7. Select [Browse for a printer], and then click [Next].
8. Double-click the computer name you want to use as the print server in the [Shared printers] window.
9. Select the brand name and printer names you want to use, and then click [OK].
10. Configure the default printer as necessary and then click [Next].
11. Click [Finish].

When you are prompted to restart your computer, restart it by following the instructions that appear.

Note

- A user code can be set after the printer driver installation. For information about user code, see the printer driver Help.
- To stop installation of the selected software, click [Cancel] before the installation is complete.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use [Add Printer]. See p.49 "Messages Displayed When Installing the Printer Driver".

Using as the NetWare Print Server/Remote Printer

This describes how to set up the Windows computer used as the NetWare client.

★ Important

- Under Windows XP, and Windows Server 2003/2003 R2, Manage Printers permission is required to install the drivers. Log on as an Administrators group member.
- IPX/SPX (NetWare) cannot be used under Windows XP x64/Vista/7 and Windows Server 2003 x64/2003 R2 x64/2008/2008 R2.

The following explanation assumes NetWare Client is installed on the client computer and the NetWare server environment is correctly set up. Install all necessary client applications before following this procedure.

Set up the printer driver while logging on to the NetWare file server.

The following values are used in the example:

- NetWare version: 4.1
- File server name: CAREE
- Queue name: R-QUEUE

1. Close all applications except this manual.
2. Insert the CD-ROM into the CD-ROM drive.

The installer starts.

Auto Run may not work with certain operating system settings. In that case, launch "Setup.exe" on the CD-ROM root directory.

3. Select an interface language, and then click [OK].

The default interface language is English.

4. Click [PCL Printer Drivers].
5. The software license agreement appears in the [License Agreement] window.

After reading the agreement, click [I accept the agreement.], and then click [Next].

6. Select the printer driver you want to use in the [Select Program] window.

You can select several printer drivers.

The PCL 6 printer driver is installed in the language specified by your operating system.

7. Click [Next].
8. Select the [Printer Name] check box to select the printer model you want to use.

The printer name can be changed in the Change settings for 'Printer Name' box.

9. Double-click the printer name to display the printer settings.

The details shown in [Comment], [Driver], and [Port] vary depending on the operating system, printer model, and port.

10. Click [Port], and then click [Add].**11. Click [Network Printer], and then click [OK].****12. Double-click the name of the NetWare file server on the network tree.**

The created queue is displayed.

13. Select the print queue, and then click [OK].**14. Check that the port of the selected printer is displayed in [Port].****15. Click [Continue].**

The printer driver installation starts.

16. Click [Finish] in the [Select Program] window.**17. After the installation is completed, select one of the options to restart the computer either now or later, and then click [Finish].**

Restart the computer to complete installation.

18. After restarting the computer, open the printer properties from the [Printers and Faxes] window.

Under Windows Server 2003/2003 R2, launch the [Printers] window, and then open the printer properties.

19. Click the [NetWare setting] tab.

Under Windows Server 2003/2003 R2, on the [Printer Settings] tab, clear the [Form Feed] and [Enable Banner] check boxes.

Do not select these check boxes since they are automatically selected by the printer driver. If you select the check boxes, the printer may not print correctly.

20. Click [OK] to close the printer properties window.**Note**

- To stop installation of the selected software, click [Cancel] before the installation is complete.
- The protocol is set to inactive as default. Enable the protocol on the control panel, using Web Image Monitor, SmartDeviceMonitor or telnet.

When using the PostScript 3 Printer Driver

★ Important

- In an IPv6 environment, NetWare servers cannot be used.

Follow the procedure below to set up the PostScript 3 printer driver.

1. In the [Printers] or [Printers and Faxes] window, open the printer properties.

2. Click the [PostScript] tab.

When using Windows XP, and Windows Server 2003/2003 R2, click the [Device Settings] tab, and then proceed to step to clear the check box.

3. Click [Advanced].

4. Clear the [Send CTRL+D before job] and [Send CTRL+D after job] check boxes, and then click [OK].

5. Click [OK] to close the printer properties window.

Form Feed

Do not use NetWare to configure form feed. Form feed is controlled by the printer driver on Windows. If NetWare form feed is configured, the printer may not print properly.

Follow the procedure below to disable form feed according to the operating system used:

- Clear the [Form feed] check box on the [NetWare Settings] tab in the printer properties window.

Banner Page

Do not use NetWare to configure a banner page.

Follow the procedure below to disable banner pages according to the operating system used:

- Clear the [Enable banner] check box on the [NetWare Settings] tab in the printer properties dialog box.

Printing after Resetting the Printer

Printer to print server connection requires 30 - 40 seconds to resume after the printer is reset. During this period, jobs may be accepted (depending on NetWare specifications) but not printed.

To print after resetting the printer as the remote printer, check on the print server that the remote printer is disconnected, or wait for two minutes before trying to print.

3. Local Connection

This chapter explains how to install the printer driver under Windows for through a local connected printer.

Installing the Printer Driver Using USB

This section explains how to install printer drivers using USB.

Before installing, check that only the operating system is running on the computer and no print jobs are in progress.

★ Important

- **Manage Printers permission is required to install the drivers. Log on as an Administrators group member.**

If the printer driver has already been installed, and plug and play is enabled, the icon of the printer connected to the "USB" port is added to the [Printers], [Printers and Faxes], or [Devices and Printers] window.

If the printer driver is not installed, follow the plug-and-play instructions of the printer to install it from the CD-ROM provided with this printer.

Windows XP, Windows Server 2003/2003 R2 - USB

1. **Close all applications except this manual.**
2. **Check that the power of the printer is off.**
3. **Connect the printer to your computer with a USB cable.**
Connect the USB cable firmly.
4. **Turn on the power of the printer.**
Found New Hardware Wizard starts, and USB Printing Support is installed automatically.
5. **Click [No, not this time], and then click [Next].**
6. **In the [Found New Hardware] window, click [Install from a list or specific location [Advanced]], and then click [Next].**
7. **Insert the CD-ROM into the CD-ROM drive.**
If Auto Run starts, click [Cancel] and then [Exit].
8. **Select the [Search removable media (floppy, CD-ROM...)] check box under [Search for the best driver in these locations], and then click [Next].**
9. **Specify the location where the source files of the printer driver are stored.**
If the CD-ROM drive is D, the source files of the printer driver are stored in the following locations:
 - PCL 5e
 - 32bit-driver

D:\X86\DRIVERS\PCL5E\XP_VISTA\(\language)\DISK1

- 64bit-driver

D:\X64\DRIVERS\PCL5E\X64\(\language)\DISK1

- PCL 5c

- 32bit-driver

D:\X86\DRIVERS\PCL5C\XP_VISTA\(\language)\DISK1

- 64bit-driver

D:\X64\DRIVERS\PCL5C\X64\(\language)\DISK1

- PCL 6

- 32bit-driver

D:\X86\DRIVERS\PCL6\XP_VISTA\MUI\DISK1

- 64bit-driver

D:\X64\DRIVERS\PCL6\X64\MUI\DISK1

- PostScript 3

- 32bit-driver

D:\X86\DRIVERS\PS\XP_VISTA\MUI\DISK1

- 64bit-driver

D:\X64\DRIVERS\PS\X64\MUI\DISK1

If the file path of the printer driver contains the word "MUI", the driver will be installed in the language of the operating system.

The PostScript 3 printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

10. Check the printer driver location, and then click [Next].

11. Click [Finish].

If the printer driver has already been installed and plug and play is enabled, the icon of the printer connected to the "USB001" port is added to the [Printers], [Printers and Faxes], or [Devices and Printers] window.

↓ Note

- To disable Auto Run, press the left Shift key when inserting the CD-ROM into the drive and keep it pressed until the computer finishes reading from the CD-ROM.
- The number after "USB" varies depending on the number of printers connected.

Windows Vista, Windows Server 2008 - USB

1. Close all applications except this manual.
2. Check that the power of the printer is off.
3. Connect the printer to your computer with a USB cable.

Connect the USB cable firmly.

4. Turn on the power of the printer.

Found New Hardware Wizard starts, and USB Printing Support is installed automatically.

5. In the [Found New Hardware] window, click [Locate and install driver software (recommended)].

If the [User Account Control] window appears, click [Yes] or [Continue].

6. Insert the CD-ROM into the CD-ROM drive.

If Auto Run starts, click [Cancel] and then [Exit].

7. Specify the location where the source files of the printer driver are stored.

If the CD-ROM drive is D, the source files of the printer driver are stored in the following locations:

- PCL 5e
 - 32bit-driver
D:\X86\DRIVERS\PCL5E\XP_VISTA\language\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL5E\X64\language\DISK1
- PCL 5c
 - 32bit-driver
D:\X86\DRIVERS\PCL5C\XP_VISTA\language\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL5C\X64\language\DISK1
- PCL 6
 - 32bit-driver
D:\X86\DRIVERS\PCL6\XP_VISTA\MUI\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL6\X64\MUI\DISK1
- PostScript 3
 - 32bit-driver
D:\X86\DRIVERS\PS\XP_VISTA\MUI\DISK1
 - 64bit-driver

D:\X64\DRIVERS\PS\X64\MUI\DISK1

If the file path of the printer driver contains the word "MUI", the driver will be installed in the language of the operating system.

The PostScript 3 printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

8. Check the printer driver location, and then click [Next].

9. Click [Close].

If the installation is successful, the icon of the printer connected to the "USB001" port is added to the [Printers], [Printers and Faxes], or [Devices and Printers] window.

Note

- To disable Auto Run, press the left Shift key when inserting the CD-ROM into the drive and keep it pressed until the computer finishes reading from the CD-ROM.
- The number after "USB" varies depending on the number of printers connected.

Windows 7, Windows Server 2008 R2 - USB

- 1. Close all applications except this manual.**
- 2. Check that the power of the printer is off.**
- 3. Connect the printer to your computer with a USB cable.**

Connect the USB cable firmly.

4. Turn on the power of the printer.

Found New Hardware Wizard starts, and USB Printing Support is installed automatically.

- 5. Click [Devices and Printers].**
- 6. Double-Click the icon of printer you want to use in the [Unspecified] category.**
- 7. Click the [Hardware] tab.**
- 8. Click [Properties].**
- 9. Click the [General] tab.**
- 10. Click [Change settings].**
- 11. Click [Driver] tab.**
- 12. Click [Update Driver...].**
- 13. Click [Browse my computer for driver software].**
- 14. Insert the CD-ROM into the CD-ROM drive.**

If Auto Run starts, click [Cancel] and then click [Exit].

15. Click [Browse...], and then select the printer driver location.

If the CD-ROM drive is D, the source files of the printer driver are stored in the following locations:

- PCL 5e
 - 32bit-driver
D:\X86\DRIVERS\PCL5E\XP_VISTA\(\language)\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL5E\X64\(\language)\DISK1
- PCL 5c
 - 32bit-driver
D:\X86\DRIVERS\PCL5C\XP_VISTA\(\language)\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL5C\X64\(\language)\DISK1
- PCL 6
 - 32bit-driver
D:\X86\DRIVERS\PCL6\XP_VISTA\MUI\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PCL6\X64\MUI\DISK1
- PostScript 3
 - 32bit-driver
D:\X86\DRIVERS\PS\XP_VISTA\MUI\DISK1
 - 64bit-driver
D:\X64\DRIVERS\PS\X64\MUI\DISK1

If the file path of the printer driver contains the word "MUI", the driver will be installed in the language of the operating system.

The PostScript 3 printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

16. Check the printer driver location, and then click [Next].**17. Click [Close].**

If the installation is successful, the icon of the printer connected to the "USB001" port is added to the [Devices and Printers] window.

 **Note**

- To disable Auto Run, press the left Shift key when inserting the CD-ROM into the drive and keep it pressed until the computer finishes reading from the CD-ROM.

- The number after "USB" varies depending on the number of printers connected.

Troubleshooting USB

Problem	Solutions
The printer is not recognized automatically.	Turn off the power of this printer, and then reconnect the USB cable. Make sure the cable is securely connected to the USB ports, and then turn on the power again.
Windows has already configured the USB settings.	Open Windows' Device Manager, and then, under [Universal Serial Bus controllers], remove any conflicting devices. Conflicting devices have a [!] or [?] icon by them. Take care not to accidentally remove required devices. For details, see Windows Help.

Installing the Printer Driver Using Parallel Cable

This describes how to install the PCL or PostScript 3 printer driver when using a parallel port.

To use a printer connected using a parallel interface, click [LPT1] when installing the printer driver.

★ Important

- **Manage Printers permission is required to install the drivers. Log on as an Administrators group member.**

3

Installing the PCL Printer Driver

This describes how to install the PCL printer driver when using a parallel port.

1. **Close all applications except this manual.**
2. **Insert the CD-ROM into the CD-ROM drive.**

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory.

3. **Select an interface language, and then click [OK].**

The default interface language is English.

4. **Click [PCL Printer Drivers].**

The software license agreement appears in the [License Agreement] window.

5. **After reading the agreement, select the [I accept the agreement.] check box, and then click [Next].**

6. **Select the printer driver you want to use in the [Select Program] window.**

You can select several printer drivers.

The PCL 6 printer driver is installed in the language specified by your operating system.

7. **Click [Next].**

8. **Select the check box of the printer model you want to use.**

The printer name can be changed in the [Change settings for 'Printer Name'] box.

9. **Double-click the printer name to display the printer settings.**

The details shown in [Comment], [Driver], and [Port] vary depending on the operating system, printer model, and port.

10. **Check that [LPT1:] is shown in [Port].**

11. **Configure the user code, default printer, and shared printer as necessary.**

12. **Click [Continue].**

13. Click [Finish].

14. Click [Finish].

When you are prompted to restart your computer, restart it by following the instructions that appear.

Note

- To stop installation of the selected software, click [Cancel] before installation is complete.
- A user code can be set after the printer driver installation. For information about user code, see the printer driver Help.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use [Add Printer]. See p.49 "Messages Displayed When Installing the Printer Driver".

Installing the PostScript 3 Printer Driver

This describes how to install the PostScript 3 printer driver when using a parallel port.

1. **Close all applications except this manual.**

2. **Insert the CD-ROM into the CD-ROM drive.**

The installer starts.

Auto Run may not work with certain operating system settings. If this happens, launch "Setup.exe" on the CD-ROM root directory. If the [User Account Control] window appears, click [Continue] to allow the auto play program to run.

3. **Select an interface language, and then click [OK].**

The printer driver with the selected language will be installed. The English printer driver is installed when the following language is selected: Suomi, Magyar, Cestina, Polski, Portugues, Russian.

4. **Click [PostScript 3 Printer Driver].**

Under Windows Vista/7, and Windows Server 2008, proceed to step 6.

5. **Click [Next].**

6. **Click [Local printer attached to this computer], and then click [Next].**

Under Windows Vista/7, and Windows Server 2008, click [Add a local printer].

7. **Select the port you want to use, and then click [Next].**

8. **Select the brand name and model name of the printer you want to use, and then click [Next].**

9. **Follow the instructions that appear. Modify settings such as printer name, default printer, and printer sharing configuration, as necessary. You can also print the test page.**

10. Click [Finish].

Note

- To stop installation of the selected software, click [Cancel] before installation is complete.

- A user code can be set after the printer driver installation. For information about user code, see the printer driver Help.
- A message appears if there is a newer version of the printer driver already installed. If there is, you cannot install the printer driver using Auto Run. If you still want to install the printer driver, use [Add Printer]. See p.49 "Messages Displayed When Installing the Printer Driver".

4. When Using the Printer under Mac OS X

This chapter explains how to install and configure the printer drivers for use on the Mac OS X operating system.

Installing the Printer

This section explains how to configure a Mac OS X to use EtherTalk, USB, and TCP/IP.

Follow the procedure below to configure Mac OS X 10.3.8. If you are not using Mac OS X 10.3.8, see the manual of the Mac OS X you are using for details.

★ Important

- Mac OS X 10.2 or higher is required.

↓ Note

- The PPD files are stored in the following folder on the CD-ROM: MacOSX PPD Installer
- If you want to use AppleTalk, use the control panel or Web Image Monitor to enable it. (The default is **Inactive**.) AppleTalk cannot be used under Mac OS X 10.6.

Installing the PPD Files

Follow the procedure below to install a PPD file to print from Mac OS X.

★ Important

- You need an administrator name and a password (phrase). For details, consult your administrator.
1. Insert the CD-ROM into the CD-ROM drive.
 2. Double-click the CD-ROM drive icon.
 3. Double-click the [Mac OS X] folder.
 4. Double-click the [(brand name)] folder.
 5. Double-click the [Mac OS X 10.2 or later] or [Mac OS X 10.5 or later] folder, depending on your operating system.
 6. Double-click the [MacOSX PPD Installer] folder.
 7. Double-click the package file icon.
 8. Follow the instructions on the screen.

Setting Up the PPD File

1. Start Printer Setup Utility or Print Center utility.

Under Mac OS X 10.5 or 10.6, start System Preferences and click [Print & Fax].

2. Click [Add] or [+].

Mac OS X 10.5 or 10.6

Click [Default]. If the printer name is not displayed, select the icon that corresponds to your network environment.

Under Mac OS 10.5, if several AppleTalk zones exist on the network, select the zone the printer belongs to.

Mac OS X 10.4

Click [More Printers...]. Then select the zone from the second pop-up menu.

Mac OS X 10.3 or lower

Click [AppleTalk] on the first pop-up menu.

3. Select the printer, and then select its brand name from the [Printer Model:] pop-up menu.

Mac OS X 10.5 or 10.6

Select the printer you are using from the [Printer Name] list.

Mac OS X 10.4

Select the printer you are using from the [Print Using] pop-up menu.

4. Select the PPD file for the model you are using, and then click [Add].

Under Mac OS X 10.5 or 10.6, click [Add].

5. Quit Printer Setup Utility, Print Center utility or System Preferences.

Setting Up Options for Mac OS X

This section explains how to configure the printer driver.

1. Start Printer Setup Utility or Print Center utility.

Under Mac OS X 10.5 or 10.6, start System Preferences and click [Print & Fax].

2. Select the printer you are using, and then click [Show Info].

Under Mac OS X 10.5 or 10.6, select the printer you are using, and then click [Options & Supplies...].

3. Select [Installable Options] in the drop-down menu, and then configure settings as needed.

Under Mac OS X 10.5 or 10.6, click [Driver], and then configure settings as needed.

4. Click [Apply Changes].

Under Mac OS X 10.5 or 10.6, click [OK].

↓ Note

- If the option you want to select is not displayed, PPD files may not be set up correctly. To complete the setup, check the name of the PPD file displayed in the window.

Using USB Interface

Follow the procedure below to setup USB connection.

★ Important

- **USB2.0 can be used only with Mac OS X 10.3.3 or higher.**
1. **Check that the power of the printer is off.**
 2. **Connect the printer to your computer with a USB cable.**
Connect the USB cable firmly.
 3. **Turn on the power of the printer.**
 4. **Start Printer Setup Utility or Print Center utility.**
Under Mac OS X 10.5 or 10.6, start System Preferences and click [Print & Fax].
 5. **Click [Add] or [+].**

Mac OS X 10.5 or 10.6

Click [Default].

Mac OS X 10.4

Click a printer that has "USB" indicated in the "Connection" column.

Mac OS X 10.3 or lower

Click [USB] on the pop-up menu.

The connected printer appears.

6. **Select the printer, and then select its brand name from the [Printer Model:] pop-up menu.**

Mac OS X 10.5 or 10.6

Select the printer you are using from the [Printer Name] list, and [kind] of USB.

Mac OS X 10.4

Select the printer you are using from the [Print Using] pop-up menu.

A list of printer types appears.

7. **Select the connected printer from the list of printer models, and then click [Add].**
8. **Quit Printer Setup Utility, Print Center utility or System Preferences.**

Note

- When printing with a USB connection to a Macintosh computer, printer language does not change automatically. Use the control panel on this printer to change printer language to [Auto Detect] or [PS] before printing.

Using Bonjour

Follow the procedure below to print using Bonjour under Mac OS X 10.2.3 or higher. Ethernet, wireless LAN connections can also be used.

4

1. Start Printer Setup Utility or Print Center utility.

Under Mac OS X 10.5 or 10.6, start System Preferences and click [Print & Fax].

2. Click [Add] or [+].

Mac OS X 10.5 or 10.6

Click [Default].

Mac OS X 10.4

Click a printer that has "Bonjour" indicated in the "Connection" column.

Mac OS X 10.3 or lower

Click [Rendezvous] on the pop-up menu.

3. Select the name of the connected printer from the list of printer models.

Mac OS X 10.5 or 10.6

Select the printer you are using from the [Printer Name] list, and [kind] of Bonjour.

Mac OS X 10.4

Select the printer you are using from the [Print Using] pop-up menu.

A list of printer types appears.

4. Click [Add].

Under Mac OS X 10.4, click [Add], and then click [Continue].

5. Quit Printer Setup Utility, Print Center utility or System Preferences.

Note

- When printing with a Bonjour connection to a Macintosh computer, printer language does not change automatically. Use the control panel on this printer to change printer language to [Auto Detect] or [PS] before printing.

Changing to EtherTalk

Follow the procedure below to configure a Mac OS X to use EtherTalk.

★ Important

- You need an administrator name and a password (phrase). For details, consult your administrator.

1. Start System Preferences, and then click the [Network] icon.
2. Click [Built-in Ethernet] or [Ethernet] in the list box.

Mac OS X 10.5 or 10.6

Click [Advanced...].

Mac OS X 10.3 or 10.4

Select [Built-in Ethernet] or [Ethernet], and then click [Configure...]

3. Click the [AppleTalk] tab.
4. Select the [Make AppleTalk Active] check box.
5. To change AppleTalk zones, select a name from the [AppleTalk Zone:] pop-up menu.
6. When the settings are made, click [Apply Now].

Under Mac OS X 10.5, click [OK], and then click [Apply].

↓ Note

- For information about installing applications required for EtherTalk, see the Mac OS manuals.

5. Appendix

Messages Displayed When Installing the Printer Driver

This section describes what to do if a message appears when installing the printer driver.

Message number 58 or 34 indicates that the printer driver cannot be installed using Auto Run. Install the printer driver using [Add Printer] or [Add a Printer].

Message number 58 appears if there is a newer version of the printer driver already installed.

Windows XP, Windows Server 2003/2003 R2

5

This section describes the procedure under Windows XP or Windows Server 2003/2003 R2.

1. On the [Start] menu, click [Printers and Faxes].

Under Windows XP Home Edition, on the [Start] menu, click [Control Panel].

2. Click or double-click [Add a printer] or the [Add Printer] icon.
3. Follow the instructions in Add Printer Wizard.

If the printer driver is on the CD-ROM, the location of the driver is \(\X86 or X64)\DRIVERS\(\PCL6, PCL5C, PCL5E, or PS)\(XP_VISTA or X64)\(language) or MUI\DISK1. If the installer starts, click [Cancel] to quit.

4. Specify a port.

↓ Note

- Available ports vary according to your Windows operating system or the type of interface. For details, see p.7 "Network Connection" or p.33 "Local Connection".

Windows Vista, Windows Server 2008

This section describes the procedure under Windows Vista or Windows Server 2008.

1. On the [Start] menu, click [Control Panel].
2. Click [Hardware and Sound].
3. Click [Printers].
4. Click [Add a printer].

5. Follow the instructions in Add Printer Wizard.

If the printer driver is on the CD-ROM, the location of the driver is \(\X86 or X64)\DRIVERS\(\PCL6, PCL5C, PCL5E, or PS)\(XP_VISTA or X64)\(language) or MUI\DISK1 . If the installer starts, click [Cancel] to quit.

6. Specify a port.

Note

- Available ports vary according to your Windows operating system or the type of interface. For details, see p.7 "Network Connection" or p.33 "Local Connection".

Windows 7, Windows Server 2008 R2

This section describes the procedure under Windows 7 or Windows Server 2008 R2.

5

1. On the [Start] menu, click [Devices and Printers].

2. Click [Add a printer].

3. Follow the instructions in [Add Printer] Window.

If the printer driver is on the CD-ROM, the location of the driver is \(\X86 or X64)\DRIVERS\(\PCL6, PCL5C, PCL5E, or PS)\(XP_VISTA or X64)\(language) or MUI\DISK1 . If the installer starts, click [Cancel] to quit.

4. Specify a port.

Note

- Available ports vary according to your Windows operating system or the type of interface. For details, see p.7 "Network Connection" or p.33 "Local Connection".

Making Option Settings for the Printer

When bidirectional communication works correctly, your computer obtains information about option, paper size and paper feed direction settings from the printer automatically. Bidirectional communication also allows you to monitor printer status.

When bidirectional communication is disabled, you have to set up option, paper size and paper feed direction settings on your computer manually.

Conditions for Bidirectional Communication

To support bidirectional communication, the following conditions must be met:

When connected with parallel cables

- The computer must support bidirectional communication.
- The interface cable must support bidirectional communication.
- The printer must be connected to the computer using the standard parallel cables and parallel connectors.

When connected with the network

- The Standard TCP/IP port must be used.
- In addition to the above, one of the following conditions must also be met:
 - The TCP/IP protocol or the IPP protocol is used. (When using the IPP protocol, the IPP port name must include the IP address.)

When connected with USB

- The printer must be connected to the computer's USB port using the USB interface cable.
- The computer must support bidirectional communication.
- [Enable bidirectional support] must be selected, and [Enable printer pooling] must not be selected on the [Ports] tab with the printer driver.

Note

- The PCL 6 and PostScript 3 printer drivers support bidirectional communication and automatic printer status updates.
- To obtain printer information automatically using the bidirectional communication function of the PCL 6 or PostScript 3 printer driver, you must select the [Automatically Update Printer Information] check box on the [Accessories] tab in the printer driver's properties window.
- The PCL 5e/5c printer driver supports bidirectional communication. You can update the printer status manually.

If Bidirectional Communication Is Disabled

This section describes how to set up option, paper size and paper feed direction settings on your computer manually.

 **Important**

- **Manage Printers permission is required to install the drivers. Log on as an Administrators group member.**

1. On the [Start] menu, click [Printers and Faxes].

When using Windows Vista or Windows Server 2008, click [Control Panel] on the [start] menu, and then click [Printer]. The [Printers] window appears.

When using Windows 7 or Windows Server 2008 R2, click the [Start] menu, and then click [Devices and Printers].

2. Click the icon of the printer you want to use.

3. On the [File] menu, click [Properties].

When using Windows Vista or Windows Server 2008, right-click the icon of the printer you want to use, and then click the [Properties].

When using Windows 7 or Windows Server 2008 R2, right-click the icon of the printer you want to use, and then click [Printer properties].

4. Click the [Accessories] tab.

If options in the [Accessories] tab are disabled, bidirectional connection is enabled. In this case, no change is necessary for option settings.

5. Select options installed from the [Options] area, and then make the necessary settings.

6. In [Input Tray:] select which trays to use, and then, in [Paper Size:] select the size of the paper that you want to load in each tray.

Click [Update] in the [Input Tray Settings] area to apply the setting for each tray.

7. Click [OK] to close the printer properties window.

Installing Font Manager

★ Important

- Manage Printers permission is required to install the drivers. Log on as an Administrators group member.
- The operating systems compatible with Font Manager are Windows XP/Vista.

1. Close all applications except this manual.
2. Insert the CD-ROM into the CD-ROM drive.
The installer starts.
3. Select an interface language, and then click [OK].
4. Click [Font Manager].
5. Follow the instructions on the display.

Using Adobe PageMaker Version 6.0, 6.5, or 7.0

Under Windows XP with Adobe® PageMaker®, you need to copy PPD files to the PageMaker folder. PPD files have the .ppd extension in the folder "`\X86\DRIVERS\PS\PM6\Language`" on the CD-ROM. The "PM6" folder inside the "PS" folder is for Windows XP. Use the folder that is appropriate for the operating system you are currently using.

The third folder "(Language)" may be substituted by an appropriate language name.

Copy the .ppd file to the PageMaker folder.

- **For PageMaker 6.0 default installation**

The directory is "`C:\PM6\RSRC\PPD4`".

- **For PageMaker 6.5 default installation**

The directory is "`C:\PM65\RSRC\USENGLISH\PPD4`".

The "USENGLISH" may vary depending on your language selection.

- **For PageMaker 7.0 default installation**

The directory is "`C:\PM7\RSRC\USENGLISH\PPD4`".

The "USENGLISH" may vary depending on your language selection.

↓ Note

- If the driver is not set correctly after copying the ".ppd" file, printing may not be performed properly.
- When using PageMaker, the optional features that can be selected by the printer driver will not be active. The following procedure describes how to activate the optional printer features.
 1. On the [File] menu, click [Print].

The [Print Document] window appears.
 2. Make the necessary settings in the [Features] box.

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The proper names of the Windows operating systems are as follows:

- The product names of Windows XP are as follows:
 - Microsoft® Windows® XP Professional Edition
 - Microsoft® Windows® XP Home Edition
 - Microsoft® Windows® XP Professional x 64 Edition
- The product names of Windows Vista are as follows:
 - Microsoft® Windows Vista® Ultimate
 - Microsoft® Windows Vista® Business
 - Microsoft® Windows Vista® Home Premium
 - Microsoft® Windows Vista® Home Basic
 - Microsoft® Windows Vista® Enterprise
- The product names of Windows 7 are as follows:
 - Microsoft® Windows® 7 Home Premium
 - Microsoft® Windows® 7 Professional
 - Microsoft® Windows® 7 Ultimate
 - Microsoft® Windows® 7 Enterprise
- The product names of Windows Server 2003 are as follows:
 - Microsoft® Windows Server® 2003 Standard Edition
 - Microsoft® Windows Server® 2003 Enterprise Edition

- The product names of Windows Server 2003 R2 are as follows:
Microsoft® Windows Server® 2003 R2 Standard Edition
Microsoft® Windows Server® 2003 R2 Enterprise Edition
- The product names of Windows Server 2008 are as follows:
Microsoft® Windows Server® 2008 Standard
Microsoft® Windows Server® 2008 Enterprise
Microsoft® Windows Server® 2008 Standard without Hyper-V™
Microsoft® Windows Server® 2008 Enterprise without Hyper-V™
- The product names of Windows Server 2008 R2 are as follows:
Microsoft® Windows Server® 2008 R2 Standard
Microsoft® Windows Server® 2008 R2 Enterprise

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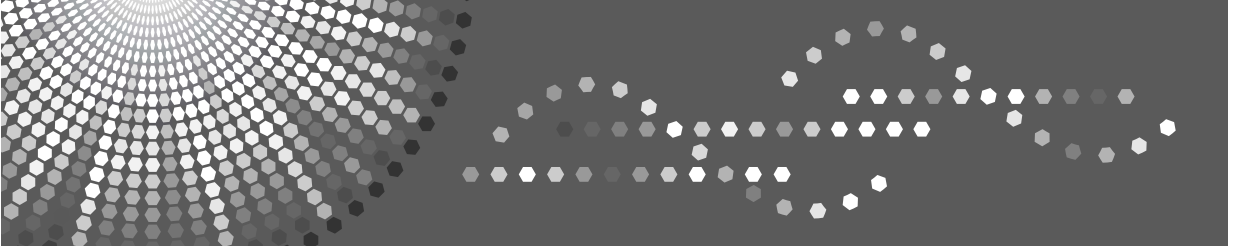
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Operating Instructions Driver Installation Guide





IPDS Printing Configuration Guide

-
- 1** Getting Started
 - 2** InfoPrint Manager for Windows
 - 3** Configuring System i for an IPDS Printer
 - 4** Configuring z/OS to Print IPDS Files
 - 5** InfoPrint Manager for AIX
 - 6** Handling Network Problems
 - 7** Appendix

Introduction

This manual contains detailed instructions and notes on the operation and use of this machine. For your safety and benefit, read this manual carefully before using the machine. Keep this manual in a handy place for quick reference.

Important

Contents of this manual are subject to change without prior notice. In no event will the company be liable for direct, indirect, special, incidental, or consequential damages as a result of handling or operating the machine.

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Manuals for the IPDS card

Refer to the manuals that are relevant to what you want to do with the IPDS card.

Important

Adobe® Acrobat® Reader® / Adobe Reader must be installed in order to view the manuals as PDF files.

❖ IPDS Supplement (IPDS.pdf)

Explains about how to configure the IPDS card for the machine, and about items selectable from the Web browser.

❖ IPDS Printing Configuration Guide (IPDS_CONF.pdf) *English Only

Explains about environment necessary for connecting the mainframe to the machine, and performing IPDS printing.

❖ IPDS Technical Reference (IPDS_TEC.pdf) *English Only

Explains about commands necessary for IPDS printing.

Note

For details about the necessary environment, and installation of the IPDS card and machine, consult your sales or service representative. For details about necessary environment and operation of the mainframe, consult IBM.

How to Read This Manual

Symbols

This manual uses the following symbols:

Important

Indicates points to pay attention to when using the machine, and explanations of likely causes of paper misfeeds, damage to originals, or loss of data. Be sure to read these explanations.

Note

Indicates supplementary explanations of the machine's functions, and instructions on resolving user errors.

Reference

This symbol is located at the end of sections. It indicates where you can find further relevant information.

[]

Indicates the names of keys that appear on the machine's display panel.

1. Getting Started

Book at a Glance

This book is designed to help you configure the Ethernet Attachment for your printer.

Server-to-Printer Attachments Described in this Book

1

This book describes the server-to-printer attachments described in the following table. Direct attachment of multiple machines to the printer, without the use of a print server, is also described for Windows systems.

Server Environment	Server-to-Printer Protocol	Data streams
AIX	TCP/IP	IPDS
System i	TCP/IP	IPDS
z/OS	TCP/IP	IPDS
Windows	TCP/IP	IPDS

 **Note**

- To print IPDS, you will need to install InfoPrint Manager for AIX, InfoPrint Manager for Windows, PSF for z/OS or PSF for i5/OS and OS/400 on the host.
- IPDS must use the TCP/IP protocol.

Configuration Checklist

The information in this chapter applies to all users.

1 Write down the NIC MAC address. The Ethernet MAC address is on the printer controller. If you are using TCP/IP, see the manual explaining the network functions provided by the supplier.

2 Power off the printer and connect the NIC to the LAN cable.

3 Power on the printer. Verify the connection to the LAN cable.

4 Configure your environment. Refer to one of the chapters in the following list.

❖ Windows

 Reference

p.9 "InfoPrint Manager for Windows"

❖ System i

 Reference

p.13 "Configuring System i for an IPDS Printer"

❖ z/OS

 Reference

p.29 "Configuring z/OS to Print IPDS Files"

❖ AIX

 Reference

p.41 "InfoPrint Manager for AIX"

Default Parameter Values

The following lists the default parameter values and other information for a NIC.

1

Parameter/Limit	Values	Affected Area
LPD port	TCP port 515	LPR printing
Raw port for printing	TCP port 2501 TCP port 9100	AIX System i
IPDS port	TCP port 5001	PSF for z/OS PSF for i5/OS and OS/400 InfoPrint Manager

2. InfoPrint Manager for Windows

Requirements - InfoPrint Manager for Windows

This machine supports the following version of InfoPrint Manager for Windows.

- InfoPrint Manager for Windows V2.2 or later.

Note

- When you install the InfoPrint Manager server software, you automatically install the InfoPrint Manager Administration GUI and the InfoPrint Manager Operations GUI on the same system. You can also install either the InfoPrint Manager Administration GUI or the InfoPrint Manager Operations GUI on remote systems. The InfoPrint Manager Operations GUI provides a subset of the functions available in the InfoPrint Manager Administration GUI. This subset includes operator tasks.

Configuration Checklist - InfoPrint Manager for Windows

Use this chapter to configure InfoPrint Manager to print using your printer.

- 1** If you have not already done so, install InfoPrint Manager.
- 2** Decide which type of destination you want to define in InfoPrint Manager for this printer. See p.10 “Choosing an InfoPrint Manager Destination Type”.
- 3** Define the printer to InfoPrint Manager. See p.11 “Adding a PSF TCP/IP Printer”.
- 4** Verify the configuration by submitting a print job.

Choosing an InfoPrint Manager Destination Type





InfoPrint Manager provides various Destination Support Systems (DSSs). The type that is most appropriate for your environment is based on what data stream you want to print (IPDS, PCL, or PostScript). Use the following table to determine what type to use.

Data Stream From Application	Data Stream To Printer	InfoPrint Manager Destination
IPDS, PCL, PS, ASCII, line data, DBCS ASCII, PDF, AFP	IPDS	PSF TCP/IP Printer

Adding a PSF TCP/IP Printer

Create a PSF TCP/IP destination to define a printer that receives IPDS jobs using the TCP/IP protocol.

1 Complete the following worksheet:

Wizard Prompt	Description	Value
Name	The name for the actual destination object (8 character limit).  Note <input type="checkbox"/> This name is case-sensitive.	
Server	The InfoPrint Manager server that controls this actual destination.	
TCP/IP address	The dotted-decimal IP address used to access this printer.	
TCP/IP port	The port used by the printer for communication. (Typically, port 5001 is used.)	
Logical destination	The logical destination that directs jobs to this actual destination.  Note <input type="checkbox"/> This name is case-sensitive.	__ Default __ Other:
Logical destination's server	The server that contains the logical destination.  Note <input type="checkbox"/> This name is case-sensitive.	
Queue	The queue for the target printer (actual destination).  Note <input type="checkbox"/> This name is case-sensitive.	__ Default __ Other:

2 Launch the InfoPrint Manager Administration GUI.

3 On the menu bar, select [Printer] -> [Create] -> [PSF] -> [TCP/IP] to start the Create Printer Wizard.

4 Provide the worksheet information to the wizard. For assistance, refer to the InfoPrint Manager Administration GUI online help.

5 If you did not enable the printer with the Create Printer Wizard, use the InfoPrint Manager Administration GUI to enable it.

3. Configuring System i for an IPDS Printer

Requirements - System i

This machine supports the following version of PSF for i5/OS and OS/400 (PSF/400).

- PSF for i5/OS and OS/400 (PSF/400) V5.4 or later.

 **Note**

- We recommend that you use the latest System i package and related software.

Printing AFP, IPDS, PDF, PCL, and PostScript Files

Use this chapter to configure the printer on System i as an IPDS printer.

The printer configured as IPDS will print only IPDS files. With the InfoPrint Server for System i, PostScript, PDF, and PCL data streams can be transformed to AFP and printed to the printer as IPDS.

- AFP files are transformed directly by Print Services Facility (PSF/400 – an integrated feature of OS/400), which then sends the transformed file to the printer.
- SCS files are transformed into IPDS by one of two conversion paths. The path recommended by IBM – a straight SCS to device-independent IPDS transform – is controlled by setting the IPDSPASTHR parameter to YES (see step 1 on p.21 “Configuring PSF/400 with CRTPSFCFG”). Setting IPDSPASTHR to YES provides the best performance because IPDS files are sent directly to the printer with no transform. If your SCS file requires any AFP processing, PSF/400 will automatically provide the requisite conversion.

Configuration Checklist - System i

- Authority Level Required
All of the following configuration steps carried out on the System i may require “create” or “change” authority.

- 1** Make sure the printer is set up. See p.7 “Configuration Checklist”.
- 2** Using the printer's control panel or Web Image Monitor, set up the printer for IPDS by setting the parameters and values shown in the following table.

Menu	Item	Setting
IPDS	Emulation Mode	Native
IPDS	Font Substitution	Off

- 3** Set TCP/IP addresses for the printer, such as an IP address, gateway address, or subnet mask. See the manual explaining the network functions provided by the supplier.
- 4** If the printer and System i are not on the same LAN segment, verify that there is a route defined in the TCP/IP route list on the System i. If necessary, use the ADDTCPRTE command on the System i to create a route definition.
- 5** Create or verify the existence of a System i TCP/IP interface for Token Ring or Ethernet. See p.16 “Configuring a System i TCP/IP Interface”.
- 6** Configure System i with p.19 “Configuring PSF/400 for IPDS”.
- 7** Vary the printer ON using the VFYCFG command.
- 8** Verify that TCP/IP has been started using the STRTCP command.
- 9** Test your configuration. See p.22 “Verifying the IPDS Configuration on System i”.
- 10** To share the printer on the network, verify that the necessary parameters have been set correctly. See p.23 “Sharing the PSF/400 Printer on the Network”.

Reference

If you have problems, refer to p.26 “Resolving System i Problems”.

Configuring a System i TCP/IP Interface

Important

- Do not enter the IP address of the printer or set the System i interface address to be the same as the printer IP address. Also, do not add the printer to the System i TCP/IP interface list.

Configuring the System i Interface with ADDTCPIFC

3

ADDTCPIFC is used to add a TCP/IP interface to System i. This step configures the System i for attachment to a TCP/IP network.

1 At the System i command line, enter a command in the form:

```
ADDTCPIFC INTNETADR('9.99.15.188') LIND(ETHLAN) SUBNET-  
MASK('255.255.255.0')
```

2 A completed screen should look like the following:

```
System: 8LDD60
Internet address . . . . . : 9.99.15.188
Subnet mask . . . . . : 255.255.255.0
Line description . . . . . : ETHLAN
Line type . . . . . : *ELAN
Interface status . . . . . : Inactive
Type of service . . . . . : +NORMAL
Maximum transmission unit . . . . . : +LIND
Automatic start . . . . . : +YES
```

3 The following parameters are required:

- Internet Address
Internet address of the System i Ethernet LAN adapter.

Note

- Do not enter the IP address of the printer.
- Subnet Mask
The subnet mask for this System i TCP/IP interface (for example, 255.255.255.0).
- Line description
The name assigned to the System i line description. Each System i LAN adapter will have its own line description.

Configuring a TCP/IP Host Table Entry

Although optional, we recommend that you create a TCP/IP host table entry. Add the System i name and the IP address of the LAN adapter to the “Host Table Entries”. Also, add the hostname and IP address of the printer to the list. You can access the host table entries function by using the CFGTCP command, then selecting option 10 from the menu.

You can also add entries to your host table for both the hostname and the fully qualified network name for your system. The entry should match what you configured for host and domain name. For example, if your hostname is “RCHASM03” and your domain name is “RCHLAND.IBM.COM”, your fully qualified network name is “RCHASM03.RCHLAND.IBM.COM”. In your host entry table, enter both RCHASM03 and RCHASM03.RCHLAND.IBM.COM.

Configuring TCP/IP Keep Alive

Although optional, we recommend that you set the TCP/IP Keep-Alive time to 1 minute. This is the minimum value that can be set; the default is 120 minutes (2 hours). Setting the value to 1 minute causes System i to detect a lost printer connection faster.

To change the keep alive time, enter the command CHGTCPA. Change the first entry as shown below:

```
TCP keep alive . . . . . 1
```

3

 **Note**

- Please note that changing the TCP/IP Keep-Alive time changes all the System i settings.

Configuring PSF/400 for IPDS

To configure IPDS on System i, you use the following commands:

CRTDEVPRT

CRTPSFCFG (Optional)

Configuring PSF with CRTDEVPRT

This section describes how to set up a device description on System i.

1 At the System i command line, enter a command in the form:

```
CRTDEVPRT DEVD(2705) DEVCLS(*LAN) TYPE(*IPDS) MODEL(0)
LANATTACH(*IP) AFP(*YES) PORT(5001) FONT(11)
FORMFEED(*AUTOCUT)RMTLOCNAME('128.9.12.134')
USRDFNOBJ(AFP/NETWRKPRT *PSFCFG) TEXT('printer name')
```

2 A completed screen looks like this:

```

Display Device Description                               Page 1
5769551 V4R0M0 990521                                BLDAS44 01/19/00 13:07:24
Device description . . . . . : DEVD      2705
Option . . . . . : OPTION    *ALL
Category of device . . . . . :          *PRT
Device class . . . . . : DEVELS   *LAN
Device type . . . . . : TYPE     *IPDS
Device model . . . . . : MODEL    0
LAN attachment . . . . . : LANATTACH *IP
Advanced function printing . . . . . : AFP      *YES
Port number . . . . . : PORT     5001
Online at IPL . . . . . : ONLINE  *YES
Font . . . . . : FONT
Identifier . . . . . :          011
Point size . . . . . :          *NONE
Form feed . . . . . : FORMFEED  *AUTOCUT
Separator drawer . . . . . : SEPDRAWER *FILE
Separator program . . . . . : SEPPGM  *NONE
Library . . . . . :
Printer error message . . . . . : PRTERMSG  *INQ
Message queue . . . . . : MSGQ     *CTLD
Current message queue . . . . . : QSYSOPR
Library . . . . . : QSYS
Activation timer . . . . . : ACTTMR   178
Image configuration . . . . . : IMSCFG  *NONE
Maximum pending requests . . . . . : MAXPNDRQS 6
Print while converting . . . . . : PRTCVT  *YES
Form definition . . . . . : FORMDF   FIC10110
Library . . . . . :          *LIBL
Character Identifier . . . . . : CHRID  *SYSVAL
Remote location . . . . . : RMTLOCNAME
Name or address . . . . . :          128.9.12.134

User-defined object . . . . . : USRDFNOBJ NETWRKPRT
Library . . . . . :          AFP
Object type . . . . . :          *PSFCFG
Data transform program . . . . . : USRDATFM *NONE
User-defined driver program . . . . . : USRDVPGM *NONE
Dependent location name . . . . . : DEPLOCLNAME *NONE
Allocated to:
Job name . . . . . :          QSYSARB
User . . . . . :          QSYS
Number . . . . . :          075445
Text . . . . . :          TEXT    printer name
User-defined options . . . . . : USRDFNOPT
-----User-defined options-----

```

3 Enter values for the following parameters:

- Device Description (DEVD)
The device description or name.
- Device Class (DEVCLS)
Specify *LAN.
- Device Type (TYPE)
Specify *IPDS.
- Device Model (MODEL)
Specify 0.
- LAN attachment (LANATTACH)
Specify *IP.
- Port Number (PORT)
Specify 5001, which is the printer's default port number. Use Web Image Monitor to set or view the IPDS port number.
- Font (FONT)
Enter an appropriate value.
- Form Feed (FORMFEED)
Specify *AUTOCUT.
- Activation timer (ACTTMR)
This value specifies the number of seconds that PSF/400 waits for a printer to respond to an activation request. If only one system will be using the printer, use the default value (170 seconds). If more than one system will be using the printer, specify *NOMAX, which will cause PSF/400 to wait indefinitely for a response to an activation request.
- Remote Location (RMTLOCNAME)
Enter the IP address or hostname of the printer.
- User-Defined Object (USRDFNOBJ)
To use a PSF configuration object, specify its name and library here. The object type must be *PSFCFG. A single PSF configuration object may be referenced by multiple device descriptions, if required.

Configuring PSF/400 with CRTPSFCFG

The PSF configuration object created with this command is used by PSF/400 when printing IPDS files only if the object is specified with the USRDFNOBJ parameter in the printer device description.

To configure System i for IPDS printing:

1 At the System i command line, enter a command in the form:

```
CRTPSFCFG PSFCFG(AFP/NETWRKPR) IPDSPASTHR(*YES)
RLSTMR(*SEC15) TEXT('printer name')
```

2 A completed screen looks like this:

```
PSF Configuration Information                               Page 1
5769551 V4R0M0 990521                                     BLDAS44 01/19/00 13:17:18
PSF configuration: NETWRKPR Library: AFP
User resource library . . . . . : *JOBLIBL
IPDS pass through . . . . . : *YES
Activate release timer . . . . . : *NORDYF
Release timer . . . . . : *SEC15
Restart timer . . . . . : *IMMED
APPC and TCP/IP retry count . . . . . : 15
Delay time between retries . . . . . : 90
Automatic session recovery . . . . . : *NO
Acknowledgment frequency . . . . . : 100
Blank page . . . . . : *YES
Page size control . . . . . : *NO
Resident fonts . . . . . : *YES
Resource retention . . . . . : *YES
Edge orient . . . . . : *NO
Use outline fonts . . . . . : *NO
PSF defined options:
+NONE
Font substitution messages . . . . . : *YES
Capture host fonts at printer . . . . . : *NO
Cut sheet emulation mode . . . . . : *NONE
Font resolution for formatting . . . . . : *SEARCH
Font mapping table . . . . . : *NONE
Library . . . . . :
Text description . . . . . : printer name
Device resource library list:
+OFF
```

3 The following parameters are recommended:

- PSF configuration (PSFCFG)
The name used for this PSF configuration object. The name must match the user-defined object name (USRDFNOBJ) in the printer DEVD.
- IPDS pass through (IPDSPASTHR)
To print SCS and IPDS files (which do not use AFP functions) with minimal processing, specify *YES. PSF/400 transforms SCS into IPDS before printing.
- Activate release timer (ACTRLSTMR)
Specifies the point at which the release timer (RLSTMR) is activated. Set to *NORDYF.
- Release timer (RLSTMR)
Specifies the amount of time to wait before a session or dialog is released, without terminating the writer. The ACTRLSTMR parameter specifies when this timer is to be activated. Verify that the IPDS TIMEOUT value on the printer is "0" or "OFF". Set the System i parameter to *SEC15.
This releases the printer to service other jobs from other ports, 15 seconds after the last IPDS job has printed.

Verifying the IPDS Configuration on System i

To test IPDS printing, do the following:

- 1 Vary on the line description if it is not already on.

```
VRYCFG CFGOBJ (line) CFGTYPE (*LIN) STATUS(*ON)
```

- 2 To start TCP/IP, enter:

```
STRTCP
```

- 3 Verify that the System i TCP/IP interface is active. Use the command:

```
WRKTCPSTS
```

and then select option 1.

- 4 Turn the printer on and wait until the printer's control panel displays READY.

- 5 To verify that the printer is connected to System i, ping the printer from a System i workstation with one of the following commands:

```
PING ip_address'
```

or

```
PING hostname
```

where ip_address is the TCP/IP address of the remote system printer, and hostname is the hostname you defined for the printer, if any.

- 6 If pings are successful, vary on the printer device description with the command:

```
VRYCFG (printer-device) CFGTYPE(*DEV) STATUS(*ON)
```

If the pings are not successful, see p.26 "Printer Cannot be PINGed".

- 7 To use PSF/400 to send an IPDS file to the printer, enter:

```
STRPRTWTR DEV (printer device)
```

If you have problems printing, do the following:

- Print a network configuration page, see the manual explaining the network functions provided by the supplier.
- Verify that the IPDS port number matches the port number in the device description.

If you are still unable to print IPDS files, contact your service or sales representative.

Sharing the PSF/400 Printer on the Network

To support printer sharing, the printer automatically switches among all logical ports. Basically, the printer prints one job at a time, and chooses the next job from the highest priority port. If the client does not end a job, then the printer applies the timeout value set for the print port.

To change the “time out” value, update the timeout value on Web Image Monitor for the appropriate port.

See p.51 “Sharing the Printer with IPDS host systems (PSF/400 or z/OS)”, for a description of concepts associated with sharing an IPDS printer between multiple host systems.

3

Sharing the printer with other non-IPDS host systems using MID

Configure the System i to use MID (Managed IPDS Dialog) in order for the printer to be shared between the IPDS System i system and other non-IPDS systems, such as desktop PCs. The following PSF configuration parameters must be set on the System i in order for it to support MID requests from the printer.

Here is a System i example with MID Enabled:

```

PSF configuration:
User resource library.....: *JOBLIBL
IPDS pass through .....: *NO
+
Activate release timer.....: *PRTNORDYF
Release timer.....: *SEC15
Restart timer.....: *IMMED
APPC and TCP/IP retry count.....: 15
Delay time between retries.....: 90
Auto Session Recovery.....: *YES
Acknowledge Fequency.....: 100
Blank page.....: *YES
Page size control.....: *NO
Resident fonts.....: *YES
Resource retention.....: *YES
Edge orient.....: *NO
Use outline fonts.....: *NO
Remote Location:

Text description.....:
Device resource library list .....: (List of names)

```

Sharing the printer with other IPDS host systems

Configure the System i without MID in order for the printer to be shared between multiple IPDS host systems. This configuration can also be used for sharing the printer with desktop PCs. The following PSF configuration does not grant MID requests from the printer.

Here is a System i example without MID:

```

Activate release timer.: *NORDYF
DISCONTV=25,
  Release timer.....: *SEC15
  Restart timer.....: *IMMED
    
```

3

To set up PSF/400 for shared printing without MID, set the following parameters:

Where Set	Parameter	Recommended Value	Description
CRTPSFCFG CHGPSFCFG	ACTRLSTMR	*NORDYF	Specifies the point at which the release timer (RLSTMR) is activated. Set to *NORDYF. This means that the release timer is activated when there are no spooled files in the printer's output queue with a status of RDY and the last page of the last spooled file processed has printed. *NORDYF is used so that all files with a status of RDY are printed before releasing the session (which does not terminate the writer, however).
CRTPSFCFG CHGPSFCFG	RLSTMR	*SEC15	Specifies the amount of time to wait before a session or dialog is released without terminating the writer. The ACTRLSTMR parameter specifies when this timer is to be activated. Set the parameter to a value at least equal to the TIMEOUT value on the printer. We recommend *SEC15.

Where Set	Parameter	Recommended Value	Description
CRTDEVPRT CHGDEVPRT	ACTTMR	*NOMAX	The value specifies the number of seconds that PSF/400 will wait for a printer to respond to an activation request. If only one system will be using the printer, use the default value (170 seconds). If more than one system will be using the printer, set the value to *NOMAX, which will cause PSF/400 to wait indefinitely for a response to an activation request.

Resolving System i Problems

Use this section to resolve problems configuring System i on TCP/IP networks.

Printer Cannot be PINGed

If you have problems pinging the printer:

- Verify the configuration of System i, including the printer and any intervening devices such as routers and bridges.
- Verify that the System i line description is varied on and the printer is turned on and displays a status of READY.
- Verify that the System i TCP/IP interface is active.

If PSF/400 Terminates When Initialized

If PSF/400 terminates when you initialize it for IPDS printing and issues message PQT3603, check for the following error codes.

- 10 means an incorrect RMTLOCNAME has been specified for the printer.
- 15 means that PSF/400 timed out waiting for the printer's response. You should check the value you entered for Activation Timer when using CRT-DEVPRT.
- Codes 20-39 indicate a general communications failure. Make sure all of the components in your network are operational, such as routers.
- Codes 40-59 indicate a logic error between PSF and the printer control unit.

Spooled Print File Remains in PND Status

Check the output queue with the command:

```
WRKOUTQ OUTQ (queuname)
```

This typically indicates that PSF/400 is waiting for a response from the printer. This can be verified by displaying the QSPL subsystem, WRKACTJOB SBS (QSPL). If the status of the PDJ job for the printer is SELW, then PSF/400 is waiting for a response from the printer. Make sure that the printer is online and in READY status and that all network connections (for example, routers) between the System i and the printer are active.

Spooled Files Disappear Without Printing

To resolve this problem:

- Check that the correct printer queue name and correct IP address have been used.
- Ping the IP address. If the ping is successful, disconnect the network cable from the printer/print server, and ping the address again. If the ping is still successful, there is another printer with that IP address on the network.

Data is Being Clipped

To resolve this problem, you may want to set the PSC (Page Size Control) parameter to *YES in the CRTPSFCFG command.

Printer Powered Off While Writer is Active

The printer should not be powered off while the PSF writer is active. If this happens, you must stop and then restart the writer.

Optionally, you may specify *YES for Automatic session recovery in the PSF configuration object. When *YES is specified and the printer connection is lost (whether caused by accidentally powering off the printer or an unexpected network problem), PSF/400 will attempt to reconnect to the printer and resume printing at the last known point. You may have pages reprinted if the connection can be established. You can control the reprinting of pages by adjusting the value for the acknowledgment frequency parameter in the PSF configuration object.

4. Configuring z/OS to Print IPDS Files

Requirements - z/OS

This machine supports the following version of PSF for z/OS.

- PSF for z/OS V4.1.0 or later.

Note

- To obtain the PTFs associated with these APARs, contact your service or sales representative.

Configuration Checklist - z/OS

Use this chapter to configure z/OS to print IPDS files on your network printer.

- Authority Level Required

All of the following configuration steps carried out on z/OS require appropriate RACF authority.

- 1** Using the printer's control panel, set up the printer for IPDS by setting the parameters and values shown in the following table.

Menu	Item	Setting
IPDS	Emulation Mode	Native
IPDS	Font Substitution	Off

- 2** Set TCP/IP addresses for the printer, such as an IP address, gateway address, or subnet mask. See the manual explaining the network functions provided by the supplier.

- 3** Configure the host environment. See p.31 "Configuring PSF to Print IPDS Files".

- 4** Verify the configuration. See p.36 "Verifying a TCP/IP-Attached Printer on z/OS".

Reference

If you want to share the printer, do the procedure in p.38 "Sharing the Network Printers on z/OS".

If you have problems, refer to p.40 "Handling z/OS Connectivity Problems".

Configuring PSF to Print IPDS Files

Data Requirements

You need the IP address of the printer.

Configuration Procedure

Configuring PSF to print IPDS files includes the following steps:

- 1** Define the z/OS communications control unit to z/OS. See p.31 “Define the Communications Control Unit to z/OS”.
- 2** Modify the TCP/IP profile on your z/OS system, if necessary. See p.32 “Modify the TCP/IP Profile in z/OS”.
- 3** Ping the printer. See p.33 “Verify the Printer Connection”.
- 4** Define the printer as a writer-controlled printer to JES. See p.33 “Define the Printer to JES”.
- 5** Define the printer to PSF with a PRINTDEV statement, including the IP address. See p.34 “Define the Printer to PSF”.

 **Note**

- This section does not provide all the information you need to install and configure TCP/IP on your z/OS system.
- The routing of information is determined on the basis of the IP address, and is performed by IP gateways. After the network is configured correctly, the z/OS host communicates directly with the TCP/IP-attached printer.

