Thermal Printer

TSP200 Series

Programmer's Manual

TABLE OF CONTENTS

1. OUTLINE

The TSP200 series is ideal for printing text, bar code and graphics.

The TSP200 series has the following features:

1. extremely quiet and fast printing (maximum 50 mm/sec.) using the direct line thermal printing method
2. support many bar code types
   (UPC-A, UPC-E, JAN/EAN-8, JAN/EAN-13, CODE 39, IFT 2 OF 5, CODE 128, CODE 93, NW-7)
3. dual interfaces (RS232C, Parallel)
4. memory switches that enable wide selection of printer default settings

The printer has two different software modes which can be selected using the DIP switch.
(Factory setting: Star Mode)

Star Mode: DIP switch 1-7 ON

This mode is compatible with Star Receipt printers, such as the SP300 and SP200 series.

ESC/POS Mode: DIP switch 1-7 OFF

This mode is compatible with the printers supporting ESC/POS command.

ESC/POS is a trademark of Seiko Epson Corporation.

For improvement purposes, the descriptions and specifications in this manual are subject to change without notice.

2. MEMORY SWITCH AND DIP SWITCH

Functional settings are made using the printer's EEPROM memory switches and the DIP switches.

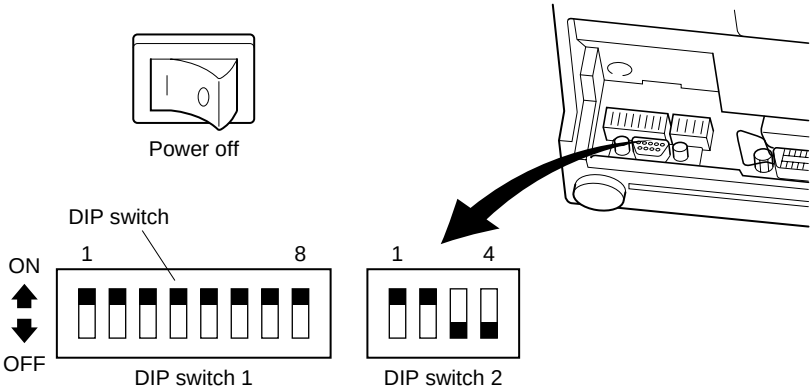
2-1. Memory Switch

Each memory switch is a 16-bit word stored in EEPROM.
The printer is shipped with the factory setting which is made in accordance with its product type.
For the detailed functions and the settings of the Memory switches, please refer to "Chapter 8".
The factory settings are shown in the table below.

Memory switch	TSP212	TSP242
#0	0000	0000
#1	0000	0000
#2	0000	0100
#3	0000	0000
#4	0000	0000

2-2. DIP Switch

Be sure to turn off the power of the printer before changing the setting of the DIP switches.



DIP switch array

DIP switch #1

The factory settings of DIP switch 1 are all on.

Switch	Contents	ON	OFF
1-1 1-2	Baud Rate		
1-3	Data Length	8 bit	7 bit
1-4	Parity Check	Disabled	Enabled
1-5	Parity Selection	Odd	Even
1-6	Handshake	DTR	XON/XOFF
1-7	Operating Mode	Star	ESC/POS
1-8	Interface	RS232C	Parallel

Baud Rate	1-1	1-2
2400BPS	OFF	OFF
4800BPS	ON	OFF
9600BPS	ON	ON
19200BPS	OFF	ON

DIP Switch #2

Factory settings: 2-1 and 2-2 are on; 2-3 and 2-4 are off.

Switch	Contents	ON	OFF
2-1 2-2	Print Density		
2-3	Serial I/F No. 6 Pin Reset Signal	Enabled	Disabled
2-4	Serial I/F No. 8 Pin Reset Signal	Enabled	Disabled

Print Density	2-1	2-2
Light	OFF	OFF
Standard	ON	ON
Somewhat Heavy	ON	OFF
Heavy	OFF	ON

3. DISPLAY PANEL AND FUNCTIONS

3-1. LED

LED	Function
POWER	Lights up when the printer is turned on. Blinks when an error occurs (Refer to 7. ERRORS.)
ON LINE	Lights up when the printer is on line; goes off when the printer is off line or error occurs (Refer to 7. ERRORS.)

3-2. Switches

Switch	Function
ON LINE	Switches between on line and off line
FEED	Feeds the paper while pressed

3-3. Switch Operation (Combined Switch Operation)

1) <SELF PRINTING>
FEED + POWER ON (Turn the power on while holding the FEED switch depressed.)
Self-printing will be performed. VER. NO., Memory switch settings, DIP switch settings and character order will be printed out.

2) <Hexadecimal dump mode>
ON LINE + POWER ON (Turn the power on while holding the ON LINE switch depressed.)
Each of the signals sent from the computer to the printer will be printed out in hexadecimal code.
This function allows you to check if a control code sent to the printer by the program being used is correct or not. The last line is not printed if its data is less than one full line. However, if the ON LINE switch is pressed to set the off line mode, the last line will be printed. To turn off the mode, it is necessary to turn off the printer completely.

4. SERIAL INTERFACE

4-1. Interface Specifications

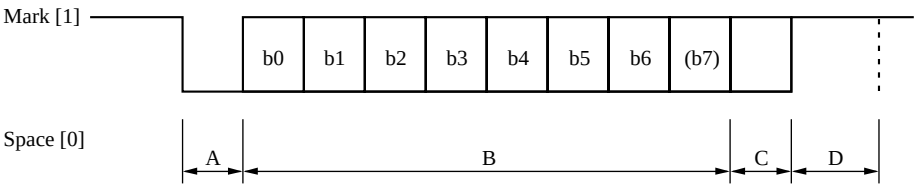
Transmission type ..... Asynchronous serial interface

Baud rate (bps) ..... 2400, 4800, 9600, or 19200
(Selected by DIP switch)

Word format
- Start bit: 1
- Data bits: ..... 7 or 8 (Selected by DIP switch)
- Parity: ..... Odd, Even, or None
(Selected by DIP switch)
- Stop bit: 1

Signal polarities
- RS-232C ..... Mark = Logic “1” (–3V to –15V)
Space = Logic “0” (+3V to +15V)

Handshaking ..... DTR or XON/XOFF mode (Selected by DIP switch)

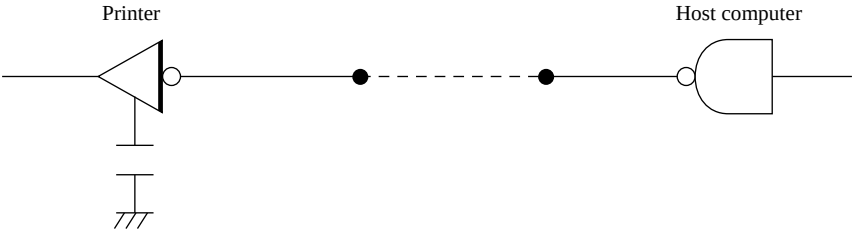


A: Start bit
B: Data bits
C: Vertical parity bit
D: Stop bit

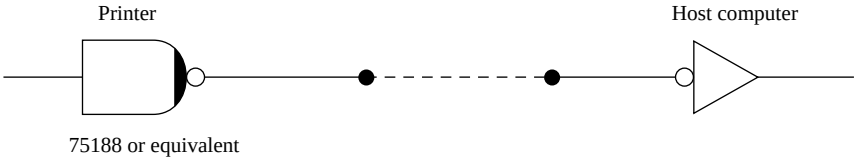
4-2. Interface Circuit

4-2-1. RS-232C Interface

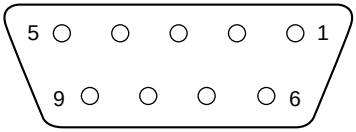
Input (RXD, DSR)



Output (DTR, FAULT, TXD, RTS)



4-3. Connectors and Signal Names



4-3-1. RS-232C Interface

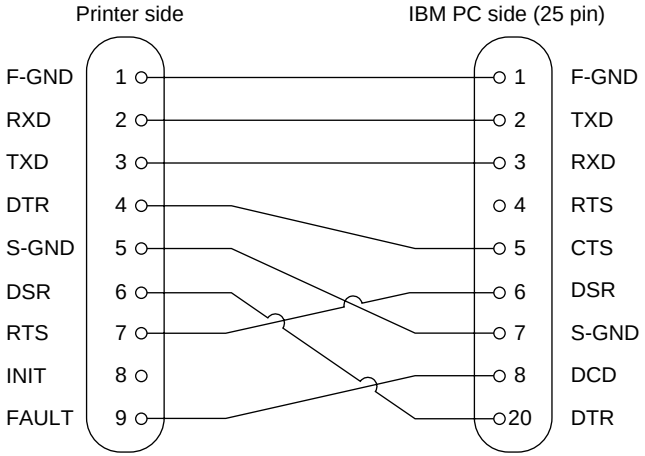
<table>
<tr><th>Pin No.</th><th>Signal name</th><th>Direction</th><th>Function</th></tr>
<tr><td>1</td><td>FG</td><td>–</td><td>Frame ground</td></tr>
<tr><td>2</td><td>RXD</td><td>IN</td><td>Receiving data</td></tr>
<tr><td>3</td><td>TXD</td><td>OUT</td><td>Transmission data</td></tr>
<tr><td>4</td><td>DTR</td><td>OUT</td><td>ESC/POS mode
1) DTR/DSR communication mode
Indicates if printer is busy or not.
Space: Printer ready
Mark: Printer busy
The conditions for busy will vary according to the memory switch settings.
<table>
<tr><th rowspan="2">Printer Status</th><th colspan="2">Memory SW #4-4</th></tr>
<tr><th>1</th><th>0</th></tr>
<tr><td>1. From when the power is turned on or I/F reset until communication possible</td><td>BUSY</td><td>BUSY</td></tr>
<tr><td>2. Test printing</td><td>BUSY</td><td>BUSY</td></tr>
<tr><td>3. Cover open</td><td>– – –</td><td>BUSY</td></tr>
<tr><td>4. Paper feed by paper feed switch</td><td>– – –</td><td>BUSY</td></tr>
<tr><td>5. Stop due to no paper</td><td>– – –</td><td>BUSY</td></tr>
<tr><td>6. During waiting for switch input in macro execution</td><td>– – –</td><td>BUSY</td></tr>
<tr><td>7. Other errors</td><td>– – –</td><td>BUSY</td></tr>
<tr><td>8. Receiving buffer full</td><td>BUSY</td><td>BUSY</td></tr>
</table>
2) XON/XOFF Communication mode
Indicates when printer can receive data from host. This is space, except for the following.
1. After reset until communication possible.
2. During test printing.</td></tr>
</table>

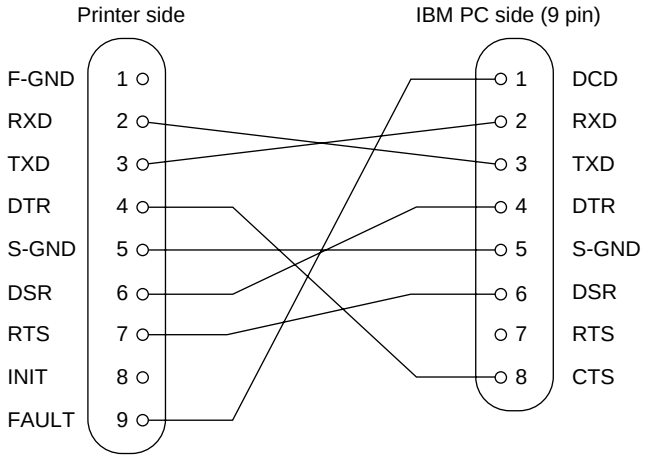
Pin No.	Signal name	Direction	Function
			Star mode Data terminal ready signal. When the printer is ready to receive data, this signal changes to “SPACE”.
5	SG	—	Signal ground
6	DSR	IN	Signal line that indicates whether the host can receive data Space : Host can receive data Mark : Host cannot receive data Does not confirm the status of this signal in XON/XOFF communication or STAR mode. This signal line can be used as an external reset signal by setting the DIP switches. A pulse width of 1 ms or more mark state activates reset.
7	RTS	OUT	Same as DTR signal.
8	INIT	IN	This signal line can be used as an external reset signal by setting the DIP switches. A pulse width of 1 ms or more space state activates reset.
9	FAULT	OUT	In the Star mode, the printer will enter the mark state during the following errors: no paper, head up, cutter error. In ESC/POS mode, this is normally space.

