

TM-T88V

Technical Reference Guide

Product Overview

Describes features of the Product.

Setup

Describes setup and installation of the product.

Handling

Describes how to handle the product.

Advanced Usage

Describes advanced usage methods for the product.

Application Development Information

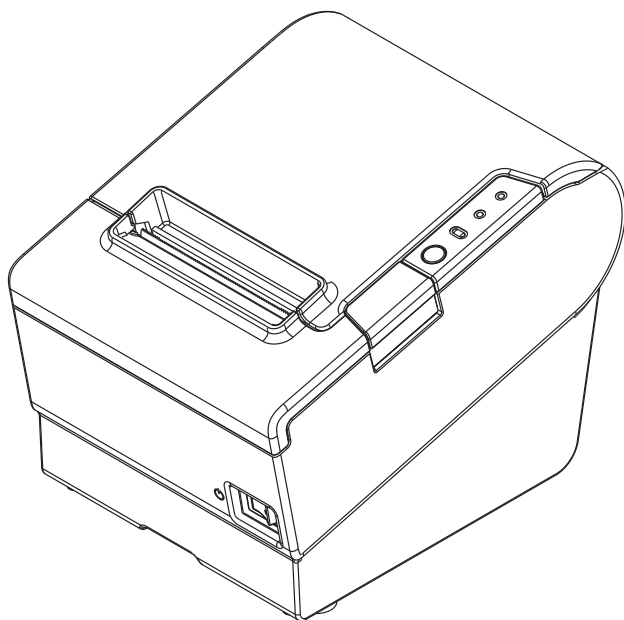
Describes how to control the printer and necessary information when you develop applications.

Replacement of the TM-T88IV

Describes precautions for replacement.

Appendix

Describes general specifications and character codes.



Cautions

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ESC/POS Command System

Epson ESC/POS is a proprietary POS printer command system that includes patented or patent-pending commands. ESC/POS is compatible with most Epson POS printers and displays.



ESC/POS is designed to reduce the processing load on the host computer in POS environments. It comprises a set of highly functional and efficient commands and also offers the flexibility to easily make future upgrades.

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For Safety

Key to Symbols

The symbols in this manual are identified by their level of importance, as defined below. Read the following carefully before handling the product.

 WARNING	You must follow warnings carefully to avoid serious bodily injury.
 CAUTION	Provides information that must be observed to prevent damage to the equipment or loss of data. <ul style="list-style-type: none">• Possibility of sustaining physical injuries.• Possibility of causing physical damage.• Possibility of causing information loss.
CAUTION	Provides information that must be observed to avoid damage to your equipment or a malfunction.
NOTE	Provides important information and useful tips.

Warnings



WARNING

- **To avoid risk of electric shock, do not set up this product or handle cables during a thunderstorm**
- **Never insert or disconnect the power plug with wet hands.**
Doing so may result in severe shock.
- **Handle the power cable with care.**
Improper handling may lead to fire or electric shock.
 - * Do not modify or attempt to repair the cable.
 - * Do not place any heavy object on top of the cable.
 - * Avoid excessive bending, twisting, and pulling.
 - * Do not place the cable near heating equipment.
 - * Check that the plug is clean before plugging it in.
 - * Be sure to push the plug all the way in.
- **Be sure to use the specified power source.**
Connection to an improper power source may cause fire or shock.
- **Do not place multiple loads on the power outlet.**
Overloading the outlet may lead to fire.
- **Shut down your equipment immediately if it produces smoke, a strange odor, or unusual noise.**
Continued use may lead to fire. Immediately unplug the equipment and contact qualified service personnel.
- **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 or fire.
- **Do not allow foreign matter to fall into the equipment.**
Penetration by foreign objects may lead to fire.
- **If water or other liquid spills into this equipment, do not continue to use it.**
Continued use may lead to fire. Unplug the power cord immediately and contact qualified service personnel.
- **If you open the DIP switch cover, be sure to close the cover and tighten the screw after adjusting the DIP switch.**
Using this product with the cover open may cause fire or electric shock.
- **Do not use aerosol sprayers containing flammable gas inside or around this product.**
Doing so may cause fire.

Cautions



- **Do not connect cables in ways other than those mentioned in this manual.**
Different connections may cause equipment damage or fire.
- **Be sure to set this equipment on a firm, stable, horizontal surface.**
The product may break or cause injury if it falls.
- **Do not knock or strike the printer. This may cause defective print.**
- **Do not use this product in locations subject to high humidity or dust levels.**
Excessive humidity and dust may cause equipment damage or fire.
- **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
- **Do not open the roll paper cover without taking the necessary precautions, as this can result in injury from the autocutter fixed blade.**
- **To ensure safety, unplug this product before leaving it unused for an extended period.**
- **Using in the presence of silicon gas (silicon adhesive, silicon oil, silicon powder, etc.) including siloxane and of malignant gas (nitric acid, hydrosulfuric, ammonia, chlorine, etc.) may cause contact failure at contact points in a mechanical switch and a DC motor, etc., in a short time because of adhesion or oxidization of the insulation film.**

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.

About this Manual

Aim of the Manual

This manual provides developers/engineers with all the necessary information for design, development and installation of a POS system, and also design and development of a printer application.

Manual Content

The manual is made up of the following sections:

Chapter 1	Product Overview
Chapter 2	Setup
Chapter 3	Handling
Chapter 4	Advanced Usage
Chapter 5	Application Development Information
Chapter 6	Replacement of the TM-T88IV
Appendix	Product Specifications Option Specifications Specifications of Interfaces and Connectors Character Code Tables

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Product Overview

This chapter describes features of the product.

Features

Printing

- High speed printing (300 mm/s maximum).
- Shifting from 80 mm width paper printing to 58 mm width paper printing is available.
- Multi-tone graphic printing.
- Coupon print function is supported.

Handling

- Easy drop-in paper loading

Software

- Command protocol is based on the ESC/POS Proprietary Command System.
- OPOS ADK, OPOS ADK for .NET, JavaPOS ADK, and Windows printer drivers are available.
- In addition to supporting several kinds of bar code printing, DS1 DataBar printing and two-dimensional symbol (PDF417, QR code, MaxiCode, Composite Symbology) printing are possible.
- Various layouts are possible by using page mode.
- A maintenance counter function is supported.
- User-defined font function is supported.
- Paper-saving function is supported.
- Image tone can be changed.
- The remote configuration tool allows you to check the status of and configure the printer connected to a computer on the network.
- The TM-T88V is ENERGY STAR® qualified. (Some configurations may be exempted, depending on their components.)

Others

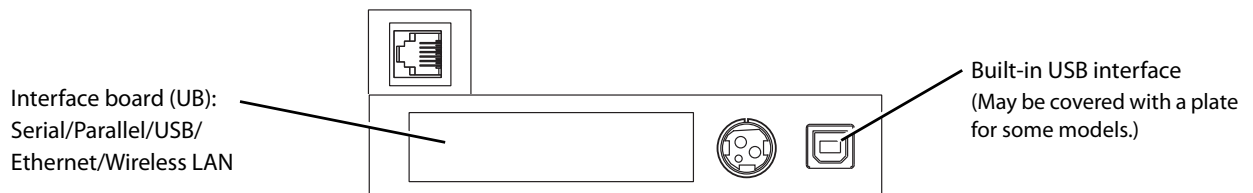
- Various interface boards (Epson UB series*) can be used.
- Built-in USB interface is also available for all interface models.
- The TM-T88V Software & Documents Disc (drivers, utility, and manuals).

* Except the following interface boards with the buzzer function

* UB-E02A, UB-R02A, UB-R03A

Product Configurations

Interfaces



- Serial UB + built-in USB interface model
- Parallel UB + built-in USB interface model
- USB UB
- Ethernet UB
- Wireless LAN UB



CAUTION

For this printer, never use a LAN interface board or a wireless LAN interface board with a buzzer function.

Otherwise, the printer or the interface board may be damaged.

The name of interface boards with a buzzer function has "A" at the end.

Example) UB-E**A, UB-R**A (*: alphanumeric character)

Buzzer

- Model with the built-in buzzer
- Optional external buzzer

CAUTION

The optional external buzzer and the built-in buzzer cannot be used together at the same time.

Accessories

Included

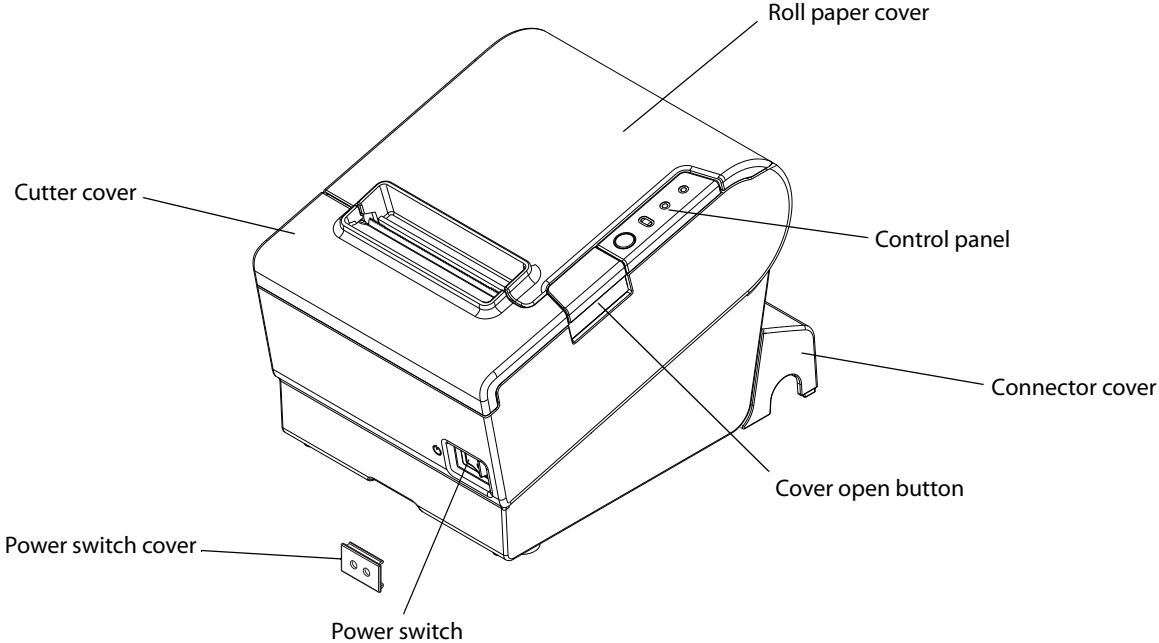
- Roll paper (for operation check)
- Power switch cover
- Connector cover
- Roll paper guide for 58 mm width paper*
- Two strips for the roll paper guide*
- Screw for the roll paper guide*
- The TM-T88V Software & Documents Disc (drivers, utilities, and documentation) *
- Warranty certificate*
- Setup Guide or User's manual

* May not be included depending on the model.

Options

- AC adapter
- AC cable
- Power supply box (Model: OT-BX88V)
- Affixing tape for fixing the printer (Model: DF-10)
- Wall hanging bracket (Model: WH-10)
- Interface boards (UB series)
- Optional external buzzer (Model: OT-BZ20)


Part Names and Functions



1

Power Switch

Turns the printer on or off. The marks on the switch: (⏻ : OFF/ | : ON)

	Before turning on the printer, be sure to check that the AC adapter is connected to the power supply.
CAUTION	

CAUTION	Before turning the printer off, it is recommended to send a power-off command to the printer. If you use the power-off sequence, the latest maintenance counter values are saved. (Maintenance counter values are usually saved every two minutes.) For detailed information about ESC/POS commands, see the ESC/POS Application Programming Guide.
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Power Switch Cover

Install the power switch cover that comes with the TM-T88V onto the printer to prevent inadvertent changing of the power switch, to prevent tampering, and to improve the appearance of the printer.

To reset the printer when the power switch cover is installed, insert a long, thin object (such as the end of a paper clip) into the hole in the power switch cover and press the power switch.



If an accident occurs with the power switch cover attached, unplug the power cord immediately.

Continued use of the printer may cause fire or shock.

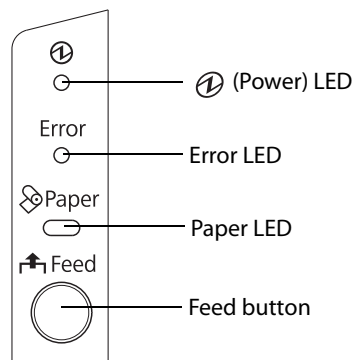
Roll paper cover/Cover open button

- When loading and replacing roll paper, use the cover open button to open the roll paper cover.
- Do not open the cover during printing or while the auto cutter is operating.

Cutter cover

Houses the autocutter. Open this when you need to move the cutter manually.

Control Panel



LEDs

Power LED (green)

- Lights when the power supply is on.
- Goes out when the power supply is turned off.

Error LED

Lights or flashes when the printer is offline.

- Lights after the power is turned on or after a reset (offline). Automatically goes out after a while to indicate that the printer is ready.
- Lights when the end of the roll paper is detected, and when printing has stopped (offline). If this happens, replace the roll paper.
- Flashes when an error occurs. (For details about the flash codes, see "[Error Status](#)" on page 20.)
- Goes out during regular operation (online).

Paper LED

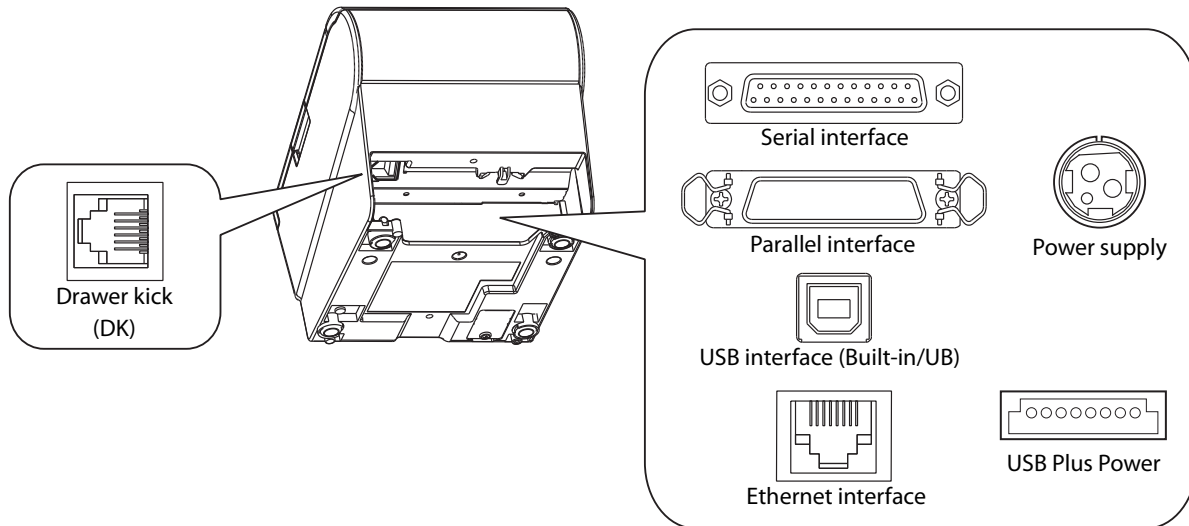
- Lights when there is no more roll paper or there is little remaining.
- Off when there is a sufficient amount of roll paper remaining.
- Flashes when a self-test is in progress.

Feed button

Pressing this button once feeds the roll paper by one line. Holding this button down feeds the roll paper continuously.

Connectors

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



- Drawer kick connector: Connects a cash drawer or the optional external buzzer.
- Interface connector: Connects the printer with the host computer interface.
- Power supply connector: Connects the power supply unit

CAUTION

The picture above shows a serial interface model. For details on the various interfaces and how to connect the power supply connector and cash drawer, see ["Connecting the Printer to the Host Computer"](#) on page 32 and ["Connecting the Cash Drawer"](#) on page 40.

Online and Offline

Online

When no events to go offline have occurred, the printer is online and ready for normal printing.

Offline

The printer automatically goes offline under the following conditions:

- During power on (including resetting with the interface) until the printer is ready.
- During the self-test.
- When the roll paper cover is open.
- While roll paper is fed using the Feed button.
- When printing stops due to end of paper. (When the roll paper end sensor detects the end of paper or the printer is set so that printing stops upon detection of roll paper near-end.)
- Macro execution standby state.
- When an error has occurred.

Error Status

There are three possible error types: automatically recoverable errors, recoverable errors, and unrecoverable errors.

Automatically Recoverable Errors

Printing is no longer possible when automatically recoverable errors occur. They can be recovered easily, as described below.

Error	Error description	Error LED flash code	Recovery measure
Roll paper cover open error	The roll paper cover was opened during printing.		Recovers automatically when the roll paper cover is closed.
Print head temperature error	A high temperature outside the head drive operating range was detected.		Recovers automatically when the print head cools.

Recoverable Errors

Printing is no longer possible when recoverable errors occur. They can be recovered easily by turning the power on again or sending an error recovery command from the driver after eliminating the cause of the error.


Error	Error description	Error LED flash code	Recovery measure
Autocutter error	Autocutter does not work correctly.		Remove the jammed paper or foreign matter in the printer, close the roll paper cover, send the error recovery command, or turn the power on to recover.

CAUTION

The error recovery command is valid only if a recoverable error (excluding automatically recoverable errors) occurs.


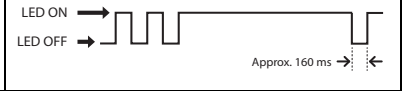


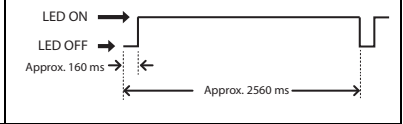
Unrecoverable Errors

Printing is no longer possible when unrecoverable errors occur. The printer must be repaired.



Turn off the power immediately when unrecoverable errors occur.

CAUTION

Error	Error description	Error LED flash code
Memory R/W error	After R/W checking, the printer does not work correctly.	
High voltage error	The power supply voltage is extremely high.	
Low voltage error	The power supply voltage is extremely low.	
CPU execution error	The CPU is executing an incorrect address.	
Internal circuit connection error	Internal circuits are not connected correctly.	