Define the Communications Control Unit to z/OS

If you have not already done so, use a hardware configuration definition (HCD) to define the communications control unit for the z/OS host, such as the 3172 or the 3745 control unit, to z/OS.

Modify the TCP/IP Profile in z/OS

The TCP/IP profile contains system configuration statements used to initialize the TCP/IP address space. The following statements in the TCP/IP profile; however, this example is not a complete profile.

Note

- ❑ If you change any of the values in the TCP/IP profile, restart TCP/IP to pick up the changes.

Sample Parameters in the TCP/IP Profile.

```
TCPIPCONFIG INTERVAL 10 SENDGARBAGE FALSE GATEWAY
; * Network First hop Linkname Packet size Subnet mask Subnet value
9 * * BPCLAN 4096 0.255.255.0 0.99.12.0
DEFAULTNET 9.99.12.254 BPCLAN 4096 0.255.255.0 0
```

4

This example is not a complete TCP/IP profile.

The statements require special considerations when you are printing from PSF on TCP/IP-attached printers:

- **TCPIPCONFIG**

The TCPIPCONFIG statement defines the interval between keep-alive transmissions. PSF relies on TCP to detect when a connection with a TCP/IP-attached printer or an i-data 7913 IPDS™ Printer LAN Attachment is no longer usable. When no data has been exchanged between PSF and its connection partner, TCP sends keep-alive probes to the connection partner periodically. These periodic probes, called keep-alive transmissions, enable TCP to discover when a connection is no longer usable even if the connection partner is abruptly powered off or is no longer accessible through the network.

The frequency of keep-alive transmissions is controlled by the INTERVAL parameter on the TCPIPCONFIG statement. The frequency applies to all TCP applications that direct TCP to send keep-alive transmissions. The default frequency is after about two hours of inactivity.

For printing on TCP/IP-attached printers, we recommend that you specify a shorter interval than the default, such as 1 minute, for the interval between keep-alive transmissions.

Also, if any target host requires that the keep-alive packet contain data, specify SENDGARBAGE TRUE. For example:

```
TCPIPCONFIG INTERVAL 1 SENDGARBAGE FALSE GATEWAY
```

- **GATEWAY**

The GATEWAY statement defines a static route to the printer.

Verify the Printer Connection

To verify that z/OS can establish a connection with the TCP/IP-attached printer, ping the printer from the z/OS system.

From a TSO session, enter the following command:

```
TSO PING ip_address
```

In a TSO session, enter the following command from the Interactive System Productivity Facility (ISPF) command menu.

```
ping ip_address
```

- `ip_address`
Specifies the IP address or host name of the printer.
Here are examples of a successful ping and an unsuccessful ping.
Successful ping:

```
EZA0458I Ping V3R1: Pinging host 9.99.12.33 (Use ATTN to interrupt.)
```

```
EZA0463I PING: Ping #1 response took 0.084 seconds.  
Successes so far = 1.
```

Unsuccessful ping:

```
EZA0458I Ping V3R1: Pinging host 9.99.12.33 (Use ATTN to interrupt.) EZA0464I PING: Ping #1 timed out
```

Note

- ❑ If you have problems pinging a printer, see p.40 “Handling z/OS Connectivity Problems”.

Define the Printer to JES

When a TCP/IP-attached printer is to be used with JES, it must be defined for spool printing mode with JES2 parameter.

- JES2 Printer Definitions:
The following example shows the JES2 printer definition initialization member, located in the system PARMLIB.

```
FSS(FSS1),PROC=PSFPROC,HASPFSSM=HASPFSSM  
PRT1 FSS=FSS1,MODE=FSS,PRMODE=(LINE,PAGE,SOSI1),  
CLASS=C,UCS=0,SEP=YES,SEPDS=NO,CKPTPAGE=100,  
START=NO,MARK=YES,TRKCELL=YES
```

- JES3 Printer Definitions:
The following shows an example of a JES3 printer definition. This example is not executable, but it is intended to help the JES3 systems programmer define the printer to the OS/390 host.

```
FSSDEF,TYPE=WTR,FSSNAME=FSS1,PNAME=PSFPROC,  
SYSTEM=SYS1,TERM=NO DEVICE,JNAME=PRT1,  
JUNIT=(,SYS1,,OFF),FSSNAME=FSS1,  
MODE=FSS,PM=(LINE,PAGE,SOSI1),CHARS=(YES,GT12),DTYPE=PRT  
AFP1 CARRIAGE=(YES,A868),CKPNTPG=100,HEADER=YES,WC=(C)
```

Define the Printer to PSF

Each TCP/IP-attached printer must be defined to PSF with a PRINTDEV statement in the PSF startup procedure.

The following proc shows a sample procedure, PSFPROC that you can modify to suit your installation. The PRINTDEV statement shows the required IPADDR keyword.

No network printer-specific writer procedure is currently supplied. You can, however, copy the APSWPROT sample from the APAR medium and modify it for the network printers.

```
//PSFPROC PROC
//***** IBM NETWORK PRINTERS WRITER PROCEDURE *****
//
//+01+ MODULE-NAME = PSFPROC
//+
//+01+ DESCRIPTIVE-NAME = START PROCEDURE FOR PSF:
//+   TCP/IP ATTACHED IBM NETWORK PRINTERS
//+
//+01+ NOTES = THE FULL NAME OF THE DEFAULT PAGEDF IS
//+   P1A06462.
//+   THE FULL NAME OF THE DEFAULT FORMDEF IS
//+   F1A10110.
//+   THE FULL NAMES OF THE DEFAULT FONTS ARE
//+   X06F10, X06S10, X0T10, AND X0G10.
//+   THE FULL NAME OF THE SEPARATOR PAGE PAGEDF IS
//+   P1V06483.
//+   THE FULL NAME OF THE SEPARATOR PAGE FONT IS
//+   X0GT15.
//+
//+
//+01+ CHANGE-ACTIVITY :
//+
//+**** END OF SPECIFICATIONS ****
//STEP1 EXEC PGM=APSPPIEP,REGION=4096K,TIME=1440,PARM=(...,TCP/IP) *P
//JOBHDR OUTPUT PAGEDF=Y06483, /* JOB SEPARATOR PAGEDF *P
//   FORMDEF=A10110,CHARS=GT15 /* JOB SEPARATOR FORMDEF *P
//JOBTLR OUTPUT PAGEDF=Y06483, /* JOB SEPARATOR PAGEDF *P
//   FORMDEF=A10110,CHARS=GT15 /* JOB SEPARATOR FORMDEF *P
//DSHDR OUTPUT PAGEDF=Y06483, /* DS SEPARATOR PAGEDF *P
//   FORMDEF=A10110,CHARS=GT15 /* DS SEPARATOR FORMDEF *P
//MSGDS OUTPUT PAGEDF=A06462, /* MESSAGE DATASET PAGEDF *P
//   FORMDEF=A10110 /* MESSAGE DATASET FORMDEF *P
//PSEG01 DD DSN=SYS1.PSEGLIB, /* SYSTEM PAGE SEGMENTS *P
//   DISP=SHR
//OLAY01 DD DSN=SYS1.OVERLIB, /* SYSTEM MEDIUM OVERLAYS *P
//   DISP=SHR /* *P
//PDEF01 DD DSN=SYS1.PDEFLIB, /* SYSTEM PAGEDFS *P
//   DISP=SHR
//FDEF01 DD DSN=SYS1.FDEFLIB, /* SYSTEM FORMDEFS *P
//   DISP=SHR

//+ ***** PRINTDEV ***** *P
//+ ***** *P
//PRT1 CNTL *P
//PRT1 PRINTDEV FONTD=*,FONT300, /* 300 PEL FONT LIBRARY DD *P
//   OVLVDD=*,OLAY01, /* OVERLAY LIBRARY DD *P
//   PSEGDD=*,PSEG01, /* SEGMENT LIBRARY DD *P
//   PDEFDD=*,PDEF01, /* PAGEDF LIBRARY DD *P
//   FDEFDD=*,FDEF01, /* FORMDEF LIBRARY DD *P
//   JOBHDR=*,JOBHDR, /* JOB HEADER SEPARATOR *P
//+ /* *P
//   /* *P
//   JOBTLR=*,JOBTLR, /* JOB TRAILER SEPARATOR *P
//+ /* *P
//   /* *P
//   DSHDR=*,DSHDR, /* DATA SET HEADER *P
//+ /* *P
//   /* *P
//   MESSAGE=*,MSGDS, /* MESSAGE DATA SET OUTPUT *P
//   PAGEDF=A06462, /* DEVICE PAGEDF DEFAULT *P
//   FORMDEF=A10110, /* DEVICE FORMDEF DEFAULT *P
//   CHARS=(GF10, /* DEVICE *P
//   GS10,TU10,GU10), /* DEFAULT FONT SET *P
//+ /* *P
//   PIMSG=YES, /* ACCUMULATE DATA SET *P
//+ /* *P
//   /* *P
//   DATAK=BLOCK, /* REPORT ALL DATA-CHECK *P
//+ /* *P
//   /* *P
//   TRACE=YES, /* CREATE INTERNAL TRACE *P
//+ /* *P
//   FAILURE=*,MCONNECT, /* PSF ACTION ON PRINTER *P
//+ /* *P
//   /* *P
//   TIMEOUT=*,REDRIVE, /* PSF ACTION ON TIMEOUT *P
//+ /* *P
//   MGMTMODE=*,OUTAVAIL, /* PRINTER MANAGEMENT MODE *P
//+ /* *P
//   DISCONTV=*,IS, /* DISCONNECT INTERVAL IN *P
//+ /* *P
//   /* *P
//+ /* *P
//   IPADDR='xxx.xxx.xxx.xxx' /* IP ADDRESS FOR TCP/IP *P
//PRT1 ENDCNTL
```


 **Note**

- ❑ To specify a TCP/IP address space name other than the default, TCPIP, code the following exec statement in the writer procedure:

```
//STEP01 EXEC PGM=APSPPIEP,  
REGION=4096K,PARM(,,,,tcpip_name)
```

- ❑ where tcpip_name is the name of the TCP/IP address space. If this parameter is not coded, PSF uses the default name, "TCPIP".
- ❑ The IP address is the only required parameter. Other parameters may be set to facilitate printer sharing as described in p.38 "Sharing the Network Printers on z/OS".
 - IPADDR
Specifies the IP address for the printer NIC, in dotted-decimal notation. The hostname can be specified in place of the dotted-decimal address.

Verifying a TCP/IP-Attached Printer on z/OS

To operate a TCP/IP-attached printer, you use JES operator commands.

Starting a TCP/IP-attached Printer

To start a TCP/IP-attached printer, do the following:

1 Start TCP/IP.

2 Power on the printer.

3 Start the printer FSA.

- On JES2, the command is:
`$Sprinter-name`
- On JES3, the command is:
`*CALL WTR,OUT=printer-name`

Stopping a TCP/IP-attached Printer

You can stop a TCP/IP-attached printer in several ways:

1 The preferred method is to first stop the PSF FSA for the printer by entering the following command from the z/OS operator panel:

JES2:

`$Pprinter-name`

JES3:

`*VARY,printer-name,OFF`

`*CANCEL,printer-name`

where printer-name specifies the name of the printer FSA.

2 Then you can turn off power to the printer.

- To end the PSF FSA for the printer, use the JES commands. If you are unable to purge or cancel the printer by use of the JES commands, enter the following command:

`MODIFY FSSname,FORCE,printer-name`

Resolving IPDS Printing Problems

If you have problems printing, do the following:

- Print a network configuration page, see the manual explaining the network functions provided by the supplier.
- Verify that the port number specified for the IPDS port matches either the port number specified in the Port number parameter in the printer inventory, or the port number specified in the PORT parameter in the PRINTDEV statement under the PSF start procedure. You can use Web Image Monitor to view or change the IPDS port number.

Sharing the Network Printers on z/OS

See p.51 “Sharing the Printer with IPDS host systems (PSF/400 or z/OS)” for a description of concepts associated with sharing an IPDS printer between multiple host systems.

The printer may be shared with PSF in one of two ways:

- Sharing the printer with other non-IPDS host systems using MID and the JES Spool.
- Sharing the printer with other IPDS host systems, without MID. This method also shares the printer with non-IPDS host systems.

4

Sharing the printer with other IPDS host systems, without MID JES Spool Printer Sharing

JES spool printer sharing is valid for TCP/IP attached network printers. A session with the printer is maintained while there is output on the JES spool and the printer is available. When there is no more output on the spool and the disconnect interval expires, PSF ends the session with the printer. This allows any other IPDS host, such as System i to share this printer. PSF attempts to restart the session when there is more work on the spool for the printer. After the session is restarted, PSF must reload the resources required for the print jobs. When using this method of network printer sharing, PSF cannot determine if another printer driver is active.

You can request this method of network printer sharing by specifying the following parameters in the PSF Startup Proc.

MGMTMODE=OUTAVAIL

FAILURE=WCONNECT

TIMEOUT=REDRIVE

DISCINTV=nn

- **MGMTMODE**
Set this parameter to “OUTAVAIL”. “OUTAVAIL” requests that PSF start a communications session with the printer only when output is available on the JES spool.
- **FAILURE**
Specifies the action PSF is to take after a printer failure or a TCP/IP network failure. If FAILURE=WCONNECT and the printer is connected to another host when PSF attempts to establish a connection on TCP/IP, PSF continuously retries (up to the limit specified by CONNINTV) until the printer becomes available. If FAILURE=STOP, PSF must be restarted by an operator command.

- **TIMEOUT**
Specifies the action that PSF is to take after a timeout when no output is available on JES. The DISCINTV parameter specifies the timeout interval. TIMEOUT=REDRIVE requests that PSF redrive the printer FSA using the value of the MGMTMODE parameter. TIMEOUT=STOP requests that PSF stop the printer FSA, which can then be restarted only by an operator command.
- **DISCINTV**
Specifies the disconnect interval in seconds. The value can range from zero to 86400. We suggest you set the value to "15". When no output is available from JES for this time period, PSF ends the session with the network printer. If the value is set to zero, PSF does not end the session because of lack of output, and other IPDS hosts will not be able to share the printer.

Handling z/OS Connectivity Problems

If you encounter problems when pinging a network printer from z/OS, here is how to resolve them.

Ping is Not Successful

If the ping is not successful, verify the following:

- The printer is powered on.
- The IP address is unique in the TCP/IP network.

If the IP address of the printer is not unique, see your network administrator to resolve the IP address problem.

If problems remain, consult your TCP/IP network administrator about a possible network problem.

Ping is Successful

A successful ping usually indicates that the z/OS system can communicate with the printer; however, you might receive a successful ping even though the IP address of the TCP/IP-attached printer is a duplicate of another IP address.

If PSF is unable to establish a network connection with the TCP/IP-attached printer or if PSF output for this printer prints elsewhere, follow these steps to determine whether the IP address of the printer is unique:

- 1** Turn the printer off.
- 2** Wait at least 5 minutes for TCP/IP to clear the Address Resolution Protocol (ARP) tables. (If your installation specified a longer interval on the ARP-AGE configuration statement in the TCP/IP profile, you may need to wait longer.)
- 3** Enter the ping command again from the z/OS system.

 **Note**

- If you receive a successful response to the ping command, there is a duplicate IP address. Consult your TCP/IP network administrator.

5. InfoPrint Manager for AIX

Requirements - InfoPrint Manager for AIX

This machine supports the following version of InfoPrint Manager for AIX.

- InfoPrint Manager for AIX V4.2 or later.

Configuration Checklist - InfoPrint Manager for AIX

- 1** Set TCP/IP addresses for the printer, such as an IP address, gateway address, or subnet mask. See the manual explaining the network functions provided by the supplier.
- 2** Define the printer to InfoPrint Manager as described in the next section, p.43 "Defining Printers to InfoPrint Manager".

Defining Printers to InfoPrint Manager





The configuration procedure to use depends on what data stream you want to send:

- To send IPDS to the printer, configure InfoPrint Manager for a PSF TCP/IP-attached printer. See p.43 “Configuring Network Printers as PSF TCP/IP-Attached Printer”.

Configuring Network Printers as PSF TCP/IP-Attached Printer

Create a PSF TCP/IP destination to define a printer that receives IPDS jobs using the TCP/IP protocol.



1 Complete the following work sheet:




Wizard Prompt	Description	Value
Name	The name for the actual destination object (8 character limit).  Note <input type="checkbox"/> This name is case-sensitive.	
Server	The InfoPrint Manager server that controls this actual destination.	
Model	The printer model, for example InfoPrint2090.	
TCP/IP address	The dotted-decimal IP address used to access this printer.	
TCP/IP port	The port used by the printer for communication. (Typically, port 5001 is used.)	
Logical destination	The logical destination that directs jobs to this actual destination.  Note <input type="checkbox"/> This name is case-sensitive.	__ Default __ Other:
Logical destination's server	The server that contains the logical destination.  Note <input type="checkbox"/> This name is case-sensitive.	
Queue	The queue for the target printer (actual destination).  Note <input type="checkbox"/> This name is case-sensitive.	__ Default __ Other:

- 2** On the menu bar, select [Printer] -> [Create] -> [PSF] -> [TCP/IP] to start the Create Printer Wizard.
- 3** Provide the worksheet information to the wizard. For assistance, refer to the InfoPrint Manager Administration GUI online help.
- 4** If you did not enable the printer with the Create Printer Wizard, use the InfoPrint Manager Administration GUI to enable it.

Adding an AIX Printer

Create an AIX printer to represent a printer that will accept the data stream that comes out of the printer driver without transforming it. For example, to send the output of a PostScript driver to a PostScript printer.

Wizard Prompt	Description	Value
Name	The name for the actual destination object (8 character limit).  Note <input type="checkbox"/> This name is case-sensitive.	
Server	The server that controls this actual destination. The server name is the same as the name of the host system where the server is installed.  Note <input type="checkbox"/> This name is case-sensitive.	
Model	Select the printer model from the pull-down list in the InfoPrint Manager Administration GUI. If the printer you are working with is not in the pull-down list, enter the name as it appears on the printer.	
SNMP TCP/IP address	The dotted-decimal IP address used to access this printer. This value is used only for SNMP printers.	
Device	The name of the printer	Specify the printer queue name that was created beforehand with AIX.
Printer Command	The command that InfoPrint Manager issues to send a job to this printer.	uusr/lib/lpd/pio/etc/pioib-mnmpm <the value you listed for server above> or SNMPTC/IP address

Wizard Prompt	Description	Value
Data stream	The data stream expected by the printer (for example, PCL5 or PPDS).	
Logical destination	The logical destination that directs jobs to this actual destination.  Note <input type="checkbox"/> The name is case-sensitive.	__ Default __ Other:
Logical destination's server	The server that contains the logical destination.  Note <input type="checkbox"/> The name is case-sensitive.	
Queue	The queue for the target printer (actual destination).  Note <input type="checkbox"/> The name is case-sensitive.	__ Default __ Other:

To create this type of printer, use the Create Printer Wizard in the InfoPrint Administration GUI. On the menu bar, click **[Printers]-> [Create]-> [AIX]**. Referring to the work sheet above, provide the information as prompted by the wizard. For assistance, refer to the online help.

If you did not enable the printer with the Create Printer Wizard, use the InfoPrint Manager Administration GUI to enable it.

6. Handling Network Problems

Introduction

Use this chapter as a guide for finding and resolving printer and NIC printing problems on TCP/IP networks.

The following types of problems are described here:

- Hardware
- Connectivity
- Formatting
- Printing

Network Setup

Before doing anything else to try to resolve problems, you should verify that you have entered the correct configuration data.

Reference

For details about network configuration, see the manual explaining the network functions provided by the supplier.

Hardware Problems

When printing problems occur, the first task is to check the physical condition of the printer and related hardware.

Hardware Problems Introduction

The hardware is where diagnosis of printer problems begins. The hardware includes the following elements:

- The printer itself
- The physical connection of the hardware to the network
- The cabling system
- The network interface

Resolving Hardware Problems

To determine whether a problem is a hardware problem or not, check the following:

- Verify that power is going to the printer by checking the printer's control panel.
- Verify that the printer is connected to the network.
- Verify that the printer is Ready.

Connectivity Problems

The network/transport level of a network provides the capability of routing packets from one device to another device on the network or to a different network on an internetwork system.

If you have trouble connecting with the network, refer to the following:

- Verify that there is no duplicate IP address on the network by:
 - Disconnecting the printer from the network.
 - Using the Ping command to try to communicate with the IP address of the printer.
- Connect the printer to the network and ping the printer to verify that there is a connection to the network.
- Printing problems may occur if the subnet mask has not been set correctly. Verify that the subnet mask is correct either by printing a network configuration page or checking with the network administrator.
- A related problem is that the gateway address may be incorrect. Verify the gateway address from the network configuration page.
- Verify that the printer is configured to accept print jobs from your client system by checking the "Accept IP Jobs From" heading in the IP section on the network configuration page. The IP addresses from which jobs are accepted can be set on **[Access Control]** in Web Image Monitor.

Ethernet Connectivity Problems

The Ethernet adapter supports Auto-negotiation and fixed settings for speed and duplex. The IEEE standard does not provide the ability to auto-detect the speed or duplex settings of the connected partner (a hub or switch) in a number of configurations. In these cases, the following conditions may occur:

- The Link light falsely appears on the printer adapter. No communication is established.
- The Link light appears and communication is established, but communication may be very slow due to collisions or lost packets.

The table below identifies various printer and switch or hub configuration settings. OK indicates that a good Link is established and normal communications should occur. These are the only supported configurations. NG indicates that a Link is established, but a speed or duplex mismatch occurs. The mismatched configuration cannot be detected by the printer. Communications may or may not work. If communications appear to work, data transfers may be slow due to collisions and lost packets. These configurations are particularly bad because they cannot be detected by either partner. Administrators must be aware of these situations and avoid these configurations. The cells marked as “No Connection” are detectable invalid configurations and no link is established.

Printer Setting	Ethernet Switch or Hub Setting				
	Auto	10 HD	10 FD	100 HD	100 FD
Auto Select	OK (100 Full) (1000 Full)	OK (10 Half)	NG (10 Half / Full) duplex mismatch	OK (100 Half)	NG (100 Half / Full) duplex mismatch
10Mbps Half Duplex	OK (10 Half)	OK (10 Half)	NG (10 Half / Full) duplex mismatch	NG, Link light is false. Speed mismatch, no communication	NG, Link light is false. Speed mismatch, no communication
10Mbps Full Duplex	OK (10 Full)	NG (10 Full / Half) duplex mismatch	OK (10 Full)	NG, Link light is false. Speed mismatch, no communication	NG, Link light is false. Speed mismatch, no communication
100Mbps Half Duplex	OK (100 Half)	No connection	No connection	OK (100 Half)	NG (100 Half / Full) duplex mismatch

Printer Setting	Ethernet Switch or Hub Setting				
	Auto	10 HD	10 FD	100 HD	100 FD
100Mbps Full Duplex	OK (100 Full)	No connection	No connection	NG (100 Full / Half) duplex mismatch	OK (100 Full)

 **Note**

- To run the 10/100/1000 Ethernet Adapter at 1000 MB/sec, you must select the Auto/Auto setting.

Formatting Problems

One possible problem is the value of the Personality item for the TCP/IP port. The Personality value is set for each TCP/IP port using the Data stream item on Web Image Monitor. The possible values are **[Auto]** (default value), **[PCL]**, and **[PS]**. If the Personality value is set to **[PCL]** or **[PS]**, all data coming in through this port will be interpreted as that data stream (for example, PostScript data received when the Personality value is set to **[PCL]** will not print correctly). Ensure that the Personality value is set to **[Auto]** if more than one data stream will be received through this port.

Sharing the Printer with IPDS host systems (PSF/400 or z/OS)

- The printer accepts jobs from multiple logical ports (such as TCP/IP LPR, Port 2501, or IPDS). The printer automatically chooses the next job to print from the highest priority port that has a job ready to print. The printer chooses the next job when the client closes the port that was used for the previous job. If the client does not close the port, the printer automatically closes it after a period of time called the timeout interval. For details, see the Web Image Monitor Help.
- Unlike PostScript and PCL, the IPDS data stream is tightly controlled by the host system. For proper operation when printing IPDS, the host system must terminate the TCP/IP connection. Host system output writers post an error if the printer closes the port. Therefore, for printing IPDS, the printer must be configured for an infinite timeout, and the host system is configured to close the connection after the output queue is empty for some period of time.
- The drawback of this method is that the IPDS host system must retransmit downloaded PSF resources each time a new connection with the printer is established. This issue can be corrected by using a feature called MID (Managed IPDS Dialog). MID allows the TCP/IP connection to remain active and it allows the printer to retain the IPDS resources while freeing the printer to process PostScript and PCL jobs from other ports. Only z/OS and the System i host systems support MID. (It is not supported by AIX or InfoPrint Manager).
- For more information, see p.23 “Sharing the printer with other non-IPDS host systems using MID” for z/OS.
- MID is a negotiated sequence between the printer and the host system. The printer requests the suspension of IPDS activity. At an appropriate time the host system grants the request. When suspended, the IPDS TCP/IP connection between the host and the printer remains open, and the downloaded IPDS resources are retained by the printer. When the printer receives the grant it is free to process PostScript and PCL jobs from other ports. IPDS activity resumes when the host system has another IPDS job to print.
- The MID feature should not be used if multiple IPDS host systems send jobs to the same printer because the first IPDS host system that gains access to the printer will block the other IPDS host systems from obtaining an IPDS TCP/IP connection to the printer.

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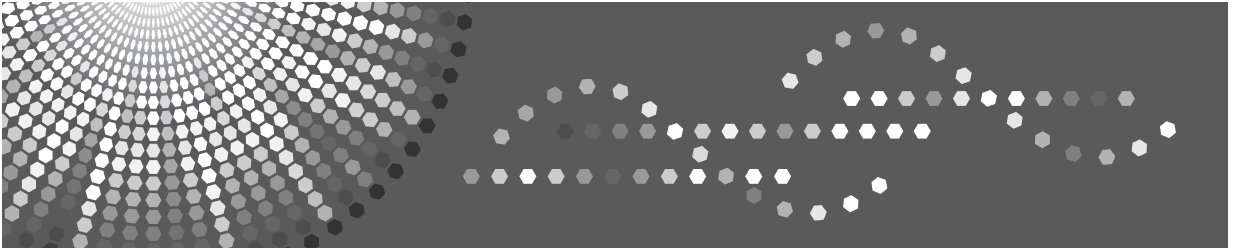
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Read this manual carefully before you use this product and keep it handy for future reference.

Introduction

This manual contains detailed instructions and notes on the operation and use of this machine. For your safety and benefit, read this manual carefully before using the machine. Keep this manual in a handy place for quick reference.

Important

Contents of this manual are subject to change without prior notice. In no event will the company be liable for direct, indirect, special, incidental, or consequential damages as a result of handling or operating the machine.

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Manuals for the IPDS card

Refer to the manuals that are relevant to what you want to do with the IPDS card.

Important

Adobe® Acrobat® Reader® / Adobe Reader must be installed in order to view the manuals as PDF files.

❖ IPDS Supplement (IPDS.pdf)

Explains about how to configure the IPDS card for the machine, and about items selectable from the Web browser.

❖ IPDS Printing Configuration Guide (IPDS_CONF.pdf) *English Only

Explains about environment necessary for connecting the mainframe to the machine, and performing IPDS printing.

❖ IPDS Technical Reference (IPDS_TEC.pdf) *English Only

Explains about commands necessary for IPDS printing.

Note

For details about the necessary environment, and installation of the IPDS card and machine, consult your sales or service representative. For details about necessary environment and operation of the mainframe, consult IBM.

How to Read This Manual

Symbols

This manual uses the following symbols:

Important

Indicates points to pay attention to when using the machine, and explanations of likely causes of paper misfeeds, damage to originals, or loss of data. Be sure to read these explanations.

Note

Indicates supplementary explanations of the machine's functions, and instructions on resolving user errors.

Reference

This symbol is located at the end of sections. It indicates where you can find further relevant information.

[]

Indicates the names of keys that appear on the machine's display panel.

Machine Types

This machine comes in three models that have different options.

When describing instructions that are model-specific, this manual refers to the different machine models as Type 1, Type 2, or Type 3.

The following table describes the model types.

❖ Model Types

Model Type	Model Name
Type 1	Aficio SP 4310N, SP 4310N
Type 2	Aficio SP 5200DN, SP 5200DN
Type 3	Aficio SP 5210DN, SP 5210DN

About This Book

This book provides technical reference information about how printers support the IPDS data stream.

Audience

This publication is intended for the system programmers, application programmers, and systems engineers who are familiar with data streams and are writing or modifying programs to operate your printer with the IPDS data stream.

Terminology

Paper Input and Output Receptacles

Input receptacles are called trays. Output receptacles are called stackers or bins.

Related Publications

This book refers to the following:

- PostScript Language Reference Manual, second edition, by Adobe Systems, Inc.
- PCL 5 Printer Language Technical Reference Manual by Hewlett-Packard Company
- PCL 5 Comparison Guide by Hewlett-Packard Company
- Printer Job Language Technical Reference Manual by Hewlett-Packard Company

Note

- For details on the IPDS Architecture, see the Intelligent Printer Data Stream Reference, S544-3417.

About IPDS

This chapter introduces the Intelligent Printer Data Stream (IPDS) and describes some of the capabilities of IPDS.

IPDS lets you print pages containing an unlimited mix of different types of data: high-quality text, images, vector graphics, and bar codes.

You can send IPDS data to printers attached to the IBM Application System/400 (AS/400) intelligent work stations, local area networks, IBM 3270-family controllers, Ethernet, and spooled systems. In some of these environments, you can create applications to directly control IPDS printers such as this printer. For more information about IPDS as a component of printing subsystems, refer to *Intelligent Printer Data Stream Reference*.

IBM provides a variety of host software products with components that generate IPDS commands for this printer or other IPDS printers. These software products vary in their use of IPDS functions. Some of the software products available are:

- OS/400 Version 5.4 or later
- Graphical Data Display Manager (GDDM) Version 2.3 or later
- Print Service Facility (PSF for z/OS) Version 4.1.0 or later
- Print Service Facility (PSF for i5/OS and OS/400) Version 5.4 or later
- InfoPrint Manager for AIX Version 4.2 or later
- InfoPrint Manager for Windows Version 2.2 or later
- InfoPrint Process Director for Linux Version 1.3.1 or later
- InfoPrint Process Director for AIX Version 1.3.1 or later

 **Note**

- The capabilities of the printer depend on the host software and the IPDS functions that the software enables.

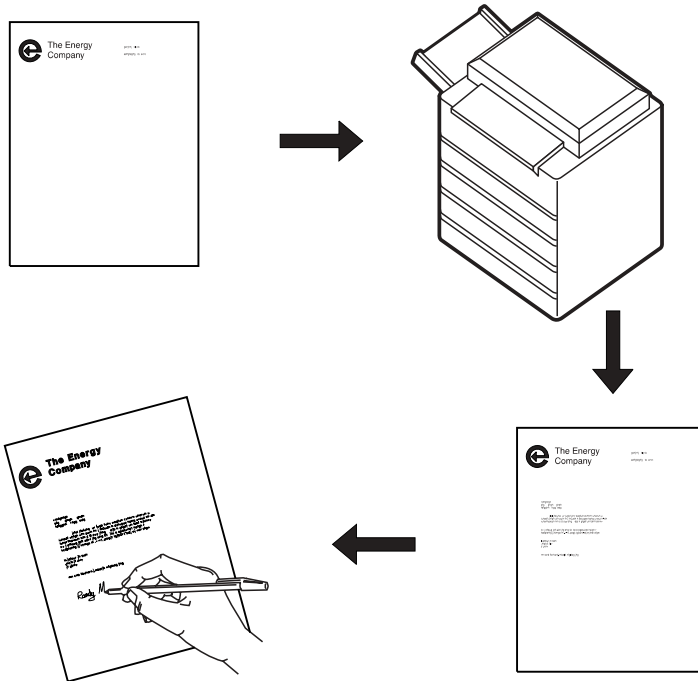
Capabilities of IPDS

A printer controlled by IPDS has a number of advantages over conventional printers. With IPDS you can:

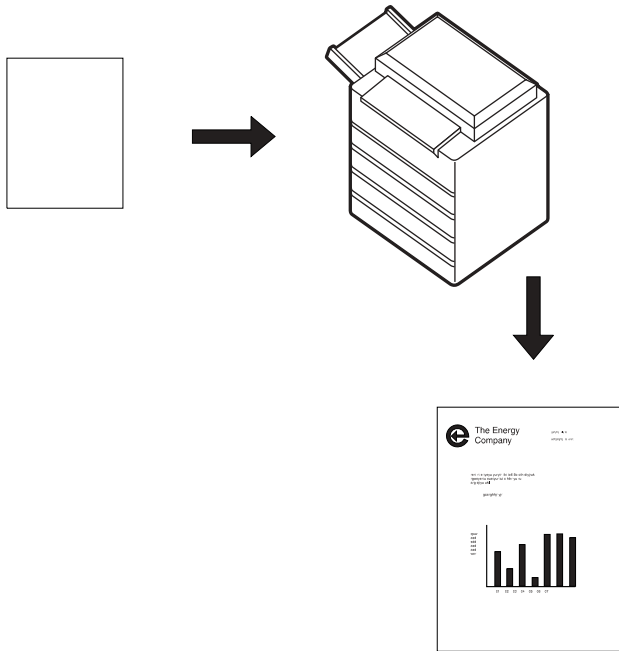
- Use the printer's all-points-addressable printing to print text, graphics, images, or bar codes at any point on a page or that is within the printer's printable area.
- Print text in a variety of type styles and switch fonts within a printed page.
- Use both images and vector graphics (explained later in this chapter) to print line drawings, pie charts, bar charts, graphics, logos, tables, and signatures.
- Combine text with images and graphics on the same page (creating what is known as a composite document).
- Electronically store and later print forms and letterheads that are always printed in the same predetermined type style.
- Electronically store and later print text where the type style printed is the same as that used in the rest of the text.
- Print any of 16 different kinds of bar codes in many sizes and with a number of variations.
- Print either portrait (upright, letter orientation) or landscape (printing "on the side", with the page wider than it is tall).
- Print on either one side or both sides of the paper (with duplex option).

Printing a Letter

IPDS lets you print a letter in just one step. In conventional printing, you must load letterhead paper into your printer, print the text of your letter, and then manually sign the letter.



Using IPDS, you can temporarily store your letterhead and signature in the printer's memory and then merge the letterhead, text, and signature with additional data to form a complete letter. You can also include graphics, such as a line chart or bar chart, in your letter, creating a composite document.



An IPDS-driven printer offers flexibility. For example, you can highlight a list of items by printing the list in a different type style from the rest of the text; or you can print your letterhead in one font and your text in another font.

You can electronically store your letterhead so it is always printed in the same type style. This printing concept is discussed in p.9 "Using Overlays".

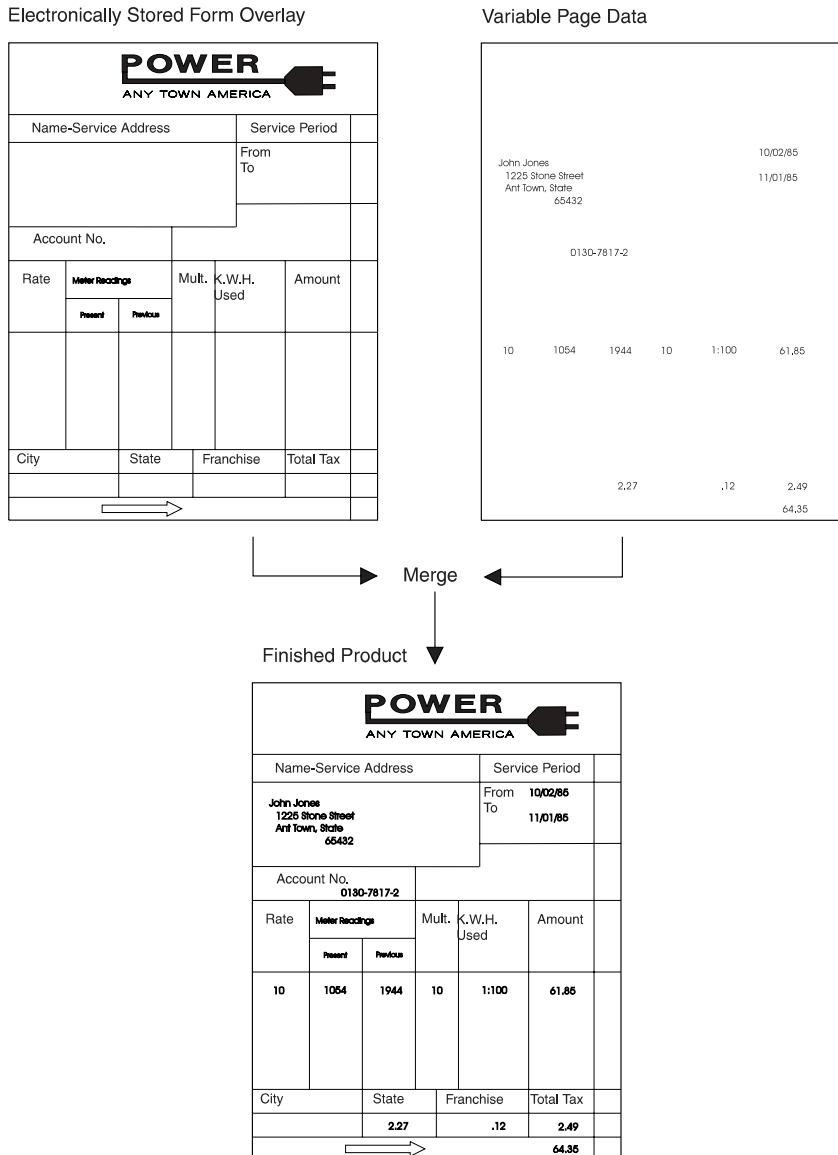
You can store your printed signature block so it is printed in the type style used in the rest of the letter or memo. That way the signature block's type style matches the letter in which it appears, no matter how many different fonts you use for different kinds of letters. This printing concept is discussed in p.10 "Using Page Segments".

You can include bar charts or line graphs in your letter. Such graphic material can be generated through either the Image function or the Graphics function. See p.11 "Using Images and Graphics".

Using Overlays

Overlays are stored constructs (text, graphics, images, and bar codes), often in complex configurations, with all the instructions needed to print. An overlay always prints in the type style used when it was stored and can be positioned anywhere on the page.

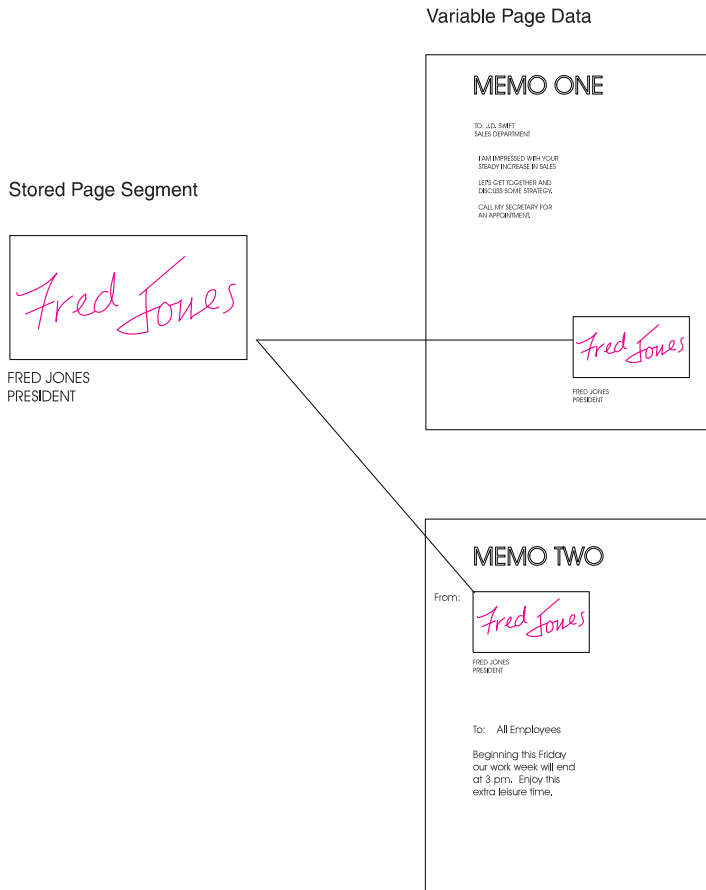
Overlays are useful for letterheads and for forms, as shown below.



Using Page Segments

Page segments are similar to overlays, except that the construct is stored without specific instructions for type styles and position on the page. Page segments are printed in the type style in use at print time. You can place a page segment anywhere on the page.

One way to use a page segment is as text under a signature, as shown below.



Using Images and Graphics

Graphic material - charts, engineering drawings, and line drawings - can be sent to the printer as IM Images, IO Images, or Graphics. In all-points-addressable printing by the printer, a page can consist of 300 points per inch, 7.8 million printable points, each one of which is individually addressable. These addressable points are called picture elements or pixels.

IM and IO Images

Images are figures on the page created by explicitly specifying each pixel in the figure. There is one bit of image data per pixel, so a large quantity of data is needed to create an image.

IM images are uncompressed raster data images. A raster pattern is composed of a series of pixels arranged in scan lines.

IO images are compressed or uncompressed raster data images. Compression generally reduces the amount of data sent to the printer and should significantly save transmission time. IO images may be arbitrarily scaled and corrected for resolution differences between the scanner and the printer.

Graphics

Graphics are line drawings created from separate lines, arcs, and markers. With vector graphics, only control information such as the end points of a line are sent to the printer. This process lets you create complex figures with a minimum of data.

For details on graphics commands, see IBM Data Stream and Object Architectures Graphics Object Content Architecture (GOCA) Reference, SC31-6804. For details on IO image commands, see IBM Data Stream and Object Architectures Image Object Content Architecture (IOCA) Reference, SC31-6805.

Using Bar Codes

Bar code data is encoded information that is recognized by optical scanning devices. The printer can print the bar code types as shown below in many sizes and variations, such as with or without the human-readable characters.

 <p>1 2 3 4 5 6</p> <p>3 of 9 Alphanumeric</p>	 <p>A - 0 0 - 2 9 - D</p> <p>USS Codabar</p>	 <p>1 2 3 4 5 6 7</p> <p>EAN-8</p>
 <p>1 2 3 4 5 6 7 8 9 0 1 2</p> <p>EAN-13</p>	 <p>1 2 3 4 5 6 7 8 9</p> <p>Interleaved 2 of 5</p>	 <p>1 2 3 4 5</p> <p>Industrial 2 of 5</p>
 <p>1 2 3 4 5 6 7 8 9 0</p> <p>Matrix 2 of 5</p>		 <p>1 2 3 4 5 6 7 8 9 0</p> <p>MSI</p>
 <p>1 1 2 3 4 5 6 7 8 9 0 1 2</p> <p>UPC Version A See Note.</p>	 <p>0 2 3 4 5 6 0 0 0 0 5</p> <p>UPC Version E See Note.</p>	
 <p>1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7</p> <p>EAN-13 with 5-Digit Supplemental</p>		 <p>1 2 3 4 5 6 7 8 9 0 1 2 3 4</p> <p>EAN-13 with 2-Digit Supplemental</p>
 <p>POSTNET</p>		 <p>012</p> <p>CODE 128</p>

Note: Also can have 2-digit and 5-digit supplemental the same as EAN 13 below.

Printing in Duplex Mode

The printer can print on one or both sides of the paper. All of the printer's IPDS capabilities are provided in either mode.

Duplex printing is controlled through the IPDS Load Copy Control (LCC) command.

1. IPDS Overview

About the IPDS Feature

The Intelligent Printer Data Stream (IPDS) is a structured field data stream designed to manage and control All Points Addressable (APA) printers. APA is a printing concept that allows users to position text, images, graphics, and overlays at any defined point on a printed page.

IPDS allows both data and commands to be streamed to the printer via channels, controllers or any type of networking link which supports the transparent transmission of data to print processes that are resident in the device.

Commands within the data stream also allow the “Host” process to control the media handling capabilities of the device, select source drawers, jog output and other operations dealing with paper. In addition, the commands provide the means for managing the down-loading of fonts and other stored resources such as overlays and page segments that are required at presentation time to construct the printed page. Finally, the commands provide the means for returning error information and performing recovery actions. The source IPDS architecture document is the Intelligent Printer Data Stream Reference.

The machine supports the following IPDS Architecture command sets.

- Device Control (DC1)
- Text (TX1 with PTOCA PT1, PT2 and PT3)
- IM Image (IM1 with IMD1)
- IO Image (IO1 with IOCA FS10 + 8-bit Grayscale via halftoning), FS11, FS40, FS42 and FS45)
- Graphics (GR1 with GOCA DR/2V0)
- Page Segments (PS1)
- Object Container (OC1)
- Overlay (OL1)
- Loaded Font (LF1 and LF3)
- Bar Code (BC1 with BCD1)

IPDS Operating States

1

If the host sends a command inappropriate for the printer state, the printer returns an error code identifying the error and follows Exception Handling Control processing.

Home State

The following actions can force the printer to home state, regardless of the current state of the printer:

- ① The Set Home State (SHS) command
- ② The Execute Order Anystate--Discard Buffered Data (XOA/DBD) command
- ③ The printer's transmission of a NACK to the host
- ④ The Arctic link-level Clear command
- ⑤ Any non-IPDS print order in NDS (New Display System)
- ⑥ An NDS Reset order
- ⑦ An NDS System Status Available No Mode order

All these actions will also force the printer to an IPDS command boundary if it is not already on one. To interpret SHS or XOA/DBD, the printer and the host must already be in agreement as to where the IPDS command boundaries are.

Deactivation of fonts with the DF command occurs in Home State.

Overlay State

Overlays can be nested to a depth of 6 as indicated in the STM Overlay Command-Set Vector, see p.185 "Overlay Command Set".

Font State

An operating state for downloading single-byte Coded Font patterns, Font Character Sets, and Code Pages.

IPDS Command Format

All IPDS commands are encoded in the following patterns:

Data Area	Value	Description	Error Code
Bytes 0-1	X'0005' X'7FFF'	LENGTH	X'0202..02'
Bytes 2-3	X'D601' X'D603' X'D60F' X'D619' X'D61A' X'D61B' X'D61D' X'D61F' X'D62D' X'D62E' X'D62F' X'D633' X'D634' X'D63C' X'D63D' X'D63E' X'D63F' X'D64C' X'D64D' X'D64E' X'D64F' X'D65B' X'D65C' X'D65D' X'D65F' X'D66C' X'D66D' X'D66F' X'D67C'	COMMAND Manage IPDS Dialog No Operation Load Font Index Load Font Character Set Control Load Code Page Control Load Code Page Load Equivalence Load Font Control Write Text Activate Resource Load Font Execute Order Anystate Presentation Fidelity Control Write Object Container Control Write Image Control Write Image Control 2 Load Font Equivalence Write Object Container Write Image Write Image 2 Deactivate Font Deactivate Data-Object-Font Component Deactivate Data Object Resource End Begin Page Segment Data Object Resource Equivalence Logical Page Position Deactivate Page Segment Include Data Object	X'8001..00'

Data Area	Value	Description	Error Code
Bytes 2-3	X'D67D'	Include Overlay	
	X'D67F'	Include Page Segment	
	X'D680'	Write Bar Code Control	
	X'D681'	Write Bar Code	
	X'D684'	Write Graphics Control	
	X'D685'	Write Graphics	
	X'D68F'	Execute Order Homestate	
	X'D697'	Set Home State	
	X'D69F'	Load Copy Control	
	X'D6AF'	Begin Page	
	X'D6BF'	End Page	
	X'D6CF'	Logical Page Descriptor	
	X'D6DF'	Begin Overlay	
	X'D6E4'	Sense Type and Model	
X'D6EF'	Deactivate Overlay		
Byte 4	Bit 0 0/1	FLAGS (Active when Bit value = 1) Acknowledgement Required (ARQ)	X'0204..02'
	Bit 1 0/1	Correlation Number Present	
	Bit 2 0/1	Acknowledgement Continuation	
	Bit 3-6 000	Reserved	
	Bit 7 0/1	Persistent NACK (DSC non-SNA ONLY, otherwise Reserved)	
Bytes 5-6	X'0000'-X'FFFF'	CORRELATION ID	
Byte 7		DATA - The specific operands, parameters and/or data fields as appropriate for the given command.	

Reserved Bytes

Throughout the command descriptions in the following chapters, some data fields, bytes, and bits are specified as reserved.

When the description for a reserved field, byte, or bit specifies “should be zero,” the printer does not check the contents of the bytes or bits. The reserved data should be set to zero, because they could be defined in future changes to the printer. However, non zero values do not cause an error and are ignored by the printer.

When the description for a reserved field, byte, or bit specifies it “must be zero,” the printer checks the contents of the bytes or bits and will return error status to the host if the field contains a non zero value.

Flag Byte

Bit 7 is the Persistent NACK bit for 3270 Non-SNA DSC (Data Stream Compatibility) Mode NACKs. This bit has no meaning in other attachment environments. Valid values for the Acknowledge Reply Flag byte are described in the Intelligent Printer Data Stream Reference.

Correlation ID (CID)

The correlation ID (CID) is an identifier of a specific instance of an IPDS command. It is used to correlate errors with the command that generated them.

It is not possible to correlate all errors with particular IPDS commands. Mechanism errors (for example, out of paper position checks and unpopulated character positions in resident fonts) are never correlated.

Therefore, it is possible for some NACKs to be returned without correlation numbers even if all downstream commands had correlation numbers.

Error Processing

1

The machine supports Page Continuation Action error processing. See Intelligent Printer Data Stream Reference for details.

The printer stops if there is a probability that it is not parsing commands correctly. This means that, regardless of the setting of the Exception Handling Control (EHC) the printer will stop processing, send a NACK, and enter home state immediately if one of the following conditions occurs:

- ① The command length is less than 5 (No correlation number present).
- ② The command length is less than 7 (Correlation number present).
- ③ The command length is greater than 32767.
- ④ The command does not have X'D6' as the first byte of the command code.
- ⑤ The command does have X'D6' as the first byte but is otherwise unrecognized.
- ⑥ A resource download is interrupted, resulting in a purge of the partial resource object.

The maximum numbers of queued asynchronous and synchronous errors are as followed.

- One for ARCTIC and NDS DSC mode
- Seven for NDS LU1 mode
- Seven for TCP/IP mode

Intervention required and equipment check exception types will be reported for NDS and TCP/IP interface type.

Exception Highlight Support

If a position exception occurs and the “position-check highlight” flag (XOA-EHC byte 2, bit 6) is on (B'1'), or if a Page Continuation Action (PCA) is taken for a position check, the approximate location of each unique occurrence of the position check will be highlighted with a Print-Error-Marker (PEM). Other exceptions detected in page state, or a derivative of page state, or when printing a medium overlay, which have a PCA defined, are also indicated by a PEM when the PCA is taken.

A PEM is a distinguishing mark which is placed in close proximity to the area on the page where the exception has occurred.

- The PEM for Position Check processing is a solid rectangular mark, placed in close proximity to the area on the page where the exception occurred. For the exception detected, the associated code (08C100) will be located at the top of the logical page, starting in the left hand corner.
- The PEM for PCA processing is a hollow rectangular mark enclosing a +, placed in close proximity to the area on the page where the exception has occurred, if the location can be accurately specified. For the exception detected, the associated code (040B00) will be located at the top of the logical page, starting in the left hand corner.
- Multiple exception code highlighting is limited to only the codes that will fit across the top of the logical page (10).
- PEM Size: 600 Pixel (80 by 80)

If error exception handling is set to allow printing of an undefined character, the undefined character will appear as:

- A Space if it is unprintable.
- The Character itself if printable.

Page and Copy Counters

1

Page and Copy Counter information is reported using the 18-byte counter format described in Intelligent Printer Data Stream Reference, section “Acknowledge Reply”. The following counters are supported:

- Received Page
- Committed Page
- Committed Copy
- Operator Viewing Page
- Operator Viewing Copy
- Jam Recovery Page
- Jam Recovery Copy
- Stacked Page
- Stacked Copy

For Action Code 22, counters are adjusted as follows:

- Received Page - Actual Received Count
- Committed Page - Mapped to Stacked Page
- Committed Copy - Mapped to Stacked Copy
- Operator Viewing Page Counter - Mapped to Stacked Page Counter
- Operator Viewing Copy Counter - Mapped to Stacked Copy Counter
- Jam Recovery Page Counter - Mapped to Stacked Page Counter
- Jam Recovery Copy Counter - Mapped to Stacked Copy Counter
- Stacked Page Counter - Last value
- Stacked Copy Counter - Last Value

Data Types

The machine supports four different types of data that may be used to create an output page. These are: text, graphics, images, and bar codes. The printed page can include any combination of these data types.

Blocks of graphics, bar code or image data are presented as a single unit to the printer. The printer enters the appropriate “Block” State (graphics block, image block, bar code block) to create the entire data group for that block of data.

Page segments and Overlays are any combinations of text, graphics, bar codes and images. The printer can store these segments and overlays for later use as the page is created.

Text

Presentation Text is the data type used to present lines of character information on a logical page.

The information to be presented is represented as a string of graphic character IDs and X'2B' control sequences that are sent to the printer in the Write Text command (See p.120 “Write Text”). The initial conditions governing the presentation of the data are established via control parameters that are sent to the printer in the Logical Page Description command (See p.66 “Logical Page Descriptor”).

The source architecture document for Text is Presentation Text Object Content Architecture Reference.

Image

Image is the data type used to present rectangular arrays of raster data in an Image block area on a page.

This data may have been created originally by a scanning process or generated by a computer program. The machine supports the IM Image Function Set (See p.135 “IM Image Command Set”) and the IO Image Function Set (See p.141 “IO Image Command Set”).

The IM Image Function Set has a syntax and functional content that is based on AFPDS image arrays and cells. The IO Image Function Set has a syntax and functional content based on the IOCA architecture for image data (See Image Object Content Architecture Reference).

The raster data to be presented is represented as a sequence of scan lines ‘m’ lines deep by ‘n’ picture elements (pixels) wide. In IO image data, there may be more than one bit per pixel if the image data is grayscale encoded. The format of the data and the recording algorithms used to encode the image array are sent to the printer as control parameters of the Write Image Control 2 command that prepares the printer for processing image data. The data itself is sent in the Write Image 2 command.

Graphics

1

Graphics is the data type used to present line art picture drawings in a graphics block area on a page.

The information to be presented is represented by a sequence of primitive drawing orders that are used by the device to construct arcs, lines, fillets, character strings, markers and other elements that define the drawing. These primitive orders, in turn, are grouped into one or more drawing segments that are executed to present the picture.

The Write Graphics Control command (See p.151 “Graphics Command Set”) is sent to the printer to establish the clipping window control parameters and initial drawing conditions to be used in presenting the picture data. The picture segments are sent to the printer as data in zero or more Write Graphics commands of the architecture.

The graphics drawing orders are summarized in p.158 “Drawing Orders”. The source architecture document for graphics data is the Graphics Object Content Architecture Reference.

Bar Code

Bar Code is the data type used to present machine-scannable bar code symbols in a bar code block area on a page.

The Write Bar Code Control command (See p.169 “Bar Code Command Set”) is sent to the printer to establish the bar code pattern parameters to be used in presentation. Data for the bar code symbols is sent to the printer in zero or more Write Bar Code commands.

Coordinate System

Xm, Ym Coordinate System (Medium Presentation Space)

The Xm, Ym coordinate system is the medium presentation space coordinate system. The origin of this system ($X_m=0$, $Y_m=0$) can be set by the IPDS XOH Set Media Origin command to any of the four corners of the media. If this command is not sent to the printer the origin is the top-left corner (viewed from the center). In this case, positive Xm values begin at the origin and increase along the top edge from left to right. Positive Ym values begin at the origin and increase along the left side from top to bottom. Top is defined as the short edge which leads into the printer. See Intelligent Printer Data Stream Reference for a description of the Xm, Ym Coordinate System and default media origin for envelopes.

Xp, Yp Coordinate System (Logical Page Presentation Space)

Identifying the Size of the Logical Page or Overlay

The size of the logical page or overlay presentation space is set during a printer initialization using the p.35 "IPDS Initialization Defaults" or by the host program when it sends a Logical Page Descriptor command.

Overlays are logical pages and are handled as such by the printer with the following special considerations:

- ① Overlays are positioned in relationship to the logical page presentation space origin ($X_p=0$, $Y_p=0$) when they are merged with the Include Overlay command.
- ② Overlays are positioned in relationship to the origin of the medium presentation space ($X_m=0$, $Y_m=0$) when they are merged with the Merge Overlay keyword in a copy control record.

I, B Coordinates System (Text)

The +I and +B directions for the logical page or overlay are specified in degrees of rotation in relationship to the +Xp direction on the logical page.

The printer sets the +I and +B directions during the initialization through the p.35 “IPDS Initialization Defaults”. The host program can change the +I and +B directions through the Logical Page Descriptor command (See Intelligent Printer Data Stream Reference).

The host program can also change the +I and +B directions as it builds a page or overlay through text controls in the print data sent by a Write Text command (See p.120 “Write Text”).

Note

- Setting the orientations of the +I and +B axes also implicitly sets their origins as one of the four corners of the logical page or overlay.

Other Text Positioning Terms

Some other terms that relate to text positioning and fonts include:

Text Orientation

The combination of the inline sequence direction (the direction which characters are added to a line) and the baseline sequence direction (the direction which lines are added to a page or overlay) identify the text orientation for a page. The inline sequence direction can be 0, 90, 180 or 270 degrees. The machine supports baseline sequence directions that are always rotated plus or minus 90 degrees from the inline sequence direction. Therefore, there are eight text orientations for printing pages or overlays.

