CITIZEN

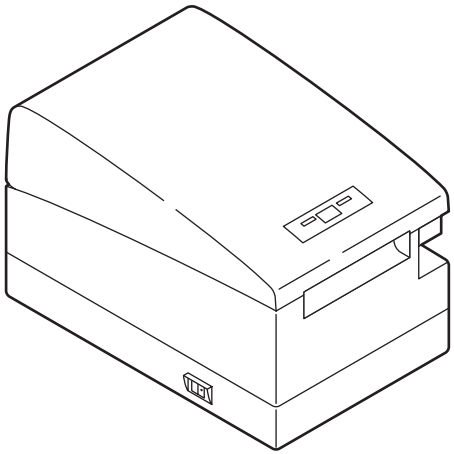
LINE THERMAL PRINTER

MODEL

CT-S2000/CT-S2000DC

CT-S2000L/CT-S2000DCL

User's Manual



CITIZEN SYSTEMS JAPAN CO., LTD.

WEEE MARK

En If you want to dispose this product, do not mix with general household waste. There is a separate collection systems for used electronics products in accordance with legislation under the WEEE Directive (Directive 2002/96/EC) and is effective only within European Union.

Ge Wenn Sie dieses Produkt entsorgen wollen, dann tun Sie dies bitte nicht zusammen mit dem Haushaltsmüll. Es gibt im Rahmen der WEEE-Direktive innerhalb der Europäischen Union (Direktive 2002/96/EC) gesetzliche Bestimmungen für separate Sammelsysteme für gebrauchte elektronische Geräte und Produkte.

Fr Si vous souhaitez vous débarrasser de cet appareil, ne le mettez pas à la poubelle avec vos ordures ménagères. Il existe un système de récupération distinct pour les vieux appareils électroniques conformément à la législation WEEE sur le recyclage des déchets des équipements électriques et électroniques (Directive 2002/96/EC) qui est uniquement valable dans les pays de l'Union européenne.
Les appareils et les machines électriques et électroniques contiennent souvent des matières dangereuses pour l'homme et l'environnement si vous les utilisez et vous vous en débarrassez de façon inappropriée.

Sp Si desea deshacerse de este producto, no lo mezcle con residuos domésticos de carácter general. Existe un sistema de recogida selectiva de aparatos electrónicos usados, según establece la legislación prevista por la Directiva 2002/96/CE sobre residuos de aparatos eléctricos y electrónicos (RAEE), vigente únicamente en la Unión Europea.

It Se desiderate gettare via questo prodotto, non mescolatelo ai rifiuti generici di casa. Esiste un sistema di raccolta separato per i prodotti elettronici usati in conformità alla legislazione RAEE (Direttiva 2002/96/CE), valida solo all'interno dell'Unione Europea.

Du Deponeer dit product niet bij het gewone huishoudelijk afval wanneer u het wilt verwijderen. Er bestaat ingevolge de WEEE-richtlijn (Richtlijn 2002/96/EG) een speciaal wettelijk voorgeschreven verzamelsysteem voor gebruikte elektronische producten, welk alleen geldt binnen de Europese Unie.

Da Hvis du vil skille dig af med dette produkt, må du ikke smide det ud sammen med dit almindelige husholdningsaffald. Der findes et separat indsamlingssystem for udtjente elektroniske produkter i overensstemmelse med lovgivningen under WEEE-direktivet (direktiv 2002/96/EC), som kun er gældende i den Europæiske Union.

Por Se quiser deitar fora este produto, não o misture com o lixo comum. De acordo com a legislação que decorre da Directiva REEE – Resíduos de Equipamentos Eléctricos e Electrónicos (2002/96/CE), existe um sistema de recolha separado para os equipamentos electrónicos fora de uso, em vigor apenas na União Europeia.

Pol Jeżeli zamierzasz pozbyć się tego produktu, nie wyrzucaj go razem ze zwykłymi domowymi odpadkami. Według dyrektywy WEEE (Dyrektywa 2002/96/EC) obowiązującej w Unii Europejskiej dla używanych produktów elektronicznych należy stosować oddzielne sposoby utylizacji.

Declaration of Conformity

This printer conforms to the following Standards:

The Low Voltage Directive 2006/95/EC, formerly 72/23/EEC, the EMC Directive 2004/108/EC, formerly 89/336/EEC, the RoHS Directive 2002/95/EC, and the WEEE Directive 2002/96/EC.

LVD : EN60950-1

EMC : EN55022 Class A
EN61000-3-2
EN61000-3-3
EN55024

This declaration is applied only for 230V model.

IMPORTANT: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.
CAUTION: Use shielded cable for this equipment.

Sicherheitshinweis
Die Steckdose zum Anschluß dieses Druckers muß nahe dem Gerät angebracht und leicht zugänglich sein.

For Uses in Canada
This Class A digital apparatus complies with Canadian ICES-003.
This digital apparatus does not exceed the class A limits for radio noise emissions from digital apparatus, as set out in the radio interference regulations of the Canadian department of communications.

Pour L'utilisateurs Canadiens
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.
Cet appareil numérique ne dépasse pas les limites de carégorie a pour les émissions de bruit radio émanant d'appareils numériques, tel que prévu dans les réglements sur l'interférence radio du départment Canadien des communications.

GENERAL PRECAUTIONS

- Before using this product, be sure to read through this manual. After having read this manual, keep it in a safe, readily accessible place for future reference.
- The information contained herein is subject to change without prior notice.
- Reproduction or transfer of part or all of this document in any means is prohibited without permission from Citizen Systems.
- Note that Citizen Systems is not responsible for any operation results regardless of missing, error, or misprinting in this manual.
- Note that Citizen Systems is not responsible for any trouble caused as a result of using options or consumables that are not specified in this manual.
- Except explained elsewhere in this manual, do not attempt to service, disassemble, or repair this product.
- Note that Citizen Systems is not responsible for any damage attributable to incorrect operation/handling or improper operating environments that are not specified in this manual.
- Data is basically for temporary use and not stored for an extended period of time or permanently. Please note that Citizen Systems is not responsible for damage or lost profit resulting from the loss of data caused by accidents, repairs, tests or other occurrence.
- If you find loss of information, error, or uncertain matter, please contact your Citizen Systems dealer.
- If you find any disordered or missing page(s), contact your Citizen Systems dealer for replacement.

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SAFETY PRECAUTIONS ... WHICH SHOULD BE STRICTLY OBSERVED

Before using this product for the first time, carefully read these SAFETY PRECAUTIONS. Improper handling may result in accidents (fire, electric shock or injury).
In order to prevent injury to operators, third parties, or damage to property, special warning symbols are used in the User's Manual to indicate important items to be strictly observed.

- After having read this Manual, keep it in a safe, readily accessible place for future reference.
- Some of the descriptions contained in this manual may not be relevant to some printer models.

The following describes the degree of hazard and damage that could occur if the printer is improperly operated by ignoring the instructions indicated by the warning symbols.

⚠WARNING

Neglecting precautions indicated by this symbol may result in fatal or serious injury.

⚠CAUTION

Neglecting precautions indicated by this symbol may result in injury or damage to properties.

This symbol is used to alert your attention to important items.

This symbol is used to alert you to the danger of electric shock or electrostatic damage.

This symbol denotes a request to unplug the printer from the wall outlet.

This symbol is used to indicate useful information, such as procedures, instructions or the like.

This symbol is used to indicate prohibited actions.

PRECAUTIONS ON PRINTER INSTALLATION

⚠ WARNING

■ Do not use or store this product in a place where it will be exposed to:
  * Flames or moist air.
  * Direct sunlight.
  * Hot airflow or radiation from a heating device.
  * Salty air or corrosive gases.
  * Ill-ventilated atmosphere.
  * Chemical reactions in a laboratory.
  * Airborne oil, steel particles, or dust.
  * Static electricity or strong magnetic field.

• **Neglecting these warnings may result in printer failure, overheating, emission of smoke, fire, or electric shock.**

■ Do not drop any foreign object nor spill liquid into the printer. Do not place any object on the printer either.
■ Do not drop any metallic object such as paper clip, pin or screw into the printer.
■ Do not place a flower vase, pot or cup containing water on the printer.
■ Do not spill coffee, soft drinks or any other liquid into the printer.
■ Do not spray insecticide or any other chemical liquid over the printer.

