

TM-H6000III

Technical Reference Guide

- Receipt and Slip model
- with MICR model
- with Endorsement model
- with Validation model
- with Endorsement and MICR model
- with Validation and MICR model
- with Image Scanner model
- Photo-ID Model with Image Scanner model

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EPSON took the initiative by introducing ESC/POS, a proprietary POS printer command system including patented commands and enabling versatile POS system construction with high scalability. Compatible with all types of EPSON POS printers and displays, this proprietary control system also offers the flexibility to easily make future upgrades. Its popularity is worldwide.

Revision Information

Revision	Page	Altered Items and Contents
Rev. A	all pages	Newly authorized
Rev. B	all pages	The validation model added
Rev. C	iv	"Restriction of Use" added
	viii	Caution for the manual cutter added
		Caution for aerosol sprayers added
Rev. D	all pages	Add the Image scanner model and the Photo-ID model.
Rev. E	all pages	UPOS information updated

About This Manual

Aim of the Manual

This manual was created to provide the information on the TM-H6000III printer for anyone who is developing hardware, installations, or programs. Programmers will also want to consult other documents.

Contents of the Manual

Chapter 1 General Information:	General description of features plus specifications.
Chapter 2 System Planning:	Contains introduction of control methods (APD, OPOS, JavaPOS, and ESC/POS) and each connection form.
Chapter 3 Setup:	Contains information on such matters as DIP switches, memory switches, error processing for using TM-H6000III.
Chapter 4 Maintenance & Troubleshooting:	Contains useful information for using.
Chapter 5 Application Development Information for UPOS:	Contains useful information for programming.
Chapter 6 Application Development Information for APD:	Contains useful information for programming.
Chapter 7 Application Development for Image Scanner:	Contains useful information for general programming with the TM-H6000III.
Appendix A Character Code Tables:	Contains the character code tables.
Appendix B Power Supply Specifications:	Contains the specifications.
Appendix C FAQ:	Contains FAQ for interfaces.
Appendix D Comparison Table:	Comparison table for TM-H6000II with Image Scanner, TM-H6000II Photo-ID Model, TM-H6000III with Image Scanner, TM-H6000III Photo-ID Model.

Key to Symbols

The following symbols are used in the documentation for this product. See the specific warnings and cautions at appropriate points throughout this guide.



WARNING:

Warnings must be followed carefully to avoid serious bodily injury.



CAUTION:

Cautions must be observed to avoid minor injury to yourself or damage to your equipment.



Note:

Notes have important information and useful tips on the operation of your printer.

Restriction of Use

When this product is used for applications requiring high reliability/safety such as transportation devices related to aviation, rail, marine, automotive etc.; disaster prevention devices; various safety devices etc; or functional/precision devices etc, you should use this product only after giving consideration to including fail-safes and redundancies into your design to maintain safety and total system reliability. Because this product was not intended for use in applications requiring extremely high reliability/safety such as aerospace equipment, main communication equipment, nuclear power control equipment, or medical equipment related to direct medical care etc, please make your own judgment on this product's suitability after a full evaluation.

Related Software and Documents

Related software and documents

Software/document name	Description
TM-H6000III User's Manual	Provides basic handling procedures to enable POS operators to use the TM-H6000III safely and correctly. This manual is packed in the box with the printer.*
ESC/POS Application Programming Guide	Provides detailed ESC/POS command information used by each TM printer, along with sample programs and other information about the printers. Contact us to obtain this guide.*
TM-H6000III Technical Reference Guide	This guide.*
EPSON OPOS ADK	This is an OCX driver.*
EPSON OPOS ADK Manual	Provides information for anyone who is programming using OPOS. This is included in the EPSON OPOS ADK.*
EPSON Advanced Printer Driver (APD)	This is a Windows driver.* This provides instructions on using the driver and programming methods. Sample programs are also included.

* You can obtain these items from one of the following URLs:

For customers from North America, go to the following web site: <http://www.epsonexpert.com/>

For customers in other countries, go to the following web site: <http://www.epson-pos.com/>

Safety Precautions

EMC and Safety Standards Applied

Product Name: TM-H6000III

Type Name: M147G

The following standards are applied only to the printers that are so labeled. (EMC is tested using the EPSON power supplies.)

Europe: CE marking
Safety: EN 60950

North America: EMI: FCC/ICES-003 Class A
Safety: UL 1950/CSA C22.2 No. 950

Japan: EMI: VCCI Class A

Oceania: EMC: AS/NZS CISPR22 Class B

WARNING

The connection of a non-shielded printer interface cable to this printer will invalidate the EMC standards of this device.

You are cautioned that changes or modifications not expressly approved by Seiko Epson could void your authority to operate the equipment.

CE Marking

The printer conforms to the following Directives and Norms

Directive 89/336/EEC

EN 55022
M147G: Class B
EN 55024
IEC 61000-4-2
IEC 61000-4-3
IEC 61000-4-4
IEC 61000-4-5
IEC 61000-4-6
IEC 61000-4-8
IEC 61000-4-11

FCC Compliance Statement For American Users

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

For Canadian Users

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

GEREÄUSCHPEGEL

Gemäß der Dritten Verordnung zum Gerätesicherheitsgesetz (Maschinenlärminformations- Verordnung-3. GSGV) ist der arbeitsplatzbezogene Geräusch-Emissionswert kleiner als 70 dB(A) (basierend auf ISO 7779).

Safety Precautions

This section presents important information to ensure safe and effective use of this product. Please read this section carefully and store it in an accessible location.



WARNING:

- ❑ Shut down your equipment immediately if it produces smoke, a strange odor, or unusual noise. Continued use may lead to fire or electric shock. Immediately unplug the equipment and contact your dealer or a Seiko Epson service center for advice.
- ❑ Never attempt to repair this product yourself. Improper repair work can be dangerous.
- ❑ Never disassemble or modify this product. Tampering with this product may result in injury, fire, or electric shock.
- ❑ Be sure to use the specified power source. Connection to an improper power source may cause fire or shock.
- ❑ Never insert or disconnect the power plug with wet hands. Doing so may result in severe shock.
- ❑ Do not allow foreign matter to fall into the equipment. Penetration of foreign objects may lead to fire or shock.
- ❑ If water or other liquid spills into this equipment, unplug the power cord immediately, and then contact your dealer or a Seiko Epson service center for advice. Continued usage may lead to fire or shock.
- ❑ Do not place multiple loads on the power outlet (wall outlet). Overloading the outlet may lead to fire.
- ❑ Always supply power directly from a standard domestic power outlet.
- ❑ Handle the power cord with care. Improper handling may lead to fire or shock.
 - Do not modify or attempt to repair the cord.
 - Do not place any object on top of the cord.
 - Avoid excessive bending, twisting, and pulling.
 - Do not place cord near heating equipment.
 - Check that the plug is clean before plugging it in.
 - Be sure to push the prongs all the way in.
- ❑ If the cord becomes damaged, obtain a replacement from your dealer or a Seiko Epson service center.

CAUTION:

- ❑ Do not connect cables other than as described in this manual. Different connections may cause equipment damage and burning.
- ❑ Be sure to set this equipment on a firm, stable, horizontal surface. Product may break or cause injury if it falls.
- ❑ Do not use in locations subject to high humidity or dust levels. Excessive humidity and dust may cause equipment damage, fire, or shock.
- ❑ Do not place heavy objects on top of this product. Never stand or lean on this product. Equipment may fall or collapse, causing breakage and possible injury.
- ❑ Take care not to injure your fingers on the manual cutter
 - When you remove printed paper
 - When you perform other operations such as loading/replacing roll paper
- ❑ To ensure safety, please unplug this product prior to leaving it unused for an extended period.
- ❑ Do not touch either the thermal or the dot matrix print head or the paper feed motor. Wait for the heads and the motor to cool. The head and the motor can be very hot after printing for a long time. Touching them may cause burns.
- ❑ Do not use aerosol sprayers containing flammable gas inside or around this product. Doing so may cause fire.

Contents

TM-H6000III Technical Reference Guide

Revision Information	iv
About This Manual	v
Aim of the Manual	v
Contents of the Manual	v
Key to Symbols	v
Restriction of Use	vi
Related Software and Documents	vi

Safety Precautions

EMC and Safety Standards Applied	vii
CE Marking	vii
FCC Compliance Statement	
For American Users	vii
For Canadian Users	viii
GEREÄUSCHPEGEL	viii
Safety Precautions	ix

Contents	xi
-----------------------	----

Chapter 1 General Information

1.1 Features	1-1
1.1.1 Receipt Section	1-1
1.1.2 Slip/ Validation/ Endorsement Section (Validation/ Endorsement option)	1-2
1.1.3 MICR section (Option)	1-2
1.1.4 Image scanner section (Option)	1-2
1.1.5 Card image scanner section (Option)	1-2
1.1.6 Others	1-2
1.1.7 About control method	1-2
1.2 Product Structure	1-3
1.2.1 Standard Parts Included with the Printer	1-3
1.2.2 Options	1-3
1.3 Consumables	1-3
1.3.1 Roll paper	1-3
1.3.2 Ribbons	1-3
1.4 Printing and Paper Specifications	1-4
1.4.1 Receipt Section	1-4
1.4.1.1 Autocutter	1-5
1.4.1.2 Paper Roll Supply Device Section	1-5
1.4.1.3 Paper Specifications	1-6
1.4.1.4 Printable Area	1-7
1.4.1.5 Printing and Cutting Positions	1-7
1.4.2 Slip/ Validation Section	1-8
1.4.2.1 Paper Specifications	1-9
1.4.2.2 Printable Area for slip	1-12
1.4.2.3 Printable Area for validation paper	1-13
1.4.2.4 Unprintable area for surface printing when Using the Image Scanner	1-13
1.4.3 Endorsement Section (Option)	1-14
1.4.3.1 Paper Specifications	1-14
1.4.3.2 Printable Area	1-15
1.4.3.3 Notes on Using the Endorsement Print Mechanism	1-16

1.4.4 MICR Reader (Option)	1-17
1.4.4.1 Reading method	1-17
1.4.4.2 Recognition rating	1-17
1.4.4.3 Inserting direction and endorsement printing	1-17
1.4.4.4 Notes on using the MICR reader	1-18
1.4.5 Slip Image Scanner Specification (Option)	1-19
1.4.5.1 Image Scanner Specification	1-19
1.4.5.2 Paper Specification	1-19
1.4.5.3 Image Readable Area	1-19
1.4.5.4 Image Data Quality	1-20
1.4.6 Card Image Scanner Specification (Option)	1-21
1.4.6.1 Image Scanner Specification	1-21
1.4.6.2 Card Specification	1-21
1.4.6.3 Example Scanning Result	1-21
1.4.6.4 Notes on Using the Card Image Scanner	1-22
1.5 Sensors	1-23
1.5.1 Paper Sensors	1-23
1.5.1.1 Receipt section	1-23
1.5.1.2 Slip/ Validation section	1-23
1.5.2 Printer Cover Sensors	1-24
1.5.2.1 Receipt section	1-24
1.5.2.2 Slip section	1-24
1.6 Other Specifications	1-25
1.6.1 Internal Buffer	1-25
1.6.2 Electrical Characteristics	1-25
1.6.3 Reliability	1-28
1.6.3.1 Receipt printer section:	1-28
1.6.3.2 Slip/Validation printer section:	1-28
1.6.3.3 Endorsement print mechanism section:	1-29
1.6.3.4 MICR section:	1-29
1.6.3.5 Image scanner section:	1-29
1.6.3.6 Card Image scanner section	1-29
1.6.4 Environmental Conditions	1-30
1.6.5 Installation	1-31
1.6.6 Interfaces	1-31
1.7 Notes for Barcode printing on slip printer	1-31
1.8 External Dimensions and Weight	1-32
1.9 Maintenance Area	1-35

Chapter 2 System Planning

2.1 Control Method	2-1
2.1.1 Windows Driver (EPSON Advanced Printer Driver)	2-1
2.1.1.1 General Features of EPSON Advanced Printer Driver	2-1
2.1.1.2 EPSON Advanced Printer Driver Supported Environment	2-3
2.1.1.3 Sample Program	2-3
2.1.2 UPOS	2-4
2.1.2.1 UPOS Driver	2-4
2.1.2.2 Downloading UPOS Driver	2-4
2.1.3 ESC/POS Command	2-4
2.1.4 Downloading Drivers, Utilities, and Manuals	2-4
2.2 Connection Form and Cables	2-5
2.2.1 USB	2-5
2.3 Serial Connection	2-6
2.3.1 Stand alone	2-7
2.3.2 Y-connection	2-7
2.3.3 Pass-Through Connections	2-8
2.4 Parallel Connection	2-8
2.5 Ethernet	2-9

Chapter 3 Setup

3.1 Part Name and Basic Operation	3-1
3.1.1 Part Names	3-1
3.1.2 Connectors	3-2
3.1.2.1 Important Installation Notes	3-3
3.1.3 The Control Panel	3-3
3.1.3.1 LED	3-3
3.1.3.2 LEDs on the Card panel	3-4
3.1.3.3 Control Panel Buttons	3-5
3.1.4 Validation paper handling (Option)	3-5
3.1.5 Card Insertion method (Option)	3-6
3.2 Setup Flow	3-7
3.3 Printer setup	3-8
3.3.1 Connecting the Power Supply Unit (PS-180)	3-8
3.3.2 Installing or Replacing the Ribbon Cassette	3-9
3.3.3 Installing or Replacing the Endorsement Ribbon Cassette	3-12
3.3.4 Installing or Replacing the Paper Roll	3-13
3.3.5 Connecting the Printer to the Host PC / POS Terminal	3-15
3.3.5.1 Serial interface model	3-15
3.3.5.2 Parallel Interface Models	3-16
3.3.5.3 USB Interface Models	3-16
3.3.5.4 Connecting a Drawer	3-17
3.4 Customizing	3-18
3.4.1 How to Confirm Current Settings	3-18
3.4.2 Adjusting the Roll Paper Near End Detector	3-18
3.4.3 Adjusting the DIP Switches	3-19
3.4.3.1 Changing the DIP Switch Settings	3-19
3.4.3.2 Serial interface model	3-20
3.4.3.3 Parallel / Ethernet interface model	3-21
3.4.3.4 USB interface model	3-22
3.4.3.5 When Using Original Paper	3-23
3.4.4 Memory Switches	3-23
3.4.5 How to Use Two-Color Printing	3-24
3.5 Self Tests	3-24
3.5.1 Running the Self Test on Roll Paper	3-24
3.5.2 Running the Self Test with Slip Paper	3-25
3.5.3 Running the Self Test with the Validation paper (Option)	3-25
3.5.4 Running the Self Test with the Endorsement Function (Option)	3-25

Chapter 4 Maintenance & Troubleshooting

4.1 Maintenance	4-1
4.1.1 Cleaning the Thermal Print Head	4-1
4.1.2 Cleaning the MICR Mechanism	4-1
4.1.2.1 Cleaning frequency	4-1
4.1.2.2 Cleaning sheet	4-2
4.1.2.3 Cleaning procedure	4-2
4.1.2.4 Self mode	4-2
4.1.2.5 Command mode	4-2
4.1.2.6 Cleaning the Card Image Scanner	4-3
4.1.2.7 Cleaning the Slip Image Scanner	4-3
4.2 Troubleshooting	4-4
4.2.1 Removing a Paper Jam	4-4
4.2.2 Autocutter Jam	4-5
4.2.3 Card Jam	4-5
4.2.4 LED Blinking Pattern	4-6
4.2.4.1 Error Types	4-6
4.2.5 Blinking pattern of Card panel LED	4-7
4.2.6 Printer prints "?" or Incorrect Data With Serial Interface	4-8
4.2.7 Hexadecimal Dump	4-8

Chapter 5 Application Development Information for UPOS

5.1 Single-pass processing	5-1
5.1.1 Recommended Flow	5-2
5.1.2 Sample Program	5-3

Chapter 6 Application Development Information for APD

Chapter 7 Application Development for Image Scanner

7.1 The flow of single pass processing	7-1
7.2 Sharpness Function	7-3
7.2.1 What is sharpness?	7-3
7.3 Comparison Tables	7-4
7.3.1 Interface and performance comparison table	7-4
7.3.2 Function vs. control method comparison table	7-5

Appendix A Character Code Tables

A.1 Page 0 (PC437: USA, Standard Europe)	A-1
A.2 Page 1 (Katakana)	A-2
A.3 Page 2 (PC850: Multilingual)	A-3
A.4 Page 3 (PC860: Portuguese)	A-4
A.5 Page 4 (PC863: Canadian-French)	A-5
A.6 Page 5 (PC865: Nordic)	A-6
A.7 Page 16 (WPC1252)	A-7
A.8 Page 17 (PC866: Cyrillic2)	A-8
A.9 Page 18 (PC852: Latin2)	A-9
A.10 Page 19 (PC858: Euro)	A-10
A.11 Page 254 (Space Page)	A-11
A.12 Page 255 (Space Page)	A-12
A.13 International Character Sets	A-13

Appendix B Power Supply Specifications

B.1 PS-180 (Energy Saving Power Supply Unit)	B-1
B.1.1 Electrical Characteristics	B-1
B.1.2 Case Specifications	B-2
Material	B-2
B.1.3 AC Cable Selection	B-2

Appendix C FAQ

C.1 Serial Interface	C-1
C.1.1 The printer does not operate correctly or the printer does not print. What should I do?	C-1
C.1.2 Printing takes a long time. What should I do?	C-1
C.1.3 The Customer Display does not operate correctly. What should I do?	C-1
C.1.4 What is the cable wiring for connecting a printer and a host PC with a serial interface?	C-2
C.1.5 How many printers can be connected?	C-3
C.1.6 Is there limitation for the length of a cable?	C-3
C.2 Parallel Interface	C-4
C.2.1 The printer does not operate correctly or the printer does not print. What should I do?	C-4
C.2.2 What is the cable wiring for connecting the printer and the host PC with a parallel interface?	C-4
C.2.3 How many printers can be connected?	C-5
C.2.4 Is there limitation for the length of a cable?	C-6
C.2.5 Can a Customer Display be connected?	C-6
C.2.6 When I turned on the printer with a parallel interface and then turned on the PC, the message "New hardware has been found." appeared and the device "EPSON TM-Px.xx" was detected. What is "EPSON TM-Px.xx"?	C-6
C.2.7 Printer cannot be reset. What should I do?	C-6

C.3 USB Interface	C-6
C.3.1 The TM printer does not operate. What should I do?	C-6
C.3.2 The Customer Display does not operate correctly. What should I do?	C-7
C.3.3 What should be considered for a Customer Display connection?	C-7
C.3.4 Can a Customer Display be connected?	C-8

Appendix D Comparison Table

Chapter 1

General Information

1.1 Features

The TM-H6000III is a high-quality POS printer that can print on slip, validation, endorsement and receipt paper (paper roll). There are also models with an image scanner and Photo-ID scanner. Following models are available.

Model	Receipt	Slip	MICR	Endorsement	Validation	Image Scanner	Photo-ID
TM-H6000III (Receipt and Slip printers) *	✓	✓					
TM-H6000III with MICR	✓	✓	✓				
TM-H6000III with Endorsement	✓	✓		✓			
TM-H6000III with Validation	✓	✓			✓		
TM-H6000III with Endorsement and MICR	✓	✓	✓	✓			
TM-H6000III with Validation and MICR	✓	✓	✓		✓		
TM-H6000III with Image Scanner	✓	✓	✓	✓		✓	
TM-H6000III Photo-ID Model with Image Scanner	✓	✓	✓	✓		✓	✓

* Models with Simplified Chinese and Traditional Chinese characters are available.
For the detailed information regarding models, please contact EPSON or your dealer.
(See "Related Software and Documents" on page vi.)

1.1.1 Receipt Section

- High-speed graphic printing
- Autocutter provides easy user operation
- Easy drop-in paper roll loading
- PDF417 symbols (2-dimensional code) printing is possible
- Two-color printing is possible with two-color paper

1.1.2 Slip/ Validation/ Endorsement Section (Validation/ Endorsement option)

- High throughput using bidirectional, minimum distance printing.
- Page mode for flexibility in printing formats
- Two ways are available for slip paper loading (drop-in for validation, and front insertion for slip)
- An endorsement printer (E/P) that enables single-pass high speed printing of endorsements.(The endorsement printer cannot be installed on a printer with the validation function.)
- Line spacing cannot be changed for an endorsement printer.

1.1.3 MICR section (Option)

- A Magnetic Ink Character Recognition (MICR) reader that enables the printer to perform consecutive reading and processing of MICR characters

1.1.4 Image scanner section (Option)

- The sharpness function is supported.
- Single-pass processing for checks eliminates the need to reverse the check paper for printing an endorsement.(The validation function model doesn't have an endorsement printer.)

1.1.5 Card image scanner section (Option)

- Card can be scanned as an image based on ISO/IEC7810
- Operation is as easy as using a card in an ATM.

1.1.6 Others

- Small footprint and simple design
- EPSON customer display modules (DM-D***) can be connected (available only for the serial interface model)
- NV (Non-volatile) bit image buffer (384 KB) *
- NV (Non-volatile) user memory (1 KB) *
- A counter function that allows checking the printer by remote maintenance
- Several interface models (USB, RS-232, bidirectional parallel, Ethernet) are supported

* The memory size can be set by ESC/POS command.

1.1.7 About control method

- Command protocol based on the ECS/POS® Proprietary Command System.
- Automatic Status Back (ASB) function that automatically transmits changes in the printer status
- Windows® printer driver is provided. (Advanced Printer Driver, OPOS and JavaPOS)

T.2 Product Structure

1.2.1 Standard Parts Included with the Printer

This printer is packed with the materials listed below.

- Printer
- User's Manual
- Roll paper (diameter 40 mm {1.57"}) 1 roll
- Power switch cover (using this cover enables you to prevent accidental turning off of the power)
- Exclusive ribbon cassette ERC-32(B)
- Endorsement ribbon cassette (only for printers equipped with the optional endorsement print mechanism)

1.2.2 Options

The options for this printer are provided as below.

- EPSON power supply unit, PS-180
- Direct connection customer display and special stand DM-D500+DP502, DM-D110+DP502, DM-D210+DP502 (available only for the serial interface model)
- Special tray (PT-6000, DPR-6000, TA-6000)

T.3 Consumables

1.3.1 Roll paper

Paper width: $79.5 \pm 0.5 \text{ mm } \{3.13" \pm 0.02"\}$

Paper roll size: Roll diameter: Maximum 83 mm {3.27"}
Take-up paper roll width: $80+0.5/-1.0 \text{ mm } \{3.15+0.02/-0.04"\}$

NOTE:

See "Paper Specifications" (page 1-6) for details.

1.3.2 Ribbons

This printer needs a ribbon cassette to print on slip/validation (and endorsement). We provide 2 ribbon cassettes:

- EPSON ribbon cassette, ERC-32 (B) (Life: 4,000,000 characters / Color: Black) for slip/validation.
- EPSON ribbon cassette ERC-41 (B) (Life: 800,000 characters) (for the optional endorsement print mechanism)

1.4 Printing and Paper Specifications

1.4.1 Receipt Section

Printing method:	Thermal line printing
Dot density:	180 dpi × 180 dpi [the number of dots per 25.4 mm {1"}]
Printing direction:	Unidirectional with friction feed
Printing width:	72 mm {2.83"}, 512 dot positions
Paper width:	79.5 ± 0.5mm {3.13 ± 0.02"}
Characters per line:	42 (font A, default) 56 (font B)
Character spacing:	0.28 mm {.01"} (2 dots) (font A, default) 0.28 mm {.01"} (2 dots) (font B) Programmable by control command.
Print speed:	Normal: 63 lps maximum (computed value for 1/8" feed) 200 mm/s {7.9"/s} maximum (at 24 V, density level 2) (lps: lines per second) Ladder barcode/2-dimensional code printing: 118 mm/s {4.65"/s} maximum Two-color print mode: 78 mm/s {3.07"/s} maximum (at 24V, density level 2)
Paper feed speed:	Approximately 200 mm/s {7.9"/s} continuous feeding
Line spacing (default):	4.23 mm {1/6"}, programmable by control commands.
Number of characters:	Alphanumeric characters: 95 International characters: 37 Extended graphics: 128 × 11 pages (including one space page) Multilingual character model supports printing with one of the following character sets: Simplified Chinese (GB2312): 7580 Traditional Chinese (Big 5): 13494
Character structure:	Font A: 12 × 24 (including 2-dot spacing in horizontal) Font B: 9 × 17 (including 2-dot spacing in horizontal) Kanji: 24 × 24 Font A is the default

Character size, characters per line

	Standard		Double-height		Double-width		Double-width/ Double-height	
	W x H in mm {inches}	CPL	W x H in mm {inches}	CPL	W x H in mm {inches}	CPL	W x H in mm {inches}	CPL
Font A 12 x 24	1.41 x 3.39 .06 x .13"	42	1.41 x 6.77 .06 x .27"	42	2.82 x 3.39 .11 x .13"	21	2.82 x 6.77 .11 x .27"	21
Font B 9 x 17	0.99 x 2.40 .04 x .09"	56	0.99 x 4.80 .04 x .19"	56	1.98 x 2.40 .08 x .09"	28	1.98 x 4.80 .08 x .19"	28
Kanji 12 x 24	3.39 x 3.39 .13 x .13"	21	3.39 x 6.77 .13 x .27"	42	6.77 x 3.39 .27 x .13"	10	6.77 x 6.77 .11 x .27"	21

- * CPL = characters per line
- * Space between characters is not included
- * Characters can be scaled up to 64 times the standard size.
- * When using Font B in a font mode such as emphasized mode, some words may be hard to read. Check the font mode in advance when using Font B.

1.4.1.1 Autocutter

Partial cut: Cutting with one point left uncut

NOTE:

1. To prevent dot displacement, after cutting, feed paper approximately 1 mm (14/360 inches) or more before printing.
2. If the printer is stopped, you must feed paper more than 40 mm (1.57") before cutting.

1.4.1.2 Paper Roll Supply Device Section

Supply method: Drop-in paper roll

Near-end sensor: Micro switch

Paper roll spool diameter:

Inside: 12 mm (.47")

Outside: 18 mm (.71")

Near-end adjustment: Adjusting screw

Remaining amount: Fixed position

#1 approximately 23 mm (0.9")

#2 approximately 27 mm (1.06")

(The adjusting screw has two positions.)

See Chapter 5.

Paper roll end detection: Micro switch

NOTE: You can use the ESC/POS command to stop printing upon detection of a paper near-end.

1.4.1.3 Paper Specifications

Paper type:	Specified thermal paper
Form:	Paper roll
Paper width:	$79.5 \pm 0.5 \text{ mm} \{3.13" \pm 0.02"\}$
Paper roll size:	Roll diameter: Maximum 83 mm {3.27"} Take-up paper roll width: $80+0.5/-1.0 \text{ mm} \{3.15+0.02/-0.04"\}$
Specified paper:	Specified thermal roll paper, NTP080-80 In Japan: Nakagawa Mfg. Co., Ltd. In USA: Nakagawa Mfg. (USA) Inc. In Europe: Nakagawa Mfg. (Europe) GmbH In Southeast Asia: N.A.K. Mfg. (Malaysia) SDN BHD [Original paper: TF50KS-E (paper thickness: 65μm) Nippon Paper Industries Co.,Ltd.] The following paper can be used instead of the specified paper above: Original paper: PD 160R (paper thickness: 75μm) (Oji Paper Mfg. Co. Ltd.) Original paper: AF50KS-E (paper thickness: 65μm) (Jujo Thermal Oy (Finland)) Original paper: P350(F380) (paper thickness: 62μm) (Kanzaki Specialty Papers, Inc. (U.S.A.)) Original paper: P310 (paper thickness: 58μm) (Kanzaki Specialty Papers, Inc. (U.S.A.)) Original paper: P300 (paper thickness: 56μm) (Kanzaki Specialty Papers, Inc. (U.S.A.)) Original paper: F5041 (paper thickness: 60μm) (Mitsubishi HiTec Paper Flensburg GmbH (Germany)) Specified two-color thermal roll paper, ENTPB080080 In Japan: Nakagawa Mfg. Co., Ltd. In USA: Nakagawa Mfg. (USA) Inc. In Europe: Nakagawa Mfg. (Europe) GmbH In Southeast Asia: N.A.K. Mfg. (Malaysia) SDN BHD [Original paper: PD750R (paper thickness: 75μm) Oji Paper Mfg. Co.,Ltd.] Paper roll which is made of the original paper PD750R can be used.

NOTE: With some printing patterns, the previous print color may not be cleared. The printer's reliability when two-color thermal paper is used differs from the reliability when monochrome paper is used.

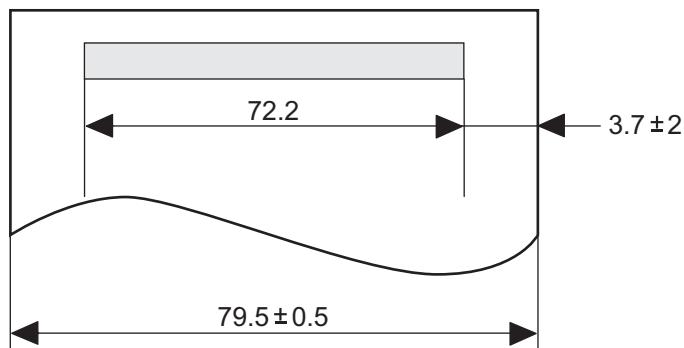
Paper roll spool diameter: Inside: 12 mm {.47"} Outside: 18 mm {.71"}

NOTE:

- Paper must not be pasted to the paper roll spool.
- When paper other than that specified is used, the thermal print head may be worn out. Be sure to use the specified paper.
- Depending on each paper specification, it is recommended to set the DIP switch.
(See "When Using Original Paper" on page 3-23.)