NV Memory

The printer's NV memory (Non-Volatile Memory) stores data even after the printer power is turned off. NV memory contains the following memory areas for the user:

- NV graphics memory
- User NV memory
- Memory switches (customized value)
- R/E (Receipt Enhancement)
- User-defined page
- Maintenance counter



NV memory can be rewritten about 100,000 times. As a guide, NV memory rewriting should be 10 times or less a day when you program applications.

NV Graphics Memory

Graphics, such as shop logos to be printed on receipts, can be stored. Even with a serial interface model whose communication speed is low, high speed graphics printing is possible.

Use the TM-T88V Utility to register graphics.

You can also print and confirm the registered graphics in the NV graphics memory print mode.



- For detailed information about the TM-T88V Utility, see the TM-T88V Utility User's Manual.
- For information about how to use the NV graphics memory print mode, see "[NV Graphics Information Print Mode](#)" on page 70.

User NV Memory

You can store and read text data for multiple purposes, such as for storing a note including customizing or maintenance information of the printer.

Memory Switches (Customized Value)

With the memory switches (customized value), which are software switches for the printer, you can set paper width, print density, font, USB class, interface mode, power supply unit capacity, automatic paper cut, paper reduction, serial interface transmission speed, and printer model. See "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.

R/E (Receipt Enhancement)

Graphics, such as shop logos to be printed on top or bottom of receipts can be registered. Use the TM-T88V Utility to register graphics.

User-defined Page

You can store character data in the user-defined page (character code table: page 255) so that you can also print characters not resident in the printer.

Maintenance Counter

With this function, printer information, such as the number of lines printed, the number of autcuts, and printer operation time after the printer starts working, is automatically stored in NV memory. You can read the information with the Status API of the APD or OPOS ADK to use it for periodical checks or part replacement.

NOTE

Maintenance Counter can be checked with the TM-T88V Utility or in a self-test.

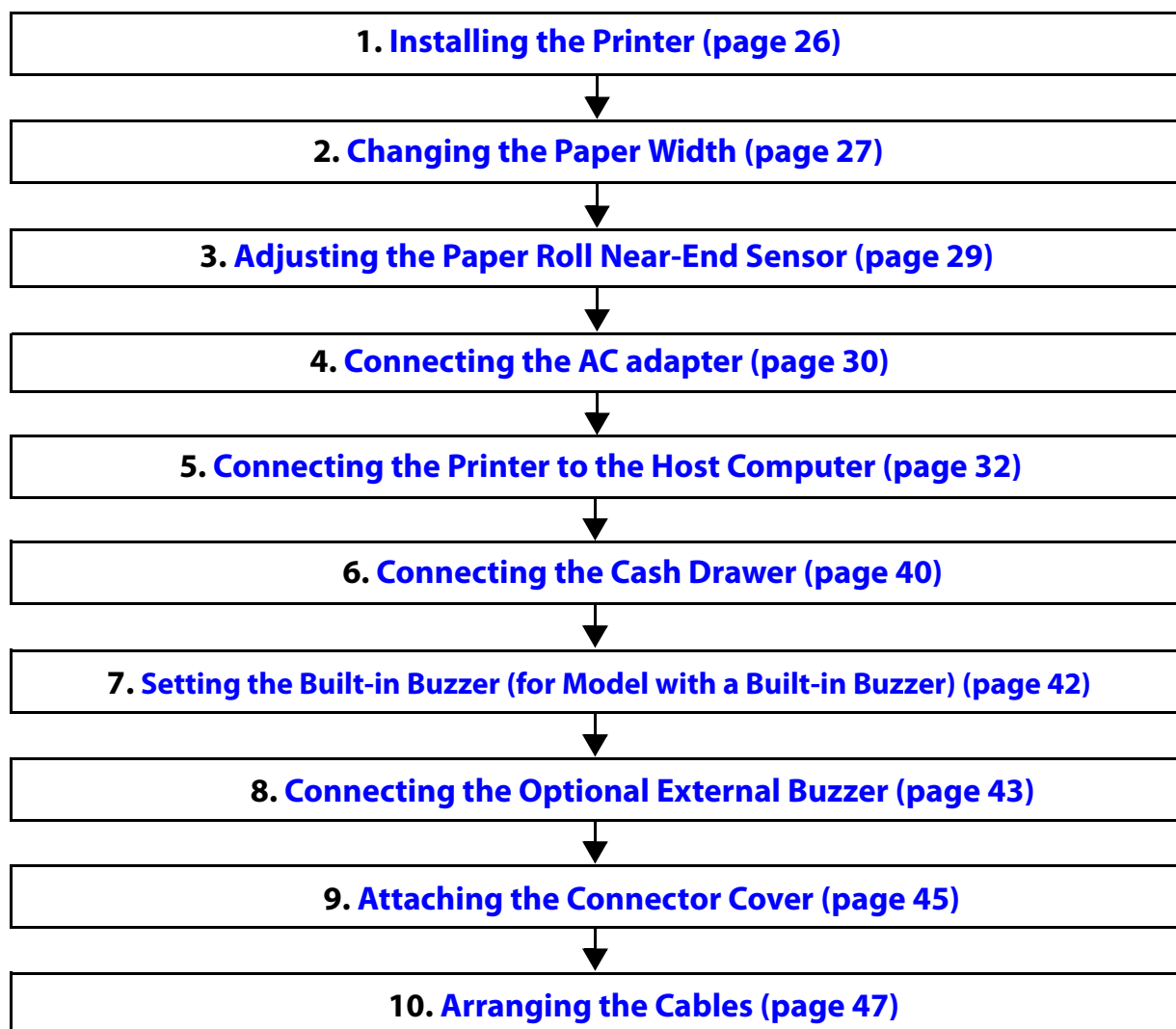


Setup

This chapter describes setup and installation of the product and peripherals.

Flow of Setup

This chapter consists of the following sections along with the setup flow of the product and peripherals.



Installing the Printer

You can install this printer horizontally. With an optional hanging bracket (WH-10), you can also attach the printer to a wall.

Important Notes on Horizontal Installation

- The printer must be installed horizontally on a flat surface (not tilted).
- Do not place the printer in dusty locations.
- Do not catch cables or place foreign matter under the printer.

Important Notes on Wall Hanging

You need to perform the following tasks to install the printer on a wall. For more details, see the installation manual for the optional wall hanging bracket (WH-10).

- Installing the roll-paper stoppers
- Changing the location of the roll paper near-end sensor
- Attaching the connector cover
- Attaching the wall hanging bracket (WH-10)

For the other notes, see the installation manual for the optional wall hanging bracket (WH-10).

CAUTION

Be sure to attach the connector cover when you install the printer on a wall using the wall hanging bracket.

Changing the Paper Width

The printer is initially set to print on 80 mm width paper and you can change the printer to print on 58 mm width paper by installing the roll paper guide and changing the paper width setting with the customized value.

Follow the steps below to install the roll paper guide.

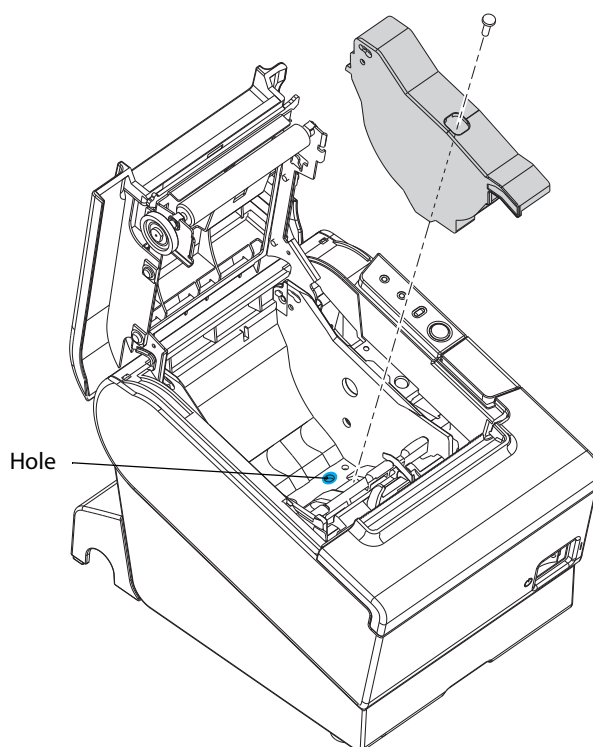
CAUTION

Once you change the paper width from 80 mm to 58 mm, you cannot change it back to 80 mm.

NOTE

To set the customized value, see "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.

- 1 Open the roll paper cover.
- 2 Install the roll paper guide so that the projection on its bottom is aligned with the hole at the right of the roll paper holder.

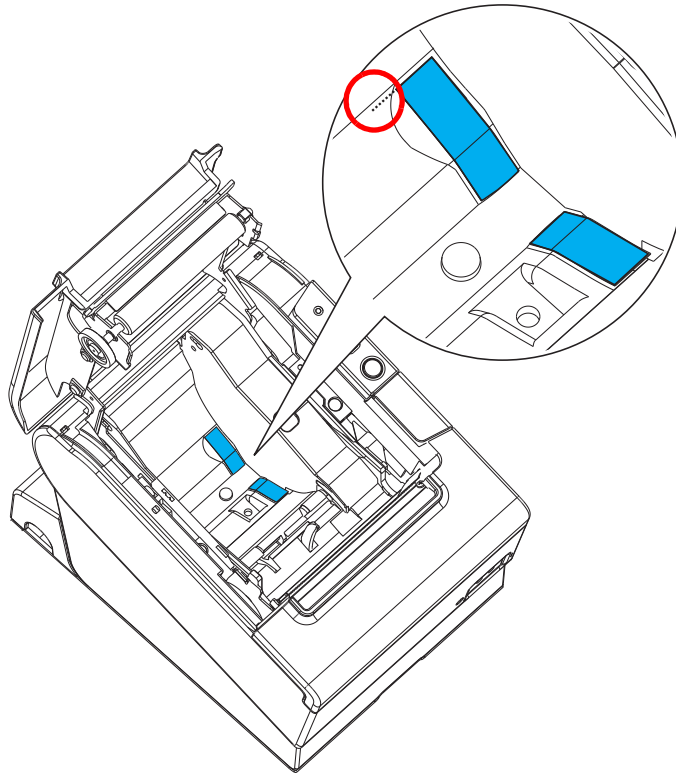


- 3 Tighten the enclosed screw to fix the roll paper guide.

- 4** Paste the enclosed 2 small strips along the roll paper guide on the bottom of the roll paper holder.

CAUTION

Make sure the space between the top edge of the strip and the line of the groove in the roll paper guide is 0.5 mm or less.



Adjusting the Paper Roll Near-End Sensor

Below are two situations where a roll paper NE sensor adjustment is required.

- To adjust the detection position to suit the diameter of the roll paper core used.
- To adjust the detection position of remaining amount of paper.

CAUTION

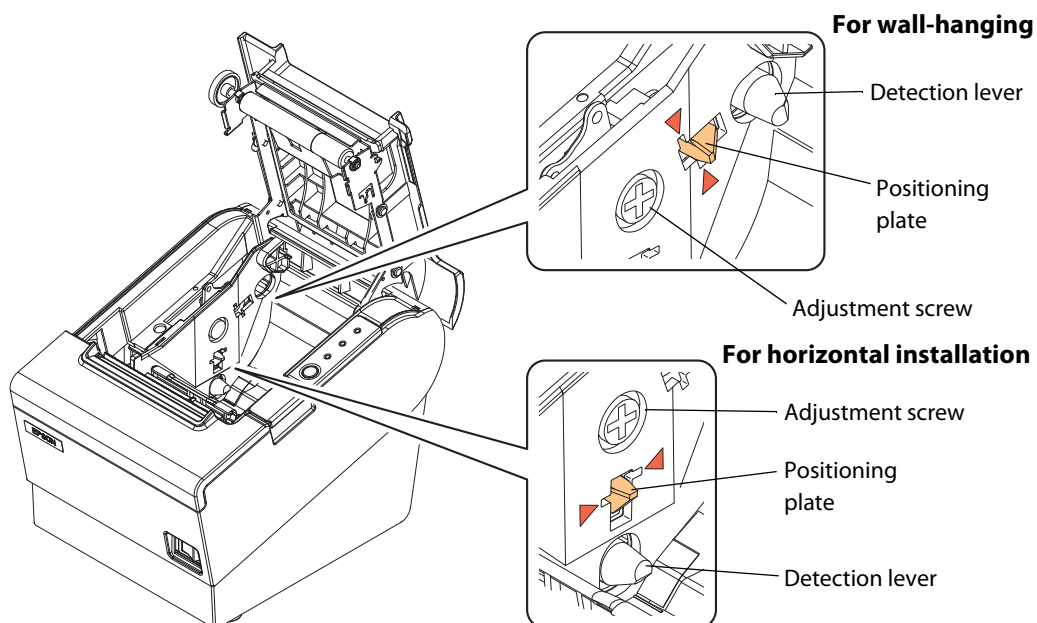
- Since roll paper cores vary slightly in shape, depending on paper roll design and manufacturing tolerances, it is impossible to detect the remaining paper exactly.
- Use roll paper with a core inner diameter of 12 mm {0.47"} and outer diameter of 18 mm {0.71"} so that the NE sensor can detect the remaining paper as accurately as possible.

Follow the steps below to adjust the roll paper near-end detector.

- 1 Open the roll paper cover, and remove the roll paper.
- 2 Loosen the adjustment screw fastening the sensor, and align the upper edge of the positioning plate with the adjustment position.

Adjustment position	Remaining amount of paper (outer diameter: mm)
Upper	Approx. 27 {1.06"}
Lower (Default setting)	Approx. 23 {0.97"}

- 3 Tighten the adjustment screw.
- 4 After adjustment, make sure that the detection lever operates smoothly.



Connecting the AC adapter

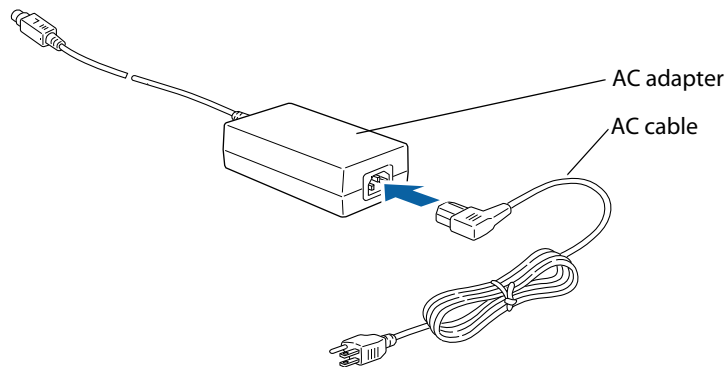
Use the Epson PS-180 or an equivalent product as the AC adapter.



If the printer emits smoke, fire, heat, any strange odor, or unusual noise, turn off the power immediately and unplug the equipment.

Connecting the AC adapter

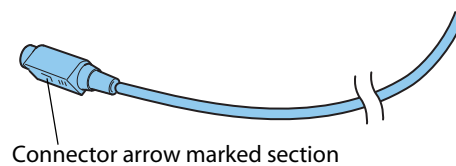
- 1 Make sure the printer's power is turned off.
- 2 Connect the AC cable to the AC adapter.



- 3 Insert the connector of the power supply cable onto the power supply connector (stamped **24V**).

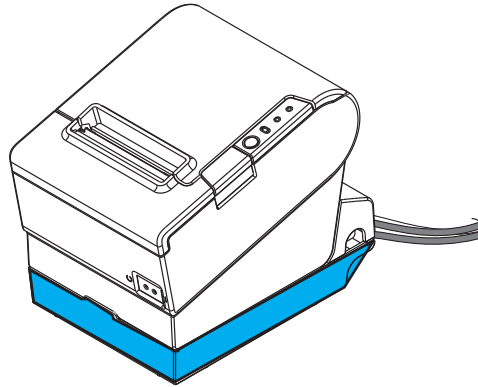
CAUTION

When removing the DC cable for the AC adapter from the printer, check that the AC cable is not connected, and then grasp the arrow marked section of the connector and pull it straight out.



NOTE

The optional power supply box (OT-BX88V) is available. You can store the power supply unit in the box attached to the printer.



Connecting the Printer to the Host Computer

CAUTION

- Be sure to install the driver before connecting the printer to the host computer.
- The printer uses modular connectors specifically designed for the cash drawer. Do not connect these connectors to an ordinary telephone line.

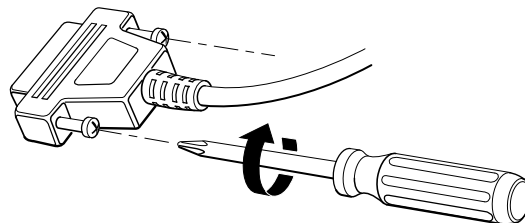
For Serial Interface

Connecting the serial interface (RS-232) cable



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

- 1 Insert the interface cable connector firmly into the interface connector on the connector panel.
- 2 When using connectors equipped with screws, tighten them to secure the connectors firmly.

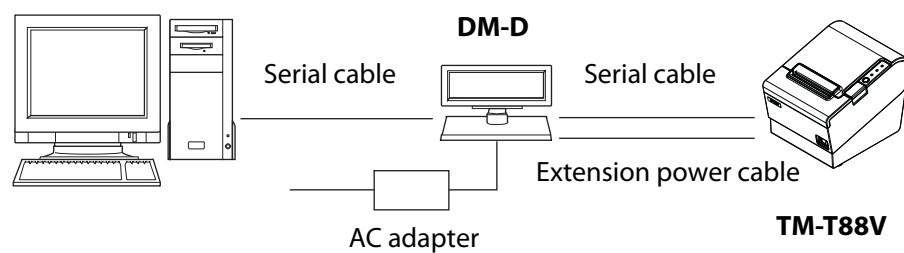


- 3 When using interface cables equipped with a grounding line, attach the ground line to the screw hole marked "FG" on the printer.
- 4 Connect the other end of the interface cable to the host computer.

Customer display connection

Pass-through connection

You can connect a customer display (DM-D) stand type and the printer to a host computer using a pass-through connection. For more details, see Technical Reference Guide of the customer display.