• **A metallic foreign object, if accidentally dropped into the printer, may cause printer failure, fire, or electric shock. Should it occur, immediately turn the printer off, unplug it from the supply outlet, and call your local Citizen Systems dealer.**

Do not handle the printer in the following ways:
■ Do not allow the printer to sustain strong impacts or hard jolts (e.g., trampling, dropping, striking with a hard edge).
■ Never attempt to disassemble or modify the printer.

• **Neglecting to handle properly may result in printer failure, overheating, emission of smoke, fire, or electric shock.**

■ Install, use, or store the printer out of the reach of children.

• **Electric appliances could cause an unexpected injury or accident if they are handled or used improperly.**
• **Keep the power cord and signal cables out of the reach of children. Also children should not be allowed to gain access to any internal part of the printer.**
• **The plastic bag the printer came in must be disposed of properly or kept away from children. Wearing it over the head may lead to suffocation.**

⚠ CAUTION

Do not use the printer under the following conditions.

■ A state subject to vibration or unstable state.
■ A state with this product slanted.
• **Otherwise dropping may cause injury.**
• **Poor print quality may occur.**

■ A state where the printer ventilation holes are obstructed by a nearby wall or other equipment.
■ A state where any object is placed on the printer
■ A state where the printer is covered or wrapped by a cloth or bed clothing
• **Be careful about internal heat buildup, which could cause fire and deform the case.**

■ Avoid using the printer near a radio or TV set or from supplying it from the same outlet as these appliances.
■ Avoid using the printer interconnected with a cable or cord that has no protection against noise. (For interconnections, use shielded or a twisted pair of cables and ferrite cores, or other anti-noise devices.)

■ Avoid using the printer with a device that is a strong source of noise.
• **The printer may have an adverse effect on nearby radio or TV transmissions. There may also be cases when nearby electrical appliances adversely influence the printer, causing data errors or malfunction.**
■ A state where this product is installed vertically or sidelong.
• **Malfunction, failure, or electric shock may result.**

■ Use the printer with its grounding post connected to a convenient grounding facility.
• **If leakage occurs electric shock may result.**

■ Do not connect the printer's grounding post onto any of the following facilities:
  * Utility gas piping
    • **A gas explosion could result.**
  * Telephone line ground
  * Lightning rod
    • **If lightning strikes a large surge of current may cause fire or shock.**
  * Utility water pipes
    • **Plastic water pipes should not be used for grounding. (Those approved by a Waterworks Department may be used.)**

■ Before connecting or disconnecting the grounding lead to or from the printer, always unplug it from supply outlet.

PRECAUTIONS IN HANDLING THE PRINTER

⚠ WARNING

Please observe the following precautions for power source and power cord:

■ Do not plug or unplug the power cord with a wet hand.

■ Use the printer only at the specified supply voltage and frequency.

■ Use only the specified AC adapter with the printer.

■ Check to make sure that the supply outlet from which the printer is powered has a sufficient capacity.

■ Do not supply the printer from a power strip or current tap shared with other appliances.

■ Do not plug the power cord into a supply outlet with dust or debris left on its plug.

■ Do not use a deformed or damaged power cord.

■ Do not move the printer while the printer power is on.

- **Neglecting to handle properly may result in printer failure, emission of smoke, fire, or electric shock.**
- **An overload may cause the power cord to overheat or fire or the circuit breaker to trip.**

■ Do not allow anything to rest on the power cord. Do not place the printer where the power cord will be trampled on.

■ Do not use or carry the printer with its power cord bent, twisted, or pulled.

■ Do not attempt to modify the power cord unnecessarily.

■ Do not lay the power cord in the neighbor of a heating device.

- **Neglecting these cautions may cause wires or insulation to break, which could result in leakage, electric shock, or printer failure. If the power cord sustains damage, contact your Citizen Systems dealer.**

■ Do not leave things around the supply outlet.

■ Supply power to the printer from a convenient wall outlet, readily accessible in an emergency.

- **The printer may not be immediately shut down in an emergency.**

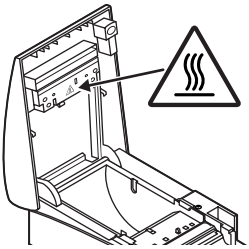
■ Insert the power plug fully into the outlet.

■ If the printer will not be used for a long time, leave it disconnected from its supply outlet.

■ Hold the plug and connector when plugging or unplugging the power cord or signal cable after turning off the printer and the appliance connected to it.

⚠ CAUTION

Caution label is attached on the position shown in the following figure. Carefully read the precautions in handling before using the printer.



THIS LABEL INDICATES THE RISK OF ANY INJURY DUE TO "HIGHTEMPERATURE" OFTHE PRINT HEAD.

■ Do not transport this printer with the paper roll inside.
- **Printer failure or breakage may occur.**

To prevent possible malfunction or failure observe the following.
■ Avoid operating the printer without paper properly loaded.
■ Avoid the use of paper not complying with specifications.
- **May result in poor print quality.**

■ Avoid using torn pieces of paper or spliced with plastic adhesive tapes.
■ Avoid forcibly pulling already loaded paper by hand.
■ Avoid wedging the paper into the printer.
- **May jam paper. To release, refer to "Removing Jammed Paper" in this manual.**

■ Avoid using a sharp pointed device to operate panel keys.

■ Be sure to firmly insert the cable plug into its mating socket.
- **A cross connection may damage the printer's internal electronics or the host system's hardware.**

■ Only use the printer with devices that have designated solenoid specifications for the cash drawer interface connector.
- **Neglecting this caution may result in malfunction or failure.**

⚠ CAUTION

To prevent injury and printer failures from worsening, observe the following:

- ■ Do not touch the printing surface of the thermal head.
- ■ Do not touch any of the moving parts (e.g., paper cutter, gears, active electrical parts) while the printer is working.
- ■ In case of trouble do not attempt to repair the printer. Ask Citizen Systems service for repair.

- ■ Be careful that the printer cover does not entrap your hands or fingers.
- ■ Be careful with sharp edges on the printer. Do not allow them to injure you or damage property.

• **May result in electric shock, burn, or injury.**

If the printer emits smoke, an odd smell, or unusual noise while printing, immediately abort the current print session and unplug the printer from the supply outlet.

ⓘ DAILY MAINTENANCE

Observe the following precautions for daily maintenance.

- ■ When cleaning the printer, always turn it off and unplug it from the supply outlet.
- ■ Use a soft, dry cloth for cleaning the surface of the printer case.
- ■ For severe stains, use a soft cloth slightly dampened with water.

- ■ Never use organic cleaning solvent such as alcohol, paint thinner, trichloroethylene, benzene, or ketone. Never use a chemically processed cleaning cloth.
- ■ To remove paper dust, use a soft brush.

⚠ CAUTION

• **The thermal head is at a dangerously high temperature immediately after printing. Allow it to cool off before launching maintenance work.**

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1. GENERAL OUTLINE

The CT-S2000/CT-S2000DC are thermal line printers designed for use with a broad array of terminal equipment including data, POS, and kitchen terminals. With extensive features, they can be used in a wide range of applications.

1.1 Features

- Compact, easy-to-use universal design.
- Drop-in Paper Roll mechanism facilitating easy paper handling and head cleaning.
- Drip-proof design
- High speed (220 mm/s) printing.
- Versatile Roll Capacity with ability to use 83 mm, 80 mm, 60 mm and 58 mm wide paper rolls.
- Can use paper roll with a maximum of 102 mm diameter.
- Equipped with USB interface as standard
- Replaceable interface board.
- High-speed parallel interface (Parallel interface model)
- Built-in cash drawer interface.
- Auto cutter mechanism provided as a standard.
- User customization such as memory switch setting are available.
- Page mode. Now you can arrange pages freely.
- Registration of user-defined characters and logos into flash memory.
- Barcode & 2D Barcode printing is supported.
- 2-color printing is supported (When specified paper is used).
- Error indication is available with LED or buzzer.

[Only CT-S2000L, CT-S2000DCL]

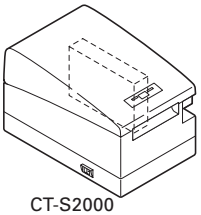
- High-speed printing at a maximum of 220 mm/s is possible (* 154 mm/s at standard density on label paper).
- Usable with label paper of 57.5 mm, 59.5 mm, and 79.5 mm wide other than 82.5 mm wide.
- Automatic adjustment of paper sensor sensitivity is available.usable without step.