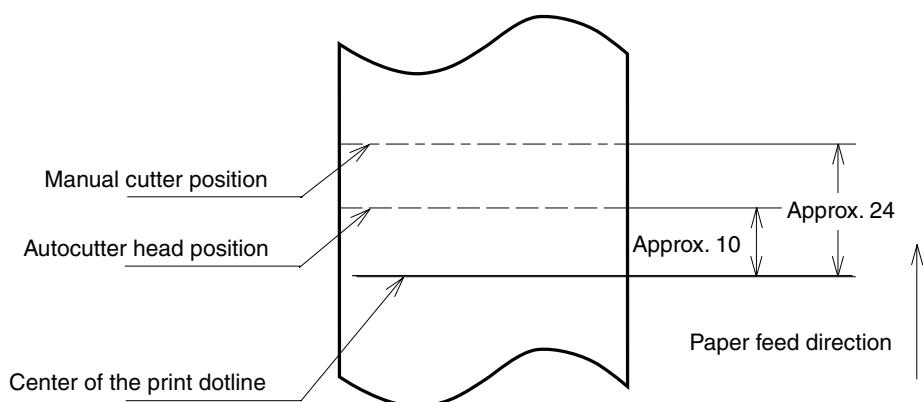
1.4.1.4 Printable Area

The printable area of a paper roll with a width of 79.5 ± 0.5 mm ($3.13'' \pm 0.02''$) is 72.2 ± 0.2 mm ($2.84'' \pm 0.008''$) (512 dots), and the space on the right and left sides are approximately 3.7 ± 2 mm ($0.15'' \pm 0.079''$).



Printable area for paper roll

1.4.1.5 Printing and Cutting Positions



[Units:mm (All the numerical values are typical.)]

Printing and cutting positions

NOTE: Numeric values used here are typical values; the values may vary slightly as a result of paper slack or variations in the paper. Take this into account when setting the cutting position of the autocutter.

1.4.2 Slip/ Validation Section

Printing method:	Serial impact dot matrix
Head wire configuration:	9-pin vertical line, 0.353 mm {1/72-inch} wire pitch
Printing direction:	Bidirectional, minimum distance printing
Printing speed:	Approximately 5.7 LPS (printing 40 columns per line with 17.8 CPI when the head energizing time is set to normal mode.)
Number of characters:	Alphanumeric characters: 95 International characters: 37 Extended graphics: 128 × 12 pages (including two space pages) Multilingual character model supports printing with one of the following character sets: Simplified Chinese (GB2312): 7580 Traditional Chinese (Big 5): 13494
Character structure:	Font A: 5 × 9 (total 270 dots horizontally) Font B: 7 × 9 (total 540 half dots horizontally) Kanji: 16 × 16 (two-pass printing font)
Characters per line:	Refer to "Character size and print speed."
Characters per inch:	Refer to "Character size and print speed."

Character size and print speed

Font	Character structure (horizontal dots × vertical dots)	Character spacing	Characters per inch	Characters per line	Character size (width×height)
A (default)	5 × 9	1 dot	13.3	45	1.56 × 3.1 mm
B	7 × 9	2 half-dots	17.8	60	1.24 × 3.1 mm
Kanji	16 × 16	2 half-dots	8.9	30	2.7 × 2.9 mm



Note:

TM-H6000III (Receipt and Slip printers) has models with Kanji characters.

Kanji character spacing by default setting is 2 half dots. (Kanji character spacing can be changed by ESC/POS command.) Printing speed for Kanji characters shown in table above is in the case of full column printing with two-pass printing.

1.4.2.1 Paper Specifications

1. Cut sheet

Paper type: Normal paper, pressure-sensitive paper, carbon copy paper

Paper size: 68 - 230 mm (W) × 68 - 297 mm (L) {2.7 - 9.1"(W) × 2.7 - 11.7"(L)}

NOTE: The minimum size is 68mm × 152mm {2.7" × 6.0"}

Copy capability and paper thickness:

- Normal paper (single-ply): 0.09 to 0.2 mm {0.0035 to 0.0079"}
- Carbon copy paper
combination: 4 sheets maximum

Backing paper: 0.07 to 0.12 mm {0.0028 to 0.0047"}

Copy and original: 0.04 to 0.07 mm {0.0016 to 0.0028"}

Carbon paper: Approximately 0.035 mm {0.0014"}

Total thickness: 0.09 to 0.31 mm {0.0035 to 0.0122"}

- Example: one original + 2 copies,

Original paper: 0.04 mm

Carbon paper: 0.07 mm (0.035 mm × 2 sheets)

Copy paper: 0.04 mm

Backing paper: 0.07 mm

Total thickness: 0.22 mm {0.0087 "}

Ambient temperature and copy capability:

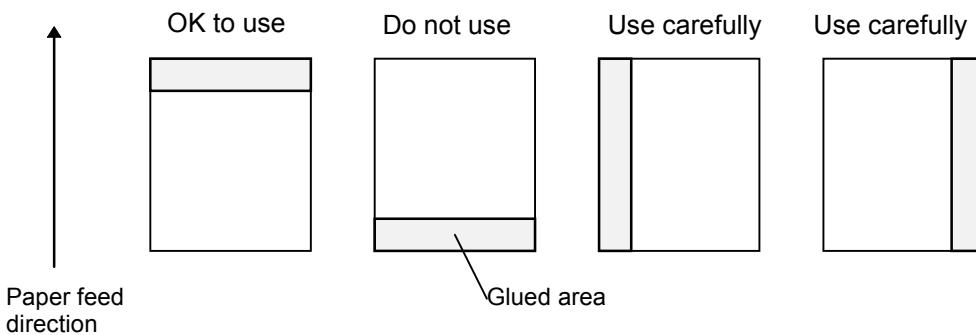
Copy capability is greatly influenced by the ambient temperature, so printing must be performed under the conditions described in the table below.

Relationship between ambient temperature and number of copies

Number of copies	Ambient temperature
Original + 3 copies	10 to 40 °C {50 to 104°F}
Original + 1 copy	5 to 45 °C {41 to 113 °F}

2. Notes on slip/validation paper

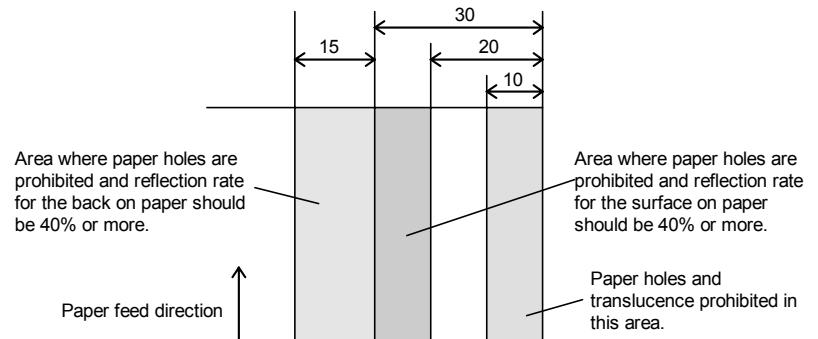
- The paper must be flat, without curls or wrinkles, especially at the top edges. Otherwise, the paper may rub against the ribbon and become dirty.
- Insert a validation from the upper side in the validation entrance of the case opening. If the validation is inserted sliding from the left to the right, the print position may be incorrect since the paper can be crooked or the validation sensor can detect incorrectly.
- There must be no glue on the bottom edge of paper. Choose paper carefully when the glue is on the right or top edge, since paper feeding and insertion are affected by gluing conditions (e.g., glue quality, method, and length) and glue location (refer to the figure below). Be especially careful when paper is wide and has the glue on the left edge, since skew may occur.



Slip (validation) paper glued area

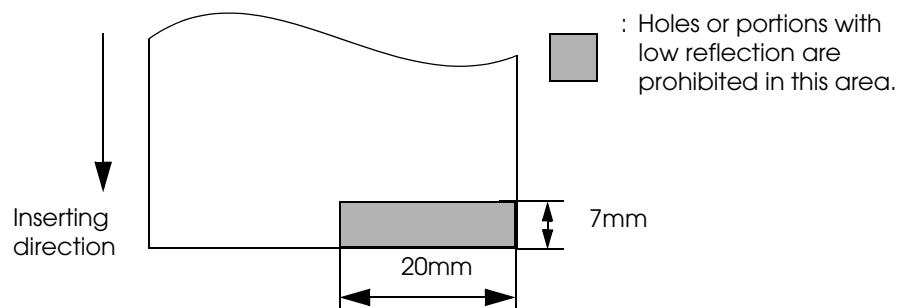
- Since the slip BOF sensor uses a photo sensor, do not use paper that has holes at the sensor position, or is translucent.
- Since the slip TOF sensor and validation sensor use a reflective photo sensor and it detects from the back of slip paper, do not use paper that has holes or dark portions with low reflection (less than 40% reflection) at the sensor position.
- Since the slip paper ejection sensor uses a reflective photo sensor and it detects from the surface of the paper roll, do not use paper that has holes or dark portions with low reflection (less than 40% reflection) at the sensor position.

- Use thinner paper (N30 or equivalent) between the top and bottom sheets of multi-ply paper. If thick paper is used, the copy capability is lowered.



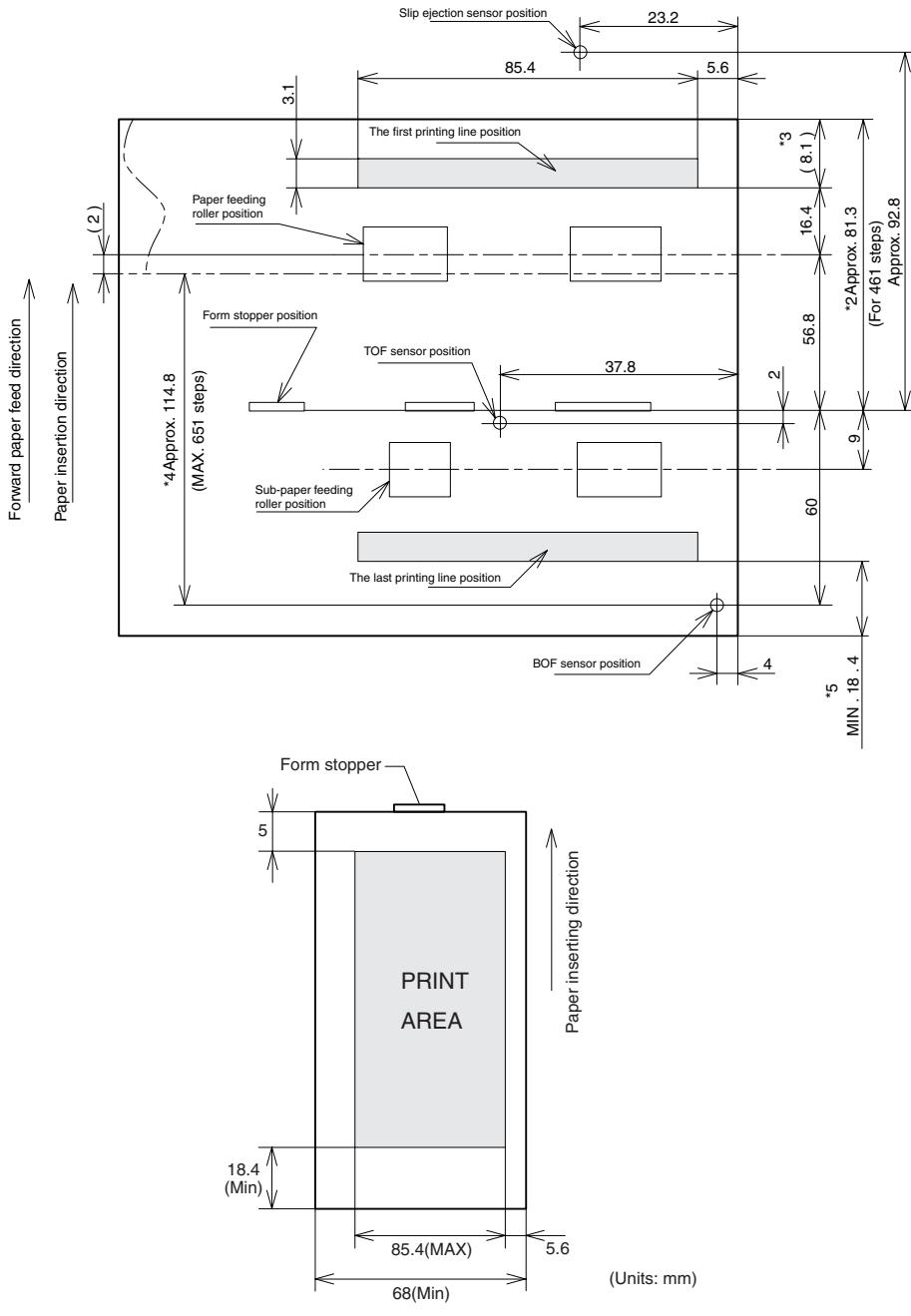
[Units: mm (All the numeric values are typical.)]

Prohibited area for slip paper holes and low reflection



Prohibited area for validation paper holes and low reflection

1.4.2.2 Printable Area for slip



Printable area for slip paper

*2 The length from the form stopper to the tip of the paper.

*3 The length from the tip of the paper to the first printing line position.

*4 The printable area after the slip BOF sensor detects the end of the paper. (The bottom margin must be considered for a real printable area.)

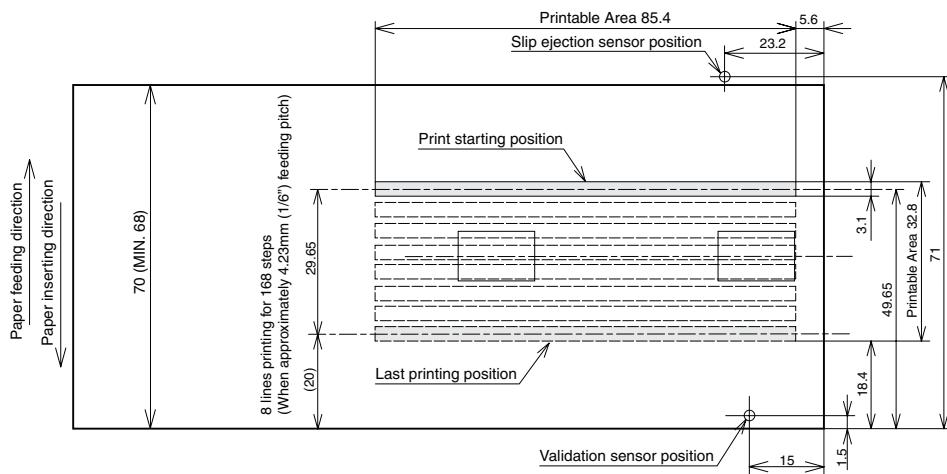
*5 Bottom margin (calculated value).



Note:

Numeric values used here are typical values; consider this for the user design for the starting position in the paper feeding direction.

1.4.2.3 Printable Area for validation paper

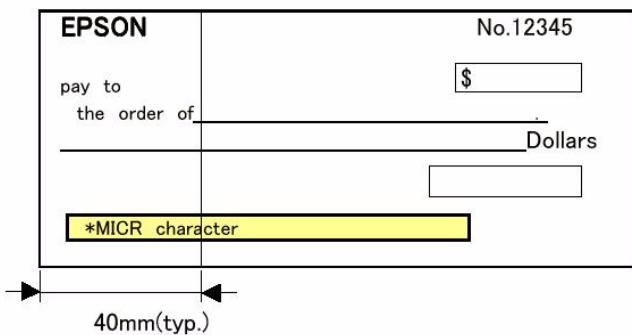


Note:

When reverse feed is performed in validation printing, keep the reverse feed within the range of the printable area. Otherwise, a paper jam may occur.

1.4.2.4 Unprintable area for surface printing when Using the Image Scanner

- In single-pass processing, when image scanning is executed in combination with surface printing, 40 mm (typical) from the edge of a check will be unprintable. If you need to print on that area, do not perform single-pass processing and be sure to perform the sequence of re-inserting the paper to do the image scan after the surface printing and paper ejection.



1.4.3 Endorsement Section (Option)

Printing method:	Shuttle impact dot matrix Wire pitch approximately 0.353 mm {1/72"}
Head wire configuration	8 print solenoids in a horizontal line
Characters per line:	40 columns
Print speed:	Approximately 1.9 lps (lps: lines per second)
Number of characters:	Alphanumeric characters: 95 International characters: 37 Extended graphics: 128 × 11 pages (including one space page)
Character structure	5 × 7 (total 240 dots horizontally)
Character size	1.1 × 2.42 mm (W × H)



Note:

*Character dot spacing can be changed by an ESC/POS command.
An endorsement printer cannot be installed on a printer with the validation function.
Line spacing cannot be changed.*

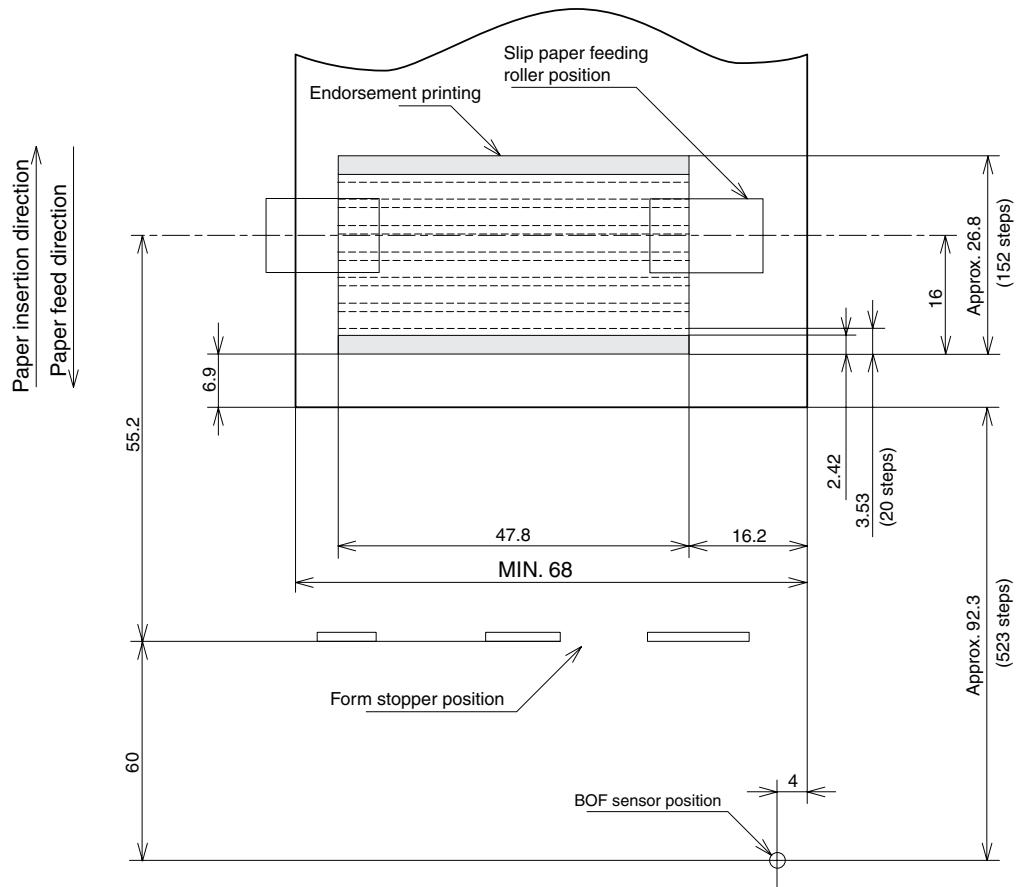
1.4.3.1 Paper Specifications

Cut sheet

Paper type:	Normal paper
Paper size:	68-230 mm (W) × 68-297 mm (L) {2.7 - 9.1"(W) × 2.7 - 11.7"(L)}
Paper thickness:	Single-ply (copy paper cannot be used) 0.09 mm - 0.2 mm {0.0035 - 0.0079"}

1.4.3.2 Printable Area

The print head consists of 8 print solenoids (A, B, C, D, E, F, G, and H) arranged in a horizontal line. The print head moves from the left (from the standby position) to the right, printing at 30 positions as each print solenoid is energized, so that one dot line is formed. The total number of dots per dot line is 240 (30 positions × 8 solenoids).



E/P printable area (for endorsement printing)

1.4.3.3 Notes on Using the Endorsement Print Mechanism

- ❑ The endorsement print mechanism (abbreviated as E/P) enables printing of endorsements as part of a sequence that is automatically processed: MICR reading, printing an endorsement on the back side of a personal check, and printing on the surface of it. Once the end of the paper exceeds the E/P print head position, reverse paper feeding to the front side is not possible.
- ❑ When the endorsement printing is executed after a MICR reading, the printer feeds the paper forward automatically after receiving a command to print the endorsement; then the printer starts printing up to approximately 7.0 mm {0.28"} from the end of the check paper by using reverse paper feeding.
- ❑ Since the E/P printing format is assumed to print an endorsement on a U.S. personal check, the print begins on the back side of the paper. (As viewed from the front of the printer, the endorsement printing characters are upside down.)
- ❑ The printing sequence for slip paper is different, depending on whether an endorsement print mechanism is installed. That is, when the E/P is installed, once the printing exceeds the E/P printable area and the slip paper is fed forward, reverse paper feeding must be prohibited. Consider this when developing application programs.
- ❑ The E/P printing must be not performed on copy paper. Otherwise, a paper jam may occur or the E/P may be broken. Because E/P printing feeds the paper in a reverse paper feed direction, the paper may be wrinkled.
- ❑ In some case paper feeding may not be accurate when E/P printing is performed on check paper. This may depend on the width of the check paper. Therefore, it is recommended for the user to check in advance whether the check paper prints correctly or not.

1.4.4 MICR Reader (Option)

1.4.4.1 Reading method

Magnetic bias

1.4.4.2 Recognition rating

98% or more (at 25 °C, 77 °F)

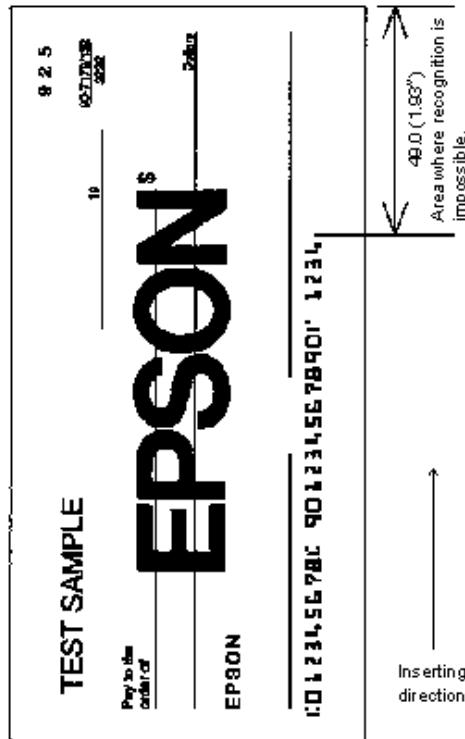
Recognition rating is defined as follows

$$\text{Recognition rating (\%)} = \frac{\text{Total number of checks} - (\text{number of sheets misread or not identified})}{\text{Total number of checks}} \times 100$$

- Check paper used for test is EPSON standard check paper.
- Checks must be flat, without curls, folds, or wrinkles.

1.4.4.3 Inserting direction and endorsement printing

- Insert the check with the surface printed with the magnetic ink upward, following the slip side guide.

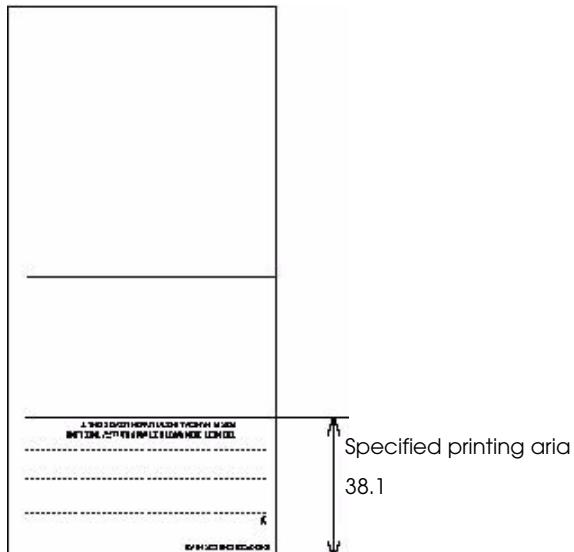


Area of personal check where MICR character recognition is impossible

- To print endorsements in the specified area (within 38.1 mm {1.5"} from the top), set the print position for the last line so that it is printed at least 3 mm {0.118"} above the bottom of the printable area (Especially when the printer is used near the display device, the user is required to check the recognition rate of the MICR).

NOTE:

- Do not install the printer near any magnetic fields, because this may cause MICR reading errors. (Be sure to check the MICR recognition rate when the printer is used near a display device.)
- MICR characters may not be recognized when impact or vibration is applied to the printer.



(Units : mm (All numeric values are typical.))

Endorsement printing

1.4.4.4 Notes on using the MICR reader

- The personal checks must be flat, without curls, folds, or wrinkles (especially at the edges). Otherwise, the check may rub against the ribbon and become ink-stained.
- Do not insert checks that have clips or staples. These may cause paper jams, MICR reading errors, and damage to the MICR head.
- Let go of the check immediately as soon as the printer starts feeding it. Otherwise, the paper is not fed straight, causing paper jams and MICR reading errors.

1.4.5 Slip Image Scanner Specification (Option)

1.4.5.1 Image Scanner Specification

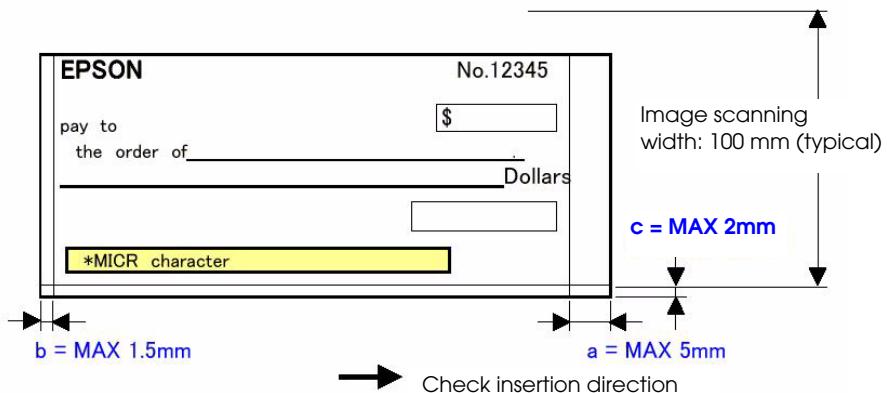
Image scanner type	Contact Image Sensor (CIS)
Resolution	200 dpi (H) × 200 dpi (V) (dpi: dots per inch (number of dots per 25.4 mm {1"}))
Gradation	Bi-tonal (black/white) or 256-level gray scale are selectable with a command.
Image scanning width	Width: 100 mm (typical)
Image scanning speed	120 mm/s
Data compression method	With bi-tonal: CCITT/group4 With gray scale: JPEG
Data transmission format	With bi-tonal: TIFF (If the data is transmitted without compressing data, raw data or BMP format.) With gray scale: JFIF (JPEG format) (If the data is transmitted without compressing data, raw data, BMP format or TIFF format.)

1.4.5.2 Paper Specification

Paper type	Normal paper
Paper dimension	68 to 100 × 152 to 230 mm (W × L) {2.7 ~3.94" × 5.98 ~9.06"} Minimum: 68 × 152 mm {2.7 ~6.0"}
Paper thickness	0.09 to 0.2 mm {0.0035 ~0.0079"} (single-ply)

1.4.5.3 Image Readable Area

There is possibility that the areas a, b, and c shown in the illustration below may not be scanned.



1.4.5.4 Image Data Quality

- ❑ Be sure to include the pre-scanning step when scanning with bi-tonal, because it can minimize as much as possible problems of decreasing image data quality caused by environmental temperature, wear of scanner parts, great variation in color shading of the background of a check, and input voltage fluctuation.
- ❑ The quality of image scanning on the front of a check may be reduced by a large variation in density of an ink ribbon cassette.
- ❑ Be sure to consider these other conditions that may reduce image quality when scanning with bitonal:
 - Extremely low density of handwriting on front of a check.
 - Extremely high density of the background of a check.
 - An extremely large variation in the density and color tone of the background of a check.
 - Many folds or wrinkles in a check.
 - Exposure of the image scanning part of the printer to strong sunlight.
 - A foreign object, such as sand, entering the printer and scratching the glass surface of the scanner.
- ❑ Be sure to consider these other conditions that may reduce image quality when scanning with gray scale:
 - Extremely low density of handwriting on front of a check.
 - Many folds or wrinkles in a check.
 - Exposure of the image scanning part of the printer to strong sunlight.
 - A foreign object, such as sand, entering the printer and scratching the glass surface of the scanner.

