Specification

Thermal Receipt Printer

Pd230
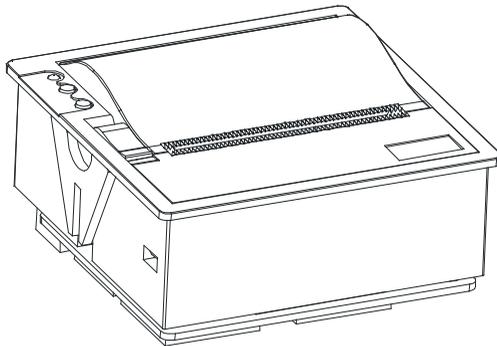
Specifications subjects to change without notice

CONTENT

Guide

The new series of PD230 are advanced versions of embedded thermal receipt printer, which have the fastest printing speed, the most reliable quality, and the most advanced technique.

Due to the characters of small size, easy operating and high cost performance ratio, PD230 series printers have been widely used in areas of medical instrument, communication testing application, electronic weighing apparatus, banking, superstore, fire department, electric power system and restaurant, and etc…

This product comes with a one-year warranty and whole-life technical support services.

Safety Notice

Before using the printer, please read the following items carefully and abide to the instructions strictly.

1. SAFETY WARNING

⚠ *WARNING:* Do not touch the printer cutter.

⚠ *WARNING:* Do not touch the printer head or other accessories in and after the printing process, while the printer head is a heating part.

⚠ *WARNING:* Do not touch the printer head or the connecting plug, avoiding the damage of static.

2 . CAUTION

（1） Install the printer on the stable surface. Choose firm, level surface where the printer will not be exposed to vibration.

（2） Do not use and store the printer in the location exposed to high temperature, high humidity and pollution.

（3） Do not let water or other electric conductive materials into the **printer.** Cut off the power when it unfortunately happens.

（4） Do not operate the printing task without paper feed. This will make serious damage to the roller and printer head.

（5） Do not disassemble the printer for reparation or modification without authorization.

（6） High quality paper is recommended for printing to assure the printing quality and printer lifespan.

（7） Make sure the printer power is off when plug and unplug the cable.

（8） Properly keep this manual for your reference.

1. General Information

1.1 Main Features

● High printing quality

● Low working noise and high printing speed

● Small size and nice outlook

● Easy paper loading and easy maintenance

● Parallel and Serial interface are available

● Built-in data buffer (Enable receiving data when printing)

● Enlarge font printing and line space adjusting supported

● Different DPI bitmap and image download printing supported

● Various barcode printing supported

● Low power consumption and operation cost (without ribbon and cartridge)

● Compatible with ESC/POS command protocols

2. Technical Specification

● **Print method:** Thermal line printing
● **Paper width:** 57.5±0.5mm
● **Printable width:** 48mm
● **Printing speed:** 60mm/sec. or 16lines/sec.
● **Printer head character:**

    Print density: 384dots/line or 8dots/mm

    Reliability: 50,000 meters

When temperature is too high inside the printer, the printer head's overheating protection function makes printer offline and stop printing, and the error indicator lighting or status indicator flashing. After the temperature falls, the printer resumes to online status and continue printing.

● **Interfaces:**

DC5V/3A POWER SOCKET	PARALLEL PORT SOCKET	SERIAL PORT SOCKET
− 4 3 2 1 +	25 23 21 19 17 15 13 11 9 7 5 3 1 / 26 24 22 20 18 16 14 12 10 8 6 4 2	9 7 5 3 1 / 10 8 6 4 2

    Serial: D-SUB 10-socket (Panel style), baud rate 1200bps, 2400bps, 4800bps, 9600bps(Default) and 19200bps are available, no parity check for data structure, 8byte data bit, one or more than one stop bit, support RTS/CTS and XON/XOFF Handshake Protocol.

    Parallel: D-SUB 26-socket (Pin style), two-way parallel, 8byte parallel interface, supports BUSY/nAck handshake protocol.

    Power Supply: DC 5V/3A

● **Character:**

    ASCII Font Set： 12×24 dots，1.25（W）×3.00（H） mm

    Simplified / Traditional Chinese:

        24×24 dots, 3.00（W）×3.00（H） mm

Barcode: EAN(JAN)13、EAN(JAN)8

● **Paper:**

Paper type: Thermal Print Paper

Width: 57.5±0.5mm **Thickness:** 0.06~0.08mm

Paper roll diameter (Max)：Φ65mm

Paper roll diameter (Min)：Φ12mm

Recommended Paper:

Model	Manufacturer
AF50KS-E	Jujo Thermal Oy(Finland)
TF-50KS-E	Nippon Paper Industries Co.，Ltd

⚠ *CAUTION:*

（1） High quality or equivalent paper is recommended for printing to assure the printing quality and printer head lifespan.

