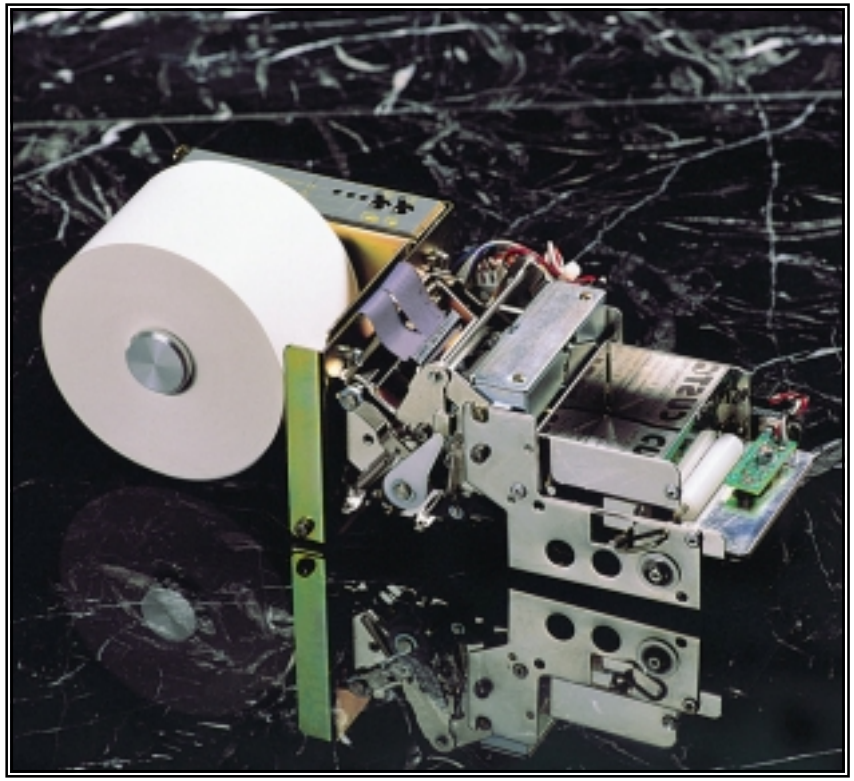
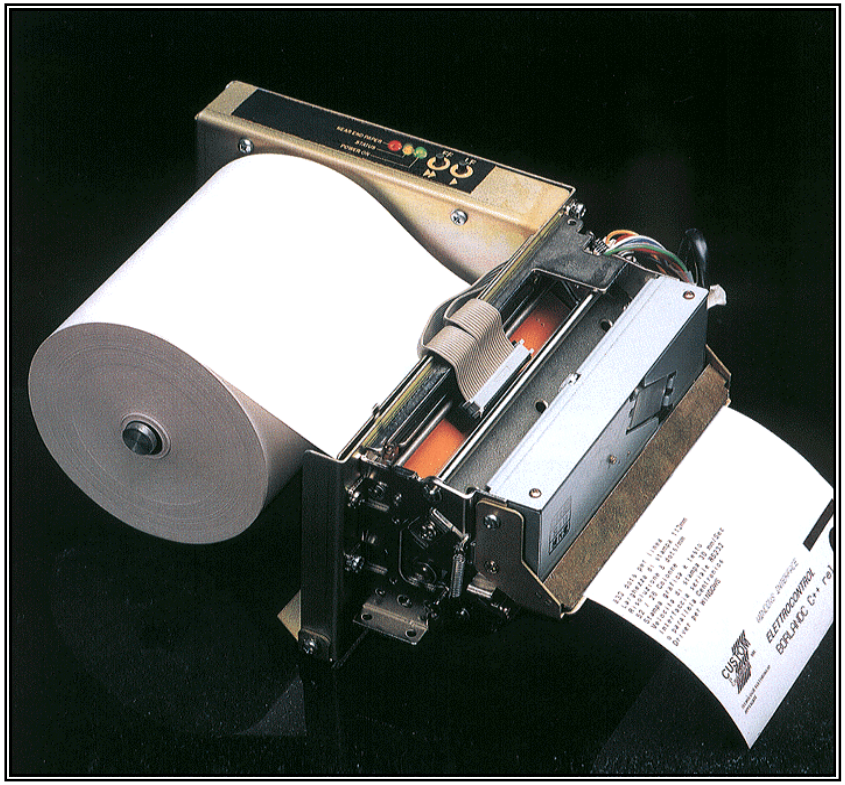
TPT60H



TPT112H



User's Manual

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Any suggestions regarding errors in its contents or possible improvements will be greatly appreciated. The products are continuously checked and improved. For this reason Custom Engineering s.r.l. reserves the right to modify the information contained in this manual without prior notice.

COD. DOME – TPTH REV. 1.21

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Custom Engineering
Str. Berettine 2 - 43010 Fontevivo (PARMA) - Italy
Tel. : +39 0521-680111 - Fax : +39 0521-610701
http: www.custom.it Email : support@custom.it

Declaration of Conformity "CE"
According to ISO/IEC Guide 22 and EN 45014

N°: DC0211198

Manufacture's Name:	Custom Engineering s.r.l.
Manufacture's Address:	Strada Berettine 2 Fontevivo (Parma) Italy

Declare the product:

Product name:	Ticket dispenser
Product type:	TPT
Model:	TPT60H, TPT112H

Conform to the following directives:

Electromagnetic Compatibility Directive 89/336/EEC; 92/31/EEC; 93/68/EEC

In accordance with following standards:

EN 55022 Class B	Limits and methods of measurement of radio disturbance characteristics of information technology equipment	1994
EN 50082-1	Electromagnetic Compatibility – Generic Immunity Standard. Part 1: Residential Commercial and Light Industry.	1992
EN 61000-4-2	Electrostatic discharge requirements 4KV contact discharge, 8KV air discharge	1995
EN 61000-4-4	Electrical fast transient/burst requirements Signal line 0.5KV, AC mains 1KV	1995
ENV 50140	Radiated radio-frequency electromagnetic field – Immunity test 3V/m, 80MHz-1000MHz, 80% 1KHz AM	1993

March 1998

SAFETY PRECAUTIONS

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.
- Ensure that the printer's electricity supply is grounded and that it is protected by a differential switch.
- 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.

CONTENTS

1.1 INTRODUCTION

The TPTH series (60/112) has a wide range of uses in addition to the standard printing ones :

- High printing speed : Ⓐ 55mm/sec, Ⓑ 50 mm/sec.
- ESC/POS™ and CUSTOM TPT emulation.
- Bar code UPC-A. UPC-E, EAN13, EAN8, CODE39, ITF, CODABAR, CODE93, CODE128 and CODE32.
- 6 standard and international characters fonts.
- Font completely or partly programmable.
- Double width-height, quadruple width-height, emphasized, script, inched 90°, 180° and 270°.
- Reception buffer 16Kbytes.
- Definition of macro function for automatic repetition of the operations.
- Internal programmable counter.
- Image mode.
- Print density.
- 3 programmable logo Ⓐ (448 x 585 dots) or Ⓑ (832 x 314 dots).
- Paper cutting.

Options :

- Windows™ Driver.
- Ejector.

1.2 GENERAL FEATURES :

Power supply	24Vdc	
Absorption		
Medium current	1.25A	
Peak Current	3.5A	
Current on Stand	60mA	
Environmental conditions		
Operating temperature	0°C - 50°C	
Operating humidity count	35% - 85%	
Storage temperature /Humidity	-35°C + 65°C / 10% - 90%	
Resolution	200 dpi (8 dots/mm)	
Paper width	60 mm	
Print method	Termal state	
Interface	Serial or parallel	
Reception buffer	16 Kbytes	
Print speed (dotline/sec)	Ⓐ440 Ⓑ400	(Speed/Quality = Normal)

ESC/POS™ emulation:

Column number	Ⓐ32	Ⓑ58	Ⓐ42	Ⓑ80	Ⓐ56 Ⓑ104
Print speed :					
Characters/sec	Ⓐ586 Ⓑ967		Ⓐ770 Ⓑ1336		Ⓐ1026 Ⓑ1736
Lines/sec	Ⓐ18,3 Ⓑ16,7		Ⓐ18,3 Ⓑ16,7		Ⓐ18,3 Ⓑ16,7
Character					
Normal	1,7 x 3		1,2 x 3		1x3
Double height	3,4 x 3		2,4 x 3		2x3
Double width	1,7 x 6		1,2 x 6		1x6
Double height and width	3,4 x 6		2,4 x 6		2x6
Quadruple height	6,8 x 3		4,8 x 3		4x3
Quadruple width	1,7 x 12		1,7 x 12		1x12
Quadruple height and width	6,8 x 12		4,8 x 12		4x12
Print direction	0°, 90°, 180°, 360°				
Character Set	3				

Custom TPT Emulation:

Column number	Ⓐ18	Ⓑ34	Ⓐ28	Ⓑ52	Ⓐ56 Ⓑ104
Print speed :					
Characters/sec	Ⓐ248 Ⓑ425		Ⓐ513 Ⓑ868		Ⓐ1540 Ⓑ2600
Lines/sec	Ⓐ13,7 Ⓑ12,5		Ⓐ18,3 Ⓑ16,7		Ⓐ27,5 Ⓑ25
Character					
Normal	3 x 4		2 x 3		1 x 2
Double height	6 x 4		4 x 3		2 x 2
Double width	3 x 8		2 x 6		1 x 4
Double height and width :	6 x 8		4 x 6		2 x 4
Quadruple height	12 x 4		8 x 3		4 x 2
Quadruple width	3 x 16		2 x 12		1 x 8
Quadruple height and width	12 x 16		8 x 12		4 x 8
Print direction	0°, 90°, 180°, 360°				
Character's Set	3				

1.3 FRONT PANEL

The FORM FEED and LINE FEED keys and a three leds are on the front panel.

- When the LINE FEED key is pressed, the printer carries out a paper feed which can be used to insert paper in the printing mechanism. During the switch on phase, if you hold the LINE FEED key down the printer performs the FONT TEST.
- If the FORM FEED key is enabled, pressing this key the printer feeds forward the paper for the number of steps programmed in the Eeprom,

  If in the other hand the FORM FEED key is disabled, the printer transmits on the serial line RS232 the 12 (HEX 0C) code. This function can be modified by the software command ESC =. (See software commands paragraph).

- During the switch on phase, if you hold down both keys, the printer goes into Print Setup. After the printer setup report, the printer waits for a button to be pressed, or for characters from serial port ; every 10 chars, prints hex values and ASCII codes (if characters are underlined, the receiving buffer is in the full state), see Hexadecimal Dump.

With the LINE FEED button, the printer skips setup mode and terminates the Hexadecimal Dump function.

With the FORM FEED button, the printer goes into the parameter setting mode. The variables are:

- **Printer emulation :** ESC/POS™, CUSTOM TPT.
- **Baud Rate :** 38400, 19200, 9600, 4800, 2400, 1200.
- **Data length :** 7, 8 bits/char.
- **Parity :** None, even or odd.
- **Handshaking :** XON/XOFF or Hardware.
- **Autofeed :** CR disabled or CR enabled.
- **Panel Key:** Enabled or Disabled.
- **Print mode :** Normal or Reverse.
- **Height mode :** x1, x2 or x4.
- **Width mode :** x1, x2 or x4.
- **Justification :** Left, Center or Right.

If ESC/POS™ :

- **Chars/line :** Ⓐ A=32 / B=42 cols. or A=42 / B=56 cols.
  Ⓑ A=58 / B=82 cols. or A=82 / B=104 cols.

If CUSTOM TPT:

- **Font Dimension :**

Ⓐ	18 col.	28 col.	56 col.
	24x32	16x24	8x16

Ⓑ	18 col.	28 col.	56 col.
	24x32	16x24	8x16

- **Speed/Quality :** Normal, Draft or High Quality.
- **Red Printing :** Disabled or Enabled.
- **Paper Autoload :** Enabled or Disabled.
- **Reception buffer reset :** No, At Paper End.
- **Print Density :** Normal, Light, Very light, Dark, Very dark, Double Copy.

- The GREEN LED indicates that the printer is on.
- The RED LED indicates that the paper is nearly finished.
- The YELLOW LED indicates the hardware error state of the printer. Check is performed "on line", indicates, in cases of malfunctioning the led will start to flash in accordance with the following table:

LED state	Description
Always off	Printer fault
Always on	Printer ON - no faults
Slow flash (long on)	Paper out message
Slow flash (short on)	Head up
Fast flash	Over temperature

1.4 HEXADECIMAL DUMP

This function prints the data transmitted from the host computer in hexadecimal numbers and in their corresponding ASCII characters.