*Description marked "*L" in this manual is the description for CT-S2000L/CT-S2000DCL. Read this manual after confirming your model in use.

1.2 Unpacking

When unpacking the printer, confirm that the following are provided:

- Printer: 1
- AC adapter (Option, only for CT-S2000DC): 1
- AC power cord (Option, only for CT-S2000DC): 1
- Sample paper roll: 1 roll
- Quick start guide: 1
- CD-ROM: 1

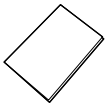


CT-S2000
(AC power type)

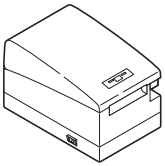
AC power cord

Sample paper roll

CD-ROM



Quick start guide



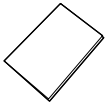
CT-S2000DC
(DC power supply type)

AC adapter
(Option)

AC power cord
(Option)

Sample paper roll

CD-ROM



Quick start guide

1.3 Model Classification

The printer models are classified by the following designation method:

CT - S2000 RS E - BK -

Power supply
No marking: AC power type
(built-in power supply)
DC: DC power supply type

Interface
PA: IEEE1284 & USB
RS: RS-232C & USB
UB: USB only (Option)
ET:Ethernet+USB

Label/Black mark
No marking: Standard
L: Label
M: Black mark

Body case color
WH: Cool white
BK: Black
GR: Dark Grey

Character set, AC cable,
E: Europe
U: USA

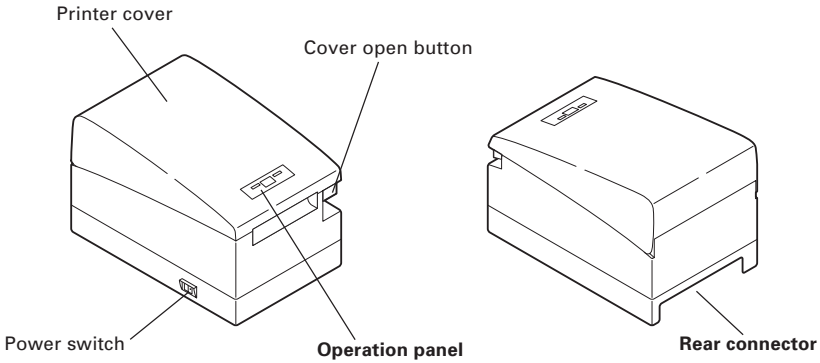
1.4 Basic Specifications

Item	Specifications					
Model	CT-S2000 PA, CT-S2000 RS, CT-S2000DC PA, CT-S2000DC RS					
Print method	Line thermal dot print method					
Print width *1	80 mm/640 dots, 72 mm/576 dots, 54.5 mm/436 dots, 54 mm/432 dots					
Dot density	8 × 8 dots/mm (203 dpi)					
Print speed	220 mm/s (Fastest, print density 100 %), 1760 dot lines/s					
Number of print columns *2	——	Number of print columns (columns)				Dot configuration (Dot)
	Paper width / Font	83mm	80mm	60mm	58mm	
	Font A	53	48	36	35	12 × 24
	Font B	71	64	48	46	9 × 24
	Font C	80	72	54	52	8 × 16
Character size *4	Font A: 1.50 × 3.00 mm Font B: 1.13 × 3.00 mm Font C: 1.00 × 2.00 mm					
Character type	Alphanumeric, International, PC437 PC850/852/857/858/860/863/864/865/866/WPC1252/Katakana/Thai code 18					
User memory	384 KB (Capable of registering user-defined characters and logos)					
Types of bar code	UPC-A/E, JAN (EAN) 13/8 columns, ITF, CODE 39, CODE 128, CODABAR, CODE 93, PDF417, QR Code					
Line spacing	4.23 mm (1/6 inch)					
Paper roll	Thermal paper roll: 83^{+0}_{-1} mm/80^{+0}_{-1} mm/60^{+0}_{-1} mm/58^{+0}_{-1} mm ×Maximum ϕ102 mm Paper thickness: 65-85 μm					
Interfacing	Serial (RS-232C compliant), Parallel (IEEE 1284 compliant), USB, Ethernet					
Cash drawer interface	2 cash drawers are supported.					
Input buffer	4k bytes/45 bytes					
Supply voltage	DC 24 V ±7%					
Power consumption	Approx. 70W (in normal printing)					
AC adapter	Rated input: AC 100 to 240 V, 50/60 Hz, 150 VA Rated output: DC 24 V, 2.1A (36AD1/37AD1, 36AD2/37AD5)					
	Model 36AD1/37AD1 for CT-S2000 / Model 36AD2/37AD5 for CT-S2000DC					
Weight	CT-S2000:Approx. 2 kg, CT-S2000DC:Approx. 1.8 kg					
Outside dimensions	147 (W) × 207 (D) × 147 (H) mm					
Operating temperature and humidity	5 to 45°C, 10 to 90% RH (No condensation)					
Storage temperature and humidity	–20 to 60°C, 10 to 90% RH (No condensation)					
Reliability	Print head life: 150 km, 2 × 10^8 pulses (At normal temperature/humidity with recommended paper used) Auto cutter life:2 million cuts (At normal temperature/humidity with recommended paper used)					
Safety standard *3	UL, C-UL, FCC Class A, TÜV-GS, CE Marking					

Notes:
*1: When paper width is 83, 80, 60, 58 mm
*2: The number of printable columns is selectable with a Memory Switch.
The number of columns in this table refers to typical model. Printer varies partly in the number of columns depending on printer specifications.
*3: This rating is obtained by the use of specified AC adapter (36AD1/37AD1, 36AD2/37AD5).
*4: As each character size includes the space inside the character font, actual character looks smaller.

2. EXPLANATION OF PRINTER PARTS

2.1 Printer Appearance



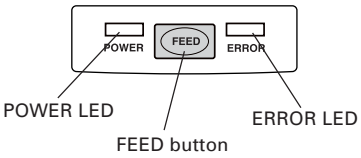
(Front view) (Rear view)

- Printer cover
  Paper is loaded under this cover.

- Cover open button
  To refill or replace paper, open the printer cover by lifting the cover open button.

- Power switch
  This switch turns the printer power ON/OFF.

Operation Panel



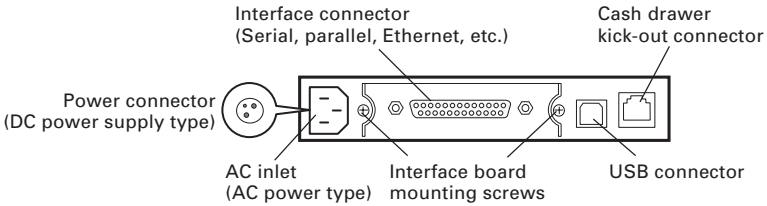
● POWER LED
Illuminated when the printer power is on and off when the printer power is off. May blink or light in a special mode or in case of failure.

● ERROR LED
Illuminated or blinks when paper is empty or in case of failure.
The interval length of blinking represents the type of error.

● FEED button
Pressing this button once causes the paper to feed one line. The longer the button is pressed, the more paper is fed.
In case of auto cutter error, press the FEED button after removing the cause of the error.

See 4.6 Error Indication

Rear Connectors



● Interface connector (Serial, parallel, Ethernet, etc.)
Connects to the interface cable. A DIP switch is provided on the serial interface board.

● Cash drawer kick-out connector
Connects to the cable from the cash drawer.

● AC inlet (AC power type)
Connects to AC power cord

● Power connector (DC power supply type)
Connects to the cable from AC adapter.

2.2 Printer Cover Inside

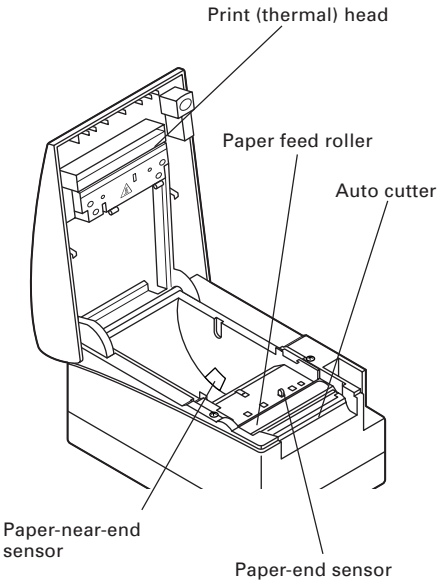
- Paper feed roller
  Feeds paper as part of print mechanism.

