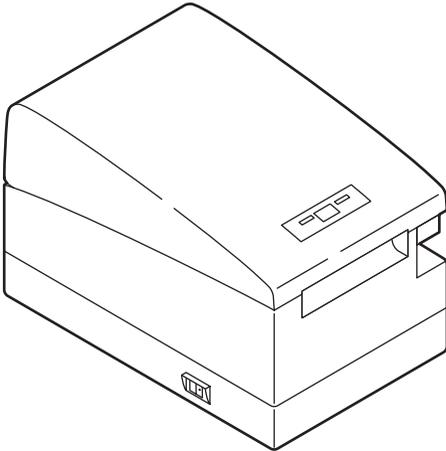


LINE THERMAL PRINTER

MODEL CT-S2000/CT-S2000DC

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 indsamlingsssystem 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:

Low Voltage Directive 73/23/EEC, 93/68/EEC and the EMC Directive 89/336/EEC, 92/31/EEC, 93/68/EEC.

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 catégorie a pour les émissions de bruit radio émanant d'appareils numériques, tel que prévu dans les règlements sur l'interférence radio du département 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.

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

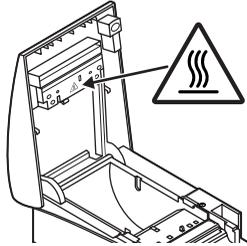
Please observe the following precautions for power source and power cord:

- 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.

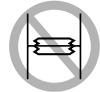


THIS LABEL INDICATES THE RISK OF ANY INJURY DUE TO "HIGH TEMPERATURE" OF THE PRINT HEAD.

- 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.

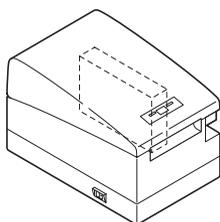
1.1 Features

- 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 printing
- 2-color printing is supported (When specified paper is used).
- Error indication is available with LED or buzzer.

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
- User's manual (This manual): 1



CT-S2000
(AC power type)



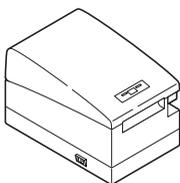
AC power cord



User's manual
(This manual)



Sample paper roll



CT-S2000DC
(DC power supply type)



AC adapter
(Option)



AC power cord
(Option)



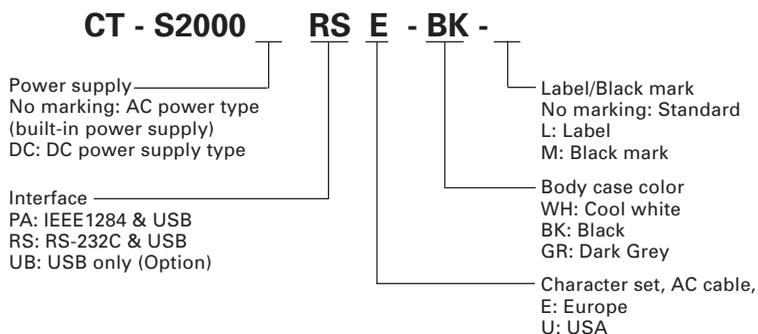
User's manual
(This manual)



Sample paper roll

1.3 Model Classification

The printer models are classified by the following designation method:



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)
	Font	Paper width	83mm	80mm	60mm	58mm
	Font A		53	48	36	35
	Font B		71	64	48	46
	Font C		80	72	54	52
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					
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 ϕ 102 mm Paper thickness: 65-85 μ m					
Interfacing	Serial (RS-232C compliant), Parallel (IEEE 1284 compliant), USB					
Cash drawer interface	2 cash drawers are supported.					
Input buffer	4k bytes/45 bytes					
Supply voltage	DC 24 V \pm 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, 2A					
	Model 35AD1 for CT-S2000 / Model 35AD2 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.