<Example printing from the Printer Setup>

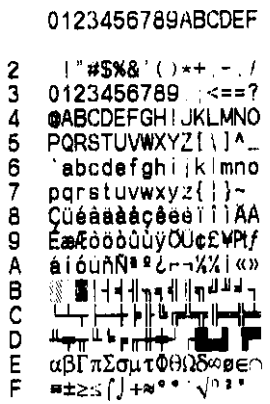
```
Print Density : Normal

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
```

1.5 CHARACTER SET

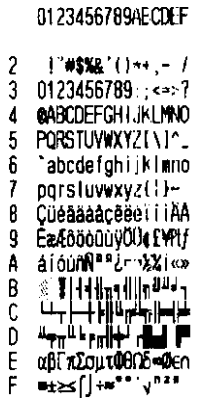
The printer has six fonts of 224 characters (two fonts for each emulation).

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

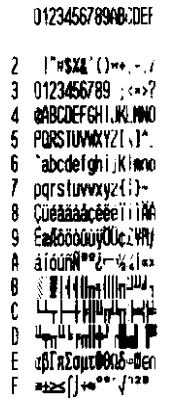
FONT 14X24



FONT 10X24

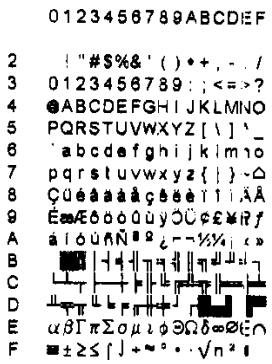


FONT 8X24

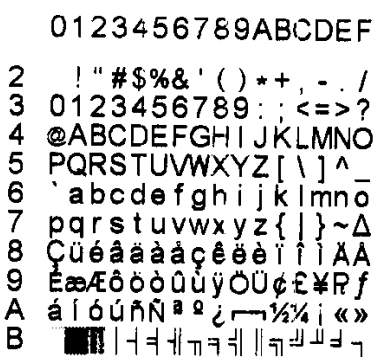


Custom TPT Emulation

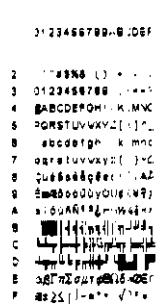
FONT 16X24



FONT 24X32



FONT 8X16



1.6 CHANGING PAPER

Pull up the printing head with the white lever. Feed paper into paper mouth passing through printing head then put down the head.

N.B. Buffer will be erased at each paper loading.

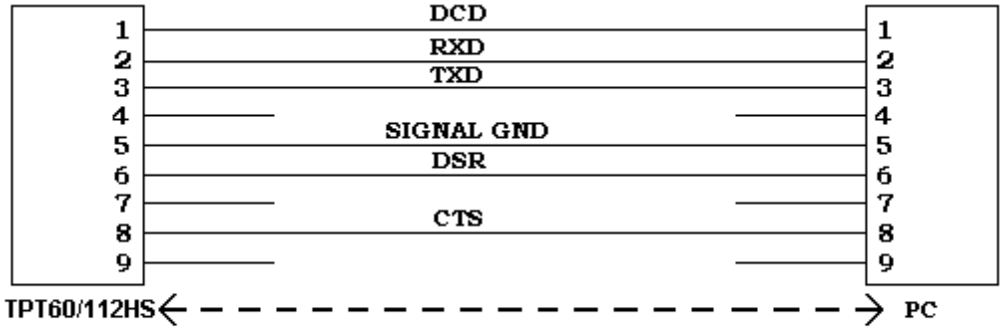
1.7 INTERFACES

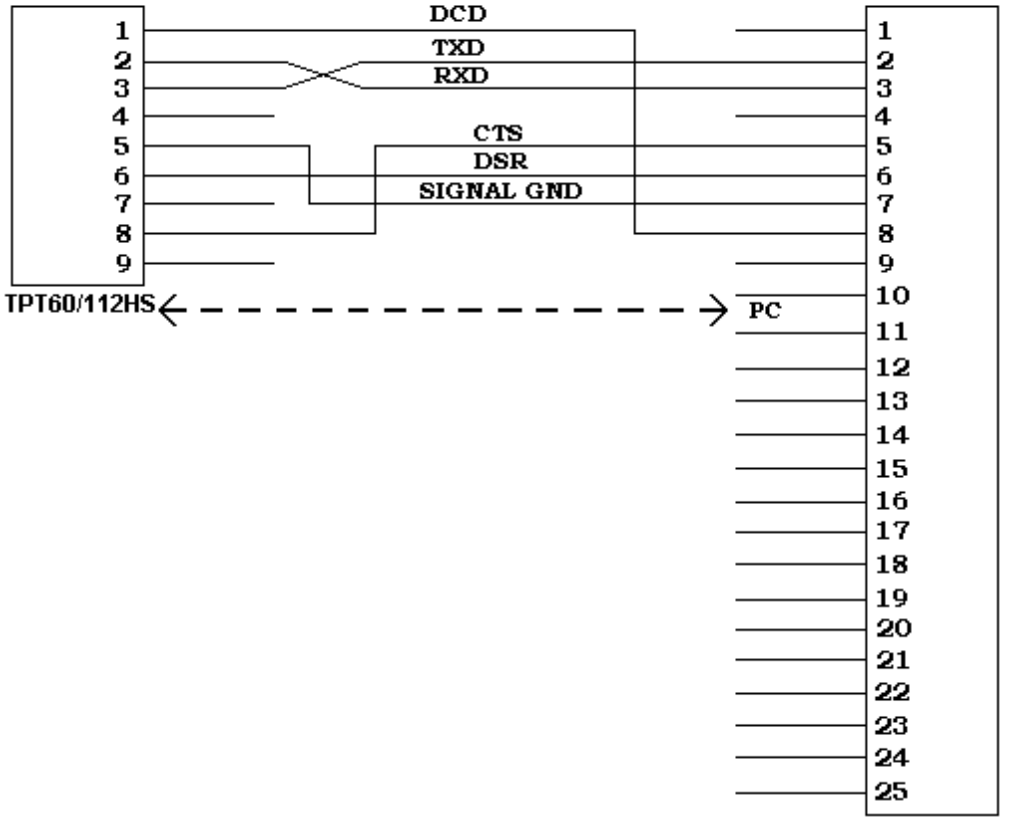
RS232 SERIAL (TPT60/112HS)

The signals on the rectangular female 9-pin connector are shown in the following table :

PIN	Signal	Direction	To	Description
1	DCD	OUT	DCD	Data Carrier Detect. Printer On
2	TXD	OUT	RXD	Receive Data. Serial output (from Host)
3	RXD	IN	TXD	Transmit Data. Serial data input (towards Host)
4	-	-	-	Not connected
5	GND	-	GND	Signal ground
6	DSR	OUT	DSR	Data Set Ready. Printer on and operating
7	-	-	-	Not connected
8	RTS	OUT	CTS	Clear To Send. Ready to receive data
9	-	-	-	Not connected

The following diagrams illustrate some connection examples between printer and Personal Computer, with 9 and 25-pin connectors respectively.





PARALLEL PORT (TPT60/112HP)

The signals on the rectangular female 25-pin connector are shown in the following table :

NO.	SIGNAL	FUNCTION
1	STROBE	Strobe input
2	D0	Data input bit 0
3	D1	Data input bit 1
4	D2	Data input bit 2
5	D3	Data input bit 3
6	D4	Data input bit 4
7	D5	Data input bit 5
8	D6	Data input bit 6
9	D7	Data input bit 7
10	ACK	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	VCC	VCC
14		
15	VCC	VCC
16	RESET	Printer reset
17	GND	GND
18		
19	GND	GND
20	GND	GND
21	GND	GND
22	GND	GND
23	GND	GND
24	GND	GND
25	GND	GND

For the parallel connector, the connection between printer and Personal Computer, must be made with a 25-pin-to-pin connector.

J5 POWER SUPPLY

NO.	SIGNAL	FUNCTION
1	GND	GND
2	VCC	Power 24 Vcc

J1 HEAD CONNECTOR

NO.	SIGNAL	FUNCTION	NO.	SIGNAL	FUNCTION
1	COM	Thermal head common	**2**	COM	Thermal head common
3	COM	Thermal head common	**4**	GND	GND
5	GND	GND	**6**	GND	GND
7	SI	Serial data input	**8**	SO	Serial data input
9	CLOCK	Synchronous data clock	**10**	GND	GND
11	LATCH	Data latch	**12**	GND	GND
13	STR5	Strobe 5	**14**	VDD	Thermal head power (+5v)
15	STR3	Strobe 3	**16**	STR4	Strobe 4
17	STR1	Strobe 1	**18**	STR2	Strobe 2
19	TM	Thermistor	**20**	TM	Thermistor
21	GND	GND	**22**	GND	GND
23	GND	GND	**24**	COM	Thermal head common
25	COM	Thermal head common	**26**	COM	Thermal head common

J2 MOTOR CONNECTOR

NO.	SIGNAL	FUNCTION	COLOUR
1	Φ1	Phase 1	Black
2	Φ 2	Phase 2	Yellow
3	Φ 3	Phase 3	Brown
4	Φ 4	Phase 4	Orange
5	COM	Common	Red
6	COM	Common	Red

J3 SENSOR CONNECTOR

NO.	SIGNAL	FUNCTION	COLOUR
1	Collector	Paper end detection 1: Penetrative type	Red
2	Emitter	Paper end detection 1: Penetrative type	Yellow
3	Anode	Paper end detection 1: Penetrative type	Blue
4	Cathode	Paper end detection 1: Penetrative type	Green
5	Emitter	Paper end detection 2	Yellow
6	Cathode	Paper end detection 2	Green
7	Anode	Paper end detection 2	Blue
8	Collector	Paper end detection 2	Red
9	Switch	Head open detection switch	White
10	Switch	Head open detection switch	White
11	Switch	Head up detection switch	White
12	Switch	Head up detection switch	White

J4 CUTTER CONNECTOR

NO.	SIGNAL	COLOUR
1	MOTOR +	RED
2	MOTOR -	BLACK
3	SWITCH	WHITE
4	SWITCH	WHITE

J6 EXTERNAL SENSOR CONNECTOR

NO.	SIGNAL	FUNCTION
1	+5 Vdc	Logic 5 Vdc
2	Ejector movement	Movement sensor input
3	Ticket presence	Ticket sensor input
4	GND	GND
5	External nick	External sensor input
6	GND	GND
7	Ejector motor +	
8	Ejector motor -	

Automatic Dispenser (optional module)

The product is an automatic dispenser for paper tickets and it is specially indicated in the following systems :

- Paying car parks
- Motorways
- Kiosks
- Self-service systems.

After printing and cutting the ticket, the printer places it in the automatic dispenser.

At this point the tickets can either be totally ejected at a speed of 1mt./sec or simply protende from the paper slit by a length wich is adjustable.

If the ticket is gently pulled, the dispenser's servo-motor will eject it.

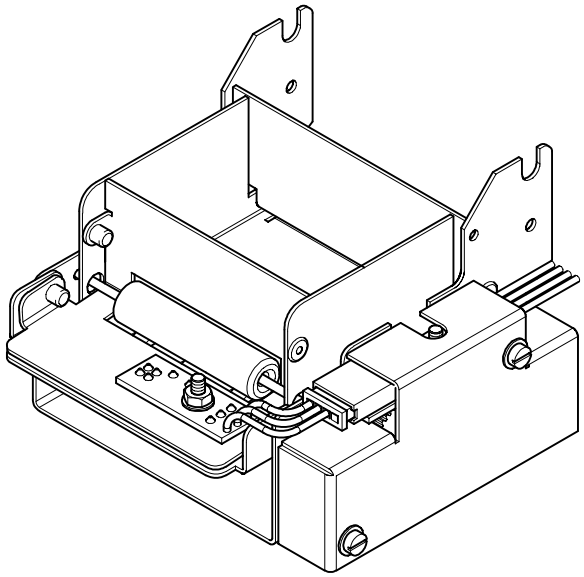
This servo-motor electronic system is patented worldwide :

Patented B.I. n° BO97A30750

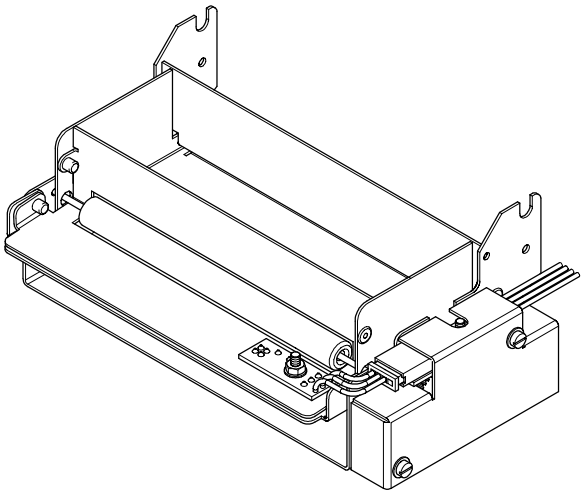
TECHNICAL CHARACTERISTICS :

Ticket Max length	1000 mm.
Ticket Min length	85 mm.
Ticket exit speed	1mt./sec.
Ticket adjustment intervals	19.43 mm.

