Thermal desk printer
DPT281
User's manual

COD. DOME - DPT281P REV. 1.10

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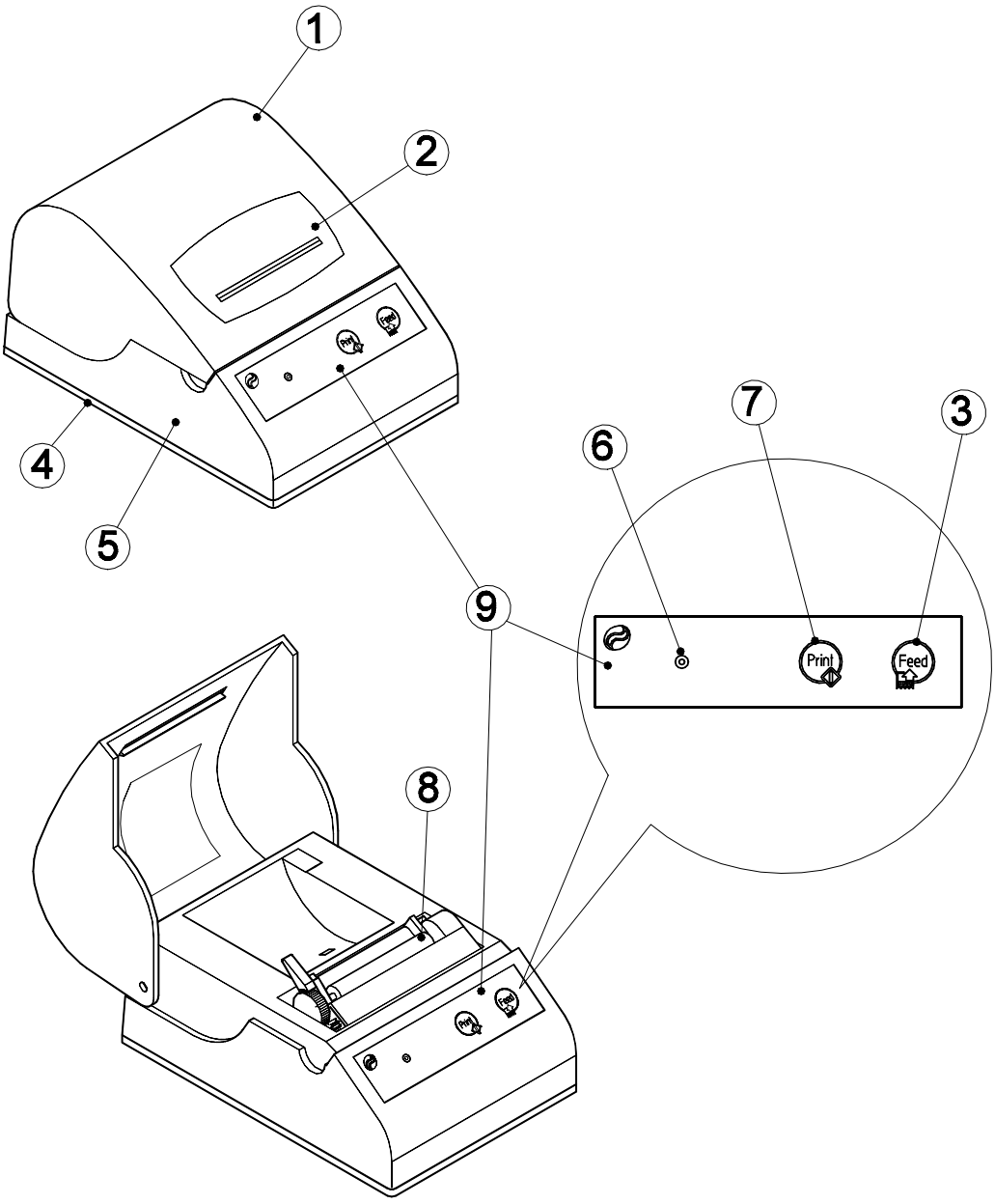
PRINTER COMPONENTS

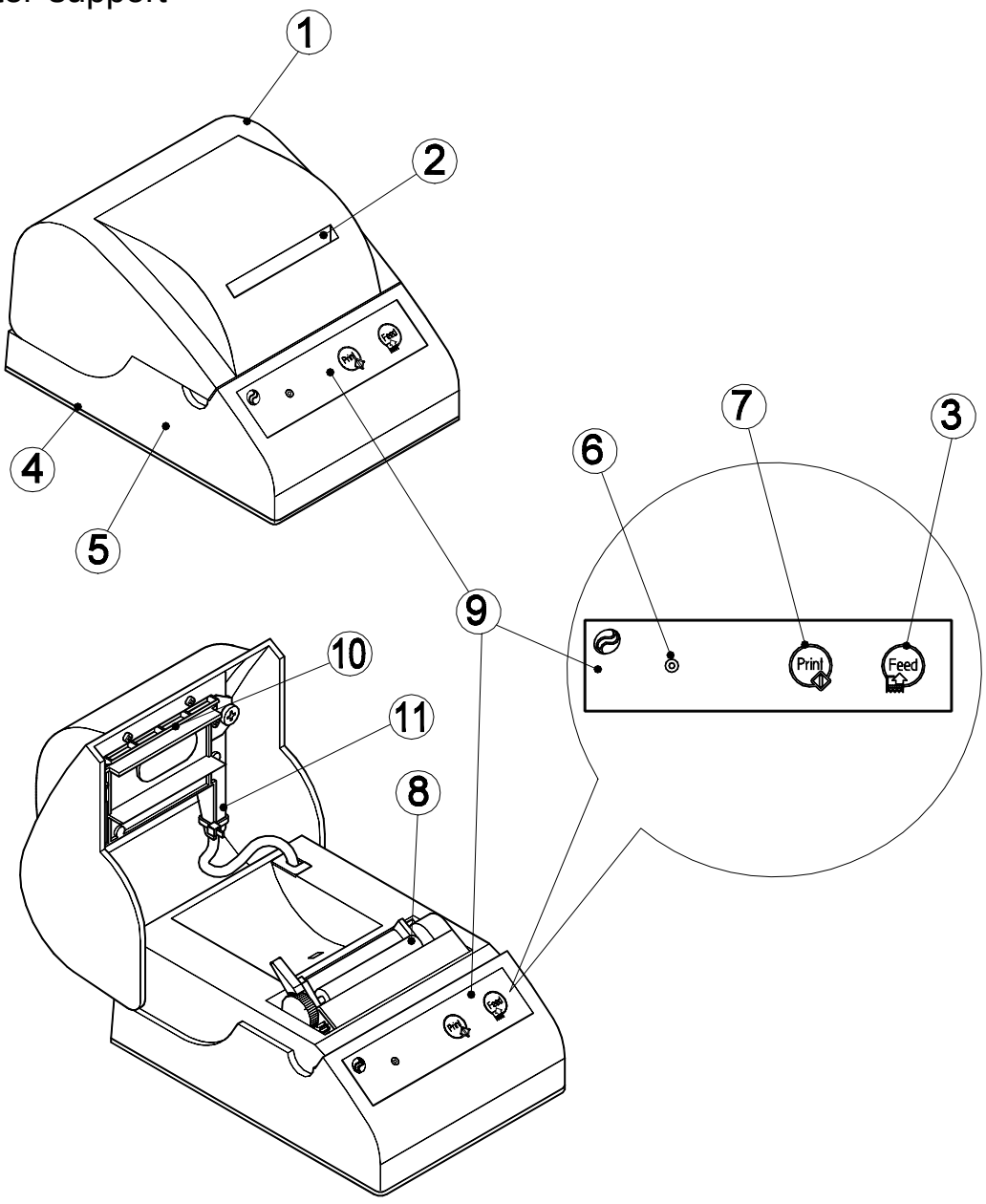
A. Front view of the exterior of the DPT281 without Autocutter

1- Cover
2- Paper outfeed
3- Feed key
4- Printer base
5- Printer body
6- LED
7- Print key
8- Print mechanism
9- Keypad



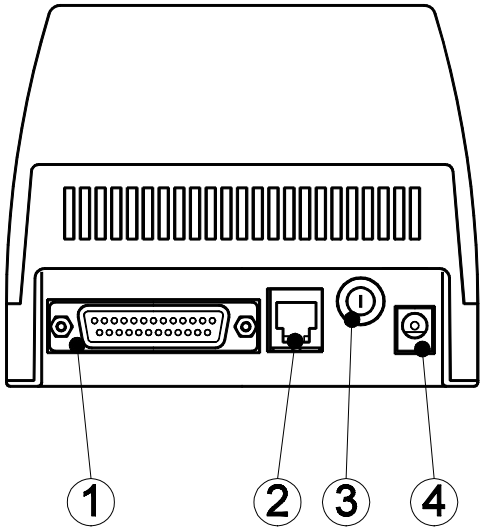
B. Front view of the exterior of the DPT281 with Autocutter

1- Cover
2- Paper outfeed
3- Feed key
4- Printer base
5- Printer body
6- LED
7- Print key
8- Print mechanism
9- Keypad
10- Cutter
11- Cutter support



C. Rear view of the DPT281

1- RS232 serial / Centronics parallel connector
2- Cash drawer connector
3- ON/OFF switch
4- Feed connector



"CE" Declaration of conformity

In accordance with standards ISO/IEC Guide 22 and EN 45014

N°: DC0251498

Manufacturer's name: Custom Engineering s.r.l.

Manufacturer's address: Strada Berettine 2
Fontevivo (Parma)
Italy

Declares that the product:

Product name: Desk printer with thermal print mechanism

Product type: DPT281

Model: DPT281-N; DPT281-A

is in conformity with the following directives:

Electrimagnetic Compatibility Directive 89/336/CEE; 92/31/CEE; 93/68/CEE

In accordance with the following standards:

EN 55022 Class B	Limits and methods of measuring the characteristics of radio disturbance produced by information technology equipment.	1994
EN 50082-1	Electromagnetic Compatibility- General immunity requirements. Part 1: Residential, commercial and light industry environments.	1992
EN 61000-4-2	Electrostatic discharge immunity tests. 4KV contact discharge, 8KV air discharge	1995
EN 61000-4-4	Electrical fast transient/burst immunity tests. Signal lines 0.5KV Feed lines AC 1KV	1995
ENV 50140	Radio-frequency irradiated electromagnetic fields. Immunity test. 3V/m, 80MHz-1000MHz, 80% 1KHz AM	1993

Marzo 1997

INTRODUCTION

1. INSTALLATION AND USE

2. INTERFACES

3. PRINTER FUNCTIONS

4. TECHNICAL SPECIFICATIONS

5. CHARACTER SETS

ATTACHMENT A - ACCESSORIES AND SPARE PARTS

CONTENTS OF THE MANUAL

In addition to the introduction which lists: the conventions used in the manual, general information relative to safety, unpacking of the printer and a brief description of the printer itself highlighting its main features, the manual is split up into the following chapters:

Chapter 1: Containing the information required for installing and using the printer correctly

Chapter 2: Containing the specifications of the interfaces

Chapter 3: Containing the description of the printer command set

Chapter 4: Containing the technical specifications of the printer

Chapter 5: Containing the character sets (fonts) used by the printer

CONVENTIONS USED IN THE MANUAL

N.B.
Gives important information or suggestions relative to the use of the printer

WARNING
The information marked with this symbol must be carefully heeded to safeguard against damaging the printer

DANGER
The information marked with this symbol must be carefully heeded to safeguard against injury to the operator.

GENERAL INFORMATION REGARDING SAFETY

The marks CE, DEMKO and UL for Canada and the United States applied to the product certify that the product itself fulfils basic safety requirements.

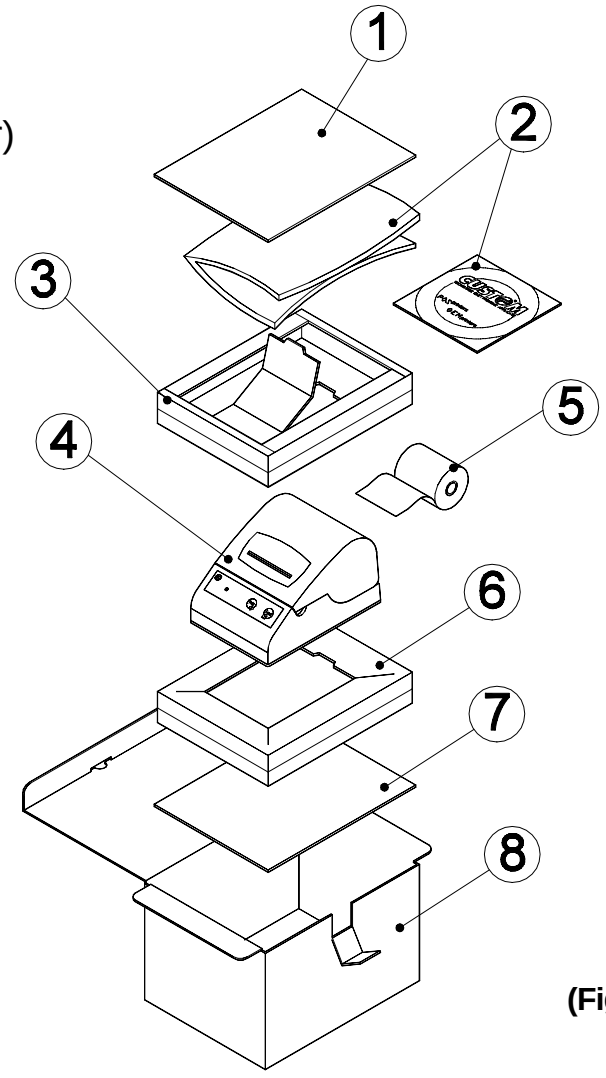
- Read and keep the following instructions.
- Observe all warnings and follow all instructions attached to the printer.
- Before cleaning the printer, disconnect the feed cable.
- Clean the printer with a damp cloth. Do not use liquid or spray products.
- Do not operate the printer near to water.
- Do not place the printer on unsteady surfaces. It could fall and get seriously damaged.
- Do not place the printer on soft surfaces or in poorly ventilated environments.
- Position the printer in such a way as to ensure that the cables connected to it will not be damaged.
- Use the type of electricity supply marked on the printer label. In the event of uncertainty, contact the seller.
- Do not obstruct the vents.
- Do not put objects of any kind inside the printer as they could cause a short circuit or damage parts which could affect its performance.
- Do not spill liquids on the printer.
- Do not carry out technical operations on the printer with the exception of the scheduled maintenance operations specifically indicated in the user's manual.
- Disconnect the printer from the electricity supply and have it repaired by a specialized technician should any of the following conditions occur:

    A. The feed connector has been damaged;
    B. Liquid has penetrated to the inside of the printer;
    C. The printer has been exposed to rain or water;
    D. The printer is not operating normally despite the instructions in the user's manual having been followed;
    E. The printer has been dropped and its case damaged;
    F. The performance of the printer is poor;
    G. The printer does not work.

UNPACKING THE PRINTER

Remove the printer from the box, taking care not to damage the packing material, as it could be needed for future transportation of the machine. Ensure that all the components illustrated are in fact present and that they are in perfect condition. If this is not the case, contact the after-sales assistance department immediately.

1. Upper tray
2. Manual (or Cdrom)
3. Upper suspended packing
4. Printer
5. Paper roll (inside the printer)
6. Lower suspended packing
7. Lower tray
8. Case



(Fig.1)

- Unpack the printer
- Remove the protective tray
- Remove the upper suspended packing and take out the manual or Cdrom)
- Take the printer out of its bag.
- Keep the box, trays and suspended packing in case the printer needs to be sent to other destinations

GENERAL FEATURES

The DPT281 is a practical, user-friendly desk printer.
It is the ideal solution for applications which require the immediate printing of data on a ticket, whether they be of an industrial, professional or laboratory nature. Typical fields of application are: POS, weighing systems, cash registers, balance statements, receipts or invoices as well as security, controlling and diagnostics purposes.
It is equipped with a 200 dpi (8 dots/mm) thermal print mechanism and uses 60mm paper rolls. The DPT281 has a wide range of supplementary functions in addition to normal print functions:

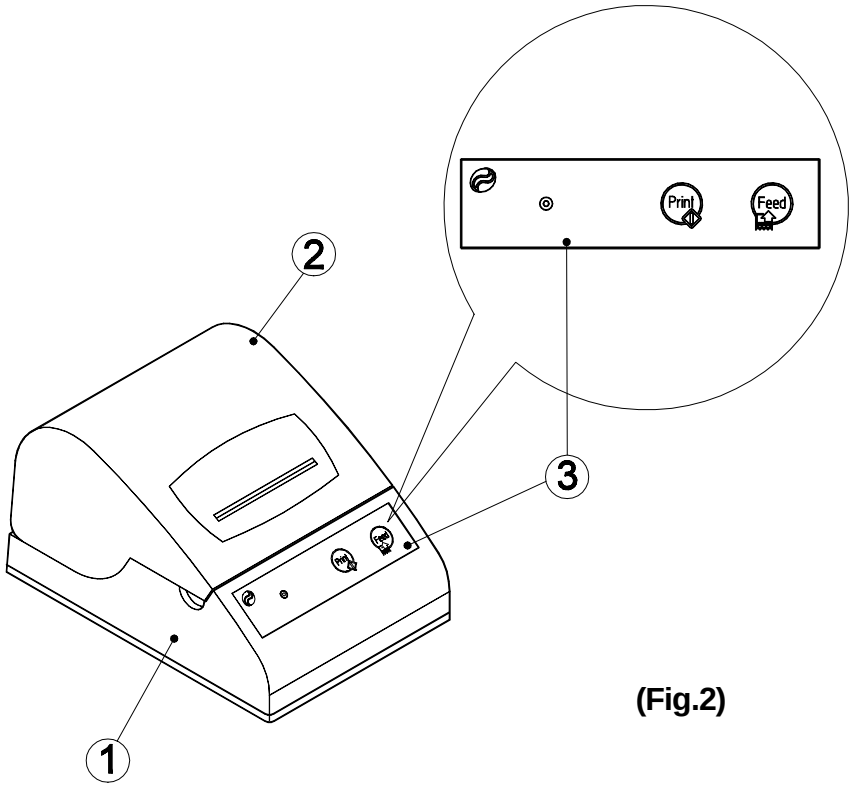
- High speed printing: 65mm/sec.
- Easy paper changing (automatic paper loading).
- ESC/POS ™ , CUSTOM DPT and CITIZEN emulation.
- Bar-codes: UPC-A, UPC-E, EAN13, EAN8, CODE39, ITF, CODABAR CODE93, CODE128 and CODE32.
- 7 standard and international character fonts.
- Entirely or partially programmable fonts.
- Double width-height, quadruple width-height, expanded print, italics rotated by 180°.
- Macro function definition for the automatic repetition of the operations.
- Internal programmable counter.
- Graphic mode.
- Print density.
- 3 programmable logotypes (448 x 585 points).

There are already two interfaces on the card: RS232 serial and centronics parallel. 32 Kbyte reception buffer.

DESCRIPTION OF THE PRINTER

LThe DPT281 printer (fig.2) has an ABS casing (1) with a cover (2), which opens to allow access to the paper roll and print mechanism.
The control panel is located on the front (3) and has a PRINT key, a FEED key and a LED indicating Power

- PRINT key. When the printer interface is RS232 serial and the PRINT key is pressed, the printer transmits the code 13 ($ 0D) in serial. This function can be disabled or modified by the software command ESC K.



(Fig.2)

(See paragraph relative to the software commands). If, on switching on the printer, the PRINT key is held down, the printer will run the GRAPHIC TEST with 3 programmable logotypes.

- FEED key. When the FEED key is pressed, the printer carries out the paper forward feed function, required when the paper is inserted in the print mechanism. If pressed once, the key forward feeds the paper twice. If, on switching on the printer, the FEED key is held down, the printer runs the FONT TEST.

- The green LED signals a printer hardware error. The control is run “on line”, i.e. in the event of malfunctioning, the LED starts flashing as per the following table:

(Tab.1)

LED status	Description
Always off	Printer off
Always on	Printer on - no failure
Slow flashing (on for a long period)	Paper out message
Slow flashing (on for a short period)	Head up
Fast flashing	Overheating

- ON/OFF key. When pressed, this switches the printer on (fig.3); when released, it switches it off.

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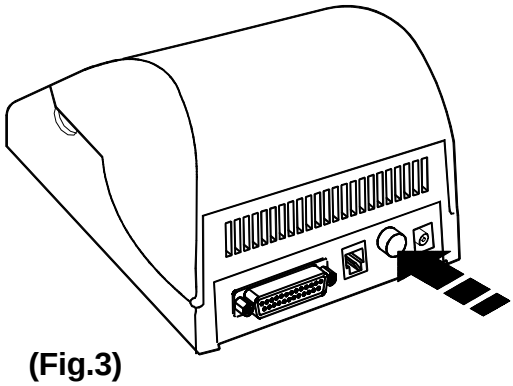
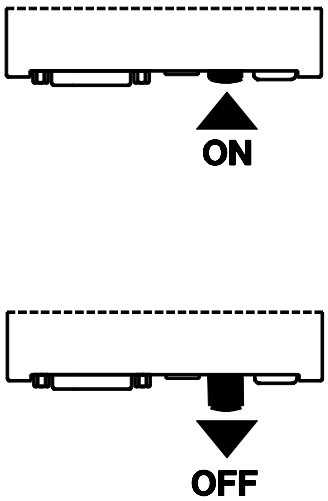
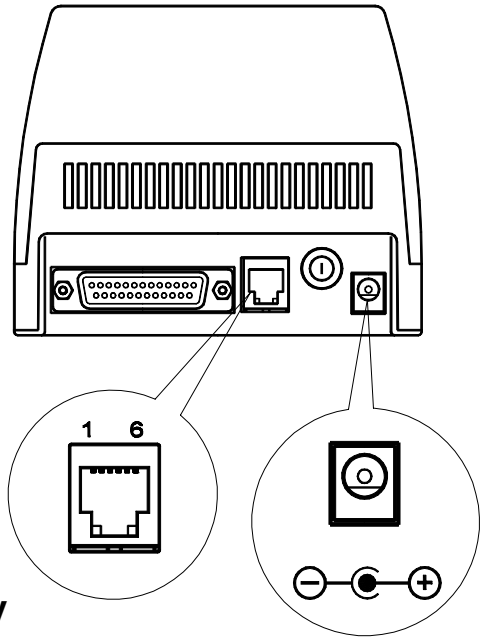


(Fig.3)



1.1 CONNECTIONS



(Fig.1.1)

1.1.1 Power Supply

The power infeed on the DPT281 is a 2.5mm bipolar jack socket.

WARNING:
Respect the polarity of the power supply.

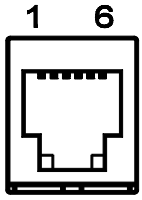
1.1.2 Drawer kick-out connector

The impulse specified by the command **ESC P**is an output signal to this connector. The host can acknowledge the status of the input signals through the commands **DLE EOT**, **ESC u**, **GS r**.
The functions of the drawer kick-out connector pins are described in the following table :

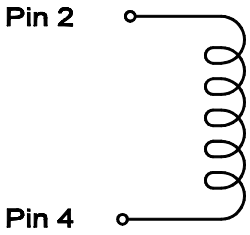
PIN	SIGNAL	IN / OUT
1	GND	
2	DRAWER KICK-OUT ENABLING SIGNAL	OUT
3	DRAWER OPEN/CLOSE SIGNAL	IN
4	+ 24 V	
5	N.C.	
6	GND	

(Tab.1.1)

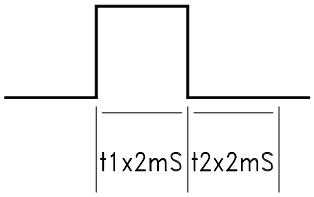
The solenoid must be connected from Pin 2 to Pin 4 of the drawer kick-out connector.