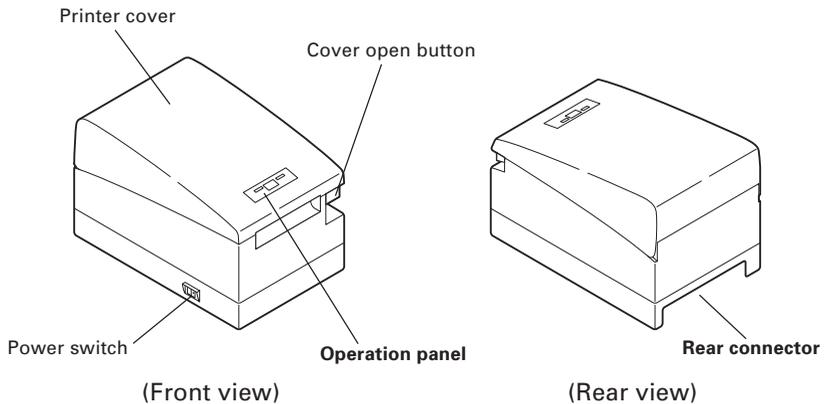
The number of columns in this table refers to typical model. Printer varies partly in the number of columns depending on printer specifications.

*3: This rating is obtained by the use of specified AC adapter (35AD1 or 35AD2).

*4: As each character size includes the space inside the character font, actual character looks smaller.

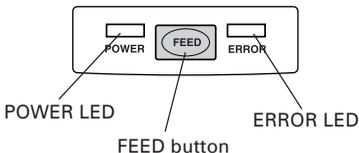
2. EXPLANATION OF PRINTER PARTS

2.1 Printer Appearance



- **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.

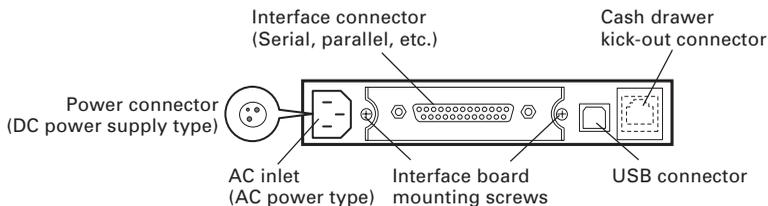
● FEED button

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, 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.

* Remove the protection seal of cash drawer kick-out connector before use.

● AC inlet (AC power type)

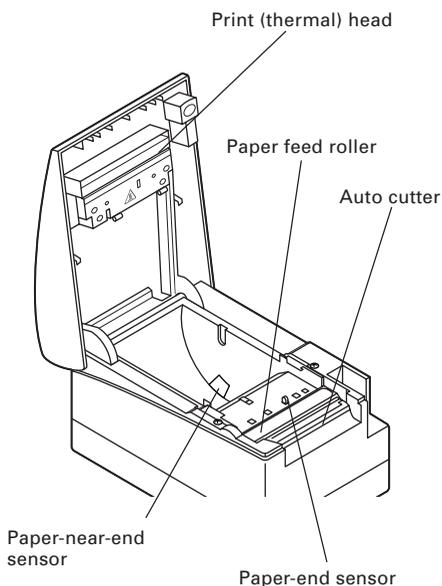
Connects to AC power cord

● 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.



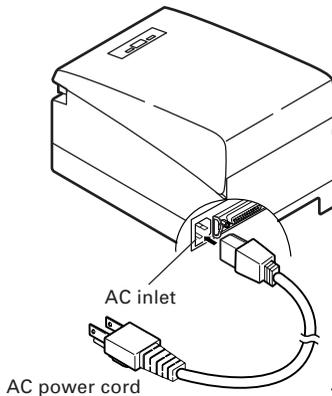
2.3 Other Built-in Functions

- 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.

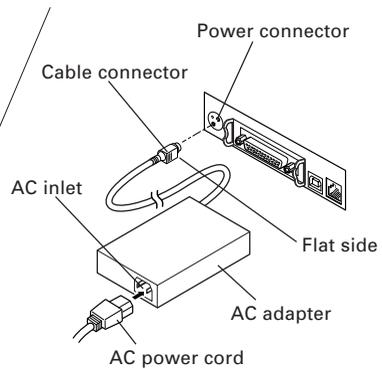
3. PREPARATION

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)



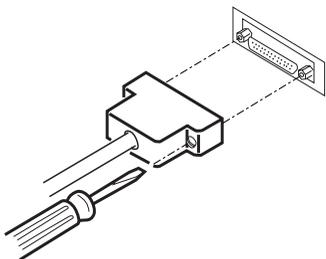
DC power supply type

CAUTION!