For Parallel Interface

Connecting the parallel interface cable

- 1** Insert the interface cable connector 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** When using 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.

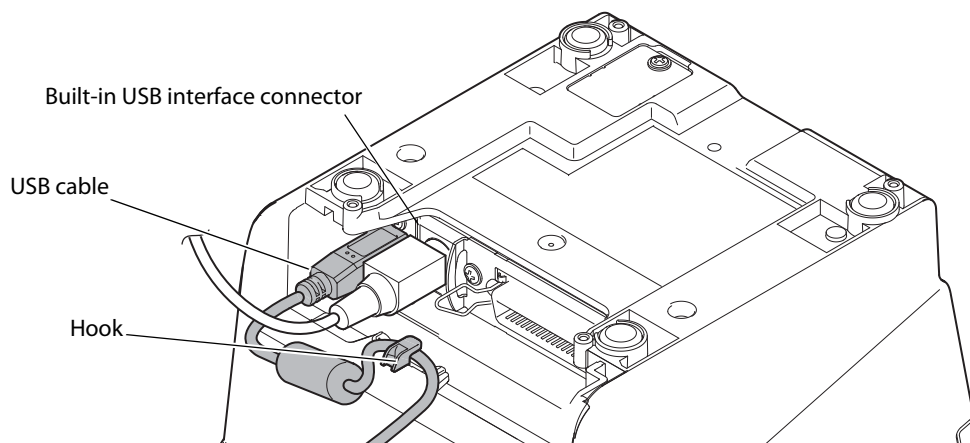
For USB Interface

CAUTION

If you want to communicate via the built-in USB interface when you use a model with an interface other than the serial/parallel interface, you need to change the interface mode with the memory switch (customized value). To set the memory switch (customized value), see "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.

Connecting the built-in USB interface cable

- 1 Put the USB cable on the hook as shown in the figure, then connect it firmly to the built-in USB interface connector.
- 2 Connect the other connector of the cable to the host computer.

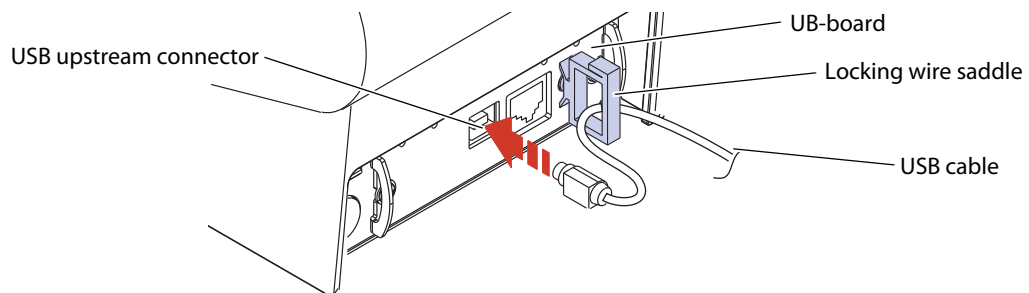


Connecting the USB interface cable

- 1 Attach the locking wire saddle at the location shown in the figure below.
- 2 Put the USB cable through the locking wire saddle.

CAUTION

Putting the USB cable through the locking wire saddle, as shown in the figure below, prevents the cable from coming unplugged.



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

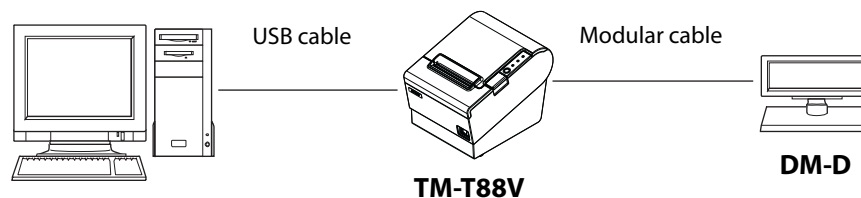
Customer display connection

Y connection (only with the UB-U01III/U02III)

This printer is connected to the host computer via the USB port. When a customer display (DM-D) is to be connected, connect it to the printer via the modular cable.

CAUTION

- Make sure to pull out the power cable before connecting cables.
- When connecting a customer display to the printer, connect the modular jack from the customer display to the DM connector.
- Set the communication conditions of the customer display as follows:
 - * Baud rate: 19200 bps
 - * Bit length: 8-bit
 - * Parity: no parity
 - * Stop bit: 1



For Ethernet Interface

Connect the printer to a network by a LAN cable via a hub.

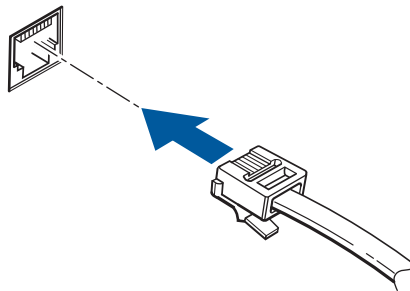
For the setting of the network parameters such as IP address, see User's Manual or Technical Reference Guide of UB-Exx.

Connecting the Ethernet interface cable



- **When LAN cables are installed outdoors, make sure devices without proper surge protection are cushioned by being connected through devices that do have surge protection.**
Otherwise, the devices can be damaged by lightning.
- **Never attempt to connect the customer display cable, drawer kick cable, or the standard telephone line cable to the LAN connector.**

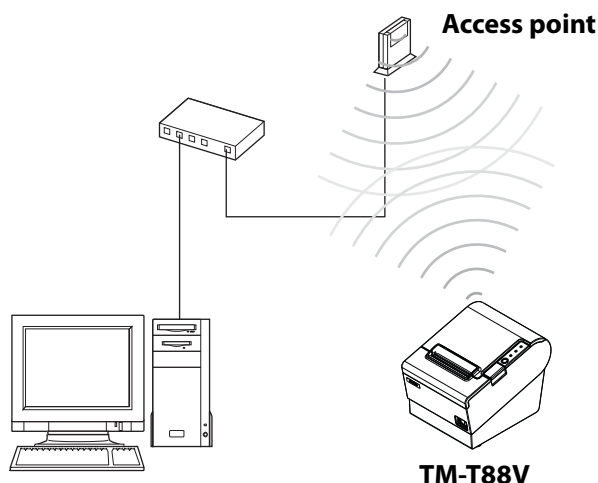
Connect a 10BASE-T/100BASE-TX cable to the LAN connector by pressing firmly until the connector clicks into place.



For Wireless LAN Interface

For details on how to set up a wireless LAN interface, see User's Manual or Technical Reference Guide of UB-Rxx.

Wireless LAN interface connection diagram



For Bluetooth Interfaces

Connecting to smart devices

You can connect by using your smart device's *Bluetooth* connection settings as well as by using the Epson TM Utility "Bluetooth Setup Wizard". See the iOS *Bluetooth*™ TM Printer Technical Reference Guide for details on connecting to iOS devices.

Connecting to Windows PCs

You can connect quickly and easily by using the EPSON™ TM *Bluetooth*™ Connector utility. Start the utility, select the search method, and then click [Search]. Select the printer you want to pair with, and then click [Connect]. If a passkey entry screen is displayed, enter the Passkey, and then click [OK]. Select the port you want to use from the drop-down list, and then click [OK]. The [Connection complete] screen is displayed.

NOTE

- The device name displayed during pairing is TM-T88V_xxxxxx (where the last six digits are the product serial number).
- The default Passkey is "0000".

Connecting the Cash Drawer

If the optional external buzzer is used, you cannot use a cash drawer.

Connecting the Drawer Kick Cable



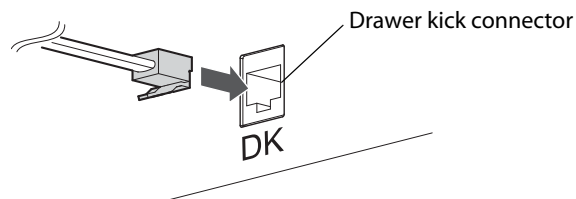
- **Specifications of drawers differ depending on makers or models. When you use a drawer other than specified, make sure its specification meets the following conditions.**

Otherwise, devices may be damaged.

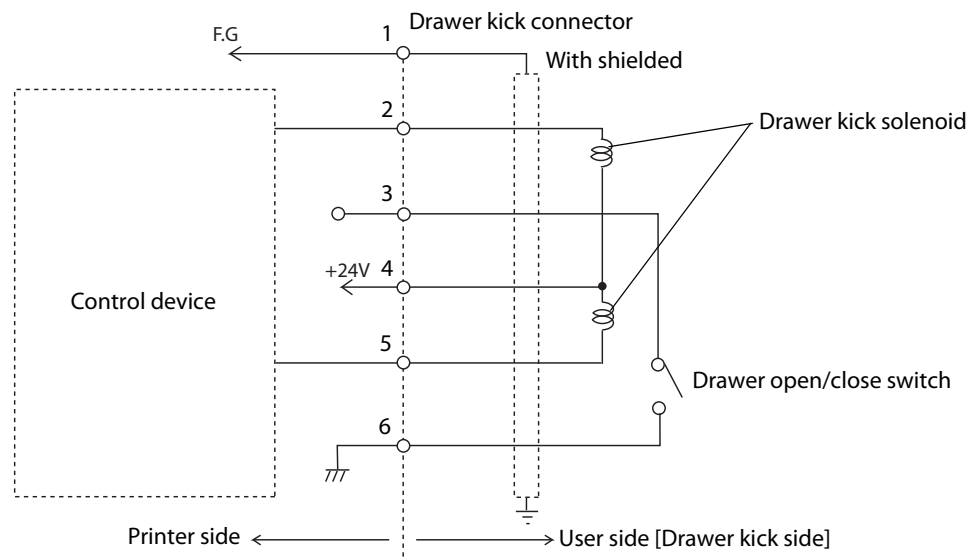
- * The load, such as a drawer kick solenoid, must be connected between pins 4 and 2 or pins 4 and 5 of the drawer kick connector.
- * When the drawer open/close signal is used, a switch must be provided between drawer kick connector pins 3 and 6.
- * The resistance of the load, such as a drawer kick solenoid, must be $24\ \Omega$ or more or the input current must be 1A or less.
- * Be sure to use the 24V power output on connector pin 4 for driving the equipment.
- **Use a shield cable for the drawer connector cable.**
- **Two driver transistors cannot be energized simultaneously.**
- **Leave intervals longer than 4 times the drawer driving pulse when sending it continuously.**
- **Be sure to use the printer power supply (connector pin 4) for the drawer power source.**
- **Do not insert a telephone line into the drawer kick connector.**
Doing so may damage the telephone line or printer.
- **For specifications with a built-in buzzer, use a cash drawer operated by pin 2 of a drawer kick connector.**

When using a cash drawer operated by pin 5, you need to make printer settings. For details, see "[Setting the Built-in Buzzer \(for Model with a Built-in Buzzer\)](#)" on page 42.

Connect the connector of the drawer kick cable to the printer.



Drawer Connection Circuitry



Setting the Built-in Buzzer (for Model with a Built-in Buzzer)

For specifications with a built-in buzzer, a pulse output is sent to drawer kick connector pin 5 to beep the buzzer.

When using a cash drawer, connect a cash drawer operated by pin 2.

If you have to use a cash drawer operated by pin 5, change the DIP switch settings for the buzzer circuit.

For details, see "[Setting the DIP Switches](#)" - "[Setting Procedure](#)" on page 55.

DIP Switch for Buzzer Circuit

DIP switch	Specified connector pin	ON	OFF	Default setting
1	Drawer kick connector pin 2	Buzzer beeps.	Buzzer does not beep.	ON
2	Drawer kick connector pin 5	Buzzer beeps.	Buzzer does not beep.	OFF

CAUTION

Do not set the buzzer to beep for pin numbers used for drawer operations. The buzzer and the cash drawer cannot be operated by one pulse signal.

NOTE

For details on controlling the built-in buzzer, see "[Controlling the Built-in Buzzer](#)" on page 77.

Connecting the Optional External Buzzer

You can use the optional external buzzer (OT-BZ20) by connecting it to the drawer kick connector.

You need to change the printer settings to make sure that it can be used.

CAUTION

- The optional external buzzer and the cash drawer cannot be used together at the same time. Do not connect them both to the printer at the same time by using a branch cable.
- If you enable the optional external buzzer, the cash drawer cannot be operated even if it is connected.
- You cannot use the built-in buzzer and the optional external buzzer. When using an optional external buzzer on a model with a built-in buzzer, set the DIP switches for the built-in buzzer to "Do not operate" for each drawer kick connector pin 2/pin 5.

Installing a Buzzer

See the buzzer's user's manual for details on installing the buzzer.

Printer Settings

The optional external buzzer is disabled by default. Follow the steps below to change the memory switch (custom values) to make sure it is enabled.

Changing Settings Using the Utility

- 1** Start the APD5 Utility or TM-T88V Utility.
For details, see the "Advanced Printer Driver Ver.5 Printer Manual" or the "TM-T88V Utility User's Manual".
- 2** Click "Option Buzzer" from the menu, and then select "Use Buzzer".
- 3** Set the timing and beep pattern for the optional buzzer as necessary.

Changing Settings Using Memory Switch Setting Mode

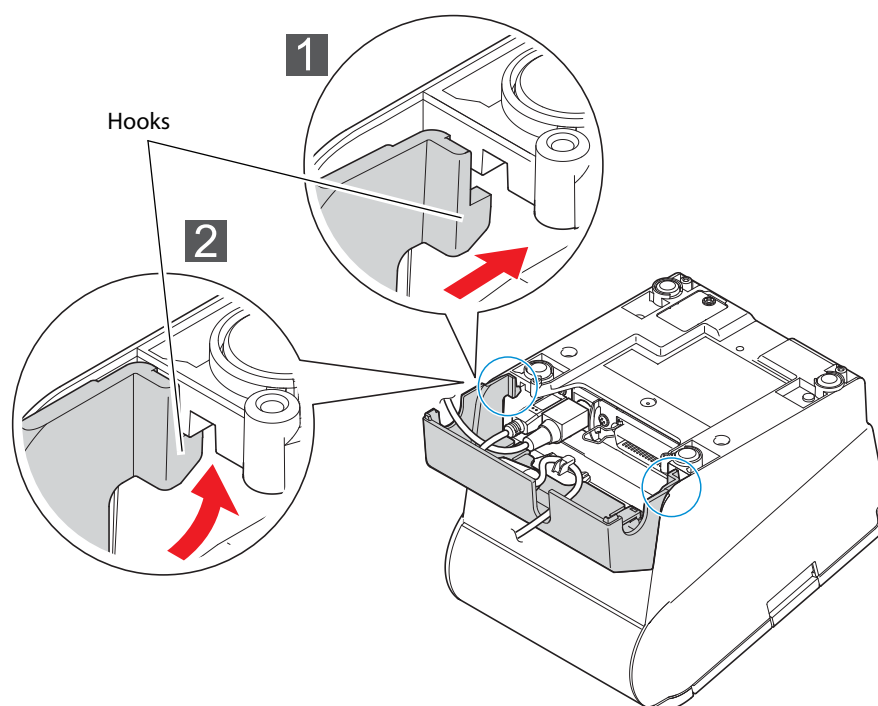
- 1** Start the Memory Switch Setting Mode.
For details, see "[Memory Switch Setting Mode](#)" on page 71.
- 2** Select Buzzer Control from Other Settings.
- 3** Select Option Buzzer, and then set Enable.
- 4** Set the timing and beep pattern for the optional buzzer as necessary.

Attaching the Connector Cover

When using the connector cover, attach the connector cover.

Follow the steps below to attach the connector cover to protect cables.

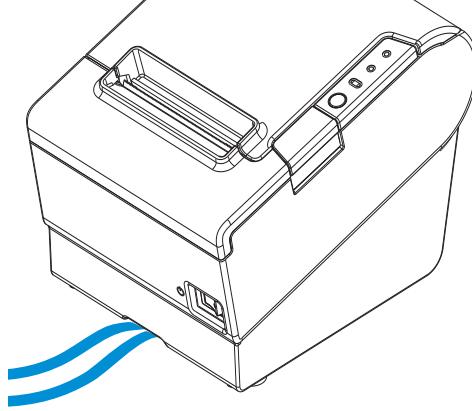
- 1** Turn over the printer.
- 2** Position the two hooks on both sides of the connector cover so that they hook the printer case.



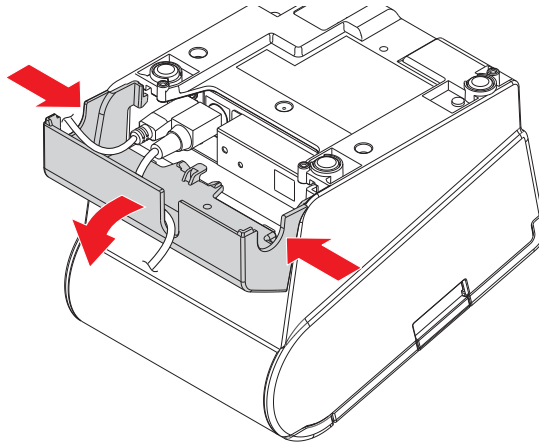
- 3** Push the connector cover down to click onto the printer case.
- 4** Pass each cable through the cable exits at the bottom of the connector cover.
- 5** Turn over the printer and make sure the cables are not pinched.

NOTE

- The serial, USB, or power cables can pass beneath the front of the printer so that the back of the printer looks uncluttered.



- To remove the connector cover, turn the printer over, and push the connector cover down while pushing both sides of the connector cover inward to detach the hooks from the printer case.