1.4.6 Card Image Scanner Specification (Option)

1.4.6.1 Image Scanner Specification

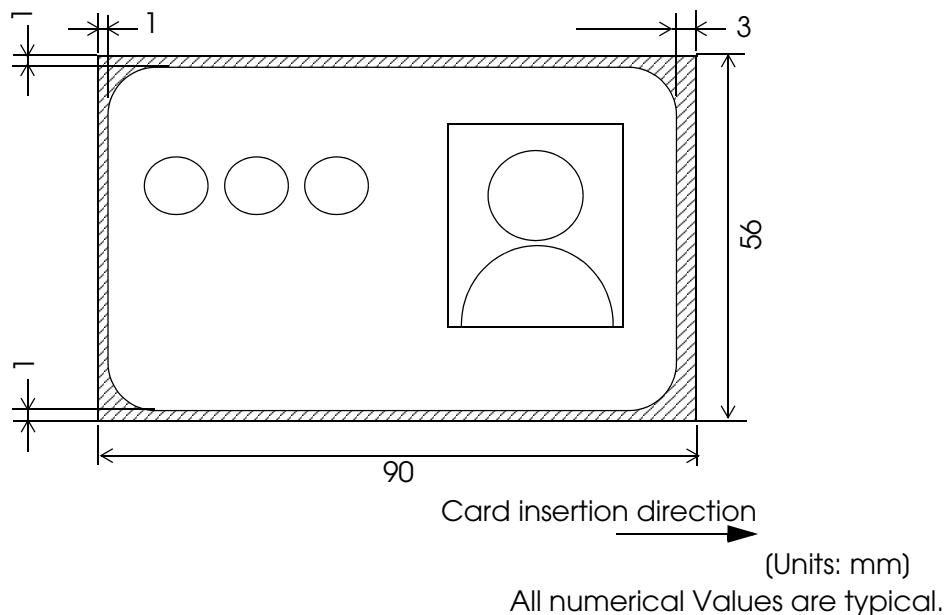
Image scanner type	Contact Image Sensor (CIS)
Resolution	200 dpi (H) × 200 dpi (V) (dpi: dots per inch (number of dots per 25.4 mm {1"}))
Gradation	256-level gray scale
Scanning area	56 × 90 mm {2.20" × 3.54"}
Image scanning speed	120 mm/s {4.72"/s}
Data compression method	JPEG
Data transmission format	JFIF (JPEG format) (If the data is transmitted without compressing data, raw data, BMP format or TIFF format.)

1.4.6.2 Card Specification

Type of card	Based on ISO/IEC 7810 (except a card with embossing)
Card size	53.92 to 54.18 × 85.47 to 85.90 mm (W × L) {2.123 ~ 2.133" × 3.365 ~ 3.382"} (W × L) (Card type: ID-1)
Card thickness	0.5 to 0.84 mm {0.020 ~ 0.033"}
Curvature of card	2mm {0.079"} or less (ISO/IEC7810)

1.4.6.3 Example Scanning Result

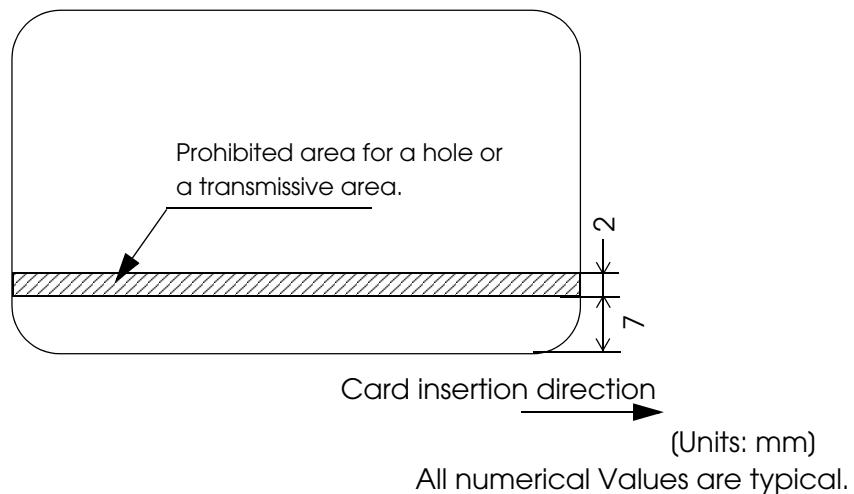
The whole of the card (one side) can be scanned. The data size is 56 × 90 mm including a 1 ~ 3mm {0.040 ~ 0.0118"} border beyond the edges of the card.



1.4.6.4 Notes on Using the Card Image Scanner

Notes on card

- The side to be scanned must be up when it is inserted.
- Make sure to use a flat card without excessive curvature, cracking, or embossing. Otherwise, the card feeding may be affected.
- When you use an IC card, be sure not to touch the contacts on it.
- Since the card sensor uses a transmissive photo sensor, do not use a card with a hole or a transmissive area in the sensor position.



Quality of image data

An appropriate quality of the scanning result may not be obtained in the following cases:

- A card that has excessive curvature, cracking, or damage.
- A card that has embossing.
- When excessively bright external light affects the image scanning.
- When the glass of the image scanner is scratched by a foreign substance such as sand.

1.5 Sensors

1.5.1 Paper Sensors

1.5.1.1 Receipt section

- Paper roll near-end sensor:
 - The sensor is located on the roll paper supply device on the receipt section. It detects the near-end of the paper roll by detecting the paper roll diameter. You can adjust the sensor. See Chapter 5 for details on adjustment.
 - When the printer detects a paper near-end, it either stops or continues printing, depending on the Paper sensor command setting.
 - When the sensor is selected to stop printing and the sensor detects a paper near-end, the printer automatically goes offline after printing the current line. To restart printing, load the paper and set the printer back online by closing the printer cover. The printer starts initializing and continues printing data stored in the print buffer.
- Paper roll end sensor:
 - The paper roll end sensor is located in the paper path on the receipt section. It detects the presence of paper in the paper path of the printer mechanism.
 - When there is no paper in the paper path, the PAPER OUT LED lights.
 - When the sensor detects a paper end, printing stops even if it is in the middle of one transaction; therefore, it is recommended to use the paper roll near-end sensor and use the paper end sensor as a supplement.

1.5.1.2 Slip/ Validation section

- TOF (Top of Form) sensor:
 - The slip TOF sensor is located in the slip paper path and detects the presence of slip paper in the paper path. The SLIP LED lights accordingly.
- BOF (Bottom of Form) sensor:
 - The sensor is located in the slip entrance and detects whether the paper is inserted correctly and whether it is removed or not. The printer does not proceed to the next operation until the paper has been inserted correctly or removed. (The SLIP LED continues blinking.)
 - When the printer detects a paper end, it either stops or continues printing depending on the Paper sensor command setting.
 - When the sensor is selected to stop printing, the sensor detects a paper-end and the printer prints data up to the end of the printable area, ejects the slip when all the next print data is transmitted, and then waits for the slip to be removed. After the slip is removed, the printer enters the paper insertion waiting state.

Validation sensor:

The validation sensor is located below the validation paper path and detects whether the paper is inserted correctly or not. The printer does not proceed to the next operation until the paper has been removed. (The SLIP LED continues flashing.)

Slip/Validation eject sensor:

The slip/validation eject sensor is located in the slip paper exit and detects whether the paper is removed or not after printing. The printer does not proceed to the next operation until the paper has been removed.

1.5.2 Printer Cover Sensors

1.5.2.1 Receipt section

Paper roll cover open sensor:

- When a paper roll is selected as the print sheet, if the sensor detects a cover open during printing, the printer goes offline, stops printing immediately, and the ERROR LED blinks. Even if the cover is closed, the ERROR LED still blinks. You need to transmit the error recovery command to recover.
If the printer continues printing, it starts printing from the beginning of the line where the error occurred; therefore, double printing or printing position shift may occur. It is recommended to clear the buffers and resend the print data.
- When a slip is selected as the print sheet, if the sensor detects a cover open during printing, the printer finishes printing data for the line when the cover open is detected, then stops the carriage movement and goes offline. The printer goes online when the cover is closed and restarts printing.

Unit cover open sensor:

- When the sensor detects a unit cover open during printing, the printer goes offline depending on the setting of bit 8 for the memory switch.
The default is that the printer finishes printing data for the line when the cover open is detected and stops printing. The printer goes online when the cover is closed and restarts printing.
If a recoverable error is selected by memory switch, the printer goes offline, stops printing immediately and the ERROR LED blinks. Even if the cover is closed, the ERROR LED still blinks. You need to transmit the error recovery command to recover. If the printer continues printing, it starts printing from the beginning of the line where the error occurred. In this case, double printing or printing position shift may occur. It is recommended to clear the buffers and resend the print data.

1.5.2.2 Slip section

Front cover open sensor:

When the sensor detects a cover open during printing, the printer finishes printing data for the line when the cover open is detected, then stops the carriage movement and goes offline. The printer goes online when the cover is closed and restarts printing.

1.6 Other Specifications

1.6.1 Internal Buffer

1. Receive buffer selectable as 45 Byte or 4 KB using the DIP switch.
2. User-defined buffer (both for user-defined characters and user-defined bit images)
Receipt: 12KB; Slip: Approximately 3KB
3. Macro buffer 2KB
4. NV (non-volatile) bit image buffer 384KB
5. NV (non-volatile) user memory 1KB

1.6.2 Electrical Characteristics

Supply voltage:	+24 V ±10% (optional power supply: EPSON PS-180) Ripple voltage: 300 mVpp or less (only when the printer is used with the MICR reader)
Current consumption (at 24V except for drawer kickout driving):	Slip: Operating: Mean: Approximately 1.7A (Character font A α-N, all columns printing) Peak: Approximately 5.5A
	Receipt: Operating: Mean: Approximately 1.8A (Character font A α-N, all columns printing) Peak: Approximately 7.7A
	Card Image Scanner: Operating: Mean: Approximately 0.5A Peak: Approximately 0.6A
Standby:	Mean: Approximately 0.2A



Note:

The current consumption is as follows when a receipt is printed in low temperature. Take in consideration if a power supply other than the Epson specified one is used or the print pattern is different.

Print pattern	See figure 'A' below		See figure 'B' below		See figure 'C' below	
Print duty	18% (Alphanumeric in full column)		50%		100%	
Current value (A) at 5C°	Peak	Mean	Peak	Mean	Peak	Mean
	7.7	1.8	8.5	3.5	9.5	5.0

- The values in the table above are measured in the following conditions, but are just for your reference.
- The Epson original power supply PS-180 can print within the print duty above.
- Contact Epson if you need more detailed information.

Environmental temperature: 5°C {41°F}

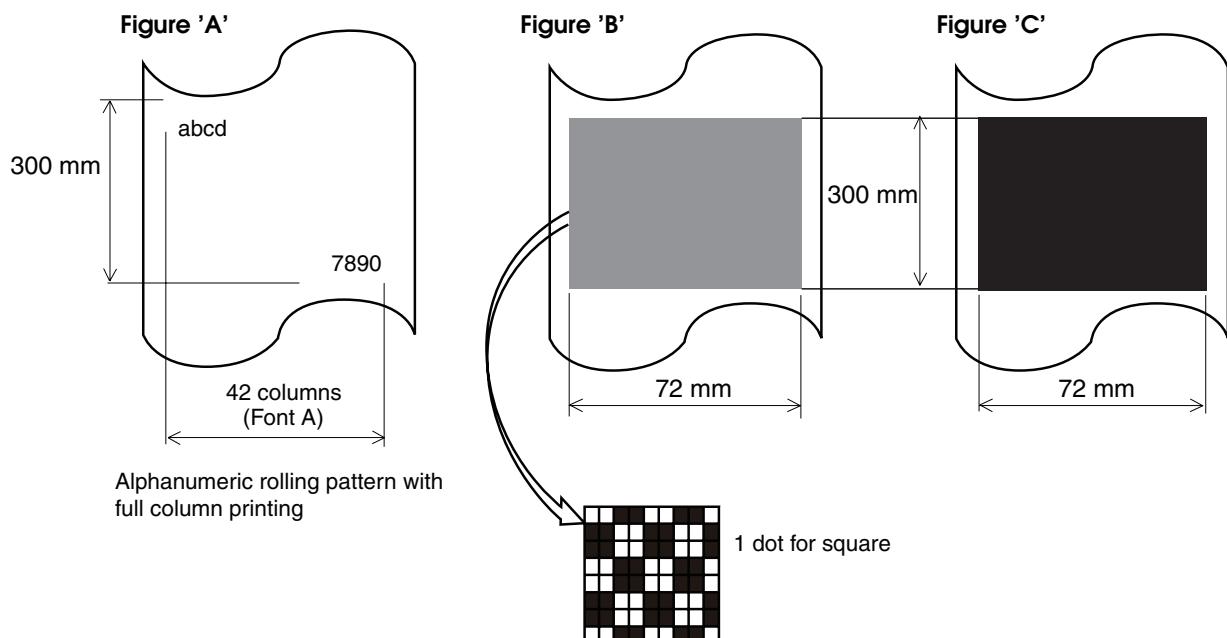
Supply voltage: 24 V

Print pattern: See figures below

Measurement terminal: At the connector of the printer's power supply

Print density: Print density level 2

The print density levels 3 and 4 are higher by +15% and +30% respectively than the value of the level 2 in the table above.



**Note:**

Notes on using the Epson PS-180 power supply unit

If the printing is continuously performed with the high print ratio, the overcurrent limitation might be operated.

Therefore, the printing length must not exceed the following values when printing with high print ratio.

*Print ratio: Number of dots being energized per one dotline / Total number of dots per one dotline
(512 dots)*

Limitation of the Printing Length on Print Ratio

Print ratio	50%	80%	100%
Print example			
Print length	--	30 mm or less	20 mm or less

If the overcurrent limitation is operated when printing is continuously performed with a high print ratio, uneven print density or a low voltage error may occur.

1.6.3 Reliability

1.6.3.1 Receipt printer section:

Life:

Mechanism: 15,000,000 lines (when using monochrome thermal paper), 7,500,000 lines (when using two-color thermal paper)

The printer is defined to have reached the end of its life when it reaches the beginning of the Wearout Period.

MTBF:

360,000 hours

In the printer's life of 15 million lines (in monochrome printing) or 7.5 million lines (in two-color printing). Failure is defined as a Random Failure occurring at the time of the Random Failure Period.

MCBF:

72,000,000 lines

This is an average failure interval based on failures relating to Wearout and Random Failures up to the life of 15 million lines (in monochrome printing) or 7.5 million lines (in two-color printing).

Thermal head life:

100 million pulses, 100 km (when using monochrome thermal paper), 50 km (when using two-color thermal paper)

Autocutter life:

1,500,000 cuts

1.6.3.2 Slip/Validation printer section:

Life:

Mechanism: 15,000,000 lines

The printer is each defined to have reached the end of its life when it reaches the beginning of the Wearout Period.

MTBF:

180,000 hours

Failure is defined as a Random Failure occurring during the Random Failure Period.

MCBF:

37,000,000 lines

This is an average failure interval based on failures relating to Wearout and Random Failures up to the life of 15 million lines.

Print head life: 200 million characters (when printed with Font B only)



Note

*Printing pattern: Average 2 dots / wire per character
This printer has nine wire (dots) vertically and prints characters moving horizontally. If one wire prints repeatedly, the problem may occur. Consider this when you use the printer.*

Example:

If the characters which consists of the horizontally adjacent dots such as "H", "L", "-", or "A" are repeatedly printed, the number of the printed lines should be ten or less. If more than ten such lines need to be printed, the printer should pause for a time longer the total printing time for each 10 lines.

1.6.3.3 Endorsement print mechanism section:

Life: Mechanism: 1,350,000 lines
The printer is defined to have reached the end of its life when it reaches the beginning of the Wearout Period.

MTBF: 180,000 hours
Failure is defined as a Random Failure occurring at the time of the Random Failure Period.

MCBF: 3,300,000 lines
This is an average failure interval based on failures relating to Wearout and Random Failures up to the life of 1.35 million lines.

1.6.3.4 MICR section:

MICR reader mechanism: 240,000 passes (when used with US personal checks)

1.6.3.5 Image scanner section:

Image scanner mechanism: 240,000 passes (when used with US personal checks)

1.6.3.6 Card Image scanner section

Image scanner mechanism: 240,000 passes

1.6.4 Environmental Conditions

Temperature:

Operating: 5 C° to 45 C° {41F° to 113F°}

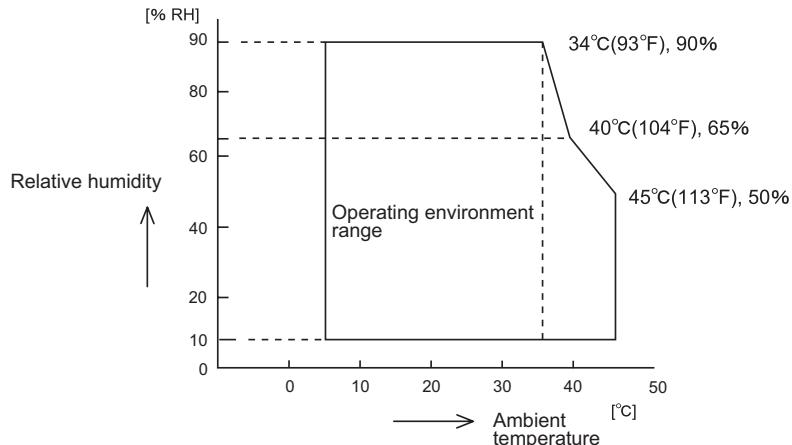
Storage: -10C° to 50 C° {14F° to 122F°}

(except for paper and ribbon)

Humidity:

Operating: 10 to 90% RH

Storage: 10 to 90% RH (except for paper and ribbon)



Operating temperature and humidity range

Vibration resistance:

When packed:

Frequency: 5 to 55 Hz

Acceleration: 2 G

Sweep: 10 minutes (half cycle)

Duration: 1 hour

Directions: x, y, and z

No external or internal damage should be found after the vibration test, and the unit should operate normally.

Impact resistance:

When packed:

Package: EPSON standard package

Height: 50 cm {19.69"}

Directions: 1 corner, 3 edges, and 6 surfaces

No external or internal damage should be found after the drop test, and the unit should operate normally.

When unpacked:

Height: 5 cm {1.97"}

Directions: Lift one edge and release it (for all 4 edges).

When the printer is not printing, no external or internal damage should be found after the drop test.

Acoustic noise (operating):

Receipt:

When using autocutter:

Approximately 52 dB (bystander position)

1.6.5 Installation

The printer must be installed horizontally.

1.6.6 Interfaces

- USB
- RS-232
- IEEE 1284 bidirectional parallel
- 10BASE-T/100BASE-TX
- RS-485

1.7 Notes for Barcode printing on slip printer

This printer supports the barcode printing on roll paper and slips. Note the following when a barcode is printed on the slip/validation.

- Ladder barcode is not supported.
- HRI character must be added.
- Use the ERC-32(B) black ink ribbon cassette.
- Recognized rate of barcode reading may differ with density, gradation, or performance capabilities of a barcode reader to be used. Therefore, process the barcode with HRI characters which can be used if the barcode is unable to be read.

1.8 External Dimensions and Weight

Width: 186 mm {7.32"}

Depth: 298 mm {11.73"}(except for the protrusion)

Height: 185 mm {7.28"}

185 mm {7.28"} Image Scanner model

209 mm {8.23"} Photo-ID model

Weight: Approximately 5.3 kg {11.7 lb}

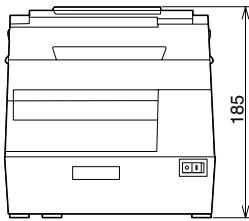
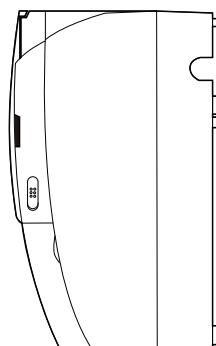
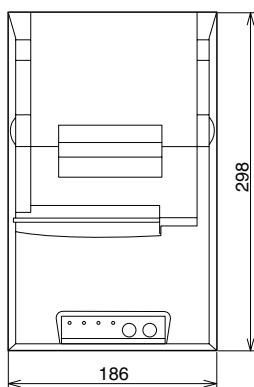
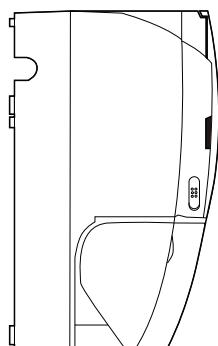
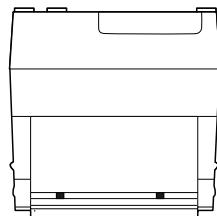
Approximately 5.7 kg {12.6 lb} Image Scanner model

Approximately 5.9 kg {13.0 lb} Photo-ID model

(All the numeric values are typical.)

Color: White (ECW), Dark Gray(EDG)

TM-H6000III:



With Image scanner model:

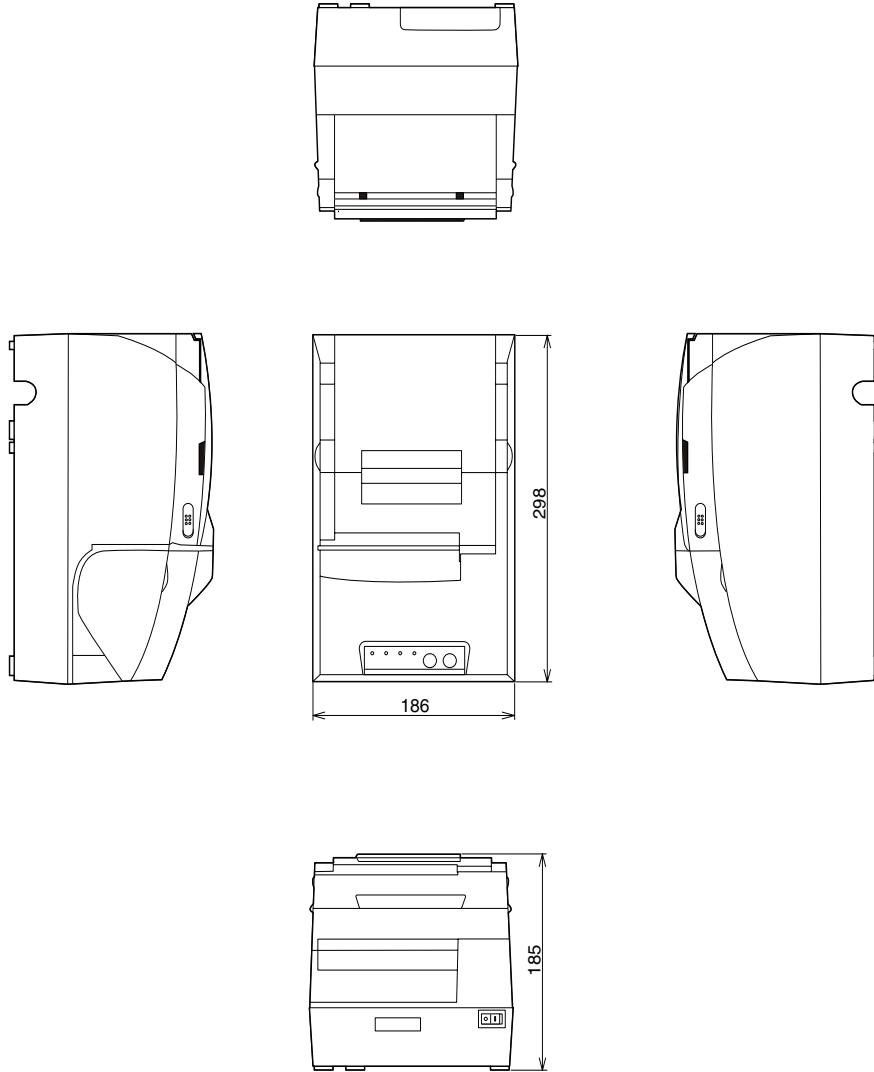
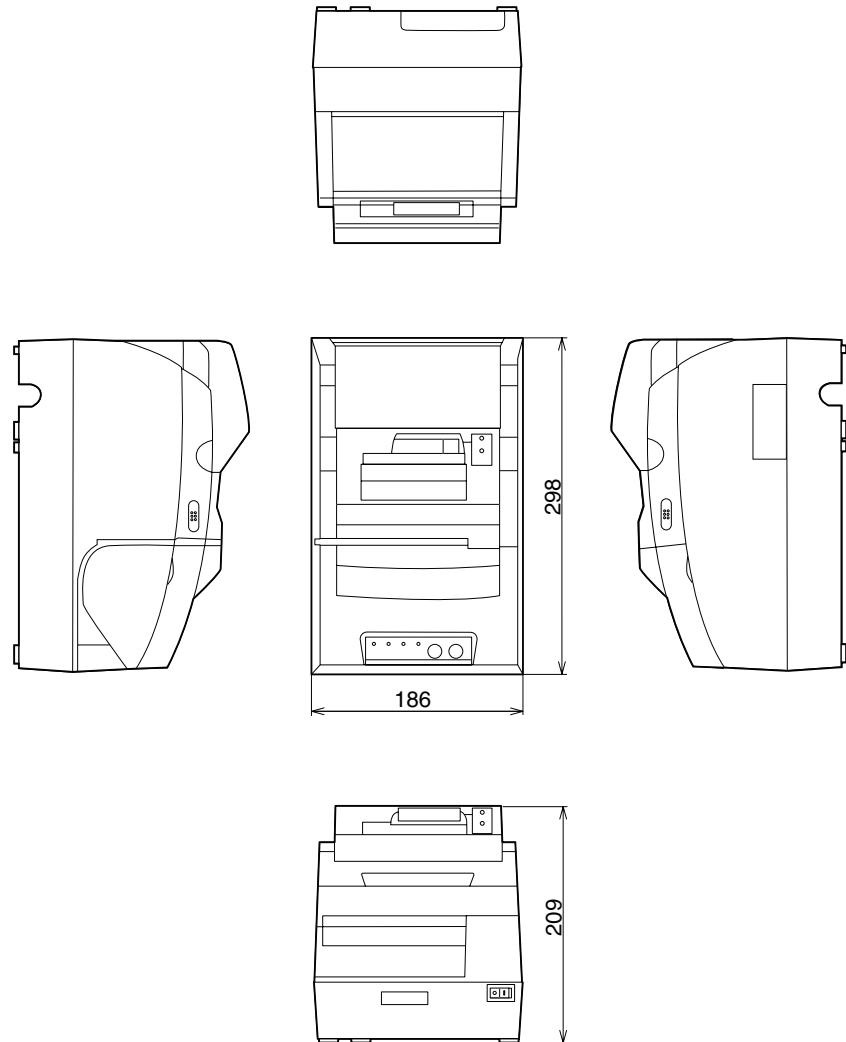
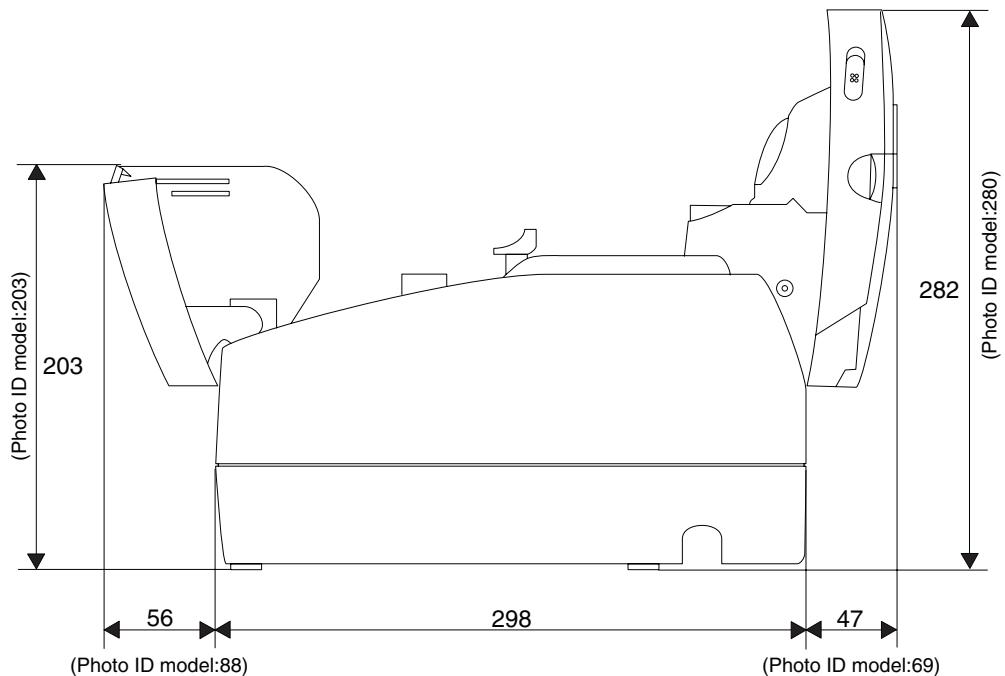


Photo-ID model:



T.9 Maintenance Area

The illustrations below show the area around the printer required for maintenance.