（2） Do not use paper rolls that have paper glued to the core, otherwise the printer may be damaged.

（3） If the paper is polluted by the chemical or oil, which leads to fade color or less sensibility of heat, and printing quality may be influenced.

（4） Do not rub the paper surface by any hard goods, otherwise the paper will depigmentize.

（5） When the temperature is higher than 70℃, paper will depigmentize. Please pay special attention to the temperature, humidity and illumination.

● **Reliability:** $5×10^6$ lines（MCBF）

● **Protocol:** Compatible with ESC/POS protocol

Character Printing: ANK character, defined characters and Chinese character proportional printing, and character margin adjust supported.

Bitmap Printing: Support different density image download and print

Curve Printing: Support curve print

- **Printer DC Input:** DC 5V/3A
- **Printer weight:** Approx.140g (without paper roller)
- **Dimensions: 85**（L）× 85（W）× 42.6（H）mm
- **Environmental:**

  Operation Temperature: 0～45℃   **Operation Humidity:** 10～80%

  Storage Temperature: -10～50℃   **Storage Humidity:** 10～90%
- **Models:**

  PD230S Serial Interface

  PD230P Parallel Interface

3. Setting up the Printer
3.1 Unpacking the Printer
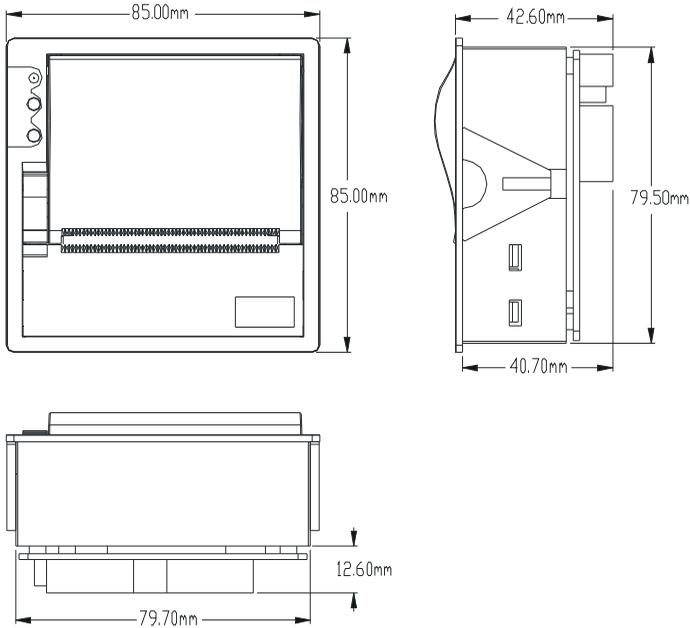
Make sure you have the following items:

|	
Printer	1 unit
Power Cord and Adapter	1 set
User's Manual	1 unit

3.2 Installation of Printer
3.2.1 Measurement

The shape structure and dimension of the printer are as follows:

- Dimension: 85mm×85mm×42.6mm
- Embedded Deepness: 40.7mm
- The max diameter of paper roll is 30mm.

3.2.2 Installations

Please insert the embedded part of the printer into the fix hole of other instruments or devices. Then put the clip into position A and tighten the screw. Another side's installation is as the same.
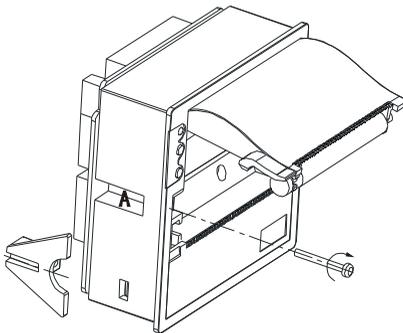
The print can be installed horizontally or vertically. If it's installed vertically, the paper hollow needs to be adown. It's recommended to use the 0.5mm to 10mm thickness of plate or plastic panel, even though the thickness of panel

won't affect the fastness of printer.

3.3 Power Cord Connecting

PD230 uses 5V DC power supply. The voltage range should be 5V±
0.25V and electric current at least 3A. The power cord along with the printer is a
double wire power cord. The connector is with protection structure. The red wire
connects to the positive pole (+) and the other one to negative pole (-) of the
power supply.

⚠️*CAUTION:*

（1）The power voltage can't be higher than 5.25V and lower than 4.75V.
The electric pole must be correct. Otherwise, it will do harm to the
printer and the company will not undertake any responsibility of
reparation.