4-4. Interface Connections

Refer to the host computer's interface specifications for details of how to connect the interface. The following illustrations show typical connection configurations.

[RS-232C]

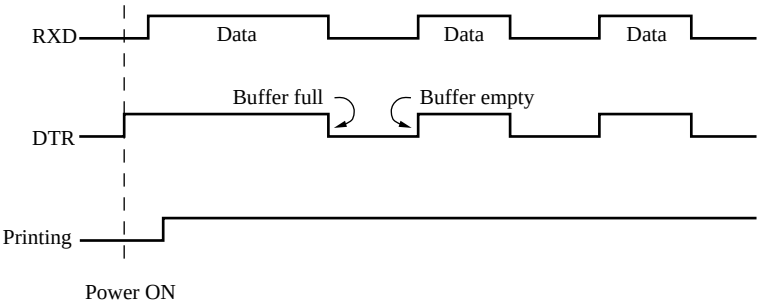




4-5. Data Protocol

4-5-1. DTR mode

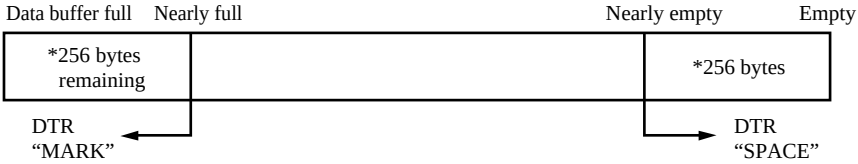
This mode is accessed when the DIP switch 1-6 is set to ON.
Signals are controlled using the DTR line as a BUSY flag.



Immediately after power on (provided that no error occurs), the printer sets DTR to “SPACE” to indicate that it is ready to receive data. When the host detects that DTR is in “SPACE” condition, it begins sending text data over the RXD line.

When the printer’s remaining buffer space falls to *256 bytes or less, the printer sets DTR to “MARK.” The host responds by halting the data transfer. However, note that the printer remains capable of receiving data until the buffer becomes full.

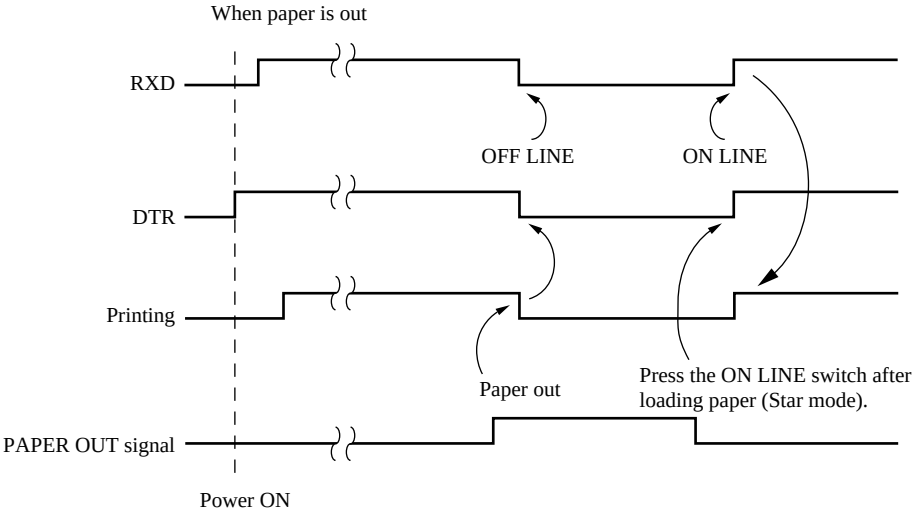
Available buffer space increases as the printer prints the buffered data. When the printer has cleared all but the last *256 bytes of data, it sets DTR back to “SPACE” to indicate that it is ready to receive more data.



* 16 bytes when the buffer size is set to 45 bytes

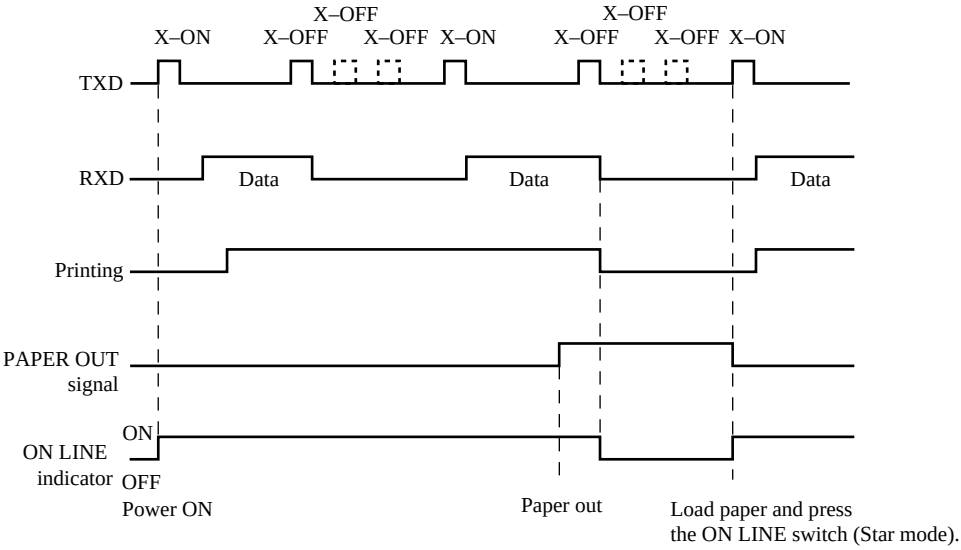
■ Error Condition

Upon detecting an error, the printer immediately sets DTR to “MARK” and goes offline. If the error was caused by a paper-out condition, you can clear it by loading new paper and then pressing the ON LINE switch (Star mode) or closing the cover (ESC/POS mode).



4-5-2. X-ON/X-OFF mode

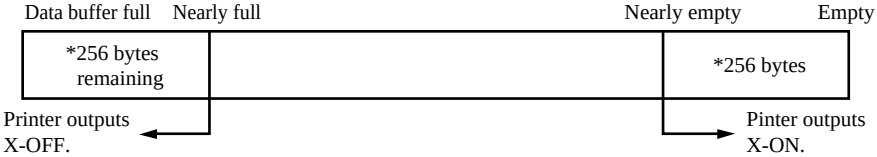
This mode is accessed when DIP switch 1-6 is set to OFF.



Immediately after power on (provided that no error occurs), the printer informs the host that it is ready to receive data by outputting the X-ON signal (control code DC1; value = 11H) over the TXD line. If necessary the printer repeats the signal every three seconds until the host begins sending text data over the RXD line.

When the printer's remaining buffer space falls to *256 bytes or less, the printer begins to output X-OFF signals (DC3, value = 13H) over the TXD line. The host responds by halting the data transfer. Note that the printer remains capable of receiving data until the buffer becomes full.

Available buffer space increases as the printer prints the buffered data. When the printer has cleared all but the last *256 bytes of data, it again outputs the X-ON signal.



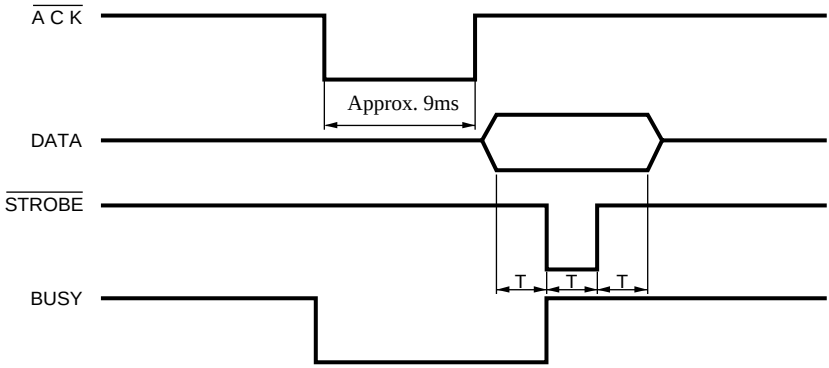
* 16 bytes when the buffer size is set to 45 bytes

5. PARALLEL INTERFACE

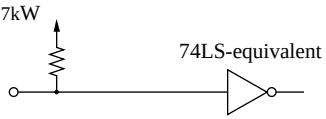
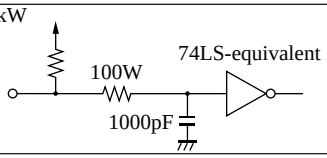
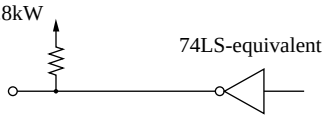
5-1. Interface Specifications

Interface:	Conforms with Centronics parallel interface standard
Data transfer speed:	1000 ~ 5000 CPS
Synchronization:	External strobe pulse
Handshaking:	Using $\overline{\text{ACK}}$ and BUSY
Logic level:	TTL-level compatible

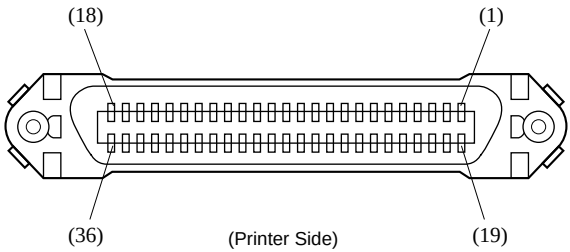
5-2. Interface Timing



T: At least 0.5ms

	Signal Name	Sample Circuit
Input	DATA 1 ~ DATA 8	
Input	$\overline{\text{STROBE}}$	
Output	BUSY $\overline{\text{ACK}}$	

5-3. Connectors and Signal Names



Conforms to Amphenol connector 57-30360

Figure 5-1. Parallel Interface Connector

Pin no	Signal name	Direction	Function
1	$\overline{\text{STROBE}}$	IN	Strobe pulse for data read. Usually HIGH; goes LOW to trigger data read.
2-9	DATA 1~8	IN	Parallel data lines for eight-bit data. HIGH is “1”; LOW is “0”.
10	$\overline{\text{ACK}}$	OUT	Printer outputs this pulse for approximately 9µs to indicate that data read is completed. Printer becomes ready to receive new data at the moment the ACK pulse ends.
11	BUSY	OUT	DC-level signal indicating printer’s current status. LOW indicates that printer is ready to receive the next data; HIGH indicates that printer is unable to receive.
12	PAPER OUT	OUT	DC-level signal indicating whether printer has paper. The signal stays LOW while paper is present; it goes HIGH to indicate that paper has run out.
13	SELECTED	OUT	DC-level signal; stays HIGH while printer is online.
14-15	N/C		Not used
16	SIGNAL GND		Signal ground
17	CHASSIS GND		Printer-frame ground
18	+5V		Outputs +5V (Max. 50mA)
19-30	TWISTED PAIR RETURN		Return pins for various signals. Each pin is connected to the corresponding signal line by twisted pair line.
31	$\overline{\text{RESET}}$	IN	LOW level causes printer to reset its control circuitry and return to its initial state.
32	$\overline{\text{ERROR}}$	OUT	Goes LOW to indicate that printer is unable to print.
33	EXT GND		Ground terminal for external connection
34-35	N/C		Not used
36	–	–	Fixed “HIGH” at printer side

6. PERIPHERAL UNIT DRIVE CIRCUIT

A drive circuit for driving peripheral units (such as cash drawers) is featured on the main logic board of this printer. A modular connector for driving peripheral units is featured on the output side on the drive circuit. When using this circuit, connect the cable for the peripheral unit. (Cables must be prepared by the user.)

Use cables which meet the following specifications.

1. Use the modular plug as shown in Figure 6-1.
2. Separate ground wire is required for Europe only.
3. If the printer is to be used in Europe, the noise filter should be attached to the cable, as shown in Figure 6-2.

CAUTION: DO NOT connect any other plug to the peripheral unit connector.

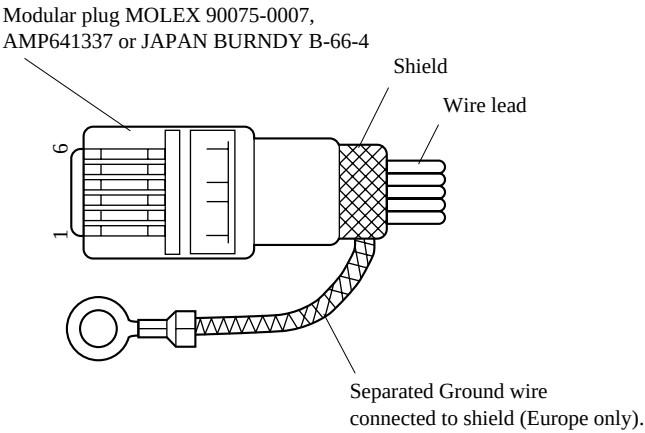


Figure 6-1. Cable specifications for peripheral unit.