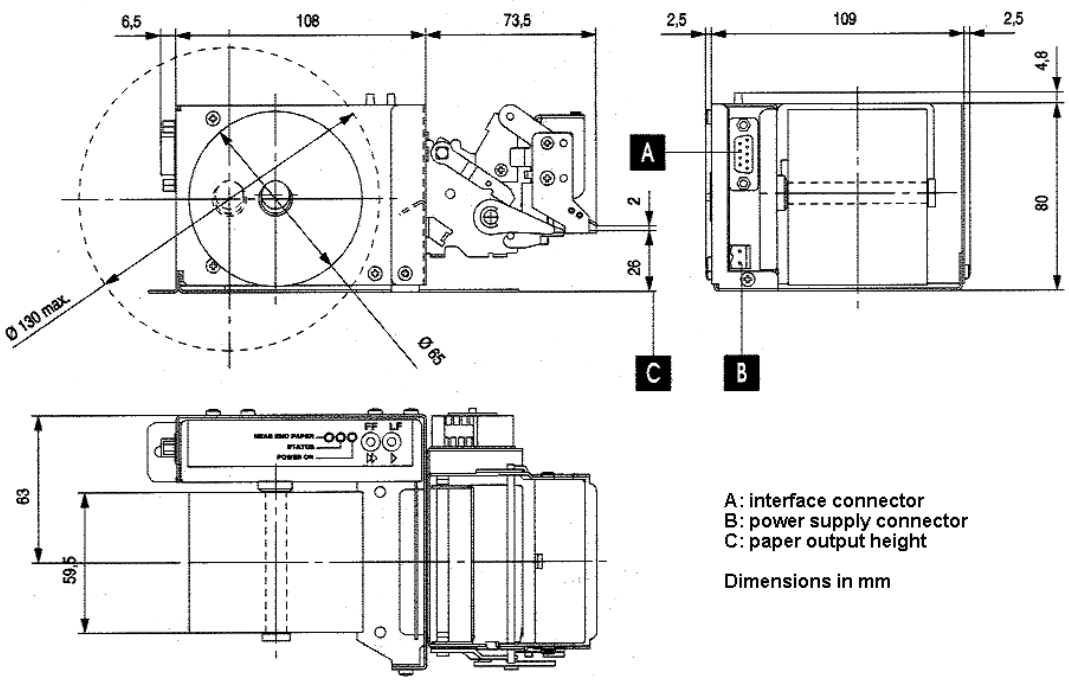
AUTOMATIC DISPENSER (MOD. AD60) FOR TPT60H



AUTOMATIC DISPENSER (MOD. AD112) FOR TPT112H



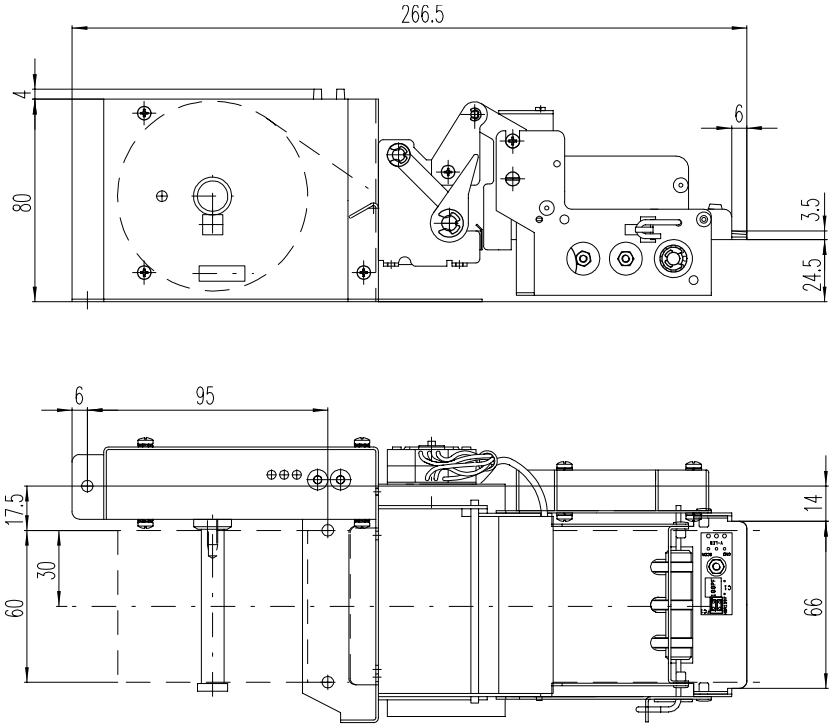
TPT60H Overall Dimensions



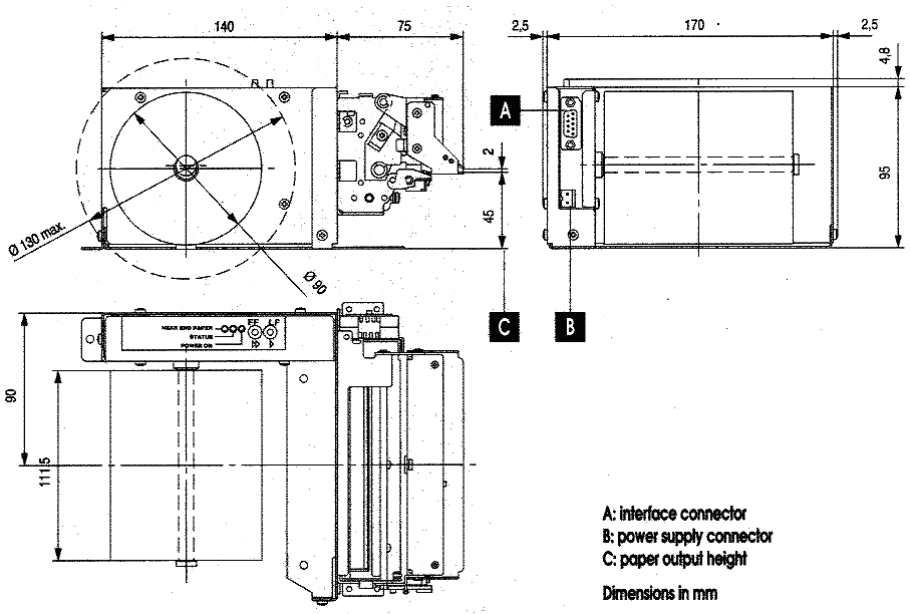
A: interface connector
B: power supply connector
C: paper output height

Dimensions in mm

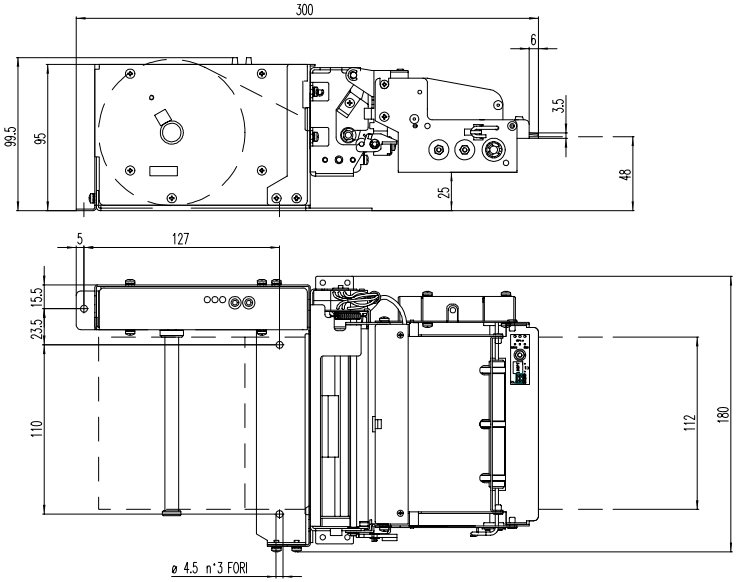
TPT60H with Ejector Overall Dimensions



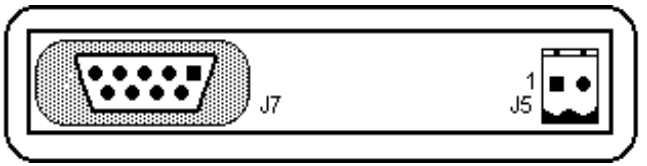
TPT112H Overall Dimensions



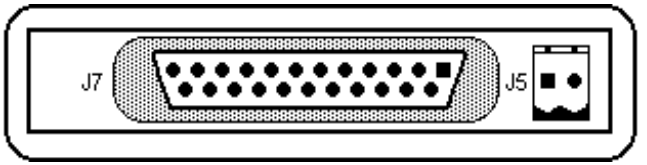
TPT112H with Ejector Overall Dimensions



REAR



TPT60/112HS



TPT60/112HP

2. CUSTOM TPTHx EMULATION COMMAND DESCRIPTION

The following table lists all the commands for function management in Custom Emulation of the TPT60H 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 executed. There are no commands with priority status; all the commands are carried out when the circular buffer is free to do so.

Command	Name
LF	Line feed
VT	Vertical tab
FF	Form feed
CR	Carriage return
CAN	Cancels line buffer
ESC !	Selects printing mode
ESC #	Receives date in graphic page
ESC $	Sets bar code print position
ESC %	Prints graphic page
ESC *	Sets bit image mode
ESC +	Prints in semi-graphic mode
ESC 4	Sets/resets script mode
ESC =	Enables form feed key
ESC ?	Requests printer setting
ESC @	Resets the machine
ESC A	Moves stepping motor
ESC D	Sets default paper sensitivity
ESC F	Copies flash bank into ram bank
ESC G	Selects double-strike mode
ESC N	Sets negative mode
ESC P	Fills ram bank from port (16384 BYTES)
ESC R	Sets font in use
ESC S	Sets paper sensitivity in use
ESC U	Sets underline mode
ESC V	Sets print mode rotated by 90°
ESC W	Prints a graphic dotline
ESC Z	Sets form feed steps number
ESC \	Sets relative print position
ESC a	Selects justification
ESC c 4	Selects paper sensor to stop printing
ESC c 5	Enables/disables panel buttons
ESC d	Forward feeds n lines
ESC f	Sets default font
ESC g	Sets/resets red printing mode
ESC i	Cuts paper completely
ESC m	Cuts paper partially
ESC r	Copies ram bank into flash bank
ESC s	Sends ram bank to port
ESC v	Status request
ESC z	Sets vtab value
ESC {	Sets reverse print
ESC |	Cancels graphic page
ESC ·	Prints graphic bank
ESC ¹	Transmits ram bank to serial port
ESC ³	Transfers flash bank into ram bank
ESC ²	Receives ram bank from serial port
ESC ¦	Transfers ram bank into flash bank
GS :	Sets starting/end of macro definition
GS C 0	Selects counter print mode
GS C 1	Selects count mode (A)
GS C 2	Sets counter
GS C ;	Selects count mode (B)
GS H	Selects HRI print position
GS I	Transmits printer ID
GS P	Sets horizontal and vertical motion units
GS ^	Executes macro
GS c	Prints counter
GS e	Ejects ticket commands
GS h	Selects bar code height
GK k	Prints a bar code
GS w	Selects bar code width

TICK MARKS LEGEND :

the table listed above, the commands marked with this symbol, apply to the serial interface only.

The symbol Ⓐ indicates TPT60Hx.

The symbol Ⓑ indicates TPT112Hx.