- Paper-near-end sensor
  Detects near paper end, change position in accordance with the outer diameter of paper core.

- Auto cutter
  Cuts the paper with a command at the end of printing. Cutting method is selectable between partial cut and full cut with a command.

- Print (thermal) head
  Prints characters and/or graphic data on thermal paper.

- Paper-end sensor
  Stops printing when this sensor detects paper end.



2.3 Other Built-in Functions

- Buzzer
  This printer has a built-in buzzer. It is operated in case of an error, operation, or by a command.

See 4.6 Error Indication

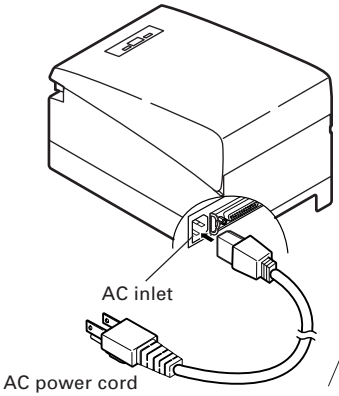
- User memory
  Allows downloading of user-defined characters and logo data in the nonvolatile memory. This data remains stored even after the printer power is off. For the registration method, refer to Command Reference Manual in separate document. To acquire the Command Reference Manual, contact your Citizen Systems dealer.

- Memory switch
  Setting of various kinds of functions can be stored in nonvolatile memory. The functions are valid even if the printer power is turned off.

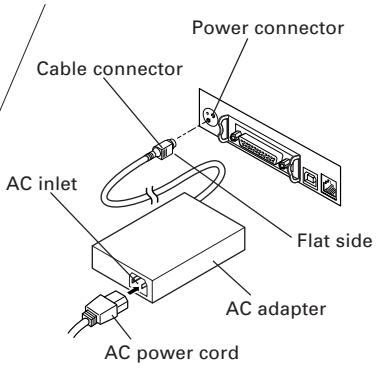
3. PREPARATION

3.1 Connecting the AC Power Cord

1. **Turn off the printer power.**
2. **● For AC power type (with built-in power supply), connect the AC power cord to the AC inlet at the back of the printer and plug the AC power cord into the wall outlet.**
   ● For DC power type, connect the AC adapter cable connector to the power connector at the back of the printer with its flat surface facing interface connector side. Then connect the AC power cord to the AC inlet of the AC adapter and then plug the AC power cord to the wall outlet.



AC power type
(built-in power supply)



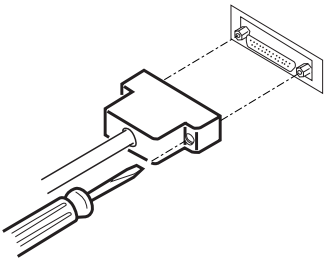
DC power supply type

⚠ CAUTION!

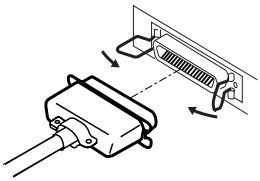
- ■ Use only the specified AC adapter with the printer.
- ■ When disconnecting a cable, DO NOT pull out by the cable. Always hold the plug.
- ■ Always keep the AC power supply away from other noise generating equipment.
- ■ DO NOT pull the AC power cord. Otherwise fire, electric shock, or power disconnection may result.
- ■ If lightning is approaching, unplug the AC power cord from the wall outlet. Otherwise fire or electric shock may result.
- ■ Keep the power cord away from heat generating appliances. Otherwise the shield of power cord may be fused resulting in a fire or electric shock.
- ■ If the printer will not be used for a long time, leave it disconnected from its supply outlet.
- ■ Avoid locating the AC power cord in places which may cause tripping or falling.

3.2 Connecting Interface Cables

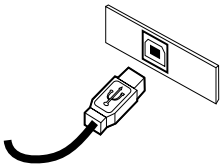
Confirm that the power switch is OFF and connect the interface cable.
Orient the interface cable terminal correctly and insert it into the interface connector.



Serial Interface



Parallel Interface



USB Interface

⚠ CAUTION!

- For the method of using the Ethernet interface, refer to Separate volume.
- When disconnecting the cable, always hold the connector.
- Be careful not to insert the USB interface cable into the cash drawer kick-out connector.

For serial interface cable, use the one with the following connection.

25-pin - 25-pin cable

PC — Printer

Signal	Pin		Pin	Signal
FG	1		1	FG
TXD	2		2	TXD
RXD	3		3	RXD
CTS	5		4	RTS
DSR	6		6	DSR
SG	7		7	SG
DTR	20		20	DTR

9-pin - 25-pin cable

PC — Printer

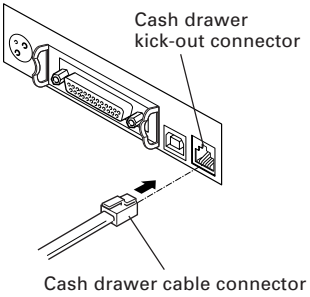
Signal	Pin		Pin	Signal
RXD	2		2	TXD
TXD	3		3	RXD
DTR	4		4	RTS
SG	5		6	DSR
DSR	6		7	SG
CTS	8		20	DTR

⚠ CAUTION!

Avoid locating the interface cable in places which may cause tripping or falling.

3.3 Connecting the Cash Drawer

1. **Confirm that the power switch is OFF.**
2. **Confirm the top and bottom of the cash drawer cable connector and insert it into the cash drawer kick-out connector at the back of the printer.**
3. **Screw the cash drawer's ground wire to the body of the printer.**

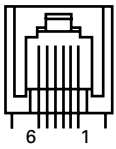


⚠CAUTION!

DO NOT connect any other device than the specified cash drawer to the cash drawer kick-out connector. (DO NOT connect a telephone line either.)

(1) Connector Pin Configuration
(2) Electrical characteristics
1) Driving voltage: 24 VDC

No.	Signal	Function
1	FG	Frame Ground
2	DRAWER 1	Drawer 1 drive signal
3	DRSW	Drawer switch input
4	VDR	Drawer drive power supply
5	DRAWER 2	Drawer 2 drive signal
6	GND	Common ground on circuits

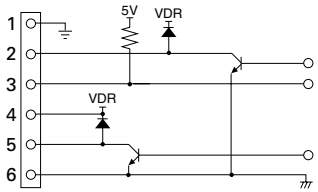


Connector used:
TM5RJ3-66 (Hirose) or equivalent
Applicable connector:
TM3P-66P (Hirose) or equivalent

2) Driving current: Approx. 1A max. (shall not exceed 510 ms.)
3) DRSW signal: Signal levels: "L" = 0 to 0.5 V, "H" = 3 to 5 V

(3) DRSW signal
DRSW signal status can be tested with the DLE+EOT, GS+a, or GS+r command or at pin 34 on the parallel interface port.

(4) Drive Circuit (printer side)

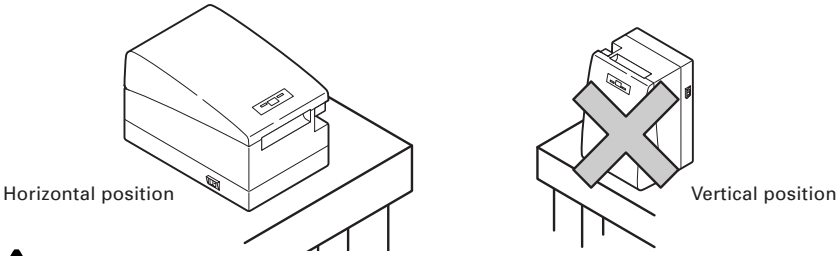


⚠CAUTION!

- No output is produced while printing.
- The cash drawers 1 and 2 cannot be driven simultaneously.
- A solenoid used for the cash drawer should be of 24 Ω or more. The output current should be kept at 1A or less; otherwise, breakdown or burning could occur.

3.4 Precautions in Installing the Printer

The printer must only be operated horizontally. Do not operate vertically or install on a wall.



⚠CAUTION!

DO NOT use the printer under the following conditions.

■ A state subject to vibration or unstable state.

■ A state with this product slanted.