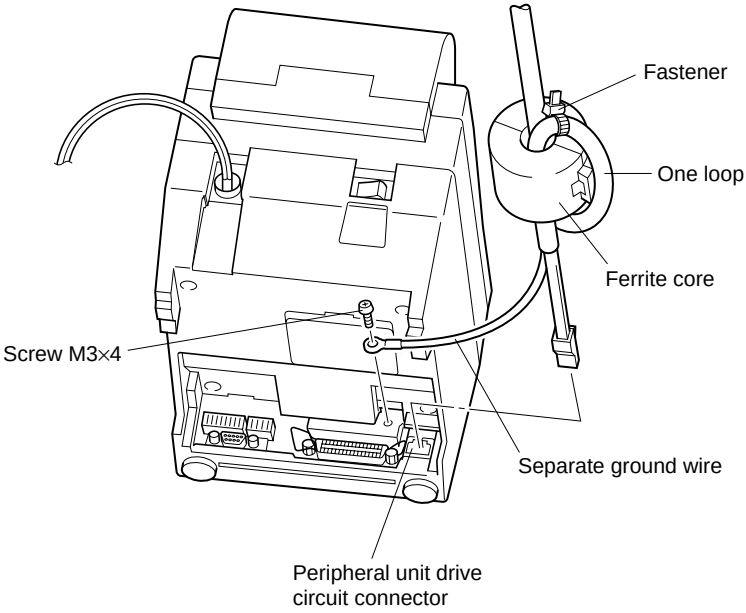
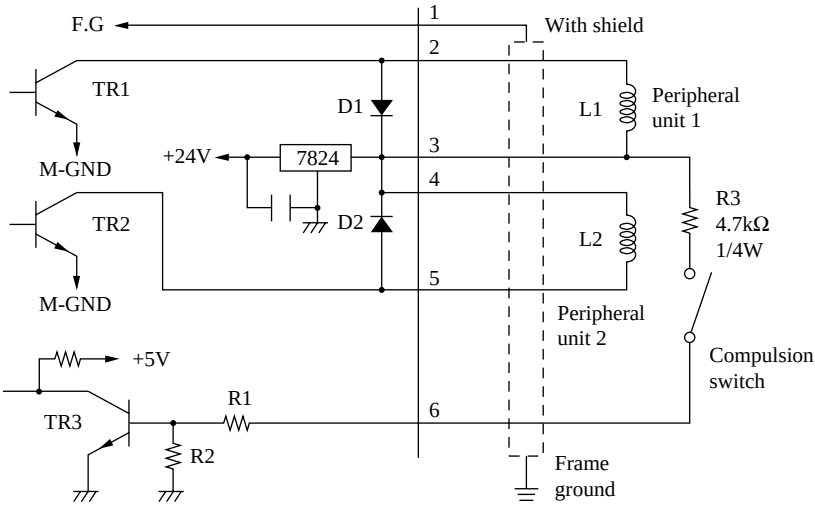


Figure 6-2. Separate ground wire and noise filter are required for Europe.

■ Drive circuit

The recommended drive circuit is shown.

[Drive output 24V, max. 1.0 A]



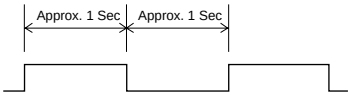
NOTES:

1. Peripheral units #1 and #2 cannot be driven simultaneously.
   When driving a device continuously, do not use drive duty above 20%.
2. Compulsion switch status is available as status data.
3. Resistance for coils L1 and L2 is not less than 24 ohms.
4. Absolute maximum ratings for diodes D1 and D2 (at Ta=25˚C):
   Average rectified current Io = 1A
   Maximum forward surge current (60Hz,1-cycle sine wave) I_{FSM}=40A
5. Absolute maximum rating for transistors TR1 and TR2 (at Ta = 25˚C):
   Collector current Ic = 2A

7. ERRORS

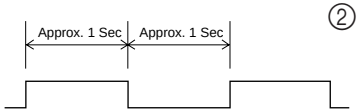
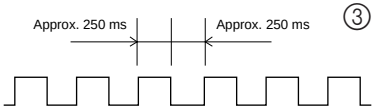
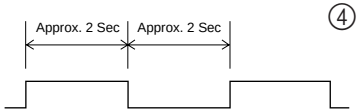
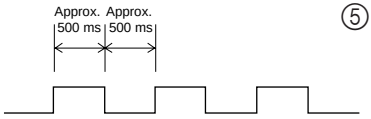
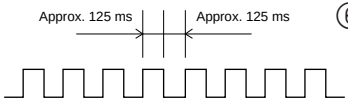
The various types of errors can be identified by the buzzer's sound and the lit LEDs.
Buzzer: The circled numbers refer to "7-4. Type of buzzer sound".

7-1. Automatic Recovery (Power Lamp: Flashing; On-Line Lamp: On)

Error Description	Power Lamp Flashing Pattern	Recovery Conditions
Abnormal head temperature		Automatic recovery after head temperature lowers

7-2. Recoverable Errors (Power Lamp: Flashing; On-Line Lamp: Off)

upper: Star mode
lower: ESC/POS mode

Error Description	Power Lamp Flashing Pattern	Recovery Conditions
No paper	 ②	Insert paper and press on-line switch. Insert paper and close cover.
Head up	 ③	Lower head and press on-line switch. Lower head and close cover.
Paper near end of roll	 ④	Press on-line switch and printing will continue. Both lamps light when printing and power lamp flashes and on-line lamp lights when on line. Same as no paper
Cover is open	 ⑤	Close cover and press on-line switch. Close cover.
Error during paper cutting	 ⑥	If the blade is at the home position, press the on-line switch for printing to continue. If the blade is not at the home position, it is not a recoverable error. Command

7-3. Fatal Error (Power Lamp: Flashing; On-Line Lamp: Flashing)

The unit will have to be repaired.

7-4. Type of buzzer sound (only Star mode) P: 50ms Pi: 100ms

① Online, Offline	P
② No Paper	PPPP PPPP
③ Head Up	PiPiPi
④ Near End	PP PP
⑤ Cover Open	PPPP
⑥ Cutter Error	Pi PPP PPiPiP PPPPPi PiPiPiPiPi PiPiPiPiPi
⑦ Buzzer by command	Pi

8. CONTROL CODES/STAR MODE

8-1. Star Mode Command Summary

The details of each command are shown in the following sections.

Commands to Select Characters

Control codes	Hexadecimal codes	Function	Page
<ESC> "R" *n*	1B 52 *n*	Select international character set	25
<ESC> "/" "1" <ESC> "/" <1>	1B 2F 31 1B 2F 01	Select slash zero	25
<ESC> "/" "0" <ESC> "/" <0>	1B 2F 30 1B 2F 00	Select normal zero	25
<ESC> "b" *n1 n2 n3 n4 d1 ...* <RS>	1B 62 *n1 n2 n3 n4 d1 ... 1E*	Select bar code printing	26
<ESC> "M"	1B 4D	Select 12-dot pitch printing	30
<ESC> "p"	1B 70	Select 14-dot pitch printing	30
<ESC> "P"	1B 50	Select 15-dot pitch printing	30
<ESC> ":"	1B 3A	Select 16-dot pitch printing	30
<ESC> <SP> *n*	1B 20 *n*	Set character spacing	30
<SO>	0E	Sets the printing magnified double in character width.	31
<DC4>	14	Resets the printing magnified in character width.	31
<ESC> "W" *n*	1B 57 *n*	Sets the magnification rate in character width.	31
<ESC> <SO>	1B 0E	Sets the printing magnified double in character height.	31
<ESC> <DC4>	1B 14	Resets the printing magnified in character height.	31
<ESC> "h" *n*	1B 68 *n*	Sets the magnification rate in character height.	32
<ESC> "i" *n1 n2*	1B 69 *n1 n2*	Sets the magnification rates in character width and height.	32
<ESC> "–" "1" <ESC> "–" <1>	1B 2D 31 1B 2D 01	Select underlining	32
<ESC>"–" "0" <ESC> "–" <0>	1B 2D 30 1B 2D 00	Cancel underlining	32
<ESC> "_" "1" <ESC> "_" <1>	1B 5F 31 1B 5F 01	Select upperlining	33
<ESC> "_" "0" <ESC> "_" <0>	1B 5F 30 1B 5F 00	Cancel upperlining	33

Control codes	Hexadecimal codes	Function	Page
<ESC> “4”	1B 34	Select highlight printing	33
<ESC> “5”	1B 35	Cancel highlight printing	33
<SI>	0F	Inverted printing	33
<DC2>	12	Cancel inverted printing	33
<ESC> “E” <ESC> “G”	1B 45 1B 47	Select emphasized printing	34
<ESC> “F” <ESC> “H”	1B 46 1B 48	Cancel emphasized printing	34

Commands to Set the Page Format

Control codes	Hexadecimal codes	Function	Page
<ESC> “C” *n*	1B 43 *n*	Set page length in lines	35
<ESC> “C” <0> *n*	1B 43 00 *n*	Set page length in inches	35
<ESC> “N” *n*	1B 4E *n*	Set bottom margin	35
<ESC> “O”	1B 4F	Cancel bottom margin	35
<ESC> “l” *n*	1B 6C *n*	Set left margin	36
<ESC> “Q” *n*	1B 51 *n*	Set right margin	36

Commands to Move the Print Position

Control codes	Hexadecimal codes	Function	Page
<LF>	0A	Line feed	37
<CR>	0D	Carriage Return	37
<ESC> “a” *n*	1B 61 *n*	Feed paper *n* lines	37
<FF>	0C	Form feed	37
<HT>	09	Horizontal tab	37
<VT>	0B	Vertical tab	38
<ESC> “z” “1” <ESC> “z” <1>	1B 7A 31 1B 7A 01	Set line spacing to 4 mm	38
<ESC> “0”	1B 30	Set line spacing to 3 mm	38
<ESC> “J” n	1B 4A *n*	One time n/4 mm feed	38
<ESC> “j” n	1B 6A *n*	One time n/4 mm backfeed	39
<ESC>“I” n	1B 49 *n*	One time n/8 mm feed	39
<ESC> “B” *n1 n2* ... <0>	1B 42 *n1 n2* ... 00	Set vertical tab stops	39
<ESC> “D” *n1 n2* ... <0>	1B 44 *n1 n2* ... 00	Set horizontal tab stops	40

Commands to Print Dot Graphics

Control codes	Hexadecimal codes	Function	Page
<ESC> "K" *n* <0> *m1 m2* ...	1B 4B *n* 00 *m1 m2* ...	Print normal density graphics	41
<ESC> "L" *n1 n2 m1 m2* ...	1B 4C *n1 n2 m1 m2* ...	Print high density graphics	43
<ESC> "k" *n* <0> *d1* ...	1B 6B *n* 00 *d1* ...	Print fine density graphics	44
<ESC> "X" *n1 n2 m1* ...	1B 58 *n1 n2 d1* ...	Print fine density graphics	47

Commands to Print Download Characters

Control codes	Hexadecimal codes	Function	Page
<ESC> "&" <1> <1> *n m1 m2 ... m48*	1B 26 01 01 *n m1 m2 ... m48*	Define download character	48
<ESC> "&" "1" "1" *n m1 m2 ... m48*	1B 26 31 31 *n m1 m2 ... m48*		
<ESC> "&" <1> <0> *n*	1B 26 01 00 *n*	Delete a download character	49
<ESC> "&" "1" "0" *n*	1B 26 31 30 *n*		
<ESC> "%" "1" <ESC> "%" <1>	1B 25 31 1B 25 01	Enable download character set	49
<ESC> "%" "0" <ESC> "%" <0>	1B 25 30 1B 25 00	Disable download character set	50

Commands to Control Peripheral Devices

Control codes	Hexadecimal codes	Function	Page
<ESC> <BEL> *n1 n2*	1B 07 *n1 n2*	Define drive pulse width for peripheral device #1	51
<BEL>	07	Control peripheral device #1	51
<FS>	1C	Control peripheral device #1 immediately	51
<EM>	19	Control peripheral device #2 immediately	51
<SUB>	1A	Control peripheral device #2 immediately	51

Commands to Control Auto Cutter

Control codes	Hexadecimal codes	Function	Page
<ESC> "d" "0" <ESC> "d" <0>	1B 64 30 1B 64 00	Full-cut command to the auto cutter	52
<ESC> "d" "1" <ESC> "d" <1>	1B 64 31 1B 64 01	Partial-cut command to the auto cutter	52

Other Commands

Control codes	Hexadecimal codes	Function	Page
<CAN>	18	Cancel last line & Initialize printer	53
<DC3>	13	Deselect printer	53
<DC1>	11	Set select mode	53
<RS>	1E	Beep the buzzer	53
<ESC> "#N, n1 n2 n3 n4" <LF> <NUL>	1B 23 N 2C n1 n2 n3 n4 0A 00	Set memory switch	54
<ESC> "@"	1B 40	Initialize printer	55
<ENQ>	05	Enquiry	55
<ESC> "?" <LF> <NUL>	1B 3F 0A 00	Reset printer hardware	56

8-2. Command Specification

Commands to Select Characters

FUNCTION Select international character set

CODE <ESC> "R" *n*

HEX 1B 52 *n*

REMARKS Selects an international character set according to the value of *n*, as shown below:

n	Character set	*n*	Character set
0	U.S.A.	7	Spain I
1	France	8	Japan
2	Germany	9	Norway
3	England	10	Denmark II
4	Denmark I	11	Spain II
5	Sweden	12	Latin America
6	Italy		

When the value of *n* is 0 to 9, 0(00H) to 9(09H) or "0"(30H) to "9"(39H) can be set. When the value of *n* is 10 to 12, 10(0AH) to 12(0CH) or "A"(41H) to "C"(43H) can be set.