Description of the paths:

XXX Command.
[Name] Command name
[Format]Code sequence.
In this description, < >H is for an hexadecimal number, < >A for an ASCII character, < > is for a decimal number and < >B a binary number.
[ ] k is for the contents of [ ] which can be repeated k times.
[Range] Describes the range of the contents.
[Description] Description of the command function.
[Notes] (Included only if necessary).
[Default] Commands default value.
[Reference] References for linked commands.
[Example] Example for use of 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] The command sets the print position at the beginning of the line.
[Default]
[Reference] **ESC 1, ESC 2**
[Example]

VT

[Name] Vertical Tab
[Format] ASCII VT
Hex 0B
Decimal 11
[Description] When this character is received, the paper forward feeds by “n” lines (default value: 10). This value can be modified by using the command “ESC z”. When the printer is next inizialized, the default value is reset.
[Notes]
[Default]
[Reference]
[Example]

FF

[Name] Form Feed
[Format] ASCII FF
Hex 0C
Decimal 12
[Description] If the buffer contains any characters, these are printed and the paper forward feeds until the detection of a reference mark on the paper, signalled by the NICK photocell. Alternatively the paper forward feeds by the number of dotlines preset by the command “ESC Z”.
[Notes]
[Default]
[Reference]
[Example]

CR

[Name] Carriage return
[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 disregarded.
[Notes] The command sets the print position at the beginning of the line.
[Default]
[Reference] **LF**
[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] The command set the print position to the beginning of the line.
[Default]
[Reference]
[Example]

ESC ! n

[Name] Select print modes
[Format] ASCII ESC ! n
Hex 1B 21 n
Decimal 27 33 n
[Range]
[Description] This command sets the print mode. Each bit of “n” is read as follows:

Bit	FUNCTION	0	1
0	n.u.		
1	n.u.		
2	Selects superscript or subscript (only for 8x16)	Superscript	Subscript
3	n.u.		
4	Double height	Cancel	Set
5	Double width	Cancel	Set
6	Quadruple height	Cancel	Set

7	Quadruple width	Cancel	Set

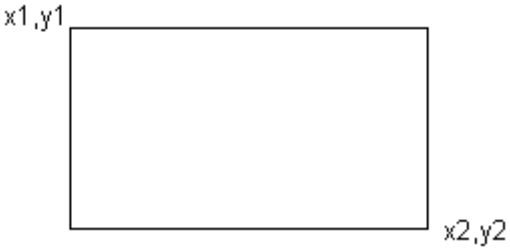
[Notes] • Height and width commands set the mode for a whole line.
[Default] n = 0
[Reference]
[Example]

ESC # n1..n8

[Name] Receives data in graphic page

[Format]					
	ASCII	ESC	#	n1	n8
	Hex	1B	23	n1	n8
	Decimal	27	35	n1	n8

[Description] This receives an array of data and arranges it in a graphic page at the given coordinates. The coordinates define the vertices of a window in which the data is stored.



x1=(n1 * 256) + n2
y1=(n3 * 256) + n4
x2=(n5 * 256) + n6
y2=(n7 * 256) + n8

The values of coordinates x1 and x2 are aligned with the byte.

[Notes]
[Default]
[Reference]
[Example]

ESC $ n1 n2

[Name] Sets the print position of the Bar Code

[Format]					
	ASCII	ESC	$	n1	n2
	Hex	1B	24	n1	n2
	Decimal	27	36	n1	n2

[Range]
[Description] The bar code is printed at position (n1*256) + n2. If the value exceeds Ⓐ 448 Ⓑ 832, it is rejected.
[Notes] Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx
[Default]
[Reference]
[Example]

ESC % n1 n2

[Name] Prints the graphic page

[Format]					
	ASCII	ESC	$	n1	n2
	Hex	1B	25	n1	n2
	Decimal	27	37	n1	n2

[Range]
[Description] This prints the graphic page starting from the beginning for a number of lines equal to (n1 * 256) + n2; if the number is higher than the lines available (Ⓐ292 Ⓑ157), it prints the entire page.
[Notes] Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx
[Default]
[Reference]
[Example]

ESC * m nL nH [d1... dk]

[Name] Select bit image-mode.

[Format]						
	ASCII	ESC	*	m	nL	nH
	Hex	1B	2A	m	nL	nH
	Decimal	27	42	m	nL	nH

[Range] m = 0, 1 ,32, 33
0 ≤ nL ≤ 255
0 ≤ nH ≤ Ⓐ3 Ⓑ 9
0 ≤ d ≤ 255

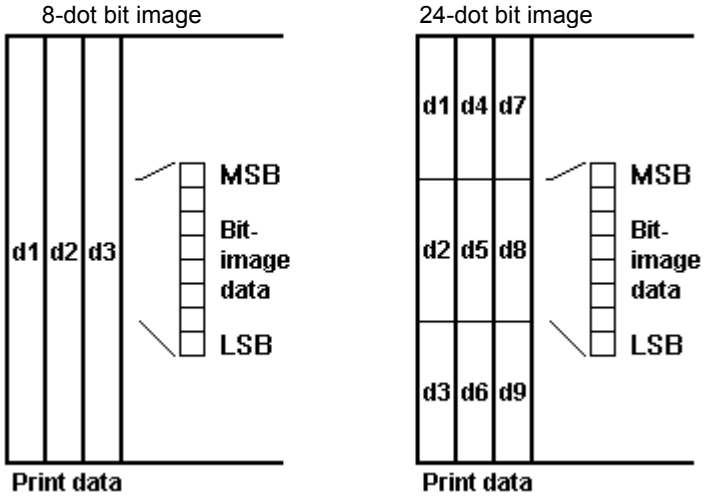
[Description] Selects a bit image-mode using *m* for the number of dots specified by *nL* and *nH*, as follows :

m	Mode	Vertical Direction		Horizontal Direction (* 1)	
		N. Dots	DPI	DPI	Number of Data (k)
0	8 dot single density	8	67	100	nL + nH × 256
1	8 dot double density	8	67	200	nL + nH × 256
32	24 dot single density	24	200	100	(nL + nH × 256)
33	24 dot double density	24	200	200	(nL + nH × 256)

[Notes]
- The *nL* and *nH* indicates the number of bytes (k).
- If the bit image data input 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, the *nL* and data following are processed as normal data.
- To print the bit image use **LF**, **CR** or **ESC d**.
- After printing a bit image, the printer return to normal data processing mode.
- This command is not affected by emphasized, double-strike, and

underline print mode (etc.), except upside down mode.

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



- Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx

[Default]
[Reference]
[Example]

ESC + n1 n2

[Name] Semi-graphic mode print

[Format]

ASCII	ESC	+	n1	n2
Hex	1B	2B	n1	n2
Decimal	27	43	n1	n2

[Range]

[Description] The bar code is printed at position (n1*256) + n2. If the value exceeds Ⓐ 448 Ⓑ 832, it is rejected.

The number of characters to be received is (n1*256) + n2.
In this mode, the bytes received are input in the line buffer at the current position of the cursor and in a different order from that of the previous command. Let's imagine that a print line consists of an array of 24 rows containing Ⓐ56 Ⓑ104 bytes each: the characters received after this command will be input starting from the top line and proceeding towards the bottom line. After 24 characters, the pointer increases and proceeds to the next position. At the Ⓐ56th Ⓑ104th position the line is printed and filling continues on the next line. Thanks to this procedure, text and graphics can be combined. In fact, if, for example, there were any characters present in the print buffer, the bytes subsequent to this command would be input in the position immediately after. Figure 1 shows a line buffer: each box corresponds to 8 dots, which on paper correspond to 1 mm, both horizontally and vertically. To fill the memory completely,
Ⓐ1344 Ⓑ2496 bytes are required. For example, to print a filled bar Ⓐ448 Ⓑ832 dots long and 24 dots high, send the following command:

Ⓐ1Bh + 2Bh + 05h + 40h + (1344* FFh)
Ⓑ1Bh + 2Bh + 09h + C0h + (2496* FFh)

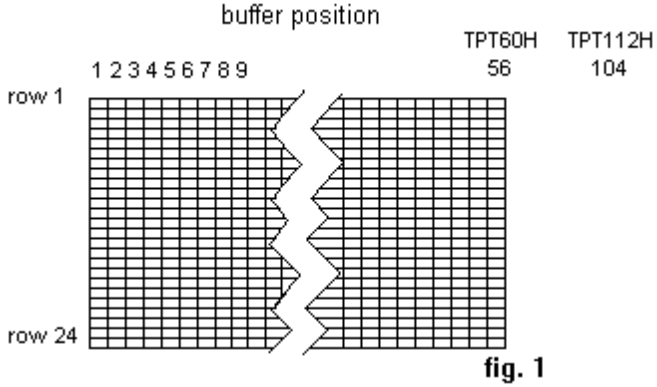


fig. 1

[Notes] Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx

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

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

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

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

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

ESC = n

[Name] Form Feed key Enable/Disable
[Format]

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

[Range]
[Description] This command is used to control the Form Feed key. Normally, when this key is pressed, the paper forward feeds until a reference mark is detected or until the steps set by the ESC + 'Z' command have been completed. When the key is released, a character FF (0Ch) is transmitted. In this way a controller can check the output of receipts with progressive number etc. directly.

n = 0 Disables the transmission - Enables the Form Feed key
n > 0 Enables the transmission when the Form Feed key is pressed.

[Notes]
[Default]
[Reference]
[Example]

ESC ? n (ONLY SERIAL INTERFACE)

[Name] Setting request
[Format]

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

[Range] $32 \le n \le 126$
[Description] This transmits two bytes, the bits of which indicate the print setting, to the serial port. The meaning of these two bytes depend on the parameter n:

n = 0

	Bit	Function	
Byte 1	0	H Mode	00= Normal
	1	H Mode	01= Double
	2	V Mode	02= Quadruple
	3	V Mode	for both Hmode and Vmode
	4		
	5	Superscr./Subscr.	00 = Superscript
			01 = Subscript
	6	Reverse	00 = Reverse OFF
	7	Rotate	00 = Rotate OFF

	Bit	Function	
Byte 2	0	Cutter Status	
	1	Paper End enable	
	2	Form Feed enable	
	3	Autofeed	
	4		0 = Font 24X32
			1 = Font 8X16 or Font 16X24
	5		
	6		
	7		

n = 1

Byte 1 Number of line feeds for VTAB
Byte 2 Analog value read on the thermal head

n = 2

Byte 1 +2 Number of dot feeds per FORM FEED

n = 3

	Bit	Function
Byte 1	0	Bar Code size
	1	Bar Code size
	2	Bar Code size
	3	HRI
	4	HRI

These bits correspond to the coding assigned with the commands GS w and GS H.

Byte 2 Bar Code height

[Notes]
[Default]
[Reference]
[Example]

ESC @

[Name] Resets the printer
[Format]

ASCII	ESC	@	
Hex	1B	40	
Decimal	27	64	

[Description] When this command is received, the printer resets, restoring the default programming and erasing the RAM.
The machine requires approx. 3 seconds from reception of the command to regain its full operating capacity.
[Notes] Same as hardware reset.
[Default]
[Reference]
[Example]

ESC A n1 n2

[Name] Moves the step motor
[Format]

ASCII	ESC	A	n1	n2
Hex	1B	41	n1	n2
Decimal	27	65	n1	n2

[Range]
[Description] This moves the paper feeding step motor by a number of steps equal to (n1*256) + n2.
[Notes]
[Default]
[Reference]
[Example]

ESC D n

[Name] Sets the default paper sensitivity
[Format]

ASCII	ESC	D	n
Hex	1B	44	n
Decimal	27	68	n

[Range]
[Description] This sets the default paper sensitivity. The paper sensitivity currently in use is also changed.

n =	00h	High
n =	01h	Normal
n =	02h	Middle
n =	03h	Low
n =	04h	Double copy

[Notes]
[Default]
[Reference]
[Example]

ESC F n

[Name] Copy flash bank into ram bank (16kbytes)
[Format]

ASCII	ESC	F	n
Hex	1B	46	n
Decimal	27	70	n

[Range] $1 \leq n \leq 6$
[Description] The value of "n" determines the flash bank :

n = 1	1st bank
n = 2	2nd bank
n = 3	3rd bank
n = 4	4th bank
n = 5	5th bank
n = 6	6th bank

If n = 0 or n > 6 the command is ignored.
[Notes]
[Default]
[Reference]
[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] $0 \leq n \leq 255$
[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.
- Printer output is the same in double-strike mode and emphasized mode.

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

ESC N n

[Name] Sets negative mode
[Format]

ASCII	ESC	N	n
Hex	1B	4E	n
Decimal	27	78	n

[Range]
[Description] Sets or cancels negative mode printing.

n = 0	Normal print
n <> 0	Negative print

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

ESC P

[Name] Fill ram bank from port (serial or parallel)

[Format]

ASCII	ESC	P	16384 bytes
Hex	1B	50	16384 bytes
Decimal	27	80	16384 bytes

[Description] This command can transfer graphic page into ram.

Ⓐ56 Ⓑ104 bytes is a horizzontal dotline of Ⓐ448 Ⓑ832 dots ; for Ⓐ292 Ⓑ157 dotlines.

The number of bytes that make graphic page are Ⓐ56x292 = 16352 Ⓑ104x157 = 16328, the other Ⓐ32 Ⓑ56 bytes must be sent, but are not important.