（2）Using improper power adapter will affect the print quality and even
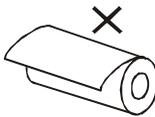damage the printer.

3.4 Paper Handling

PD230 is designed to use the 58mm thermal paper. Easy paper loading
structure makes loading paper convenient. The max diameter of paper roll is
30mm.

Follow the steps:

（1）Open the printer front cover.

（2）Insert the paper roll into the paper hollow.
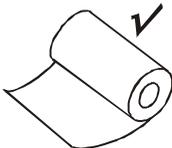
Right   Wrong

（3）Feed the paper manually and close the front cover.

（4）Make the paper edge neat by the printer cutter.

3.5 Buttons and Indicators

FEED: To feed the paper

When the indicator on standing status，press "FEED" button to feed continuously, and it is invalid during the printing process.

ONLINE: To switch online/offline status

Press ONLINE to switch online/offline status.

When the printer is online, the STATUS indicator is light.

When the printer is offline, the STATUS indicator is dim.

STATUS: Status Indicator

Indicating the printer status.

When the status indicator is light, the printer is online;

When the status indicator is dim, the printer is turned off or offline;

When the status indicator flashes, happens shortage of the paper, printer head overheating, printer head error or other unconventionalities.

3.6 The Printer Self Test

The self-test checks whether the printer has any problems. If the printer can correctly print the self-test list, it means the printer itself function well. Otherwise, the printer needs repair.

The self-test prints the current printer status, which provides the control ROM version, current interface, English letters and some Chinese characters.

Self Test Operation: Make sure paper roll has been installed properly as well as the power cord. Turn on the power while holding down the FEED button. Release the FEED button after less than five seconds. The self-test

begins.

The self-test automatically ends after printing the following.

<div align="center">**** Completed ****</div>

3.7 Hexadecimal Dumping

This feature allows experienced users to see exactly what data is coming to the printer. This can be useful in finding the transmission problem between the printer and computer.

Start Hexadecimal Dumping: Make sure paper roll has been installed properly as well as the power cord. Turn on the power while holding down the REVERSE button. Release the REVERSE button after more than five seconds. The hexadecimal dumping mode is on. Begins with "Hexadecimal Dump", the printer automatically starts printing the hexadecimal codes and the corresponding characters.

⚠️*CAUTION:*

（1）A period "." is printed for each code that no ASCII equivalent.

（2）During the hexadecimal dumping, all commands are disabled.

End Hexadecimal Dumping: Turn off the printer and then the hexadecimal mode is off.

Sample is as follow：

```
Hex Dump Mode

57 65 60 63 6F 6D 65 20      Welcome
54 6F 20 47 61 69 6E 73      To Gains
```

3.8 Serial Interface

PD230S use the serial interface of D-SUB 10-socket (Panel style), baud rate 1200bps, 2400bps, 4800bps, 9600bps(Default) and 19200bps are available, no parity check for data structure, 8byte data bit, one or more than one stop bit, support RTS/CTS and XON/XOFF Handshake Protocol.

Pins and Functions Definition:

9	7	5	3	1
10	8	6	4	2

PIN	SIGNAL NAME	SIGNAL SOURCE	DEFINITION
5	TXD	In	Receive data.
3	RXD	Out	When using the XON/XOFF handshake protocol, the printer sends the control code XON/XOFF to the computer.
6	CTS	Out	Low voltage for busy status. High voltage for ready to send data to the printer.
2	DSR	Out	The signal response the printer status. High voltage for printer online.
9	GND	--	Signal Grand

Note: 1. "In" stands for printer receiving data.

    2. "Out" stands for printer sending data.

3.9 Parallel Interface

PD230P uses the parallel interface of D-SUB 26Pin socket with 8bit transmission speed, and supports BUSY/nAck Handshake Protocol.

Pins and Functions Definition:

25	23	21	19	17	15	13	11	9	7	5	3	1
26	24	22	20	18	16	14	12	10	8	6	4	2

PIN	SIGNAL NAME	SIGNAL SOURCE	DEFINITION
1	/STB	In	Data trigger the pulse, receive data when it reduce.
3	DATA0	In	Stands for parallel data of 1st bit to 8th bit.
5	DATA1	In	
7	DATA2	In	Logic "1" signal for high voltage and logic
9	DATA3	In	"0" signal for low voltage.
11	DATA4	In	
13	DATA5	In	
15	DATA6	In	
17	DATA7	In	
19	nAck	Out	Response signal for had received 1 bit data.
21	BUSY	Out	High voltage for busy.
23	Paper End	Out	High voltage for paper shortage.
25	Select	Out	High voltage for printer online.
4	NError	Out	Error Signal.
2, 6, 8, 26	NC	Out	No connection.
10~24	GND	——	Signal Grand.