- **Otherwise dropping may cause injury.**
- **Poor print quality may occur.**

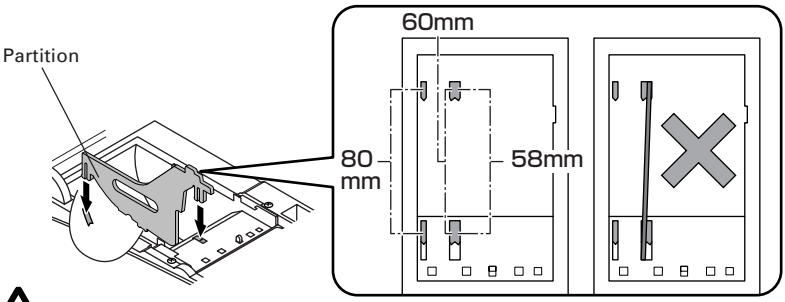
■ A state where this product is installed vertically or sidelong.

- **Malfunction, failure, or electric shock may result.**

3.5 Partition for Paper Roll

At the time of shipment, this partition is set to “80-mm wide roll paper position”.

1. **Confirm that the power switch is OFF.**
2. **Open the printer cover.**
3. **Set the partition to each to the slot which meets the width of the paper roll used. When using the 83-mm wide paper roll, remove the partition.**
4. **Change the setting of paper width by reffering to the section 5.2, "Manual Setting of Memory Switch".**

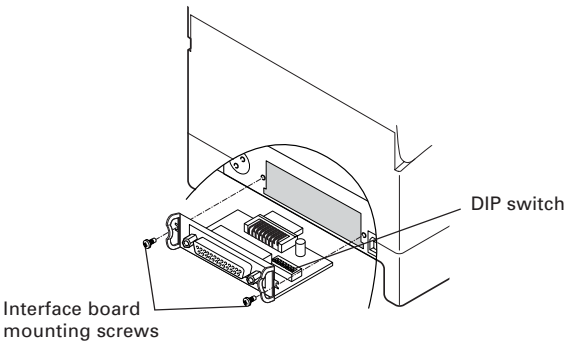


⚠CAUTION!

When setting the partition to the slot for 58 mm or 60 mm paper roll, be sure not to set it slanted.

3.6 Setting DIP Switch

The DIP switch is present on the serial interface board.
Remove the board fixing screws, take out the interface board, and then set the DIP switch. The function of each switch is as shown below.



⚠CAUTION!

When setting the DIP switch, DO NOT remove screws other than those for mounting the serial interface board.

Switch No.	Function	ON	OFF	Initial Settings
1	Communication condition setting method	DIP switch setting	Memory switch setting	OFF
2	Hand shake	XON/XOFF	DTR/DSR	OFF
3	Bit length	7 bits	8 bits	OFF
4	Parity check	With parity	None	OFF
5	Parity selection	Even parity	Odd parity	OFF
6	Baud rate selection	See Table below.		ON
7				ON
8	INIT	Reset	Invalid	OFF

Selecting baud rate

Baud Rate (bps)	Switch No.	
	6	7
2400	OFF	OFF
4800	ON	OFF
9600	OFF	ON
19200	ON	ON

1200, 38400, 57600 and 115200 bps can also be selected by a command, etc.

3.7 Adjusting the Paper Near-end Sensor

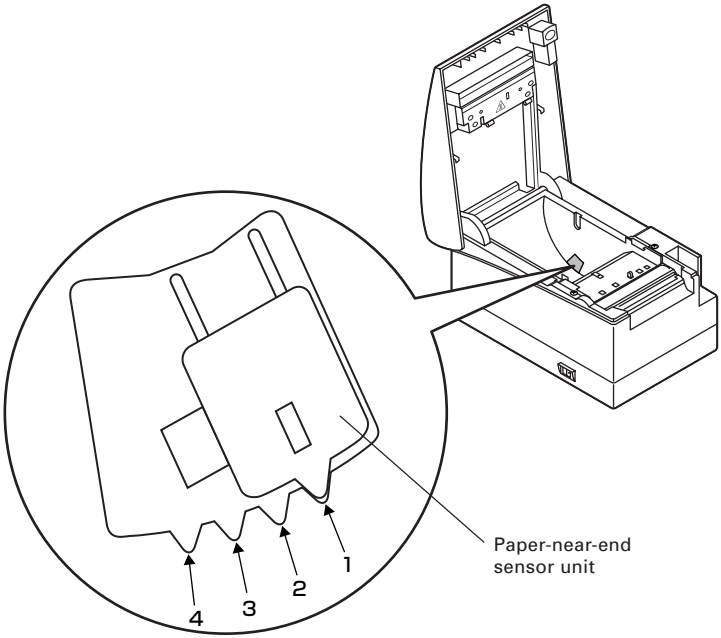
1. **Lightly push in the paper near-end sensor unit.**
2. **Move the paper near-end sensor unit to the right and left while keeping to press it. The sensor position is as shown below depending on the diameter of the roll paper used.**

Sensor Position	Roll paper diameter at the detection of near-end	Outer core diameter of roll paper used
**1	ϕ22	ϕ18
*2	ϕ25	ϕ22
3	ϕ29	ϕ25
4	ϕ34	ϕ32

* The PNE Sensor (Memory SW2-8) is set to "Invalid" for USA version at the factory. When the SW2-8 is changed to "Valid", the above Sensor Position 2 will be enabled.
** Factory setting for other country version

⚠ CAUTION!

- ■ Paper remaining differs by the type of paper roll used.
- ■ The external diameter of the paper roll is only for reference.
- ■ When a paper end error is detected incorrectly during using a paper roll with a honeycomb type core, move the sensor position to the larger number.



3.8 Installieren eines Treibers

Drivers are included on the CD-ROM that comes with the printer.
Install the driver required by your printer.
For information about driver installation, functions, and operations, see the information provided on the CD-ROM for each driver.
Visit the site below to download the latest driver versions and information.

http://www.citizen-systems.co.jp/english/support/download/printer/driver/

3.9 Precautions for Creating Applications and Practical Operations

If printing is done immediately after the paper is partially cut and torn off, the top of the next print out may be distorted.
We recommend advancing the paper one line after cutting before printing.

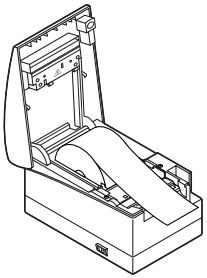
If you are using a serial interface that has a slow data transmission speed, streaks may appear in the printouts when you are printing graphics or gradated text, which require large amounts of data.

USB interfaces may be susceptible to the effects of electromagnetic interference from the host or environment.
If this is the case, try using a cable with ferrite cores on both ends, which are very effective at eliminating EMI.

4. MAINTENANCE AND TROUBLESHOOTING

4.1 Setting/Replacing the paper roll

1. **Lift the cover open button.**
2. **Open the printer cover.**
3. **Insert a paper roll with its print area facing down as shown in the figure and pull out the paper end straightforward by several cm out of the printer.**
4. **Firmly close the printer cover until a click can be heard. With the factory setting, the paper is fed and cut automatically.**



See 5.3 Manual Setting of Memory Switch

⚠CAUTION!

- Always use the specified types of paper roll.
- Confirm that the paper roll is set correctly.
- When the paper is skewed and not extended straightforward from under the printer cover, open the printer cover and adjust the paper correctly.
- When the cover is opened after paper setting, be sure to pull the paper straightforward by several cm out of the printer, and then close the cover.
- When closing the printer cover, press on the center part of the cover to close it firmly.
- When setting paper, be careful not to have your finger injured by the paper edge.

⚠WARNING

When opening the printer cover, DO NOT touch the print head or cutter blade. Otherwise, burning or injury of hand may result.

4.2 Removing Jammed Paper

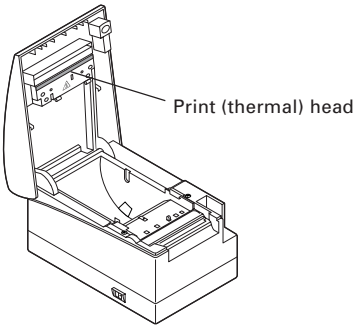
1. **Turn the printer power off.**
2. **Open the printer cover.**
3. **Remove the jammed paper including any paper chips remaining. (Remove the paper roll set in the holder as well.)**
4. **Reinstall the paper roll and close the printer cover.**
5. **Turn on the printer. The auto cutter mechanism is initialized and the alarm is cleared.**

⚠CAUTION!