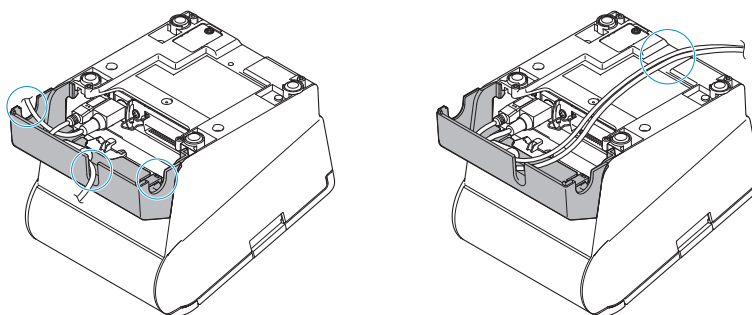


Arranging the Cables

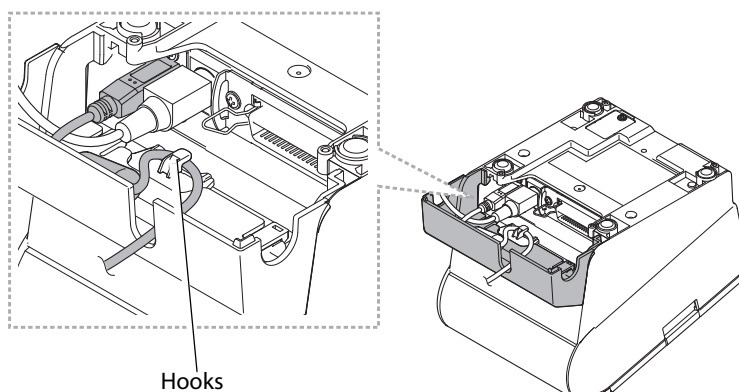
Route the cables when using the connector cover.

Pass the cables through cable exits in the connector cover. The connector cover has cable exits on the back and both sides.

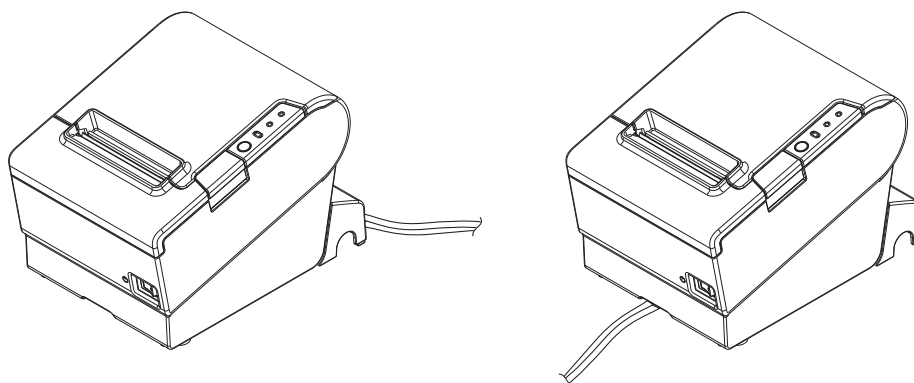
You can also route the cables out the front by passing them through the notch in the printer bottom.



If you want to pass the USB cable through the cable exit on the back, fit the cable under the hook on the printer to prevent the cable from coming off.



After the cable arrangement, turn over the printer, and make sure the cables are not pinched.





Handling

This chapter describes basic handling of the printer.

Installing and Replacing Roll Paper



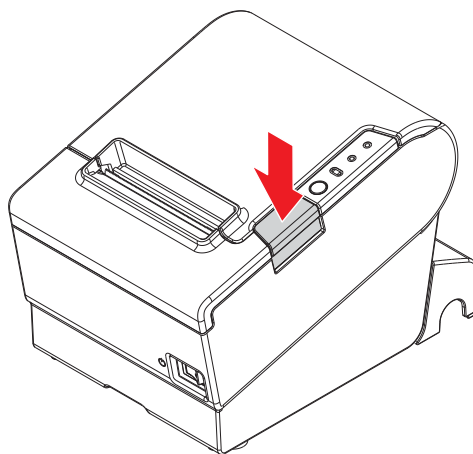
WARNING

- **Do not open the roll paper cover during printing.**
The printer may be damaged.
- **Do not touch the manual cutter with your hands when installing or replacing the roll paper.**
Otherwise, you may be injured because the manual cutter blade is sharp.

CAUTION

- Use roll paper that meets the printer specification. For details about paper specification, see ["Paper Specifications" on page 99](#).
- Paper must not be pasted to the roll paper spool.

- 1 Press the cover open lever to open the roll paper cover.

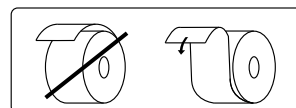
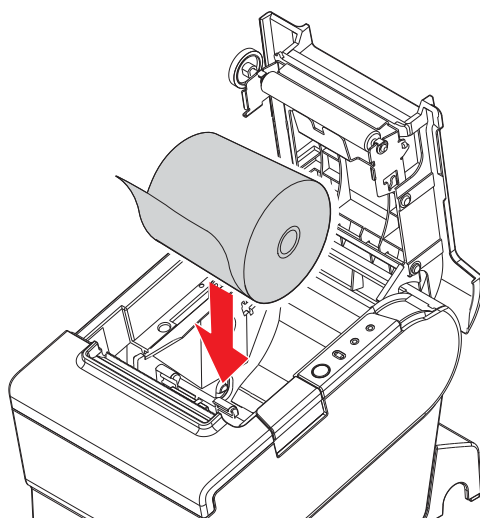


CAUTION

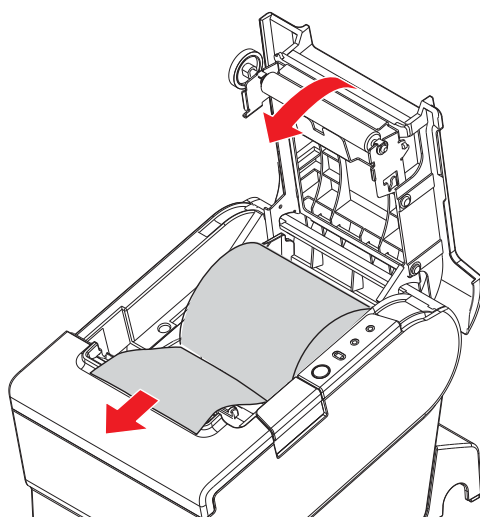
When the roll paper cover cannot be opened, see ["Removing Jammed Paper" on page 51](#).

- 2 Remove the used roll paper core, if any.

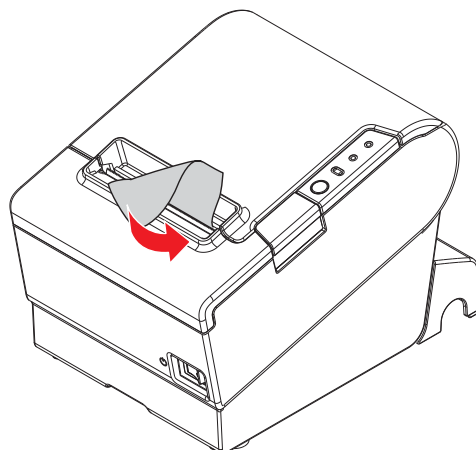
- 3** Install the roll paper in the correct direction.



- 4** Pull out some roll paper, and close the roll paper cover.



- 5** Tear off the roll paper with the manual cutter.



Removing Jammed Paper

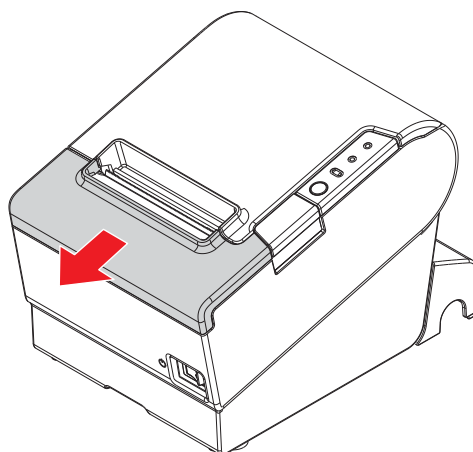
When a paper jam occurs, never pull out the paper forcibly. Open the roll paper cover and remove the jammed paper.

When the roll paper cover cannot be opened, follow the steps below to remove the jammed paper.

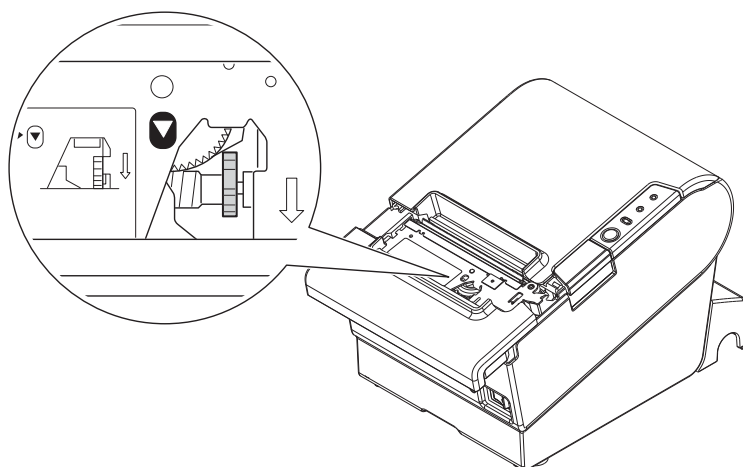


Do not touch the thermal head (See "Cleaning the Thermal Head/Platen Roller" on page 53.) because it can be very hot after printing.

- 1 Turn off the printer.
- 2 Slide the cutter cover toward the front to open it.



- 3 Turn the knob until you see a triangle in the opening.
This returns the cutter blade to the normal position. There is a label near the cutter to assist you.



-
- 4** Close the cutter cover.
 - 5** Open the roll paper cover and remove the jammed paper.

Cleaning the Printer

Cleaning the Printer Case

Be sure to unplug the AC cable from the wall socket, and turn off the printer before cleaning. Wipe the dirt off the printer case with a dry cloth or a damp cloth.

CAUTION

Never clean the product with alcohol, benzine, thinner, or other such solvents. Doing so may damage or break the parts made of plastic and rubber.

Cleaning the Thermal Head/Platen Roller

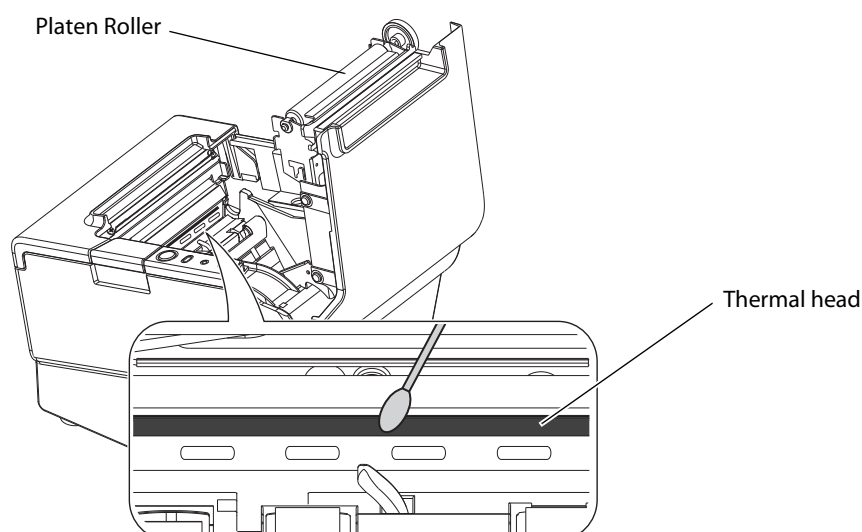
Epson recommends cleaning the thermal head periodically (generally every 3 months) to maintain receipt print quality.

Depending on the roll paper used, paper dust may stick to the platen roller and cause an irregular paper feed. To remove the paper dust, clean the platen roller with a cotton swab moistened with water. Turn on the printer power only after the water has completely dried.

Turn off the printer, open the roll paper cover, and clean the thermal elements of the thermal head with a cotton swab moistened with an alcohol solvent (ethanol or IPA).

CAUTION

- After printing, the thermal head can be very hot. Do not touch it and let it cool before you clean it.
- Do not damage the thermal head by touching it with your fingers or any hard object.



Preparing for Transport

Follow the steps below to transport the printer.

- 1** Turn off the printer.
- 2** Remove the power supply connector.
- 3** Remove the roll paper.
- 4** Pack the printer upright.

Advanced Usage

Setting the DIP Switches

On this printer, you can make various settings with DIP switches.

The DIP switches are already set for the current interfaces. Change the setting if necessary.

Functions of the DIP switches differ depending on the interface.

NOTE

For models with the buzzer function, see also "[Setting the Built-in Buzzer \(for Model with a Built-in Buzzer\)](#)" on page 42.

Setting Procedure

Follow the steps below to change the DIP switch settings.



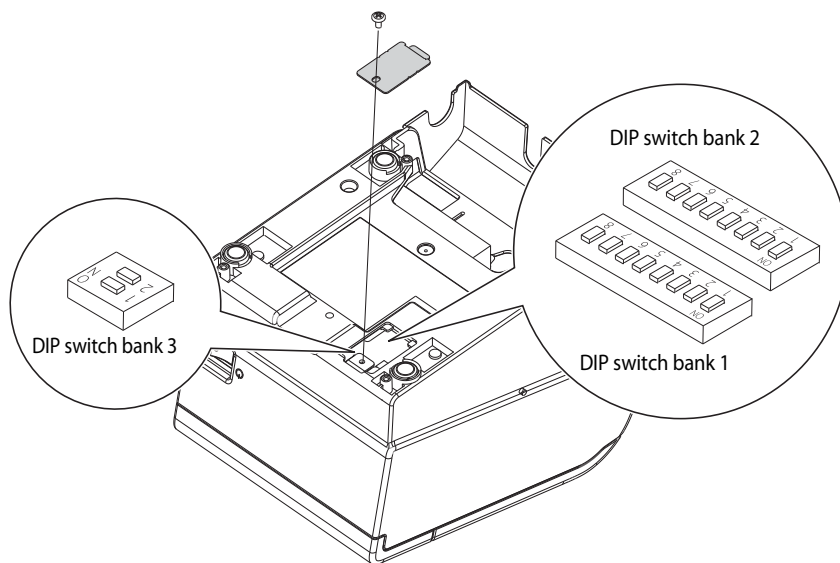
Before you remove the DIP switch cover, turn the printer off.

Otherwise, a short-circuit may cause the printer to malfunction.

CAUTION

- DIP switch settings are enabled only when the power is turned on or the printer is reset via the interface. If the settings are changed after that, the functions will not change.
- Do not change switches that are fixed to ON or OFF. Otherwise, the printer may not operate normally.

- 1** Make sure the power supply for the printer is turned off.
- 2** Unscrew the screw to remove the DIP switch cover from the base of the printer.



- 3 Set the DIP switches, using the tip of a tool, such as a small screwdriver.
- 4 Replace the DIP switch cover, and screw it in place.

For Serial Interface

When using the built-in USB interface, it is not necessary to change the DIP switch setting but their function changes. For the details, see ["For Built-in USB Interface" on page 59](#).

DIP Switch Bank 1

SW	Function	ON	OFF	Default setting
1-1	Data reception error	Ignored	Prints "?"	OFF
1-2	Receive buffer capacity	45 bytes	4 KB	OFF
1-3	Handshaking	XON/XOFF	DTR/DSR	OFF
1-4	Word length	7 bits	8 bits	OFF
1-5	Parity check	Yes	No	OFF
1-6	Parity selection	Even	Odd	OFF
1-7	Transmission speed selections	See the "Transmission Speed (DIP Switches 1-7/1-8)" table below.		ON
1-8				OFF

CAUTION

For DIP switch 1-2 (Receive buffer capacity), see also DIP switch 2-5 (Sets the release condition of the receive buffer BUSY state.)

Transmission Speed (DIP Switches 1-7/1-8)

Transmission speed (bps: bits per second)	SW 1-7	SW 1-8
Depends on the memory switches (customized value) settings.*	ON	ON
4800	OFF	ON
9600 (default)	ON	OFF
19200	OFF	OFF

bps: bits per second

* The default value of transmission speed set with memory switches (customized value) is 38400 bps. (See ["Setting the Memory Switches \(Customized Value\)"](#) on page 63.)

NOTE

Depending on print conditions, such as print duty, print head temperature, and data transmission speed, print speed is automatically adjusted, which can cause white lines due to intermittent print (the motor sometimes stops). To avoid this, set the transmission speed higher or keep the print speed constant by setting it lower.

DIP Switch Bank 2

SW	Function	ON	OFF	Default setting
2-1	Handshaking (BUSY condition)	Receive buffer full	<ul style="list-style-type: none"> Offline Receive buffer full 	OFF
2-2	Reserved (Do not change setting)	Fixed to OFF		OFF
2-3 ~ 2-4	Selects print density	See "Selecting the Print Density (DIP Switches 2-3/2-4)" on page 62.		OFF
2-5	Sets the release condition of the receive buffer BUSY state. (This function is effective when DIP Switch 1-2 is set to off.)	Releases the BUSY state when the remaining capacity of the receive buffer reaches 138 bytes.	Releases the BUSY state when the remaining capacity of the receive buffer reaches 256 bytes.	OFF
2-6	Reserved (Do not change setting)	Fixed to OFF		OFF
2-7	I/F pin 6 reset signal	Enabled	Disabled	OFF
2-8	IF pin 25 reset signal	Enabled	Disabled	OFF

CAUTION

- For DIP Switch 2-1 (BUSY condition), see also ["Selecting the BUSY Status" on page 62.](#)
- When you use the APD, change the setting of DIP switch 2-1 (BUSY condition) to ON.

For Parallel Interface

When using the built-in USB interface, it is not necessary to change the DIP switch setting but their function changes. For the details, see ["For Built-in USB Interface" on page 59](#).

DIP Switch Bank 1

SW	Function	ON	OFF	Default setting
1-1	Auto line feed	Always enabled	Always disabled	OFF
1-2	Receive buffer capacity	45 bytes	4 KB	OFF
1-3	Selects paper sensors to output paper-end signals (default value of a command)	Disabled	Roll paper end sensor enabled, roll paper near-end sensor enabled	OFF
1-4	Error signal output	Disabled	Enabled	OFF
1-5 ~ 1-8	Undefined	—		OFF

DIP Switch Bank 2

SW	Function	ON	OFF	Default setting
2-1	Handshaking (BUSY condition)	Receive buffer full	<ul style="list-style-type: none"> • Offline • Receive buffer full 	OFF
2-2	Reserved (Do not change setting)	Fixed to OFF		OFF
2-3 ~ 2-4	Selects print density	See "Selecting the Print Density (DIP Switches 2-3/2-4)" on page 62 .		OFF
2-5	Sets the release condition of the receive buffer BUSY state. (This function is effective when DIP Switch 1-2 is set to off.)	Releases the BUSY state when the remaining capacity of the receive buffer reaches 138 bytes.	Releases the BUSY state when the remaining capacity of the receive buffer reaches 256 bytes.	OFF
2-6 ~ 2-7	Reserved (Do not change settings)	Fixed to OFF		OFF
2-8	IF pin 31 reset signal (Do not change setting)	Fixed to ON		ON

CAUTION

For DIP Switch 2-1 (BUSY condition), see also ["Selecting the BUSY Status" on page 62](#).

