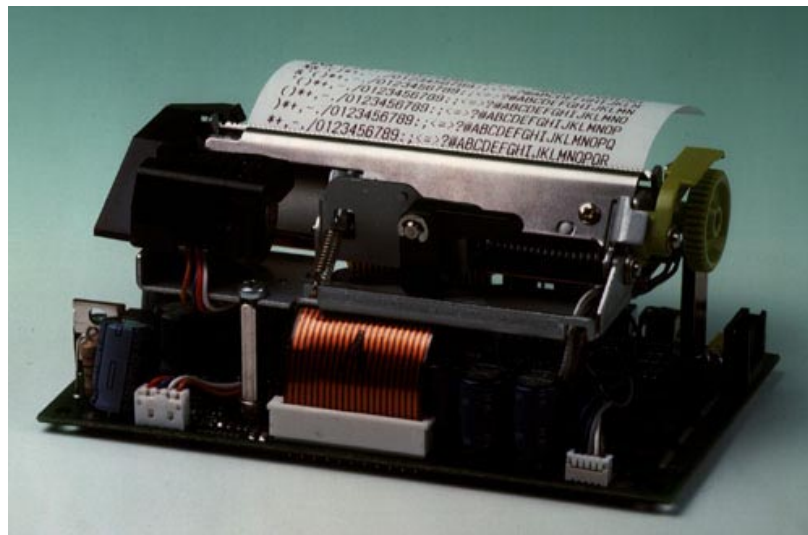


# Integrated printing module PM8024 User Manual



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COD. DOME - PM8024

REV. 1.00

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Custom Engineering

Str. Berettine 2 - 43010 Fontevivo (PARMA) - Italy

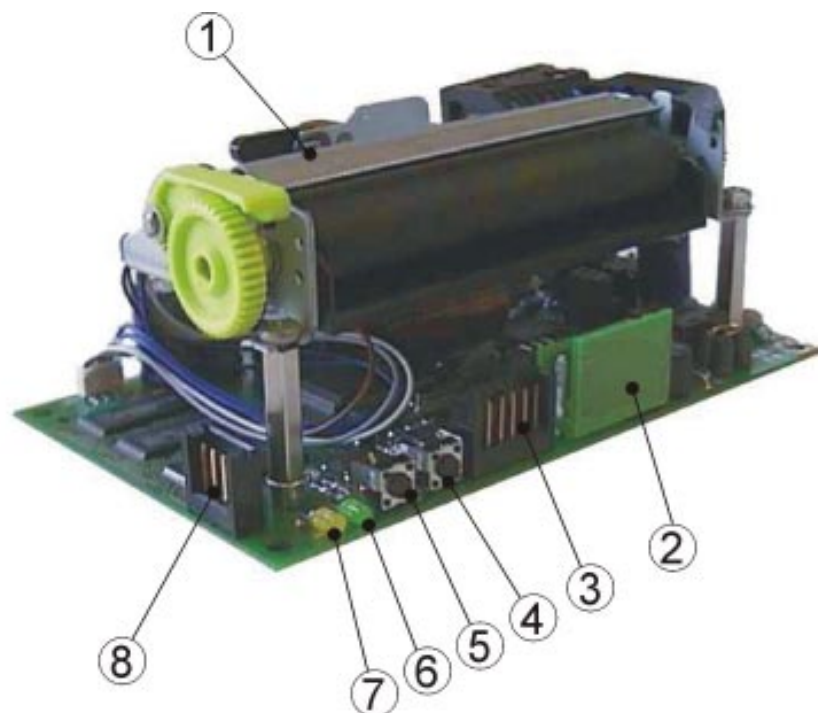
Tel. : +39 0521-680111 - Fax : +39 0521-610701

http: [www.custom.it](http://www.custom.it) Email : [support@custom.it](mailto:support@custom.it)

## PRINTER COMPONENTS

### A. Front view of the exterior of the PM8024

- 1- Print mechanism
- 2- Feed connector and I<sup>2</sup>C bus
- 3- RS232 connector
- 4- PRINT key
- 5- FEED key
- 6- "Power" Led
- 7- "Status" Led
- 8- Keys connector tasti and external leds



## Dichiarazione "CE" di conformità

Rispetto alle norme ISO/IEC Guida 22 e EN 45014

N°:  
DC0413099

Nome del produttore: Custom Engineering s.r.l.

Indirizzo del produttore: Strada Berettine 2  
Fontevivo (Parma)  
Italy

Dichiara il prodotto:

Nome prodotto: Modulo di stampa integrato

Nome tipo: PM8024

Modello: PM8024

conforme alle seguenti direttive:

Direttiva Compatibilità Elettromagnetica 89/336/CEE; 92/31/CEE; 93/68/CEE

In accordo con i seguenti standard:

|                      |                                                                                                                                      |      |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|------|
| EN 55022<br>Classe B | Limiti e metodi di misura delle caratteristiche di radiodisturbo prodotto dagli apparecchi per la tecnologia dell'informazione.      | 1994 |
| EN 50082-1           | Compatibilità Elettromagnetica - Norma generica sull'immunità. Parte 1: Ambienti residenziali, commerciali e dell'industria leggera. | 1992 |
| EN 61000-4-2         | Prove di immunità a scariche elettrostatiche. 4KV a contatto, 8KV in aria                                                            | 1995 |
| EN 61000-4-4         | Prove di immunità a transitori/treni elettrici veloci. Linee di segnale 0,5KV Linee di alimentazione AC 1KV                          | 1995 |
| ENV 50140            | Campi elettromagnetici irradiati a radiofrequenza. Prova di immunità. 3V/m, 80MHz-1000MHz, 80% 1KHz AM                               | 1993 |

Luglio 1999

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## CONTENTS OF THE MANUAL

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

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

Chapter 2: Containing the specifications of the interfaces

Chapter 3: Containing the description of the printer command set

Chapter 4: Containing the technical specifications of the printer

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

## CONVENTIONS USED IN THE MANUAL



### **N.B.**

Gives important information or suggestions relative to the use of the printer



### **WARNING**

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



### **DANGER**

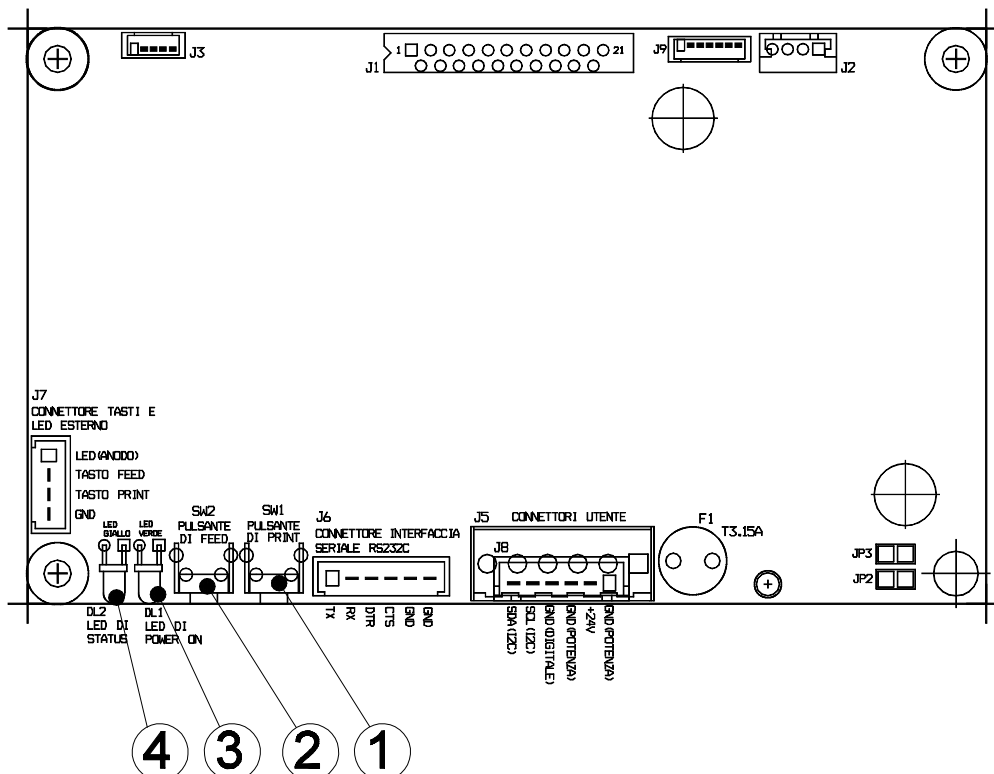
The information marked with this symbol must be carefully heeded to safeguard against injury to the operator.

## GENERAL FEATURES

The PM8024 is a practical, user-friendly printer.

It is equipped with a 200 dpi (8 dots/mm) thermal print mechanism and uses 60mm paper rolls. The PM8024 has a wide range of supplementary functions in addition to normal print functions:

- Serial interface RS232 and I<sup>2</sup>C bus.
- High speed printing: 60mm/sec.
- Easy paper changing (automatic paper loading).
- ESC/POS™, CUSTOM DPT and CITIZEN emulation.
- Bar-codes: UPC-A, UPC-E, EAN13, EAN8, CODE39, ITF, CODABAR, CODE93, CODE128 and CODE32.
- 7 standard and international character fonts.
- Entirely or partially programmable fonts.
- Double width-height, quadruple width-height, expanded print, italics rotated by 180°.
- 32 Kbyte reception buffer.
- Macro function definition for the automatic repetition of the operations.
- Internal programmable counter.
- Graphic mode.
- Print density.
- 3 programmable logotypes ( 448 x 585 points ).



(Fig.1)

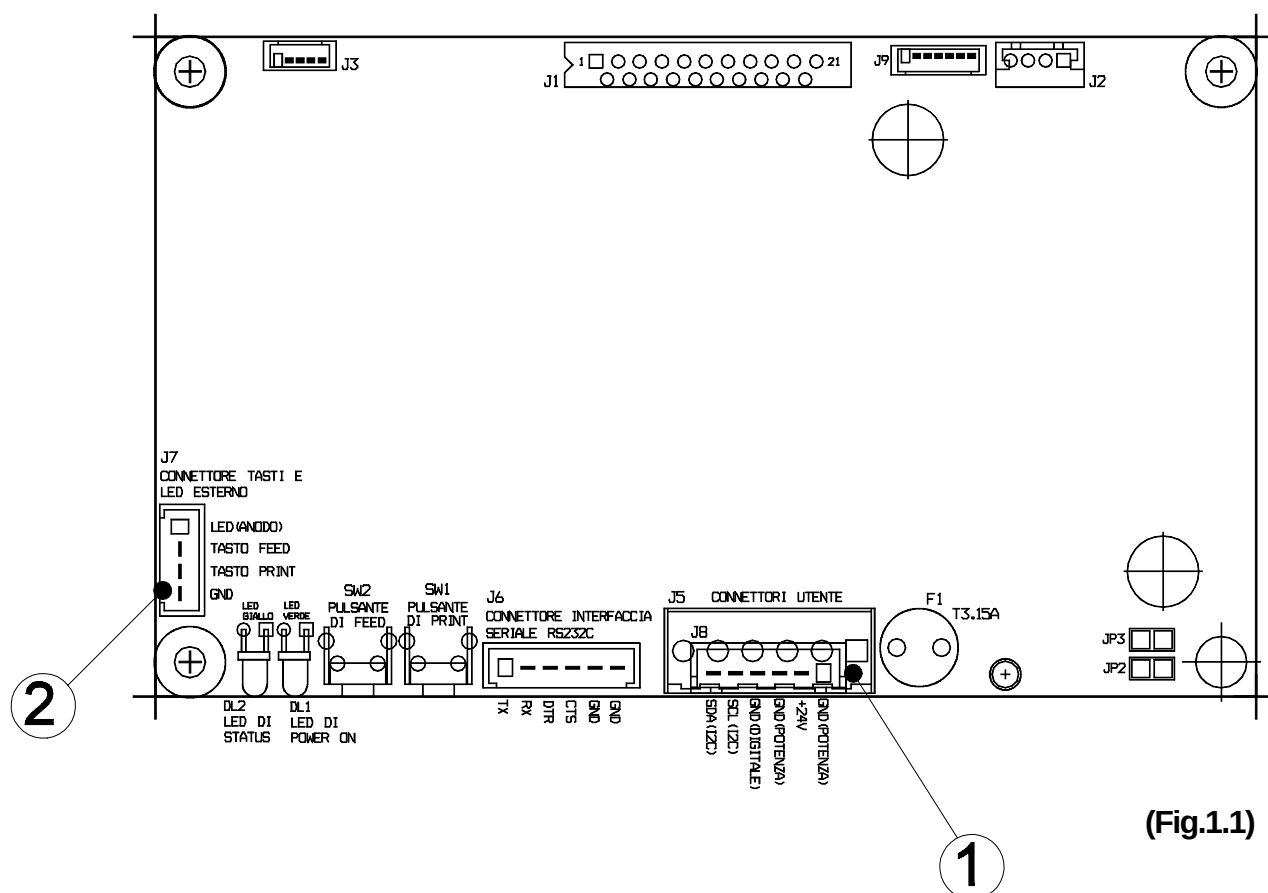
## DESCRIPTION OF THE PRINTER

The control panel is located on the front (fig. 1) and has a PRINT key (1), a FEED key (2) and a two lighting led : Green LED indicating Power (3) and Yellow Led indicating Status (4).

- **PRINT key.** When the printer interface is RS232 serial and the PRINT key is pressed, the printer transmits the code 13 (\$ 0D) in serial. This function can be disabled or modified by the software command ESC K. (See paragraph relative to the software commands). If, on switching on the printer, the PRINT key is held down, the printer will run the GRAPHIC TEST with 3 programmable logotypes.
- **FEED key.** When the FEED key is pressed, the printer carries out the paper forward feed function, required when the paper is inserted in the print mechanism. If pressed once, the key forward feeds the paper twice. If, on switching on the printer, the FEED key is held down, the printer runs the FONT TEST.
- The yellow LED signals a printer hardware error. The control is run "on line", i.e. in the event of malfunctioning, the LED starts flashing as per the following table:

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

## 1.1 CONNECTIONS



(Fig.1.1)

### 1.1.1 Power Supply

The PM8024 printer is equipped with a standard 6-pin male AMPMODU1-type connector (J5). In this connector are you the signals for the I<sup>2</sup>C interface too. The signals on the connector pins are indicated in the table 1.1.



#### WARNING:

Respect the polarity of the power supply.

(Tab.1.1)

| PIN      | SIGNAL     | NOTES            |
|----------|------------|------------------|
| <b>1</b> | GND        | POWER            |
| <b>2</b> | + 24 V     | POWER            |
| <b>3</b> | GND        | POWER            |
| <b>4</b> | SIGNAL GND |                  |
| <b>5</b> | SCL        | I <sup>2</sup> C |
| <b>6</b> | SDA        | I <sup>2</sup> C |

### 1.1.2 Keys and external leds

An external Print key, a Key feed and an external led can be connected to connector J7 (2). The polarity and functions of the signals are shown in Table 1.2.

| Pin | Signal       |
|-----|--------------|
| 1   | LED ( ANODE) |
| 2   | FEED KEY     |
| 3   | PRINT KEY    |
| 4   | GND          |

(Tab.1.2)

## 1.2 CONFIGURATION

The PM8024 enables the configuration of the printer default parameters. The parameters affected during configuration are:

- **Printer number:** 1-127.
- **I<sup>2</sup>C Baud Rate:** 80 - 100 KHz, 40 - 50 KHz, 10 - 12 KHz, 1 - 2 KHz.
- **Printer emulation:** ESC/POS™, CUSTOM DPT24, CUSTOM DPT42 or CBM iDP560RS.
- **Protocol:** RS-232C, I<sup>2</sup>C.
- **Baud Rate:** 38400, 19200, 9600, 4800, 2400, 1200.
- **Length of data:** 7, 8 bits/char.
- **Parity:** None, even or odd.
- **Flow control:** XON/XOFF or Hardware.
- **Automatic feed:** CR disabled or CR enabled.
- **Panel Key:** Enabled or Disabled.
- **Print mode:** Normal or Reverse.
- **Height mode:** x1, x2 or x4.
- **Width mode:** x1, x2 or x4.
- **Justification:** Left, Centred or Right.

#### With ESC/POS™ :

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

#### With CBM iDP560RS:

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

## 1. INSTALLATION AND USE

### With CUSTOM DPTxx:

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

The settings made are saved on the EEPROM (non volatile memory).

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

When the FEED key is pressed, the printer skips setup mode and terminates the Hexadecimal dump function.

When the PRINT key is pressed, the printer enters parameter setting mode.