- If the cutter blade remains protruded with paper jammed, press the FEED button. If the cutter blade does not move back, performe the above step 1 through 3 and then turn the printer on without a paper roll. Contact your Citizen Systems dealer. Be carefull not to have your hand injured by the cutter blade in the operation.
- The print head is hot immediately after printing. DO NOT touch it with your hand. DO NOT touch the heating element of the head with a bare hand or metal object either.

4.3 Cleaning the Print Head

1. **Turn the printer power off.**
2. **Open the printer cover.**
3. **Wait several minutes. Wipe off any debris on the heating element of the head using a cotton swab soaked in ethyl alcohol.**

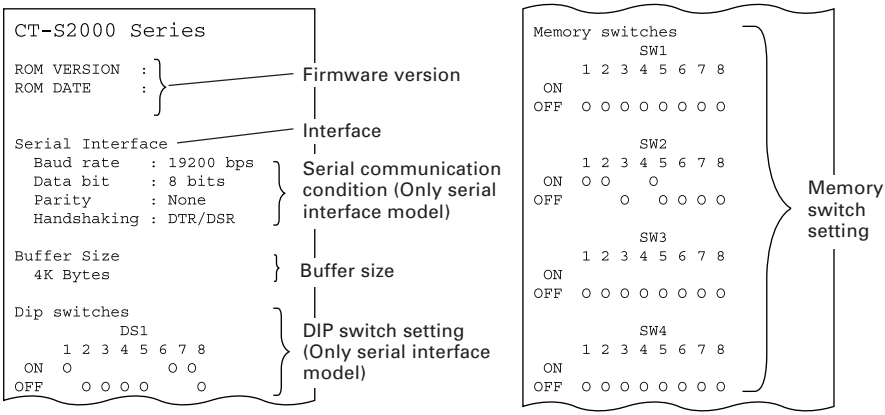


⚠ CAUTION!

The print head is hot immediately after printing. DO NOT touch it with your hand. DO NOT touch the heating element of the head with a bare hand or metal object either.

4.4 Self-printing

Insert paper into the printer. With the FEED button pressed and held, turn the printer power on, keep the FEED button held for about 1 second, and then release the FEED button. The printer starts self-printing. The printer prints model name, version, DIP switch setting, memory switch setting, and built-in fonts.



4.5 Hexadecimal Dump Printing

This function is to print all received data in hexadecimal numbers. If problems such as missing data, data duplication, etc. should occur, this function allows checking whether or not the printer is receiving data correctly.
Set paper to the printer and keep the printer cover open. With the FEED button pressed and held, turn the printer power on and then close the printer cover. The printer prints "HEX dump print mode" followed by the received data printed in hexadecimal numbers and some characters.

⚠ CAUTION!

- The printer prints "." if there is no characters corresponding to data.
- During hexadecimal dump, functions except some command will be disabled.
- If print data DOES NOT cover a line, press the FEED button to print the line.

When you press the FEED button three times consecutively, or you turn the printer power off, or the printer receives a reset signal from the interface, the hexadecimal dump printing is terminated.

Print example

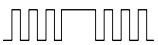
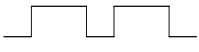
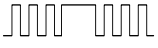
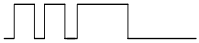
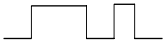
```
HEX DUMP PRINT MODE
1B 21 00 1B 20 04 41 42 43 44 .!.. .ABCD
45 46 47 48 49 4A 4B 4C 4D 4E EFGHIJKLMN
4F 50 0D 0A 31 32 33 0D 0A    OP..123..
```

4.6 Error Indication

- Paper end
  Paper empty is detected in two steps: paper near-end and paper end. It causes the ERROR LED to light. If paper end is detected, refill the paper. If the printer cover is open, a paper-end is detected.
- Printer cover open
  During printing, do not open the printer cover. If you open the printer cover accidentally, the ERROR LED blinks. Check the paper, pull the paper straightforward by several cm out of the printer, and then close the printer cover. Printing resumes automatically. Sending a command to resume printing may be required depending on the memory switch setting.
- Cutter lock
  If the cutter blade stops operating due to paper jam or the like, the ERROR LED blinks. Remove the cause of the trouble and press the FEED button. If the blade still does not move and the cover cannot be opened, contact your Citizen Systems dealer.
- Thermal head overheat
  When you print dense characters or dark image, the head temperature rises. If the head temperature exceeds a specified level, the printer stops printing operation and waits till the head temperature is lowered. During waiting, the ERROR LED blinks. When the head temperature is lowered, printing resumes automatically.

● Power switch operation error
If you turn power on again just after powering off, an error may occur.
Before turning power on again, wait till POWER LED goes off completely after powering off.

Lighting and blinking status of each error including the above is shown below.

Status	POWER LED	ERROR LED	Buzzer
Paper-end	Lights	Lights	
Paper near-end	Lights	Lights	—
Cover open error	Lights	Lights	
Cover open error *1	Lights		
Cutter lock error	Lights		
Head overheat error	Lights		—
Motor overheat error	Lights		—
Memory check error		Lights	—
Low voltage error	Lights		—
High voltage error or Power switch operation error	Lights		—
Macro execution wait *2	Lights		—
Wait for cutting label *L	OFF		—
Paper detection error *L	OFF		

*1: When the printer is printing.
*2: The ERROR LED may blink even in the execution of macro function.

4.7 Paper Jams

Take care to avoid obstruction of the paper outlet and paper jamming around the outlet during printing.
If paper cannot get out of the printer, it can roll up on the platen inside the printer and cause an error.
If the paper wraps around the platen, open the paper cover and carefully pull the paper out.

4.8 Serial Interface Operation Precautions

While using the serial interface, certain printing conditions can cause white stripes in printouts and feed failure. To avoid these problems, change memory switch settings as described below.

1. **Change MSW7-1 (serial baud rate) to a faster baud rate setting.**
2. **Change MSW10-2 (print speed) to a lower level.**

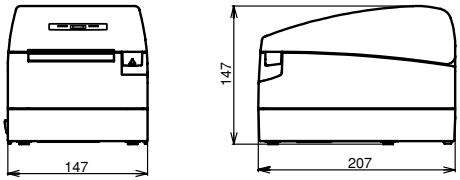
⚠ CAUTION!

■ Depending on the serial interface transmission speed, ambient temperature, print data duty, and other factors, changing the above settings may not eliminate the problems.

5. OTHER

5.1 External Views and Dimensions

(Unit: mm)

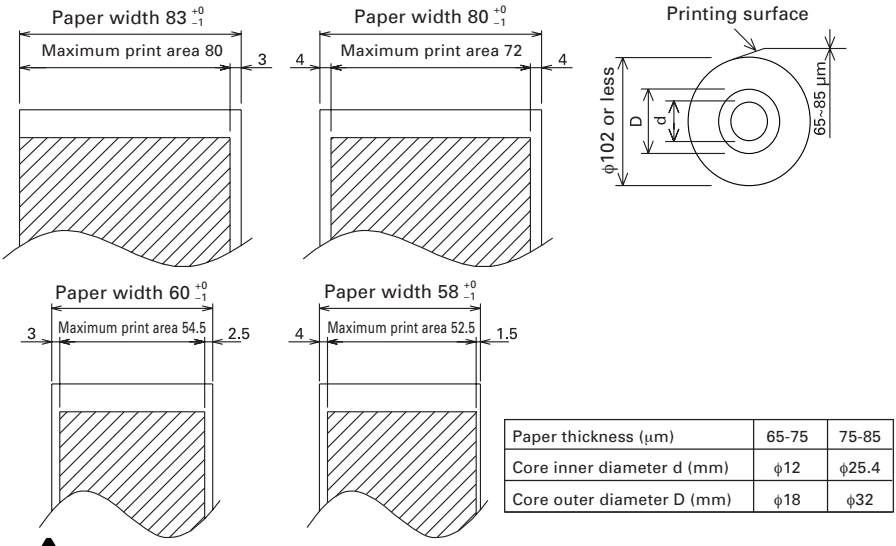


5.2 Printing Paper

Use the print paper shown in the following table or the paper with equivalent quality.