Printing Baseline

An imaginary line that extends across the page or overlay in the positive inline sequence direction (+I), between pixels, and beginning from the baseline sequence printing coordinate (Bc). (Sometimes shown as baseline as in the font terms baseline offset and baseline extent.)

In languages with a right to left or left to right reading order (for example, English), the printing baseline is the imaginary line on which the main body of the character appears to rest. Descenders (the “tails” of lower case g, j, p, q, and y characters) usually extend below the printing baseline.

In languages with a top to bottom reading order (for example, Kanji), the printing baseline is an imaginary vertical line that passes through the center of the character.

Each font index record contains a Font Inline Sequence field. The field value specifies a relationship between the inline sequence direction and the font rotation (the character pattern rotation for the font). The printer uses the font index record to identify how to place characters on the printing baseline for a page or overlay. The characters are placed in the combination of the inline sequence direction (the printing direction) and the font rotation.

The Baseline Offset value is another field in the font index record. This value locates the printing baseline relationship to a specified character box reference edge.

Notation Conventions

Some field values (or ranges of values) are specified assuming a unit of measure of 14400 L-units per 10 inches (5670 L-units per 10 centimeters). To determine supported values for a unit of measure of 2400 L-units per 10 inches (945 L-units per 10 centimeters) use the following steps.

- ① Convert the specified value from hex (2's complement) to decimal.
- ② Divide the + or - decimal number by 6.
- ③ Round to the nearest integer.
- ④ Convert the + or - decimal value back to hex (2's complement).

For example, if the specified value is X'8000' the following steps would be performed.

- ① $8000(\text{H}) = -32768(\text{D})$
- ② $-32768/6 = -5461.333$
- ③ $-5461(\text{D}) = \text{EAAB}(\text{H})$

Color Simulation

1

This printer provides "limited color simulation" by either simulating with generated grayscales or substituting "black" in special cases.

- Data objects whose colors are simulated with "grayscale":
 - PTOCA (characters, underscores, overscores, text rules)
 - GOCA (characters, lines, arcs, image, solid-area fill, pattern fill)
 - IM1/IOCA (bi-level image)
 - Object Areas (Pages, Overlays, BCOCA and IOCA)
- Data objects whose colors are simulated with "black":
 - GOCA Markers
 - BCOCA Bar Code Symbols and HRI
- Full Color Image is not supported on this printer since the transformation to grayscale would be very costly from a performance perspective. Host utilities are available to convert full color images to bi-level images for printing on monochrome printers.
- Grayscale Image (8 bits/pixel) is supported on this printer, however for very large images unacceptable performance degradation may result, due to the dithering process to produce bi-level image.

Simulation Modes Supported

There are two color simulation modes that may be supported:

- Legacy Mode (Substituting "black" or Pattern Creation)
- Fidelity Mode (Simulation with Grayscale)

The machine supports both the Legacy Mode and the Fidelity Mode of color simulation.

The Legacy Mode is provided to support customer legacy applications where simulation with grayscale would produce unacceptable results. There are console configuration menus to allow customers to select what level of color simulation best meets their needs. There are also console configuration menus to allow customers to select whether or not Color PTOCA (text) Objects should be simulated with grayscale or rendered with black. Rendering all PTOCA objects with black may be desirable, especially when small fonts are utilized.

Color Simulation Processes and Algorithms

To allow printing of documents containing color specifications, the specified colors in the document should be simulated in a consistent and predictable manner.

Color simulation occurs independently at the object level.

- **Named Colors**

Convert Named Color to RGB Process Color using the following table.

This table defines the valid color values used to specify named colors in PTOCA, GOCA, BCOCA, IOCA and IM objects. The table also specifies the RGB values for each named color, assuming that each component is specified with 8 bits and that the component intensity range 0 to 1 is mapped to the binary value range 0 to 255. For a definition of the supported colors for individual objects refer to the appropriate OCA specifications, since some objects only support a subset of the colors.

Value	Named Color	Red (R)	Green (G)	Blue (B)
X'0000' or X'FF00'	Printer Default (Black)	0	0	0
X'0001' or X'FF01'	Blue	0	0	255
X'0002' or X'FF02'	Red	255	0	0
X'0003' or X'FF03'	Pink (magenta)	255	0	255
X'0004' or X'FF04'	Green	0	255	
X'0005' or X'FF05'	Turquoise (cyan)	0	255	255
X'0006' or X'FF06'	Yellow	255	255	0
X'0007'	White	255	255	255
X'0008'	Black	0	0	0
X'0009'	Dark Blue	0	0	170
X'000A	Orange	255	128	0
X'000B'	Purple	170	0	170
X'000C'	Dark Green	0	146	0
X'000D'	Dark Turquoise	0	146	170
X'000E'	Mustard	196	160	32
X'000F'	Gray	131	131	131
X'0010'	Brown	144	48	0
X'FF07'	Printer Default (Black)	0	0	0
X'FF08'	Color of Medium (Reset)			

– Simulate RGB Process Color with Grayscale

- Full-process Colors. To maintain output consistency across different printer families, process colors to be simulated are converted to grayscale intensities based on color “luminance” (Y). A luminance of 0 is defined to be black and a luminance of 1 is defined to be white. CIE luminance (Y) is derived using the following “architected” equations:

❖ **RGB Color Space:**

Where Y=0 is black, Y=1 is white

$$Y = 0.212(R) + 0.701(G) + 0.087(B)$$

assuming 0 R,G,B 1

Where R, G and B represent the non-gamma-corrected (linear) red, green and blue components.

❖ **CIELab Color Space:**

CIELab space is the exception where the current implementation directly utilizes Lightness (L).

L = L

assuming 0 L 100

❖ **CMYK Color Space:**

Where Y=0 is black, Y=1 is white

$$Y = 1 - \min(1, (0.212C + 0.701M + 0.087Y + K))$$

assuming 0 C,M,Y,K 1

Where the function min (a,b) selects the smaller of (a,b).

- Highlight Colors

Color Mapping Tables (CMT) are not supported, therefore mapping to process color is not provided.

- Highlight colors are mapped to black with the % coverage applied to produce a gray level.

Logical Page and Object Area Coloring

Color Specification

The Color Specification triplet is used to specify the foreground color of the logical page or object area before any object data is placed on the logical page or object area.

Data Area	Value	Description	Error Code
Byte 0	X'0E'-X'10'	TRIPLET LENGTH	X'020E..01'
Byte 1	X'4E'	COLOR SPECIFICATION TRIPLET	
Byte 2	X'00'	RESERVED	
Byte 3	X'01'	COLOR SPACE (Note 1) RGB - Limited Simulated Color Support	X'020E..02'
	X'04'	CMYK - Limited Simulated Color Support	
	X'06'	Highlight - Limited Simulated Color Support	
	X'08'	CIELAB - Limited Simulated Color Support	
	X'40'	Standard OCA - Limited Simulated Color Support	
Bytes 4-7	X'00000000'	RESERVED	
Byte 8	X'01' - X'08' X'10'	1ST COLOR COMPONENT BITS (RGB, CMYK, CIELAB) (Standard OCA, Highlight)	X'020E..05'
Byte 9	X'00' - X'08'	2ND COLOR COMPONENT BITS (RGB, CMYK, Highlight, CIELAB)	X'020E..05'
Byte 10	X'00' - X'08'	3RD COLOR COMPONENT BITS (RGB, CMYK, CIELAB)	X'020E..05'
Byte 11	X'00' - X'08'	4TH COLOR COMPONENT BITS (CMYK)	X'020E..05'
Bytes 12-15	X'nn'	COLOR VALUE RGB Color Space Red Intensity	X'020E..03' X'020E..04'
	X'nn'	Green Intensity	
	X'nn'	Blue Intensity CMYK Color Space	

Data Area	Value	Description	Error Code	
Bytes 12-15	X'nn'	Cyan Intensity		
	X'nn'	Magenta Intensity		
	X'nn'	Yellow Intensity		
	X'nn'	Black Intensity		
			Highlight Color Space	
	X'nnnn'		Highlight Color Number	
	X'nn'		Percent Coverage	
	X'nn'		Percent Shading	
			CIELAB Color Space	
	X'nn'		Luminance (L)	
	X'nn'		Chrominance Difference (a)	
	X'nn'		Chrominance Difference (b)	
			Standard OCA Color Space	
	X'0000' or X'FF00'		Printer Default (Black)	
	X'0001' or X'FF01'		Blue	
	X'0002' or X'FF02'		Red	
	X'0003' or X'FF03'		Pink	
	X'0004' or X'FF04'		Green	
	X'0005' or X'FF05'		Turquoise	
	X'0006' or X'FF06'		Yellow	
	X'0007'		White - Color of Medium (Reset)	
	X'0008'		Black	
	X'0009'		Dark Blue	
	X'000A'		Orange	
	X'000B'		Purple	
	X'000C'		Dark Green	
	X'000D'		Dark Turquoise	
	X'000E'		Mustard	
	X'000F'		Gray	
	X'0010'		Brown	
	X'FF07'		Printer Default (Black)	
	X'FF08'		Color of Medium (Reset)	

Presentation Space Reset Mixing

The Presentation Space Reset Mixing triplet is used to specify whether or not a logical page or object area is reset to the color of medium before any object data is placed on the logical page or object area.

Data Area	Value	Description	Error Code
Byte 0	X'03'	TRIPLET LENGTH	X'020E..01'
Byte 1	X'70'	PRESENTATION SPACE RESET MIXING TRIPLET	
Byte 2	Bit 0 0	MIXING FLAGS Do not reset to color of the logical page to color of medium.	
	Bit 0 1	Reset to color of the logical page to color of medium.	
	Bits 1-7 0000000	Reserved	

2. Summary of IPDS Commands

IPDS Initialization Defaults

This chapter lists the IPDS commands that can be used with the printer. For more information about how to use these commands, see the Intelligent Printer Data Stream Reference.

Printer commands listed on the following pages are the valid values as identified in Intelligent Printer Data Stream Reference unless otherwise noted. Where the IPDS architecture allows choices, those choices are indicated.


When you set the printer power switch to the On (I) position, various IPDS data stream parameters are set to their initialization default values. These values are used for control parameters when:


- The command stream specifies that the printer default should be used,
- No explicit values are specified in the command stream sent to the printer, or
- Previously transmitted values are lost and initial machine settings are reestablished at POR time.

These values remain in effect until overridden by specific data stream commands from the host application program. The following list of values remain in effect until explicitly overridden by the following IPDS commands:

- Load Copy Control
- Load Font Equivalence
- Logical Page Descriptor
- Logical Page Position
- XOA Exception Handling Control
- XOH Select Input Media Source
- XOH Set Media Origin
- XOH Set Media Size
- Text Control Sequences (STO, SIM, SIA, SBI, SCFL, STC, DIR, and DBR)

The following table shows the initialization defaults:

Description	Default Value
L-Units Base Value	X'00' (10 inches)
L-Units per Base	X'3840' (14400 per 10 inches)
Input Media Source	Determined by the printer's control panel, Forms Device Setting
Media Origin	X'00' (top-left)
Width of the Physical Page	Derived from X-Extent of Medium Presentation Space
Length of the Physical Page	Derived from Y-Extent of Medium Presentation Space
Width of the Logical Page in L-Units (X p-Extent)	Derived from X-Extent of Medium Presentation Space
Length of the Logical Page in L-Units (Y p-Extent)	Derived from Y-Extent of Medium Presentation Space
Ordered Data Flags	X'00' (Unordered page, block, and text flags)
Inline Sequence	X'0000' (0 degrees)
Baseline Sequence	X'2D00' (90 degrees)
Initial I Print Coordinate	X'0000'
Initial B Print Coordinate	X'00C0' (192 L-Units below the logical page origin)  Note <input type="checkbox"/> Text printing on the first line requires the Current B Text Position to be large enough to accommodate the height of the current font.
Xm-Coordinate page origin	X'000000' Logical page X-displacement from the physical page origin (0 in)
Ym-Coordinate page origin	X'000000' Logical page Y-displacement from the physical page origin (0 in)
Initial Inline Margin in L-Units	X'0000'
Inter-character Adjustment	X'0000'
Baseline Increment	X'00F0' (240 L-Units)
Text Color	Black
Code Page ID	From configuration settings

Description	Default Value
Font Type	Font selection from configuration settings.  Note <input type="checkbox"/> The default font may be changed to another font which supports the selected Code Page. For printer generated bar codes with human readable information (HRI), the default font is OCR-B (UPC and EAN bar code types) or OCR-A (other bar code types with HRI).
Exception Handling Control	X'C10101' Report undefined characters, position checks, and all other exceptions. Do not take Alternate Exception Action. Terminate, print page, and go to home state. No highlighting of position checks.
Number of Copy Groups	X'01'
X-Extent of Medium Presentation Space	Determined by Configuration
Y-Extent of Medium Presentation Space	Determined by Configuration
X Coordinate (logical page origin)	X'0000'
Y Coordinate (logical page origin)	X'0000'
Xp-Extent of Logical Page	Derived from X-Extent of Medium Presentation Space
Yp-Extent of Logical Page	Derived from Y-Extent of Medium Presentation Space
Code Page Global ID (CPGID)	Determined by Configuration
Font Global ID (FGID)	Determined by Configuration
Font Width (FW)	Determined by Configuration
Copy Group Definition Length	X'04' (The default copy group definition is four bytes long.)
Number of Identical Copies	X'01' (The printer prints one copy of each page.)
Keyword Entry	X'C100' (The printer prints simplex, no text suppression, no overlays.)

Page Printer Initialization Sequence

Before printing begins, the host may determine characteristics of the printer and its resources and may specify certain parameters related to subsequent printing. Following is a typical sequence of initialization commands.

- Sense Type and Model (STM) with ARQ
- XOH Obtain Printer Characteristics (OPC) with ARQ
- Set Home State (SHS)
- Logical Page Descriptor (LPD)
- Logical Page Position (LPP)
- Load Copy Control (LCC)
- Load Font Equivalence (LFE) with ARQ

3. Device Control Command Set

About Device Control Command Set

Device Control commands control basic device operations, error reporting and recovery, and the construction of logical pages on the physical medium.

Before the host program sends the Begin Page command to begin defining a page to be printed, it should establish the printing environment in which the page is to be printed.

The following Device Control commands are described in this section:

- p.40 "Acknowledgement Reply"
- p.43 "Activate Resource"
- p.50 "Begin Page"
- p.51 "Deactivate Font"
- p.53 "End"
- p.54 "End Page"
- p.55 "Load Copy Control"
- p.63 "Load Font Equivalence"
- p.66 "Logical Page Descriptor"
- p.70 "Logical Page Position"
- p.71 "Presentation Fidelity Control"
- p.73 "Sense Type and Model"
- p.86 "Execute Order Any State (XOA)"
- p.86 "XOA Mark Form"
- p.86 "XOA Exception Handling Control"
- p.91 "Execute Order Home State (XOH)"
- p.91 "XOH Obtain Printer Characteristics"
- p.112 "XOH Select Input Media Source"
- p.114 "XOH Set Media Origin"
- p.114 "XOH Set Media Size"
- p.115 "XOH Page Counter Control"
- p.115 "XOH Define Group Boundary"
- p.117 "XOH Specify Group Operation"
- p.246 "XOA-RRL Replies for Font Character Sets"

Acknowledgement Reply

The Acknowledge Reply returns device status, sense data, and other information the host program requests. The printer sends an acknowledgement when it finds either of the following:

- A data stream or device error that requires the printer to return a negative acknowledgement (NACK).
- The Acknowledgement Required (ARQ) flag bit in the command the printer receives is set to 1.

3

The Acknowledge Reply is returned to the host in the standard IPDS command format although it goes from the printer to the host. See Intelligent Printer Data Stream Reference for details.

The following table lists Bit Codes for IPDS command stream flags for Acknowledge Reply.

Bit Code	Meaning
Bit 0	Reserved
Bit 1	Correlation Number Present
Bit 2	Acknowledgement Continuation
Bits 3-6	Reserved
Bit 7	The Persistent NACK bit is for Non-SNA DSC Mode NACKs only. This bit has no meaning in other attachment environments.

Note

- When a command is received with Bit 1 set, the Acknowledge Reply will be returned with this bit set, indicating that a two byte “Correlation Number” follows.
- The Correlation Number, a two byte identifier, is returned if available for:
 - Synchronous NACKs
 - Response to information request commands
 - Acknowledgement requested (Flag byte bit 0 = 1)
- The Special Data area of the Acknowledgement Reply contains:
 - Error sense bytes when reporting an exception
 - Response to the following information request commands:
 - Sense Type and Model
 - XOH Obtain Printer Characteristics
 - XOA Request Resource List

Data Area	Value	Description	Error Code
Byte 0		ACKNOWLEDGEMENT TYPE: A one byte field that identifies the type of acknowledgement record and contents (if any) of the Special Data area.	
	X'40'	None	
	X'41'	Sense Type and Model	
	X'44'	Request Resource List	
	X'46'	Obtain Printer Characteristics	
	X'C0'	Sense Bytes	
Bytes 1-2	X'0000' - X'FFFF'	Received Page Counter* *Incremented when the End Page processing is completed.	
Bytes 3-4	X'0000'-X'FFFF'	Committed Page Counter* *Incremented by the number of pages on a sheet when the last copy of the sheet is stacked.	
Bytes 5-6	X'0000'-X'FFFF'	Committed Copy Counter* *Incremented by the number of pages on a sheet when the sheet is stacked.	
Bytes 7-8	X'0000'-X'FFFF'	Operator Viewing Page Counter* *Incremented by the number of pages on a sheet when the last copy of the sheet is stacked.	
Bytes 9-10	X'0000'-X'FFFF'	Operator Viewing Copy Counter* *Incremented by the number of pages on a sheet when the sheet is stacked.	
Bytes 11-12	X'0000'-X'FFFF'	Jam Recovery Page Counter* *Incremented by the number of pages on a sheet when the last copy of the sheet is stacked.	
Bytes 13-14	X'0000'-X'FFFF'	Jam Recovery Copy Counter* *Incremented by the number of pages on a sheet when the sheet is stacked.	
Bytes 15-16	X'0000'-X'FFFF'	Stacked Page Counter* *Incremented by the number of pages on a sheet when the last copy of the sheet is stacked.	
Bytes 17-18	X'0000'-X'FFFF'	Stacked Copy Counter* *Incremented by the number of pages on a sheet when the sheet is stacked.	

Data Area	Value	Description	Error Code
Bytes 19-n		SPECIAL DATA AREA: This area contains zero or more bytes of additional data as requested by the host program defined by the Acknowledgement Type.	

Activate Resource

This command maps a 6-byte Host Assigned Resource ID (HAID/FIS/Section) to a resident Resource ID of the format specified in the Resource ID Format parameter (Byte 6). The Resource ID formats which are supported may be determined using the XOH OPC command (See p.91 “XOH Obtain Printer Characteristics”).

An AR mapping (HAID to Resource ID mapping) remains in effect until:

- an XOH Erase Residual Font Data command or Deactivate Font (See p.51 “Deactivate Font”) command is received (the mapping is removed and font deactivated)
- the printer performs an IML (the mapping is removed)


If a Deactivate Font command is received for a single byte font, the font identified by the HAID is deactivated (made unavailable for use by the host), but all other current font mappings remain in effect until one of the actions described in the preceding paragraph occurs. If a Deactivate Font command is received which specifies all single byte fonts, all font mappings are removed as those fonts are deactivated.

The maximum of Activate Resource ID mappings that may be received is limited only by the available memory.

Note

- IPDS architecture describes the mapping and activation of resident resources as two conceptually separate processes. The printer, however, implements mapping and activation as one inseparable process. Un-map and de-activate are also inseparable operations. Thus, a Deactivate Font command directed at a mapped and activated resident font, both un-maps and de-activates the specified font(s).

Data Area	Value	Description	Error Code
Bytes 0-1		ENTRY LENGTH	X'028F..01'
	X'0002'	Null entry	
	X'000C'	Specifying without an equivalence	
	X'000E'	Valid for RT=X'06' with RIDF=X'03'	
	X'000E'-008D'	Valid for RT=X'42' with RIDF=X'09'	
	X'0010'	Valid for RT=X'06' or X'07' with RIDF=X'03'	
	X'0012'	Valid for RT=X'41' with RIDF=X'0A'	
	X'0014'	Valid for RT=X'01', X'08', X'09', X'10' with RIDF=X'03'	
	X'001E'	Valid for RT=X'01', X'08', X'09', X'10' with RIDF=X'07'	
	X'00B8'	Valid for RT=X'01' or X'08' with RIDF=X'06'	
Byte 2		RESOURCE TYPE (RT)	X'028F..01'
	X'01'	Single byte LF1 coded font	
	X'03'	Double-byte LF1-type coded font sections	
	X'06'	Code Page	
	X'07'	Font Character Set	
	X'08'	Single byte font index	
	X'09'	Double-byte LF1-type coded font section indexes	
	X'10'	Coded Font	
	X'40'	Data object resource	
	X'41'	Data-object font	
	X'42'	Data-object font component	
	Bytes 3-4	X'0001'-X'7EFF'	
Byte 5	X'41'-X'FE'	Ignored for RT=X'01', X'06', X'07', X'08' and X'10'	
Byte 6		RESOURCE ID FORMAT (RIDF)	X'028F..01'
	X'03'	IBM Registered Global Resource ID parts	
	X'06'	MVS host unalterable remote font environment	
	X'07'	Coded font	
	X'09'	Object-OID	
	X'0A'	Data-object font	

Data Area	Value	Description	Error Code
Bytes 7-8		FONT INLINE SEQUENCE	X'028F..01'
	X'0000'	0 degrees	
	X'2D00'	90 degrees	
	X'5A00'	180 degrees	
	X'8700'	270 degrees	
		 Note <input type="checkbox"/> That the Font Inline Sequence is ignored for RT=X'06' and X'07'. For outline fonts with RT=X'10', FIS is used to select the character metrics for a specific writing mode.	
Bytes 9-10	X'0000'	Reserved	
Byte 11		RESOURCE CLASS FLAGS	
	Bit 0 0/1	Public/Private (Resource Capture)	
	Bit 1 0	Retired	
	Bit 2 0/1	Ignored (Reset)	
	Bit 3 0/1	AR NACK Enabled	
	Bit 4 0/1	Outline Font Substitution	
	Bits 5-7 0	Reserved	
Bytes 12-n		RESOURCE ID and triplets	X'028F..01'

 **Note**

- Zero or more additional entries, analogous to bytes 0 - n above.

Resource ID example with RIDF = GRID

Data Area	Value	Description	Error Code
Bytes 12-13	X'0000' X'0001' - X'FFFE' X'FFFF'	GRAPHIC CHARACTER SET GLOBAL ID No value supplied GCSGID All characters with assigned code points in the associated code page	X'028F..02'
Bytes 14-15	X'0000' X'0001' - X'FFFE' X'FFFF'	CODE PAGE GLOBAL ID No value supplied CPGID Default Code Page (Configuration Settings)	X'028F..02'
Bytes 16-17	X'0000' X'0001' - X'FFFE' X'FFFF'	FONT GLOBAL ID No value supplied FGID Default FGID (Configuration Set- tings)	X'028F..02'
Bytes 18-19	X'0000' X'0001' - X'FFFE' X'FFFF'	FONT WIDTH No value supplied FW Default FW (Configuration Settings)	X'028F..02'

Resource ID example with RIDF = MVS Host Unalterable Remote Font Environment

Data Area	Value	Description	Error Code
Bytes 12-13		CRC	
Bytes 14-21		Ignored (MVS Host System ID)	
Bytes 22-27		Ignored (VOLSER of Host library)	
Bytes 28-71		Ignored (DSNAME of Host library)	
Bytes 72-77		Date Stamp	
Bytes 78-85		Time Stamp	
Bytes 86-93		Ignored (Host Library Member Name)	
Bytes 94-95	X'0000' X'0001' - X'FFFE' X'FFFF'	GRAPHIC CHARACTER SET GLOBAL ID No value supplied GCSGID All characters with assigned code points in the associated code page	X'028F..02'
Bytes 96-97	X'0000' X'0001' - X'FFFE' X'FFFF'	CODE PAGE GLOBAL ID No value supplied CPGID Default Code Page (Configuration Settings)	X'028F..02'
Bytes 98-99		CRC	
Bytes 100-107		Ignored (MVS Host System ID)	
Bytes 108-113		Ignored (VOLSER of Host library)	
Bytes 114-157		Ignored (DSNAME of Host library)	
Bytes 158-163		Date Stamp	
Bytes 164-171		Time Stamp	
Bytes 172-179		Ignored (Host Library Member Name)	
Bytes 180-181	X'0000' X'0001' - X'FFFE' X'FFFF'	FONT GLOBAL ID No value supplied FGID Default FGID (Configuration Set- tings)	X'028F..02'

Data Area	Value	Description	Error Code
Bytes 182-183	X'0000'	FONT WIDTH No value supplied	X'028F..02'
	X'0001' - X'FFFE'	FW	
	X'FFFF'	Default FW (Configuration Settings)	

Resource ID example with RIDF = Coded Font

Data Area	Value	Description	Error Code
Bytes 12-13	X'0000'	FONT CHARACTER SET HAID No value supplied	
	X'0001' - X'7FFF'	FCS HAID	
Bytes 14-15	X'0000'	CODE PAGE HAID No value supplied	
	X'0001' - X'7FFF'	CP HAID	
Bytes 16-17	X'0000'	GRAPHIC CHARACTER SET GLOBAL ID No value supplied	
	X'0001' - X'FFFE'	GCSGID	
	X'FFFF'	All characters with assigned code points	
Bytes 18-19	X'0000'	CODE PAGE GLOBAL ID No value supplied	
	X'0001' - X'FFFE'	CPGID	
	X'FFFF'	Default Code Page (Configuration Settings)	
Bytes 20-21	X'0000'	FONT GLOBAL ID No value supplied	
	X'0001' - X'FFFE'	FGID	
	X'FFFF'	Default FGID (Configuration Settings)	
Bytes 22-23	X'0000'	FONT WIDTH No value supplied	
	X'0001' - X'FFFE'	FW	
	X'FFFF'	Default FW (Configuration Settings)	
Byte 24	X'00'	PATTERN TECHNOLOGY ID No value supplied	
	X'1E'	Composite technology	
	X'1F'	Adobe Type-1 PFB	

Data Area	Value	Description	Error Code
Byte 25		Reserved	
Bytes 26-27	X'0000' X'0001' - X'7FFF'	VERTICAL SCALE FACTOR No value supplied VSF in 1440th of an inch	
Bytes 28-29	X'0000' X'0001' - X'7FFF'	HORIZONTAL SCALE FACTOR No value supplied HSF in 1440th of an inch	

Resource ID example with RIDF = Object-OID

Data Area	Value	Description	Error Code
Byte 12	X'06'	IDENTIFIER Short Form OID	
Byte 13	X'00' - X'7F'	OID LENGTH	
Bytes 2 to end	Any Value	Unique OID	

Resource ID example with RIDF = Data-object font

Data Area	Value	Description	Error Code
Bytes 12-13	X'0001' - X'7EFF'	Base Font HAID TrueType/OpenType font or TrueType/OpenType collection	
Bytes 14-15	X'0000' X'0001' - X'7EFF'	CODE PAGE HAID No Value supplied CP HAID	
Bytes 16-17	X'0000' - X'FFFF'	TTC Font Index Font Identifier	
Bytes 2 to end	X'02' X'50' X'8B' X'8D'	Triples (One or more of the following triplets) Fully Qualified Name triplet Encoded Scheme ID triplet Data-Object Font Descriptor triplet Linked Font triplet	

Begin Page

This command is only valid in home state and causes the printer to enter page state. See the Intelligent Printer Data Stream Reference for details.

 **Note**

- ❑ At Begin Page processing time a test for media source and destination compatibility will be performed. If it is determined that the processing of this page with the media source and media destination specified is incompatible an exception X'0237..04' will be reported.

Deactivate Font

The Deactivate Font command carries one to six bytes of data used by the host to deactivate one or more coded fonts, coded font indexes, font character sets, or code pages.

Data Area	Value	Description	Error Code
Byte 0		DEACTIVATION TYPE	X'0217..02'
	X'11'	Deactivate one single-byte LF1 Coded Font and related indexes	X'02C5..01' X'02C6..01'
	X'12'	Deactivate one single-byte font index	
	X'1E'	Deactivate all single-byte LF1 Coded Fonts and all indexes	
	X'1F'	Deactivate all single-byte LF1 Coded Fonts and all indexes (same as above)	
	X'20'	Deactivate double-byte LF1 Coded Font section and related indexes	
	X'21'	Deactivate double-byte LF1 Coded Font section, all higher sections and all related indexes	
	X'22'	Deactivate a font index for a double-byte Coded Font section	
	X'2F'	Deactivate all double-byte LF1 Coded Fonts and all related indexes	
	X'30'	Deactivate one Code Page	
	X'3F'	Deactivate all Code Pages	
	X'40'	Deactivate one Font Character Set	
	X'4F'	Deactivate all Font Character Sets	
	X'50'	Deactivate one LF1 or LF3 Coded Font	
	X'51'	Deactivate one LF1 or LF3 Coded Font and all associated components	
	X'5D'	Deactivate all resident Coded Fonts and all associated components	
	X'5E'	Deactivate all Coded Fonts	
	X'5F'	Deactivate all Coded Fonts and all associated components	
	X'60'	Deactivate a data-object font	
X'6E'	Deactivate all data-object fonts		

Data Area	Value	Description	Error Code
Bytes 1-2	X'0001' - X'7EFF'	HOST ASSIGNED ID (Deactivation Types X'11', X'12', X'20', X'21', X'22', X'30', X'40', X'50' and X'51')	X'0214..02' X'0215..02' X'02C5..01' X'02C6..01'
Byte 3	X'00' X'41' - X'FD'	SECTION ID Single-byte font Double-byte font (Deactivation types X'20', X'21' and X'22')	
Bytes 4-5	X'0000' X'2D00' X'5A00' X'8700'	FONT INLINE SEQUENCE (Deactivation Type X'12' and X'22') 0 degrees 90 degrees 180 degrees 270 degrees	X'0240..02'

End

The End command is the ending control for a series of Write Image, Write Image 2, Write Graphics, Write Bar Code, Load Code Page, or Load Font commands. This command marks either the end of an image object, a graphics object, a bar code object, or the end of a downloaded font sequence. See the Intelligent Printer Data Stream Reference, S544-3417, for more details.

End Page

The End Page (EP) command causes the printer to return to home state from page state, page segment state, or overlay state and thus marks the end of a page, a page segment, or an overlay. The EP command is an implicit command to schedule that page for printing if the command is being used to exit page state; all data for that page is available to the printer. Zero or more data bytes can be transmitted but are ignored. See the Intelligent Printer Data Stream Reference, S544-3417, for more details.

Load Copy Control

A copy control record 2 to 32760 bytes long specifies how the printer is to modify and print logical pages in one or more copy subgroup definitions. Each copy subgroup definition can be from 2 to 254 bytes long (divisible by 2). The maximum number of key-words that the host program can specify in a copy subgroup definition is:

- X'80nn' specify 1 time
- X'90nn' specify 1 time
- X'91nn' specify 1 time
- X'C1nn' specify 1 time
- X'C2nn' specify 1 time
- X'D1nn' specify 1 to 126 times
- X'E1nn' specify 1 to 126 times
- X'E4nn' specify 1 to 63 times
- X'E5nn' specify 1 to 63 times

Note

- ❑ Actual tray capacity is determined by media weight.
- ❑ The machine supports media source tray numbering. Media source values in the LCC support tables represent the default settings when the printer is initially installed. The printer's control panel menu mode is provided to allow customers to specify the source tray numbers to meet requirements of legacy applications. Example: customer might want to address the Manual Tray as tray 4 instead of the tray 100 (default).
- ❑ For the tray in which "envelope" has been specified as the paper type, the tray values of the tray ID are (in ascending for each respective tray that is installed) as follows: X'8040', X'8041', etc. If a different paper type is specified for the tray, the tray values of the tray ID are (in ascending for each respective tray that is installed) as follows: X'8000', X'8001', etc. In regards to the bypass tray and default tray, even if you specify "envelope" as the paper type, the tray value will not be changed.
- ❑ To ascertain which machine type your model corresponds to, see p.3 "Machine Types".

Data Area	Value	Description	Error Code
Byte 0	X'02' - X'FE'	COPY SUBGROUP DEFINITION LENGTH	
Byte 1	X'01' - X'FF'	NUMBER OF IDENTICAL COPIES	X'0231..01'
Bytes 2-n		COPY MODIFICATION KEY-WORDS	X'0232..01'
		Media Source (Reference Notes)	
	X'8000'	Tray 1	X'02C2..02'
	X'8001'	Tray 2* (Machine type: Type 1)	X'02C8..01'
	X'8040'	Tray 1 + Tray 2 + Bypass tray	
	X'8001'	Tray 1 + Envelope feeder tray 2 + Bypass tray	
	X'8001'	Tray 1 + Tray 2 + Tray 3 + Bypass tray	
	X'8040'	Tray 1 + Envelope feeder tray 2 + Tray 3 + Bypass tray	
	X'8001'	Tray 1 + Tray 2 + Envelope feeder tray 3 + Bypass tray	
	X'8040'	Tray 1 + Envelope feeder tray 2 + Envelope feeder tray 3 + Bypass tray	
	X'8001'	Tray 2 (Machine type: Type 2 or Type 3)	
	X'8002'	Tray 3* (Machine type: Type 1)	
	X'8001'	Tray 1 + Tray 2 + Tray 3 + Bypass tray	
	X'8040'	Tray 1 + Envelope feeder tray 2 + Tray 3 + Bypass tray	
	X'8041'	Tray 1 + Envelope feeder tray 2 + Envelope feeder tray 3 + Bypass tray	
	X'8002'	Tray 3 (Machine type: Type 2 or Type 3)	
	X'8003'	Tray 4 (Machine type: Type 2 or Type 3)	
	X'8004'	Tray 5 (Machine type: Type 2 or Type 3)	
	X'8063'	Bypass tray	
	X'80FF'	Default Tray	
	Media Destination (Byte Pairs)		
X'9101'	Internal tray		

* Available values vary depending on the installed option.

Media Source and Destination Support Matrices

The following tables are provided to document Media Source and Destination support. This information is provided to ensure better overall understanding of the media handling characteristics. For more details on the actual X and Y media extents see p.91 "Printable Area Self-Defining Field".

❖ Media Source and Destination Support Matrices (Machine type: Type 1)

○ = Duplex SEF / △ = Duplex LEF / ● = SEF / ▲ = LEF

	Tray 1 Capacity: 500	Tray 2 Capacity: 500	Envelope feeder unit tray 2 Capacity: 60	Tray 3 Capacity: 500	Envelope feeder unit tray 3 Capacity: 60	Bypass tray Capacity: 100
A4 (210×297mm)	○	○		○		○
A5 (210×148mm)	○ △	○		○		○ △
A6 (105×148mm)						●
B5 (182×257mm)	○	○		○		○
B6 (128×182mm)						●
Legal (8.5×14in.)	○	○		○		○
Foolscap (8.5×13in.)	○	○		○		○
Letter (8.5×11in.)	○	○		○		○
Folio (8.25×13in.)	○	○		○		○
F/GL (8×13in.)	○	○		○		○
Executive (7.25×10.5in.)		●		●		●
HalfLetter (5.5×8.5in.)	○ △	○		○		○ △
Com10 (4.125×9.5in.)			●		●	●

	Tray 1 Capacity: 500	Tray 2 Capacity: 500	Envelope feeder unit tray 2 Capacity: 60	Tray 3 Capacity: 500	Envelope feeder unit tray 3 Capacity: 60	Bypass tray Capacity: 100
Monarch (3.875×7.5in.)			●		●	●
C5 (162×229mm)			●		●	●
C6 (114×162mm)			●		●	●
DL Env (110×220mm)			●		●	●
16kai(195×267mm)	○	○		○		○
Custom Sizes	*1	*2		*2		*3

*1 139.7×139.7 mm to 216.0×356.0 mm

*2 139.7×160.0 mm to 216.0×356.0 mm

*3 64.0×139.7 mm to 216.0×432.0 mm

- Duplexing of Custom Paper (variable paper size) is enabled, however some small sizes may jam or exhibit registration problems due to print engine limitations.

Y = Yes / N = No

	Internal tray Capacity: 250
A4(210×297mm) SEF	Y
A5(210×148mm) SEF/LEF	Y
A6(105×148mm) SEF	Y
B5(182×257mm) SEF	Y
B6(128×182mm) SEF	Y
Legal(8.5×14in.) SEF	Y
Foolscap(8.5×13in.) SEF	Y
Letter(8.5×11in.) SEF	Y
Folio(8.25×13in.) SEF	Y
F/GL(8×13in.) SEF	Y
Executive(7.25×10.5in.) SEF	Y
HalfLetter(5.5×8.5in.) SEF/LEF	Y
Com10(4.125×9.5in.) SEF	Y
Monarch(3.875×7.5in.) SEF	Y
C5(162×229mm) SEF	Y
C6(114×162mm) SEF	Y
DL Env(110×220mm) SEF	Y

	Internal tray Capacity: 250
16kai(195×267mm) SEF	Y
Custom Sizes	64.0×139.7 mm to 216.0×900.0 mm

❖ **Media Source and Destination Support Matrices (Machine type: Type 2 or Type 3)**

○ = Duplex SEF / △ = Duplex LEF / ● = SEF / ▲ = LEF

3

	Tray 1 Capacity: 550	Tray 2 Capacity: 550	Tray 3 Capacity: 550	Tray 4 Capacity: 550	Tray 5 Capacity: 550	Bypass tray Capacity: 100
A4 (210×297mm)	○	○	○	○	○	○
A5 (210×148mm)	○ ▲	○	○	○	○	○ ▲
A6 (105×148mm)	●					●
B5 (182×257mm)	○	○	○	○	○	○
B6 (128×182mm)	○	○	○	○	○	○
Legal (8.5×14in.)	○	○	○	○	○	○
Foolscap (8.5×13in.)	○	○	○	○	○	○
Letter (8.5×11in.)	○	○	○	○	○	○
Folio (8.25×13in.)	○	○	○	○	○	○
F/GL (8×13in.)	○	○	○	○	○	○
Executive (7.25×10.5in.)	○	○	○	○	○	○
HalfLetter (5.5×8.5in.)	○ ▲	○	○	○	○	○ ▲
Com10 (4.125×9.5in.)	●	●	●	●	●	●
Monarch (3.875×7.5in.)	●	●	●	●	●	●

	Tray 1 Capacity: 550	Tray 2 Capacity: 550	Tray 3 Capacity: 550	Tray 4 Capacity: 550	Tray 5 Capacity: 550	Bypass tray Capacity: 100
C5 (162×229mm)	●	●	●	●	●	●
C6 (114×162mm)	●	●	●	●	●	●
DL Env (110×220mm)	●	●	●	●	●	●
16kai(195×267mm)	○	○	○	○	○	○
Custom Sizes	*1	*2	*2	*2	*2	*3

*1 98.0×140.0 mm to 216.0×356.0 mm

*2 98.0×160.0 mm to 216.0×356.0 mm

*3 64.0×140.0 mm to 216.0×900.0 mm

- Duplexing of Custom Paper (variable paper size) is enabled, however some small sizes may jam or exhibit registration problems due to print engine limitations.

Y = Yes / N = No

	Internal tray Capacity: 500
A4(210×297mm) SEF	Y
A5(210×148mm) SEF/LEF	Y
A6(105×148mm) SEF	Y
B5(182×257mm) SEF	Y
B6(128×182mm) SEF	Y
Legal(8.5×14in.) SEF	Y
Foolscap(8.5×13in.) SEF	Y
Letter(8.5×11in.) SEF	Y
Folio(8.25×13in.) SEF	Y

	Internal tray Capacity: 500
F/GL(8×13in.) SEF	Y
Executive(7.25×10.5in.) SEF	Y
HalfLetter(5.5×8.5in.) SEF/LEF	Y
Com10(4.125×9.5in.) SEF	Y
Monarch(3.875×7.5in.) SEF	Y
C5(162×229mm) SEF	Y
C6(114×162mm) SEF	Y
DL Env(110×220mm) SEF	Y
16kai(195×267mm) SEF/LEF	Y
Custom Sizes	64.0×140.0 mm to 216.0×900.0 mm

Load Font Equivalence

The font equivalence record is a list of 0 to 254 font equivalence entries (each entry is 16 bytes). The font equivalence record permits the host program to equate a Local-Font ID (specified in text control p.126 "Set Coded Font Local", graphics order p.238 "Character Set" or p.173 "Bar Code Data Descriptor", p.170 "Write Bar Code Control") with:

- Font Host Assigned ID (HAID)
- The Font Inline Sequence or character rotation table to be used when processing characters
- Global Resource ID (GRID) for resident fonts. The GRID is made up of the following components:
 - GCSGID Graphic Character Set Global ID
 - CPGID Code Page Global ID
 - FGID Font Global ID
 - FW Font width in 1/1440 inch units

If a GRID is specified in bytes 5-12, the entry is requesting the activation of a coded font and assigning a HAID to it. The printer uses the information provided in the GRID to locate the component parts of the coded font. First, the GCSGID and FGID values are used to find the font character set, and GCSGID and CPGID are used to find the code page. In some cases, the printer will locate the code page using just the CPGID value. If the character set and code page are not found in the above manner, information in the GRID will be used together with the Font Inline Sequence value (Bytes 3-4) to locate a single-byte fully described font and font index. The set of supported GCSGID/CPGID/FGID/FW (GRID) combinations is described in p.233 "Code Page and Font Identification" and is available to the host PSF by means of the XOA-RRL command. For typographic and scalable fonts, a Font Width (FW) must be specified in order to uniquely select a point size, unless FW=0 or X'FFFF', in which case the printer's control panel [Characters Per Inch] setting is used ([Characters Per Inch] on the IPDS Menu).

Exception X'021D..02' is reported back if a non-zero GRID is requested with parts that are not supported in the printer, except in the case of GCSGID subset substitution or LFE Bold Attribute substitution.

For outline coded fonts, the FW value is used to derive a scale factor as follows:

- For typographic and proportionally spaced fonts, both horizontal and vertical scale factors are 3 (FW).
- For fixed pitch, uniform character increment fonts, both horizontal and vertical scale factors are derived using the following algorithm (fractions are truncated):

$$V_Scale = H_Scale = 1000 *^1 FW/SPACE$$

In this case SPACE is the value of the Space Character increment in relative units.

^{*1} 4028-type font substitution is provided as the printer's control panel feature. It is independent of the device emulation mode setting (native or 4028). Default is No Font Substitution.

Data Area	Value	Description	Error Code
Byte 0	X'00' - X'FE'	LOCAL-FONT ID	X'0219..02'
	X'FF'	Reserved	X'0218..02'
Bytes 1-2	X'0001' - X'7EFF'	FONT HOST ASSIGNED ID	X'0218..02' X'021F..02'
Bytes 3-4	X'0000'	FONT INLINE SEQUENCE 0 degrees	X'0247..02'
	X'2D00'	90 degrees	
	X'5A00'	180 degrees	
	X'8700'	270 degrees	
Bytes 5-6	X'0000'	GCSGID No value assigned (Note 2)	
	X'0001' - X'FFFE'	Graphic Character Set Global ID	
	X'FFFF'	All characters with assigned code points in the associated code page	
Bytes 7-8	X'0000'	CPGID No value assigned (Note 2)	X'021D..02'
	X'0001' - X'FFFE'	Code Page Global ID	
	X'FFFF'	Printer Default (Configuration Setting)	
Bytes 9-10	X'0000'	FGID No value assigned (Note 2)	X'021D..02'
	X'0001' - X'FFFE'	Font Global ID	
	X'FFFF'	Printer Default (Configuration Setting)	
Bytes 11-12	X'0000'	FW No value assigned (Note 2)	
	X'0001' - X'7FFF'	Font Width (Ignored for Fixed Pitch Fonts)	
	X'FFFF'	Printer Default as specified by Configuration Settings	
Byte 13	X'00'	Reserved	

Data Area	Value	Description	Error Code
Byte 14	Bit 0 0/1 Bits 1-2 00 Bit 3 0/1 Bit 4 0/1 Bit 5 0/1 Bit 6 0/1 Bit 7 0/1	FONT ATTRIBUTES (Note 3) Ignored (Symbol Sets) Reserved Ignored (Double High) Ignored (Italics) Ignored (Double Strike) Bold = 1 Ignored (Double Wide)	
Byte 15	X'00'	Reserved	
Bytes 16-n		Additional LFE ENTRIES	X'023A..02'

Note

- For LF1 coded fonts, FIS specifies the font index table for character rotation. For LF3 coded fonts, FIS is used to select the metrics for a specific writing mode.
- Global Resource IDs (bytes 5-12) apply to printer resident fonts only. If these fields are all X'0000', then an activation is not done. If GCSGID and/or FW are 0 or X'FFFF':
 - CPGID (non-zero) defines the CPGID/GCSGID
 - FGID (non-zero) defines the FGID/FW (Non-Typographic)
 - FGID (non-zero) and the printer's control panel CPI defines the FGID/FW (Typographic)
- When the chosen font and attribute combination is restricted by a licensing agreement the font attributes may be executed by substitution or other means. If an appropriate font is not available, the attribute may not occur. Also, with font substitution, the available characteristics may change. Combinations of attributes may not be available. Font attributes will not be applied to host downloaded fonts.

Logical Page Descriptor


Before the printer can present a page of data it must know the following:

- The units in which distances have been measured
- The boundaries of the logical page
- Initialization values for control parameters (Margins, Line spacing...)

The controls established in a Logical Page Descriptor command remain in effect until the next Logical Page Descriptor is received unless superseded by explicit controls in other commands (See p.120 "Write Text"). In any case, the latest LPD control values are restored with each Begin Page or Begin Overlay command.

The LPD command is valid with 24, 28, 34, 36, 38, 40, 41 or 43 bytes. The printer accepts the LPD command using any of these valid lengths.

Data Area	Value	Description	Error Code
Byte 0	X'00' X'01'	UNIT-BASE (Measurement Units) 10 in. 10 centimeters	X'0264..02'
Byte 1		Reserved	
Bytes 2-3	X'3840' X'1626' X'0960' X'03B1'	Xp AND I L-units PER UNIT-BASE 14400 L-units per 10 in. 5670 L-units per 10 centimeters 2400 L-units per 10 in. 945 L-units per 10 centimeters	X'0260..02'
Bytes 4-5	X'3840' X'1626' X'0960' X'03B1'	Yp AND B L-units PER UNIT-BASE 14400 L-units per 10 in. 5670 L-units per 10 centimeters 2400 L-units per 10 in. 945 L-Units per 10 centimeters	X'0261..02'
Byte 6		Reserved	
Bytes 7-9	X'000001' - X'007FFF'	Xp-EXTENT OF LOGICAL PAGE (Width) See p.27 "Notation Conventions"	X'0262..02'
Byte 10		Reserved	
Bytes 11-13	X'000001' - X'007FFF'	Yp-EXTENT OF LOGICAL PAGE (Height) See p.27 "Notation Conventions"	X'0263..02'
Byte 14		Reserved	
Byte 15		Ignored (Ordered Data)	
Bytes 16-23		Reserved	


Data Area	Value	Description	Error Code
Bytes 24-25	X'0000' X'2D00' X'5A00' X'8700' X'FFFF'	I-AXIS ORIENTATION 0 degrees 90 degrees 180 degrees 270 degrees Printer Default	X'0268..02'
Bytes 26-27	X'0000' X'2D00' X'5A00' X'8700' X'FFFF'	B-AXIS ORIENTATION 0 degrees 90 degrees 180 degrees 270 degrees Printer Default  Note <input type="checkbox"/> See p.131 "Set Text Orientation" for valid combinations of I-axis and B-axis orientations.	X'0269..02'
Bytes 28-29	X'0000' - X'7FFF'	INITIAL I PRINT COORDINATE See p.27 "Notation Conventions"	X'026A..02'
Bytes 30-31	X'0000' - X'7FFF'	INITIAL B PRINT COORDINATE See p.27 "Notation Conventions"	X'026B..02'
Bytes 32-33	X'0000' - X'7FFF' X'FFFF'	INLINE MARGIN See p.27 "Notation Conventions" Printer Default	X'0210..01'
Bytes 34-35	X'0000' - X'7FFF' X'FFFF'	INTERCHARACTER ADJUSTMENT (+) See p.27 "Notation Conventions" Printer Default	X'0212..01'
Bytes 36-37		Reserved	
Bytes 38-39	X'0000' - X'7FFF' X'FFFF'	BASELINE INCREMENT See p.27 "Notation Conventions" Printer Default	X'0211..01'
Byte 40	X'00' - X'FE' X'FF'	LOCAL FONT ID Printer Default	

Data Area	Value	Description	Error Code
Bytes 41-42		TEXT COLOR	X'0258..03'
	X'0000' or X'FF00'	Printer Default (Black)	
	X'0001' or X'FF01'	Blue - Limited Simulated Color Support	
	X'0002' or X'FF02'	Red - Limited Simulated Color Support	
	X'0003' or X'FF03'	Pink - Limited Simulated Color Support	
	X'0004' or X'FF04'	Green - Limited Simulated Color Support	
	X'0005' or X'FF05'	Turquoise - Limited Simulated Color Support	
	X'0006' or X'FF06'	Yellow - Limited Simulated Color Support	
	X'0008'	Black	
	X'0010'	Brown - Limited Simulated Color Support	
	X'FF07'	Printer Default (Black)	
	X'FF08'	Color of Medium (Reset)	
X'FFFF'	Printer Default (Black)		

Data Area	Value	Description	Error Code
Bytes 43-end		<p>LPD Triplets</p> <ul style="list-style-type: none"> • Color Specification Triplet. This optional triplet can be placed at the end of the LPD command to specify the foreground color of the object area, before any object data is placed on the object area. Any number of LPD triplets can be received, they are processed in the order received and the resulting color of the object area depends on the last instance of the triplet received. See p.31 "Color Specification" for details. • Presentation Space Reset Mixing Triplet. This optional triplet can be placed at the end of the LPD command to specify whether or not an object area is reset to the color of medium before any object data is placed on the object area. Any number of LPD triplets can be received, they are processed in the order received and the resulting color of the object area depends on the last instance of the triplet received. See p.33 "Presentation Space Reset Mixing" for details. 	

Logical Page Position

This command defines the position on the physical sheet of paper where the logical page is to be placed.

Data Area	Value	Description	Error Code
Byte 0	X'00'	RESERVED	
Bytes 1-3	X'FF8000' - X'007FFF'	Xm OFFSET of the LOGICAL PAGE ORIGIN in L-Units See p.27 "Notation Conventions".	X'02A4..01' X'02AD..01'
Byte 4	X'00' X'10' X'11' X'20' X'21' X'30' X'31' X'40' X'41'	PAGE PLACEMENT Default placement Partition 1, front side Partition 1, back side Partition 2, front side Partition 2, back side Partition 3, front side Partition 3, back side Partition 4, front side Partition 4, back side	
Bytes 5-7	X'FF8000' - X'007FFF'	Ym OFFSET of the LOGICAL PAGE ORIGIN in L-Units See p.27 "Notation Conventions".	X'02A5..01' X'02AD..01'
Bytes 8-9	X'0000' X'2D00' X'5A00' X'8700'	PAGE ORIENTATION 0 degrees 90 degrees 180 degrees 270 degrees  Note <input type="checkbox"/> Explicit placement is supported.	

Presentation Fidelity Control

The Presentation Fidelity Control (PFC) command is only valid in home state and specifies the fidelity requirements for certain presentation functions. The desired fidelity for each supported presentation function can be specified with a triplet on the PFC command. The activate flag can be used to reset all fidelity controls to their default settings before activating the settings specified in the PFC triplets. A PFC command with no triplets and with the activate flag set to B'0' resets all fidelity controls to their default settings.

Data Area	Value	Description	Error Code
Byte 0	X'00'	RESERVED	
Byte 1	Bit 0 0 1 Bits 1-7 00000000000000	FLAGS ACTIVATE Reset to default fidelity controls and activate PFC triplets Just activate PFC triplets Reserved	
Bytes 2-3	X'0000'	Reserved	
Bytes 4-n		Triplets (Zero or more optional PFC triplets) X'86' Text Fidelity Control X'88' Finishing Fidelity Control	X'0254..05'

Text Fidelity Control

The Text Fidelity triplet specifies the exception continuation and reporting rules when an unrecognized or unsupported text control sequence is encountered.

Data Area	Value	Description	Error Code
Byte 0	X'07'	LENGTH	X'0254..51'
Byte 1	X'86'	Text Fidelity Triplet ID	
Byte 2	X'01' X'02'	CONTINUE Stop on Exception ID X'0200..01' Continue Processing Write Text Data	X'0254..52'
Byte 3	X'00'	Reserved	
Byte 4	X'01' X'02'	REPORT Report X'0200..01' Exception Do Not Report X'0200..01' Exception	X'0254..53'
Bytes 5-6	X'0000'	Reserved	

Finishing Fidelity Control

The Finishing Fidelity triplet specifies the exception continuation and reporting rules for finishing exceptions. This fidelity control applies when a request for a specific finishing operation cannot be satisfied.

Data Area	Value	Description	Error Code
Byte 0	X'07'	LENGTH	X'0254..51'
Byte 1	X'86'	Text Fidelity Triplet ID	
Byte 2	X'01' X'02'	CONTINUE Stop at first finishing exception Continue without the finishing operation	X'0254..52'
Byte 3	X'00'	Reserved	
Byte 4	X'01' X'02'	REPORT Report Finishing Exceptions Do Not Report Finishing Exceptions	X'0254..53'
Bytes 5-6	X'0000'	Reserved	

Sense Type and Model

Causes the printer to place into the Special Data Area of the Acknowledge Reply (See p.40 “Acknowledgement Reply”) a record containing type and model information and the functions the printer supports.

This command is effectively a NOP if the ARQ bit is NOT ON in the command header.

❖ Sense Type and Model


Special Data Area	Value	Description
Byte 0	X'FF'	Convention
Bytes 1-2	X'2707'	Product Code Aficio SP 4310N/5200DN/5210DN SP 4310N/5200DN/5210DN
	X'4028'	4028 Emulation (4028)
Byte 3	X'01'	Model Aficio SP 4310N, SP 4310N
	X'01'	Aficio SP 5200DN, SP 5200DN
	X'02'	Aficio SP 5210DN, SP 5210DN
	X'00'	4028 Emulation (Simplex)
	X'12'	4028 Emulation (Duplex)
Bytes 4-5	X'0000'	Reserved

Note

- To ascertain which machine type your model corresponds to, see p.3 “Machine Types”.


❖ Device-Control Command Set

Special Data Area	Value	Description
Bytes 0-1	X'nnnn'	VECTOR LENGTH
Bytes 2-3	X'C4C3'	DEVICE CONTROL Command-Set ID
Bytes 4-5	X'FF10'	DC1 Subset ID
Bytes 6-7	X'6001'	MULTIPLE COPY and COPY-SUBGROUP support in LCC
Bytes 8-9	X'6002'	Media-source-selection support in LCC
Bytes 10-11	X'6003'	Media-destination-selection support in LCC
Bytes 12-13	X'6101'	Explicit Page Placement and Orientation Support
Bytes 14-15	X'6201'	LOGICAL PAGE AND OBJECT AREA COLORING support
Bytes 16-17	X'7001'	MANAGE IPDS DIALOG (MID) Command support
Bytes 18-19	X'702E'	ACTIVATE RESOURCE Command support
Bytes 20-21	X'7034'	PRINT FIDELITY Command support
Bytes 22-23	X'8008'	XOA Order MARK FORM
Bytes 24-25	X'800A'	XOA Order ALTERNATE OFFSET STACKER
Bytes 26-27	X'80F2'	XOA Order DISCARD BUFFERED DATA
Bytes 28-29	X'80F4'	XOA Order REQUEST RESOURCE LIST
Bytes 30-31	X'80F6'	XOA Order EXCEPTION HANDLING CONTROL
Bytes 32-33	X'80F8'	XOA Order PRINT QUALITY CONTROL
Bytes 34-35	X'9001'	XOH Order PRINT BUFFERED DATA
Bytes 36-37	X'9003'	XOH Order SPECIFY GROUP OPERATION
Bytes 38-39	X'9004'	XOH Order DEFINE GROUP BOUNDARY
Bytes 40-41	X'9005'	XOH Order ERASE RESIDUAL PRINT DATA
Bytes 42-43	X'9007'	XOH Order ERASE RESIDUAL FONT DATA
Bytes 44-45	X'900D'	XOH Order STACK RECEIVED PAGES
Bytes 46-47	X'9013'	XOH Order EJECT to FRONT FACING
Bytes 48-49	X'9015'	XOH Order SELECT INPUT MEDIA SOURCE
Bytes 50-51	X'9016'	XOH Order SET MEDIA ORIGIN
Bytes 52-53	X'9017'	XOH Order SET MEDIA SIZE
Bytes 54-55	X'90F3'	XOH Order OBTAIN PRINTER CHARACTERISTICS
Bytes 56-57	X'90F5'	XOH Order PAGE COUNTERS CONTROL


Special Data Area	Value	Description
Bytes 58-59	X'F001'	END PERSISTENT NACK Without Leaving IPDS
Bytes 60-61	X'F200'	OBJECT DATE AND TIME STAMP TRIPLETS SUPPORTED
Bytes 62-63	X'F201'	ACTIVATION (AR) FAILED NACK SUPPORTED
Bytes 64-65	X'F202'	Font resolution and metric technology triplets supported
Bytes 66-67	X'F203'	Metric adjustment triplets supported in AR commands
Bytes 68-69	X'F204'	Data-object font support
Bytes 70-71	X'F601'	Position check highlighting support in XOA EHC
Bytes 72-73	X'F602'	Independent exception page print in XOA-EHC  Note <input type="checkbox"/> Independent Exception Page Print is only present in Native mode, not 4028 Emulation mode.
Bytes 74-75	X'F701' or X'F801' or X'F704' or X'F804'	SIMPLEX 1-UP supported in LCC SIMPLEX and DUPLEX 1-UP supported in LCC SIMPLEX 4-UP supported in LCC SIMPLEX and DUPLEX 4-UP supported in LCC
Bytes 76-77	X'FF01'	POSITION EXCEPTION SENSE FORMAT ^{*1}
Bytes 78-79	X'FB00'	All architected units of measure

^{*1} Independent Exception Page Print is only supported in Native mode.