NOTE:

203 mm = 8.0"
56 mm = 2.1"
298 mm = 11.7"
47 mm = 1.9"
282 mm = 11.1"

(Photo-ID model)
203 mm = 8.0"
88 mm = 3.5"
298 mm = 11.7"
69 mm = 2.7"
280 mm = 11.0"

Chapter 2

System Planning

This section provides you information for system planning.

2.1 Control Method

A TM printer can print and be controlled using any of the following three methods:

1. Windows printer driver (EPSON Advanced Printer Driver)
2. UPOS (OPOS, OPOS for .NET, JavaPOS)
3. ESC/POS commands

Depending on the driver or interface to be used, an IP setting tool for the Ethernet specification and a logo registration utility for printing (TMFlash logo utility) are provided.

See “Downloading Drivers, Utilities, and Manuals” on page 2-4.

2.1.1 Windows Driver (EPSON Advanced Printer Driver)

The EPSON Advanced Printer Driver is a method for controlling the TM printer in the same manner as the Windows standard printer driver.

2.1.1.1 General Features of EPSON Advanced Printer Driver

Easy

- Allows you to print from commercially available applications, since the APD is a Windows driver.
- Allows you to print a Barcode and 2D-Code with the fonts built in the APD.
- Allow you to print logos and graphics.
- Allows you to send the paper cut command to the TM printer.
- Allows you to send the open command to the cash drawer.

Fast

- Achieves high speed printing using the Device fonts of the TM printer.
- Allows you to convert the Windows fonts to the Device fonts.
- Allows you to print an image such as a store logo faster by registering the image in the TM printer.

□ Convenience

- Allows you to make horizontally long printings by rotated printing, for example landscape format receipt. When using the TM printer oriented vertically (wall mount), it can print backward to make it easy to read for customers.
- Allows you to print images as a background.

□ Expandability

- Printer sharing is supported. Allows you to share TM printer with other computers on a network. (Printer sharing through a print server is not supported.)
- Allows you to use ESC/POS commands control.

□ Programming

- Win32/.Net environment is supported. See the “Status API Manual” to find out which development language is supported.
- Allows you to check the status of the device (TM printer) by using the Status API.

□ Installation

- Allows you to copy the existing settings of the APD environment to other computers. (Silent Install)
- After the APD installation, the printer driver will be automatically installed to the TM printer equipped with a USB interface by the Plug and Play function.

□ Compatibility

- Note that APD 4.xx cannot coexist with APD 2.xx or 3.xx.



Note:

When you install APD 4.xx in an environment in which APD 2.xx or 3.xx is already installed, APD first automatically uninstalls the previous version before installing 4.xx

- Coexistence with OPOS in a computer is not possible.

2.1.1.2 EPSON Advanced Printer Driver Supported Environment

- Supported interfaces
 - Parallel
 - Serial
 - USB
USB 2.0 compliant (Full-Speed 12 Mbps operation. High-Speed operation is not possible.)
 - Ethernet (10/100 Base-T)
 - Wireless LAN (IEEE 802.11b)
- Supported Operating Systems
 - Microsoft Windows Vista SP1 (32bit) English version
 - Microsoft Windows XP Professional SP3 (32bit) English version
 - Microsoft Windows XP Embedded SP2 English version



Note:

It cannot be used in the Terminal Server environment.

- Supported Development Languages

Win32:

- Visual Basic 6.0
- Visual C++

.NET:

- Visual Basic .NET
- Visual C#



Note:

If you use Status API .NET Wrapper in Windows XP, install .NET Frame Work 2.0 or later before installing APD.

2.1.1.3 Sample Program

Sample programs using the APD are provided in supported development languages.

2.1.2 UPOS

UPOS is a driver formulated for POS application development complying with the UPOS specification.

2.1.2.1 UPOS Driver

OPOS

A driver using the OLE technology. Visual Basic/Visual C++ are used as the development language.

OPOS for .NET

A driver using the Microsoft .NET Framework technology. Complies with POS for .NET. Visual Basic .NET/Visual C# are used as the development language.

JavaPOS

A driver using the Java technology. Supports Windows/Linux as the operation environment. Java SE Development Kit is used as the development language.

2.1.2.2 Downloading UPOS Driver

Go to the web site below to download the UPOS driver.

<http://www.epsonexpert.com/>

2.1.3 ESC/POS Command

Print/control by ESC/POS commands is direct control for TM printers using the ESC/POS commands proposed by EPSON. Sending ESC/POS commands to the printer from an application enables direct control of the printer. For the detailed information regarding the ESC/POS commands, please contact EPSON or your dealer.

2.1.4 Downloading Drivers, Utilities, and Manuals

Drivers, utilities, and manuals can be downloaded from one of the following URLs:

For customers from North America, go to the following web site:

<http://www.epsonexpert.com/>

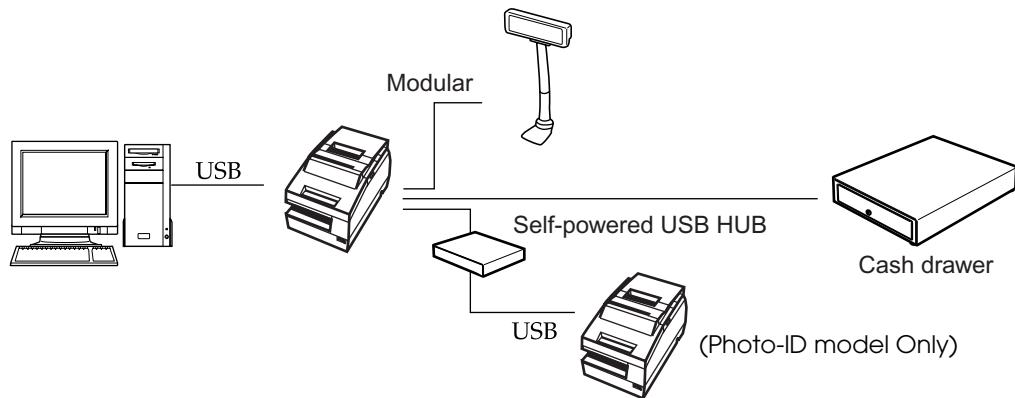
For customers in other countries, go to the following web site:

<http://www.epson-pos.com/>

2.2 Connection Form and Cables

2.2.1 USB

The TM printer can be connected to the host PC via a USB connector, and other TM printers can be connected to the first printer via USB. (See “Changing the DIP Switch Settings” in Chapter 3 for DIP switch settings.)



Note: The host PC needs to have an installed “USB device driver” for using USB model TM printer. See “Downloading Drivers, Utilities, and Manuals” on page 2-4. See the *readme_e.txt* of the driver for the procedure for installing.

EPSON does not supply the port driver or similar program necessary to control the USB interface printer with the ESC/POS commands. Control it with the driver (APD, OPOS or JavaPOS).

If you connect a Customer Display, set DIP switch settings as follows. For details, see the User’s Manual packed with your Customer Display.

Item	Selection	
Transmission setting	Transmission speed	19200 bps
	Parity	None
	Data word length	8 bits

Before turning on the printer, be sure to turn on the Customer Display. If you reverse the order, the Customer Display will not be recognized correctly.

To satisfy the EMI standard, be sure to mount the ferrite core on the display module cable. To mount the ferrite core, put the display module cable into the ferrite core.

See also “FAQ” on page C-1 for more details.

2.3 Serial Connection

When the TM printer is connected to the host PC with a serial interface, the following connection forms are possible:

- Stand alone
- Y-connection
- Pass-through connection

Connections for usable serial cross cables are as follows:

Type A

D-Sub 25P(TM)		D-Sub 9P(PC)	
Pin No	Signal	Signal	Pin No
1	FG	DCD	1
2	TXD	TXD	3
3	RXD	RXD	2
20	DTR	DTR	4
6	DSR	DSR	6
4	RTS	RTS	7
5	CTS	CTS	8
7	GD	GD	5
25	RESET	RI/RESET	9

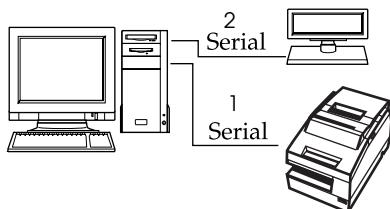
Type B

D-Sub 25P(TM)		D-Sub 9P(PC)	
Pin No	Signal	Signal	Pin No
1	FG	DCD	1
2	TXD	TXD	3
3	RXD	RXD	2
20	DTR	DTR	4
6	DSR	DSR	6
4	RTS	RTS	7
5	CTS	CTS	8
7	GD	GD	5
25	RESET	RI/RESET	9

The type of cable that should be used depends on the operation and the handshake method for the TM printer. You can operate the TM printer by Windows driver, OPOS, JavaPOS, or ESC/POS commands. XON/XOFF, DTR/DSR, or RTS/CTS are available as handshake controls. See tables in following sections for the type of cable for each connection.

2.3.1 Stand alone

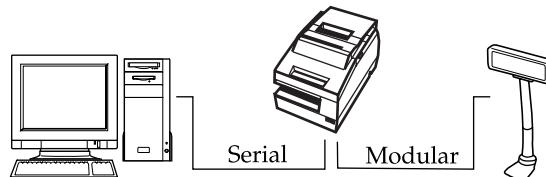
Both TM printer and Customer Display are connected to the host PC via serial port.



Application TM side control control setting		XON/XOFF (except OPOS)	DTR/DSR (DOS, OPOS, Visual C)	RTS/CTS (DOS, Windows driver, Visual C, Visual Basic, MSComm)
XON/XOFF	1	Type A or B	—	—
	2	DM-D500: A,B Other DM-D: not available	—	—
DTR/DSR	1	—	Type A or B	Type B
	2	—	Type A or B	Type B

2.3.2 Y-connection

TM printer is connected to the host PC via serial port and the Customer Display is connected to TM printer via modular connector.



Application TM side control control setting		XON/XOFF (except OPOS)	DTR/DSR (DOS, OPOS, Visual C)	RTS/CTS (DOS, Windows driver, Visual C, Visual Basic, MSComm)
XON/XOFF		Not available	—	—
DTR/DSR		—	Type B (*)	Type B

(*) When RTS/CTS control is used between the TM and Customer Display.



Note:
You need to use the UB-S09 interface when you use a modular connector.

On a Customer Display (DM-D500 etc...) device that has a DIP switch to select the Y-type connection, confirm that the DIP switch has been set to "Y-type connection: Enable." For details of the DIP switch, see the User's Manual packed with your Customer Display.

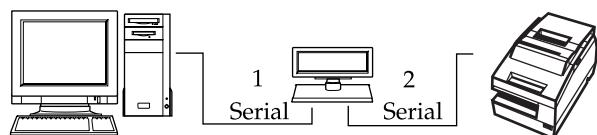
2.3.3 Pass-Through Connections

The TM printer is connected to the Customer Display via a serial port, and the Customer Display is connected to the host PC via a serial port.



Note:

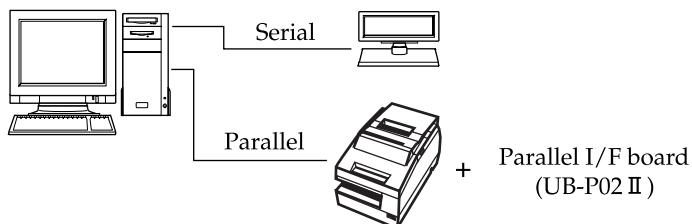
On a Customer Display (DM-D500 etc...) device that has a DIP switch to select the Y-type connection, confirm that the DIP switch has been set to "Y-type connection: Disable." For details of the DIP switch, see the User's Manual packed with your Customer Display.



Application TM side control control setting		XON/XOFF (except OPOS)	DTR/DSR (DOS, OPOS, Visual C)	RTS/CTS (DOS, Windows driver, Visual C, Visual Basic, MSComm)
XON/XOFF		Not available	—	—
DTR/DSR	1	—	Type A or B	Type B
	2	—	Type A or B	Type A or B

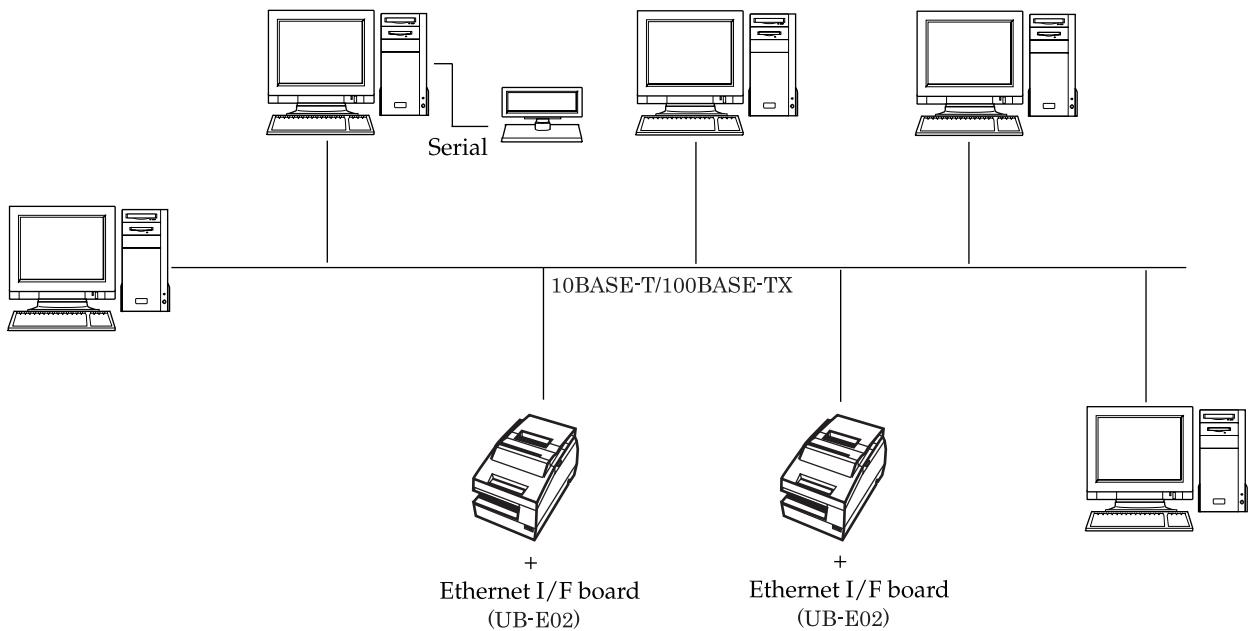
2.4 Parallel Connection

The TM printer is connected to the host PC via a parallel interface board (UB-P02II). The Customer Display is connected to the host PC via a serial port.



2.5 Ethernet

TM printers are connected to a network via a hub using an Ethernet cable.



Note:

If the TM printer is connected to the host PC via an Ethernet interface, a Customer Display cannot be connected to the TM printer.

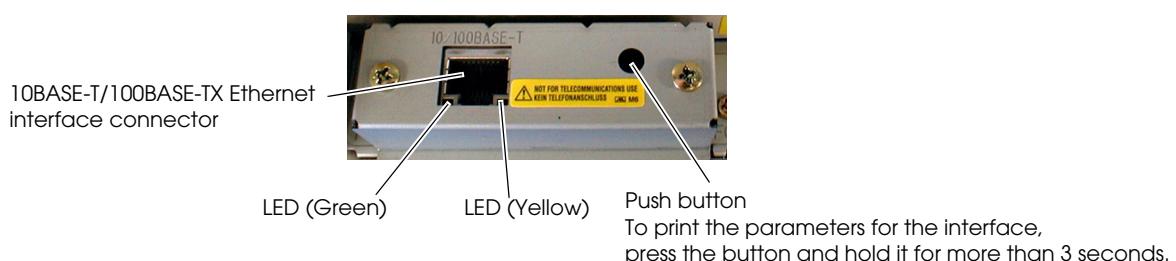
We provide the IP address setup utility "EPSON TMNet WinConfig," for setting the IP address of the Ethernet model TM printer on the host PC. It is downloadable from the web site. See "Downloading Drivers, Utilities, and Manuals" on page 2-4.

The Ethernet interface TM printer does not accept a Customer Display. Connect the Customer Display to a POS terminal or appropriate equipment other than the printer.

When controlling the printer with OPOS, it is necessary to use exclusive control. Therefore, when using 1 printer with several PCs, it is necessary to consider that application programming by a PC that already has the exclusive right must release it; then another PC must claim it.

Names of parts

The names of the various parts of the Ethernet interface are shown below.



Connection procedure

⚠ CAUTION:

Connecting devices directly to LAN cables that are installed outdoors will expose them to damage from power surges caused by lightning and other inductive sources. It is best to make sure that devices without proper surge protection are cushioned by being connected through devices that do have surge protection. Otherwise, it is better not to connect them to outdoor lines.

Never attempt to connect the Customer Display cable, drawer kick out cable or the standard telephone line cable to the 10 Base-T Ethernet connector.

1. Confirm that the power supplies for both the printer and the host computer have been turned off.
2. Connect the 10 Base-T cable to the 10 Base-T Ethernet connector by pressing firmly until the connectors click.



Note:

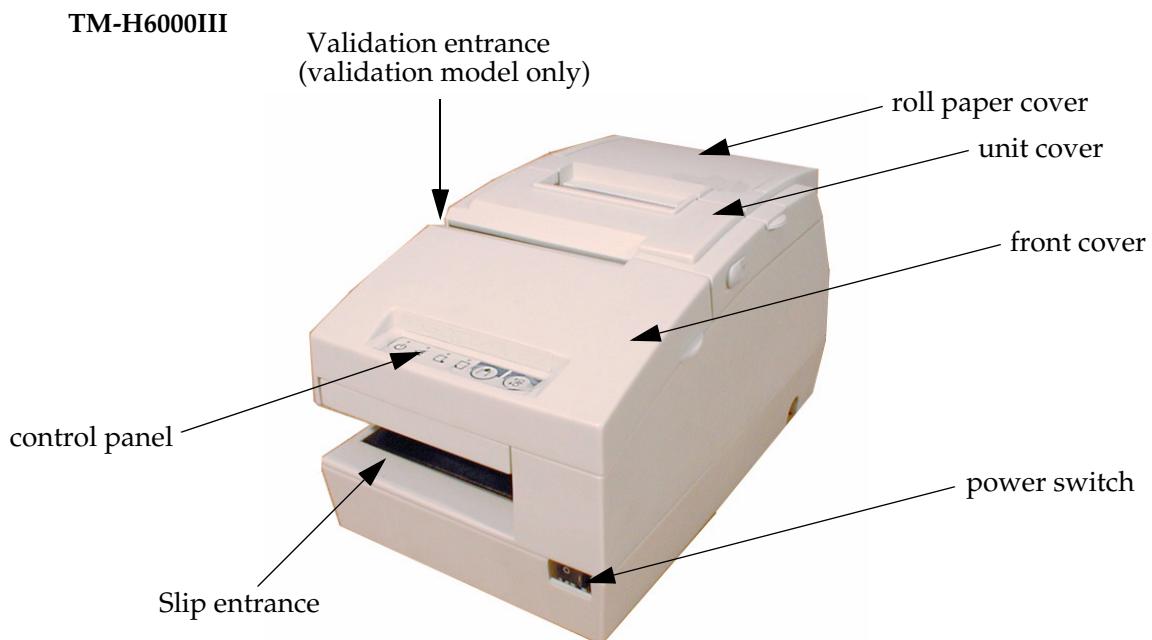
For the various methods of setting the Ethernet interface, refer to the Technical Reference Guide for the interface. It is downloadable from the web site. See "Downloading Drivers, Utilities, and Manuals" on page 2-4.

Chapter 3

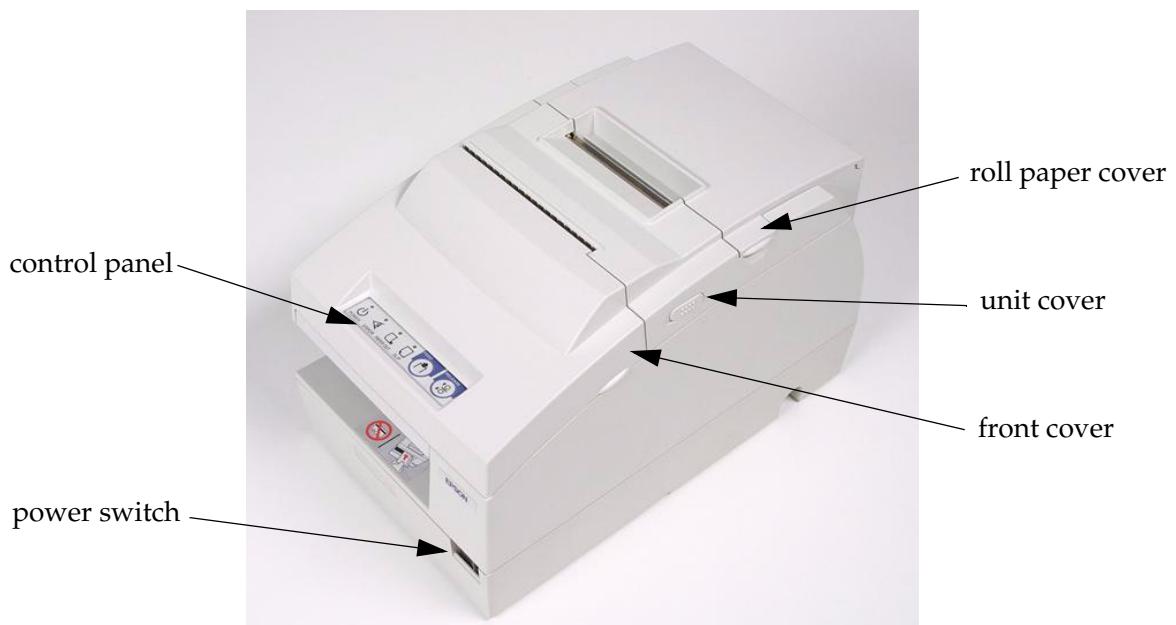
Setup

3.1 Part Name and Basic Operation

3.1.1 Part Names



TM-H6000III with Image Scanner model



TM-H6000III Photo-ID model

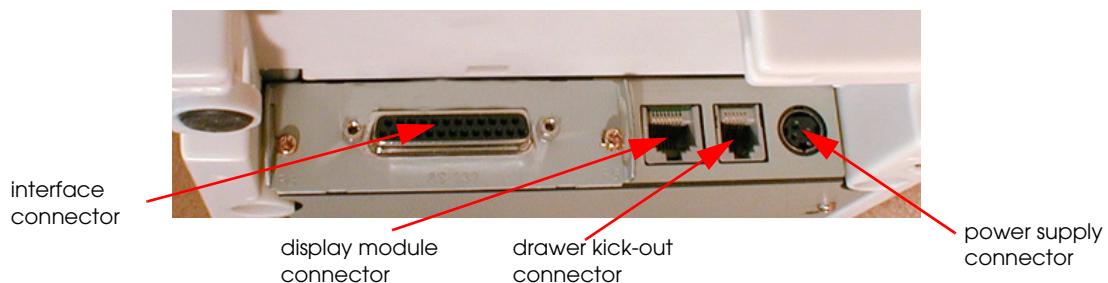


3.1.2 Connectors

⚠️ WARNING:

Do not connect a telephone line to the drawer kick-out connector or the display module connector; otherwise the printer and the telephone line may be damaged.

You can connect up to four cables to the printer. They all connect to the connector panel (on the bottom rear of the printer), which is shown below.

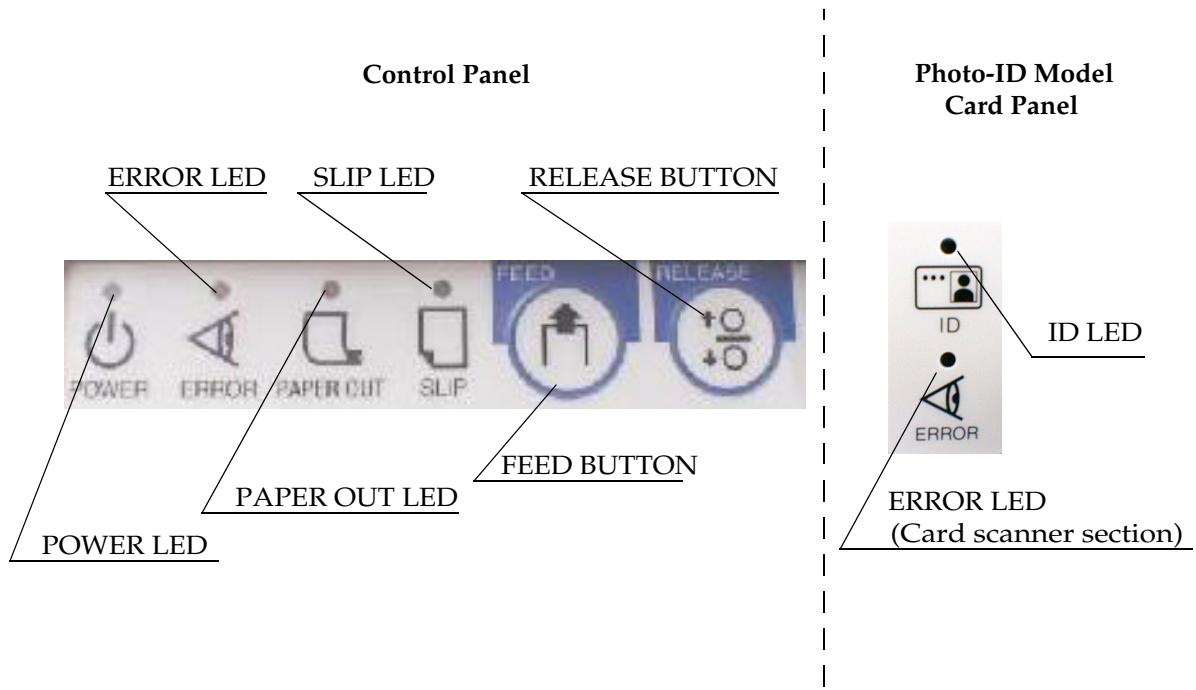


This illustration shows the serial interface model. The parallel interface connector and USB looks slightly different.

3.1.2.1 Important Installation Notes

- For a serial interface, use a null modem cable.
- For a parallel interface, use an IEEE 1284 cable.
- For a USB interface, install the driver before connecting the printer.

3.1.3 The Control Panel



3.1.3.1 LED

POWER

This light is on when the power is turned on.

ERROR

When this light is on but not blinking, it means that the printer is offline. Check to see if a cover is open. When this light is blinking, there is an error. See "LED Blinking Pattern" in Chapter 4.

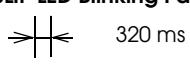
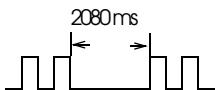
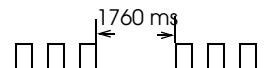
PAPER OUT

This light comes on when the printer is out, or nearly out, of roll paper. The printer has a paper end detector, and it also has a near-end detector (which can be adjusted) to warn you that the printer is nearly out of paper. See "Adjusting the Roll Paper Near End Detector" (page 3-18) for information on adjusting the detector.

This light blinks during the self-test printing standby state or macro execution standby state (when the macro execution command is used).

SLIP

- This light blinks when the printer is ready to receive slip paper. It stays on during printing on slip paper and blinks again when slip paper should be removed. When the slip paper is removed in the slip removal waiting state, the printer enters the paper roll mode two seconds later. The SLIP LED light is on during this time. The blinking patterns for the slip inserting and removal waiting states are different as follows:

State	SLIP LED Blinking Pattern
	
Slip insertion waiting	
Slip removal waiting	
Check insertion waiting (only for MICR-equipped model)	

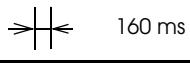
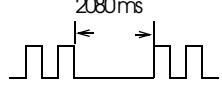
3.1.3.2 LEDs on the Card panel

ID

On: Card scanner is operating.

Off: Card scanner is not selected.

Flashing: Card insertion / removal waiting state (refer to the following table).

State	SLIP LED Blinking Pattern
	
Card insertion waiting	
Card removal waiting	

ERROR

Off: Normal condition.

Flashing: Error (refer to the following figure).

State	SLIP LED Blinking Pattern
Card Ejection error	 5120 ms

3.1.3.3 Control Panel Buttons

The control panel has two paper buttons that you may have to use, although most paper handling functions will be handled by your software.

FEED

Use this button to feed roll paper or to start a roll paper self test. (See the instructions later in this chapter.)

RELEASE

Use this button to release slip paper or to start a slip paper self test. (See the instructions later in this chapter.)

Panel Button Operations

ESC/POS command can be set to enable or disable the panel buttons.

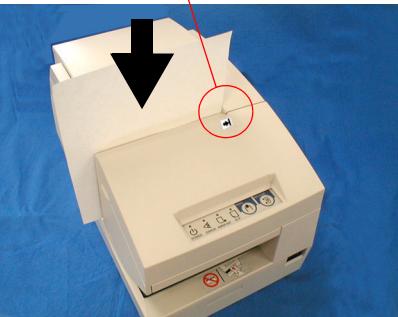
3.1.4 Validation paper handling (Option)

1. Transmit the command from host PC to make the printer ready for a validation paper to be inserted.
2. Insert a validation paper into the validation entrance from the upper side.

insert the paper against the corner



incorrect insertion



correct insertion



Note:

Use only validation paper (flat paper, without wrinkles, creases, or folds) that matches the specifications. The validation function is a factory option.