Note: *1. "In" stands for printer receiving data.*

2. "Out" stands for printer sending data.

3.10 Printer Cleaning
3.10.1 Printer Head Cleaning

Printer head needs to be cleaned, when

（1）The printing is unclear;

（2）Some columns on the paper is unclear;

（3）Paper feeding noise is loud.

Cleaning Steps:

（1）Turn off the printer, open the printer front cover and remove the wastepaper if there is any;

（2）Wait for cooling of the printer head when after printing;

（3）Wipe the printer head by a soft cloth with isopropyl alcohol (IPA) to remove the dust and dirt;

（4）After the volatilization, close the front cover and operate the self-test print.

3.10.2 Paper Sensor Cleaning

Paper sensor needs to be cleaned, when

（1）Sometimes stop printing and indicate shortage of paper during the printing process;

（2）Shortage of paper but do not indicate.

Cleaning Steps:

（1）Turn off the printer, open the printer front cover and remove the wastepaper if there is any;

（2）Wipe the paper sensor by a soft cloth with isopropyl alcohol (IPA) to remove the dust and dirt;

（3）After the volatilization, close the front cover and try printing.

3.10.3 Roller Cleaning

The roller needs to be cleaned, when

（1）Printed characters is unclear;

（2）Some columns on the paper is unclear;

（3）Paper feeding noise is loud.

Cleaning Steps:

（1）Turn off the printer, open the printer front cover;

（2）Wipe the roller by a soft cloth with neutral detergent to remove the dust and dirt;

（3）After the volatilization, close the front cover.

⚠️ *CAUTION:*

（1） Make sure the printer is tuned off during the maintaining.

（2） Do not touch the printer head by hand or any metal goods, such as tweezers, which will do harm to the printer head, roller and paper sensor.

（3） Do not use organic solvent, such as gas or acetone.

（4） Do not turn on the printer and start printing before the volatilization of detergent.

3.11 Paper Jam Fixing

When paper jam happens, please turn off the printer first, and open the front cover. After the cooling of the printer head, remove the jammed paper carefully. Then reload the paper and close the front cover. High quality or equivalent paper is recommended to avoid paper jam.

3.12 Trouble Shooting

If the printer does not function, please check the printer by following the suggestions. Contact the dealer or manufactory directly if the trouble can't be solved.

3.12.1 Indicator on the control panel doesn't light

Make sure the power cord connects with printer, adaptor, and power outlet correctly, and the power switch is on.

3.12.2 ERROR indicator flash continuously and printer doesn't work

If the printer has worked for long time, the printer head is overheating. Try to wait some minutes, and the printer will continue printing after cooling.

If neither paper jammed nor hot working, turn off the printer power, and then restart after 10 minutes. Unplug the power cord from the power outlet and

contact the technical service for help if the trouble continues.

3.12.3 ERROR indicator is light and printer doesn't work

Run the printer self test to check if the printer works properly. Contact the dealer or technician directly if the self test can't be run.

If the self test runs properly, please check the followings:

（1） Check the connection between printer and host computer, and at the same time please confirm that the connection cable accords with the specification of both printer and computer.

（2） Data transmitting settings between printer and host computer maybe different. Make sure printer data parameters as same as the computer. You can use self test to print out the interface settings information.

If the printer can't run self test, please contact your dealer or technician for help.

4. Printer Control Command List

Num	Control Code	Function
Paper Feed Code		
01	LF	Print and line feed
02	CR	Print and enter
03	ESC J n	Print and feed n lines
Format Setting Code		
04	ESC 1 n	Set n dots line spacing
05	ESC p n	Set characters spacing
06	ESC B n1 n2…NUL	Set vertical table position
07	VT	Execute vertical table printing
08	ESC D n1 n2…NUL	Set horizontal table position
09	HT	Execute horizontal table printing
10	ESC f m n	Print a space or a blank line
11	ESC Q n	Set right margin
12	ESC l n	Set left margin
13	ESC m n	Select printing deepness
Character Setting Code		
14	ESC U n	Enlarge horizontally
15	ESC V n	Enlarge vertically
16	ESC W n	Enlarge horizontally and vertically
17	ESC - n	Select/Cancel underline
18	ESC + n	Select/Cancel upper line
19	ESC i n	Select/Cancel reverse color printing
20	ESC c n	Select/Cancel reverse direction printing
User Defined Character Setting Code		
21	ESC & m d1 d2…dk	Define user-defined characters
22	ESC % m1 n1 m2 n2…mk nk NUL	Replace user-defined characters
23	ESC :	Resume the built-in characters
Graphics Printing Code		
24	ESC K nL nH d1 d2…dk	Print dot matrix graphics
25	ESC 'nL nH l1 h1 l2 h2 l3 h3…lk hk CR	Print curve
26	GS W n1 n2	Set barcode size
27	GS k m d1 d2…dk NUL	Print barcode
28	GS H n	Select/Cancel HRI character print
29	GS h n	Set barcode height
30	GS w n	Set barcode width
Chinese Characters Setting Code		