❖ Presentation Text Command Set

Special Data Area	Value	Description
Bytes 0-1	X'000C'	VECTOR LENGTH
Bytes 2-3	X'D7E3'	PRESENTATION TEXT Command Set - TX1 Subset
Bytes 4-5	X'FF20' X'FF30'	PT2 Data PT3 Data
Bytes 6-7	X'1001'	UNORDERED TEXT
Bytes 8-9	X'4022'	COLOR of MEDIUM SUPPORTED LIMITED SIMULATED COLOR SUPPORTED  Note <input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.
Bytes 10-11	X'50FF'	8 TEXT ORIENTATIONS supported

❖ IM Image Command Set

Special Data Area	Value	Description
Bytes 0-1	X'000C'	VECTOR LENGTH
Bytes 2-3	X'C9D4'	IM IMAGE Command Set - IM1 Subset
Bytes 4-5	X'FF10'	IMD1 Data
Bytes 6-7	X'1001'	UNORDERED IMAGE BLOCKS
Bytes 8-9	X'4022'	COLOR of MEDIUM SUPPORTED LIMITED SIMULATED COLOR SUPPORTED  Note <input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.
Bytes 10-11	X'A004'	ALL 4 ORIENTATIONS Supported


❖ IO Image Command Set (IOCA FS10)

Special Data Area	Value	Description
Bytes 0-1	X'001E'	VECTOR LENGTH
Bytes 2-3	X'C9D6'	IO Image Command Set
Bytes 4-5	X'FF10'	IO/1 Level
Bytes 6-7	X'1001'	Unordered Image Blocks
Bytes 8-9	X'1202'	IO Image Objects Downloaded Resources in Home State
Bytes 10-11	X'4022'	COLOR of MEDIUM SUPPORTED LIMITED SIMULATED COLOR SUPPORTED  Note <input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.
Bytes 12-13	X'5001'	MMR Compression algorithm supported
Bytes 14-15	X'5003'	Uncompressed Image supported
Bytes 16-17	X'5006'	RL4 Compression supported
Bytes 18-19	X'5081'	G3 Facsimile Coding Scheme (CCITT G3MR)
Bytes 20-21	X'5082'	G4 Facsimile Coding Scheme (CCITT G4MMR)
Bytes 22-23	X'5101'	Bit ordering supported
Bytes 24-25	X'5505'	Multiple Image Content Supported
Bytes 26-27	X'A004'	All four orientations supported
Bytes 28-29	X'F300'	Replicate and Trim mapping supported
Bytes 30-31	X'F301'	Scale-to-fill mapping supported


 **Note**

- The Replicate and Trim Mapping Control Option is not supported when IPDS Print Mode = STD (Standard 300 dpi).


❖ IO Image Command Set (IOCA FS11)

Special Data Area	Value	Description
Bytes 0-1	X'0028'	VECTOR LENGTH
Bytes 2-3	X'C9D6'	IO Image Command Set
Bytes 4-5	X'FF11'	IO/1 Level
Bytes 6-7	X'1001'	Unordered Image Blocks
Bytes 8-9	X'1202'	IO Image Objects Downloaded Resources in Home State
Bytes 10-11	X'4003'	COLOR of MEDIUM SUPPORTED MULTIPLE-COLOR SUPPORTED
Bytes 12-13	X'4020'	LIMITED SIMULATED COLOR SUPPORTED
Bytes 14-15	X'4022'	COLOR of MEDIUM SUPPORTED LIMITED SIMULATED COLOR SUPPORTED  Note <input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.
Bytes 16-17	X'4401'	Extended IOCA Bi-level Image Color supported
Bytes 18-19	X'5001'	MMR Compression algorithm supported
Bytes 20-21	X'5003'	Uncompressed Image supported
Bytes 22-23	X'5008'	ABIC Compression supported
Bytes 24-25	X'500A'	Concatenated ABIC
Bytes 26-27	X'5082'	G4 Facsimile Coding Scheme (CCITT G4MMR)
Bytes 28-29	X'5083'	ISO/ITU-TSS JPEG supported
Bytes 30-31	X'5101'	Bit ordering supported
Bytes 32-33	X'5204'	Unpadded RIDIC Recording Algorithm supported
Bytes 34-35	X'5505'	Multiple Image Content supported
Bytes 36-37	X'A004'	All four orientations supported
Bytes 38-39	X'F301'	Scale-to-fill mapping supported


❖ IO Image Command Set (IOCA FS40)

Special Data Area	Value	Description
Bytes 0-1	X'0028'	VECTOR LENGTH
Bytes 2-3	X'C9D6'	IO Image Command Set
Bytes 4-5	X'FF40'	IO/1 Level
Bytes 6-7	X'1001'	Unordered Image Blocks
Bytes 8-9	X'1202'	IO Image Objects Downloaded Resources in Home State
Bytes 10-11	X'4003'	COLOR of MEDIUM SUPPORTED MULTIPLE-COLOR SUPPORTED
Bytes 12-13	X'4020'	LIMITED SIMULATED COLOR SUPPORTED
Bytes 14-15	X'4022'	COLOR of MEDIUM SUPPORTED LIMITED SIMULATED COLOR SUPPORTED  Note <input type="checkbox"/> p.28 "Color Simulation" for color simulation details and product support specifics.
Bytes 16-17	X'4401'	Extended IOCA Bi-level Image Color supported
Bytes 18-19	X'5001'	MMR Compression algorithm supported
Bytes 20-21	X'5003'	Uncompressed Image supported
Bytes 22-23	X'5008'	ABIC Compression supported
Bytes 24-25	X'5080'	G3 Facsimile Coding Scheme (CCITT G3MH)
Bytes 26-27	X'5081'	G3 Facsimile Coding Scheme (CCITT G3MR)
Bytes 28-29	X'5082'	G4 Facsimile Coding Scheme (CCITT G4MMR)
Bytes 30-31	X'5101'	Bit ordering supported
Bytes 32-33	X'5204'	Unpadded RIDIC Recording Algorithm supported
Bytes 34-35	X'5505'	Multiple image Content supported
Bytes 36-37	X'A004'	All four orientations supported
Bytes 38-39	X'F301'	Scale-to-fill mapping supported


❖ IO Image Command Set (IOCA FS42)

Special Data Area	Value	Description
Bytes 0-1	X'0024'	VECTOR LENGTH
Bytes 2-3	X'C9D6'	IO Image Command Set
Bytes 4-5	X'FF42'	IO/1 Level
Bytes 6-7	X'1001'	Unordered Image Blocks
Bytes 8-9	X'1202'	IO Image Objects Downloaded Resources in Home State
Bytes 10-11	X'4003'	COLOR of MEDIUM SUPPORTED MULTIPLE-COLOR SUPPORTED
Bytes 12-13	X'4020'	LIMITED SIMULATED COLOR SUPPORTED  Note <input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.
Bytes 14-15	X'4401'	Extended IOCA Bi-level Image Color SDF supported
Bytes 16-17	X'5001'	MMR Compression algorithm supported
Bytes 18-19	X'5003'	Uncompressed Image supported
Bytes 20-21	X'5008'	ABIC Compression supported
Bytes 22-23	X'5020'	Solid Fill Rectangle
Bytes 24-25	X'5082'	G4 Facsimile Coding Scheme (CCITT G4MMR)
Bytes 26-27	X'5101'	Bit ordering supported
Bytes 28-29	X'5204'	Unpadded RIDIC Recording Algorithm supported
Bytes 30-31	X'5505'	Multiple image content supported
Bytes 32-33	X'A004'	All four orientations supported
Bytes 34-35	X'F301'	Scale-to-fill mapping supported

❖ IO Image Command Set (IOCA FS45)

Special Data Area	Value	Description
Bytes 0-1	X'001C'	VECTOR LENGTH
Bytes 2-3	X'C9D6'	IO Image Command Set
Bytes 4-5	X'FF45'	IO/1 Level
Bytes 6-7	X'1001'	Unordered Image Blocks
Bytes 8-9	X'1202'	IO Image Objects Downloaded Resources in Home State
Bytes 10-11	X'4003'	COLOR of MEDIUM SUPPORTED MULTIPLE-COLOR SUPPORTED
Bytes 12-13	X'4020'	LIMITED SIMULATED COLOR SUPPORTED
Bytes 14-15	X'4022'	COLOR of MEDIUM SUPPORTED LIMITED SIMULATED COLOR SUPPORTED  Note <input type="checkbox"/> p.28 "Color Simulation" for color simulation details and product support specifics.
Bytes 16-17	X'4401'	Extended IOCA Bi-level Image Color supported
Bytes 18-19	X'5020'	Solid Fill Rectangle supported
Bytes 20-21	X'5101'	Bit ordering supported
Bytes 22-23	X'5505'	Multiple image Content supported
Bytes 24-25	X'A004'	All four orientations supported
Bytes 26-27	X'F301'	Scale-to-fill mapping supported

❖ Graphics Command Set

Special Data Area	Value	Description
Bytes 0-1	X'0012'	VECTOR LENGTH
Bytes 2-3	X'E5C7'	GRAPHICS Command Set - GR1 Subset
Bytes 4-5	X'FF20'	DR/2V0 Data
Bytes 6-7	X'1001'	UNORDERED GRAPHICS BLOCKS
Bytes 8-9	X'4022'	COLOR of MEDIUM SUPPORTED LIMITED SIMULATED COLOR SUPPORTED  Note <input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.
Bytes 10-11	X'4100'	Set Process Color Supported
Bytes 12-13	X'4101'	GOCA Box Drawing Supported
Bytes 14-15	X'4102'	Partial Arc Drawing Supported
Bytes 16-17	X'4106'	Set Fractional Line Width Supported
Bytes 18-19	X'A004'	All 4 orientations supported

❖ Page Segment Command Set

Special Data Area	Value	Description
Bytes 0-1	X'0008'	VECTOR LENGTH
Bytes 2-3	X'D7E2'	PAGE SEGMENT Command Set
Bytes 4-5	X'FF10'	PS1 Subset
Bytes 6-7	X'1101'	EXTENDED PAGE SEGMENT SUPPORT (32K)

❖ Overlay Command Set

Special Data Area	Value	Description
Bytes 0-1	X'000A'	VECTOR LENGTH
Bytes 2-3	X'D6D3'	OVERLAY Command Set
Bytes 4-5	X'FF10'	OL1 Subset
Bytes 6-7	X'1102'	EXTENDED OVERLAY SUPPORT (32K)
Bytes 8-9	X'1506'	OVERLAY NESTING = 6 Levels

❖ **Loaded Font Command Set (LF1) - Single Byte**

Special Data Area	Value	Description
Bytes 0-1	X'0010'	VECTOR LENGTH
Bytes 2-3	X'C3C6'	LOADED FONT Command Set
Bytes 4-5	X'FF10'	LF1 subset - fully described font + font index
Bytes 6-7	X'A004'	4 CHARACTER ROTATIONS (LFI command)
Bytes 8-9	X'B002'	LFI UNDERSCORE Width and Position USED
Bytes 10-11	X'C005'	BOUNDED BOX RASTER FONT TECHNOLOGY
Bytes 12-13	X'C100'	FIXED METRICS
Bytes 14-15	X'C101'	RELATIVE METRICS

❖ **Loaded Font Command Set (LF1) - Double Byte**

Special Data Area	Value	Description
Bytes 0-1	X'0012'	VECTOR LENGTH
Bytes 2-3	X'C3C6'	LOADED FONT Command Set
Bytes 4-5	X'FF10'	LF1 subset - fully described font + font index
Bytes 6-7	X'A004'	4 CHARACTER ROTATIONS (LFI command)
Bytes 8-9	X'B001'	Double-Byte coded fonts supported
Bytes 10-11	X'B002'	LFI UNDERSCORE Width and Position USED
Bytes 12-13	X'C005'	BOUNDED BOX RASTER FONT TECHNOLOGY
Bytes 14-15	X'C100'	FIXED METRICS
Bytes 16-17	X'C101'	RELATIVE METRICS


❖ **Loaded Font Command Set (LF3) - Single Byte**

Special Data Area	Value	Description
Bytes 0-1	X'0012'	VECTOR LENGTH
Bytes 2-3	X'C3C6'	LOADED FONT Command Set
Bytes 4-5	X'FF30'	LF3 subset - code page + font character set
Bytes 6-7	X'A004'	4 CHARACTER ROTATIONS (LFI command)
Bytes 8-9	X'B002'	LFI UNDERSCORE Width and Position USED
Bytes 10-11	X'B003'	GRID PARTS REQUIRED IN LFC, LFCSC and LCPC COMMANDS
Bytes 12-13	X'B004'	Default Character Parameters in LCPC Supported
Bytes 14-15	X'B005'	Extended (Unicode mapping) code page support
Bytes 16-17	X'C01F'	ADOBE TYPE-1 PFB OUTLINE FONT TECHNOLOGY
Bytes 18-19	X'C101'	RELATIVE METRICS

❖ **Loaded Font Command Set (LF3) - Double Byte**

Special Data Area	Value	Description
Bytes 0-1	X'0016'	VECTOR LENGTH
Bytes 2-3	X'C3C6'	LOADED FONT Command Set
Bytes 4-5	X'FF30'	LF3 subset - code page + font character set
Bytes 6-7	X'A004'	4 CHARACTER ROTATIONS (LFI command)
Bytes 8-9	X'B001'	Double-Byte coded fonts supported
Bytes 10-11	X'B002'	LFI UNDERSCORE Width and Position USED
Bytes 12-13	X'B003'	GRID PARTS REQUIRED IN LFC, LFCSC and LCPC COMMANDS
Bytes 14-15	X'B004'	Default Character Parameters in LCPC Supported
Bytes 16-17	X'B005'	Extended (Unicode mapping) code page support
Bytes 18-19	X'C01E'	CID-keyed OUTLINE FONT TECHNOLOGY
Bytes 20-21	X'C01F'	ADOBE TYPE-1 PFB OUTLINE FONT TECHNOLOGY
Bytes 22-23	X'C101'	RELATIVE METRICS

❖ **Bar Code Command Set**

Special Data Area	Value	Description
Bytes 0-1	X'000C'	VECTOR LENGTH
Bytes 2-3	X'C2C3'	BAR CODE Command Set - BC1 Subset
Bytes 4-5	X'FF10'	BCD1 Data
Bytes 6-7	X'1001'	UNORDERED BAR CODE BLOCKS
Bytes 8-9	X'4022'	COLOR of MEDIUM SUPPORTED LIMITED SIMULATED COLOR SUPPORTED  Note <input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.
Bytes 10-11	X'A004'	All four orientations supported

 **Note**

- See p.176 "Bar Code Type and Modifier Description and Values" for a list of supported Bar Code Types.

❖ **Object Container Command Set**

Special Data Area	Value	Description
Bytes 0-1	X'000A'	VECTOR LENGTH
Bytes 2-3	X'D6C3'	Object Container Command set - OC1 Subset
Bytes 4-5	X'0000'	No levels defined
Bytes 6-7	X'1201'	Data-object resource support
Bytes 8-9	X'F301'	Scale-to-fill mapping supported

Execute Order Any State (XOA)

This command identifies a set of subcommands which take effect immediately, regardless of the current printer operating state.

Each Execute Order Any state command consists of a two-byte order code followed by zero or more bytes of parameters.

XOA Mark Form

3

The MF order causes the printer to place two rectangular blocks of job separation marks on the current or the next sheet. One block is printed on the leading edge of the sheet and one block is printed on the trailing edge of the sheet.


If the MF order is included in a page that is part of a Load Copy Control copy group (See p.55 “Load Copy Control”) all the copies of the page will have a job separator mark included.

Data Area	Value	Description	Error Code
Bytes 0-1	X'0800'	MARK FORM	

XOA Exception Handling Control

The Exception-Handling Control command allows the host to control how the printer reports and processes exceptions. A data-stream exception exists when the printer detects an invalid or unsupported command, control, or parameter value.


Data Area	Value	Description	Error Code
Bytes 0-1	X'F600'	EXCEPTION HANDLING CONTROL (EHC)	
Byte 2	Bit 0: 0	Do not Report Undefined Character Check	
	Bit 0: 1	Report Undefined Character Check	
	Bit 1: 0	Do not Report Page Position Check	
	Bit 1: 1	Report Page Position Check	
	Bits 2-5: 00	Reserved	
	Bit 6: 0	Do not Highlight Position Checks	
	Bit 6: 1	Highlight Position Checks (08C1..00 and 0411..00)	
	Bit 7: 0	Do not Report All other Exceptions with AEA's	
	Bit 7: 1	Report All other Exceptions with AEA's	

Data Area	Value	Description	Error Code
Byte 3	Bits 0-6: 0	ALTERNATE EXCEPTION ACTIONS Reserved	
	Bit 7: 0	Take AEA (if defined)	
	Bit 7: 1	Don't take AEA	
Byte 4	Bits 0-5: 0	EXCEPTION PRESENTATION PROCESSING Reserved	
	Bit 6: 0	No Page Continuation	
	Bit 6: 1	Page Continuation Action (Independent Exception Page Print Supported) Discard Page	
	Bit 7: 0	Print to point of Exception	
	Bit 7: 1	(Process limits may apply)  Note <input type="checkbox"/> Independent Exception Page Print is only present in Native mode, not 4028 Emulation mode.	

XOA Request Resource List

This order causes the Resource List (See "Resource List Reply") to be placed in the Special Data Area of the Acknowledge Reply (See p.40 "Acknowledgement Reply") requested with this order. If the ARQ flag was not set for this XOA sub-command, it is treated as a NOP.

A Resource List Reply may consist of multiple entries. If the Resource List Reply contains an entry that does not fit in the space available in the Special Data Area of Acknowledge Reply, the printer will follow either the acknowledge continuation method or the RRL-continuation method, depending on the host, as described in Intelligent Printer Data Stream Reference.

Data Area	Value	Description	Error Code
Bytes 0-1	X'F400'	REQUEST RESOURCE LIST (RRL)	
Byte 2	X'05' X'00' or X'FF'	QUERY TYPE Resource Activation Status General Resource Status	X'0291..02'
Bytes 3-4	X'0000'-X'FFFF'	ENTRY CONTINUATION Indicator	
Byte 5	X'03'-X'xx'	ENTRY LENGTH  Note <input type="checkbox"/> Multiple-entry queries are not supported. Byte 5 indicates the length of the command.	X'0291..02'
Byte 6	X'01' X'02' X'03' X'04' X'05' X'06' X'07' X'08' X'09' X'10' X'11' X'12' X'41' X'42' X'40' X'FF'	RESOURCE TYPE Single Byte Coded Fonts Double-byte LF1-type Coded Fonts Double-byte LF1-type Coded Font Sections Page Segments Overlays Device Version Code Pages Font Character Sets Single-byte coded-font indexes Double-byte LF1-type Coded Font Section Indexes Coded Fonts (treated as RT 01) Graphic Character Sets supported in a font character set Specific Code Pages Data-object font Data-object font component Data Object Resource All Resources	X'0291..02'
Byte 7	X'00' X'03' X'09'	RESOURCE ID FORMAT Host-Assigned Resource ID IBM Registered Global Resource ID parts Object-OID	X'0291..02'
Bytes 8-n		RESOURCE IDENTIFIER	

- Multiple-entry queries are not supported. Byte 5 indicates the length of the command.
- If the entire resource list does not fit in the Special Data area of the Acknowledge Reply, continuation is necessary. The printer indicates continuation using the acknowledgement continuation bit in the flag byte of the Acknowledge Reply. If the host requests Acknowledgement continuation by sending a command with ARQ bit and the Continuation bit set, the printer will complete the RRL reply using Acknowledgement continuation. If the host requests RRL continuation (by sending an RRL command with non-zero value in bytes 3 and 4) the printer will use conventional RRL continuation to finish the reply. If the host requests both RRL and ACK continuation, the printer will default to RRL continuation.
- Bytes 8 and 9 are ignored when the resource type is ALL.
- Exception ID 0291..02 in bytes 6 and 7 are for invalid values. If either value is unsupported, then the query is not understood and the reply is a single entry that sets the resource type to zero, echoes other values, and sets the resource size to zero (not present).

❖ Resource List Reply

Data Area	Value	Description	Error Code
Byte 0	X'FF	UNORDERED LIST	
Byte 1	X'01'	END of LIST	
	X'04' - X'nn'	LENGTH of this ENTRY	
Byte 2	X'00'	RESOURCE TYPE Resource Size=0. The queried Resource Type, ID Format, or ID is unknown, unsupported, or inconsistent	
	X'01'	Single Byte Coded Font	
	X'02'	Double Byte Coded Fonts	
	X'03'	Double Byte Coded-font Sections	
	X'04'	Page Segment	
	X'05'	Overlay	
	X'06'	Device Version Code Pages	
	X'07'	Font Character Sets	
	X'08'	Single Byte Coded Font Index	
	X'09'	Double Byte Coded-font Section Indexes	
	X'11'	Graphic Character Sets supported in a font character set	
	X'12'	Specific Code Pages	
	X'41'	Data-object font	
	X'42'	Data-object font component	
	X'FF'	All Resources	

Data Area	Value	Description	Error Code
Byte 3	X'00' X'03'	RESOURCE ID FORMAT Host-Assigned Resource ID IBM Registered Global Resource ID parts	
Byte 4	X'00' X'01'	RESOURCE SIZE Indicator Resource not present Resource present	
Bytes 5-6	X'xxxx'	Resource ID	

- Bytes 2-6 repeat for each resource type.
- A query for a HARID that maps to a GCSGID/CPGID/FGID/FW combination which is not supported in the current configuration will result in a negative response (Reply Byte 4 = 0).
- See p.233 "Code Page and Font Identification" for a description of the supported GCSGID/CPGID/FGID/FW combinations.

Execute Order Home State (XOH)

Each Execute Order Homestate command consists of a two-byte order code followed by zero or more bytes of parameters.

XOH Obtain Printer Characteristics

This order causes a set of self-defined fields describing printer characteristics to be placed in the Special Data Area of the requested Acknowledge Reply and is identified with an acknowledgement type of X'46'. If the ARQ flag was not set on the XOH command containing this order, then this order is equivalent to a No Operation.

Data Area	Value	Description	Error Code
Bytes 0-1	X'F300'	OPC Order Code	


Printable Area Self-Defining Field

- The printer provides two modes that determine the specification of the Xm Offset, Ym Offset, Xm Extent and Ym Extent of the Printable Area.
 - Restricted (No Print Border) (Guaranteed Print Legibility) (Default)
 - Unrestricted (Edge-to-Edge Addressability)
- The Xm Extent and Ym Extent of the Printable Area parameters documented in the following table are representative of the standard printer source media configuration. These extents can be modified as a result of receiving a XOH-SMO command, as described in p.114 "XOH Set Media Origin".
- Actual tray capacities are determined media weight. The capacities in the following table are the maximum allowable.
- The machine supports media source tray numbering. Media source values in the printer's control panel OPC support tables represent the default settings when the printer is initially installed. An the menu mode is provided to allow customers to specify the source tray numbers to meet requirements of legacy applications. Example: customer might want to address the Manual Tray as tray 4 instead of the tray 100 (default).

Note

- For the tray in which "envelope" has been specified as the paper type, the tray values of the tray ID are (in ascending for each respective tray that is installed) as follows: X'8040', X'8041', etc. If a different paper type is specified for the tray, the tray values of the tray ID are (in ascending for each respective tray that is installed) as follows: X'8000', X'8001', etc. In regards to the bypass tray and default tray, even if you specify "envelope" as the paper type, the tray value will not be changed.
- To ascertain which machine type your model corresponds to, see p.3 "Machine Types".

Special Data Area	Value	Description
Bytes 0-1	X'0018' or	LENGTH of this Self-Defining Field
	X'0024' or	Machine with NO Media OID
	X'0025' or	Machine with Single Media OID
	X'0026' or	Machine with Double Media OID
	X'0027' or	Machine with Triple Media OID
	X'nnnn'	Machine with Quadruple Media OID
Machine with Media Name		
Bytes 2-3	X'0001'	PRINTABLE AREA Self-Defining Field ID
Byte 4		INPUT MEDIA SOURCE (See Notes)
	X'00'	Tray 1
	X'01'	Tray 2* (Machine type: Type 1)
	X'40'	Tray 1 + Tray 2 + Bypass tray
	X'01'	Tray 1 + Envelope feeder tray 2 + Bypass tray
	X'40'	Tray 1 + Tray 2 + Tray 3 + Bypass tray
	X'01'	Tray 1 + Envelope feeder tray 2 + Tray 3 + Bypass tray
	X'01'	Tray 1 + Tray 2 + Envelope feeder tray 3 + Bypass tray
	X'40'	Tray 1 + Envelope feeder tray 2 + Envelope feeder tray 3 + Bypass tray
	X'01'	Tray 2 (Machine type: Type 2 or Type 3)
	X'02'	Tray 3* (Machine type: Type 1)
	X'01'	Tray 1 + Tray 2 + Tray 3 + Bypass tray
	X'40'	Tray 1 + Envelope feeder tray 2 + Tray 3 + Bypass tray
	X'41'	Tray 1 + Tray 2 + Envelope feeder tray 3 + Bypass tray
	X'41'	Tray 1 + Envelope feeder tray 2 + Envelope feeder tray 3 + Bypass tray
	X'02'	Tray 3 (Machine type: Type 2 or Type 3)
X'03'	Tray 4 (Machine type: Type 2 or Type 3)	
X'04'	Tray 5 (Machine type: Type 2 or Type 3)	
X'63'	Bypass tray	
X'FF'	Default Tray	
Byte 5	X'00'	Reserved
Byte 6	X'00'	UNIT BASE 10 in.
Byte 7	X'00'	Reserved

Special Data Area	Value	Description
Bytes 8-9	X'3840'	L-units per UNIT BASE
Bytes 10-11	X'0001' - X'xxxx'	WIDTH of the Medium Presentation Space in L-units (determined by configuration)
Bytes 12-13	X'0001' - X'xxxx'	LENGTH of the Medium Presentation Space in L-units (determined by configuration)
Bytes 14-15	X'00E3' X'0000'	Xm OFFSET of the Printable Area in L-Units Restricted (4mm) Unrestricted (0mm)
Bytes 16-17	X'00E3' X'0000'	Ym OFFSET of the Printable Area in L-units Restricted (4mm) Unrestricted (0mm)  Note <input type="checkbox"/> For A4 media there is special processing with respect to reporting the Xm OFFSET and subsequently the Xm EXTENT of the printable area. The 4028 printer used an offset of 3.386 mm for A4 paper (short edge) instead of 4 mm. This was done as a customer satisfaction issue to allow a printable area 8 in. wide.
Bytes 18-19 (Restricted: No Print Border)		Xm EXTENT of the Printable Area in L-units
	X'1D2A' X'2702' X'2B3A' X'2E0A' X'30DA' X'2B3A' X'2CA2' X'2E0A' X'2E0A' X'367A' X'367A' X'3C1A' X'3C1A'	Paper Statement (5.185 in.) Executive (6.935 in.) 8in. × 10in. (7.685 in.) Letter (8.185 in.) Letter Tabstock (8.685 in.) 8in. × 13in. (7.685 in.) 8.25in. × 13in. (7.935 in.) 8.5 × 13 in. (8.185 in.) Legal (8.185 in.) 10in. × 14in. (9.685 in.) 10in. × 15in. (9.685 in.) 11in. × 14in. (10.685 in.) 11in. × 15in. (10.685 in.)

Special Data Area	Value	Description
	X'3C1A'	Ledger (10.685 in.)
	X'41BA'	12in. × 18in. (11.685 in.)
	X'157B'	A6 (97 mm)
	X'1A93'	B6 (120 mm)
	X'1F1D'	A5 (140.5 mm)
	X'23E0'	170 × 210mm (162 mm)
	X'2689'	182 × 210mm (174 mm)
	X'2CBC'	210 × 340mm (202 mm)
	X'2688'	B5 (JIS) (174 mm)
	X'2CBC'	A4 (202 mm)
	X'2F86'	A4 Tabstock (214.6 mm)
	X'3724'	B4 (ISO) (249 mm)
	X'395C'	8 Kai (259 mm)
	X'296A'	16 Kai (187 mm)
	X'4000'	A3 (289 mm)
	X'145F' - X'474F'	Custom (92 mm to 322 mm)
X'2E0A'		Letter (8.185 in.)
	X'2CBC'	A4 (202 mm)
Bytes 18-19 (Unrestricted: Edge-to-Edge Addressability)		Xm EXTENT of the Printable Area in L-units
		Paper
	X'1EF0'	Statement (5.5 in.)
	X'28C8'	Executive (7.25 in.)
	X'2D00'	8in. × 10in. (8 in.)
	X'2FD0'	Letter (8.5 in.)
	X'32A0'	Letter Tabstock (9 in.)
	X'2D00'	8in. × 13in. (8 in.)
	X'2E68'	8.25in. × 13in. (8.25 in.)
	X'2FD0'	8.5in. × 13in. (8.5 in.)
	X'2FD0'	Legal (8.5 in.)
	X'3840'	10in. × 14in. (10 in.)
	X'3840'	10in. × 15in. (10 in.)
	X'3DE0'	11in. × 14in. (11 in.)
	X'3DE0'	11in. × 15in. (11 in.)
X'3DE0'	Ledger (11 in.)	

Special Data Area	Value	Description
	X'4380'	12in. × 18in. (12 in.)
	X'1741'	A6 (105 mm)
	X'1C59'	B6 (128 mm)
	X'20E3'	A5 (148.5 mm)
	X'25A6'	170 × 210mm (170 mm)
	X'284E'	182 × 210mm (182 mm)
	X'2E82'	210 × 340mm (210 mm)
	X'284E'	B5 (JIS) (182 mm)
	X'2E82'	A4 (210 mm)
	X'314C'	A4 Tabstock (222.6 mm)
	X'38EA'	B4 (ISO) (257 mm)
	X'3B21'	8 Kai (267 mm)
	X'2B30'	16 Kai (195 mm)
	X'41C6'	A3 (297 mm)
	X'1625' - X'4914'	Custom (100 mm to 330 mm)
		Transparencies/Labels
	X'2FD0'	Letter (8.5 in.)
	X'2E82'	A4 (210 mm)
Bytes 20-21 (Restricted: No Print Border)		Ym EXTENT of the Printable Area in L-units
		Paper
	X'2E0A'	Statement (8.185 in.)
	X'394A'	Executive (10.185 in.)
	X'367A'	8in. × 10in. (9.685 in.)
	X'394A'	8in. × 10.5in. (10.185 in.)
	X'3C1A'	Letter (10.685 in.)
	X'3C1A'	Letter Tabstock (10.685 in.)
	X'475A'	8in. × 13in. (12.685 in.)
	X'475A'	8.25in. × 13in. (12.685 in.)
	X'475A'	8.5in. × 13in. (12.685 in.)
	X'4CFA'	Legal (13.685 in.)
	X'4CFA'	10in. × 14in. (13.685 in.)
	X'529A'	10in. × 15in. (14.685 in.)
	X'4CFA'	11in. × 14in. (13.685 in.)
	X'529A'	11in. × 15in. (14.685 in.)
	X'5DDA'	Ledger (16.685 in.)

Special Data Area	Value	Description
	X'637A'	12in. × 18in. (17.685 in.)
	X'1F1D'	A6 (140.5 mm)
	X'2689'	B6 (174 mm)
	X'2CBC'	A5 (202 mm)
	X'2CBC'	170 × 210mm (202 mm)
	X'2CBC'	182 × 210mm (202 mm)
	X'4986'	210 × 340mm (332 mm)
	X'3724'	B5 (JIS) (249 mm)
	X'4000'	A4 (289 mm)
	X'4000'	A4 Tabstock (289 mm)
	X'4ED6'	B4 (ISO) (356 mm)
	X'5499'	8 Kai (382 mm)
	X'395C'	16 Kai (259 mm)
	X'5B3D'	A3 (412 mm)
	X'1D02 - 63A8'	Custom (131 mm to 450 mm)
		Transparencies/Labels
	X'3C1A'	Letter (10.685 in.)
	X'4000'	A4 (289 mm)
Bytes 20-21(Unrestricted: Edge-to-Edge Addressability)		Ym EXTENT of the Printable Area in L-units
		Paper
	X'2FD0'	Statement (8.5 in.)
	X'3B10'	Executive (10.5 in.)
	X'3840'	8in. × 10in. (10 in.)
	X'3DE0'	Letter (11 in.)
	X'3DE0'	Letter Tabstock (11 in.)
	X'4920'	8in. × 13in. (13 in.)
	X'4920'	8.25in. × 13in. (13 in.)
	X'4920'	8.5in. × 13in. (13 in.)
	X'4EC0'	Legal (14 in.)
	X'4EC0'	10in. × 14in. (14 in.)
	X'5460'	10in. × 15in. (15 in.)
	X'4EC0'	11in. × 14in. (14 in.)
	X'5460'	11in. × 15in. (15 in.)
	X'5FA0'	Ledger (17 in.)
	X'20C7'	12in. × 18in. (18 in.)

Special Data Area	Value	Description
	X'20E3'	A6 (148.5 mm)
	X'284E'	B6 (182 mm)
	X'2E82'	A5 (210 mm)
	X'2E82'	170 × 210mm (210 mm)
	X'2E82'	182 × 210mm (210 mm)
	X'4B4C'	210 × 340mm (340 mm)
	X'38EA'	B5 (JIS) (257 mm)
	X'41C6'	A4 (297 mm)
	X'41C6'	A4 Tabstock (297 mm)
	X'509C'	B4 (ISO) (364 mm)
	X'565F'	8 Kai (390 mm)
	X'3B21'	16 Kai (267 mm)
	X'5D03'	A3 (420 mm)
	X'1EC8 - 656D'	Custom (139 mm to 458 mm)
		Transparencies/Labels
	X'3DE0'	Letter (11 in.)
	X'41C6'	A4 (297 mm)
Bytes 22-23		INPUT MEDIA SOURCE CHARACTERISTICS
	Bit 0: 0/1	0 = No Duplex; 1 = Duplex
	Bits 1-2: 10	10 = Cut Sheet Media
	Bit 3: 1	0 = Tray Not Available; 1 = Tray Available
	Bit 4: 0	0 = Reserved
	Bit 5: 0/1	0 = No Envelopes; 1 = Auto or Manual Envelope Feature
	Bit 6: 0/1	0 = Auto Media Feed; 1 = Manual Media Feed
	Bit 7: 0	0 = No Computer Output on Microfilm (COM)
	Bit 8: 0	0 = No Carrier Strips (Ignored for Cut Sheet Media)
	Bit 9: 0/1	0 = Not an Inserter Bin; 1 = Inserter Bin
	Bits 10-15:all 0	Reserved

Special Data Area	Value	Description
Bytes 24-25	X'000C' or X'000D' or X'000E' or X'000F'	Input Media ID LENGTH (Note 3) Machine with Single OID byte Machine with Double OID byte Machine with Triple OID byte Machine with Quadruple OID byte
Byte 26	X'10'	INPUT MEDIA ID Type MO:DCA Input Media Type OID
Byte 27	X'06'	OID Encoding
Byte 28	X'07' or X'08' or X'09' or X'0A'	OID LENGTH Machine with Single OID byte Machine with Double OID bytes Machine with Triple OID bytes Machine with Quadruple OID bytes
Bytes 29-34	X'2B1200040301'	Input Media ID (Common Part)
Bytes 35-36	X'45' X'41' X'8120' X'32' X'33' X'34' X'8111' No OID Returned No OID Returned X'3F' X'3C' X'3D' No OID Returned No OID Returned No OID Returned No OID Returned X'43' X'9B' No OID Returned	Input Media ID (Media Specific Part) Paper Statement (69) Executive (65) 8in. × 10in. (160) Letter (50) Letter Colored (51) Letter Transparent (52) Letter Tabstock (9×11) (145) 8in. × 13in. 8.25in. × 13in. 8.5in. × 13in. (63) Legal (60) Legal Colored (61) 10in. × 14in. 10in. × 15in. 11in. × 14in. 11in. × 15in. Ledger (67) 12in. × 18in. (155) A6

Special Data Area	Value	Description
	No OID Returned	B6
	X'14'	A5 (20)
	X'15'	A5 Colored (21)
	No OID Returned	170 × 210mm
	No OID Returned	182 × 210mm
	No OID Returned	210 × 340mm
	X'2B'	B5 (JIS) (43)
	X'00'	A4 (0)
	X'01'	A4 Colored (1)
	X'02'	A4 Transparent (2)
	X'07'	A4 Tabstock (7)
	X'1E'	B4 (ISO) (30)
	X'1F'	B4 Colored (ISO) (31)
	No OID Returned	8 Kai
	No OID Returned	16 Kai
	X'0A'	A3 (10)
	X'0B'	A3 Colored (11)
	No OID Returned	Custom
Bytes 37-38	X'0004' - X'0013'	Input Media ID LENGTH (Note 4)
Byte 39	X'00'	Input Media ID TYPE User Defined Name
Bytes 40-end	X'4C6574746572'(ie. Letter)	Input Media ID (Form Name) (1 to 16 Byte Form Name)

* Available values vary depending on the installed option.

- In the OPC Acknowledge Reply, the Printable Area SDF repeats for every installed Media Source. Therefore, since printers are capable of supporting multiple installed input trays, multiple Printable Area SDF's may be returned in a single XOH-OPC Acknowledge Reply.
- The Input Media Source Characteristics (Bit 0), of the Printable Area SDF indicates the duplex ability of a given media source. See "Media Source and Destination Support Matrices", for specific details on media duplex ability.
- Input Media ID type X'06' - Media OID is only returned if a particular media has a registered MO:DCA Media Type OID.
- Input Media ID type X'00' - User Defined Name is only returned if the user defines a Form, assigns a Form Name to the Form and associates that Form with a given Input Media Source tray.

Image and Coded Font Resolution Self-Defining Field

Special Data Area	Value	Description
Bytes 0-1	X'000A'	LENGTH of this Self-Defining Field
Bytes 2-3	X'0003'	IMAGE and CODED FONT RESOLUTION Self-Defining Field
Byte 4	X'00'	UNIT BASE 10 inches
Byte 5		FONT RESOLUTIONS
	X'00'	Resolution Acceptance Mode (Only value in bytes 6-9)
	X'FF'	Resolution Independence Mode (Bytes 6-9 specify highest resolution) (240 DPI or 300 DPI or 600 DPI)
Bytes 6-7		X PIXELS per Unit Base
	X'0960'	2400 pixels/10 inches
	X'0BB8'	3000 pixels/10 inches
	X'1770'	6000 pixels/10 inches
Bytes 8-9		Y PIXELS per Unit Base
	X'0960'	2400 pixels/10 inches
	X'0BB8'	3000 pixels/10 inches
	X'1770'	6000 pixels/10 inches

- Value for byte 5 is controlled by the [Resolution] setting in the IPDS menu. Byte 5 will indicate Resolution Acceptance mode X'00' if the IPDS Resolution setting is 240, 300 or 600 DPI. Byte 5 will indicate Resolution Independence mode X'FF' if the IPDS Resolution setting is Auto.
- Values for bytes 6-9 are controlled by the setting of byte 5 (Font Resolutions). If byte 5 indicates Resolution Acceptance mode X'00', bytes 6-9 reflect the [Resolution] setting in the IPDS menu. If byte 5 indicates Resolution Independence mode X'FF', bytes 6-9 reflect the [Print Mode] setting in the IPDS menu. Note that the resolutions specified also apply to GOCA image if the image resolution specified in the GDD command is X'0000', indicating that no explicit GOCA image resolution was specified.
- If the [Print Mode] = STD (Standard 300 DPI), then the [Resolution] setting is ignored. Byte 5 will indicate Resolution Acceptance mode X'00' and bytes 6-9 will reflect the IPDS Print Mode setting (300 DPI).
- For the printer to specify IPDS Resolution support of 240, 600, or AUTO, the IPDS Print Mode must be set to Enhanced (PRINT MODE = ENH on the IPDS Menu). In enhanced print mode, complex (full page) image jobs may not yield optimal print performance due to the increased print fidelity required to accurately render 240 and 600 DPI print objects.

Storage Pools Self-Defining Field - Single Byte

Special Data Area	Value	Description
Bytes 0-1	X'0033'	VECTOR LENGTH
Bytes 2-3	X'0004'	STORAGE POOLS Self-Defining Field
Byte 4	X'2F'	LENGTH of each Storage Pool Self-Defining Field
Byte 5	X'01'	Triplet ID
Byte 6	X'00'	STORAGE POOL ID
Bytes 7-10	X'nnnnnnnn'	Storage pool varies based on installed memory and features
Bytes 11-14	X'00000000'	Reserved
Bytes 15-16	X'0011'	PAGE GRAPHICS Data
Bytes 17-18	X'0012'	PAGE IMAGE Data
Bytes 19-20	X'0013'	PAGE TEXT Data
Bytes 21-22	X'0014'	PAGE BAR CODE Data
Bytes 23-24	X'0021'	OVERLAY GRAPHICS Data
Bytes 25-26	X'0022'	OVERLAY IMAGE Data
Bytes 27-28	X'0023'	OVERLAY TEXT Data
Bytes 29-30	X'0024'	OVERLAY BAR CODE Data
Bytes 31-32	X'0031'	PAGE SEGMENT GRAPHICS Data
Bytes 33-34	X'0032'	PAGE SEGMENT IMAGE Data
Bytes 35-36	X'0033'	PAGE SEGMENT TEXT Data
Bytes 37-38	X'0034'	PAGE SEGMENT BAR CODE Data
Bytes 39-40	X'0040'	Single-Byte CODED FONT Index Tables
Bytes 41-42	X'0041'	Single-Byte CODED FONT Descriptors
Bytes 43-44	X'0042'	Single-Byte CODED FONT Patterns
Bytes 45-46	X'0050'	CODE PAGES
Bytes 47-48	X'0060'	FONT CHARACTER SETS
Bytes 49-50	X'0070'	CODED FONTS

Storage Pools Self-Defining Field - Double Byte

Special Data Area	Value	Description
Bytes 0-1	X'0039'	VECTOR LENGTH
Bytes 2-3	X'0004'	STORAGE POOLS Self-Defining Field
Byte 4	X'35'	LENGTH of each Storage Pool Self-Defining Field
Byte 5	X'01'	Triplet ID
Byte 6	X'00'	STORAGE POOL ID
Bytes 7-10	X'nnnnnnnn'	Storage pool varies based on installed memory and features
Bytes 11-14	X'00000000'	Reserved
Bytes 15-16	X'0011'	PAGE GRAPHICS Data
Bytes 17-18	X'0012'	PAGE IMAGE Data
Bytes 19-20	X'0013'	PAGE TEXT Data
Bytes 21-22	X'0014'	PAGE BAR CODE Data
Bytes 23-24	X'0021'	OVERLAY GRAPHICS Data
Bytes 25-26	X'0022'	OVERLAY IMAGE Data
Bytes 27-28	X'0023'	OVERLAY TEXT Data
Bytes 29-30	X'0024'	OVERLAY BAR CODE Data
Bytes 31-32	X'0031'	PAGE SEGMENT GRAPHICS Data
Bytes 33-34	X'0032'	PAGE SEGMENT IMAGE Data
Bytes 35-36	X'0033'	PAGE SEGMENT TEXT Data
Bytes 37-38	X'0034'	PAGE SEGMENT BAR CODE Data
Bytes 39-40	X'0040'	Single-Byte CODED FONT Index Tables
Bytes 41-42	X'0041'	Single-Byte CODED FONT Descriptors
Bytes 43-44	X'0042'	Single-Byte CODED FONT Patterns
Bytes 45-46	X'0048'	Double-Byte CODED FONT Index Tables
Bytes 47-48	X'0049'	Double-Byte CODED FONT Descriptors
Bytes 49-50	X'004A'	Double-Byte CODED FONT Patterns
Bytes 51-52	X'0050'	CODE PAGES
Bytes 53-54	X'0060'	FONT CHARACTER SETS
Bytes 55-56	X'0070'	CODED FONTS

Color Support Self-Defining Field

Special Data Area	Value	Description
Bytes 0-1	X'0006'	LENGTH of this Self-Defining Field
Bytes 2-3	X'0005'	COLOR SUPPORT Self-Defining Field
Bytes 4-5	X'0008'	BLACK

Installed Features Self-Defining Field

Since printers are capable of supporting multiple features, multiple configuration combinations are possible. All installable features are described below.


Special Data Area	Value	Description
Bytes 0-1	X'000A'	LENGTH of this Self Defining Field
Bytes 2-3	X'0006'	INSTALLED FEATURES Self Defining Field
Bytes 4-5	X'0100'	DUPLEX
Bytes 6-7	X'0300'	CUT SHEET Output
Bytes 8-9	X'0600'	OFFSET STACKER
Bytes 10-11	X'0700'	Envelopes
Bytes 12-13	X'0800'	MICR (If MICR Enabled)

Available Features Self-Defining Field


Since printers are capable of supporting multiple features, multiple configuration combinations are possible. All available features are described below.

Special Data Area	Value	Description
Bytes 0-1	X'000A'	LENGTH of this Self Defining Field
Bytes 2-3	X'0007'	AVAILABLE FEATURES Self Defining Field
Bytes 4-5	X'0100'	DUPLEX
Bytes 6-7	X'0300'	CUT SHEET Output
Bytes 8-9	X'0600'	OFFSET STACKER
Bytes 10-11	X'0700'	Envelopes
Bytes 12-13	X'0800'	MICR (If MICR Enabled)

RRL Resource Type and ID Format Self-Defining Field - Single Byte


Special Data Area	Value	Description
Bytes 0-1	X'002C'	VECTOR LENGTH
Bytes 2-3	X'000A'	RRL RESOURCE TYPE Self  Note <input type="checkbox"/> RRL query combinations that receive a non-zero Resource Type reply (See p.87 "XOA Request Resource List")
Bytes 4-5	X'0100'	Single-Byte Coded Fonts as Host Assigned Resource ID
Bytes 6-7	X'0103'	Single-Byte Coded Fonts as IBM Global Resource ID
Bytes 8-9	X'0400'	Page Segments as Host Assigned Resource ID
Bytes 10-11	X'0500'	Overlays as Host Assigned Resource ID
Bytes 12-13	X'0600'	Device Version Code Pages as Host Assigned Resource ID
Bytes 14-15	X'0603'	Device Version Code Pages as IBM Global Resource ID
Bytes 16-17	X'0700'	Font Character Set as Host Assigned Resource ID
Bytes 18-19	X'0703'	Font Character Set as IBM Global Resource ID
Bytes 20-21	X'0800'	Single-Byte Coded Font Index as Host Assigned Resource ID
Bytes 22-23	X'1000'	Coded Fonts as Host Assigned Resource ID
Bytes 24-25	X'1003'	Coded Fonts as IBM Global Resource ID
Bytes 26-27	X'1103'	Graphic Character Sets/Subsets as IBM Global Resource ID
Bytes 28-29	X'1200'	Specific Code Pages as Host Assigned Resource ID
Bytes 30-31	X'1203'	Specific Code Pages as IBM Global Resource ID
Bytes 32-33	X'FF00'	All Resources as Host Assigned Resource ID

RRL Resource Type and ID Format Self-Defining Field - Double Byte

Special Data Area	Value	Description
Bytes 0-1	X'0034'	VECTOR LENGTH
Bytes 2-3	X'000A'	RRL RESOURCE TYPE Self  Note <input type="checkbox"/> RRL query combinations that receive a non-zero Resource Type reply (See p.87 "XOA Request Resource List")
Bytes 4-5	X'0100'	Single-Byte Coded Fonts as Host Assigned Resource ID
Bytes 6-7	X'0103'	Single-Byte Coded Fonts as IBM Global Resource ID
Bytes 8-9	X'0200'	Double-Byte Coded LF1 Fonts as Host Assigned Resource ID
Bytes 10-11	X'0203'	Double-Byte Coded LF1 Fonts as IBM Global Resource ID
Bytes 12-13	X'0300'	Double-Byte Coded LF1 Font Sect as Host Assigned Resource ID
Bytes 14-15	X'0400'	Page Segments as Host Assigned Resource ID
Bytes 16-17	X'0500'	Overlays as Host Assigned Resource ID
Bytes 18-19	X'0600	Device Version Code Pages as Host Assigned Resource ID
Bytes 20-21	X'0603'	Device Version Code Pages as IBM Global Resource ID
Bytes 22-23	X'0700'	Font Character Set as Host Assigned Resource ID
Bytes 24-25	X'0703'	Font Character Set as IBM Global Resource ID
Bytes 26-27	X'0800'	Single-Byte Coded Font Index as Host Assigned Resource ID
Bytes 28-29	X'0900'	Double-Byte Coded Font Sect Index as Host Assigned Resource ID
Bytes 30-31	X'1000'	Coded Fonts as Host Assigned Resource ID
Bytes 32-33	X'1003'	Coded Fonts as IBM Global Resource ID
Bytes 34-35	X'1103'	Graphic Character Sets/Subsets as IBM Global Resource ID
Bytes 36-37	X'1200'	Specific Code Pages as Host Assigned Resource ID
Bytes 38-39	X'1203'	Specific Code Pages as IBM Global Resource ID


Special Data Area	Value	Description
Bytes 40-41	X'4000'	Data object resource as Host Assigned Resource ID
Bytes 42-43	X'4009'	Data object resource with Object-OID Format
Bytes 44-45	X'4100'	Data-object Font as Host Assigned Resource ID
Bytes 46-47	X'4200'	Data-object Font Components as Host Assigned Resource ID
Bytes 48-49	X'4209'	Data-object Font Components with Object-OID Format
Bytes 50-51	X'FF00'	All Resources as Host Assigned Resource ID

Activate Resource RT and ID Format Self-Defining Field - Single Byte

Special Data Area	Value	Description
Bytes 0-1	X'001A'	VECTOR LENGTH
Bytes 2-3	X'000B'	RRL RESOURCE TYPE Self  Note <input type="checkbox"/> RRL query combinations that receive a non-zero Resource Type reply (See p.87 "XOA Request Resource List")
Bytes 4-5	X'0103'	Single-Byte Coded LF1 Fonts with IBM Global Resource IDs
Bytes 6-7	X'0106'	Single-Byte Coded LF1 Fonts with MVS Host Unalterable Remote Font Environment
Bytes 8-9	X'0603'	Code Pages with IBM Global Resource IDs
Bytes 10-11	X'0703'	Font Character Sets with IBM Global Resource IDs
Bytes 12-13	X'0803'	Single-Byte Coded LF1 Font Index as IBM Global Resource ID
Bytes 14-15	X'0806'	Single-Byte Coded LF1 Fonts Index as MVS Host Unalterable
Bytes 16-17	X'1003'	Single-Byte/Double-Byte Coded Fonts with IBM Global Resource IDs
Bytes 18-19	X'1007'	Single-Byte/Double-Byte Coded Fonts with Coded Font Format
Bytes 20-21	X'4009'	Data object resource with Object-OID Format
Bytes 22-23	X'410A'	Data-object Font with Data-object Font Format

Special Data Area	Value	Description
Bytes 24-25	X'4209'	Data-object Font Components with Object-OID Format

Activate Resource RT and ID Format Self-Defining Field - Double Byte

Special Data Area	Value	Description
Bytes 0-1	X'0022'	VECTOR LENGTH
Bytes 2-3	X'000B'	RRL RESOURCE TYPE Self  Note <input type="checkbox"/> RRL query combinations that receive a non-zero Resource Type reply (See p.87 "XOA Request Resource List")
Bytes 4-5	X'0103'	Single-Byte Coded LF1 Fonts with IBM Global Resource IDs
Bytes 6-7	X'0106'	Single-Byte Coded LF1 Fonts with MVS Host Unalterable Remote Font Environment
Bytes 8-9	X'0303'	Double-Byte Coded LF1 Font Secs with IBM Global Resource IDs
Bytes 10-11	X'0306'	Double-Byte Coded LF1 Font Secs with MVS Host Unalterable Remote Font Environment
Bytes 12-13	X'0603'	Code Pages with IBM Global Resource IDs
Bytes 14-15	X'0703'	Font Character Sets with IBM Global Resource IDs
Bytes 16-17	X'0803'	Single-Byte Coded LF1 Fonts Index as IBM Global Resource ID
Bytes 18-19	X'0806'	Single-Byte Coded LF1 Font Index as MVS Host Unalterable
Bytes 20-21	X'0903'	Double-Byte Coded LF1 Font Secs Index with IBM Global Resource ID
Bytes 22-23	X'0906'	Double-Byte Coded LF1 Font Secs with MVS Host Unalterable RMTFE
Bytes 24-25	X'1003'	Single-Byte/Double-Byte Coded Fonts with IBM Global Resource IDs
Bytes 26-27	X'1007'	Single-Byte/Double-Byte Coded Fonts with Coded Font Format
Bytes 28-29	X'4009'	Data object resource with Object-OID Format
Bytes 30-31	X'410A'	Data-object Font with Data-object Font Format
Bytes 32-33	X'4209'	Data-object Font Components with Object-OID Format

Bar Code Type Self-Defining Field ID

Special Data Area	Value	Description
Bytes 0-1	X'0013'	VECTOR LENGTH
Bytes 2-3	X'000E'	BAR CODE TYPE Self Defining Field
Byte 4	X'0D'	CODABAR Modifier Byte Options X'01' and X'02'
Byte 5	X'11'	CODE 128 Modifier Byte Option X'02'
Byte 6	X'18'	POSTNET Modifier Byte Options X'00' - X'03'
Byte 7	X'1A'	RM4SCC Modifier Byte Option X'00'
Byte 8	X'1B'	Japan Postal Bar code Modifier Byte Options X'00' and '01'
Byte 9	X'1C'	Data Matrix 2D Bar Code Modifier Byte Option X'00'
Byte 10	X'1D'	MaxiCode 2D Bar Code Modifier Byte Option X'00'
Byte 11	X'1E'	PDF417 2D Bar Code Modifier Byte Options X'00' and X'01'
Byte 12	X'1F'	Australia Post Bar Code Modifier Byte Options X'01' - X'08'
Byte 13	X'9A'	Rm4scc Modifier byte option X'01'
Byte 14	X'20'	QR Code 2D Bar Code Modifier Byte Option X'02'
Byte 15	X'21'	Code 93 Modifier Byte Option X'00'
Byte 16	X'91'	Code 128 Modifier Byte Option X'03'
Byte 17	X'98'	POSTNET (PLANET) Modifier Byte Option X'04'
Byte 18	X'22'	USPS Four-State Bar Code Modifier Byte Options X'00' through X'03'

 **Note**

- See p.176 “Bar Code Type and Modifier Description and Values” for all Bar-Codes supported.

Media-Destinations Self-Defining Field ID

Special Data Area	Value	Description
Bytes 0-1	X'000A'	LENGTH of this Self Defining Field
Bytes 2-3	X'0010'	Media-Destinations self-defining ID
Bytes 4-5	X'nnnn'	Default media-destination ID (Determined by Configuration)
Bytes 6-9		RANGES OF MEDIA DESTINATION IDs
	X'9101'	Internal tray

Note

- To ascertain which machine type your model corresponds to, see p.3 “Machine Types”.

Supported Group Operations Self-Defining Field ID

Special Data Area	Value	Description
Bytes 0-1	X'0006'	LENGTH of this Self-Defining Field
Bytes 2-3	X'0012'	SUPPORTED GROUP OPERATIONS Self-Defining Field
Byte 4	X'01'	Keep group together as a print unit
Byte 5	X'04'	Finish

Product Identifier Self-Defining Field ID

Special Data Area	Value	Description
Bytes 0-1	X'0053'	LENGTH of this Self Defining Field
Bytes 2-3	X'0013'	PRODUCT IDENTIFIER Self Defining Field ID
Byte 4	X'38'	LENGTH of Self Defining Product ID Parameter
Bytes 5-6	X'0001'	UNIQUE PRODUCT IDENTIFIER Parameter ID
Bytes 7-12	X'F0F0F4F3F1F0'	Aficio SP 4310N SP 4310N
	X'F0F0F5F2F0F0'	Aficio SP 5200DN SP 5200DN
	X'F0F0F5F2F1F0'	Aficio SP 5210DN SP 5210DN

Object Container Type Support Self-Defining Field ID

Special Data Area	Value	Description
Bytes 0-1	X'00A8'	LENGTH of this Self Defining Field
Bytes 2-3	X'0014'	Object Container Type Support Self Defining Field
Byte 4	X'42'	Type Record Length
Byte 5	X'01'	Type - Page or Overlay State
Bytes 6-21	X'06072b1200040101160000 0000000000'	Graphics Interchange Format (GIF)
Bytes 22-37	X'06072b12000401012F0000 0000000000'	IOCA Tile Resource
Bytes 38-53	X'06072b1200040101170000 0000000000'	JPEG File Interchange Format (JFIF)
Bytes 54-69	X'06072b12000401010E000 0 0000000000'	Tag Image File Format (TIFF)
Byte 70	X'62'	Type Record Length
Byte 71	X'02'	Type - Home state
Bytes 72-87	X'06072b1200040101160000 0000000000'	Graphics Interchange Format (GIF)
Bytes 88-103	X'06072b12000401012F0000 0000000000'	IOCA Tile Resource
Bytes 104-119	X'06072b1200040101170000 0000000000'	JPEG File Interchange Format (JFIF)
Bytes 120-135	X'06072b12000401010E000 0 0000000000'	Tag Image File Format (TIFF)
Bytes 136-151	X'06072b1200040101350000 0000000000'	TrueType/OpenType Collection
Bytes 152-167	X'06072b1200040101330000 0000000000'	TrueType/OpenType Font

Finishing Operations Self-Defining Field ID

Special Data Area	Value	Description
Bytes 0-1	X'0008'	LENGTH of this Self Defining Field
Bytes 2-3	X'0018'	FINISHING OPERATIONS Self Defining Field

PFC Triplets Supported Self Defining Field ID

Special Data Area	Value	Description
Bytes 0-1	X'0006'	LENGTH of this Self Defining Field
Bytes 2-3	X'0016'	PFC Triplets Supported Self Defining Field
Byte 4	X'86'	Text Fidelity Triplet
Byte 5	X'88'	Finishing Fidelity Triplet

3

XOH Select Input Media Source

This order selects the input media source and, indirectly, the input media, for subsequent physical sheets.