### 1.3 HEXADECIMAL DUMP

After completing the autotest procedure, the printer enters Hexadecimal Dump mode. This function is used for the diagnostics of characters received in serial. In fact, these are printed in hexadecimal code together with the corresponding Ascii code. Figure 1.2 shows an example of printing from the printer Setup:

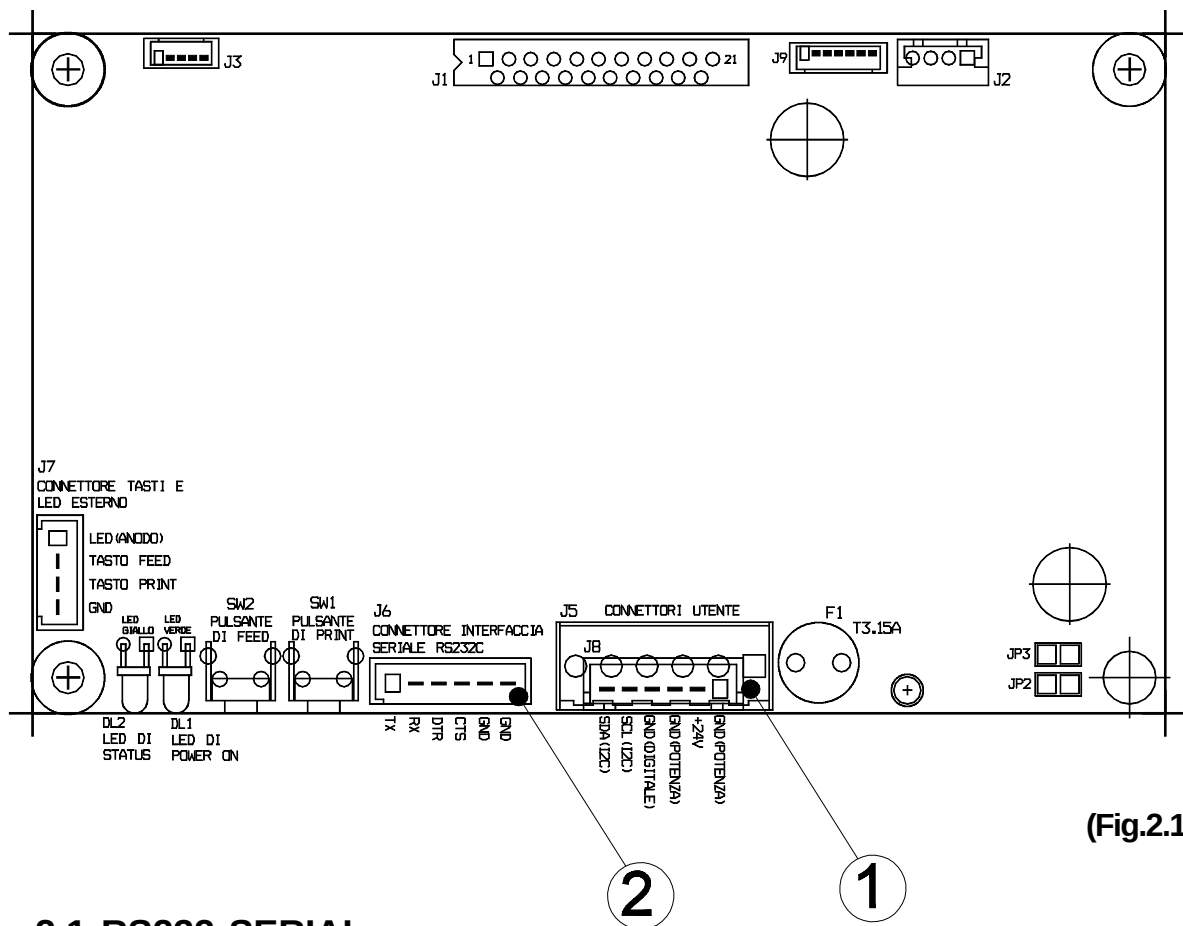
```
Font Dimension: 14x24 32 col
Speed/Quality : Normal
Print Density : Normal

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

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

(Fig.1.2)

## 2. INTERFACES



(Fig.2.1)

## 2.1 RS232 SERIAL

The PM8024 has an RS232 serial interface and is connected by means of a 6 pin connector (2). In the following table, the signals present on the connector are listed:

| PIN         | SIGNAL | IN/OUT | DESCRIPTION                                                                                                                                                                        |
|-------------|--------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b>    | TX     | OUT    | Data reception. Serial output (from host)                                                                                                                                          |
| <b>2</b>    | RX     | IN     | Data transmission. Serial input data (to host)                                                                                                                                     |
| <b>3</b>    | DTR    | OUT    | To select DTR/DSR command, this signal indicates when the printer is busy. SPACE indicates when the printer is ready to receive data, and MARK indicates when the printer is busy. |
| <b>4</b>    | RTS    | OUT    | Ready to send. Ready to receive data (active on high RS232 level).                                                                                                                 |
| <b>5, 6</b> | GND    | -      | GND                                                                                                                                                                                |

**(Tab.2.1)**

**2.2 I<sup>2</sup>C SERIAL**

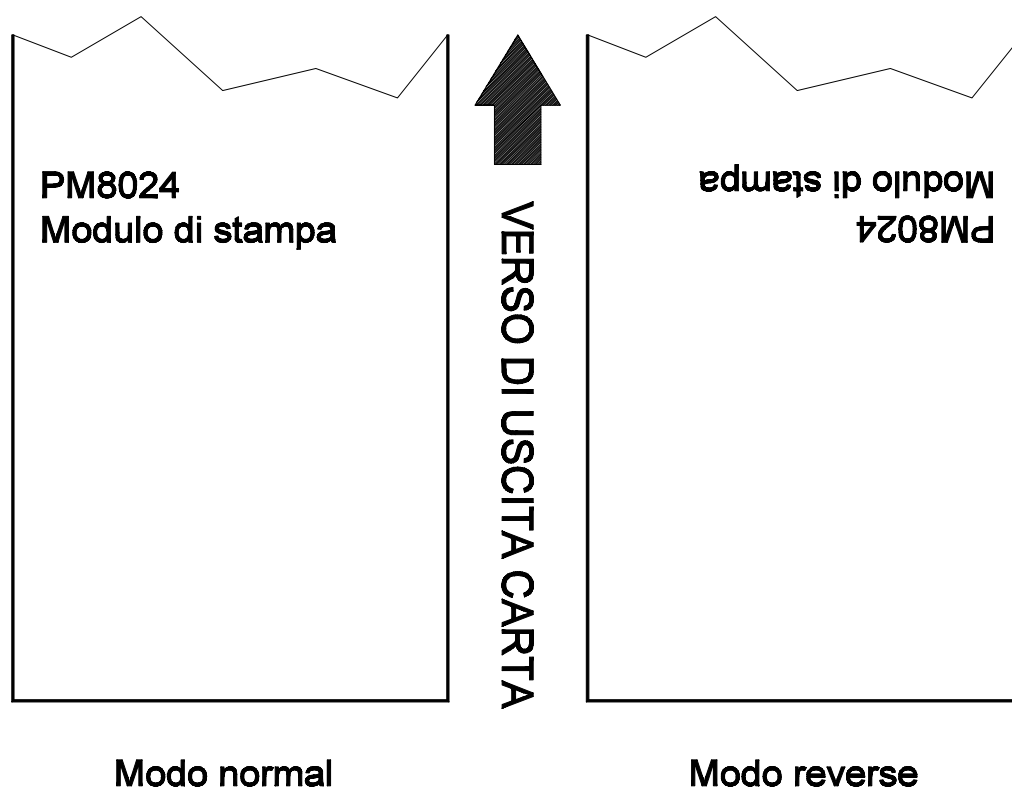
It's possible to set I<sup>2</sup>C communication protocol on PM8024. The J5 (1) connector has the power supply function too (see the chapter one). In the following table, the signals present on the connector are listed:

**(Tab.2.2)**

| <b>PIN</b> | <b>SIGNAL</b> | <b>NOTES</b>     |
|------------|---------------|------------------|
| <b>1</b>   | GND           | POWER            |
| <b>2</b>   | + 24 V        | POWER            |
| <b>3</b>   | GND           | POWER            |
| <b>4</b>   | SIGNAL GND    |                  |
| <b>5</b>   | SCL           | I <sup>2</sup> C |
| <b>6</b>   | SDA           | I <sup>2</sup> C |

#### 3.1 PRINT DIRECTION

The PM8024 printer has two print modes, selectable through the control characters: normal and reverse.



(Fig.3.1)

## 3.2 CONTROL CHARACTERS

### 3.2.1 ESC/POS Emulation

The following table lists all the commands for the management of the ESC/POS™ Emulation of the PM8024 printer. The commands can be transmitted to the printer at any moment, but they will only be carried out when the commands previously sent have been executed. There are no commands with priority status; all the commands are carried out when the circular buffer is feed to do so.

(Tab.3.1) COMMAND TABLE

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

### 3. PRINTER FUNCTIONS

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

### 3. PRINTER FUNCTIONS

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

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

#### HT

[Name] **Horizontal tabs**

[Format]      ASCII      HT  
                  Hex        09  
                  Decimal    9

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

### 3. PRINTER FUNCTIONS

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

[Default]

[Reference] **ESC D**

[Example]

#### LF

[Name] **Print and line feed**

[Format]

|         |    |
|---------|----|
| ASCII   | LF |
| Hex     | 0A |
| Decimal | 10 |

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

[Notes]

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

[Default]

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

[Example]

#### BS

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

[Format]

|         |    |
|---------|----|
| ASCII   | BS |
| Hex     | 08 |
| Decimal | 8  |

[Description] Moves print position to previous character.

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

[Default]

[Reference]

[Example]

#### CR

|               |                                                                                                                      |    |  |
|---------------|----------------------------------------------------------------------------------------------------------------------|----|--|
| [Name]        | <b>Print and line feed</b>                                                                                           |    |  |
| [Format]      | ASCII                                                                                                                | CR |  |
|               | Hex                                                                                                                  | 0D |  |
|               | Decimal                                                                                                              | 13 |  |
| [Description] | When autofeed is CR enabled, this command functions in the same way as LF, otherwise it is ignored.                  |    |  |
| [Notes]       | <ul style="list-style-type: none"><li>• This command sets the print position at the beginning of the line.</li></ul> |    |  |
| [Default]     | See autofeed parameter on Setup.                                                                                     |    |  |
| [Reference]   | <b>LF</b>                                                                                                            |    |  |
| [Example]     |                                                                                                                      |    |  |

#### DLE EOT n

|               |                                                                                                                                                                                                                                                                     |     |     |   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|---|
| [Name]        | <b>Transmission of status in real time</b>                                                                                                                                                                                                                          |     |     |   |
| [Format]      | ASCII                                                                                                                                                                                                                                                               | DLE | EOT | n |
|               | Hex                                                                                                                                                                                                                                                                 | 10  | 04  | n |
|               | Decimal                                                                                                                                                                                                                                                             | 16  | 4   | n |
| [Range]       | $1 \leq n \leq 4$                                                                                                                                                                                                                                                   |     |     |   |
| [Description] | Transmits in real time the selected status of the printer specified by <i>n</i> according to the following parameters:<br>n = 1 transmit printer status<br>n = 2 transmit off-line status<br>n = 3 transmit error status<br>n = 4 transmit paper roll sensor status |     |     |   |
| [Notes]       | <ul style="list-style-type: none"> <li>• This command is executed even when the reception buffer is full.</li> </ul> The status is transmitted whenever the data sequence 10H 04H n ( $1 \leq n \leq 4$ ) is received.                                              |     |     |   |
| [Default]     |                                                                                                                                                                                                                                                                     |     |     |   |
| [Reference]   |                                                                                                                                                                                                                                                                     |     |     |   |
| [Example]     |                                                                                                                                                                                                                                                                     |     |     |   |

### 3. PRINTER FUNCTIONS

#### n=1: Printer status

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

#### n=2: Off-line status

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

#### n=3: Error status

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

### 3. PRINTER FUNCTIONS

n=4: Paper roll sensor status

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

#### CAN

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

#### ESC SP n

|               |                                                                                                                                                                                                                                                                          |     |    |   |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---|
| [Name]        | <b>Set character right-side spacing</b>                                                                                                                                                                                                                                  |     |    |   |
| [Format]      | ASCII                                                                                                                                                                                                                                                                    | ESC | SP | n |
|               | Hex                                                                                                                                                                                                                                                                      | 1B  | 20 | n |
|               | Decimal                                                                                                                                                                                                                                                                  | 27  | 32 | n |
| [Range]       | $0 \leq n \leq 255$                                                                                                                                                                                                                                                      |     |    |   |
| [Description] | Sets spacing to right of character at [ n x horizontal or vertical motion units].                                                                                                                                                                                        |     |    |   |
| [Notes]       | <ul style="list-style-type: none"> <li>The spacing to the right of the character for double width mode is double that used for normal mode. When the characters are enlarged, the spacing to the right of the character is m (2 or 4) times the normal value.</li> </ul> |     |    |   |

### 3. PRINTER FUNCTIONS

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

[Default]  $n = 0$

[Reference] **GS P**

[Example]

#### ESC ! n

[Name] **Select print modes.**

[Format]      ASCII      ESC !      n  
                  Hex        1B    21      n  
                  Decimal    27    33      n

[Range]         $0 \leq n \leq 255$

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

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

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

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

[Default] n = 0

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

[Example]

#### **ESC \$ nL nH**

[Name] **Set absolute print position**

|          |         |        |    |    |
|----------|---------|--------|----|----|
| [Format] | ASCII   | ESC \$ | nL | nH |
|          | Hex     | 1B 24  | nL | nH |
|          | Decimal | 27 36  | nL | nH |

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

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

The distance from the beginning of the line to the print position is  $[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$  inches.

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

### 3. PRINTER FUNCTIONS

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

[Default]

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

[Example]

#### ESC % n

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

[Format]

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

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

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

[Notes]

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

[Default] n=0

[Reference] **ESC &, ESC ?**

[Example]

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

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

[Format]

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

[Range]

y = 3

$32 \leq c1 \leq c2 \leq 126$

$0 \leq x \leq 14$  (Font 14 x 24)

$0 \leq x \leq 10$  (Font 10 x 24)

$0 \leq x \leq 8$  (Font 8 x 24)

$0 \leq d1 \dots d(y \times xk) \leq 255$

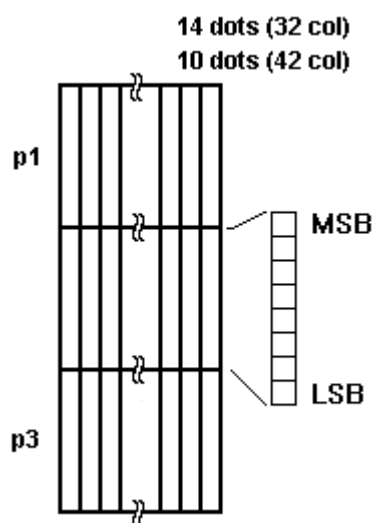
$k = c2 - c1 + 1$

### 3. PRINTER FUNCTIONS

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Description] | <p>Defines user programmables characters.</p> <p>Y specifies the number of bytes in the vertical direction.</p> <p>C1 specifies the beginning character code for the definition and C2 specifies the final code.</p> <p>X specifies the number of dots in the horizontal direction.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| [Notes]       | <ul style="list-style-type: none"><li>• The allowable character code range is from ASCII code 20H (32) to 7EH (126) (95 characters).</li><li>• It is possible to define multiple characters for consecutive character codes. If only one character is desired, use c1 = c2.</li><li>• If c2 &lt; c1, the command is not executed.</li><li>• d is the dot data for the characters. The dot pattern runs horizontally from the left. Any remaining dots on the right side are blank.</li><li>• the data to define a user-defined character is ( x ´ y) bytes.</li><li>• set a corresponding bit to 1 to print a dot or to 0 not to print a dot.</li><li>• this command can define different user-defined character patterns by each font. To select the font, use the command <b>ESC !</b>.</li><li>• A user-defined character and a downloaded bit image cannot be defined simultaneously. When this command is executed, the downloaded bit image is cleared.</li><li>• The user-defined character definition is cleared when :<br/><b>ESC @</b> is executed;<br/><b>GS *</b> is executed;<br/><b>ESC ?</b> is executed;</li></ul> <p>The printer is reset or the power is turned off.</p> |
| [Default]     | The internal character set.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| [Reference]   | <b>ESC %</b> , <b>ESC ?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

### 3. PRINTER FUNCTIONS

[Example]



#### ESC \* m nL nH d1...dk

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

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

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

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

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

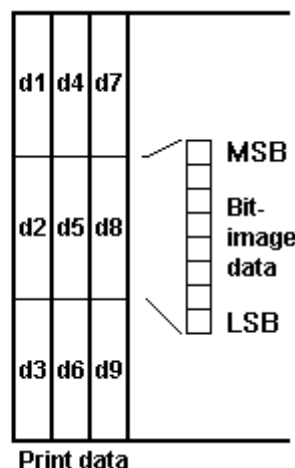
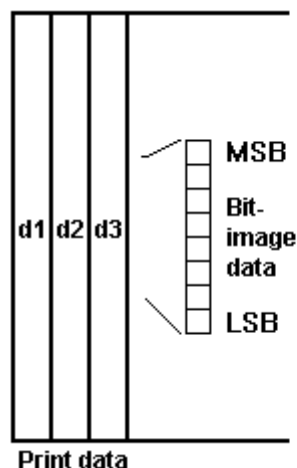
### 3. PRINTER FUNCTIONS

[Notes]

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

8 dot image

24 dot image



[Default]

[Reference]

[Example]

### 3. PRINTER FUNCTIONS

#### ESC - n

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |    |   |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---|
| [Name]        | <b>Turn underline mode on/off.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |    |   |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ESC | -  | n |
|               | Hex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1B  | 2D | n |
|               | Decimal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 27  | 45 | n |
| [Range]       | $0 \leq n \leq 2, 48 \leq n \leq 50$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |    |   |
| [Description] | Turns underline mode on or off, based on the following values of n:<br>n = 0, 48 Turns off underline mode<br>n = 1, 49 Turns on underline mode (1-dot thick)<br>n = 2, 50 Turns on underline mode (2-dot thick)                                                                                                                                                                                                                                                                                                                                                  |     |    |   |
| [Notes]       | <ul style="list-style-type: none"><li>• The printer can underline all characters but cannot underline the space set by <b>HT</b> and right-side character spacing.</li><li>• The printer cannot underline 90° clockwise rotated characters and white/black inverted characters.</li><li>• When underline mode is turned off by setting the value of <i>n</i> at 0 or 48, the following data is not underlined.</li><li>• Underline mode can also be turned on or off by using <b>ESC !</b>. Note, however, that the last command received is effective</li></ul> |     |    |   |
| [Default]     | n=0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |    |   |
| [Reference]   | <b>ESC !</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |    |   |
| [Example]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |    |   |

#### ESC 0

|               |                                      |     |    |  |
|---------------|--------------------------------------|-----|----|--|
| [Name]        | <b>Select 1/8-inch line spacing.</b> |     |    |  |
| [Format]      | ASCII                                | ESC | 0  |  |
|               | Hex                                  | 1B  | 30 |  |
|               | Decimal                              | 27  | 48 |  |
| [Description] | Selects 1/8-inch line spacing.       |     |    |  |
| [Notes]       |                                      |     |    |  |
| [Default]     |                                      |     |    |  |
| [Reference]   | <b>ESC 2, ESC 3</b>                  |     |    |  |
| [Example]     |                                      |     |    |  |

#### ESC 2

|               |                                      |     |    |
|---------------|--------------------------------------|-----|----|
| [Name]        | <b>Set line spacing at 1/6 inch.</b> |     |    |
| [Format]      | ASCII                                | ESC | 2  |
|               | Hex                                  | 1B  | 32 |
|               | Decimal                              | 27  | 50 |
| [Description] | Selects 1/6 inch line spacing.       |     |    |
| [Notes]       |                                      |     |    |
| [Default]     |                                      |     |    |
| [Reference]   | <b>ESC 0, ESC 3</b>                  |     |    |
| [Example]     |                                      |     |    |

#### ESC 3 n

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |    |   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---|
| [Name]        | <b>Set line spacing.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |    |   |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ESC | 3  | n |
|               | Hex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1B  | 33 | n |
|               | Decimal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 27  | 51 | n |
| [Range]       | $0 \leq n \leq 255$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |    |   |
| [Description] | Sets the line spacing at [ $n \times$ (vertical or horizontal motion unit)] inches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |    |   |
| [Notes]       | <ul style="list-style-type: none"> <li>Horizontal and vertical motion units are specified by the command <b>GS P</b>. Changing the horizontal or vertical motion unit does not affect the current line spacing.</li> <li>The command <b>GS P</b> can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum vertical movement amount.</li> <li>In standard mode, the vertical motion unit is used.</li> <li>The maximum line spacing is <math>n = 255</math> (<math>\cong 32\text{mm}</math>).</li> </ul> |     |    |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |    |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |    |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |    |   |
| [Default]     | n = 32 (1/6 inch)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |    |   |
| [Reference]   | <b>ESC 0, ESC 2, ESC P</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |    |   |
| [Example]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |    |   |

### 3. PRINTER FUNCTIONS

#### ESC 4 n

|               |                                                                     |
|---------------|---------------------------------------------------------------------|
| [Name]        | <b>Set / reset script mode.</b>                                     |
| [Format]      | ASCII ESC    4    n<br>Hex    1B   34   n<br>Decimal    27   52   n |
| [Range]       | $0 \leq n \leq 1, 48 \leq n \leq 49$                                |
| [Description] | Turns script mode on or off, based on the following values of $n$ : |

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

|             |                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Notes]     | <ul style="list-style-type: none"><li>• The printer can print all characters in script mode.</li><li>• When script mode is turned off by setting the value <math>n</math> at 0 or 48, the data that follows is printed in normal mode.</li><li>• Script mode can also be turned on or off by using <b>ESC !</b>. Note, however, that the last command received is effective</li></ul> |
| [Default]   | $n = 0$                                                                                                                                                                                                                                                                                                                                                                               |
| [Reference] | <b>ESC !</b>                                                                                                                                                                                                                                                                                                                                                                          |
| [Example]   |                                                                                                                                                                                                                                                                                                                                                                                       |

#### ESC = n

|               |                                                                                 |
|---------------|---------------------------------------------------------------------------------|
| [Name]        | <b>Select peripheral device</b>                                                 |
| [Format]      | ASCII        ESC =    n<br>Hex        1B    3D    n<br>Decimal    27    61    n |
| [Range]       | $0 \leq n \leq 255$                                                             |
| [Description] | Selects the device to which the host computer sends data, using $n$ as follows: |

### 3. PRINTER FUNCTIONS

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

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

[Default]                    n = 1

[Reference]

[Example]

#### ESC ? n

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

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

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

[Description]            Cancels user-defined characters.

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

[Default]

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

[Example]

### 3. PRINTER FUNCTIONS

#### ESC @

|               |                                                                                                                                                     |     |    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| [Name]        | Inizialize the printer.                                                                                                                             |     |    |
| [Format]      | ASCII                                                                                                                                               | ESC | @  |
|               | Hex                                                                                                                                                 | 1B  | 40 |
|               | Decimal                                                                                                                                             | 27  | 64 |
| [Description] | Clears the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.                        |     |    |