FUNCTION Select zero style

CODE <ESC> "/" *n*

HEX 1B 2F *n*

REMARKS Causes subsequent zero characters to be printed with a slash when *n* is 1, and without a slash when *n* is 0.
The value of *n* can be set to 0(00H) or "0"(30H), or 1(01H) or "1"(31H).

FUNCTION Select bar code printing

CODE <ESC> "b" *n1* *n2* *n3* *n4* *di* ... *dk* <RS>

HEX 1B 62 *n1* *n2* *n3* *n4* *di* ... *dk* 1E

REMARKS Prints bar code according to the value of *n1*, as shown below:

n1: Type of bar code

0	UPC-E
1	UPC-A
2	JAN/EAN-8
3	JAN/EAN-13
4	CODE 39
5	ITF
6	CODE 128
7	CODE 93
8	NW-7

The value of *n1* can be set to 0(00H) or 8(08H) or "0"(30H) to "8"(38H).

n2: Printing character below bar code or line feed

1	Character below bar code is not printed, Line feed is performed after execution of command.
2	Character below bar code is printed, Line feed is performed after execution of command.
3	Character below bar code is not printed, Line feed is not performed after execution of command.
4	Character below bar code is printed, Line feed is not performed after execution of command.

The value of *n2* can be set to 1(01H) to 4(04H) or "1"(31H) to "4"(34H).

n3: Mode of bar code

UPC-E, UPC-A, JAN/EAN-8, JAN/EAN-13, CODE 128, CODE 93

1	Minimum module 2 dots
2	Minimum module 3 dots
3	Minimum module 4 dots

CODE 39, NW-7, ITF

		CODE 39, NW-7	ITF
1	Narrow : wide	2:6 dots	2:5 dots
2	Narrow : wide	3:9 dots	4:10 dots
3	Narrow : wide	4:12 dots	6:15 dots
4	Narrow : wide	2:5 dots	2:4 dots
5	Narrow : wide	3:8 dots	4:8 dots
6	Narrow : wide	4:10 dots	6:12 dots
7	Narrow : wide	2:4 dots	2:6 dots
8	Narrow : wide	3:6 dots	3:9 dots
9	Narrow : wide	4:8 dots	4:12 dots

When the value of *n3* is UPC-E, UPC-A, JAN/EAN-8, JAN/EAN-13, CODE128 or CODE93, 1(01H) to 3(03H) or "1"(31H) to "3"(33H) can be set. When the value of n3 is CODE39, NW-7 or ITF, 1(01H) to 9(09H) or "1"(31H) to "9"(39H) can be set.

n4: Height of bar code
Can be up to 255 dots (31.9mm).
If the bar code height is larger than the line feed amount, the line feed amount is automatically multiplied by an integer.

di...dk: Bar code data

UPC-E/UPC-A: K = 11 (or 12)
The check digit at the 12th digit is automatically added, and ignored even if it is specified.

JAN/EAN-8: K = 7 (or 8)
The check digit at the 8th digit is automatically added, and ignored even if it is specified.

JAN/EAN-13: K = 12 (or 13)
The check digit at the 13th digit is automatically added, and ignored even if it is specified.

CODE39: The value of k is optional, and the maximum value also differs according to the modes (21 digits maximum in mode 7).
The start/stop code ("∗") is automatically added.

ITF: The value of k is optional, and the maximum value also differs according to the modes (40 digits maximum in mode 4).
If the data is number of an odd digits, 0 is automatically added at the beginning of the data.

CODE 128: The value of k is optional, and the maximum value also differs according to the modes and the types of character number (51 digits maximum in mode 1).
The check character is automatically added.

CODE93: The value of k is optional, and the maximum value also differs according to the modes and the types of character (30 digits maximum in mode 1).
The check characters (C and K) are automatically added.

NW-7: The value of k is optional, and the maximum value also differs according to the modes and the types of character number (29 digits maximum in mode 7).
The start/stop code is also contained in the data (it is not automatically added).

The bar code printing start position is at the upper end of the current line.
If the bar code is positioned beyond the right margin, neither the bar code nor the character below the bar code will be printed.

Data of CODE 128 and CODE 93

When <LF> is used in a command, some kinds of control code cannot be sent by the host PC. The control code should be sent as the data as shown below:

- When sending the following data, express as a set of two characters.
  Express "% (25H)" as "%0 (25H30H)".
  Add "40H - 5FH" after "%" for the control codes (00H - 1FH).
  Express the control code (7FH) as "%5(25H35H)".
  Add "1 - 4 (31H - 34H)" after "%" for the function code.
  Add "6 - 8 (36H - 38H)" after "%" for the start code.

3) 2-character codes

Control codes

CODE	FORMAT
NUL 00H	%@ 25H 40H
SOH 01H	%A 25H 41H
STX 02H	%B 25H 42H
ETX 03H	%C 25H 43H
EOT 04H	%D 25H 44H
ENQ 05H	%E 25H 45H
ACK 06H	%F 25H 46H
BEL 07H	%G 25H 47H
BS 08H	%H 25H 48H
HT 09H	%I 25H 49H
LF 0AH	%J 25H 4AH
VT 0BH	%K 25H 4BH
FF 0CH	%L 25H 4CH
CR 0DH	%M 25H 4DH
SO 0EH	%N 25H 4EH
SI 0FH	%O 25H 4FH
DLE 10H	%P 25H 50H
DC1 11H	%Q 25H 51H
DC2 12H	%R 25H 52H
DC3 13H	%S 25H 53H
DC4 14H	%T 25H 54H
NAK 15H	%U 25H 55H
SYN 16H	%V 25H 56H
ETB 17H	%W 25H 57H
CAN 18H	%X 25H 58H
EM 19H	%Y 25H 59H
SUB 1AH	%Z 25H 5AH
ESC 1BH	%[25H 5BH
FC 1CH	%¥ 25H 5CH
GS 1DH	%] 25H 5DH
RS 1EH	%^ 25H 5EH
US 1FH	%_ 25H 5FH
DEL 7FH	%5 25H 35H

Special code

CODE	FORMAT
% 25H	%0 25H 30H

Function codes

CODE	FORMAT	
FNC1	%1 25H 31H	☆
FNC2	%2 25H 32H	☆
FNC3	%3 25H 33H	☆
FNC4	%4 25H 34H	☆

Start codes

CODE	FORMAT	
START A	%6 25H 36H	☆
START B	%7 25H 37H	☆
START C	%8 25H 38H	☆

☆ For CODE 128 only.

FUNCTION Select 12-dot pitch printing

CODE <ESC> "M"

HEX 1B 4D

REMARKS Prints 12-dot pitch characters without an extra space.

FUNCTION Select 14-dot pitch printing

CODE <ESC> "p"

HEX 1B 70

REMARKS Prints 12-dot pitch characters with 2-dot spacing between characters.

FUNCTION Select 15-dot pitch printing

CODE <ESC> "P"

HEX 1B 50

REMARKS Prints 12-dot pitch characters with 3-dot spacing between characters.

FUNCTION Select 16-dot pitch printing

CODE <ESC> ":"

HEX 1B 3A

REMARKS Prints 12-dot pitch characters with 4-dot spacing between characters.

FUNCTION Set the character spacing

CODE <ESC> <SP> *n*

HEX 1B 20 *n*

REMARKS Sets the space between characters to *n* dots, where *n* is a number from 0 to 15.
When the value of *n* is 0 to 9, 0(00H) to 9(09H) or "0"(30H) to "9"(39H) can be set. When the value of *n* is 10 to 15, 10(0AH) to 15(0FH) or "A"(41H) to "F"(46H) can be set.

FUNCTION Sets the printing magnified double in character width.

CODE <SO>

HEX 0E

REMARKS Prints the subsequent data including a character spacing set by <ESC><SP> *n*, magnified double in character width.

FUNCTION Resets the printing magnified in character width.

CODE <DC4>

HEX 14

REMARKS Resets the printing magnified in character width set by <SO>, <ESC>"W"*n* and <ESC>"i"*n1n2*.

FUNCTION Sets the magnification rate in character width.

CODE <ESC> "W" *n*

HEX 1B 57 *n*

REMARKS Prints the subsequent data including a character spacing set by <ESC><SP> *n*, magnified in character width by a rate specified by the value of *n*.

n	Character width	*n*	Character width
0	Unmagnify	3	Quadruple
1	Double	4	Quintuple
2	Triple	5	Sextuple

The value of *n* can be set to 0(00H) to 5(05H) or "0"(30H) to "5"(35H).

FUNCTION Sets the printing magnified double in character height.

CODE <ESC> <SO>

HEX 1B 0E

REMARKS Prints the subsequent data magnified double in character height.

FUNCTION Resets the printing magnified in character height.

CODE <ESC><DC4>

HEX 1B 14

REMARKS Resets the printing magnified in character height set by <ESC><SO>, <ESC>"h"*n* and <ESC>"i"*n1n2*.

FUNCTION Sets the magnification rate in character height.

CODE <ESC> "h" *n*

HEX 1B 68 *n*

REMARKS Prints the subsequent data magnified in character height by a rate specified by the value of *n*.

n	Character height	*n*	Character height
0	Unmagnify	3	Quadruple
1	Double	4	Quintuple
2	Triple	5	Sextuple

The value of *n* can be set to 0(00H) to 5(05H) or "0"(30H) to "5"(35H).

FUNCTION Sets the magnification rates in character width and height.

CODE <ESC> "i" *n1 n2*

HEX 1B 69 *n1 n2*

REMARKS Prints the subsequent data in the size specified by *n1*, *n2*. *n1* indicates the height magnification and *n2* indicates the width magnification.

n1 (*n2*) = 0 Normal height (or width) size.
1 Double height (or width) size.
2 Triple height (or width) size.
3 Quadruple height (or width) size.
4 Quintuple height (or width) size.
5 Sextuple height (or width) size.

The values of *n1*, *n2* are 0(00H) to 5(05H) or "0"(30H)" to "5"(35H).

FUNCTION Underlining

CODE <ESC> "–" *n*

HEX 1B 2D *n*

REMARKS When the value of *n* is 1, underlines the subsequent data including a character spacing set by <ESC><SP> *n*.
The part to be skipped by the horizontal tab setting and the block graphic characters are not underlined.
Resets the underline mode when the value of *n* is 0.
The value of *n* can be set to 0(00H) or "0"(30H), or 1(01H) or "1"(31H).

FUNCTION Upperlining

CODE <ESC> "_" *n*

HEX 1B 5F *n*

REMARKS When the value of *n* is 1, overlines the subsequent data including a character spacing set by <ESC><SP> *n*.
The part to be skipped by the horizontal tab setting and the block graphic characters are not upperlined.
Resets the upperline mode when the value of *n* is 0.
The value of *n* can be set to 0(00H) or "0"(30H), or 1(01H) or "1"(31H).