The set of valid values differs according to which forms module configuration is installed and selected by the operator. Since printers are capable of supporting multiple installed input bins, multiple configuration combinations are possible. All input media sources are described below.

When the number of installed input bins changes, the printer is POR'd and initial machine settings are established. When the bin configuration changes exception X'0101..00' is reported to the host.

- Actual tray capacities are determined by media weight. The capacities indicated in the table are the maximum allowable.
- The machine supports media source tray numbering. Media source values in the SIMS support tables represent the default settings when the printer is initially installed. For this machine, the printer's control panel menu mode is provided to allow customers to specify the source tray numbers to meet requirements of legacy applications.

Note

- ❑ For the tray in which "envelope" has been specified as the paper type, the tray values of the tray ID are (in ascending for each respective tray that is installed) as follows: X'8040', X'8041', etc. If a different paper type is specified for the tray, the tray values of the tray ID are (in ascending for each respective tray that is installed) as follows: X'8000', X'8001', etc. In regards to the bypass tray and default tray, even if you specify "envelope" as the paper type, the tray value will not be changed.
- ❑ To ascertain which machine type your model corresponds to, see p.3 "Machine Types".

Data Area	Value	Description	Error Code
Bytes 0-1	X'1500'	SELECT INPUT MEDIA SOURCE	
Byte 2		INPUT MEDIA SOURCE (Reference Notes Below)	X'02C8..01'
	X'00'	Tray 1	
	X'01'	Tray 2* (Machine type: Type 1)	
	X'40'	Tray 1 +Tray 2 + Bypass tray	
	X'01'	Tray 1 + Envelope feeder tray 2 + Bypass tray	
	X'01'	Tray 1 + Tray 2 + Tray 3 + Bypass tray	
	X'40'	Tray 1 + Envelope feeder tray 2 + Tray 3 + Bypass tray	
	X'01'	Tray 1 + Tray 2 + Envelope feeder tray 3 + Bypass tray	
	X'40'	Tray 1 + Envelope feeder tray 2 + Envelope feeder tray 3 + Bypass tray	
	X'01'	Tray 2 (Machine type: Type 2 or Type 3)	
	X'02'	Tray 3* (Machine type: Type 1)	
	X'01'	Tray 1 + Tray 2 + Tray 3 + Bypass tray	
	X'40'	Tray 1 + Envelope feeder tray 2 + Tray 3 + Bypass tray	
	X'41'	Tray 1 + Tray 2 + Envelope feeder tray 3 + Bypass tray	
	X'41'	Tray 1 + Envelope feeder tray 2 + Envelope feeder tray 3 + Bypass tray	
	X'02'	Tray 3 (Machine type: Type 2 or Type 3)	
	X'03'	Tray 4 (Machine type: Type 2 or Type 3)	
X'04'	Tray 5 (Machine type: Type 2 or Type 3)		
X'63'	Bypass tray		
X'FF'	Default Tray		

* Available values vary depending on the installed option.

XOH Set Media Origin

The XOH Set Media Origin (SMO) command specifies the origin of the media. This order takes effect on the next-received page. The media origin will not change until either another XOH-SMO command is processed or the printer is reinitialized.

Data Area	Value	Description	Error Code
Bytes 0-1	X'1600'	SET MEDIA ORIGIN	
Byte 2	X'00'	MEDIA ORIGIN Top-left corner	X'026F..02'
	X'01'	Top-right corner (Bottom-left corner if back side of duplex sheet)	
	X'02'	Bottom-right corner	
	X'03'	Bottom-left corner (Top-right corner if back side of duplex sheet)	

XOH Set Media Size

This order specifies SIZE of the physical medium.

Data Area	Value	Description	Error Code
Bytes 0-1	X'1700'		
Byte 2	X'00'	UNIT BASE (Measurement Units) 10 in.	X'0274..02'
	X'01'	10 centimeters	
Bytes 3-4	X'3840'	L-Units per UNIT BASE 14400 L-Units/10 inches	X'0270..02'
	X'1626'	5670 L-Units/10 centimeters	
	X'0960'	2400 L-Units/10 inches	
	X'03B1'	945 L-Units/10 centimeters	
Bytes 5-6	X'0001' - X'7FFF'	Xm EXTENT of MEDIUM See p.27 "Notation Conventions"	X'0272..02'
	X'FFFF'	Printer Default (Printer's control panel setting or Tray sensors)	
Bytes 7-8	X'0001' - X'7FFF'	Ym EXTENT of MEDIUM See p.27 "Notation Conventions"	X'0273..02'
	X'FFFF'	Printer Default (Printer's control panel setting or Tray sensors)	

XOH Page Counter Control

The XOH Page Counter Control (PCC) command provides a counter synchronization function that should only be used to recover from an exception or after a XOA Discard Buffer Data command.

Data Area	Value	Description	Error Code
Bytes 0-1	X'F500'	OPC Order Code	
Byte 2	X'00'	Do Nothing (default)	
	X'01'	Synchronize Counters	

3

XOH Define Group Boundary

This order initiates or terminates a grouping of pages. When a grouping of pages is initiated the page that next increments the received page counter is the first sheet in the designated group.

Data Area	Value	Description	Error Code
Bytes 0-1	X'0400'	Define Group Boundary	X'018F..00' X'0277..01' X'0278..01' X'027A..01' X'027B..01'
Byte 2	X'00'	Initiate Group	
	X'01'	Terminate Group	
Byte 3	X'00' - X'FF'	Group Level	
Bytes 4-end of command	See specific triplet description.	X'00' Group ID triplet	
		X'6E' Group information triplet	X'027C..01'
		X'85' Finishing Operation triplet	X'027C..02'

Group ID Triplet

The Group ID triplet specifies host specific print-data formats for print job identification. The printer utilizes this information to provide IPDS print job identification on the printer console display.

Data Area	Value	Description	Error Code
Byte 0	X'02'-X'FF'	LENGTH	X'027A..01' X'027B..02'
Byte 1	X'01'	Group ID Triplet	
Byte 2	X'01' X'02' X'03' X'06' X'13'	HOST FORMAT MVS and VSE print-data VM print-data OS/400 print-data (4 char spool file #) AIX and NT print-data OS/400 print-data (6 char spool file #)	
Bytes 4-11	X'C2E4C4C7C5 E3F0F1' (i.e. BUDGET01)	MVS and VSE ID DATA Job Name (EBCDIC) (8 bytes)	
Bytes 4-11	X'C2E4C4C7C5 E3F0F1' (i.e. BUDGET01)	VM ID DATA Filename (EBCDIC) (8 bytes)	
Bytes 23-32	X'C2E4C4C7C5 E3F2F0F0F1' (i.e. BUDGET2000)	OS/400 ID DATA Filename (EBCDIC) (10 bytes)	
Bytes 3-End	X'444550544255 44474554323030 30' (i.e. DEPTBUDGET2 000)	AIX and NT ID DATA Name (ASCII) (1-251 bytes)	

Group Information Triplet

The Group Information is accepted, although no specific processing will occur.

XOH Specify Group Operation

This order indicates to an attached printer, pre-processor, or post-processor that the specified processing option is to be performed upon subsequent boundary groups of the group level identified in this command.

Data Area	Value	Description	Error Code
Bytes 0-1	X'0300'	Define Group Boundary	
Byte 2	X'00'-X'FF'	Operation Identifier	
	X'01'	Keep group together as a print unit	
	X'04'	Finish	
Byte 3	X'00'-X'FF'	Group Level	

Note

- For SGO Identifier (Byte 2), X'01' and X'04' are the only supported operations. All other identifiers are accepted, although no specific processing will occur.

4. Presentation Text Command Set

Presentation Text Commands

Name	Command	Sub-command	Where to Look
Load Equivalence	X'D61D'		p.119 "Load Equivalence"
Write Text	X'D62D'		p.120 "Write Text"

Load Equivalence

This command permits text-suppression values imbedded in text data stored within the printer to be referenced externally using different values. For example, the Internal Suppression value of X'02' may be referenced externally on a Load Copy Control as a X'06' provided that an appropriate Load Equivalence command was previously received.

If more than 127 LE entries are specified, exception X'0202..02' is reported.

Data Area	Value	Description	Error Code
Bytes 0-1	X'0100'	MAPPING TYPE Suppression Mapping	X'02C6..02'
Bytes 2-3	X'0001' - X'00FF'	INTERNAL VALUE from BS..ES Pair	X'02C1..02' X'02C8..02'
Bytes 4-5	X'0001' - X'007F'	EXTERNAL VALUE from LCC	X'02C8..02'
Bytes 6-509		Zero or more additional entries anal- ogous to Bytes 2-5	

Write Text

In this Write Text description, references made to pages also apply to overlays and page segments.

The print data is a string of 1-byte code points. To determine the character raster pattern, the printer uses the code point to identify the character metrics obtained from:

- Load Font Index (See p.199 “Load Font Index”)
- Load Font Control (See p.196 “Load Font Control”)
- Font Local ID (See p.63 “Load Font Equivalence”)
- Resident Font Data

4

When the printer processes a Begin Page, it uses the values from the existing Logical Page Descriptor (See p.66 “Logical Page Descriptor”) or Initialization Default (See p.35 “IPDS Initialization Defaults”) until it processes one of the following text control sequences:

- Draw B-Axis Rule
- Draw I-Axis Rule
- Set Baseline Increment
- Set Coded Font Local
- Set Extended Text Color
- Set Inline Margin
- Set Intercharacter Adjustment
- Set Text Color
- Set Text Orientation
- Set Variable Space Character Increment
- Temporary Baseline Move

The text control sequence value supersedes the Logical Page Descriptor or Initialization Default value and it remains in effect until it is changed by another text control sequence, or End Page is received.

For a complete description of the following text control sequences see the Presentation Text Object Content Architecture Reference and the Intelligent Printer Data Stream Reference.

Absolute Move Baseline

Absolute Move Baseline Control Sequence moves the baseline coordinate relative to the I-axis of the Presentation Text Space.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'04'	LENGTH	X'021E..01'
Byte 3	X'D2' X'D3'	ABSOLUTE MOVE BASELINE Unchained Chained	
Bytes 4-5	X'0000' - X'7FFF'	DISPLACEMENT (Bc) See p.27 "Notation Conventions"	X'0213..01'

Absolute Move Inline

Absolute Move Inline Control Sequence moves an inline coordinate position relative to the B-axis of the Presentation Text Space.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Escape Sequence	
Byte 2	X'04'	LENGTH	X'021E..01'
Byte 3	X'C6' X'C7'	ABSOLUTE MOVE INLINE Unchained Chained	
Bytes 4-5	X'0000' - X'7FFF'	DISPLACEMENT (Ic) See p.27 "Notation Conventions"	X'0214..01'

Begin Line

Begin Line Control Sequence begins a new line.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Escape Sequence	
Byte 2	X'02'	LENGTH	X'021E..01'
Byte 3	X'D8' X'D9'	BEGIN LINE Unchained Chained	

Begin Suppression

Begin Suppression Control Sequence marks the beginning of a string of presentation text that may be suppressed from the visible output.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Escape Sequence	
Byte 2	X'03'	LENGTH	X'021E..01'
Byte 3	X'F2' X'F3'	BEGIN SUPPRESSION Unchained Chained	
Byte 4	X'01' - X'FF'	SUPPRESSION ID	X'0298..01'

4

Draw B-Axis Rule

Draw B-axis Rule Control Sequence draws a rule in the b-direction.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Escape Sequence	
Byte 2	X'04' or X'07'	LENGTH	X'021E..01'
Byte 3	X'E6' X'E7'	DRAW B-AXIS RULE Unchained Chained	
Bytes 4-5	X'8000' - X'7FFF'	LENGTH (Bl) See p.27 "Notation Conventions"	
Bytes 6-7	X'8000' - X'7FFF' X'FFFF'	WIDTH (Bw) Printer Default 24/1440 inch	
Byte 8		IGNORED	

Draw I-Axis Rule

Draw I-axis Rule Control Sequence draws a rule in the i-direction.

Table 70. Draw I-Axis Rule

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Escape Sequence	
Byte 2	X'04' or X'07'	LENGTH	X'021E..01'
Byte 3	X'E4' X'E5'	DRAW I-AXIS RULE Unchained Chained	
Bytes 4-5	X'8000' - X'7FFF'	LENGTH (Il) See p.27 "Notation Conventions"	
Bytes 6-7	X'8000' - X'7FFF' X'FFFF'	WIDTH (Iw) Printer Default 24/1440 inch	
Byte 8		IGNORED	

End Suppression

End Suppression Control Sequence marks the end of a string of presentation text that may be suppressed from the visible output.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Escape Sequence	
Byte 2	X'03'	LENGTH	X'021E..01'
Byte 3	X'F4' X'F5'	END SUPPRESSION Unchained Chained	
Byte 4	X'01' - X'FF'	SUPPRESSION ID	X'0202..01' X'0204..01' X'0298..01'

No Operation

No Operation Control Sequence has no effect on presentation.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Escape Sequence	
Byte 2	X'02' - X'FF'	LENGTH	X'021E..01'
Byte 3	X'F8' X'F9'	NO OPERATION Unchained Chained	
Bytes 4-255		DATA (Ignored)	

4

Overstrike

The Overstrike control identifies text that is to be overstruck with a specified character.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Escape Sequence	
Byte 2	X'05'	LENGTH	X'021E..01'
Byte 3	X'72' X'73'	OVERSTRIKE Unchained Chained	
Byte 4	Bits 0-3 Bit 4: 0 Bit 4: 1 Bit 5: 0 Bit 5: 1 Bit 6: 0 Bit 6: 1 Bit 7: 0 Bit 7: 1	BYPASS IDENTIFIERS Reserved Overstrike white space from RMI Bypass white space from RMI Overstrike white space from AMI Bypass white space from AMI Overstrike white space from Space or Variable Space Character Bypass white space from Space or Variable Space Character BYPASS Treat Bits 0-6 according to their set values NO BYPASS Treat Bits 0-6 as if their values are set to zero	
Byte 5		IGNORED	
Byte 6	X'00' - X'FF'	OVERSTRIKE CHARACTER	

Relative Move Baseline

Relative Move Baseline Control Sequence moves a baseline coordinate relative to the current baseline coordinate position.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Escape Sequence	
Byte 2	X'04'	LENGTH	X'021E..01'
Byte 3	X'D4' X'D5'	RELATIVE MOVE BASELINE Unchained Chained	
Bytes 4-5	X'8000' - X'7FFF'	INCREMENT (Br) See p.27 "Notation Conventions"	

Relative Move Inline

Relative Move Inline Control Sequence moves the inline coordinate of the presentation position relative to the current inline position.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'04'	LENGTH	X'021E..01'
Byte 3	X'C8' X'C9'	RELATIVE MOVE INLINE Unchained Chained	
Bytes 4-5	X'8000' - X'7FFF'	INCREMENT (Ir) See p.27 "Notation Conventions"	

Repeat String

Repeat String Control Sequence contains a string of coded graphic characters that is repeated on the current line.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'04' - X'FF'	LENGTH	X'021E..01'
Byte 3	X'EE' X'EF'	REPEAT STRING Unchained Chained	
Bytes 4-5	X'0000' - X'7FFF'	REPEAT LENGTH (RL)	X0219..01'
Bytes 6-n		REPEAT DATA	X021F..01'

Set Baseline Increment

Set Baseline Increment Control Sequence specifies the distance to be added to the current baseline coordinate when a Begin Line control sequence is executed.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'04'	LENGTH	X'021E..01'
Byte 3	X'D0' X'D1'	SET BASELINE INCREMENT Unchained Chained	
Bytes 4-5	X'8000' - X'7FFF' X'FFFF'	INCREMENT (Bi) See p.27 "Notation Conventions" Use LPD value. If no LPD is received, use printer default	

Set Coded Font Local

Set Coded Font Local Control Sequence specifies the character attributes to be used and invokes a coded font.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'03'	LENGTH	X'021E..01'
Byte 3	X'F0' X'F1'	SET CODED FONT LOCAL Unchained Chained	
Byte 4	X'01' - X'FE' X'FF'	LOCAL FONT ID Use LPD value. If no LPD is received, use printer default	X'0218..02' X'023F..02'

Set Extended Text Color

The Set Extended Text Color control specifies the color value and defines the color space and encoding for that value. The specified color value is applied to foreground areas of the presentation text space. Foreground areas consist of the following:

- The stroked and filled areas of solid text characters, including overstrike characters. With hollow characters, only the stroked portion of the character is considered foreground.
- The stroked area of a rule.
- The stroked area of an underscore.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'14' - X'16'	LENGTH	X'021E..01'
Byte 3	X'80' X'81'	SET EXTENDED TEXT COLOR Unchained Chained	
Byte 4	X'00'	RESERVED	
Byte 5	X'01' X'04' X'06' X'08' X'40'	COLOR SPACE RGB - Limited Simulated Color Support CMYK - Limited Simulated Color Support HCS - Limited Simulated Color Support CIELAB - Limited Simulated Color Support Standard OCA - Limited Simulated Color Support	X'020E..02'
Bytes 6-9	X'00000000'	RESERVED	
Byte 10	X'01' - X'08' X'10'	1ST COLOR COMPONENT BITS (RGB, CMYK, CIELAB) (Standard OCA, Highlight)	X'020E..05'
Byte 11	X'00' - X'08'	2ND COLOR COMPONENT BITS (RGB, CMYK, Highlight, CIELAB)	X'020E..06'
Byte 12	X'00' - X'08'	3RD COLOR COMPONENT BITS (RGB, CMYK, CIELAB)	X'020E..07'
Byte 13	X'00' - X'08'	4TH COLOR COMPONENT BITS (CMYK)	X'020E..08'

Data Area	Value	Description	Error Code
Bytes 14-17		COLOR VALUE	X'020E..03'
		RGB Color Space	X'020E..04'
	X'nn'	Red Intensity	
	X'nn'	Green Intensity	
	X'nn'	Blue Intensity	
		CMYK Color Space	
	X'nn'	Cyan Intensity	
	X'nn'	Magenta Intensity	
	X'nn'	Yellow Intensity	
	X'nn'	Black Intensity	
		Highlight Color Space	
	X'nnnn'	Highlight Color Number	
	X'nn'	Percent Coverage	
	X'nn'	Percent Shading	
		CIELAB Color Space	
	X'nn'	Luminance (L)	
	X'nn'	Chrominance Difference (a)	
	X'nn'	Chrominance Difference (b)	
		Standard OCA Color Space	
	X'0000' or X'FF00'	Printer Default (Black)	
	X'0001' or X'FF01'	Blue	
	X'0002' or X'FF02'	Red	
	X'0003' or X'FF03'	Pink	
	X'0004' or X'FF04'	Green	
	X'0005' or X'FF05'	Turquoise	
	X'0006' or X'FF06'	Yellow	
	X'0007'	White - Color of Medium (Reset)	
	X'0008'	Black	
	X'0010'	Brown	
	X'FF07'	Printer Default (Black)	
	X'FF08'	Color of Medium (Reset)	

Set Inline Margin

Set Inline Margin Control Sequence specifies position of an inline margin.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'04'	LENGTH	X'021E..01'
Byte 3	X'C0' X'C1'	SET INLINE MARGIN Unchained Chained	
Bytes 4-5	X'0000' - X'7FFF' X'FFFF'	DISPLACEMENT (Ia) See p.27 "Notation Conventions" Use LPD value. If no LPD is received, use printer default	X'0210..01'

4

Set Intercharacter Adjustment

Set Intercharacter Adjustment Control Sequence specifies additional increment or decrement between graphic characters.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'04' or X'05'	LENGTH	X'021E..01'
Byte 3	X'C2' X'C3'	SET INTERCHARACTER ADJUSTMENT Unchained Chained	
Bytes 4-5	X'0000' - X'7FFF' X'FFFF'	ADJUSTMENT (ica) See p.27 "Notation Conventions" Use LPD value. If no LPD is received, use printer default	X'0212..01'
Byte 6	X'00' X'01' X'FF'	DIRECTION Increment Direction Decrement Direction Same as X'00'	X'0212..01'

Set Text Color

The Set Text Color control specifies the foreground color attribute that selects the color for subsequent text characters.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'04' or X'05'	LENGTH	X'021E..01'
Byte 3	X'74' X'75'	SET TEXT COLOR Unchained Chained	
Bytes 4-5	X'0000' or X'FF00' X'0001' or X'FF01' X'0002' or X'FF02' X'0003' or X'FF03' X'0004' or X'FF04' X'0005' or X'FF05' X'0006' or X'FF06' X'0007' X'0008' X'0010' X'FF07' X'FF08' X'FFFF'	COLOR Printer Default (Black) Blue - Limited Simulated Color Support Red - Limited Simulated Color Support Pink - Limited Simulated Color Support Green - Limited Simulated Color Support Turquoise - Limited Simulated Color Support Yellow - Limited Simulated Color Support White - Color of Medium (Reset) Black Brown - Limited Simulated Color Support Printer Default (Black) Color of Medium (Reset) Use LPD color value Note <input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.	X'0258..03'
Byte 6	X'00' - X'01' X'FF'	PRECISION Same as X'00'	X'0258..03'

Set Text Orientation

Set Text Orientation Control Sequence establishes i-direction and b-direction for the following presentation text.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'06'	LENGTH	X'021E..01'
Byte 3	X'F6' X'F7'	SET TEXT ORIENTATION Unchained Chained	
Bytes 4-5	X'0000' X'2D00' X'5A00' X'8700' X'FFFF'	I-AXIS ORIENTATION 0 degrees (+X direction) 90 degrees (+Y direction) 180 degrees (-X direction) 270 degrees (-Y direction) Use LPD value. If no LPD is received, use printer default	X'020F..01'
Byte 6	X'0000' X'2D00' X'5A00' X'8700' X'FFFF''	B-AXIS ORIENTATION 0 degrees (+X direction) 90 degrees (+Y direction) 180 degrees (-X direction) 270 degrees (-Y direction) Use LPD value. If no LPD is re- ceived, use printer default	X'020F..01'

The permitted combinations are those where the difference between the I-axis orientation and the B-axis orientation are 90 degrees.

```

INLINE-DIRECTION BASELINE-DIRECTION
0 deg. rotation 90 deg. rotation
0 deg. rotation 270 deg. rotation
90 deg. rotation 180 deg. rotation
90 deg. rotation 0 deg. rotation
180 deg. rotation 270 deg. rotation
180 deg. rotation 90 deg. rotation
270 deg. rotation 180 deg. rotation
270 deg. rotation 0 deg. rotation

```

Set Variable Space Character Increment

Set Variable Space Character Increment Control Sequence specifies the increment of a Variable Space Character.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'04'	LENGTH	X'021E..01'
Byte 3	X'C4' X'C5'	SET VARIABLE SPACE CHARACTER INCREMENT Unchained Chained	
Bytes 4-5	X'0000' - X'7FFF' X'FFFF'	INCREMENT (vsi) See p.27 "Notation Conventions" Default Variable Space Increment for Current Font	X'0217..01'

Temporary Baseline Move

The Temporary Baseline Move Control Sequence is used to change the position of the sequential baseline without change to the established baseline.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'03' or X'06'	LENGTH	X'021E..01'
Byte 3	X'78' X'79'	TEMPORARY MOVE BASELINE Unchained Chained	
Byte 4	X'00' X'01' X'02' X'03' X'FF'	DIRECTION Baseline is Unchanged Return to Established Baseline Shift Baseline away from I-axis (Subscript) Shift Baseline toward I-axis (Superscript) Same as X'00'	X'0298..03'

Data Area	Value	Description	Error Code
Byte 5	X'00'	PRECISION Accurate placement and character representation is required using the current font.	X'0298..03
	X'01'	A substitute font with characteristics identical to the current font may be used to simulate baseline shift (superscript/subscript). The printer accepts this value but treats it as X'00'.	
	X'FF'	Same as X'00'	
Bytes 6-7	X'0000' - X'7FFF'	TEMPORARY BASELINE INCREMENT See p.27 "Notation Conventions"	X'0298..03'
	X'FFFF'	Half the current baseline increment	

Transparent Data

Transparent Data Control Sequence contains a sequence of coded characters that are presented without a scan for embedded control sequences.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'02' - X'FF'	LENGTH	X'021E..01'
Byte 3	X'DA'	TRANSPARENT DATA Unchained	
	X'DB'	Chained	
Bytes 4-255		CHARACTER STRING	

Underscore

The Underscore control sequence identifies text that is to be underscored.

Data Area	Value	Description	Error Code
Bytes 0-1	X'2BD3'	TEXT CONTROL Sequence	
Byte 2	X'03'	LENGTH	X'021E..01'
Byte 3	X'76' X'77'	UNDERSCORE Unchained Chained	
Byte 4	Bits 0-3 Bit 4: 0 Bit 4: 1 Bit 5: 0 Bit 5: 1 Bit 6: 0 Bit 6: 1 Bit 7: 0 Bit 7: 1 X'FF'	BYPASS IDENTIFIERS Reserved Underscore white space from Relative Move Inline Bypass white space from Relative Move Inline Underscore white space from Absolute Move Inline Bypass white space from Absolute Move Inline Underscore white space from Space or Variable Space Character Bypass white space from Space or Variable Space Character BYPASS Treat Bits 0-6 according to their set values NO BYPASS Treat Bits 0-6 as if their values are set to zero NO BYPASS in EFFECT	

5. IM Image Command Set

IM Image Commands


Name	Command	Sub-command	Where to Look
Write Image Control	X'D63D'		p.136 "Write Image Control"
Write Image	X'D64D'		p.139 "Write Image"

Write Image Control

The Write Image Control command is the first command in the sequence to send raster image data to the printer. The command contains fields to define the input, scale, and image placement parameters. Several Write Image Control commands may be required to a complete raster image.

Data Area	Value	Description	Error Code
Bytes 0-1	X'0001' - X'7FFF'	Pixels per scan line in the output image	X'0242..01' X'0243..01'
Bytes 2-3	X'0001' - X'7FFF'	Number of scan lines in the output image	X'0244..01' X'0245..01'
Bytes 4-5	X'0001' - X'7FFF'	Pixels per scan line in the input image	X'0242..01' X'0243..01'
Bytes 6-7	X'0001' - X'7FFF'	Number of scan lines in the input image	X'0244..01' X'0245..01'
Byte 8	X'00'	Uncompressed input image	X'0246..01'
Byte 9	X'00'	One bit per pixel in the input image format	X'0246..01'
Byte 10	X'01' X'02'	PIXEL MAGNIFICATION FACTOR No Magnification Factor Magnification Factor of 2	X'0247..01'
Byte 11	X'01' X'02'	SCAN LINE MAGNIFICATION FACTOR No Magnification Factor Magnification Factor of 2	X'0247..01'
Bytes 12-13	X'0000' X'2D00' X'5A00' X'8700'	SCAN LINE DIRECTION 0 degrees 90 degrees 180 degrees 270 degrees	X'0248..01'

Data Area	Value	Description	Error Code
Bytes 14-15	X'0000' X'2D00' X'5A00' X'8700'	SCAN LINE SEQUENCE DIRECTION 0 degrees 90 degrees 180 degrees 270 degrees	X'0249..01'
Byte 16	X'00' X'20' X'40' X'60' X'A0'	REFERENCE COORDINATE SYSTEM Absolute I, Absolute B Absolute I, Relative B Relative I, Absolute B Relative I, Relative B Xp, Yp	X'024A..01'
Bytes 17-19	X'FF8000' - X'007FFF'	Xp, I or I offset coordinate of the IM image block origin	X'024A..01'
Byte 20	X'00'	Reserved	
Bytes 21-23	X'FF8000' - X'007FFF'	Yp, B or B offset coordinate of the IM image block origin	X'024A..01'
Bytes 24-25	X'0000' or X'FF00' X'0001' or X'FF01' X'0002' or X'FF02' X'0003' or X'FF03' X'0004' or X'FF04' X'0005' or X'FF05' X'0006' or X'FF06' X'0007' X'0008' X'0009' X'000A'	IMAGE COLOR (Named Color) Printer Default (Black) Blue - Limited Simulated Color Support Red - Limited Simulated Color Support Pink - Limited Simulated Color Support Green - Limited Simulated Color Support Turquoise - Limited Simulated Color Support Yellow - Limited Simulated Color Support White - Color of Medium (Reset) Black Dark Blue - Limited Simulated Color Support Orange - Limited Simulated Color Support	X'0253..01'

Data Area	Value	Description	Error Code
	X'000B'	Purple - Limited Simulated Color Support	
	X'000C'	Dark Green - Limited Simulated Color Support	
	X'000D'	Dark Turquoise - Limited Simulated Color Support	
	X'000E'	Mustard - Limited Simulated Color Support	
	X'000F'	Gray - Limited Simulated Color Support	
	X'0010'	Brown - Limited Simulated Color Support	
	X'FF07'	Printer Default (Black)	
	X'FF08'	Color of Medium (Reset)	
		<p> Note</p> <p><input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.</p>	

Write Image

The data is a binary representation of the raster image. In the binary data, a 1-bit represents a colored pixel and a 0-bit represents a pixel left unchanged in the page map. In other words, if a pixel is set black by another block on the page (for example, text), it will not be reset to white if it is written with a 0-bit in the image block. Several Write Image commands may be required to a complete raster image.

An error occurs if the host program sends the End command and the total number of bytes of image data is a different number than specified in the image control record.

Data Area	Value	Description	Error Code
Bytes 0-End		Binary RASTER IMAGE	X'026A..01' X'026B..01' X'0264..01'

6. IO Image Command Set

IO Image Commands

Name	Command	Sub-command	Where to Look
Write Image Control 2	X'D63E'		p.142 "Write Image Control 2"
Image Area Position		X'AC6B'	p.142 "Image Area Position"
Image Output Control		X'A66B'	p.143 "Image Output Control"
Image Data Descriptor		X'A6FB'	p.145 "Image Data Descriptor"
Write Image 2	X'D64E'		p.147 "Write Image 2"
Begin Segment		X'70'	p.147 "Begin Segment"
Begin Image Content		X'91'	p.147 "Begin Image Content"
Image Size Parameter		X'94'	p.148 "Image Size Parameter"
Image Encoding Parameter		X'95'	p.148 "Image Encoding Parameter"
Image Data Element Size Parameter		X'96'	p.149 "Image Data Element Size Parameter"
Image Look-up Table ID Parameter		X'97'	p.150 "Image Look-up Table ID Parameter"
Image Data		X'FE92'	p.150 "Image Data"
End Image Content		X'93'	p.150 "End Image Content"
End Segment		X'71'	p.150 "End Segment"

Write Image Control 2

The Write Image Control 2 data consists of three consecutive structured fields:

- Image Area Position Control (IAP)
- Image Output Control (IOC)
- Image Data Descriptor (IDD)

The Write Image Control 2 command and the command sequence that follows defines the image presentation block area on the current page. The parameters of this command define the size, placement and orientation of the image block and establish the parameters required to interpret the image segments.

Positive acknowledgement of image commands in Overlay State or Page Segment State means that the command or command sequence has been accepted for processing, but does not imply that its parameters have been checked in any way.

Image Area Position

This data structured field specifies the position and orientation of the image output area relative to a reference coordinate system. It is a REQUIRED data field in the Write Image Control 2 command.

Data Area	Value	Description	Error Code
Bytes 0-1	X'000B' - X'xxxx'	LENGTH of Image Area Position	X'0202..05'
Bytes 2-3	X'AC6B'	STRUCTURED FIELD ID	X'020B..05'
Bytes 4-5	X'8000' - X'7FFF'	Image Object Area Origin Xp, I, or I-offset Coordinate Position See p.27 "Notation Conventions"	
Bytes 6-7	X'8000 - X'7FFF'	Image Object Area Origin Yp, B, or B-offset Coordinate Position See p.27 "Notation Conventions"	
Bytes 8-9	X'0000' X'2D00' X'5A00' X'8700'	ORIENTATION OF IMAGE BLOCK 0 degrees 90 degrees 180 degrees 270 degrees	X'0203..05'
Byte 10	X'00' X'20' X'40' X'60' X'A0'	COORDINATE REFERENCE SYSTEM Absolute I, absolute B Absolute I, relative B Relative I, absolute B Relative I, relative B Page Xp, Yp	X'0204..05'
Bytes 11-n		Ignored	

Image Output Control

This data structured field specifies the mapping option for the image object. It is an ELECTIVE data field in the Write Image Control 2 command. If this field is omitted, the printer will use the following default values:

Mapping option = X'30' (Position and Trim)

X, Y Offset = 0.

X, Y Extent = Image Presentation Space extent defined by the Image Data Descriptor structured field.

Data Area	Value	Description	Error Code
Bytes 0-1	X'0010' - X'xxxx'	LENGTH of Image Output Control	X'0202..05'
Bytes 2-3	X'A66B'	Structured Field ID	X'020B..05'
Byte 4	X'00' X'01'	UNIT BASE (Measurement Units) 10 Inches 10 Centimeters	X'0205..05'
Bytes 5-6	X'0001'-X'7FFF'	L-units per UNIT BASE	X'0206..05'
Bytes 7-8	X'0001'-X'7FFF' X'FFFF'	X extent of IO image block in L-units for Page, Overlay and Page Segment (See p.27 "Notation Conventions") Use Load Page Descriptor Value	X'0207..05'
Bytes 9-10	X'0001'-X'7FFF' X'FFFF'	Y extent of IO image block in L-units for Page, Overlay and Page (See p.27 "Notation Conventions") Use Load Page Descriptor Value	X'0207..05'
Byte 11	X'10' X'20' X'30' X'41' X'42' X'50'	MAPPING CONTROL OPTION Scale to fit Center and trim Position and trim Point to pixel Point to pixel with double dot Replicate and Trim	X'0208..05'
Bytes 12-13	X'8000'-X'7FFF'	X OFFSET L-units See p.27 "Notation Conventions"	X'0209..05'
Bytes 14-15	X'8000'-X'7FFF'	Y OFFSET L-units See p.27 "Notation Conventions"	X'0209..05'

Data Area	Value	Description	Error Code
Bytes 16-n		<p>IOC Triplets</p> <ul style="list-style-type: none"> • Color Specification Triplet. This optional triplet can be placed at the end of the IOC command to specify the foreground color of the object area, before any object data is placed on the object area. Any number of IOC triplets can be received, they are processed in the order received and the resulting color of the object area depends on the last instance of the triplet received. See p.31 “Color Specification” for details. • Presentation Space Reset Mixing Triplet. This optional triplet can be placed at the end of the IOC command to specify whether or not an object area is reset to the color of medium before any object data is placed on the object area. Any number of IOC triplets can be received, they are processed in the order received and the resulting color of the object area depends on the last instance of the triplet received. See p.33 “Presentation Space Reset Mixing” for details. 	

 **Note**

- ❑ The Replicate and Trim Mapping Control option is supported only when the IPDS Menu PRINT MODE item is set to ENH (Enhanced 600 dpi).

Image Data Descriptor

This is a REQUIRED data structured field in the Write Image Control 2 command. It specifies parameters that define the image presentation space size and resolution.

Data Area	Value	Description	Error Code
Bytes 0-1	X'000F' - X'xxxx'	LENGTH of Image Data Descriptor	X'0202..05'
Bytes 2-3	X'A6FB'	STRUCTURED FIELD ID	X'020B..05'
Bytes 4-5	X'0000'	Reserved	
Byte 6	X'00' X'01'	UNIT BASE (Measurement Units) 10 Inches 10 Centimeters	X'0205..05'
Bytes 7-8	X'0001'-X'7FFF'	X image points per unit base	X'0206..05'
Bytes 9-10	X'0001'-X'7FFF'	Y image points per unit base	X'0206..05'
Bytes 11-12	X'0001'-X'7FFF'	X EXTENT of image presentation space (in image points) See p.27 "Notation Conventions"	X'0207..05'
Bytes 13-14	X'0001'-X'7FFF'	Y EXTENT of image presentation space (in image points) See p.27 "Notation Conventions"	X'0207..05'
Bytes 15-end of IDD		IOCA SDFs	
Byte 0	X'F4' X'F6'	Set Extended Bilevel Image Color SDF Set Bilevel Image Color SDF *1	
Byte 1	X'04'	LENGTH	
Byte 2	X'00'	AREA	
Byte 3	X'00'	Reserved	
Bytes 4-5	X'0000' or X'FF00' X'0001' or X'FF01' X'0002' or X'FF02' X'0003' or X'FF03' X'0004' or X'FF04' X'0005' or X'FF05'	Named Color Printer Default (Black) Blue - Limited Simulated Color Support Red - Limited Simulated Color Support Pink - Limited Simulated Color Support Green - Limited Simulated Color Support Turquoise - Limited Simulated Color Support	

Data Area	Value	Description	Error Code
Bytes 4-5	X'0006' or X'FF06'	Yellow - Limited Simulated Color Support	
	X'0007'	White - Color of Medium (Reset)	
	X'0008'	Black	
	X'0009'	Dark Blue - Limited Simulated Color Support	
	X'000A'	Orange - Limited Simulated Color Support	
	X'000B'	Purple - Limited Simulated Color Support	
	X'000C'	Dark Green - Limited Simulated Color Support	
	X'000D'	Dark Turquoise - Limited Simulated Color Support	
	X'000E'	Mustard - Limited Simulated Color Support	
	X'000F'	Gray - Limited Simulated Color Support	
	X'0010'	Brown - Limited Simulated Color Support	
	X'FF07'	Printer Default (Black)	
	X'FF08'	Color of Medium (Reset)	

^{*1} Refer to the Intelligent Printer Data Stream Reference and the Image Object Content Architecture Reference for specifics on the Set Bilevel Image Color SDF format.

Write Image 2

The image segment is processed as it is received by the printer and is not retained or stored as a named image segment.

Write Image 2 command carries the IO image data within a hierarchical sequence of self-defining fields. See the Intelligent Printer Data Stream Reference and the Image Object Content Architecture Reference.

Begin Segment

Data Area	Value	Description	Error Code
Byte 0	X'70'	Begin Segment	X'0570..0F'
Byte 1	X'00'-X'FF'	Length	

Begin Image Content

Data Area	Value	Description	Error Code
Byte 0	X'91'	Begin Image Content	X'0591..0F'
Byte 1	X'01'-X'FF'	Length	X'0500..03'
Byte 2	X'FF'	Format Specification	X'0500..04'

Image Size Parameter

The Image Size Parameter specifies the size of the image defined within the image segment. Mapping of the image into the image presentation space (See p.145 “Image Data Descriptor”) is on a 1 image point to 1 image point basis (one image point of an IO-Image segment is mapped to one image point of the image presentation space).

Data Area	Value	Description	Error Code
Byte 0	X'94'	IMAGE SIZE	X'0594..0F'
Byte 1	X'09'-X'FF'	LENGTH of the following bytes	X'0500..03'
Byte 2	X'00' X'01' X'02'	UNIT BASE (Measurement Units) 10 Inches 10 Centimeters Logical (resolution ratio)	
Bytes 3-4	X'0000' - X'7FFF'	X image points per unit base	
Bytes 5-6	X'0000' - X'7FFF'	Y image points per unit base	
Bytes 7-8	X'0000'-X'7FFF'	X extent of the image in image points	X'0500..04' X'0594..11' X'0595..11' X'05A9..02'
Bytes 9-10	X'0000'-X'7FFF'	Y extent of the image in image points	X'0500..04' X'05A9..02'

Image Encoding Parameter

Data Area	Value	Description	Error Code
Byte 0	X'95'	IMAGE ENCODING	X'0595..0F'
Byte 1	X'02'-X'FF'	LENGTH of the following bytes	X'0500..03'
Byte 2	X'01' X'03' X'06' X'08' X'80' X'81' X'82'	COMPRESSION ALGORITHM IBM MMR compression No compression RL4 compression ABIC (Bilevel Q-Coder) G3 MH (CCITT T.4 facsimile 1-D) G3 MR (CCITT T.4 G3 facsimile 2-D) G4 MMR (CCITT T.6 G4 facsimile 2-D)	X'0595..10' X'0595..11'

Data Area	Value	Description	Error Code
Byte 3	X'01'	RECORDING ALGORITHM RIDIC (Recording Image Data Inline Code) Unpadded RIDIC	X'0595..10'
Byte 4	X'00' X'01'	BIT ORDER within each image data byte Left-to-Right Right-to-Left	

Image Data Element Size Parameter

Data Area	Value	Description	Error Code
Byte 0	X'96'	IMAGE DATA ELEMENT SIZE	X'0596..0F'
Byte 1	X'01'-X'FF'	LENGTH of the following bytes	X'0500..03'
Byte 2	X'01' X'08'	NUMBER of BITS per PIXEL 1 bit per pixel 8 bits per pixel	X'0596..10' X'0500..04' X'0596..11'

If 1 is specified, the image is binary, with 1-bit representing black pixels and 0-bit representing pixels unchanged in the page map. If the image is uncompressed, each raster scan in the image data must be padded so that it is an integral number of bytes.

If 8 is specified, the image is gray scale. Each image byte is considered to be a value 0 to 255, where 0 is maximum black, 255 is no black at all, and the values in between are shades of gray.

The printer implements 8 bit per pixel images by halftoning. Halftoning significantly degrades image detail. For that reason, resolutions of gray scale data greater than 120 pixels per inch are not recommended except for draft printing purposes.

If 8 is specified, the Image Compression, if specified with the Image Encoding command, must be uncompressed. This error is detected when the first Image Data command is received.

Image Look-up Table ID Parameter

Data Area	Value	Description	Error Code
Byte 0	X'97'	Image Look-up Table ID Parameter	X'0597..0F'
Byte 1	X'01'-X'FF'	LENGTH of the following bytes	X'0500..03'
Byte 2	X'00'	Look up table ID	X'0597..10'

Image Data

Data Area	Value	Description	Error Code
Bytes 0-1	X'FE92'	Image Data	X'0592..0F'
Bytes 2-3	X'0001'-X'FFFF'	Length	X'0500..03' X'0594..01'
Bytes 4-end	X'x...x'	Image Data	X'0597..10'

End Image Content

Data Area	Value	Description	Error Code
Byte 0	X'93'	End Image Content	X'0593..0F'
Byte 1	X'00'-X'FF'	Length	

End Segment

Data Area	Value	Description	Error Code
Byte 0	X'71'	End Segment	X'0571..0F'
Byte 1	X'00'-X'FF'	Length	

7. Graphics Command Set

Graphics Commands

The base reference for graphic drawing orders is the Graphics Object Content Architecture Reference.

Name	Command	Sub-command	Where to Look
Write Graphics Control	X'D684'		Graphics Area Position p.151 "Write Graphics Control"
Graphics Area Position		X'AC6B'	p.151 "Graphics Area Position"
Graphics Output Control		X'A66B'	p.152 "Graphics Output Control"
Graphics Data Descriptor		X'A6BB'	p.154 "Graphics Data Descriptor"
Write Graphics	X'D685'		p.151 "Write Graphics Control"
Begin Segment Introducer		X'70'	p.158 "Begin Segment Introducer"

Write Graphics Control

Graphics Area Position

Data Area	Value	Description	Error Code
Bytes 0-1	X'000B'-X'xxxx'	LENGTH of Graphics Area Position	X'0202..05'
Bytes 2-3	X'AC6B'	Structured Field ID.	X'020B..05'
Bytes 4-5	X'8000'-X'7FFF'	GRAPHICS BLOCK ORIGIN Xp, I, or I-offset Coordinate Position. See p.27 "Notation Conventions"	
Bytes 6-7	X'8000'-X'7FFF'	GRAPHICS BLOCK ORIGIN Yp, B, or B-offset Coordinate Position. See p.27 "Notation Conventions"	
Bytes 8-9	X'0000' X'2D00' X'5A00' X'8700'	ORIENTATION of Graphic Block 0 degrees 90 degrees 180 degrees 270 degrees	X'0203..05'

Data Area	Value	Description	Error Code
Byte 10	X'00'	COORDINATE REFERENCE SYSTEM Absolute I, Absolute B	X'0204..05'
	X'20'	Absolute I, Relative B	
	X'40'	Relative I, Absolute B	
	X'60'	Relative I, Relative B	
	X'A0'	Page Xp, Yp	
Bytes 11-n		Ignored	

Graphics Output Control

Data Area	Value	Description	Error Code
Bytes 0-1	X'0010'-X'xxxx'	LENGTH of Graphics Output Control (GOC)	X'0202..05'
Bytes 2-3	X'A66B'	STRUCTURED FIELD ID	X'020B..05'
Byte 4	X'00'	UNIT BASE (Measurement Units) 10 Inches	X'0205..05'
	X'01'	10 Centimeters	
Bytes 5-6	X'0001' - X'7FFF'	L-Units per UNIT BASE	X'0206..05'
Bytes 7-8	X'0001' - X'7FFF'	X EXTENT of GRAPHICS BLOCK in L-units See p.27 "Notation Conventions"	X'0207..05'
	X'FFFF'	Use Load Page Descriptor Value	
Bytes 9-10	X'0001' - X'7FFF'	Y EXTENT of GRAPHICS BLOCK in L-units See p.27 "Notation Conventions"	X'0207..05'
	X'FFFF'	Use Load Page Descriptor Value	
Byte 11	X'10'	MAPPING Control Option Scale to Fit	X'0208..05'
	X'20'	Center and Trim	
	X'30'	Position and Trim	
Bytes 12-13	X'8000' - X'7FFF'	X OFFSET L-units. See p.27 "Notation Conventions"	X'0209..05'
Bytes 14-15	X'8000' - X'7FFF'	Y OFFSET L-units. See p.27 "Notation Conventions"	X'0209..05'

Data Area	Value	Description	Error Code
Bytes 16-n		<p>GOC Triplets</p> <ul style="list-style-type: none"> • Color Specification Triplet. This optional triplet can be placed at the end of the GOC command to specify the foreground color of the object area, before any object data is placed on the object area. Any number of GOC triplets can be received, they are processed in the order received and the resulting color of the object area depends on the last instance of the triplet received. See p.31 "Color Specification" for details. • Presentation Space Reset Mixing Triplet. This optional triplet can be placed at the end of the GOC command to specify whether or not an object area is reset to the color of medium before any object data is placed on the object area. Any number of GOC triplets can be received, they are processed in the order received and the resulting color of the object area depends on the last instance of the triplet received. See p.33 "Presentation Space Reset Mixing" . 	

 **Note**

- The Graphics Output Control Self Defining Field is optional and may be omitted from the WGC command. If the GOC is omitted, the printer uses the following:
 - Mapping Control Option X'30' (Position and Trim)
 - X Offset = 0
 - Y Offset = 0
 - Graphics Block size equals the Graphics Presentation Space Window size which is defined in the Graphics Data Descriptor (GDD) Self Defining Field (See p.154 "Graphics Data Descriptor").

Graphics Data Descriptor

Data Area	Value	Description	Error Code
Bytes 0-1	X'001C'-X'xxxx'	LENGTH of Graphics Data Descriptor (GDD)	X'0202..05'
Bytes 2-3	X'A6BB'	STRUCTURED FIELD ID	X'020B..05'
Byte 4	X'00' X'01'	UNIT BASE (Measurement Units) 10 Inches 10 Centimeters	X'0205..05'
Byte 5	X'00'	Reserved	
Bytes 6-7	X'0001' - X'7FFF'	Xg UNITS per UNIT BASE	X'0206..05'
Bytes 8-9	X'0001' - X'7FFF'	Yg UNITS per UNIT BASE Yg = Xg	X'0206..05'
Bytes 10-13	X'00000000'	Reserved	
Bytes 14-15	X'8000'-X'7FFF'	Xg LEFT LIMIT of Graphic Presentation Space Window. See p.27 "Notation Conventions"	
Bytes 16-17	X'8000'-X'7FFF'	Xg RIGHT LIMIT of Graphic Presentation Space Window. See p.27 "Notation Conventions"	
Bytes 18-19	X'8000'-X'7FFF'	Yg TOP LIMIT of Graphic Presentation Space Window. See p.27 "Notation Conventions"	
Bytes 20-21	X'8000'-X'7FFF'	Yg BOTTOM LIMIT of Graphic Presentation Space Window. See p.27 "Notation Conventions"	
Bytes 22-27	X'000000000000'	Reserved	
Bytes 28-n		INITIAL GRAPHICS DEFAULTS. See "GDD Initial Graphics Defaults Self Describing Instructions"	

If the image resolution specified in the GDD is X'0000' (indicating that no explicit resolution is specified), then the resolution used is the resolution specified in the OPC's Image and Coded Font Resolution Self-Defining Field.

❖ **GDD Initial Graphics Defaults Self Describing Instructions**

Data Area	Value	Description	Error Code
Byte 0	X'21'	SET CURRENT DEFAULTS	X'0300..21'
Byte 1	X'04'-X'FF'	LENGTH of Data	X'0300..03'
Byte 2	X'00'	SET Byte Drawing Attributes	X'0300..02'
	X'01'	Line Attributes	
	X'02'	Character Attributes	
	X'03'	Marker Attributes	
	X'04'	Pattern Attributes	
	X'0B'	Arc Parameters	
Bytes 3-4		MASK Bytes. See p.156 "Graphics Drawing Order Defaults and Masks"	X'0300..03'
Byte 5	X'0F'	DEFAULT Byte Use Standard Default	X'0300..02'
	X'8F'	Use the following Data Bytes	X'0300..03'
Bytes 6-n		Data bytes	X'0300..21'

 **Note**

☐ See p.158 "Drawing Orders" for valid drawing order defaults.

❖ Graphics Drawing Order Defaults and Masks

Set Byte	Mask Bit	Description
X'00'	0	DRAWING ATTRIBUTES Color (Named Color)
	1	Foreground Mix
	2	Background Mix
	3-15	Reserved
X'01'	0	LINE ATTRIBUTES Line Type
	1	Line Width
	2-15	Reserved
X'02'	0	CHARACTER ATTRIBUTES Angle X, Y
	1	Character Cell Size CW, CH
	2	Direction
	3	Precision
	4	Character Set
	5	Shear X, Y
	6-15	Reserved
X'03'	0-2	MARKER ATTRIBUTES Reserved
	3	Precision
	4	Marker Set
	5-6	Reserved
	7	Marker Symbol
	8-15	Reserved
X'04'	0-6	PATTERN ATTRIBUTES Reserved
	7	Pattern Symbol
	8-15	Reserved
X'0B'	0	ARC PARAMETERS P Value
	1	R Value
	2	Q Value
	3	S Value
	4-15	Reserved

Write Graphics

Write Graphics Defaults

The following defaults will be used if not previously defined by p.156 "Graphics Drawing Order Defaults and Masks". The current value of an attribute is taken into account when the drawing order is received.

Description	Value
Color	Black
Line Type	Solid
Line Width	Normal (4 pixel)
Character Cell	10 CPI
Character Set	Courier 10
Character Angle	No Rotation
Character Direction	Left to Right
Marker Symbol	Cross
Pattern Symbol	Solid Shading
Current Position	X,Y = 0,0
Arc Parameters	P=Q=1; R=S=0
Foreground Mix	Overpaint
Background Mix	Leave Alone
Character Precision	Character Precision
Marker Precision	Character Precision
Marker Symbol Set	Resident Set in Printer

Begin Segment Introducer

Data Area	Value	Description	Error Code
Byte 0	X'70'	BEGIN SEGMENT code	
Byte 1	X'0C'	LENGTH of the following parameters	X'0370..C1'
Bytes 2-5		SEGMENT ID (Ignored)	
Byte 6	X'00'	Reserved	
Byte 7	Bits 0-2: 00 Bit 3: 0/1 Bit 4: 0 Bits 5-6: 00/11 Bit 7: 0	FLAGS Reserved No Prolog (0); Prolog (1) Reserved New Segment (reinitialize graphics defaults)/Append Segment (do not reinitialize defaults) Reserved	X'0370..01' X'0370..82'
Bytes 8-9	X'0000'-X'FFFF'	Length of this segment (SEGLEN)	
Bytes 10-13	X'00000000'	Reserved	
Bytes 14-n		See p.158 "Drawing Orders"	

Drawing Orders

The machine supports all DR2 Drawing Orders and valid data values as defined in the Intelligent Printer Data Stream Reference. The following are those Drawing Orders which define specific data values.

❖ Set Background Mix:

Data Area	Value	Description	Error Code
Byte 0	X'0D'	Order code	
Byte 1	X'00' X'05'	BACKGROUND MIX ATTRIBUTE Drawing default Leave Alone	X'0300..04' X'0300..0E'

❖ **Set Character Angle:**

Data Area	Value	Description	Error Code
Byte 0	X'34'	Order code	
Byte 1	X'04'	Length	X'0300..03'
Bytes 2-3	X'8000' - X'7FFF'	Xg COORDINATE	X'0334..00'
Bytes 4-5	X'8000' - X'7FFF'	Yg COORDINATE	X'0334..00'

- If Xg = 0 and Yg = 0 then the character angle is 0 degrees (default)
- If Xg > 0 and Yg = 0 then the character angle is 0 degrees
- If Xg = 0 and Yg > 0 then the character angle is 90 degrees
- If Xg < 0 and Yg = 0 then the character angle is 180 degrees
- If Xg = 0 and Yg < 0 then the character angle is 270 degrees

📌 **Note**

❑ Exception X'0334..00' applies when both Xg and Yg are non-zero values.


❖ **Set Character Precision:**

Data Area	Value	Description	Error Code
Byte 0	X'39'	Order code	
Byte 1		PRECISION TYPE	X'0300..04'
	X'00'	Current default	X'0300..0E'
	X'01'	String Precision	
	X'02'	Character Precision	


❖ **Set Character Set:**

Data Area	Value	Description	Error Code
Byte 0	X'38'	Order code	
Byte 1		LOCAL CHARACTER SET ID	X'03C3..00'
	X'00'	Current default	
	X'01' - X'FE'	Local ID for Character Set	
	X'FF'	Printer Default	

❖ **Set Color:**

Data Area	Value	Description	Error Code
Byte 0	X'0A'	Order code	
Byte 1		COLOR	X'0300..04'
	X'00'	Printer Default (Black)	
	X'01'	Blue - Limited Simulated Color Support	
	X'02'	Red - Limited Simulated Color Support	
	X'03'	Pink - Limited Simulated Color Support	
	X'04'	Green - Limited Simulated Color Support	
	X'05'	Turquoise - Limited Simulated Color Support	
	X'06'	Yellow - Limited Simulated Color Support	
	X'07'	Black	
	X'08'	Color of Medium (Reset)	
		 Note <input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.	

❖ **Set Extended Color:**

Data Area	Value	Description	Error Code
Byte 0	X'26'	Order code	
Byte 1	X'02'	Length	X'0300..03'
Bytes 2-3		EXTENDED COLOR	X'0300..04'
	X'0000' or X'FF00'	Printer Default (Black)	
	X'0001' or X'FF01'	Blue - Limited Simulated Color Support	
	X'0002' or X'FF02'	Red - Limited Simulated Color Support	
	X'0003' or X'FF03'	Pink - Limited Simulated Color Support	
	X'0004' or X'FF04'	Green - Limited Simulated Color Support	
	X'0005' or X'FF05'	Turquoise - Limited Simulated Color Support	
	X'0006' or X'FF06'	Yellow - Limited Simulated Color Support	
	X'0007'	White - Color of Medium (Reset)	
	X'0008'	Black	
	X'0009'	Dark Blue - Limited Simulated Color Support	
	X'000A'	Orange - Limited Simulated Color Support	
	X'000B'	Purple - Limited Simulated Color Support	
	X'000C'	Dark Green - Limited Simulated Color Support	
	X'000D'	Dark Turquoise - Limited Simulated Color Support	
	X'000E'	Mustard - Limited Simulated Color Support	
	X'000F'	Gray - Limited Simulated Color Support	
	X'0010'	Brown - Limited Simulated Color Support	
	X'FF07'	Printer Default (Black)	
	X'FF08'	Color of Medium (Reset)	
		 Note	
		<input type="checkbox"/> See p.28 "Color Simulation" for color simulation details and product support specifics.	