| [Notes]       | <ul style="list-style-type: none"><li>• The data in the reception buffer is not cleared.</li><li>• The macro definitions are not cleared.</li></ul> |     |    |
| [Default]     |                                                                                                                                                     |     |    |
| [Reference]   |                                                                                                                                                     |     |    |
| [Example]     |                                                                                                                                                     |     |    |

#### ESC D [n1...nk] NUL

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |    |         |     |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---------|-----|
| [Name]        | Set the horizontal tabs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |    |         |     |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ESC | D  | n1...nk | NUL |
|               | Hex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1B  | 44 | n1...nk | 00  |
|               | Decimal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 27  | 68 | n1...nk | 0   |
| [Range]       | $1 \leq n \leq 255$<br>$0 \leq k \leq 32$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |    |         |     |
| [Description] | Sets the horizontal tabs. <ul style="list-style-type: none"><li>• <i>n</i> specifies the number of columns for setting a horizontal tab from the beginning of the line.</li><li>• <i>k</i> indicates the total number of horizontal tabs to be set.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                     |     |    |         |     |
| [Notes]       | <ul style="list-style-type: none"><li>• The horizontal tab position is stored as a value of [character width x <i>n</i>] measured from the beginning of the line. The width of the character includes the space to the right of the character and double width characters are set with a width which is double that of normal characters.</li><li>• This command cancels the previous horizontal tab setting.</li><li>• When setting <math>n = 8</math>, the print position is moved to column 9 by sending <b>HT</b>.</li><li>• Up to 32 tab positions can be set ( <math>k = 32</math> ). Any data exceeding the 32 tabs is processed as normal data.</li></ul> |     |    |         |     |

- Transmit [ *n* ] *k* in ascending order and put a code 0 NUL at the end. When [ *n* ] *k* is less than or equal to the preceding value [ *n* ] *k*-1, tab setting is finished and the following data is processed as normal data.

- **ESC D NUL** cancels all horizontal tab positions.

- The previously specified horizontal tab positions do not change, even if the character width changes.

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

[Reference] **HT**

[Example]

#### ESC E *n*

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

[Format] ASCII ESCE *n*

Hex 1B 45 *n*

Decimal 27 69 *n*

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

[Description] Turns bold mode On or Off.

- When the LSB of *n* is 0, bold mode is turned off.

- When the LSB of *n* is 1, bold mode is turned on.

[Notes] • Only the LSB of *n* is effective.

- The command **ESC !** also turns bold mode on and off. In any case, the last command received is enabled.

[Default] *n* = 0

[Reference] **ESC !**

[Example]

#### ESC G *n*

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

[Format] ASCII ESC G *n*

Hex 1B 47 *n*

Decimal 27 71 *n*

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

### 3. PRINTER FUNCTIONS

[Description] Turns double-strike mode On or Off.

- When the LSB of  $n$  is 0, double-strike mode is turned off.
- When the LSB of  $n$  is 1, double-strike mode is turned on.

[Notes]

- Only the LSB of  $n$  is effective.
- The printer output is the same in double-strike mode and bold mode.

[Default]  $n = 0$

[Reference] **ESC E**

[Example]

#### ESC J n

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

[Format]

|         |       |   |
|---------|-------|---|
| ASCII   | ESCJ  | n |
| Hex     | 1B 4A | n |
| Decimal | 27 74 | n |

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

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

[Notes]

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

[Default]

[Reference] **GS P**

[Example]

### 3. PRINTER FUNCTIONS

#### ESC R n

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

[Format] ASCII      ESCR    n

Hex          1B 52 n

Decimal    27 82 n

[Range]       $0 \leq n \leq 12$

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

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

[Default]      n = 0

[Reference]

[Example]

### 3. PRINTER FUNCTIONS

#### ESC \ nL nH

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |    |    |  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|----|--|
| [Name]        | <b>Set relative print position.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |    |    |  |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ESC \ | nL | nH |  |
|               | Hex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1B 5C | nL | nH |  |
|               | Decimal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 27 92 | nL | nH |  |
| [Range]       | $0 \leq nL \leq 255$<br>$0 \leq nH \leq 255$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |    |    |  |
| [Description] | <p>Sets the print starting position based on the current position by using the horizontal or vertical motion unit.</p> <p>This command sets the distance from the current position to <math>[(nL + nH \times 256) \times (\text{horizontal or vertical motion unit})]</math>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       |    |    |  |
| [Notes]       | <ul style="list-style-type: none"> <li>Any setting that exceeds the printable area is ignored.</li> <li>When the starting position is specified by n motion units to the right :<br/> <math>nL + nH \times 256 = n</math><br/> When the starting position is specified by n motion units to the left (negative direction) use the complement of 65536 :<br/> <math>nL + nH \times 256 = 65536 - n</math> </li> <li>If setting exceeds printing area width, left or right margin is set to default value.</li> <li>The horizontal and vertical motion units are specified by <b>GS P</b>.</li> <li>The command <b>GS P</b> can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount.</li> <li>In standard mode, the horizontal motion unit is used.</li> </ul> |       |    |    |  |
| [Default]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |    |    |  |
| [Reference]   | <b>ESC \$, GS P</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |    |    |  |
| [Example]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |    |    |  |

#### ESC a n

|               |                                                                                                                                                                                                                                                                                                                                 |                                   |                                   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|
| [Name]        | <b>Select justification.</b>                                                                                                                                                                                                                                                                                                    |                                   |                                   |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                           | ESC a                             | n                                 |
|               | Hex                                                                                                                                                                                                                                                                                                                             | 1B 61                             | n                                 |
|               | Decimal                                                                                                                                                                                                                                                                                                                         | 27 97                             | n                                 |
| [Range]       | 0 ≤ n ≤ 2, 48 ≤ n ≤ 50                                                                                                                                                                                                                                                                                                          |                                   |                                   |
| [Description] | Aligns all the data in one line in the position specified.<br><i>n</i> selects the type of justification as follows:                                                                                                                                                                                                            |                                   |                                   |
|               | <b>n</b>                                                                                                                                                                                                                                                                                                                        | <b>Justification</b>              |                                   |
|               | 0, 48                                                                                                                                                                                                                                                                                                                           | Left justification                |                                   |
|               | 1, 49                                                                                                                                                                                                                                                                                                                           | Centring                          |                                   |
|               | 2, 50                                                                                                                                                                                                                                                                                                                           | Right justification               |                                   |
| [Notes]       | <ul style="list-style-type: none"><li>• This command is only enabled if input at the beginning of the line.</li><li>• The lines are justified within the specified printing area.</li><li>• The spaces set by the commands <b>HT</b>, <b>ESC \$</b> and <b>ESC \</b> remain justified as per the previously set mode.</li></ul> |                                   |                                   |
| [Default]     | n = 0                                                                                                                                                                                                                                                                                                                           |                                   |                                   |
| [Reference]   |                                                                                                                                                                                                                                                                                                                                 |                                   |                                   |
| [Example]     | Left justification                                                                                                                                                                                                                                                                                                              | Centring                          | Right justification               |
|               | <div>ABC<br/>ABCD<br/>ABCDE</div>                                                                                                                                                                                                                                                                                               | <div>ABC<br/>ABCD<br/>ABCDE</div> | <div>ABC<br/>ABCD<br/>ABCDE</div> |

#### ESC c 5 n

|               |                                                                                                                                                                                                                                                  |       |    |   |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|---|
| [Name]        | <b>Enable or disable the front panel keys.</b>                                                                                                                                                                                                   |       |    |   |
| [Format]      | ASCII                                                                                                                                                                                                                                            | ESC c | 5  | n |
|               | Hex                                                                                                                                                                                                                                              | 1B 63 | 35 | n |
|               | Decimal                                                                                                                                                                                                                                          | 27 99 | 53 | n |
| [Range]       | $0 \leq n \leq 255$                                                                                                                                                                                                                              |       |    |   |
| [Description] | Enables or disables the front panel keys. <ul style="list-style-type: none"> <li>• When the LSB of n is 0, the panel keys are enabled.</li> <li>• When the LSB of n is 1, the panel keys are disabled.</li> </ul>                                |       |    |   |
| [Notes]       | <ul style="list-style-type: none"> <li>• Only the LSB of n is effective.</li> <li>• In the printer, the panel buttons are the FEED and PRINT keys.</li> <li>• When the panel keys are disabled, the keys can only operate when reset.</li> </ul> |       |    |   |

### 3. PRINTER FUNCTIONS

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

#### ESC d n

[Name]            **Print and feed paper  $n$  lines.**  
[Format]        ASCII        ESC        d            n  
                  Hex        1B        64 n  
                  Decimal    27        100 n  
[Range]          $0 \leq n \leq 255$   
[Description]   Prints the data in the print buffer and feeds the paper  $n$  lines.  
[Notes]         

- This command sets the print starting position at the beginning of the line.
- This command does not affect the line spacing set by ESC 2 or ESC 3.
- The maximum paper feed amount is 200 lines. Even if a paper feed exceeding 200 lines is set, the printer only feeds the paper by 200 lines.

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

#### ESC i

[Name]            **Total cut.**  
[Format]        ASCII        ESCi  
                  Hex        1B    69  
                  Decimal    27    105  
[Description]   This command enables cutter operation; if there is no cutter, a disabling flag is set any subsequent cutting commands will be ignored.  
[Notes]         

- The printer waits until all the paper movement commands have been completed before executing total cut

  
[Default]  
[Reference]  
[Example]

#### ESC m

|               |                                                                                                                                                            |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Name]        | <b>Partial cut.</b>                                                                                                                                        |
| [Format]      | ASCII ESC      m<br>Hex    1B 6D<br>Decimal    27 109                                                                                                      |
| [Description] | This command enables partial cutter operation. If there is no cutter, a disabling flag is set and any subsequent cutting commands will be ignored.         |
| [Notes]       | <ul style="list-style-type: none"> <li>The printer waits until all the paper movement commands have been completed before executing partial cut</li> </ul> |
| [Default]     |                                                                                                                                                            |
| [Reference]   |                                                                                                                                                            |
| [Example]     |                                                                                                                                                            |

#### ESC p m t1 t2

|                 |                                                                                                                                                                                                                                                                                             |                 |                      |       |                                    |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------|-------|------------------------------------|
| [Name]          | <b>Generate pulse.</b>                                                                                                                                                                                                                                                                      |                 |                      |       |                                    |
| [Format]        | ASCII      ESC    p      m      t1      t2<br>Hex          1B    70    m      t1      t2<br>Decimal    27    112    m      t1      t2                                                                                                                                                       |                 |                      |       |                                    |
| [Range]         | m = 0, 48<br>$0 \leq t1 \leq 255$<br>$0 \leq t2 \leq 255$                                                                                                                                                                                                                                   |                 |                      |       |                                    |
| [Description]   | Outputs the pulse specified by t1 and t2 to the Pin <i>m</i> of the connector as follows: <div style="margin-left: 150px;"> <table> <tr> <td><b><i>m</i></b></td> <td><b>Connector pin</b></td> </tr> <tr> <td>0, 48</td> <td>Pin 2 of drawer kick-out connector</td> </tr> </table> </div> | <b><i>m</i></b> | <b>Connector pin</b> | 0, 48 | Pin 2 of drawer kick-out connector |
| <b><i>m</i></b> | <b>Connector pin</b>                                                                                                                                                                                                                                                                        |                 |                      |       |                                    |
| 0, 48           | Pin 2 of drawer kick-out connector                                                                                                                                                                                                                                                          |                 |                      |       |                                    |
| [Notes]         | <ul style="list-style-type: none"> <li>The pulse ON time is [ <math>t1' 2</math> ms ] and the OFF time is [ <math>t2' 2</math> ms ].</li> <li>If <math>t2 &lt; t1</math>, the OFF time is [ <math>t1' 2</math> ms ].</li> </ul>                                                             |                 |                      |       |                                    |
| [Default]       |                                                                                                                                                                                                                                                                                             |                 |                      |       |                                    |
| [Reference]     |                                                                                                                                                                                                                                                                                             |                 |                      |       |                                    |
| [Example]       |                                                                                                                                                                                                                                                                                             |                 |                      |       |                                    |

#### ESC r n

|               |                                                                                                                                                                                                              |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Name]        | <b>Set/ Reset red printing mode</b>                                                                                                                                                                          |
| [Format]      | ASCII      ESC r      n<br>Hex          1B    72    n<br>Decimal    27    114   n                                                                                                                            |
| [Range]       | $0 \leq n \leq 1, 48 \leq n \leq 49$                                                                                                                                                                         |
| [Description] | Sets and resets red printing mode.<br><b>n      Function</b><br>0, 48   Reset red printing mode<br>1, 49   Set red printing mode                                                                             |
| [Notes]       | <ul style="list-style-type: none"> <li>• The printer only prints the whole line, and not single characters, in red.</li> <li>• The printer only prints in red if enabled (see parameter setting).</li> </ul> |
| [Default]     | $n = 0$                                                                                                                                                                                                      |
| [Reference]   |                                                                                                                                                                                                              |
| [Example]     |                                                                                                                                                                                                              |

#### ESC t n

|               |                                                                                  |
|---------------|----------------------------------------------------------------------------------|
| [Name]        | <b>Select the character code table.</b>                                          |
| [Format]      | ASCII      ESCt      n<br>Hex          1B    74    n<br>Decimal    27    116   n |
| [Range]       | $n = 0, 255$                                                                     |
| [Description] | Selects a page $n$ from the character code table, as follows:                    |

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

|             |                          |
|-------------|--------------------------|
| [Note]      |                          |
| [Default]   | $n = 0$                  |
| [Reference] | See character code table |
| [Example]   |                          |

#### ESC u n

|               |                                                                                               |
|---------------|-----------------------------------------------------------------------------------------------|
| [Name]        | <b>Transmit peripheral device status.</b>                                                     |
| [Format]      | ASCII ESC    u    n<br>Hex    1B 75   n<br>Decimal    27 117 n                                |
| [Range]       | $n = 0, 48$                                                                                   |
| [Description] | Transmits the status of connector pin $n$ upon receiving this command, using $n$ as follows : |

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

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Notes] | <ul style="list-style-type: none"> <li>• This command is executed when the data is processed in the reception buffer. There may be a time lag, therefore, between receiving the command and transmitting the status, depending on the status of the reception buffer.</li> <li>• When the connector is not used, the value of the bit 0 is always 1.</li> <li>• The status to be transmitted is shown in the table below:</li> </ul> |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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