[Notes] Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx

[Default]

[Reference]

[Example]

ESC R n

[Name] Sets font

[Format]

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

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

[Description] It sets the font currently being used. This setting is maintained until a new command is given or the machine is reset.

n =	01h	Font 8x16
n =	02h	Font 16x24
n =	03h	Font 24x32

[Notes]

[Default]

[Reference]

[Example]

ESC S n

[Name] Sets paper sensitivity

[Format]

ASCII	ESC	R	n
Hex	1B	53	n
Decimal	27	83	n

[Range]

[Description] It sets the paper sensitivity currently in use. This setting is maintained until a new command is given or the machine is reset.

n =	00h	High
n =	01h	Normal
n =	02h	Middle
n =	03h	Low
n =	04h	Double copy

[Notes]

[Default]

[Reference]

[Example]

ESC U n

[Name] Sets underline mode

[Format]

ASCII	ESC	U	n
Hex	1B	55	n
Decimal	27	85	n

[Range]

[Description] Sets or cancels underline mode printing.

n = 0	Normal print
n <> 0	Underline mode

[Notes]

[Default]

[Reference]

[Example]

ESC V n

[Name] Sets the print mode rotated by 90°

[Format]

ASCII	ESC	V	n
Hex	1B	56	n
Decimal	27	86	n

[Range]

[Description] Sets or cancels the 90° rotation print flag according to “n”.

n = 0	Normal print
n <> 0	Rotated print

The direction of the rotation depends on the reverse bit.

[Notes]

[Default]

[Reference]

[Example]

ESC W Ⓐ56 bytes Ⓑ104 bytes

[Name] Prints a graphic dotline

[Format]

ASCII	ESC	W	Ⓐ56 bytes	Ⓑ104 bytes
Hex	1B	57	Ⓐ56 bytes	Ⓑ104 bytes
Decimal	27	87	Ⓐ56 bytes	Ⓑ104 bytes

[Range]

[Description] This command prints a dotline (Ⓐ448 Ⓑ832 dots) after the Ⓐ56 Ⓑ104 bytes and feeds.

[Notes] Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx

[Default]

[Reference]

[Example]

ESC Z n1 n2

[Name] Sets the number of steps for form feed

[Format]

ASCII	ESC	Z	n1	n2
Hex	1B	5A	n1	n2
Decimal	27	90	n1	n2

[Description] When the printer receives an FF (0Ch) character, or when the FF key is pressed, the paper forward feeds until the photocell finds a reference point or up to the distance preset in the Eeprom. The default value, which is 240 (30 mm), can be modified by the user. The number of steps is given by (n1*256) +n2.
The set value is stored in the Eeprom, and continues to be stored even when the printer is switched off.

[Notes]
[Default]
[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
[($nL + nH \times 256$) × (horizontal or vertical motion unit)].

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

[Default]
[Reference] **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 to the specified position.
n selects the type of justification as follows :

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

[Notes]
- The command is enabled only when input at the beginning of the line.
- Lines are justified within the specified printing area.
- Spaces set by **HT**, and **ESC ** are all justified.

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

Left justification

ABC
ABCD
ABCDE

Centering

ABC
ABCD
ABCDE

Right justification

ABC
ABCD
ABCDE

ESC c 4 n

[Name] Select paper sensor to stop printing

[Format]

ASCII	ESC	c	4	n
Hex	1B	63	34	n
Decimal	27	99	52	n

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

[Description] Selects the paper sensor used to stop printing when a near paper-end is detected, using *n* as follows :

Bit	Off/On	Hex	Decimal	Function
0	Off On	00 01	0 1	Paper roll end sensor enabled. Paper roll near-end sensor enabled.
1	-	-	-	Undefined
2	-	-	-	Undefined
3	-	-	-	Undefined
4	-	-	-	Undefined
5	-	-	-	Undefined
6	-	-	-	Undefined
7	-	-	-	Undefined

[Notes]
- When a near paper-end is detected, printing stops after printing the current line and feeding the paper.

- The paper roll near-end sensor is enabled when either bit 0 is 1.
- This setting is not cleared by printer resetting, because it is stored in the Eeprom.

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

ESC c 5 n

[Name] Enable/disable panel buttons.

[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 panel buttons.
- When the LSB of *n* is 0, the panel buttons are enabled.
- When the LSB of *n* is 1, the panel buttons are disabled.

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

[Default] n = 0
[Reference]
[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 print starting position at the beginning of the lines.
- The maximum paper feed legth is 200 lines. Even if a paper feed length of more than 200 lines is set, the printer feeds the paper by 200 lines only.

[Default]
[Reference]
[Example]

ESC f n

[Name] Sets the default font

[Format]			
ASCII	ESC	f	n
Hex	1B	66	n
Decimal	27	102	n

[Range]
[Description] This sets the default font. The font currently in use is also changed.
n = 01h Font 8x16
n = 02h Font 16x24
n = 03h Font 24x32

[Notes]
[Default]
[Reference]
[Example]

ESC g n

[Name] Set/Reset red printing mode.

[Format]			
ASCII	ESC	g	n
Hex	1B	67	n
Decimal	27	103	n

[Range] $0 \le n \le 1, 48 \le n \le 49$
Description] Sets and resets negative mode

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

[Notes]
- The printer prints red for a complete line only, and not for single characters.
- The printer prints red only if enabled by setup.

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

ESC i

[Name] Total cut.

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

[Description] This command enables the cutter; if there is no cutter, a disabling flag is set and any subsequent cut commands will be ignored.
[Notes]
- The printer waits to complete all paper movement commands, before executing the total cut.
- With TPT112H, the kind of cutter sets total or partial cut.

[Default]
[Reference]
[Example]

ESC m (ONLY TPT60H VERSION)

[Name] Partial cut.

[Format]		
ASCII	ESC	m
Hex	1B	6D
Decimal	27	109

[Description] This command enables partial cutting; if there is no cutter, a disabling flag is set and any subsequent cut commands will be ignored.
[Notes]
- The printer waits to complete all paper movement commands, before executing partial cut.

[Default]
[Reference]
[Example]

ESC r n

[Name] Copy ram bank into flash bank (16kbytes)

[Format]

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

[Range]

[Description] The value of "n" determines the flash bank :

n = 1	1st bank
n = 2	2nd bank
n = 3	3rd bank
n = 4	4th bank
n = 5	5th bank
n = 6	6th bank

If n = 0 or n > 6 the command is ignored.
For about 1 sec. the printer does not receive characters or commands.
The serial version (TPT60S4) return :
77h if flash memory is not programmed
88h if flash memory is not erased
AAh if flash memory is programmed.

[Notes]
[Default]
[Reference]
[Example]

ESC s (ONLY SERIAL INTERFACE)

[Name] Sends RAM bank to port (16kbytes)

[Format]

ASCII	ESC	s	
Hex	1B	73	
Decimal	27	115	

[Description] This command sends the 16384 RAM bytes to the serial port.
[Notes]
[Default]
[Reference]
[Example]

ESC v (ONLY SERIAL INTERFACE)

[Name] Status request

[Format]

ASCII	ESC	v	
Hex	1B	76	
Decimal	27	118	

[Description] This transmits a byte, the bits of which indicate the status of the machine, to the serial port.

Bit	FUNCTION
0	Paper Almost Out Photocell
1	Nick photocell
2	Paper Presence
3	Line Feed key
4	Form Feed key
5	Over-Heat flag
6	Motor ON
7	Error due to Paper End, Head Up etc.

[Notes] This command is executed immediately (full buffer too)
[Default]
[Reference]
[Example]

ESC z

[Name] Set the vertical tab value

[Format]

ASCII	ESC	z	
Hex	1B	7A	
Decimal	27	122	

[Description] Sets the number of feed lines when a vertical tab. character is received.
The default value on switching on the printer is 10.
The set value is valid until the printer is next initialized.

[Notes]
[Default]
[Reference]
[Example]

ESC { n

[Name] Sets reverse print mode

[Format]

ASCII	ESC	{	n
Hex	1B	7B	n
Decimal	27	123	n

[Description] This sets or cancels the reverse print flag according to "n".

n = 0	Normal printing
n <> 0	Reverse printing

[Notes]
[Default]
[Reference]
[Example]

ESC |

[Name] Cancels the graphic page

[Format]

ASCII	ESC	|	
Hex	1B	7C	
Decimal	27	124	

[Description] This cancels the graphic page.

[Notes]
[Default]
[Reference]
[Example]

ESC · n xH xL yH yL

[Name] Print graphic bank (Ⓐ448 × 585 dots Ⓑ832x315).

[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] Print graphic bank from flash or ram.
n selects the bank as follows :

n	Function
0	Print ram 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 Ⓑ1 ÷ 315).
yL + y*H* × 256 specifies the number of lines to print.

[Notes]
- If (*xL* + (*xH* × 256)) > Ⓐ585 Ⓑ 315 the printer does not execute the command.
- If(*xL* + (*xH* × 256) + *yL* +(y*H* × 256))> Ⓐ585 Ⓑ 315 the printer prints only Ⓐ585 Ⓑ 315 - *xL* + (*xH* × 256) +1 dotlines.
- If *n*=0 the checking will not be executed on the *x* and *y* limit values, allowing to print 64Kb RAM bank.
- Ⓐ indicates TPT60Hx Ⓑindicates TPT112Hx

[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 (ONLY 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 Ⓑ832 horizontal dots (Ⓐ56 Ⓑ104 bytes/dotline) × Ⓐ585 Ⓑ315 vertical dots (32760 bytes = 16380 words).
- Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx

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

ESC ³ n

[Name] Transfer 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 ram bank from serial 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 the serial port and puts them into the ram bank.

[Notes]
- The number of data bytes received is [*nL* + (*nH* × 256)] × 2.
- Every word, the printer receives first MSByte and then LSByte
- If [*nL* + (*nH* × 256)] exceeds 16384, the data following is processed as normal data.

• An horizontal dotline is represented by Ⓐ28 Ⓑ 52 words.

[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] 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 :

[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 receiving during normal operation. Macro definition ends when this command is received during macro definition.
- When **GS ^** is received during macro definition, the printer ends macro definitions and clears all definitions.
- Macro is not defined when the power is turned on.
- The defined contents of the macro are not cleared by **ESC @**. Therefore, **ESC @** can be included in the contents of the macro defintions.
- If the printer receives **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 2048 bytes. If the macro definition exceeds 2048 bytes excess data is not stored.

[Default]
[Reference] **GS ^**
[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 ≤ n ≤ 5
m = 0, 1, 2, 48, 49, 50
[Description] Selects a print mode for the serial number counter.
- *n* specifies the number of digit 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* has no meaning.

[Default] *n* = 0, *m* = 0
[Reference] **GS C 1, GS C 2, GS C ;, GS c**
[Example]

n = 3, m = 0

☐☐1

n = 3, m = 1

001

n = 3, m=2

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* or *bL*, *bH* specify the counter range.
- *n* indicates 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's 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's resumed with the maximum value.
- When this 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 for '0' to '9'.
- *sa* and *sb* specify the counter range.
- *sn* indicates the stepping amount for counting up or down.
- *sr* indicates the repetition number when 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 value is *sb*. If counting up reaches a value exceeding the maximum, it's 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 minimum, it's 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**.
- Parameter *sa* to *sc* can be omitted. If omitted, these argument values are unchanged.
- Parameter *sa* to *sc* must not contain characters, except '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) characters
[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	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 (ONLY SERIAL INTERFACE)

[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.	05H (TPT60H) 06H (TPT112H)
2, 50	Type ID.	Refer to table below
3, 51	ROM version ID.	Depends on ROM version (4 char)

n = 2, Type ID

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Two byte character codes not supported
1	Off On	00 02	0 2	Autocutter not equipped Autocutter equipped
2	Off On	00 04	0 4	Non-label thermal paper Label thermal paper
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed to Off
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off On	00 80	0 128	Custom TPT Emulation ESC/POS Emulation

[Notes] • This command is executed when the data is processed in the receive buffer. Therefore, there may be a time lag between receiving the command and transmitting the status, depending on the receive buffer status.
[Default]
[Reference]
[Example]

GS P x y

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

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

[Range] x = 100, 200
y = 100, 200
[Description] Sets the horizontal and vertical motion units to 1/x inch and 1/y inch, respectively.
When *x* is set to 0, the default setting value is used.
When *y* is set to 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*, regardless of character rotation (upside-down or 90° clockwise rotation) :
① Command using *x* : **ESC SP, ESC $, ESC \, GS L, GS W**.
② Command 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] $0 \le r, t \le 255$
$0 \le m \le 1$
[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 $t \times 100$ 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 by *t*.
When LSB of *m* = 1, after waiting for the period specified by *t*, the LED indicator blinks and the printer waits for the FORM 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 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 definition is cleared.