FUNCTION Select highlight printing

CODE <ESC> "4"

HEX 1B 34

REMARKS Prints the subsequent data including a character spacing set by <ESC><SP> *n* reversed.
The part to be skipped by the horizontal tab setting is not reversed.

FUNCTION Cancel highlight printing

CODE <ESC> "5"

HEX 1B 35

REMARKS Cancels highlight printing.

FUNCTION Inverted printing

CODE <SI>

HEX 0F

REMARKS Causes subsequent characters to be inverted.

FUNCTION Cancel inverted printing

CODE <DC2>

HEX 12

REMARKS Cancels inverted printing.

FUNCTION Select emphasized printing

CODE <ESC> “E”

HEX 1B 45

CODE <ESC> “G”

HEX 1B 47

REMARKS Causes subsequent characters to be emphasized.

FUNCTION Cancel emphasized printing

CODE <ESC> “F”

HEX 1B 46

CODE <ESC> “H”

HEX 1B 48

REMARKS Cancels emphasized printing.

Commands to Set the Page Format

FUNCTION Set page length in lines

CODE <ESC> "C" *n*

HEX 1B 43 *n*

REMARKS Sets the page length using the current line spacing, where *n* is between 1 and 127.
Changing the line spacing later does not alter the physical page length.
The current line becomes the top of the page.
Resets the bottom margin.
Default page length is 42 lines.

FUNCTION Set page length in inches

CODE <ESC> "C" <0> *n*

HEX 1B 43 00 *n*

REMARKS Sets the page length to *n* × 24 mm, where *n* is between 1 and 22.
The current line becomes the top of the page.
Resets the bottom margin.

FUNCTION Set bottom margin

CODE <ESC> "N" *n*

HEX 1B 4E *n*

REMARKS Sets the bottom margin to *n* lines at the current line spacing, where *n* is between 0 and 127.
Bottom margin is reset when you change the page length.
Setting is invalid if the printing area on one page is 36 mm or less.

FUNCTION Cancel bottom margin

CODE <ESC> "O"

HEX 1B 4F

REMARKS Cancels the bottom margin.

FUNCTION Set left margin

CODE <ESC> "l" *n*

HEX 1B 6C *n*

REMARKS Sets the left margin at column *n* (where *n* is between 0 and 255) at the current character pitch.
The left margin does not move if the character pitch is changed later.
Setting is invalid if the printing area for one line would be 36mm or less.

FUNCTION Set right margin

CODE <ESC> "Q" *n*

HEX 1B 51 *n*

REMARKS Sets the right margin at column *n* (where *n* is between 1 and 255) at the current character pitch.
The right margin does not move if the character pitch is changed later.
Setting is invalid if column *n* is beyond the right edge of the printing area.
Setting is invalid if the printing area for one line would be 36mm or less.

Commands to Move the Print Position

FUNCTION Line feed

CODE <LF>

HEX 0A

REMARKS Prints the current line and feeds the paper to the next line.

FUNCTION Carriage return

CODE <CR>

HEX 0D

REMARKS Prints the current line and feeds the paper to the next line. This command is ignored when CR code is invalid.

FUNCTION Feed paper *n* lines

CODE <ESC> "a" *n*

HEX 1B 61 *n*

REMARKS Prints the current line and feeds the paper *n* lines (where *n* is between 1 and 127).

FUNCTION Form feed

CODE <FF>

HEX 0C

REMARKS Feeds the paper to the top of the next page, according to the page length set by <ESC>"C"*n* or <ESC>"C"<0>*n* when memory switch 1-2 is set to 0. If memory switch 1-2 is set to 1, the paper is fed 18 mm, cut fully, and then feed back 18 mm. The print position is at the left margin in both cases.

FUNCTION Horizontal tab

CODE <HT>

HEX 09

REMARKS Moves the print position to the next horizontal tab stop. Ignored if there is no next horizontal tab stop on the current line.

FUNCTION Vertical tab

CODE <VT>

HEX 0B

REMARKS Prints the current line and feeds the paper to the next vertical tab stop and moves the print position to the left margin.
Performs paper feed if no vertical tabs are set or if the current line is at or below the last vertical tab stop.

FUNCTION Set line spacing to 4 mm

CODE <ESC> "z" "1" or <ESC> "z" <1>

HEX 1B 7A 31 or 1B 7A 01

REMARKS Sets the distance the paper advances in subsequent line feeds to 4 mm.

FUNCTION Set line spacing to 3 mm

CODE <ESC> "0"

HEX 1B 30

REMARKS Sets the distance the paper advances in subsequent line feeds to 3 mm.

FUNCTION One time n/4 mm feed

CODE <ESC> "J" *n*

HEX 1B 4A *n*

REMARKS Performs a line feed of *n*/4mm once only.
The value of *n* is 1 to 255.
Space setting for lines is not changed.

FUNCTION One time n/4 mm backfeed

CODE <ESC> "j" *n*

HEX 1B 6A *n*

REMARKS Feeds the paper back *n*/4mm once only.
The value of n is 1 to 255.
Space setting for one line is not changed.
This command can also feed the paper back to the page before the current page. In this case, the position of the line on the previous page is determined by the page length control.

FUNCTION One time n/8 mm feed

CODE <ESC> "I" *n*

HEX 1B 49 *n*

REMARKS Performs a line feed *n*/8mm once only.
The value of *n* is 1 to 255.
Space setting for lines is not changed.

FUNCTION Set vertical tab stops

CODE <ESC> "B" *n1* *n2* ... <0>

HEX 1B 42 *n1* *n2* ... 00

REMARKS Cancels all current vertical tab stops and sets new vertical tab stops at lines *n1*, *n2*, etc., where *n1*, *n2*, etc. are numbers between 0 and 255. A maximum of 16 vertical tab stops can be set.
The tab stops must be specified in ascending order; any violation of ascending order terminates the tab stop list. Standard termination is by the <0> control code.
The vertical tab stops are set in terms of the current line spacing and do not move if the line spacing is changed later.

FUNCTION Set horizontal tab stops

CODE <ESC> "D" *n1* *n2* ... <0>

HEX 1B 44 *n1* *n2* ... 00

REMARKS Cancels all current horizontal tab stops and sets new tab stops at columns *n1*, *n2*, etc. at the current character pitch, where *n1*, *n2*, etc. are numbers between 1 and 255. A maximum of 16 horizontal tab stops can be set.

The tab stops must be specified in ascending order; any violation of ascending order terminates the tab stop list. Standard termination is by the <0> control code.

Commands to Print Dot Graphics

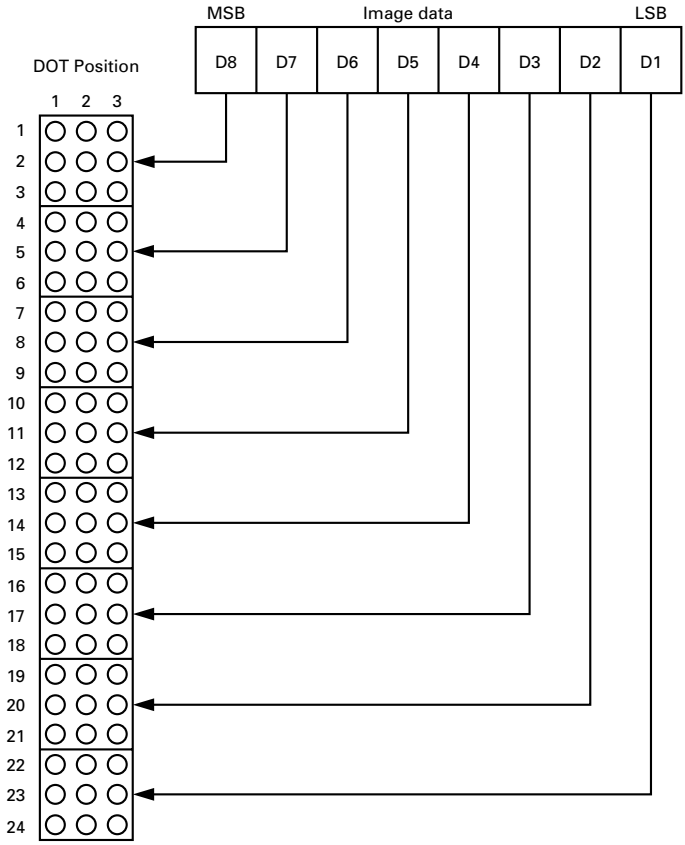
FUNCTION Print normal density graphics

CODE <ESC> "K" *n* <0> *m1* *m2* ...

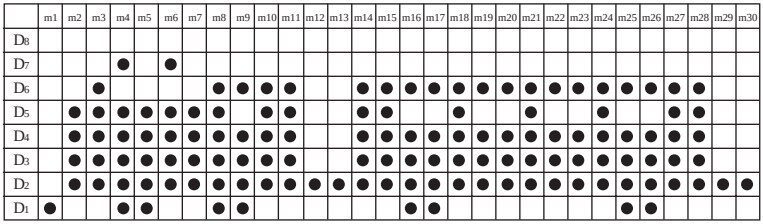
HEX 1B 4B *n* 00 *m1* *m2* ...

REMARKS Prints normal density dot graphics. The graphics image is 24 dots high and $n \times 3$ dots wide. Maximum width is 576 dots.
m1, *m2*, ... are the dot data, each a 1-byte value from 0 to 255 representing 24 vertical dots, with the most significant bit representing the top three and the least significant bit representing the bottom three.
The number of data bytes must be *n*.
Dots beyond the right margin are ignored.

Relationship between image data and print dots



EXAMPLE We will create the design below using a bit image.



	m1	m2	m3	m4	m5	m6	m7	m8	m9	m10	m11	m12	m13	m14	m15	m16	m17	m18	m19	m20	m21	m22	m23	m24	m25	m26	m27	m28	m29	m30
D_8																														
D_7				●		●																								
D_6			●					●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
D_5		●	●	●	●	●	●	●		●	●			●	●			●		●		●		●		●		●	●	
D_4		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
D_3		●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
D_2		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
D_1	●			●	●			●	●							●	●								●	●				

First, since the volume of data is 30, *n1* = (1E)H. If the data *m1* ~ *m30* is converted to hexadecimal, it appears as shown below.

Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal
m1	00000001	01	*m11*	00111110	3E	*m21*	00111110	3E
m2	00011110	1E	*m12*	00000010	02	*m22*	00101110	2E
m3	00111110	3E	*m13*	00000010	02	*m23*	00101110	2E
m4	01011111	5F	*m14*	00111110	3E	*m24*	00111110	3E
m5	00011111	1F	*m15*	00111110	3E	*m25*	00101111	2F
m6	01011110	5E	*m16*	00101111	2F	*m26*	00101111	2F
m7	00011110	1E	*m17*	00101111	2F	*m27*	00111110	3E
m8	00111111	3F	*m18*	00111110	3E	*m28*	00111110	3E
m9	00101111	2F	*m19*	00101110	2E	*m29*	00000010	02
m10	00111110	3E	*m20*	00101110	2E	*m30*	00000010	02

Printing Sample

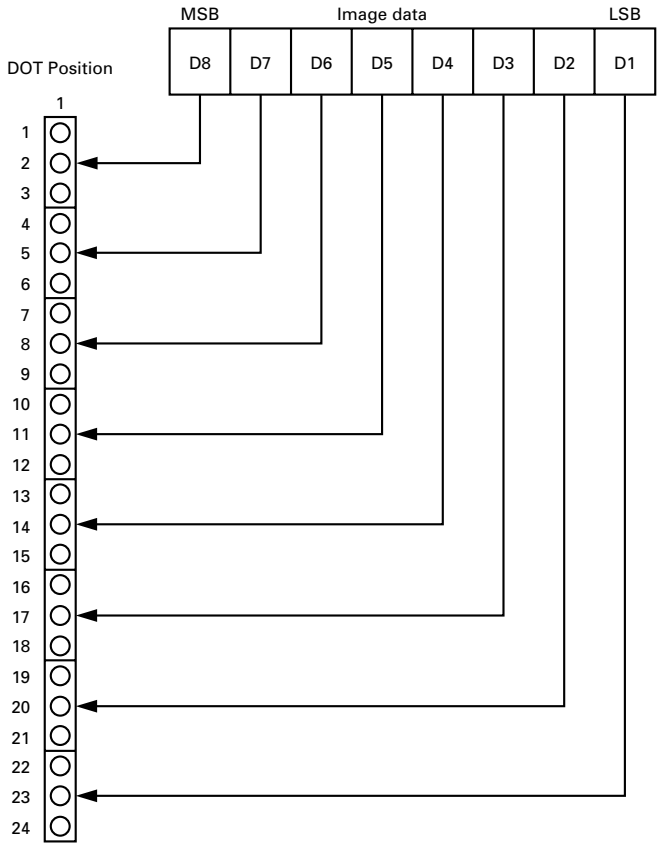
FUNCTION Print high density graphics

CODE <ESC> "L" *n1* *n2* *m1* *m2* ...