For Built-in USB Interface

When using the serial or parallel interface, it is not necessary to change the DIP switch setting but their function changes. For the details, see ["For Serial Interface" on page 56](#) and ["For Parallel Interface" on page 58](#).

DIP Switch Bank 1

SW	Function	ON	OFF	Default setting
1-1	Auto line feed	Always enabled	Always disabled	OFF
1-2	Receive buffer capacity	45 bytes	4 KB	OFF
1-3 ~ 1-6	Undefined	—		OFF
1-7	Undefined	—		*
1-8	Setting of USB power-saving function	Disabled	Enabled	OFF

* Varies depending on the interfaces.

DIP Switch Bank 2

SW	Function	ON	OFF	Default setting
2-1	Handshaking (BUSY condition)	Receive buffer full	<ul style="list-style-type: none"> • Offline • Receive buffer full 	OFF
2-2	Reserved (Do not change setting)	Fixed to OFF		OFF
2-3 ~ 2-4	Selects print density	See "Selecting the Print Density (DIP Switches 2-3/ 2-4)" on page 62 .		OFF
2-5	Sets the release condition of the receive buffer BUSY state. (This function is effective when DIP Switch 1-2 is set to off.)	Releases the BUSY state when the remaining capacity of the receive buffer reaches 138 bytes.	Releases the BUSY state when the remaining capacity of the receive buffer reaches 256 bytes.	OFF
2-6 ~ 2-7	Reserved (Do not change settings)	Fixed to OFF		OFF
2-8	Reserved	—		*

* Varies depending on the interfaces.

CAUTION

For DIP Switch 2-1 (BUSY condition), see also ["Selecting the BUSY Status" on page 62](#).

For Ethernet/Wireless LAN/USB Interface

DIP Switch Bank 1

SW	Function	ON	OFF	Default setting
1-1	Auto line feed	Always enabled	Always disabled	OFF
1-2	Receive buffer capacity	45 bytes	4 KB	OFF
1-3 ~ 1-8	Undefined	—		OFF

DIP Switch Bank 2

SW	Function	ON	OFF	Default setting
2-1	Handshaking (BUSY condition)	Receive buffer full	<ul style="list-style-type: none"> • Offline • Receive buffer full 	OFF
2-2	Reserved (Do not change setting)	Fixed to OFF		OFF
2-3 ~ 2-4	Selects print density	See " Selecting the Print Density (DIP Switches 2-3/2-4) " on page 62.		OFF
2-5	Sets the release condition of the receive buffer BUSY state. (This function is effective when DIP Switch 1-2 is set to off.)	Releases the BUSY state when the remaining capacity of the receive buffer reaches 138 bytes.	Releases the BUSY state when the remaining capacity of the receive buffer reaches 256 bytes.	OFF
2-6 ~ 2-7	Reserved (Do not change settings)	Fixed to OFF		OFF
2-8	Reserved (Do not change setting)	Fixed to ON		ON

CAUTION

For DIP Switch 2-1 (BUSY condition), see also "[Selecting the BUSY Status](#)" on page 62.

Bluetooth Interface

DIP Switch Bank 1

SW	Function	ON	OFF	Default setting
1-1	Auto line feed	Always enabled	Always disabled	OFF
1-2	Receive buffer capacity	45 bytes	4 KB	OFF
1-3 ~ 1-8	Undefined	—		OFF

DIP Switch Bank 2

SW	Function	ON	OFF	Default setting
2-1	Reserved (Do not change setting)	Fixed to ON		ON
2-2	Reserved (Do not change setting)	Fixed to OFF		OFF
2-3 ~ 2-4	Selects print density	See "Selecting the Print Density (DIP Switches 2-3/2-4)" on page 62.		OFF
2-5	Sets the release condition of the receive buffer BUSY state. (This function is effective when DIP Switch 1-2 is set to off.)	Releases the BUSY state when the remaining capacity of the receive buffer reaches 138 bytes.	Releases the BUSY state when the remaining capacity of the receive buffer reaches 256 bytes.	OFF
2-6 ~ 2-7	Reserved (Do not change settings)	Fixed to OFF		OFF
2-8	Reserved (Do not change setting)	Fixed to ON		ON

Selecting the Print Density (DIP Switches 2-3/2-4)

Function	SW 2-3	SW 2-4
Do not set	ON	ON
Print density (standard)	OFF	OFF
Print density (darker than standard)	ON	OFF
Print density (dark)	OFF	ON

CAUTION

- If the print density is set to "Darker than standard" or "Dark" level, print speed may be reduced.
- The print density can be set with DIP switches (2-3/2-4) or the customized value. (See "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.) The default setting of the customized value is "Depends on the DIP switch settings." If the customized value is changed, the value set with the customized value is enabled.

Selecting the BUSY Status

With DIP switch 2-1, you can select conditions for invoking a BUSY state as either of the following:

- When the receive buffer is full
- When the receive buffer is full or the printer is offline

CAUTION

In either case above, the printer enters the BUSY state after power is turned on (including resetting with the interface) and when a self-test is being run.

Printer BUSY Condition and Status of DIP Switch 2-1

Printer status		DIP SW 2-1	
		ON	OFF
Offline	During the period after power is turned on (including resetting with the interface) to when the printer is ready to receive data.	BUSY	BUSY
	During the self-test.	BUSY	BUSY
	When the cover is open.	—	BUSY
	During paper feed with the Feed button.	—	BUSY
	When the printer stops printing due to a paper-end (when printer has run out of roll paper).	—	BUSY
	When waiting for the paper Feed button to be pressed before macro execution.	—	BUSY
	When an error has occurred.	—	BUSY
When the receive buffer becomes full.		BUSY	BUSY

Setting the Memory Switches (Customized Value)

With the “memory switch (customized value),” a software switch for this printer, you can set the functions shown in the table below.

The memory switches (customized value) are already set. Change the setting if necessary.

For an outline of the functions, see the following section.

Use the methods in this table to set the memory switches (customized value).

	Memory Switch Setting Mode	TM-T88V Utility	ESC/POS Commands
Paper width	✓	✓	✓
Print density	✓	✓	✓
Multi-tone print density	✓	✓	✓
Print speed	✓	✓	✓
Font <ul style="list-style-type: none"> • Code page • International character set • Font A/B replacement 	✓	✓	✓
Optional Buzzer	✓	✓	✓
USB class	✓	✓	✓
Selection of interface mode	✓		✓
Number of head energizing parts	✓		✓
Power supply unit capacity	✓	✓	✓
Automatic paper cut	✓	✓	✓
Paper reduction <ul style="list-style-type: none"> • Upper space reduction • Lower space reduction • Line space reduction rate • Line feed reduction rate • Barcode height reduction rate 	✓	✓	✓
Transmission speed for serial interface	✓	✓	✓
Printer model*¹	✓		✓

*1: Setting printer model is also available with the TM-T88V Printer Model Setting Utility.

NOTE

- To directly configure the printer in the memory switch setting mode, see "[Memory Switch Setting Mode](#)" on page 71.
- For detailed information about the TM-T88V Utility, see the TM-T88V Utility User's Manual.
- For detailed information about ESC/POS commands, see the ESC/POS Application Programming Guide.

Functions

Setting the paper width

- 80 mm (default setting)
- 58 mm

CAUTION

- Be sure to install the roll paper guide when you select the 58 mm paper width. (See "[Changing the Paper Width](#)" on page 27.)
- Once you change the paper width from 80 mm to 58 mm, you cannot change it back to 80 mm.

Setting the print density

Selectable from levels 1 to 13 (70 ~ 130%)

NOTE

The print density can be set with DIP switches (2-3/2-4) or the customized value. (See "[Selecting the Print Density \(DIP Switches 2-3/2-4\)](#)" on page 62.) The default setting of the customized value is "Depends on the DIP switch settings." If the customized value is changed, the value set with the customized value is enabled.

Setting the multi-tone print density

Selectable from levels 1 to 13 (70 ~ 130%)

NOTE

- First change the print density, and then configure the Multi-tone print density.
- If you set the density too high, the contrast becomes lower. Select the density level checking the overall tone balance of your image.

Setting the print speed

Selectable from levels 1 to 13 (Slow ~ Fast) (default setting: level 13)

NOTE

Depending on print conditions, such as print duty, print head temperature, and data transmission speed, print speed is automatically adjusted, which may cause white lines due to intermittent print (the motor sometimes stops). To avoid this, keep the print speed constant by setting it lower, or set the transmission speed higher for the serial interface. (See "[Transmission Speed \(DIP Switches 1-7/1-8\)](#)" on page 57.)

Setting font

- Code page: Selectable from 43 pages including user defined page
- International character set: Selectable from 18 sets
- Font A/B replacement

Optional Buzzer

When to sound the buzzer is selectable from the following occasions.

- When an error occurs
- When automatic paper cut activates
- When specified pulse 1 (2 pin) occurs
- When specified pulse 2 (5 pin) occurs

USB Class

- Printer Class
- Vendor Class

Selecting interface mode

Selectable from: automatic selection, fixed to UB interface, or fixed to built-in USB. Those 3 modes are described in both tables below.

NOTE

The TM-T88V has dual interfaces: a built-in USB interface and another interface selected by the customer. (The selectable interface is referred to as the “UB” interface.) The table below describes the modes you can set for the printer to control the dual interfaces.

For models with serial/parallel UB

Interface mode	UB	Built-in USB
Automatic selection (default setting)	Available	Available
Fixed to UB	Available	Not available
Fixed to built-in USB	Not available	Available

For models with other UB

Interface mode	UB	Built-in USB
Automatic selection (default setting)	Available	Not available
Fixed to UB	Available	Not available
Fixed to built-in USB	Not available	Available

NOTE**Automatic selection:**

The interface of either the UB or built-in USB to which data is transmitted first is selected. Once the interface is selected, the selection is enabled until the power is turned off or the printer is reset.

Setting the number of head energizing parts

- One-part energizing (default setting)
- Two-part energizing
- Four-part energizing

NOTE

- Usually, the number of head energizing parts does not need to be changed.
- The maximum print speed (300 mm/s) can be performed only when one-part energizing is selected.

Setting the power supply unit capacity

Selectable from levels 1 to 3 (Low ~ High) (default setting: level 3)

Depending on the print pattern or usage environment and so on, if problems such as a low voltage error or power shutdown occur, you may be able to avoid the problem by setting the power supply unit capacity. If you cannot avoid the problem even after setting the power supply unit capacity to level 1, you may be able to avoid it by reducing the print speed and reviewing the print pattern (reducing the amount of printing).

Setting the automatic paper cut

- Not use this function (default setting)
- Cut paper when the cover is closed
- Print logo when paper is cut

CAUTION

Printing logo when paper is cut is not available with memory switch setting mode.

Setting the paper reduction

- Extra upper space reduction: enabled or disabled (default setting)
- Extra lower space reduction: enabled or disabled (default setting)
- Line space reduction rate: not reduced (default setting), 25%, 50%, or 75%
- Line feed reduction rate: not reduced (default setting), 25%, 50%, or 75%
- Barcode height reduction rate: not reduced (default setting), 25%, 50%, or 75%

Setting the transmission speed for serial interface

When DIP switches 1-7 and 1-8 are set to ON, the memory switch settings (custom values) are enabled. You can select the communication speed from 2400, 4800, 9600, 19200, 38400, 57600, or 115200 bps. (The default is 38400 bps.) (See "[Transmission Speed \(DIP Switches 1-7/1-8\)](#)" on page 57.)

Setting the printer model

When you use the TM-T88V with the APD Ver. 4.00 ~ 4.04, you need to change the printer model name to "TM-T88IV."

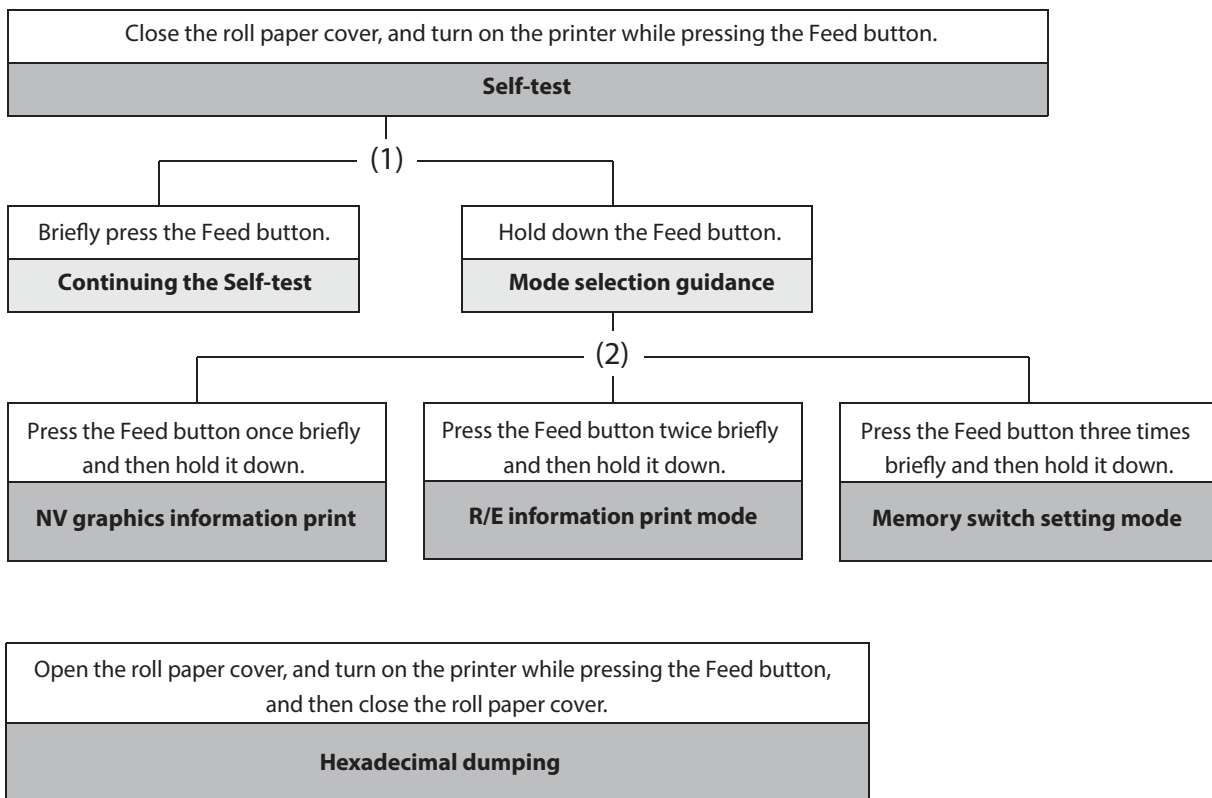
Setting/Checking Modes

As well as print mode, the following modes are also provided for making various printer settings and checking items.

- Self-test mode
- NV graphics information print mode
- R/E (receipt enhancement) information print mode
- Memory switch setting mode
- Hexadecimal dumping mode

The self-test mode or hexadecimal dumping mode is selected depending on the operation performed when the power is turned on.

NV graphic information print mode, R/E (receipt enhancement) information print mode, and the Memory switch setting mode are selected depending on the Feed button operation performed during a self-test.



In (1) and (2), the following guidances are printed, the Power LED flashes, and instructs the user's operations.

(1) Continuing self-test guidance

```
Select Modes by pressing Feed Button.
Continue SELF-TEST: Less than 1 second
Mode Selection      : 1 second or more
```

(2) Mode selection guidance

Mode Selection

Modes

```
0: Exit and Reboot Printer
1: NV Graphics Information
2: Receipt Enhancement Information
3: Customize Value Settings
4 or more: None
```

Select Modes by executing following procedure.

- step 1. Press the Feed button less than 1 second as many times as the selected mode number.
- step 2. Press Feed button for 1 second or more.

Self-test Mode

You can check the following items using the self-test.

- Firmware version
- Interface information
- Buffer capacity
- BUSY condition (depends on the interface)
- Built-in fonts
- Auto line feed setting (parallel interface only)
- Print density
- Maintenance information (head mileage, autocut count)
- Settings of Dip switch 1 and 2

Follow the steps below.

- 1** Close the roll paper cover.
- 2** While pressing the Feed button, turn on the printer. (Hold down the Feed button until printing starts.)
After printing the current print status, a Continuing self-test guidance is printed, and the Power LED flashes.
- 3** Briefly press the Feed button (less than one second) to continue the self-test.
The printer prints a rolling pattern on the roll paper, using the built-in character set.
After “*** completed ***” is printed, the printer initializes and switches to standard mode.

NV Graphics Information Print Mode

Prints the following NV graphic information registered to the printer.

- NV graphics capacity
- NV graphics usage capacity
- NV graphics free capacity
- NV graphics registration
- Key code for each data, number of X direction dots, number of Y direction dots
- NV graphics data

NOTE

For details on NV graphics, see ["NV Graphics Memory" on page 22](#).

Follow the steps below.

- 1** After running a self-test, hold down the Feed button for at least one second, and then select the Mode selection.
The Mode selection guidance is printed, and the Paper LED flashes.
- 2** After briefly (less than one second) pressing the Feed button once, hold it down for at least one second, to print the NV graphics information.
After information printing, the Mode selection guidance is printed again.
- 3** To finish, turn off the power, or select “Exit and Reboot Printer”.

Receipt Enhancement Information Print Mode

Prints the following R/E (receipt enhancement) information registered to the printer.

- Automatic top logo setting
- Automatic bottom logo setting
- Extended settings for automatic top/bottom logo

Follow the steps below.

- 1** After running a self-test, hold down the Feed button for at least one second, and then select the Mode selection.
The Mode selection guidance is printed, and the Power LED flashes.
- 2** After briefly pressing the Feed button twice (less than one second), hold it down for at least one second, to print the Receipt enhancement information.
- 3** To finish, turn off the power, or select "Exit and Reboot Printer".