❖ **Set Line Type:**

Data Area	Value	Description	Error Code
Byte 0	X'18'	Order code	
Byte 1	X'00'	LINE TYPE Current default	X'0300..04' X'0300..0E'
	X'01'	Dotted Line	
	X'02'	Short Dashed Line	
	X'03'	Dashed and Dotted Line	
	X'04'	Double Dotted Line	
	X'05'	Long Dashed Line	
	X'06'	Dashed Double Dotted Line	
	X'07'	Solid Line	
	X'08'	Invisible Line	

❖ **Set Fractional Line Width (4028 Emulation Mode):**

Data Area	Value	Description	Error Code
Byte 0	X'11'	Order code	
Byte 1	X'02'	Length	X'0300..03'
Bytes 2-3	X'0000'	FRACTIONAL LINE WIDTH Current default	X'0300..04' X'0300..0E'
	X'0001' - X'00FF'	2 Pixels Wide	
	X'0100' - X'017F'	4 Pixels Wide	
	X'0180' - X'01FF'	6 Pixels Wide	
	X'0200' - X'0F7F'	G8-60 Pixels Wide	
	X'0F80' - X'FFFF'	62 Pixels Wide	

❖ **Set Fractional Line Width (Native Mode):**

Data Area	Value	Description	Error Code
Byte 0	X'11'	Order code	
Byte 1	X'02'	Length	X'0300..03'
Bytes 2-3		FRACTIONAL LINE WIDTH	X'0300..04'
	X'0000'	Current default	X'0300..0E'
	X'0001' - X'007F'	1 Pixel Wide	
	X'0080' - X'00BF'	2 Pixels Wide	
	X'00C0' - X'00FF'	3 Pixels Wide	
	X'0100' - X'013F'	4 Pixels Wide	
	X'013F' - X'017F'	5 Pixels Wide	
	X'0180' - X'01BF'	6 Pixels Wide	
	X'01C0' - X'01FF'	7 Pixels Wide	
	X'0200' - X'0F7F'	8-60 Pixels Wide	
	X'0F80' - X'FFFF'	62 Pixels Wide	

❖ **Set Line Width:**

Data Area	Value	Description	Error Code
Byte 0	X'19'	Order code	
Byte 1		LINE WIDTH	X'0300..04'
	X'00'	Current default	X'0300..0E'
	X'01' - X'0F'	2-58 Pixels Wide (4 pixels increments)	
	X'10' - X'FF'	62 Pixels Wide	

❖ **Set Marker Precision:**

Data Area	Value	Description	Error Code
Byte 0	X'3B'	Order code	
Byte 1		MARKER PRECISION	X'0300..04'
	X'00'	Drawing default	X'0300..0E'
	X'01'	Character Precision	
	X'02'	Stroke Precision	

❖ **Set Mix:**

Data Area	Value	Description	Error Code
Byte 0	X'0C'	Order code	
Byte 1		MIX ATTRIBUTE	X'0300..04'
	X'00'	Drawing default	X'0300..0E'
	X'02'	Overpaint	

❖ **Set Pattern Set:**

Data Area	Value	Description	Error Code
Byte 0	X'08'	Order code	
Byte 1	X'00'	PATTERN SET ID	X'0368..03'

❖ **Set Pattern Symbol:**

Data Area	Value	Description	Error Code
Byte 0	X'28'	Order code	
Byte 1		PATTERN SYMBOL ID	X'0368..04'
	X'00'	Use Current default	
	X'01' - X'08'	Decreasing Density	
	X'09'	Vertical Lines	
	X'0A'	Horizontal Lines	
	X'0B'	Diagonal Lines 1 (Bot L/Top R)	
	X'0C'	Diagonal Lines 2 (Bot L/Top R)	
	X'0D'	Diagonal Lines 1 (Top L/Bot R)	
	X'0E'	Diagonal Lines 2 (Top L/Bot R)	
	X'0F'	No Shading	
	X'10'	Solid Shading	
	X'40'	Blank	

Set Process Color

The Set Process Color control specifies a process color, highlights color or named color that sets the following color attributes to the same value:

- Character color
- Image color
- Line color
- Marker color
- Pattern color

Data Area	Value	Description	Error Code
Byte 0	X'B2'	Order Code	
Byte 1	X'12' - X'14'	LENGTH	X'0300..03'
Byte 2	X'00'	RESERVED	
Byte 3	X'01'	COLOR SPACE RGB - Limited Simulated Color Support	X'020E..02'
	X'04'	CMYK - Limited Simulated Color Support	
	X'06'	HCS - Limited Simulated Color Support	
	X'08'	CIELAB - Limited Simulated Color Support	
	X'40'	Standard OCA - Limited Simulated Color Support	
Bytes 4-7	X'00000000'	RESERVED	
Byte 8	X'01' - X'08'	1ST COLOR COMPONENT BITS (RGB, CMYK, CIELAB)	X'020E..05'
	X'10'	Standard OCA Color Space	
Byte 9	X'00' - X'08'	2ND COLOR COMPONENT BITS (RGB, CMYK, Highlight, CIELAB)	X'020E..05'
Byte 10	X'00' - X'08'	3RD COLOR COMPONENT BITS (RGB, CMYK, CIELAB)	X'020E..05'
Byte 11	X'00' - X'08'	4TH COLOR COMPONENT BITS (CMYK)	X'020E..05'

Data Area	Value	Description	Error Code
Bytes 12-15		COLOR VALUE	X'020E..03'
		RGB Color Space	X'020E..04'
	X'nn'	Red Intensity	
	X'nn'	Green Intensity	
	X'nn'	Blue Intensity	
		CMYK Color Space	
	X'nn'	Cyan Intensity	
	X'nn'	Magenta Intensity	
	X'nn'	Yellow Intensity	
	X'nn'	Black Intensity	
		Highlight Color Space	
	X'nnnn'	Highlight Color Number	
	X'nn'	Percent Coverage	
	X'nn'	Percent Shading	
		CIELAB Color Space	
	X'nn'	Luminance (L)	
	X'nn'	Chrominance Difference (a)	
	X'nn'	Chrominance Difference (b)	
		Standard OCA Color Space	
	X'0000' or X'FF00'	Printer Default (Black)	
X'0001' or X'FF01'	Blue		
X'0002' or X'FF02'	Red		
X'0003' or X'FF03'	Pink		
X'0004' or X'FF04'	Green		
X'0005' or X'FF05'	Turquoise		
X'0006' or X'FF06'	Yellow		
X'0007'	White - Color of Medium (Reset)		
X'0008'	Black		
X'0010'	Brown		
X'FF07'	Printer Default (Black)		
X'FF08'	Color of Medium (Reset)		

Drawing Order Summary

Zero or more drawing orders follow each Begin Segment Introducer. These drawing orders either specify graphics to be printed or assign drawing attributes.

Given below is a list of the supported drawing orders. Please refer to the AFP GOCA Reference, S544-5498, for complete descriptions of all GOCA drawing orders.

Code	Drawing Order
X'68'	Begin Area
X'D1'	Begin Image
X'91'	Begin Image at Current Position
X'C0'	Box
X'80'	Box at Current Position
X'C3'	Character String
X'83'	Character String at Current Position
X'01'	Comment
X'60'	End Area
X'93'	End Image
X'3E'	End Prolog
X'71'	End Segment (treated like a No Operation command)
X'C5'	Fillet
X'85'	Fillet at Current Position
X'C7'	Full Arc
X'87'	Full Arc at Current Position
X'92'	Image Data
X'C1'	Line
X'81'	Line at Current Position
X'C2'	Marker
X'82'	Marker at Current Position
X'00'	No Operation
X'E1'	Relative Line
X'E3'	Partial Arc
X'A3'	Partial Arc at Current Position
X'A1'	Relative Line at Current Position
X'04'	Segment Characteristics (treated like a No Operation command)
X'22'	Set Arc Parameters
X'OD'	Set Background Mix

Code	Drawing Order
X'34'	Set Character Angle
X'33'	Set Character Cell
X'3A'	Set Character Direction
X'39'	Set Character Precision
X'38'	Set Character Set
X'35'	Set Character Shear
X'0A'	Set Color
X'21'	Set Current Position
X'26'	Set Extended Color
X'11'	Set Fractional Line Width
X'18'	Set Line Type
X'19'	Set Line Width
X'37'	Set Marker Cell
X'3B'	Set Marker Precision
X'3C'	Set Marker Set
X'29'	Set Marker Symbol
X'0C'	Set Mix
X'08'	Set Pattern Set
X'28'	Set Pattern Symbol
X'43'	Set Pick Identifier (treated like a No Operation command)
X'B2'	Set Process Color

8. Bar Code Command Set

The base reference for Bar Code commands is the Bar Code Object Content Architecture Reference.

Bar Code Commands

Name	Command	Sub-command	Where to Look
Write Bar Code Control	X'D680'		p.170 "Write Bar Code Control"
Bar Code Area Position		X'AC6B'	p.170 "Bar Code Area Position"
Bar Code Output Control		X'A66B'	p.171 "Bar Code Output Control"
Bar Code Data Descriptor		X'A6EB'	p.173 "Bar Code Data Descriptor"
Write Bar Code	X'D681'		p.183 "Write Bar Code"

Write Bar Code Control

Bar Code Area Position

Data Area	Value	Description	Error Code
Bytes 0-1	X'000B'-X'xxxx'	LENGTH of Bar Code Area Position (BCAP)	X'0202..05'
Bytes 2-3	X'AC6B'	STRUCTURED FIELD ID	X'020B..05'
Bytes 4-5	X'8000'-X'7FFF'	Bar Code BLOCK ORIGIN Xp, I, or I-OFFSET coordinate position (in 1440ths)	X'0411..00'
Bytes 6-7	X'8000'-X'7FFF'	Bar Code BLOCK ORIGIN Yp, B, or B-OFFSET coordinate position (in 1440ths)	X'0411..00'
Bytes 8-9	X'0000' X'2D00' X'5A00' X'8700'	ORIENTATION OF Bar Code BLOCK 0 degrees 90 degrees 180 degrees 270 degrees	X'0203..05'
Byte 10	X'00' X'20' X'40' X'60' X'A0'	COORDINATE REFERENCE SYSTEM Absolute I, Absolute B Absolute I, Relative B Relative I, Absolute B Relative I, Relative B Page Xp, Yp	X'0204..05'
Bytes 11-n :c		Ignored	

Bar Code Output Control

Data Area	Value	Description	Error Code
Bytes 0-1	X'0010'-X'xxxx'	LENGTH of Bar Code Output Control (BCOC)	X'0202..05'
Bytes 2-3	X'A66B'	STRUCTURED FIELD ID	X'020B..05'
Byte 4	X'00' X'01'	UNIT BASE (Measurement Units) 10 Inches 10 Centimeters	X'0205..05'
Bytes 5-6	X'0001' - X'7FFF'	L-Units per UNIT BASE	X'0206..05'
Bytes 7-8	X'0001' - X'7FFF' X'FFFF'	X EXTENT of Bar Code BLOCK in L-units See p.27 "Notation Conventions" Use Load Page Descriptor Value	X'0207..05'
Bytes 9-10	X'0001' - X'7FFF' X'FFFF'	Y EXTENT of Bar Code BLOCK in L-units See p.27 "Notation Conventions" Use Load Page Descriptor Value	X'0207..05'
Byte 11	X'30'	MAPPING CONTROL OPTION (Position)	X'0208..05'
Bytes 12-13	X'8000' - X'7FFF'	X OFFSET L-units See p.27 "Notation Conventions"	X'0209..05'
Bytes 14-15	X'8000' - X'7FFF'	Y OFFSET L-units See p.27 "Notation Conventions"	X'0209..05'

Data Area	Value	Description	Error Code
Bytes 16-n		<p>Triplets</p> <ul style="list-style-type: none">• Color Specification Triplet. This optional triplet can be placed at the end of the BCOC command to specify the foreground color of the object area, before any object data is placed on the object area. Any number of BCOC triplets can be received, they are processed in the order received and the resulting color of the object area depends on the last instance of the triplet received. See p.31 "Color Specification" for details.• Presentation Space Reset Mixing Triplet. This optional triplet can be placed at the end of the BCOC command to specify whether or not an object area is reset to the color of medium before any object data is placed on the object area. Any number of BCOC triplets can be received, they are processed in the order received and the resulting color of the object area depends on the last instance of the triplet received. See p.33 "Presentation Space Reset Mixing" for details.	

Bar Code Data Descriptor

Data Area	Value	Description	Error Code
Bytes 0-1	X'001B'-X'xxxx'	LENGTH of Bar Code Data Descriptor (BCDD)	X'0202..05'
Bytes 2-3	X'A6EB'	STRUCTURED FIELD ID	X'020B..05'
Byte 4	X'00' X'01'	UNIT BASE (Measurement Units) 10 Inches 10 Centimeters	X'0205..05'
Byte 5	X'00'	Reserved	
Bytes 6-7	X'0001' - X'7FFF'	Xbc Units per UNIT BASE	X'0206..05'
Bytes 8-9	X'0001' - X'7FFF'	Ybc Units per UNIT BASE	X'0206..05'
Bytes 10-11	X'0001' - X'7FFF' X'FFFF'	X EXTENT of Bar Code Presentation Space in L-units. See p.27 "Notation Conventions" Use BCOC X EXTENT	X'0207..05'
Bytes 12-13	X'0001' - X'7FFF' X'FFFF'	Y EXTENT of Bar Code Presentation Space in L-units. See p.27 "Notation Conventions" Use BCOC Y EXTENT	X'0207..05'
Bytes 14-15	X'0000'	Reserved	
Byte 16		BAR CODE TYPE See p.176 "Bar Code Type and Modifier Description and Values"	X'0403..00'
Byte 17		BAR CODE MODIFIER See p.176 "Bar Code Type and Modifier Description and Values"	X'040B..00'
Byte 18	X'01' - X'FE' X'FF'	FONT LOCAL ID Default Font Local ID (Note 1)	X'0404..00'
Bytes 19-20	X'0000' or X'FF00' X'0001' or X'FF01' X'0002' or X'FF02' X'0003' or X'FF03' X'0004' or X'FF04' X'0005' or X'FF05'	COLOR (Named Color) Printer Default (Black) Blue - Limited Simulated Color Support Red - Limited Simulated Color Support Pink - Limited Simulated Color Support Green - Limited Simulated Color Support Turquoise - Limited Simulated Color Support	X'0405..00'

Data Area	Value	Description	Error Code
	X'0006' or X'FF06'	Yellow - Limited Simulated Color Support	
	X'0007'	White - Color of Medium (Reset) Black	
	X'0008'	Dark Blue - Limited Simulated Color Support	
	X'0009'	Orange - Limited Simulated Color Support	
	X'000A'	Purple - Limited Simulated Color Support	
	X'000B'	Dark Green - Limited Simulated Color Support	
	X'000C'	Dark Turquoise - Limited Simulated Color Support	
	X'000D'	Mustard - Limited Simulated Color Support	
	X'000E'	Gray - Limited Simulated Color Support	
	X'000F'	Brown - Limited Simulated Color Support	
	X'0010'	Printer Default (Black)	
	X'FF07'	Color of Medium (Reset)	
	X'FF08'	Printer Default (Black)	
	X'FFFF'		
Byte 21	X'07' - X'36' X'FF'	UNIT MODULE WIDTH Printer Default Range and Printer Default are specified by Bar Code Type in Byte 16 (especially 2D bar codes)	X'0406..00'
Bytes 22-23	X'0001' - X'7FFF' X'FFFF'	ELEMENT HEIGHT in L-units See p.27 "Notation Conventions" Printer Default as specified by Bar Code Type in Byte 16	X'0407..00'
Byte 24	X'01'-X'FF'	Height multiplier	X'0408..00'

Data Area	Value	Description	Error Code
Bytes 25-26		WIDE-TO-NARROW RATIO (WE NE)	X'0409..00'
	X'0000'	Not Applicable Note 2	
	X'0002'	2: 1	
	X'0003'	3: 1	
	X'0014' to X'001E'	2.0: 1 - 3.0: 1	
	X'00C8' to X'012C'	2.00: 1 - 3.00: 1	
	X'FFFF'	Printer Default as specified by Bar Code Type (Byte 16)	
Bytes 27-end		Ignored	

- The Font Local ID specified in BCDD Byte 18 should be OCR-A, OCR-B or Code 128 dependent on the Bar Code Type specified in BCDD Byte 16. The default Font Local ID and Bar Code Type relationships are as follows:

OCR-A	OCR-B
Code 128	UPC-A
Code 3 of 9	UPC-E
MSI	UPC 2-Digit Add-on
2 of 5 Industrial	UPC 5-Digit Add-on
2 of 5 Matrix	EAN-8
2 of 5	EAN-13
Interleaved	EAN 2-Digit Add-on
Codabar	EAN 5-Digit Add-on

- Wide-to-Narrow Ratio (BCDD Bytes 25-26) is only valid for the following Bar Code Types:
X'01' 3 of 9
X'02' MSI
X'0A' 2 of 5 Industrial
X'0B' 2 of 5 Matrix
X'0C' Interleaved 2 of 5
X'0D' Codabar
- Default wide-to-narrow ratio for Codabar, Code 3 of 9, and the 2 of 5 types is dictated by the lowest unit module width that results in a readable bar code. The default wide-to-narrow ratio for MSI is 2:1 unless it can't be printed with the selected unit module width.

Bar Code Type and Modifier Description and Values

Bar Code Type (Byte 16)	Bar Code Description	Unit Module Width Default (mils)	Unit Module Width Range (mils)	Element Height Default (mils)	Element Height Range (mils)	Wide-to-Narrow Ratio
X'01'	3 of 9 Code AIM USS-39	14	7-54	234	234-14000	7.3
X'02'	MSI	14	7-54	300	300-14000	
X'03'	UPC/CGPC Version A	14	7-54	1020	250-14000	
X'05'	UPC/CGPC Version E	14	7-54	1020	250-14000	
X'06'	UPC 2 Character Supplemental (Periodicals)	14	7-54	1020	250-14000	
X'07'	UPC 5 Character Supplemental (Paperbacks)	14	7-54	1020	250-14000	
X'08'	EAN-8 (JAN Short)	14	7-54	840	250-14000	
X'09'	EAN-13 (JAN Standard)	14	7-54	1020	250-14000	
X'0A'	Industrial 2 of 5	14	7-54	234	234-14000	8:02
X'0B'	Matrix 2 of 5	14	7-54	234	234-14000	4:02
X'0C'	Interleaved 2 of 5 AIM USS-I 2/5	14	7-54	234	234-14000	3:02
X'0D'	Codabar 2 of 7 Code AIM USS-Codabar	14	7-54	234	234-14000	4:02
X'11'	Code 128 AIM USS-128	14	7-54	250	250-14000	

Bar Code Type (Byte 16)	Bar Code Description	Unit Module Width Default (mils)	Unit Module Width Range (mils)	Element Height Default (mils)	Element Height Range (mils)	Wide-to-Narrow Ratio
X'16'	EAN 2 Digit Add-on	14	7-54	1020	250-14000	
X'17'	EAN 5 Digit Add-on	14	7-54	1020	250-14000	
X'18'	POSTNET (Include PLANET)	14	7-54	1000	250-14000	
X'1A'	RM4SCC Royal Mail (Inc. Dutch KIX)	14	7-54	1000	250-14000	
X'1B'	Japan Postal	14	7-54	1000	250-14000	
X'1C'	Data Matrix 2D	21	12-254	21	12-254	
X'1D'	MaxiCode 2D					
X'1E'	PDF417 2D	14	7-254	15% of width or 0.2 in.	4*width - 524287	
X'1F'	Australia Post	14	7-54	1000	250-14000	
X'20'	QR Code 2D	14	7-254	21	12-254	
X'21'	Code 93	14	7-54	234	234-14000	7:03
X'22'	USPS Four- State	14	7-54	1000	250-14000	

❖ Bar Code Type and Modifier Description and Values

Byte 16 Value	Bar Code Type	Byte 17 Value	Description
X'01'	3 of 9 Code, AIM USS-39	X'01'	Print Bar Code with no Printer-Generated Check Character.
		X'02'	Generate Check Character and Print with Bar Code.
X'02'	MSI	X'01'	Print Bar Code with no Printer-Generated Check Character.
		X'02'	Print Bar Code with IBM Modulus 10 Check Digit Generated by Printer and Put at End of Data.
		X'03'	First check digit IBM Modulus 10.
		X'04'	First check digit NCR Modulus 11. Check digit equals remainder. Check digit of 10 equals error.
		X'05'	First check digit IBM Modulus 11. Check digit equals remainder. Check digit of 10 equals error.
		X'06'	First check digit NCR Modulus 11. Check digit equals 11 minus remainder. Check digit of 10 equals zero.
		X'07'	First check digit IBM Modulus 11. Check digit equals 11 minus remainder. Check digit of 10 equals error.
		X'08'	First check digit NCR Modulus 11. Check digit equals 11 minus remainder. Check digit of 10 equals error.
		X'09'	First check digit IBM Modulus 11. Check digit equals 11 minus remainder. Check digit of 10 equals error.
X'03'	UPC/CGPC Version A	X'00'	Generate check digit and Print standard symbol.
X'05'	UPC/CGPC Version E	X'00'	Print bar code. Six digits are encoded.
X'06'	UPC 2-Character Supplemental (Periodicals)	X'00'	Print the 2 supplemental digits (bar/space pattern and HRI).
X'07'	UPC 5-Character Supplemental (Paperbacks)	X'00'	Print the 5 supplemental digits (bar/space pattern and HRI).
X'08'	EAN-8 (JAN Short)	X'00'	Print bar code symbol. Input variable data is 7 digits (2 flag and 5 article ID digits).

Byte 16 Value	Bar Code Type	Byte 17 Value	Description
X'09'	EAN-13 (JAN Standard)	X'00'	Print bar code symbol. Input variable data is 12 digits (2 flag and 10 article ID digits).
X'0A'	2 of 5 Industrial	X'01'	Print bar code with no printer-generated check character.
		X'02'	Generate check character and print with bar code.
X'0B'	2 of 5 Matrix	X'01'	Print bar code with no printer-generated check character.
		X'02'	Generate check character and print with bar code.
X'0C'	Interleaved 2 of 5, AIM USS-I 2/5	X'01'	Print bar code with no printer-generated check character.
		X'02'	Generate check character and print with bar code.
X'0D'	Codabar, 2 of 7 Code, AIM USS-Codabar	X'01'	Print bar code with no printer-generated check character.
		X'02'	Generate check character and print with bar code (Check character appears in HRI).
X'11'	Code 128, AIM USS-128	X'02'	Generate check character and print with bar code.
		X'03'	Generate check character and print with bar code that supports UCC/EAN 128.
X'16'	EAN 2 Digit Add-on	X'00'	Print the 2 digit add-on (bar/space pattern and HRI).
X'17'	EAN 5 Digit Add-on	X'00'	Print the 5 digit add-on (bar/space pattern and HRI).

Byte 16 Value	Bar Code Type	Byte 17 Value	Description
X'18'	POSTNET		USPS Specification
		X'00'	Print 5 digit POSTNET 'Zip Code' bar code with leading frame bar and trailing correction digit and frame.
		X'01'	Print 9 digit POSTNET 'Zip + 4' bar code with leading frame bar and trailing correction digit and frame.
		X'02'	Print 11 digit POSTNET 'ABC' bar code with leading frame bar and trailing correction digit and frame.
		X'03'	Print variable length data POSTNET bar code with leading frame bar and trailing correction digit and frame. Data length checking is not performed with modifier X'03'.
		X'04'	Print PLANET bar code symbology.
X'1A'	RM4SCC (Royal Mail 4 State Customer Code)	X'00'	Variable Length Data. Printer will generate Start bit, Checksum Character and Stop bit. Checksum algorithm is performed on the data characters only. User is responsible for 2 mm quiet zone (all around) and proper sequencing of the Postal Code data (including International Prefix, Outward Code, Inward Code and Delivery Point Suffix).
X'1A'	RM4SCC (Dutch KIX Postal Bar Code)	X'01'	Present a RM4SCC bar code symbol with NO Start bit, NO Checksum Character and NO Stop bit. Checksum algorithm is performed on the data characters only. User is responsible for 2 mm quiet zone (all around) and proper sequencing of the Postal Code data (including International Prefix, Outward Code, Inward Code and Delivery Point Suffix).
X'1B'	Japan Postal Bar Code	X'00'	Present a Japan Postal Bar Code symbol with a generated start character, checksum character and stop character.
		X'01'	Present a Japan Postal Bar Code symbol directly from the bar code data.
X'1C'	Data Matrix 2D	X'00'	Present a Data Matrix Bar Code symbol.

Byte 16 Value	Bar Code Type	Byte 17 Value	Description
X'1D'	MaxiCode 2D	X'00'	Present a MaxiCode Bar Code symbol.
X'1E'	PDF417 2D	X'00'	Present a "full" PDF417 Bar Code symbol.
		X'01'	Present a "truncated" PDF417 Bar Code symbol.
X'1F'	Australia Post	X'01'	Standard Customer Bar Code (Format Code 11) - An 8 digit number representing the Sorting Code.
		X'02'	Customer Bar Code 2 using Table N (Format Code 59) An 8 digit number representing the Sorting Code, followed by up to 8 numeric digits representing the Customer Information.
		X'03'	Customer Bar Code 2 using Table C (Format Code 59) An 8 digit number representing the Sorting Code, followed by up to 5 characters (A-Z, a-z, 0-9, space, #) representing the Customer Information.
		X'04'	Customer Bar Code 2 using proprietary encoding (Format Code 59) - An 8 digit number representing the Sorting Code, followed by up to 16 numeric digits (0-3) representing the Customer Information. Each of the 16 digits specify one of the 4 types of bar code.
		X'05'	Customer Bar Code 3 using Table N (Format Code 62) An 8 digit number representing the Sorting Code, followed by up to 15 numeric digits representing the Customer Information.
		X'06'	Customer Bar Code 3 using Table C (Format Code 62) An 8 digit number representing the Sorting Code, followed by up to 10 characters (A-Z, a-z, 0-9, space, #) representing the Customer Information.
		X'07'	Customer Bar Code 3 using proprietary encoding (Format Code 62) - An 8 digit number representing the Sorting Code, followed by up to 31 numeric digits (0-3) representing the Customer Information. Each of the 31 digits specify one of the 4 types of bar code.
		X'08'	Reply Paid Bar Code (Format Code 45) - An 8 digit number representing the Sorting Code.

Byte 16 Value	Bar Code Type	Byte 17 Value	Description
X'20'	QR Code 2D	X'02'	Present a model 2 QR Code bar code symbol.
X'21'	Code 93	X'02'	Present a Code 93 bar code symbol.
X'22'	USPS Four State		USPS Specification
		X'00'	Present a USPS Four-State bar code symbol with no Routing ZIP Code. The input data for this bar code symbol must be 20 numeric digits.
		X'01'	Present a USPS Four-State bar code symbol with a 5-digit Routing ZIP Code. The input data for this bar code symbol must be 25 numeric digits. The valid values for the Routing Zip Code are 00000-99999.
		X'02'	Present a USPS Four-State bar code symbol with a 9-digit Routing ZIP Code. The input data for this bar code symbol must be 29 numeric digits. The valid values for the Routing Zip Code are 000000000-999999999.
		X'03'	Present a USPS Four-State bar code symbol with an 11 digit Routing ZIP Code. The input data for this bar code symbol must be 31 numeric digits. The valid values for the Routing Zip Code are 00000000000-99999999999.

Write Bar Code

Data Area	Value	Description	Error Code
Byte 0		FLAGS	
	Bit 0	HRI PRINTING (Not supported for postal bar code types)	X'0410..00'
	0	Print HRI	
	1	No HRI	
	Bits 1-2	HRI LOCATION	
	00	Printer Default (Below symbol)	
	01	Below symbol (Except UPC/EAN with 2 or 5 digit add-on)	
	10	Above symbol (UPC/EAN with 2 or 5 digit add-on only)	
	Bit 3	START/STOP HRI for 3 of 9 Code (Asterisk)	
0	Do not print HRI for 3 of 9 Start/Stop pattern		
1	Print HRI for 3 of 9 Start/Stop pattern		
Bit 4	CODE PAGE TYPE (Ignore)		
Bit 5	BAR CODE SUPPRESSION		
0	Present the bar code symbol		
1	Suppress presentation of the bar code symbol		
Bit 6			
Bit 7			
Bytes 1-2	X'0001' - X'7FFF'	X COORDINATE of the symbol ORIGIN See p.27 "Notation Conventions"	X'040A..00'
Bytes 3-4	X'0001' - X'7FFF'	Y COORDINATE of the symbol ORIGIN See p.27 "Notation Conventions"	X'040A..00'
Bytes 5-End		DATA to be bar encoded	X'040C..00'

9. Overlay Command Set

Overlay Function Set Commands

Name	Command	Sub-command	Where to Look
Begin Overlay	X'D6DF'		Intelligent Printer Data Stream Reference
Deactivate Overlay	X'D6EF'		Intelligent Printer Data Stream Reference
Include Overlay	X'D67D'		Intelligent Printer Data Stream Reference

Note

- The machine does not support Secure Overlay (value X'01' in byte 2 of Include Overlay is not supported).
- See p.27 "Notation Conventions" regarding the notation convention for Include Overlay bytes 3-5 and 7-9.

10. Page Segment Command Set

Page Segment Function Set Commands

Name	Command	Sub-command	Where to Look
Begin Page Segment	X'D65F'		Intelligent Printer Data Stream Reference
Deactivate Page Segment	X'D66F'		Intelligent Printer Data Stream Reference
Include Page Segment	X'D67F'		Intelligent Printer Data Stream Reference

11. Object Container Command Set

Object Container Function Set Commands

Name	Command	Sub-command	Where to Look
Write Object Container Control	X'D63C'		Intelligent Printer Data Stream Reference
Write Object Container	X'D64C'		Intelligent Printer Data Stream Reference
Deactivate Data-Object-Font	X'D65B'		Intelligent Printer Data Stream Reference
Deactivate Data-Object-Resource	X'D65C'		Intelligent Printer Data Stream Reference
Data-Object-Resource Equivalence	X'D66C'		Intelligent Printer Data Stream Reference
Include Data-Object	X'D67C'		Intelligent Printer Data Stream Reference

Note

- ❑ For specific details on the Object Container Command Set, see the Intelligent Printer Data Stream Reference, S544-3417.

12. Loaded Font Command Set

Loaded Font Function Set Commands

Name	Command	Sub-command	Where to Look
Load Code Page	X'D61B'		p.191 "Load Code Page"
Load Code Page Control	X'D61A'		p.192 "Load Code Page Control"
Load Font	X'D62F'		p.193 "Load Font"
Load Font Character Set Control	X'D619'		p.195 "Load Font Character Set Control"
Load Font Control	X'D61F'		p.196 "Load Font Control"
Load Font Index	X'D60F'		p.199 "Load Font Index"

Load Code Page

This command assigns each code point of a code page to a specific Graphic Character Global ID (GCGID). One or more Load Code Page (LCP) commands follow the Load Code Page Control command.

A sequence of LCP commands are used to transmit the entire code page. This sequence is initiated by the first LCP command that contains data and terminates with an End command. Entries may be split across LCP commands on any byte boundary and are restricted in size by the standard IPDS 32767 byte command length limit.

Data Area	Value	Description	Error Code
Bytes 0-7	(8 Bytes)	GRAPHIC CHARACTER GLOBAL ID	
Byte 8	Bit 0: 0/1 Bit 1: 0/1 Bit 2: 0/1 Bits 3-7	PROCESSING FLAGS Defined/Undefined Defined/Undefined Incrementing/Nonincrementing Reserved	
Bytes 9-n		CODE POINT	X'02B0..07'

Load Code Page Control

This command describes a code page resource which will be used to carry code page data. The Load Code Page Control (LCPC) command is followed by one or more Load Code Page (LCP) commands that specify the code page data.

The LCPC command is valid only in Home State and causes a transition to Code Page State. Code Page State ends when the printer receives the End command following receipt of at least one LCP command.

Data Area	Value	Description	Error Code
Bytes 0-1	X'0001' - X'7EFF'	CODE PAGE HOST ASSIGNED ID	X'02B0..00' X'02B0..01'
Bytes 2-3	Bits 0-3: 0000 Bits 4-7: 0001 Bits 4-7: 0010 Bits 8-15: 00000000	ENCODING SCHEME Reserved Number of Bytes Fixed Single-byte Fixed Double-byte Reserved	X'02B0..02'
Bytes 4-7	X'0000000A' - X'FFFFFFFF'	BYTE COUNT for subsequent LCP commands	X'02B0..04' X'02B0..05'
Bytes 8-9	X'0000'	Reserved	
Bytes 10-n	X'nn' X'nnnn'	VARIABLE SPACE CODE POINT SBCS DBCS	
Bytes n+1 to n+2	X'0000' X'0001' - X'FFFE' X'FFFF'	GCSGID No Value Supplied Specific GCSGID Use Default	
Bytes n+3 to n+4	X'0001' - X'FFFE'	CPGID Specific CPGID	
Bytes n+5 to n+12	X'nnnnnnnnnnn nnnnn'	GCGID Default GCGID	

Data Area	Value	Description	Error Code
Bytes n+13		GCGID PROCESSING FLAGS	
	Bit 0: 0	Defined	
	Bit 0: 1	Undefined	
	Bit 1: 0	Printing	
	Bit 1: 1	Nonprinting	
	Bit 2: 0	Incrementing	
	Bit 2: 1	Nonincrementing	
	Bit 3: 0	Reserved	
	Bit 4: 0	Retired	
	Bit 4: 1	Retired	
	Bit 5 - 7: 0000	Reserved	

Note

- If the code point specified in VARIABLE SPACE CODE POINT is not contained in the associated font character set, the printer will use a character increment of 333 relative units for typographic and proportionally spaced fonts and 600 relative units for fixed pitch, uniform character increment fonts.
- GCSGID/CPGID will be used for CMAP matching (DBCS), in all other instances they will be ignored.

Load Font

LF1 Format

When downloading a fully described font (LF1 format), the Load Font (LF) carries a series of character raster pattern bit strings. Consecutive Load Font commands are supported for downloading the LF1 font character patterns.

Data Area	Value	Description	Error Code
Bytes 0-n	Any Value in conformance with LFC Font Byte Count	FONT DATA in LF1 FORMAT (Character Patterns)	X'022E..02' X'0232..02'

LF3 Format

When downloading a font character set (LF3 format), the LF consists of a character ID map followed by zero or more (technology specific) Adobe Type-1 PFB objects. Consecutive LF commands are supported for downloading the LF3 font data.

❖ **Character ID Map**

Data Area	Value	Description	Error Code
Byte 0	X'02'	IBM CHARACTER ID FORMAT (IBM Registered EBCDIC GCGID)	
Byte 1	X'03' X'04'	TECHNOLOGY SPECIFIC CHARACTER ID FORMAT Font-specific ASCII Character name used with Type-1 PFB fonts ASCII numeric Glyph ID (used with Adobe Composite fonts) ASCII numeric Glyph ID (used with Adobe Composite fonts)	
Zero or more entries in the following format			
Bytes +0-7		IBM CHARACTER ID (GCGID)	X'02B1..04'
Bytes +8-11		OFFSET into the following list of Adobe Type-1 Character ID entries (each GCGID maps to exactly one Adobe Type-1 Character ID)	
Zero or more Adobe Type-1 Character ID entries in the following			
Byte ++0	X'02'-X'80'	LENGTH of Adobe Type-1 Character ID entry (including this field)	X'02B1..03'
Bytes +1-n		ADOBE Type-1 CHARACTER ID	

❖ **Technology Specific Font Objects**

The technology specific LF3 font object supported is a form of Adobe Type-1 PFB file. Each PFB object contains the following information.

Data Area	Value	Description	Error Code
Bytes 0-3	X'0000000A' - X'FFFFFFF'	LENGTH of Adobe Type-1 PFB file (including this field)	X'02B1..08'
Bytes 4-7		CHECKSUM	X'02B1..09'
Bytes 8-9	X'0002' - X'FFFF'	LENGTH of Adobe PFB object NAME	X'02B1..0A
Bytes 10-n		Adobe PFB Object NAME	
Bytes (n+1)-z		OBJECT DATA for Adobe Type-1 PFB fonts (PFB file)	

Load Font Character Set Control

This command provides control information for each font character set that the host downloads to the printer. The command is only used for LF-3 type coded fonts. The LFCSC command is followed by one or more Load Font commands that contain the actual font character set information. This command is valid only in home state and causes a transition to font state. Font state ends when the printer receives the End command following receipt of at least one LF command.

Data Area	Value	Description	Error Code
Bytes 0-1	X'0001' - X'7EFF'	FONT CHARACTER SET HAID	X'02B0..0A' X'02B0..0B'
Bytes 2-3	X'0000'	Reserved	
Byte 4	X'1F'	PATTERN TECHNOLOGY ID Type 1 PFB	
Byte 5	X'00'	Adobe PFB Object NAME	
Byte 6	Bit 0: 0/1 Bit 1: 0/1 Bits 2-7: 000000	INTENDED USE FLAGS Not intended for MICR printing/Intended for MICR printing (If MICR Installed) This is NOT a FCS extension/This IS a FCS extension Reserved	X'02B2..04' X'02B2..01' X'02B2..02'
Bytes 7-10	X'00000002' - X'FFFFFFF'	NUMBER of BYTES in the LOAD FONT COMMANDS	X'022E..02' X'0232..02' X'02B0..0E'
Bytes 11-14	X'00000002' - X'FFFFFFF'	NUMBER of BYTES in the CHARACTER ID MAP	X'02B0..0F'
Bytes 15-16	X'nnnn'	NUMBER of GCGIDs in the CHARACTER ID MAP	
Bytes 17-18	X'0000' X'0001' - X'FFFE' X'FFFF'	GCSGID No Value Supplied Specific GCSGID Use Default	
Bytes 19-20	X'0001' - X'FFFE'	FGID Specific FGID	

Load Font Control

This command is $40 + (8 \times n)$ bytes long, where n (4090 max) is the number of font characters that have associated raster patterns. The command contains font id, overall font characteristics, and the information needed to parse the font raster patterns. There is only one Load Font Control command for each font or font section. This command can only be issued in Home State and causes a transition to Font State.

Data Area	Value	Description	Error Code
Bytes 0-1	X'0001'-X'7EFF'	FONT HOST ASSIGNED ID	X'0218..02' X'0239..02'
Byte 2	X'00' X'41'-X'FE'	SECTION ID Single-byte fonts Double-byte font sections	X'0243..02'
Byte 3	X'00'	Reserved (Font-index Format)	X'0221..02'
Byte 4	X'05'	Pattern Data Format (bounded box)	X'0222..02'
Byte 5	Bits 0-1: 00 Bits 2-3: 01/10 Bits 4-5: 00 Bit 6: 1/0 Bit 7: 0	FONT TYPE BITS Reserved FONT TYPE: Single-byte/Double-byte Reserved CHARACTER BOX SIZE: Uniform size (see bytes 6-7)/Individual size (see bytes 40-End) Reserved	X'0223..02'
Bytes 6-7	X'0001' - X'7FFF'	UNIFORM or MAXIMUM CHARACTER BOX X SIZE	X'0226..02'
Bytes 8-9	X'0001' - X'7FFF'	UNIFORM or MAXIMUM CHARACTER BOX Y SIZE	X'0227..02'
Byte 10	X'00' X'02'	UNIT BASE for L-units Ten in. (fixed metric technology) Relative units (relative metric technology)	X'021B..02'
Byte 11	X'00'	Reserved	

Data Area	Value	Description	Error Code
Bytes 12-13	X'03E8' X'0960' X'0BB8' X'1770'	L-units per UNIT BASE in the X direction Byte 10 = X'02' 1000 Byte 10 = X'00' 2400 (240 DPI) 3000 (300 DPI) 6000 (600 DPI)	X'022A..02'
Bytes 14-15	X'03E8' X'0960' X'0BB8' X'1770'	L-units per UNIT BASE in the Y direction Byte 10 = X'02' 1000 Byte 10 = X'00' 2400 (240 DPI) 3000 (300 DPI) 6000 (600 DPI)	X'022B..02'
Bytes 16-17	X'0000'	Reserved	
Bytes 18-20	X'000001' - X'7FFFFFF'	FONT BYTE COUNT	X'021C..02'
Byte 21	X'01' X'04' X'08'	CHARACTER DATA ALIGNMENT Starting address 1 byte aligned Starting address 4 byte aligned Starting address 8 byte aligned	X'022D..02'
Bytes 22-23	X'nnnn'	GCSGID (ignored)	
Bytes 24-25	X'nnnn'	CPGID (ignored)	
Byte 26	X'00'	UNIT BASE for PIXEL-Units Ten in.	X'0287..02'
Byte 27	X'00'	Reserved	
Bytes 28-29	X'0960' X'0BB8' X'1770'	PIXEL-Units per UNIT BASE in the X direction (only applicable if byte 10 = x'02') 2400 Units per 10 in. (240 dpi) 3000 Units per 10 in. (300 dpi) 6000 Units per 10 in. (600 dpi)	X'0288..02'

Data Area	Value	Description	Error Code
Bytes 30-31	X'0960' X'0BB8' X'1770'	PIXEL-Units per UNIT BASE in the Y direction (only applicable if byte 10 = x'02') 2400 Units per 10 in. (240 dpi) 3000 Units per 10 in. (300 dpi) 6000 Units per 10 in. (600 dpi)	X'0289..02'
Bytes 32-33	X'0001' - X'7FFF'	RELATIVE METRIC MULTIPLYING FACTOR	X'028A..02'
Bytes 34-35	X'nnnn'	FGID (ignored)	
Byte 36	X'01'	STAGEABILITY Font is not stageable (retired)	X'0220..02'
Byte 37	Bit 0: 0/1 Bits 1-7: 0000000	INTENDED USE FLAGS: Not intended for MICR printing/Intended for MICR printing (If MICR Installed) Reserved	
Bytes 38-39	X'nnnn'	Font width (ignored)	
Bytes 40-n		Zero or more CHARACTER PATTERN DESCRIPTORS in the following format	
+ 0-1 bytes	X'0000' - X'7FFF'	CHARACTER BOX X SIZE	X'0226..02'
+ 2-3 bytes	X'0000' - X'7FFF'	CHARACTER BOX Y SIZE	X'0227..02'
+ 4-7 bytes	X'00000000' - X'007FFFFE'	CHARACTER PATTERN ADDRESS	X'023E..02'

Load Font Index

This command is 32 + (256 × 16) (the (256 × 16) byte field is not always required) bytes long. It contains general information needed to print the patterns and a description of the characteristics of each of the 256 possible code points. Each font can have from one to four associated font indices.

Each index is loaded by a separate Load Font Index command. This command can only be issued in Home State.

Data Area	Value	Description	Error Code
Bytes 0-1	X'0001' - X'7EFF'	FONT HOST ASSIGNED ID (HAID)	X'0218..02'
Byte 2	X'00' X'41' - X'FE'	SECTION ID Single byte Double-byte section	X'0243..02'
Byte 3	Bit 0: 0/1 Bits 1-7: 0000000	FLAGS VARIABLE SPACE: Disabled/Enabled Reserved	
Bytes 4-5	X'0000' X'2D00' X'5A00' X'8700'	FONT INLINE SEQUENCE 0 degrees 90 degrees 180 degrees 270 degrees	X'0240..02' X'0246..02'
Bytes 6-7	X'0000'	Reserved	
Bytes 8-9	X'8000' - X'7FFF'	UNIFORM or MAXIMUM BASELINE OFFSET	X'023C..02'
Bytes 10-11	X'8000' - X'7FFF'	UNIFORM or MAXIMUM CHARACTER INCREMENT	X'023C..02'
Bytes 12-13	X'0000'	Reserved	
Bytes 14-15	X'0000' - X'7FFF'	MAXIMUM BASELINE EXTENT	

Data Area	Value	Description	Error Code
Byte 16		ORIENTATION FLAGS	
	Bits 0-4: 00000	Reserved	
	Bit 5: 1/0	UNIFORM A-SPACE: Bytes 18, 19 specify uniform value/Bytes 18, 19 specify minimum value A-space for each character is in the character index entry	
	Bit 6: 1/0	UNIFORM BASELINE OFFSET: Bytes 8, 9 specify uniform baseline offset/Bytes 8, 9 specify minimum baseline offset (Baseline offset for each character is in the character index entry)	
Bit 7: 1/0	UNIFORM CHARACTER INCREMENT: Bytes 10, 11 specify uniform character increment/Bytes 10, 11 specify minimum character increment (Character increment for each character is in the character index entry)		
Byte 17	X'00'	Reserved	
Bytes 18-19	X'8000' - X'7FFF'	UNIFORM or MINIMUM A-SPACE	X'023C..02'
Bytes 20-21	X'0000' - X'FFFF'		
Bytes 22-23	X'8000' - X'7FFF'		
Bytes 24-25		RECOMMENDED UNDERSCORE WIDTH	X'023C..02'
	X'0000' X'0001' - X'7FFF'	No recommendation Underscore width in L-units	
Bytes 26-27	X'8000' - X'7FFF'	RECOMMENDED UNDERSCORE POSITION (L-units)	
Bytes 28-31	X'00000000'	Reserved	
Bytes 32-4127			

Data Area	Value	Description	Error Code
+ 0-1 bytes	X'0000'	CHARACTER FLAGS Defined, printing, incrementing	
	X'2000'	Defined, printing, non-incrementing	
	X'4000'	Defined, non-printing, incrementing	
	X'6000'	Defined, non-printing, non-incrementing	
	X'8000'	Undefined, printing, incrementing	
	X'A000'	Undefined, printing, non-incrementing	
	X'C000'	Undefined, non-printing, incrementing	X'023C..02'
	X'E000'	Undefined, non-printing, non-incrementing	X'023C..02'
+ 2-3 bytes	X'0000' - X'xxxx'	PATTERN INDEX	
+ 4-5 bytes	X'8000' - X'7FFF'	CHARACTER INCREMENT	
+ 6-7 bytes	X'8000' - X'7FFF'	A-SPACE	X'023C..02'
+ 8-13 bytes	X'000000000000'	Reserved	
+ 14-15 bytes	X'8000' - X'7FFF'	BASELINE OFFSET	

13. Exception Reporting, Sense Data, and Recovery

About Exception Reporting, Sense Data, and Recovery

This chapter supplies information about Acknowledge Reply, which the IPDS uses for exception reporting.

The chapter begins with general information followed by tables of the exception-reporting codes for the printer. The tables contain details about the specific exceptions. The chapter concludes with a section on printer counter adjustments.

Note

- When you have questions about codes from the printer, use this chapter instead of the exception-reporting chapter in the Intelligent Printer Data Stream Reference. Although the two chapters are similar, this chapter contains only those exception codes that the printer returns.

General Reply Rules

IPDS uses the Acknowledge Reply command to return both positive and negative replies to the host.

Positive messages are Acknowledge Replies. The negative messages (exception messages) are NACKs and are sent as sense-byte information in the special data area. For more information about Acknowledge Replies, see p.39 “Device Control Command Set”.

The following general rules apply to printer replies:

- The printer reports a data-stream exception with a NACK. Only one exception can be returned in each NACK.
- The printer sends an ACK or a NACK in response to an Acknowledgement Required (ARQ) flag. If there is an exception, the printer sends a NACK without receiving an ARQ.
- If the printer receives a command requesting an acknowledgement, it expects the host to wait for the acknowledgement before sending more commands.

- Any data received after an exception is reported is discarded until all queued NACKs have been either sent to the host or cleared by an appropriate link-level command.

An exception on a command can be reported before receiving the entire command data. When an Alternate Exception Action (AEA) or Page Continuation Action (PCA) is not to be taken, the next data received should be part of a new command. Otherwise, an 8001..00 exception may result. The printer might not discard the remaining bytes in a command with an error when reported. Therefore, the next data received should be the start of a new command. As a result, begin the host data re-transmission only after a synchronizing command (such as XOH Print Buffered Data or XOA Discard Buffered Data) is successfully acknowledged.

A terminating condition causes the first NACK to be reported. The next NACK is reported when the next five bytes of data are received. This is usually an IPDS command header. Reporting a NACK discards all data currently received. The process of receiving five bytes and sending a NACK repeats until the NACK queue is exhausted or cleared by the appropriate link-level command.

- An ACK indicates that the data stream was checked and that commands were transformed into the printer's internal command language, with the following exceptions:
 - Asynchronous-position exceptions and undefined character exceptions are not detected until print time.
 - The data stream is not checked when IPDS is being saved for future use, as in overlays and page segments, and when more than one copy group is specified in a Load Copy Control (LCC) command.

An exception in an overlay or page segment is reported synchronously with the End Page (EP) command on the page it is used. An exception in a saved copy group is reported synchronously after the EP command; that is, in the next command after the EP.

- The XOA Exception-Handling Control (EHC) order tells the printer how to handle exceptions. More information about the EHC order follows.

Exception-Handling Control (EHC)

The EHC order lets you control the three exception-handling functions listed below. Brief descriptions of the functions follow this listing.

- **Exception Reporting.** You can record three types of exception conditions and related exception information and have them reported at specified times using NACKs.
- **Alternate Exception Actions (AEA).** You can specify whether the printer is to take Alternate Exception Actions (AEAs), which prescribe actions to take when the printer is given an IPDS command or parameters it does not support.
- **Exception-Presentation Processing.** The exception-presentation processing function has two parts:
 - **Page Continuation Actions (PCA).** You can specify whether to end or continue processing a page that has an exception.
 - **Exception Page Print.** You can specify whether the printer is to print or discard a page that was terminated.

Exception Reporting

Use the exception-reporting bits in the Exception-Handling Control (EHC) record to control the recording and reporting of three classes of exceptions:

- Undefined characters
- Position exceptions
- All other exceptions that have AEAs.

When you instruct the printer to record a given class of exception, it always records exceptions that fit in that class. If you instruct the printer not to record a given class of exception, the printer still records such exceptions if the printer was told not to take the AEA.

Classes of Data Stream Exceptions

All printer data stream exceptions are returned in 24 bytes of detailed sense information in the special data area of the NACK. The exception-code identifier consists of three bytes: 0, 1, and 19. Byte 0 specifies the exception class; bytes 1 and 19 identify the particular exception.


The six classes of data-stream exceptions are:

- Command Reject
- Intervention Required
- Equipment Check
- Data Check
- Specification Check
 - IO Images
 - Bar Codes
 - Graphics
 - General
- Conditions Requiring Host Notification.

See p.210 “Exception Classes” for more information.

Sense Byte Information

The following list gives details of the information in each sense byte.

Byte(s)	Description
0	Defines the exception class for the specific exception. It is the first byte of each 3-byte exception ID.
1	Together with sense byte 19, byte 1 defines the specific exception within an exception class. It is the second byte of each 3-byte exception ID.
2	Contains exception-recovery action codes that specify the required actions for the exception conditions. For more information, see p.208 "Action Codes in Sense Byte 2".
3	Reserved
4 through 18	<p>Describe the specific cause in three separate formats:</p> <ul style="list-style-type: none"> • Format 0 Provides details about all data stream exceptions other than data check positioning exceptions. • Format 2 Provides details about device exceptions, including intervention-required exceptions, equipment-check exceptions, and conditions requiring host notification. • Format 7 Provides details about data check positioning exceptions. <p> Reference For more information about formats, see p.209 "Formats 0, 1, and 2 for Sense Bytes 4-18 and 20-23".</p>
19	Together with sense byte 1, byte 19 defines the specific exception within an exception class. It is the third byte of each 3-byte exception ID.
20 through 23	Contain additional information about the state of the printer when it senses an exception.

Action Codes in Sense Byte 2

The action codes in sense byte 2 classify the exception to assist host-exception recovery and allow printing to continue. The action codes listed are the only ones returned by the printer.

Action Code (in hex)	Exception-Recovery Action
01 Data Stream Exception	A syntax error exists in the IPDS data stream. The specific recovery actions depend on the specific exception (sense bytes 0, 1, and 19 in the tables of printer exception codes) and host support requirements. Data stream exceptions occur on the page or resource just before the received page counter.
08 Paper Jam	The printer detects a paper jam. Retransmit all pages and associated resources (overlays, page segments, and fonts) that have not passed the printer-defined jam recovery point.
09 Data-Related Print Exception	A sheet cannot be printed because of something within the data stream. The data might be too complex, too dense, or the media source selected might be incompatible with the media destination selected. The printer has discarded all buffered pages and modified the page and copy counters.
0C Resource Storage Exception	The printer cannot accept a page or resource (overlay, page segment, or font) because the storage area is full. Delete all resources not necessary to continue printing and retransmit the page in progress. If this action fails, the recovery action depends on host-support requirements.
15 Cancel	The printer operator requests that the current job be canceled. Cancel the job containing the page at the host-defined canceling point.
1A Re-drive Buffered Pages	The printer may not be in Ready State, may need paper or toner, or may have a full exit tray. Take the appropriate recovery action for the exception code and retransmit all pages and associated resources that have not been committed for printing.
1D Printer Characteristics Changed	At least one of the printer characteristics that is reported in the reply to an XOH OPC command has changed. The host should issue an XOH OPC command to obtain the new printer characteristics.
1E Asynchronous Out-of-Storage Exception	A resource or a page that is not currently being received at the Received Page ID caused an out-of-storage exception. The printer has discarded all buffered pages and reset the page and copy counters. The page on which this exception was discovered will not print. The host must issue an XOH PBD to ensure that the page and copy counters are accurately adjusted. After the XOH PBD has returned an ACK, the page in error is the page just before the Committed Page Counter. Cancel the printed data containing the page just before the Committed Page ID.
22 Printer Communications Inoperative	A printer condition exists from which the printer cannot recover without operator intervention. End the communication and the session.

Formats 0, 1, and 2 for Sense Bytes 4-18 and 20-23

Sense bytes 4 through 18 and 20 through 23 describe the cause of each exception condition. (Sense byte 19 is byte 3 of the exception code.) These descriptions are presented in three separate formats, which are explained below.

❖ Format 0

Format 0 provides detailed information for all data stream exceptions except data check positioning exceptions. This format applies to all data check, specification-check, and command-reject exceptions, except for exceptions X'08C1..00', X'020A..05', and X'0411..00'.

Byte	Description
4	Data exception, X'DE'
5	Format Identifier, X'00'
6,7	Count of occurrences of the exception (the printer provides an approximate count of occurrences of some exceptions)
8,9	ID of overlay that has an exception
10,11	ID of page segment that has an exception
12,13	Command in process when exception found
14,15	Object Identifier (other than overlay or page segment that has an exception, such as a font exception)
16,17	Identifies a part within an object that has the exception, such as "font"
18	Reserved
20-23	Page Identifier for the page that has the exception

❖ Format 1

Format 1 provides detailed information for both data check positioning exceptions. This format applies only to data check exceptions X'08C1..00', X'020A..05', and X'0411..00'.

Byte	Description
4	Data exception, X'DE'
5	Format Identifier, X'01'
6, 7	Count of occurrences of the exception (the printer provides an approximate count of occurrences of some exceptions)
8, 18	Reserved
20-23	Page Identifier for the page that has the exception

❖ **Format 2**

Format 2 provides detailed information for all device exceptions. This format applies to all intervention-required and equipment-check exceptions and for conditions requiring host notification.

Byte	Description
4	System Reference Code, X'BF'
5	Format Identifier, X'02'
6-23	Format Identifier, X'02'

Exception-Reporting Codes

The following tables describe all printer exception codes that are returned to the host in the special data area of a NACK.

Each exception code is identified by three bytes: byte 0, byte 1, and byte 19. The first table lists the names of the exception classes which are returned in byte 0. The subsequent tables give detailed information about each of the groups listed in the first table.

Note

- ❑ The printer provides an approximate count of occurrences of some exceptions.

Exception Classes

Sense Byte 0	Exception Class and Description
X'80'	Command Reject—the printer cannot recognize a received command.
X'50'	Equipment Check with Intervention Required—the printer detects a condition caused by hardware failure or hardware limitations, and manual intervention at the printer is required.
X'40'	Intervention Required—the printer detects a condition that requires manual intervention, such as “out of paper”.
X'20'	Reserved
X'10'	Equipment Check—the printer detects an equipment malfunction or hardware error.
X'08'	Data Check—the printer detects a position exception or an undefined character exception.
X'05'	Specification Check - IO Images—the printer detects an invalid or unsupported data value in an IO image command.
X'04'	Specification Check - Bar Codes—the printer detects an invalid or unsupported data value in a bar code command.
X'03'	Specification Check - Graphics—the printer detects an invalid or unsupported data value in a graphics command.

Sense Byte 0	Exception Class and Description
X'02'	Specification Check - General—the printer detects an invalid or unsupported data value in a received command.
X'01'	Conditions Requiring Host Notification—the printer detects a condition that requires action by the host.

Tables of Printer Exception Codes

The following tables list specific exception classes and are arranged in three columns. The first column lists the 3-byte ID given in sense bytes 0, 1, and 19. The second column gives a description of each exception. The third column lists the action code given in sense byte 2.

Typically, when an exception has a defined AEA, the PCA is the AEA. Also, no PCA is taken when the command is received in Home state or Font state.

In each table, the exceptions are listed in ascending numeric order.

Note

- ❑ The term architecturally valid refers to the range of values permitted by the IPDS architecture. An “invalid” value denotes one outside the range defined by the architecture. “Supported” values are those that the printer accepts. Therefore, “unsupported” values may be valid by architecture but not in the printer implementation.
 - The machine supports 24 Byte Sense data (See p.73 “Sense Type and Model”).
 - The machine supports AEA and PCA error processing. See Intelligent Printer Data Stream Reference for details on Sense byte information and error processing.
- ❑ The maximum number of queued asynchronous and synchronous errors is 1 for Twinax and Coax DSC mode and 7 for Coax LU1 mode and TCP/IP mode.
- ❑ The cause of the exception and the Alternate Exception Action (AEA) are the same as specified in Intelligent Printer Data Stream Reference unless otherwise noted.