|             |                                                        |
|-------------|--------------------------------------------------------|
| [Default]   |                                                        |
| [Reference] | <b>DLE EOT, GS r</b><br>See drawer kick-out connector. |
| [Example]   |                                                        |

### 3. PRINTER FUNCTIONS

#### ESC x n

|               |                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------------------------------------|
| [Name]        | Select speed / quality mode.                                                                                            |
| [Format]      | ASCII ESC    x    n<br>Hex    1B   78   n<br>Decimal   27   120 n                                                       |
| [Range]       | 0 ≤ n ≤ 2                                                                                                               |
| [Description] | Selects speed / quality mode.<br>n Function<br>0 Draft mode (high speed)<br>1 Normal mode<br>2 High quality (low speed) |
| [Notes]       | • In high quality mode ( n= 2 ), the printer may be noisy.                                                              |
| [Default]     | n = 1                                                                                                                   |
| [Reference]   |                                                                                                                         |
| [Example]     |                                                                                                                         |

#### ESC v

|               |                                                                                                                                                       |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Name]        | <b>Transmit paper sensor status.</b>                                                                                                                  |
| [Format]      | ASCII    ESC v<br>Hex       1B    76<br>Decimal   27    118                                                                                           |
| [Description] | Transmits the current paper sensor status upon receiving this command.                                                                                |
| [Notes]       | • This command is executed immediately, even when the reception buffer is full (Busy ).<br>The status to be transmitted is shown in the table below : |

### 3. PRINTER FUNCTIONS

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

[Default]

[Reference] **DLE EOT**

[Example]

#### ESC { n

[Name] **Turn upside-down printing mode on/off.**

[Format] ASCII ESC{ n  
Hex 1B 7B n  
Decimal 27 123 n

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

[Description] Turns upside-down printing mode on/off.

- When the LSB of  $n$  is 0, upside-down printing mode is turned off.
- When the LSB of  $n$  is 1, upside-down printing mode is turned on.

[Notes]

- Only the LSB of  $n$  is effective.
- This command is only enabled when input at the beginning of a line.
- In upside-down printing mode, the printer rotates the line to be printed by 180° and then prints it.

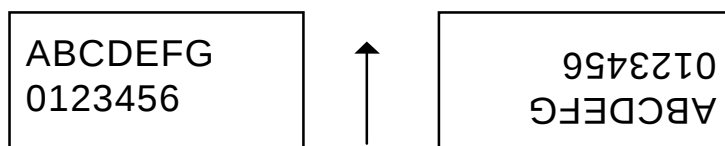
[Default]  $n = 0$

[Reference]

[Example]

### 3. PRINTER FUNCTIONS

Upside-down printing Off      Upside-down printing On



Paper outfeed direction

#### ESC · n xH xL yH yL

|               |                                                                                      |     |     |   |    |    |    |    |
|---------------|--------------------------------------------------------------------------------------|-----|-----|---|----|----|----|----|
| [Name]        | <b>Print graphic bank ( 448 x585 dots).</b>                                          |     |     |   |    |    |    |    |
| [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]       | $0 \leq n \leq 3$<br>$0 \leq xH, xL, yH, yL \leq 255$                                |     |     |   |    |    |    |    |
| [Description] | Prints the graphics bank from flash or ram.<br><i>n</i> selects the bank as follows: |     |     |   |    |    |    |    |

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

$xL + xH' - 256$  specifies the starting dot line ( 1 , 585 ).

$yL + yH' - 256$  specifies the number of lines to print.

|         |                                                                                                                                                                                                                                                                                               |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Notes] | <ul style="list-style-type: none"> <li>• If <math>(xL + (xH' - 256)) &gt; 585</math> the printer does not execute the command.</li> <li>• Se <math>(xL + (xH' - 256) + yL + (yH' - 256)) &gt; 585</math> the printer only prints <math>585 - xL + (xH' - 256) + 1</math> dotlines.</li> </ul> |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

[Default]

[Reference] **ESC<sup>3</sup>, ESC<sup>2</sup>, ESC<sup>1</sup>**

[Example] To print from ram bank dotline 100 to dotline 299, send:  
1BH FAH00H00H64H00HC7H

#### ESC <sup>1</sup> nL nH

|               |                                                                                                                                                                                              |                  |    |    |  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----|----|--|
| [Name]        | <b>Transmit ram bank to serial port.</b>                                                                                                                                                     |                  |    |    |  |
| [Format]      | ASCII                                                                                                                                                                                        | ESC <sup>1</sup> | 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]       | <ul style="list-style-type: none"> <li>The size of the ram bank for graphic printing is 448 horizontal dots (56 bytes/dotline) ´ 585 vertical points (32760 bytes = 16380 words).</li> </ul> |                  |    |    |  |
| [Default]     |                                                                                                                                                                                              |                  |    |    |  |
| [Reference]   | <b>ESC <sup>3</sup>, ESC <sup>2</sup>, ESC  </b>                                                                                                                                             |                  |    |    |  |
| [Example]     |                                                                                                                                                                                              |                  |    |    |  |

#### ESC <sup>3</sup> n

|               |                                                                                      |                  |   |  |  |
|---------------|--------------------------------------------------------------------------------------|------------------|---|--|--|
| [Name]        | <b>Transfer the flash bank into ram bank.</b>                                        |                  |   |  |  |
| [Format]      | ASCII                                                                                | ESC <sup>3</sup> | n |  |  |
|               | Hex                                                                                  | 1B FC            | n |  |  |
|               | Decimal                                                                              | 27 252           | n |  |  |
| [Range]       | $1 \leq n \leq 3$                                                                    |                  |   |  |  |
| [Description] | Transfers flash bank into ram bank ( 32768 bytes).<br>n selects the bank as follows: |                  |   |  |  |

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

|             |                                                  |
|-------------|--------------------------------------------------|
| [Note]      |                                                  |
| [Default]   |                                                  |
| [Reference] | <b>ESC <sup>1</sup>, ESC <sup>2</sup>, ESC  </b> |
| [Example]   |                                                  |

### 3. PRINTER FUNCTIONS

#### ESC <sup>2</sup> nL nH

|               |                                                                                                                                                                                                                                                                                                   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Name]        | Receive ram bank from port.                                                                                                                                                                                                                                                                       |
| [Format]      | ASCII      ESC <sup>2</sup> nL      nH<br>Hex          1B    FD    nL      nH<br>Decimal    27    253   nL      nH                                                                                                                                                                                |
| [Range]       | 0 ≤ nL, nH ≤ 255                                                                                                                                                                                                                                                                                  |
| [Description] | Receives [nL + (nH ´ 256)] words from port and puts them into ram bank.                                                                                                                                                                                                                           |
| [Notes]       | <ul style="list-style-type: none"> <li>• The number of data bytes received is [nL + (nH ´ 256)] ´ 2.</li> <li>• Each word is received first in MSByte form and then in LSByte form</li> <li>• If [nL + (nH ´ 256)] exceeds 16384, the data following will be processed as normal data.</li> </ul> |
| [Default]     |                                                                                                                                                                                                                                                                                                   |
| [Reference]   | ESC ·, ESC <sup>3</sup> , ESC                                                                                                                                                                                                                                                                     |
| [Example]     |                                                                                                                                                                                                                                                                                                   |

#### ESC | n

|               |                                                                                       |
|---------------|---------------------------------------------------------------------------------------|
| [Name]        | <b>Transfer ram bank into flash bank.</b>                                             |
| [Format]      | ASCII      ESC        n<br>Hex          1B    FE    n<br>Decimal    27    254   n     |
| [Range]       | 1 ≤ n ≤ 3                                                                             |
| [Description] | Transfer ram bank into flash bank. ( 32768 bytes).<br>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 <sup>2</sup> , ESC <sup>3</sup> |
| [Example]   |                                            |

#### GS ! n

|               |                                                                                                                                                                                   |    |    |   |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|---|
| [Name]        | <b>Select character size.</b>                                                                                                                                                     |    |    |   |
| [Format]      | ASCII                                                                                                                                                                             | GS | !  | n |
|               | Hex                                                                                                                                                                               | 1D | 21 | n |
|               | Decimal                                                                                                                                                                           | 29 | 33 | n |
| [Range]       | $0 \leq n \leq 255$                                                                                                                                                               |    |    |   |
| [Description] | Selects character height and width, as follows:                                                                                                                                   |    |    |   |
|               | <ul style="list-style-type: none"> <li>• Bits 0 to 3 : character height selection ( see table 2 ).</li> <li>• Bits 4 to 7 : character width selection ( see table 1 ).</li> </ul> |    |    |   |

Table1 Character width selection

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

Table 2 Character height selection

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

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

[Default]      n = 0

[Reference]    **ESC !**

[Example]

### 3. PRINTER FUNCTIONS

#### GS :

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| [Name]        | <b>Start / end macro definition.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |    |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | GS | :  |
|               | Hex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1D | 3A |
|               | Decimal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 29 | 58 |
| [Description] | Starts or ends macro definition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |
| [Notes]       | <ul style="list-style-type: none"><li>• Macro definition starts when this command is received during normal operation.</li><li>• When the command <b>GS ^</b> is received during macro definition, the printer ends the macro definitions and clears all definitions.</li><li>• Macro not defined when the power is turned on.</li><li>• The defined contents of the macro are not cleared by the command <b>ESC @</b>. Therefore, <b>ESC @</b> can be included in the contents of the macro definitions.</li><li>• If the printer receives the command <b>GS :</b> again immediately after previously receiving <b>GS :</b>, the printer remains in the macro undefined state.</li><li>• The contents of the macro can be defined up to 1024 bytes. If the macro definition exceeds 1024 bytes, the excess data is not stored.</li></ul> |    |    |
| [Default]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |
| [Reference]   | <b>GS ^</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |    |
| [Example]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |

#### GS B n

|               |                                                                                                                                                                                                                                                                                             |    |    |   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|---|
| [Name]        | <b>Turn white / black reverse printing mode on/off.</b>                                                                                                                                                                                                                                     |    |    |   |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                       | GS | B  | n |
|               | Hex                                                                                                                                                                                                                                                                                         | 1D | 42 | n |
|               | Decimal                                                                                                                                                                                                                                                                                     | 29 | 66 | n |
| [Range]       | $0 \leq n \leq 255$                                                                                                                                                                                                                                                                         |    |    |   |
| [Description] | <p>Turns white/black reverse printing mode on or off.</p> <ul style="list-style-type: none"><li>• When the LSB of <math>n</math> is 0, white/black reverse printing is turned off.</li><li>• When the LSB of <math>n</math> is 1, white/black reverse printing mode is turned on.</li></ul> |    |    |   |

- [Notes]
- Only the LSB of  $n$  is effective.
  - This command is available for built-in characters and user-defined characters.
  - This command does not affect bit image, downloaded bit image, bar codes, HRI characters and spacing skipped by **HT**, **ESC \$** and **ESC \**.
  - This command does not affect the space between lines.
  - White/black reverse mode has a higher priority than underline mode. Even if underline mode is on, it is disabled (but not cancelled) when white/black reverse mode is selected.
- [Default]  $n = 0$
- [Reference]
- [Example]

#### GS C 0 n m

- [Name] **Select counter print mode.**
- [Format]
- |         | ASCII | GS | C  | 0 | n | m |
|---------|-------|----|----|---|---|---|
| Hex     | 1D    | 43 | 30 | n | m |   |
| Decimal | 29    | 67 | 48 | n | m |   |
- [Range]  $0 \leq n \leq 5$   
 $m = 0, 1, 2, 48, 49, 50$
- [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                       |

### 3. PRINTER FUNCTIONS

|             |                                                                                                                                                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Notes]     | <ul style="list-style-type: none"> <li>• If <math>n</math> or <math>m</math> is out of the defined range, the previously set print mode is not changed.</li> <li>• If <math>n = 0</math>, <math>m</math> does not have any meaning.</li> </ul> |
| [Default]   | $n = 0, m = 0$                                                                                                                                                                                                                                 |
| [Reference] | <b>GS C 1, GS C 2, GS C ;, GS c</b>                                                                                                                                                                                                            |
| [Example]   | $n = 3, m = 0$ $n = 3, m = 1$ $n = 3, m = 2$<br><div style="display: flex; justify-content: space-around; width: 100%;"> <span>□□1</span> <span>001</span> <span>1□□</span> </div>                                                             |

□ indicates a space

#### GS C 1 aL aH bL bH n r

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |    |   |   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|----|---|---|
| [Name]        | <b>Select count mode (A).</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |    |    |    |    |    |    |   |   |
| [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]       | $0 \leq aL, aH \leq 255$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |    |    |    |    |    |   |   |
|               | $0 \leq bL, bH \leq 255$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |    |    |    |    |    |   |   |
|               | $0 \leq n, r \leq 255$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |    |    |    |    |    |    |    |   |   |
| [Description] | Selects a count mode for the serial number counter. <ul style="list-style-type: none"> <li>• <math>aL, aH</math> or <math>bL, bH</math> specify the counter range.</li> <li>• <math>n</math> specify the stepping amount when counting up or down.</li> <li>• <math>r</math> indicates the repetition number when the counter value is fixed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |    |    |    |    |    |   |   |
| [Notes]       | <ul style="list-style-type: none"> <li>• Count-up mode is specified when:<br/> <math>[aL + (aH \times 256)] &lt; [bL + (bH \times 256)]</math> and <math>n \neq 0</math> and <math>r \neq 0</math></li> <li>• Count-down mode is specified when:<br/> <math>[aL + (aH \times 256)] &gt; [bL + (bH \times 256)]</math> and <math>n \neq 0</math> and <math>r \neq 0</math></li> <li>• Counting stops when:<br/> <math>[aL + (aH \times 256)] = [bL + (bH \times 256)]</math> or <math>n = 0</math> or <math>r = 0</math></li> <li>• In setting count-up mode, the minimum value of the counter is <math>[aL + (aH \times 256)]</math> and the maximum value is <math>[bL + (bH \times 256)]</math>. If counting up reaches a value exceeding the maximum, it is resumed with the minimum value.</li> <li>• In setting count-down mode, the maximum value of the counter is <math>[aL + (aH \times 256)]</math> and the minimum value is <math>[bL + (bH \times 256)]</math>. If counting down reaches a value less than minimum, it is resumed with the maximum value.</li> <li>• When the command is executed, the internal count that indicates the repetition number specified by <math>r</math> is cleared.</li> </ul> |    |    |    |    |    |    |    |   |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |    |   |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |    |   |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |    |   |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |    |   |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |    |   |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |    |   |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |    |   |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |    |   |   |
|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |    |   |   |

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

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

[Notes]

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

[Default]

$sa = 1$ ,  $sb = 65535$ ,  $sn = 1$ ,  $sr = 1$ ,  $sc = 1$

[Reference]

**GS C 0**, **GS C 2**, **GS C 1**, **GS c**

[Example]

#### GS H n

|               |                                                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------|
| [Name]        | Select printing position of Human Readable Interpretation (HRI)                                                               |
| [Format]      | ASCII      GS   H    n<br>Hex        1D   48   n<br>Decimal   29   72   n                                                     |
| [Range]       | $0 \leq n \leq 3, 48 \leq n \leq 51$                                                                                          |
| [Description] | Selects the printing position of HRI characters when printing bar code.<br><i>n</i> 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] | <b>GS f, GS k</b>                                              |
| [Example]   |                                                                |

#### GS I n

|               |                                                                           |
|---------------|---------------------------------------------------------------------------|
| [Name]        | <b>Transmit printer ID.</b>                                               |
| [Format]      | ASCII      GS   I    n<br>Hex        1D   49   n<br>Decimal   29   73   n |
| [Range]       | $1 \leq n \leq 3, 49 \leq n \leq 51$                                      |
| [Description] | Transmits the printer ID specified by <i>n</i> as follows:                |

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| n     | Printer ID       | Specification                   |
|-------|------------------|---------------------------------|
| 1. 49 | Printer model ID | 15H (PM8024)                    |
| 2. 50 | Type ID          | Refer to table below            |
| 3. 51 | ROM version ID   | Depends on ROM version (4 char) |

#### **n = 2, Function identification**

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

[Notes]

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

[Default]

[Reference]

[Example]

#### GS L nL nH

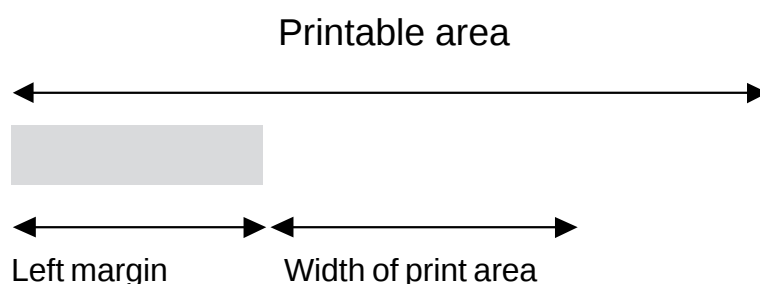
[Name] **Set left margin.**

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

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

[Description] Sets the left margin.

- The left margin is set at  $[(nL + nH \cdot 256) \cdot (\text{horizontal motion unit})]$  inches.



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

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

[Reference]    **GS P, GS W**

[Example]

### 3. PRINTER FUNCTIONS

#### GS P x y

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |    |    |   |   |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|---|---|
| [Name]        | <b>Set horizontal and vertical motion units.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |    |    |   |   |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | GS | P  | x | y |
|               | Hex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1D | 50 | x | y |
|               | Decimal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 29 | 80 | x | y |