Memory Switch Setting Mode

You can configure the memory switches (customized values) of the printer.

- Print density
- Communication conditions using a serial interface
- Auto reduction of the amount of paper to use
- Autocutting of paper while the cover is closed
- Paper width
- Default value of character code page/international character set
- Auto replacement of font
- Selection of an interface
- Selection of USB class
- Power supply capacity
- Print speed
- Other settings (optional external buzzer control and so on)

NOTE

For detailed information about memory switches (customized value), see "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.

Follow the steps below.

- 1** After running a self-test, hold down the Feed button for at least one second, and then select the Mode selection.

The Mode selection guidance is printed, and the Paper LED flashes.

- 2** Briefly press the Feed button three times (less than one second), hold it down for at least one second, and then select the Software settings mode (Customized value setting).

The Software setting mode guidance is printed, and the Paper LED flashes.

Customize Value Settings

Modes

- 0: Exit
- 1: Print Current Settings
- 2: Print Density
- 3: Baud Rate
- 4: Automatic Paper Reduction
- 5: Auto Paper Feed&Cut at cover close
- 6: Paper Width
- 7: Thai Character Composition
- 8: Default Character
- 9: Embedded Font Replacement
- 10: Interface Selection
- 11: USB Interface Settings
- 12: Power Supply Output
- 13: Printing Speed
- 14: Other Settings

Select Modes by executing following procedure.

- step 1. Press the Feed button less than 1 second as many times as the selected mode number.
- step 2. Press Feed button for 1 second or more.

- 3** After briefly pressing the Feed button (less than one second) for the number of times shown in the print result, hold down the button for more than one second, and then select the setting items.

Options for the selected setting item, the current value and default value are printed.

Depending on the setting item, you may need to continue selecting the setting item before the settings are printed.

- 4 Select a setting by briefly pressing the Feed button (less than one second) for the number of times applicable to the setting, and then hold down the button for more than one second to confirm your selection.

After saving the settings, the Software setting mode guidance is printed, and the Paper LED flashes.

- 5 To close Software setting mode, turn off the printer, or select “Exit” to return to Mode selection guidance, and then select “Exit and Reboot Printer”.

NOTE

- To select 0 as the item number, hold down the Feed button until printing starts.
- If the button is pressed a number of times that is not displayed by the Setup guidance, the operation is invalid and the same guidance is printed.

Hexadecimal Dumping Mode

In hexadecimal dumping mode, data from the host computer is printed in hexadecimal numbers and characters. By comparing the print outs and the program, you can check whether or not data is being sent to the printer correctly.

NOTE

- When there are no characters that correspond to the print data, “.” is printed.
- If you press the Feed button when there is less than one line of print data, one line is printed.
- During hexadecimal dumping mode, applications that check the printer status may not operate correctly. The printer only returns the status for the “Real-time transmission status” command.

Follow the steps below.

- 1 Open the roll paper cover.
- 2 While pressing the Feed button, turn on the printer. (Hold down the Feed button until the Error LED turns on.)
- 3 Close the roll paper cover.
From this point, all data received by the printer is printed in the corresponding hexadecimal numbers and ASCII characters.

Example of printing in hexadecimal dumping mode

```
Hexadecimal Dump
To terminate hexadecimal dump,
press FEED button three times.

1B 21 00 1B 26 02 40 40 1B 69 . ! . . & . @ @ . i
1B 25 01 1B 63 34 00 1B 30 31 . % . . c 4 . . 0 1
41 42 43 44 45 46 47 48 49 4A A B C D E F G H I J

*** completed ***
```

- 4 To close hexadecimal dumping mode, turn off the printer after printing is complete, or press the Feed button for three times.

Application Development Information

This chapter describes how to control the printer and gives information useful for printer application development.

Controlling the Printer

The printer supports the following command systems:

- ESC/POS

Users can control the printer by using the aforementioned command, or the following development kits or drivers.

- OPOS ADK
- OPOS ADK for .NET
- JavaPOS ADK
- EPSON Advanced Printer Driver (APD)
- ePOS-Print SDK (for Android/iOS/Windows Store Apps/JavaScript)

ESC/POS

ESC/POS is the Epson original printer command system for POS printers and customer display. With ESC/POS commands, you can directly control all the printer functions, but detailed knowledge of printer specifications or combination of commands is required, compared to using drivers and applications.

For detailed information about ESC/POS commands, see the ESC/POS Command Reference that can be accessed from the following URL.

<https://www.epson-biz.com/pos/reference/>

Controlling the Cash Drawer

A pulse output is sent to drawer kick connector pin 2 or pin 5, and you can open the drawer.

You can also check the open/close status of the drawer by checking the signal level of the drawer kick connector pin 3.

These controls are executed by a driver or by commands.

ESC/POS Commands

Prepare the output command for the specified pulse and the status transmission command.

For details, see the ESC/POS Command Reference.

For Windows Printer Drivers (APD)

You can set so that the drawer opens at the start/end of printing or start/end of a page. For details, see the manual for drivers.

For details on control, see the manual for Status API of the driver.

OPOS (OCX Driver)

Register a cash drawer using the SetupPOS Utility, and control using the OpenDrawer method or the DirectIO function.

For details, see the "EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE Cash Drawer" and the "UnifiedPOS Specification".

OPOS for .NET

Register a cash drawer using the SetupPOS Utility, and control using the OpenDrawer method or the DirectIO function.

For details, see the "EPSON OPOS ADK for .NET MANUAL Application Development Guide Cash Drawer (EPSON Standard)" and the "UnifiedPOS Specification".

ePOS-Print SDK

The output command for the drawer kick pulse and the status transmission command are provided in each SDK library. For details, see the user's manuals provided with each SDK.

NOTE

- Whether or not pin 2 or pin 5 operates the drawer kick connector depends on the connected cash drawer.
- You can acquire documents regarding the UnifiedPOS from the following link.
<https://www.omg.org/spec/UPOS>

Controlling the Built-in Buzzer

For specifications with a built-in buzzer, a pulse output is sent to the operating pin for the drawer kick connector, and the built-in buzzer beeps.

You cannot change the volume or the sound emitted, but you can change the buzzing time by changing the signal pulse width.

This is controlled by a driver or by commands.

ESC/POS Commands

The output command for the specified pulse is used.

For details, see the ESC/POS Command Reference.

For Windows Printer Drivers (APD)

You can set so that the buzzer beeps at the start/end of printing or start/end of a page. For details, see the manual for drivers.

For API, the API for opening the drawer is used. For details, see the manual for Status API of the driver.

OPOS (OCX Driver)

Register a POS printer using the SetupPOS Utility and control using the DirectIO function.

For details, see the "EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE POSPrinter (TM Series)".

OPOS for .NET

Register a POS printer using the SetupPOS Utility and control using the DirectIO function.

For details, see the "EPSON OPOS ADK for .NET MANUAL Application Development Guide POSPrinter (TM-T88V)".

ePOS-Print SDK

Use the output command for the drawer kick pulse provided in each SDK library. For details, see the user's manuals provided with each SDK.

NOTE

When using a cash drawer operated by pin 5 with a built-in buzzer, you need to change the DIP switch settings for the buzzer circuit so that the buzzer beeps from a pulse signal for pin 2. For details, see "[Setting the Built-in Buzzer \(for Model with a Built-in Buzzer\)](#)" on page 42.

Controlling the Optional External Buzzer

You can set the optional external buzzer to buzz when an error occurs and when an automatic cut off occurs.

The buzzer can be buzzed using a driver or a command.

You can also set the timing and the beep pattern for the buzzer.

ESC/POS Command

Use the buzzer control command or the output command for the specified pulse.

For details, see the ESC/POS Command Reference.

For Windows Printer Drivers (APD)

You can set so that the buzzer beeps at the start/end of printing or start/end of a page. For details, see the manual for drivers.

For API, use the DirectIO function or the API for opening the drawer. For details, see the manual for Status API of the drivers.

OPOS (OCX Driver)

Register a POS printer using the SetupPOS Utility and control using the DirectIO function.

For details, see the "EPSON OPOS ADK MANUAL APPLICATION DEVELOPMENT GUIDE POSPrinter (TM Series)".

OPOS for .NET

Register a POS printer using the SetupPOS Utility and control using the DirectIO function.

For details, see the "EPSON OPOS ADK for .NET MANUAL Application Development Guide POSPrinter (TM-T88V)".

ePOS-Print SDK

The command for the buzzer function is provided in each SDK library. For details, see the user's manuals provided with each SDK.

NOTE	For details on setting the optional external buzzer, see " Connecting the Optional External Buzzer " on page 43.
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Software and Manuals

The following software and manuals are provided for application development.

Development Kits

Software	Description	Target model
ePOS-Print SDK	This development kit is for controlling the printer from Web applications and native applications of smart devices. It includes libraries, manuals, and sample programs.	
for Android		Ethernet / Wireless LAN / Bluetooth / USB
for iOS		Ethernet / Wireless LAN / Bluetooth
for Windows Store Apps		Ethernet / Wireless LAN / Bluetooth
for JavaScript		Ethernet ^{*1} / Wireless LAN ^{*2}

*1: Except for models with the following interface boards.

UB-E02, UB-E02A, UB-E03

*2: Except for models with the following interface boards.

UB-R02, UB-R02A, UB-R03, UB-R03A

Software	Description	Operating environment
EPSON OPOS ADK	This OCX driver can control POS peripherals using OLE technology ^{*1} . Because controlling POS peripherals with original commands is not required on the application side, efficient system development is possible.	Windows
EPSON OPOS ADK for .NET	The OPOS ADK for .NET is a POS industry standard printer driver compatible with Microsoft POS for .NET. It allows you to develop applications that are compatible with the UPOS (Unified POS) specification. When developing applications, use a separate development environment such as Microsoft Visual Studio .NET.	Windows

Software	Description	Operating environment
JavaPOS ADK	<p>JavaPOS is the standard specification which defines an architecture and device interface (API) to access various POS devices from a Java based system.</p> <p>Using JavaPOS standard API allows control with Java based applications of functions inherent to each device.</p> <p>A flexible design with Java language and JavaPOS enables many different types of computer systems, such as stand alone or network configuration, to use a same application.</p> <p>You can use JavaPOS to build applications and drivers independently of platforms.</p> <p>This allows flexible configurations using thin clients to meet the system requirements.</p>	Windows, Linux

*1: OLE technology developed by Microsoft divides software into part blocks.

The OPOS driver is presupposed to be used with a development environment such as Visual Basic, unlike ordinary Windows printer drivers. It is not a driver to be used for printing from commercial applications.

Drivers

Software	Description	Operating environment
EPSON Advanced Printer Driver (APD)	In addition to ordinary Windows printer driver functions, this driver has controls specific to POS. The Status API (Epson original DLL) that monitors printer status and sends ESC/POS commands is also attached to this driver.	Windows
EPSON TM Virtual Port Driver	This is a serial/parallel-USB/LAN conversion driver to make an Epson TM/BA/EU printer connected via USB or LAN accessible from a POS application through a virtual serial or parallel port. It allows you to directly control devices connected via USB or LAN with ESC/POS commands without making changes in the POS application that controls devices connected via a serial or parallel interface.	Windows

Software	Description	Operating environment
TM-T88V Mac Printer Driver	<p>Mac printer driver allows you to control the TM-T88V using Common UNIX Printing System (CUPS) on Mac OS X.</p> <p>This is a full raster printer driver. It is able to print images, text, and vector graphics etc., that an application displays. With this driver many printer controls are possible, such as paper cut timing control, cash drawer control, print speed control, blank line skip, and upside-down printing. It also provides API and dialogues for print setting, sample applications, and logo setting utility.</p>	Mac
Epson TM/BA Series Thermal Printer Driver	<p>This driver allows you to control the TM-T88V using Common UNIX Printing System (CUPS) on GNU/Linux.</p> <p>This is a full raster printer driver. It is able to print images, text, and vector graphics etc., that an application displays. With this driver many printer control are possible, such as paper cut timing control, cash drawer control, print speed control, blank line skip, and upside-down printing.</p>	Linux

Utilities

Software	Description	Operating environment
TM-T88V Utility	<p>A utility for checking and changing various printer settings. Use this utility to:</p> <ul style="list-style-type: none"> • Checking current settings • Operation check • Storing logos • Coupon settings • Paper reduction settings • Automatic paper cut settings • Printing control settings • Font settings • Optional buzzer settings • Communication I/F settings • Backup/restore 	Windows
TM-T88V Printer Model Setting Utility	Use to change the printer model name when you use the TM-T88V with the APD Ver. 4.00 ~ 4.04.	Windows
EpsonNet Config	<p>A network setting tool for Epson network products.</p> <p>In the case of this printer, you can use this tool to check and/or set network parameters by connecting the Wireless LAN model to a computer for setup via the USB interface.</p>	Windows, Mac

Software	Description	Operating environment
Monitoring Tool	Use to check a list of status for the Epson printers connected to the network.	Windows
Deployment Tool	Use to make network and printer settings simultaneously, via USB. Allows you to make settings efficiently at the time of introducing TM printers for the first time, or when configuring multiple TM printers at the same time.	Windows
BmpToRaster	This is a command line and GUI utility that converts Windows BMP files to raster graphics data for ESC/POS commands. You can create a variety of multiple tone or monochrome image print data. You can print graphics by sending the created binary file to the printer as it is.	Windows

Download

You can obtain software and manuals from one of the following URLs.

For customers in North America, go to the following web site and follow the on-screen instructions.

<https://www.epson.com/support/>

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

<https://www.epson-biz.com/>

Replacement of the TM-T88IV

The TM-T88V is designed so that it can smoothly replace the TM-T88IV. This chapter describes precautions for the replacement.

Compatibility

Printing

The printing and character specifications are the same as those of the TM-T88IV. Without special configurations, the TM-T88V prints the same results as the TM-T88IV prints.

Print Density

The print density of the TM-T88V can be set with DIP switches (2-3/2-4) as can the TM-T88IV. Set the density the same as for the TM-T88IV to print in the same print density.

NOTE

The print density can be set also with a customized value. The default setting of the customized value is "Depends on the DIP switch settings." If the customized value is changed, the value set with the customized value is enabled. (See "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.)

Two-Color Printing

You cannot use the paper for two-color printing (P320RB/P320BB) with the TM-T88V, which you can use with the TM-T88IV.

Number of Head Energizing Parts

For the TM-T88V, the default setting of the number of head energizing parts is "One-part energizing." You can change the setting with the customized value (See "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.); however it does not usually need to be changed.

	TM-T88V	TM-T88IV
Number of head energizing part	<ul style="list-style-type: none"> • One-part energizing • Two-part energizing • Four-part energizing 	<ul style="list-style-type: none"> • One-part energizing • Two-part energizing • Four-part energizing • Auto energizing

Printable Area (for 80 mm Width Paper)

The printable area (left/right margins, print start position from the autocutting position, print start position from the manual cutting position) of the TM-T88V is the same as that of the TM-T88IV.

Cutting Method

The TM-T88V uses the partial cutting method (cutting with one point in left edge left uncut) as does the TM-T88IV.

Manual Paper Feed

Manual paper feed is not possible with the TM-T88V while it is possible with the TM-T88IV after printing pauses.

Receive Buffer

You can set the receive buffer of the TM-T88V to 4KB or 45 bytes with DIP switch 1-2 as with the TM-T88IV. The buffer full condition and buffer full release condition of the TM-T88V are the same as those of the TM-T88IV.

Memory Capacity

The sizes of the download buffer and NV graphics data of the TM-T88V are the same as those of the TM-T88IV.

Electrical Characteristics

The operating voltage of the TM-T88V is $DC24\pm 7\%$, the same as the TM-T88IV. The current consumption differs, depending on the print duty.

NOTE

The TM-T88V does not have a low power consumption mode, which the TM-T88IV has, so you cannot set DIP switches 2-3 and 2-4 to on. Use the newly added low power load mode instead.

DIP Switches

The functional assignments of DIP switches are the same as those of the TM-T88IV except for DIP switches 2-3 and 2-4.

Since the TM-T88V does not have a low power consumption mode, do not set DIP switches 2-3 and 2-4 both to ON.

Printer Status

The TM-T88V goes to the same status under the same conditions as the TM-T88IV. You can replace the TM-T88V with the TM-T88IV without modifying applications.

Logo Registration

The TM-T88V can register logos in the NV memory (NVRAM) with the TM-T88V Utility, while the TM-T88IV can register logos with the TM Flash LOGO Setup Utility for NVRAM (TM-Flogo).

NOTE

For detailed information about the TM-T88V Utility, see the TM-T88V Utility User's Manual.

Driver Compatibility

You can operate the TM-T88V with a driver for the TM-T88IV or the TM-T88III.

CAUTION

You cannot operate the TM-T88IV with a driver for the TM-T88V.

Advanced Printer Driver

When the TM-T88IV was controlled by APD Ver. 4.00 ~ 4.04, you need to change the TM-T88V printer model name to "TM-T88IV" using the customized value. (See "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.)

When the TM-T88IV was controlled by an APD other than Ver. 4.00 ~ 4.04, you can replace it with the TM-T88V without modifying the APD.

OPOS ADK

If the TM-T88IV was controlled by an OPOS ADK, you can replace it with the TM-T88V without modifying the OPOS ADK.

USB Low Power Consumption Mode

With the TM-T88V, you can enable the USB low power consumption mode with DIP Switch 1-8, just as you can with the TM-T88IV. (See "[For Ethernet/Wireless LAN/USB Interface](#)" on page 60.)

Maintenance Counter

The TM-T88V has a maintenance counter just as the TM-T88IV has.

Buzzer

TM-T88V is available with a built-in buzzer or without the buzzer. Even if you purchase the one without the buzzer, you can attach an optional external buzzer. You can beep the buzzer with the pulse signal using a command. (See "[Setting the Built-in Buzzer \(for Model with a Built-in Buzzer\)](#)" on page 42, "[Connecting the Optional External Buzzer](#)" on page 43.)