TCP/IP Sense Data

Intervention Required Sense Data

Exception ID	Description	Action Code
X'4000..00'	Printer not ready	3
X'4001..00'	Out of paper	3
X'4002..00'	Output bin full	3
X'4004..00'	Out of toner	3
X'4031..00'	Paper Length Check	3
X'4033..00'	Paper Width Check	3
X'40E6..00'	Cover open	3

IPDS Exceptions Reported

Command Reject Exceptions

Exception ID	Description	Action Code
X'8001..00'	Invalid IPDS command code	01
X'8002..00'	Invalid IPDS command sequence	01
X'8004..00'	Data received after ARQ	01
X'80E0..00'	Invalid IPDS command length	01

Equipment Check with Intervention Required

Exception ID	Description	Action Code
50F8..00	Media Source X'nn' is not available (has been disabled).	01

Intervention Required Exceptions

Exception ID	Description	Action Code
X'4000..00'	Printer is not ready: <ul style="list-style-type: none"> The printer is in a not-ready state. Alternate Exception Action: none. Page Continuation Action: none. 	1A
X'4001..00'	Printer is out of paper: <ul style="list-style-type: none"> The printer is out of paper, and paper was not added within specified amount of time. Alternate Exception Action: none. Page Continuation Action: none. 	1A
X'4002..00'	The printer's exit tray is full: <ul style="list-style-type: none"> The printer's exit tray is full and it was not emptied within a specified amount of time. Alternate Exception Action: none. Page Continuation Action: none. 	1A
X'4004..00'	Printer is out of toner: <ul style="list-style-type: none"> The printer is out of toner, and toner was not added within a specified amount of time. Alternate Exception Action: none. Page Continuation Action: none. 	1A
X'4031..00'	Paper Length Check <ul style="list-style-type: none"> The printer has detected a paper-length check, and it has not been corrected by the operator after a specified amount of time. Alternate Exception Action: none. Page Continuation Action: none. 	1A
X'4033..00'	Paper Width Check <ul style="list-style-type: none"> The printer has detected a paper-width check, and it has not been corrected by the operator after a specified amount of time. Alternate Exception Action: none. Page Continuation Action: none. 	1A
X'40E5..00'	Paper jam recovery needed: <ul style="list-style-type: none"> A paper jam has occurred and has not been cleared within a specified amount of time. Any lost pages must be resent. Alternate Exception Action: none. Page Continuation Action: none. 	08
X'40E6..00'	Cover open	03
X'40E8..nn'	Supported but not installed media source ID	1A

Equipment Check Exceptions

Exception	Description	Action Code
X'10F1..00'	Permanent hardware exception: <ul style="list-style-type: none"> • A permanent hardware failure exists. • The microcode detected either a logic exception from which the printer could not recover or a condition that should not have occurred. • Alternate Exception Action: none. • Page Continuation Action: none. 	22

Data Check Exceptions

Exception ID	Description	Action Code
X'0821..00'	Undefined character	01
X'0860..00'	Numeric representation precision check	01
X'08C1..00'	Numeric representation precision check	01

IO-Image Specification Exceptions

Exception ID	Description	Action Code
X'0500..01'	Invalid or unsupported IO Image SDF code	01
X'0500..03'	Invalid or unsupported IO Image SDF	01
X'0500..04'	Invalid IO Image SDF value	01
X'0570..0F'	IO Image Begin Segment out of sequence	01
X'0571..0F'	IO Image End Segment out of sequence	01
X'0591..0F'	IO Image Begin Image Content out of sequence	01
X'0592..0F'	IO Image Data SDF out of sequence	01
X'0593..0F'	IO Image End Image Content out of sequence	01
X'0594..01'	Inconsistent Image Size Parameter value and Image data	01
X'0594..0F'	IO Image Size Parameter missing or out of sequence	01
X'0594..11'	IO Image Size cannot be determined	01
X'0595..0F'	IO Image Encoding Parameter out of sequence	01
X'0595..10'	IO Image Encoding Parameter unsupported value	01
X'0595..11'	IO Image Decompression error	01

Exception ID	Description	Action Code
X'0596..0F'	IO Image Data Element Size Parameter out of sequence	01
X'0596..10'	IO Image Data Element Size Parameter unsupported value	01
X'0596..11'	IO Image Data Element Size Parameter and Image Encoding Parameter inconsistent	01
X'0597..0F'	IO Image Look Up Table ID Parameter out of sequence	01
X'0597..10'	IO Image Look Up Table ID Parameter unsupported value	01
X'05A9..02'	IO Image data outside the Image Presentation Space	01

Bar Code Specification Exceptions

Exception ID	Description	Action Code
X'0403..00'	Invalid or unsupported bar code type	01
X'0404..00'	Unsupported local-font ID or font not available	01
X'0405..00'	Invalid or unsupported bar code color	01
X'0406..00'	Invalid or unsupported module width	01
X'0407..00'	Invalid or unsupported element height	01
X'0408..00'	Invalid or unsupported height multiplier	01
X'0409..00'	Invalid or unsupported wide-to-narrow ratio	01
X'040A..00'	Invalid or unsupported symbol origin	01
X'040B..00'	Invalid or unsupported bar code modifier	01
X'040C..00'	Invalid or unsupported bar code data length	01
X'040E..00'	Check-digit calculation exception	01
X'040F..00'	Unsupported 2D bar code size	01
X'040F..01'	Invalid structured append sequence indicator	01
X'040F..02'	Structured append sequence indicator too large	01
X'040F..03'	Mismatched structured append information	01
X'040F..04'	Invalid number of structured append symbols	01
X'040F..05'	Invalid symbol mode value	01
X'040F..06'	Invalid data symbol characters per row value	01
X'040F..07'	Invalid desired number of row values	01
X'040F..08'	Too much data for a PDF417 bar code	01
X'040F..09'	Invalid security level value	01

Exception ID	Description	Action Code
X'040F..0A'	Incompatible combination of Data Matrix parameters	01
X'040F..0B'	Invalid structured append file identification value	01
X'040F..0C'	Invalid Macro PDF417 Control Block length value	01
X'040F..0D'	Invalid Macro PDF417 Control Block data	01
X'040F..0E'	Invalid QR Code EBCDIC Code Page value	01
X'040F..0F'	Invalid QR Code Version value	01
X'040F..10'	Invalid QR Code Error Correction-level value	01
X'040F..11'	Incompatible combination of QR Code Special-function flags	01
X'0410..00'	Invalid or unsupported human-readable interpretation location	01
X'0411..00'	Attempt to print portion of symbol outside block or VPA	01

Graphics Specification Exceptions

Exception ID	Description	Action Code
X'0300..01'	Unallocated or unsupported graphics order or command code	01
X'0300..02'	Reserved byte exception or invalid attribute set	01
X'0300..03'	Incorrect drawing order length	01
X'0300..04'	Invalid attribute value	01
X'0300..08'	Truncated order exception	01
X'0300..0C'	Segment prolog exception	01
X'0300..0E'	Unsupported attribute value	01
X'0300..21'	Invalid or unsupported default	01
X'0334..00'	Character angle value not supported	01
X'033E..00'	Invalid End Prolog	01
X'0360..00'	Area bracket exception	01
X'0368..00'	Begin Area received incorrectly	01
X'0368..01'	Area truncated exception	01
X'0368..02'	Supported order invalid in area	01
X'0368..03'	Pattern Symbol Set not supported	01
X'0368..04'	Undefined pattern symbol	01
X'0370..01'	Unsupported Begin Segment Introducer segment flag	01

Exception ID	Description	Action Code
X'0370..82'	Invalid Begin Segment Introducer segment flag	01
X'0370..C1'	Invalid Begin Segment Introducer length	01
X'0370..C5'	Insufficient Segment Data	01
X'0392..00'	Graphics image order sequence exception	01
X'0392..01'	Image data discrepancy	01
X'0393..00'	Graphics image bracket exception	01
X'0393..01'	Incorrect number of Image Data drawing orders	01
X'03C2..00'	Marker Symbol Set not supported	01
X'03C2..01'	Undefined marker code	01
X'03C3..00'	Font not available	01
X'03C3..01'	Undefined graphics character code	01
X'03C6..01'	Arc drawing check	01
X'03D1..00'	Truncated graphics image exception	01
X'03D1..01'	Invalid order in graphics image	01
X'03D1..02'	Graphics image format not supported	01
X'03D1..03'	Image width greater than maximum supported	01
X'03D1..04'	Image height greater than maximum supported	01
X'03E1..00'	Relative line outside coordinate space	01

General Specification Exceptions

Exception ID	Description	Action Code
X'0200..01'	Embedded Control Sequence Code Exception	01
X'0202..01'	End Suppression (ESU) text-control exception	01
X'0202..02'	Invalid or unsupported IPDS command length	01
X'0202..05'	Invalid data self-defining-field length	01
X'0203..02'	IPDS Command Header Length too small	01
X'0203..05'	Invalid or unsupported block orientation	01
X'0204..01'	EP command encountered	01
X'0204..02'	Invalid use of Acknowledgement Continuation Bit	01
X'0204..05'	Invalid or unsupported area-position reference system	01
X'0205..01'	Invalid spanning sequence	01
X'0205..05'	Invalid or unsupported self-defining-field unit base	01

Exception ID	Description	Action Code
X'0206..01'	Invalid Begin Suppression (BSU)	01
X'0206..05'	Invalid or unsupported self-defining field L-units	01
X'0207..05'	Invalid or unsupported self-defining-field extents or Graphic Window values inconsistent	01
X'0208..05'	Invalid or unsupported mapping option	01
X'0209..05'	Invalid or unsupported axis offsets	01
X'020B..05'	Invalid self-defining-field identifier	01
X'020E..02'	Invalid or unsupported Color Space	01
X'020E..03'	Invalid or unsupported Color value	01
X'020E..05'	Invalid or unsupported number of bits for a color component	01
X'020F..01'	Invalid or unsupported Set Text Orientation (STO)	01
X'0210..01'	Invalid or unsupported Set Inline Margin (SIM)	01
X'0211..01'	Invalid or unsupported Set Baseline increment (SBI)	01
X'0212..01'	Invalid or unsupported inter-character adjustment	01
X'0213..01'	Invalid or unsupported Absolute Move Baseline (AMB)	01
X'0214..01'	Invalid or unsupported Absolute Move Inline (AMI)	01
X'0214..02'	The font resource to be deactivated is not found	01
X'0215..01'	Invalid or unsupported Relative Move Inline (RMI)	01
X'0215..02'	Invalid or unsupported DF command font or font-section ID	01
X'0216..01'	Invalid or unsupported Relative Move Baseline (RMB)	01
X'0217..01'	Invalid or unsupported Set Variable-Space Increment (SVI)	01
X'0217..02'	Invalid or unsupported DF command deletion type	01
X'0218..02'	Invalid, unsupported, or unavailable font ID	01
X'0219..01'	Invalid or Unsupported value for Repeat String (RPS) repeat length	01
X'0219..02'	Multiple occurrences of the same LFE font-equivalence number	01

Exception ID	Description	Action Code
X'021A..01'	Repeat String (RPS) or Transparent Data (TRN) exception	01
X'021B..01'	Repeat String (RPS) target-string length exception	01
X'021B..02'	Invalid or unsupported Load Font Control unit base for L-units	01
X'021C..01'	Invalid escape sequence	01
X'021C..02'	Invalid LFC command byte-count value	01
X'021D..02'	Invalid or unsupported the Load Font Equivalence global font ID	01
X'021E..01'	Invalid WT text-control length	01
X'021F..01'	Repeat String (RPS) length exception	01
X'021F..02'	Mismatch of LFE command font Host-Assigned IDs	01
X'0220..02'	Invalid Load Font Control (Byte 36 value)	01
X'0221..02'	Invalid or unsupported Load Font Control font-index format	01
X'0222..02'	Invalid or unsupported Load Font Control data pattern format	01
X'0223..02'	Invalid or unsupported Load Font Control font-type bits	01
X'0226..02'	Invalid or unsupported LSS or LFC X-box size	01
X'0227..02'	Invalid or unsupported LSS or LFC Y-box size	01
X'022A..02'	Invalid or unsupported Load Font Control L-Units per unit base in the X-direction	01
X'022B..02'	Invalid or unsupported Load Font Control L-Units per unit base in the Y-direction	01
X'022D..02'	Invalid or unsupported Load Font Control character-data alignment	01
X'022E..02'	Insufficient font data received	01
X'0231..01'	Invalid or unsupported Load Copy Control number of copies	01
X'0232..01'	Invalid or unsupported Load Copy Control Keyword in copy-group entry	01
X'0232..02'	Excess font data received	01
X'0234..01'	Invalid or unsupported Load Copy Control entry-byte count	01
X'0236..01'	Invalid or unsupported Load Copy Control simplex/duplex parameter	01
X'0237..01'	Invalid or Unsupported LCC N-up Parameter	01

Exception ID	Description	Action Code
X'0237..03'	Invalid or Unsupported LCC Media Destination Parameter	01
X'0237..04'	Incompatible Media Source and Media Destination	09
X'0237..05'	Mixture of Media Source or Destination IDs in a duplex copy-subgroup pair	01
X'0238..01'	Maximum supported number of Overlays per LCC copy-group exceeded	01
X'0239..01'	Maximum supported number of Suppressions per LCC copy-group exceeded	01
X'0239..02'	Load Font Control font Host-Assigned ID already assigned	01
X'023A..02'	Maximum number of Fonts allowed by printer exceeded	01
X'023C..02'	Invalid or unsupported value within Load Font Index command	01
X'023E..02'	Invalid Load Font Control character-pattern address	01
X'023F..02'	STO-SCFL-LFE mismatch	01
X'0240..02'	Invalid or unsupported value for Font Inline Sequence	01
X'0242..01'	WIC pixel count is less than the minimum required	01
X'0243..01'	WIC command pixel count is greater than the maximum supported value	01
X'0243..02'	Invalid double-byte font-section identifier	01
X'0244..01'	WIC command scan count is less than the minimum required	01
X'0245..01'	WIC command scan count is greater than the maximum supported value	01
X'0246..01'	Invalid WIC source image format	01
X'0246..02'	Invalid parameter for the Load Font Index command	01
X'0247..01'	Invalid or unsupported Write Image Control magnification factor	01
X'0247..02'	Invalid or unsupported Load Font Equivalence font-inline sequence	01
X'0248..01'	Invalid or unsupported Write Image Control scan-line direction	01
X'0249..01'	Invalid scan-line-sequence direction in the WIC command	01

Exception ID	Description	Action Code
X'024A..01'	Invalid or unsupported Write Image Control image block location	01
X'0253..01'	Invalid or unsupported Write Image Control image color	01
X'0254..41'	Invalid Finishing Fidelity Triplet Length	01
X'0254..42'	Invalid Finishing Fidelity Triplet Continue value	01
X'0254..43'	Invalid Finishing Fidelity Triplet Report value	01
X'0254..51'	Invalid Text Fidelity Triplet Length	01
X'0254..52'	Invalid Text Fidelity Triplet Continue value	01
X'0254..53'	Invalid Text Fidelity Triplet Report value	01
X'0258..03'	Invalid or unsupported text color	01
X'0260..02'	Invalid or unsupported Load Page Descriptor Xp and I L-units per unit base	01
X'0261..02'	Invalid L-Units (Yp) Value in the LPD command	01
X'0262..02'	Invalid or unsupported Load Page Descriptor Xp-extent	01
X'0263..02'	Invalid or unsupported Load Page Descriptor Yp-extent	01
X'0264..02'	Invalid or unsupported Load Page Descriptor unit base	01
X'0268..02'	Invalid or unsupported Load page Descriptor	01
X'0269..02'	Invalid baseline-sequence direction in the LPD command	01
X'026A..01'	Insufficient source image data	01
X'026A..02'	Invalid or unsupported LPD initial I print coordinate	01
X'026B..01'	Excess source image data received	01
X'026B..02'	Invalid or unsupported LPD initial B print coordinate	01
X'026F..02'	Invalid XOH-SMO Media Origin	01
X'0270..02'	Invalid or unsupported XOH Set Media Size L-units per unit base	01
X'0272..02'	Invalid or unsupported XOH Set Media Size Xm-extent	01
X'0273..02'	Invalid or unsupported XOH Set Media Size Ym-extent	01
X'0274..02'	Invalid or unsupported XOH Set Media Size unit base	01
X'0277..01'	Group Termination Exception	01

Exception ID	Description	Action Code
X'027A..01'	Invalid triplet length value in a group triplet	01
X'027B..01'	Incorrect number of triplet data bytes in a group triplet	01
X'027C..01'	Incompatible finishing operations	01
X'027C..02'	Too many or too few sheets for a finishing operation	01
X'027C..03'	Invalid or unsupported finishing operation type	01
X'027C..04'	Invalid or unsupported finishing operation reference corner and edge	01
X'027C..05'	Unsupported finishing operation count	01
X'027C..06'	Invalid or unsupported finishing operation axis offset	01
X'027C..07'	Invalid or unsupported number of finishing positions	01
X'027C..09'	Finishing operation incompatible with physical media or media destination	06
X'027C..0A'	Incompatible media destination change in a group to be finished	06
X'0280..02'	Invalid or unsupported rule width	06
X'0282..02'	Invalid or unsupported rule length	01
X'0285..01'	Invalid or unsupported Delete Overlay command overlay ID	01
X'0287..02'	Invalid or unsupported Load Font Control unit base for Pixel-units	01
X'0288..02'	Invalid or unsupported Load Font Control Pixel-units per unit base in the X-direction	01
X'0289..02'	Invalid or unsupported Load Font Control Pixel-units per unit base in the Y-direction	01
X'028A..01'	Invalid or unsupported Delete Page Segment command page segment Host-Assigned ID	01
X'028A..02'	Invalid or unsupported Load Font Control Relative-Metric Multiplying Factor	01
X'028F..01'	Invalid or unsupported AR command parameter values	01
X'028F..02'	AR activation command failed	01
X'028F..03'	Invalid Resource ID triplet length	01
X'028F..04'	Invalid or unsupported resolution or metric-technology value	01
X'028F..10'	Invalid or unsupported value in a Metric Adjustment triplet	01

Exception ID	Description	Action Code
X'028F..11'	Baseline adjustment value too large or too small	01
X'0290..01'	Invalid or unsupported Overlay ID	01
X'0291..01'	BO overlay ID already loaded	01
X'0291..02'	Invalid or unsupported XOA Request Resource list entry	01
X'0292..01'	Overlay ID not loaded	01
X'0293..01'	Recursive overlay invocation	01
X'0294..01'	Invalid or unsupported page segment Host-Assigned ID	01
X'0295..01'	Page segment Host-Assigned ID already loaded	01
X'0295..02'	Invalid or unsupported XOH Page Counters Control page-counter update	01
X'0296..01'	Page segment Host-Assigned ID not loaded	01
X'0297..01'	Overlay nesting limit exceeded	01
X'0298..01'	Invalid or unsupported suppression number	01
X'0298..03'	Invalid or unsupported Temporary Baseline Move text control	01
X'029A..01'	Invalid overstrike character increment	01
X'02A4..01'	Page boundary in the X-direction cannot be presented by the printer	01
X'02A5..01'	Page boundary in the Y-direction cannot be presented by the printer	01
X'02AC..01'	Insufficient Main Storage to print the Sheet	09
X'02AD..01'	Invalid or unsupported Load Page Position command	01
X'02AE..01'	Invalid or unsupported parameter in an IO command	01
X'02AF..01'	Insufficient storage to print the sheet	0C
X'02AF..01'	Asynchronous Insufficient storage to print the sheet	1E
X'02B0..00'	LCPC Code Page HAID already in use	01
X'02B0..01'	Invalid LCPC Code Page HAID	01
X'02B0..02'	Invalid or Unsupported LCPC Encoding Scheme	01
X'02B0..04'	Too much or too little code page data	01
X'02B0..05'	Invalid or Unsupported LCPC Byte count	01
X'02B0..07'	Code points out of order in LCP command	01
X'02B0..0A'	LFCSC HAID already assigned	01

Exception ID	Description	Action Code
X'02B0..0B'	Invalid LFCSC HAID	01
X'02B0..0C'	Invalid or Unsupported LFCSC pattern technology ID	01
X'02B0..0E'	Invalid or Unsupported LFCSC Byte count	01
X'02B0..0F'	Invalid or Unsupported LFCSC Map size	01
X'02B1..01'	Invalid or Unsupported LF Character ID format	01
X'02B1..02'	Invalid LF technology specific ID offset	01
X'02B1..03'	Invalid LF technology specific ID length	01
X'02B1..04'	GCGIDs out of order in a Font Character Set	01
X'02B1..08'	Invalid LF technology specific object length	01
X'02B1..09'	LF checksum mismatch	01
X'02B1..0A'	Invalid Name Length in LF3 technology specific object	01
X'02B1..0B'	Invalid data within a LF3 technology specific object	01
X'02B2..01'	Parent character set not activated	01
X'02B2..02'	Font character set extension not valid with pattern technology	01
X'02B2..03'	Mismatched character ID format in a LF command	01
X'02B2..04'	Mismatched MICR printing flag in a LFCSC command	01
X'02C0..01'	Mixture of Xm-axis duplex and Ym-axis duplex copy groups	01
X'02C0..02'	Mixture of N-up copy subgroups in a LCC command	01
X'02C0..03'	More than one N-up keyword specified in a copy subgroup	01
X'02C0..04'	Duplexing and N-up not supported together	01
X'02C0..05'	N-up partitioning not supported with envelope media	01
X'02C1..01'	Maximum number of simplex or duplex keywords in an LCC command	01
X'02C1..02'	Internal value not unique in an LE command	01
X'02C2..01'	Odd number of duplex copy groups in an LCC command	01
X'02C2..02'	More than one Media Source or Destination Keyword specified in a copy subgroup	01
X'02C3..01'	Mixture of simplex and duplex parameters in an LCC command	01

Exception ID	Description	Action Code
X'02C4..01'	Unequal copy counts in an LCC command	01
X'02C5..01'	Unable to delete resource (needed on duplex side)	01
X'02C5..02'	Physical media not compatible with duplex printing	01
X'02C6..01'	Unable to deactivate a component of an activated coded font	01
X'02C6..02'	Invalid mapping type in an LE command	01
X'02C8..01'	An unsupported Input Media Source ID was specified	01
X'02C8..02'	Invalid or unsupported internal value or external value in an Load Equivalence command	01
X'02FF..02'	Exceptions detected but not queued	01

Host Notification Exceptions

Exception ID	Description	Action Code
X'0100..00'	Normal Printer Restart (Printer IMLed or IPDS Dialog Resources Deleted)	0D
X'0101..00'	Media Size or Input Media Source ID Changed	1D
X'0180..00'	Request to end IPDS Dialog	05
X'018F..00'	Error Printer Restart (Printer IMLed)	0D
X'01E4..00'	Cancel Key Pressed	15

Page Counter Adjustments

To identify which page or pages to send to the printer after an exception occurs, the host program must determine the position of the sheets in the paper path.

Count fields in the ACK command identify the state of a virtual paper path that includes a count of the number of pages received, the number of pages past the jam-recovery point, and the number of pages stacked.

The printer tracks the following:

- Received Page Counter
- Committed Page Counter
- Committed Copy Counter
- Stacked Page Counter
- Stacked Copy Counter

All other counters are mapped to the Stacked Page Counter (for pages) and the Stacked Copy Counter (for copies).

The following rules define how the counters are updated:

- After power is switched on, all counter values equal X'0000'.
- When a counter containing X'FFFF' increments, the counter wraps to X'0000'.
- The counters are updated as shown in the following table as each condition is detected.
- The Copy Counters are incremented when more than one copy of a page is printed. When all copies have passed a station, the Copy Counter is then reset to zero and the Page Counter is incremented.

The Copy Counters are not reset to zero during exception recovery.

Condition (in hex)	Counters	Counter Adjustments
Action Codes	Received Page Counter	Set to Jam Recovery Page Counter
08	Committed Page Counter	Set to Jam Recovery Page Counter
22	Committed Copy Counter	Set to Jam Recovery Page Counter
	Operator Viewing Page Counter	Set to Jam Recovery Page Counter
	Operator Viewing Copy Counter	Set to Jam Recovery Page Counter
	Jam Recovery Page Counter	No change
	Jam Recovery Copy Counter	No change
	Stacked Page Counter	Set to Jam Recovery Page Counter
	Stacked Copy Counter	Set to Jam Recovery Copy Counter

Condition (in hex)	Counters	Counter Adjustments
Action Codes 15 1A 1D	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	Set to Committed Page Counter No change No change No change No change No change No change No change No change
Action Code 0C	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	No change No change No change No change No change No change No change No change No change
Action Code 01	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	No change No change No change No change No change No change No change No change No change
Action Code 1E	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	Set to Committed Page Counter No change No change No change No change No change No change No change No change

Condition (in hex)	Counters	Counter Adjustments
All other action codes	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	No change No change No change No change No change No change No change No change No change
Command XOA - Discard Buffered Data	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	Set to Committed Page Counter No change No change No change No change No change No change No change No change
Normal Counter Wrap (on a Per-Counter Basis)	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	Reset to 0 Reset to 0 Reset to 0 Reset to 0 Reset to 0 Reset to 0 Reset to 0 Reset to 0 Reset to 0
Command XOH - Page Counters Control	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	For details about XOH PCC command, see p.39 "Device Control Command Set".

Note

- ❑ Should not be incremented for page in error (that is, any partial page is discarded).
- ❑ The Received Page Counter should be incremented if a partial or complete page is printed.
- ❑ For Action Code X'1E', the host should issue an XOH Print Buffered Data command with the ARQ bit on and a unique correlation ID (to ensure that the Acknowledge Reply matches the Print Buffer Data [PBD] command) to cause the Committed Page/Copy Counter to reflect the page in error.

Page and Copy Counter Adjustments for Data-Stream Exceptions

The following are counter adjustments for simplex copy groups.

Condition (in hex)	Counters	Counter Adjustments
Action Code 01 and the page is printed	Received Page Counter	Does not reflect the page in which the error occurs.
	Committed Page Counter	No change
	Committed Copy Counter	Reflects any committed copies resulting from prior error-free copy groups.
	Operator Viewing Page Counter	No change
	Operator Viewing Copy Counter	No change
	Jam Recovery Page Counter	No change
	Jam Recovery Copy Counter	No change
	Stacked Page Counter	No change
Action Code 01 and the page is not printed	Stacked Copy Counter	No change
	Received Page Counter	Reflects the page in which the error occurs, only if the error occurred on the last copy group.
	Committed Page Counter	No change
	Committed Copy Counter	Reflects any committed copies resulting from prior error-free copy groups or from the copy group in error.
	Operator Viewing Page Counter	No change
	Operator Viewing Copy Counter	No change
	Jam Recovery Page Counter	No change
	Jam Recovery Copy Counter	No change
	Stacked Page Counter	No change
	Stacked Copy Counter	No change

The following are counter adjustments for duplex copy groups.

Condition (in hex)	Counters	Counter Adjustments
Action Code 01 on the front side and the page is printed	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	Reflects the page in which the error occurs (the front side) only if the error occurred on the other in a copy group other than the first copy group. No change Reflects any committed copies resulting from prior error-free copy group pairs. No change No change No change No change No change No change
Action Code 01 on back side and the page is not printed	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	Does not reflect the page in the error occurs (the back side) it does reflect the front side. No change Reflects any committed copies resulting from prior error-free copy group pairs. No change No change No change No change No change No change
Action Code 01 on the front side and the page is not printed	Received Page Counter Committed Page Counter Committed Copy Counter Operator Viewing Page Counter Operator Viewing Copy Counter Jam Recovery Page Counter Jam Recovery Copy Counter Stacked Page Counter Stacked Copy Counter	Reflects the page in which the error occurs (front side). No change Reflects any committed copies resulting from prior error-free copy group pairs. No change No change No change No change No change No change

Condition (in hex)	Counters	Counter Adjustments
Action Code 01 on the back side and the page is printed	Received Page Counter	Reflects the page in which the error occurs (back side) only if the error occurred on the last copy group. Reflects front side.
	Committed Page Counter	No change
	Committed Copy Counter	Reflects any committed copies resulting from prior error-free copy group pairs or from the copy group in error.
	Operator Viewing Page Counter	No change
	Operator Viewing Copy Counter	No change
	Jam Recovery Page Counter	No change
	Jam Recovery Copy Counter	No change
	Stacked Page Counter	No change
	Stacked Copy Counter	No change

14. Code Page and Font Identification

About Code Page and Font Identification

The machine supports both raster and outline technology fonts: Single and Double byte. The resident single-byte LF1 "raster" fonts are generated using outline font technology (IBM AFP Font Collection): the IBM Core Interchange Font Set, the IBM Coordinated Font Set and the 4028 Compatibility Font Set.

The valid combinations of GCSGID/CPGID, GCSGID/FGID/FW, or GCSGID/CPGID/FGID/FW are too numerous to list here. They can be obtained by the host using the Any state command p.87 "XOA Request Resource List" with the appropriate Resource Type and RIDF.

They can also be determined by using the information under p.244 "Resident IPDS Fonts" with the criteria described in the following sections:

Note

- The machine supports Download and Capture of Font Resources. There is Date/Time stamp information to help identify versions of font resources. p.244 "Resident IPDS Fonts" includes the Date/Time stamps for the resident fonts.
- The machine will report DBCS raster font (and any captured raster fonts) using the RRL command when the IPDS Resolution (op panel) setting is Independence Mode. If the IPDS Resolution (op panel) setting is an Acceptance Mode, only those raster fonts with resolutions that match the current Acceptance mode resolution setting (240 or 300 or 600 DPI), will be reported via RRL.

RRL RT'06' Code Page (CPGID)

Values are listed in p.254 "IBM Core Interchange Resident Code Page Set", p.262 "4028 Compatibility Resident Code Page Set", and p.265 "IBM Coordinated Font Set Code Page Set", and will be reported via XOA-RRL RT 06 RIDF 03.

RRL RT'12' Specific Code Pages (GCSGID/CPGID)

Valid combinations are listed in p.254 "IBM Core Interchange Resident Code Page Set", p.262 "4028 Compatibility Resident Code Page Set", and p.265 "IBM Coordinated Font Set Code Page Set", and will be reported via XOA-RRL RT 12 RIDF 03.

RRL RT'11' Graphic Character Sets (GCSGID SUB/SUPERSETS)

Valid combinations are listed in p.265 "GCSGID Subsets for the Strategic Font Set 2" and will be reported via XOA-RRL RT 11 RIDF 03.

RRL RT'07' Font Character Sets (GCSGID/FGID/FW)

- Valid combinations for the IBM Core Interchange Set are listed in p.247 “IBM Core Interchange Resident Scalable Font Set”, and will be reported via XOA-RRL RT 07 RIDF 03.
 - Scalable Font Width (FW) will be reported as 0 to the host PSF. This indicates that any width/scale-factor is valid.
 - p.253 “GCSGID Subsets for IBM Core Interchange Fonts” shows the subset GCSGIDs for each of the listed superset GCSGIDs in p.247 “IBM Core Interchange Resident Scalable Font Set”. These subset GCSGIDs are valid combinations for the associated superset GCSGIDs in the GCSGID/FGID/FW, but will not be added to the RRL 0703 response unless required by the host PSF’s.
- Valid combinations for the IBM Coordinated Set are listed in p.263 “Resident PSC Strategic Scalable Font Set 2” and will be reported via XOA-RRL RT 07 RIDF 03.
 - Scalable Font Width (FW) will be reported as 0 to the host PSF. This indicates that any width/scale-factor is valid.
 - p.265 “GCSGID Subsets for the Strategic Font Set 2” shows the subset GCSGIDs for each of the listed superset GCSGIDs in p.263 “Resident PSC Strategic Scalable Font Set 2”. These subset GCSGIDs are valid combination entries for the associated superset GCSGIDs in the GCSGID/FGID/FW, but will not be added to the RRL 0703 response unless required by the host PSF’s.
- Valid combinations for the 4028 Compatibility Set require p.260 “4028 Compatibility Resident Font Set” (FGID/FW) and p.262 “4028 Compatibility Resident Code Page Set” (GCSGID), and will be reported via XOA-RRL RT 07 RIDF 03.
 - The FW’s for these fonts are non-zero, because they represent fixed-width fonts.
 - The Alternate FGIDs are valid values for GCSGID/FGID/FW combinations.
 - Native Mode - These fonts (which are representing 4028 raster fonts) don’t have a GCSGID of their own, so the GCSGID used is from the associated Code Pages (CPGIDs).
The GCSGIDs are obtained by finding the Code Page(s) in p.262 “4028 Compatibility Resident Code Page Set” that matches the Code Page(s) listed for a given FGID/FW entry in p.260 “4028 Compatibility Resident Font Set”. The GCSGID for each of the Code Pages listed with an FGID is a valid combination entry.
Since these fonts don’t have a superset GCSGID, there is no subset condition. So each of these unique GCSGID/FGID/FW combinations will be added to the XOA-RRL 0703 report to the host PSF.
 - 4028 Emulation Mode - These fonts (which are representing 4028 raster fonts) don’t have a GCSGID of their own, so the GCSGID used is 0.

RRL RT'01'/'03'/'10' RIDF'03' (GCSGID/CPGID/FGID/FW = GRID)

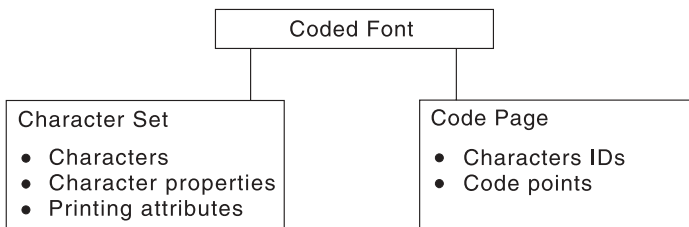
- Valid combinations for the IBM Core Interchange Set require p.247 “IBM Core Interchange Resident Scalable Font Set” (superset GCSGID/FGID/FW), p.253 “GCSGID Subsets for IBM Core Interchange Fonts” (GCSGID subsets) and p.254 “IBM Core Interchange Resident Code Page Set” (GCSGID/CPGID), and will be reported via XOA-RRL RT 01 RIDF 03 (also RT 10 RIDF 03). In all GRIDs, the GCSGID chosen will belong to the Code Page, as this is almost always the subset of the outline font GCSGID.
 - Scalable Font Width (FW) will be reported as 0 to the host PSF. This indicates that any width/scale-factor is valid.
 - CPGIDs and GCSGIDs are listed in p.254 “IBM Core Interchange Resident Code Page Set”. For each pair, determine which FGIDs in p.247 “IBM Core Interchange Resident Scalable Font Set” can combine with them. This is done by finding the superset GCSGID in p.253 “GCSGID Subsets for IBM Core Interchange Fonts” which contains the p.254 “IBM Core Interchange Resident Code Page Set” GCSGID as a subset. An example is that there would be 51 GRID combinations for the Times New Roman Medium font...FGID is always 2308, FW is always 0, and there are 51 unique CPGID/GCSGID pairs in Table p.254 “IBM Core Interchange Resident Code Page Set” which are subsets of the superset GCSGID 1269.
- Valid combinations for the IBM Coordinated Set require p.263 “Resident PSC Strategic Scalable Font Set 2” (superset GCSGID/FGID/FW), p.265 “GCSGID Subsets for the Strategic Font Set 2” (GCSGID subsets) and p.254 “IBM Core Interchange Resident Code Page Set” and p.265 “IBM Coordinated Font Set Code Page Set” (GCSGID/CPGID), and will be reported via XOA-RRL RT 01 RIDF 03 (also RT 10 RIDF 03). In all GRIDs, the GCSGID chosen will belong to the Code Page, as this is almost always the subset of the outline font GCSGID.
 - Scalable Font Width (FW) will be reported as 0 to the host PSF. This indicates that any width/scale-factor is valid.
 - CPGIDs and GCSGIDs are listed in p.254 “IBM Core Interchange Resident Code Page Set” and p.265 “IBM Coordinated Font Set Code Page Set”. For each pair, determine which FGIDs in p.263 “Resident PSC Strategic Scalable Font Set 2” can combine with them. This is done by finding the superset GCSGID in p.265 “GCSGID Subsets for the Strategic Font Set 2” which contains the p.254 “IBM Core Interchange Resident Code Page Set” GCSGID as a subset. An example is that there would be 41 GRID combinations for the Letter Gothic font...FGID is always 400, FW is always 0, and there are 41 unique CPGID/GCSGID pairs in p.254 “IBM Core Interchange Resident Code Page Set” and p.265 “IBM Coordinated Font Set Code Page Set”. which are subsets of the superset GCSGID 2039.

- Valid combinations for the 4028 Compatibility Set require p.260 “4028 Compatibility Resident Font Set” (FGID/FW) and p.262 “4028 Compatibility Resident Code Page Set” (GCSGID/CPGID), and will be reported via XOA-RRL RT 01 RIDF 03. In all GRIDs, the GCSGID chosen will belong to the Code Page, as this is almost always the subset of the outline font GCSGID.
 - The FW’s for these fonts are non-zero, because they represent fixed-width fonts.
 - The Alternate FGIDs are valid values for FGID/FW combinations.
 - The GCSGID/CPGID pairs for each font are obtained by finding the Code Page(s) in p.262 “4028 Compatibility Resident Code Page Set” that match the Code Page(s) listed for a given FGID/FW pair in p.260 “4028 Compatibility Resident Font Set”.

IBM Font Structure

In IBM AFP terminology, a font has three components. They are:

- Coded font
- Character set
- Code page



Note

- ❑ These terms have different meanings in Operating System/400 (OS/400). See p.240 “Operating System/400 Terms” for what these terms mean in OS/400.

Coded Font

In IBM font structure, a coded font translates your request for type (for example, text you previously entered at a computer terminal) into characters for printing. A coded font consists of two parts:

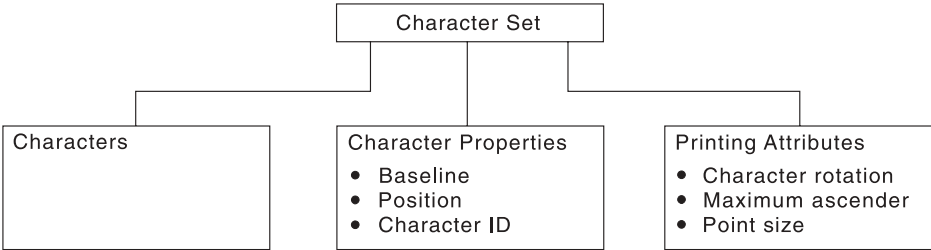
- References to specific character sets
- References to specific code pages

A character must be included in the specified character set and listed on the specified code page before it can be printed.

A coded font associates a specific code page with a specific character set. A coded font contains one code-page and one character-set pair.

Character Set

In IBM font structure, a character set corresponds to the definition of a font; it contains the characters of a single type family, typeface, and type size. In addition, a character set specifies character properties and printing attributes.



❖ Characters

Characters are the letters, numerals, punctuation marks, or other symbols of a font.

❖ Character properties

Character properties detail how a character is positioned relative to the characters around it. Some character properties include the following:

- The baseline of a character, showing its general alignment
- The dimensions of space in which the character is printed
- The position of the character within that space
- The identifier of the character (the character ID)

One of the character properties is the character ID (or graphic character ID). Each character is assigned a character ID; for example, the character A (uppercase A) is assigned the character ID LA020000.

The purpose of a character ID is to distinguish the character from similar characters. For example, the following characters look similar; however, they are different and are assigned different character IDs:

- Minus sign (-): Character ID SA000000
- Hyphen (-): Character ID SP100000
- Em dash (—): Character ID SM900000

For a list of character IDs and the graphic character each represents, refer to “ABOUT TYPE: IBM’s Technical Reference for Core Interchange Digitized Type”.

❖ Printing attributes

The printing attributes define how the character set will be printed. Some printing attributes include rotation of characters, maximum ascender, and point size.

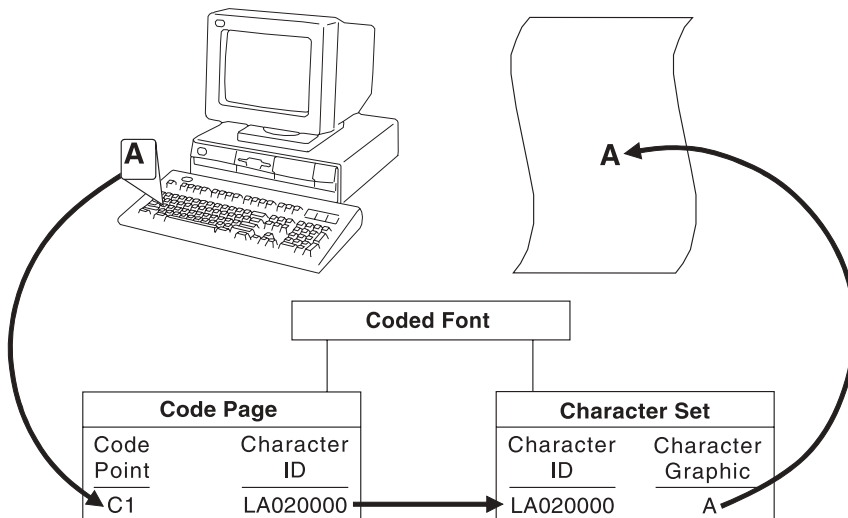
Code Page

A code page is a set of symbols that can be printed by your printer. These symbols can be letters, numbers, or graphic elements such as lines or patterns. The symbols may be grouped to be specific to a country, language, or special symbol set. By supporting different code pages, the printer can support different language requirements.

No particular typeface is assumed for any particular code page. The typeface is defined as a font by the assignment of size, weight, and posture.

Character IDs and Code Points

In IBM font structure, a code page maps each character of text to the characters in a character set. The following figure shows how a code page maps text to the characters in a character set. As you enter your text at a computer terminal, each keyboard character is translated into a code point. When the text is printed, each code point is matched to a character ID on the code page you specified. The character ID then is matched to the image (raster pattern) of the character in the character set you specified. The image in the character set is the image that is printed in your text. To be a valid code page for a particular character set, all character IDs in the code page must be included in that character set.



Every code page has 256 positions, or code points, that represent potential characters. Each of the code points is normally identified by its bit configuration in hexadecimal, with two hex characters per byte. The range of values is hex 00 through hex FF, or 256 values. The code page determines which character prints for each of the printable code points.

A character ID is an 8-byte standard identifier for a character regardless of its type family. For example, all uppercase “A” have the same character ID (LA020000). Character IDs also are called graphic character identifiers (GCIDs).

Binary: 11000001

Decimal: 193

Hexadecimal: C1

The following figure shows an example of a part of a code page. When the printer receives hexadecimal code point C1 for the code page shown (code page 00037 Version 1), it prints an uppercase A (character ID LA020000). Baselines for each character on the example code page show the general alignment of characters.

CPGD: 37
GCSGD: 697

Hex Codes 1E -> 30E 1	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000
-1	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000	SPR000
-2	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000
-3	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000
-4	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000
-5	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000
-6	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000
-7	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000
-8	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000	LA0000

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Different Code Pages

Code pages accommodate various national languages by using characters and special symbols appropriate to the language. Code pages can have identical character IDs assigned to different code points.

For example, the character é (lowercase e accent acute, character ID LE110000) has the following code point assignment in two different code pages:

- Hexadecimal code point 51 in code page 00037 Version 1
- Hexadecimal code point 5A in code page 00280 Version 1

Operating System/400 Terms

Table 158 lists the IBM AFP font terminology and describes how it is used with the OS/400 printing interfaces.

AFP Term	OS/400 AFP Implementation	OS/400 Print File Term
Coded font	*FNTRSC object with CDEFNT attribute	Coded font
Character set	*FNTRSC object with FNTCHRSET attribute	Font
Code page	*FNTRSC object with CDEPAG attribute	Character ID (CHRID)

Note

- ❑ This is not the character ID that identifies individual characters within an AFP character set. This is a control object that identifies a code page by two numbers representing a character set ID and a code page ID.

Font Terms

A font is a complete set of characters in a particular typeface, type size, and code page. The following terms help define a font:

❖ **Character Set**

A set of numeric, alphabetic, or graphic characters with their assigned code points.

❖ **Code Page**

A table of alphanumeric characters and graphic characters each of which is assigned a 1-byte value (a code point). These values define which characters will print.

❖ **Code Page Global ID (CPGID)**

Identifies a specific set of code points assigned to a specific list of graphic character IDs.

❖ **Font Global ID (FGID)**

Specifies a value for selecting a font. IBM fonts have a preassigned FGID value.

❖ **Graphic Character Set Global ID (GCSGID)**

Identifies the list of graphic character IDs included in the code page.

❖ **Spacing**

Also called font width or escapement. Spacing is the distance from the start of a character to the start of the next character. Font spacing can be defined by spacing type:

- Fixed-pitch fonts – All characters in a fixed-pitch font have the same spacing, which is specified as the number of characters per inch.
- Typographic fonts – Typographic fonts are identified as Typo.

Most documents are easier to read if the widths of the characters vary, that is, if a W is printed wider than an I. Typographic fonts have this variability. These fonts are sized by height, not width.

Seventy-two points equals approximately one inch. Therefore, a 10-point font is 10/72 inch high.

Type height includes some white space above and below the printed character for adequate minimum spacing between the lines of type.

Text is most readable when character spacing ranges from 8 to 12 points. For example, the text in this document is 10 point.

 **Note**

- ❑ For typographic fonts, it is recommended that the first and last print positions on each line be left blank.
 - Proportionally spaced machine (PSM) fonts – Proportionally spaced machine fonts are identified by PSM or PS. PSM fonts are a compromise between the variability of typographic sizes and the simple uniformity of fixed pitch. With PSM fonts, the widths of the characters vary. For example, a lowercase “i” has a different width than an uppercase W. However, a specific character in one font will be the same width in another font. For example, a W in one PSM font is the same width as the W in every other PSM font. Therefore, it is possible to have only one character-width table that applies to every PSM font.

❖ **Posture**

Refers to a character’s incline, or tilt. Roman posture is upright. Italic posture is inclined to the right.

❖ **Type Size**

Also called point size. Specifies the overall height of the font, measured in printer’s points. A point is 1/72 inch. For example, a 12-point font is 1/6 inch high.

❖ **Typeface**

Also called type style. Specifies the shape and design of each letter of the alphabet. A complete alphabet of letter designs makes up one typeface.

❖ **Weight**

Refers to the thickness of the strokes that make up the characters of a font, as in a bold font weight.

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Font and Code Page Selection

Printers with an IPDS feature receive IPDS commands to specify fonts. The IPDS command set can select any font or code page supported by the printer. See the printer User's Guide for a list of the IPDS fonts supported. However, host software may restrict the actual fonts or code pages that can be selected. This includes typographic and nontypographic fonts in all pitches, point sizes, and widths. The information provided to the printer to select a font is called a GRID (Global Resource Identifier). The GRID consists of the following (See p.241 "Font Terms" for a description of these terms):

- FGID (Font Global Identifier)
- GCSGID (Graphic Character Set Global Identifier)
- CPGID (Code Page Global Identifier)
- Font Width

For typographic fonts with the same FGID, specify the FONT WIDTH parameter to the printer. The printer needs the font width parameter to identify the font in order to specify the point size. The FONT WIDTH parameter is described in detail in the IPDS section.

You can select the code page and code page version from a configuration setting. Refer to your printer's User's Guide for instructions on changing code page and code page version configuration settings. Some system software does not allow you to change code pages by software and uses the printer default code page for printing. The printer factory default character set is 0697 and the code page is 00037 version 1.

This may require you to change the printer code page to match the system software.

Note

- When using an application that does not allow selection of font width, use the alternate FGID when available to access typographic fonts.

Resident IPDS Fonts

Printer will support outline fonts from both the IBM Core Interchange Font Set and the IBM Coordinated Font Set as resident fonts. In addition, selections of these fonts are grouped into the 4028 Compatibility Font set. This set is used to represent the 4028 base internal raster fonts for limited compatibility. The font technologies used in the printer are:

IBM Core Interchange - Type 1 Outlines

IBM Coordinated - Type 1 Outlines

4028 Compatibility - Type 1 Outlines

3820 ROM Font Compatibility - Raster

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Resident Font Activation Methods

Fonts resident within the Printer may be activated using the following IPDS commands. Note that some fonts have restrictions on allowable font activation methods.

Load Font Equivalence

The Load Font Equivalence (LFE) command maps font local identifiers, specified within text, graphics or bar code data, to font Host Assigned IDs (HAIDs) and Global Resource IDs (GRIDs).

If the GRID specified in the LFE command matches a GRID contained in the printer, the font is activated.

Activate Resource (Load Resource Equivalence)

The Activate Resource (AR) command (previously known as Load Resource Equivalence) maps Host Assigned IDs to global names of another format. The format for the global name is identified by a resource type and resource ID combination.

If the Printer has a resource that matches the global name in the AR command, that resource is activated.

The following combinations of Resource Type and Resource ID Format are supported by the Printer.

Resource Type	RT Hex	Resource ID Format	RIDF Hex
Single Byte Coded Raster Font	X'01'	IBM GRID	X'03'
Single Byte Coded Raster Font	X'01'	MVS Host Unalterable	X'06'
Double Byte Coded Font Section	X'03'	IBM GRID	X'03'
Double Byte Coded Font Section	X'03'	MVS Host Unalterable	X'06'
Code Page	X'06'	IBM GRID	X'03'
Font Character Set	X'07'	IBM GRID	X'03'
Single Byte Coded Font Index	X'08'	IBM GRID	X'03'
Single Byte Coded Font Index	X'08'	MVS Host Unalterable	X'06'
Double Byte Coded Font Index	X'09'	IBM GRID	X'03'
Double Byte Coded Font Index	X'09'	MVS Host Unalterable	X'06'
Coded Font	X'10'	IBM GRID	X'03'
Coded Font	X'10'	Coded Font Format	X'07'

IBM Core Interchange Resident Scalable Font Set (IPDS only)

The IBM Core Interchange fonts as shown in Table 159 will be supported as resident fonts in the following language groups:

- Latin 1/2/3/4/5
- Symbols
- Arabic
- Cyrillic Greek
- Hebrew
- Thai
- Lao
- Katakana

p.247 “IBM Core Interchange Resident Scalable Font Set” lists the typefaces resident in the Printer and includes the valid FGID and code pages for each font. The Date Stamp on the character sets with GCSGIDs of 1269, 1275, 1300, 1264, and 1265 is 94350, and the Time Stamp used is 00:00:00.00. The Date Stamp on the character sets with a GCSGID of 1355 is 98152 and the Time Stamp used is 00:00:00.00. The Date Stamp used on the remaining character sets is 02185, and the Time Stamp used is 00:00:01.00.

p.253 “GCSGID Subsets” provides a mapping of the valid subsets of the GCSGIDs listed for the IBM Core Interchange fonts.

XOA-RRL Replies for Font Character Sets

The resident set as shown in Table 159 will support a font character set of any valid font width when queried as an individual font character set.

When queried for a list of font character sets, the resident character sets will be reported with a font width of zero. A font width of zero indicates that the font is scalable.

Valid combinations of the CPGIDs, GCSGIDs, FGIDs and Font Widths for the resident fonts are defined in p.233 “Code Page and Font Identification”.

❖ IBM Core Interchange Resident Scalable Font Set

Typeface	FGID	GCSGID	Font Width	Code Pages
Latin 1/2/3/4/5 with Euro and Vietnamese				
Times New Roman Medium	2308	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Times New Roman Bold	2309	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Times New Roman Italic Medium	2310	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Times New Roman Italic Bold	2311	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Helvetica Roman Medium	2304	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Helvetica Roman Bold	2305	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Helvetica Italic Medium	2306	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Helvetica Italic Bold	2307	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Roman Medium	416	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Roman Bold	420	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Italic Medium	424	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Italic Bold	428	1503	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".

Typeface	FGID	GCSGID	Font Width	Code Pages
Symbols with Euro				
Times New Roman Medium	2308	1191	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Times New Roman Bold	2309	1191	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Helvetica Roman Medium	2304	1191	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Helvetica Roman Bold	2305	1191	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Roman Medium	416	1191	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Roman Bold	420	1191	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
APL2				
APL2	307	1364	Scalable	293, 310, 910
APL2 Bold	322	1364	Scalable	293, 310, 910
Cyrillic Greek with Euro				
Times New Roman Medium	2308	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Times New Roman Bold	2309	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Times New Roman Italic Medium	2310	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Times New Roman Italic Bold	2311	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Helvetica Roman Medium	2304	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Helvetica Roman Bold	2305	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Helvetica Italic Medium	2306	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".

Typeface	FGID	GCSGID	Font Width	Code Pages
Helvetica Italic Bold	2307	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Roman Medium	416	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Roman Bold	420	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Italic Medium	424	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Italic Bold	428	1504	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Arabic with Euro				
ITC Boutros Setting Medium	2308	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
ITC Boutros Setting Bold	2309	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
ITC Boutros Setting Italic Medium	2310	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
ITC Boutros Setting Italic Bold	2311	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
ITC Boutros Modern Rokaa Medium	2304	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
ITC Boutros Modern Rokaa Bold	2305	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
ITC Boutros Modern Rokaa Italic Medium	2306	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
ITC Boutros Modern Rokaa Italic Bold	2307	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Boutros Typing Medium	416	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Boutros Typing Bold	420	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".

Typeface	FGID	GCSGID	Font Width	Code Pages
Boutros Typing Italic Medium	424	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Boutros Typing Italic Bold	428	1506	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Hebrew with Euro				
Narkissim Medium	2308	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Narkissim Bold	2309	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Narkissim Italic Medium	2310	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Narkissim Italic Bold	2311	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Narkiss Tam Medium	2304	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Narkiss Tam Bold	2305	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Narkiss Tam Italic Medium	2306	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Narkiss Tam Italic Bold	2307	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Shalom Medium	416	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Shalom Bold	420	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Shalom Italic Medium	424	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Shalom Italic Bold	428	1362	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".

Typeface	FGID	GCSGID	Font Width	Code Pages
Thai				
Burirum Medium	2308	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Burirum Bold	2309	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Burirum Italic Medium	2310	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Burirum Italic Bold	2311	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Thonburi Medium	2304	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Thonburi Bold	2305	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Thonburi Italic Medium	2306	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Thonburi Italic Bold	2307	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Thai Medium	416	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Thai Bold	420	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Thai Italic Medium	424	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Thai Italic Bold	428	1505	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".

Typeface	FGID	GCSGID	Font Width	Code Pages
Lao				
Kaewfah Medium	2308	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Kaewfah Bold	2309	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Kaewfah Italic Medium	2310	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Kaewfah Italic Bold	2311	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Pusuwan Medium	2304	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Pusuwan Bold	2305	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Pusuwan Italic Medium	2306	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Pusuwan Italic Bold	2307	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Lao Medium	416	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Lao Bold	420	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Lao Italic Medium	424	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Courier Lao Italic Bold	428	1341	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Katakana				
Katakana Gothic	304	1306	Scalable	290, 897, 1027, 1041, 1139

GCSGID Subsets

The following table provides a mapping of the valid subsets of the GCSGIDs listed for the IBM Core Interchange fonts.

❖ GCSGID Subsets for IBM Core Interchange Fonts

GCSGID	Valid GCSGID Subsets
1269	0101, 0103, 0119, 0251, 0265, 0269, 0273, 0277, 0281, 0285, 0288, 0289, 0293, 0297, 0301, 0305, 0309, 0313, 0317, 0321, 0325, 0329, 0337, 0341, 0611, 0697, 0919, 0959, 0965, 0980, 0982, 0983, 0987, 0990, 0991, 0993, 0995, 1111, 1132, 1133, 1145, 1146, 1149, 1152, 1166, 1167, 1174, 1188, 1189, 1198, 1220, 1232, 1233, 1237, 1256, 1258, 1259, 1260, 1261, 1268, 1286, 1301, 1302, 2039
1355	1269, 2041
2041	0695, 0988, 1243, 1353, 1412, 2039
1275	0340, 0630, 0909, 1191, 1257
1264	0235, 0994, 1154, 1162, 1177, 1244
1265	0941, 0687, 0986, 0992, 1147, 1199, 1217, 1218
1300	0218, 0925, 0960, 0981, 0985, 0996, 0998, 1150, 1190, 1231, 1235, 1249, 1251, 1276, 1401
1279	1102, 1395, 1396
1304	380, 963, 1113
1306	332, 1122, 1164, 1172, 1187
1364	1304, 1330, 1340
1362	1265, 1356, 1357, 1358, 1360
1502	969
1503	1305, 1336, 1346, 1347, 1355, 1375, 1377, 1378, 1380, 1391, 1392, 1393, 1394, 1397, 1410, 1414, 1418, 1421
1504	1300, 1331, 1338, 1371, 1373, 1381, 1383, 1385, 1387, 1388, 1390, 1411, 1413, 1441
1505	1279
1506	1264, 1461, 1463, 1464, 1465

IBM Core Interchange Resident Code Page Set

The following lists the code pages used with the IBM Core Interchange Resident Fonts. Not all code Pages apply to each font; this is determined by the character set. Please correlate the GCSGIDs found in the following lists with the correct IBM Core Interchange Font GCSGID superset in p.253 "GCSGID Subsets for IBM Core Interchange Fonts" to determine which code pages apply to a particular font family.