| [Range]       | x = 100, 200<br>y = 100, 200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |   |   |
| [Description] | Sets the horizontal and vertical motion units at 1/x inches and 1/y inches, respectively.<br>When x is set at 0, the default setting value is used.<br>When y is set at 0, the default setting value is used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |   |   |
| [Notes]       | <ul style="list-style-type: none"> <li>• The horizontal direction is perpendicular to the paper feed direction.</li> <li>• In standard mode, the following commands use x or y, irrespective of character rotation (upside down or 90° clockwise rotation):</li> </ul> <p>① <b>Commands using x</b> : ESC SP, ESC \$, ESC \, GS L, GS W.</p> <p>② <b>Commands using y</b> : ESC 3, ESC J.</p> <ul style="list-style-type: none"> <li>• This command does not affect the previously specified values.</li> <li>• 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.</li> </ul> |    |    |   |   |
| [Default]     | x = 200, y = 200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |    |    |   |   |
| [Reference]   | <b>ESC SP, ESC \$, ESC \, ESC 3, ESC J, GS L, GS W</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |    |    |   |   |
| [Example]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |    |    |   |   |

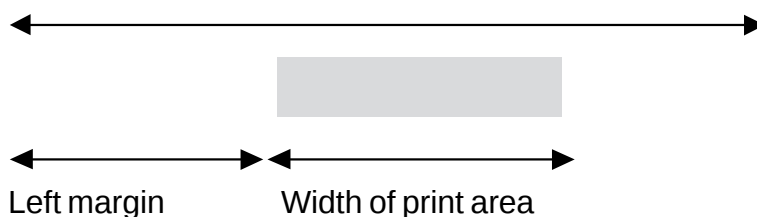
#### GS W nL nH

|               |                                                                  |    |    |    |    |
|---------------|------------------------------------------------------------------|----|----|----|----|
| [Name]        | <b>Set printing area width.</b>                                  |    |    |    |    |
| [Format]      | ASCII                                                            | GS | W  | nL | nH |
|               | Hex                                                              | 1D | 57 | nL | nH |
|               | Decimal                                                          | 29 | 87 | nL | nH |
| [Range]       | $0 \leq nL, nH \leq 255$                                         |    |    |    |    |
| [Description] | Sets the printing area width to the area specified by nL and nH. |    |    |    |    |

### 3. PRINTER FUNCTIONS

- The left margin is set at  $[(nL + nH \cdot 256) \cdot (\text{horizontal motion unit})]$  inches.

Printable area



[Notes]

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

[Default]

If Font A :       $nL = 192$   
                           $nH = 1$   
 If Font B :       $nL = 164$   
                           $nH = 1$

[Reference]

**GS L, GS P**

[Example]

#### **GS ^ r t m**

[Name]

**Execute macro.**

[Format]

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

[Range]

$0 \leq r, t \leq 255$   
 $0 \leq m \leq 1$

[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.

### 3. PRINTER FUNCTIONS

- $m$  specifies macro executing mode:

When the LSB of  $m = 0$ , the macro executes  $r$  times continuously at the interval specified  $t$ .

When the LSB of  $m = 1$ , after waiting for the period specified by  $t$ , the LED indicator blinks and the printer waits for the FEED button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats the operation  $r$  times.

[Notes]

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

[Default]

[Reference]

**GS :**

[Example]

#### GS c

[Name]

**Print counter.**

[Format]

|         |    |    |
|---------|----|----|
| ASCII   | GS | c  |
| Hex     | 1D | 63 |
| Decimal | 29 | 99 |

[Description]

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

[Notes]

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

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

[Default]

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

[Example]

#### **GS f n**

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

[Format] ASCII GS f n  
Hex 1D 66 n  
Decimal 29 102 n

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

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

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

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

[Default] n = 0

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

[Example]

#### **GS h n**

[Name] **Set bar code height**

[Format] ASCII GS h n  
Hex 1D 68 n  
Decimal 29 104 n

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

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

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[Notes]

[Default]         $n = 96$  ( 12 mm )

[Reference]     **GS k**

[Example]

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

[Name]            **Print bar code.**

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

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

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

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

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

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

[Notes]

- If  $d$  is outside the specified range, the printer prints the following message: "BAR CODE GENERATOR NON OK !" and processes the following data as normal data.

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

[Note for ①]

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

[Note for ②]

- If  $n$  is outside the specified range, the printer stops command processing and process the following data as normal data.

When to use

CODE93:

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

When to use

CODE128:

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

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- Special characters are defined by combining two characters “{” and one character. The ASCII character “}” is defined by transmitting “{” twice consecutively.

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

[Default]

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

[Example]

#### **GS r n**

[Name] **Transmit status.**

[Format] ASCII GS r n

Hex 1D 72 n

Decimal 29 114 n

[Range]  $1 \leq n \leq 2, 49 \leq n \leq 50$

[Description] Transmits the status specified by n as follows:

n Function

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

2, 50 Transmits drawer kick-out connector status (same as ESC u 0)).

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#### Paper sensor status (n = 1, 49)

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

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

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

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

[Default]

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

[Example]

#### GS w n

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

[Format] ASCII GS w n  
Hex 1D 77 n  
Decimal 29 119 n

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

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

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

[Notes]

[Default] n = 3

[Reference] **GS k**

[Example]

#### **GS ~ n**

[Name] Set superscript / subscript.

[Format] ASCII GS ~ n

Hex 1D 7E n

Decimal 29 126 n

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

[Description] Sets superscript or subscript character position.

*n* specifies the position as follows:

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

[Notes] • This command is executed if there are characters with different heights on the same line.

[Default] n = 0

[Reference] **ESC !, GS !**

[Example]

#### GS | n

[Name] **Set printing density.**

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

[Range] 0 £ n £ 4, 48 £ n £ 52

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

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

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

[Default] n = 2

[Reference]

[Example]

**3.2.2 Custom emulation**

The following table lists all the commands for the management of the CUSTOM emulation functions of the PM8024 printer. The commands can be transmitted to the printer at any moment, but they will only be carried out when the commands previously transmitted have been carried out. There are no priority commands; all commands are carried out when the circular buffer is free to do so.

**COMMAND TABLE**

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

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

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

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

#### (n) VT

|               |                                                                                         |
|---------------|-----------------------------------------------------------------------------------------|
| [Name]        | <b>Vertical tabs</b>                                                                    |
| [Format]      | ASCII      n      VT<br>Hex          n      0B<br>Decimal    n      11                  |
| [Range]       | $0 < n \leq 9$                                                                          |
| [Description] | Runs as many feeds as are defined by <i>n</i> .                                         |
| [Notes]       | <ul style="list-style-type: none"> <li>• This command zeroes the line buffer</li> </ul> |
| [Default]     |                                                                                         |
| [Reference]   |                                                                                         |
| [Example]     |                                                                                         |

#### CRLF

|               |                                                                                                                |
|---------------|----------------------------------------------------------------------------------------------------------------|
| [Name]        | <b>Ignore CR</b>                                                                                               |
| [Format]      | ASCII      SI<br>Hex          0F<br>Decimal    15                                                              |
| [Description] | After this command the CR code is ignored.                                                                     |
| [Notes]       | <ul style="list-style-type: none"> <li>• To put the CR code back into operation, reset the printer.</li> </ul> |

### 3. PRINTER FUNCTIONS

[Default]  
[Reference]  
[Example]

#### LF

|               |                                                                                      |
|---------------|--------------------------------------------------------------------------------------|
| [Name]        | <b>Line feed</b>                                                                     |
| [Format]      | ASCII      LF<br>Hex          0A<br>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]   | <b>ESC 2, ESC 3</b>                                                                  |
| [Example]     |                                                                                      |

#### CR

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

#### 00H

|          |                                                  |
|----------|--------------------------------------------------|
| [Name]   | <b>Print with small character</b>                |
| [Format] | ASCII      -<br>Hex          00<br>Decimal     0 |

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

#### 01H

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

#### 02H

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

#### 03H

|               |                                                          |
|---------------|----------------------------------------------------------|
| [Name]        | <b>Printing with expanded character</b>                  |
| [Format]      | ASCII     -<br>Hex        03<br>Decimal    3             |
| [Description] | Printing of the character is executed in expanded format |

### 3. PRINTER FUNCTIONS

|             |                                  |
|-------------|----------------------------------|
| [Notes]     | • Setting remains until next set |
| [Default]   | Set up from front keys.          |
| [Reference] | <b>00H, 01H, 02H, 04H</b>        |
| [Example]   |                                  |

#### 04H

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

#### 11H

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

### 3. PRINTER FUNCTIONS

**X R P6 P5 P4 P3 P2 P1**  
**D7D6 D5 D4 D3 D2 D1 D0**

where:

**X** is not utilized (we recommend 0);

**R** must be set at 1;

**P1,,P6** are the data of the graphic dots (1 prints, 0 does not print).

The P6 bit of the string of dots transmitted, is printed on the left and the others (P5, P4, P3, P2, P1) follow from left to right as shown:

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

[Default]

[Reference]

[Example]

To print a line of dots, transmit:

11H, n x 7FH (where n is the number of characters per line), 0DH.

To print an empty line, transmit:

11H, 40H, 0DH.

#### 12H

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

[Format] ASCII DC2

Hex 12

Decimal 18

[Description] Sets / cancels (alternately) red printing.

[Notes]

- The printer only prints the whole line, and not single characters, in red.
- The printer only prints in red if enabled by setup.

[Default]

[Reference]

[Example]

### 3. PRINTER FUNCTIONS

#### ESC ! n

[Name] **Select print modes.**

[Format]      ASCII      ESC !      n  
                  Hex        1B    21    n  
                  Decimal    27    33    n

[Range]         $0 \leq n \leq 255$

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

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

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

### 3. PRINTER FUNCTIONS

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

[Default]  $n = 0$

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

[Example]

#### ESC \$ nL nH

[Name] **Set absolute print position**

|          |         |        |    |    |
|----------|---------|--------|----|----|
| [Format] | ASCII   | ESC \$ | nL | nH |
|          | Hex     | 1B 24  | nL | nH |
|          | Decimal | 27 36  | nL | nH |

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

[Description] Sets the distance from the beginning of the line to the position in which the subsequent characters are to be printed. The distance from the beginning of the line to the print position is  $[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$  inches.

[Notes]

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

[Default]

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

[Example]

#### ESC \* m nL nH d1...dk

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

|          |         |       |   |    |    |         |
|----------|---------|-------|---|----|----|---------|
| [Format] | ASCII   | ESC * | m | nL | nH | d1...dk |
|          | Hex     | 1B 2A | m | nL | nH | d1...dk |
|          | Decimal | 27 42 | m | nL | nH | d1...dk |

### 3. PRINTER FUNCTIONS

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

$0 \leq nL \leq 255$

$0 \leq nH \leq 1$

$0 \leq d \leq 255$

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

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

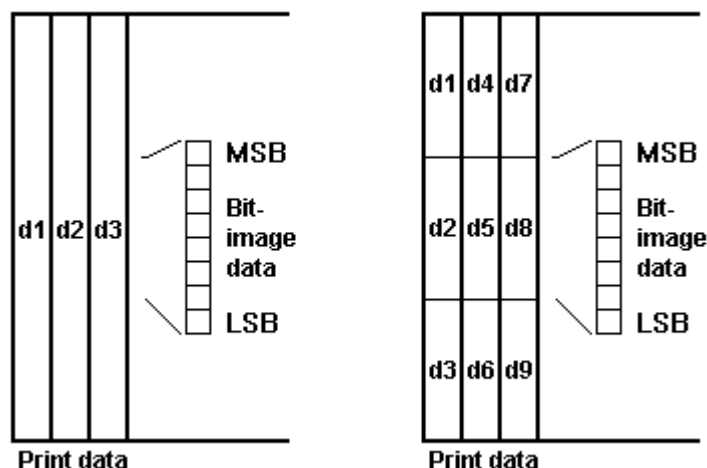
- [Notes]
- The commands ***nL*** and ***nH*** indicate the number of horizontal dots in the graphic image. The ***nL*** and ***nH*** indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated by  $nL + nH \times 256$
  - If the bit image data exceeds the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

### 3. PRINTER FUNCTIONS

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

8 dot image

24 dot image



[Default]

[Reference]

[Example]

#### ESC 4 n

[Name] Set /reset script mode.

[Format] ASCII ESC 4 n

Hex 1B 34 n

Decimal 27 52 n

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

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

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

[Notes]

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

### 3. PRINTER FUNCTIONS

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

#### ESC ?

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

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

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

#### ESC @

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

|               |                                                                                                                            |
|---------------|----------------------------------------------------------------------------------------------------------------------------|
| [Description] | Clears the data in the print buffer and resets the printer mode to the one that was in effect when the power was turned on |
| [Notes]       | <ul style="list-style-type: none"><li>• Same as hardware reset</li></ul>                                                   |
| [Default]     |                                                                                                                            |
| [Reference]   |                                                                                                                            |
| [Example]     |                                                                                                                            |

#### ESC B

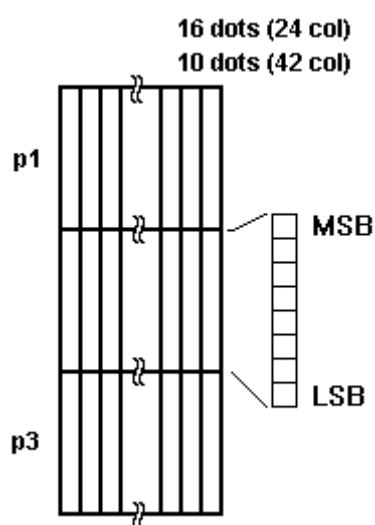
|               |                                                                                   |     |    |
|---------------|-----------------------------------------------------------------------------------|-----|----|
| [Name]        | <b>Select Font 1</b>                                                              |     |    |
| [Format]      | ASCII                                                                             | ESC | B  |
|               | Hex                                                                               | 1B  | 42 |
|               | Decimal                                                                           | 27  | 66 |
| [Description] | Select FONT 1                                                                     |     |    |
| [Notes]       | <ul style="list-style-type: none"><li>• Setting remains until next set.</li></ul> |     |    |
| [Default]     | Set up from front keys.                                                           |     |    |
| [Reference]   | <b>ESC b, ESC 4</b>                                                               |     |    |
| [Example]     |                                                                                   |     |    |

#### ESC C

|               |                                                                                                                                                          |     |    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| [Name]        | <b>Total cut</b>                                                                                                                                         |     |    |
| [Format]      | ASCII                                                                                                                                                    | ESC | C  |
|               | Hex                                                                                                                                                      | 1B  | 43 |
|               | Decimal                                                                                                                                                  | 27  | 67 |
| [Description] | This command enables cutter operation; if there is no cutter, a disabling flag is set and any subsequent cutting commands will be ignored.               |     |    |
| [Notes]       | <ul style="list-style-type: none"><li>• The printer waits until all the paper movement commands have been completed before executing total cut</li></ul> |     |    |
| [Default]     |                                                                                                                                                          |     |    |
| [Reference]   |                                                                                                                                                          |     |    |
| [Example]     |                                                                                                                                                          |     |    |

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

|               |                                                                                                                                                                                         |     |    |   |   |   |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---|---|---|
| [Name]        | <b>Define programmable characters</b>                                                                                                                                                   |     |    |   |   |   |
| [Format]      | ASCII                                                                                                                                                                                   | ESC | J  | s | n | m |
|               | Hex                                                                                                                                                                                     | 1B  | 4A | s | n | m |
|               | Decimal                                                                                                                                                                                 | 27  | 74 | s | n | m |
| [Range]       | s = 3                                                                                                                                                                                   |     |    |   |   |   |
|               | $32 \leq n \leq m \leq 255$                                                                                                                                                             |     |    |   |   |   |
|               | $0 \leq a \leq 6$                                                                                                                                                                       |     |    |   |   |   |
|               | $0 \leq p1 \dots ps * a \leq 255$                                                                                                                                                       |     |    |   |   |   |
| [Description] | Defines programmable characters.                                                                                                                                                        |     |    |   |   |   |
|               | • “s” specifies the number of bytes in vertical direction.                                                                                                                              |     |    |   |   |   |
|               | • “n” specifies the ASCII code of the initial programmable character and “m” the final code. If you wish to programme one character only, set n = m.                                    |     |    |   |   |   |
|               | • The ASCII character range is from <20>H to <FF>H, or 224 characters.                                                                                                                  |     |    |   |   |   |
|               | • “a” specifies the number of dots in horizontal direction.                                                                                                                             |     |    |   |   |   |
|               | • “p” is the datum in character dots. The data go from left to right and the remaining dots not specified by the user are forced as blanks. The total data number corresponds to s * a. |     |    |   |   |   |
|               | • After the user has defined the character set, it remains active until a new definition or a hardware or software reset.                                                               |     |    |   |   |   |
| [Notes]       | • The set of programmable characters and the bit image cannot be active at the same time; if this command is executed, the bit image will be cancelled.                                 |     |    |   |   |   |
| [Default]     | The programmable character set is the same as the internal one.                                                                                                                         |     |    |   |   |   |
| [Reference]   | <b>ESC 4</b>                                                                                                                                                                            |     |    |   |   |   |
| [Example]     |                                                                                                                                                                                         |     |    |   |   |   |



#### ESC K [d] CR

|               |                                                                                                                                                               |       |    |    |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|----|
| [Name]        | Set the characters to transmit on pressing the Print key.                                                                                                     |       |    |    |
| [Format]      | ASCII                                                                                                                                                         | ESC K | CR |    |
|               | Hex                                                                                                                                                           | 1B    | 4B | 0D |
|               | Decimal                                                                                                                                                       | 27    | 75 | 13 |
| [Description] | Saves characters to transmit on pressing Print key.<br>“d” is the ASCII string to transmit, terminating with CR. To deactivate this function, transmit a NUL. |       |    |    |
| [Notes]       | • The maximum number of characters to transmit is 24 (with CR at the end).                                                                                    |       |    |    |
| [Default]     | d = 13                                                                                                                                                        |       |    |    |