NOTE

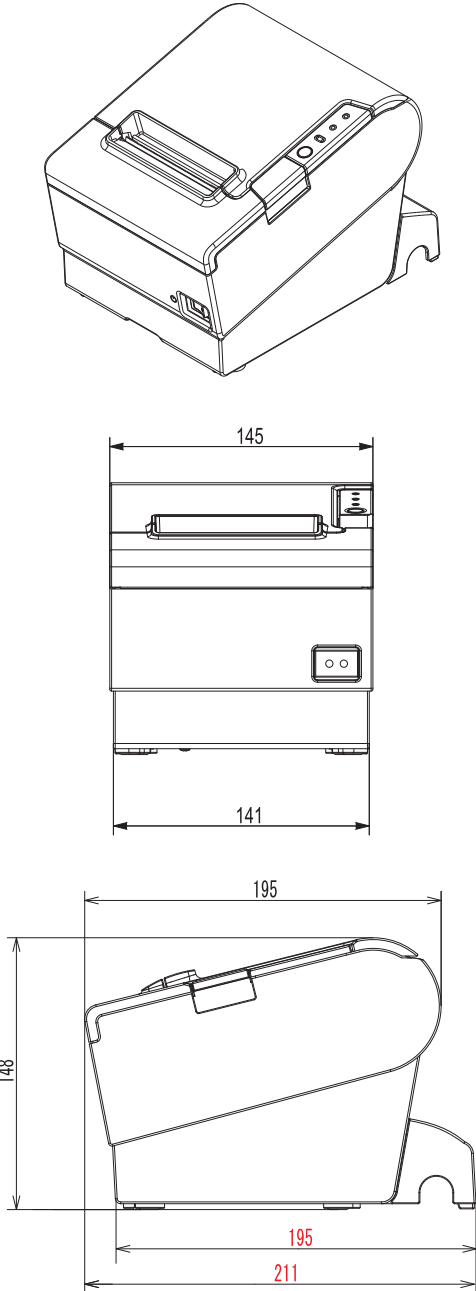
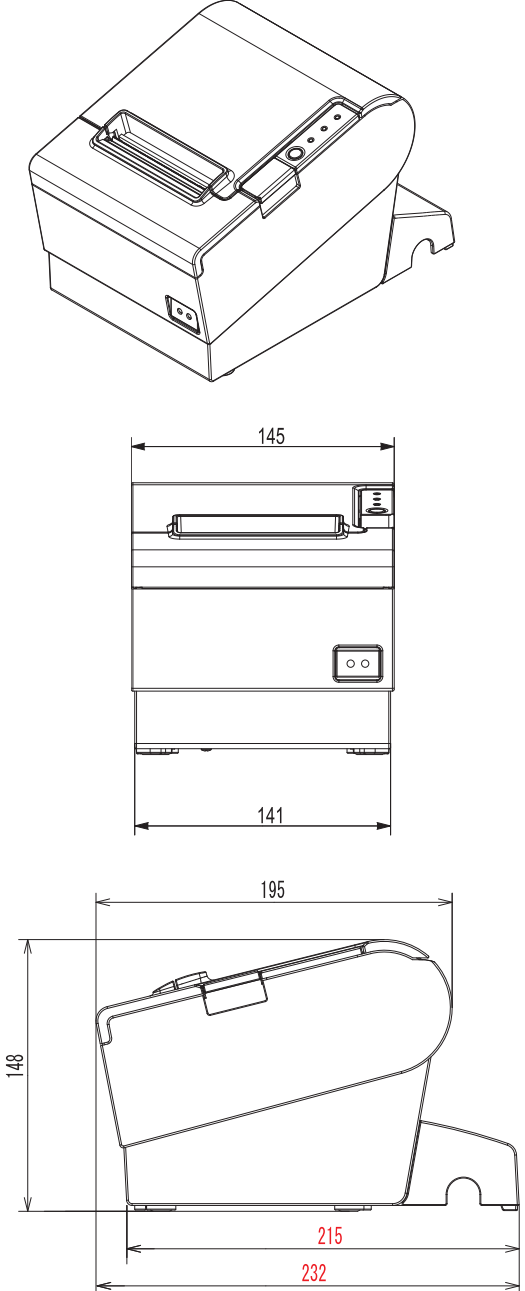
For detailed information about ESC/POS commands, see the ESC/POS Application Programming Guide.

Power Supply Box

The optional power supply box (OT-BX88V) is available to be attached under the TM-T88V to hold the power unit, just as the OT-BX88 has been available for the TM-T88IV.

Overall Dimensions

You can place the TM-T88V in the same location as the TM-T88IV, since its overall dimensions and weight are about the same as or smaller than those of the TM-T88IV. With the wall hanging bracket (WH-10), you can attach the TM-T88V to a wall just as you can with the TM-T88IV.

TM-T88V W:145 × D:195 × H:148 mm Approximately 1.6kg {W:5.71" × D:7.68" × H:5.83" Approximately 3.53 lb}	TM-T88IV W:148 × D:145 × H:195 Approximately 1.8kg {W:5.71" × D:7.68" × H:5.83" Approximately 3.97 lb}
	

Additional Functions and Functional Improvements

Paper Width

You can change the printer to print on 58 mm width paper by installing the roll paper guide and changing the paper width setting with the customized value.

CAUTION

Once you change the paper width from 80 mm to 58 mm, you cannot change it back to 80 mm.

Print Speed

The TM-T88V has increased its print speed up to a maximum of 300 mm/s.

	TM-T88V	TM-T88IV
Maximum print speed	300 mm/s	200 mm/s
Print speed setting (Customized value)	Level 1 to 13	Level 1 to 9

Note: When the printer prints text (built-in fonts) with the default print density level at 24V and 25°C {77°F}.

CAUTION

Depending on print conditions such as print duty, print head temperature, and data transmission speed, print speed is automatically adjusted.

Barcodes

With the TM-T88V, printing the following barcodes, two-dimensional symbols and composite symbology is additionally possible.

- GS1-128
- GS1 DataBar Omnidirectional
- GS1 DataBar Truncated
- GS1 DataBar Stacked
- GS1 DataBar Stacked Omnidirectional
- GS1 DataBar Limited
- GS1 DataBar Expanded
- GS1 DataBar Expanded Stacked
- MaxiCode
- Composite Symbology

Number of Characters

For the TM-T88V, character code tables and international characters are added.

	TM-T88V	TM-T88IV
Character code tables	128 × 43 pages (including user-defined page)	128 × 11 pages (including user-defined page)
International characters	18 sets	14 sets

Image Tone Setting

The TM-T88V allows you to specify tone of images (2 tones/Grayscale).

Interface

The USB interface is added to the main unit of the TM-T88V as standard equipment.

USB Class

When using the built-in USB interface or USB Plus Power, USB printer class can be used beside the USB vendor-defined class. This setting can be done in customized value. (See "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.)

Coupon Printing

The TM-T88V allows you to print coupons registered and set with the TM-T88V Utility.

NOTE

For detailed information about the TM-T88V Utility, see the TM-T88V Utility User's Manual.

Customized Value

For the TM-T88V, the following customized value functions are added.

- Paper width
- Multi-tone print density
- Default value of the character code table
- Default value of the international character set
- Optional buzzer
- USB class
- Interface mode
- Power supply unit capacity
- Automatic paper cut when the cover is closed
- Automatic paper-saving (upper space reduction)
- Automatic paper-saving (lower space reduction)
- Automatic paper-saving (line space reduction rate)
- Automatic paper-saving (line feed reduction rate)
- Automatic paper-saving (barcode height reduction rate)
- Font A replacement
- Font B replacement
- Printer model

For the TM-T88V, the following customized value functions are deleted.

- Single-color printing/two-color printing
- Black-color density in two-color printing

NOTE

For detailed information about the customized value, see "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.

R/E Information Printing Mode

The TM-T88V has a Receipt Enhancement (R/E) Information Printing mode that lets you confirm the following information:

- Automatic top logo setting
- Automatic bottom logo setting
- Extended settings for automatic top/bottom logo

Low Power Load Mode

For the TM-T88V, there is a new low power load mode. In this mode, the power supply load is lowered by automatically changing the print speed, depending on the print duty. You can set the mode with the customized value. (See "[Setting the Memory Switches \(Customized Value\)](#)" on page 63.)

Reliability

The TM-T88V has improved reliability.

		TM-T88V	TM-T88IV
Life	Printer mechanism	20 million lines	15 million lines
	Print head	150 million pulse, 150 km	100 million pulse, 100 km
	Autocutter	2 million cuts	1.5 million cuts
MCBF		70 million lines	52 million lines



Appendix

Product Specifications

Printing method	Thermal line printing	
Cutting method	Partial cut (cutting with one point in left edge left uncut)	
Roll paper (single-ply) width	80 mm width paper printing: 79.5±0.5 mm (3.13±0.02") 58 mm width paper printing: 57.5±0.5 mm (2.26±0.02")	
Interfaces	Serial (RS-232), Parallel (IEEE1284), Ethernet (10/100BASE-T), USB (Full-speed), Wireless LAN (IEEE802.11b)	
Buffers	Receive buffer	4 KB/45 bytes (selectable using DIP switch 1-2)
	Downloaded buffer	12 KB (both for user-defined characters and downloaded images)
	NV graphics data	256 KB
Barcode/two-dimensional symbol/ composite symbol printing	UPC-A, UPC-E, JAN 8 (EAN 8), JAN 13 (EAN 13), CODE 39, ITF, CODABAR (NW-7), CODE 93, CODE 128, GS1-128, GS1 DataBar Omnidirectional, GS1 DataBar Truncated, GS1 DataBar Stacked, GS1 DataBar Stacked Omnidirectional, GS1 DataBar Limited, GS1 DataBar Expanded, GS1 DataBar Expanded Stacked, PDF417, QR CODE, MaxiCode, Composite Symbology	
DKD function	2 drives	
Supplied voltage	DC 24 V ±7%	
Life	Mechanism	20,000,000 lines
	Thermal head	150 million pulses 150 km
	Autocutter	2,000,000 cuts (when using the specified original paper types, PD150R or PD160R) 1,500,000 cuts (when using paper types other than the specified original paper types)
	MTBF	360,000 hours
	MCBF	70,000,000 lines
Temperature/humidity	Operating: 5 to 45°C {41 to 113°F}, 10 to 90% RH Storage: -10 to 50°C {14 to 122°F}, 10 to 90% RH	
Overall dimensions	145 × 195 × 148 mm {5.71 × 7.68 × 5.83"} (W × D × H)	
Mass	Approx. 1.6 kg {3.5 lb} (roll paper excluded)	

Printing Specifications

Printing method	Thermal line printing
Dot density	180 × 180 dpi
Printing direction	Unidirectional with friction feed (Reverse feed is not supported.)
Printing width	80 mm width paper printing: 72.0 mm (2.83"), 512 dots 58 mm width paper printing: 50.8 mm (2.0"), 360 dots
Characters per line	Font A (12 × 24) 80 mm width paper printing: 42 58 mm width paper printing: 30
	Font B (9 × 17) 80 mm width paper printing: 56 58 mm width paper printing: 40
Maximum print speed* ¹	300 mm/s
Line spacing	4.23 mm {1/6"} (Default value, programmable by command)

dpi: dots per inch

*1: when the printer prints text (built-in fonts) with the default print density level at 24V and 25°C {77°F}.

NOTE

Print speed may be slower, depending on the such items as the data transmission speed.

Character Specifications

Number of characters	Alphanumeric characters: 95 Extended graphics: 128 × 43 pages (including user-defined page) International characters: 18 sets GB18030-2022: 28,806 (Lv.2) (for Simplified Chinese characters model) Big 5: 13,535 (for Traditional Chinese characters model) Korean Kanji (KC C5601): 8,366 (for Korean model) Thai character: 3-pass printing font (for South Asia model) 128 characters × 3 pages (133 character types) Vietnam character (for South Asia model) 128 characters × 2 pages (135 character types)
Character structure (W x H dots)	Font A (default): 12 × 24 (including 2-dot horizontal spacing) Font B: 9 × 17 (including 2-dot horizontal spacing)
Character size (W x H)	Font A Standard: 1.41 × 3.39 mm Double-height: 1.41 × 6.77 mm Double-width: 2.82 × 3.39 mm Double-width, double-height: 2.82 × 6.77 mm
	Font B Standard: 0.99 × 2.40 mm Double-height: 0.99 × 4.80 mm Double-width: 1.98 × 2.40 mm Double-width, double-height: 1.98 × 4.80 mm

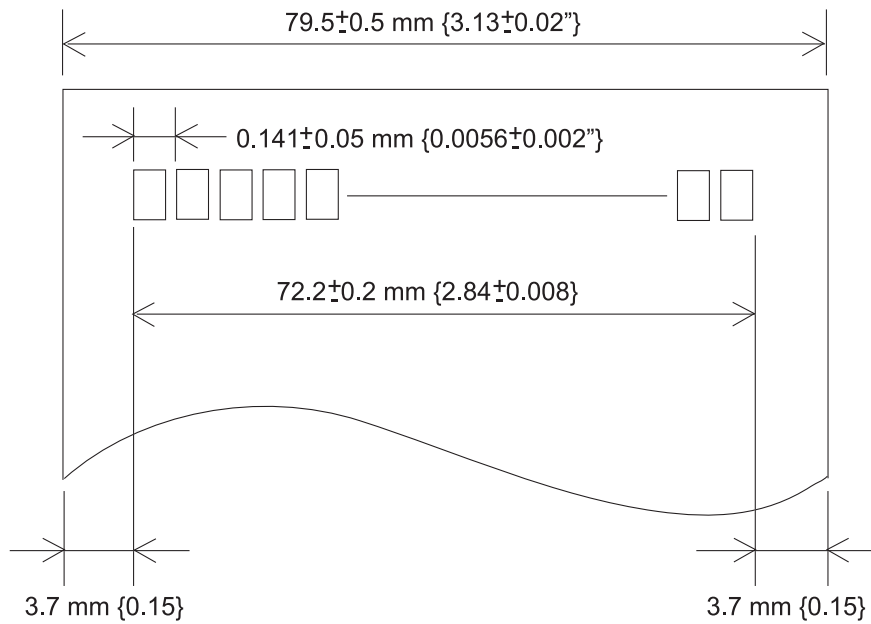
Note:

1. Space between characters is not included.
2. Characters can be scaled up to 64 times as large as the standard size.

Printable Area

80 mm paper width printing

The printable area of paper 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 is approximately 3.7 mm $\{0.15\}$ ".



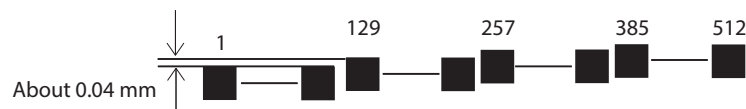
All the numeric values are typical.

CAUTION

- In 2-divided energizing, the print position within the printable area of the thermal elements for dots 1 to 256 and 257 to 512 is shifted approximately 0.07 mm $\{0.0028\}$ " in the paper feed direction as shown in the figure below.

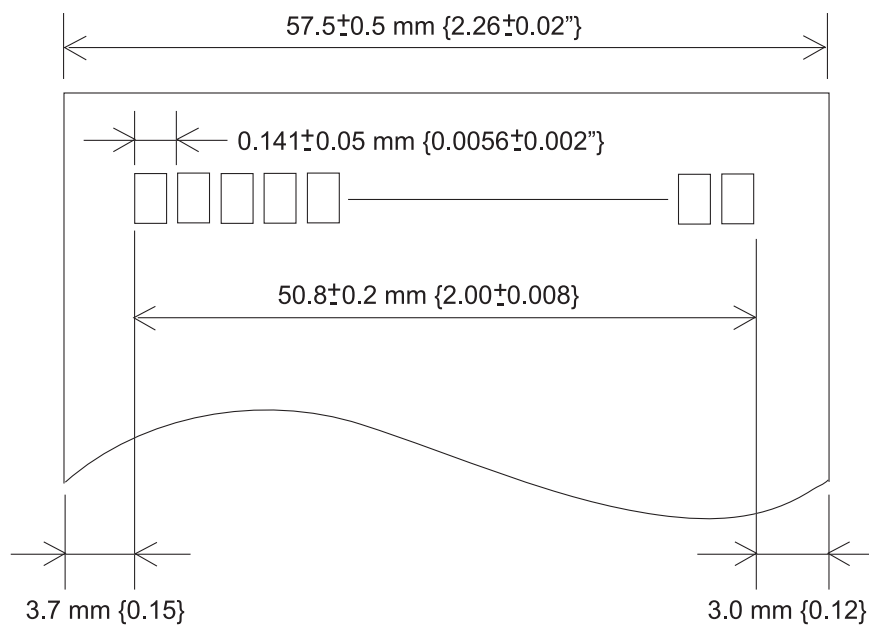


- In 4-divided energizing, the print position within the printable area of the thermal elements for dots 1 to 128, 129 to 256, 257 to 384, and 385 to 512 is shifted approximately 0.04 mm $\{0.0016\}$ " in the paper feed direction as shown in the figure below.



58 mm paper width printing

The printable area of paper with a width of 57.5 ± 0.5 mm $\{2.26 \pm 0.02\}$ " is 50.8 ± 0.2 mm $\{2.00 \pm 0.008\}$ " (360 dots), and the space on the left side is approximately 3.7 mm $\{0.15\}$ " and the space on the right side is approximately 3.0 mm $\{0.12\}$ ".



All the numeric values are typical.

