BemaTECH

::POS Printer

MP-4000 TH

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MP-4000 TH Programmer's Manual
Rev.1.4

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www.bematech.com

Summary

Introduction

The objective of this manual is to give to programmers all necessary information to properly program and integrate the MP-4000 TH printer into a system. The MP-4000 TH printer is able to interpret ESC/Bema commands and ESC/POS® [1] commands.

For further information refer to the documentation below available in our website:

www.bematech.com

User's Manual – Contains information referring to operation, features and specifications of the MP-4000 TH printer.

Service Manual – Contains information necessary to identify and resolve MP-4000 TH printer problems.

Developers advice

Beside this manual, the drivers and API (and all their documentation) listed below are available from our website (http://www.bematech.com):

- **Windows 2000/XP/Vista-32 –** API dynamic-link library driver (mp2032.dll); recent spooler drivers (BemaSetupXXxX.exe); parallel port driver and USB port driver; software for testing purposes.

- **Windows 9x/ME/NT4 -** API dynamic-link library driver (mp2032.dll); old and unsupported spooler drivers (BemaSetupXXxX.exe);

- **Linux (x86) -** CUPS™ spooler drivers compatible with Redhat 8.0; partial implementantion of mp2320 library as a shared object (mp2032.so);

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1 ESC/POS® is registered trademark of Seiko Epson Corporation.

1 Commands

The MP-4000 TH printer has a series of programming commands that may be used in the remote mode. Two types of commands can be sent:

1.1 Direct command

In this mode, a simple ASCII code is enough to command the printer. For example:

```
ASCII CODE        :    LF
DECIMAL           :    10
HEXADECIMAL       :    0A
```

This command causes the printer to perform a line feed.

1.2 Control sequence

In this mode, more than one code may be sent to command or program the printer. This "control sequence" always starts with the ASCII code "ESC", "FS" or "GS". For example:

```
ASCII CODE        :    ESC   W    1
DECIMAL           :    27    87   01
HEXADECIMAL       :    1B    57   01
```

This command switches the printing mode to "expanded".
Following is a summary of all commands accepted by the MP-4000 TH printer.

2 Using the command summary

The following section lists and describes all resident commands including command parameters. The command syntax is as follows:

- **ESC P** is a command without parameters;
- **ESC Q n** is a command with one parameter only;
- **ESC K n1 n2** is a command with two parameters;
- **ESC D n1**...**nk** is a command with a variable number of parameters.

A character 'h' following an alphanumeric string represents an hexadecimal number. A number with no 'h' following it is in decimal mode. An italic item is a parameter to the escape function.

Note: MP-4000 TH printer is capable of interpreting ESC/Bema commands and ESC/POS commands.

2.1 ESC/Bema Command Table

<table>
<tr><td colspan="4" align="center">Operation</td></tr>
<tr><td>Code</td><td>Function</td><td>Format hexadecimal</td><td>Page</td></tr>
<tr><td>GS F9h 5 <i>00h</i></td><td>Select ESC/Bema operation mode. Writes on flash. Use with caution.</td><td>1D F9 35 <i>00</i></td><td>13</td></tr>
<tr><td>GS F9h 20h 30h</td><td>Select ESC/Bema temporary operation mode. Doesn't alters flash.</td><td>1D F9 20 30</td><td>13</td></tr>
<tr><td>GS F9h 1Fh 31h</td><td>Return to previous set of commands configured before temporary setting.</td><td>1D F9 1F 31</td><td>14</td></tr>
<tr><td>ESC @</td><td>Initializes the MP-4000 TH printer</td><td>1B 40</td><td>14</td></tr>
<tr><td>ESC b <i>n</i></td><td><i>n</i> = 1 => PE signal reflects drawer sensor
<i>n</i> = 0 => PE signal reflects paper sensor</td><td>1B 62 <i>n</i></td><td>14</td></tr>
<tr><td>ESC v <i>n</i></td><td>Activate drawer for <i>n</i> milliseconds (-50ms < <i>n</i> < 200ms)</td><td>1B 76 <i>n</i></td><td>14</td></tr>
<tr><td>ESC w</td><td>Performs a full paper cut</td><td>1B 77</td><td>15</td></tr>
<tr><td>ESC m</td><td>Performs a partial paper cut</td><td>1B 6D</td><td>15</td></tr>
<tr><td>ESC y <i>n</i></td><td>Enable / disable panel keys</td><td>1B 79 <i>n</i></td><td>15</td></tr>
<tr><td>ESC x</td><td>Enable Dump Mode</td><td>1B 78</td><td>16</td></tr>
<tr><td>ESC z <i>n</i></td><td>Enable (<i>n</i> = 1) / disable (<i>n</i> = 0) automatic line feed</td><td>1B 7A <i>n</i></td><td>16</td></tr>
<tr><td>ESC (A <i>pL pH fn n1 n2 vol</i></td><td>Activate/deactivate buzzer</td><td>1B 28 41 <i>pL pH fn n1 n2 vol</i></td><td>16</td></tr>
<tr><td>GS F9h – <i>n</i></td><td>Set printer priority (high quality or high speed)</td><td>1D F9 2D <i>n</i></td><td>17</td></tr>
<tr><td>GS F9h ! <i>n</i></td><td>Set paper width</td><td>1D F9 21 <i>n</i></td><td>17</td></tr>
<tr><td>GS F9h , <i>n</i></td><td>Enable/Disable paper near end sensor</td><td>1D F9 2C <i>n</i></td><td>18</td></tr>
<tr><td>GS F9h + <i>n</i></td><td>Set and save printing intensity</td><td>1D F9 2B <i>n</i></td><td>18</td></tr>
<tr><td>GS FAh <i>n</i></td><td>Set printer language</td><td>1D FA <i>n</i></td><td>18</td></tr>
<tr><td>GS F9h " 0</td><td>Get printer log</td><td>1D F9 22 30</td><td>19</td></tr>
<tr><td>GS F9h ' <i>n</i></td><td>Get printer information</td><td>1D F9 27 <i>n</i></td><td>19</td></tr>
<tr><td>GS F9h (0</td><td>Load default user configuration</td><td>1D F9 28 30</td><td>20</td></tr>
<tr><td>GS F9h) 0</td><td>Print user configuration</td><td>1D F9 29 30</td><td>20</td></tr>
<tr><td>GS F7h BS NUL ! <i>i$_1$...i$_4$ s$_1$..s$_4$</i></td><td>Set IP address and subnet mask</td><td>1D F7 08 00 21 <i>i$_1$...i$_4$ s$_1$..s$_4$</i></td><td>20</td></tr>
<tr><td>GS F9h * <i>n</i></td><td>Set USB address</td><td>1D F9 2A <i>n</i></td><td>20</td></tr>
</table>

Vertical positioning

Code	Function	Format hexadecimal	Page
ESC C *n*	Set page size in lines	1B 43 *n*	21
ESC c *n1 n2*	Set page size in millimeters	1B 63 *n1 n2*	21
ESC J *n*	Performs a fine line feed	1B 4A *n*	21
FF	Feeds one page	0C	21
LF	Feeds one line	0A	22
ESC 2	Line feed of 1/6 inch	1B 32	22
ESC 3 *n*	Line feed of *n*/144 inch	1B 33 *n*	23
ESC f 1 *n*	Vertical skipping	1B 66 31 *n*	23
ESC A *n*	Feeding paper (*n* * 0,375mm)	1B 41 *n*	23

Horizontal positioning

Code	Function	Format hexadecimal	Page
ESC f 0 *n*	Horizontal skipping	1B 66 30 *n*	24
ESC Q *n*	Set right margin	1B 51 *n*	24
ESC l *n*	Set left margin	1B 6C *n*	24
ESC a *n*	Centralize (*n* = 1) or left align (*n* = 0) characters	1B 61 *n*	25

Character types

Code	Function	Format hexadecimal	Page
ESC - *n*	Enable / disable underlined print mode	1B 2D *n*	26
ESC 4	Enable italic print mode	1B 34	26
ESC 5	Disable italic print mode	1B 35	26
ESC E	Enable emphasized print mode	1B 45	27
ESC F	Disable emphasized print mode	1B 46	27
ESC t *n*	Select code page	1B 74 *n*	27
ESC S *n*	Enable superscript and / or subscript	1B 53 *n*	28
ESC T	Disable superscript and subscript modes	1B 54	28
ESC N *n*	Select Intensity Mode	1B 4E *n*	28
ESC ! *n*	Select print mode	1B 21 *n*	29
ESC } *n*	Enable / Disable inverted mode	1B 7D *n*	29

Print width, character width and height

Code	Function	Format hexadecimal	Page
DC2	Disable condensed mode	12	30
DC4	Disable on-line expanded print	14	30
ESC d *n*	Enable / Disable double height print mode	1B 64 *n*	30
ESC H	Set default column per line	1B 48	31
ESC P	Set default column per line	1B 50	31
ESC SI	Set condensed mode	1B 0F	31
ESC SO	Set on-line expanded mode	1B 0E	32
ESC V	Set on-line double height mode	1B 56	32
ESC W *n*	Enable / Disable expanded mode	1B 57 *n*	32
SI	Enable condensed mode	0F	33
SO	Enable on-line expanded mode	0E	33

Bit images and graphics

Code	Function	Format hexadecimal	Page
ESC $ $n1$ $n2$	Fill in blank bit columns	1B 24 $n1$ $n2$	35
ESC * ! $n1$ $n2$ $b1...bn$	24-bit graphics	1B 2A 21 $n1$ $n2$ $b1$ ... bn	35
ESC K $n1$ $n2$ $b1...bn$	8-bit graphics	1B 4B $n1$ $n2$ $b1$ ... bn	36
FS p n m	Print NV bit image	1C 70 n m	36
FS q n $[x_L$ x_H y_L y_H $d_1...d_k]_1...[x_L$ x_H y_L y_H $d_1...d_k]_n$	Define NV bit image	1C 71 n $[x_L$ x_H y_L y_H $d_1...d_k]_1...[x_L$ x_H y_L y_H $d_1...d_k]_n$	37
GS / m	Print downloaded bit image	1D 2F m	38
GS * x y $d_1...d_{(x \times y \times 8)}$	Define downloaded bit image	1D 2A x y $d_1...d_{(x \times y \times 8)}$	38
GS v 0 m x_L x_H y_L y_H $d_1...d_k$	Print Raster Bitmap	1D 76 30 m x_L x_H y_L y_H $d_1...d_k$	39

Communication

Code	Function	Format hexadecimal	Page
ENQ	Serial communication status enquiry	05	41
GS ° 1	Serial / USB communication advanced status	1D F8 31	41
ETX	End buffer	03	44
STX	Clear buffer	02	44

Data Control

Code	Function	Format hexadecimal	Page
CAN	Cancel last line	18	45
DEL	Cancel last character	7F	45