| [Reference]   |                                                                                                                                                               |       |    |    |
| [Example]     |                                                                                                                                                               |       |    |    |

#### ESC G

|          |                         |    |    |       |
|----------|-------------------------|----|----|-------|
| [Name]   | Set default parameters. |    |    |       |
| [Format] | ASCII                   | dH | dL | ESC G |
|          | Hex                     | dH | dL | 1B 47 |
|          | Decimal                 | dH | dL | 27 71 |

### 3. PRINTER FUNCTIONS

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Range]       | <i>d</i> :<br>bit 0= 0 : NORMAL printing<br>1 : REVERSE printing<br>bit 1= 0 : CR command executed<br>1 : CR command ignored<br>bit 2= 0 : horizontal printing<br>1 : vertical printing<br>bit 3= 0 : doesn't execute centred printing<br>1 : executes centred printing<br>bit 4= 0 : aligns print to left<br>1 : aligns print to right<br>bit 5= fixed at 0<br>bit 6= 0 : deactivates underlining<br>1 : activates underlining<br>bit 7= 0 : deactivates bold printing<br>1 : activates bold printing |
| [Description] | Sets default and "on line" parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| [Notes]       | Setting is memorized in EEPROM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| [Default]     | Set up from front keys.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| [Reference]   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| [Example]     | If <i>dH</i> = '4' and <i>dL</i> = 'D' the value of <i>d</i> is 77 (4DH)                                                                                                                                                                                                                                                                                                                                                                                                                               |

#### ESC M

|               |                                                                                                              |           |           |       |    |
|---------------|--------------------------------------------------------------------------------------------------------------|-----------|-----------|-------|----|
| [Name]        | <b>Set default parameters of print mode.</b>                                                                 |           |           |       |    |
| [Format]      | ASCII                                                                                                        | <i>dH</i> | <i>dL</i> | ESC M |    |
|               | Hex                                                                                                          | <i>dH</i> | <i>dL</i> | 1B    | 4D |
|               | Decimal                                                                                                      | <i>dH</i> | <i>dL</i> | 27    | 77 |
| [Range]       | <i>d</i> :<br>00H : small print<br>01H : double width print<br>02H : double height print<br>03H : bold print |           |           |       |    |
| [Description] | Sets the default parameters of print mode.                                                                   |           |           |       |    |
| [Notes]       | Setting is memorized in EEPROM.                                                                              |           |           |       |    |
| [Default]     | Set up from front keys.                                                                                      |           |           |       |    |
| [Reference]   |                                                                                                              |           |           |       |    |
| [Example]     | If <i>dH</i> = 'A' and <i>dL</i> = '3' the value of <i>d</i> is 163 (A3H)                                    |           |           |       |    |

#### ESC N

|               |                                   |     |    |
|---------------|-----------------------------------|-----|----|
| [Name]        | <b>Set printing in NORMAL</b>     |     |    |
| [Format]      | ASCII                             | ESC | N  |
|               | Hex                               | 1B  | 4E |
|               | Decimal                           | 27  | 78 |
| [Description] | Selects printing in NORMAL mode.  |     |    |
| [Notes]       | • Setting remains until next set. |     |    |
| [Default]     | Set up from front keys.           |     |    |
| [Reference]   | <b>ESC R</b>                      |     |    |
| [Example]     |                                   |     |    |

#### ESC P

|               |                                                                                                                                                    |     |    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| [Name]        | <b>Partial cut</b>                                                                                                                                 |     |    |
| [Format]      | ASCII                                                                                                                                              | ESC | P  |
|               | Hex                                                                                                                                                | 1B  | 50 |
|               | Decimal                                                                                                                                            | 27  | 80 |
| [Description] | This command enables the partial cutter operation; if there is no cutter, a disabling flag is set and any subsequent cut commands will be ignored. |     |    |
| [Notes]       | • The printer waits until all the paper movement commands have been completed before executing partial cut                                         |     |    |
| [Default]     |                                                                                                                                                    |     |    |
| [Reference]   |                                                                                                                                                    |     |    |
| [Example]     |                                                                                                                                                    |     |    |

#### ESC R

|               |                                  |     |    |
|---------------|----------------------------------|-----|----|
| [Name]        | <b>Set printing in REVERSE</b>   |     |    |
| [Format]      | ASCII                            | ESC | R  |
|               | Hex                              | 1B  | 52 |
|               | Decimal                          | 27  | 82 |
| [Description] | Set printing in REVERSE mode.    |     |    |
| [Notes]       | • Setting remains until next set |     |    |
| [Default]     | Set up from front keys.          |     |    |
| [Reference]   | <b>ESC N</b>                     |     |    |
| [Example]     |                                  |     |    |

### 3. PRINTER FUNCTIONS

#### ESC a n

| [Name]        | <b>Select justification</b>                                                                                                                                                                                                                                                                                                     |                                   |                                   |   |               |       |                    |       |          |       |                     |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|---|---------------|-------|--------------------|-------|----------|-------|---------------------|
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                           | ESC a                             | n                                 |   |               |       |                    |       |          |       |                     |
|               | Hex                                                                                                                                                                                                                                                                                                                             | 1B 61                             | n                                 |   |               |       |                    |       |          |       |                     |
|               | Decimal                                                                                                                                                                                                                                                                                                                         | 27 97                             | n                                 |   |               |       |                    |       |          |       |                     |
| [Range]       | 0 ≤ n ≤ 2, 48 ≤ n ≤ 50                                                                                                                                                                                                                                                                                                          |                                   |                                   |   |               |       |                    |       |          |       |                     |
| [Description] | Aligns all the data in one line in the position specified.<br>n selects the type of justification as follows: <table><tr><th>n</th><th>Justification</th></tr><tr><td>0, 48</td><td>Left justification</td></tr><tr><td>1, 49</td><td>Centring</td></tr><tr><td>2, 50</td><td>Right justification</td></tr></table>             |                                   |                                   | n | Justification | 0, 48 | Left justification | 1, 49 | Centring | 2, 50 | Right justification |
| n             | Justification                                                                                                                                                                                                                                                                                                                   |                                   |                                   |   |               |       |                    |       |          |       |                     |
| 0, 48         | Left justification                                                                                                                                                                                                                                                                                                              |                                   |                                   |   |               |       |                    |       |          |       |                     |
| 1, 49         | Centring                                                                                                                                                                                                                                                                                                                        |                                   |                                   |   |               |       |                    |       |          |       |                     |
| 2, 50         | Right justification                                                                                                                                                                                                                                                                                                             |                                   |                                   |   |               |       |                    |       |          |       |                     |
| [Notes]       | <ul style="list-style-type: none"><li>• This command is only enabled if input at the beginning of the line.</li><li>• The lines are justified within the specified printing area.</li><li>• The spaces set by the commands <b>HT</b>, <b>ESC \$</b> and <b>ESC \</b> remain justified as per the previously set mode.</li></ul> |                                   |                                   |   |               |       |                    |       |          |       |                     |
| [Default]     | n = 0                                                                                                                                                                                                                                                                                                                           |                                   |                                   |   |               |       |                    |       |          |       |                     |
| [Reference]   |                                                                                                                                                                                                                                                                                                                                 |                                   |                                   |   |               |       |                    |       |          |       |                     |
| [Example]     | Left justification                                                                                                                                                                                                                                                                                                              | Centring                          | Right justification               |   |               |       |                    |       |          |       |                     |
|               | <div>ABC<br/>ABCD<br/>ABCDE</div>                                                                                                                                                                                                                                                                                               | <div>ABC<br/>ABCD<br/>ABCDE</div> | <div>ABC<br/>ABCD<br/>ABCDE</div> |   |               |       |                    |       |          |       |                     |

#### ESC b

|               |                                                                                  |
|---------------|----------------------------------------------------------------------------------|
| [Name]        | <b>Select FONT 2.</b>                                                            |
| [Format]      | ASCII ESC b                                                                      |
|               | Hex 1B 62                                                                        |
|               | Decimal 27 98                                                                    |
| [Description] | Select FONT 2.                                                                   |
| [Notes]       | <ul style="list-style-type: none"><li>• Setting remains until next set</li></ul> |
| [Default]     | Set up from front keys.                                                          |
| [Reference]   | <b>ESC B, ESC 4</b>                                                              |
| [Example]     |                                                                                  |

#### ESC m

|               |                                              |       |     |
|---------------|----------------------------------------------|-------|-----|
| [Name]        | <b>Read default parameters of print mode</b> |       |     |
| [Format]      | ASCII                                        | ESC m |     |
|               | Hex                                          | 1B    | 6D  |
|               | Decimal                                      | 27    | 109 |
| [Description] | Reads default parameters of print mode.      |       |     |
| [Notes]       | See ESC M.                                   |       |     |
| [Default]     | Set up from front keys.                      |       |     |
| [Reference]   | <b>ESC M</b>                                 |       |     |
| [Example]     |                                              |       |     |

#### ESC p

|               |                                         |       |     |
|---------------|-----------------------------------------|-------|-----|
| [Name]        | <b>Read default parameters</b>          |       |     |
| [Format]      | ASCII                                   | ESC p |     |
|               | Hex                                     | 1B    | 70  |
|               | Decimal                                 | 27    | 112 |
| [Description] | Reads default and “on line” parameters. |       |     |
| [Notes]       | See ESC G.                              |       |     |
| [Default]     | Set up from front keys                  |       |     |
| [Reference]   | <b>ESC G</b>                            |       |     |
| [Example]     |                                         |       |     |

#### ESC r

|               |                                                                                                                                                                                                            |    |    |        |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|--------|
| [Name]        | <b>Read EEPROM position.</b>                                                                                                                                                                               |    |    |        |
| [Format]      | ASCII                                                                                                                                                                                                      | aH | aL | ESC r  |
|               | Hex                                                                                                                                                                                                        | aH | aL | 1B 72  |
|               | Decimal                                                                                                                                                                                                    | aH | aL | 27 114 |
| [Range]       | $0 \leq a \leq 63$                                                                                                                                                                                         |    |    |        |
|               | $'0' \leq aH \leq '9', 'A' \leq aH \leq 'F'$                                                                                                                                                               |    |    |        |
|               | $'0' \leq aL \leq '9', 'A' \leq aL \leq 'F'$                                                                                                                                                               |    |    |        |
| [Description] | Reads the location addressed by <i>a</i> where:<br><i>aH</i> is the most significant nibble, expressed in ASCII, of <i>a</i><br><i>aL</i> is the least significant nibble, expressed in ASCII, of <i>a</i> |    |    |        |
| [Notes]       |                                                                                                                                                                                                            |    |    |        |
| [Default]     |                                                                                                                                                                                                            |    |    |        |

### 3. PRINTER FUNCTIONS

[Reference] **ESC w**

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

31H 32H 1BH 72H

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

#### ESC w

[Name] **Write EEPROM position.**

|          |         |    |    |    |    |     |     |
|----------|---------|----|----|----|----|-----|-----|
| [Format] | ASCII   | aH | aL | dH | dL | ESC | w   |
|          | Hex     | aH | aL | dH | dL | 1B  | 77  |
|          | Decimal | aH | aL | dH | dL | 27  | 119 |

[Range]  $0 \leq a \leq 63$   
 $'0' \leq aH \leq '9', 'A' \leq aH \leq 'F'$   
 $'0' \leq aL \leq '9', 'A' \leq aL \leq 'F'$   
 $0 \leq d \leq 255$   
 $'0' \leq dH \leq '9', 'A' \leq dH \leq 'F'$   
 $'0' \leq dL \leq '9', 'A' \leq dL \leq 'F'$

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

[Notes]

[Default]

[Reference] **ESC r**

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

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

#### ESC · n xH xL yH yL

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

|          |         |       |     |    |    |    |       |
|----------|---------|-------|-----|----|----|----|-------|
| [Format] | ASCII   | ESC · | n   | xH | xL | yH | yL    |
|          | Hex     | 1B    | FA  | n  | xH | xL | yH yL |
|          | Decimal | 27    | 250 | n  | xH | xL | yH yL |

[Range]  $0 \leq n \leq 3$   
 $0 \leq xH, xL, yH, yL \leq 255$

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

### 3. PRINTER FUNCTIONS

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

$xL + xH \times 256$  specifies the starting dot line (  $1 \div 585$  ).

$yL + yH \times 256$  specifies the number of lines to print.

[Notes]

- If  $(xL + (xH \times 256)) > 585$  the printer does not execute the command.
- Se  $(xL + (xH \times 256) + yL + (yH \times 256)) > 585$  the printer only prints  $585 - xL + (xH \times 256) + 1$  dotlines.

[Default]

[Reference]

**ESC <sup>3</sup>, ESC <sup>2</sup>, ESC !**

[Example]

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

#### ESC <sup>1</sup> nL nH

[Name]

**Transmit ram bank to serial port.**

[Format]

|         |                  |    |    |
|---------|------------------|----|----|
| ASCII   | ESC <sup>1</sup> | nL | nH |
| Hex     | 1B FB            | nL | nH |
| Decimal | 27 251           | nL | nH |

[Description]

Transmit  $(nH \times 256) + nL$  words of ram bank to serial port.

[Notes]

- The size of the ram bank for graphic printing is 448 horizontal dots (56 bytes/dotline)  $\times$  585 vertical points (32760 bytes = 16380 words).

[Default]

[Reference]

**ESC <sup>3</sup>, ESC <sup>2</sup>, ESC !**

[Example]

### 3. PRINTER FUNCTIONS

#### ESC <sup>3</sup> n

|               |                                                                                             |     |              |   |
|---------------|---------------------------------------------------------------------------------------------|-----|--------------|---|
| [Name]        | <b>Transfer the flash bank into ram bank.</b>                                               |     |              |   |
| [Format]      | ASCII                                                                                       | ESC | <sup>3</sup> | n |
|               | Hex                                                                                         | 1B  | FC           | n |
|               | Decimal                                                                                     | 27  | 252          | n |
| [Range]       | 1 ≤ n ≤ 3                                                                                   |     |              |   |
| [Description] | Transfers flash bank into ram bank ( 32768 bytes).<br><i>n</i> 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 <sup>2</sup> , ESC ! |
| [Example]   |                                 |

#### ESC <sup>2</sup> nL nH

|               |                                                                                                                                                                                                                                                                                                                                   |                  |    |    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----|----|
| [Name]        | <b>Receive bank ram from port.</b>                                                                                                                                                                                                                                                                                                |                  |    |    |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                             | ESC <sup>2</sup> | nL | nH |
|               | Hex                                                                                                                                                                                                                                                                                                                               | 1B FD            | nL | nH |
|               | Decimal                                                                                                                                                                                                                                                                                                                           | 27 253           | nL | nH |
| [Range]       | $0 \leq nL, nH \leq 255$                                                                                                                                                                                                                                                                                                          |                  |    |    |
| [Description] | Receives [ <i>nL</i> + ( <i>nH</i> × 256)] words from port and puts them into ram bank.                                                                                                                                                                                                                                           |                  |    |    |