CAUTION

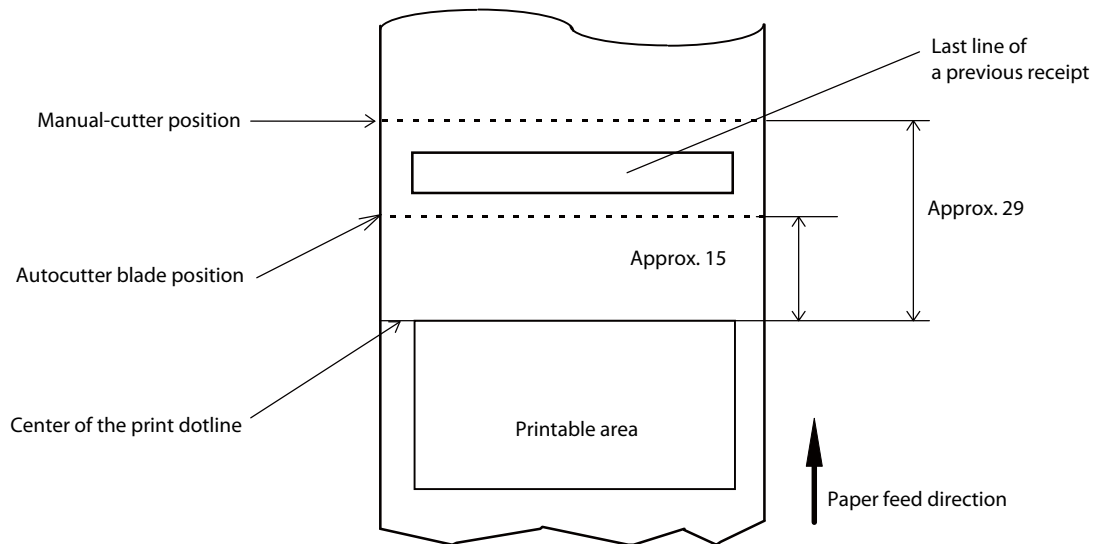
- In 2-divided energizing, the print position within the printable area of the thermal elements for dots 1 to 256 and 257 to 360 is shifted approximately 0.07 mm $\{0.0028\}$ " in the paper feed direction as shown in the figure below.



- In 4-divided energizing, the print position within the printable area of the thermal elements for dots 1 to 128, 129 to 256, and 257 to 360 is shifted approximately 0.04 mm $\{0.0016\}$ " in the paper feed direction as shown in the figure below.



Printing and Cutting Positions



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

CAUTION

The values above 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.

Paper Specifications

Paper types	Specified thermal paper	
Form	Roll paper	
Size	Roll paper diameter	83 mm {3.27"} maximum
	Roll paper spool	Inside: 12 mm {0.47"}, Outside: 18 mm {0.71"}
	Roll width when taken up	80 mm width paper printing: 80+0.5/-1.0 mm 58 mm width paper printing: 58+0.5/-1.0 mm
	Paper width	80 mm width paper printing: 79.5±0.5 mm 58 mm width paper printing: 57.5±0.5 mm
Specified roll paper type	NTP080-80/NTP058-80 In U.S.A.: Nakagawa Mfg. (USA) Inc. In Europe: Nakagawa Mfg. (Europe) GmbH In Southeast Asia: N.A.K. Mfg. (Malaysia) SDN BHD (Original paper: TF50KS-E Nippon Paper Industries Co., Ltd.)	
Specified original paper type	P300, P310, P350 (Kanzaki Specialty Papers) AF50KS-E (Jujo Thermal Oy) F5041 (Mitsubishi HiTec Paper Flensburg GmbH) KT55F20, KT48F20 (Koehler Paper Group)	

CAUTION

- Paper must not be pasted to the roll paper spool.
- The remaining amount of the roll paper when a roll paper near-end is detected differs depending on the spool type.

Electrical Characteristics

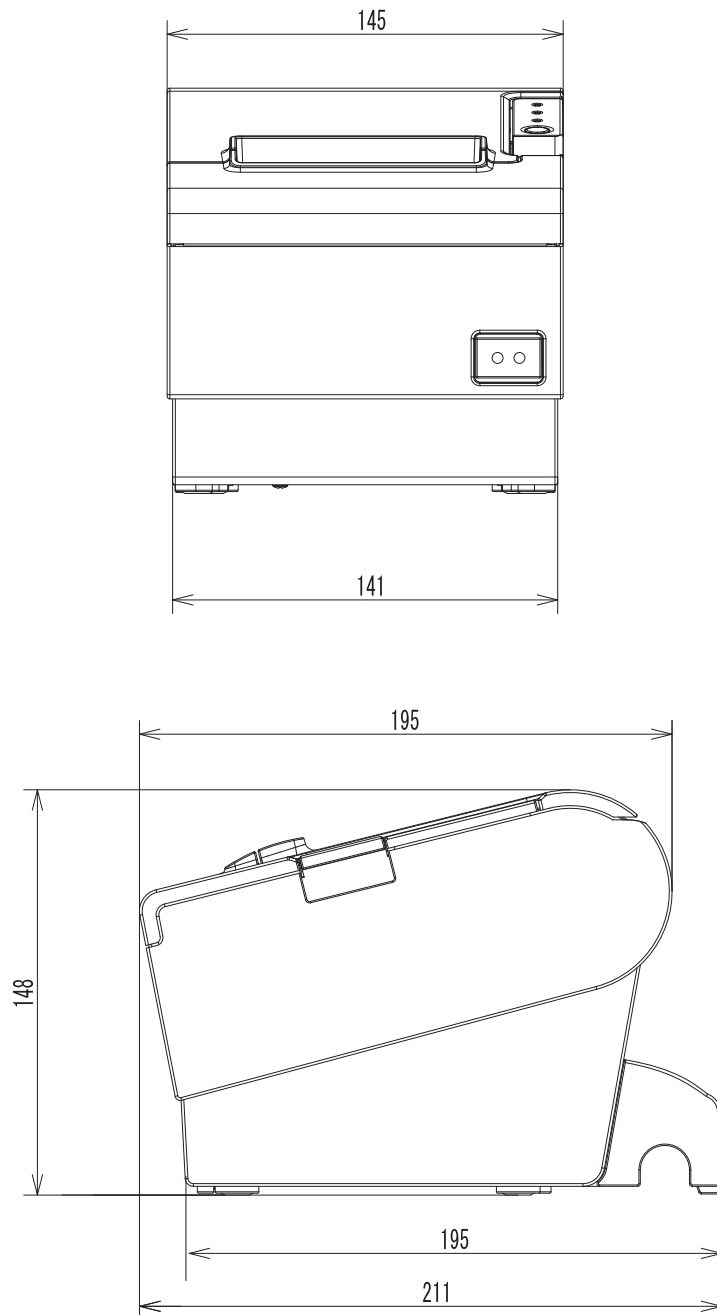
Supply voltage		DC 24V \pm 7%
Current consumption (at 24V, 25°C, normal print density)	Standby	Mean: Approximately 0.015A Maximum 1A for drawer kick driving.
	Operating	Mean: Approximately 1.8A Note: When print ratio is approximately 18% <ul style="list-style-type: none"> • Continuous printing for 50 lines (repeating 20H-7FH) <ul style="list-style-type: none"> * Font A * 42 columns * ASCII character • 5 line feeding • Autocutting

Environmental Conditions

Temperature/ Humidity	Operating	5 to 45°C {41 to 113°F}, 10 to 90% RH (See the operating temperature and humidity range below.)
	Storage (Factory packing)	-10 to 50°C {14 to 122°F}, 10 to 90% RH (except for paper)
		<p>Relative humidity [%RH]</p> <p>Ambient temperature [°C]</p> <p>Operating environment range</p> <p>31°C, 90%</p> <p>34°C, 90%</p> <p>34°C, 75%</p> <p>40°C, 65%</p> <p>45°C, 50%</p> <p>45°C, 43%</p> <p>— Specified original paper other than below</p> <p>— Specified original paper: P300, P310, P350</p>
Acoustic noise (operating)	<p>Approximately 55 dB (bystander position)</p> <p>Note:</p> <p>The values above are measured in the Epson evaluation condition.</p> <p>Acoustic noise differs depending on the paper used, printing contents, and the setting values, such as print speed or print density.</p>	

External Dimensions and Mass

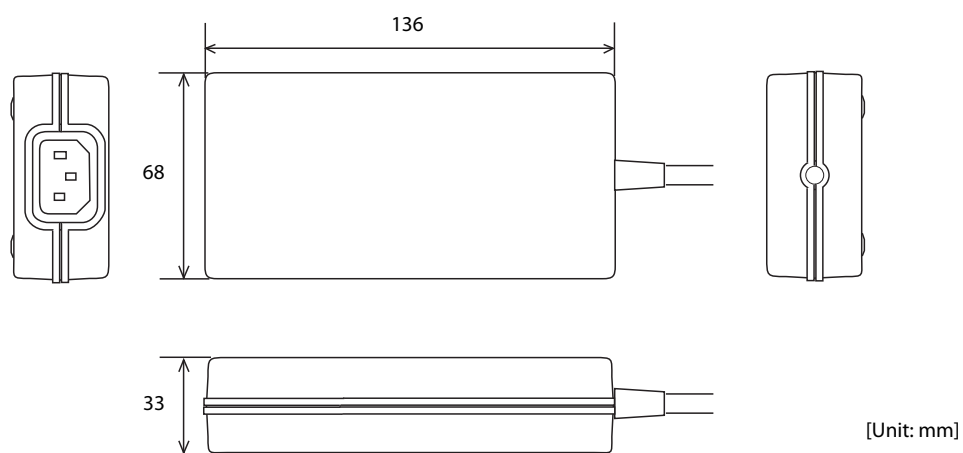
- Width: Approximately 145 mm {5.71"}
- Depth: Approximately 195 mm {7.68"}
- Height: Approximately 148 mm {5.83"}
- Mass: Approximately 1.6 kg {3.53 lb} (except for roll paper)



[Units: mm]

Option Specifications

AC adapter (PS-180)



Electric characteristics	Input conditions	Input voltage (rating): 90 to 264VAC (100VAC -10% to 230VAC +15%)
		Frequency (rating): 50/60 Hz \pm 3 Hz
		Input current (rating): 1.3A
	Output conditions	Output voltage (rating): 24VDC \pm 5%
		Output current (rating): 2.1A
Case specifications	Dimensions (W \times D \times H)	136 \times 33 \times 68 mm {5.35 \times 1.30 \times 2.68"} (excluding projections)
	Weight	Approx. 0.4 kg {14.11 oz} (excluding the AC cable)
	Color	Black (matte)

CAUTION

For ENERGY STAR® printers, always use the AC adapter that came with your printer.

Specifications of Interfaces and Connectors

NOTE

For detailed information about LAN or wireless LAN, see the Technical Reference Guide for the interface board.

RS-232 Serial Interface

Interface board specifications (RS-232-compliant)

Item		Specifications
Data transfer method		Serial
Synchronization		Asynchronous
Handshake		Select one of the following with DIP switch 1-3: <ul style="list-style-type: none"> • DTR/DSR • XON/XOFF
Signal level	MARK	-3V to -15V logic "1"/OFF
	SPACE	+3V to +15V logic "0"/ON
Bit length		Select one of the following with DIP switch 1-4: <ul style="list-style-type: none"> • 7 bit • 8 bit
Transmission speed [bps: bits per second]		<ul style="list-style-type: none"> • Select one of the following with DIP switch 1-7/1-8: 4800/9600/19200/38400 bps • Select one of the following with commands: 2400/4800/9600/19200/38400/57600/115200 bps
Parity check		Select one of the following with DIP switch 1-5: <ul style="list-style-type: none"> • Yes • No
Parity selection		Select one of the following with DIP switch 1-6: <ul style="list-style-type: none"> • Even • Odd
Stop bit		1 or more bits However, the stop bit for data transfer from the printer is fixed to 1 bit.
Connector	Printer side	DSUB 25-pin (female) connector

Functions of each connector pin

Pin no.	Signal name	Signal direction	Function
1	FG	—	Frame ground
2	TXD	Output	Transmission data
3	RXD	Input	Reception data
4	RTS	Output	Equivalent to DTR signal (pin 20)
6	DSR	Input	<p>This signal indicates whether the host computer can receive data.</p> <p>SPACE indicates that the host computer can receive data. MARK indicates that the host computer cannot receive data.</p> <p>When DTR/DSR control is selected, the printer transmits data after confirming this signal (except if transmitted using some ESC/POS commands).</p> <p>When XON/XOFF control is selected, the printer does not check this signal.</p> <p>Changing DIP switch 2-7 lets this signal be used as a printer reset signal.</p> <p>When you use this signal as the printer's reset signal, the printer is reset when the signal remains MARK for a pulse width of 1 ms or more.</p>
7	SG	—	Signal ground
20	DTR	Output	<p>1) When DTR/DSR control is selected, this signal indicates whether the printer is BUSY.</p> <ul style="list-style-type: none"> • SPACE status Indicates that the printer is ready to receive data. • MARK status Indicates that the printer is BUSY. Set BUSY conditions with DIP switch 2-1. <p>2) When XON/XOFF control is selected, the signal indicates that the printer is properly connected and ready to receive data from the host. The signal is always SPACE, except in the following cases:</p> <ul style="list-style-type: none"> • During the period from when power is turned on to when the printer is ready to receive data. • During the self-test.
25	INT	Input	Changing DIP switch 2-8 enables this signal to be used as a reset signal for the printer. The printer is reset if the signal remains at SPACE for a pulse width of 1 ms or more.

XON/XOFF

When XON/XOFF control is selected, the printer transmits the XON or XOFF signals as follows. The transmission timing of XON/XOFF differs, depending on the setting of DIP switch 2-1.

Signal	Printer status	DIP switch 2-1	
		1 (ON)	0 (OFF)
XON	1) When the printer goes online after turning on the power (or reset using the interface)	Transmit	Transmit
	2) When the receive buffer is released from the buffer full state	Transmit	Transmit
	3) When the printer switches from offline to online	—	Transmit
	4) When the printer recovers from an error using some ESC/POS commands	—	Transmit
XOFF	5) When the receive buffer becomes full	Transmit	Transmit
	6) When the printer switches from online to offline	—	Transmit

Code

The hexadecimal numbers corresponding to the XON/XOFF codes are shown below.

- XON code: 11H
- XOFF code: 13H



- When the printer goes from offline to online and the receive buffer is full, XON is not transmitted.
- When the printer goes from online to offline and the receive buffer is full, XOFF is not transmitted.
- When DIP switch 1-3 is off, XON is not transmitted as long as the printer is offline, even if a receive buffer full state has been cleared.

IEEE 1284 Parallel Interface

Modes

The IEEE 1284 parallel interface supports the following two modes.

Mode	Communication direction	Other information
Compatibility mode	Host → Printer communication	Centronics-compliant
Reverse mode	Printer → Host communication	Assumes a data transfer from an asynchronous printer

Compatibility Mode

Compatibility mode allows data transmission from host to printer only: Centronics-compatible.

Specification

Data transmission	8-bit parallel
Synchronization	Externally supplied $\overline{\text{STROBE}}$ signals
Handshaking	$\overline{\text{ACK}}$ and BUSY signals
Signal levels	TTL-compatible connector
Connector	ADS-B36BLFDR176 (HONDA) or equivalent product
Reverse communication	Nibble or byte mode

Reverse Mode

The transfer of status data from the printer to the host proceeds in the nibble or byte mode.

This mode allows data transfer from an asynchronous printer under the control of the host. Data transfers in the nibble mode are made via the existing control lines in units of four bits (a nibble). In the byte mode, data transfer proceeds by making the 8-bit data lines bidirectional. Both modes fail to proceed concurrently in the compatibility mode, thereby causing half-duplex transmission.

Interface signals

Pin	Source	Compatibility Mode	Nibble Mode	Byte Mode
1	Host	Strobe	HostClk	HostClk
2	Host/Ptr	Data0 (LSB)	Data0 (LSB)	Data0 (LSB)
3	Host/Ptr	Data1	Data1	Data1
4	Host/Ptr	Data2	Data2	Data2
5	Host/Ptr	Data3	Data3	Data3
6	Host/Ptr	Data4	Data4	Data4
7	Host/Ptr	Data5	Data5	Data5
8	Host/Ptr	Data6	Data6	Data6
9	Host/Ptr	Data7 (MSB)	Data7 (MSB)	Data7 (MSB)
10	Printer	$\overline{\text{Ack}}$	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	$\overline{\text{AutoFd}}$	HostBusy k	HostBusy
15		NC	ND	ND
16		GND	GND	GND
17		FG	FG	FG
18	Printer	Logic-H	Logic-H	Logic-H
19		GND	GND	GND
20		GND	GND	GND
21		GND	GND	GND
22		GND	GND	GND
23		GND	GND	GND
24		GND	GND	GND
25		GND	GND	GND
26		GND	GND	GND
27		GND	GND	GND

Pin	Source	Compatibility Mode	Nibble Mode	Byte Mode
28		GND	GND	GND
29		GND	GND	GND
30		GND	GND	GND
31	Host	$\overline{\text{Init}}$	$\overline{\text{Init}}$	$\overline{\text{Init}}$
32	Printer	$\overline{\text{Fault}}$	$\overline{\text{DataAvail/Data0,4}}$	$\overline{\text{DataAvail}}$
33		GND	ND	ND
34	Printer	DK_STATUS	ND	ND
35	Printer	+5V	ND	ND
36	Host	$\overline{\text{SelectIn}}$	1284-Active	1284-Active

NC: Not Connected

ND: Not Defined



- A signal name with a rule above it indicates an “L” active signal.
- Bidirectional communications cannot take place, unless all signal names for both sides correspond to each other.
- Connect all signal lines using a twisted-pair cable. Connect the return side to the signal ground level.
- Make sure the signals satisfy electrical characteristics.
- Set the leading edge and trailing edge times to 0.5ms or less.
- Do not ignore $\overline{\text{ACK}}$ or BUSY signals during a data transfer. Ignoring such signals may result in data corruption.
- Make the interface cables as short as possible.

USB (Universal Serial Bus) Interface

Outline

- Full-speed transmission at 12 Mbps [bps: bits per second]
- Plug & Play, Hot Insertion & Removal

USB transmission specifications

USB function

Overall specifications	According to USB 2.0 specifications
Transmission speed	USB Full-Speed (12 Mbps)
Transmission method	USB bulk transmission method
Power supply specifications	USB self power supply function
Current consumed by USB bus	0 mA
USB packet size (with full-speed connection)	
USB bulk OUT (TM)	64 bytes
USB bulk IN (TM)	64 bytes

Status transmission from printer with USB interface

In order to ensure that there is no lack of status data, it is necessary to periodically retrieve status data at the host computer.

Unlike RS 232C transmission, it cannot spontaneously interrupt data transmission to the host computer.

The printer has a 128-byte status data buffer. Statuses that exceed the buffer capacity are canceled.

Character Code Tables

Refer to the following URL regarding the character code table.

<https://www.epson-biz.com/pos/reference/charcode/>