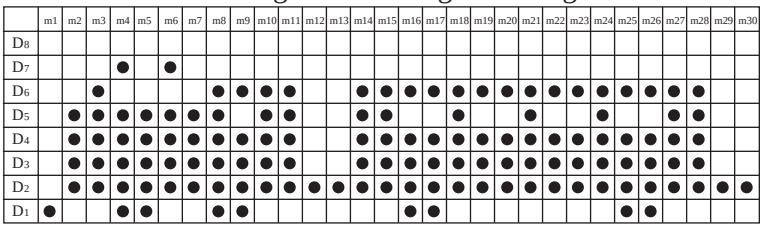
HEX 1B 4C *n1* *n2* *m1* *m2* ...

REMARKS Prints high density dot graphics. The graphics image is 24 dots high and $n1 + n2 \times 256$ dots wide. Maximum width is 576 dots. *m1*, *m2*, ... are the dot data, each a 1-byte value from 0 to 255 representing 24 vertical dots, with the most significant bit representing the top three and the least significant bit representing the bottom three.
The number of data bytes must be $n1 + n2 \times 256$.
Dots beyond the right margin are ignored.

Relationship between image data and print dots



EXAMPLE We will create the design below using a bit image.



First, since the volume of data is 30, *n1* = (1E)H. If the data *m1* ~ *m30* is converted to hexadecimal, it appears as shown below.

Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal
m1	00000001	01	*m11*	00111110	3E	*m21*	00111110	3E
m2	00011110	1E	*m12*	00000010	02	*m22*	00101110	2E
m3	00111110	3E	*m13*	00000010	02	*m23*	00101110	2E
m4	01011111	5F	*m14*	00111110	3E	*m24*	00111110	3E
m5	00011111	1F	*m15*	00111110	3E	*m25*	00101111	2F
m6	01011110	5E	*m16*	00101111	2F	*m26*	00101111	2F
m7	00011110	1E	*m17*	00101111	2F	*m27*	00111110	3E
m8	00111111	3F	*m18*	00111110	3E	*m28*	00111110	3E
m9	00101111	2F	*m19*	00101110	2E	*m29*	00000010	02
m10	00111110	3E	*m20*	00101110	2E	*m30*	00000010	02

Horizontal density is three times that of the bit image for <ESC>"k". (Compare the print samples.)

Printing Sample

FUNCTION Print fine density bit image

CODE <ESC> "k" *n* <0> *d1...dk* [k = *n* * 24]

HEX 1B 6B *n* 00 *d1...dk* [k = *n* * 24]

REMARKS Prints a bit image using 1 horizontal dot and 1 vertical dot for 1 dot of input data.

n is designated by the number of data bytes in the horizontal direction and n must be within the range 1 to 72.

The data is ignored if it is longer than 72 digits or goes beyond the right margin. Relationship between the input data and actual printing is shown below.

Relationship between image data and print dots

Image data

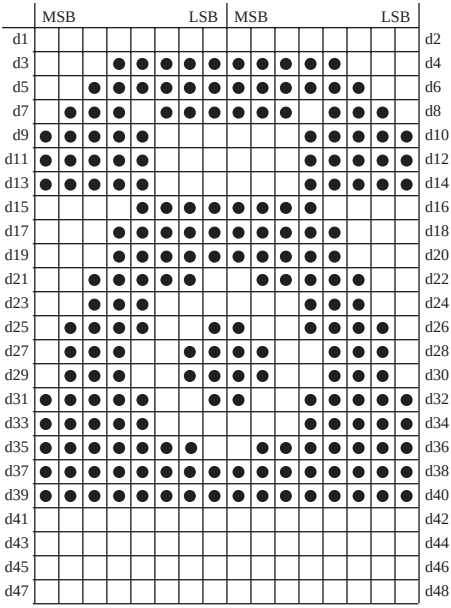
b7	b6	b5	b4	b3	b2	b1	b0

Dot position

d_1 b7 b6 b5 b4 b3 b2 b1 b0	d_2 b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_n b7 b6 b5 b4 b3 b2 b1 b0
d_{n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{2n} b7 b6 b5 b4 b3 b2 b1 b0
d_{2n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{2n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{3n} b7 b6 b5 b4 b3 b2 b1 b0
d_{3n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{3n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{4n} b7 b6 b5 b4 b3 b2 b1 b0
d_{4n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{4n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{5n} b7 b6 b5 b4 b3 b2 b1 b0
d_{5n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{5n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{6n} b7 b6 b5 b4 b3 b2 b1 b0
d_{6n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{6n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{7n} b7 b6 b5 b4 b3 b2 b1 b0
d_{7n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{7n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{8n} b7 b6 b5 b4 b3 b2 b1 b0
d_{8n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{8n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{9n} b7 b6 b5 b4 b3 b2 b1 b0
d_{9n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{9n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{10n} b7 b6 b5 b4 b3 b2 b1 b0
d_{10n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{10n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{11n} b7 b6 b5 b4 b3 b2 b1 b0
d_{11n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{11n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{12n} b7 b6 b5 b4 b3 b2 b1 b0
d_{12n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{12n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{13n} b7 b6 b5 b4 b3 b2 b1 b0
d_{13n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{13n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{14n} b7 b6 b5 b4 b3 b2 b1 b0
d_{14n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{14n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{15n} b7 b6 b5 b4 b3 b2 b1 b0
d_{15n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{15n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{16n} b7 b6 b5 b4 b3 b2 b1 b0
d_{16n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{16n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{17n} b7 b6 b5 b4 b3 b2 b1 b0
d_{17n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{17n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{18n} b7 b6 b5 b4 b3 b2 b1 b0
d_{18n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{18n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{19n} b7 b6 b5 b4 b3 b2 b1 b0
d_{19n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{19n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{20n} b7 b6 b5 b4 b3 b2 b1 b0
d_{20n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{20n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{21n} b7 b6 b5 b4 b3 b2 b1 b0
d_{21n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{21n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{22n} b7 b6 b5 b4 b3 b2 b1 b0
d_{22n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{22n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{23n} b7 b6 b5 b4 b3 b2 b1 b0
d_{23n+1} b7 b6 b5 b4 b3 b2 b1 b0	d_{23n+2} b7 b6 b5 b4 b3 b2 b1 b0	• • •	d_{24n} b7 b6 b5 b4 b3 b2 b1 b0

EXAMPLE

Printing Sample



Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal
d1	00000000	00	d2	00000000	00
d3	00011111	1F	d4	11111000	F8
d5	00111111	3F	d6	11111100	FC
d7	01110111	77	d8	01110111	EE
d9	11111000	F8	d10	00011111	1F
d11	11111000	F8	d12	00011111	1F
d13	11111000	F8	d14	00011111	1F
d15	00001111	0F	d16	11110000	F0
d17	00011111	1F	d18	11111000	F8
d19	00011111	1F	d20	11111000	F8
d21	00111110	3E	d22	01111100	7C
d23	00111000	38	d24	00011100	1C
d25	011111001	79	d26	10011110	9E
d27	01110011	73	d28	11001110	CE
d29	01110011	73	d30	11001110	CE
d31	11111001	F9	d32	10011111	9F
d33	11111000	F8	d34	00011111	1F
d35	11111110	FE	d36	01111111	7F
d37	11111111	FF	d38	11111111	FF
d39	11111111	FF	d40	11111111	FF
d41	00000000	00	d42	00000000	00
d43	00000000	00	d44	00000000	00
d45	00000000	00	d46	00000000	00
d47	00000000	00	d48	00000000	00

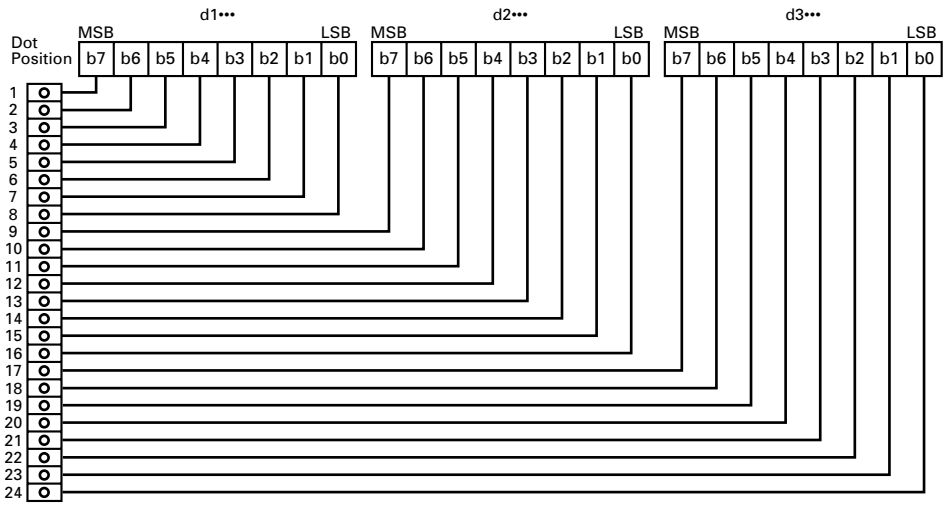
FUNCTION Print fine density graphics

CODE <ESC> “X” *n*1 *n*2 d1...d [(n1+n2*256)*3]

HEX 1B 5 *n*1 *n*2 d1...d [(n1+n2*256)*3]

REMARKS Prints a bit image of the input data using horizontal and vertical resolutions of 8 dots/mm.
Data extending past the right margin is ignored.
The relationship between the input data and the actual printing is shown below.

$1 \leqq n1 + n2 \times 256 \leqq 576$



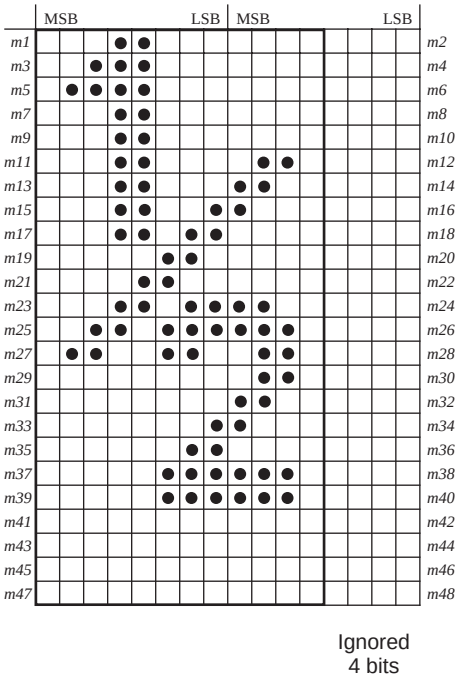
Commands to Print Download Characters

FUNCTION Define download character

CODE	<ESC>	"&"	<1>	<1>	*n*	*m1*	*m2*	...	*m48*
HEX	1B	26	01	01	*n*	*m1*	*m2*	...	*m48*
CODE	<ESC>	"&"	"1"	"1"	*n*	*m1*	*m2*	...	*m48*
HEX	1B	26	31	31	*n*	*m1*	*m2*	...	*m48*

REMARKS Defines one new character and stores it in RAM for later use.
n is the character code of the character defined and must be between 32 and 127.
If the maximum of 32 external characters have already been stored, the oldest stored external character are deleted so that new external character can be stored.
The character matrix is 12 dots wide and 24 dots high.
Relationship between the character pattern and the character data is shown below.