Barcodes			
Code	**Function**	**Format hexadecimal**	**Page**
GS h n	Sets the height n of the barcode generated	1D 68 n	46
GS w n	Determines the width of the barcode	1D 77 n	46
GS H n	Choose the position of the human readable information (HRI) of the barcode	1D 48 n	46
GS f n	Sets the font used to print the human readable information (HRI)	1D 66 n	47
GS k 0 $d_1…d_{11}$ NUL	Prints an UPC-A barcode	1D 6B 00 $d_1…d_{11}$ 00	47
GS k 65 11 $d_1...d_{11}$	Prints an UPC-A barcode	1D 6B 41 0B $d_1…d_{11}$	47
GS k 1 $d_1…d_6$ NUL	Prints an UPC-E barcode	1D 6B 01 $d_1…d_6$ 00	48
GS k 66 6 $d1…d_6$	Prints an UPC-E barcode	1D 6B 42 06 $d_1…d_6$	48
GS k 2 $d_1…d_{12}$ NUL	Prints an EAN-13 barcode	1D 6B 02 $d_1…d_{12}$ 00	48
GS k 67 12 $d_1…d_{12}$	Prints an EAN-13 barcode	1D 6B 43 0C $d_1…d_{12}$	49
GS k 3 $d_1…d_7$ NUL	Prints an EAN-8 barcode	1D 6B 03 $d_1…d_7$ 00	49
GS k 68 7 $d_1…d_7$	Prints an EAN-8 barcode	1D 6B 44 07 $d_1…d_7$	49
GS k 4 $d_1…d_n$ NUL	Prints a CODE 39 barcode	1D 6B 04 $d_1…d_n$ 00	50
GS k 69 n $d_1…d_n$	Prints a CODE 39 barcode	1D 6B 45 n $d_1…d_n$	50
GS k 5 $d_1…d_n$ NUL	Prints an ITF barcode	1D 6B 05 $d_1…d_n$ 00	50
GS k 70 n $d_1...d_n$	Prints an ITF barcode	1D 6B 46 n $d_1…d_n$	51
GS k 6 $d_1…d_n$ NUL	Prints a CODABAR barcode	1D 6B 06 $d_1…d_n$ 00	51
GS k 71 n $d_1…d_n$	Prints a CODABAR barcode	1D 6B 47 n $d_1…d_n$	51
GS k 72 $d_1…d_n$	Prints a CODE 93 barcode	1D 6B 48 n $d_1…d_n$	52
GS k 73 n $d_1…d_n$	Prints a CODE 128 barcode	1D 6B 49 n $d_1…d_n$	52
GS k 128 $n1$ $n2$ n_3 n_4 n_5 n_6 $d1…d_n$	Prints a PDF-417 barcode	1D 6B 80 n_1 n_2 n_3 n_4 n_5 n_6 $d1…d_n$	53
GS k 21 $d_1…d_9$ NUL	Prints an ISBN barcode	1D 6B 15 $d_1…d_9$ 00	53
GS k 22 $d_1…d_n$ NUL	Prints a MSI barcode	1D 6B 16 $d_1…d_n$ 00	54
GS k 130 n $d_1…d_n$	Prints a MSI barcode	1D 6B 82 n $d_1…d_n$	54
GS k 23 $d_1…d_n$ NUL	Prints a PLESSEY barcode	1D 6B 17 $d_1…d_n$ 00	54
GS k 131 n $d_1…d_n$	Prints a PLESSEY barcode	1D 6B 83 n $d_1…d_n$	55
GS k 132 n_1 n_2	Programs barcode's left margin	1D 6B 84 n_1 n_2	55

2.2 ESC/POS Command Table

Operation

Code	Function	Format hexadecimal	Page
GS F9h 5 *01h*	Select ESC/POS operation mode. Writes on flash. Use with caution.	1D F9 35 *01*	56
GS F9h 20h 31h	Select ESC/POS temporary operation mode. Doesn't alters flash.	1D F9 20 31	56
GS F9h 1Fh 31h	Return to previous set of commands configured before temporary setting.	1D F9 1F 31	57
ESC = *n*	Select peripheral device	1B 3D *n*	57
ESC @	Initialize printer	1B 40	57
ESC c 3 *n*	Select paper sensor(s) to output paper-end signals	1B 63 33 *n*	58
ESC c 4 *n*	Select paper sensor(s) to stop printing	1B 63 34 *n*	58
ESC c 5 *n*	Enable/disable panel buttons	1B 63 35 *n*	59
ESC p *m t_1 t_2*	General pulse	1B 70 *m t_1 t_2*	59
GS (A p_L p_H *n m*	Execute test print	1D 28 41 p_L p_H *n m*	60
DLE DC4 *n m t*	Generate pulse at real-time	10 14 *n m t*	60
GS V *m (n)*	Select cut mode and cut paper	1D 56 *m (n)*	61
ESC (A *pL pH fn n c t1 t2*	Activate buzzer	1B 28 41 *pL pH fn n c t1 t2*	61

Vertical positioning

Code	Function	Format hexadecimal	Page
LF	Print and line feed	0A	62
FF	Print and return to standard mode	0C	62
CR	Print and carriage return	0D	62
ESC $ n_L n_H	Set absolute print position	1B 24 n_L n_H	63
ESC 2	Select default line spacing	1B 32	63
ESC 3 *n*	Set line spacing	1B 33 *n*	63
ESC \ n_L n_H	Set relative print position	1B 5C n_L n_H	63
ESC d *n*	Print and feed *n* lines	1B 64 *n*	64

Horizontal positioning

Code	Function	Format hexadecimal	Page
HT	Horizontal tab	09	65
ESC SP *n*	Set right-side character spacing	1B 20 *n*	65
ESC D *n1…n_K* NUL	Set horizontal tab positions	1B 44 *n1…nk* 00	65
ESC a *n*	Select justification	1B 61 *n*	66
GS L n_L n_H	Set left margin	1D 4C n_L n_H	66

Character types

Code	Function	Format hexadecimal	Page
ESC – *n*	Turn underline mode on/off	1B 2D *n*	67
ESC E *n*	Turn emphasized mode on/off	1B 45 *n*	67
ESC M *n*	Select character font	1B 4D *n*	67
GS B	Activate/deactivate black/white reverse printing	1D 42 *n*	68
ESC R *n*	Select an international character set	1B 52 *n*	68
ESC t *n*	Select character code table	1B 74 *n*	68

Communication

Code	Function	Format hexadecimal	Page
DLE EOT *n*	Real-time status transmission	10 04 *n*	69
DLE ENQ *n*	Real-time request to printer	10 05 *n*	70
GS I *n*	Transmit printer ID	1D 49 *n*	71
GS a *n*	Enable/disable Automatic Status Back (ASB)	1D 61 *n*	72
GS r *n*	Transmit status	1D 72 *n*	73

Data Control

Code	Function	Format hexadecimal	Page
CAN	Cancel print data	18	75

Barcodes

Code	Function	Format hexadecimal	Page
GS h *n*	Set bar code height	1D 68 *n*	46
GS w *n*	Set bar code width	1D 77 *n*	46
GS H *n*	Select printing position of HRI characters	1D 48 *n*	46
GS f *n*	Select font for HRI characters	1D 66 *n*	47
GS k 0 $d1…d1_1$ NUL	Prints an UPC-A barcode	1D 6B 00 $d1…d1_1$ 00	47
GS k 65 11 $d1...d1_1$	Prints an UPC-A barcode	1D 6B 41 0B $d1…d1_1$	47
GS k 1 $d1…d_6$ NUL	Prints an UPC-E barcode	1D 6B 01 $d1…d_6$ 00	48
GS k 66 6 $d1…d_6$	Prints an UPC-E barcode	1D 6B 42 06 $d1…d_6$	48
GS k 2 $d1…d1_2$ NUL	Prints an EAN-13 barcode	1D 6B 02 $d1…d1_2$ 00	48
GS k 67 12 $d1…d1_2$	Prints an EAN-13 barcode	1D 6B 43 0C $d1…d1_2$	49
GS k 3 $d1…d_7$ NUL	Prints an EAN-8 barcode	1D 6B 03 $d1…d_7$ 00	49
GS k 68 7 $d1…d_7$	Prints an EAN-8 barcode	1D 6B 44 07 $d1…d_7$	49
GS k 4 $d1…d_n$ NUL	Prints a CODE 39 barcode	1D 6B 04 $d1…d_n$ 00	50
GS k 69 n $d1…d_n$	Prints a CODE 39 barcode	1D 6B 45 n $d1…d_n$	50
GS k 5 $d1…d_n$ NUL	Prints an ITF barcode	1D 6B 05 $d1…d_n$ 00	50
GS k 70 n $d1...dn$	Prints an ITF barcode	1D 6B 46 n $d1…d_n$	51
GS k 6 $d1…d_n$ NUL	Prints a CODABAR barcode	1D 6B 06 $d1…d_n$ 00	51
GS k 71 n $d1…d_n$	Prints a CODABAR barcode	1D 6B 47 n $d1…d_n$	51
GS k 72 $d1…d_n$	Prints a CODE 93 barcode	1D 6B 48 n $d1…d_n$	52
GS k 73 n $d1…d_n$	Prints a CODE 128 barcode	1D 6B 49 n $d1…d_n$	52
GS k 128 $n1$ $n2$ n_3 n_4 n_5 n_6 $d1…d_n$	Prints a PDF-417 barcode	1D 6B 80 $n1$ $n2$ n_3 n_4 n_5 n_6 $d1…d_n$	53
GS k 21 $d1…d_9$ NUL	Prints an ISBN barcode	1D 6B 15 $d1…d_9$ 00	53
GS k 22 $d1…d_n$ NUL	Prints a MSI barcode	1D 6B 16 $d1…d_n$ 00	54
GS k 130 n $d1…d_n$	Prints a MSI barcode	1D 6B 82 n $d1…d_n$	54
GS k 23 $d1…d_n$ NUL	Prints a PLESSEY barcode	1D 6B 17 $d1…d_n$ 00	54
GS k 131 n $d1…d_n$	Prints a PLESSEY barcode	1D 6B 83 n $d1…d_n$	55
GS k 132 $n1$ $n2$	Programs barcode's left margin	1D 6B 84 $n1$ $n2$	55

Bit images and graphics			
Code	**Function**	**Format hexadecimal**	**Page**
ESC * ! *n1 n2 b1...bn*	24-bit graphics	1B 2A 21 *n1 n2 b1 ... bn*	35
FS p *n m*	Print NV bit image	1C 70 *n m*	36
FS q *n [x_L x_H y_L y_H $d_1...d_k$]$_1$...[x_L x_H y_L y_H $d_1...d_k$]$_n$*	Define NV bit image	1C 71 *n [x_L x_H y_L y_H $d_1...d_k$]$_1$...[x_L x_H y_L y_H $d_1...d_k$]$_n$*	37
GS / *m*	Print downloaded bit image	1D 2F *m*	38
GS * *x y $d_1...d_{(x \times y \times 8)}$*	Define downloaded bit image	1D 2A *x y $d_1...d_{(x \times y \times 8)}$*	38
GS v 0 *m x_L x_H y_L y_H $d_1...d_k$*	Print Raster Bitmap	1D 76 30 *m x_L x_H y_L y_H $d_1...d_k$*	39

3. ESC/Bema Commands

3.1 Operation Commands

The following section details each of the commands presented in the Command Table, ESC/Bema section.

GS F9h 5 00h

[Function]	Select ESC/Bema operation mode.	

[Format]	ASCII	GS F9h 5 00h
Hexadecimal	1D F9 35 00	
Decimal	29 249 53 0	

[Description] Tells printer to interpret ESC/Bema commands from now.