Drawer kick-out connector



Solenoid



Outout Wave form

(Fig.1.2)

WARNING:
in order to avoid an overcurrent, the resistance of the drawer kick-out connector must be 24 ≥ Ω or more.

Drawer kick-out enabling signal
Current: 1A (max 10 sec.) or less
Output wave form: t1 (ON time) and t2 (OFF time) are specified by **ESC P.**
During the ON time phase (t1), the output voltage is approx. 0V.
During the OFF time phase (t2), the output signal is at high impedance.

1.2 CONFIGURATION

The DPT281 enables the configuration of the printer default parameters.
The parameters affected during configuration are:

- **Printer emulation:** ESC/POS™, CUSTOM DPT24, CUSTOM DPT42 or CBM iDP560RS.
- **Baud Rate:** 38400, 19200, 9600, 4800, 2400, 1200.
- **Length of data:** 7, 8 bits/char.
- **Parity:** None, even or odd.
- **Flow control:** XON/XOFF or Hardware.
- **Automatic feed:** CR disabled or CR enabled.
- **Print mode:** Normal or Reverse.
- **Height mode:** x1, x2 or x4.
- **Width mode:** x1, x2 or x4.
- **Justification:** Left, Centred or Right.

With ESC/POS™ :

- **Char/line:** A=32 / B=42 columns. or A=42 / B=56 columns.

With CBM iDP560RS:

- **Font Dimensions:** 18x24 24 columns. or 11x24 40 columns.

With CUSTOM DPTxx:

- **Type of Font:** Font A or Font B.

- **Speed/Quality:** Normal, Draft or High Quality.
- **Printing in red:** Disabled or Enabled.
- **Print density:** Normal, Light, Very light, Dark, Very dark, Double copy.

The settings made are saved on the EEPROM (non volatile memory).
If when the printer is switched on, the PRINT and FEED keys are held down, the printer enters configuration mode and prints the first modifiable parameter. After the setup report, the printer waits until a key is pressed or characters are received from the port; every 10 characters, it prints hexadecimal values and ASCII codes (if the characters are underlined, this means that the reception buffer is full), see Hexadecimal dump.
When the FEED key is pressed, the printer skips setup mode and terminates the Hexadecimal dump function.
When the PRINT key is pressed, the printer enters parameter setting mode.

1.3 HEXADECIMAL DUMP

After completing the autotest procedure, the printer enters Hexadecimal Dump mode. This function is used for the diagnostics of characters received in serial. In fact, these are printed in hexadecimal code together with the corresponding Ascii code.
Figure 1.3 shows an example of printing from the printer Setup:

```
Font Dimension: 14x24 32 col
Speed/Quality : Normal
Print Density : Normal

[PRINT] key to enter setup
[FEED] key to skip setup

AA 43 55 53 54 4F 4D 20 45 6E   ¬CUSTOM En
67 69 6E 65 65 72 69 6E 67 20   gineering
48 65 78 61 64 65 63 69 6D 61   Hexadecima
6C 20 64 75 6D 70 20 66 75 6E   l dump fun
63 74 69 6F 6E 20 30 31 32 33   ction 0123
34 35 36 37 38 39 61 62 63 64   456789abcd
65 66 67 68 69 6A 6B 6C 6D 6E   efghijKlmn
6F 70 71 72 73 74 75 76 77 78   opqrstuvwx
79 7A                           yz
```

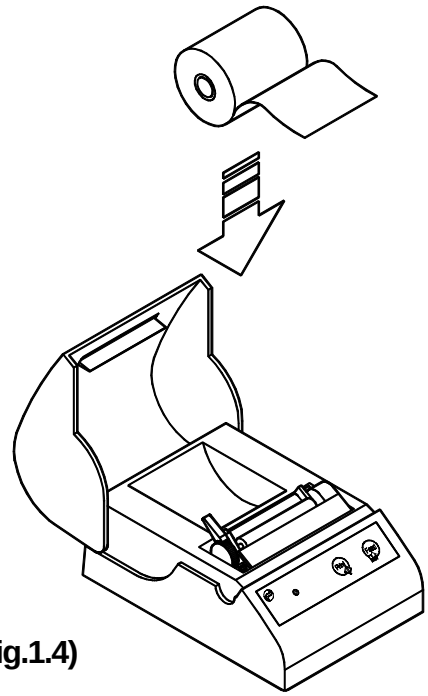
(Fig.1.3)

1.4 MAINTENANCE

1.4.1 Changing the paper roll

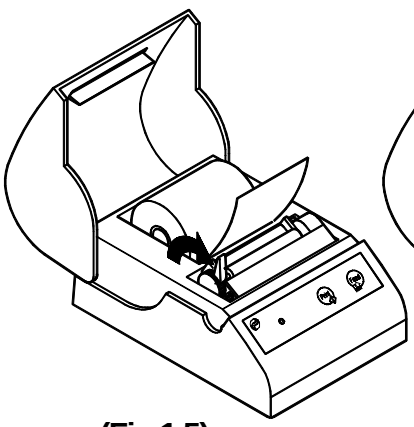
To change the paper roll in a DPT281 printer without autocutter, proceed as follows:

1) Open the printer cover and position the paper roll, so that it rotates in the direction indicated (fig.1.4);
2) Use the lever to lift the print head (fig.1.5);

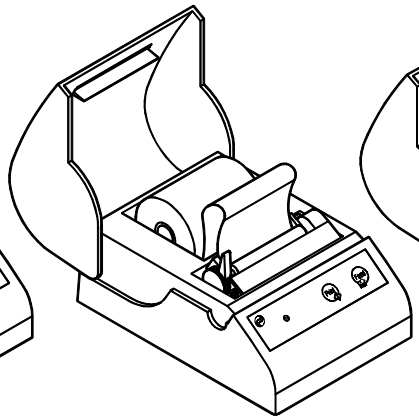


(Fig.1.4)

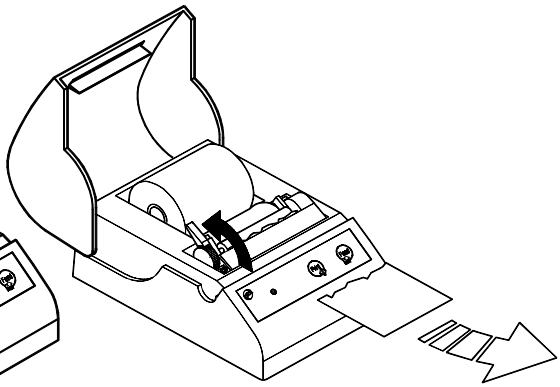
3) Insert the end of the paper roll in the slit on the print mechanism and wait until the roll loads automatically (fig.1.6);
4) Lower the head lever and tear off the paper (fig.1.7);



(Fig.1.5)

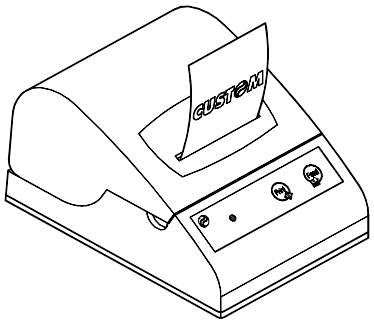


(Fig.1.6)



(Fig.1.7)

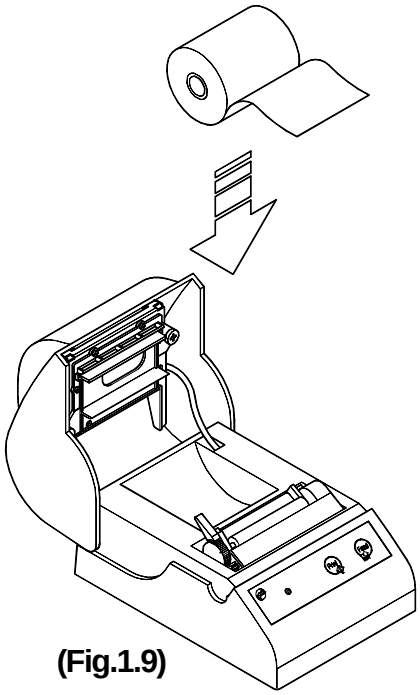
5) Close the cover: the printer is now ready to print (fig. 1.8);



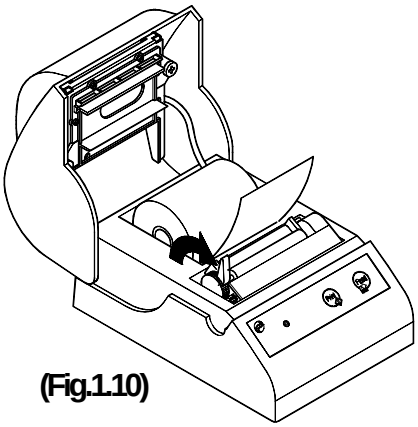
(Fig.1.8)

To change the paper roll in a DPT281 printer with autocutter, proceed as follows: :

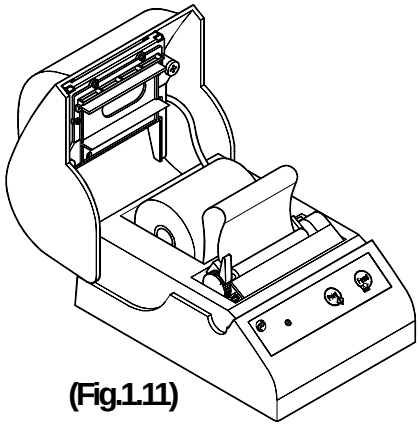
1) Open the printer cover and position the paper roll, so that it rotates in the direction indicated (fig.1.10);
2) Use the lever to lift the print head (fig.1.11);
3) Insert the end of the paper roll in the slit on the print mechanism and wait until the roll loads automatically (fig.1.12);



(Fig.1.9)

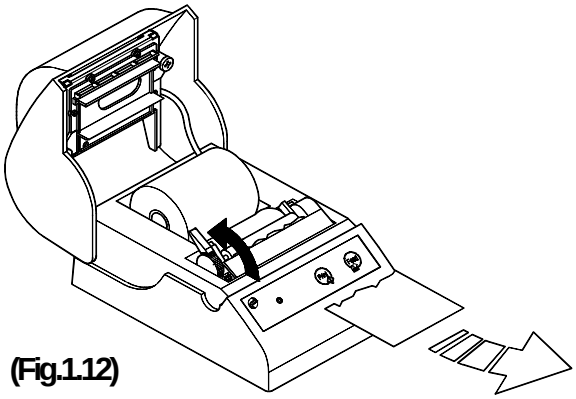


(Fig.1.10)

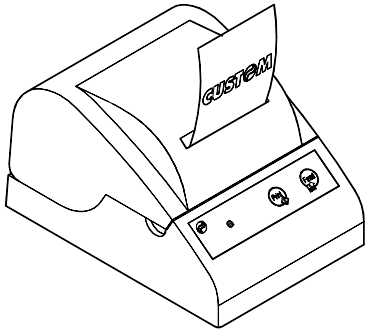


(Fig.1.11)

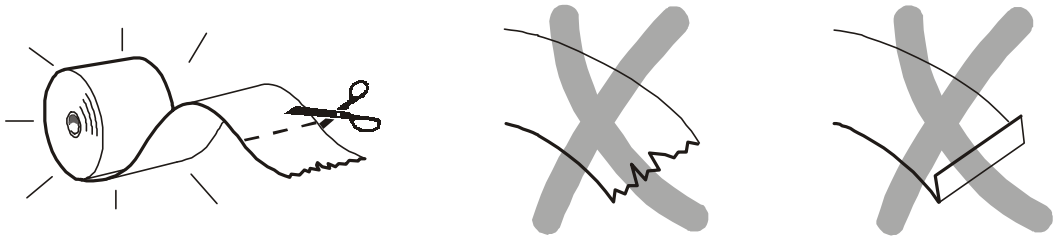
4) Lower the head lever and tear off the paper (fig.1.12);
5) Close the cover: the printer is now ready to print (fig.1.13).



(Fig.1.12)



(Fig.1.13)

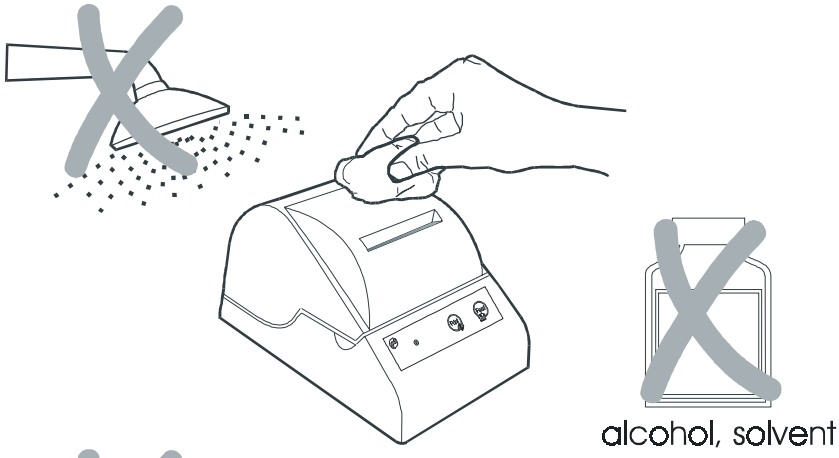


(Fig.1.14)

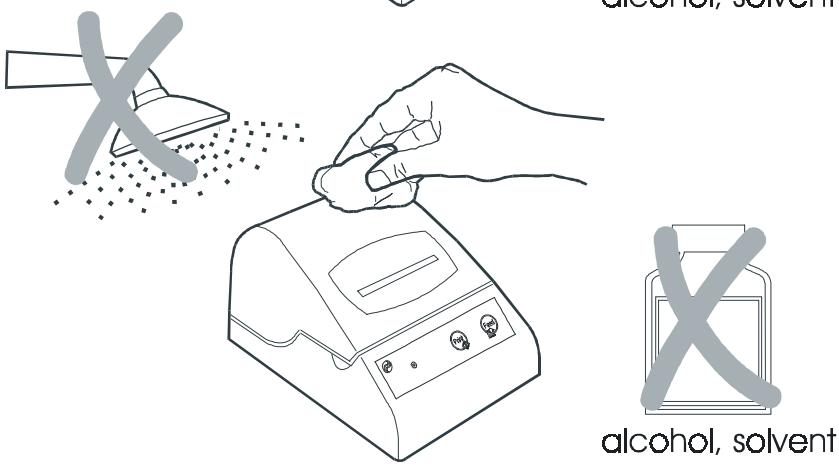
WARNING
Before inserting the paper,
ensure that it is cut evenly.

1.4.2 Cleaning

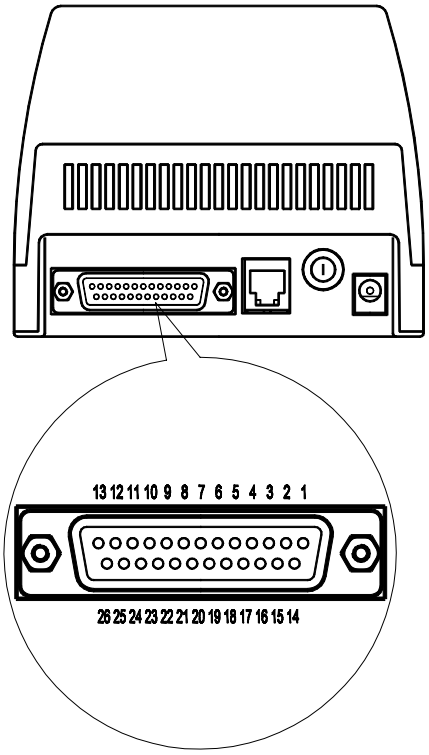
To clean the printer, use a vacuum cleaner or a soft cloth.
Before cleaning the printer, disconnect the feed cable.
Do not use alcohol, solvents or hard-bristled brushes.
Do not allow water or other liquids to wet the printer's internal mechanisms.



(Fig.1.15)



(Fig.1.16)



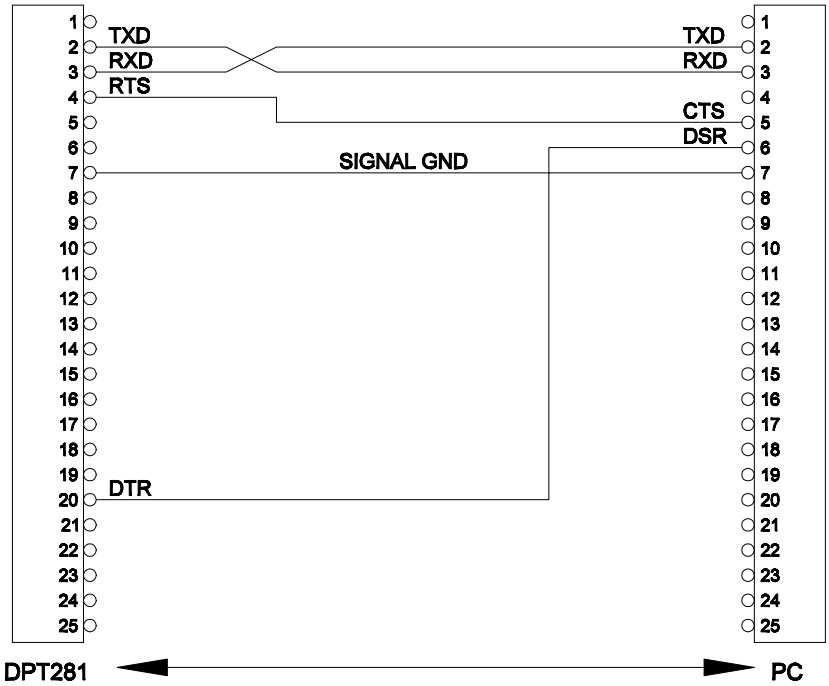
(Fig.2.1)

2.1 RS232 SERIAL

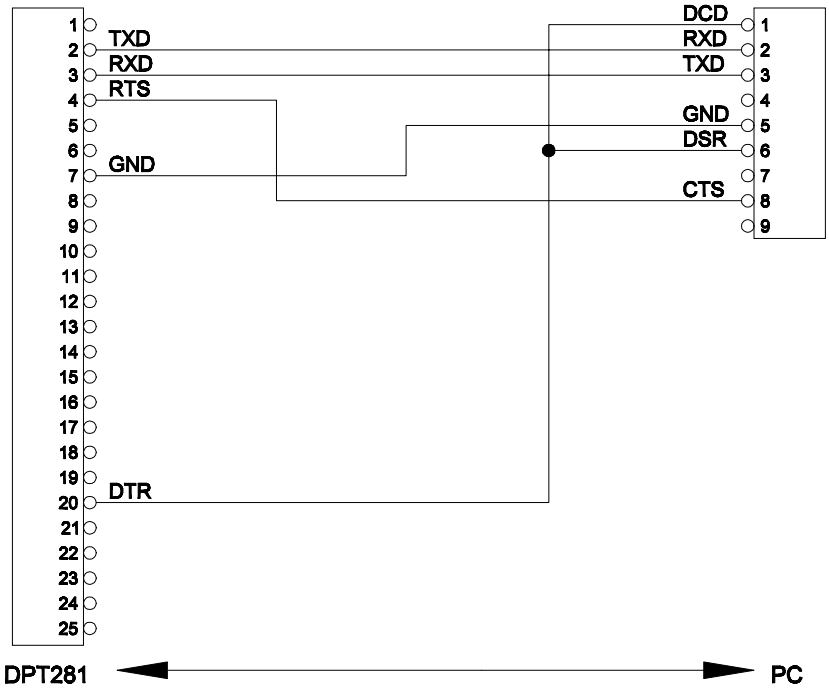
The printer has an RS232 serial interface and is connected by means of a 25-pin female connector. In the serial protocol, the signals which distinguish the communication are TXD, RXD, and RTS if the RTS/CTS protocol has been selected while, if the XON/XOFF protocol has been selected, the signals are TXD and RXD.
In the following table, the signals present on the connector are listed: **(Tab.2.1)**

PIN	SIGNAL	DIRECTION	DESCRIPTION
1	FG	-	Ground
2	TXD	Output	Data transmission
3	RXD	Input	Data reception
4	RTS	Output	Same as DTR signal
7	SG	-	Ground signal
20	DTR	Output	On selecting the command DTR/DSR, this signal indicates when the printer is busy. SPACE indicates that the printer is ready to receive data, and MARK indicates that the printer is busy.

The following diagrams show examples of connections between the printer and the Personal Computer using 25 and 9 pin female connectors.



(Fig.2.2)



(Fig.2.3)

2.2 CENTRONICS PARALLEL

The printer has a Centronics parallel interface and is connected by means of a 25-pin female connector.

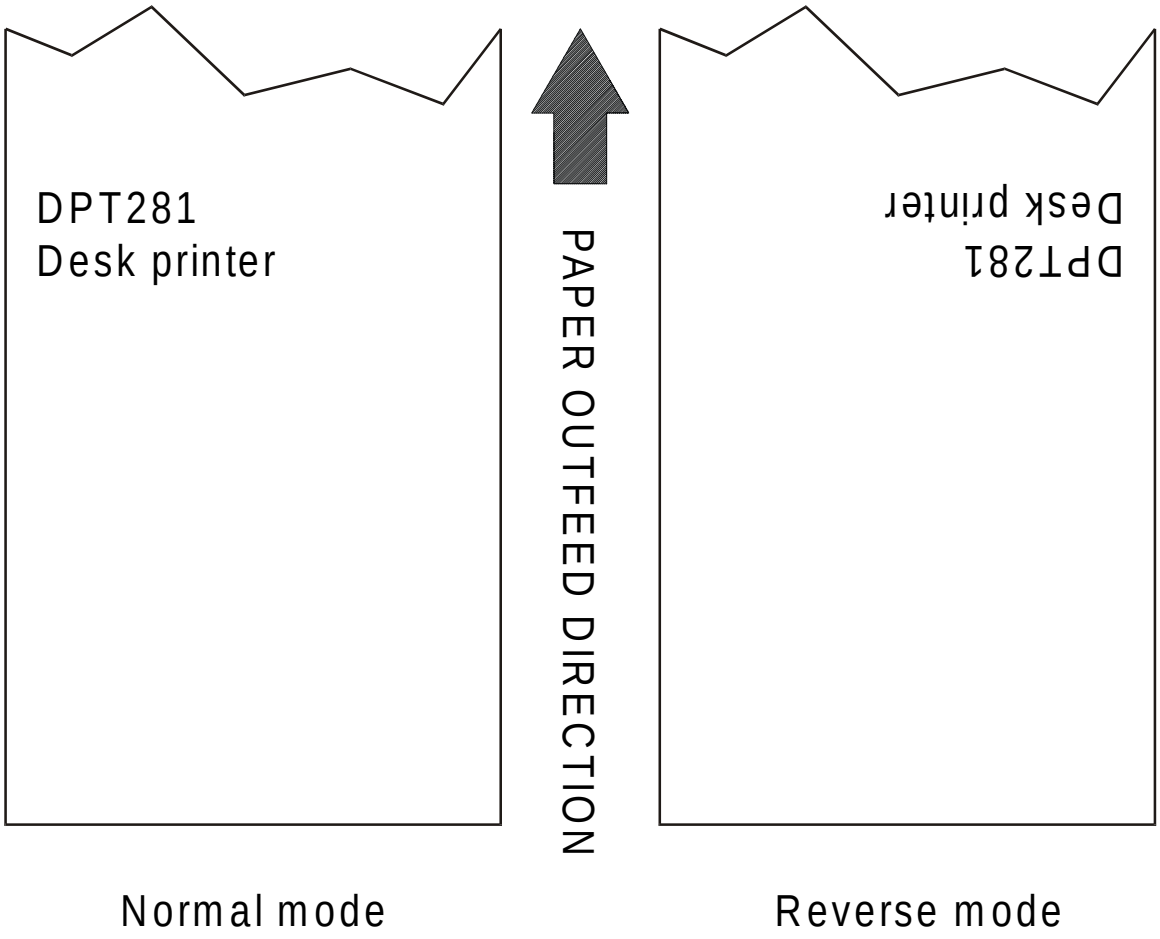
In the following table, the signals present on the connector are listed:

PIN	SIGNAL	DIRECTION
1	$\overline{\text{Strobe}}$	Input
2	Data bit 0	Input
3	Data bit 1	Input
4	Data bit 2	Input
5	Data bit 3	Input
6	Data bit 4	Input
7	Data bit 5	Input
8	Data bit 6	Input
9	Data bit 7	Input
10	$\overline{\text{ACK}}$	Output
11	BUSY	Output
12	PAPER END	Output
13	SELECT	Output
14	$\overline{\text{AUTO FEED}}$	Input
15	$\overline{\text{FAULT}}$	Output
16	$\overline{\text{RESET}}$	Input
17	$\overline{\text{SELECT INPUT}}$	Input
18-25	GND	-

(Tab.2.2)

3.1 PRINT DIRECTION

The DPT281 printer has two print modes, selectable through the control characters: normal and reverse.