- If the macro is not defined or if *r* is 0, nothing is executed.
- When the macro is executed by pressing the FORM FEED button (*m* = 1), paper can not be fed by using the FORM 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 e n [m] [l]

[Name] Eject ticket commands
[Format]

ASCII	GS	e	n	[m]	[l]
Hex	1D	65	n	[m]	[l]
Decimal	29	101	n	[m]	[l]

[Range] $1 \le n \le 7$
[Description] This command controls the ticket dispenser

n = 1 Dispenser motor off
n = 2 Dispenser motor on
n = 3 ticket ejecting with m steps (1 step = 22 mm)
n = 4 ticket catch
n = 5 ticket expulsion
n = 6 transmit ejector byte status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not near paper end
	On	01	1	Near paper end
1	Off	00	0	Not used. Fixed to Off
2	Off	00	0	Paper end sensor.
	On	04	4	Paper is present.
3	Off	00	0	Ticket out
	On	08	8	Ticket present on ejector mouth
4	Off	00	0	Printer step motor off
	On	10	16	Printer step motor on
5	Off	00	0	Dispenser motor off
	On	20	32	Dispenser motor on
6	Off	00	0	No error
	On	40	64	Error occurs.
7	Off	00	0	Not used. Fixed to Off

n = 7 set ticket max length :
The ticket max length is [(*m**256+l) * (vertical motion unit)] inches.

[Notes] *m* must be sent with *n* = 3,7;
l must be sent with *n* = 7;
if *n*=3 and the ticket is not cut yet, before to execute the command a total cutting will be make.
[Default] Max ticket length *m**256+*l* = 2000 (25 cm)
[Reference]
[Example]

GS h n

[Name] Set bar code heght
[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.
The value of *n* determines bar code height in 1/8 mm units.
The minimum value is 8 (1 mm) and the maximum value is 255 (31.8 mm).
[Notes]
[Default] n = 96 (12 mm)
[Reference] **GS k**
[Example]

GS k n *<HRI>* CR

[Name] Prints a Bar Code
[Format]

ASCII	GS	k	n	<HRI>	CR
Hex	1D	6B	n	<HRI>	0D
Decimal	29	107	n	<HRI>	13

[Range]
[Description] The value of “n” determines the type of bar code to be printed.
n = 1 UPC-E
n = 2 EAN 13
n = 3 EAN 8
n = 4 CODE 39 (max 12 char)
n = 5 ITF (Interleaved 2 of 5) (max 22 char)
n = 6 CODEBAR (max 16 char)
n = 7 UPC-A
Rotate command have no effect on bar code printing.
[Notes]
[Default]
[Reference] **GS h**
[Example]

GS v (ONLY SERIAL INTERFACE)

[Name] Extended status request.
[Format]

ASCII	GS	v	
Hex	1D	76	
Decimal	29	118	

[Description] This command transmits two byte, the bits shows th printer status on the serial port.
First byte:

Bit	FUNCTION
0	Paper Almost Out Photocell
1	Nick photocell
2	Paper Presence
3	Line Feed key
4	Form Feed key
5	Over-Heat flag
6	Motor ON
7	Error due to Paper End, Head Up etc.

Second byte:

Bit	FUNCTION
0	Printing
1	Head up
2	Outside notch
3	Ticket on the exit mouth
4	ON ejector motor
5	Not Used
6	Not Used
7	Not Used

[Notes] This command is executed immediately (full buffer too)
[Default]
[Reference]
[Example]

GS w n

[Name] Set bar code width.
[Format]

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

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

3. ESC/POS™ COMMAND DESCRIPTION

The following table lists all the commands for function management in ESC/POS™ Emulation of the TPT60/112H 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 executed. There are no commands with priority status; all the commands are carried out when the circular buffer is free to do so.

Command	Name
HT	Horizontal tab
LF	Print and line feed
BS	Back space
CR	Print and carriage return ✹
DLE EOT	Real-time status transmission
CAN	Cancel print data in page mode
ESC SP	Set character right-side spacing
ESC !	Set print mode
ESC $	Set absolute position
ESC %	Select/cancel user-defined character set
ESC &	Define user-defined characters
ESC *	Set bit image mode
ESC -	Turn underline mode on/off
ESC 0	Select 1/8-inch line spacing
ESC 2	Set 1/6-inch line spacing
ESC 3	Set line spacing using minimun units
ESC 4	Set/reset script mode
ESC =	Select device
ESC ?	Cancel user-defined characters
ESC @	Initialize printer
ESC D	Set horizontal tab positions
ESC E	Select emphasized mode
ESC G	Select double-strike mode
ESC J	Print and feed paper using minimum units
ESC R	Select international character set
ESC \	Set relative print position
ESC V	Turn 90° clockwise rotation mode on/off
ESC a	Select justification
ESC c 4	Select paper sensor to stop printing
ESC c 5	Enable/disable panel buttons
ESC d	Print and feed paper *n* lines
ESC i	Total cut
ESC m	Partial cut
ESC r	Set/reset red printing mode
ESC t	Select character code table
ESC x	Select speed/quality mode
ESC v	Transmit paper sensor status ✹
ESC {	Set/cancel upside-down character printing
ESC ·	Print graphic bank
ESC ¹	Transmit ram bank to serial port ✹
ESC ³	Transfer flash bank into ram bank
ESC ²	Receive ram bank from serial port
ESC ¦	Transfer ram bank into flash bank
GS !	Select character size
GS :	Set starting/end of macro definition
GS B	Turn white/black reverse printing mode on/off
GS C 0	Select counter print mode
GS C 1	Select count mode (A)
GS C 2	Set counter
GS C ;	Select count mode (B)
GS H	Select printing position of HRI characters
GS I	Transmit printer ID ✹
GS L	Set left margin
GS P	Set horizontal and vertical motion units
GS W	Set printing area width
GS ^	Execute macro
GS c	Print counter
GS e	Ejects ticket commands
GS f	Select font for HRI characters
GS h	Select height of bar code
GS k	Print bar code
GS r	Transmit status ✹
GS w	Select horizontal size (magnification) of bar code
GS ~	Set superscript/subscript
GS |	Set printing density

TICK MARKS LEGEND :

In the table listed above, the commands signed with this simbol, are defined only for the serial interface.

✹

The symbol Ⓐ indicates TPT60Hx.

The symbol Ⓑ indicates TPT112Hx.

Description of the paths:

XXX Command.
[Name] Command name
[Format]Code sequence.
In this description, < >H is for an hexadecimal number, < >A for an ASCII character, < > is for a decimal number and < >B a binary number.
[ ] k is for the contents of [ ] which can be repeated k times.
[Range] Describes the range of the contents.
[Description] Description of the command function.
[Notes] (Included only if necessary).
[Default] Commands default value.
[Reference] References for linked commands.
[Example] Example for use of command.

HT

[Name] Horizontal tab
[Format] ASCII HT
Hex 09
Decimal 9
[Description] Moves the print position to the next horizontal tab position. This command is ignored unless the next horizontal tab position has been set.
[Notes]
- Horizontal tab positions are set using **ESC D**.
- If the command is received when the printing position is at the right margin, the printer executes print buffer full printing and horizontal tab processing from the beginning of the next line.

[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] The command sets the print position to the beginning of the line.
[Default]
[Reference] **ESC 2, ESC 3**
[Example]

BS

[Name] Back space
[Format] ASCII BS
Hex 08
Decimal 8
[Description] Moves print position to previous character.
[Notes] This command can put two character at the same position.
[Default]
[Reference]
[Example]

CR

[Name] Carriage return
[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 disregarded.
[Notes] The command sets the print position at the beginning of the line.
[Default]
[Reference] **LF**
[Example]

DLE EOT n (ONLY SERIAL INTERFACE)

[Name] Real-time status transmission
[Format] ASCII DLE EOT n
Hex 10 04 n
Decimal 16 4 n
[Range] $1 \le n \le 4$
[Description] Transmits the selected printer status specified by **n** in real time, 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 in receive buffer full state.
- The status is transmitted whenever the data sequence of 10H 04H n($1 \le n \le 4$) is received.

[Default]
[Reference] See following tables.
[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	Not used. Fixed at Off.
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	0	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 occurs.
7	Off	0	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 occurs.
7	Off	0	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 t On.
2,3	Off	00	0	Paper adeguate.
	On	0C	12	Near paper end
4	On	10	16	Not used. Fixed at On.
5,6	Off	00	0	Paper adeguate.
	On	60	96	Near paper end
7	Off	0	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] The command set the print position at the beginning of the line.
[Default]
[Reference]
[Example]

ESC SP n

[Name] Set right-side character spacing
[Format] ASCII ESC SP n
Hex 1B 20 n
Decimal 27 32 n
[Range] $0 \le n \le 255$
[Description] Sets the character spacing for the right side of the character to [n × horizontal or vertical motion units].
[Notes]
- The right character spacing for double-width mode is twice the normal value.

When the characters are enlarged, the right side character spacing is m (2 or 4) times the normal value.

- The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current right side spacing.
- The **GS P** command 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.
- 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] Select print modes using *n* (see following tables):
[Notes]
- The printer can underline all characters, but can not underline the space set by **HT**, **ESC $**, **ESC ** and 90° clockwise rotated characters.
- When characters are enlarged with different heights on one line, the characters are aligned at the baseline or topline (see **GS ~**).
- The command reset left and right margin at default value (see **GS L**, **GS W**).
- **ESC E** can also turn on/off emphasized mode. However, the setting of the last received command is effective.
- **ESC -** can also turn on/off underline mode mode. However, the setting of the last received command is effective.
- **ESC 4** can also turn on/off script mode. However, the setting of the last received command is effective.
- **GS !** can also select character size. However, the setting of the last received command is effective.

[Default] n = 0
[Reference] **ESC -, ESC E, ESC 4, GS !**
[Example]

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character font A selected.
	On	01	0	Character font B selected.
1	-	-	-	Undefined.
2	-	-	-	Undefined.
3	Off	00	0	Emphasized mode not selected.
	On	08	8	Emphasized 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.

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 at which 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 horizzontal and vertical motion unit are specified by **GS P**.
- The **GS P** command 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 setting 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 set
[Format]

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

[Range] $0 \le n \le 255$
[Description] Selects or cancels the user-defined character set.
When the Least Significant Bit (LSB) of n is 0, the user-defined character set is cancelled.
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 cancelled, 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] Defined user-defined characters.
[Format]

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

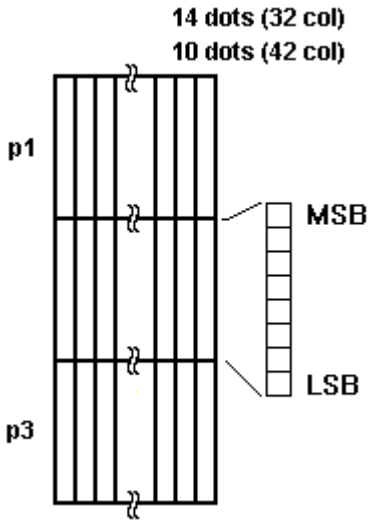
[Range] y = 3
$32 \le c1 \le c2 \le 126$
$0 \le x \le 14$ (Font 14 × 24)
$0 \le x \le 10$ (Font 10 × 24)
$0 \le x \le 8$ (Font 8 × 24)
$0 \le d1 \ldots d (y \times xk) \le 255$
$k = c2 - c1 + 1$
[Description] Defined user-defined characters.
y specifies the number of bytes in the vertical direction.

c1 specifies the 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 is in the horizontal direction from the left side. 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 0 not to print a dot.
- this command can define different user-defined character patterns by each font. To select the font, use **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 definitions 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
Hex	1B	2A	m	nL	nH
Decimal	27	42	m	nL	nH