[Notes]   ● This command saves data on printer flash memory and therefore is slow, which may affect printer performance and funcionality if mixed with other faster commands. **Please**, **use with caution**.
● When ESC/Bema mode is enabled and a DB25 serial interface is connected, the printer will automatically change its flow control to RTS/CTS.

GS F9h 20h 30h

[Function]   Select ESC/Bema temporary operation mode.

[Format]	ASCII	GS F9h 20h 30h
Hexadecimal	1D F9 20 30	
Decimal	29 249 32 48	

[Description]   Tells printer to interpret ESC/Bema commands from now.

[Notes]   ● This command doesn't writes anything on flash memory, so it can be used anyway.
● When ESC/Bema mode is enabled and a DB25 serial interface is connected, the printer will automatically change its flow control to RTS/CTS.

GS F9h 1Fh 31h

[Function]	Return to previous set of commands configured before temporary setting.	

[Format]	ASCII	GS F9h 1Fh 31h
Hexadecimal	1D F9 1F 31	
Decimal	29 249 31 49	

[Description]   Tells printer to interpret the command set that was configured before an temporary set has been done.

ESC @

[Function]   Initializes the MP-4000 TH printer.

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

[Description]   All settings, including character font, line spacing, left margin, right margin, intensity and inverted mode are canceled.

ESC b *n*

[Function]   Select sensor to signalize.

[Format]	ASCII	ESC b n
Hexadecimal	1B 62 n	
Decimal	27 98	

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

[Description]   When n = 1 (or n = 49), PE signal reflects drawer sensor. When n = 0 (or n = 48), PE signal reflects paper sensor.

[Notes]   PE is a signal from the parallel interface.

ESC v *n*

[Function]   Activate drawer.

[Format]	ASCII	ESC v n
Hexadecimal	1B 76 n	
Decimal	27 118 n	

[Description]   Activate drawer pin for n milliseconds (-50ms < n < 200ms).

ESC w

[Function]	Performs a full paper cut.	

[Format]	ASCII	ESC w
Hexadecimal	1B 77	
Decimal	27 119	

[Description]   This command operates the auto cutter, performing a full cut in the paper.

[Notes]   When presenter is activated there is a minimum receipt size (roughly 3.3 inches) to avoid paper jam inside the presenter. If the receipt size is less than the minimum, the full cut command will automatically add line feeds to perform the cut.

ESC m

[Function]   Performs a partial paper cut.

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

[Description]   This command operates the auto cutter, performing a partial cut in the paper.

[Notes]   This command is available only if presenter is not activated.

ESC y *n*

[Function]   Enable / disable panel keys.

[Format]	ASCII	ESC y n
Hexadecimal	1B 79 n	
Decimal	27 121 n	

[Range]	n = 0,1
[Default]	n = 1

[Description]   Enables or disables the panel key.
    ✓ When n is 0 (00h or 30h), the panel key is disabled.
    ✓ When n is 1 (01h or 31h), the panel key is enabled.
    ✓
[Notes]   When the panel key is disabled, no button on the panel is usable.

ESC x

[Function]	Enable Dump Mode.	
[Format]	ASCII	ESC x
	Hexadecimal	1B 78
	Decimal	27 120
[Description]	Enables dump mode. In this mode advanced users and programmers can identify communication problems between the host and the printer or check if a certain programmed data is correctly being sent to the printer, thus being a debugging tool.	
[Note]	The dump mode is disabled just resetting the printer.	

ESC z *n*

[Function]	Enable / disable automatic line feed.	
[Format]	ASCII	ESC z *n*
	Hexadecimal	1B 7A *n*
	Decimal	27 122 *n*
[Description]	Enables automatic line feed.	

✓ When *n* is 1 (01h or 31h), the automatic line feed is enabled.

✓ When *n* is 0 (00h or 30h), the automatic line feed is disabled.

[Notes]	If automatic line feed is enabled, the printer will perform a LF if a CR is received.

ESC (A p_L p_H *fn* n_1 n_2 *vol*

[Function]	Activate/deactivate buzzer.	
[Format]	ASCII	ESC (A p_L p_H *fn* n_1 n_2 *vol*
	Hexadecimal	1B 28 41 p_L p_H *fn* n_1 n_2 *vol*
	Decimal	27 40 65 p_L p_H *fn* n_1 n_2 *vol*
[Description]	Activate or deactivate printer buzzer.	

$(p_L + p_H \times 256) = 4$, i.e., p_L must be 4 and p_H must be 0.

fn = 1, 31h – activate buzzer

fn = 0, 30h – deactivate buzzer

n = (n_1 + n_2 × 256) – time in milliseconds

vol = 0, 30h – low volume

vol = 1, 31h – high volume

GS F9h - *n*

[Function]	Set printer priority.	
[Format]	ASCII	GS F9h - *n*
	Hexadecimal	1D F9 2D *n*
	Decimal	29 249 45 *n*
[Description]	Set printer priority to high quality or high speed.	

n = 1, 31h – high quality

n = 0, 30h – high speed

GS F9h ! *n*

[Function]	Set paper width.	
[Format]	ASCII	GS F9h ! *n*
	Hexadecimal	1D F9 21 *n*
	Decimal	29 249 33 *n*
[Description]	Set printer paper width as shown on following table:	

n	paper width (mm)	printing width (mm)
00h	58	48
01h	76	72
02h	80	72
03h	80	76
04h	82.5	72
05h	82.5	76
06h	82.5	80
07h	76	64
08h	80	64
09h	82.5	64

[Description]   This command has no effect when ESC/POS mode is enabled. ESC/POS mode fixes paper/printing width to 80 mm / 76 mm.

GS F9h , *n*

[Function]   Enable/disable paper near end sensor.

[Format]   ASCII   GS F9h , *n*

                    Hexadecimal   1D F9 2C *n*

                    Decimal   29 249 44 *n*

[Description]   Enable or disable paper near end sensor (PNES).

                    n = 1, 31h – enable PNES

                    n = 0, 30h – disable PNES

GS F9h + *n*

[Function]   Set and save printing intensity.

[Format]   ASCII   GS F9h + *n*

                    Hexadecimal   1D F9 2B *n*

                    Decimal   29 249 43 *n*

[Description]   Set and save printing intensity on flash memory.

                    n may vary from 0 (00h, 30h) to 4 (04h, 34h), meaning weakest to strongest printing respectively.

GS FAh *n*

[Function]   Set printer language.
[Format]   ASCII   GS FAh *n*
                    Hexadecimal   1D FA *n*
                    Decimal   29 250 *n*
[Description]   Set printer language.
                    n = 0, 30h – english
                    n = 1, 31h – portuguese
                    n = 2, 32h - spanish

GS F9h " 0

[Function]	Get printer log.	
[Format]	ASCII	GS F9h " 0
	Hexadecimal	1D F9 22 30
	Decimal	29 249 34 48
[Description]	Tells the printer to send its log.	
[Note]	This command doesn't work with parallel port in SPP mode.	

GS F9h ' *n*

[Function]	Get printer information.	
[Format]	ASCII	GS F9h ' *n*
	Hexadecimal	1D F9 27 *n*
	Decimal	29 249 39 *n*
[Description]	Get printer information as shown on following table:	

n	Information
0, 30h	Product code
1, 31h	Serial number
2, 32h	Manufacturing date
3, 33h	Firmware version
4, 34h	Reserved
5, 35h	Manufacturing timestamp (dd/mm/yyyy hh:mm:ss format)

GS F9h (0

[Function]	Load default user configuration.	
[Format]	ASCII	GS F9h (0
	Hexadecimal	1D F9 28 30
	Decimal	29 249 40 48
[Description]	Reload all configurations from flash memory.	

GS F9h) 0

[Function]	Print user configuration.	
[Format]	ASCII	GS F9h (0
	Hexadecimal	1D F9 29 30
	Decimal	29 249 41 48
[Description]	Print user configuration.	

GS F7h BS NUL ! *i1...i4 s1..s4*

[Function]	Set IP address and subnet mask.	
[Format]	ASCII	GS F7h BS NUL ! *i1...i4 s1..s4*
	Hexadecimal	1D F7 08 00 21 *i1...i4 s1..s4*
	Decimal	29 247 08 00 33 *i1...i4 s1..s4*
[Description]	Set IP address and subnet mask on hexadecimal format without points.	
[Example]	IP 10.1.1.250 and SUBNET 255.0.0.0 must be sent as 0Ah 01h 01h FAh FFh 00h 00h 00h	

GS F9h * *n*

[Function]	Set USB address.	
[Format]	ASCII	GS F9h * n
Hexadecimal	1D F9 2A n	
Decimal	29 249 42 n	
[Description]	Set USB address to allow the use of more than one printer on same computer.	

3.2 Vertical positioning

ESC C *n*

[Function]	Set page size in lines.	
[Format]	ASCII	ESC C *n*
	Hexadecimal	1B 43 *n*
	Decimal	27 67 *n*
[Range]	$0 < n < 256$	
[Default]	$n = 12$	
[Description]	Sets the page size where *n* is the number of lines (single height).	

ESC c *n₁* *n₂*

[Function]	Set page size in millimeters.	
[Format]	ASCII	ESC c *n1 n2*
	Hexadecimal	1B 63 *n1 n2*
	Decimal	27 99 *n1 n2*
[Range]	$0 < n1 < 256; 0 < n2 < 256$	
[Description]	Sets the page size in millimeters where size is 0,125mm*$n1$ *$n2$.	

ESC J *n*

[Function]	Performs a fine line feed.	
[Format]	ASCII	ESC J *n*
	Hexadecimal	1B 4A *n*
	Decimal	27 74 *n*
[Range]	$0 < n < 256$	
[Description]	Performs the feeding of *n**0,125mm of paper.	
[Notes]	This command is very useful in the graphic mode.	

FF

[Function]	Feeds one page.	
[Format]	ASCII	FF
	Hexadecimal	0C
	Decimal	12
[Description]	Performs a form feed to the top of the form.	
[Notes]	The form feed command can be disabled. Set the page size to zero.	

LF

[Function]	Feeds one line.	
[Format]	ASCII	LF
	Hexadecimal	0A
	Decimal	10
[Description]	Prints the contents of the buffer (if exists) and performs one line feed using the default line spacing.	
[Notes]	The next character print position is on the left margin of the next line.	

ESC 2

[Function]	Line feed of 1/6".	
[Format]	ASCII	ESC 2
	Hexadecimal	1B 32
	Decimal	27 50
[Description]	Sets the line feed of 1/6 inch. The line feed rate per line is specified by 1/6 inch.	
[Notes]	This is the default value when printer performed a reset or ESC @ was received.	

ESC 3 *n*

[Function]   Line feed of *n*/144 inch.

[Format]   ASCII   ESC 3 *n*

         Hexadecimal   1B 33 *n*

         Decimal   27 51 *n*

[Range] $16 \leq n \leq 255$

[Description] The line feed rate per line is specified by *n*/144 inch.

[Notes]   This command takes effect immediately.

ESC f 1 *n*

[Function]   Vertical skipping

[Format]   ASCII   ESC f 1 *n*

         Hexadecimal   1B 66 31 *n*

         Decimal   27 102 49 *n*

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

[Description] Performs a vertical skipping of *n* characters.