(Fig.3.1)

3.2 CONTROL CHARACTERS

3.2.1 ESC/POS Emulation

The following table lists all the commands for the management of the ESC/POS™ Emulation of the DPT281 printer. The commands can be transmitted to the printer at any moment, but they will only be carried out when the commands previously sent have been executed. There are no commands with priority status; all the commands are carried out when the circular buffer is feed to do so.

(Tab.3.1) COMMAND TABLE

ASCII Comm.	HEX Comm.	Description
HT	$09	Horizontal tabs
LF	$0A	Print and line feed
BS	$08	Moving back of one character
CR	$0D	Print and line feed
DLE EOT n	$10 $04 (n)	Real-time status transmission
CAN	$18	Cancel print data
ESC SP n	$1B $20 (n)	Set character right-side spacing
ESC ! n	$1B $21 (n)	Set print mode
ESC $ nL nH	$1B $24 nL nH	Set absolute position
ESC % n	$1B $25 (n)	Select/cancel user-defined characters
ESC & y c1 c2	$1B $26 y c1 c2	Define user programmables characters
ESC * m nL nH d1...dk	$1B $2A m nL nH d1...dk	Set bit image mode
ESC - n	$1B $2D (n)	Turn underline mode on/off
ESC 0	$1B $30	Select 1/8-inch line spacing
ESC 2	$1B $32	Select 1/6-inch line spacing
ESC 3 n	$1B $33 (n)	Set line spacing using minimum units
ESC 4 n	$1B $34 (n)	Set / reset script mode
ESC = n	$1B $3D (n)	Select device
ESC ? n	$1B $3F (n)	Cancel user-defined characters
ESC @	$1B $40	Initialize printer

ASCII Comm.	HEX Comm.	Description
ESC D n1...nk NUL	$1B $44 n1...nk 00	Set horizontal tab positions
ESC E n	$1B $45 (n)	Select bold mode
ESC G n	$1B $47 (n)	Select double-strike mode
ESC J n	$1B $4A (n)	Print and feed paper
ESC R n	$1B $52 (n)	Select international character set
ESC \ nL nH	$1B $5C nL nH	Set relative print position
ESC a n	$1B $61 (n)	Select justification
ESC c 5 n	$1B $63 $35 (n)	Enable / disable panel keys
ESC d n	$1B $64 (n)	Print and feed paper n lines
ESC i	$1B $69	Total cut
ESC m	$1B $6D	Partial cut
ESC p m t1 t2	$1B $70 m t1 t2	Generate pulse
ESC r n	$1B $72 (n)	Set / reset red printing mode
ESC t n	$1B $74 (n)	Select character code table
ESC u n	$1B $75 (n)	Transmit peripheral device status
ESC x n	$1B $78 (n)	Select speed / quality mode
ESC v	$1B $76	Transmit printer status
ESC { n	$1B $7B (n)	Set / cancel upside-down character printing
ESC · n xL xH yH yL	$1B $FA n xL xH yH yL	Print graphic bank
ESC ¹	$1B $FB	Transmit ram bank to serial port
ESC ³ n	$1B $FC (n)	Transmit flash bank into ram bank
ESC ² nL nH	$1B $FD nL nH	Receive ram bank from port
ESC ¦ n	$1B $FE (n)	Transfer ram bank into flash bank
GS ! n	$1D $21 (n)	Select character size
GS :	$1D $3A	Set starting / end of macro definition
GS B n	$1D $42 (n)	Turn white/black reverse printing on/off
GS C 0 n m	$1D $43 $30 n m	Select counter print mode

ASCII Comm.	HEX Comm.	Description
GS C 1 aL aH bL bH n r	$1D $43 $31 aL aH bL bH n r	Select count mode(A)
GS C 2 nL nH	$1D $43 $32 nL nH	Select counter
GS C ; sa ; sb ; sn ; sr ; sc ;	$1D $43 $3B sa $3B sb $3B sn $3B sr $3B sc $3B	Select count mode (B)
GS H n	$1D $48 (n)	Select printing position of HRI characters
GS I n	$1D $49 (n)	Transmit printer ID ✹
GS L nL nH	$1D $4C nL nH	Set left margin
GS P x y	$1D $50 x y	Set horizontal and vertical motion units
GS W nL nH	$1D $57 nL nH	Set printing area width
GS ^ r t m	$1D $5E r t m	Execute macro
GS c	$1D $63	Print counter
GS f n	$1D $66 (n)	Select font for HRI characters
GS h n	$1D $68 (n)	Select height of bar code
GS k m NUL	$1D $6B m 00	Print bar code
GS r n	$1D $72 (n)	Transmit status ✹
GS w n	$1D $77 (n)	Select horizontal size (magnification) of) bar code
GS ~ n	$1D $7E (n)	Set superscript / subscript
GS | n	$1D $7C (n)	Set printing density

✹ In the above table, the commands marked with this symbol are for the serial interface only.

The following pages provide a more detailed description of each command.

HT

[Name] **Horizontal tabs**

[Format] ASCII HT

Hex 09

Decimal 9

[Description] Moves the print position to the next horizontal tab position.

[Notes]
- This command is ignored if the next horizontal tab position has not been set.
- If the next horizontal tab is outside the print area, the printer will print the entire contents of the print buffer, then proceed with the processing of the horizontal tabs from the beginning of the following line.
- The horizontal tabs are set through the command ESC D.

[Default]

[Reference] **ESC D**

[Example]

LF

[Name] **Print and line feed**

[Format]

ASCII	LF
Hex	0A
Decimal	10

[Description] Prints the data in the buffer and feeds one line, based on the current line spacing.

[Notes]
- This command sets the print position at the beginning of the line.

[Default]

[Reference] **ESC 2, ESC 3**

[Example]

BS

[Name] **Moving back of one character**

[Format]

ASCII	BS
Hex	08
Decimal	8

[Description] Moves print position to previous character.

[Notes] This command can put two characters at the same position.

[Default]

[Reference]

[Example]

CR

[Name] **Print and line feed**

[Format]

ASCII	CR	
Hex	0D	
Decimal	13	

[Description] When autofeed is CR enabled, this command functions in the same way as LF, otherwise it is ignored.

[Notes] • This command sets the print position at the beginning of the line.

[Default] See autofeed parameter on Setup.

[Reference] **LF**

[Example]

DLE EOT n (SERIAL INTERFACE ONLY)

[Name] **Transmission of status in real time**

[Format]

ASCII	DLE	EOT	n
Hex	10	04	n
Decimal	16	4	n

[Range] $1 \leq n \leq 4$

[Description] Transmits in real time the selected status of the printer specified by *n* according to the following parameters:

n = 1 transmit printer status
n = 2 transmit off-line status
n = 3 transmit error status
n = 4 transmit paper roll sensor status

[Notes] • This command is executed even when the reception buffer is full.
The status is transmitted whenever the data sequence 10H 04H n (1≤n≤4)is received.

[Default]

[Reference]

[Example]

n=1: Printer status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed at Off.
1	On	02	2	Not used. Fixed at On.
2	Off	00	0	Drawer kick-out signal is Low.
	On	04	4	Drawer kick-out signal is High.
3	Off	00	0	On-line.
	On	08	8	Off-line.
4	On	10	16	Not used. Fixed at On
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed at Off

n=2: Off-line status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed at Off.
1	On	02	2	Not used. Fixed at On.
2	Off	00	0	Not used. Fixed at Off.
3	Off	00	0	Paper is not being fed by FEED button.
	On	08	8	Paper is being fed by FEED button.
4	On	10	16	Not used. Fixed at On.
5	Off	00	0	No paper end stop.
	On	20	32	Printing stops due to paper end.
6	Off	00	0	No error
	On	40	64	Error
7	Off	00	0	Not used. Fixed at Off

n=3: Error status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed at Off.
1	On	02	2	Not used. Fixed at On.
2	Off	00	0	Not used. Fixed at Off.
3	-	-	-	Undefined.
4	On	10	16	Not used. Fixed at On
5	Off	00	0	Not used. Fixed at Off.
6	Off	00	0	No auto-recoverable error.
	On	40	64	Auto-recoverable error.
7	Off	00	0	Not used. Fixed at Off

n=4: Paper roll sensor status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed at Off
1	On	02	2	Not used. Fixed at On.
2	Off	00	0	Not used. Fixed at Off.
3	Off	00	0	Not used. Fixed at Off.
4	On	10	16	Not used. Fixed at On
5, 6	On	60	96	Fixed at On. Paper end is detected by the paper end sensor.
7	Off	00	0	Not used. Fixed at Off

CAN

[Name] **Cancel print data buffer.**

[Format] ASCII CAN
Hex 18
Decimal 24

[Description] Deletes all the print data in the current print buffer.

[Notes] This command sets the print position at the beginning of the line.

[Default]

[Reference]

[Example]

ESC SP n

[Name] **Set character right-side spacing**

[Format] ASCII ESC SP n
Hex 1B 20 n
Decimal 27 32 n

[Range] $0 \leq n \leq 255$

[Description] Sets spacing to right of character at [n x horizontal or vertical motion units].

[Notes] • The spacing to the right of the character for double width mode is double that used for normal mode. When the characters are enlarged, the spacing to the right of the character is m (2 or 4) times the normal value.

• The horizontal and vertical motion units are specified by the command **GS P**. Changing the horizontal or vertical motion does not affect the current right side spacing.
• The command **GS P** can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal spacing amount.
• In standard mode, the horizontal motion unit is used.
• The maximum right side spacing is 255/200 inches.

[Default] n = 0

[Reference] **GS P**

[Example]

ESC ! n

[Name] **Select print modes.**

[Format]

ASCII	ESC	!	n
Hex	1B	21	n
Decimal	27	33	n

[Range] $0 \le n \le 255$

[Description] Selects the print mode using *n* (see following tables):

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character font A selected.
	On	01	1	Character font B selected.
1	-	-	-	Undefined.
2	-	-	-	Undefined.
3	Off	00	0	Bold mode not selected.
	On	08	8	Bold mode selected.
4	Off	00	0	Double height mode not selected.
	On	10	16	Double height mode selected.
5	Off	00	0	Double width mode not selected.
	On	20	32	Double width mode selected.
6	Off	00	0	Script mode not selected.
	On	40	64	Script mode selected.
7	Off	00	0	Underline mode not selected.
	On	80	128	Underline mode selected.

[Notes] • The printer can underline all the characters, but it cannot underline the space set by commands **HT, ESC $, ESC ** and 90° clockwise rotated characters.

• When the characters on the same line are enlarged to different heights, they are either aligned at the baseline or topline (see **GS ~**).
• This command resets the left and right margin at the default value (see **GS L, GS W**).
• The command **ESC E** can also turn on/off bold mode. However, the setting of the last received command is effective.
• The command **ESC -** can also turn on/off underline mode. However, the setting of the last received command is effective
• The command **ESC 4** can also turn on/off script mode. However, the setting of the last received command is effective.
• The command **GS !** can select the character size. However,the setting of the last received command is effective.

[Default] n = 0

[Reference] **ESC -, ESC E, ESC 4, GS !**

[Example]

ESC $ nL nH

[Name] **Set absolute print position**

[Format]

ASCII	ESC	$	nL	nH
Hex	1B	24	nL	nH
Decimal	27	36	nL	nH

[Range] $0 \le nL \le 255$
$0 \le nH \le 255$

[Description] Sets the distance from the beginning of the line to the position in which the subsequent characters are to be printed.

The distance from the beginning of the line to the print position is [(nL + nH × 256)× (vertical or horizontal motion unit)] inches.

[Notes] • Settings outside the specified printable area are ignored.
• The vertical and horizontal motion units are specified by **GS P**.
• The command **GS P** can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount.
• In standard mode the horizontal motion unit (x) is used.

• If the setting is outside the printing area width, set absolute print position, but left or right margin is set at default value.

[Default]
[Reference] **ESC \, GS P**
[Example]

ESC % n

[Name] **Select / Cancel user-defined character sets**

[Format]

ASCII	ESC	%	n
Hex	1B	25	n
Decimal	27	37	n

[Range] $0 \le n \le 255$

[Description] Selects or cancels user-defined character sets.
When the LSB OF n is 0, the user-defined character set is deleted.
When the LSB of n is 1, the user-defined character set is selected.

[Notes]
• Only the LSB of n is effective.
• When the user-defined character set is deleted, the internal character set is automatically selected.

[Default] n=0
[Reference] **ESC &, ESC ?**
[Example]

ESC & y c1 c2 [x1 d1...d(y ´ x1)]...[xkd1...d(y ´ xk)]

[Name] **Define user-defined characters.**

[Format]

ASCII	ESC	&	y	c1	c2
Hex	1B	26	y	c1	c2
Decimal	27	37	y	c1	c2

[Range] y = 3
$32 \le c1 \le c2 \le 126$
$0 \le x \le 14$ (Font 14 x 24)
$0 \le x \le 10$ (Font 10 x 24)
$0 \le x \le 8$ (Font 8 x 24)
$0 \le d1 \ldots d (y \times xk) \le 255$
$k = c2 - c1 + 1$

[Description] Defines user programmables characters.
Y specifies the number of bytes in the vertical direction.
C1 specifies the beginning character code for the definition and C2 specifies the final code.
X specifies the number of dots in the horizontal direction.

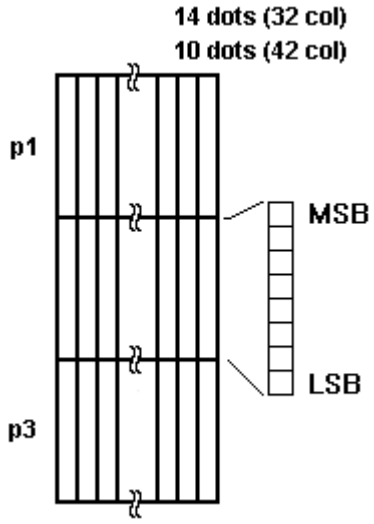
[Notes]
- The allowable character code range is from ASCII code 20H (32) to 7EH (126) (95 characters).
- It is possible to define multiple characters for consecutive character codes. If only one character is desired, use c1 = c2.
- If c2 < c1, the command is not executed.
- d is the dot data for the characters. The dot pattern runs horizontally from the left. Any remaining dots on the right side are blank.
- the data to define a user-defined character is (x ´ y) bytes.
- set a corresponding bit to 1 to print a dot or to 0 not to print a dot.
- this command can define different user-defined character patterns by each font. To select the font, use the command **ESC !.**
- A user-defined character and a downloaded bit image cannot be defined simultaneously. When this command is executed, the downloaded bit image is cleared.
- The user-defined character definition is cleared when :

ESC @ is executed;
GS * is executed;
ESC ? is executed;
The printer is reset or the power is turned off.

[Default] The internal character set.

[Reference] **ESC %, ESC ?**

[Example]



ESC * m nL nH d1...dk

[Name] **Select bit image mode.**

[Format]

ASCII	ESC	*	m	nL	nH	d1...dk
Hex	1B	2A	m	nL	nH	d1...dk
Decimal	27	42	m	nL	nH	d1...dk

[Range] m = 0, 1, 32, 33

$0 \le nL \le 255$

$0 \le nH \le 1$

$0 \le d \le 255$

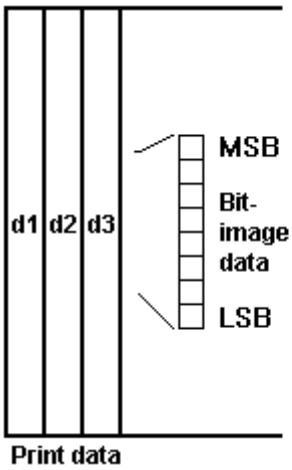
[Description] Selects a bit image-mode using *m* for the number of dots specified by *nL* and *nH*, as follows:

m	Mode	Vertical direction		Horizontal direction (*1)	
		N° dots	DPI	DPI	N° data (k)
0	8 dots single density	8	67	100	nL + nH x 256
1	8 dots double density	8	67	200	nL + nH x 256
32	24 dots single density	24	200	100	(nL + nH x 256) x 3
33	24 dots double density	24	200	200	(nL + nH x 256) x 3

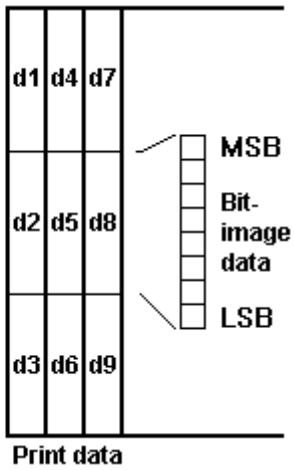
[Notes]

• The commands *nL* and *nH* indicate the number of horizontal dots in the graphic image. The nL and nH indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated by nL + nH × 256
• If the bit image data exceeds the number of dots to be printed on a line, the excess data is ignored.
• *d* indicates the bit image data. Set a corresponding bit to 1 to print dot or to 0 not to print dot.
• if the value of *m* is out of the specified range, *nL* and the data following are processed as normal data.
• If the width of the printing area set by the commands **GS L** and **GS W** is less than the width required by the data sent with the command **ESC *** , the excess data is ignored.
• To print the bit image use commands **LF, CR, ESC J** or **ESC d**.
• After printing a bit image, the printer returns to normal data processing mode.
• This command is not affected by bold, double-strike and underline (etc.) print modes, only by upside-down mode.
The relationship between the bit image and the dots to be printed is as follows:

8 dot image



24 dot image



[Default]

[Reference]

[Example]

ESC - n

[Name] **Turn underline mode on/off.**

[Format]

ASCII	ESC	-	n
Hex	1B	2D	n
Decimal	27	45	n

[Range] $0 \le n \le 2, 48 \le n \le 50$

[Description] Turns underline mode on or off, based on the following values of n:

n = 0, 48 Turns off underline mode
n = 1. 49 Turns on underline mode (1-dot thick)
n = 2. 50 Turns on underline mode (2-dot thick)

[Notes]
- The printer can underline all characters but cannot underline the space set by **HT** and right-side character spacing.
- The printer cannot underline 90° clockwise rotated characters and white/black inverted characters.
- When underline mode is turned off by setting the value of *n* at 0 or 48, the following data is not underlined.
- Underline mode can also be turned on or off by using **ESC !.** Note, however, that the last command received is effective

[Default] n=0

[Reference] **ESC !**

[Example]

ESC 0

[Name] **Select 1/8-inch line spacing**.

[Format]

ASCII	ESC	0
Hex	1B	30
Decimal	27	48

[Description] Selects 1/8-inch line spacing.

[Notes]

[Default]

[Reference] **ESC 2, ESC 3**

[Example]

ESC 2

[Name] **Set line spacing at 1/6 inch**.

[Format]

ASCII	ESC	2
Hex	1B	32
Decimal	27	50

[Description] Selects 1/6 inch line spacing.

[Notes]

[Default]

[Reference] **ESC 0, ESC 3**

[Example]

ESC 3 n

[Name] **Set line spacing.**

[Format]

ASCII	ESC	3	n
Hex	1B	33	n
Decimal	27	51	n

[Range] $0 \leq n \leq 255$

[Description] Sets the line spacing at [*n*× (vertical or horizontal motion unit)] inches.

[Notes]
- Horizontal and vertical motion units are specified by the command **GS P**. Changing the horizontal or vertical motion unit does not affect the current line spacing.
- The command **GS P** can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum vertical movement amount.
- In standard mode, the vertical motion unit is used.
- The maximum line spacing is *n* = 255 (≅ 32mm).

[Default] n = 32 (1/6 inch)

[Reference] **ESC 0, ESC 2, ESC P**

[Example]

ESC 4 n

[Name] **Set / reset script mode.**

[Format]
ASCII ESC 4 n
Hex 1B 34 n
Decimal 27 52 n

[Range] 0 ≤ n ≤ 1, 48 ≤ n ≤ 49

[Description] Turns script mode on or off, based on the following values of *n* :

n	Function
0, 48	Turns script mode off
1, 49	Turns script mode on

[Notes]
• The printer can print all characters in script mode.
• When script mode is turned off by setting the value *n* at 0 or 48, the data that follows is printed in normal mode.
• Script mode can also be turned on or off by using **ESC !**. Note, however, that the last command received is effective

[Default] n = 0

[Reference] **ESC !**

[Example]

ESC = n

[Name] **Select peripheral device**

[Format]
ASCII ESC = n
Hex 1B 3D n
Decimal 27 61 n

[Range] 0 ≤ n ≤ 255

[Description] Selects the device to which the host computer sends data, using n as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Printer disabled.
	On	01	1	Printer enabled.
1	-	-	-	Undefined
2	-	-	-	Undefined
3	-	-	-	Undefined
4	-	-	-	Undefined
5	-	-	-	Undefined
6	-	-	-	Undefined
7	-	-	-	Undefined

[Notes] • When the printer is disabled, it ignores all transmitted data until the printer is enabled by this command.

[Default] n = 1

[Reference]

[Example]

ESC ? n

[Name] **Cancel user-defined characters.**

[Format]

ASCII	ESC	?	n
Hex	1B	3F	n
Decimal	27	63	n

[Range] $32 \leq n \leq 126$

[Description] Cancels user-defined characters.

[Notes] • This command cancels the patter defined for the character code specified by *n* . After the user-defined characters have been cancelled, the corresponding pattern for the internal characters is printed.
• This command deletes the pattern defined for the specified character code in the font selected by **ESC !**.
• If the user-defined character has not been defined for the specified character code, the printer ignores this command.