EXAMPLE



Data	Binary	Hexa-decimal	Data	Binary	Hexa-decimal
m1	00011000	18	*m2*	00000000	00
m3	00111000	38	*m4*	00000000	00
m5	01111000	78	*m6*	00000000	00
m7	00011000	18	*m8*	00000000	00
m9	00011000	18	*m10*	00000000	00
m11	00011000	18	*m12*	01100000	60
m13	00011000	18	*m14*	11000000	C0
m15	00011001	19	*m16*	10000000	80
m17	00011011	1B	*m18*	00000000	00
m19	00000110	06	*m20*	00000000	00
m21	00001100	0C	*m22*	00000000	00
m23	00011011	1B	*m24*	11000000	C0
m25	00110111	37	*m26*	11100000	E0
m27	01100110	66	*m28*	01100000	60
m29	00000000	00	*m30*	01100000	60
m31	00000000	00	*m32*	11000000	C0
m33	00000001	01	*m34*	10000000	80
m35	00000011	03	*m36*	00000000	00
m37	00000111	07	*m38*	11100000	E0
m39	00000111	07	*m40*	11100000	E0
m41	00000000	00	*m42*	00000000	00
m43	00000000	00	*m44*	00000000	00
m45	00000000	00	*m46*	00000000	00
m47	00000000	00	*m48*	00000000	00

FUNCTION Delete a download character

CODE <ESC> “&” <1> <0> *n*

HEX 1B 26 01 00 *n*

CODE <ESC> “&” “1” “0” *n*

HEX 1B 26 31 30 *n*

REMARKS Deletes the download character which was assigned the value *n*.

FUNCTION Enable download character set

CODE <ESC> “%” “1” or <ESC> “%” <1>

HEX 1B 25 31 or 1B 25 01

REMARKS Enables the download character set.

FUNCTION Disable download character set

CODE <ESC> “%” “0” or <ESC> “%” <0>

HEX 1B 25 30 or 1B 25 00

REMARKS Disables the selected download character set and returns to the built-in ROM character set.

Commands to Control Peripheral Devices

FUNCTION Define drive pulse width for peripheral device #1

CODE <ESC><BEL> *n1* *n2*

HEX 1B 07 *n1* *n2*

REMARKS Defines the drive pulse width for peripheral devices requiring other than standard 200 ms pulse time and delay time.
n1 indicates the energizing time and *n2* indicates the delay time, using 10ms units.

FUNCTION Control peripheral device #1

CODE <BEL>

HEX 07

REMARKS Executes drive pulse for peripheral device #1.

FUNCTION Control peripheral device #1 immediately

CODE <FS>

HEX 1C

REMARKS Executes drive pulse for peripheral device #1 immediately.

FUNCTION Control peripheral device #2 immediately

CODE <EM>

HEX 19

REMARKS Drives peripheral device #2. The drive pulse width and delay time are fixed at 200 ms.

FUNCTION Control peripheral device #2 immediately

CODE <SUB>

HEX 1A

REMARKS Drives peripheral device #2. The drive pulse width and delay time are fixed at 200 ms.

Commands to Control Auto Cutter

FUNCTION	Full-cut command to the auto cutter
CODE	<ESC> “d” “0” or <ESC> “d” <0>
HEX	1B 64 30 or 1B 64 00
REMARKS	Cuts the paper fully when memory switch 2-C is set to 0. If memory switch 2-C is set to 1, the paper is fed to 18 mm and cut fully. When auto cutter is invalid, this command is not valid.

FUNCTION	Partial-cut command to the auto cutter
CODE	<ESC> “d” “1” or <ESC> “d” <1>
HEX	1B 64 31 or 1B 64 01
REMARKS	Cuts the paper partially when memory switch 2-C is set to 0. If memory switch 2-C is set to 1, the paper is fed to 18 mm and cut partially.

Other Commands

FUNCTION Cancel last line & Initialize printer

CODE <CAN>

HEX 18

REMARKS Clears the line buffer, and initializes the commands set already. Does not affect the external equipment drive conditions set by the code <ESC> <BEL> *n1 n2*. (This is the same during a mechanical error.)
(Line buffer means the print data expansion area.)

FUNCTION Deselect printer

CODE <DC3>

HEX 13

REMARKS Deselects the printer. The printer disregards all subsequent characters and commands except <DC1>, which activates the printer.

FUNCTION Set select mode

CODE <DC1>

HEX (11)H

REMARKS When the printer receives a <DC1> code, the deselect mode is canceled and data following this code is input to the buffer.

FUNCTION Beep the buzzer

CODE <RS>

HEX 1E

REMARKS Sounds a brief beep tone.

FUNCTION Set memory switch

CODE <ESC> "# N , n1n2n3n4" <LF> <NUL>

HEX 1B 23 N 2C n1n2n3n4 0A 00

REMARKS Set the memory switch. In order to enable changed memory switch setting, turn the printer OFF and ON again or send printer reset command (<ESC> "?") to the printer. Changed memory switch settings are stored in EEPROM and these setting will be stored as long as the time when they are changed again.

N : Memory switch number (0, 1, 2, 3, 4)

n1n2n3n4 : Mode settings (For details see below)

1) N=0

n1 : Always "0"

n2 : Always "0"

n3 : Always "0"

(Default) ○: Available

Parameter	Setting	0	4	Star	ESC/POS
n4	FF command	Form Feed	Paper Feed, Cut & Back	○	–

2) N=1

n1 : Always "0"

n2 : Always "0"

(Default) ○: Available

Parameter	Setting	0	1	Star	ESC/POS
n3	Zero style	Normal zero	Slashed zero	○	–
n4	International character set		See below	○	–

n4	Country
0	USA
1	France
2	Germany

n4	Country
3	UK
4	Denmark #1
5	Sweden

n4	Country
6	Italy
7	Spain #1
8	Japan

n4	Country
9	Norway
A	Denmark #2
B	Spain #2

n4	Country
C	Latin America

3) N=2

n3 : Always "0"

(Default) ○: Available

Parameter	Setting	0	1	Star	ESC/POS
n1	ESC d command	Cut	Paper feed & cut	○	–
n2	Cutter	Invalid (TSP212)	Valid (TSP242)	○	○
n4	Paper near end	Invalid	Valid	○	–

4) N=3

n1 : Always "0" (Default) ○: Available

Parameter	Setting	0	1	2	3	Star	ESC/POS
n2	Character table	Normal	IBM	Katakana	IBM	○	–
n3	Print column	48	38	–	–	○	–
n4	CR code	Invalid	Invalid	Same as <LF>	Same as <LF>	○	–
	Line feed (mm)	4	3	4	3		

5) N=4

n1 : Always "0"

(Default) ○: Available

Parameter	Setting	0	1	Star	ESC/POS
n2	Buffer size	4 Kbytes	45 bytes	○	○
n3	Busy conditions	See 4-3-1 RS-232C Interface		–	○
n4	Data receive error	Print "?"	Ignore	–	○

FUNCTION Initialize printer

CODE <ESC> "@"

HEX 1B 40

REMARKS Reinitializes the printer. Clears the print buffer and returns settings to their power-up values.
Does not clear the input buffer, downloaded characters, or conditions for peripheral devices.

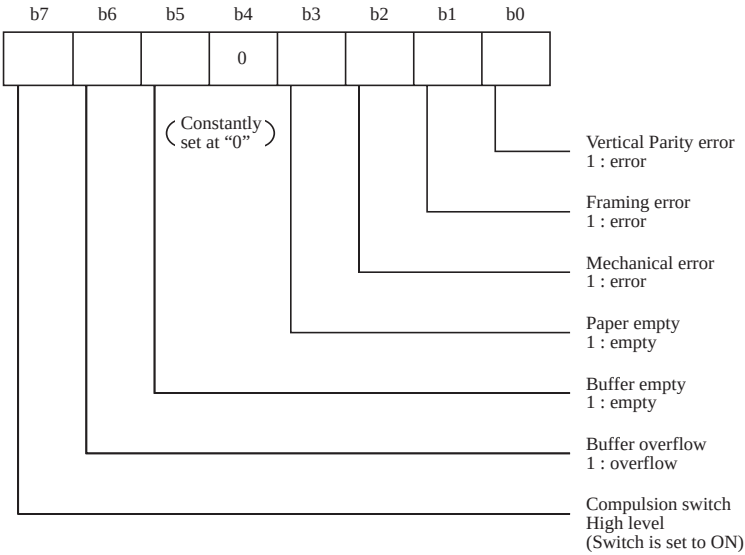
FUNCTION Enquiry

CODE <ENQ>

HEX 05

REMARKS Causes the printer to transmit a status byte.

Status byte



FUNCTION Reset the printer hardware.

CODE <ESC> "?" <LF><NUL>

HEX 1B 3F 0A 00

REMARKS Resets the printer hardware.

9. CONTROL CODES/ESC/POS MODE

Control Code	Hexadecimal Code	Function
HT	09	Horizontal tab
LF	0A	Print line feed
FF	0C	Page mode print and return
DLE EOT	10 04	Real time transmission of status
DLE ENQ	10 05	Real time request to printer
CAN	18	Cancel print data in page mode
ESC FF	1B FF	Print page mode data
ESC SP	1B 20	Set right space amount of character
ESC !	1B 21	Universal print mode designation
ESC #	1B 23	Set memory switch
ESC $	1B 24	Designate absolute printing
ESC %	1B 25	Designate/cancel download character set
ESC &	1B 26	Define download characters
ESC *	1B 2A	Designate bit image mode
ESC -	1B 2D	Designate/cancel underline
ESC 2	1B 32	Set 1/6 inch line feed amount
ESC 3	1B 33	Set line feed amount
ESC =	1B 3D	Select peripheral equipment
ESC ?	1B 3F	Delete download characters
ESC @	1B 40	Initialize printer
ESC D	1B 44	Set horizontal tab position
ESC E	1B 45	Designate/cancel emphasized print
ESC G	1B 47	Designate/cancel double print
ESC J	1B 4A	Print and paper feed
ESC L	1B 4C	Select page mode
ESC R	1B 52	Select international characters
ESC S	1B 53	Select standard mode
ESC T	1B 54	Select character print direction in print mode
ESC V	1B 56	Designate/cancel 90° character rotation
ESC W	1B 57	Set print range in page mode
ESC \	1B 5C	Designate relative position
ESC a	1B 61	Align position
ESC c4	1B 63 34	Select no valid paper detector at print stop
ESC c5	1B 63 35	Enable/disable panel switch
ESC d	1B 64	Print and paper feed “n” lines
ESC i	1B 69	Partial cut (one section remaining)
ESC p	1B 70	Designate pulse generation
ESC t	1B 74	Select character code table

Control Code	Hexadecimal Code	Function
ESC u	1B 75	Transmission of peripheral equipment status
ESC v	1B 76	Transmission of paper detection status
ESC {	1B 7B	Designate/cancel inverted printing
GS !	1D 21	Designate character size
GS $	1D 24	Designate absolute position of vertical direction of characters in page mode
GS *	1D 2A	Define download bit image
GS /	1D 2F	Print download bit image
GS :	1D 3A	Start/finish macro definition
GS B	1D 42	Designate/cancel reverse printing
GS H	1D 48	Select print position of HRI characters
GS I	1D 49	Printer ID transmission
GS L	1D 4C	Set left margin
GS P	1D 50	Set basic calculated pitch
GS V	1D 56	Paper cut
GS W	1D 57	Set print range
GS \	1D 5C	Designate the relative position of vertical characters when printing in the page mode
GS ^	1D 5E	Execute macro
GS a	1D 61	Enable/disable automatic status transmission
GS f	1D 66	Select HRI character font
GS h	1D 68	Set bar code height
GS k	1D 6B	Printing of bar code
GS r	1D 72	Transmission of status
GS w	1D 77	Set lateral size of bar code

10. CHARACTER CODE TABLES

Star Mode

Hexa-decimal	0	1	2	3	4	5	6	7
0	<NUL> 0	16	SP 32	0 48	@ 64	P 80	` 96	p 112
1	1	<DC1> 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	2	<DC2> 18	” 34	2 50	B 66	R 82	b 98	r 114
3	3	<DC3> 19	# 35	3 51	C 67	S 83	c 99	s 115
4	4	<DC4> 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	<ENQ> 5	21	% 37	5 53	E 69	U 85	e 101	u 117
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	<BEL> 7	23	’ 39	7 55	G 71	W 87	g 103	w 119
8	8	<CAN> 24	(40	8 56	H 72	X 88	h 104	x 120
9	<HT> 9	<EM> 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	<LF> 10	<SUB> 26	* 42	: 58	J 74	Z 90	j 106	z 122
B	<VT> 11	<ESC> 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	<FF> 12	<FS> 28	, 44	< 60	L 76	\ 92	l 108	¦ 124
D	<CR> 13	29	– 45	= 61	M 77	] 93	m 109	} 125
E	<SO> 14	<RS> 30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	<SI> 15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127

Star Mode

(Character table: Normal)