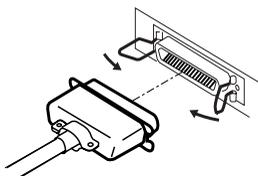
- Use only the specified AC adapter with the printer.
- When disconnecting a cable, DO NOT pull out by the cable. Always hold the plug.
- Always keep the AC power supply away from other noise generating equipment.
- DO NOT pull the AC power cord. Otherwise fire, electric shock, or power disconnection 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

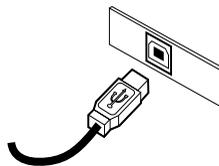
Confirm that the power switch is OFF and connect the interface cable. Orient the interface cable terminal correctly and insert it into the interface connector.



Serial Interface



Parallel Interface



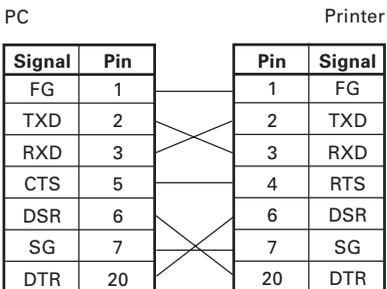
USB Interface

CAUTION!

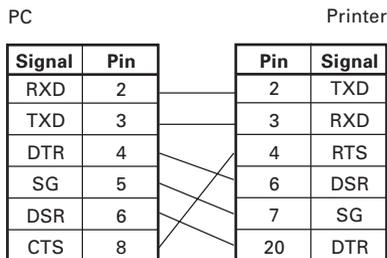
- When disconnecting the cable, always hold the connector.
- Be careful not to insert the USB interface cable into the cash drawer kick-out connector.

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

25-pin - 25-pin cable



9-pin - 25-pin cable

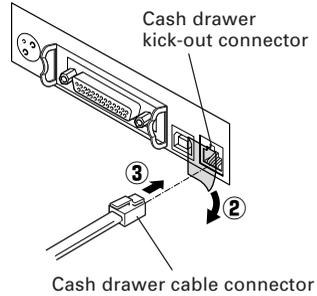


CAUTION!

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. Detach the protection seal of the cash drawer kick-out connector.
3. 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.
4. Screw the cash drawer's ground wire to the body of the printer.

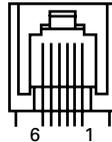


CAUTION!

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.)

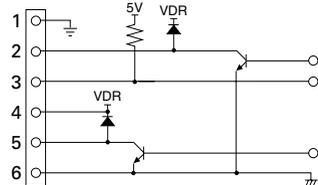
- (1) Connector Pin Configuration
- (2) Electrical characteristics
 - 1) Driving voltage: 24 VDC

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)

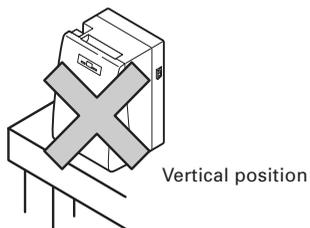
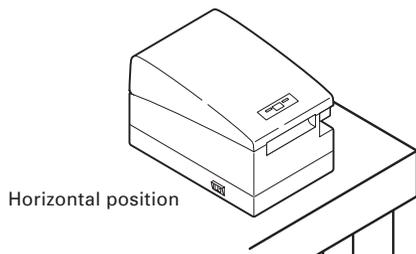


CAUTION!

- 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!

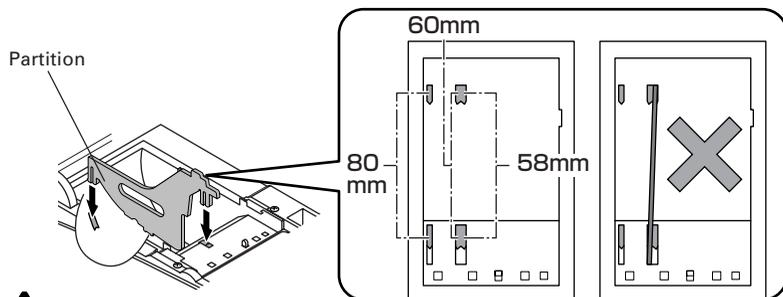
DO NOT use the printer under the following conditions.

- 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 referring to the section 5.2, "Manual Setting of Memory Switch".**



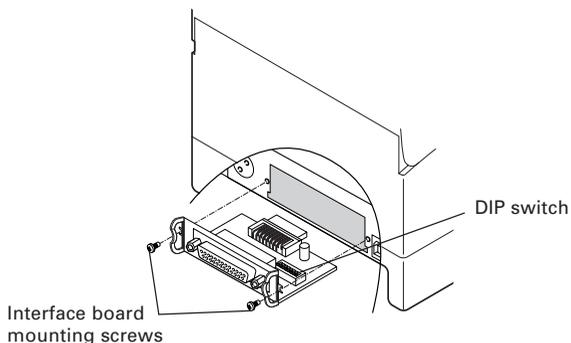
CAUTION!