[Default]

[Reference] **ESC &**, **ESC %**

[Example]

ESC @

[Name] **Inizialize the printer.**

[Format]

ASCII	ESC	@
Hex	1B	40
Decimal	27	64

[Description] Clears the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.

[Notes]
- The data in the reception buffer is not cleared.
- The macro definitions are not cleared.

[Default]

[Reference]

[Example]

ESC D [n1...nk] NUL

[Name] Set the horizontal tabs.

[Format]

ASCII	ESC	D	n1...nk	NUL
Hex	1B	44	n1...nk	00
Decimal	27	68	n1...nk	0

[Range]
$1 \leq n \leq 255$
$0 \leq k \leq 32$

[Description] Sets the horizontal tabs.
- *n* specifies the number of columns for setting a horizontal tab from the beginning of the line.
- *k* indicates the total number of horizontal tabs to be set.

[Notes]
- The horizontal tab position is stored as a value of [character width x *n*] measured from the beginning of the line. The width of the character includes the space to the right of the character and double width characters are set with a width which is double that of normal characters.
- This command cancels the previous horizontal tab setting.
- When setting n = 8, the print position is moved to column 9 by sending **HT**.
- Up to 32 tab positions can be set (*k* = 32). Any data exceeding the 32 tabs is processed as normal data.

• Transmit [*n*] *k* in ascending order and put a code 0 NUL at the end. When [*n*] *k* is less than or equal to the preceding value [*n*] *k*-1, tab setting is finished and the following data is processed as normal data.
• **ESC D NUL** cancels all horizontal tab positions.
• The previously specified horizontal tab positions do not change, even if the character width changes.

[Default] The default tabs are at intervals of 8 characters (columns 9, 17, 25, …) for the A Font when the space to the right of the character is 0.

[Reference] **HT**

[Example]

ESC E n

[Name] **Turn bold mode on/off.**

[Format]

ASCII	ESC	E	n
Hex	1B	45	n
Decimal	27	69	n

[Range] 0 ≤ n ≤ 255

[Description] Turns bold mode On or Off.
• When the LSB of *n* is 0, bold mode is turned off.
• When the LSB of *n* is 1, bold mode is turned on.

[Notes] • Only the LSB of *n* is effective.
• The command **ESC !** also turns bold mode on and off. In any case, the last command received is enabled.

[Default] n = 0

[Reference] **ESC !**

[Example]

ESC G n

[Name] **Turn double strike mode On/Off**.

[Format]

ASCII	ESC	G	n
Hex	1B	47	n
Decimal	27	71	n

[Range] 0 ≤ n ≤ 255

[Description] Turns double-strike mode On or Off.
• When the LSB of *n* is 0, double-strike mode is turned off.
• When the LSB of *n is* 1, double-strike mode is turned on.

[Notes] • Only the LSB of *n* is effective.
• The printer output is the same in double-strike mode and bold mode.

[Default] n = 0

[Reference] **ESC E**

[Example]

ESC J n

[Name] **Print and feed paper.**

[Format]

ASCII	ESC	J	n
Hex	1B	4A	n
Decimal	27	74	n

[Range] $0 \leq n \leq 255$

[Description] Prints the data in the print buffer and feeds the paper [n × (vertical or horizontal motion unit) inches.

[Notes] • After printing is over, this command sets the print starting position at the beginning of the line.
• The paper feed amount set by this command does not affect the values set by **ESC 2** or **ESC 3**.
• The horizontal and vertical motion unit are specified by **GS P**.
• The command **GS P** can change the vertical (and horizontal)motion unit. However, the value cannot be less than the minimum vertical movement amount.
• In standard mode, the vertical motion unit is used.
• The maximum paper feed amount is 31.8 mm.

[Default]

[Reference] **GS P**

[Example]

ESC R n

[Name] **Select the international character set**.

[Format]

ASCII	ESC	R	n
Hex	1B	52	n
Decimal	27	82	n

[Range] $0 \le n \le 12$

[Description] Selects the international character set by setting *n* as in the following table :

	Hex	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
n	Character set												
0	U.S.A.	#	$	@	[	\	]	^	`	{	|	}	~
1	France	#	$	à	°	ç	§	^	`	è	ù	è	"
2	Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	β
3	Great Britain	£	$	@	[	\	]	^	`	{	|	}	~
4	Denmark I	#	$	@	Æ	∅	Å	^	`	æ	ϕ	å	~
5	Sweden	#		È	Ä	Ö	Å	Ü	è	ä	ö	å	ü
6	Italy	#	$	@	°	\	è	^	ù	à	ò	è	ì
7	Spain 1	Pt	$	@	i	Ñ	¿	^	`	"	ñ	}	~
8	Japan	#	$	@	[	¥	]	^	`	{	|	}	~
9	Norway	#		È	Æ	∅	Å	Ü	è	æ	ϕ	å	ü
10	Denmark II	#	$	È	Æ	∅	Å	Ü	è	æ	ϕ	å	ü
11	Spain 2	#	$	à	i	Ñ	¿	è	`	í	ñ	ö	ü
12	South America	#	$	à	i	Ñ	¿	è	ù	í	ñ	ö	ü

[Default] n = 0

[Reference]

[Example]

ESC \ nL nH

[Name] **Set relative print position**.

[Format]

ASCII	ESC	\	nL	nH
Hex	1B	5C	nL	nH
Decimal	27	92	nL	nH

[Range] $0 \le nL \le 255$
$0 \le nH \le 255$

[Description] Sets the print starting position based on the current position by using the horizontal or vertical motion unit.
This command sets the distance from the current position to [(nL+ nH × 256) × (horizontal or vertical motion unit)].

[Notes]
• Any setting that exceeds the printable area is ignored.
• When the starting position is specified by n motion units to the right :
nL + nH × 256 = n
When the starting position is specified by n motion units to the left (negative direction) use the complement of 65536 :
nL + nH ´ 256 = 65536 – n
• If setting exceeds printing area width, left or right margin is set to default value.
• The horizontal and vertical motion units are specified by **GS P**.
• The command **GS P** can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount.
• In standard mode, the horizontal motion unit is used.

[Default]

[Reference] **ESC $**, **GS P**

[Example]

ESC a n

[Name] **Select justification**.

[Format]

ASCII	ESC	a	n
Hex	1B	61	n
Decimal	27	97	n

[Range] $0 \le n \le 2, 48 \le n \le 50$

[Description] Aligns all the data in one line in the position specified.
n selects the type of justification as follows:

n	Justification
0, 48	Left justification
1, 49	Centring
2, 50	Right justification

[Notes]
- This command is only enabled if input at the beginning of the line.
- The lines are justified within the specified printing area.
- The spaces set by the commands **HT, ESC $** and **ESC ** remain justified as per the previously set mode.

[Default] n = 0

[Reference]

[Example]

Left justification

```
ABC
ABCD
ABCDE
```

Centring

```
 ABC
ABCD
ABCDE
```

Right justification

```
  ABC
 ABCD
ABCDE
```

ESC c 5 n

[Name] **Enable or disable the front panel keys.**

[Format]

ASCII	ESC	c	5	n
Hex	1B	63	35	n
Decimal	27	99	53	n

[Range] $0 \le n \le 255$

[Description] Enables or disables the front panel keys.
- When the LSB di *n* is 0, the panel keys are enabled.
- When the LSB of *n* is 1, the panel keys are disabled.

[Notes]
- Only the LSB of *n* is effective.
- In the printer, the panel buttons are the FEED and PRINT keys.
- When the panel keys are disabled, the keys can only operate when reset.

[Default] n = 0
[Reference] See the “Panel key” parameter from Setup.
[Example]

ESC d n

[Name] **Print and feed paper n lines.**
[Format]

ASCII	ESC	d	n
Hex	1B	64	n
Decimal	27	100	n

[Range] $0 \le n \le 255$
[Description] Prints the data in the print buffer and feeds the paper *n* lines.
[Notes]
- This command sets the print starting position at the beginning of the line.
- This command does not affect the line spacing set by ESC 2 or ESC 3.
- The maximum paper feed amount is 200 lines. Even if a paper feed exceeding 200 lines is set, the printer only feeds the paper by 200 lines.

[Default]
[Reference] **ESC 2, ESC 3**
[Example]

ESC i

[Name] **Total cut**.
[Format]

ASCII	ESC	i
Hex	1B	69
Decimal	27	105

[Description] This command enables cutter operation; if there is no cutter, a disabling flag is set any subsequent cutting commands will be ignored.
[Notes]
- The printer waits until all the paper movement commands have been completed before executing total cut

[Default]
[Reference]
[Example]

ESC m

[Name] **Partial cut**.

[Format]

ASCII	ESC	m
Hex	1B	6D
Decimal	27	109

[Description] This command enables partial cutter operation. If there is no cutter, a disabling flag is set and any subsequent cutting commands will be ignored.

[Notes] • The printer waits until all the paper movement commands have been completed before executing partial cut

[Default]

[Reference]

[Example]

ESC p m t1 t2

[Name] **Generate pulse**.

[Format]

ASCII	ESC	p	m	t1	t2
Hex	1B	70	m	t1	t2
Decimal	27	112	m	t1	t2

[Range] m = 0, 48

$0 \le t1 \le 255$

$0 \le t2 \le 255$

[Description] Outputs the pulse specified by t1 and t2 to the Pin *m* of the connector as follows:

m	**Connector pin**
0, 48	Pin 2 of drawer kick-out connector

[Notes] • The pulse ON time is [*t1´* 2 ms] and the OFF time is [*t2´* 2 ms].

• If *t2* < *t1*, the OFF time is [*t1´* 2 ms].

[Default]

[Reference]

[Example]

ESC r n

[Name] **Set/ Reset red printing mode**

[Format]

ASCII	ESC	r	n
Hex	1B	72	n
Decimal	27	114	n

[Range] $0 \le n \le 1, 48 \le n \le 49$

[Description] Sets and resets red printing mode.

n	Function
0, 48	Reset red printing mode
1, 49	Set red printing mode

[Notes]
- The printer only prints the whole line, and not single characters, in red.
- The printer only prints in red if enabled (see parameter setting).

[Default] *n* = 0

[Reference]

[Example]

ESC t n

[Name] **Select the character code table.**

[Format]

ASCII	ESC	t	n
Hex	1B	74	n
Decimal	27	116	n

[Range] n = 0, 255

[Description] Selects a page *n* from the character code table, as follows:

n	Page
0	0 (PC437 [U.S.A., Standard Europe])
255	Page space

[Note]

[Default] n = 0

[Reference] See character code table

[Example]

ESC u n (WITH SERIAL INTERFACE ONLY)

[Name] **Transmit peripheral device status**.

[Format]
ASCII ESC u n
Hex 1B 75 n
Decimal 27 117 n

[Range] *n* = 0, 48

[Description] Transmits the status of connector pin *n* upon receiving this command, using *n* as follows :

n	Connector PIN
0. 48	Pin 3 of drawer kick-out connector

[Notes]
• This command is executed when the data is processed in the reception buffer. There may be a time lag, therefore, between receiving the command and transmitting the status, depending on the status of the reception buffer.
• When the connector is not used, the value of the bit 0 is always 1.
• The status to be transmitted is shown in the table below:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Level of pin 3 low
	On	01	1	Level of pin 3 high
1	-	-	-	Undefined
2	-	-	-	Undefined
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed at Off
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed at Off

[Default]

[Reference] **DLE EOT, GS r**
See drawer kick-out connector.

[Example]

ESC x n

[Name] Select speed / quality mode.

[Format]

ASCII	ESC	x	n
Hex	1B	78	n
Decimal	27	120	n

[Range] 0 £ *n* £ 2

[Description] Selects speed / quality mode.

n	Function
0	Draft mode (high speed)
1	Normal mode
2	High quality (low speed)

[Notes] • In high quality mode (*n*= 2), the printer may be noisy.

[Default] *n* = 1

[Reference]

[Example]

ESC v (WITH SERIAL INTERFACE ONLY)

[Name] **Transmit paper sensor status**.

[Format]

ASCII	ESC	v
Hex	1B	76
Decimal	27	118

[Description] Transmits the current paper sensor status upon receiving this command.

[Notes] • This command is executed immediately, even when the reception buffer is full (Busy).
The status to be transmitted is shown in the table below :

Bit	Off/On	Hex	Decimal	Function
0,1	Off	00	0	Not used
	On	03	3	Not used
2,3	Off	00	0	Paper out sensor Paper present
	On	(0C)	(12)	Paper out sensor Paper not present
4	Off	00	0	Not used. Fixed at Off
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed at Off

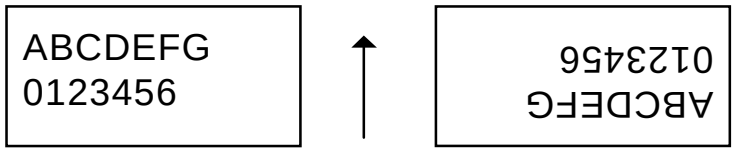
[Default]
[Reference] **DLE EOT**
[Example]

ESC { n

[Name] **Turn upside-down printing mode on/off**.
[Format] ASCII ESC{ n
Hex 1B 7B n
Decimal 27 123 n
[Range] $0 \le n \le 255$
[Description] Turns upside-down printing mode on/off.
• When the LSB of *n* is 0, upside-down printing mode is turned off.
• When the LSB of *n* is 1, upside-down printing mode is turned on.
[Notes] • Only the LSB of *n* is effective.
• This command is only enabled when input at the beginning of a line.
• In upside-down printing mode, the printer rotates the line to be printed by 180° and then prints it.

[Default] n = 0
[Reference]
[Example]

Upside-down printing Off Upside-down printing On



Paper outfeed direction

ESC · n xH xL yH yL

[Name] **Print graphic bank (448 ×585 dots).**

[Format]

ASCII	ESC	·	n	xH	xL	yH	yL
Hex	1B	FA	n	xH	xL	yH	yL
Decimal	27	250	n	xH	xL	yH	yL

[Range] $0 \le n \le 3$

$0 \le xH, xL, yH, yL \le 255$

[Description] Prints the graphics bank from flash or ram.
n selects the bank as follows:

n	Function
0	Print graphic bank
1	Print flash bank logo 1
2	Print flash bank logo 2
3	Print flash bank logo 3

xL + *xH* ´ 256 specifies the starting dot line (1 ¸ 585).
yL + y*H* ´ 256 specifies the number of lines to print.

[Notes] • If (*xL* + (*xH* ´ 256)) > 585 the printer does not execute the command.
• Se (*xL* + (*xH* ´ 256) + *yL* +(y*H* ´ 256))> 585 the printer only prints 585 - *xL* + (*xH* ´ 256) +1 dotlines.

[Default]

[Reference] **ESC ³, ESC ², ESC ¦**

[Example] To print from ram bank dotline 100 to dotline 299, send:
1BH FAH00H 00H 64H 00H C7H

ESC ¹ nL nH (ONLY WITH SERIAL INTERFACE)

[Name] **Transmit ram bank to serial port.**

[Format]

ASCII	ESC ¹		nL	nH
Hex	1B	FB	nL	nH
Decimal	27	251	nL	nH

[Description] Transmits (nH x 256) + nL words of ram bank to serial port.

[Notes] • The size of the ram bank for graphic printing is 448 horizontal dots (56 bytes/dotline) ´585 vertical points (32760 bytes = 16380 words).

[Default]

[Reference] **ESC ³, ESC ², ESC ¦**

[Example]

ESC ³ n

[Name] **Transfer the flash bank into ram bank.**

[Format]

ASCII	ESC ³		n
Hex	1B	FC	n
Decimal	27	252	n

[Range] $1 \le n \le 3$

[Description] Transfers flash bank into ram bank (32768 bytes).
n selects the bank as follows:

n	Function
1	Transfer flash bank logo 1 into ram.
2	Transfer flash bank logo 2 into ram.
3	Transfer flash bank logo 3 into ram.

[Note]

[Default]

[Reference] **ESC ·, ESC ², ESC ¦**

[Example]

ESC ² nL nH

[Name] Receive ram bank from port.

[Format]

ASCII	ESC ²	nL	nH
Hex	1B	FD	nL	nH
Decimal	27	253	nL	nH

[Range] 0 £ *nL*, *nH* £ 255

[Description] Receives [*nL* + (*nH* ´ 256)] words from port and puts them into ram bank.

[Notes]
- The number of data bytes received is [*nL* + (*nH* ´ 256)] ´ 2.
- Each word is received first in MSByte form and then in LSByte form
- If [*nL* + (*nH* ´ 256)] exceeds 16384, the data following will be processed as normal data.

[Default]

[Reference] **ESC ·, ESC ³, ESC ¦**

[Example]

ESC ¦ n

[Name] **Transfer ram bank into flash bank.**

[Format]

ASCII	ESC ¦	n
Hex	1B	FE	n
Decimal	27	254	n

[Range] 1 ≤ n ≤ 3

[Description] Transfer ram bank into flash bank. (32768 bytes).
n selects the bank as follows :

n	Function
1	Transfer ram bank into flash bank logo 1.
2	Transfer ram bank into flash bank logo 2.
3	Transfer ram bank into flash bank logo 3..

[Notes]

[Default]

[Reference] **ESC ·, ESC ², ESC ³**

[Example]

GS ! n

[Name] **Select character size**.

[Format]

ASCII	GS	!	n
Hex	1D	21	n
Decimal	29	33	n

[Range] $0 \le n \le 255$

[Description] Selects character height and width, as follows:
- Bits 0 to 3 : character height selection (see table 2).
- Bits 4 to 7 : character width selection (see table 1).

Table1 Character width selection

Hex	Decimal	Width
00	0	1 (normal)
10	16	2 (double width)
20	32	3 (quadruple width)
30	48	
40	64	
50	80	
60	96	
70	112	

Table 2 Character height selection

Hex	Decimal	Height
00	0	1 (normal)
01	1	2 (double height)
02	2	3 (quadruple height)
03	3	
04	4	
05	5	
06	6	
07	7	

[Notes]
- This command is effective for all characters (except HRI characters).
- If n is outside the defined range, this command is ignored.
- When characters are enlarged with different heights on one line, the are aligned at the baseline or topline (see GS ~).
- The character size can also be selected by the command ESC ! However,the setting of the last received command is effective.

[Default] n = 0

[Reference] **ESC !**

[Example]

GS :

[Name] **Start / end macro definition**.

[Format]

ASCII	GS	:
Hex	1D	3A
Decimal	29	58

[Description] Starts or ends macro definition.

[Notes]
- Macro definition starts when this command is received during normal operation.
- When the command **GS ^** is received during macro definition, the printer ends the macro definitions and clears all definitions.
- Macro not defined when the power is turned on.
- The defined contents of the macro are not cleared by the command **ESC** @. Therefore, **ESC** @ can be included in the contents of the macro definitions.
- If the printer receives the command **GS :** again immediately after previously receiving **GS :**,the printer remains in the macro undefined state.
- The contents of the macro can be defined up to 1024 bytes. If the macro definition exceeds 1024 bytes, the excess data is not not stored.

[Default]

[Reference] **GS ^**

[Example]

GS B n

[Name] **Turn white / black reverse printing mode on/off**.

[Format]

ASCII	GS	B	n
Hex	1D	42	n
Decimal	29	66	n

[Range] $0 \le n \le 255$

[Description] Turns white/black reverse printing mode on or off.
- When the LSB of *n* is 0, white/black reverse printing is turned off.
- When the LSB of *n* is 1, white/black reverse printing mode is turned on.

[Notes]
- Only the LSB of *n* is effective.
- This command is available for built-in characters and user-defined characters.
- This command does not affect bit image, downloaded bit image, bar codes, HRI characters and spacing skipped by **HT, ESC $** and **ESC \.**
- This command does not affect the space between lines.
- White/black reverse mode has a higher priority than underline mode. Even if underline mode is on, it is disabled (but not cancelled) when white/black reverse mode is selected.

[Default] n = 0

[Reference]

[Example]

GS C 0 n m

[Name] **Select counter print mode.**

[Format]

ASCII	GS	C	0	n	m
Hex	1D	43	30	n	m
Decimal	29	67	48	n	m

[Range] $0 \le n \le 5$
m = 0, 1, 2, 48, 49, 50

[Description] Selects a print mode for the serial number counter.
- *n* specifies the number of digits to be printed as follows:
when *n* = 0, the printer prints the actual digits indicated by the number value.
when *n* = 1 to 5, this command sets the number of digits to be printed.
- m specifies the printing position within the entire range of printed digits, as follows:

m	Printing position	Processing of digits less than those specified
0. 48	Align right	Adds spaces to the left.
1. 49	Align right	Adds '0' to the left.
2. 50	Align left	Adds spaces to the right

[Notes] • If *n* or *m* is out of the defined range, the previously set print mode is not changed.
• If *n* = 0, *m* does not have any meaning.

[Default] *n* = 0, *m* = 0

[Reference] **GS C 1, GS C 2, GS C ;, GS c**

[Example] n = 3,m = 0 n = 3, m = 1 n = 3, m=2
□□1 001 1□□

□ indicates a space

GS C 1 aL aH bL bH n r

[Name] **Select count mode (A)**.

[Format]

ASCII	GS	C	1	aL	aH	bL	bH	n	r
Hex	1D	43	31	aL	aH	bL	bH	n	r
Decimal	29	67	49	aL	aH	bL	bH	n	r

[Range] $0 \le aL, aH \le 255$
$0 \le bL, bH \le 255$
$0 \le n, r \le 255$

[Description] Selects a count mode for the serial number counter.
• *aL*, *aH* o *bL*, *bH* specify the counter range.
• *n* specify the stepping amount when counting up or down.
• *r* indicates the repetition number when the counter value is fixed.

[Notes] • Count-up mode is specified when:
$[aL + (aH \times 256)] < [bL + (bH \times 256)]$ and $n \neq 0$ and $r \neq 0$
• Count-down mode is specified when:
$[aL + (aH \times 256)] > [bL + (bH \times 256)]$ and $n \neq 0$ and $r \neq 0$
• Counting stops when:
$[aL + (aH \times 256)] = [bL + (bH \times 256)]$ or $n = 0$ or $r = 0$
• In setting count-up mode, the minimum value of the counter is $[aL + (aH \times 256)]$ and the maximum value is $[bL + (bH \times 256)]$. If counting up reaches a value exceeding the maximum, it is resumed with the minimum value.
• In setting count-down mode, the maximum value of the counter is $[aL + (aH \times 256)]$ and the minimum value is $[bL + (bH \times 256)]$. If counting down reaches a value less than minimum, it is resumed with the maximum value.
• When the command is executed, the internal count that indicates the repetition number specified by *r* is cleared.