[Notes]   The command 1Bh 66h 01h *n* has the same effect.

ESC A *n*

[Function]   Feeding paper *n* * 0,375mm.

[Format]   ASCII   ESC A *n*

         Hexadecimal   1B 41 *n*

         Decimal   27 65 *n*

[Range] $0 < n < 256$

[Description] Performs the feeding of *n* * 0,375mm.

[Notes]   If *n* < 17, the line feed will be equal to zero. For *n* > 100, the line feed

         will be equal to 32mm. For other values, the line feed is equal to

         n*0,375mm.

3.3 Horizontal positioning

ESC f 0 *n*

[Function]	Horizontal skipping	
[Format]	ASCII	ESC f 0 *n*
	Hexadecimal	1B 66 30 *n*
	Decimal	27 102 48 *n*

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

[Description]   Performs a horizontal skipping of *n* characters.

[Notes]   The command 1B 66 00 *n* has the same effect.

ESC Q *n*

[Function]	Set right margin.	
[Format]	ASCII	ESC Q *n*
	Hexadecimal	1B 51 *n*
	Decimal	27 81 *n*

[Range] $0 < n < 256$

[Description]   Sets right margin in characters from the default left margin.

[Notes]   If the right margin is set to the left of the current horizontal position, the new margin becomes valid in the next line.

ESC l *n*

[Function]	Set left margin.	
[Format]	ASCII	ESC l *n*
	Hexadecimal	1B 6C *n*
	Decimal	27 108 *n*

[Range] $0 < n < 256$

[Description]   Sets left margin in characters from the default left margin.

[Notes]   If the left margin is set to the right of the current horizontal position, the new margin becomes valid in the next line.

ESC a *n*

[Function]	Aligning the characters		
[Format]	ASCII	ESC a *n*	
	Hexadecimal	1B 61 *n*	
	Decimal	27 97 *n*	

[Range]   *n* = 0, 1

[Default]   *n* = 0

[Description]   This command sets the horizontal justification.

✓ When *n* is 0 (00h or 30h), align is left justified.

✓ When *n* is 1 (01h or 31h), align is center justified.

[Notes]   The power on default is left justified.

3.4 Character Types

ESC - *n*

[Function]	Enable / disable underlined print mode	
[Format]	ASCII	ESC - *n*
	Hexadecimal	1B 2D *n*
	Decimal	27 45 *n*
[Range]	*n* = 0,1	
[Default]	*n* = 0	
[Description]	Enables or disables the underlined print mode.	

✓ When *n* is 1 (01h or 31h), underlined mode is enabled.

✓ When *n* is 0 (00h or 30h), underlined mode is disabled.

[Notes]   All subsequent text and spaces are underlined.

ESC 4

[Function]	Enable italic print mode	
[Format]	ASCII	ESC 4
	Hexadecimal	1B 34
	Decimal	27 52
[Description]	Enables italic print mode.	
[Notes]	Italic is available in all print modes.	

ESC 5

[Function]	Disable italic print mode	
[Format]	ASCII	ESC 5
	Hexadecimal	1B 35
	Decimal	27 53
[Description]	Disables italic print mode.	

ESC E

[Function]	Enable emphasized print mode	
[Format]	ASCII	ESC E
	Hexadecimal	1B 45
	Decimal	27 69
[Description]	Enables emphasized print mode.	
[Notes]	Emphasized print is bolder than normal print. Emphasized print is available in all print modes.	

ESC F

[Function]	Disable emphasized print mode	
[Format]	ASCII	ESC F
	Hexadecimal	1B 46
	Decimal	27 70
[Description]	Disables emphasized print mode.	

ESC t *n*

[Function]	Selects code page	
[Format]	ASCII	ESC t *n*
	Hexadecimal	1B 74 *n*
	Decimal	27 116 *n*
[Range]	*n* = 2, 3, 4, 5	
[Default]	*n* = 2	
[Description]	Selects character code page.	

    ✓ When *n* is 2 (02h or 32h), CODEPAGE 850 is selected.

    ✓ When *n* is 3 (03h or 33h), CODEPAGE 437 is selected.

    ✓ When *n* is 4 (04h or 34h), CODEPAGE 860 is selected.

    ✓ When *n* is 5 (05h or 35h), CODEPAGE 858 is selected.

[Notes]	CODEPAGE 850 is the default character code page.

ESC S *n*

[Function]	Enable superscript and / or subscript	
[Format]	ASCII	ESC S *n*
	Hexadecimal	1B 53 *n*
	Decimal	27 83 *n*
[Range]	*n* = 0, 1	
[Description]	Enables superscript character and or subscript.	

✓ When *n* is 0 (00h or 30h), the superscript is enabled. The following characters are printed on the upper side of the print line.

✓ When *n* is 1 (01h or 31h), the subscript is enabled. The following characters are printed on the bottom side of the print line.

ESC T

[Function]	Disable superscript and subscript modes	
[Format]	ASCII	ESC T
	Hexadecimal	1B 54
	Decimal	27 84
[Description]	Disables both superscript and subscript print modes.	

ESC N *n*

[Function]	Select Intensity Mode	
[Format]	ASCII	ESC N *n*
	Hexadecimal	1B 4E *n*
	Decimal	27 78 *n*
[Range]	*n* = 0, 1, 2, 3, 4	
[Default]	*n* = 2	
[Description]	Selects intensity mode.	

✓ When *n* is 0 (30h), the intensity selected is VERY WEAK.

✓ When *n* is 1 (31h), the intensity selected is WEAK.

    ✓ When *n* is 2 (32h), the intensity selected is NORMAL.

    ✓ When *n* is 3 (33h), the intensity selected is STRONG.

    ✓ When *n* is 4 (34h), the intensity selected is VERY STRONG.

ESC ! *n*

[Function]	Select print mode	
[Format]	ASCII	ESC ! *n*
	Hexadecimal	1B 21 *n*
	Decimal	27 33 *n*

[Description]   Selects the print mode depending on byte *n* as shown in the table below:

Bit	Function	Value	
		0	1
0	Undefined		
1	Undefined		
2	Undefined		
3	Emphasized	Canceled	Specified
4	Double height	Canceled	Specified
5	Double width	Canceled	Specified
6	Undefined		
7	Underlined	Canceled	Specified

ESC } *n*

[Function]	Enable / Disable Inverted mode	
[Format]	ASCII	ESC } *n*
	Hexadecimal	1B 7D *n*
	Decimal	27 125 *n*

[Range]	*n* = 0, 1
[Default]	*n* = 0
[Description]	Enables or disables inverted mode.

    ✓ When *n* is 1 (01h or 31h), the inverted mode is enabled.
    ✓ When *n* is 0 (00h or 30h), the inverted mode is disabled.

3.5 Print width, character width and height

DC2

[Function]	Disable condensed mode	
[Format]	ASCII	DC2
	Hexadecimal	12
	Decimal	18
[Description]	Disables the condensed mod set by the ESC SI or SI command.	

DC4

[Function]	Disable on-line expanded print	
[Format]	ASCII	DC4
	Hexadecimal	14
	Decimal	20
[Description]	Disables the on-line expanded print set by ESC SO or SO command.	

ESC d *n*

[Function]	Enable / Disable double height print mode	
[Format]	ASCII	ESC d *n*
	Hexadecimal	1b 64 *n*
	Decimal	27 100 *n*
[Range]	*n* = 0, 1	
[Default]	*n* = 0	
[Description]	Enables or disables double height print mode.	

- ✓ When *n* is 1 (01h or 31h), the double height is enabled.
- ✓ When *n* is 0 (00h or 30h), the double height is disabled.

ESC H

[Function]	Set default column per line	
[Format]	ASCII	ESC H
	Hexadecimal	1B 48
	Decimal	27 72
[Description]	Set the default cpl. All characters type can be set in this mode. See table 1 to know the number of cpl, according to your printer model.	

ESC P

[Function]	Set default column per line	
[Format]	ASCII	ESC P
	Hexadecimal	1B 50
	Decimal	27 80
[Description]	This command set the default cpl. All characters type can be set in this mode. See table 1 to know the number of cpl, according to your printer model. It is a copy of ESC H.	

ESC SI

[Function]	Set condensed mode	
[Format]	ASCII	ESC SI
	Hexadecimal	1B 0F
	Decimal	27 15
[Description]	This command set the ESC SI cpl. All characters type can be set in this mode. See table 1 to know the number of cpl, according to your printer model.	

ESC SO

[Function]	Set on-line expanded mode	
[Format]	ASCII	ESC SO
	Hexadecimal	1B 0E
	Decimal	27 14
[Description]	If this command is received in the beginning of the line, expanded is valid for all line. If already exist some characters in the line, next characters in this line (if any) will be in expanded mode. Next lines will be in normal mode.	

ESC V

[Function]	Set on-line double height mode	
[Format]	ASCII	ESC V
	Hexadecimal	1B 56
	Decimal	27 86
[Description]	If this command is received in the beginning of the line, double height is valid for all line. If already exist some characters in the line, next characters in this line (if any) will be in double height mode. Next lines will be in normal mode.	

ESC W *n*

[Function]	Enable / Disable expanded mode	
[Format]	ASCII	ESC W *n*
	Hexadecimal	1B 57n
	Decimal	27 87 *n*
[Description]	Set expanded mode (double width).	

✓ When *n* is 1 (01h or 31h), the expanded mode is enabled.

✓ When *n* is 0 (00h or 30h), the expanded mode is disabled.

[Notes]	This command can be sent at any time, even in the middle of the line.

SI

[Function]	Set condensed mode	
[Format]	ASCII	SI
	Hexadecimal	0F
	Decimal	15
[Description]	This command set the ESC SI cpl. All characters type can be set in this mode. See table 1 to know the number of cpl, according to your printer model. It is a copy of ESC SI command.	

SO

[Function]	Set on-line expanded mode	
[Format]	ASCII	SO
	Hexadecimal	0E
	Decimal	14
[Description]	If this command is received in the beginning of the line, expanded is valid for all line. If already exist some characters in the line, next characters in this line (if any) will be in expanded mode. Next lines will be in normal mode. It is a copy of ESC SO command.	

3.6 Bit images and graphics

3.6.1 24-bit graphics
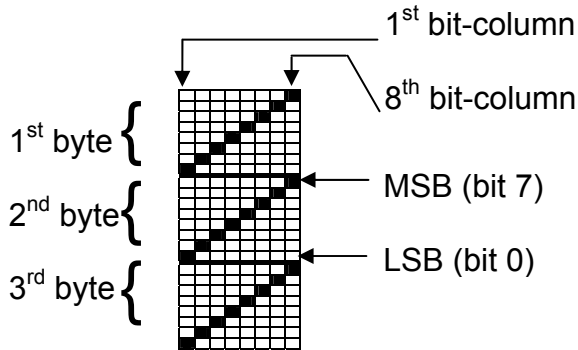
For this 24-bit graphic pattern we have eight bit-columns, each with a height of 3 bytes (24 bits). The printer must, after the command is stated, receive the 1st , 2nd and 3rd bytes of the first bit-column, than the 1st , 2nd and 3rd bytes of the second bit-column and so on, until the last bit-

The command sequence to print this graphic pattern would be (numbers in decimal):

ESC * ! 8 0 1 1 1 2 2 2 4 4 4 8 8 8 16 16 16 32 32 32 64 64 64 128 128 128

Where you have 8 + 0 * 256 = 8 bit-columns to be filled, each with 3 bytes that will give us a total of 24 bytes to be sent (excluding the command sequence).