❖ IBM Core Interchange Resident Code Page Set

Code Page Global ID (CPGID)	Graphic Character Set ID (GCSGID)	Language Supported
Latin 1 Country Extended Code Pages		
37	697	US English, Canadian English, Canadian French, Dutch, Brazilian Portuguese, Portuguese
273	697	Austrian, German
274	697	Belgian
275	697	Brazilian
277	697	Danish, Norwegian
278	697	Finnish, Swedish
280	697	Italian
281	697	Japanese
282	697	Portuguese
284	697	Castilian Spanish, Latin American Spanish
285	697	UK English
297	697	French, Catalan
500	697	Multinational, Belgium French, Belgium Dutch, Swiss French, Swiss German, Swiss Italian
871	697	Icelandic
1140	695	US English, Canadian English, Canadian French, Dutch, Brazilian Portuguese, Portuguese ECECP
1141	695	Austrian, German ECECP
1142	695	Danish, Norwegian ECECP
1143	695	Finnish, Swedish ECECP
1144	695	Italian ECECP
1145	695	Castilian Spanish, Latin American Spanish ECECP

Code Page Global ID (CPGID)	Graphic Character Set ID (GCSGID)	Language Supported
1146	695	UK English ECECP
1147	695	French, Catalan ECECP
1148	695	Multinational ECECP, Belgium French, Belgium Dutch, Swiss French, Swiss German, Swiss Italian
1149	695	Icelandic ECECP
Latin 1 EBCDIC Publishing Code Pages		
361	1145	Multinational, Belgium French, Belgium Dutch, Swiss French, Swiss German, Swiss Italian
382	1145	German
383	1145	Belgian
384	1145	Brazilian Portuguese
385	1145	Canadian French
386	1145	Danish, Norwegian
387	1145	Finnish, Swedish
388	1145	French, Catalan
389	1145	Italian
390	1145	Japanese
391	1145	Portuguese
392	1145	Castilian Spanish
393	1145	Latin American Spanish
394	1145	UK English
395	1145	US English, Canadian English
Latin 1 ASCII Code Pages		
437	919	Multinational, US English, UK English, Dutch, German, Finnish, French, Italian, Spanish, Swedish
850	980	Multinational PC
858	988	Multinational PC with Euro
860	990	Portuguese (Primary = 850)
861	991	Icelandic (Primary = 850)
863	993	Canadian French (Primary = 850)
865	995	Nordic (Primary = 850)
1004	1146	IBM PC Desktop Publishing
819	697	ISO Latin 1

Code Page Global ID (CPGID)	Graphic Character Set ID (GCSGID)	Language Supported
1252	1412	Windows Latin 1
1112	1305	Baltic, Multi EBCDIC
1257	1421	Windows, Baltic Rim
Latin 2/3/4/5 EBCDIC and ASCII Code Pages		
852	982	Croatian, Czech, East German, Hungarian, Polish, Romanian, Slovak, Slovenian
852	1377	Croatian, Czech, East German, Hungarian, Polish, Romanian, Slovak, Slovenian with Euro
870	959	Latin 2 Multilingual
912	959	Latin 2 ISO/ ANSI 8 Bit
1153	1375	Latin 2 Multilingual with Euro
1250	1410	Windows Latin 2
853	983	Latin 3 Multilingual PC
905	1286	Latin 3 Multilingual
913	1286	Latin 3 Multilingual
1069	1256	Latin 4 EBCDIC
914	1256	Latin 4 ISO/ASCII
857	987	Latin 5 Turkey PC
857	1380	Latin 5 Turkey PC with Euro
1155	1378	EBCDIC Turkey with Euro
857	987	Latin 5 PC
920	1152	Latin 5 ISO/ANSI 8 Bit
1026	1152	Latin 5
1254	1414	Windows, Turkish
1157	1391	EBCDIC Estonia with Euro
922	1347	Estonia, PC
902	1392	8-bit Estonia with Euro
1156	1393	EBCDIC Baltic Multilingual with Euro
921	1346	PC Baltic Multilingual
901	1394	PC Baltic Multilingual with Euro
Latin 9 EBCDIC and ASCII Code Pages		
923	1353	Latin 9
924	1353	Latin 9 EBCDIC

Code Page Global ID (CPGID)	Graphic Character Set ID (GCSGID)	Language Supported
Vietnamese		
1130	1336	Vietnamese EBCDIC
1164	1397	Vietnamese EBCDIC with Euro
1129	1336	Vietnamese ISO-8
1163	1397	Vietnamese ISO-8 with Euro
1258	1418	Windows Vietnamese
Thailand		
838	1279	Thailand
889	1102	Thailand
874	1279	Thailand, PC
1160	1395	Thailand, EBCDIC with Euro
1161	1395	Thailand, PC with Euro
1162	1396	Windows Thailand
Lao		
1132	1341	Lao EBCDIC
1133	1341	Lao ISO-8
Latin EBCDIC DCF Code Pages		
1002	1132	DCF Release 2 Compatibility
1003	1133	US Text Subset
1068	1259	Text with Numeric Spacing
1039	1258	GML List Symbols
Cyrillic and Greek EBCDIC and ASCII Code Pages		
880	960	Cyrillic Multilingual (Primary = 1025)
915	1150	Cyrillic ISO/ASCII 8 Bit
855	985	Cyrillic PC
866	996	Cyrillic #2 PC
1025	1150	Cyrillic Multilingual
1251	1411	Windows, Cyrillic
423	218	Greek 183 (Primary = 875)
813	925	Greek ISO/ASCII 8 Bit
813	1371	Greek ISO/ASCII 8 Bit with Euro
851	981	Greek PC (Primary = 869)
869	998	Greek PC
869	1373	Greek PC with Euro
875	925	Greek

Code Page Global ID (CPGID)	Graphic Character Set ID (GCSGID)	Language Supported
875	1371	Greek with Euro
1039	1258	GML List Symbols
1253	1413	Windows, Greek
1253	1381	EBCDIC Cyrillic Multi. with Euro
808	1385	PC, Cyrillic, Russian with Euro
1131	1338	PC, Cyrillic, Belo Russian
849	1387	PC, Cyrillic, Belo Russian with Euro
808	1385	PC, Cyrillic, Russian with Euro
1158	1388	EBCDIC Cyrillic, Ukraine with Euro
1125	1331	PC, Cyrillic, Ukrainian
848	1390	PC, Cyrillic, Ukrainian with Euro
872	1383	Cyrillic PC with Euro
1166	1441	EBCDIC Cyrillic Multi. with Euro
Arabic EBCDIC and ASCII Code Pages		
420	235	Arabic Bilingual
420	1461	Arabic Bilingual with Euro
864	994	Arabic PC
864	1463	Arabic PC with Euro
1008	1162	Arabic ISO/ASCII 8 Bit
1008	1464	Arabic ISO/ASCII 8 Bit with Euro
1029	1154	Arabic Extended ISO/ASCII 8 Bit
1046	1177	Arabic Extended ISO/ASCII 8 Bit
1046	1465	Arabic Extended ISO/ASCII 8 Bit with Euro
1039	1258	GML List Symbols
Hebrew EBCDIC and ASCII Code Pages		
916	941	Hebrew ISO/ASCII 8 Bit
1028	941	Hebrew Publishing
424	941	Hebrew
424	1356	Hebrew with Euro
803	1147	Hebrew Character Set A (Primary = 424)
803	1357	Hebrew Character Set A (Primary = 424) with Euro
856	986	Hebrew PC (Primary = 862)
856	1358	Hebrew PC (Primary = 862) with Euro

Code Page Global ID (CPGID)	Graphic Character Set ID (GCSGID)	Language Supported
862	992	Hebrew PC
867	1360	Israel with Euro
1039	1258	GML List Symbols
Symbols		
259	340	Symbols, Set 7
899	340	Symbols, Set 7 ASCII
1087	1257	Symbols, Adobe
1038	1257	Symbols, Adobe ASCII
1091	1191	Symbols, Modified Set 7
1092	1191	Symbols, Modified Set 7 ASCII
363	630	Symbols, Set 8
829	909	Math Symbols
1039	1258	GML List Symbols
Katakana		
1027	1172	Japanese Latin Extended
290	332	Japan Katakana
290	1172	Host/PC Japanese Katakana Extended
897	1164	Japan PC #1
1041	1187	Japanese Extended PC
1139	1122	Japan Alphanumeric Katakana
APL2		
293	1340	APL USA
310	963	Graphic Escape APL/TN
910	1330	APL ASCII

4028 Compatibility Resident Font Set

The following lists the typefaces resident in the Printer and includes the valid FGID and code pages for each font. The Date Stamp on most of these character sets is 94350, and the Time Stamp used is 00000000.

The Date Stamp on FGIDs 76 and 159(20224) is 96036. The Date Stamp on FGID 164 is 96039 with a Time Stamp 08225100 for all GCSGIDs except 695, where the Data Stamp is 98124 and the Time Stamp is 13491500. The Date Stamp on FGID 701 is 96309 with a Time Stamp of 08230800 for all GCSGIDs except 695, where the Date Stamp is 98124 and the Time Stamp is 13492000. Fonts listed with an “Alt FGID”, are used as a substitute for the requested “Alt FGID”.

The Printer will substitute Times New Roman (from the IBM Core Interchange Set) for the Times Roman fonts listed in Table 162. The Courier fonts will also come from the IBM Core Interchange Set. All the remaining listed fonts will be from the IBM Coordinated Font Set (See p.263 “Resident PSC Strategic Scalable Font Set 2”).

See p.262 “4028 Compatibility Resident Code Page Set” for an explanation of the groups used in the “Code Pages” column.

 **Note**

- ❑ Prestige fonts used with code pages with a CPGID of 259 are mapped to the Courier Roman Medium Symbols font (FGID 416 GCSGID 1275) as shown in Table 159. When the printer is in Box-Draw mode, any font which does not indicate CPGID 259 support will print with the Roman Medium Symbols font in a point size of 10 (12 pitch) when used with Code Page 259. This emulates 4028 behavior.
- ❑ Courier FGIDs 11 and 85 and Prestige FGIDs 12 and 86 now support Code Page 259 (when Box-Draw mode is on) to the extent these were supported in the 4028. In this mode, CPGID 1091 is substituted for CPGID 259 in order to print box-draw characters that line up with each other. The registered CPGID 259 does not have such characters, and is used when not in Box-Draw mode.
- ❑ To match the 4028 and 3116 printed font sizes, the FGIDs 254, 256, 281, and 290 are scaled anamorphically (internal to the Printer) as follows:

FGID	Vertical × Horizontal Scale Factors (points)
254	7.8 vpt × 7.0 hpt
256	7.8 vpt × 7.0 hpt
281	7.0 vpt × 6.0 hpt
290	5.0 vpt × 4.5 hpt

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❖ 4028 Compatibility Resident Font Set

Typeface	FGID	Alt FGID	Pitch	Point Size	Font width	Code Pages
Boldface	159		Proportional	12	120	A, B
Prestige PSM Roman Medium	164		Proportional	12	120	A, B
Courier	11		10	12	144	259, A, B
Courier	85		12	10	120	259, A, B
Courier	223		15	8	96	A, B
Courier.17ss	254		17.1	7.8	84	A, B
Courier Bold	46		10	12	144	A, B
Courier Bold	108		12	10	120	A, B
Courier Italic	92		12	10	120	A, B
Letter Gothic	281		20	7	72	A, B
OCR A	19		10	12	144	892
OCR B	3		10	12	144	893
Prestige Pica	12		10	12	144	259, A, B
Prestige Elite	86		12	10	120	259, A, B
Prestige	221		15	7.8	96	A, B
Prestige	256		17.1	8.5	84	A, B
Prestige PSM	164		Proportional	12	120	A, B
Prestige Elite Bold	111		12	10	120	A, B
Prestige Elite Italic	112		12	10	120	A, B
Times Roman	5687	760	Typo	6	40	A
Times Roman	5687	751	Typo	8	53	A
Times Roman	5687	1051	Typo	10	67	A
Times Roman	5687	1351	Typo	12	80	A
Times Roman Bold	5707	1053	Typo	10	67	A
Times Roman Bold	5707	761	Typo	12	80	A
Times Roman Bold	5707	762	Typo	14	93	A
Times Roman Bold	5707	1803	Typo	18	120	A
Times Roman Bold	5707	2103	Typo	24	160	A
Times Roman Italic	5815	1056	Typo	10	67	A
Times Roman Italic	5815	763	Typo	12	80	A
Times Roman Bold Italic	5835	764	Typo	10	67	A

Typeface	FGID	Alt FGID	Pitch	Point Size	Font width	Code Pages
Times Roman Bold Italic	5835	765	Typo	12	80	A
Gothic Text (311x)	203		13.3	9	108	A, B
Gothic Text (311x)	283		20	6	72	A, B
Gothic Text (311x)	290		26.7	5	54	A, B

4028 Compatibility Resident Code Page Set

The following lists provides an explanation of the groups as used in the Code Pages column of p.260 “4028 Compatibility Resident Font Set”.

❖ 4028 Compatibility Resident Code Page Set

Code Page Global ID (CPGID)	Graphic Character Set ID (GCSGID)
Group A	
037, 273, 274, 277, 278, 280, 281, 284, 285, 297, 500, 871	697
1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149	695
038, 367	103
260	341
276	277
286	317
287	321
288	325
1002	1132
437	919
850	980
858	988
1003 (Addition to 4028 font support. Not supported by 4028.)	1133
Group B	
256 (Replaced by 500)	337
289 (Replaced by 500, but missing obsolete “Peseta” character)	329

Code Page Global ID (CPGID)	Graphic Character Set ID (GCSGID)
Miscellaneous	
310	963
259	340
892	968
893	969
1303 (Used internally for resident Code 128 barcode font and postal bar code font support)	n/a

IBM Coordinated Font Set (IPDS)

p.263 “Resident PSC Strategic Scalable Font Set 2” lists the scalable IBM Coordinated font set typefaces resident in the Printer and includes the valid FGID and code pages for each font.

Where the IBM Core Interchange code pages are referenced in p.254 “IBM Core Interchange Resident Code Page Set”, only the Latin 1 Country Extended, Latin 1 EBCDIC Publishing, Latin 1 ASCII and Latin EBCDIC DCF code pages are supported.

GCSGID Subsets

The following lists provides an a mapping of the valid subsets of the GCSGIDs listed for the PSC Strategic Font Set 2.

❖ Resident PSC Strategic Scalable Font Set 2

Typeface	FGID	GCSGID	Font width	Code Pages
APL	307	1304	Scalable	293, 310, 910
APL Bold	322	1304	Scalable	293, 310, 910
Boldface	20224	2039	Scalable	See p.254 “IBM Core Interchange Resident Code Page Set”.
Boldface (Euro)	20224	2041	Scalable	See p.254 “IBM Core Interchange Resident Code Page Set”.
Gothic Text	304	2039	Scalable	See p.254 “IBM Core Interchange Resident Code Page Set”.
Gothic Text (Euro)	304	2041	Scalable	See p.254 “IBM Core Interchange Resident Code Page Set”.
Letter Gothic	400	2039	Scalable	See p.254 “IBM Core Interchange Resident Code Page Set”.

Typeface	FGID	GCSGID	Font width	Code Pages
Letter Gothic (Euro)	400	2041	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Letter Gothic Bold	404	2039	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Letter Gothic Bold (Euro)	404	2041	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
OCR A	305	968	Scalable	876, 892
OCR B	306	969	Scalable	877, 893
OCR B (Euro)	306	1502	Scalable	877, 893
Prestige	432	2039	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Prestige (Euro)	432	2041	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Prestige Bold	318	2039	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Prestige Bold (Euro)	318	2041	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Prestige Italic	319	2039	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Prestige Italic (Euro)	319	2041	Scalable	See p.254 "IBM Core Interchange Resident Code Page Set".
Katakana Gothic	304	1306	Scalable	290, 897, 1027, 1041

IBM Coordinated Font Set Code Page Set

The following lists provides the GCSGIDs and CPGIDs for the individual Code Pages listed in the Code Pages column of p.263 “Resident PSC Strategic Scalable Font Set 2”.

❖ IBM Coordinated Font Set Code Page Set

Code Page Global ID (CPGID)	Graphic Character Set ID (GCSGID)
293	380
310	963
910	1113
876, 892	968
877, 893	969
877, 893	1502
290, 1027	1172
897	1164
1041	1187

❖ GCSGID Subsets for the Strategic Font Set 2

GCSGID	Valid GCSGID Subsets
1304	0380, 0963, 1113
2039	0101, 0103, 0119, 0251, 0265, 0269, 0273, 0277, 0281, 0285, 0288, 0289, 0293, 0297, 0301, 0305, 0309, 0313, 0317, 0321, 0325, 0329, 0337, 0341, 0611, 0697, 0919, 0980, 0990, 0991, 0993, 0995, 1132, 1133, 1145, 1146, 1149, 1198, 1220, 1258, 1259, 1260
1306	0332, 1164, 1172, 1187
2041	0695, 0988, 1243, 1353, 1412, 2039

IPDS Default Font

Factory Setting

The factory setting for the default font is Courier Roman Medium 10 pitch (12 point) using code page 037, version 1. The GRID for the default font is: FGID=416, GCSGID=697, CPGID=037, FontWidth=144 (CPI setting is 10.0). The default font may be changed by the operator using the printer's control panel. It will reset to the Factory Setting upon each IML. It can be reset to the Factory Setting by doing a Cold Reset to the printer.

The default font can be set for Single Byte fonts. It does not contain Double Byte Font Character Sets or Code Pages.

Selectable IPDS Default Font

To change the default font requires the use of the printer's control panel. The printer's control panel will present menu choices for selecting the various parts of the font.

The operator may select the default font using any or all of the Code Page (CPGID), Font (FGID), and Characters Per Inch (CPI) parameters. The available parameters will be listed in Groups to help identify valid/invalid combinations. An invalid combination will be resolved inside the printer because the printer must have a valid default font. However, the parameter adjustment will not be visible at the printer's control panel display. Detailed information listing the valid combinations and how to select them will be available with the printer.

The selection is based upon a hierarchy: Code Page is highest, Font is next, and Font Width (CPI) is the lowest. Should an invalid combination be selected, the Code Page will override Font and CPI, and Font will override CPI.

There are 5 Groups, A-E, into which all the fonts, code pages, and widths fall. All combinations defined within a Group are valid. When internal modification is necessary, the following rules apply:

- An invalid/unsupported CPGID becomes Code Page 037 (Group A).
- An invalid/unsupported Font Width (CPI) becomes 10.0 CPI (which will translate to 12 points).
- For a Group A CPGID, an invalid/unsupported FGID becomes 416 Courier Roman Medium.
- For a Group B CPGID, the FGID is automatically 304 Gothic Katakana.
- For a Group C CPGID, the FGID is automatically 305 OCR A. Font Width is 10.0 CPI.
- For a Group D CPGID, the FGID is automatically 306 OCR B. Font Width is 10.0 CPI.
- For a Group E CPGID, an invalid/unsupported FGID becomes 416 Courier Roman Medium.

Note

- The 4028 compatibility fonts are a new addition to the printer's control panel selection. This is necessary because some of these FGIDs are anamorphically scaled, and therefore cannot be correctly reproduced with just an AFP FGID and a CPI value.

These fonts are handled specially in that all of these FGIDs (except 5687, 5707, 5815, 5835) ignore the printer's control panel CPI value, because the FGID fully describes the font. In the case of the 4 typographic FGIDs, there are valid discreet sizes associated with them. If the correct CPI values are not used, the printer will default to the nearest discrete size value. Tie goes to the smaller value.

Selectable Code Pages

The following code pages are selectable by the operator:

Code-Page/Group	Code Page Description
500 A	Belgium, Switzerland / International
037 A	US, Canada, Netherlands, Portugal
038 A	US English ASCII
260 A	Canadian French
273 A	Austrian / German
274 A	Belgium
276 A	Canadian French (94 character set)
277 A	Danish / Norwegian
278 A	Finnish / Swedish
280 A	Italian
281 A	Japanese
284 A	Spanish
285 A	UK English
286 A	Austrian / German (Alternate)
287 A	Danish / Norwegian (Alternate)
288 A	Finnish / Swedish (Alternate)
297 A	French
871 A	Icelandic
1140 A	US, Canada, Netherlands, Portugal (Euro)
1141 A	Austrian, German (Euro)
1142 A	Danish Norwegian (Euro)
1143 A	Finnish, Swedish (Euro)
1144 A	Italian (Euro)
1145 A	Spanish (Euro)
1146 A	UK English (Euro)
1147 A	Catalan French (Euro)
1148 A	Multinational (Euro)
1149 A	Icelandic (Euro)
290 B	Japanese / Katakana
892 C	OCR - A
893 D	OCR - B
420 E	Arabic

Code-Page/Group	Code Page Description
423 E	Greek
424 E	Hebrew
870 E	Latin 2 Multilingual
875 E	Greek
880 E	Cyrillic
905 E	Turkish
1025 E	Cyrillic (primary)
1026 E	Turkish (primary)

Selectable Fonts

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The following fonts (FGID) are selectable by the operator:

FGID/Group	FGID Description
2304 A, E	Helvetica Roman/ITC Boutros Modern Rokaa/Narkiss Tam - Medium
2305 A, E	Helvetica Roman/ITC Boutros Modern Rokaa/Narkiss Tam - Bold
2306 A, E	Helvetica Roman/ITC Boutros Modern Rokaa/Narkiss Tam - Italic Medium
2307 A, E	Helvetica Roman/ITC Boutros Modern Rokaa/Narkiss Tam - Italic Bold
2308 A, E	Times New Roman/ITC Boutros Setting Rokaa/Narkissim - Medium
2309 A, E	Times New Roman/ITC Boutros Setting Rokaa/Narkissim - Bold
2310 A, E	Times New Roman/ITC Boutros Setting Rokaa/Narkissim - Italic Medium
2311 A, E	Times New Roman/ITC Boutros Setting Rokaa/Narkissim - Italic Bold
416 A, E	Courier Roman/Boutros Typing/Shalom - Medium
420 A, E	Courier Roman/Boutros Typing/Shalom - Bold
424 A, E	Courier Roman/Boutros Typing/Shalom - Italic Medium
428 A, E	Courier Roman/Boutros Typing/Shalom - Italic Bold
20224 A	Boldface
304 A	Gothic Text
400 A	Letter Gothic
404 A	Letter Gothic Bold
432 A	Prestige

FGID/Group	FGID Description
318 A	Prestige Bold
319 A	Prestige Italic
304 B	Katakana Gothic
305 C	OCR A
306 D	OCR B

4028 Selectable Fonts

The following 4028 fonts (FGID) are also selectable by the operator:

FGID/Group	FGID Description
159 A	Boldface (Proportional Space 12 pt., based on 10 CPI)
11 A	Courier 10.0 CPI
85 A	Courier 12.0 CPI
223 A	Courier 15.0 CPI
254 A	Courier 17.1 CPI
46 A	Courier Bold 10.0 CPI
18 A	Courier Italic 10.0 CPI
92 A	Courier Italic 12.0 CPI
203 A	Gothic Text 13.3 CPI
283 A	Gothic Text 20.0 CPI
290 A	Gothic Text 26.7 CPI
281 A	Letter Gothic 20 CPI
19 C	OCR A
03 D	OCR B
12 A	Prestige Pica 10.0 CPI
86 A	Prestige Elite 12.0 CPI
221 A	Prestige Elite 15.0 CPI
256 A	Prestige Elite 17.1 CPI
111 A	Prestige Elite Bold 12.0 CPI
112 A	Prestige Elite Italic 12.0 CPI
5687 A	Times Roman Typographic 6, 8, 10, 12 pt
5707 A	Times Roman Typographic Bold 10, 12, 14, 18, 24 pt
5815 A	Times Roman Typographic Italic 10, 12 pt
5835 A	Times Roman Typographic Bold Italic 10, 12 pt

Selectable Font Widths

The following Font Widths (CPI) are selectable by the operator:

Group	Range in characters per inch
A, B, E	5.0 CPI - 30.0 CPI, in increments of 0.1 CPI.
C, D	10.0 CPI.
4028 Fixed Width	Ignored. Handled internally because the FGID defines the size.
5687 6 pt	20.0 CPI
5687 8 pt	15.1 CPI
5687 10 pt	11.9 CPI
5687 12 pt	10.0 CPI
5707 10 pt	11.9 CPI
5707 12 pt	10.0 CPI
5707 14 pt	8.6 CPI
5707 18 pt	6.7 CPI
5707 24 pt	5.0 CPI
5815 10 pt	11.9 CPI
5815 12 pt	10.0 CPI
5835 10 pt	11.9 CPI
5835 12 pt	10.0 CPI

Normally, IPDS Font Width is in terms of 1440ths of an inch (for example, 144, 120). However, printer's control panel Font Width selection is more easily understood (and more universally used) as Characters Per Inch. So the values will range from 5.0 cpi (Font Width 288) to 30.0 cpi (Font Width 48) in increments of 0.1 cpi.

The resulting cpi will be translated internally to the nearest integer font width value. Since CPI is inherently a reciprocal, 0.1 cpi increments will be a non-linear font width progression. This should not prove a serious problem since default fonts for IPDS are not the primary selection path.

An extra note is that font widths for fixed width fonts are calculated differently than for typographic fonts.

The vertical point size is the real common ground. So to get a 12 point size, a fixed width font will use a font width of 144; 10 cpi. A typographic font will use a font width of 80. To keep compatible sizes this is also translated from 10 cpi. The FGID defines which range to use. For further details, refer to the LFE and/or AR command sections of the IPDS architecture spec.

IPDS Bar Code Printing

To support the BCOCA tower for printing of bar codes, the OCR-A and OCR-B fonts and their corresponding code pages (892 and 893) must be resident in the printer. These are supported as shown in p.260 “4028 Compatibility Resident Font Set”.

Code page 1303 is also resident to be used for printing code 128 bar codes.

IPDS Font Bolding

The Printer will accept the IPDS Load Font Equivalence command and support the bold and double strike bits for both resident Type 1 and loaded raster fonts. No other bits within the LFE flags byte are supported.

The bold/double strike attributes are handled the same way within the printer. The function is provided by printing a text block multiple times, each time shifted an appropriate amount. Since the attributes are tied to the font LID and not the font resource, the font resource is not affected.

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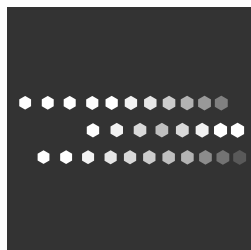
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IPDS Supplement

-
- 1 Getting Started
 - 2 Using Web Image Monitor
 - 3 Accessing User Tools
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Manuals for the IPDS card

Refer to the manuals that are relevant to what you want to do with the IPDS card.

★ Important

- Adobe® Acrobat® Reader®/Adobe Reader must be installed in order to view the manuals as PDF files.

IPDS Supplement (IPDS.pdf)

Explains about how to configure the IPDS card for the machine, and about items selectable from the Web browser.

IPDS Printing Configuration Guide (IPDS_CONF.pdf) *English Only

Explains about environment necessary for connecting the mainframe to the machine, and performing IPDS printing.

IPDS Technical Reference (IPDS_TEC.pdf) *English Only

Explains about commands necessary for IPDS printing.

↓ Note

- For details about the necessary environment, and installation of the IPDS card and machine, consult your sales or service representative. For details about necessary environment and operation of the mainframe, consult IBM.

Notice

Important

Contents of this manual are subject to change without prior notice.

In no event will the company be liable for direct, indirect, special, incidental, or consequential damages as a result of handling or operating the machine.

How to Read This Manual

Symbols

This manual uses the following symbols:

 **Important**

Indicates points to pay attention to when using the machine, and explanations of likely causes of paper misfeeds, damage to originals, or loss of data. Be sure to read these explanations.

 **Note**

Indicates supplementary explanations of the machine's functions, and instructions on resolving user errors.

[]

Indicates the names of keys on the machine's display or control panels.

Machine Types

This machine comes in three models that have different options.

When describing instructions that are model-specific, this manual refers to the different machine models as Type 1, Type 2, or Type 3.

The following table describes the model types.

Model types

Model Type	Model name
Type 1	Aficio SP 4310N, SP 4310N
Type 2	Aficio SP 5200DN, SP 5200DN
Type 3	Aficio SP 5210DN, SP 5210DN



1. Getting Started

About IPDS

IPDS (Intelligent Printer Data Stream) is a page printing format for IBM mainframe and client computers. This machine can perform IPDS printing if the IPDS card is installed.

2. Using Web Image Monitor

List of the Setting Items

If you install the IPDS card to the machine, following Web Image Monitor items can be viewed or modified depending on the selected mode on the Web browser.

Select one of the following modes to log on Web Image Monitor:

- User mode: logged on as a user
- Administrator mode: logged on as an administrator

Note

- IPDS cannot use the delete reservation function of Web Image Monitor. After you login to administrator mode in Web Image Monitor, even if you select a currently printing IPDS job at the Current/Waiting Jobs and then click [Delete Reservation], nothing happens.
- For details about Web Image Monitor, see the manual explaining the network functions provided by the supplier or Web Image Monitor Help.

Configuration

Printer

Menu	User mode	Administrator mode
Basic Settings	Read	Read/Modify
IPDS Form List	Read	Read/Modify
Reset IPDS Fonts	None	Read/Modify

Note

- "IPDS Menu" will appear in Basic Settings.

Network

Menu	User mode	Administrator mode
IPv4	Read	Read/Modify

↓ Note

- "IPDS" and "IPDS Port Number" will be displayed.

Security

2

Menu	User mode	Administrator mode
Network Security	None	Read/Modify

↓ Note

- "IPDS" will be displayed.

3. Accessing User Tools

User Tools Settings

When the IPDS card is installed, IPDS print settings become available and will appear on the control panel.

List/Test Print

3

IPDS Font List

Prints a list of IPDS-supported fonts.

 **Note**

- The layout of the IPDS Font List produced by the test print is fixed to A4 or 8¹/₂" × 11" (letter) size. We recommend you load A4 or 8¹/₂" × 11" (letter) size paper (plain or recycled) in one of the paper trays.
- For details about printing lists, see the manual explaining how to print lists provided by the supplier.

Maintenance

HDD Management

- Reset IPDS Fonts

Use this page to delete all IPDS captured fonts.

 **Note**

- This menu appears only when the HDD unit is installed.
- Only the Machine Administrator can reset IPDS fonts.

IPDS Menu

Tray Form (When using Type 1 model)

Specifies an IPDS form for each paper tray.

- Tray 1
- Tray 2
- Tray 3
- Bypass Tray

For each paper tray, select the form you want to allocate to it.

Tray Form (When using Type 2 or 3 model)

Specifies an IPDS form for each paper tray.

- Tray 1
- Tray 2
- Tray 3
- Tray 4
- Tray 5
- Bypass Tray

For each paper tray, select the form you want to allocate to it.

Emulation Mode

Specifies the emulation mode.

- Native (Default)
- 4028

Print Mode

Specifies the print mode.

- Standard
- Enhanced (Default)

Default Code Page

Specifies the default code page.

The default value is "037".

- 037 : US, Canada, Netherlands, Portugal
- 038 : US English ASCII
- 260 : Canadian French
- 273 : Austrian/German
- 274 : Belgium
- 276 : Canadian French
- 277 : Danish/Norwegian
- 278 : Finnish/Swedish
- 280 : Italian
- 281 : Japanese
- 284 : Spanish
- 285 : UK English

- 286 : Austrian/German (alternate)
- 287 : Danish/Norwegian (alternate)
- 288 : Finnish/Swedish (alternate)
- 290 : Japanese/Katakana
- 297 : French
- 420 : Arabic
- 423 : Greek
- 424 : Hebrew
- 500 : Belgium, Switzerland/International
- 870 : Latin 2 Multilingual
- 871 : Icelandic
- 875 : Greek
- 880 : Cyrillic
- 892 : OCR - A
- 893 : OCR - B
- 905 : Turkish
- 1025 : Cyrillic
- 1026 : Turkish

The following code pages include the Euro character:

- 1140 : US, Canada, Netherlands, Brazil, Portugal
- 1141 : Austrian/German
- 1142 : Danish/Norwegian
- 1143 : Finnish/Swedish
- 1144 : Italian
- 1145 : Spanish
- 1146 : UK English
- 1147 : French
- 1148 : Belgium, Switzerland/International
- 1149 : Icelandic

Default FGID

Specifies the default FGID (Font Typeface Global Identifier), which identifies the printer's default resident font.

The default FGID is 416 (Courier Roman Medium 10).

To display a list of the fonts and FGIDs that the printer supports, print out the list of IPDS resident fonts. For details about printing lists, see the manual explaining how to print lists provided by the supplier.

- 3 : OCR B
- 11 : Courier 10
- 12 : Prestige Pica
- 18 : Courier Italic 10
- 19 : OCR A
- 46 : Courier Bold 10
- 85 : Courier 12
- 86 : Prestige Elite
- 92 : Courier Italic 12
- 111 : Prestige Elite Bold
- 112 : Prestige Elite Italic
- 159 : Boldface
- 164 : Prestige PSM Roman Medium
- 203 : Gothic Text
- 221 : Prestige 15
- 223 : Courier 15
- 254 : Courier.17 ss
- 256 : Prestige 17
- 281 : Letter Gothic
- 283 : Gothic Text
- 290 : Gothic Text
- 304 : Katakana Gothic
- 305 : OCR A
- 306 : OCR B
- 318 : Prestige Bold
- 319 : Prestige Italic
- 400 : Letter Gothic
- 404 : Letter Gothic Bold
- 416 : Courier Roman Medium 10
- 420 : Courier Roman Bold
- 424 : Courier Italic Medium

- 428 : Courier Italic Bold
- 432 : Prestige
- 2304 : Helvetica Roman Medium
- 2305 : Helvetica Roman Bold
- 2306 : Helvetica Italic Medium
- 2307 : Helvetica Italic Bold
- 2308 : Times New Roman Medium
- 2309 : Times New Roman Bold
- 2310 : Times New Roman Italic Medium
- 2311 : Times New Roman Italic Bold
- 5687 : Times Roman
- 5707 : Times Roman Bold
- 5815 : Times Roman Italic
- 5835 : Times Roman Bold Italic
- 20224 : Boldface

Characters Per Inch

Specifies the number of characters per inch (pitch) for the default font. Valid values are 5.0 to 30.0 in units of one tenth of an inch. The default value is 10.0.

Valid Printable Area Check

Specifies whether or not to report the Position check error (NACK 08C1..00) to the host, when valid printable area is checked

- On (Default)

The printer checks for pixels that fall outside the intersection of the logical and physical pages. If there are pixels outside the area and error reporting has been set using the "IPDS Exception Handling Control" command, the printer reports an error to the host.

- Off

The printer does not report pixels outside the valid printable area.

Page

Specifies how data is positioned on the page.

- Whole (Default)

IPDS whole page. The printer does not move or compress the page. This is the preferred method; all page positioning and formatting is done at the application level on the host. The [Print], [Comp1], and [Comp2] commands may alter the appearance of the page, or may not be compatible with earlier products (for example, 3116, 3916), especially if these options are used in combination with duplex and other IPDS Menu page format adjustments. The

[Print], [Comp1], and [Comp2] commands are included to allow line printer jobs to fit onto pages where "Edge to Edge" printing is not possible; we do not recommend you use them to create new applications.

- Comp1

This command uses the "Print Page" command as its base, and compresses the spacing between text lines generated by the "IPDS Begin Line" command. Its primary purpose is to compress "Begin Line" command text data onto pages that have unprintable borders.

- Comp2

This command uses the "Print Page" command as its base, and compresses "IPDS Begin Line" command text (see Comp1) and the data of the following vertical text positioning commands: "Absolute Move Baseline", "Relative Move Baseline", "Draw B Axis Rule", and "Draw I Axis Rule".

Note

- Alignment problems can occur if you select [Comp1] or [Comp2], and print jobs that mix text with images, graphics, or bar codes. Problems can occur if text positioning commands are used to move across text or into non-text (image, graphic, or bar code) areas. Both [Comp1] and [Comp2] reduce the line spacing of text only and have no effect on non-text data. To minimize alignment problems, select [Comp1], because "Begin Line" commands are not normally used to move across or into non-text areas. If, however, the application you want to compress does not use the "Begin Line" command, select [Comp2].

- Print

IPDS print page. If the page origin is within the unprintable area, the origin of the page is moved to the inside edge of the nearest unprintable area border. If the origin violates the unprintable area on two edges, it is moved to the nearest inside corner of the unprintable area. If the origin violates only one edge of the unprintable area, the origin is adjusted to avoid that area only.

If a location adjustment is made, the printed page is shifted in the direction of the adjustment. There is no compression, so data on the opposite edge may be pushed off the page.

Note

- For the "Print" command to function, the [Edge to Edge] setting must be set to [Off]. Any data placed in this unprintable area is lost. Also, [Print] will not function on media overlays (overlays that are part of the base page, not the overlays included in the variable print data).

Edge to Edge

Turns "Edge to Edge" printing on or off.

- On

The printer allows printing up to the physical page size.

- Off (Default)

The printer maintains a border of 2 mm (0.078 in) on the leading edge, but prints to all other page borders.

↓ Note

- To prevent toner from accumulating inside the printer, we recommend leaving [Edge to Edge] set to [Off] for IPDS, and setting it to [On] only when necessary.
- The "Edge to Edge" IPDS Menu item affects IPDS data only.

When using IPDS, the "Edge to Edge" setting on System menu will be invalid.

Font Substitution

Turns font substitution on or off.

- On

If a job requests a font that is not loaded on the printer, the printer uses a substitute font.

- Off (Default)

If a job requests a font that is not loaded on the printer, the printer generates an IPDS NACK (Negative Acknowledgement) message and the host holds the job.

Caching

Specifies whether or not to use caching for repeated overlays.

- On

The printer uses caching, which provides better performance for jobs with repeated overlays, but uses more memory.

- Off (Default)

The printer does not use caching, which requires less memory but provides less performance for jobs with repeated overlays.

↓ Note

- Overlay caching is recommended for repeated overlays. Overlay caching does not improve performance with non-overlay IPDS data or overlays that are used only once or infrequently.

Font Capture

Sets Font Capture processing:

- On (Default)

The printer saves downloaded font resources on its hard disk drive for use beyond the duration of the current power cycle. The IPDS host must provide the "Activate Resource" command with the correct resource identifiers before downloading the font resource to be captured.

- Off

The printer stores downloaded font resources for the duration of one power cycle only.

↓ Note

- This menu appears only when the HDD unit is installed.

Resolution

Specifies the resolution reported to the host in the "IPDS XOA-OPC" command for raster coded fonts and IM1 image support. The [Resolution] menu item also helps determine whether or not a printer-resident raster font is used. For example, 240 dpi raster fonts are activated at the [240dpi] setting, not at [300dpi] or [600dpi]. The [Resolution] setting does not affect outline fonts, nor does it determine which raster fonts can be downloaded to the printer as temporary activation fonts.

- Auto (Default)

Reports to the host that the printer supports raster fonts of any dpi value and IM1 images.

"Resident" or "Captured" raster fonts of other resolutions are not activated unless a matching "Font Resolution" and "Metric Technology Triplet" is provided with the activation request.

- 240dpi

Reports to the host that the printer supports 240 dpi raster fonts and IM1 images.

"Resident" or "Captured" raster fonts of other resolutions are not activated unless a matching "Font Resolution" and "Metric Technology Triplet" is provided with the activation request.

- 300dpi

Reports to the host that the printer supports 300 dpi raster fonts and IM1 images.

"Resident" or "Captured" raster fonts of other resolutions are not activated unless a matching "Font Resolution" and "Metric Technology Triplet" is provided with the activation request.

- 600dpi

Reports to the host that the printer supports 600 dpi raster fonts and IM1 images.

"Resident" or "Captured" raster fonts of other resolutions are not activated unless a matching "Font Resolution" and "Metric Technology Triplet" is provided with the activation request.

↓ Note

- If you select [Standard] for the [Print Mode] setting, the resolution changes to [300dpi].
- To set the IPDS resolution to [240dpi], [600dpi], or [Auto], you must first set [Print Mode] to [Enhanced]. Enhanced print mode produces optimal print quality, but can slow down the printing of complex jobs.

Graphic Character String

Specifies the Graphic Character String (Graphic Character Sizing) processing method.

- Auto (Default)

Applies the value specified by the [Emulation Mode] item ([Native] or [4028]).

- Character Scale

Applies 4028 IPDS Emulation. Prints graphics and text characters by scaling the characters in a currently activated font. Character cell size is defined in the GOCA data stream. Not available for DBCS.

- Font Activation

Applies Native IPDS Emulation. Prints graphics and text characters using a currently activated font at the font's activation size, without scaling. GOCA data stream Character cell size information is ignored.

Bar Code

Specifies the barcode level protocol.

- Auto (Default)

Applies the value specified by the [Emulation Mode] item ([Native] or [4028]).

- 4028

Applies 4028 IPDS Emulation.

- Native

Applies Native IPDS Emulation.

Box Draw

Specifies the Box Draw processing.

- On

Uses special outline fonts to draw Symbol Set box characters. Select [On] to fill gaps caused by special raster fonts that contain extended length box characters (as found in older applications, for example).

- Off (Default)

Uses Symbol Set outline font characters to draw boxes as the font-defined characters.

Color Simulation

Allows you to select how color specification controls are processed on a monochromatic printer.

- Fidelity (Default)

The printer accepts all color specification controls and simulates unique colors with shades of gray.

- Legacy

The printer accepts all color specification controls, but performs only limited color simulation using black.

Text Color Simulation

Specifies how text color specification controls are processed on a monochrome laser printer.

- On (Default)

The printer accepts all text color specification controls and simulates the unique colors with shades of gray.

- Off

The printer accepts all text color specification controls, but performs only limited color simulation using black.

Note

- This menu item is available only if [Color Simulation] mode is set to [Fidelity].

3

Tray Mapping (When using Type 1 model)

Maps the media source (input tray) to an ID the host uses for the media source.

- Tray 1
 - Auto (Default)
 - IPDS Tray
- Tray 2
 - Auto (Default)
 - IPDS Tray
- Tray 3
 - Auto (Default)
 - IPDS Tray
- Bypass Tray
 - Auto (Default)
 - IPDS Tray

Note

- If [IPDS Tray] is selected, enter the tray parameter replacement value for each paper tray, using up to 254 digits.

Tray Mapping (When using Type 2 or 3 model)

Maps the media source (input tray) to an ID the host uses for the media source.

- Tray 1
 - Auto (Default)
 - IPDS Tray
- Tray 2
 - Auto (Default)
 - IPDS Tray
- Tray 3
 - Auto (Default)

- IPDS Tray
- Tray 4
 - Auto (Default)
 - IPDS Tray
- Tray 5
 - Auto (Default)
 - IPDS Tray
- Bypass Tray
 - Auto (Default)
 - IPDS Tray

↓ Note

- If [IPDS Tray] is selected, enter the tray parameter replacement value for each paper tray, using up to 254 digits.

↓ Note

- [Tray Form] and [Tray Mapping] appear differently depending on the options installed.
- [Tray Form] allocates the form specified using Web Image Monitor's [IPDS Form List] to the installed tray. For details about IPDS Form List, see the Web Image Monitor Help.
- Tray commands of [Tray Form] differ depending on the machine you want to use. For details about selectable tray commands, see "Load Copy Control", IPDS Technical Reference.
- For details about the control panel settings, see the manual explaining how to specify the control panel settings, provided by the supplier.

4. Appendix

Precautions

Limitations

PCL fonts are not accessible via AFP/IPDS, nor can PCL access AFP/IPDS fonts.

PostScript® fonts are not accessible via AFP/IPDS, nor can PostScript access AFP/IPDS fonts.

The mainframe or host computer will not be notified of errors that happen before this machine establishes connection with them.

4

Functions Requiring the SDRAM Module and HDD Unit

If using Type 1 or 2 model, you must install the IPDS card and SDRAM module to use standard IPDS functions. In addition to the IPDS card and SDRAM module, you must also install the HDD unit in order to use the following functions:

- DBCS
- FS45
- Object Container

SDRAM modules required for each model are as follows:

- Type 1 model
128 MB or 256 MB
- Type 2 model
256 MB or 512 MB

Functions for Which 512 MB RAM Is Recommended

If using Type 1 or 2 model, in addition to the HDD unit mentioned above, a total of 512 MB RAM is also recommended to use the following functions. The standard RAM size of Type 1 and 2 model is 256 MB, so we recommend that you install the 256 MB SDRAM module.

- FS45
- Object Container (Image (GIF/TIFF/JPEG))

About AFP/IPDS Fonts

The AFP/IPDS Single Byte Character Set (SBCS) font is stored on the hard disk drive.

Trademarks

Adobe, Acrobat, PostScript, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

AFP/ADVANCED FUNCTION PRINTING, IPDS and Intelligent Printer Data Stream are trademarks of Ricoh Co., Ltd.

IBM[®] is a trademark of International Business Machines Corporation in the United States, other countries, or both.

PCL[®] is a registered trademark of Hewlett-Packard Company.

Monotype is a registered trademark of Monotype Imaging, Inc.

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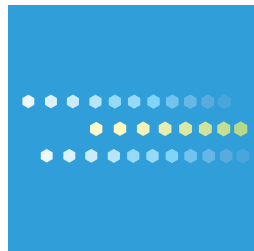
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MEMO



Information

Introduction

This manual contains detailed instructions and notes on the operation and use of this machine. For your safety and benefit, read this manual carefully before using the machine. Keep this manual in a handy place for quick reference.

Important

Contents of this manual are subject to change without prior notice.


In no event will the company be liable for direct, indirect, special, incidental, or consequential damages as a result of handling or operating the machine.



Notes:

Some illustrations in this manual might be slightly different from the machine. Certain options might not be available in some countries. For details, please contact your local dealer.

Depending on which country you are in, certain units may be optional. For details, please contact your local dealer.



Caution

For good print quality, the manufacturer recommends that you use genuine toner from the manufacturer.

The manufacturer shall not be responsible for any damage or expense that might result from the use of parts other than genuine parts from the manufacturer with your office products.

Power Source

220-240 V, 50/60 Hz, 4.3 A or less

Please be sure to connect the power cord to a power source as above.

Laws and Regulations

Legal Prohibition

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The preceding list is meant as a guide only and is not inclusive. We assume no responsibility for its completeness or accuracy. If you have any questions concerning the legality of copying or printing certain items, consult with your legal advisor.

Laser Safety

This machine complies with the requirements of IEC60825-1:2007(EN-60825-1:2007) for class 1 laser product.

This machine contains four AlGaAs laser diodes, with 6.2 milliwatt, 770 - 790 nanometer wavelength.

The beam divergence angle is 25 degrees (minimum) and 38 degrees (maximum) in the vertical direction, and 8 degrees (minimum) 14 degrees (maximum) in the horizontal direction, and laser beams are generated in Continuous Wave (CW) mode.

This equipment does not emit hazardous light, since the beam is totally enclosed during all customer modes of operation and maintenance.

The following label is attached on the inside of the printer near the toner cartridge.



Caution:

Use of controls or adjustments or performance of procedures other than those specified in this manual might result in hazardous radiation exposure.

User Information on Electrical & Electronic Equipment

Users in the EU, Switzerland and Norway

Our Products contain high quality components and are designed to facilitate recycling.

Our products or product packaging are marked with the symbol below.



The symbol indicates that the product must not be treated as municipal waste. It must be disposed of separately via the appropriate return and collection systems available. By following these instructions you ensure that this product is treated correctly and help to reduce potential impacts on the environment and human health, which could otherwise result from inappropriate handling. Recycling of products helps to conserve natural resources and protect the environment.

For more detailed information on collection and recycling systems for this product, please contact the shop where you purchased it, your local dealer or sales/service representatives.

All Other Users

If you wish to discard this product, please contact your local authorities, the shop where you bought this product, your local dealer or sales/service representatives.

For Turkey only

EEE Yönetmeliğine Uygundur.

Bu sistem sarf malzemeleri ve yedek parçaları da dahil olmak üzere EEE Yönetmeliğine Uygundur.

Note for the Battery and/or Accumulator Symbol (For EU countries only)



In accordance with the Battery Directive 2006/66/EC Article 20 Information for end-users Annex II, the above symbol is printed on batteries and accumulators. This symbol means that in the European Union, used batteries and accumulators should be disposed of separately from your household waste.

In the EU, there are separate collection systems for not only used electrical and electronic products but also batteries and accumulators.


Please dispose of them correctly at your local community waste collection/ recycling centre.


Safety Information

When using this machine, the following safety precautions should always be followed.

Safety During Operation

In this manual, the following important symbols are used:

 **WARNING:**
Indicates a potentially hazardous situation which, if instructions are not followed, could result in death or serious injury.

 **CAUTION:**
Indicates a potentially hazardous situation which, if instructions are not followed, may result in minor or moderate injury or damage to property.

Safety Precautions to be Followed

This section explains safety precautions that should always be followed when using this machine.

Environments where the machine can be used

This section explains safety precautions about environments where the machine can be used.

 **WARNING:**

• *Do not use flammable sprays or solvents in the vicinity of this machine. Doing so could result in fire or electric shock.*

• *Do not place vases, plant pots, cups, toiletries, medicines, small metal objects, or containers holding water or any other liquids, on or close to this machine. Fire or electric shock could result from spillage or if such objects or substances fall inside this machine.*

 **CAUTION:**

• *Keep the machine away from humidity and dust. Otherwise a fire or an electric shock might occur.*

• *Do not place the machine on an unstable or tilted surface. If it topples over, an injury might occur.*

• *Do not place heavy objects on the machine. Doing so can cause the machine to topple over, possibly resulting in injury.*

• *Make sure the room where you are using the machine is well ventilated and spacious. Good ventilation is especially important when the machine is used heavily.*

• *Keep the machine away from salt-bearing air and corrosive gases. Also, do not install the machine in places where chemical reactions are likely (laboratories, etc.), as doing so will cause the machine to malfunction.*

• *Do not obstruct the machine's vents. Doing so risks fire caused by overheated internal components.*

• *When new, electrical devices containing volatile materials will normally release emissions into the air of their vicinity. For this reason, for the first few days after installation of a new device, strong ventilation inside the room where it is placed is necessary.*

• *Machine sound levels exceeding [Sound Power Level (Black and White)] > 63 dB (A) are not suitable for desk work environment, so place the machine in another place.*

 **Note**

To avoid possible build-up of ozone, locate this machine in large well ventilated room that has an air turnover of more than 30 m³/hr/person.

Handling power cords and power plugs

This section explains safety precautions about handling power cords and power plugs.

WARNING:

• ***If the power cord is damaged and its inner wires are exposed or broken, contact your service representative for a replacement. Use of damaged power cords could result in fire or electric shock.***

• ***Do not use any power sources other than those that match the specifications shown in this manual. Doing so could result in fire or electric shock.***

• ***Do not use any frequencies other than those that match the specifications shown. Doing so could result in fire or electric shock.***

• ***Do not use multi-socket adaptors. Doing so could result in fire or electric shock.***

• ***Do not use extension cords. Doing so could result in fire or electric shock.***

• ***Do not use power cords that are damaged, broken, or modified. Also, do not use power cords that have been trapped under heavy objects, pulled hard, or bent severely. Doing so could result in fire or electric shock.***

• ***Touching the prongs of the power cable's plug with anything metallic constitutes a fire and electric shock hazard.***

• ***The supplied power cord is for use with this machine only. Do not use it with other appliances. Doing so could result in fire, electric shock, or injury.***

• ***It is dangerous to handle the power cord plug with wet hands. Doing so could result in electric shock.***

⚠ CAUTION:

• ***Be sure to push the plug of the power cord fully into the wall outlet. Partially inserted plugs create an unstable connection that can result in unsafe buildup of heat.***

• ***If this machine is not going to be used for several days or longer at a time, disconnect its power cord from the wall outlet.***

• ***When disconnecting the power cord from the wall outlet, always pull the plug, not the cord. Pulling the cord can damage the power cord. Use of damaged power cords could result in fire or electric shock.***

• ***Be sure to disconnect the plug from the wall outlet and clean the prongs and the area around the prongs at least once a year. Allowing dust to build up on the plug constitutes a fire hazard.***

• ***When performing maintenance on the machine, always disconnect the power cord from the wall outlet.***

Handling the main machine

This section explains safety precautions about handling the main machine.

WARNING:

- ***Be sure to locate the machine as close as possible to a wall outlet. This will allow easy disconnection of the power cord in the event of an emergency.***
- ***If the machine emits smoke or odours, or if it behaves unusually, you must turn off its power immediately. After turning off the power, be sure to disconnect the power cord plug from the wall outlet. Then contact your service representative and report the problem. Do not use the machine. Doing so could result in fire or electric shock.***
- ***If metal objects, or water or other fluids fall inside this machine, you must turn off its power immediately. After turning off the power, be sure to disconnect the power cord plug from the wall outlet. Then contact your service representative and report the problem. Do not use the machine. Doing so could result in fire or electric shock.***
- ***If the machine topples, or if a cover or other part gets broken, you must turn off its power immediately. After turning off the power, be sure to disconnect the power cord plug from the wall outlet. Then contact your service representative and report the problem. Do not use the machine. Doing so could result in fire or electric shock.***
- ***Do not touch this machine if a lightning strike occurs in the immediate vicinity. Doing so could result in electric shock.***
- ***Keep the polythene materials (bags, etc.) supplied with this machine away from babies and small children at all times. Suffocation can result if polythene materials are brought into contact with the mouth or nose.***

CAUTION:

- ***Unplug the power cord from the wall outlet before you move the machine. While moving the machine, take care that the power cord is not damaged under the machine. Failing to take these precautions could result in fire or electric shock.***
- ***Before installing or removing options, always disconnect the power cord plugs from the wall outlet and allow time for the main unit to fully cool. Failing to take these precautions could result in burns.***

- *When moving the machine, hold the inset grips at both sides, and then lift the printer slowly. Lifting it carelessly or dropping it may cause an injury.*

Important

- Rating voltage of the connector for options: Max. DC 24 V.
- Voltage must not fluctuate more than 10%.

Handling the machine's interior

This section explains safety precautions about handling the machine's interior.

WARNING:

- ***Do not remove any covers or screws other than those explicitly mentioned in this manual. Inside this machine are high voltage components that are an electric shock hazard and laser components that could cause blindness. Contact your sales or service representative if any of the machine's internal components require maintenance, adjustment, or repair.***
- ***Do not attempt to disassemble or modify this machine. Doing so risks burns and electric shock. Note again that exposure to the laser components inside this machine risks blindness.***

CAUTION:

- *Some of this machine's internal components get very hot. For this reason, take care when removing misfed paper. Not doing so could result in burns.*
- *The inside of the machine could be very hot. Do not touch the parts with a label indicating the "hot surface". Otherwise, an injury might occur.*
- *When loading paper, take care not to trap or injure your fingers.*
- *During operation, rollers for transporting the paper and originals revolve. A safety device has been installed so that the machine can be operated safely. But take care not to touch the machine during operation. Otherwise, an injury might occur.*
- *If the machine's interior is not cleaned regularly, dust will accumulate. Fire and breakdown can result from heavy accumulation of dust inside this machine. Contact your sales or service representative for details about and charges for cleaning the machine's interior.*
- *Do not pull out the paper tray forcefully. If you do, the tray might fall and cause an injury.*

- *Do not touch the inside of the controller board compartment. It may cause a machine malfunction or a burn.*

Handling the machine's supplies

This section explains safety precautions about handling the machine's supplies.

⚠ WARNING:

- ***Do not incinerate toner (new or used) or toner containers. Doing so risks burns. Toner will ignite on contact with naked flame.***
- ***Do not store toner (new or used) or toner containers anywhere near naked flames. Doing so risks fire and burns. Toner will ignite on contact with naked flame.***
- ***Keep the polythene materials (bags, gloves, etc.) supplied with this machine away from babies and small children at all times. Suffocation can result if polythene materials are brought into contact with the mouth or nose.***

⚠ CAUTION:

- *Do not crush or squeeze toner containers. Doing so can cause toner spillage, possibly resulting in dirtying of skin, clothing, and floor, and accidental ingestion.*
- *Store toner (new or used), toner containers, and components that have been in contact with toner out of reach of children.*
- *If toner or used toner is inhaled, gargle with plenty of water and move into a fresh air environment. Consult a doctor if necessary.*
- *If toner or used toner gets into your eyes, flush immediately with large amounts of water. Consult a doctor if necessary.*
- *If toner or used toner is swallowed, dilute by drinking a large amount of water. Consult a doctor if necessary.*
- *When removing jammed paper or replacing toner, avoid getting toner (new or used) on your clothing. If toner comes into contact with your clothing, wash the stained area with cold water. Hot water will set the toner into the fabric and make removing the stain impossible.*

- *When removing jammed paper or replacing toner, avoid getting toner (new or used) on your skin. If toner comes into contact with your skin, wash the affected area thoroughly with soap and water.*

- *Do not attempt to print on stapled sheets, aluminum foil, carbon paper, or any kind of conductive paper. Doing so risks fire.*

- *Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.*



CEE132

The inside of this printer becomes very hot. Do not touch parts with this label (indicates a hot surface). Touching these parts may result in burns.

Power Switch Symbols

The meanings of the symbols for the switches on this machine are as follows:

- **I** : POWER ON.
- **O** : POWER OFF.

ENERGY STAR Program

ENERGY STAR® Program Requirements for Imaging Equipment



The ENERGY STAR® Program Requirements for Imaging Equipment encourage energy conservation by promoting energy efficient computers and other office equipment. The program backs the development and dissemination of products that feature energy saving functions.

It is an open program in which manufacturers participate voluntarily.

Targeted products are computers, monitors, printers, facsimiles, copiers, scanners, and multi-function devices. Energy Star standards and logos are internationally uniform.

This machine is equipped with the following Energy Saver mode: Auto Off Mode. The machine recovers from Energy Saver mode when it receives a print job, or when the any key is pressed. For more information about how to configure Energy Saver modes, see “Making Printer Settings Using the Control Panel”, Software Guide as a HTML file on the CD-ROM.

❖ Auto Off Mode (Sleep Mode)

If this machine remains idle for a specified period, it automatically enters Sleep mode to further reduce its electrical consumption.

The default delay time the machine waits before entering Auto Off Mode 1 minute. This default time can be changed.

The machine can print jobs from computers while in Sleep mode.

❖ Specifications

Auto Off Mode (Sleep Mode)	Power Consumption	With Options: 7.5 W or less Printer Only: 3.9 W or less
	Default Time	1 minute
	Recovery Time	12 seconds or less

Recycled Paper

We recommend use of recycled paper which is environment friendly. Please contact your sales representative for recommended paper.

Noise Emission

❖ Sound power level

- Main unit only

Stand-by	Less than 42 dB (A)
Printing	Less than 67 dB (A)

❖ Sound Pressure level

- Main unit only

Stand-by	Less than 36 dB (A)
Printing	Less than 61 dB (A)

- Sound power level and sound pressure level are actual values measured in accordance with ISO 7779.
- Sound pressure level is measured from the position of the bystander.

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