| [Notes]       | <ul style="list-style-type: none"><li>• The number of data bytes received is [<i>nL</i> + (<i>nH</i> × 256)] × 2.</li><li>• Each word is received first in MSByte form and then in LSByte form</li><li>• If [<i>nL</i> + (<i>nH</i> × 256)] is greater than 16384, the data following will be processed as normal data.</li></ul> |                  |    |    |
| [Default]     |                                                                                                                                                                                                                                                                                                                                   |                  |    |    |
| [Reference]   | ESC ·, ESC <sup>3</sup> , ESC !                                                                                                                                                                                                                                                                                                   |                  |    |    |
| [Example]     |                                                                                                                                                                                                                                                                                                                                   |                  |    |    |

#### ESC | n

|               |                                                                                       |        |   |
|---------------|---------------------------------------------------------------------------------------|--------|---|
| [Name]        | <b>Transfer ram bank into flash bank.</b>                                             |        |   |
| [Format]      | ASCII                                                                                 | ESC    | n |
|               | Hex                                                                                   | 1B FE  | n |
|               | Decimal                                                                               | 27 254 | n |
| [Range]       | $1 \leq n \leq 3$                                                                     |        |   |
| [Description] | Transfers ram bank into flash bank. ( 32768 bytes).<br>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] | <b>ESC , ESC <sup>2</sup>, ESC <sup>3</sup></b> |
| [Example]   |                                                 |

#### GS FF

|               |                                                                                                                    |    |    |
|---------------|--------------------------------------------------------------------------------------------------------------------|----|----|
| [Name]        | <b>Print the buffer contents.</b>                                                                                  |    |    |
| [Format]      | ASCII                                                                                                              | GS | FF |
|               | Hex                                                                                                                | 1D | 0C |
|               | Decimal                                                                                                            | 29 | 12 |
| [Description] | Prints contents of buffer characters and executes a line feed.<br>Sets the printing start position at left margin. |    |    |
| [Notes]       |                                                                                                                    |    |    |
| [Default]     |                                                                                                                    |    |    |
| [Reference]   | <b>LF, FF</b>                                                                                                      |    |    |
| [Example]     |                                                                                                                    |    |    |

### 3. PRINTER FUNCTIONS

#### GS :

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |  |  |  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|--|--|--|
| [Name]        | <b>Start / end macro definition.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |    |    |  |  |  |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | GS | :  |  |  |  |
|               | Hex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1D | 3A |  |  |  |
|               | Decimal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 29 | 58 |  |  |  |
| [Description] | Starts or ends macro definition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |    |    |  |  |  |
| [Notes]       | <ul style="list-style-type: none"> <li>• Macro definition starts when this command is received during normal operation.</li> <li>• When the command <b>GS ^</b> is received during macro definition, the printer ends the macro definitions and clears all definitions.</li> <li>• Macro not defined when the power is turned on.</li> <li>• The defined contents of the macro are not cleared by the command <b>ESC @</b>. Therefore, <b>ESC @</b> can be included in the contents of the macro definitions.</li> <li>• If the printer receives the command <b>GS :</b> again immediately after previously receiving <b>GS :</b>, the printer remains in the macro undefined state.</li> <li>• The contents of the macro can be defined up to 1024 bytes. If the macro definition exceeds 1024 bytes, the excess data is not stored.</li> </ul> |    |    |  |  |  |
| [Default]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |  |  |  |
| [Reference]   | <b>GS ^</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |    |  |  |  |
| [Example]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |  |  |  |

#### GS C 0 n m

|               |                                                                                                                                                                                                                                                                                                                                                                                                    |    |    |    |   |   |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|---|---|
| [Name]        | <b>Set counter print mode.</b>                                                                                                                                                                                                                                                                                                                                                                     |    |    |    |   |   |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                                                                                              | GS | C  | 0  | n | m |
|               | Hex                                                                                                                                                                                                                                                                                                                                                                                                | 1D | 43 | 30 | n | m |
|               | Decimal                                                                                                                                                                                                                                                                                                                                                                                            | 29 | 67 | 48 | n | m |
| [Range]       | $0 \leq n \leq 5$<br>$m = 0, 1, 2, 48, 49, 50$                                                                                                                                                                                                                                                                                                                                                     |    |    |    |   |   |
| [Description] | Selects a print mode for the serial number counter. <ul style="list-style-type: none"> <li>• <math>n</math> specifies the number of digits to be printed as follows:<br/>               when <math>n = 0</math>, the printer prints the actual digits indicated by the number value.<br/>               when <math>n =</math> from 1 to 5, this command sets the number of             </li> </ul> |    |    |    |   |   |

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of digits to be printed.

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

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

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

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

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

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

□ indicates a space

#### GS C 1 aL aH bL bH n r

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

[Format]

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

[Range]  $0 \leq aL, aH \leq 255$

$0 \leq bL, bH \leq 255$

$0 \leq n, r \leq 255$

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

- [Notes]
- Count-up mode is specified when:  
 $[aL + (aH \times 256)] < [bL + (bH \times 256)]$  and  $n \neq 0$  and  $r \neq 0$
  - Count-down mode is specified when:  
 $[aL + (aH \times 256)] > [bL + (bH \times 256)]$  and  $n \neq 0$  and  $r \neq 0$

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

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

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

[Example]

#### GS C 2 nL nH

[Name] **Set counter.**

|          |         |    |    |    |    |    |
|----------|---------|----|----|----|----|----|
| [Format] | ASCII   | GS | C  | 2  | nL | nH |
|          | Hex     | 1D | 43 | 32 | nL | nH |
|          | Decimal | 29 | 67 | 50 | nL | nH |

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

[Description] Sets the serial number counter value.

- $nL$  and  $nH$  determine the value of the serial number counter set by  $[nL + (nH \times 256)]$ .

- [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]

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

|          |                                |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----------|--------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| [Name]   | <b>Select count mode.</b>      |    |    |    |    |    |    |    |    |    |    |    |    |    |
| [Format] | ASCII                          | GS | C  | ;  | sa | ;  | sb | ;  | sn | ;  | sr | ;  | sc | ;  |
|          | Hex                            | 1D | 43 | 3B | sa | 3B | sb | 3B | sn | 3B | sr | 3B | sc | 3B |
|          | Decimal                        | 29 | 67 | 59 | sa | 59 | sb | 59 | sn | 59 | sr | 59 | sc | 59 |
| [Range]  | $0 \leq sa, sb, sc \leq 65535$ |    |    |    |    |    |    |    |    |    |    |    |    |    |
|          | $0 \leq sn, sr \leq 255$       |    |    |    |    |    |    |    |    |    |    |    |    |    |

These values are all character strings.

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Description] | <p>Selects a count mode for the serial number counter and specifies the value of the counter.</p> <ul style="list-style-type: none"> <li>• <i>sa</i>, <i>sb</i>, <i>sn</i>, <i>sr</i> and <i>sc</i> are all displayed in ASCII characters using the codes from '0' to '9'.</li> <li>• <i>sa</i> and <i>sb</i> specify the counter range.</li> <li>• <i>sn</i> indicates the stepping amount for counting up or down.</li> <li>• <i>sr</i> indicates the repetition number with the counter value fixed.</li> <li>• <i>sc</i> indicates the counter value.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| [Notes]       | <ul style="list-style-type: none"> <li>• Count-up mode is specified when:<br/><math>sa &lt; sb</math> and <math>sn \neq 0</math> and <math>sr \neq 0</math></li> <li>• Count-down mode is specified when:<br/><math>sa &gt; sb</math> and <math>sn \neq 0</math> and <math>sr \neq 0</math></li> <li>• Counting stops when:<br/><math>sa = sb</math> or <math>sn = 0</math> or <math>sr = 0</math></li> <li>• In setting count-up mode, the minimum value of the counter is <i>sa</i> and the maximum is <i>sb</i>. If counting up reaches a value exceeding the maximum, it is resumed with the minimum value. If the counter value set by <i>sc</i> is outside the counter operation range, the counter value is forced to convert to the minimum value by executing GS c.</li> <li>• In setting count-down mode, the maximum value of the counter is <i>sa</i> and the minimum value is <i>sb</i>. If counting down reaches a value less than the minimum, it is resumed with the maximum value. If the counter value set by <i>sc</i> is outside the counter operation range, the counter value is forced to convert to the maximum value by executing GS c.</li> <li>• Parameters <i>sa</i> to <i>sc</i> can be omitted. If omitted, these values remain unchanged.</li> <li>• Parameters <i>sa</i> to <i>sc</i> must not contain characters, with the exception of those from '0' to '9'.</li> </ul> |

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

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

[Example]

#### **GS H n**

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

[Format] ASCII GS H n  
Hex 1D 48 n  
Decimal 29 72 n

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

[Description] Selects the printing position of HRI characters when printing bar code.

*n* selects the printing position as follows:

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

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

[Default] n = 0

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

[Example]

#### **GS I n**

[Name] **Transmit printer ID.**

[Format] ASCII GS I n  
Hex 1D 49 n  
Decimal 29 73 n

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

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

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| n     | Printer ID                  | Specification                   |
|-------|-----------------------------|---------------------------------|
| 1. 49 | Printer mode identification | 15H (PM8024)                    |
| 2. 50 | Function identification     | See table below                 |
| 3. 51 | ROM version identification  | Depends on ROM version (4 char) |

#### n = 2, Function identification

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

#### [Notes]

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

#### [Default]

#### [Reference]

#### [Example]

### 3. PRINTER FUNCTIONS

#### GS P x y

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |    |   |   |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|---|---|
| [Name]        | <b>Set horizontal and vertical motion units.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |    |    |   |   |
| [Format]      | ASCII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | GS | P  | x | y |
|               | Hex                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1D | 50 | x | y |
|               | Decimal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 29 | 80 | x | y |
| [Range]       | x = 100, 200<br>y = 100, 200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |   |   |
| [Description] | <p>Sets the horizontal and vertical motion units at 1/x inches and 1/y inches, respectively.</p> <p>When x is set at 0, the default setting value is used.</p> <p>When y is set at 0, the default setting value is used.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |   |   |
| [Notes]       | <ul style="list-style-type: none"> <li>• The horizontal direction is perpendicular to the paper feed direction.</li> <li>• In standard mode, the following commands use x or y, irrespective of character rotation (upside down or 90° clockwise rotation): <ul style="list-style-type: none"> <li>① Commands using x : ESC SP, ESC \$, ESC \, GS L, GS W.</li> <li>② Commands using y : ESC 3, ESC J.</li> </ul> </li> <li>• This command does not affect the previously specified values.</li> <li>• 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.</li> </ul> |    |    |   |   |
| [Default]     | x = 200, y = 200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |    |    |   |   |
| [Reference]   | <b>ESC SP, ESC \$, ESC \, ESC 3, ESC J, GS L, GS W</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |    |    |   |   |
| [Example]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |    |    |   |   |

#### GS ^ r t m

|          |                             |    |    |   |   |   |
|----------|-----------------------------|----|----|---|---|---|
| [Name]   | <b>Execute macro.</b>       |    |    |   |   |   |
| [Format] | ASCII                       | GS | ^  | r | t | m |
|          | Hex                         | 1D | 5E | r | t | m |
|          | Decimal                     | 29 | 94 | r | t | m |
| [Range]  | 0 ≤ r, t ≤ 255<br>0 ≤ m ≤ 1 |    |    |   |   |   |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Description] | <p>Executes a macro.</p> <ul style="list-style-type: none"> <li>• <math>r</math> specifies the number of times to execute the macro.</li> <li>• <math>t</math> specifies the waiting time for executing the macro. The waiting time is <math>t \times 100</math> msec. for every macro execution.</li> <li>• <math>m</math> specifies macro executing mode:<br/>When the LSB of <math>m = 0</math>, the macro executes <math>r</math> times continuously at the interval specified <math>t</math>.<br/>When the LSB of <math>m = 1</math>, after waiting for the period specified by <math>t</math>, the LED indicator blinks and the printer waits for the FEED button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats the operation <math>r</math> times.</li> </ul> |
| [Notes]       | <ul style="list-style-type: none"> <li>• This command lasts for a period of (<math>t \times 100</math> msec.) after a macro is executed by <math>t</math>.</li> <li>• If this command is received while a macro is being defined, the macro definition is aborted and the definitions cleared.</li> <li>• If the macro is not defined or if <math>r</math> is 0, nothing happens.</li> <li>• When the macro is executed by pressing the FEED button (<math>m = 1</math>), the paper can not be fed by using the FEED button.</li> </ul>                                                                                                                                                                                                                                                                                     |
| [Default]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| [Reference]   | <b>GS :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| [Example]     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

#### GS c

|               |                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Name]        | <b>Print counter.</b>                                                                                                                                                                                                                                                                                                                                                                                |
| [Format]      | ASCII      GS    c<br>Hex        1D   63<br>Decimal    29   99                                                                                                                                                                                                                                                                                                                                       |
| [Description] | Sets the serial counter value in the print buffer and increments or decrements the counter value.                                                                                                                                                                                                                                                                                                    |
| [Notes]       | <ul style="list-style-type: none"> <li>• 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.</li> <li>• The counter print mode is set by <b>GS C 0</b>.</li> </ul> |

### 3. PRINTER FUNCTIONS

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

[Default]

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

[Example]

#### **GS f n**

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

[Format] ASCII GS f n  
Hex 1D 66 n  
Decimal 29 102 n

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

[Description] Selects a font for the HRI characters used when printing a bar code.

n selects a font from the following table:

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

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

[Default] n = 0

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

[Example]

**GS h n**

|               |                                                                                                      |    |     |   |
|---------------|------------------------------------------------------------------------------------------------------|----|-----|---|
| [Name]        | <b>Set bar code height</b>                                                                           |    |     |   |
| [Format]      | ASCII                                                                                                | GS | h   | n |
|               | Hex                                                                                                  | 1D | 68  | n |
|               | Decimal                                                                                              | 29 | 104 | n |
| [Range]       | $1 \leq n \leq 255$                                                                                  |    |     |   |
| [Description] | Sets the height of the bar code.<br><i>n</i> specifies the number of dots in the vertical direction. |    |     |   |
| [Notes]       |                                                                                                      |    |     |   |
| [Default]     | $n = 96$ ( 12 mm )                                                                                   |    |     |   |
| [Reference]   | <b>GS k</b>                                                                                          |    |     |   |
| [Example]     |                                                                                                      |    |     |   |

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

|               |                                                                                                      |                     |    |     |   |     |
|---------------|------------------------------------------------------------------------------------------------------|---------------------|----|-----|---|-----|
| [Name]        | <b>Print bar code.</b>                                                                               |                     |    |     |   |     |
| [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                                                                                                    | $0 \leq m \leq 6$   |    |     |   |     |
|               | ②                                                                                                    | $65 \leq m \leq 73$ |    |     |   |     |
| [Description] | Selects a bar code system and prints the bar code.<br><i>m</i> selects a bar code system as follows: |                     |    |     |   |     |

### 3. PRINTER FUNCTIONS

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

[Notes]

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

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

[Notes for ①]

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

[Note for ②]

- If  $n$  is outside the specified range, the printer stops command processing and process the following data as normal data.

When to use

CODE93:

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

When to use

CODE128:

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

### 3. PRINTER FUNCTIONS

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

[Default]

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

[Example]

#### **GS w n**

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

[Format]

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

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

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

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

[Notes]

[Default] n = 3

[Reference] **GS k**

[Example]

#### **GS | n**

[Name] **Set printing density.**

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

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

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

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

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

[Default] n = 2

[Reference]

[Example]

### 3. PRINTER FUNCTIONS

#### 3.2.3 CBM iDP560RS Emulation

##### COMMAND TABLE

The following table lists all the commands for function management in CBM iDP560RS Emulation of the PM8024 printer. The commands can be transmitted to the printer at any moment, but they will only be carried out when the commands previously sent have been executed. There are no priority commands; all commands are carried out when the circular buffer is free to do so.

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

### 3. PRINTER FUNCTIONS

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

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

#### LF

|               |                                                                                      |
|---------------|--------------------------------------------------------------------------------------|
| [Name]        | <b>Print and line feed</b>                                                           |
| [Format]      | ASCII      LF<br>Hex          0A<br>Decimal     10                                   |
| [Description] | Prints the data in the buffer and feeds one line, based on the current line spacing. |
| [Notes]       | This command sets the print position at the beginning of the line.                   |
| [Default]     |                                                                                      |