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

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.

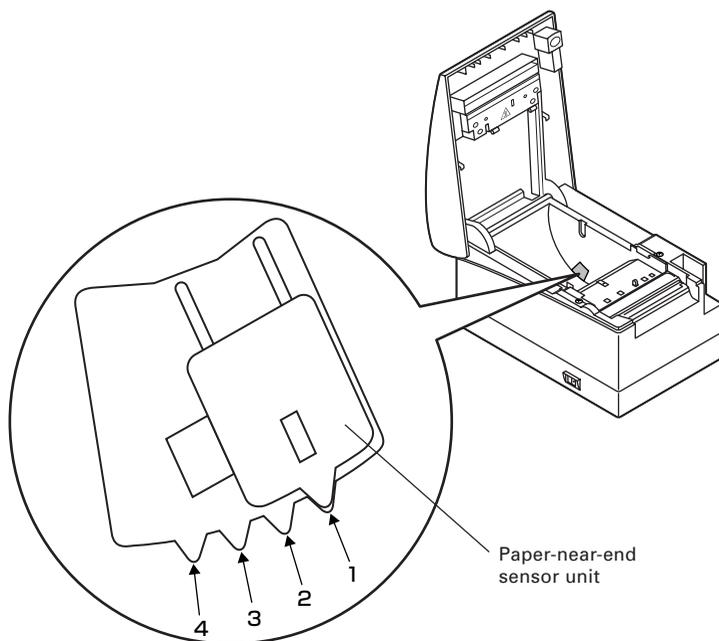
Sensor Position	Roll paper diameter at the detection of near-end	Outer core diameter of roll paper used
**1	$\phi 22$	$\phi 18$
*2	$\phi 25$	$\phi 22$
3	$\phi 29$	$\phi 25$
4	$\phi 34$	$\phi 32$

* Factory setting for USA version

** Factory setting for other country version

CAUTION!

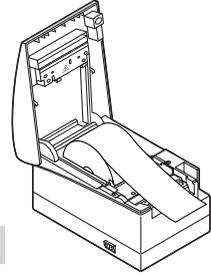
- Paper remaining differs by the type of paper roll used.
- The external diameter of the paper roll is only for reference.
- When a paper end error is detected incorrectly during using a paper roll with a honey-comb type core, move the sensor position to the larger number.



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.
If the cutter blade remains protruded with paper jammed, do not open the printer cover forcibly. Referring to section 4.4, restore the blade to the normal position and then open the cover.
3. Remove the jammed paper including any paper chips remaining.
4. Turn on the printer. The auto cutter mechanism is initialized and the alarm is cleared.

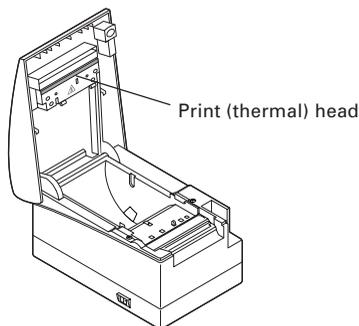


CAUTION!

- If the cutter blade remains protruded with paper jammed, DO NOT open the printer cover forcibly. If the cutter blade cannot be restored, contact your Citizen Systems dealer.
- 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.

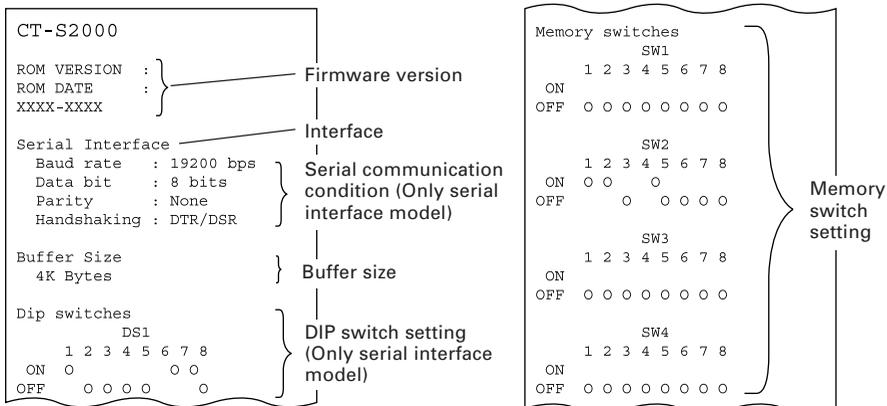


CAUTION!