3.1.5 Card insertion method (Option)

When you would like to scan a card with the TM-H6000III with Photo-ID, follow the following procedure.

1. Transmit control command to TM-H6000III from your application for card insertion.



Note:

The control command depends on your control method. See Chapter 5 or Chapter 6 according to your method for confirming the command.

2. When the TM-H6000III receives the transmitted control command, the ID LED blinks. Insert the card face up into the card entrance as far as far as it will go.
(See illustration on the right.)



3. The printer will detect the card and start drawing it in. When the printer starts drawing it in, let go of the card immediately.
4. The printer scans the card while ejecting it.
5. When the ID light starts flashing again, remove the card by pulling it straight out; do not pull it at an angle.



Note:

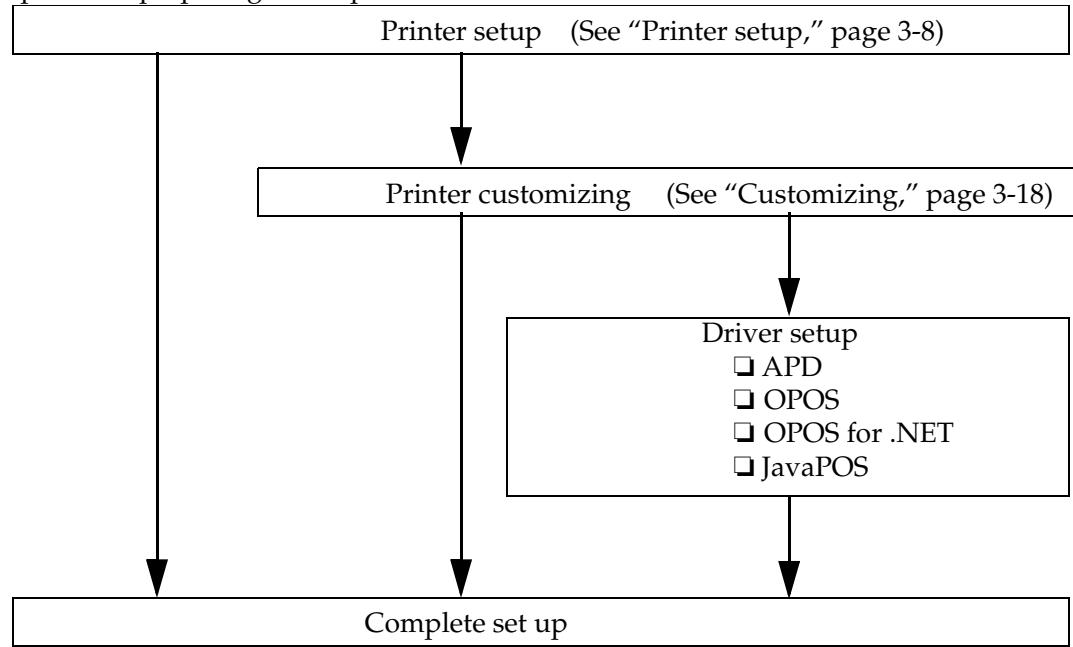
Appropriate image data quality might not be acquired in the following conditions:

- *Excessive damage such as curvature, cracking, or folding of the card.*
- *Embossed cards.*
- *When the image scanner part is exposed to excessive light such as sunlight, a spotlight, or fluorescent lamp.*
- *When the scanner glass has been damaged by foreign matter such as sand.*

3.2 Setup Flow

You have to set up your printer to use it. And you can adjust some feature by customizing them. This section describes the setup.

The set up flow of preparing to use printer is below..

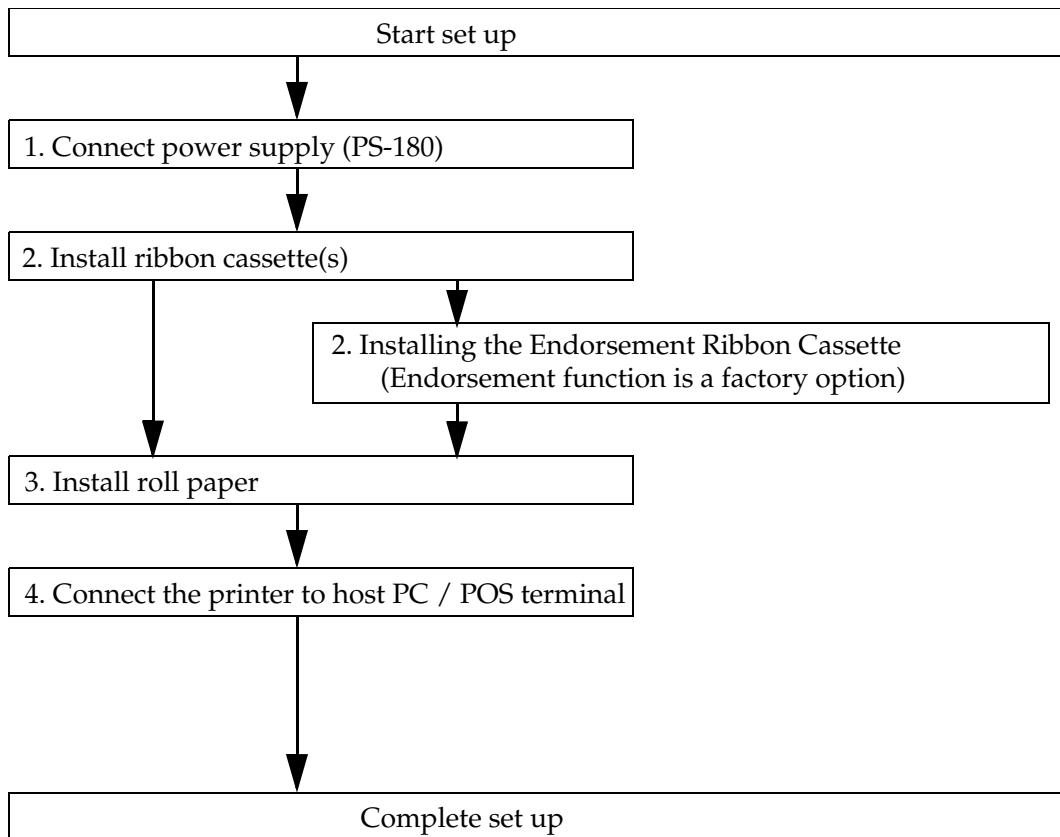


Note:

When you use OPOS (OCX driver from EPSON), Advanced Printer Driver, or JavaPOS, you need to install the driver. When you use ESC/POS commands, you don't have to install drivers. For information on these drivers, see "Control Method" (page 2-1).

3.3 Printer setup

This section describes the setup. The flow of preparing to use printer is below



Note:

If your printer is equipped with the endorsement function, you also need to install the endorsement ribbon cassette, which is smaller than the standard ribbon cassette. If your printer isn't equipped with the endorsement function, you don't need to install it.

When you use this printer with a serial interface, you have to adjust the communication settings. See "Customizing" (page 3-18) for how to set them.

3.3.1 Connecting the Power Supply Unit (PS-180)

Use the optional EPSON PS-180 power supply or equivalent for your printer.

⚠ WARNING:

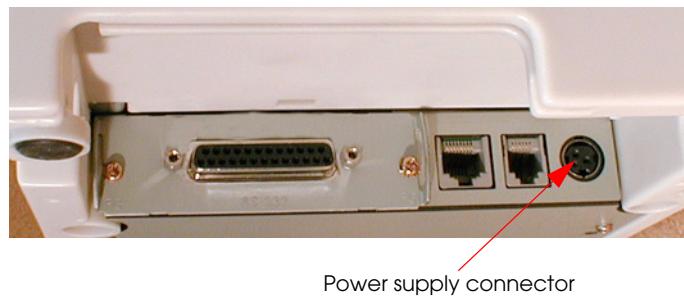
Make sure you use the EPSON PS-180 power supply or equivalent. Using an incorrect power supply may cause fire or electrical shock.

⚠ CAUTION:

When connecting or disconnecting the power supply from the printer, make sure the power supply is not plugged into an electrical outlet. Otherwise you may damage the power supply or the printer.

If the power supply's rated voltage and your outlet's voltage do not match, contact your dealer for assistance. Do not plug in the power cord. Otherwise you may damage the power supply or the printer.

1. Make sure the printer's power switch is turned off, and the power supply's power cord is unplugged from the electrical outlet.
2. Check the label on the power supply to make sure the voltage required by the power supply matches that of your electrical outlet.
3. Plug the power supply cord into the connector shown below.



Note:
To remove the DC cable connector, make sure the power supply's power cord is unplugged; then grasp the connector at the arrow and pull it straight out.

3.3.2 Installing or Replacing the Ribbon Cassette

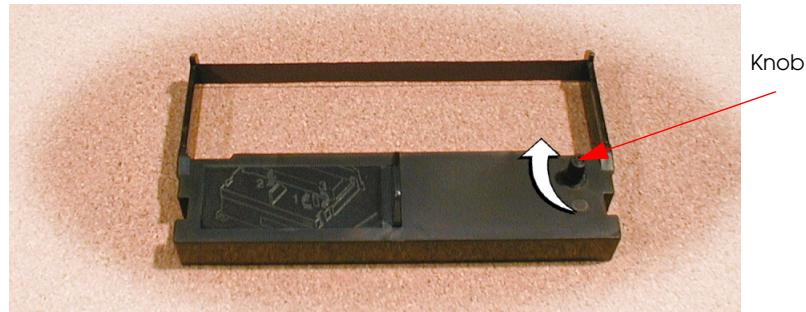
EPSON recommends the use of genuine EPSON ribbon cassettes. Ribbon cassettes not manufactured by EPSON may cause damage to your printer that is not covered by EPSON's warranties.

To install the ribbon cassette for the first time or to replace a used ribbon, follow the steps below:

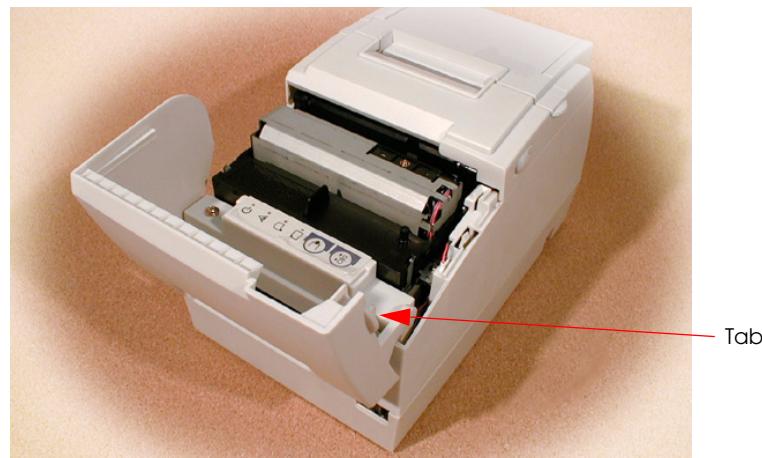


Note:
Be sure to turn on the power before installing a ribbon cassette. When the printer is turned off, the ribbon cassette cannot be installed or removed.

1. Unpack the ribbon cassette and turn the knob in the direction shown to take up any slack.



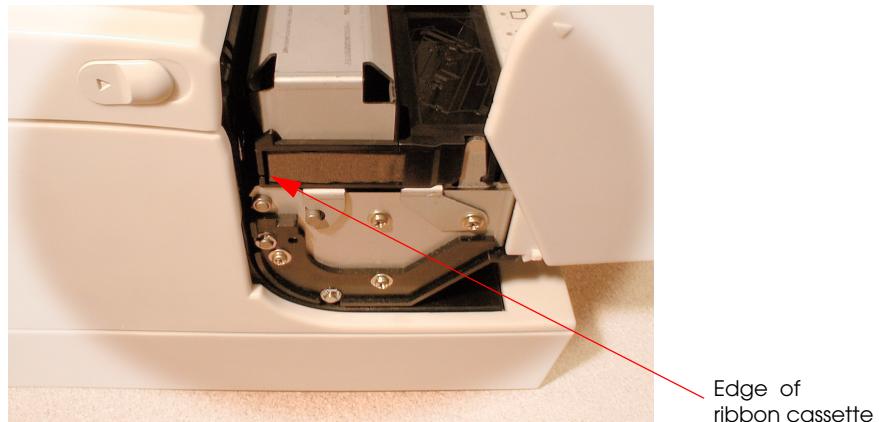
2. Open the front cover of the printer, using the tabs on each side of the cover.



3. Remove the old ribbon, if there is one.
4. Insert the new ribbon cassette as shown.



5. Turn the knob two or three times to make sure the ribbon is seated correctly. You can also look at the side of the slip unit to see if the ribbon is in the correct place. See below.



6. Close the front cover of the printer.

3.3.3 Installing or Replacing the Endorsement Ribbon Cassette

If your printer is equipped with the endorsement function, you also need to install the endorsement ribbon cassette, which is smaller than the standard ribbon cassette.

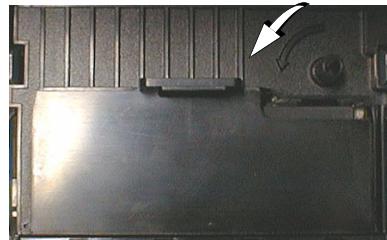
EPSON recommends the use of genuine EPSON ribbon cassettes. Ribbon cassettes not manufactured by EPSON may cause damage to your printer that is not covered by EPSON's warranties.



Note:

Be sure to turn on the power before installing a ribbon cassette.

1. Unpack the ribbon cassette and turn the knob in the direction shown to take up any slack.

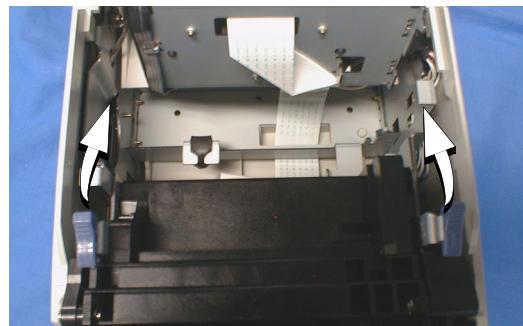
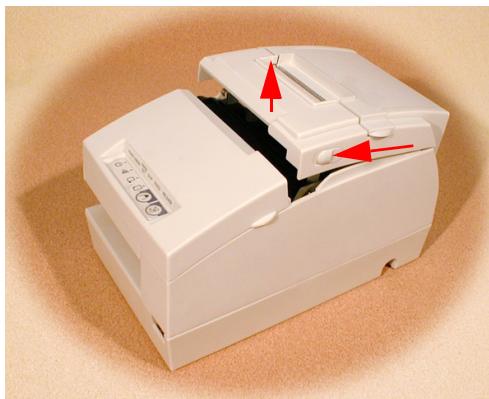


2. Open the unit cover, as shown below. Inside the printer, push the levers backward to open the unit.

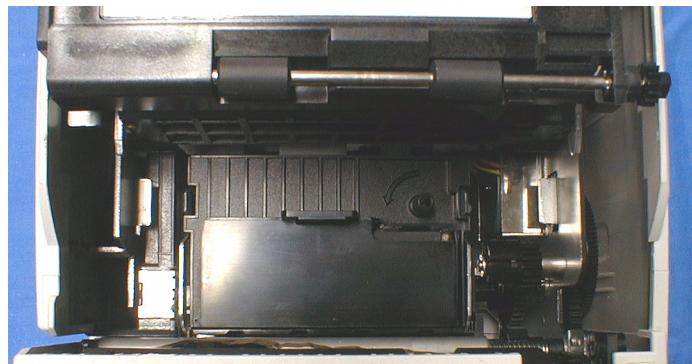


Note:

Do not open the unit during printing.



3. Insert the ribbon cartridge into the printer. You can see a properly installed ribbon in the illustration below.



4. Turn the knob two or three times to make sure that the ribbon is seated correctly.
5. Close the cover of the printer.

3.3.4 Installing or Replacing the Paper Roll



Note:

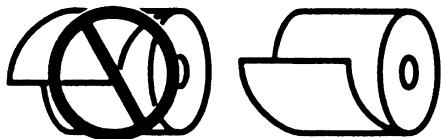
Do not use paper rolls that have the paper glued or taped to the core because they might cause a paper jam.

To prevent paper jams, make sure that nothing obstructs paper coming out of the paper exit, and do not pull the paper out of the printer.

1. To prevent data loss make sure that the printer is not receiving data.
2. Open the paper roll cover by lifting up the two tabs on the paper roll cover and then pushing the cover back.
3. Remove the used paper roll core if there is one.
4. Insert the paper roll as shown.



5. Be sure to note the correct direction that the paper should come off the roll.

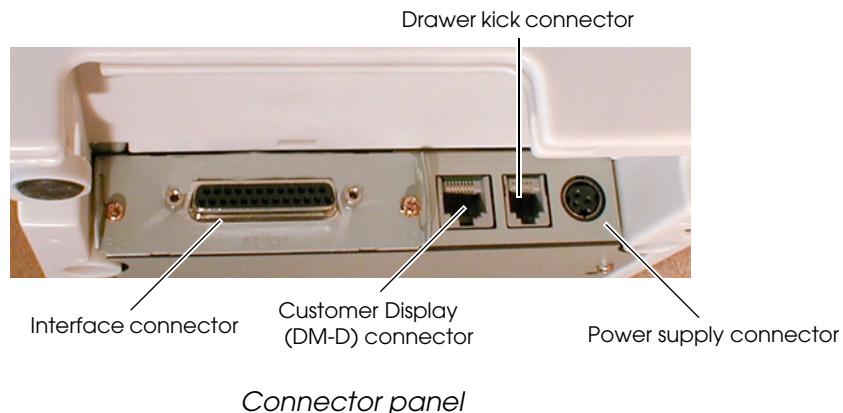


6. Pull out a small amount of paper, as shown. Then close the cover and tear off the extra paper by pulling it toward the front of the printer.



3.3.5 Connecting the Printer to the Host PC / POS Terminal

All cables are connected to the connector panel located on the lower rear side of the printer.



Note:
The figure above shows the connector panel for the RS-232/RS-485 interface model printer. The shape of the interface connector varies according to the type of interface used.

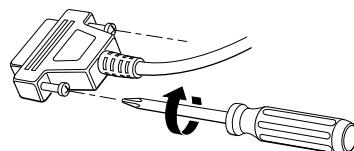
Be sure to turn off the power supply for both the printer and the host computer unit before connecting the various cables.

3.3.5.1 Serial interface model

Before connecting any of the cables, make sure that both the printer and the host PC are turned off.

You need an appropriate serial, parallel, USB, or Ethernet interface cable to connect your computer to the printer. For the serial model, it is important that you use a null modem cable, not any other serial cable, and for the parallel model use an IEEE 1284 cable.

1. Plug the cable connector securely into the printer's interface connector.
2. If the cable connector has screws on it, tighten the screws on both sides of the connector.



3. If your interface connector has a grounding wire, attach it to the printer using the screw labeled FG, which is next to the interface connector.
4. Attach the other end of the cable to the host PC.



When using serial interface, you need to adjust serial communication using the DIP switches. See "Adjusting the DIP Switches" (page 3-19) for details.

3.3.5.2 Parallel Interface Models

1. Press the connector on the end of the interface cable firmly into the interface connector on the connector panel.
2. Press down the clips on either side of the connector to lock it in place.
3. For interface cables equipped with a ground line, attach the ground line to the screw hole marked "FG" on the printer.
4. Connect the other end of the interface cable to the host computer.

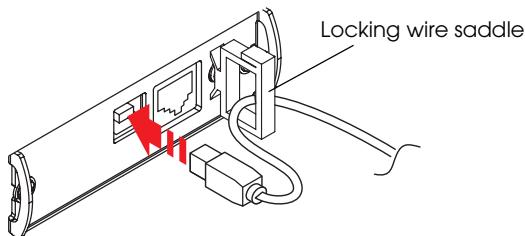
3.3.5.3 USB Interface Models

1. Attach the locking wire saddle at the location shown in the figure below.
2. Hook the USB cable through the locking wire saddle, as shown in the figure below.



Note:

Hooking the USB cable through the locking wire saddle, as shown in the figure below, will prevent the cable from coming unplugged.



Attaching locking wire saddle

3. Connect the USB cable from the host computer to the USB upstream connector.

3.3.5.4 Connecting a Drawer

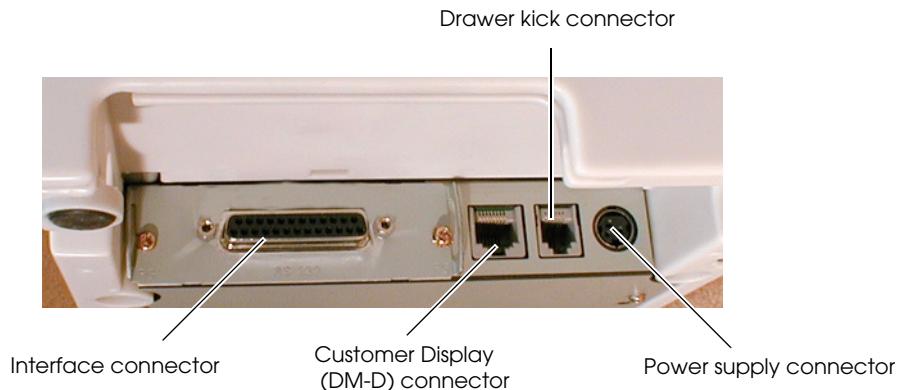
⚠ CAUTION:

Be sure to connect a drawer that meets printer specifications. Connecting a drawer of the wrong specifications may result in damage to both the drawer and the printer.

Never connect a telephone line to the drawer kick out connector (labeled "DK"). Doing so may result in damage to both the telephone line and the printer.

Never connect the drawer cable to the customer display connector (labeled "DM-D"). Doing so may result in damage to both the drawer cable and the printer.

1. Connect the drawer cable to the drawer kick out connector (labeled "DK") on the connector panel.



Connecting drawer

2. The connecting is finished.

3.4 Customizing

This printer is able to be customized for the items below:

- Roll paper near end detector
- DIP switch (communication condition, print density, etc...)
- Memory switch (some notices enable/disable, roll paper type, error signal output, paper jam detection for slip, and unit cover open while printing)

The current settings can be confirmed by a self-test.

3.4.1 How to Confirm Current Settings

You can use a self-test to confirm the current settings. "Self Tests" on page 3-24

3.4.2 Adjusting the Roll Paper Near End Detector

The paper near end detector detects when paper is almost gone by measuring the diameter of the paper roll. The detector has two settings.

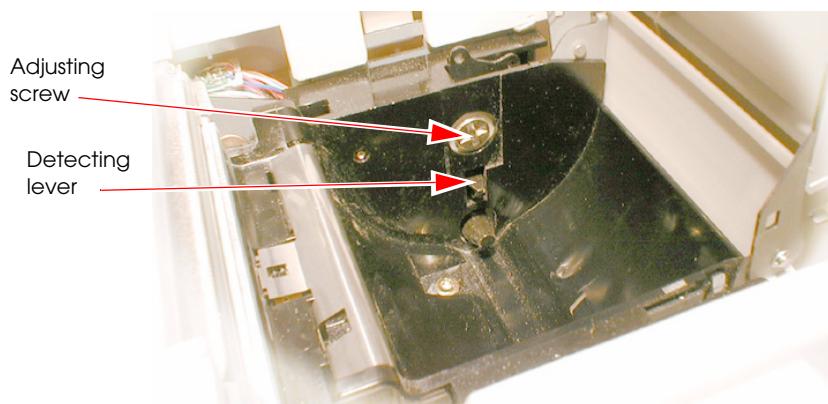


Note:

Because of variations in paper roll cores, it is not possible for the detector to measure exactly the length of paper left on the roll when the detector is triggered.

If you want more paper left when the detector is triggered, change the setting, as described below.

1. Open the printer cover, and remove the paper roll.
2. Loosen the adjusting screw with a coin, and carefully move the detecting lever up.



3. Tighten the adjusting screw, and check to be sure that the detecting lever moves freely.
4. Replace the paper roll.

3.4.3 Adjusting the DIP Switches

The printer has two sets of DIP switches. The function of the DIP switches is different for each interface model.

3.4.3.1 Changing the DIP Switch Settings

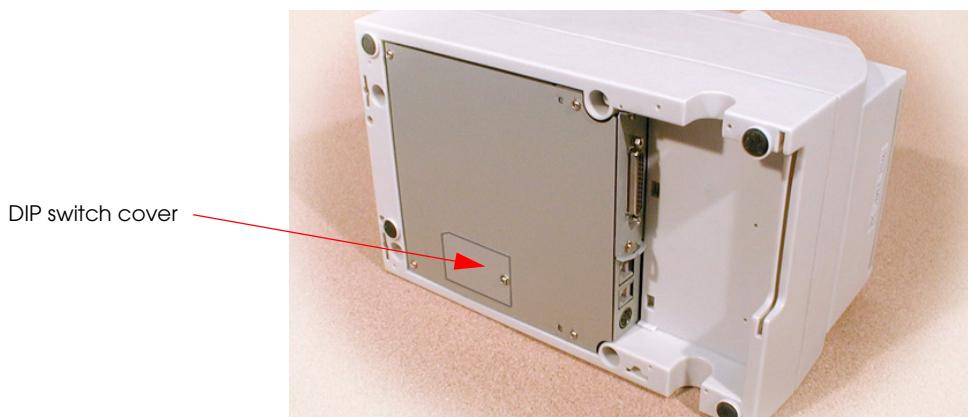
If you need to change settings, follow the steps below to make your changes:

⚠ CAUTION:

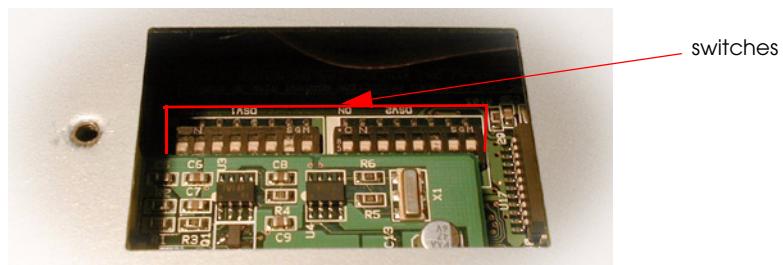
Turn off the power while removing the DIP switch cover to prevent an electric short, which can damage the printer.

Use a crosshead screwdriver to remove the screw holding the DIP switch cover.

1. Make sure the printer is turned off.
2. Remove the screw from the DIP switch cover. Then take off the DIP switch cover.



3. Set switches using a pointed tool, such as tweezers or a small screwdriver.



4. Replace the DIP switch cover. Then secure it with the screw.

The new settings take effect when you turn on the printer.



Note:

The functions of the switches are shown in the following sections.

3.4.3.2 Serial interface model

DIP Switch 1

SW	Function	ON	OFF
1-1	Data receive error	Ignored	Prints “?”
1-2	Receive buffer capacity	45 bytes	4 KB
1-3	Handshaking	XON/XOFF	DTR/DSR
1-4	Data word length	7 bits	8 bits
1-5	Parity check	Enabled	Disabled
1-6	Parity selection	Even	Odd
1-7	Transmission speed (See the table below.)		
1-8			

Transmission speed

Transmission Speed in BPS (bits per second)	1-7	1-8
4800	ON	ON
9600	OFF	ON
19200	ON	OFF
38400	OFF	OFF

DIP Switch 2

SW	Function	ON	OFF
2-1	Handshaking (BUSY condition)	Receive buffer full	Offline or receive buffer full
2-2	Customer display connection	Connected	Not connected
2-3	Print density (See the table below.)		
2-4			
2-5	Internal use	Fixed to OFF	
2-6	Internal use	Fixed to OFF	
2-7	I/F pin 6 reset signal	Enabled	Disabled
2-8	I/F pin 25 reset signal	Enabled	Disabled

Print density

Print Density	SW 2-3	SW 2-4
1 (Light)	ON	ON
2↑	OFF	OFF
3↓	ON	OFF
4 (Dark)	OFF	ON

NOTE:

Changes in DIP switch settings (excluding switches 2-7 and 2-8, interface reset signals) are recognized only when the printer power is turned on or when the printer is reset. If the DIP switch setting is changed after the printer power is turned on, the change does not take effect until the printer is turned on again or is reset.

If you turn on DIP switch 2-7 or 2-8 while the printer power is turned on, the printer may be reset, depending on the signal state. DIP switches should not be changed while the printer power is on.

If the print density is set to level 3 or 4, print speed is reduced as follows:

Maximum 180mm/s at 24V, 25°C in level 3
Maximum 170mm/s at 24V, 25°C in level 4

For a tip about print density, see “**When Using Original Paper**” (page 3-23).