31	FS W n	Enlarge characters
32	FS + n	Select/Cancel upper line
33	FS - n	Select/Cancel underline
34	FS i n	Select/Cancel reverse printing
Initial Code		
35	ESC @	Initialize the printer

5. Control Command

5.1 Command Conception

GP-5830 series printer support ESC/POS commands set.

Command description:

Print Command   Functions

Format: ASCII: Showing as standard ASCII characters

Decimal: Showing as Decimal figure list

Hex: Showing as hex figure list

Description: This command function and instruction.

Example: Give some examples to understand this command clearly.

5.2 Command Description

LF

[Name]	Print and line feed	
[Format]	ASCII	LF
	Hex	0A
	Decimal	10
[Description]	Prints the data in the print buffer and feeds one line based on the current line spacing.	
	This command sets the print position to the beginning of the line.	

CR

[Name]	Print and enter to next line		
[Format]	ASCII	CR	
	Hex	0D	
	Decimal	13	
[Description]	It's the same as LF command.		

ESC J n

[Name]	Print and feed n dots line			
[Format]	ASCII	ESC	J	n
	Hex	1B	4A	n
	Decimal	27	74	n
[Description]	Print the data in the print buffer and feed n dots line. ($0 \leqslant n \leqslant 255$)			

ESC 1 n

[Name]	Print and feed n dots line			
[Format]	ASCII	ESC	1	n
	Hex	1B	31	n
	Decimal	27	49	n
[Description]	Setting n dots line space for the changing line command. (n is absolute value and not effective by the enlarge or dwindle command.)			
	0≤n≤255, n=3 after power on or initialization			

ESC p n

[Name]	Set characters spacing			
[Format]	ASCII	ESC	p	n
	Hex	1B	70	n
	Decimal	27	112	n
[Description]	• Use this command to set the characters spacing.			
	• By default, n=0, that means there is no spacing between characters.			
	• n is absolute value and not effective by the enlarge or dwindle command.			
	• 0≤n≤255			

ESC B n1 n2…NUL

[Name]	Set vertical tab position					
[Format]	ASCII	ESC	p	n1	n2 ⋯	NUL
	Decimal	27	66	n1	n2 ⋯	0
	Hex	1B	42	n1	n2 ⋯	00

[Description]　• Use n1, n2 and etc to set the vertical tab position. (Eight positions can be set.)

　• The Null data followed means the end of the command.

　• All of the vertical tab position can be cleared by the command ESC B NUL.

VT

[Name]	Execute vertical tab position
[Format]	ASCII　VT
	Decimal　11
	Hex　0B

[Description]　• Feed paper to the next vertical tab position set by the command ESC B.

　• If the vertical tab positions have be cleared or the current position is on or exceed the last vertical tab position, command VT feeds a single line.

ESC D n1 n2…NUL

[Name]	Set horizontal tab position					
[Format]	ASCII	ESC	D	n1	n2 ⋯	NUL
	Decimal	27	68	n1	n2 ⋯	0
	Hex	1B	44	n1	n2 ⋯	00

[Description]　• Use n1, n2 and etc to set the horizontal tab position. Eight positions can be set. All of this data should be less than the max numbers of characters. Each character is calculated as 12+ character spacing.

　• The Null data followed means the end of the command.

　• All of the horizontal tab positions can be cleared by the command ESC D NUL.

　•When setting the horizontal tab position for Chinese characters, it should be noticed that the positions are set by the characters setting.

HT

[Name]	Execute horizontal tab position		
[Format]	ASCII	HT	
	Decimal	9	
	Hex	09	

[Description] • Moves the print position to the next horizontal tab position set by the ESC D.

• If the horizontal tab positions have be cleared or the current position is on or

exceeds the last horizontal tab position, command VT is ignored.

ESC f m n

[Name]	Print a space or a blank line			
[Format]	ASCII	ESC f	m	n
	Decimal	27 102	m	n
	Hex	1B 66	m	n

[Description] •If m=0, n spaces will be printed. Each space is calculated as 12+ character spacing.