[Default] aL = 1, aH = 0, bL = 255, bH = 255, n = 1, r = 1
[Reference] **GS C 0, GS C 2, GS C ;, GS c**
[Example]

GS C 2 nL nH

[Name] **Set counter**.
[Format]

ASCII	GS	C	2	nL	nH
Hex	1D	43	32	nL	nH
Decimal	29	67	50	nL	nH

[Range] 0 ≤ nL, nH ≤ 255
[Description] Sets the serial number counter value.
• *nL* and *nH* determine the value of the serial number counter set by [*nL* + (*nH* × 256)].
[Notes] • In count-up mode, if the counter value specified by this command goes out of the counter operation range specified by **GS C 1** or **GS C ;,** it is forced to convert to the minimum value by **GS c**.
• In count-down mode, if the counter value specified by this command goes out of the counter operation range specified by **GS C 1** or **GS C ;**, it is forced to convert to the maximum value by **GS c**.
[Default] nL = 1, nH = 0
[Reference] **GS C 0, GS C 1, GS C ;, GS c**
[Example]

GS C ; sa ; sb ; sn ; sr ; sc ;

[Name] **Select count mode.**
[Format]

ASCII	GS	C	;	sa	;	sb	;	sn	;	sr	;	sc	;	
Hex	1D	43	3B	sa	3B	sb	3B	sn	3B	sr	3B	sc	3B	
Decimal	29	67	59	sa	59	sb	59	sn	59	sr	59	sc	59	

[Range] 0 ≤ sa, sb, sc ≤ 65535
0 ≤ sn, sr ≤ 255
These values are all character strings.
[Description] Selects a count mode for the serial number counter and specifies the value of the counter.

• *sa*, *sb*, *sn*, *sr* and *sc* are all displayed in ASCII characters using the codes from ‘O’ to ‘9’.
• *sa* and *sb* specify the counter range.
• *sn* indicates the stepping amount for counting up or down.
• *sr* indicates the repetition number with the counter value fixed.
• *sc* indicates the counter value.

[Notes]
• Count-up mode is specified when:
$sa < sb$ and $sn \neq 0$ and $sr \neq 0$
• Count-down mode is specified when:
$sa > sb$ and $sn \neq 0$ and $sr \neq 0$
• Counting stops when:
$sa = sb$ or $sn = 0$ or $sr = 0$
• In setting count-up mode, the minimum value of the counter is sa and the maximum is sb. If counting up reaches a value exceeding the maximum, it is resumed with the minimum value. If the counter value set by sc is outside the counter operation range, the counter value is forced to convert to the minimum value by executing **GS c**.
• In setting count-down mode, the maximum value of the counter is sa and the minimum value is sb. If counting down reaches a value less than the minimum, it is resumed with the maximum value. If the counter value set by sc is outside the counter operation range, the counter value is forced to convert to the maximum value by executing **GS c**.
• Parameters *sa* to *sc* can be omitted. If omitted, these values remain unchanged.
• Parameters *sa* to *sc* must not contain characters, with the exception of those from ‘0’ to ‘9’.

[Default] sa = 1, sb = 65535, sn = 1, sr = 1, sc = 1

[Reference] **GS C 0, GS C 2, GS C 1, GS c**

[Example]

GS H n

[Name] Select printing position of Human Readable Interpretation (HRI)

[Format]

ASCII	GS	H	n
Hex	1D	48	n
Decimal	29	72	n

[Range] $0 \le n \le 3, 48 \le n \le 51$

[Description] Selects the printing position of HRI characters when printing bar code.
n selects the printing position as follows:

n	Function
0. 48	Not printed
1. 49	Above the bar code.
2. 50	Below the bar code.
3. 51	Both above and below the bar code.

[Notes] • HRI characters are printed using the font specified by GS f.

[Default] n = 0

[Reference] **GS f, GS k**

[Example]

GS I n (WITH SERIAL INTERFACE ONLY)

[Name] **Transmit printer ID.**

[Format]

ASCII	GS	I	n
Hex	1D	49	n
Decimal	29	73	n

[Range] $1 \le n \le 3, 49 \le n \le 51$

[Description] Transmits the printer ID specified by n as follows:

n	Printer ID	Specification
1. 49	Printer model ID	07H (DPT281S)
2. 50	Type ID	Refer to table below
3. 51	ROM version ID	Depends on ROM version (4 char)

n = 2, Function identification

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	2-byte character codes not supported
1	Off	00	0	Autocutter not supplied
				Autocutter supplied
2	Off	00	0	Non-label thermal paper
	On	04	4	Label thermal paper
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed at Off
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed at Off

[Notes]

• When the DTR/DSR control is selected, the printer only transmits 1 byte (Printer identification) after it has been given confirmation that the host is ready to receive data. If the host is not ready, the printer waits until it is.

• When the XON/XOFF control is selected, the printer only transmits 1 byte (Printer identification) if it has not been given confirmation that the host is ready to receive data.

• This command is carried out once the data has been processed in the reception buffer. There may therefore be a delay between the moment in which the command is received and that in which the data is transmitted, depending on the status of the reception buffer

.

[Default]

[Reference]

[Example]

GS L nL nH

[Name] **Set left margin.**

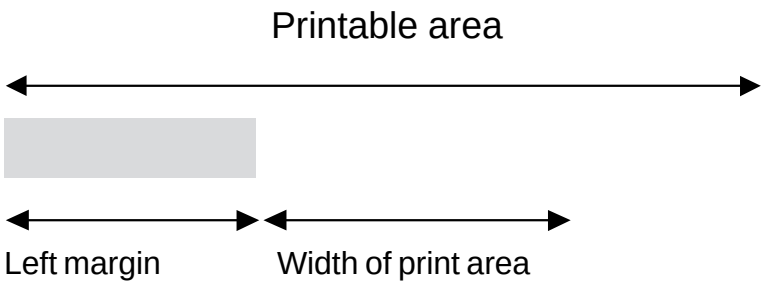
[Format]

ASCII	GS	L	nL	nH
Hex	1D	4C	nL	nH
Decimal	29	76	nL	nH

[Range] 0 ≤ nL, nH ≤ 255

[Description] Sets the left margin.

• The left margin is set at [(nL + nH ´ 256) ´ (horizontal motion unit)] inches.



[Notes]

• This command is enabled only at the beginning of the line.
• If the setting exceeds the printable area, the maximum value of the printable area is used.
• If left margin + printing area width is greater than printable area, then printing area width is set at maximum value.
• The horizontal and vertical motion units are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current left margin.
• The command **GS P** can change the horizontal (and vertical) motion unit.
• However, the value cannot be less than the minimum horizontal movement amount and it must be expressed in even units of the minimum horizontal movement amount.

[Default] If Font A : nL = nH = 0
If Font B : nL =14
nH = 0

[Reference] **GS P, GS W**

[Example]

GS P x y

[Name] **Set horizontal and vertical motion units.**

[Format]

ASCII	GS	P	x	y
Hex	1D	50	x	y
Decimal	29	80	x	y

[Range] x = 100, 200
y = 100, 200

[Description] Sets the horizontal and vertical motion units at 1/x inches and 1/y inches, respectively.
When *x* is set at 0, the default setting value is used.
When *y* is set at 0, the default setting value is used.

[Notes]
• The horizontal direction is perpendicular to the paper feed direction.
• In standard mode, the following commands use *x* or *y*, irrespective of character rotation (upside down or 90° clockwise rotation):
① **Commands using *x*** : ESC SP, ESC $, ESC \, GS L, GS W.
② **Commands using y** : ESC 3, ESC J.
• This command does not affect the previously specified values.
• The calculated result from combining this command with others is truncated to the minimum value of the mechanical pitch or an exact multiple of that value.

[Default] x = 200, y = 200

[Reference] **ESC SP, ESC $, ESC \, ESC 3, ESC J, GS L, GS W**

[Example]

GS W nL nH

[Name] **Set printing area width.**

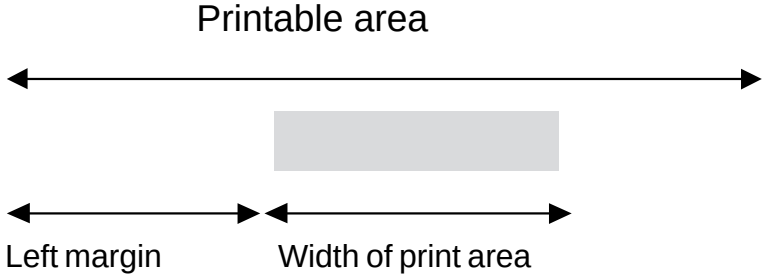
[Format]

ASCII	GS	W	nL	nH
Hex	1D	57	nL	nH
Decimal	29	87	nL	nH

[Range] $0 \leq nL, nH \leq 255$

[Description] Sets the printing area width to the area specified by *nL* and *nH*.

• The left margin is set at [(nL + nH ´ 256) ´ (horizontal motion unit)] inches.



[Notes]
• This command is only enabled at the beginning of the line.
• If right margin is greater than printable area, then the printing area width is set at maximum value.
• If printing area width = 0, then it is set at maximum value.
• The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current left margin.
• The command **GS P** can change the horizontal (and vertical) motion unit.
• However, the value cannot be less than the minimum horizontal movement amount and it must be expressed in even units of the minimum horizontal movement amount.

[Default]
If Font A : nL = 192, nH = 1
If Font B : nL =164, nH = 1

[Reference] **GS L, GS P**

[Example]

GS ^ r t m

[Name] **Execute macro.**

[Format]

ASCII	GS	^	r	t	m
Hex	1D	5E	r	t	m
Decimal	29	94	r	t	m

[Range] $0 \le r, t \le 255$
$0 \le m \le 1$

[Description] Executes a macro.
• *r* specifies the number of times to execute the macro.
• *t* specifies the waiting time for executing the macro.
The waiting time is *t*× 100 msec. for every macro execution.

• *m* specifies macro executing mode:
When the LSB of *m* = 0, the macro executes *r* times continuously at the interval specified *t*.
When the LSB of *m* = 1, after waiting for the period specified by *t*, the LED indicator blinks and the printer waits for the FEED button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats the operation *r* times.

[Notes]
• This command lasts for a period of ($t \times 100$ msec.) after a macro is executed by *t*.
• If this command is received while a macro is being defined, the macro definition is aborted and the definitions cleared.
• If the macro is not defined or if *r* is 0, nothing happens.
• When the macro is executed by pressing the FEED button (*m* = 1), the paper can not be fed by using the FEED button.

[Default]

[Reference] **GS :**

[Example]

GS c

[Name] **Print counter.**

[Format]

ASCII	GS	c
Hex	1D	63
Decimal	29	99

[Description] Sets the serial counter value in the print buffer and increments or decrements the counter value.

[Notes]
• After setting the current counter value in the print buffer as print data (a character string), the printer counts up or down based on the count mode set. The counter value in the print buffer is printed when the printer receives a print command or is in the buffer full state.
• The counter print mode is set by **GS C 0**.
• The counter mode is set by **GS C 1** or **GS C ;**.
• In count-up mode, if the counter value set by this command goes out of the counter operation range set by **GS C 1** or **GS C ;**, it is forced to convert to the minimum value.

• In count-down mode, if the counter value set by this command goes out of the counter operation range set by **GS C 1** or **GS C ;**, it is forced to convert to the maximum value.

[Default]

[Reference] **GS C 0, GS C1, GS C 2, GS C ;**

[Example]

GS f n

[Name] **Select font for HRI characters.**

[Format]

ASCII	GS	f	n
Hex	1D	66	n
Decimal	29	102	n

[Range] n = 0, 1, 48, 49

[Description] Selects a font for the HRI characters used when printing a bar code.
n selects a font from the following table:

n	Font
0. 48	Font A.
1. 49	Font B.

[Notes] The HRI characters are printed at the position specified by the command **GS H.**

[Default] n = 0

[Reference] **GS H, GS k**

[Example]

GS h n

[Name] **Set bar code height**

[Format]

ASCII	GS	h	n
Hex	1D	68	n
Decimal	29	104	n

[Range] $1 \le n \le 255$

[Description] Sets the height of the bar code.
n specifies the number of dots in the vertical direction.

[Notes]
[Default] n = 96 (12 mm)
[Reference] **GS k**
[Example]

Œ GS k m [d1...dk] NUL , GS k m n [d1...dn]

[Name] **Print bar code.**

[Format]

①	ASCII	GS	k	m	NUL
	Hex	1D	6B	m	00
	Decimal	29	107	m	0
②	ASCII	GS	k	m	n
	Hex	1D	6B	m	n
	Decimal	29	107	m	n

[Range] ① $0 \le m \le 6$
② $65 \le m \le 73$

[Description] Selects a bar code system and prints the bar code.
m selects a bar code system as follows:

	m	Bar code system	Number of characters	Remarks
Œ	0	UPC-A	11 ≤ k ≤ 12	48 ≤ d ≤ 57
	1	UPC-E	11 ≤ k ≤ 12	48 ≤ d ≤ 57
	2	EAN13 (JAN)	12 ≤ k ≤ 13	48 ≤ d ≤ 57
	3	EAN8 (JAN)	7 ≤ k ≤ 8	48 ≤ d ≤ 57
	4	CODE39	1 ≤ k	48 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37, 43, 45, 46, 47
	5	ITF	1 ≤ k (even number)	48 ≤ d £ 57
	6	CODABAR	1 ≤ k	48 ≤ d ≤ 57, 65 ≤ d1 ≤ 68, 36, 43, 45, 46, 47, 58
	7	CODE93	1 ≤ k ≤ 255	1 ≤ d ≤ 127
	8	CODE128	2 ≤ k ≤ 255	1 ≤ d ≤ 127
	20	CODE32	8 ≤ k ≤ 9	48 ≤ d ≤ 57

’	65	UPC-A	11 ≤ n ≤ 12	48 ≤ d ≤ 57
	66	UPC-E	11 ≤ n ≤ 12	48 ≤ d ≤ 57
	67	EAN13 (JAN)	12 ≤ n ≤ 13	48 ≤ d ≤ 57
	68	EAN8 (JAN)	7 ≤ n ≤ 8	48 ≤ d ≤ 57
	69	CODE39	1 ≤ n ≤ 255	48 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37, 43, 45, 46, 47
	70	ITF	1 ≤ n ≤ 255	48 ≤ d ≤ 57
	71	CODABAR	1 ≤ n ≤ 255	48 ≤ d ≤ 57, 65 ≤ d1 ≤ 68, 36, 43, 45, 46, 47, 58
	72	CODE93	1 ≤ n ≤ 255	0 ≤ d ≤ 127
	73	CODE128	2 ≤ n ≤ 255	0 ≤ d ≤ 127
	90	CODE32	8 ≤ n ≤ 9	48 ≤ d ≤ 57

[Notes] • If *d* is outside the specified range, the printer prints the following message: “BAR CODE GENERATOR NON OK !” and processes the following data as normal data.

• If the horizontal size exceeds the printing area, the printer only feeds the paper.
• This command feeds as much paper as is required to print the bar code, irrespective of the line spacing specified by **ESC 2** or **ESC 3**.
• After printing the bar code, this command sets the print position at the beginning of the line.
• This command is not affected by print modes (bold, double strike, underline or character size), with the exception of upside-down mode and justification.

[Note for ①]
• This command ends with a NUL code.
• When the bar code used is UPC-A or UPC-E, the printer prints the bar code data after receiving 11 (without check digit) or 12 (with check digit) byte bar code data.
• When the bar code system used is EAN13, the printer prints the bar code after receiving 12 (without check digit) or 13 (with check digit) byte bar code data.
• When the system used is EAN8, the printer prints the bar code after receiving 7 (without check digit) or 8 (with check digit) byte bar code data.
• The number of data for ITF bar code must be even. When an odd number of data is input, the printer ignores the last received data.

[Note for ②]
• If *n* is outside the specified range, the printer stops command processing and process the following data as normal data.

When to use CODE93:
• The printer prints an HRI character (o) as a start character at the beginning of the HRI character string.
• The printer prints an HRI character (o) as a stop character at the end of the HRI character string.
• The printer prints an HRI character (n) as a control character (00H to 1FH and 7FH).

When to use CODE128:
• When using the CODE128 in this printer, take the following points into account for data transmission:
• The top of the bar code data string must be a code set selection character (CODE A , CODE B or CODE C) which selects the first code set.

• Special characters are defined by combining two characters "{" and one character. The ASCII character "}" is defined by transmitting "{" twice consecutively.

Specific character	Data transmission		
	ASCII	Hex	Decimal
SHIFT	{S	7B, 53	123. 83
CODE A	{A	7B, 41	123. 65
CODE B	{B	7B, 42	123. 66
CODE C	{C	7B, 43	123. 67
FNC1	{1	7B, 31	123. 49
FNC2	{2	7B, 32	123. 50
FNC3	{3	7B, 33	123. 51
FNC4	{4	7B, 34	123. 52
'{'	{{	7B, 7B	123. 123

[Default]
[Reference] **GS H, GS f, GS h, GS w**
[Example]

GS r n (WITH SERIAL INTERFACE ONLY)

[Name] **Transmit status.**
[Format] ASCII GS r n
Hex 1D 72 n
Decimal 29 114 n
[Range] $1 \le n \le 2, 49 \le n \le 50$
[Description] Transmits the status specified by n as follows:

n	Function
1, 49	Transmits paper sensor status (same as ESC v).
2, 50	Transmits drawer kick-out connector status (same as **ESC u 0**)).

Paper sensor status (n = 1, 49)

Bit	Off/On	Hex	Decimal	Function
0,1	Off	00	0	Not used.
	On	03	3	Not used.
2,3	Off	00	0	Paper out sensor: paper present
	On	0C	12	Paper out sensor: paper not present
4	Off	00	0	Not used. Fixed at Off
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed at Off

Drawer kick-out connector status (n = 2, 50)

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Level of drawer connector Pin 3 low
	On	01	1	Level of drawer connector Pin 3 high
1	-	-	-	Undefined
2	-	-	-	Undefined
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed at Off
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed at Off

[Notes] • This command is executed when the data is processed in the reception buffer. There may therefore be a time lag between receiving the command and transmitting the status, depending on the status of the reception buffer.

[Default]

[Reference] **DLE EOT, ESC u, ESC v**

[Example]

GS w n

[Name] **Set bar code width.**

[Format]

ASCII	GS	w	n
Hex	1D	77	n
Decimal	29	119	n

[Range] $2 \leq n \leq 6$

[Description] Sets the horizontal size of the bar code.
n specifies the bar code width as follows:

n	Module width (mm)
2	0.25
3	0.375
4	0.5
5	0.625
6	0.75

[Notes]
[Default] n = 3
[Reference] **GS k**
[Example]

GS ~ n

[Name] Set superscript / subscript.
[Format] ASCII GS ~ n
Hex 1D 7E n
Decimal 29 126 n
[Range] n = 0, 1, 48, 49
[Description] Sets superscript or subscript character position.
n specifies the position as follows:

n	Function
0. 48	Subscript character position.
1. 49	Superscript character position.

[Notes] • This command is executed if there are characters with different heights on the same line.
[Default] n = 0
[Reference] **ESC !, GS !**
[Example]

GS | n

[Name] **Set printing density.**

[Format]

ASCII	GS	|	n
Hex	1D	7C	n
Decimal	29	124	n

[Range] 0 £ n £ 4, 48 £ n £ 52

[Description] Sets the printing density

n specifies the printing density as follows:

n	Printing density
0. 48	Very light
1. 49	Light
2. 50	Normal
3. 51	Dark
4. 52	Very dark

[Notes] • The printing density is cleared at default value when the printer is reset or the power is turned off.

[Default] n = 2

[Reference]

[Example]

3.2.2 Custom emulation

The following table lists all the commands for the management of the CUSTOM emulation functions of the DPT281 printer. The commands can be transmitted to the printer at any moment, but they will only be carried out when the commands previously transmitted have been carried out. There are no priority commands; all commands are carried out when the circular buffer is free to do so.

COMMAND TABLE

ASCII Com.	HEX Com.	Description
(n) VT	(n) $0B	Vertical tabs
CRLF	$0F	Ignore CR
LF	$0A	Print and line feed
	$00	Printing with small characters
	$01	Printing with double width characters
	$02	Printing in double height characters
	$03	Printing with expanded characters
	$04	Printing with small characters
	$11	DP 24/40 graphic mode
	$12	Set / cancel red printing mode
ESC ! n	$1B $21 (n)	Set print mode
ESC $ nL nH	$1B $24 nL nH	Set absolute position
ESC * m nL nH d1...dk	$1B $2A m nL nH d1...dk	Set bit image mode
ESC 4 n	$1B $34 (n)	Set / reset script mode
ESC @	$1B $40	Initialize printer
ESC B	$1B $42	Select FONT 1
ESC C	$1B $43	Total cut
ESC J s n m [a[p] s*a] m-n+1	$1B $4A s n m	Define programmable characters

ASCII Comm.	HEX Comm.	Description
ESC K [d] CR	$1B $4B $0D	Set characters to transmit on pressing Print key
ESC G	$1B $47	Set default parameters
ESC M	$1B $4D	Set default parameters of print mode
ESC N	$1B $4E	Set printing in NORMAL
ESC P	$1B $50	Partial cut
ESC R	$1B $52	Set printing in REVERSE
ESC a (n)	$1B $61 (n)	Select justification
ESC b	$1B $62	Set font 2
ESC m	$1B $6D	Read default parameters of print mode
ESC p	$1B $70	Read default parameters
ESC r	$1B $72	Read EEPROM location
ESC w	$1B $77	Write EEPROM location
ESC · n xL xH yH yL	$1B $FA n xL xH yH yL	Print graphic bank
ESC ¹	$1B $FB	Transmit ram bank to serial port
ESC ³ n	$1B $FC (n)	Transfer flash bank into ram bank
ESC ² nL nH	$1B $FD nL nH	Receive ram bank from port
ESC ¦ n	$1B $FE (n)	Transfer ram bank into flash bank
GS FF	$1D $0C	Print the buffer contents
GS :	$1D $3A	Set starting/end of macro definition
GS C 0 n m	$1D $43 $30 n m	Select counter print mode
GS C 1 aL aH bL bH n r	$1D $43 $31 aL aH bL bH n r	Select count mode (A)
GS C 2 nL nH	$1D $43 $32 nL nH	Set counter
GS C ; sa ; sb ; sn ; sr ; sc ;	$1D $43 $3B sa $3B sb $3B sn $3B sr $3B sc $3B	Select count mode (B)
GS H n	$1D $48 (n)	Select printing position of HRI characters
GS I n	$1D $49 (n)	Transmit printer ID

Com. ASCII	Com. HEX	Description
GS P x y	$1D $50 x y	Set horizontal and vertical motion units
GS ^ r t m	$1D $5E r t m	Execute macro
GS c	$1D $63	Print counter
GS f n	$1D $66 (n)	Select font for HRI characters
GS h n	$1D $68 (n)	Select height of bar code
GS k m NUL	$1D $6B m 00	Print bar code
GS w n	$1D $77 (n)	Select horizontal size (magnification) of bar code
GS | n	$1D $7C (n)	Set printing density

In the above table, the commands marked with this symbol are for the serial interface only.

The following pages provide a more detailed description of each command.

(n) VT

[Name] **Vertical tabs**

[Format]

ASCII	n	VT
Hex	n	0B
Decimal	n	11

[Range] $0 < n \leq 9$

[Description] Runs as many feeds as are defined by ***n***.

[Notes] • This command zeroes the line buffer

[Default]

[Reference]

[Example]

CRLF

[Name] **Ignore CR**

[Format]

ASCII	SI
Hex	0F
Decimal	15

[Description] After this command the CR code is ignored.