Paper Type	Product Name
Recommended thermal paper roll	TF50KS-E2D from Nippon Paper PD150R, PD160R from Ohji Paper PA220AG, HP220A, HP220AB-1, F230AA, P220AB from Mitsubishi Paper

(Unit: mm)



Paper thickness (µm)	65-75	75-85
Core inner diameter d (mm)	φ12	φ25.4
Core outer diameter D (mm)	φ18	φ32

⚠ CAUTION!

DO NOT use the following type of paper roll.
- ■ Paper with folds.
- ■ Paper with bent corners.
- ■ Paper pasted or glued to the core.
- ■ In-wound paper roll (print side in).

5.3 Manual Setting of Memory Switch

Memory switches can be set manually or by a command.
For manual setting, refer to the next page.
The function of each memory switch is shown in the following table.
(The white-on-black characters are factory setting.)

Switch No.	Setting	0 (OFF)	1 (ON)
Memory SW1-1	Power ON Info	Valid	Not send
SW1-2	Buffer Size	4k bytes	45 bytes
SW1-3	Busy Condition	Full/Err	Full
SW1-4	Receive Error	Print ?	No Print
SW1-5	CR mode	Ignored	LF
SW1-6	Reserved	Fixed	–
SW1-7	DSR Signal	Invalid	Valid
SW1-8	Init Signal	Invalid	Valid
Memory SW2-1	Reserved	–	Fixed
SW2-2	Auto Cutter	Invalid	Valid
SW2-3	Spool Print	Invalid	Valid
SW2-4	Full Col Print	LineFeed	WaitData
SW2-5	Resume aft PE	Next	Top
SW2-6	Reserved	Fixed	–
SW2-7	Reserved	Fixed	–
SW2-8	PNE Sensor	Valid	Invalid **
Memory SW3-1	Resum Cttr Err	Valid	Invalid
SW3-2	Reserved	Fixed	–
SW3-3	Parallel 31 Pin	Valid	Invalid
SW3-4	Reserved	Fixed	–
SW3-5	Reserved	Fixed	–
SW3-6	Reserved	Fixed	–
SW3-7	CBM1000 Mode	Invalid	Valid
SW3-8	Resum Open Err	Close	Command
Memory SW4-1	Reserved	Fixed	–
SW4-1*L	Paper Length Setting	Auto Measure	Command
SW4-2	Reserved	Fixed	–
SW4-2*L	Top of Form at Power ON	Invalid	Valid
SW4-3	Feed&Cut at TOF	Invalid	Valid
SW4-4	Reserved	Fixed	–
SW4-4*L	Paper Select	Thermal Roll	BM.P/Lbl.P *
SW4-5	Reserved	Fixed	–
SW4-5*L	Position Detect	Black Mark	Label
SW4-6	Reserved	Fixed	–
SW4-6*L	Paper Change	Invalid	Valid
SW4-7	Reserved	Fixed	–
SW4-8	Partial only	Invalid	Valid

* When printing on label paper, adjust the layout so that right and left margins are 4 mm or more.
* The memory switch SW4-8 will be ignored for black mark paper.
* The memory switches SW2-8 and SW4-8 will be ignored for label.

Switch No.	Setting	0 (OFF)	1 (ON)
Memory SW5-1	Buzzer	Valid	Invalid
SW5-2	Line Pitch	360	406
SW5-3	USB Mode	Virtual COM	Printer Class
SW5-4	Reserved	Fixed	–
SW5-5	No use	Fixed	–
SW5-6	Fine Printing	Invalid	Valid
SW5-7	No use	Fixed	–
SW5-8	No use	Fixed	–

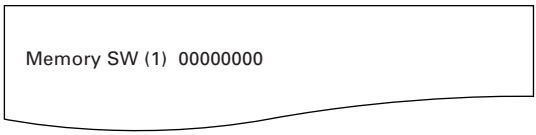
Switch No.	Setting	Default	Set Values
Memory SW7-1	Baud Rate	19200 bps/ 9600 bps**	1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps
SW7-2	Data Length	8bits	7bits, 8bits
SW7-3	Stop Bit	1bit	1bit, 2bits
SW7-4	Parity	NONE	NONE, EVEN, ODD
SW7-5	Flow Control	DTR/DSR	DTR/DSR, XON/XOFF
SW7-6	DMA Control	Valid	Valid, Invalid
SW7-7	VCom Protocol	PC Setting	PC Setting, DTR/DSR, XON/XOFF
Memory SW8-1	Print Width	576 dots	360 dots, 384 dots, 420 dots, 432 dots, 436 dots, 512 dots, 576 dots, 640 dots
SW8-2	Paper Type	1 Color Normal	1 Color Normal, 2 Color Normal
Memory SW9-1	Code Page	PC437	PC437/Katakana/PC850,858/PC860/PC863/ PC865/PC852/PC866/PC857/WPC1252/PC864/ Thai Code 18
Memory SW9-2	International Character	USA	USA, France, Germany, England, Denmark, Sweden, Italy, Spain, Japan, Norway, Denmark 2, Spain 2, Latin America, Korea, Croatia, China
Memory SW9-3*	Kanji	OFF	ON, OFF
SW9-4*	JIS/Shift JIS	JIS	JIS, Shift JIS
Memory SW10-1	Print Density	100%	70%, 75%, 80%, 85%, 90%, 95%, 100%, 105%, 110%, 115%, 120%, 125%, 130%, 135%, 140%
SW10-2	Print Speed	Level 9	Level 1, Level 2, Level 3, Level 4, Level 5, Level 6, Level 7, Level 8, Level 9
SW10-3	ACK Timing	Before Busy	Before Busy, Same Period, After Busy
SW10-4	NV User	192Kbytes	1Kbytes, 64Kbytes, 128Kbytes, 192Kbytes
SW10-5	NV Graphic	384Kbytes	0 byte, 64Kbytes, 128Kbytes, 192Kbytes, 256Kbytes, 320Kbytes, 384Kbytes

* In this printer, Memory Switches 9-3 and 9-4 are not usable.
** For USA version.

Manual Setting of Memory Switch (Memory SW)

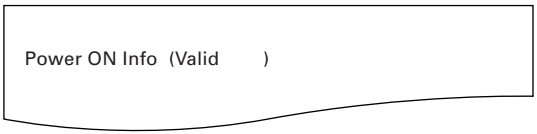
The memory switch can be selected, changed, or written by the combination of three actions: pressing the FEED button, pressing and holding the FEED button, and opening or closing the printer cover.

1. Entering memory switch setting mode.
   Set paper to the printer and keep the printer cover open. With the FEED button pressed and held, turn the printer power on, and then press the FEED button twice. Close the cover. If the current settings of the memory switch etc. are printed, the printer is now in the memory switch setting mode.



(No indication for 0/1 with memory switch 7 through 10)

2. Selecting memory switch
   When the FEED button is pressed short (within 2 seconds), printing occurs in the order of "Memory SW1" → "Memory SW2" → "Memory SW3" → ....."Memory SW10" → "Save To Memory" → "Memory SW1" → ..... repeatedly. When the memory switch you want to change is reached, press and hold the FEED button (for more than 2 seconds).
3. Selecting each switch item
   2-16 items are provided for setting in each switch. By pressing and holding the FEED button long, the printer goes to the next item and prints the current setting of the item. Repeat pressing and holding till the item you want to change is reached.



(With memory switch 7 through 10, ERROR LED goes on only at the factory setting.)

4. Changing the setting
   When the item you want to change is printed, press the FEED button short. The changed set value is printed. (When change of set value is repeated, the original set value is recovered). When you press the FEED button long, the set value is accepted and then the printer goes to the next setting item.
5. Returning to the memory switch select mode
   When the setting of the desired content is completed, open the printer cover and then close the printer cover. This allows the printer to print the setting of the changed memory switch.
6. Saving the setting and exiting the memory switch setting mode
   Press the FEED button short to move to "Save To Memory". Then press and hold the FEED button. The printer prints the content of new setting and exits the memory switch setting mode to return to the normal standby state.
   * Unless saving the setting is executed, the changed setting cannot be enabled.
7. Initializing the memory switch
   When you want to return the memory switch setting to the initial state, go to "Save To Memory" in the above procedure. Here, open the printer cover and press and hold the FEED button till buzzer sounds. This allows the printer to return to the initial state.
   * All the memory switches settings are returned to the factory set values.

5.4 Selecting Paper Type*L

Paper type selection is available by the combination of memory switches SW4-4 and SW4-5 by the used of "Memory Switch Select Mode". In addtion, the following procedure is available.