[Range] m = 0, 1 ,32, 33
0 ≤ nL ≤ 255
0 ≤ nH ≤ Ⓐ1 Ⓑ 3
0 ≤ d ≤ 255

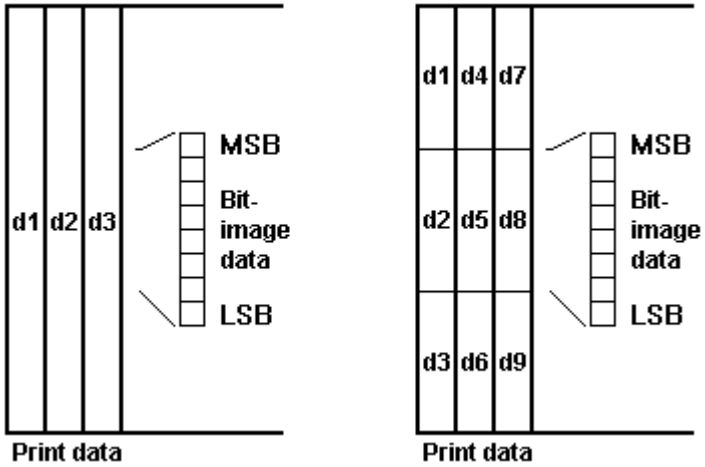
[Description] Selects a bit image-mode using *m* for the number of dots specified by *nL* and *nH*, as follows :

m	Mode	Vertical Direction		Horizontal Direction (* 1)	
		N. Dots	DPI	DPI	Number of Data (k)
0	8 dot single density	8	67	100	nL + nH × 256
1	8 dot double density	8	67	200	nL + nH × 256
32	24 dot single density	24	200	100	(nL + nH × 256) × 3
33	24 dot double density	24	200	200	(nL + nH × 256) × 3

[Notes]
- 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 input 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 0 not to print a dot.
- If the value of *m* is out of the specified range, the *nL* and data following are processed as normal data.
- If the width of the printing area set by **GS L** and **GS W** is less then the width required by the data sent with the **ESC *** command, the extra data is ignored.
- To print the bit image use **LF**, **CR**, **ESC J** or **ESC d**.
- After printing a bit image, the printer return to normal data processing mode.
- This command is not affected by emphasized, double-strike, and underline print mode (etc.), but by upside down mode only.
- The relationship between the image data and the dots to be printed is as follows :

8-dot bit image 24-dot bit image

- Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx



[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] Turn underline mode on or off, based on the following values of *n* :

n	Function
0, 48	Turns off underline mode
1, 49	Turns on underlined mode (1-dot thick)
2, 50	Turns on underlined 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* to 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 received command 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] Select 1/6-inch line spacing.
[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] $0 \le n \le 255$
[Description] Sets the line spacing to [*n* × (vertical or horizontal motion unit)] inches.
[Notes]
- The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current line spacing.
- The **GS P** command 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**, **GS P**
[Example]

ESC 4 n

[Name] Set / Reset script mode.
[Format]

ASCII	ESC	4	n
Hex	1B	34	n

	Decimal	27	52	n

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

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

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

[Notes]
- The printer can print all characters in script mode.
- When script mode is turned off by setting the value of *n* to 0 or 48, the following data is printed in normal mode.
- Script mode can also be turned on or off by using **ESC !**. Note, however, that the last received command 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] $0 \le n \le 255$

[Description] Select 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 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] $32 \le n \le 126$

[Description] Cancels user-defined characters.

[Notes]
- This command cancels the pattern defined for the character code specified by *n* . After the user-defined character is cancelled, the corresponding pattern for the internal character 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] Initialize printer.

[Format]

ASCII	ESC	@	
Hex	1B	40	
Decimal	27	64	

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

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

[Default]

[Reference]

[Example]

ESC D [n1...nk] NUL

[Name] Set horizontal tab positions.

[Format]

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

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

$0 \le K \le 32$

[Description] Sets horizontal tab positions.

n specifies the column number for setting a horizontal tab position from the beginning of the line.

k indicates the total number of horizontal tab positions to be set.

[Notes]
- The horizontal tab position is stored as a value of [character width × *n*] measured from the beginning of the line. The character width includes the right-side character spacing, and double-width characters are set at twice the width 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 position (*k* = 32) can be set. Data exceeding 32 tab positions is processed has normal data.
- Transmit [*n*] *k* in ascending order and place a NUL code 0 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 position.
- The previously specified horizontal tab position do not change, even if the character width changes.

[Default] The default tab positions are at intervals of 8 characters (columns 9, 17, 25, ...) for Font A when the right-side character spacing is 0.
[Reference] **HT**
[Example]

ESC E n

[Name] Turn emphasized mode On/Off.
[Format]

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

[Range] 0 ≤ n ≤ 255
[Description] Turns emphasized mode On or Off.
- When the LSB of *n* is 0, emphasized mode is turned off.
- When the LSB of *n* is 1, emphasized mode is turned on.

[Notes]
- Only the LSB of *n* is effective.
- **ESC !** also turns on and off emphasized mode. Hower, the last received command is effective.

[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.
- Printer output is the same in double-strike mode and emphasized 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 ≤ n ≤ 255
[Description] Prints the data in the print buffer and feeds the paper [n × (vertical or horizontal motion unit)] inches.
[Notes]
- After printing is completed, this command sets the print starting position to 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 horizzontal and vertical motion unit are specified by **GS P**.
- The **GS P** command 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 31.8 mm.

[Default]
[Reference] **GS P**
[Example]

ESC R n

[Name] Select an international character set.
[Format]

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

[Range] 0 ≤ n ≤ 12
[Description] Select the international character set *n* from 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	§	^	`	é	ù	è	"
2	Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	β
3	U.K.	£	$	@	[	\	]	^	`	{	|	}	~
4	Denmark I	#	$	@	Æ	∅	Å	^	`	æ	ø	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain 1	Pt	$	@	¡	Ñ	¿	^	`	"	ñ	}	~
8	Japan	#	$	@	[	¥	]	^	`	{	|	}	~
9	Norway	#	¤	É	Æ	∅	Å	Ü	è	æ	ø	å	ü
10	Denmark II	#	$	É	Æ	∅	Å	Ü	è	æ	ø	å	ü
11	Spain 2	#	$	à	¡	Ñ	¿	é	`	í	ñ	ö	ü
12	South America	#	$	à	¡	Ñ	¿	é	ù	í	ñ	ö	ü

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

ESC V n

[Name] Turn 90° clockwise rotation mode on/off
[Format]

ASCII	ESC	V	n
Hex	1B	56	n
Decimal	27	86	n

[Range] $0 \le n \le 1, 48 \le n \le 49$
[Description] Turn 90° clockwise rotation mode on/off.
n is used as follows :

n	Function
0,48	Turns off 90° clockwise rotation mode
1,49	Turns on 90° clockwise rotation mode

[Notes]
- When underline mode is turned on, the printer does not underline 90° clockwise-rotated characters. However, underline mode can be selected.
- Double-width and double-height commands in 90° rotation mode enlarge characters in the opposite directions from double-height and double-width commands in normal mode.
- This command has no effect in page mode.
- If this command is input in page mode, the printer performs only internal flag operations.

[Default] n = 0
[Reference] **ESC !**, **ESC -**

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
[($nL + nH \times 256$) × (horizontal or vertical motion unit)].

[Notes]
- Any setting that exceeds the printable area is ignored.
- When the starting position is specified by N motion unit to the right :
$nL + nH \times 256 = N$
When the starting position is specified by N motion unit to the left (negative direction), use the complement of 65536 :
$nL + nH \times 256 = 65536 - N$
- If setting exceeds printing area width, left or right margin is set to default value.
- The horizzontal and vertical motion unit are specified by **GS P**.
- The **GS P** command 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 to the specified position.
n selects the type of justification as follows :

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

[Notes]
- The command is enabled only when input at the beginning of the line.
- Lines are justified within the specified printing area.
- Spaces set by **HT**, **ESC $** and **ESC ** are all justified.

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

Left justification

```
ABC
ABCD
ABCDE
```

Centering

```
 ABC
ABCD
ABCDE
```

Right justification

```
  ABC
 ABCD
ABCDE
```

ESC c 4 n

[Name] Select paper sensor to stop printing
[Format]

ASCII	ESC	c	4	n
Hex	1B	63	34	n
Decimal	27	99	52	n

[Range] $0 \le n \le 255$
[Description] Selects the paper sensor used to stop printing when a near paper-end is detected, using *n* as follows :

Bit	Off/On	Hex	Decimal	Function

0	Off On	00 01	0 1	Paper roll end sensor enabled. Paper roll near-end sensor enabled.
1	-	-	-	Undefined
2	-	-	-	Undefined
3	-	-	-	Undefined
4	-	-	-	Undefined
5	-	-	-	Undefined
6	-	-	-	Undefined
7	-	-	-	Undefined

[Notes]
- When a near paper-end is detected, printing stops after printing the current line and feeding the paper.
- The paper roll near-end sensor is enabled when either bit 0 is 1.
- This setting is not cleared by printer resetting, because it is stored in the Eeprom.

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

ESC c 5 n

[Name] Enable/disable panel buttons.
[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 panel buttons.
- When the LSB of *n* is 0, the panel buttons are enabled.
- When the LSB of *n* is 1, the panel buttons are disabled.

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

[Default] n = 0
[Reference]
[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 print starting position at the beginning of the lines.
- This command does not affect the line spacing set by **ESC 2** or **ESC 3**.
- The maximum paper feed length is 200 lines. Even if a paper feed amount of more than 200 lines is set, the printer feeds the paper by 200 lines only.

[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 the cutter; if there is no cutter, a disabling flag is set and any subsequent cut commands will be ignored.
[Notes]
- The printer waits to complete all paper movement commands, before executing the total cut.
- With TPT112H, the kind of cutter sets total or partial cut.

[Default]
[Reference]
[Example]

ESC m (ONLY TPT60H VERSION)

[Name] Partial cut.
[Format]

ASCII	ESC	m	
Hex	1B	6D	
Decimal	27	109	

[Description] This command enables partial cutting; if there is no cutter, a disabling flag is set and any subsequent cut commands will be ignored.
[Notes]
- The printer waits to complete all paper movement commands, before executing the partial cut.

[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 negative mode

n	Function
0, 48	Resets red printing mode
1, 49	Sets red printing mode

[Notes]
- The printer prints red only for a complete line only, and not for single characters.

• The printer prints red only if enabled by setup.
[Default] *n* = 0
[Reference]
[Example]

ESC t n

[Name] Select 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	Space page

[Notes] •
[Default] *n* = 0
[Reference] See Character Code Tables.
[Example]

ESC x n

[Name] Select speed /quality mode.
[Format]

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

[Range] $0 \le n \le 2$
[Description] Selects printing 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 (ONLY SERIAL INTERFACE)

[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 receive 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	Paper is present
	On	03	3	Paper near end.
2, 3	Off	00	0	Paper-end sensor. Paper is present.
	On	(0C)	(12)	Paper-end sensor. Paper is 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] Turns upside-down printing mode on/off.
[Format]

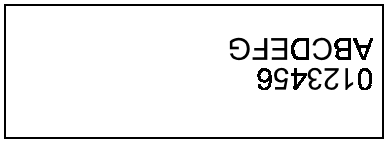
ASCII	ESC	{	n
Hex	1B	7B	n
Decimal	27	123	n

[Range] $0 \le n \le 255$
[Description] Turns upside-down printing mode on or off.
• When the LSB of *n* is 0, upside-down printing mode is turned to off.
• When the LSB of *n* is 1, upside-down printing mode is turned to on.
[Notes] • Only the LSB of *n* is effective.
• This command is enabled only when input of 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
[Example]

When upside-down mode is Off

ABCDEFG
0123456

When upside-down mode is Off



Paper Feed direction

ESC · n xH xL yH yL

[Name] Print graphic bank (Ⓐ448 × 585 dots Ⓑ832x315).
[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] Print graphic bank from flash or ram.
n selects the bank as follows :

n	Function
0	Print ram bank.
1	Print flash bank logo 1
2	Print flash bank logo 2
3	Print flash bank logo 3

$xL + xH \times 256$ specifies the starting dot line (Ⓐ1 ÷ 585 Ⓑ1 ÷ 315).
$yL + yH \times 256$ specifies the number of lines to print.

[Notes]
- If $(xL + (xH \times 256)) >$ Ⓐ585 Ⓑ 315 the printer does not execute the command.
- If($xL + (xH \times 256) + yL +(yH \times 256))>$ Ⓐ585 Ⓑ 315 the printer prints only Ⓐ585 Ⓑ 315 - $xL + (xH \times 256) +1$ dotlines.
- If *n*=0 the checking will not be executed on the *x* and *y* limit values, allowing to print 64Kb RAM bank.
- Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx

[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 (ONLY 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
  Ⓑ832 horizontal dots (Ⓐ56 Ⓑ104 bytes/dotline) × Ⓐ585
  Ⓑ315 vertical dots (32760 bytes = 16380 words).
- Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx

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

ESC ³ n

[Name] Transfer 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 ram bank from serial 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 the serial port and put them into the ram bank.
[Notes]
- The number of data bytes received is $[nL + (nH \times 256)] \times 2$.
- Every word, the printer receives first MSByte and then LSByte
- If $[nL + (nH \times 256)]$ exceeds 16384, the data following is processed as normal data.
- An horizontal dotline is represented by Ⓐ28 Ⓑ 52 words.