[Notes] • To put the CR code back into operation, reset the printer.
[Default]
[Reference]
[Example]

LF

[Name] **Line feed**
[Format] ASCII LF
Hex 0A
Decimal 10
[Description] Prints the data in the buffer and feeds one line, based on the current line spacing.
[Notes] • The command sets the print position at the beginning of the line.
[Default]
[Reference] **ESC 2, ESC 3**
[Example]

CR

[Name] **Print and line feed**
[Format] ASCII CR
Hex 0D
Decimal 13
[Description] This command prints the data in the buffer.
[Notes] • This command sets the print position at the beginning of the line.
[Default]
[Reference] **LF**
[Example]

00H

[Name] **Print with small character**
[Format] ASCII -
Hex 00
Decimal 0

[Description] Character printing is executed in small format (normal)
[Notes] • Setting remains until the next set
[Default] Set up from front keys.
[Reference] **01H, 02H, 03H, 04H**
[Example]

01H

[Name] **Printing with double width character**
[Format] ASCII -
Hex 01
Decimal 1
[Description] Printing of the character is executed in double width format
[Notes] • Setting remains until next set
[Default] Set up from front keys.
[Reference] **00H, 02H, 03H, 04H**
[Example]

02H

[Name] **Printing in double height character**
[Format] ASCII -
Hex 02
Decimal 2
[Description] Printing of the character is executed in double height format
[Notes] • Setting remains until next set
[Default] Set up from front keys.
[Reference] **00H, 01H, 03H, 04H**
[Example]

03H

[Name] **Printing with expanded character**
[Format] ASCII -
Hex 03
Decimal 3
[Description] Printing of the character is executed in expanded format

[Notes] • Setting remains until next set
[Default] Set up from front keys.
[Reference] **00H, 01H, 02H, 04H**
[Example]

04H

[Name] **Print with small character**
[Format] ASCII -
Hex 04
Decimal 4
[Description] Character printing is executed in small format (normal)
[Notes] • Setting remains until next set
[Default] Set up from front keys.
[Reference] **00H, 01H, 02H, 03H**
[Example]

11H

[Name] **Graphic mode DP24/40**
[Format] ASCII -
Hex 11
Decimal 17
[Description] Prints in graphic mode like the DP 24/40.
The command 11H enables the DP24-40 printer graphic mode, i.e. to print in graphic mode, transmit the command 11H at the beginning of each line. One line for the DP24-40 printer (24 column model) corresponds to 44 horizontal dots divided into 24 6-dot blocks. For the DP24-40 printer (40-column model) one line corresponds to 240 horizontal dots divided into 40 6-dot blocks.
[Notes] The size of the graphic dot and the number of dots per line vary depending on the number of columns.
To obtain a graphic printout, enter the command 11H at the beginning of each line. The graphic configuration byte format is as follows:

X	**R**	**P6**	**P5**	**P4**	**P3**	**P2**	**P1**
D7	D6	D5	D4	D3	D2	D1	D0

where:
X is not utilized (we recommend 0);
R must be set at 1;
P1,.P6 are the data of the graphic dots (1 prints, 0 does not print).
The P6 bit of the string of dots transmitted, is printed on the left and the others (P5, P4, P3, P2, P1) follow from left to right as shown:

1st byte ➔	**2nd byte ➔**	**3rd byte ➔**
P6 P5 P4 P3 P2 P1	P6 P5 P4 P3 P2 P1	P6 P5 P4 P3 P2 P1

[Default]
[Reference]
[Example] To print a line of dots, transmit:
11H, n x 7FH (where n is the number of characters per line), 0DH.
To print an empty line, transmit:
11H, 40H, 0DH.

12H

[Name] **Set / cancel red printing mode**
[Format] ASCII DC2
Hex 12
Decimal 18
[Description] Sets / cancels (alternately) red printing.
[Notes] • The printer only prints the whole line, and not single characters, in red.
• The printer only prints in red if enabled by setup.
[Default]
[Reference]
[Example]

ESC ! n

[Name] **Select print modes**.

[Format]

ASCII	ESC	!	n
Hex	1B	21	n
Decimal	27	33	n

[Range] $0 \le n \le 255$

[Description] Selects the print mode using *n* (see following tables):

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character font A selected.
	On	01	1	Character font B selected.
1	-	-	-	Undefined.
2	-	-	-	Undefined.
3	Off	00	0	Bold mode not selected.
	On	08	8	Bold mode selected.
4	Off	00	0	Double height mode not selected.
	On	10	16	Double height mode selected.
5	Off	00	0	Double width mode not selected.
	On	20	32	Double width mode selected.
6	Off	00	0	Script mode not selected.
	On	40	64	Script mode selected.
7	Off	00	0	Underline mode not selected.
	On	80	128	Underline mode selected.

[Notes]

- The printer can underline all the characters, but it cannot underline the space set by commands **HT, ESC $, ESC** \and 90° clockwise rotated characters.
- When the characters on the same line are enlarged to different heights, they are either aligned at the baseline or topline (see **GS ~**).
- This command resets the left and right margin at the default value (see **GS L, GS W**).
- The command **ESC E** can also turn on/off bold mode. However, the setting of the last received command is effective.
- The command **ESC -** can also turn on/off underline mode. However, the setting of the last received command is effective
- The command **ESC 4** can also turn on/off script mode. However, the setting of the last received command is effective.

• The command **GS !** can select the character size. However, the setting of the last received command is effective.

[Default] n = 0

[Reference] **ESC -, ESC E, ESC 4, GS !**

[Example]

ESC $ nL nH

[Name] **Set absolute print position**

[Format]

ASCII	ESC	$	nL	nH
Hex	1B	24	nL	nH
Decimal	27	36	nL	nH

[Range] $0 \le nL \le 255$
$0 \le nH \le 255$

[Description] Sets the distance from the beginning of the line to the position in which the subsequent characters are to be printed.

The distance from the beginning of the line to the print position is [(nL + nH × 256)× (vertical or horizontal motion unit)] inches.

[Notes]
• Settings outside the specified printable area are ignored.
• The vertical and horizontal motion units are specified by GS P.
• The command **GS P** can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount.
• In standard mode the horizontal motion unit (x) is used.
• If the setting is outside the printing area width, set absolute print position, but left or right margin is set at default value.

[Default]

[Reference] **ESC \, GS P**

[Example]

ESC * m nL nH d1...dk

[Name] **Select bit image mode.**

[Format]

ASCII	ESC	*	m	nL	nH	d1...dk
Hex	1B	2A	m	nL	nH	d1...dk
Decimal	27	42	m	nL	nH	d1...dk

[Range] m = 0, 1, 32, 33
$0 \le nL \le 255$
$0 \le nH \le 1$
$0 \le d \le 255$

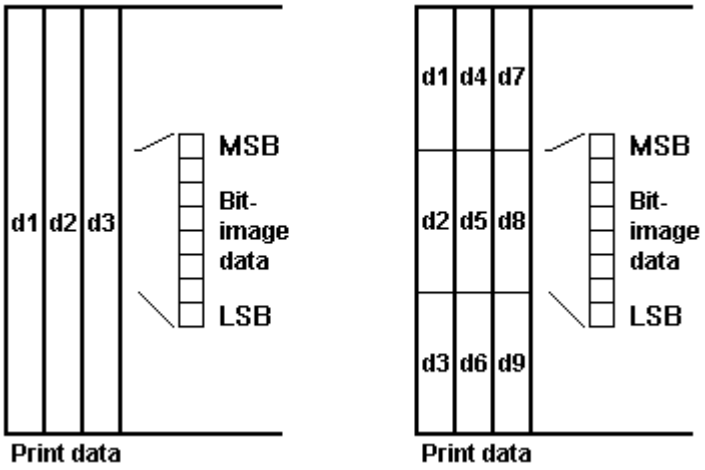
[Description] Selects a bit image-mode using ***m*** **for the number of dots specified by** ***nL*** **and by** ***nH*****, as follows**:

m	Mode	Vertical direction		Horizontal direction (*1)	
		N° dot	DPI	DPI	N° of data (k)
0	8 dots single density	8	67	100	nL + nH x 256
1	8 dots double density	8	67	200	nL + nH x 256
32	24 dots single density	24	200	100	(nL + nH x 256) x 3
33	24 dots double density	24	200	200	(nL + nH x 256) x 3

[Notes]
- The commands *nL* and *nH* indicate the number of horizontal dots in the graphic image. The nL and nH indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated by nL + nH $\times$ 256
- If the bit image data exceeds the number of dots to be printed on a line, the excess data is ignored.
- *d* indicates the bit image data. Set a corresponding bit at 1 to print dot or at 0 not to print dot.
- If the value of *m* is outside the specified range, *nL* and the data following are processed as normal data.
- If the width of the printing area set by commands **GS L** and **GS W** is less than the required width set by the command **ESC *** , the excess data is ignored.
- To print the bit-image, use the commands **LF, CR, ESC J or ESC d**.
- After printing a bit image, the printer reverts to normal data processing mode.
- This command is not affected by bold, double strike, underlining (etc.) modes, with the exception of upside down mode.

The relationship between the image data and the dots to be printed is as follows:

8 dot image 24 dot image



[Default]

[Reference]

[Example]

ESC 4 n

[Name] **Set /reset script mode**.

[Format]

ASCII	ESC	4	n
Hex	1B	34	n
Decimal	27	52	n

[Range] 0 ≤n ≤ 1, 48 ≤ n ≤ 49

[Description] Turns script mode on or off, based on the following values of *n* :

n	Function
0. 48	Turns script mode off
1. 49	Turns script mode on

[Notes]

• The printer can print all characters in script mode.

• When script mode is turned off by setting the value *n* at 0 or 48, the data that follows is printed in normal mode.

• Script mode can also be turned on or off by using **ESC !**. Note, however, that the last command received is effective

[Default] n = 0
[Reference] **ESC !**
[Example]

ESC ?

[Name] **Transmit status.**
[Format] ASCII ESC ?
Hex 1B 3F
Decimal 27 63
[Description] Transmits the current status upon receiving this command.
[Notes] • This command is executed immediately, even when the reception buffer is full (Busy).
• The status to be transmitted is shown in the table below:

Bit	Off/On	Hex	Decimal	Functions
0, 2	Off	00	0	Paper present.
	On	05	5	Paper not present.
1, 3	-	-	-	Not used.
4	-	-	-	Not used.
5	Off	00	0	Print key released
	On	20	32	Print key pressed.
6	Off	00	0	Feed key released.
	On	40	64	Feed key pressed.
7	Off	00	0	No errors.
	On	80	128	Error (overtemp., paper...).

[Default]
[Reference] **ESC &**, **ESC %**
[Example]

ESC @

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

[Description] Clears the data in the print buffer and resets the printer mode to the one that was in effect when the power was turned on

[Notes] • Same as hardware reset

[Default]

[Reference]

[Example]

ESC B

[Name] **Select Font 1**

[Format]

ASCII	ESC	B
Hex	1B	42
Decimal	27	66

[Description] Select FONT 1

[Notes] • Setting remains until next set.

[Default] Set up from front keys.

[Reference] **ESC b, ESC 4**

[Example]

ESC C

[Name] **Total cut**

[Format]

ASCII	ESC	C
Hex	1B	43
Decimal	27	67

[Description] This command enables cutter operation; if there is no cutter, a disabling flag is set and any subsequent cutting commands will be ignored.

[Notes] • The printer waits until all the paper movement commands have been completed before executing total cut

[Default]

[Reference]

[Example]

ESC J s n m [a[p] s*a] m-n+1

[Name] **Define programmable characters**

[Format]

ASCII	ESC	J	s	n	m
Hex	1B	4A	s	n	m
Decimal	27	74	s	n	m

[Range]
s = 3
32 ≤ n ≤ m ≤ 255
0 ≤ a ≤ 6
0 ≤ p1 ... ps * a ≤ 255

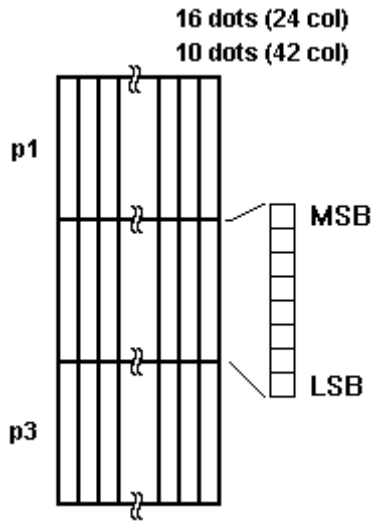
[Description] Defines programmable characters.
• “s” specifies the number of bytes in vertical direction.
• “n” specifies the ASCII code of the initial programmable character and “m” the final code. If you wish to programme one character only, set n = m.
• The ASCII character range is from <20>H to <FF>H, or 224 characters.
• “a” specifies the number of dots in horizontal direction.
• “p” is the datum in character dots. The data go from left to right and the remaining dots not specified by the user are forced as blanks. The total data number corresponds to s * a.
• After the user has defined the character set, it remains active until a new definition or a hardware or software reset.

[Notes] • The set of programmable characters and the bit image cannot be active at the same time; if this command is executed, the bit image will be cancelled.

[Default] The programmable character set is the same as the internal one.

[Reference] **ESC 4**

[Example]



ESC K [d] CR

[Name] **Set the characters to transmit on pressing the Print key**.

[Format]

ASCII	ESC	K	CR
Hex	1B	4B	0D
Decimal	27	75	13

[Description] Saves characters to transmit on pressing Print key.
"*d*" is the ASCII string to transmit, terminating with CR. To deactivate this function, transmit a NUL.

[Notes] • The maximum number of characters to transmit is 24 (with CR at the end).

[Default] *d* = 13

[Reference]

[Example]

ESC G

[Name] **Set default parameters.**

[Format]

ASCII	dH	dL	ESC	G
Hex	dH	dL	1B	47
Decimal	dH	dL	27	71

[Range] *d* :
bit 0= 0 : NORMAL printing
1 : REVERSE printing
bit 1= 0 : CR command executed
1 : CR command ignored
bit 2= 0 : horizontal printing
1 : vertical printing
bit 3= 0 : doesn't execute centred printing
1 : executes centred printing
bit 4= 0 : aligns print to left
1 : aligns print to right
bit 5=: fixed at 0
bit 6= 0 : deactivates underlining
1 : activates underlining
bit 7= 0 : deactivates bold printing
1 : activates bold printing

[Description] Sets default and "on line" parameters

[Notes] Setting is memorized in EEPROM.

[Default] Set up from front keys.

[Reference]

[Example] If *dH* = '4' and *dL* = 'D' the value of *d* is 77 (4DH)

ESC M

[Name] **Set default parameters of print mode**.

[Format]

ASCII	dH	dL	ESC	M
Hex	dH	dL	1B	4D
Decimal	dH	dL	27	77

[Range] *d* :
00H : small print
01H : double width print
02H : double height print
03H : bold print

[Description] Sets the default parameters of print mode.

[Notes] Setting is memorized in EEPROM.

[Default] Set up from front keys.

[Reference]

[Example] If *dH* = 'A' and *dL* = '3' the value of *d* is 163 (A3H)

ESC N

[Name] **Set printing in NORMAL**

[Format]

ASCII	ESC	N
Hex	1B	4E
Decimal	27	78

[Description] Selects printing in NORMAL mode.

[Notes] • Setting remains until next set.

[Default] Set up from front keys.

[Reference] **ESC R**

[Example]

ESC P

[Name] **Partial cut**

[Format]

ASCII	ESC	P
Hex	1B	50
Decimal	27	80

[Description] This command enables the partial cutter operation; if there is no cutter, a disabling flag is set and any subsequent cut commands will be ignored.

[Notes] • The printer waits until all the paper movement commands have been completed before executing partial cut

[Default]

[Reference]

[Example]

ESC R

[Name] **Set printing in REVERSE**

[Format]

ASCII	ESC	R
Hex	1B	52
Decimal	27	82

[Description] Set printing in REVERSE mode.

[Notes] • Setting remains until next set

[Default] Set up from front keys.

[Reference] **ESC N**

[Example]

ESC a n

[Name] **Select justification**

[Format]

ASCII	ESC	a	n
Hex	1B	61	n
Decimal	27	97	n

[Range] $0 \le n \le 2, 48 \le n \le 50$

[Description] Aligns all the data in one line in the position specified.
n selects the type of justification as follows:

n	Justification
0, 48	Left justification
1, 49	Centring
2, 50	Right justification

[Notes]
- This command is only enabled if input at the beginning of the line.
- The lines are justified within the specified printing area.
- The spaces set by the commands **HT, ESC $** and **ESC** \ remain justified as per the previously set mode.

[Default] n = 0

[Reference]

[Example]

Left justification

```
ABC
ABCD
ABCDE
```

Centring

```
 ABC
ABCD
ABCDE
```

Right justification

```
  ABC
 ABCD
ABCDE
```

ESC b

[Name] **Select FONT 2.**

[Format]

ASCII	ESC	b
Hex	1B	62
Decimal	27	98

[Description] Select FONT 2.

[Notes]
- Setting remains until next set

[Default] Set up from front keys.

[Reference] **ESC B, ESC 4**

[Example]

ESC m (FOR SERIAL INTERFACE ONLY)

[Name] **Read default parameters of print mode**

[Format]

ASCII	ESC	m	
Hex	1B	6D	
Decimal	27	109	

[Description] Reads default parameters of print mode.

[Notes] See ESC M.

[Default] Set up from front keys.

[Reference] **ESC M**

[Example]

ESC p (FOR SERIAL INTERFACE ONLY)

[Name] **Read default parameters**

[Format]

ASCII	ESC	p	
Hex	1B	70	
Decimal	27	112	

[Description] Reads default and “on line” parameters.

[Notes] See ESC G.

[Default] Set up from front keys

[Reference] **ESC G**

[Example]

ESC r (WITH SERIAL INTERFACE ONLY)

[Name] **Read EEPROM position.**

[Format]

ASCII	aH	aL	ESC	r
Hex	aH	aL	1B	72
Decimal	aH	aL	27	114

[Range] $0 \le a \le 63$
‘0’ ≤ aH ≤ ‘9’, ‘A’ ≤ aH ≤ ‘F’
‘0’ ≤ aL ≤ ‘9’, ‘A’ ≤ aL ≤ ‘F’

[Description] Reads the location addressed by *a* where:
aH is the most significant nibble, expressed in ASCII, of *a*
aL is the least significant nibble, expressed in ASCII, of *a*

[Notes]

[Default]

[Reference] **ESC w**

[Example] To read the position 12h, transmit:

31H 32H 1BH 72H

The response will be the location value in hexadecimals expressed in two ASCII bytes.

ESC w

[Name] **Write EEPROM position.**

[Format]

ASCII	aH	aL	dH	dL	ESC	w
Hex	aH	aL	dH	dL	1B	77
Decimal	aH	aL	dH	dL	27	119

[Range] $0 \le a \le 63$

'0' ≤ aH ≤ '9', 'A' ≤ aH ≤ 'F'

'0' ≤ aL ≤ '9', 'A' ≤ aL ≤ 'F'

$0 \le d \le 255$

'0' ≤ dH ≤ '9', 'A' ≤ dH ≤ 'F'

'0' ≤ dL ≤ '9', 'A' ≤ dL ≤ 'F'

[Description] Writes, at the location addressed by *a*, data *d* where:
aH is the most significant nibble, expressed in ASCII, of *a*
aL is the least significant nibble, expressed in ASCII, of *a*
dH is the most significant nibble, expressed in ASCII, of *d*
dL is the least significant nibble, expressed in ASCII, of *d*

[Notes]

[Default]

[Reference] **ESC r**

[Example] To write the value 34H in position 12H, transmit:

31H 32H 33H 34H 1BH 77H

ESC · n xH xL yH yL

[Name] **Print graphic bank (448 × 585 dots).**

[Format]

ASCII	ESC	·	n	xH	xL	yH	yL
Hex	1B	FA	n	xH	xL	yH	yL
Decimal	27	250	n	xH	xL	yH	yL

[Range] $0 \le n \le 3$

$0 \le xH, xL, yH, yL \le 255$

[Description] Prints the graphics bank from flash or ram.
n selects the bank as follows:

n	Function
0	Print graphic bank
1	Print flash bank logo 1
2	Print flash bank logo 2
3	Print flash bank logo 3

xL + *xH* × 256 specifies the starting dot line (1 ÷ 585).
yL + y*H* × 256 specifies the number of lines to print.

[Notes] • If (*xL* + (*xH* × 256)) > 585 the printer does not execute the command.
• Se (*xL* + (*xH* × 256) + *yL* +(y*H* × 256))> 585 the printer only prints 585 - *xL* + (*xH* × 256) +1 dotlines.

[Default]

[Reference] **ESC ³, ESC ², ESC ¦**

[Example] To print from ram bank dotline 100 to dotline 299, send:
1BH FAH 00H 00H 64H 00H C7H

ESC ¹ nL nH (WITH SERIAL INTERFACE ONLY)

[Name] **Transmit ram bank to serial port.**

[Format]

ASCII	ESC ¹		nL	nH
Hex	1B	FB	nL	nH
Decimal	27	251	nL	nH

[Description] Transmit (nH x 256) + nL words of ram bank to serial port.

[Notes] • The size of the ram bank for graphic printing is 448 horizontal dots (56 bytes/dotline) ×585 vertical points (32760 bytes = 16380 words).

[Default]

[Reference]
ESC ³, ESC ², ESC ¦

[Example]

ESC ³ n

[Name] **Transfer the flash bank into ram bank.**

[Format]

ASCII	ESC	³	n
Hex	1B	FC	n
Decimal	27	252	n

[Range] $1 \le n \le 3$

[Description] Transfers flash bank into ram bank (32768 bytes).
n selects the bank as follows:

n	Function
1	Transfer flash bank logo 1 into ram.
2	Transfer flash bank logo 2 into ram.
3	Transfer flash bank logo 3 into ram.

[Notes]

[Default]

[Reference] **ESC ·, ESC ², ESC ¦**

[Example]

ESC ² nL nH

[Name] **Receive bank ram from port.**

[Format]

ASCII	ESC	²	nL	nH
Hex	1B	FD	nL	nH
Decimal	27	253	nL	nH

[Range] $0 \le nL, nH \le 255$

[Description] Receives [*nL* + (*nH* × 256)] words from port and puts them into ram bank.

[Notes]
- The number of data bytes received is [*nL* + (*nH* × 256)] × 2.
- Each word is received first in MSByte form and then in LSByte form
- If [*nL* + (*nH* × 256)] is greater than 16384, the data following will be processed as normal data.

[Default]

[Reference] **ESC ·, ESC ³, ESC ¦**

[Example]

ESC ¦ n

[Name] **Transfer ram bank into flash bank.**

[Format]

ASCII	ESC	¦	n
Hex	1B	FE	n
Decimal	27	254	n

[Range] $1 \le n \le 3$

[Description] Transfers ram bank into flash bank. (32768 bytes).
n selects the bank as follows:

n	Function
1	Transfer ram bank into flash bank logo 1.
2	Transfer ram bank into flash bank logo 2.
3	Transfer ram bank into flash bank logo 3.

[Notes]

[Default]

[Reference] **ESC ·, ESC ², ESC ³**

[Example]

GS FF

[Name] **Print the buffer contents.**

[Format]

ASCII	GS	FF
Hex	1D	0C
Decimal	29	12

[Description] Prints contents of buffer characters and executes a line feed.
Sets the printing start position at left margin.

[Notes]

[Default]

[Reference] **LF, FF**

[Example]

GS :

[Name] **Start / end macro definition.**

[Format]

ASCII	GS	:
Hex	1D	3A
Decimal	29	58

[Description] Starts or ends macro definition.