1 Enter Selecting Paper Type mode.

1) Open the printer cover and remove paper. Pressing and holding the **FEED button**, turn the printer power ON. The POWER LED starts blinking.
2) Release the **FEED button** and then close the printer cover. Buzzer sounds and the paper type currently set is indicated by the LED on the operation panel.

2 Select Paper Type.

Press the **FEED button** to match the paper type loaded to the LED indications in the table below. (Refer to the table below.)

	POWER LED	ERROR LED
Label	Green lit	(OFF)
Thermal paper roll	(OFF)	Red lit
Black mark paper	Green lit	Red lit

3 Save the selected Paper Type to the Printer.

Open and close the printer cover. By this operation, selected paper type is stored in the printer memory and the Selecting Paper Type mode is terminated. Since then, "P.Length Set" of Memory switch 4-1 becomes disable.
When closing the printer cover during the setting a black mark paper or label paper in the printer, paper length is measured, and the result will be printed out.

* When paper detection error occurs at the measurement of paper length, automatically enters paper sensor adjustment mode. Adjust the sensor in accordance with "5.5 Adjusting the Sensitivity of Paper Sensor".

5.5 Adjusting the Sensitivity of Paper Sensor*L

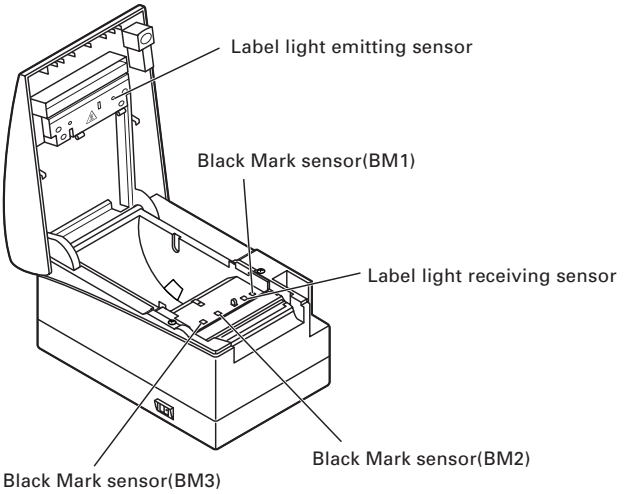
Before using black mark paper (BM paper) or label paper, adjust the sensitivity of the paper sensor by using actual paper.

1 Enter Adjusting Paper Sensor mode.

Open the printer cover, remove paper, and then set the printer power switch to ON. Here, POWER LED and ERROR LED go on with the buzzer sound. Then close the printer cover while pressing the **FEED button**. The ERROR LED starts blinking with the buzzer sound.

2 Set paper to the printer.

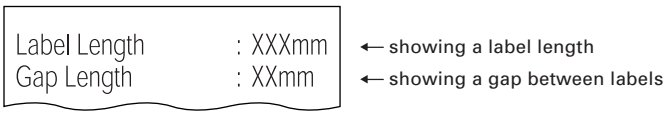
This printer has three types of built-in paper sensors.
In case of label, set it so that label is positioned on the label light receiving sensor and label light emitting sensor. In case of black mark paper, set it so that the printable portion (other than black mark) is positioned on the black mark sensor. With this state kept, closing the printer cover causes ERROR LED to blink with the buzzer sound.



3 Adjust the sensitivity of the paper sensor and measure the length of paper.

Pressing the FEED switch causes label to be fed and paper sensor sensitivity adjustment and paper length measurement are carried out automatically. If the **FEED button** is pressed during the paper measuring, the result will be printed out as follows, and the printer memory switch will be initialized.

* The measuring result is a reference value



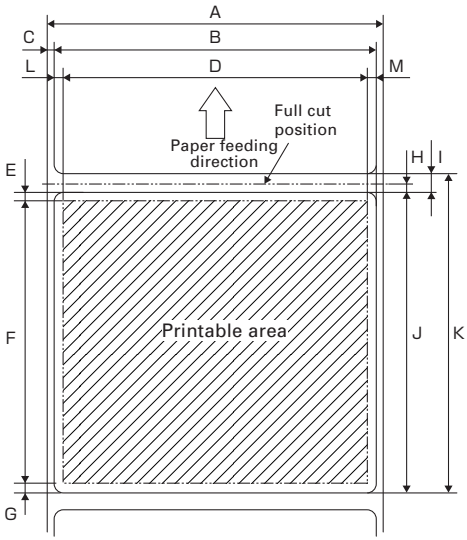
< Example of label measuring result >

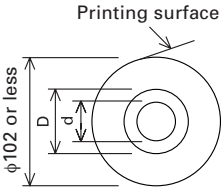
5.6 Printing Paper*L

Also refer to the core dimension and notes of "5.2 Printing Paper" in User's Manual of standard model. Use print paper shown in the following table or the equivalent.

Paper type	Product name
Recommended thermal label paper	GG40/P22/G6B from Ojitac, HD75 from Nippon Paper, 150LA-1 from Ricoh

a) Label paper





Roll paper specifications

Label paper thickness*	65 to 85 μm
Liner thickness	60 μm max
Core inner diameter d	25.4mm
Core outer diameter D	32mm

Unit: mm

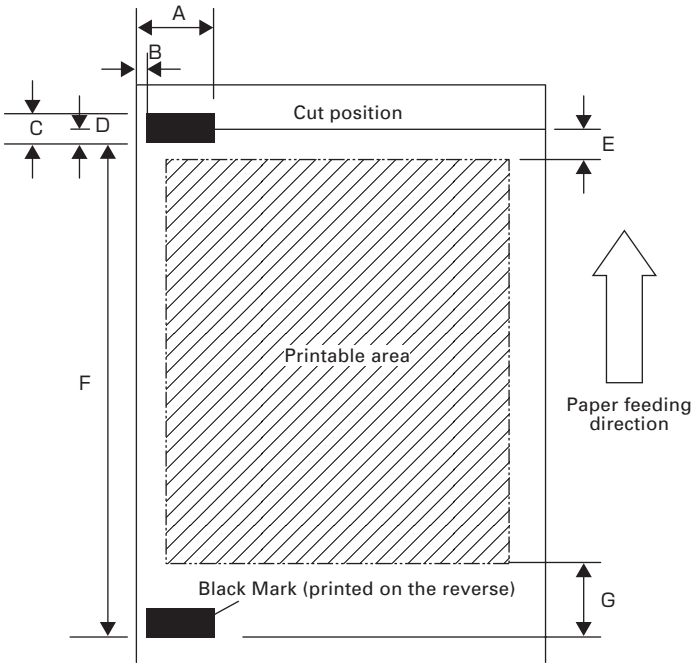
Mark	Item	Dimensions
A	Liner width	57.5, 59.5, 79.5, 82.5 ± 0.5
B	Label width	(Size A) -4 ± 0.5
C	Left edge of label	2 ± 0.5
D	Print width	(Size A) -8
E	Top margin	2 ± 1
F	Print length	21 to 296
G	Bottom margin	2 ± 1
H	Cut position between labels	1/2 x (Size I)
I	Gap between labels	4 to 30
J	Label length	25 to 300
K	Label pitch	I+J
L	Right margin	2 ± 1
M	Left margin	2 ± 1

⚠ CAUTION!

Pay attention to the following when using Auto Cutter. Otherwise, a cutter lock or a cutter failure may occur.

- ■ Set the cut length of paper to 25 mm or more.
- ■ When using label paper, cut the gap between labels (liner sheet). Do not cut the label paper (tack paper).
- ■ Adjusting the paper sensor must be carried when the type of liner is changed.

b) Black mark paper (BM paper)



Unit: mm

Mark	Item	Dimensions		
		BM1	BM2	BM3
A	Right edge of black mark	13.5 or more	57.5 or more	80.5 or more
B	Left edge of black mark	1.5 or or less	45.5 oror less	68.5 or or less
C	Black mark height	5		
D	Cut position in black mark	2.5		
E	Top margin	6.5		
F	Black mark pitch	30 to 300		
G	Bottom margin	9		

⚠ CAUTION!

- PCS value of black mark must be 0.9 or more.
- When using the black mark paper, consider the margin of +/- 2 mm for the print position against the standard position and maximum -5% for print length.
- Refer to the above drawing for the printable area and have enough margings specified in the marks E and G. If the print data size is out of the printable area, the printer should skip to next page.

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