Hexa-decimal	8	9	A	B	C	D	E	F
0	128	144	Ä 160	é 176	ù 192	ā 208	224	240
1	129	145	Ö 161	è 177	ū 193	â 209	225	241
2	130	146	Ü 162	ē 178	û 194	° 210	226	242
3	131	147	ß 163	ê 179	ç 195	℃ 211	227	243
4	132	148	§ 164	ï 180	¿ 196	℉ 212	228	244
5	133	149	a 165	í 181	N̄ 197	Ω 213	229	245
6	134	150	o 166	ì 182	n̄ 198	µ 214	230	246
7	135	151	f̲ 167	ī 183	Ē 199	∑ 215	231	247
8	136	152	¢ 168	Î 184	ɔ 200	σ 216	232	248
9	137	153	1/2 169	ö 185	i 201	x̄ 217	233	249
A	138	154	N T 170	ó 186	Å 202	TL 218	234	250
B	139	155	T X 171	ò 187	ϕ 203	X 219	235	251
C	140	156	¥ 172	ō 188	θ 204	∞ 220	236	252
D	141	157	1/4 173	ô 189	ä 205	± 221	237	253
E	142	158	Ā 174	ü 190	á 206	÷ 222	238	254
F	143	× 159	ë 175	ú 191	à 207	π 223	239	255

Star Mode

(Character table: katakana)

Hexa-decimal	8	9	A	B	C	D	E	F
0	128	144	160	ー 176	タ 192	ミ 208	224	240
1	129	145	◦ 161	ア 177	チ 193	ム 209	225	241
2	130	146	「 162	イ 178	ツ 194	メ 210	226	242
3	131	147	」 163	ウ 179	テ 195	モ 211	227	243
4	132	148	、 164	エ 180	ト 196	ヤ 212	228	244
5	133	149	・ 165	オ 181	ナ 197	ユ 213	229	245
6	134	150	ヲ 166	カ 182	ニ 198	ヨ 214	230	246
7	135	151	ァ 167	キ 183	ヌ 199	ラ 215	231	247
8	136	152	ィ 168	ク 184	ネ 200	リ 216	232	248
9	137	153	ゥ 169	ケ 185	ノ 201	ル 217	233	249
A	138	154	ェ 170	コ 186	ハ 202	レ 218	234	250
B	139	155	ォ 171	サ 187	ヒ 203	ロ 219	235	251
C	140	156	ャ 172	シ 188	フ 204	ワ 220	236	252
D	141	157	ュ 173	ス 189	ヘ 205	ン 221	237	253
E	142	158	ョ 174	セ 190	ホ 206	゛ 222	238	254
F	143	159	ッ 175	ソ 191	マ 207	゜ 223	239	255

Star Mode

(Character table: IBM)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	 182	╞ 198	╓ 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	 185	╔ 201	┘ 217	Θ 233	∙ 249
A	è 138	Ü 154	¬ 170	 186	╩ 202	┌ 218	Ω 234	− 250
B	ï 139	₵ 155	½ 171	 187	╦ 203	 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	 188	╠ 204	 220	∞ 236	∩ 252
D	ì 141	¥ 157	¡ 173	 189	═ 205	 221	ϕ 237	² 253
E	Ä 142	₱ 158	« 174	 190	╬ 206	 222	∈ 238	254
F	Å 143	ƒ 159	» 175	191	╧ 207	223	∩ 239	255

Star Mode

International Character Set

	35	36	64	91	92	93	94	96	123	124	125	126
U. S. A.	#	$	@	[	\	]	^	`	{	|	}	~
France	#	$	à	°	ç	§	^	`	é	ù	è	¨
Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
England	£	$	@	[	\	]	^	`	{	|	}	~
Denmark 1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
Spain 1	₧	$	@	¡	Ñ	¿	^	'	¨	ñ	}	~
Japan	#	$	@	[	¥	]	^	`	{	|	}	~
Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark 2	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Spain 2	#	$	á	¡	Ñ	¿	é	'	í	ñ	ó	ú
Latin America	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú

ESC/POS Mode

Hexa-decimal	0	1	2	3	4	5	6	7
0	<NUL> 0	<DLE> 16	SP 32	0 48	@ 64	P 80	` 96	p 112
1	1	<XON> 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	2	18	” 34	2 50	B 66	R 82	b 98	r 114
3	3	<XOFF> 19	# 35	3 51	C 67	S 83	c 99	s 115
4	<EOT> 4	20	$ 36	4 52	D 68	T 84	d 100	t 116
5	<ENQ> 5	21	% 37	5 53	E 69	U 85	e 101	u 117
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118
7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119
8	8	<CAN> 24	(40	8 56	H 72	X 88	h 104	x 120
9	<HT> 9	25	) 41	9 57	I 73	Y 89	i 105	y 121
A	<LF> 10	26	* 42	: 58	J 74	Z 90	j 106	z 122
B	11	<ESC> 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	<FF> 12	28	, 44	< 60	L 76	\ 92	l 108	¦ 124
D	13	<GS> 29	– 45	= 61	M 77	] 93	m 109	} 125
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	15	31	/ 47	? 63	O 79	_ 95	o 111	SP 127

ESC/POS Mode

Page 0 (PC437: USA, Standard Europe)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▒ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	2 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

ESC/POS Mode

Page 1(Katakana)

Hexa-decimal	8	9	A	B	C	D	E	F
0	― 128	ｴ 144	SP 160	― 176	タ 192	ミ 208	＝ 224	× 240
1	― 129	ｵ 145	｡ 161	ア 177	チ 193	ム 209	ｷ 225	円 241
2	― 130	ｶ 146	「 162	イ 178	ツ 194	メ 210	ｸ 226	年 242
3	― 131	ｷ 147	」 163	ウ 179	テ 195	モ 211	ｹ 227	月 243
4	― 132	― 148	、 164	エ 180	ト 196	ヤ 212	◢ 228	日 244
5	― 133	ｰ 149	・ 165	オ 181	ナ 197	ユ 213	◣ 229	時 245
6	― 134	ｱ 150	ヲ 166	カ 182	ニ 198	ヨ 214	◥ 230	分 246
7	― 135	ｲ 151	ｧ 167	キ 183	ヌ 199	ラ 215	◤ 231	秒 247
8	― 136	ｳ 152	ｨ 168	ク 184	ネ 200	リ 216	♠ 232	〒 248
9	― 137	ｴ 153	ｩ 169	ケ 185	ノ 201	ル 217	♥ 233	市 249
A	― 138	ｵ 154	ｪ 170	コ 186	ハ 202	レ 218	◆ 234	区 250
B	― 139	ｶ 155	ｫ 171	サ 187	ヒ 203	ロ 219	♣ 235	町 251
C	― 140	ｷ 156	ｬ 172	シ 188	フ 204	ワ 220	● 236	村 252
D	― 141	ｸ 157	ｭ 173	ス 189	ヘ 205	ン 221	○ 237	人 253
E	― 142	ｹ 158	ｮ 174	セ 190	ホ 206	゛ 222	／ 238	※ 254
F	+ 143	ｺ 159	ッ 175	ソ 191	マ 207	゜ 223	＼ 239	SP 255

ESC/POS Mode

Page 2 (PC850: Multilingual)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▒ 176	└ 192	ð 208	α 224	― 240
1	ü 129	æ 145	í 161	▓ 177	┴ 193	Ð 209	ß 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	= 242
3	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	Õ 229	§ 245
6	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 247
7	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	Þ 231	¸ 247
8	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	Þ 232	° 248
9	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	ï 139	ø 155	½ 171	╗ 187	╦ 203	▉ 219	Ù 235	1 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▪ 220	ý 236	3 252
D	ì 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	Ý 237	2 253
E	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	― 238	▮ 254
F	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▪ 223	´ 239	SP 255

ESC/POS Mode

Page 3 (PC860: Portuguese)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	À 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	È 146	ó 162	▒ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ã 132	õ 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	Á 134	Ú 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	Ì 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	Ê 137	Õ 153	Ò 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	Í 139	₵ 155	½ 171	╗ 187	╦ 203	▉ 219	δ 235	√ 251
C	Ô 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	ì 141	Ù 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	2 253
E	Ã 142	₱ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	Â 143	Ó 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

ESC/POS Mode

Page 4 (PC863: Canadian-French)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	160	176	192	208	α 224	≡ 240
1	ü 129	È 145	161	177	193	209	β 225	± 241
2	é 130	Ê 146	ó 162	178	194	210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	179	195	211	π 227	≤ 243
4	Â 132	Ë 148	¨ 164	180	196	212	Σ 228	⌠ 244
5	à 133	Ï 149	165	181	197	213	σ 229	⌡ 245
6	¶ 134	û 150	³ 166	182	198	214	µ 230	÷ 246
7	ç 135	ù 151	‗ 167	183	199	215	τ 231	≈ 247
8	ê 136	¤ 152	Î 168	184	200	216	Φ 232	° 248
9	ë 137	Ô 153	169	185	201	217	Θ 233	• 249
A	è 138	Ü 154	170	186	202	218	Ω 234	· 250
B	ï 139	¢ 155	½ 171	187	203	219	δ 235	√ 251
C	î 140	£ 156	¼ 172	188	204	220	∞ 236	n 252
D	= 141	Ù 157	¾ 173	189	205	221	φ 237	² 253
E	À 142	Û 158	« 174	190	206	222	∈ 238	■ 254
F	§ 143	ƒ 159	» 175	191	207	223	∩ 239	SP 255

ESC/POS Mode

Page 5 (PC865: Nordic)

Hexa-decimal	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	▒ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▒ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	• 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	ø 155	½ 171	╗ 187	╦ 203	▉ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▪ 220	∞ 236	n 252
D	ì 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
F	Å 143	ƒ 159	¤ 175	┐ 191	╧ 207	▀ 223	∩ 239	SP 255

ESC/POS Mode

Page 255 (Space Page)

Hexa-decimal	8	9	A	B	C	D	E	F
0	SP 128	SP 144	SP 160	SP 176	SP 192	SP 208	SP 224	SP 240
1	SP 129	SP 145	SP 161	SP 177	SP 193	SP 209	SP 225	SP 241
2	SP 130	SP 146	SP 162	SP 178	SP 194	SP 210	SP 226	SP 242
3	SP 131	SP 147	SP 163	SP 179	SP 195	SP 211	SP 227	SP 243
4	SP 132	SP 148	SP 164	SP 180	SP 196	SP 212	SP 228	SP 244
5	SP 133	SP 149	SP 165	SP 181	SP 197	SP 213	SP 229	SP 245
6	SP 134	SP 150	SP 166	SP 182	SP 198	SP 214	SP 230	SP 246
7	SP 135	SP 151	SP 167	SP 183	SP 199	SP 215	SP 231	SP 247
8	SP 136	SP 152	SP 168	SP 184	SP 200	SP 216	SP 232	SP 248
9	SP 137	SP 153	SP 169	SP 185	SP 201	SP 217	SP 233	SP 249
A	SP 138	SP 154	SP 170	SP 186	SP 202	SP 218	SP 234	SP 250
B	SP 139	SP 155	SP 171	SP 187	SP 203	SP 219	SP 235	SP 251
C	SP 140	SP 156	SP 172	SP 188	SP 204	SP 220	SP 236	SP 252
D	SP 141	SP 157	SP 173	SP 189	SP 205	SP 221	SP 237	SP 253
E	SP 142	SP 158	SP 174	SP 190	SP 206	SP 222	SP 238	SP 254
F	SP 143	SP 159	SP 175	SP 191	SP 207	SP 223	SP 239	SP 255

ESC/POS Mode

International Character Set

	35	36	64	91	92	93	94	96	123	124	125	126
U. S. A.	#	$	@	[	\	]	^	`	{	|	}	~
France	#	$	à	°	ç	§	^	`	é	ù	è	¨
Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
England	£	$	@	[	\	]	^	`	{	|	}	~
Denmark 1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
Spain	₧	$	@	¡	Ñ	¿	^	'	¨	ñ	}	~
Japan	#	$	@	[	¥	]	^	`	{	|	}	~
Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark 2	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

11. AUTOMATIC CUTTER

The TSP242 comes equipped with a guillotine-type automatic paper cutter.

① The cutter operates in response to data commands. To enable cutter operation, set Memory Switch #2-8 to indicate that the cutter is installed.

② NEVER place fingers or metal objects in the cutter area.

③ If a jam occurs in the cutter area, switch off the power, use tweezers to remove the jammed paper, then switch the power back on. The printer will return the blade to the home position.

④ Never clean the cutter blade with alcohol or any other solvent, as this may remove the blade's lubrication and shorten the blade life.

MEMO

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