3.4.3.3 Parallel / Ethernet interface model

DIP Switch 1

SW	Function	ON	OFF
1-1	Auto line feed	Always enabled	Always disabled
1-2	Receive buffer capacity	45 bytes	4KB
1-3~ 1-8	Reserved	Fixed to OFF	

DIP Switch 2

SW	Function	ON	OFF
2-1	Handshaking (BUSY condition)	Receive buffer full	Offline or receive buffer full
2-2	Internal use (Do not change setting.)	Fixed to OFF	
2-3	Print density (See the table below.)		
2-4			
2-5~ 2-6	Internal use (Do not change setting.)	Fixed to OFF	
2-7	Reserved (for serial interface)	Fixed to OFF	
2-8	I/F pin 31 reset signal (Do not change setting.)	Fixed to ON	

Print density

Print Density	SW 2-3	SW 2-4
1 (Light)	ON	ON
2↑	OFF	OFF
3↓	ON	OFF
4 (Dark)	OFF	ON

NOTE:

When pin 6 of the interface connector is used for the reset signal, the printer is reset at MARK on the RS-232 level.

Changes in DIP switch settings (excluding switch 2-8, interface reset signal) are recognized only when the printer power is turned on or when the printer is reset by using the interface. If the DIP switch setting is changed after the printer power is turned on, the change does not take effect until the printer is turned on again or is reset.

If you turn on DIP switch 2-8 while the printer is turned on, the printer may be reset, depending on the signal state. DIP switches should not be changed while the printer power is on.

If the print density is set to level 3 or 4, print speed is reduced as follows:

Maximum 180mm/s at 24V, 25°C in level 3

Maximum 170mm/s at 24V, 25°C in level 4

For a tip about print density, see “**When Using Original Paper**” (page 3-23).

3.4.3.4 USB interface model

DIP Switch 1

SW	Function	ON	OFF
1-1	Auto line feed	Always enabled	Always disabled
1-2	Receive buffer capacity	45 bytes	4KB
1-3~ 1-8	Reserved	Fixed to OFF	

DIP Switch 2

SW	Function	ON	OFF
2-1	Handshaking (BUSY condition)	Receive buffer full	Offline or receive buffer full
2-2	Customer display connection	Connected	Not connected
2-3	Print density (See the table below.)		
2-4			
2-5~ 2-6	Internal use (Do not change setting.)	Fixed to OFF	
2-7	Reserved (for serial interface)	Fixed to OFF	
2-8	Reserved	Differs depending on printer specifications.	

Print density

Print Density	SW 2-3	SW 2-4
1 (Light)	ON	ON
2↑	OFF	OFF
3↓	ON	OFF
4 (Dark)	OFF	ON

NOTE:

If the print density is set to level 3 or 4, print speed is reduced as follows:

Maximum 180mm/s at 24V, 25°C in level 3

Maximum 170mm/s at 24V, 25°C in level 4

For a tip about print density, see “**When Using Original Paper**” (page 3-23).

3.4.3.5 When Using Original Paper

When you use original paper such as P350 (F380), we recommend setting the DIP switches as shown in the table below. The setting differs depending on each paper specification. See the Other Qualified Suppliers for Thermal Paper section later in this chapter.

Original paper type	DIP SW2		Print density level
	3	4	
P350 (F380)	ON	ON	1
PD160R, AF50KS-E, P310, P300	OFF	OFF	2 (default)



Note:

See the thermal paper section in Chapter 4 for information about thermal paper.

3.4.4 Memory Switches

This printer has "Memory switches" which are software switches. A memory switch setting utility can change the memory switch 1 or 8 to ON or OFF as shown in the table below (default: all OFF):

- Switch 1

Bit	ON	OFF
1	Transmits the power ON notice	Does not transmit the power ON notice
2 ~8	Reserved (Do not change the setting)	

- Switch 8

Bit	ON	OFF
1-3	Reserved (Do not change the setting)	
4	Uses two-color roll paper	Uses monochrome roll paper
5	Reserved (Do not change the setting)	
6	Error signal output: Disabled	Error signal output: Enabled
7	Slip paper jam detection: Disabled	Slip paper jam detection: Enabled
8	Becomes recoverable error if the unit cover and front cover is open during printing	Goes offline if the unit cover and front cover is open during printing



Note:

Settings of the memory switch are stored in the NV memory; therefore, even if the printer is turned off, the settings are maintained. Excessive use of this function may destroy the NV memory. As a guideline, do not use this function more than 10 times a day.

You can obtain the Memory switch utility from our web site. "Downloading Drivers, Utilities, and Manuals" on page 2-4

When you use OPOS or APD, generally you don't need to adjust memory switch because OPOS or APD are able to set these items automatically.

3.4.5 How to Use Two-Color Printing

This printer is able to print in two colors by using two-color thermal paper. The adjustment method is described below.

1. Adjust Memory switch 8-4 to ON “Uses two-color roll paper.” (“Memory Switches” on page 3-23) When you use OPOS, adjust the “paper” item in the setupPOS utility.
2. Install two-color thermal paper in the printer.
3. Print two color data. (Ex: two-color graphic data)



Note:

When you use APD, you may use the memory switch utility to set the memory switch. You can obtain the Memory switch utility from our web site. “Downloading Drivers, Utilities, and Manuals” on page 2-4

3.5 Self Tests

The self tests let you know if your printer is operating properly. There are self tests for both roll paper and slip paper. They check the control circuits, printer mechanisms, print quality, control software version, and DIP switch settings.

These tests are independent of any other equipment or software, so it is a good idea to run them when you first set up the printer and if you have any trouble. If the self tests work correctly, the problem is in the other equipment or the software, not the printer.

3.5.1 Running the Self Test on Roll Paper

1. Make sure the printer is turned off and the printer cover is closed properly.
2. While holding down the FEED button, turn on the printer using the switch on the front of the printer. The self test prints the printer settings and then prints the following, cuts the paper, and pauses. (The PAPER OUT light blinks.)

**If you want to continue SELF-TEST printing, Please press the
FEED button.**

3. Press the FEED button to continue printing. The printer prints a pattern using the built-in character set.
4. The self test automatically ends and cuts the paper after printing the following:

***** completed *****

The printer is ready to receive data as soon as it completes the self test.



Note:

If you want to pause the self test manually, press the FEED button. Press the FEED button again to continue the self test.

3.5.2 Running the Self Test with Slip Paper

1. Make sure the printer is turned off and the printer cover is closed properly.
2. While holding down the RELEASE button, turn on the printer using the switch on the front of the printer. (The SLIP light blinks.)
3. Feed a sheet of slip paper into the printer. The printer loads the paper automatically, prints the printer settings, and then ejects the paper. (The SLIP light blinks.)
4. Remove the paper from the printer and feed another sheet of slip paper into the printer to print characters from the character table. Continue to feed slip paper into the printer until the self test prints the following:

*****completed*****

The printer is ready to receive data as soon as it completes the self test.

3.5.3 Running the Self Test with the Validation paper (Option)

1. Make sure the printer is turned off and the printer cover is closed properly.
2. While holding down the FEED button and RELEASE button, turn on the printer using the switch on the front of the printer. (The SLIP light flashes.)
3. Feed a validation paper into the printer. The printer loads the paper automatically, prints the printer settings, and then ejects the paper. (The SLIP light flashes.)
4. Remove the paper from the printer and feed another validation paper into the printer to print characters from the character table. Continue to feed slip paper into the printer until the self test prints the following:

***** completed*****

The printer is ready to receive data as soon as it completes the self test.

3.5.4 Running the Self Test with the Endorsement Function (Option)

If your printer has the endorsement function, the slip paper self test is slightly different. When you feed additional sheets of slip paper in step 4, two lines are printed on the back of the slip by the endorsement print mechanism; then the test continues printing on the surface side of the slip as described above.

Chapter 4

Maintenance & Troubleshooting

This section describes maintenance and general troubleshooting.

4.1 Maintenance

4.1.1 Cleaning the Thermal Print Head

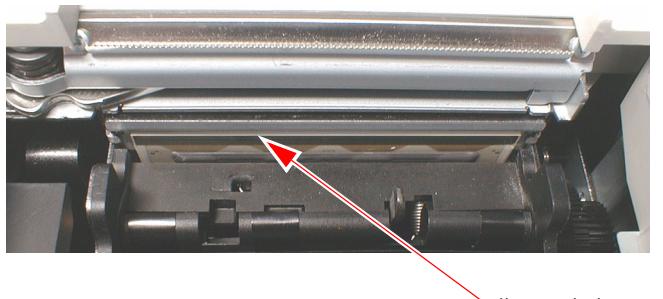
⚠ CAUTION:

After printing, the print head can be very hot. Be careful not to touch it. Also let it cool before you clean it.

Do not damage the print head by touching it with your fingers or any hard object.

1. Open the paper roll cover.
2. Clean the thermal element of the print head with a cotton swab moistened with an alcohol solvent (ethanol, methanol, or IPA)

Clean the thermal head periodically (generally every three months) to maintain receipt print quality.



4.1.2 Cleaning the MICR Mechanism

Use a moistened cleaning sheet for the MICR head.



Note:
Be sure not to use an adhesive cleaning sheet.

4.1.2.1 Cleaning frequency

Clean the MICR head every 12 months or 72000 passes.

4.1.2.2 Cleaning sheet

Use the following or an equivalent commercially available cleaning sheet:

PRESAT brand (KIC) "CHECK READER CLEANING CARD."

4.1.2.3 Cleaning procedure

You can perform cleaning either in self mode or command mode. These modes are described below.

4.1.2.4 Self mode

1. Load a paper roll in the printer.
2. Turn off the power.
3. Open the paper roll cover.
4. Turn the power back on while holding down the RELEASE button.
5. Press the RELEASE button seven times.
6. Close the paper roll cover.
7. The printer prints the following message on receipt paper and the SLIP light flashes.

**** RECOGNITION MODE ****

Please set check.

8. Load the cleaning sheet like a standard check.

⚠ CAUTION:

Be sure that the sheet is inserted with the correct side up and that it is inserted in the correct direction.

9. When the sheet is ejected, press the RELEASE button, and remove the sheet from the printer.

⚠ CAUTION:

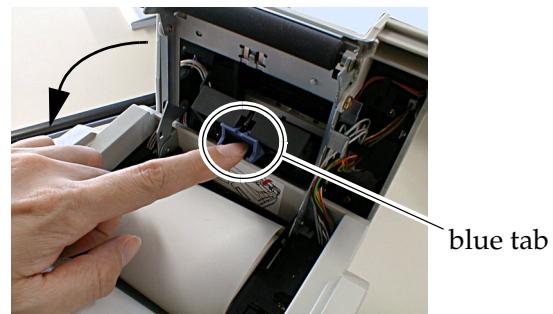
Do not use a cleaning sheet more than once.

4.1.2.5 Command mode

1. Send the cleaning command to the printer.
2. Perform steps 8 and 9, as described in self mode.

4.1.2.6 Cleaning the Card Image Scanner

The glass part of the scanner may become dirty due to ink or paper dust, which can decrease the image quality. To avoid this, clean the glass part every 12 months.



1. Open the roll paper cover.
2. Push the blue tab down in the direction indicated by the arrow and pull it toward you to open the card feed path.
3. Wipe the glass gently with a soft, dry cloth.

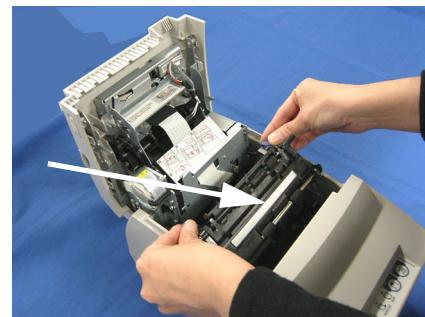
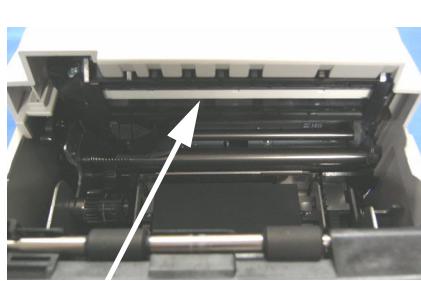


Note:

When cleaning the scanner glass, do not use any liquid, such as detergent, benzine, or water.

Liquids can reach the back of the scanner glass and cause it to become dirty. If the scanner glass has foreign matter that is hard to remove, such as oil or grease, you can wet a cloth a little with alcohol and wipe the scanner glass, but never put any liquid directly on the scanner glass.

4.1.2.7 Cleaning the Slip Image Scanner



The glass part of the scanner (indicated by the arrows in the illustration) may become dirty due to ink or paper dust, which can decrease the image quality. To avoid this, clean the glass part every 12 months.

1. Open the unit cover.
2. Inside the printer, push the levers backward to open the unit.
3. Wipe the glass gently with a soft, dry cloth.

4.2 Troubleshooting

4.2.1 Removing a Paper Jam

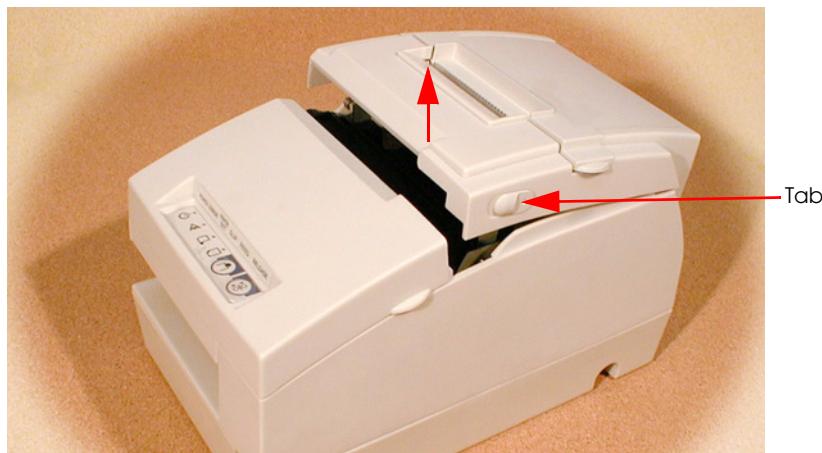


CAUTION:

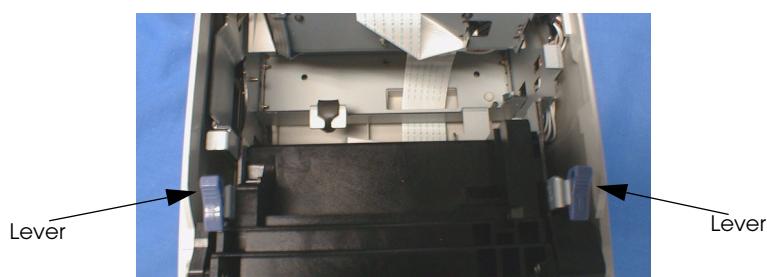
Do not touch the paper feed motor because it can be very hot.

If the paper is jammed in the paper roll section, turn the printer off. Next, open the paper roll cover. Then remove the jammed paper and put the roll back in the printer and close the cover.

If the paper is jammed in the slip section, turn off the printer and remove the jammed paper and use a fresh sheet. If you cannot remove the jammed paper easily, open the unit cover. Move the tabs on the sides of the cover forward and then lift the cover, as shown below.



Push the levers backward to open the unit as shown below, and then remove the jammed paper.



If the paper roll cover cannot be opened because paper is caught in the autocutter in the receipt section, follow the instructions in the autocutter section below.

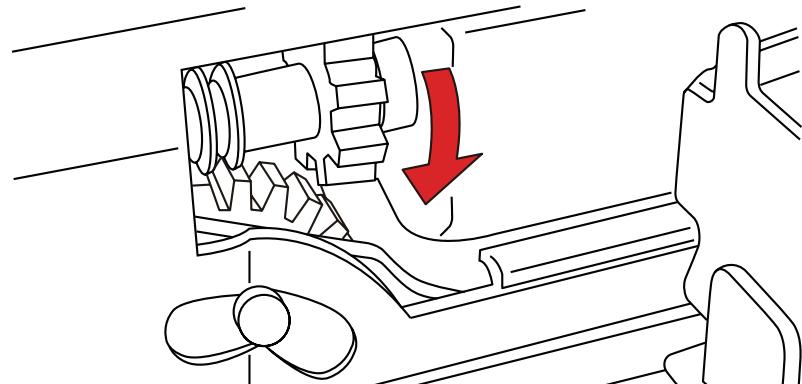
4.2.2 Autocutter Jam

If a foreign object such as a push pin or paper clip drops in the autocutter and causes the auto cutter to lock up, the printer enters an error state and begins the recovery operation automatically.

If the problem is not serious, the autocutter returns to its normal position without any intervention by the user.

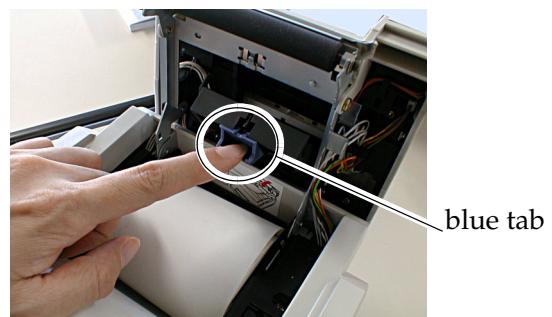
If the autocutter does not return to its normal position by itself, follow the steps below to correct the problem:

1. If the paper roll cover cannot be opened because paper is caught in the autocutter in the receipt section, open the unit cover. Move the tabs on the sides of the cover forward and then lift the cover, as shown on the previous page.
2. Following the instructions on the label inside the printer, turn the knob until you see a pin in the opening, as shown in the illustration below. This returns the cutter blade to the normal position.



3. Close the unit cover.

4.2.3 Card Jam



4.2.4 LED Blinking Pattern

4.2.4.1 Error Types

The printer stops all printer operations for the selected paper section, goes offline, and blinks the ERROR LED when detecting an error.

- Errors that automatically recover

ERROR	Description	ERROR LED Blinking Pattern	Recovery
Print head temperature error	The temperature of the thermal print head is extremely high	 320 ms	Recovers automatically when the print head cools



Note:

Print head temperature error is not abnormal.

- Errors that have the possibility of recovery:

When a recoverable error occurs, after the cause of the error is removed, the printer can recover from the error by transmitting error recovery command without turning off the power:

ERROR	Description	ERROR LED Blinking Pattern	Recovery
Autocutter error	The autocutter does not work correctly		Recovers by error recovery command
Home position detection error	The home position cannot be detected due to a paper jam		Recovers by error recovery command
Carriage detection error	The carriage is malfunctioning due to a paper jam, etc.		Recovers by error recovery command
Paper roll cover open error	Printing on the paper roll is not performed correctly due to a paper roll cover open or unit cover open		Recovers by error recovery command with the cover closed
Slip ejection error	The slip is not ejected when the printer feeds a specified amount of paper		Recovers by error recovery command
Unit cover open error	Printing on the paper roll or on the slip is not performed correctly due to a unit cover open and front cover open		When bit 8 of memory switch 8 is set to OFF: Recovers by closing the unit cover When bit 8 of memory switch 8 is set to ON: Recovers by error recovery command

See "Removing a Paper Jam" (page 4-4) for removing a paper jam.

**Note:**

When the printer recovers from an error using error recovery command while slip paper is selected, the printer first ejects the slip. A error recovery command do loading paper additionally. However, when the printer recovers from a slip ejection error, the printer only ejects the slip and does not load paper.

- Errors that are impossible to recover:

Call your dealer to repair the printer.

ERROR	Description	ERROR LED Blinking Pattern 	Recovery
R/W error in memory or gate array	After R/W checking, the printer does not work correctly. Writing to, reading out, or erasing the NV memory for image scanning results does not work correctly.		Impossible to recover
High voltage error	The power supply voltage is extremely high		Impossible to recover
Low voltage error	The power supply voltage is extremely low		Impossible to recover
CPU execution error	The CPU executes an incorrect address or I/F board is not connected		Impossible to recover
Control circuit board error	There is an abnormality in the print head temperature, thermistor is detected incorrectly or thermistor wiring is not connected or the endorsement printer is broken or the lever driving motor is broken, or the image scanner operation is not correct		Impossible to recover

4.2.5 Blinking pattern of Card panel LED

The Card panel ERROR LED flashes, the error have the possibility of recovery:

State	Description	ERROR LED Blinking Pattern 	Recovery
Card ljection error	This error is caused by card jam.		Fix the card jam according to the desription of "Card Jam"on page 5-5 by youself, then transmit a recovery command.

4.2.6 Printer prints “?” or Incorrect Data With Serial Interface

If one of the following errors occurs during serial interface communication, the printer prints “?” or ignores the data, depending on the setting of DIP switch 1-1.

- Parity error
- Framing error
- Overrun error



Note:

For other errors, we recommend confirming the transmission setting of DIP switch 1-3: Handshaking.

4.2.7 Hexadecimal Dump

This feature allows experienced users to see exactly what data is coming to the printer. This can be useful in finding software problems. When you turn on the hex dump function, the printer prints all commands and other data in hexadecimal format, along with a guide section to help you find specific commands.

To use the hex dump feature, follow these steps:

1. After you make sure the printer is off, open the paper roll cover.
2. Hold down the FEED button while you turn on the printer.
3. Close the cover.
4. Run any software program that sends data to the printer. The printer prints “Hexadecimal Dump” and then all the codes it receives in a two-column format. The first column contains the hexadecimal codes and the second column gives the ASCII characters that correspond to the codes. Part of a hexadecimal dump is shown below:

Hexadecimal Dump

**To terminate hexadecimal dump,
press FEED button three times.**

```
1B 21 00 1B 26 02 40 40      . ! . . & . @ @  
1B 25 01 1B 63 34 00 1B      . % . . c 4 .  
41 42 43 44 45 46 47 48      A B C D E F G H
```

- A period (.) is printed for each code that has no ASCII equivalent.
- In hex dump mode all commands except real time ESC/POS commands are disabled.

5. Open the cover to set the printer offline so that it will print the last line.
6. Close the cover and turn off the printer, press the FEED button three times, or reset the printer to turn off the hex dump mode.



Note:

The hexadecimal dump mode can't be used with OPOS, APD, or JavaPOS.

Chapter 5

Application Development Information for UPOS

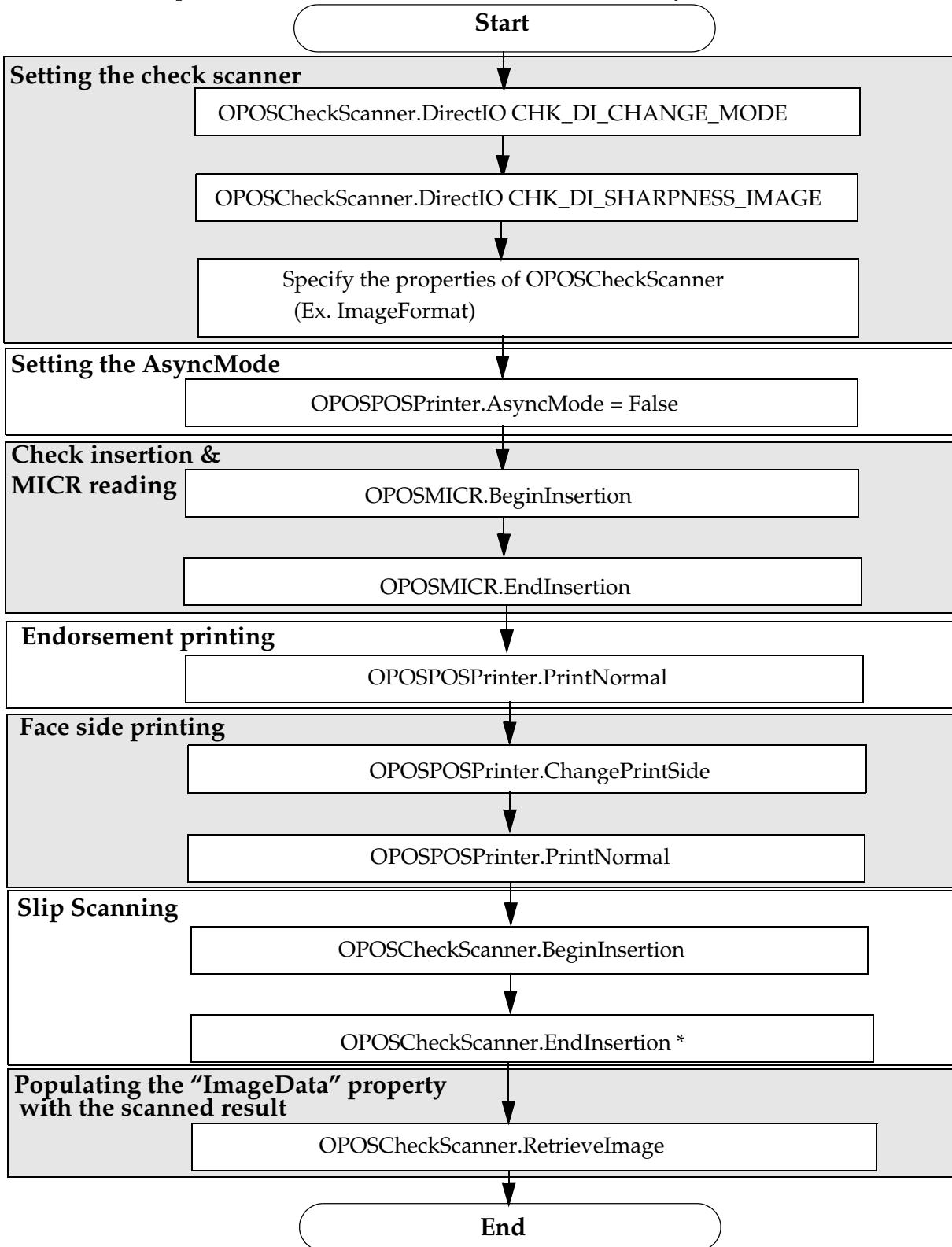
5.1 Single-pass processing

TM-H6000III with Image scanner can use Single-pass processing for check. The Single-pass processing for checks can process 4 actions without the check fliping and another inserting operation. The actions are as following.

- MICR reading
- Endorsement printing
- Face printing
- Check image scanning

5.1.1 Recommended Flow

The recommended flow of the Single-pass processing is shown below. It is explained for OPOS. You need to replace it with JavaPOS or OPOS for .NET if necessary.



* you may execute the prescan at the check scanner's EndInsertion by "CHK_DI_ENDINSERTION_EXTENDED."

5.1.2 Sample Program

Below is an example of how to use Slip & MICR & Slip image scanner Combination with OPOS ADK Ver.2.30 or later. This program is based upon the description "5.1.1 Recommended Flow (page 5-2)"

```

Private Sub Command1_Click()
    Dim strDum As String
    Dim IDum As Long
    Dim iDum As Integer

    Dim IDataSize As Long

    strDum = ""      'initialize

    With OPOSCheckScanner1
        'Selects the slip scanner
        IDum = CHK_DI_MODE_CHECKSCANNER
        .DirectIO CHK_DI_CHANGE_MODE, IDum, strDum

        'This sample scans an image with Bi-tonal format
        iDum = CHK_CL_MONO
        .Color = iDum

        'This sample selects JPEG format for image data
        iDum = CHK_IF_JPEG
        .ImageFormat = iDum

        'selects the "sharpness" process is enabled
        IDum = CHK_DI_SHARPNESS_ON
        .DirectIO CHK_DI_SHARPNESS_IMAGE, IDum, strDum

        'If you would like to specify other properties of
        'the OPOSCheckScanner, specify this timing.
        End With
    
```

Setting the check scanner


```

        OPOSPOSPrinter1.AsyncMode = False      'For slip printing
    
```

Setting the AsyncMode


```

        'Paper preparation procedure
        While OPOSMICR1.BeginInsertion(3000) = OPOS_E_TIMEOUT
            MsgBox "Please insert a check."
            DoEvents
        Wend
        OPOSMICR1.EndInsertion
    
```

Check insertion & MICR reading


```

    ****
    'This sample omits the MICR character reading result process.
    ****

```

(To be continue to the next page)

```

With OPOSPOSPrinter1
    'Endorsement Printing
    .PrintNormal PTR_S_SLIP, Chr(&H1B) & "Endorsement Printing" & vbLf
    'Change of the printing side & face printing
    .ChangePrintSide PTR_PS_SIDE1
    .PrintNormal PTR_S_SLIP, Chr(&H1B) & " Slip Printing" & vbLf
End With

'Scans the check image
With OPOSCheckScanner1

    '.ClearInput
    'Ready to fired event
    .DataEventEnabled = True

    'Add timeout function.
    While .BeginInsertion(3000) = OPOS_E_TIMEOUT
        MsgBox "Please insert a check."
        DoEvents
    Wend

    'Set paper & Scanning
    .EndInsertion

    'Call to retrieve an image to the ImageData property
    .RetrieveImage CHK_CROP_AREA_ENTIRE_IMAGE

End With
End Sub

```

Endorsement printing

Printing side change & face printing

Slip scanning

Populating the Image data



Note:

Process the image data using the "ImageData" property for the porpuse of your application program.

When you scan a check with 256-level gray scale data format, you don't need the prescanning.

This check image scanning doesn't require "BeginRemoval" and "EndRemoval" methods.

After execution each method, confirm the "Result code," and necessary of an Error processing.

About detail of methods and properties, see "OPOS APG," and "EPSON OPOS Application Development Guide (Generarl Information, Common Information, Check Scanner)."

Chapter 6

Application Development Information for APD

You can program the following functions for the application using the APD.