| [Reference]   | <b>ESC 1, ESC 2</b>                                                                  |
| [Example]     |                                                                                      |

### 3. PRINTER FUNCTIONS

#### CR

|               |                                                                                                        |    |
|---------------|--------------------------------------------------------------------------------------------------------|----|
| [Name]        | <b>Print and line feed</b>                                                                             |    |
| [Format]      | ASCII                                                                                                  | CR |
|               | Hex                                                                                                    | 0D |
|               | Decimal                                                                                                | 13 |
| [Description] | When autofeed is "CR enabled", this command functions in the same way as LF, otherwise, it is ignored. |    |
| [Notes]       | This command sets the print position at the beginning of the line.                                     |    |
| [Default]     | See the "autofeed" parameter from Setup.                                                               |    |
| [Reference]   | <b>LF</b>                                                                                              |    |
| [Example]     |                                                                                                        |    |

#### FF

|               |                                                                                                              |    |
|---------------|--------------------------------------------------------------------------------------------------------------|----|
| [Name]        | <b>Carries out form feed after printing.</b>                                                                 |    |
| [Format]      | ASCII                                                                                                        | FF |
|               | Hex                                                                                                          | 0A |
|               | Decimal                                                                                                      | 10 |
| [Description] | Prints the data in the buffer and feeds in accordance with the page length specified by the command ESC C n. |    |
| [Notes]       | This command sets the print position at the beginning of the line.                                           |    |
| [Default]     |                                                                                                              |    |
| [Reference]   | <b>ESC C</b>                                                                                                 |    |
| [Example]     |                                                                                                              |    |

#### RS

|               |                                                            |    |
|---------------|------------------------------------------------------------|----|
| [Name]        | <b>Enhanced character designation.</b>                     |    |
| [Format]      | ASCII                                                      | RS |
|               | Hex                                                        | 1E |
|               | Decimal                                                    | 30 |
| [Description] | Printing of the character is executed in expanded format.  |    |
| [Notes]       | • The command RS is automatically launched after printing. |    |
| [Default]     | Set up from front keys                                     |    |

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

[Example]

#### **US**

[Name] **Standard character designation.**

[Format] ASCII US

Hex 1F

Decimal 31

[Description] Printing of the character is executed in small format (normal).

[Notes]

[Default] Set up from front keys

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

[Example]

#### **SI**

[Name] **Standard character designation (same as US)**

[Format] ASCII SI

Hex 0F

Decimal 15

[Description] Printing of the character is executed in small format (normal).

[Notes] • Same as US

[Default] Set up from front keys

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

[Example]

#### **SO**

[Name] **Improved character designation (same as RS)**

[Format] ASCII SO

Hex 0E

Decimal 14

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

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

### 3. PRINTER FUNCTIONS

- Same as RS

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

#### 00H

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

#### 01H

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

#### 02H

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

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

#### 03H

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

#### 04H

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

#### DC1

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

### 3. PRINTER FUNCTIONS

[Reference]     **DC3**

[Example]

#### **DC2**

[Name]            **Set / cancel red printing**

[Format]          ASCII        DC2

Hex               12

Decimal        18

[Description]    Sets / cancels (alternately) red printing.

[Notes]           • The printer only prints the whole line, and not single characters, in red.  
                     • The printer only prints in red if enabled by setup.

[Default]

[Reference]

[Example]

#### **DC3**

[Name]            **Places the printer OFF LINE.**

[Format]          ASCII        DC3

Hex               13

Decimal        19

[Description]    Places the printer OFF LINE.

[Notes]

[Default]

[Reference]     **DC1**

[Example]

#### **DC4**

[Name]            **Set/ erase reverse printing mode.**

[Format]          ASCII        DC4

Hex               14

Decimal        20

[Description]    Sets / erases (alternately) reverse printing mode.

[Notes]

[Default]

[Reference]

[Example]

#### CAN

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

[Format] ASCII CAN

Hex 18

Decimal 24

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

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

[Default]

[Reference]

[Example]

#### ESC 1

[Name] **Set 3 mm. line spacing**

[Format] ASCII ESC 1

Hex 1B 31

Decimal 27 49

[Description] Sets 3 mm line spacing

[Notes]

[Default]

[Reference] **ESC 2**

[Example]

#### ESC 2

[Name] **Set 5.5 mm line spacing.**

[Format] ASCII ESC 2

Hex 1B 32

Decimal 27 50

[Description] Set 5.5 mm line spacing.

[Notes]

[Default]

[Reference] **ESC 1**

### 3. PRINTER FUNCTIONS

[Example]

#### ESC @

[Name] **Inizialize the printer.**

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

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

[Notes] • Same as hardware reset

[Default]

[Reference]

[Example]

#### ESC C n

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

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

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

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

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

[Default]  $n = 66$

[Reference] **FF, ESC O**

[Example]

**ESC K n1 n2**

|               |                                                                                                                                                                            |       |       |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|
| [Name]        | <b>Graphic mode printing</b>                                                                                                                                               |       |       |
| [Format]      | ASCII                                                                                                                                                                      | ESC K | n1 n2 |
|               | Hex                                                                                                                                                                        | 1B 4B | n1 n2 |
|               | Decimal                                                                                                                                                                    | 27 75 | n1 n2 |
| [Range]       | $1 \leq n1 \leq 240$ ; n2 = mute data                                                                                                                                      |       |       |
| [Description] | This command prints n1 bytes of data in graphic mode. The data bytes are arranged vertically starting from the left margin, but only the first seven LSBs are significant. |       |       |
| [Notes]       | After the last data byte, the printer prints, forward feeds the paper (by 21 dots per line) and graphic mode printing is cleared.                                          |       |       |
| [Default]     |                                                                                                                                                                            |       |       |
| [Reference]   |                                                                                                                                                                            |       |       |
| [Example]     |                                                                                                                                                                            |       |       |

**ESC O**

|               |                             |       |  |
|---------------|-----------------------------|-------|--|
| [Name]        | <b>Page formatting off</b>  |       |  |
| [Format]      | ASCII                       | ESC O |  |
|               | Hex                         | 1B 4F |  |
|               | Decimal                     | 27 79 |  |
| [Description] | Cancel page formatting mode |       |  |
| [Notes]       |                             |       |  |
| [Default]     |                             |       |  |
| [Reference]   | <b>ESC C</b>                |       |  |
| [Example]     |                             |       |  |

**ESC R n**

|               |                                                                                        |       |   |
|---------------|----------------------------------------------------------------------------------------|-------|---|
| [Name]        | <b>Select the international character set.</b>                                         |       |   |
| [Format]      | ASCII                                                                                  | ESCR  | n |
|               | Hex                                                                                    | 1B 52 | n |
|               | Decimal                                                                                | 27 82 | n |
| [Range]       | $0 \leq n \leq 12$                                                                     |       |   |
| [Description] | Selects the international character set by setting <i>n</i> as in the following table: |       |   |

### 3. PRINTER FUNCTIONS

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

[Default]        n = 0

[Reference]

[Example]

#### ESC i

[Name]            **Total cut.**

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

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

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

[Default]

[Reference]

[Example]

#### ESC m

[Name] **Partial cut.**

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

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

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

[Default]

[Reference]

[Example]

#### ESC p m t1 t2

[Name] **Generate pulse.**

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

[Range] m = 0, 48  
 $0 \leq t1 \leq 255$   
 $0 \leq t2 \leq 255$

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

***m* Connector pin**

0, 48 Pin 2 of drawer kick-out connector

[Notes] • The pulse ON time is [  $t1 \times 2$  ms ] and the OFF time is [  $t2 \times 2$  ms ].  
• If  $t2 < t1$ , the OFF time is [  $t1 \times 2$  ms ].

[Default]

[Reference]

[Example]

### 3. PRINTER FUNCTIONS

#### ESC · n xH xL yH yL

|               |                                                                                      |     |     |   |    |    |    |    |
|---------------|--------------------------------------------------------------------------------------|-----|-----|---|----|----|----|----|
| [Name]        | <b>Print graphic bank ( 448 ×585 dots).</b>                                          |     |     |   |    |    |    |    |
| [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]       | $0 \leq n \leq 3$<br>$0 \leq xH, xL, yH, yL \leq 255$                                |     |     |   |    |    |    |    |
| [Description] | Prints the graphics bank from flash or ram.<br><i>n</i> selects the bank as follows: |     |     |   |    |    |    |    |

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

|             |                                                                                                                                                                                                                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Notes]     | $xL + xH \times 256$ specifies the starting dot line ( $1 \div 585$ ).<br>$yL + yH \times 256$ specifies the number of lines to print.                                                                                                                                                                        |
|             | <ul style="list-style-type: none"> <li>• If <math>(xL + (xH \times 256)) &gt; 585</math> the printer does not execute the command.</li> <li>• Se <math>(xL + (xH \times 256) + yL + (yH \times 256)) &gt; 585</math> the printer only prints <math>585 - xL + (xH \times 256) + 1</math> dotlines.</li> </ul> |
|             | [Default]                                                                                                                                                                                                                                                                                                     |
| [Reference] | <b>ESC <sup>3</sup>, ESC <sup>2</sup>, ESC !</b>                                                                                                                                                                                                                                                              |
| [Example]   | To print from ram bank dotline 100 to dotline 299, send:<br>1BH FAH 00H 00H 64H 00H C7H                                                                                                                                                                                                                       |

#### ESC <sup>1</sup> nL nH

|               |                                                                                                                                                                                               |                  |    |    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----|----|
| [Name]        | <b>Transmit ram bank to serial port.</b>                                                                                                                                                      |                  |    |    |
| [Format]      | ASCII                                                                                                                                                                                         | ESC <sup>1</sup> | nL | nH |
|               | Hex                                                                                                                                                                                           | 1B FB            | nL | nH |
|               | Decimal                                                                                                                                                                                       | 27 251           | nL | nH |
| [Description] | Transmits $(nH \times 256) + nL$ words of ram bank to serial port.                                                                                                                            |                  |    |    |
| [Notes]       | <ul style="list-style-type: none"> <li>• The size of the ram bank for graphic printing is 448 horizontal dots (56 bytes/dotline) ×585 vertical points (32760 bytes = 16380 words).</li> </ul> |                  |    |    |

[Default]

[Reference] **ESC <sup>3</sup>, ESC <sup>2</sup>, ESC ;**

[Example]

#### **ESC <sup>3</sup> n**

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

[Format] ASCII ESC <sup>3</sup> n

Hex 1B FC n

Decimal 27 252 n

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

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

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

[Note]

[Default]

[Reference] **ESC , ESC <sup>2</sup>, ESC ;**

[Example]

#### **ESC <sup>2</sup> nL nH**

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

[Format] ASCII ESC <sup>2</sup> nL nH

Hex 1B FD nL nH

Decimal 27 253 nL nH

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

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

[Notes]

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

### 3. PRINTER FUNCTIONS

[Default]

[Reference] **ESC ·, ESC <sup>3</sup>, ESC |**

[Example]

#### **ESC | n**

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

[Format] ASCII ESC | n

Hex 1B FE n

Decimal 27 254 n

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

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

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

[Note]

[Default]

[Reference] **ESC ·, ESC <sup>2</sup>, ESC <sup>3</sup>**

[Example]

#### **GS I n**

[

[Name] **Transmit printer ID.**

[Format] ASCII GS I n

Hex 1D 49 n

Decimal 29 73 n

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

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

### 3. PRINTER FUNCTIONS

| n     | Printer ID                 | Specification                   |
|-------|----------------------------|---------------------------------|
| 1. 49 | Printer model ID           | 15H (PM8024)                    |
| 2. 50 | Function identification    | Refer to table below            |
| 3. 51 | ROM version identification | Depends on ROM version (4 char) |

#### n = 2, Function identification

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

[[Notes]

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

[Default]

[Reference]

[Example]

#### GS | n

[Name]

**Set printing density.**

[Format]

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

[Range]

$0 \leq n \leq 4, 48 \leq n \leq 52$

[Description]

Sets the printing density.  
*n* specifies the printing density as follows:

### 3. PRINTER FUNCTIONS

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

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

[Default] n = 2

[Reference]

[Example]

## 4. TECHNICAL SPECIFICATIONS

### 4.1 TECHNICAL SPECIFICATIONS

The main technical features of the PM8024 printer models are listed in table 4.1.

(Tab.4.1)

|                                     |                                                                                                  |
|-------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Resolution</b>                   | 200 DPI (8 dot/mm)                                                                               |
| <b>Paper roll dimensions</b>        | Ø60 mm ± 0.5mm                                                                                   |
| <b>Sensors</b>                      | Paper out, head open, head temperature.                                                          |
| <b>Print method</b>                 | Thermal fixed head (8 dot/mm)                                                                    |
| <b>Print direction</b>              | Normal,180°                                                                                      |
| <b>Print formats</b>                | Normal, double and quadruple height and width, expanded , negative, underlined and script modes. |
| <b>Character fonts</b>              | ASCII standard, EPSON <sup>®</sup> , International.                                              |
| <b>Standard interfaces</b>          | RS232 Serial/ I <sup>2</sup> C BUS                                                               |
| <b>Baud rate</b>                    | From 1200 to 38400 bps / 1-100KHz                                                                |
| <b>Reception buffer</b>             | 32 Kbyte                                                                                         |
| <b>Flash memory</b>                 | 256 Kbyte                                                                                        |
| <b>Graphic memory</b>               | Three 32-Kbyte logos each                                                                        |
| <b>Printing speed (dotline/sec)</b> | 520 (Speed/Quality=normal)                                                                       |
| <b>Power supply</b>                 | 24Vdc                                                                                            |
| <b>Absorption</b>                   |                                                                                                  |
| Stand-by                            | 0.1 A                                                                                            |
| Medium when printing                | 1.1 A                                                                                            |
| Peak                                | 1.8 A                                                                                            |
| <b>Environmental conditions</b>     |                                                                                                  |
| Operating temperature               | 0°C - 45°C                                                                                       |
| Operating humidity                  | 35% - 85% (no condensing)                                                                        |
| Storage temperature / humidity      | -20°C - +60°C / 10% - 90%                                                                        |

## 4. TECHNICAL SPECIFICATIONS

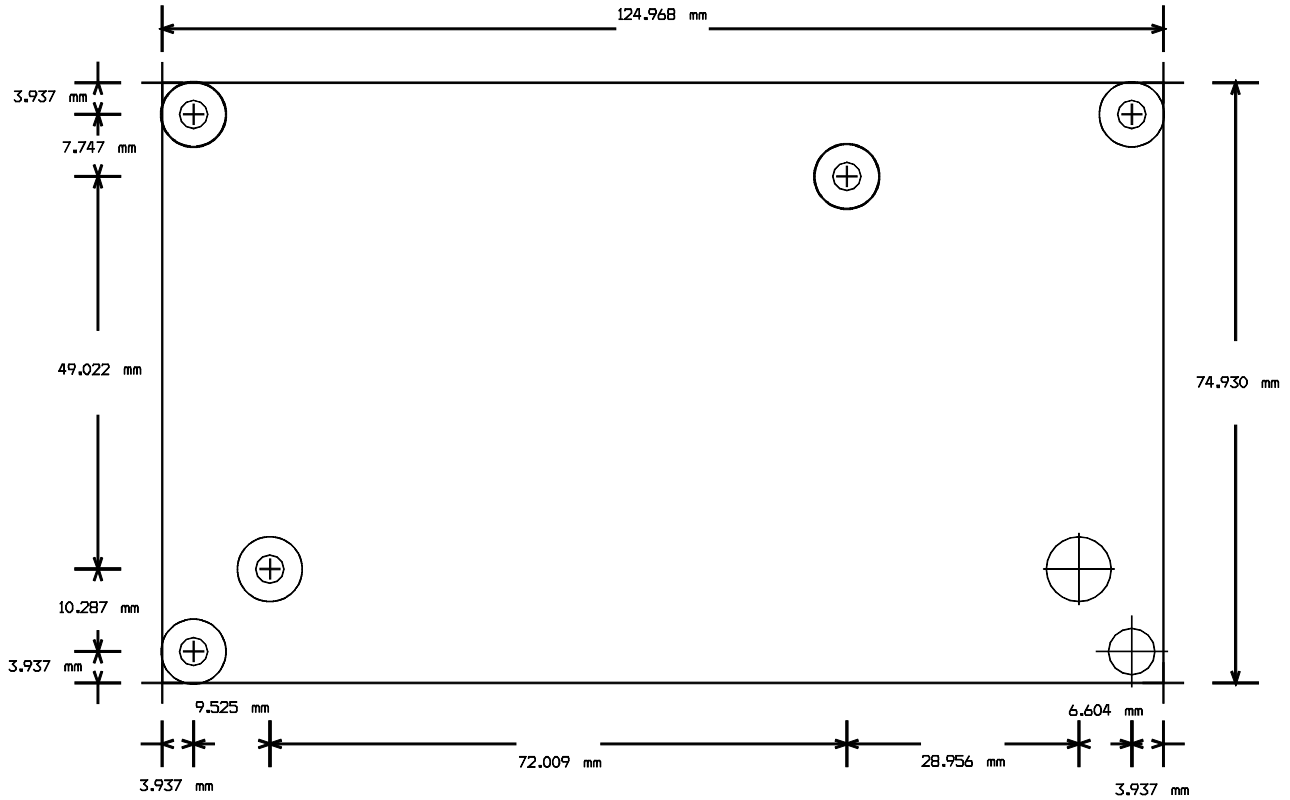
| ESC/POS™ EMULATION         |                    |          |        |
|----------------------------|--------------------|----------|--------|
| Number of columns          | 32                 | 42       | 56     |
| Printing speed             |                    |          |        |
| Characters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

#### 4. TECHNICAL SPECIFICATIONS

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

### 4.2 DIMENSIONS

Figure 4.1 shows the dimensions of the printer PM8024.



(Fig.4.1)

## 5. CHARACTER SETS

### 5.1 CHARACTER SETS

The PM8024 printer has seven FONTS, each with 224 characters.

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

| Font 32 col.                    | Font 42 col.                    | Font 56 col.                    |
|---------------------------------|---------------------------------|---------------------------------|
| 0123456789ABCDEF                | 0123456789ABCDEF                | 0123456789ABCDEF                |
| 2 !"#%&'()*+,-./                | 2 !"#%&'()*+,-./                | 2 !"#%&'()*+,-./                |
| 3 0123456789:;<=>?              | 3 0123456789:;<=>?              | 3 0123456789:;<=>?              |
| 4 @ABCDEFGHIJKLMNO              | 4 @ABCDEFGHIJKLMNO              | 4 @ABCDEFGHIJKLMNO              |
| 5 PQRSTUVWXYZ[\]^_              | 5 PQRSTUVWXYZ[\]^_              | 5 PQRSTUVWXYZ[\]^_              |
| 6 `abcdefghijklmnopqrstuvwxyz{~ | 6 `abcdefghijklmnopqrstuvwxyz{~ | 6 `abcdefghijklmnopqrstuvwxyz{~ |
| 8 Çüéàáâäåçèéëìíîïÿ             | 8 Çüéàáâäåçèéëìíîïÿ             | 8 Çüéàáâäåçèéëìíîïÿ             |
| 9 ÊëÏôöûüÿÖÜç£¥Þþ               | 9 ÊëÏôöûüÿÖÜç£¥Þþ               | 9 ÊëÏôöûüÿÖÜç£¥Þþ               |
| A áíóúñÑª«»¼½¾¿                 | A áíóúñÑª«»¼½¾¿                 | A áíóúñÑª«»¼½¾¿                 |
| B                               | B                               | B                               |
| C                               | C                               | C                               |
| D                               | D                               | D                               |
| E αβΓπΣμτΦΘΩδϵϰ                 | E αβΓπΣμτΦΘΩδϵϰ                 | E αβΓπΣμτΦΘΩδϵϰ                 |
| F ≡±≤≥∫∓≈°•√²³                  | F ≡±≤≥∫∓≈°•√²³                  | F ≡±≤≥∫∓≈°•√²³                  |

(Fig.5.1)

#### Custom DPT24 Emulation

| Font A DPT24                    | Font B DPT24                    |
|---------------------------------|---------------------------------|
| 0123456789ABCDEF                | 0123456789ABCDEF                |
| 2 !"#%&'()*+,-./                | 2 !"#%&'()*+,-./                |
| 3 0123456789:;<=>?              | 3 0123456789:;<=>?              |
| 4 @ABCDEFGHIJKLMNO              | 4 @ABCDEFGHIJKLMNO              |
| 5 PQRSTUVWXYZ[\]^_              | 5 PQRSTUVWXYZ[\]^_              |
| 6 `abcdefghijklmnopqrstuvwxyz{~ | 6 `abcdefghijklmnopqrstuvwxyz{~ |
| 7 pqrstuvwxyz{~                 | 7 pqrstuvwxyz{~                 |
| 8 Çüéàáâäåçèéëìíîïÿ             | 8 Çüéàáâäåçèéëìíîïÿ             |
| 9 ÊëÏôöûüÿÖÜç£¥Þþ               | 9 ÊëÏôöûüÿÖÜç£¥Þþ               |
| A áíóúñÑª«»¼½¾¿                 | A áíóúñÑª«»¼½¾¿                 |
| B                               | B                               |
| C                               | C                               |
| D                               | D                               |
| E αβΓπΣμτΦΘΩδϵϰ                 | E αβΓπΣμτΦΘΩδϵϰ                 |
| F ≡±≤≥∫∓≈°•√²³                  | F ≡±≤≥∫∓≈°•√²³                  |

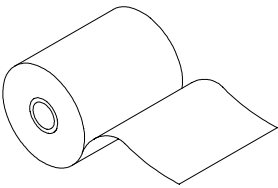
(Fig.5.2)



**A.1 SPARE PARTS**

(Tab.A.1)

|                 |                           |
|-----------------|---------------------------|
| <b>RCT60X55</b> | <b>Thermal paper roll</b> |
|-----------------|---------------------------|



(Fig.A.1)

**Blank page**