3.6.2 8-bit graphics
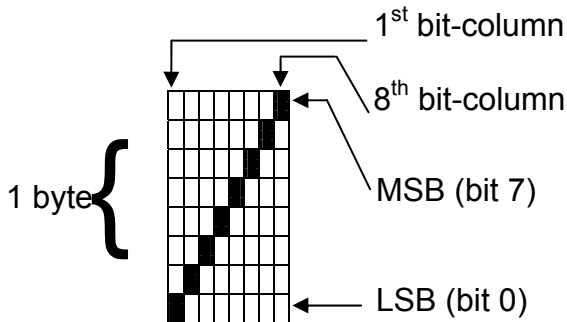
For this 8-bit graphic pattern we have eight bit-columns, each with a height of 1 byte (8 bits). The printer must, after the command is stated, receive the byte for the first bit-column, than the byte for the second bit-column and so on, until the last bit-column is filled. The resolution is lower but needs less bytes to be sent

The command sequence to print this graphic pattern would be (numbers in decimal):

ESC K 8 0 1 2 4 8 16 32 64 128

Where you have 8 + 0 * 256 = 8 bit-columns to be filled, each with 1 byte that will give us a total of 8 bytes to be sent (excluding the command sequence).

ESC $ *n1 n2*

[Function]	Fill in blank bit columns	
[Format]	ASCII	ESC $ *n1 n2*
	Hexadecimal	1B 24 *n1 n2*
	Decimal	27 36 *n1 n2*
[Description]	This command fills in blank bit columns, from the actual column until column number (*n1+n2*256)*, where *n1+n2*256<= N.* See '*N*' value in the table 2.	

ESC * ! *n1 n2 b1...bn*

[Function]	24-bit graphics	
[Format]	ASCII	ESC * ! *n1 n2 b1...bn*
	Hexadecimal	1B 2A 21 *n1 n2 b1 ... bn*
	Decimal	27 42 33 *n1 n2 b1 … bn*
[Description]	This command programs bit image for 24 bits, in double density where *n1+n2*256* is the number of bit-columns that will be sent (see Bit images and graphics) and *b1*...*bn* are the bytes that compose the bit image. For each column one may need 3 bytes to complete. So, if you need to send an image with an 8-column width you may send 24 bytes to fill those columns. A full line has '*N*' bit columns so a full line will need *N**3 bytes. If the image you want to print has less than '*N*' graphic columns, a LF must be sent to complete line printing. Text and graphic can be mixed in the same line. If the printer is used with pograms that convert text to graphics, the printer is slower than if the printer is sent ASCII text. See *N* value in the Table 2.	

ESC K *n1 n2 b1...bn*

[Function]	8-bit graphics	
[Format]	ASCII	ESC K *n1 n2 b1...bn*
	Hexadecimal	1B 4B *n1 n2 b1 ... bn*
	Decimal	27 75 *n1 n2 b1 … bn*

[Description]   Selects the "8 pin" bit image (compatible with matrix printers) where you use *n1+n2*256* columns, with 1 byte per column thus using a lower resolution and up to '*N*' columns. If the image you want to print has less than '*N*' graphic columns, a LF must be sent to complete line printing. Text and graphic can be mixed in the same line. See '*N*' value in the Table 2.

FS p *n m*

[Function]	Print NV bit image.	
[Format]	ASCII	FS p *n m*
	Hexadecimal	1C 70 *n m*
	Decimal	28 112 *n m*

[Description]   Prints a NV bit image *n* using the mode specified by *m*.

m	Mode	Vertical Dot Density	Horizontal Dot Density
0, 48	Normal	180 dpi	180 dpi
1, 49	Double-width	180 dpi	90 dpi
2, 50	Double-height	90 dpi	180 dpi
3, 51	Quadruple	90 dpi	90 dpi

[dpi: dots per 25.4 mm {1"}]

• *n* is the number of the NV bit image (defined using the FS q command).

• *m* specifies the bit image mode.

• NV bit image means a bit image which is defined in a non-volatile memory by FS q and printed by FS p.

• This command is not effective when the specified NV bit image has not been defined.

FS q n $[x_L\ x_H\ y_L\ y_H\ d_1...d_k]_1...[x_L\ x_H\ y_L\ y_H\ d_1...d_k]_n$

[Function]   Define NV bit image.

[Format]   ASCII   FS q n $[x_L\ x_H\ y_L\ y_H\ d_1...d_k]_1...[x_L\ x_H\ y_L\ y_H\ d_1...d_k]_n$

                     Hexadecimal 1C 70 n $[x_L\ x_H\ y_L\ y_H\ d_1...d_k]_1...[x_L\ x_H\ y_L\ y_H\ d_1...d_k]_n$

                     Decimal   28 112 n $[x_L\ x_H\ y_L\ y_H\ d_1...d_k]_1...[x_L\ x_H\ y_L\ y_H\ d_1...d_k]_n$

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

$0 \le xL \le 255$

$0 \le xH \le 3$ (when $1 \le (xL + xH \times 256) \le 1023$)

$0 \le yL \le 255$

$0 \le yL \le 1$ (when $1 \le (yL + yH \times 256) \le 288$)

$0 \le d \le 255$

$k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$

Total defined data area = 2M bits (256K bytes).

[Description] Define n NV bit images that are stored on non-volatile memory.

- n specifies the number of defined NV bit images.

- x_L, x_H specifies $(x_L + x_H \times 256) \times 8$ dots in the horizontal direction for the NV bit image you are defining.

- y_L, y_H specifies $(y_L + y_H \times 256) \times 8$ dots in the vertical direction for the NV bit image you are defining.

- This command cancels all NV bit images that have already been defined by this command.

The printer can not redefine only one of several data definitions previously defined. In this case, all data needs to be sent again.
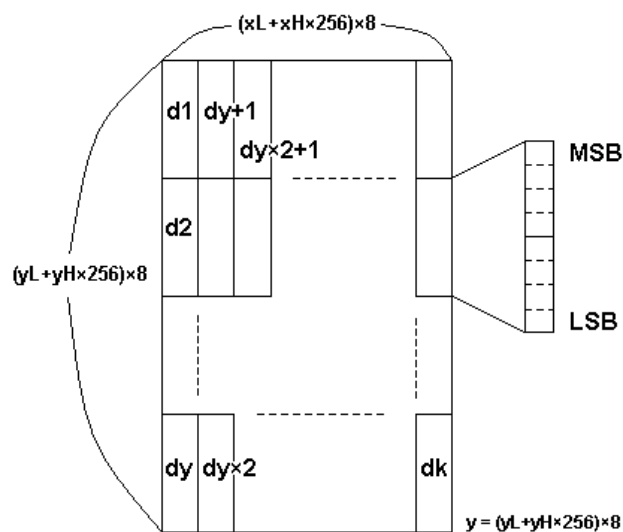
GS / *m*

[Function]	Print downloaded bit image.	
[Format]	ASCII	GS / *m*
	Hexadecimal	1D 2F *m*
	Decimal	29 47 *m*

[Description]   Prints a downloaded bit image using the mode specified by *m*.

m	Mode	Vertical Dot Density	Horizontal Dot Density
0, 48	Normal	180 dpi	180 dpi
1, 49	Double-width	180 dpi	90 dpi
2, 50	Double-height	90 dpi	180 dpi
3, 51	Quadruple	90 dpi	90 dpi

[dpi: dots per 25.4 mm {1"}]

- *m* specifies the bit image mode.

- This command is ignored if a downloaded bit image has not been defined.

GS * *x y d$_1$...d$_{(x \times y \times 8)}$*

[Function]	Define downloaded bit image.	
[Format]	ASCII	GS * *x y d$_1$...d$_{(x \times y \times 8)}$*
	Hexadecimal	1D 2A *x y d$_1$...d$_{(x \times y \times 8)}$*
	Decimal	29 42 *x y d$_1$...d$_{(x \times y \times 8)}$*

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

$1 \le y \le 64$

$x \times y \le 2048$

$0 \le d \le 255$

Total defined data area = 16K bytes.

[Description] Defines a downloaded bit image using the number of dots specified.

- *x* specifies the number of dots in the horizontal direction.

- *y* specifies the number of dots in the vertical direction.

- The number of dots in the horizontal direction is $x \times 8$, in the vertical direction it is $y \times 8$.

- The downloaded bit image definition is cleared when:

    ESC @ is executed.

    FS q is executed.

    Printer is reset or the power is turned off.

• The following figure shows the relationship between the downloaded bit image and the printed data:
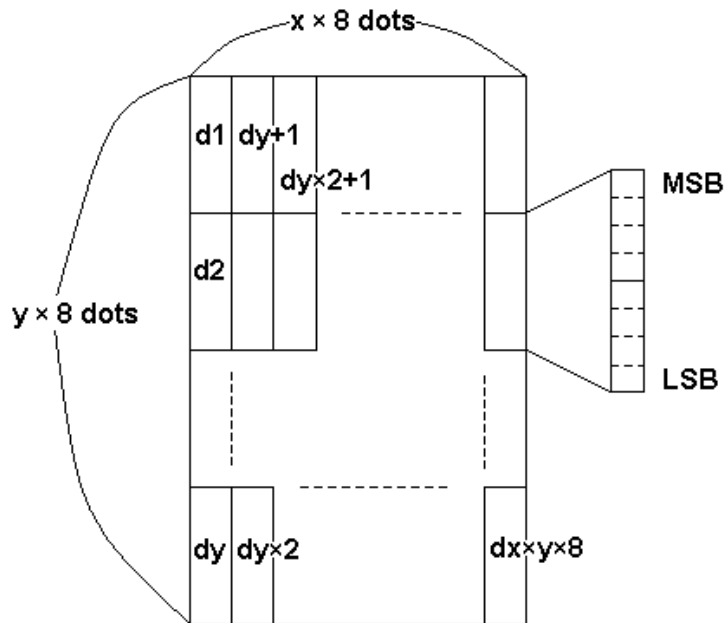
GS v 0 m x_l x_H y_l y_H $d_1...d_k$

[Function]	Print raster bitmap.	
[Format]	ASCII	GS v 0 m x_L x_H y_L y_H $d_1...d_k$
	Hexadecimal	1D 76 30 m x_L x_H y_L y_H $d_1...d_k$
	Decimal	29 118 48 m x_L x_H y_L y_H $d_1...d_k$

[Range]

$0 \leq m \leq 3, 48 \leq m \leq 51$

$0 \leq x_L \leq 255$

$0 \leq x_H \leq 255$

$0 \leq y_L \leq 255$

$0 \leq y_H \leq 8$

$0 \leq d \leq 255$

$k = (x_L + x_H \times 256) \times (y_L + y_H \times 256)$ $(k \neq 0)$

[Description] Print raster bitmap using the mode defined by m:

m	Mode	Vertical Dot Density	Horizontal Dot Density
0, 48	Normal	180 dpi	180 dpi
1, 49	Double-width	180 dpi	90 dpi
2, 50	Double-height	90 dpi	180 dpi
3, 51	Quadruple	90 dpi	90 dpi

[dpi: dots per 25.4 mm {1"}]

- xL, xH, select the number of data bytes (xL+xH×256) in the horizontal direction for the bit image.
- yL, yH, select the number of data bytes (yL+yH×256) in the vertical direction for the bit image.
- Data outside the printing area is read in and discarded on a dot-by-dot basis.
- The position at which subsequent characters are to be printed for raster bit image is specified by HT (Horizontal Tab), ESC $ (Set absolute print position), ESC \ (Set relative print position), and GS L (Set left margin). If the position at which subsequent characters are to be printed is not a multiple of 8, print speed may decline.
- The ESC a (Select justification) setting is also effective on raster bit images.
- d indicates the bit-image data. Set time a bit to 1 prints a dot and setting it to 0 does not print a dot.