[Notes]
- Macro definition starts when this command is received during normal operation.
- When the command **GS ^** is received during macro definition, the printer ends the macro definitions and clears all definitions.
- Macro not defined when the power is turned on.
- The defined contents of the macro are not cleared by the command **ESC** @. Therefore, **ESC** @ can be included in the contents of the macro definitions.
- If the printer receives the command **GS :** again immediately after previously receiving **GS :**, the printer remains in the macro undefined state.
- The contents of the macro can be defined up to 1024 bytes. If the macro definition exceeds 1024 bytes, the excess data is not not stored.

[Default]

[Reference] **GS ^**

[Example]

GS C 0 n m

[Name] **Set counter print mode.**

[Format]

ASCII	GS	C	0	n	m
Hex	1D	43	30	n	m
Decimal	29	67	48	n	m

[Range] $0 \le n \le 5$
m = 0, 1, 2, 48, 49, 50

[Description] Selects a print mode for the serial number counter.
- *n* specifies the number of digits to be printed as follows:

when *n* = 0, the printer prints the actual digits indicated by the number value.
when *n* = from 1 to 5, this command sets the number of

of digits to be printed.

• m specifies the printing position within the entire range of printed digits, as follows:

m	P	Processing of digits lower than those specified
0. 48	Right justification	Add spaces to left..
1. 49	Right justification	Add '0' to left.
2. 50	Left justification	Add spaces to right.

[Notes] • if *n* or *m* is outside the defined range, the previously set print mode is not changed.
• If *n* = 0, *m* has no meaning.

[Default] *n* = 0, *m* = 0

[Reference] **GS C 1, GS C 2, GS C ;, GS c**

[Example] n = 3, m = 0 n = 3, m = 1 n = 3, m=2
□□1 001 1□□

□ indicates a space

GS C 1 aL aH bL bH n r

[Name] **Select count mode (A).**

[Format]

ASCII	GS	C	1	aL	aH	bL	bH	n	r
Hex	1D	43	31	aL	aH	bL	bH	n	r
Decimal	29	67	49	aL	aH	bL	bH	n	r

[Range] 0 ≤ aL, aH ≤ 255
0 ≤ bL, bH ≤ 255
0 ≤ n, r ≤ 255

[Description] Selects a count mode for the serial number counter.
• *aL*, *aH* o *bL*, *bH* specify the counter range.
• *n* specify the stepping amount when counting up or down.
• *r* indicates the repetition number when the counter value is fixed.

[Notes] • Count-up mode is specified when:
[a*L* + (a*H* × 256)] < [b*L* + (b*H* × 256)] and $n \neq 0$ and $r \neq 0$
• Count-down mode is specified when:
[a*L* + (a*H* × 256)] > [b*L* + (b*H* × 256)] and $n \neq 0$ and $r \neq 0$

• Counting stops when:
[a*L* + (a*H* × 256)] = [b*L* + (b*H* × 256)] or *n* = 0 or *r* = 0
• In setting count-up mode, the minimum value of the counter is [a*L* + (a*H* × 256)] and the maximum value is [b*L* + (b*H* × 256)]. If counting up reaches a value exceeding the maximum, it is resumed with the minimum value.
• In setting count-down mode, the maximum value of the counter is [a*L* + (a*H* × 256)] and the minimum value is [b*L* + (b*H* × 256)]. If counting down reaches a value less than minimum, it is resumed with the maximum value.
• When the command is executed, the internal count that indicates the repetition number specified by *r* is cleared.

[Default] aL = 1, aH = 0, bL = 255, bH = 255, n = 1, r = 1

[Reference] **GS C 0, GS C 2, GS C ;, GS c**

[Example]

GS C 2 nL nH

[Name] **Set counter.**

[Format]

ASCII	GS	C	2	nL	nH
Hex	1D	43	32	nL	nH
Decimal	29	67	50	nL	nH

[Range] 0 ≤ nL, nH ≤ 255

[Description] Sets the serial number counter value.
• *nL* and *nH* determine the value of the serial number counter set by [*nL* + (*nH* × 256)].

[Notes] • In count-up mode, if the counter value specified by this command goes out of the counter operation range specified by GS C 1 or GS C ;, it is forced to convert to the minimum value by GS c.
• In count-down mode, if the counter value specified by this command goes out of the counter operation range specified by GS C 1or GS C ;, it is forced to convert to the maximum value by GS c.

[Default] nL = 1, nH = 0

[Reference] **GS C 0, GS C 1, GS C ;, GS c**

[Example]

GS C ; sa ; sb ; sn ; sr ; sc ;

[Name] **Select count mode.**

[Format]

ASCII	GS	C	;	sa	;	sb	;	sn	;	sr	;	sc	;
Hex	1D	43	3B	sa	3B	sb	3B	sn	3B	sr	3B	sc	3B
Decimal	29	67	59	sa	59	sb	59	sn	59	sr	59	sc	59

[Range] $0 \leq sa, sb, sc \leq 65535$

$0 \leq sn, sr \leq 255$

These values are all character strings.

[Description] Selects a count mode for the serial number counter and specifies the value of the counter.

- *sa*, *sb*, *sn*, *sr* and *sc* are all displayed in ASCII characters using the codes from ‘O’ to ‘9’.
- *sa* and *sb* specify the counter range.
- *sn* indicates the stepping amount for counting up or down.
- *sr* indicates the repetition number with the counter value fixed.
- *sc* indicates the counter value.

[Notes]

- Count-up mode is specified when:
  $sa < sb$ and $sn \neq 0$ and $sr \neq 0$
- Count-down mode is specified when:
  $sa > sb$ and $sn \neq 0$ and $sr \neq 0$
- Counting stops when:
  $sa = sb$ or $sn = 0$ or $sr = 0$
- In setting count-up mode, the minimum value of the counter is sa and the maximum is sb. If counting up reaches a value exceeding the maximum, it is resumed with the minimum value. If the counter value set by sc is outside the counter operation range, the counter value is forced to convert to the minimum value by executing GS c.
- In setting count-down mode, the maximum value of the counter is sa and the minimum value is sb. If counting down reaches a value less than the minimum, it is resumed with the maximum value. If the counter value set by sc is outside the counter operation range, the counter value is forced to convert to the maximum value by executing GS c.
- Parameters *sa* to *sc* can be omitted. If omitted, these values remain unchanged.
- Parameters *sa* to *sc* must not contain characters, with the exception of those from ‘0’ to ‘9’.

[Default] sa = 1, sb = 65535, sn = 1, sr = 1, sc = 1
[Reference] **GS C 0, GS C 2, GS C 1, GS c**
[Example]

GS H n

[Name] **Select printing position of Human Readable Interpretation (HRI)**
[Format] ASCII GS H n
Hex 1D 48 n
Decimal 29 72 n
[Range] 0 ≤ n ≤ 3, 48 ≤ n ≤ 51
[Description] Selects the printing position of HRI characters when printing bar code.
n selects the printing position as follows:

n	Function
0. 48	Not printed
1. 49	Above the bar code.
2. 50	Underneath the bar code.
3. 51	Both above and underneath the bar code.

[[Notes] • HRI characters are printed using the font specified by the command GS f.
[Default] n = 0
[Reference] **GS f, GS k**
[Example]

GS I n (WITH SERIAL INTERFACE ONLY)

[Name] **Transmit printer ID.**
[Format] ASCII GS I n
Hex 1D 49 n
Decimal 29 73 n
[Range] 1 ≤ n ≤ 3, 49 ≤ n ≤ 51
[Description] Transmits the printer ID specified by n as follows:

n	Printer ID	Specification
1. 49	Printer mode identification	07H (DPT281S)
2. 50	Function identification	See table below
3. 51	ROM version identification	Depends on ROM version (4 char)

n = 2, Function identification

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Non supported 2-byte character codes
1	Off	00	0	Autocutter not supplied
				Autocutter supplied
2	Off	00	0	Thermal paper without label
	On	04	4	Thermal paper with label
3	-	-	-	Not defined
4	Off	00	0	Not used. Fixed at Off
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed at Off

[Notes]

- When the DTR/DSR control is selected, the printer only transmits 1 byte (Printer identification) after it has been given confirmation that the host is ready to receive data. If the host is not ready, the printer waits until it is.
- When the XON/XOFF control is selected, the printer only transmits 1 byte (Printer identification) if it has not been given confirmation that the host is ready to receive data.
- This command is carried out once the data has been processed in the reception buffer. There may therefore be a delay between the moment in which the command is received and that in which the data is transmitted, depending on the status of the reception buffer.

[Default]

[Reference]

[Example]

GS P x y

[Name] **Set horizontal and vertical motion units.**

[Format]

ASCII	GS	P	x	y	
Hex	1D	50	x	y	
Decimal	29	80	x	y	

[Range] x = 100, 200
y = 100, 200

[Description] Sets the horizontal and vertical motion units at 1/x inches and 1/y inches, respectively.
When *x* is set at 0, the default setting value is used.
When *y* is set at 0, the default setting value is used.

[Notes]
- The horizontal direction is perpendicular to the paper feed direction.
- In standard mode, the following commands use *x* or *y*, irrespective of character rotation (upside down or 90° clockwise rotation):
  ① Commands using *x* : ESC SP, ESC $, ESC \, GS L, GS W.
  ② Commands using y : ESC 3, ESC J.
- This command does not affect the previously specified values.
- The calculated result from combining this command with others is truncated to the minimum value of the mechanical pitch or an exact multiple of that value.

[Default] x = 200, y = 200

[Reference] **ESC SP, ESC $, ESC \, ESC 3, ESC J, GS L, GS W**

[Example]

GS ^ r t m

[Name] **Execute macro.**

[Format]

ASCII	GS	^	r	t	m	
Hex	1D	5E	r	t	m	
Decimal	29	94	r	t	m	

[Range] 0 ≤ r, t ≤ 255
0 ≤ m ≤ 1

[Description] Executes a macro.
• *r* specifies the number of times to execute the macro.
• *t* specifies the waiting time for executing the macro.
The waiting time is *t* ´ 100 msec. for every macro execution.
• *m* specifies macro executing mode:
When the LSB of *m* = 0, the macro executes *r* times continuously at the interval specified *t*.
When the LSB of *m* = 1, after waiting for the period specified by *t*, the LED indicator blinks and the printer waits for the FEED button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats the operation *r* times.

[Notes] • This command lasts for a period of (*t* ´ 100 msec.) after a macro is executed by *t*.
• If this command is received while a macro is being defined, the macro definition is aborted and the definitions cleared.
• If the macro is not defined or if *r* is 0, nothing happens.
• When the macro is executed by pressing the FEED button (*m* = 1), the paper can not be fed by using the FEED button.

[Default]

[Reference] **GS :**

[Example]

GS c

[Name] **Print counter.**

[Format]

ASCII	GS	c
Hex	1D	63
Decimal	29	99

[Description] Sets the serial counter value in the print buffer and increments or decrements the counter value.

[Notes] • After setting the current counter value in the print buffer as print data (a character string), the printer counts up or down based on the count mode set. The counter value in the print buffer is printed when the printer receives a print command or is in the buffer full state.
• The counter print mode is set by **GS C 0**.

• The counter mode is set by **GS C 1** or **GS C ;**.
• In count-up mode, if the counter value set by this command goes out of the counter operation range set by **GS C 1** or **GS C ;**, it is forced to convert to the minimum value.
• In count-down mode, if the counter value set by this command goes out of the counter operation range set by **GS C 1 or GS C ;**, it is forced to convert to the maximum value.

[Default]

[Reference] **GS C 0, GS C1, GS C 2, GS C ;**

[Example]

GS f n

[Name] **Select font for HRI characters.**

[Format]

ASCII	GS	f	n
Hex	1D	66	n
Decimal	29	102	n

[Range] n = 0, 1, 48, 49

[Description] Selects a font for the HRI characters used when printing a bar code.
n selects a font from the following table:

n	Font
0. 48	Font A.
1. 49	Font B.

[Notes] The HRI characters are printed at the position specified by the command **GS H**.

[Default] n = 0

[Reference] **GS H, GS k**

[Example]

GS h n

[Name] **Set bar code height**

[Format]

ASCII	GS	h	n
Hex	1D	68	n
Decimal	29	104	n

[Range] $1 \le n \le 255$

[Description] Sets the height of the bar code.
n specifies the number of dots in the vertical direction.

[Notes]

[Default] n = 96 (12 mm)

[Reference] **GS k**

[Example]

GS k m [d1...dk] NUL , GS k m n [d1...dn]

[Name] **Print bar code.**

[Format]

① ASCII	GS	k	m	NUL
Hex	1D	6B	m	00
Decimal	29	107	m	0

② ASCII	GS	k	m	n
Hex	1D	6B	m	n
Decimal	29	107	m	n

[Range] ① $0 \le m \le 6$
② $65 \le m \le 73$

[Description] Selects a bar code system and prints the bar code.
m selects a bar code system as follows:

	m	Bar code system	Number of characters	Remarks
Œ	0	UPC-A	11 ≤ k ≤ 12	48 ≤ d ≤ 57
	1	UPC-E	11 ≤ k ≤ 12	48 ≤ d ≤ 57
	2	EAN13 (JAN)	12 ≤ k ≤ 13	48 ≤ d ≤ 57
	3	EAN8 (JAN)	7 ≤ k ≤ 8	48 ≤ d ≤ 57
	4	CODE39	1 ≤ k	48 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37, 43, 45, 46, 47
	5	ITF	1 ≤ k (even number)	48 ≤ d £ 57
	6	CODABAR	1 ≤ k	48 ≤ d ≤ 57, 65 ≤ d1 ≤ 68, 36, 43, 45, 46, 47, 58
	7	CODE93	1 ≤ k ≤ 255	1 ≤ d ≤ 127
	8	CODE128	2 ≤ k ≤ 255	1 ≤ d ≤ 127
	20	CODE32	8 ≤ k ≤ 9	48 ≤ d ≤ 57
’	65	UPC-A	11 ≤ n ≤ 12	48 ≤ d ≤ 57
	66	UPC-E	11 ≤ n ≤ 12	48 ≤ d ≤ 57
	67	EAN13 (JAN)	12 ≤ n ≤ 13	48 ≤ d ≤ 57
	68	EAN8 (JAN)	7 ≤ n ≤ 8	48 ≤ d ≤ 57
	69	CODE39	1 ≤ n ≤ 255	48 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37, 43, 45, 46, 47
	70	ITF	1 ≤ n ≤ 255	48 ≤ d ≤ 57
	71	CODABAR	1 ≤ n ≤ 255	48 ≤ d ≤ 57, 65 ≤ d1 ≤ 68, 36, 43, 45, 46, 47, 58
	72	CODE93	1 ≤ n ≤ 255	0 ≤ d ≤ 127
	73	CODE128	2 ≤ n ≤ 255	0 ≤ d ≤ 127
	90	CODE32	8 ≤ n ≤ 9	48 ≤ d ≤ 57

[Notes]

- If *d* is outside the specified range, the printer prints the following message: “BAR CODE GENERATOR NON OK !” and processes the following data as normal data.
- If the horizontal size exceeds the printing area, the printer only feeds the paper.

• This command feeds as much paper as is required to print the bar code, irrespective of the line spacing specified by **ESC 2 or ESC 3.**
• After printing the bar code, this command sets the print position at the beginning of the line.
• This command is not affected by print modes (bold, double strike, underline or character size), with the exception of upside-down mode and justification.

[Notes for ①]
• This command ends with a NUL code.
• When the bar code used is UPC-A or UPC-E, the printer prints the bar code data after receiving 11 (without check digit) or 12 (with check digit) byte bar code data.
• When the bar code system used is EAN13, the printer prints the bar code after receiving 12 (without check digit) or 13 (with check digit) byte bar code data.
• When the system used is EAN8, the printer prints the bar code after receiving 7 (without check digit) or 8 (with check digit) byte bar code data.
• The number of data for ITF bar code must be even. When an odd number of data is input, the printer ignores the last received data.

[Note for ②]
• If *n* is outside the specified range, the printer stops command processing and process the following data as normal data.

When to use CODE93:
• The printer prints an HRI character (o) as a start character at the beginning of the HRI character string.
• The printer prints an HRI character (o) as a stop character at the end of the HRI character string.
• The printer prints an HRI character (n) as a control character (00H to 1FH and 7FH).

When to use CODE128:
• When using the CODE128 in this printer, take the following points into account for data transmission:
• The top of the bar code data string must be a code set selection character(CODE A , CODE B or CODE C) which selects the first code set.
• Special characters are defined by combining two characters “{“ and one character. The ASCII character “}” is defined by transmitting “{“ twice consecutively.

Specific character	Data transmission		
	ASCII	Hex	Decimal
SHIFT	{S	7B, 53	123. 83
CODE A	{A	7B, 41	123. 65
CODE B	{B	7B, 42	123. 66
CODE C	{C	7B, 43	123. 67
FNC1	{1	7B, 31	123. 49
FNC2	{2	7B, 32	123. 50
FNC3	{3	7B, 33	123. 51
FNC4	{4	7B, 34	123. 52
'{'	{{	7B, 7B	123.123

[Default]
[Reference] **GS H, GS f, GS h, GS w**
[Example]

GS w n

[Name] **Set bar code width.**

[Format]

ASCII	GS	w	n
Hex	1D	77	n
Decimal	29	119	n

[Range] $2 \leq n \leq 6$

[Description] Sets the horizontal size of the bar code.
n specifies the bar code width as follows:

n	Module width (mm)
2	0.25
3	0.375
4	0.5
5	0.625
6	0.75

[Notes]
[Default] n = 3
[Reference] **GS k**
[Example]

GS | n

[Name] **Set printing density.**
[Format] ASCII GS | n
Hex 1D 7C n
Decimal 29 124 n
[Range] 0 ≤ n ≤ 4, 48 ≤ n ≤ 52
[Description] Sets the printing density.
n specifies the printing density as follows:

n	Printing density
0. 48	Very light
1. 49	Light
2. 50	Normal
3. 51	Dark
4. 52	Very dark

[Notes] • The printing density is cleared at default value when the printer is reset or the power is turned off.
[Default] n = 2
[Reference]
[Example]

3.2.3 CBM iDP560RS Emulation

COMMAND TABLE

The following table lists all the commands for function management in CBM iDP560RS Emulation of the DPT281 printer. The commands can be transmitted to the printer at any moment, but they will only be carried out when the commands previously sent have been executed. There are no priority commands; all commands are carried out when the circular buffer is free to do so.

ASCII Comm.	HEX Comm.	Description
LF	$0A	Print and line feed
CR	$0D	Print and carriage return
FF	$0A	Carries out form feed after printing
RS	$1E	Enhanced character designation (one line)
US	$1F	Standard character designation
SI	$0F	Standard character designation (same as US)
SO	$0E	Improved character designation (same as RS)
	$00	Printing with small characters
	$01	Printing with double width characters
	$02	Printing with double height characters
	$03	Printing with expanded characters
	$04	Printing with small characters
DC1	$11	Makes the printer SELECT state (ON LINE)
DC2	$12	Set / cancel red printing mode
DC3	$13	Makes the printer DESELECT state (OFF LINE)
DC4	$14	Set / cancel reverse printing mode
CAN	$18	Clears the print data in the buffer
ESC 1	$1B $31	3 mm line spacing
ESC 2	$1B $32	5.5 mm line spacing

ASCII Comm.	HEX Comm.	Description
ESC @	$1B $40	Initialize printer
ESC C n	$1B $43 (n)	Page length designation and page formatting
ESC K n1 n2	$1B $4B (n1 n2)	Graphic print mode
ESC O	$1B $4F	Page formatting off
ESC R	$1B $52	Select international character set
ESC i	$1B $69	Total cut
ESC m	$1B $6D	Partial cut
ESC p m t1 t2	$1B $70 m t1 t2	Generate pulse
ESC · n xL xH yH yL	$1B $FA n xL xH yH yL	Print graphic bank (448 x 585 dots)
ESC ¹	$1B $FB	Transmit ram bank to serial port ✹
ESC ³ n	$1B $FC (n)	Transfer flash bank into ram bank
ESC ² nL nH	$1B $FD nL nH	Receive ram bank from port
ESC ¦ n	$1B $FE (n)	Transfer ram bank into flash bank
GS I n	$1D $49 (n)	Transmit printer ID ✹
GS | n	$1D $7C (n)	Set printing density

✹ In the above table, the commands marked with this symbol are for the serial interface only.

The following pages provide a more detailed description of each command.

LF

[Name] **Print and line feed**

[Format] ASCII LF
Hex 0A
Decimal 10

[Description] Prints the data in the buffer and feeds one line, based on the current line spacing.

[Notes] This command sets the print position at the beginning of the line.

[Default]

[Reference] **ESC 1, ESC 2**

[Example]

CR

[Name] **Print and line feed**

[Format] ASCII CR
Hex 0D
Decimal 13

[Description] When autofeed is “CR enabled”, this command functions in the same way as LF, otherwise, it is ignored.

[Notes] This command sets the print position at the beginning of the line.

[Default] See the “autofeed” parameter from Setup.

[Reference] **LF**

[Example]

FF

[Name] **Carries out form feed after printing.**

[Format] ASCII FF
Hex 0A
Decimal 10

[Description] Prints the data in the buffer and feeds in accordance with the page length specified by the command ESC C n.

[Notes] This command sets the print position at the beginning of the line.

[Default]

[Reference] **ESC C**

[Example]

RS

[Name] **Enhanced character designation.**

[Format] ASCII RS
Hex 1E
Decimal 30

[Description] Printing of the character is executed in expanded format.

[Notes] • The command RS is automatically launched after printing.

[Default] Set up from front keys

[Reference] **US, SI, SO, 01H, 02H, 03H, 04H**
[Example]

US

[Name] **Standard character designation.**
[Format] ASCII US
Hex 1F
Decimal 31
[Description] Printing of the character is executed in small format (normal).

[Notes]
[Default] Set up from front keys
[Reference] **RS, SI, SO, 01H, 02H, 03H, 04H**
[Example]

SI

[Name] **Standard character designation (same as US)**
[Format] ASCII SI
Hex 0F
Decimal 15

[Description] Printing of the character is executed in small format (normal).
[Notes] • Same as US
[Default] Set up from front keys
[Reference] **RS, US, SO, 01H, 02H, 03H, 04H**
[Example]

SO

[Name] **Improved character designation (same as RS)**
[Format] ASCII SO
Hex 0E
Decimal 14
[Description] Printing of the character is executed in expanded format.
[Notes] • The command SO is automatically launched after printing.