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..
```

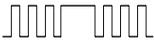
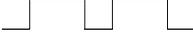
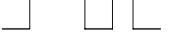
4.6 Error Indication

- 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.
- 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.
- 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.

● **Black Mark detection error (in Black Mark mode)**

When Black Mark cannot be detected even if a certain amount of paper feed is carried out for Black mark detection, a Black Mark detection error occurs. If black detection continues more than the specified period, a No Paper condition is assumed and the same error as No Paper is indicated.

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	Lights		—
Macro execution wait *2	Lights		—
Black Mark detection error	Lights		—

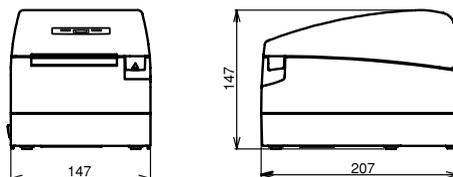
*1: When the printer is printing.

*2: The ERROR LED may blink even in the execution of macro function.

5. OTHER

5.1 External Views and Dimensions

(Unit: mm)

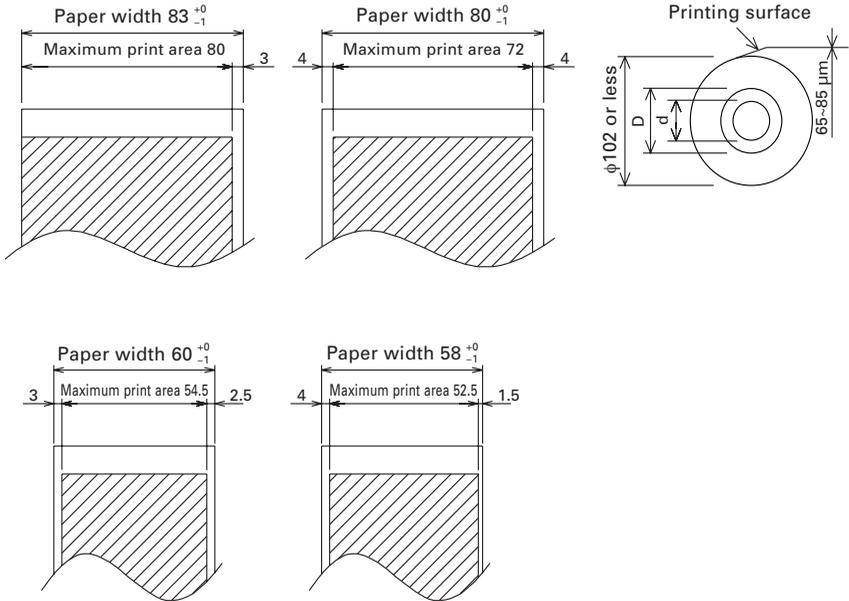


5.2 Printing Paper

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)	$\phi 12$	$\phi 25.4$
Core outer diameter D (mm)	$\phi 18$	$\phi 32$

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 Ctrr 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	BM Measure	Invalid	Valid
SW4-2	Reserved	Fixed	-
SW4-3	Feed&Cut at TOF	Invalid	Valid
SW4-4	Reserved	Fixed	-
SW4-5	Reserved	Fixed	-
SW4-6	Reserved	Fixed	-
SW4-7	Reserved	Fixed	-
SW4-8	Partial only	Invalid	Valid
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	No use	Fixed	-
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, 1 Color BM, 1 Color Label, 2 Color Normal, 2 Color BM
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
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

* 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.

Memory SW (1) 00000000

0: OFF state

1: ON state

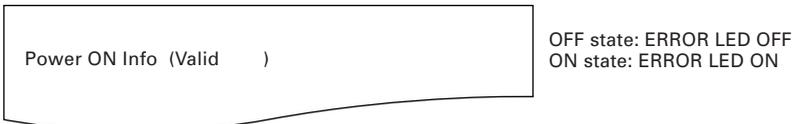
(No indication for 0/1 with memory switch 7-10)

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

3-8 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 7-10, 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.

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