[Example]   When printing 640 dots, $x_L+x_H \times 256$ must be 80, as illustrated on following figure:
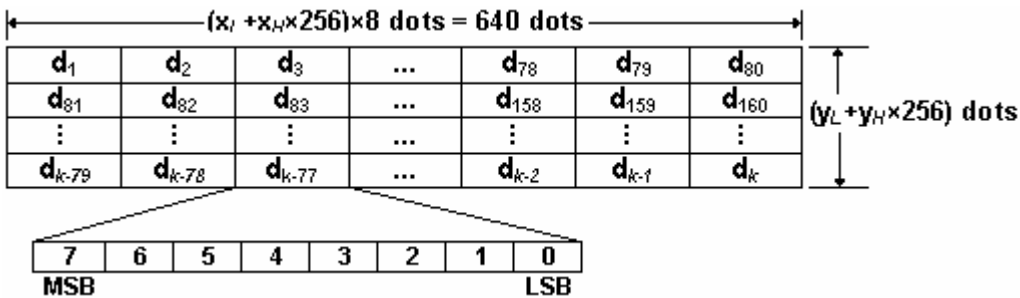
3.7 Communication

ENQ

[Function]	Serial communication status enquiry	
[Format]	ASCII	ENQ
	Hexadecimal	05
	Decimal	05
[Description]	After this command is issued, the printer returns a status by the serial RS-232 communication port, defined below.	

3.7.1 Serial interface status byte

The serial interface status byte is composed of 8 bits – 7 through 0 – the most significant bit is Bit 7 and the least significant bit is Bit 0.

Status bit number	Logic "0"	Logic "1"
0	Printer Off Line	Printer On Line
1	Replicates Drawer status	
2*	Drawer pin low	Drawer pin high
3	Print head raised	Print head down
4	Paper Full	Paper Near End
5	Command not executed	Command executed
6 – 7	Not used (will always be logic "0")	

* Refer to your drawer's manual to know what this levels mean.

GS ° 1

[Function]	Serial / USB communication advanced status	
[Format]	ASCII	GS ° 1
	Hexadecimal	1D F8 31
	Decimal	29 248 49
[Description]	After this command is issued, the printer returns a status by the serial RS-232 communication port, defined below.	

3.7.2 Serial / USB / EPP interface advanced status bytes

The serial/USB/EPP interface status bytes is composed of 8 bits – 7 through 0 – the most significant bit is Bit 7 and the least significant bit is Bit 0.

1) Printer Status

7	6	5	4	3	2	1	0
1	Buffer status		Wait	On / Off line	Overrun Error	0	0

```
Bit 2: Overrun Error – indicates when data sent to printer will be losted.
       0 - data received will be printed
       1 - data received will be lost


Bit 3: On / Off line – indicates when printer is operational (on-line) or not.
       0 - on-line
       1 - off-line


Bit 4: Wait – indicates when printer is busy or not.
       0 – printer is busy and printing
       1 – printer has printed all buffer and is waiting for commands


Bit 6 & 5: Buffer status – details the status of the printer buffer.
       00 – buffer empty
       01 – buffer less 1/3 full
       10 – buffer more 1/3 full
       11 – buffer more 3/4 full
```

2) Off-line Status

7	6	5	4	3	2	1	0
Cover status	Error Reported	No paper	Drawer status	0	Paper sensor	Paper near end sensor	1

```
Bit 1: Paper near end sensor – informs the status of the paper near end sensor.
       0 – there's paper for printing
       1 - there's few paper for printing


Bit 2: Paper sensor – informs the status of the paper sensor.
       0 – there's paper on sensor
       1 – there's no paper on sensor


Bit 4: Drawer status – indicates status for drawer sensor.
       0 – drawer sensor is indicating low level (logical 0)
       1 – drawer sensor is indicating high level (logical 1)


Bit 5: No paper – indicates if there is available paper for printing.
       0 – there's paper available
       1 – no paper is available


Bit 6: Error Reported – informs if an error was reported on Error Status.
       0 – no error reported
       1 – there's error reported


Bit 7: Cover status – tells about the printer paper cover.
       0 – cover is open
       1 – cover is closed
```

3) Error Status

7	6	5	4	3	2	1	0
1	Recoverable error	Non recoverable error	1	Cutter error	Cutter presence	0	0

```
Bit 2: Cutter presence – indicates the presence of a cutter on printer.
```

```
        0 - cutter present
        1 - cutter absent

Bit 3: Cutter error
        0 - no cutter error
        1 - cutter error

Bit 5: 0 - without non-recoverable error
       1 - an non-recoverable error occurred

Bit 6: 0 - without recoverable error
       1 - an recoverable error occurred
```

4) Continuous Paper Sensor Status

1	0	0	1	0	Head temperature	0	1

```
Bit 2: Head temperature – informs about the printer head temperature
        0 - normal temperature
        1 - temperature above the normal
```

5) Firmware Version

0	Major firmware version digit	Minor firmware version digit

It is not necessary to send any command to the printer to receive the status using the parallel interface. The parallel interface provides status using hardware pins as shown below.

3.7.3 Standard parallel interface status byte

The table below shows the printer statuses obtained through the standard parallel interface, with the printer configured for ESC/Bema commands:

Parallel Interface Status Byte									Description
/BUSY	/ACK	PE	SEL	/ERROR	U	U	U	HEX	
1	1	0	1	1	x	x	x	D8h	Online
0	1	1	0	0	x	x	x	60h	Paper end
1	1	1	1	1	x	x	x	F8h	Paper near end
0	1	1	1	0	x	x	x	70h	Head up

The table below shows the printer statuses obtained through the standard parallel interface, with the printer configured for ESC/POS^{TM} commands:

Parallel Interface Status Byte									Description
/BUSY	/ACK	PE	SEL	/ERROR	U	U	U	HEX	
1	1	0	1	1	x	x	x	D8h	Online
0	1	1	1	0	x	x	x	70h	Paper end
1	1	1	1	0	x	x	x	F0h	Paper near end
0	1	0	1	1	x	x	x	58h	Head up

ETX

[Function]	End buffer	
[Format]	ASCII	ETX
	Hexadecimal	03
	Decimal	03
[Description]	The printer will be BUSY while the printing is performed, changing status only when the buffer is empty. On serial interfaces DTR (RTS) will be low while the printing is performed.	

STX

[Function]	Clear buffer	
[Format]	ASCII	STX
	Hexadecimal	02
	Decimal	02
[Description]	This commands clears the print buffer and any un-printed information in the printer receive before it. This command does not restore default conditions.	

3.8 Data Control

CAN

[Function]	Cancel last line	
[Format]	ASCII	CAN
	Hexadecimal	18
	Decimal	24
[Description]	This commands clears the last line sent to the printer. All other data is stored.	

DEL

[Function]	Cancel last character	
[Format]	ASCII	DEL
	Hexadecimal	7F
	Decimal	127
[Description]	This commands clears the last character sent to the printer. All other data is stored.	

3.9 Barcodes

GS h *n*

[Function]	Sets the height *n* of the barcode generated	
[Format]	ASCII	GS h *n*
	Hexadecimal	1D 68 *n*
	Decimal	29 104 *n*
[Description]	Each height unit corresponds to a dot of 0.125 mm, so the final height is *n* x 0.125 mm where $1 \leq n \leq 255$. The default is *n*=162.	

GS w *n*

[Function]	Determines the width of the barcode	
[Format]	ASCII	GS w *n*
	Hexadecimal	1D 77 *n*
	Decimal	29 119 *n*
[Description]	This command changes the barcode width where *n*=2 correspond to normal width, *n*=3 is double width and *n*=4 is quadruple width. The default is *n*=3.	

GS H *n*

[Function]	Choose the position of the human readable information (HRI) of the barcode	
[Format]	ASCII	GS H *n*
	Hexadecimal	1D 48 *n*
	Decimal	29 72 *n*
[Description]	*n*=0: No HRI *n*=1: On top of the barcode (default) *n*=2: On the bottom of the barcode *n*=3: Both on top and on the bottom of the barcode	

GS f *n*

[Function]	Sets the font used to print the human readable information (HRI)	
[Format]	ASCII	GS f *n*
	Hexadecimal	1D 66 *n*
	Decimal	29 102 *n*
[Description]	For a normal font ('*N*' characters per line), *n*=0 or *n*=48. For a condensed font ('*N*' characters per line), *n*=1 or *n*=49. The default is normal font. See *N* value in the Table 2.	

GS k 0 $d_1…d_{11}$ NUL

[Function]	Prints an UPC-A barcode	
[Format]	ASCII	GS k 0 $d_1…d_{11}$ NUL
	Hexadecimal	1D 6B 00 $d_1…d_{11}$ 00
	Decimal	29 107 0 $d_1…d_{11}$ 0
[Description]	$d_1…d_{11}$ is a sequence of 11 bytes containing the barcode information with $48 \leq d \leq 57$. A check sum digit will be added automatically.	

GS k 65 11 $d_1…d_{11}$

[Function]	Prints an UPC-A barcode	
[Format]	ASCII	GS k 65 11 $d_1…d_{11}$
	Hexadecimal	1D 6B 41 0B $d_1…d_{11}$
	Decimal	29 107 65 11 $d_1…d_{11}$
[Description]	It is a copy of GS k 0 $d_1…d_{11}$ NUL command.	

GS k 1 $d_1…d_6$ NUL

[Function]	Prints an UPC-E barcode	
[Format]	ASCII	GS k 1 $d_1…d_6$ NUL
	Hexadecimal	1D 6B 01 $d_1…d_6$ 00
	Decimal	29 107 1 $d_1…d_6$ 0
[Description]	$d_1...d_6$ is a sequence of 6 bytes containing the barcode information with $48 \leq d \leq 57$. A check sum digit will be added automatically.	

GS k 66 6 $d_1…d_6$

[Function]	Prints an UPC-E barcode	
[Format]	ASCII	GS k 66 6 $d_1…d_6$
	Hexadecimal	1D 6B 42 06 $d_1…d_6$
	Decimal	29 107 66 6 $d_1…d_6$
[Description]	It is a copy of GS k 1 $d1…d_6$ NUL command.	