Note:

For details of development, see the APD Manuals and the sample programs.
(See "Downloading Drivers, Utilities, and Manuals" on page 4.)

- Can print a barcode and 2D-Code.
- Can print graphics such as shop logos and bitmap files.
- Can program the following functions using the Status API.
 - Check the printer status such as offline and printing, and also check the status with maintenance counters.
 - Open the drawer, and also check the drawer status.
 - Use MICR and scanner functions.
 - Retouch scanned image data.
- Can change the APD settings by using the Devmode API. The following settings can be changed.
 - Paper Size
 - Rotate
 - Paper Conservation
 - Input Unit
 - Paper Source
 - Printing Speed
 - True Type Font Substitution

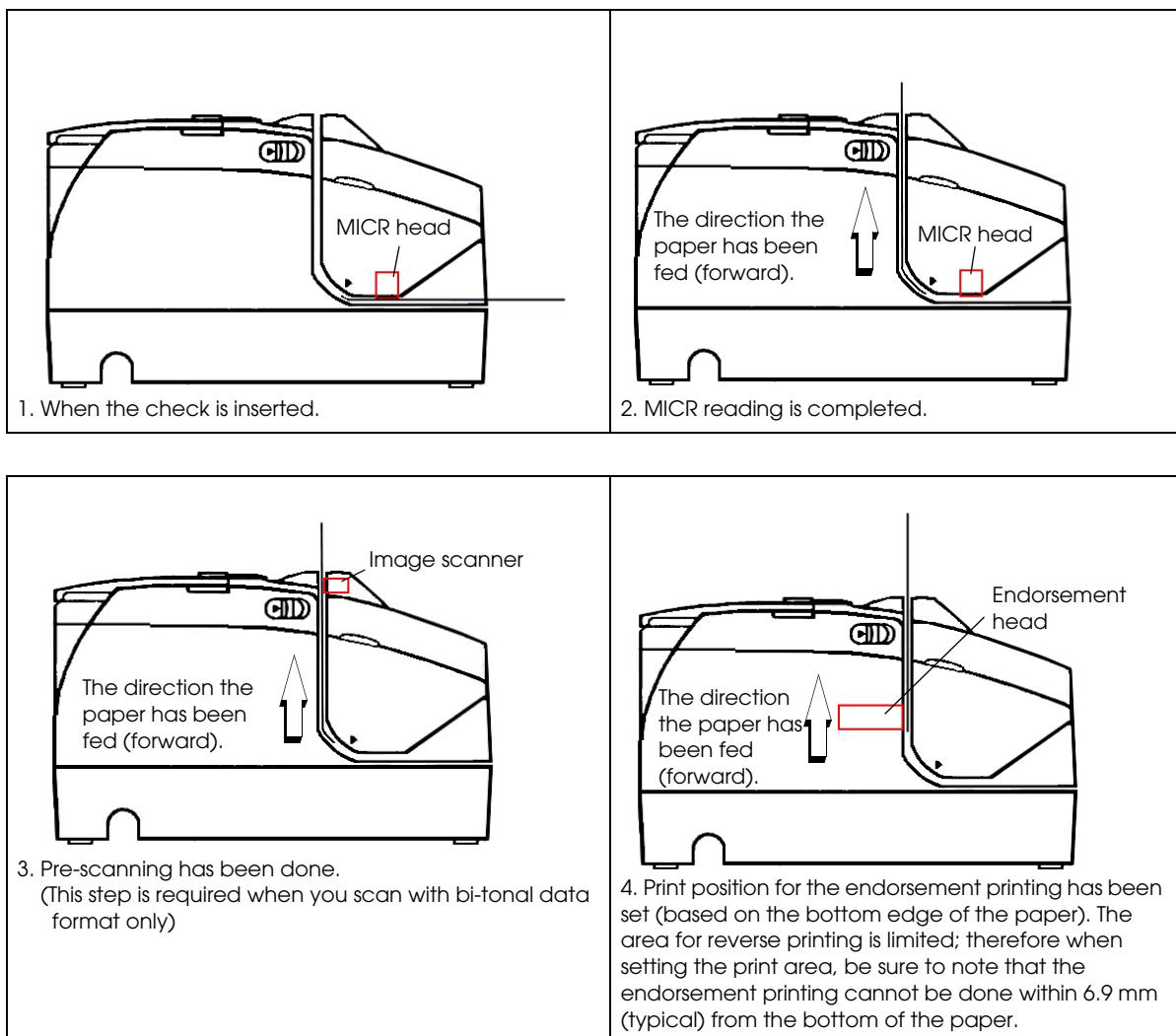
Chapter 7

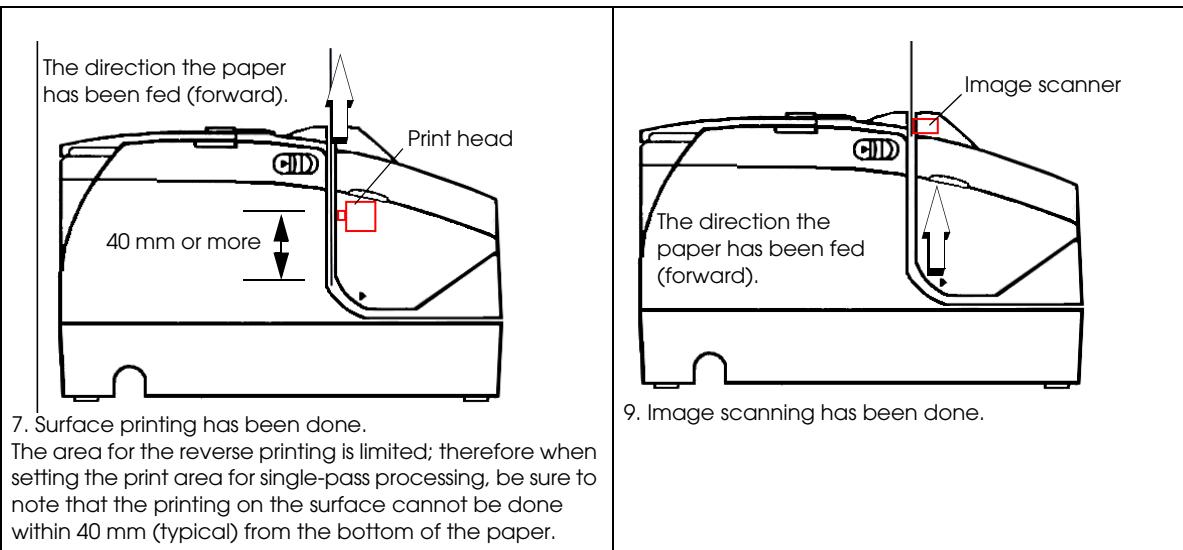
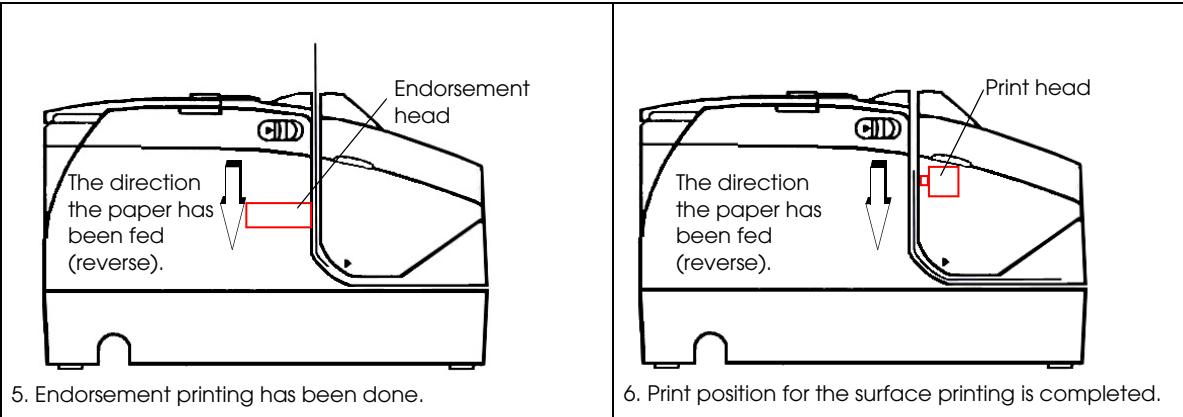
Application Development for Image Scanner

This section explains key words in a question and answer format and the single-pass processing for developing a system with the TM-H6000III with the image scanner.

7.1 The flow of single pass processing

The following figures introduce you to “smart pass processing.” This processing provides you MICR reading, slip printing (face & endorsement), and scanning a check with one time insertion.



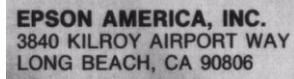
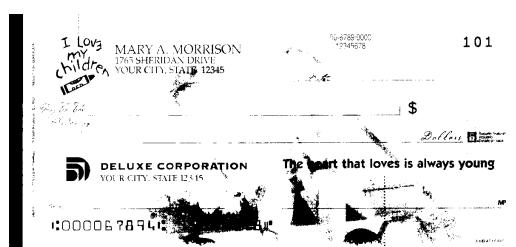
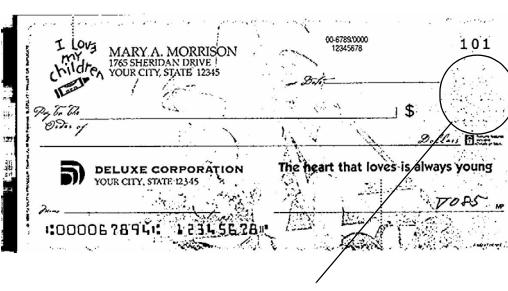


7.2 Sharpness Function

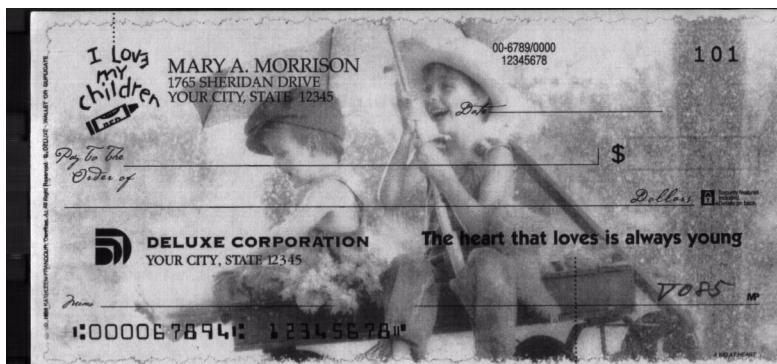
7.2.1 What is sharpness?

Sharpness is a process to improve the readability of scanned image data.

- When sharpness is specified for 256-level gray scale image data, the readability of small characters is improved by emphasizing the edges.
- When sharpness is specified for bitonal (black/white) image data, the readability of characters is improved because the edges of characters on dark backgrounds are emphasized to separate the character from the background.

	Scanned result when sharpness is disabled	Scanned result when sharpness is enabled
256-level gray scale		
Bi-tonal data (black / white)		 <p>An example of surplus dots</p>

- For your reference, the original check for the examples above for bitonal data is shown below without sharpness applied.



However, the sharpness processing may have the opposite effect for bitonal (black/white) data with a finely detailed background:

- The Image data quality may be severely reduced, as shown in the above example: (there may be surplus dots)
- The usual compression rate may not be possible.

7.3 Comparison Tables

7.3.1 Interface and performance comparison table

The following table indicates environmental aptitudes for scanning function.

Environment	Image scanning with TIFF (Slip)	Image scanning with JPEG (Slip)	Image scanning with JPEG (Card)
Serial (19,200 bps)	B	B	B
Serial (38,400 bps)	A	B	B
Parallel	B	B	B
USB (USB interface board for This printer; Ex. UB-U05 / UB-U06/ UB-U19)	A(*1)	A (*1)	A (*1)
Ethernet (UB-E series; Ex. UB-E02)	B	B	B



Note:

A: It is recommended

B: Confirm the required time to transmit stored data in your environment.

(*1) Use a USB interface with OPOS, JavaPOS or APD.

(*2) Please contact Epson about the condition.

7.3.2 Function vs. control method comparison table

The following table indicates enabled functions for each control method.

Function	ESC/POS	APD	OPOS / OPOS for .NET	JavaPOS
Auto Size	Disabled	Enabled	Enabled	Enabled
Cropping (according to UPOS) (*1)	Enabled	Enabled	Enabled	Enabled
Filtering (*1)	Enabled	Enabled	Enabled	Enabled
Sharpness	Enabled	Enabled	Enabled	Enabled
Image Rotation (90°)	Disabled	Enabled	Enabled	Enabled
Full Rimless	Disabled	Enabled	Enabled	Enabled
Storage function for host PC (function for OPOS)	Disabled	Enabled	Enabled	Enabled



Note:

(*1) *Cropping function: The function cuts out necessary parts from a image data.*

Filtering function: The function masks unnecessary parts of a image data with white color.

Functions supported by OPOS differ depending on the version of OPOS. See the OPOS Manual for details.

Appendix A

Character Code Tables**A.1 Page 0 (PC437: USA, Standard Europe)**

(International Character Set: USA)

	HEX	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
HEX BIN	00000	00000	00010	00100	01000	01100	01110	10000	10001	10100	10110	11000	11010	11100	11110	11111	
0	NULL	00	NULL	DE	SP	O	@	P	64	80	96	P	C	E	a	L	L
1	00011	01	XON	!	1	A	Q	a	q	ü	ü	112	128	144	160	176	192
2	00110	02	"	2	B	R	b	r	é	ó	ó	113	129	145	161	177	193
3	00111	03	XOFF	#	3	C	S	c	s	á	á	65	81	97	115	131	147
4	01000	04	EOT	DC4	\$	4	D	T	á	ä	ä	66	82	98	114	130	146
5	01010	05	ENQ	%	5	E	U	e	u	à	à	68	84	100	116	132	148
6	01100	06	&	6	F	V	f	v	å	å	å	69	85	101	117	133	149
7	01111	07	,	7	G	W	g	w	å	å	å	70	86	102	118	134	150
8	10000	08	BS	CAN	(8	H	X	h	x	é	71	87	103	119	135	151
9	10011	09	HT)	9	I	Y	i	y	é	ý	72	88	104	120	136	152
A	10100	10	LF	*	:	J	Z	j	z	é	é	73	89	105	121	137	153
B	10111	11	ESC	+	K	[]	k	{	í	í	74	90	106	122	138	154
C	11000	12	FF	,	<	L	/	l	;	í	í	75	91	107	123	139	155
D	11011	13	GS	-	M]	m	}	í	í	í	76	92	108	124	140	156
E	11100	14	FS	.	<	N	~	n	í	í	í	77	93	109	125	141	157
F	11111	15	CR	/	?	O	?	o	í	í	í	78	94	110	126	142	158

NOTE: Character code tables show only character configurations, not the actual print pattern.

A.2 Page 1 (Katakana)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	-	一	SP	-	タ	ミ	=	×
		[128]	[144]	[160]	[176]	[192]	[208]	[224]	[240]
1	0001	-	ト	。	ア	チ	ム	フ	円
		[129]	[145]	[161]	[177]	[193]	[209]	[225]	[241]
2	0010	-	ト	」	イ	ツ	メ	ヰ	年
		[130]	[146]	[162]	[178]	[194]	[210]	[226]	[242]
3	0011	-	ト	」	ウ	テ	モ	ヰ	月
		[131]	[147]	[163]	[179]	[195]	[211]	[227]	[243]
4	0100	■	、	エ	ト	ヤ	△	日	
		[132]	[148]	[164]	[180]	[196]	[212]	[228]	[244]
5	0101	■	-	オ	ナ	ユ	◆	時	
		[133]	[149]	[165]	[181]	[197]	[213]	[229]	[245]
6	0110	■	।	ヲ	カ	ニ	ヨ	▼	分
		[134]	[150]	[166]	[182]	[198]	[214]	[230]	[246]
7	0111	■	।	ア	キ	ヌ	ラ	◆	秒
		[135]	[151]	[167]	[183]	[199]	[215]	[231]	[247]
8	1000	।	フ	イ	ク	ネ	リ	♠	〒
		[136]	[152]	[168]	[184]	[200]	[216]	[232]	[248]
9	1001	।	ト	ウ	ケ	ノ	ル	♥	市
		[137]	[153]	[169]	[185]	[201]	[217]	[233]	[249]
A	1010	।	フ	エ	コ	ハ	レ	♦	区
		[138]	[154]	[170]	[186]	[202]	[218]	[234]	[250]
B	1011	।	ト	オ	サ	ヒ	ロ	♣	町
		[139]	[155]	[171]	[187]	[203]	[219]	[235]	[251]
C	1100	।	フ	ヤ	シ	フ	ワ	●	村
		[140]	[156]	[172]	[188]	[204]	[220]	[236]	[252]
D	1101	।	フ	ユ	ス	ヘ	ン	○	人
		[141]	[157]	[173]	[189]	[205]	[221]	[237]	[253]
E	1110	।	フ	ヨ	セ	ホ	・	/	
		[142]	[158]	[174]	[190]	[206]	[222]	[238]	[254]
F	1111	+	ノ	ツ	ソ	マ	・	＼	SP
		[143]	[159]	[175]	[191]	[207]	[223]	[239]	[255]

A.3 Page 2 (PC850: Multilingual)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	ç	é	á	í	ł	š	ó	-
		[128]	[144]	[160]	[176]	[192]	[208]	[224]	[240]
1	0001	ü	æ	í	í	ł	đ	þ	±
		[129]	[145]	[161]	[177]	[193]	[209]	[225]	[241]
2	0010	é	æ	ó	ó	ł	ê	ô	-
		[130]	[146]	[162]	[178]	[194]	[210]	[226]	[242]
3	0011	â	ô	ú	í	ł	ë	ò	$\frac{3}{4}$
		[131]	[147]	[163]	[179]	[195]	[211]	[227]	[243]
4	0100	ä	ö	ñ	ñ	-	è	ð	¶
		[132]	[148]	[164]	[180]	[196]	[212]	[228]	[244]
5	0101	à	ò	ñ	á	+	í	õ	§
		[133]	[149]	[165]	[181]	[197]	[213]	[229]	[245]
6	0110	å	û	ä	å	ä	í	µ	÷
		[134]	[150]	[166]	[182]	[198]	[214]	[230]	[246]
7	0111	ç	ù	ó	å	å	î	þ	,
		[135]	[151]	[167]	[183]	[199]	[215]	[231]	[247]
8	1000	ê	ÿ	ç	ç	ł	ï	þ	°
		[136]	[152]	[168]	[184]	[200]	[216]	[232]	[248]
9	1001	ë	ö	®	®	ł	ú	ú	..
		[137]	[153]	[169]	[185]	[201]	[217]	[233]	[249]
A	1010	è	ü	-		ł	ö	ü	.
		[138]	[154]	[170]	[186]	[202]	[218]	[234]	[250]
B	1011	í	ø	$\frac{1}{2}$	¶	ł	í	ù	¹
		[139]	[155]	[171]	[187]	[203]	[219]	[235]	[251]
C	1100	î	£	$\frac{1}{4}$	»	ł	í	ý	$\frac{3}{4}$
		[140]	[156]	[172]	[188]	[204]	[220]	[236]	[252]
D	1101	ì	ø	i	¢	-	í	ÿ	$\frac{2}{4}$
		[141]	[157]	[173]	[189]	[205]	[221]	[237]	[253]
E	1110	Ä	×	«	¥	+	ì	í	■
		[142]	[158]	[174]	[190]	[206]	[222]	[238]	[254]
F	1111	À	f	»	¬	¤	—	,	SP
		[143]	[159]	[175]	[191]	[207]	[223]	[239]	[255]

A.4 Page 3 (PC860: Portuguese)

	HEX	8	9	A -	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	ç	é	á	â	í	ú	à	=
		[128]	[144]	[160]	[176]	[192]	[208]	[224]	[240]
1	0001	ü	À	í	è	ó	ñ	ß	±
		[129]	[145]	[161]	[177]	[193]	[209]	[225]	[241]
2	0010	é	À	ó	ê	ó	í	ô	≥
		[130]	[146]	[162]	[178]	[194]	[210]	[226]	[242]
3	0011	â	ò	ú	ô	í	ñ	π	≤
		[131]	[147]	[163]	[179]	[195]	[211]	[227]	[243]
4	0100	ã	õ	ñ	ñ	ñ	-	Σ	÷
		[132]	[148]	[164]	[180]	[196]	[212]	[228]	[244]
5	0101	à	ò	ñ	ñ	ñ	+	σ	ј
		[133]	[149]	[165]	[181]	[197]	[213]	[229]	[245]
6	0110	Á	Ú	á	á	í	í	μ	÷
		[134]	[150]	[166]	[182]	[198]	[214]	[230]	[246]
7	0111	ç	ù	ó	ó	í	í	τ	≈
		[135]	[151]	[167]	[183]	[199]	[215]	[231]	[247]
8	1000	ê	ì	¿	¿	í	í	Φ	°
		[136]	[152]	[168]	[184]	[200]	[216]	[232]	[248]
9	1001	Ê	Ó	Ó	Ó	í	í	θ	•
		[137]	[153]	[169]	[185]	[201]	[217]	[233]	[249]
A	1010	è	Ü	-	í	í	í	Ω	•
		[138]	[154]	[170]	[186]	[202]	[218]	[234]	[250]
B	1011	Í	¢	½	½	í	í	δ	√
		[139]	[155]	[171]	[187]	[203]	[219]	[235]	[251]
C	1100	Ô	£	¼	¼	í	í	∞	n
		[140]	[156]	[172]	[188]	[204]	[220]	[236]	[252]
D	1101	Ì	Ù	i	i	í	í	ø	²
		[141]	[157]	[173]	[189]	[205]	[221]	[237]	[253]
E	1110	Ã	Pt	«	»	í	í	≡	■
		[142]	[158]	[174]	[190]	[206]	[222]	[238]	[254]
F	1111	Â	Ó	»	í	í	í	SP	255
		[143]	[159]	[175]	[191]	[207]	[223]	[239]	

A.5 Page 4 (PC863: Canadian-French)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	ç [128]	é [144]	í [160]	ó [176]	ł [192]	ł [208]	à [224]	≡ [240]
1	0001	ü [129]	è [145]	' [161]	ó [177]	ł [193]	ł [209]	þ [225]	± [241]
2	0010	é [130]	ê [146]	ó [162]	ó [178]	ł [194]	ł [210]	Γ [226]	≥ [242]
3	0011	â [131]	ô [147]	ú [163]	í [179]	ł [195]	ł [211]	π [227]	≤ [243]
4	0100	Ā [132]	Ē [148]	" [164]	“ [180]	- [196]	ł [212]	Σ [228]	ƒ [244]
5	0101	à [133]	ï [149]	„ [165]	„ [181]	+	ƒ [213]	σ [229]	j [245]
6	0110	¶ [134]	û [150]	³ [166]	॥ [182]	ƒ [198]	ƒ [214]	μ [230]	÷ [246]
7	0111	ç [135]	ù [151]	— [167]	— [183]	+	+	τ [231]	≈ [247]
8	1000	ê [136]	œ [152]	î [168]	” [184]	ł [200]	+	Φ [232]	° [248]
9	1001	ë [137]	ö [153]	— [169]	— [185]	ƒ [201]	— [217]	θ [233]	• [249]
A	1010	è [138]	ü [154]	— [170]	— [186]	ł [202]	— [218]	Ω [234]	· [250]
B	1011	ï [139]	ɸ [155]	½ [171]	— [187]	ł [203]	■ [219]	δ [235]	√ [251]
C	1100	î [140]	£ [156]	¼ [172]	— [188]	ƒ [204]	■ [220]	∞ [236]	n [252]
D	1101	— [141]	Ù [157]	¾ [173]	— [189]	— [205]	■ [221]	ø [237]	z [253]
E	1110	À [142]	Û [158]	« [174]	— [190]	+	■ [222]	€ [238]	■ [254]
F	1111	§ [143]	f [159]	» [175]	— [191]	— [207]	■ [223]	∩ [239]	SP [255]

A.6 Page 5 (PC865: Nordic)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	ç	é	á	í	ł	ł	ą	=
		[128]	[144]	[160]	[176]	[192]	[208]	[224]	[240]
1	0001	ü	æ	í	ó	ł	ł	þ	±
		[129]	[145]	[161]	[177]	[193]	[209]	[225]	[241]
2	0010	é	æ	ó	ú	ł	ł	ł	≥
		[130]	[146]	[162]	[178]	[194]	[210]	[226]	[242]
3	0011	â	ô	ú	í	ł	ł	π	≤
		[131]	[147]	[163]	[179]	[195]	[211]	[227]	[243]
4	0100	ä	ö	ñ	í	-	ł	Σ	ƒ
		[132]	[148]	[164]	[180]	[196]	[212]	[228]	[244]
5	0101	à	ò	ñ	í	+	ł	σ	j
		[133]	[149]	[165]	[181]	[197]	[213]	[229]	[245]
6	0110	å	û	ä	í	ł	ł	μ	÷
		[134]	[150]	[166]	[182]	[198]	[214]	[230]	[246]
7	0111	ç	ù	ö	í	ł	ł	τ	≈
		[135]	[151]	[167]	[183]	[199]	[215]	[231]	[247]
8	1000	ê	ÿ	ç	í	ł	+	Φ	°
		[136]	[152]	[168]	[184]	[200]	[216]	[232]	[248]
9	1001	ë	ö	—	í	ł	ł	θ	•
		[137]	[153]	[169]	[185]	[201]	[217]	[233]	[249]
A	1010	è	ü	—	í	ł	ł	Ω	·
		[138]	[154]	[170]	[186]	[202]	[218]	[234]	[250]
B	1011	ï	ø	½	í	ł	ł	δ	√
		[139]	[155]	[171]	[187]	[203]	[219]	[235]	[251]
C	1100	î	£	¼	í	ł	ł	∞	n
		[140]	[156]	[172]	[188]	[204]	[220]	[236]	[252]
D	1101	ì	ø	i	í	—	ł	ø	²
		[141]	[157]	[173]	[189]	[205]	[221]	[237]	[253]
E	1110	Ä	Pt	«	í	—	ł	€	■
		[142]	[158]	[174]	[190]	[206]	[222]	[238]	[254]
F	1111	Å	f	¤	í	—	ł	∩	SP
		[143]	[159]	[175]	[191]	[207]	[223]	[239]	[255]

A.7 Page 16 (WPC1252)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	€	SP	SP	·	À	Đ	à	ð
		[128]	[144]	[160]	[176]	[192]	[208]	[224]	[240]
1	0001	SP	'	í	±	Á	Ñ	á	ñ
		[129]	[145]	[161]	[177]	[193]	[209]	[225]	[241]
2	0010	,	‘	¢	’	À	Ò	â	ò
		[130]	[146]	[162]	[178]	[194]	[210]	[226]	[242]
3	0011	f	“	£	”	Ã	Ó	ã	ó
		[131]	[147]	[163]	[179]	[195]	[211]	[227]	[243]
4	0100	"	"	¤	-	Ä	Ö	ä	ö
		[132]	[148]	[164]	[180]	[196]	[212]	[228]	[244]
5	0101	...	·	¥	µ	Å	Ø	å	ø
		[133]	[149]	[165]	[181]	[197]	[213]	[229]	[245]
6	0110	†	-	:	¶	Æ	Ö	æ	ö
		[134]	[150]	[166]	[182]	[198]	[214]	[230]	[246]
7	0111	‡	-	§	-	Ç	×	ç	+
		[135]	[151]	[167]	[183]	[199]	[215]	[231]	[247]
8	1000	^	-	..	-	È	Ø	è	ø
		[136]	[152]	[168]	[184]	[200]	[216]	[232]	[248]
9	1001	%	™	©	¹	É	Ù	é	ù
		[137]	[153]	[169]	[185]	[201]	[217]	[233]	[249]
A	1010	Š	š	·	°	Ê	Ú	ê	ú
		[138]	[154]	[170]	[186]	[202]	[218]	[234]	[250]
B	1011	‘	’	«	»	È	Û	ë	û
		[139]	[155]	[171]	[187]	[203]	[219]	[235]	[251]
C	1100	Œ	œ	-	%	Ì	Ü	ì	ü
		[140]	[156]	[172]	[188]	[204]	[220]	[236]	[252]
D	1101	SP	SP	-	%	Í	Ý	í	ý
		[141]	[157]	[173]	[189]	[205]	[221]	[237]	[253]
E	1110	Ž	ž	®	%	Î	Þ	í	þ
		[142]	[158]	[174]	[190]	[206]	[222]	[238]	[254]
F	1111	SP	¥	-	¸	Ï	ß	ï	ÿ
		[143]	[159]	[175]	[191]	[207]	[223]	[239]	[255]