The value of n should be less than the max numbers of characters.

• If m=1, n lines will be printed. (24dots per line)

• $0 \leqslant n \leqslant 255$

ESC Q n

[Name]	Set right margin		
[Format]	ASCII	ESC Q	n
	Decimal	27 81	n
	Hex	1B 51	n

[Description] • $0 \leqslant n \leqslant 32$ and the default is that n = 0, which means there is no right margin.

•Right margin means that the number of characters that won't be printed on the right

side. The value is an absolute one and won't be affected by the characters enlarging

command ESC U and ESC W. Each space is calculated as 12+ character spacing.

• After power on or initialization, n = 0, which means there is no right margin.

• When this command is used, printer will automatically add enter command as

soon as arrives the right margin position.

ESC l n

[Name]	Set left margin		
[Format]	ASCII	ESC l	n
	Decimal	27 108	n
	Hex	1B 6C	n

[Description]   • 0≤n≤32 and the default is that n = 0, which means there is no left margin.

• Right margin means that the number of characters that won't be printed on the left side. The value is an absolute one and won't be affected by the characters enlarging command ESC U and ESC W. Each space is calculated as 12+ character spacing.

ESC m n

[Name]	Select printing deepness		
[Format]	ASCII	ESC m	n
	Decimal	27 109	n
	Hex	1B 6D	n

[Description]   • Set different print deepness according to different thermal paper.

• 0≤n≤6 and the default is that n = 4. n=1 is for the least deepness and n=6 is for the most deepness.

Character Setting Code

ESC U n

[Name]	Enlarge horizontally		
[Format]	ASCII	ESC U	n
	Decimal	27 85	n
	Hex	1B 55	n

[Description]   • 0≤n≤8 and the default is that n = 1.

•The width of characters is printed *n* times larger than the normal size after using this command.

ESC U n

[Name]	Enlarge vertically			
[Format]	ASCII	ESC	V	n
	Decimal	27	86	n
	Hex	1B	56	n

[Description]　・0≤n≤8 and the default is that n = 1.

　・The height of characters is printed *n* times larger than the normal size after using this command.

ESC W n

[Name]	Enlarge horizontally and vertically			
[Format]	ASCII	ESC	W	n
	Decimal	27	87	n
	Hex	1B	57	n

[Description]　・0≤n≤8 and the default is that n = 1.

　・Both of width and height of characters are printed *n* times larger than the normal sizes after using this command.

ESC - n

[Name]	Select/Cancel underline			
[Format]	ASCII	ESC	-	n
	Decimal	27	45	n
	Hex	1B	2D	n

[Description]　・0 ≤ n ≤ 255, and the default is that n = 0.

　・*n* is available only for the least significant bit (LSB).

　・When the LSB of *n* is 0, the underline mode is canceled.

　・When the LSB of *n* is 1, the underline mode is selected.

　・When the underline mode is selected, all characters, including Kanji Characters and spaces are printed with underline.

ESC + n

[Name]	Select/Cancel upper line		
[Format]	ASCII	ESC +	n
	Decimal	27 43	n
	Hex	1B 2B	n

[Description] • 0 ≤ n ≤ 255, and the default is that n = 0.

 • *n* is available only for the least significant bit (LSB).

 • When the LSB of *n* is 0, the upper line mode is canceled.

 • When the LSB of *n* is 1, the upper line mode is selected.

 • When the upper line mode is selected, all characters, including Kanji Characters

and spaces are printed with upper line.

ESC i n

[Name]	Select/Cancel reverse color printing		
[Format]	ASCII	ESC i	n
	Decimal	27 105	n
	Hex	1B 69	n

[Description] • 0 ≤ n ≤ 255, and the default is that n = 0.

 • *n* is available only for the least significant bit (LSB).

 • When the LSB of *n* is 0, the reverse color mode is canceled.

 • When the LSB of *n* is 1, the reverse color mode is selected.

 •When the reverse color mode is selected, all characters, including Kanji Characters

and spaces are printed with white font and black background.

ESC c n

[Name]	Select/Cancel reverse direction printing		
[Format]	ASCII	ESC i	n
	Decimal	27 105	n
	Hex	1B 69	n

[Description] • 0 ≤ n ≤ 255, and the default is that n = 1.

 • *n* is available only for the least significant bit (LSB).

• When the LSB of *n* is 0, the reverse direction printing mode is canceled. In this mode, the print direction is from left to right.