GS k 2 $d_1…d_{12}$ NUL

[Function]	Prints an EAN-13 barcode	
[Format]	ASCII	GS k 2 $d_1…d_{12}$ NUL
	Hexadecimal	1D 6B 02 $d_1…d_{12}$ 00
	Decimal	29 107 2 $d_1…d_{12}$ 0
[Description]	$d1...d1_2$ is a sequence of 12 bytes containing the barcode information with $48 \leq d \leq 57$. The printer generates automatically the 13th digit.	

GS k 67 12 $d_1…d_{12}$

[Function]	Prints an EAN-13 barcode	
[Format]	ASCII	GS k 67 12 $d_1…d_{12}$
	Hexadecimal	1D 6B 43 0C $d_1…d_{12}$
	Decimal	29 107 67 12 $d_1…d_{12}$
[Description]	It is a cop of command GS k 2 $d_1…d_{12}$ NUL.	

GS k 3 $d_1…d_7$ NUL

[Function]	Prints an EAN-8 barcode	
[Format]	ASCII	GS k 3 $d_1…d_7$ NUL
	Hexadecimal	1D 6B 03 $d_1…d_7$ 00
	Decimal	29 107 3 $d_1…d_7$ 0
[Description]	$d_1…d_7$ is a sequence of 7 bytes containing the barcode information with $48 \leq d \leq 57$. The printer generates automatically the 8th digit.	

GS k 68 7 $d_1…d_7$

[Function]	Prints an EAN-8 barcode	
[Format]	ASCII	GS k 68 7 $d_1…d_7$
	Hexadecimal	1D 6B 44 07 $d_1…d_7$
	Decimal	29 107 68 7 $d_1…d_7$
[Description]	It is a copy of GS k 3 $d_1…d_7$ NUL command.	

GS k 4 $d_1...d_n$ NUL

[Function]	Prints a CODE 39 barcode	
[Format]	ASCII	GS k 4 $d_1...d_n$ NUL
	Hexadecimal	1D 6B 04 $d_1...d_n$ 00
	Decimal	29 107 4 $d_1...d_n$ 0

[Description] $d_1...d_n$ is the sequence of n bytes containing the barcode information. The bytes that can be used in d are 32, 36, 37, 42, 43, 45 to 57 and 65 to 90 (upper case letters) or 97 to 122 (lower case letters). Lower case and upper case letters can't be combined in the same barcode. A check sum digit will be added automatically. Number of digits in the barcode limited by the print field as well as the configured barcode width.

GS k 69 n $d_1...d_n$

[Function]	Prints a CODE 39 barcode	
[Format]	ASCII	GS k 69 n $d_1...d_n$
	Hexadecimal	1D 6B 45 n $d_1...d_n$
	Decimal	29 107 69 n $d_1...d_n$

[Description]   It is a copy of the command GS k 4 $d_1...d_n$ NUL.

GS k 5 $d_1...d_n$ NUL

[Function]	Prints an ITF barcode	
[Format]	ASCII	GS k 5 $d_1...d_n$ NUL
	Hexadecimal	1D 6B 05 $d_1...d_n$ 00
	Decimal	29 107 5 $d_1...d_n$ 0

[Description] $d_1...d_n$ is the sequence of n bytes containing the barcode information with $48 \leq d \leq 57$. Number of digits in the barcode limited by the print field as well as the configured barcode width.

GS k 70 n $d_1…d_n$

[Function]	Prints an ITF barcode	
[Format]	ASCII	GS k 70 n $d_1…d_n$
	Hexadecimal	1D 6B 46 n $d_1…d_n$
	Decimal	29 107 70 n $d_1…d_n$
[Description]	It is a copy of the command GS k 5 $d_1…d_n$ NUL	

GS k 6 $d_1…d_n$ NUL

[Function]	Prints a CODABAR barcode	
[Format]	ASCII	GS k 6 $d_1…d_n$ NUL
	Hexadecimal	1D 6B 06 $d_1…d_n$ 00
	Decimal	29 107 6 $d_1…d_n$ 0

[Description] $d_1…d_n$ is the sequence of n bytes containing the barcode information. The bytes that can be used in d are 36, 43, 45 to 57 and 65 to 68 (upper case letters) *or* 97 to 100 (lower case letters). Lower case and upper case letters can't be combined in the same barcode. A check sum digit will be added automatically. Number of digits in the barcode limited by the print field as well as the configured barcode width. If the first character is a letter, the last character must also be a letter. Excluding these two characters (the first and the last one), any other character can be a letter.

GS k 71 n $d_1…d_n$

[Function]	Prints a CODABAR barcode	
[Format]	ASCII	GS k 71 n $d_1…d_n$
	Hexadecimal	1D 6B 47 n $d_1…d_n$
	Decimal	29 107 71 n $d_1…d_n$
[Description]	It is a copy of the command GS k 6 $d_1…d_n$ NUL	

GS k 72 $d_1…d_n$

[Function]	Prints a CODE 93 barcode	
[Format]	ASCII	GS k 72 $d_1…d_n$
	Hexadecimal	1D 6B 48 n $d_1…d_n$
	Decimal	29 107 72 n $d_1…d_n$

[Description] n indicates the number of bytes that will be sent and $d_1…d_n$ is the sequence of n bytes containing the barcode information. This code can use all bytes from 0 to 127. A check sum digit will be added automatically. Number of digits in the barcode limited by the print field as well as the configured barcode width.

GS k 73 n $d_1…d_n$

[Function]	Prints a CODE 128 barcode	
[Format]	ASCII	GS k 73 n $d_1…d_n$
	Hexadecimal	1D 6B 49 n $d_1…d_n$
	Decimal	29 107 73 n $d_1…d_n$

[Description] n indicates the number of bytes that will be sent and $d_1…d_n$ is the sequence of n bytes containing the barcode information. This code can use all bytes from 0 to 127. The subset is automatically chosen by the printer based on the data received. A check sum digit will be added automatically. Number of digits in the barcode limited by the print field as well as the configured barcode width.

GS k 128 n_1 n_2 n_3 n_4 n_5 n_6 $d_1…d_n$

[Function]	Prints a PDF-417 barcode	
[Format]	ASCII	GS k 128 n_1 n_2 n_3 n_4 n_5 n_6 $d_1…d_n$
	Hexadecimal	1D 6B 80 n_1 n_2 n_3 n_4 n_5 n_6 $d_1…d_n$
	Decimal	29 107 128 n_1 n_2 n_3 n_4 n_5 n_6 $d_1…d_n$

[Description] n_1 is the ECC level (from 0 to 8) (Error correction level).

n_2 is the pitch height (from 1 to 8) where height=n_2 x 0.125mm.

n_3 is the pitch width (from 1 to 4) where width=n_3 x 0.125mm.

n_4 is the number of codewords per row – if n_4 is 0, the maximum number of columns allowed for the pitch width informed will be used. If the barcode can't fit the print width the printer automatically adjusts it for the maximum permitted width within the line field.

n_5 and n_6 indicate the number of bytes that will be coded, where total=n_5 + n_6 x 256, and total must be less than 900.

$d_1…d_n$ is the actual sequence of bytes that will be coded.

GS k 21 $d_1…d_9$ NUL

[Function]	Prints an ISBN barcode	
[Format]	ASCII	GS k 21 $d_1…d_9$ NUL
	Hexadecimal	1D 6B 15 $d_1…d_9$ 00
	Decimal	29 107 21 $d_1…d_9$ 0

[Description] $d_1…d_9$ is the sequence of 9 bytes containing the barcode information. The bytes that can be used in d are 45, 48 to 57 and 88. If hyphens were included in the information as in the example below, they will not be computed as a byte received. After the ninth valid digit, an hyphen can be added followed by an "X" (58h) or any other digit (30h to 39h). In this case there are two options:

1. Send the 00h and the barcode will be printed
2. Send space (20h) and more 5 digits (30h to 39h)

    Example: 1-56592-292-X 90000

            1-56592-292-1 90000

            1-56592-292-X

            1-56592-292-1

GS k 22 $d_1…d_n$ NUL

[Function]	Prints a MSI barcode	
[Format]	ASCII	GS k 22 $d_1…d_n$ NUL
	Hexadecimal	1D 6B 16 $d_1…d_n$ 00
	Decimal	29 107 22 $d_1…d_n$ 0

[Description] $d_1…d_n$ is the sequence of n bytes containing the barcode information. The bytes that can be used in d are 48 to 57. The limitation of size for this barcode is given by the print field as well as the configured bar width. A check sum digit will be added automatically.

GS k 130 n $d_1…d_n$

[Function]	Prints a MSI barcode	
[Format]	ASCII	GS k 130 n $d_1…d_n$
	Hexadecimal	1D 6B 82 n $d_1…d_n$
	Decimal	29 107 130 n $d_1…d_n$
[Description]	It is a copy of the command GS k 22 $d_1…d_n$ NUL	

GS k 23 $d_1…d_n$ NUL

[Function]	Prints a PLESSEY barcode	
[Format]	ASCII	GS k 23 $d_1…d_n$ NUL
	Hexadecimal	1D 6B 17 $d_1…d_n$ 00
	Decimal	29 107 23 $d_1…d_n$ 0

[Description] $d_1…d_n$ is the sequence of n bytes containing the barcode information. The bytes that can be used in d are 48 to 57 plus 65 to 70 (upper case letters) or 97 to 102 (lower case letters). Lower case and upper case letters can't be combined in the same barcode. The limitation of size for this barcode is given by the print field as well as the configured bar width. A check sum digit will be added automatically.

GS k 131 *n d₁…dₙ*

[Function]	Prints a PLESSEY barcode	
[Format]	ASCII	GS k 131 n $d_1…d_n$
	Hexadecimal	1D 6B 83 n $d_1…d_n$
	Decimal	29 107 131 n $d_1…d_n$
[Description]	It is a copy of the command GS k 23 $d_1…d_n$ NUL	

GS k 132 *n₁ n₂*

[Function]	Programs barcode's left margin	
[Format]	ASCII	GS k 132 n_1 n_2
	Hexadecimal	1D 6B 84 n_1 n_2
	Decimal	29 107 132 n_1 n_2
[Description]	Programs the position of the barcode's left margin position given by n_1 + n_2 x 256.	

4. ESC/POS Commands

4.1 Operation Commands

The following section details each of the commands presented in the Command Table, ESC/POS section.

GS F9h 5 01h

[Function]	Select ESC/POS operation mode.	
[Format]	ASCII	GS F9h 5 01h
	Hexadecimal	1D F9 35 01
	Decimal	29 249 53 1
[Description]	Tells printer to interpret ESC/POS commands from now.	

[Notes]
● This command saves data on printer flash memory and therefore is slow, which may affect printer performance and funcionality if mixed with other faster commands. **Please, use with caution**.

● When ESC/POS mode is enabled and a DB25 serial interface is connected, the printer will automatically change its flow control to DTR/DSR instead of RTS/CTS.

GS F9h 20h 31h

[Function]	Select ESC/POS temporary operation mode.	
[Format]	ASCII	GS F9h 20h 31h
	Hexadecimal	1D F9 20 31
	Decimal	29 249 31 49
[Description]	Tells printer to interpret ESC/Bema commands from now.	

[Notes]
● This command doesn't writes anything on flash memory, so it can be used anyway.