• Same as RS

[Default] Set up from front keys
[Reference] **RS, US, SI, 01H, 02H, 03H, 04H**
[Example]

00H

[Name] **Print with small character**
[Format] ASCII NUL
Hex 00
Decimal 0
[Description] Character printing is executed in small format (normal)
[Notes] • Setting remains until next set
[Default] Set up from front keys
[Reference] **RS, US, SI, SO, 01H, 02H, 03H, 04H**
[Example]

01H

[Name] **Printing with double width character**
[Format] ASCII SOH
Hex 01
Decimal 1
[Description] Printing of the character is executed in double width format
[Notes] • Setting remains until next set
[Default] Set up from front keys
[Reference] **00H, 02H, 03H, 04H**
[Example]

02H

[Name] **Printing in double height character**
[Format] ASCII STX
Hex 02
Decimal 2
[Description] Printing of the character is executed in double height format
[Notes] • Setting remains until next set

[Default] Set up from front keys
[Reference] **RS, US, SI, SO, 00H, 01H, 03H, 04H**
[Example]

03H

[[Name] **Printing with expanded character**
[Format] ASCII EXT
Hex 03
Decimal 3
[Description] Printing of the character is executed in expanded format
[Notes] • Setting remains until next set
[Default] Set up from front keys
[Reference] **RS, US, SI, SO, 00H, 01H, 02H, 04H**
[Example]

04H

[Name] **Print with small character**
[Format] ASCII EOT
Hex 04
Decimal 4
[Description] Character printing is executed in small format (normal)
[Notes] • Setting remains until next set
[Default] Set up from front keys
[Reference] **RS, US, SI, SO, 00H, 01H, 02H, 03H**
[Example]

DC1

[Name] **Places the printer ON LINE.**
[Format] ASCII DC1
Hex 11
Decimal 17
[Description] Places the printer ON LINE.
[Notes] • Only this code can be accepted independently of the status OFF LINE.
[Default]

[Reference] **DC3**
[Example]

DC2

[Name] **Set / cancel red printing**
[Format] ASCII DC2
Hex 12
Decimal 18
[Description] Sets / cancels (alternately) red printing.
[Notes] • The printer only prints the whole line, and not single characters, in red.
• The printer only prints in red if enabled by setup.
[Default]
[Reference]
[Example]

DC3

[Name] **Places the printer OFF LINE.**
[Format] ASCII DC3
Hex 13
Decimal 19
[Description] Places the printer OFF LINE.
[Notes]
[Default]
[Reference] **DC1**
[Example]

DC4

[Name] **Set/ erase reverse printing mode.**
[Format] ASCII DC4
Hex 14
Decimal 20
[Description] Sets / erases (alternately) reverse printing mode.
[Notes]
[Default]

[Reference]
[Example]

CAN

[Name] **Cancel print data buffer.**
[Format] ASCII CAN
Hex 18
Decimal 24
[Description] Deletes all the print data in the current print buffer.
[Notes] This command sets the print position at the beginning of the line.
[Default]
[Reference]
[Example]

ESC 1

[Name] **Set 3 mm. line spacing**
[Format] ASCII ESC 1
Hex 1B 31
Decimal 27 49
[Description] Sets 3 mm line spacing
[Notes]
[Default]
[Reference] **ESC 2**
[Example]

ESC 2

[Name] **Set 5.5 mm line spacing.**
[Format] ASCII ESC 2
Hex 1B 32
Decimal 27 50
[Description] Set 5.5 mm line spacing.
[Notes]
[Default]
[Reference] **ESC 1**

[Example]

ESC @

[Name] **Inizialize the printer.**

[Format] ASCII ESC @
Hex 1B 40
Decimal 27 64

[Description] Clears the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.

[Notes] • Same as hardware reset

[Default]

[Reference]

[Example]

ESC C n

[Name] **Page length designation and page formatting.**

[Format] ASCII ESC C n
Hex 1B 43 n
Decimal 27 67 n

[Range] $14 \leq n \leq 120$

[Description] This command sets the length (number of lines) of the page, and paging formatting begins.
A space of three lines is left at both the top and bottom of the page.

[Notes] • Page formatting can be cleared through the command ESC O

[Default] n = 66

[Reference] **FF, ESC O**

[Example]

ESC K n1 n2

[Name] **Graphic mode printing**

[Format]

ASCII	ESC	K	n1	n2
Hex	1B	4B	n1	n2
Decimal	27	75	n1	n2

[Range] $1 \le n1 \le 240$; n2 = mute data

[Description] This command prints n1 bytes of data in graphic mode. The data bytes are arranged vertically starting from the left margin, but only the first seven LSBs are significant.

[Notes] After the last data byte, the printer prints, forward feeds the paper (by 21 dots per line) and graphic mode printing is cleared.

[Default]

[Reference]

[Example]

ESC O

[Name] **Page formatting off**

[Format]

ASCII	ESC	O	
Hex	1B	4F	
Decimal	27	79	

[Description] Cancel page formatting mode

[Notes]

[Default]

[Reference] **ESC C**

[Example]

ESC R n

[Name] **Select the international character set.**

[Format]

ASCII	ESC	R	n
Hex	1B	52	n
Decimal	27	82	n

[Range] $0 \le n \le 12$

[Description] Selects the international character set by setting *n* as in the following table:

	Hex	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
n	Character set												
0	U.S.A.	#	$	@	[	\	]	^	`	{	|	}	~
1	France	#	$	à	°	ç	§	^	`	è	ù	è	"
2	Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	β
3	Great Britain	£	$	@	[	\	]	^	`	{	|	}	~
4	Denmark I	#	$	@	Æ	∅	Å	^	`	æ	ϕ	å	~
5	Sweden	#		È	Ä	Ö	Å	Ü	è	ä	ö	å	ü
6	Italy	#	$	@	°	\	è	^	ù	à	ò	è	ì
7	Spain 1	Pt	$	@	¡	Ñ	¿	^	`	"	ñ	}	~
8	Japan	#	$	@	[	¥	]	^	`	{	|	}	~
9	Norwegian	#		È	Æ	∅	Å	Ü	è	æ	ϕ	å	ü
10	Denmark II	#	$	È	Æ	∅	Å	Ü	è	æ	ϕ	å	ü
11	Spain 2	#	$	à	¡	Ñ	¿	è	`	í	ñ	ö	ü
12	South America	#	$	à	¡	Ñ	¿	è	ù	í	ñ	ö	ü

[Default] n = 0
[Reference]
[Example]

ESC i

[Name] **Total cut.**

[Format] ASCII ESC i
Hex 1B 69
Decimal 27 105

[Description] This command enables cutter operation; if there is no cutter, a disabling flag is set any subsequent cutting commands will be ignored.

[Notes] • The printer waits until all the paper movement commands have been completed before executing total cut

[Default]

[Reference]

[Example]

ESC m

[Name] **Partial cut.**

[Format]

ASCII	ESC	m	
Hex	1B	6D	
Decimal	27	109	

[Description] This command enables partial cutter operation. If there is no cutter, a disabling flag is set and any subsequent cutting commands will be ignored.

[Notes] • The printer waits until all the paper movement commands have been completed before executing partial cut

[Default]

[Reference]

[Example]

ESC p m t1 t2

[Name] **Generate pulse.**

[Format]

ASCII	ESC	p	m	t1	t2
Hex	1B	70	m	t1	t2
Decimal	27	112	m	t1	t2

[Range] m = 0, 48

$0 \le t1 \le 255$

$0 \le t2 \le 255$

[Description] Outputs the pulse specified by t1 and t2 to the Pin *m*of the connector as follows:

m	**Connector pin**
0, 48	Pin 2 of drawer kick-out connector

[Notes] • The pulse ON time is [*t1*× 2 ms] and the OFF time is [*t2* × 2 ms].

• If *t2* < *t1*, the OFF time is [*t1* × 2 ms].

[Default]

[Reference]

[Example]

ESC · n xH xL yH yL

[Name] **Print graphic bank (448 ×585 dots).**

[Format]

ASCII	ESC	·	n	xH	xL	yH	yL
Hex	1B	FA	n	xH	xL	yH	yL
Decimal	27	250	n	xH	xL	yH	yL

[Range] $0 \le n \le 3$

$0 \le xH, xL, yH, yL \le 255$

[Description] Prints the graphics bank from flash or ram.
n selects the bank as follows:

n	Function
0	Print graphic bank
1	Print flash bank logo 1
2	Print flash bank logo 2
3	Print flash bank logo 3

xL + *xH* × 256 specifies the starting dot line (1 ÷ 585).
yL + y*H* × 256 specifies the number of lines to print.

[Notes] • If (*xL* + (*xH* × 256)) > 585 the printer does not execute the command.
• Se (*xL* + (*xH* × 256) + *yL* +(y*H* × 256))> 585 the printer only prints 585 - *xL* + (*xH* × 256) +1 dotlines.

[Default]

[Reference] **ESC ³, ESC ², ESC ¦**

[Example] To print from ram bank dotline 100 to dotline 299, send:
1BH FAH 00H 00H 64H 00H C7H

ESC ¹ nL nH (WITH SERIAL INTERFACE ONLY)

[Name] **Transmit ram bank to serial port.**

[Format]

ASCII	ESC	¹	nL	nH
Hex	1B	FB	nL	nH
Decimal	27	251	nL	nH

[Description] Transmits (nH x 256) + nL words of ram bank to serial port.

[Notes] • The size of the ram bank for graphic printing is 448 horizontal dots (56 bytes/dotline) ×585 vertical points (32760 bytes = 16380 words).

[Default]
[Reference] **ESC ³, ESC ², ESC ¦**
[Example]

ESC ³ n

[Name] **Transmit flash bank into ram bank.**
[Format] ASCII ESC ³ n
Hex 1B FC n
Decimal 27 252 n
[Range] $1 \le n \le 3$
[Description] Transfers flash bank into ram bank (32768 bytes).
n selects the bank as follows:

n	Function
1	Transfer flash bank logo 1 into ram.
2	Transfer flash bank logo 2 into ram.
3	Transfer flash bank logo 3 into ram.

[Note]
[Default]
[Reference] **ESC ·, ESC ², ESC ¦**
[Example]

ESC ² nL nH

[Name] **Receive ram bank from port.**
[Format] ASCII ESC ² nL nH
Hex 1B FD nL nH
Decimal 27 253 nL nH
[Range] $0 \le nL, nH \le 255$
[Description] Receives [$nL + (nH \times 256)$] words from port and puts them into ram bank.
[Notes] • The number of data bytes received is [$nL + (nH \times 256)$] $\times$ 2.
• Each word is received first in MSByte form and then in LSByte form
• If [$nL + (nH \times 256)$] exceeds 16384, the data following will be processed as normal data.

[Default]
[Reference] **ESC ·, ESC ³, ESC ¦**
[Example]

ESC ¦ n

[Name] **Transfer ram bank into flash bank.**
[Format] ASCII ESC ¦ n
Hex 1B FE n
Decimal 27 254 n
[Range] 1 ≤ n ≤ 3
[Description] Transfer ram bank into flash bank. (32768 bytes).
n selects the bank as follows:

n	Function
1	Transfer ram bank into flash bank logo 1.
2	Transfer ram bank into flash bank logo 2 .
3	Transfer ram bank into flash bank logo 3..

[Note]
[Default]
[Reference] **ESC ·, ESC ², ESC ³**
[Example]

GS I n (WITH SERIAL INTERFACE ONLY)

[
[Name] **Transmit printer ID.**
[Format] ASCII GS I n
Hex 1D 49 n
Decimal 29 73 n
[Range] 1 ≤ n ≤ 3, 49 ≤ n ≤ 51
[Description] Transmits the printer ID specified by n as follows:

n	Printer ID	Specification
1. 49	Printer model ID	07H (DPT281S)
2. 50	Function identification	Refer to table below
3. 51	ROM version identification	Depends on ROM version (4 char)

n = 2, Function identification

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	2-byte character codes not supported
1	Off	00	0	Autocutter not supplied
				Autocutter supplied
2	Off	00	0	Non-label thermal paper
	On	04	4	Label thermal paper
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed at Off
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed at Off

[[Notes] • This command is executed when the data is processed in the reception buffer. There may therefore be a time lag between receiving the command and transmitting the data, depending on the status of the reception buffer.

[Default]

[Reference]

[Example]

GS | n

[Name] **Set printing density.**

[Format]

ASCII	GS	|	n
Hex	1D	7C	n
Decimal	29	124	n

[Range] $0 \le n \le 4, 48 \le n \le 52$

[Description] Sets the printing density.
n specifies the printing density as follows:

n	Printing density
0. 48	Very light
1. 49	Light
2. 50	Normal
3. 51	Dark
4. 52	Very dark

[Notes] • The printing density is cleared at default value when the printer is reset or the power is turned off.

[Default] n = 2

[Reference]

[Example]

4.1 TECHNICAL SPECIFICATIONS

The main technical features of the DPT281 printer models are listed in table 4.1.

(Tab.4.1)

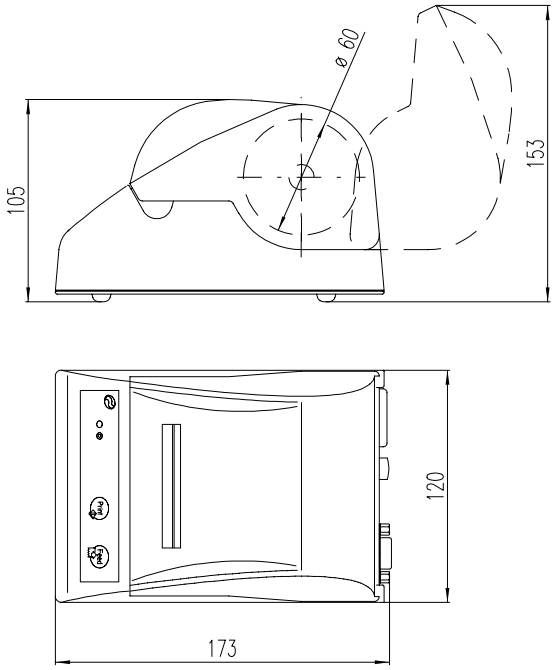
Resolution	200 DPI (8 dot/mm)
Paper roll dimensions	Ø60 mm ± 0.5mm
Sensors	Paper out, head open, head temperature.
Print method	Thermal fixed head (8 dot/mm)
Print direction	Normal,180°
Print formats	Normal, double and quadruple height and width, expanded , negative, underlined and script modes.
Character fonts	ASCII standard, EPSON ®, International.
Standard interfaces	RS232 Serial or CENTRONICS
Baud rate	From 1200 to 38400 bps
Reception buffer	32 Kbyte
Flash memory	256 Kbyte
Graphic memory	Three 32-Kbyte logos each
Printing speed (dotline/sec)	520 (Speed/Quality=normal)
Power supply	24Vdc ± 10%
Absorption	
Stand-by	0.1 A
Medium when printing	1.1 A
Peak	1.8 A
Environmental conditions	
Operating temperature	0°C - 45°C
Operating humidity	35% - 85% (no condensing)
Storage temperature / humidity	-20°C - +60°C / 10% - 90% (no condensing)
Options	Cutter, drawer operation, Windows™ Driver

ESC/POS™ EMULATION			
Number of columns	**32**	**42**	**56**
Printing speed			
Characters / sec	690	910	1213
Lines / sec	21.6	21.6	21.6
Character (L x H mm)			
Normal	1.7 x 3	1.2 x 3	1 x 3
Double height	3.4 x 3	2.4 x 3	2 x 3
Double width	1.7 x 6	1.2 x 6	1 x 6
Double height and width	3.4 x 6	2.4 x 6	2 x 6
Quadruple height	6.8 x 3	4.8 x 3	4 x 3
Quadruple width	1.7 x 12	1.7 x 12	1 x 12
Quadruple height and width	6.8 x 12	4.8 x 12	4 x 12
Print direction	Normal and Reverse		
Character set	3		
CUSTOM 24/42 EMULATION			
Number of columns	**24**	**42**	
Printing speed			
Characters/sec	520	910	
Lines/sec	21,6	21,6	
Character (L x H mm)			
Normal	2 x 3	1.2 x 3	
Double height	4 x 3	2.4 x 3	
Double width	2 x 6	1.2 x 6	
Double height and width	4 x 6	2.4 x 6	
Quadruple height	8 x 3	4.8 x 3	
Quadruple width	2 x 12	1.7 x 12	
Quadruple height and width	8 x 12	4.8 x 12	
Print direction	Normal and Reverse		
Character set	4		

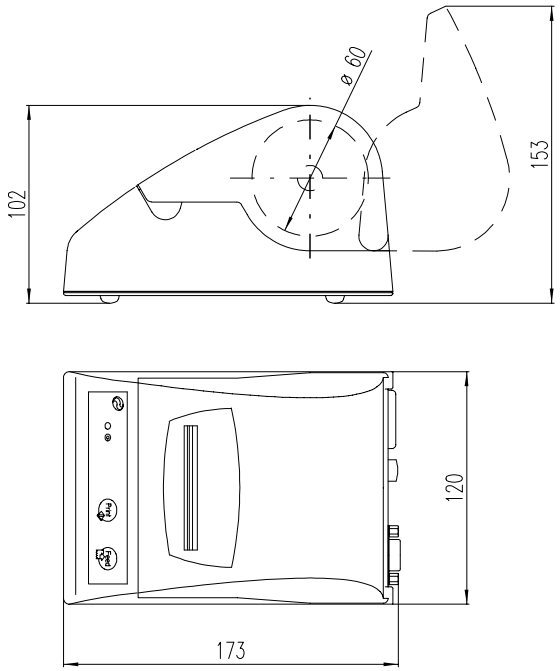
CITIZEN EMULATION		
Number of columns	**24**	**40**
Printing speed		
Characters/sec	520	867
Lines / sec	21.6	21.6
Character (L x H mm)		
Normal	2 x 3	1.2 x 3
Double height	4 x 3	2.4 x 3
Double width	2 x 6	1.2 x 6
Double height and width	4 x 6	2.4 x 6 4.8 x 3
Quadruple height	8 x 3	
Quadruple width	2 x 12	1.7 x 12
Quadruple height and width	8 x 12	4.8 x 12
Print direction	Normal and Reverse	
Character set	2	

4.2 DIMENSIONS

Figure 4.1 shows the dimensions of the desk printer DPT281 with autocutter, while figure 4.2 shows the dimensions of the same printer without autocutter.



(Fig.4.1)

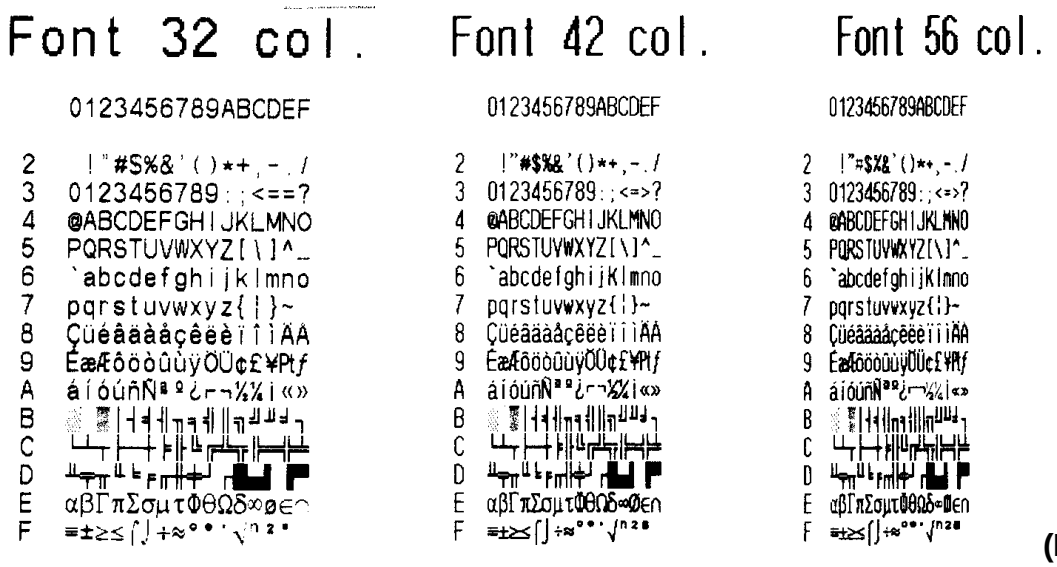


(Fig.4.2)

5.1 CHARACTER SETS

The DPT281 printer has seven FONTS, each with 224 characters.

ESC/POS™ Emulation (PC437 USA, Standard Europe)



(Fig.5.1)

Custom DPT24 Emulation

(Fig.5.2)

Custom DPT42 Emulation

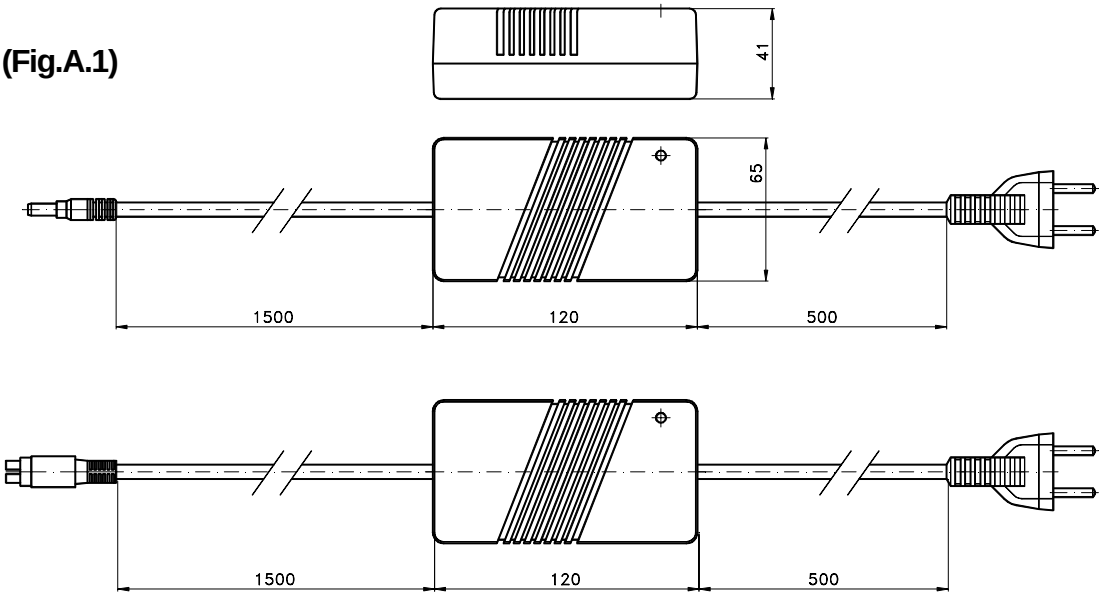
(Fig.5.3)

A.1 ACCESSORIES

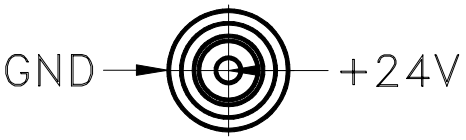
A.1.1 Power supply

The following figure shows the power supply, manufactured by Custom Engineering, that can be used to operate the DPT281 printer.
The power supply model is the PSP24.

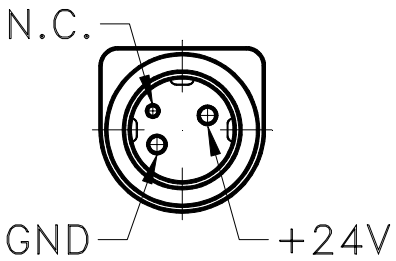
(Fig.A.1)



(Tab.A.1)



Mod. PSP24-D



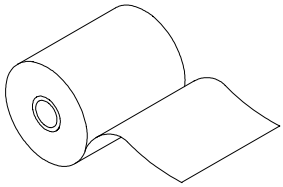
Mod. PSP24-T

Input specifications		
Input voltage		100 Vac to 240 Vac
Input frequency		50 Hz to 60 Hz
PSP24 Output specifications		
Output voltage		24 V
Output current	Minimum	0 A
	Maximum	1.25 A
	Peak	3,5 A
	Short Circuit	6 A

A.2 SPARE PARTS

(Tab.A.2)

RCT60X55	Thermal paper roll			
	Quantities recommended for n° of appliances purchased			
N° appliances	<10	<50	<100	>100
Quantities recommended	5	30	60	90



(Fig.A.2)