• When the LSB of *n* is 1, the reverse direction printing mode is selected. In this mode, the print direction is from right to left.

• When the printer is plumb installed, reverse direction printing mode may be used for convenient observation of the print result.

User Defined Character Setting Code

ESC & m d1 d2…d36

[Name]	Define user-defined characters					
[Format]	ASCII	ESC	&	m	d1	d2 … d36
	Decimal	27	38	m	d1	d2 … d36
	Hex	1B	26	m	d1	d2 … d36

[Description] • 32 ≤ m ≤ 61, 0 ≤ d1 …. d36 ≤ 255.

• The command allows user to define an user-defined character *m*.

• The user-defined character is a 12X24 dots matrix, which is 12 columns and 24 dots each. Every column is expressed by 3 bits data and the setting order is from left to right and from top to bottom. The *d* stands for the user-defined character data and the numbers of *d* data are up to 36.

• If there are many *m* value setting by ESC &, only the last one is efficient and user can define 30 characters at most.

ESC % m1 n1 m2 n2…mk nk NUL

[Name]	Replace user-defined characters								
[Format]	ASCII	ESC	%	m1	n1	m2	n2…mk	nk	NUL
	Decimal	27	37	m1	n1	m2	n2…mk	nk	NUL
	Hex	1B	25	m1	n1	m2	n2…mk	nk	NUL

[Description] • This command is used to replace the character *n* in current character set with the user-defined character *m*.

• m1, m2, ... mk are user-defined characters.

• n1, n2, ... nk are characters in current character set to be replaced.

• 32≤m≤61, 32≤n≤61.

• 1≤k≤32, the max number of characters to be replaced is 32 characters.

• The data 0 adding in the end stands for the end of this command.

ESC :

[Name]	Resume the built-in characters		
[Format]	ASCII	ESC	:
	Decimal	27	58
	Hex	1B	3A

[Description]　・Use this command to resume the built-in characters, which were replaced by

the user-defined characters by the ESC % previously.

Graphics Printing Code

ESC K nL nH d1 d2…dk

[Name]	Print dot matrix graphics						
[Format]	ASCII	ESC	K	nL	nH	d1	d2…dk
	Decimal	27	75	nL	nH	d1	d2…dk
	Hex	1B	4B	nL	nH	d1	d2…dk

[Description] • The values of nL and nH are 16-bit binaries. The nL stands for the low 8 bits and nH stands for the high 8 bits. The numbers of input graphics data are nH×256+nL. That's k = nH×256+nL. The graphics size will be affected by the characters enlarge and reduce commands.

 • This command print (k / 3) × 24 dots lattice image and the width is k/3 dots and height is 24 dots. 24 dots of each column are presented by three 8bit bytes that have the highest bit on top. While the data setting is input, the order is from top to bottom and left to right of the 8bit bytes.

 •After sending the above graph command twice or more than twice, the output graph snap to the first column. The width can be different and can be mixed with any other characters.

 • When the height of the graph is large than an unit of graph, it can be separated to different units and printed one by one. Null dots can be used to fill up.

ESC ' nL nH l1 h1 l2 h2 …lk hk CR

[Name]	Print curve										
[Format]	ASCII	ESC	'	nL	nH	l1	h1	l2	h2 …lk	hk	CR
	Decimal	27	39	nL	nH	l1	h1	l2	h2 …lk	hk	CR
	Hex	1B	27	nL	nH	l1	h1	l2	h2 …lk	hk	CR

[Description] • This command is used to set and print curve graph line by line in the paper feed direction. The values of nL and nH are the dots of curve needed to be printed in each line, which are range from 1 dot to the max number of dots in every line.

 • lk and hk stand for the position of the *k* dot in the curve. The lk is low byte and hk is high byte and both value should be less than the max numbers of dots in every line.

The curve is printed by setting the values of lk and hk of every line.

・Various length of curve can be printed by using this command continuously,

・Use CR to execute the print operation of the current line.

GS W n1 n2

[Name]	Set barcode size			
[Format]	ASCII	GS	W	n1	n2
	Decimal	29	87	n1	n2
	Hex	1D	57	n1	n2

[Description] ・Use this command to set the barcode size.

・n1 stands for narrow bars. The unit is a dot and 0.125mm each.

・n2 stands for broad bars. The unit is a dot and 0.125mm each.

GS k m d1 d2…dk NUL

[Name]	Print barcode					
[Format]	ASCII	GS	k	m	d1	d2…dk NUL
	Decimal	29	107	m	d1	d2…dk NUL
	Hex	1D	6B	m	d1	d2…dk NUL

[Description] ・m = 2 or m = 3.