[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 ! 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 selction (see table 2).
- Bits 4 to 7 : character height selction (see table 1).

Table 1 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	Width
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 for HRI characters).
- If *n* is outside of the defined range, this command is ignored.
- When characters are enlarged with different heights on one line, the characters are aligned at the baseline or topline (see **GS ~**).
- **ESC !** can also select character size. 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 receiving during normal operation. Macro definition ends when this command is received during macro definition.
- When **GS ^** is received during macro definition, the printer ends macro definitions and clears all definitions.
- Macro is not defined when the power is turned on.
- The defined contents of the macro are not cleared by **ESC @**. Therefore, **ESC @** can be included in the contents of the macro defintions.
- If the printer receives **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 2048 bytes. If the macro definition exceeds 2048 bytes, excess data is 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 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, barcode, HRI characters, and spacing skipped by **HT**, **ESC $** and **ESC **.
- This command does not affect the space between lines.
- White/black reverse mode has an higher priority than underline mode. Even if underline mode is on, 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

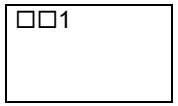
[Range] $0 \le n \le 5$
m = 0, 1, 2, 48, 49, 50
[Description] Selects a print mode for the serial number counter.
- *n* specifies the number of digits to be printed as follows :
  when *n* = 0, the printer prints the actual digits indicated by the number value.
  When *n* = 1 to 5, this command sets the number of digits to be printed.

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

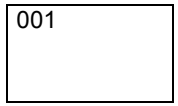
m	Printing position	Processing of digits less than those specified
0, 48	Align right	Adds spaces to the left.
1, 49	Align right	Adds '0' to the left.
2, 50	Align left	Adds spaces to the right.

[Notes] • If *n* or *m* is out of the defined range, the previously set print mode is not changed.
• If *n* = 0, *m* has no meaning.
[Default] *n* = 0, *m* = 0
[Reference] **GS C 1, GS C 2, GS C ;, GS c**
[Example]

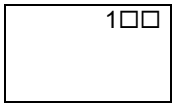
n = 3, m = 0



n = 3, m = 1



n = 3, m=2



□ 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* or *bL*, *bH* specify the counter range.
• *n* indicates 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* ≠ 0 and *r* ≠ 0
• Count-down mode is specified when :
[a*L* + (a*H* × 256)] > [b*L* + (b*H* × 256)] and *n* ≠ 0 and *r* ≠ 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's 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's resumed with the maximum value.
• When this command is executed, the internal count that indicates the repetition number specifies by *r* 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 dispalyed in ASCII character using the codes for '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 width the counter value fixed.
• *sc* indicates the counter value.
[Notes] • Count-up mode is specified when :
sa < *sb* and *sn* ≠ 0 and *sr* ≠ 0
• Count-down mode is specified when :

sa > *sb* and *sn* ≠ 0 and *sr* ≠ 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 value is *sb*. If counting up reaches a value exceeding the maximum, it's 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 minimum, it's 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**.
- Parameter *sa* to *sc* can be omitted. If omitted, these argument values are unchanged.
- Parameter *sa* to *sc* must not contain characters, except '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) characters

[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 codes.
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 (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.	05H (TPT60H) 06H (TPT112H)
2, 50	Type ID.	Refer to table below
3, 51	ROM version ID.	Depends on ROM version (4 char)

n = 2, Type ID

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Two byte character codes not supported
1	Off On	00 02	0 2	Autocutter not equipped Autocutter equipped
2	Off On	00 04	0 4	Non-label thermal paper Label thermal paper
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed at Off
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off On	00 80	0 128	Custom TPT Emulation ESC/POS Emulation

[Notes]
- This command is executed when the data is processed in the receive buffer. Therefore, there may be a time lag between receiving the command and transmitting the status, depending on the receive buffer status.

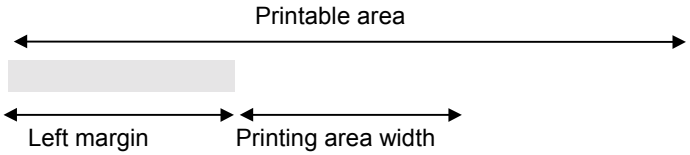
[Default]
[Reference]
[Example]

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 to [(nL + nH × 256) × (horizontal motion unit)] inches.



[Notes]
- This command is enabled only of 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 horizzontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current left margin.
- The **GS P** command can change the horizontal (and vertical) motion unit.
- However, the value cannot be less than the minimum horizontal movement amount and it must be in even units of the minimum horizontal movement amount.
- Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx

[Default]

Ⓐ		Ⓑ	
If 32 e 56 col.:	nL = nH = 0	if 104 col.	nL=nH=0
If 42 col.:	nL =14	if 80 col.	nL=nH=16
	nH = 0	if 52 col.	nL=nH=10

[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	
	Decimal	29	80	x	y

[Range] x = 100, 200
y = 100, 200
[Description] Sets the horizontal and vertical motion units to 1/x inch and 1/y inch, respectively.
When *x* is set to 0, the default setting value is used.
When *y* is set to 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*, regardless of character rotation (upside-down or 90° clockwise rotation) :
  ① Command using *x* : **ESC SP, ESC $, ESC \, GS L, GS W**.
  ② Command 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.

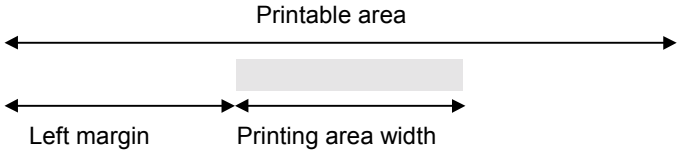
[Default] x = 200, y = 200
[Reference] **ESC SP, ESC $, ESC \, ESC 3, ESC J, GS L, GS W**
[Example]

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 ≤ nL, nH ≤ 255
[Description] Sets the printing area width to the area specified by *nL* and *nH*..
- The left margin is set to [(nL + nH × 256) × (horizontal motion unit)] inches.



[Notes]
- This command is enabled only at the beginning of the line.
- If the right margin is greater than the printable area, then the printing area width is set at maximum value.
- If the printing area width = 0, it then 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 **GS P** command can change the horizontal (and vertical) motion unit.
- However, the value cannot be less than the minimum horizontal movement amount and it must be in even units of the minimum horizontal movement amount.
- Ⓐ indicates TPT60Hx Ⓑ indicates TPT112Hx

[Default]

Ⓐ		Ⓑ	
If 32 e 56 col.:	nL = 192	if 104 col.	nL=64
	nH = 1		nH=3
If 42 col.:	nL =164	if 80 col.	nL=32
	nH = 1		nH=3
		if 58 col.	nL=44
			nH=3

[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 ≤ 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 by *t*.
When LSB of *m* = 1, after waiting for the period specified by *t*, the LED indicator blinks and the printer waits for the FORM 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 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 definition is cleared.
- If the macro is not defined or if *r* is 0, nothing is happens.
- When the macro is executed by pressing the FORM FEED button (*m* = 1), paper can not be fed by using the FORM 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 e n [m] [l]

[Name] Eject ticket commands
[Format]

ASCII	GS	e	n	[m]	[l]
Hex	1D	65	n	[m]	[l]
Decimal	29	101	n	[m]	[l]

[Range] $1 \le n \le 7$

[Description] This command controls the ticket ejector

n = 1 ejector motor off
n = 2 ejector motor on
n = 3 ticket ejecting with m steps (1 step = 22 mm)
n = 4 ticket catch
n = 5 ticket expulsion
n = 6 transmit ejector byte status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not near paper end
	On	01	1	Near paper end
1	Off	00	0	Not used. Fixed at Off
2	Off	00	0	Paper end sensor.
	On	04	4	Paper is present.
3	Off	00	0	Ticket out
	On	08	8	Ticket present on ejector mouth
4	Off	00	0	Printer step motor off
	On	10	16	Printer step motor on
5	Off	00	0	Ejector motor off
	On	20	32	Ejector motor on
6	Off	00	0	No error
	On	40	64	Error occurs.
7	Off	00	0	Not used. Fixed at Off

n = 7 set ticket max length :
The ticket max length is [(*m**256+l) * (vertical motion unit)] inches.

[Notes] *m* must be sent with *n* = 3,7;
l must be sent with *n* = 7;
if *n*=3 and the ticket is not cut yet, before to execute the command a total cutting will be make.
[Default] Max ticket length *m**256+*l* = 2000 (25 cm)
[Reference]
[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 codes.

n selects a font from the following the table :

n	Font
0, 48	Font A (14 x 24).
1, 49	Font B (10 x 24).

[Notes] HRI character are printed at the position specified by **GS H**.
[Default] n = 0
[Reference] **GS H, GS k**
[Example]

GS h n

[Name] Set bar code heght
[Format]

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

[Range] 1 ≤ n ≤ 255
[Description] Sets the heigth of the bar codes.
n specifies the number of the dots in the vertical direction.
[Notes]
[Default] n = 96 (12 mm)
[Reference] **GS k**
[Example]

① GS k m [d1...dk] NUL ② 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 ≤ m ≤ 6
② 65 ≤ m ≤ 73
[Description] Selects a bar code system and prints the bar codes.
m selects a bar codes system as follows :

	m	Bar code system	Number of characters	Remarks
①	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
②	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 of the specified range, the printer prints the following message : “BAR CODE GENERATOR IS NOT OK !” and processing the following data as normal data.
- If the horizontal size exceeds printing area, the printre only feeds th e paper.
- This command feeds as much paper as is required to print the bar code, regardless of the line spacing specified by **ESC 2** Or **ESC 3**.
- After printing bar code, this command sets the print position to the beginning of the line.
- This commnad is not affected by prints modes (emphasized, double stricke, underline or character size), except for upside-down mode and justification.

[Notes for ①]
- This command ends with a NUL code.
- When the bar code system 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) bytes 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) bytes bar code data.
- When *n* the bar code system used is EAN8, the printer prints the bar code after receiving 7 (without check digit) or 8 (with check digit) bytes bar code data.
- The number of data for ITF bar code must be even numbers. When an odd number of data is input, the printer ignores the last received data.

[Notes for ②]
- If *n* is outside of the specified range, the printer stops command processing and processes the following data as normal data.

When CODE93 is used :
- The printer prints an HRI character (□) as a start character at the beginning of the HRI character string.
- The printer prints an HRI character (□) as a stop character at the end of the HRI character string.
- The printer prints an HRI characters (■) as a control character (00H to 1FH and 7FH).

When CODE128 is used :
- 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 code set selection character (any of 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	Transmit data		
	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 (ONLY SERIAL INTERFACE)

[Name] Transmit status.
[Format]

ASCII	GS	r	n
Hex	1D	72	n
Decimal	29	114	n

[Range] n =1, 49
[Description] Transmits the status specified by *n* as follows :

n	Function
1, 49	Transmits paper sensor status (same as **ESC v**).

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-end sensor. Paper is present.
	On	(0C)	(12)	Paper-end sensor. Paper is not present.
4	Off	00	0	Not used. Fixed to Off
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to Off

[Notes]
- This command is executed when the data is processed in the receive buffer. Therefore, there may be a time lag between receiving the command and transmitting the status, depending on the receive buffer status.

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

GS v (ONLY SERIAL INTERFACE)

[Name] Extended status request.
[Format]

ASCII	GS	v	
Hex	1D	76	
Decimal	29	118	

[Description] This command transmits two byte, the bits shows th printer status on the serial port.

First byte:

Bit	FUNCTION
0	Paper Almost Out Photocell
1	Nick photocell
2	Paper Presence
3	Line Feed key
4	Form Feed key
5	Over-Heat flag
6	Motor ON
7	Error due to Paper End, Head Up etc.

Second byte:

Bit	FUNCTION
0	Printing
1	Head up
2	Outside notch
3	Ticket on the exit mouth
4	ON ejector motor
5	Not Used
6	Not Used
7	Not Used

[Notes] This command is executed immediately (full buffer too)
[Default]
[Reference]
[Example]

GS w n

[Name] Set bar code width.
[Format]

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

[Range] $2 \le n \le 6$
[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 exponent / deponent.
[Format]

ASCII	GS	~	n
Hex	1D	7E	n
Decimal	29	126	n

[Range] n = 0, 1, 48, 49
[Description] Sets exponent or deponent character position.
n specifies the position as follows :

n	Function
0, 48	Deponent character position.
1, 49	Exponent character position.

[Notes] • This command is executed if there are characters with different height 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] $0 \le n \le 5, 48 \le n \le 53$
[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
5, 53	Double copy

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