A.8 Page 17 (PC866: Cyrillic2)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	А 128	Р 144	а 160	и 176	ц 192	ш 208	р 224	Ё 240
1	0001	Б 129	С 145	б 161	и 177	ч 193	ш 209	с 225	ě 241
2	0010	В 130	Т 146	в 162	и 178	т 194	ш 210	т 226	€ 242
3	0011	Г 131	У 147	г 163	и 179	н 195	ш 211	у 227	ε 243
4	0100	Д 132	Ф 148	д 164	и 180	н 196	ш 212	ф 228	ї 244
5	0101	Е 133	Х 149	е 165	и 181	н 197	ш 213	х 229	і 245
6	0110	Ж 134	Ц 150	ж 166	и 182	н 198	ш 214	ц 230	Ӵ 246
7	0111	З 135	Ч 151	з 167	и 183	н 199	ш 215	ч 231	ӹ 247
8	1000	И 136	Ш 152	и 168	и 184	и 200	и 216	и 232	• 248
9	1001	Й 137	Щ 153	й 169	и 185	и 201	и 217	и 233	• 249
A	1010	К 138	҃ 154	к 170	и 186	и 202	и 218	и 234	• 250
B	1011	Л 139	Ы 155	л 171	и 187	и 203	и 219	и 235	✓ 251
C	1100	М 140	҂ 156	м 172	и 188	и 204	и 220	и 236	№ 252
D	1101	Н 141	҃ 157	н 173	и 189	и 205	и 221	и 237	□ 253
E	1110	О 142	Ю 158	о 174	и 190	и 206	и 222	и 238	■ 254
F	1111	П 143	Я 159	и 175	и 191	и 207	и 223	и 239	SP 255

A.9 Page 18 (PC852: Latin2)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	ç	é	á	í	ú	đ	ó	-
		[128]	[144]	[160]	[176]	[192]	[208]	[224]	[240]
1	0001	ü	ł	í	ó	đ	đ	þ	"
		[129]	[145]	[161]	[177]	[193]	[209]	[225]	[241]
2	0010	é	í	ó	á	í	đ	ô	,
		[130]	[146]	[162]	[178]	[194]	[210]	[226]	[242]
3	0011	â	ô	ú	í	h	ë	ñ	·
		[131]	[147]	[163]	[179]	[195]	[211]	[227]	[243]
4	0100	ä	ö	å	h	í	đ	ń	~
		[132]	[148]	[164]	[180]	[196]	[212]	[228]	[244]
5	0101	ú	ł	ä	á	í	ñ	ň	§
		[133]	[149]	[165]	[181]	[197]	[213]	[229]	[245]
6	0110	ć	ĩ	ž	â	ă	í	š	÷
		[134]	[150]	[166]	[182]	[198]	[214]	[230]	[246]
7	0111	ç	ś	ż	ě	á	í	ş	,
		[135]	[151]	[167]	[183]	[199]	[215]	[231]	[247]
8	1000	ł	ś	ę	ş	í	ě	ŕ	·
		[136]	[152]	[168]	[184]	[200]	[216]	[232]	[248]
9	1001	ě	ö	ę	í	í	ú	ú	-
		[137]	[153]	[169]	[185]	[201]	[217]	[233]	[249]
A	1010	ö	ü	í	í	í	í	í	·
		[138]	[154]	[170]	[186]	[202]	[218]	[234]	[250]
B	1011	ö	ť	ž	í	í	ú	ú	ü
		[139]	[155]	[171]	[187]	[203]	[219]	[235]	[251]
C	1100	î	ť	č	í	í	ý	ŕ	·
		[140]	[156]	[172]	[188]	[204]	[220]	[236]	[252]
D	1101	ž	ł	š	ž	í	ý	ř	ř
		[141]	[157]	[173]	[189]	[205]	[221]	[237]	[253]
E	1110	ä	×	«	ž	í	ú	í	■
		[142]	[158]	[174]	[190]	[206]	[222]	[238]	[254]
F	1111	ć	č	»	í	í	í	sp	sp
		[143]	[159]	[175]	[191]	[207]	[223]	[239]	[255]

A.10 Page 19 (PC858: Euro)

	HEX	8	9	A	B	C	D	E	F
	HEX BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	ç	é	á	í	l	ñ	ó	-
		[128]	[144]	[160]	[176]	[192]	[208]	[224]	[240]
1	0001	ü	æ	í	í	í	đ	þ	±
		[129]	[145]	[161]	[177]	[193]	[209]	[225]	[241]
2	0010	é	æ	ó	ó	í	é	ö	-
		[130]	[146]	[162]	[178]	[194]	[210]	[226]	[242]
3	0011	â	ô	ú	í	í	ë	ö	$\frac{3}{4}$
		[131]	[147]	[163]	[179]	[195]	[211]	[227]	[243]
4	0100	ä	ö	ñ	í	-	è	ö	¶
		[132]	[148]	[164]	[180]	[196]	[212]	[228]	[244]
5	0101	à	ò	ñ	á	+	€	ö	§
		[133]	[149]	[165]	[181]	[197]	[213]	[229]	[245]
6	0110	å	û	á	â	â	í	µ	÷
		[134]	[150]	[166]	[182]	[198]	[214]	[230]	[246]
7	0111	ç	ù	ó	á	â	í	p	,
		[135]	[151]	[167]	[183]	[199]	[215]	[231]	[247]
8	1000	ê	ÿ	ç	ç	í	í	p	°
		[136]	[152]	[168]	[184]	[200]	[216]	[232]	[248]
9	1001	ë	ö	®	í	í	j	ú	..
		[137]	[153]	[169]	[185]	[201]	[217]	[233]	[249]
A	1010	è	ü	í	í	í	í	ú	.
		[138]	[154]	[170]	[186]	[202]	[218]	[234]	[250]
B	1011	ï	ø	½	í	í	■	ú	¹
		[139]	[155]	[171]	[187]	[203]	[219]	[235]	[251]
C	1100	î	£	¼	í	í	■	ý	³
		[140]	[156]	[172]	[188]	[204]	[220]	[236]	[252]
D	1101	ì	ø	i	¢	-	í	ý	²
		[141]	[157]	[173]	[189]	[205]	[221]	[237]	[253]
E	1110	À	x	«	¥	+	í	»	■
		[142]	[158]	[174]	[190]	[206]	[222]	[238]	[254]
F	1111	Ã	f	»	í	í	í	’	SP
		[143]	[159]	[175]	[191]	[207]	[223]	[239]	[255]

A.11 Page 254 (Space Page)

	HEX	8	9	A	B	C	D	E	F	
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111	
0	0000	SP 128	Ó 144	SP 160	0 176	@ 192	P 208	.	P 240	
1	0001	δ 129	μ 145	! 161	1 177	A 193	Q 209	a 224	q 241	
2	0010	Đ 130	þ 146	" 162	2 178	B 194	R 210	b 226	r 242	
3	0011	È 131	p 147	# 163	3 179	C 195	S 211	c 227	s 243	
4	0100	È 132	Ú 148	\$ 164	4 180	D 196	T 212	d 228	t 244	
5	0101	È 133	Ó 149	% 165	5 181	E 197	U 213	e 229	u 245	
6	0110	í 134	Ù 150	& 166	6 182	F 198	V 214	f 230	v 246	
7	0111	í 135	ÿ 151	,	7 183	G 199	W 215	g 231	w 247	
8	1000	í 136	ÿ 152	(168	8 184	H 200	X 216	h 232	x 248	
9	1001	í 137	± 153) 169	9 185	I 201	Y 217	i 233	y 249	
A	1010	Ó 138	÷ 154	* 170	:	J 202	Z 218	j 234	z 250	
B	1011	Þ 139	.	+	;	K 203	[219	k 235	{ 251	
C	1100	Ó 140	SP 156	,	< 172	L 204	\ 220	l 236	 252	
D	1101	Ó 141	SP 157	-	= 173	M 205] 221	m 237	}	253
E	1110	SP 142	SP 158	.	> 174	N 206	- 222	n 238	~ 254	
F	1111	Ó 143	SP 159	/	? 175	O 207	- 223	o 239	.	255

NOTE: Page 254 is supported only when printing on the face of a slip. When font A is selected, character codes 80H to FFH are all spaces. When font B is selected, the font above is defined as the default.

A.12 Page 255 (Space Page)

	HEX	8	9	A	B	C	D	E	F
HEX	BIN	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	Ç [128]	É [144]	á [160]	.	176 [192]	.	H [208]	SP [224]
1	0001	ü [129]	æ [145]	í [161]	.	177 [193]	.	I [209]	SP [225]
2	0010	é [130]	Æ [146]	ó [162]	.	178 [194]	.	SP [210]	SP [226]
3	0011	â [131]	ô [147]	ú [163]	.	179 [195]	.	SP [211]	SP [227]
4	0100	ä [132]	ö [148]	ñ [164]	.	180 [196]	.	SP [212]	SP [228]
5	0101	à [133]	ò [149]	Ñ [165]	À [181]	.	197 [213]	SP [229]	SP [245]
6	0110	å [134]	û [150]	Ğ [166]	Â [182]	â [198]	.	SP [214]	SP [230]
7	0111	ç [135]	ù [151]	ğ [167]	À [183]	Ä [199]	.	SP [215]	SP [231]
8	1000	ë [136]	ÿ [152]	ç [168]	í [184]	ł [200]	SP [216]	SP [232]	SP [248]
9	1001	ë [137]	Ö [153]	.	‡ [169]	ƒ [185]	SP [201]	SP [217]	SP [233]
A	1010	è [138]	Ü [154]	.	 [170]	¶ [186]	SP [202]	SP [218]	SP [234]
B	1011	ï [139]	ø [155]	.	¶ [171]	¶ [187]	SP [203]	SP [219]	SP [235]
C	1100	î [140]	£ [156]	.	¶ [172]	ƒ [188]	SP [204]	SP [220]	SP [236]
D	1101	ì [141]	Ø [157]	i [173]	¢ [189]	= [205]	SP [221]	SP [237]	SP [253]
E	1110	Ä [142]	§ [158]	.	+	SP [206]	SP [222]	SP [238]	SP [254]
F	1111	Å [143]	§ [159]	¤ [175]	.	SP [191]	SP [207]	SP [223]	SP [239]
									255

NOTE: In printing on the face of a slip with page 255, the font is selected as above, when font A is selected, character codes 80H to FFH are all spaces, when font B is selected, the following font is defined as the default. In printing on roll paper or the back side of a slip, character codes 80H to FFH are all spaces.

A.13 International Character Sets

Country	ASCII code (Hex)											
	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
U.S.A	#	\$	@	[\]	^	`	{		}	~
France	#	\$	à	°	ç	§	^	`	é	ù	è	“
Germany	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
U.K.	£	\$	@	[\]	^	`	{		}	~
Denmark I	#	\$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	\$	@	°	\	é	^	ù	à	ò	è	ì
Spain I	Pt	\$	@	í	Ñ	í	^	`	..	ñ	}	~
Japan	#	\$	@	[¥]	^	`	{		}	~
Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark II	#	\$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Spain II	#	\$	á	í	Ñ	í	é	`	í	ñ	ó	ú
Latin America	#	\$	á	í	Ñ	í	é	ü	í	ñ	ó	ú
Korea	#	\$	@	[₩]	^	`	{		}	~

Appendix B

Power Supply Specifications

This appendix describes the optional power supply unit (PS-180).

B.1 PS-180 (Energy Saving Power Supply Unit)

B.1.1 Electrical Characteristics

Input conditions

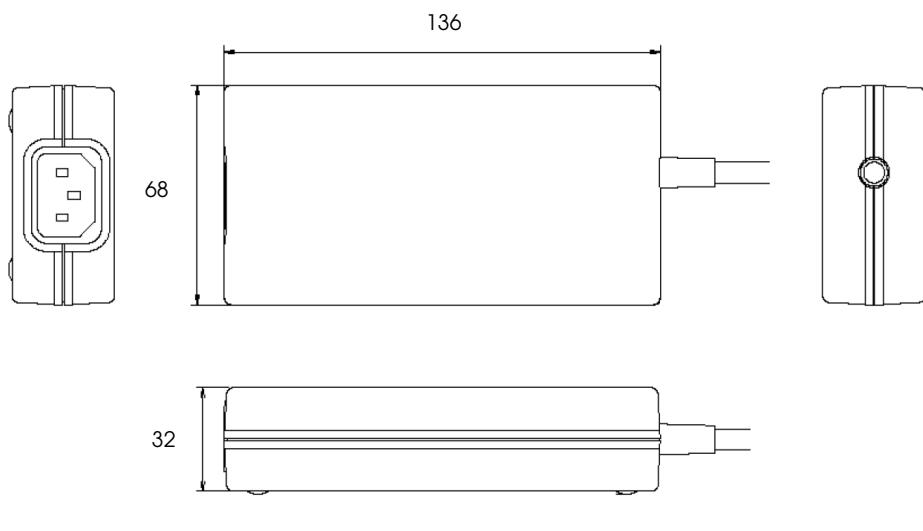
Input voltage (rating):	90 to 264VAC (100 VAC -10% to 230 VAC +15%)
Frequency (rating):	47 Hz to 63 Hz
Input current (rating):	100VA
AC switch	None
LED	None

Output conditions

Output voltage (rating):	24 V ± 5%
Output current (rating):	2.0 A
Output electric power (rating):	48 W
Output peak current:	4.5 A (within 300ms on 1/6 duty)

B.1.2 Case Specifications

- Size: 68 mm (D) × 136 mm (L) × 32 mm (H) (excluding projections) Refer to the figure below.
- Mass: Approx. 0.4 kg (excluding the AC cable)
- Material: Flame-resistance grade: V0
- Color: Black (mat)



Case specifications

Material

No specific brominated flame retardants such as PBBE, PBB are used in this product.

B.1.3 AC Cable Selection

- Select an AC cable that satisfies the following conditions.
 - Safety Standard product
 - Plug with P.E terminal
- Ground connection: Ground certainly for safety.

Appendix C

FAQ

C.1 *Serial Interface*

C.1.1 *The printer does not operate correctly or the printer does not print. What should I do?*

- Confirm that the cable is connected correctly.
 - Is the cable wiring between the printer and the host PC correct? See the wiring cable diagrams shown in “What is the cable wiring for connecting a printer and a host PC with a serial interface?” on page 2 of this section.
 - Confirm that the COM port (1 or 2) of the host PC to which the printer is connected is correct.
 - Confirm that the cable is not broken.
- Confirm that the DIP switch settings of the printer are correctly set.
 - Confirm that the settings such as the baud rate for the printer are the same as those of the host PC.
- Confirm that all necessary drivers are installed. For details, see the manuals for the drivers.
- Confirm that the necessary settings of the driver are correct. Is the output port setting correctly set? Is the baud rate the same as that of the printer?

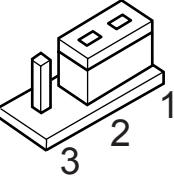
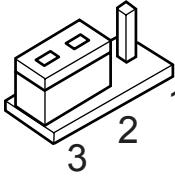
C.1.2 *Printing takes a long time. What should I do?*

- Compared to other interfaces, the transmission speed of a serial interface is slower; therefore, when transmitting large amount of data, printing may take time. Especially, when using TrueType fonts with the APD (Advanced Printer Driver), the printing will take time. It is recommended to use the built-in fonts of the printer.

C.1.3 *The Customer Display does not operate correctly. What should I do?*

- Confirm that the DIP switch settings of the Customer Display and the TM are correctly set.
- Confirm that the Customer Display connector is correctly connected.
- Confirm that the jumper switch settings are correct.

- If the Customer Display is connected to the Customer Display connector of the UB-S09, confirm that the settings of the jumper switch on the UB-S09 are correctly set.

JP 1	1-2 shorted	2-3 shorted
Customer Display connection settings	Customer Display connected 	Customer Display not connected 



Note:

Do not set JP1 open (without jumper). If you short pins other than 1 and 2 or 2 and 3 of JP1, the UB-S09 will not operate correctly.

C.1.4 What is the cable wiring for connecting a printer and a host PC with a serial interface?

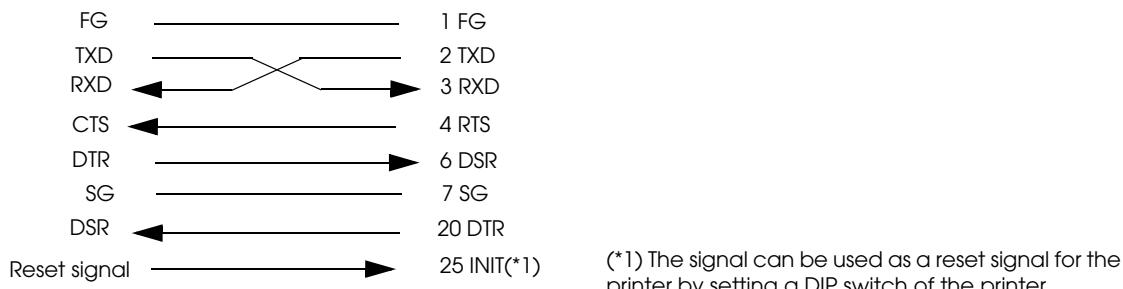
The diagrams below show the pin numbers and pin assignments for the interface connectors, but only the pin assignments without numbers for the PC side because serial interface pin assignments of different PCs are different.



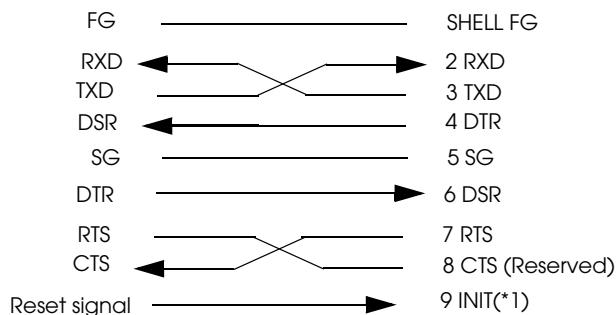
Note:

This type of connection is frequently called a "null modem cable."

- 9 pin (PC) - 25 pin (Interface)



- 9 pin (PC) - 9 pin (Interface)



(*1) When the reset signal of the host PC is used.

C.1.5 How many printers can be connected?

- How many printers can be connected depends on how many COM ports are provided by the host PC. It is possible to connect multiple printers if there are unconnected COM ports on the host PC.

C.1.6 Is there limitation for the length of a cable?

- The RS-232 standard says that it should be 15 meters or less; however, the length will vary depending on the quality or the baud rate of a cable to be used. To secure stable communication, use a cable as short as possible.



Note:

If a cable is too long or its quality is poor, garbage printing may occur.

C.2 Parallel Interface

C.2.1 The printer does not operate correctly or the printer does not print. What should I do?

- Confirm that the cable is connected correctly.
 - Is the cable wiring between the printer and the host PC correct? For details, see the table in "What is the cable wiring for connecting the printer and the host PC with a parallel interface?" on page 4 of this section.
 - Confirm that the LPT port of the host PC to which the printer is connected is correct.
 - Confirm that the cable is not broken.
- Confirm that all necessary drivers are installed. For details, see the manuals for the drivers.
- Confirm that the necessary settings of the driver are correct. Is the output port setting correctly set?

C.2.2 What is the cable wiring for connecting the printer and the host PC with a parallel interface?



Note:

The parallel interface pin assignments of different PCs are different, so pin assignments for the interface only are given in the table.

- ❑ Be sure to use a cable conforming to IEEE1284 standards. The pin assignments of the interface are shown below.

Pin	Source	Compatibility Mode	Nibble Mode	Byte Mode
1	Host	nStrobe	HostClk	HostClk
2	Host/Printer	Data0(LSB)	Data0(LSB)	Data0(LSB)
3	Host/Printer	Data1	Data1	Data1
4	Host/Printer	Data2	Data2	Data2
5	Host/Printer	Data3	Data3	Data3
6	Host/Printer	Data4	Data4	Data4
7	Host/Printer	Data5	Data5	Data5
8	Host/Printer	Data6	Data6	Data6
9	Host/Printer	Data7(MSB)	Data7(MSB)	Data7(MSB)
10	Printer	nAck	PtrClk	PtrClk
11	Printer	Busy	PtrBusy/Data3,7	PtrBusy
12	Printer	Perror	AckDataReq/ Data2,6	AckDataReq
13	Printer	Select	Xflag/Data1,5	Xflag
14	Host	nAutoFd	HostBusy	HostBusy
15		NC	ND	ND
16		GND	GND	GND
17		FG	FG	FG
18	Printer	Logic-H	Logic-H	Logic-H
19-30		GND	GND	GND
31	Host	nInit	nInit	nInit
32	Printer	nFault	nDataAvail/Data0,4	nDataAvail
33		GND	ND	ND
34	Printer	DK_STATUS	ND	ND
35	Printer	+5V	ND	ND
36	Host	nSelectIn	1284-Active	1284-Active

NC: No connection, ND: Not defined

C.2.3 How many printers can be connected?

- ❑ The number of printers that can be connected depends on how many parallel ports are provided for the host PC. It is possible to connect multiple printers if there are unconnected parallel ports on the host PC.

C.2.4 Is there limitation for the length of a cable?

- The length and the quality of a cable must conform to the IEEE1284 standards. A cheap cable or a long cable may not conform to the standard. Use as short a cable as possible.

C.2.5 Can a Customer Display be connected?

- No. A Customer Display cannot be connected.

C.2.6 When I turned on the printer with a parallel interface and then turned on the PC, the message “New hardware has been found.” appeared and the device “EPSON TM-Px.xx” was detected. What is “EPSON TM-Px.xx”?

- It is the device ID of the parallel interface board used with the TM printer. Regardless of the connected printer model, it is the common name.

C.2.7 Printer cannot be reset. What should I do?

- Confirm that the reset function is enabled by the DIP switch setting.

C.3 USB Interface

C.3.1 The TM printer does not operate. What should I do?

- If the printer power has been turned on before installing the printer driver, the printer driver will not operate correctly.
- Confirm usage conditions of the interface.
 - If the USB host controller of the host PC is USB 2.0, a USB 2.0 hub is used, or the TM printer is a HighSpeed model, the guaranteed operating systems are Windows 2000 SP4 or later and Windows XP SP1 or later and Windows Vista.
- Confirm that the BIOS setting is correct.
 - Confirm that USB items are set to “Enabled.” If they are disabled, change the settings to “Enabled.”
- Confirm that the power cable and the USB cable are correctly inserted.
 - Be sure to use a USB cable that conforms to the USB 2.0 standard certification (with the USB logo) and a USB hub (USB 1.1 or higher).
- Confirm that all necessary devices such as the TM printer and the USB hub are turned on.

- Confirm that the interface is correctly recognized by the host PC.
 - Confirm that [EPSON USB Controller for TM Printer Series] appears in the device manager of the host PC. If "?, x, or !", [Unknown Device], or [USB Printing Support] appears, re-install the device driver as follows.
 1. Turn on the printer.
 2. Double-click SETUP.EXE in the TMUSB package.
 3. Delete the incorrect item ([Unknown Device] or [USB Printing Support]).
 4. Turn off the printer and turn it on again.

C.3.2 ***The Customer Display does not operate correctly. What should I do?***

- Confirm that the baud rate is set to 19200 bps by the DIP switch of the Customer Display. See the User's Manual of your Customer Display or you can check the setting with the self test of the TM printer.
- Confirm that the Customer Display connector is connected to the Customer Display connector on the USB interface board.

When the USB interface is mounted on the TM printer, the display module connector (Customer Display connector) on the TM printer cannot be used. Be sure to use the Customer Display connector on the interface when a Customer Display is connected.

- Confirm that the TM printer and the Customer Display are turned on.

Be sure to check that the power of all necessary devices is turned on.

- Confirm that the power of the Customer Display has been turned on before turning on the power of the TM printer.

When the TM printer is turned on, it recognizes whether the Customer Display is connected or not. For correct recognition, be sure to turn on the Customer Display and then turn on the TM printer.

C.3.3 ***What should be considered for a Customer Display connection?***

- Fix the baud rate of a Customer Display to 19200 bps.
- Turn on the power of a Customer Display before turning on the power of the TM printer. Otherwise, the Customer Display is not recognized correctly.
- Use the Customer Display connector on the USB interface board. When the USB interface is mounted on the TM printer, the display module connector (Customer Display connector) on the TM printer cannot be used. Be sure to use the Customer Display connector on the interface.
- Be sure to attach a ferrite core. To mount the ferrite core, put the display module cable into the ferrite core.

C.3.4 Can a Customer Display be connected?

- A Customer Display can be connected to the Customer Display connector on the USB interface board. The Customer Display connector on the TM printer cannot be used.

Appendix D

Comparison Table

Differences between the TM-H6000III with ImageScanner and the previous model, the TM-H6000II with ImageScanner, are shown in the following table.

Specification related items	TM-H6000II with Image Scanner Model	TM-H6000II Photo-ID Model with Image Scanner	TM-H6000III with Image Scanner Model	TM-H6000III Photo-ID Model with Image Scanner
Case dimensions (mm) (W × D × H)	186 × 298 × 185	186 × 298 × 209	186 × 298 × 185	186 × 298 × 209
Weight	6.2 kg	6.5 kg	5.7 kg	5.9 kg
2 dimension barcode PDF 417 availability	Available	Available	Available	Available
2 color printing	Available	Available	Available	Available
Image scanning	Available	Available	Available	Available
Image data storage	Available (Option)	Available (Option)	Available (Option)	Available (Option)
Sharpness function (for scanned image data)	Available	Available	Available	Available
Slip Image data compression method	Bitonal: CCITT/group 4 Gray scale: JPEG	Bitonal: CCITT/group 4 Gray scale: JPEG	Bitonal: CCITT/group 4 Gray scale: JPEG	Bitonal: CCITT/group 4 Gray scale: JPEG
Slip Image data transmission format	Bitonal: Raw, BMP, TIFF (When using compression) Gray scale: Raw, BMP, TIFF, JFIF (When using JPEG compression)	Bitonal: Raw, BMP, TIFF (When using compression) Gray scale: Raw, BMP, TIFF, JFIF (When using JPEG compression)	Bitonal: Raw, BMP, TIFF (When using compression) Gray scale: Raw, BMP, TIFF, JFIF (When using JPEG compression)	Bitonal: Raw, BMP, TIFF (When using compression) Gray scale: Raw, BMP, TIFF, JFIF (When using JPEG compression)
Card Image data compression method (*1)	--	JPEG	--	JPEG
Card Image data transmission format (*1)	--	Raw, BMP, TIFF, JFIF (When using JPEG compression)	--	Raw, BMP, TIFF, JFIF (When using JPEG compression)

Specification related items	TM-H6000II with Image Scanner Model	TM-H6000II Photo-ID Model with Image Scanner	TM-H6000III with Image Scanner Model	TM-H6000III Photo-ID Model with Image Scanner
Thermal print speed (Receipt)	Single color mode: max 170 mm/s 2-color print mode: max 75 mm/s	Single color mode: max 170 mm/s 2-color print mode: max 75 mm/s	Single color mode: max 200 mm/s 2-color print mode: max 78 mm/s	Single color mode: max 200 mm/s 2-color print mode: max 78 mm/s
Optional roll paper spacer for 58mm or 60mm PG-58	Available by memory switch setting option: PG-58 Print speed: Single color mode: max 150 mm/s 2-color print mode: max 75 mm/s	Available by memory switch setting option: PG-58 Print speed: Single color mode: max 150 mm/s 2-color print mode: max 75 mm/s	--	--
Ladder barcode print speed	max 114 mm/s	max 114 mm/s	max 118 mm/s	max 118 mm/s
Paper feed speed	Approximately 170 mm/s {6.7"/s} continuous feeding	Approximately 170 mm/s {6.7"/s} continuous feeding	Approximately 200 mm/s {7.9"/s} continuous feeding	Approximately 200 mm/s {7.9"/s} continuous feeding
Slip print speed	Approximately 5.14ips	Approximately 5.14ips	Approximately 5.7ips	Approximately 5.7ips
Paper Roll Supply Device Section Paper roll end detection	Detection method: Reflective photo sensor	Detection method: Reflective photo sensor	Detection method: Micro switch	Detection method: Micro switch
Printing and Cutting Positions	Manual cutter position: Approximately 27 Auto cutter position: Approximately 10.5	Manual cutter position: Approximately 27 Auto cutter position: Approximately 10.5	Manual cutter position: Approximately 24 Auto cutter position: Approximately 10	Manual cutter position: Approximately 24 Auto cutter position: Approximately 10
Dip Switch 2-3, 2-4	If the print density is set to level 3 or 4, printing speed is usually reduced.	If the print density is set to level 3 or 4, printing speed is usually reduced.	If the print density is set to level 3 or 4, printing speed is as below. max 180mm/s(at24V, 25°C Print density level3) max 170mm/s(at24V, 25°C Print density level4)	If the print density is set to level 3 or 4, printing speed is as below. max 180mm/s(at24V, 25°C Print density level3) max 170mm/s(at24V, 25°C Print density level4)
EMI (CE marking)	Class A	Class A	Class A (Oceania model is Class B)	Class A (Oceania model is Class B)
OPOS supported version (*2)	2.10E SP4 or later	2.30 SP3 or later	2.50 or later	2.50 or later

Specification related items	TM-H6000II with Image Scanner Model	TM-H6000II Photo-ID Model with Image Scanner	TM-H6000III with Image Scanner Model	TM-H6000III Photo-ID Model with Image Scanner
APD (Advanced Printer Driver) Ver.4.xx	✓	✓	✓	✓
APD (Advanced Printer Driver) Ver.3.xx	✓	✓	✓	✓
APD (Advanced Printer Driver) Ver.2.xx	✓	✓	-	-

(*1) The card scanner scans with 256-level gray scale data format only.

(*2) Please contact EPSON about supported OS versions.

SEIKO EPSON CORPORATION