・Use m to select barcode type. The d stands for the characters to be printed.

m	BARDCODE TYPE	Number of Characters	Characters	Note
2	JAN13 (EAN13)	12 ≤ k ≤ 13	0~9	48 ≤ d ≤ 57
3	JAN8 (EAN8)	7 ≤ k ≤ 8	0~9	48 ≤ d ≤ 57

・The corresponding number of characters should be noticed. All kinds of barcode can make verified code automatically.

・NUL stands for the end of this command and executes the printing of barcode.

・When the barcode print is finished, the print position will be adjusted to the beginning of line.

GS H n

[Name]	Select/Cancel HRI character print		
[Format]	ASCII	GS H	n
	Decimal	29 72	n
	Hex	1D 48	n

[Description]　· $0 \leqslant n \leqslant 255$ and n = 0 by default.

　　· n is available only for the least significant bit (LSB).

　　· When the LSB of n is 0, HRI characters won't be printed.

　　· When the LSB of n is 1, HRI characters will be printed under the barcode.

n（LSB）	Print position of HRI
0	Not to print
1	Print under the barcode

　　· HRI characters are remarks of barcode.

GS h n

[Name]	Set barcode height		
[Format]	ASCII	GS h	n
	Decimal	29 104	n
	Hex	1D 68	n

[Description]　· $0 \leqslant n \leqslant 255$ and n = 90 by default.

　　· Use this command to set height of the barcode to $n \times 0.125$mm.

GS w n

[Name]	Set barcode width		
[Format]	ASCII	GS w	n
	Decimal	29 119	n
	Hex	1D 77	n

[Description]　· $0 \leqslant n \leqslant 4$ and n = 3 by default.

　　· Use this command to set width of the barcode.

　　· Specify the width of barcode module by n as follows:

n	Narrow module (mm)	Broad module (mm)
1	0.125	0.375
2	0.25	0.625
3	0.375	0.875
4	0.5	1.125

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Chinese Characters Setting Code

FS W n

[Name]	Enlarge characters		
[Format]	ASCII	FS W	n
	Decimal	28 87	n
	Hex	1C 57	n

[Description] • 0 ⩽ n ⩽ 8 and n = 1 by default.

• The Chinese characters after this command will be printed in *n* times larger than normal size, both in width and height.

FS + n

[Name]	Select/Cancel upper line for Chinese characters		
[Format]	ASCII	FS +	n
	Decimal	28 43	n
	Hex	1C 2B	n

[Description] • 0 ⩽ n ⩽ 255 and n = 0 by default.

• *n* is available only for the least significant bit (LSB).

• When the LSB of *n* is 0, upper line mode for Chinese characters is canceled.

• When the LSB of *n* is 1, upper line mode for Chinese characters is selected.

• While the upper line mode is selected, all of the characters including space will be printed with upper line.

FS - n

[Name]	Select/Cancel underline for Chinese characters		
[Format]	ASCII	FS -	n
	Decimal	28 105	n
	Hex	1C 69	n

[Description] • 0 ⩽ n ⩽ 255 and n = 0 by default.

• *n* is available only for the least significant bit (LSB).

• When the LSB of *n* is 0, underline mode for Chinese characters is canceled.

・When the LSB of *n* is 1, underline mode for Chinese characters is selected.

・While the underline mode is selected, all of the characters including space will be printed with underline.

FS i n

[Name]	Select/Cancel reverse printing			
[Format]	ASCII	FS	i	n
	Decimal	28	105	n
	Hex	1C	69	n

[Description] ・$0 \leqslant n \leqslant 255$ and n = 0 by default.

・*n* is available only for the least significant bit (LSB).

・When the LSB of *n* is 0, reverse printing is canceled.

・When the LSB of *n* is 1, reverse printing is selected.

・While the reverse printing mode is selected, all of the characters will be printed in white font color and black background.

Initial Code

ESC @

[Name]	Initialize the printer		
[Format]	ASCII	ESC	@
	Decimal	27	64
	Hex	1B	40

[Description] ・After receiving this command, the printer will be initialized.

・There are two ways to initialize the printer. One is to use command ESC @ to initialize the printer in software way and the other one is to power on/off the printer.

・The initialization including:

(1) Clear the print buffer;

(2) Characters and Chinese character will be print in normal size;

(3) Cancel the upper line, underline and reverse printing mode;

(4) Forbid the upper line, underline and reverse printing mode;

(5) Print characters in reverse way, from right to left;

(6) No left margin or right margin setting;

(7) Set the print deepness to default value n=4;

(8) Set the line spacing to default value 3 and character spacing to 0.