● When ESC/POS mode is enabled and a DB25 serial interface is connected, the printer will automatically change its flow control to DTR/DSR instead of RTS/CTS.

GS F9h 1Fh 31h

[Function]	Return to previous set of commands configured before temporary setting.	
[Format]	ASCII	GS F9h 1Fh 31h
	Hexadecimal	1D F9 1F 31
	Decimal	29 249 31 49
[Description]	Tells printer to interpret the command set that was configured before an temporary set has been done.	

ESC = *n*

[Function]	Select peripheral device.	
[Format]	ASCII	ESC = *n*
	Hexadecimal	1B 40 *n*
	Decimal	27 64 *n*
[Description]	Enable/disable printer based on *n* value as follow:	

✓ When bit 0 from *n* is 0, printer is disabled

✓ When bit 0 from *n* is 1, printer is enabled

✓ All other bits (1 to 7) are ignored

[Default]   *n* = 1

ESC @

[Function]	Initializes the MP-4000 TH printer.	
[Format]	ASCII	ESC @
	Hexadecimal	1B 40
	Decimal	27 64
[Description]	All settings, including character font, line spacing, left margin, right margin, intensity and inverted mode are canceled.	

ESC c 3 *n*

[Function]   Select paper sensor(s) to output paper end signals.

[Format]   ASCII   ESC c 3 *n*

                    Hexadecimal   1B 63 33 *n*

                    Decimal   27 99 51 *n*

[Description]   Selects the paper sensor(s) to output paper end (PE) signals. Each bit of *n* is used as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Paper roll near-end sensor disabled
	On	01	1	Paper roll near-end sensor enabled
1	Off	00	0	Paper roll near-end sensor disabled
	On	02	2	Paper roll near-end sensor enabled
2	Off	00	0	Paper roll end sensor disabled
	On	04	4	Paper roll end sensor enabled
3	Off	00	0	Paper roll end sensor disabled
	On	04	8	Paper roll end sensor enabled
4-7	-	-	-	Undefined

ESC c 4 *n*

[Function]   Select paper sensor(s) to stop printing.

[Format]   ASCII   ESC c 4 *n*

                    Hexadecimal   1B 63 34 *n*

                    Decimal   27 99 52 *n*

[Description]   Selects the paper sensor(s) to output paper end signals. Each bit of *n* is used as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Paper roll near end sensor disabled.
	On	01	1	Paper roll near end sensor enabled.
1	Off	00	0	Paper roll near end sensor disabled.
	On	02	2	Paper roll near end sensor enabled.
2-7	-	-	-	Undefined

ESC c 5 *n*

[Function]	Enable/disable panel buttons.	
[Format]	ASCII	ESC c 5 *n*
	Hexadecimal	1B 63 35 *n*
	Decimal	27 99 53 *n*
[Description]	Enables or disables the panel buttons:	

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

[Default]	*n* = 0

ESC p *m* t_1 t_2

[Function]	Generate pulse.	
[Format]	ASCII	ESC p *m* t_1 t_2
	Hexadecimal	1B 70 *m* t_1 t_2
	Decimal	27 112 *m* t_1 t_2
[Description]	Outputs the pulse specified by t_1 and t_2 to connector pin *m* as follows:	

m	Connector pin
0, 48	Drawer kick-out connector pin 2.
1, 49	Drawer kick-out connector pin 5.

[Details]   The pulse ON time is [t1 × 2 ms] and the OFF time is [t2 × 2 ms]. If t2 < t1, the OFF time is [t1 × 2 ms].

GS (A p_L p_H n m

[Function]	Execute test print.

[Format]

ASCII	GS (A p_L p_H n m
Hexadecimal	1D 28 41 p_L p_H n m
Decimal	29 40 65 p_L p_H n m

[Description]

• Executes a test print with a specified test pattern on a specified paper.
• p_L and p_H specifies the number of the parameter such as n, m to (p_L + (p_H × 256)) bytes.
• n specifies the paper to be tested:

n	Paper
0, 48	Basic sheet (paper roll)
1, 49, 2, 50	Paper roll

m specifies a test pattern:

m	Test pattern
1, 49	Hexadecimal dump
2, 50	Printer status print
3, 51	Rolling pattern print

[Details]

(p_L + (p_H × 256)) must be equal 2. Therefore, p_L must be 2 and p_H must be 0.

DLE DC4 n m t

[Function]	Generate pulse at real-time.

[Format]

ASCII	DLE DC4 n m t
Hexadecimal	10 14 n m t
Decimal	16 20 n m t

[Description]

Outputs the pulse specified by t to connector pin m as follows:

m	Connector pin
0	Drawer kick-out connector pin 2.
1	Drawer kick-out connector pin 5.

[Details]

The pulse ON time is [t × 100 ms] and the OFF time is [t × 100 ms]. n must be 1.

GS V *m (n)*

[Function]	Select cut mode and cut paper.	
[Format]	ASCII	GS V *m (n)*
	Hexadecimal	1D 56 *m (n)*
	Decimal	29 86 *m (n)*

[Description]   Selects a mode for cutting paper and executes paper cutting. The value of m selects the mode as follows:

m	Print mode
1, 49	Partial cut (one point left uncut)
66	Feeds paper (cutting position + [*n* × (vertical motion unit)]), and cuts the paper

[Details]   When *m* = 1, *n* isn't needed and will be treated as normal data.

ESC (A *pL pH fn n c t1 t2*

[Function]	Activate buzzer.	
[Format]	ASCII	ESC (A 05 00 a d *c t1 t2*
	Hexadecimal	1D 28 41 05 00 61 64 *c t1 t2*
	Decimal	29 40 65 5 0 97 100 *c t1 t2*

[Description]   Beeps the integrated beeper.
c specifies times of beeping.
t1 specifies beeping time (*t1* × 100 ms).
t2 specifies time for stop beeping (*t2* × 100 ms).

[Notes]   This function repeats integrated beeper control of [(*t1* × 100 ms) beep/ (*t2* × 100 ms) stop] *c* times.
- If this command is newly processed during beeping of the buzzer, the current process for beeping the buzzer is stopped and the new process for beeping the buzzer is started.
- Integrated beeper beeping by this function stops due to any of the following factors:
  - Finish specification of *c*.
  - Reset or power off.

4.2 Vertical positioning

LF

[Function]	Print and line feed.

[Format]	ASCII	LF
	Hexadecimal	0A
	Decimal	10

[Description]	Prints the contents of the buffer (if exists) and performs one line feed using the default line spacing.

[Notes]	The next character print position is on the left margin of the next line.

FF

[Function]	Print and return to standard mode.

[Format]	ASCII	FF
	Hexadecimal	0C
	Decimal	12

[Description]	Prints the data in the print buffer collectively and returns to standard mode.

CR

[Function]	Print and carriage return.

[Format]	ASCII	CR
	Hexadecimal	0D
	Decimal	13

[Description]	When automatic line feed is enabled, this command functions the same as LF; when automatic line feed is disabled, this command is ignored.

ESC $ n_L n_H

[Function]	Set absolute print position.	
[Format]	ASCII	ESC $ n_L n_H
	Hexadecimal	1B 24 n_L n_H
	Decimal	27 36 n_L n_H

[Description]   • Sets the distance from the beginning of the line to the position at which subsequent characters are to be printed.
• The distance from the beginning of the line to the print position is $[(n_L + n_H \times 256) \times$ (vertical or horizontal motion unit)].

ESC 2

[Function]	Select default line spacing.	
[Format]	ASCII	ESC 2
	Hexadecimal	1B 32
	Decimal	27 50

[Description]   Selects approximately 4.23 mm (1/6") spacing.

ESC 3 n

[Function]	Set line spacing.	
[Format]	ASCII	ESC 3 n
	Hexadecimal	1B 33 n
	Decimal	27 51 n

[Description]   Sets the line spacing to [$n \times$ vertical or horizontal motion unit].

ESC \ n_L n_H

[Function]	Set relative print position.	
[Format]	ASCII	ESC \ n_L n_H
	Hexadecimal	1B 5C n_L n_H
	Decimal	27 92 n_L n_H

[Description]   Sets the print starting position based on the current position by using the horizontal or vertical motion unit. This command sets the distance from the current position to $[(n_L + n_H \times 256) \times$ horizontal or vertical motion unit].

ESC d *n*

[Function]   Print and feed *n* lines.

[Format]   ASCII   ESC 3 *n*
                  Hexadecimal   1B 64 *n*
                  Decimal   27 100 *n*

[Description]   Prints the data in the print buffer and feeds *n* lines.

4.3 Horizontal positioning

HT

[Function]	Horizontal tab.	
[Format]	ASCII	HT
	Hexadecimal	09
	Decimal	9
[Description]	Moves the print position to the next horizontal tab position.	
[Details]	• This command is ignored unless the next horizontal tab position has been set.	
	• Horizontal tab positions are set with ESC D.	

ESC SP *n*

[Function]	Set right-side character spacing.	
[Format]	ASCII	ESC SP *n*
	Hexadecimal	1B 20 *n*
	Decimal	27 32 *n*
[Description]	Sets the character spacing for the right side of the character to [*n* × horizontal or vertical motion units].	

ESC D $n_1...n_k$ NUL

[Function]	Sets horizontal tab positions.	
[Format]	ASCII	ESC D $n_1...n_k$ NUL
	Hexadecimal	1B 44 $n_1...n_k$ 00
	Decimal	27 68 $n_1...n_k$ 0
[Description]	Sets horizontal tab positions.	

• *n* specifies the column number for setting a horizontal tab position from the beginning of the line.
• *k* indicates the total number of horizontal tab positions to be set.
• When setting *n* = 8, the print position is moved to column 9 by sending HT.
• Up to 32 tab positions ($0 \le k \le 32$) can be set. Data exceeding 32 tab positions is processed as normal data.
• Transmit [n]k in ascending order and place a NUL code 0 at the end.
• ESC D NUL cancels all horizontal tab positions.

ESC a *n*

[Function]   Select justification.

[Format]   ASCII   ESC a *n*
                    Hexadecimal   1B 61 *n*
                    Decimal   27 97 *n*

[Description]   Aligns all the data in one line to the specified position defined by n as
                    follows:

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

GS L *n$_L$ n$_H$*

[Function]   Set relative print position.

[Format]   ASCII   GS L *n$_L$ n$_H$*
                    Hexadecimal   1D 4C *n$_L$ n$_H$*
                    Decimal   29 76 *n$_L$ n$_H$*

[Description]   Sets the left margin to [(n_L + n_H × 256) × horizontal motion unit)]
                    inches.

4.4 Character types

ESC - *n*

[Function]   Turn underline mode on/off.

[Format]   ASCII   ESC - *n*
                    Hexadecimal   1B 2D *n*
                    Decimal   27 45 *n*

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

n	Function
0, 48	Turns off underline mode
1, 49	Turns on underline mode (1-dot thick)

ESC E *n*

[Function]   Turn emphasized mode on/off.

[Format]   ASCII   ESC E *n*
                    Hexadecimal   1B 45 *n*
                    Decimal   27 69 *n*

[Description]   Turns emphasized mode on or off.
                    When the LSB of n is 0, emphasized mode is turned off.
                    When the LSB of n is 1, emphasized mode is turned on.

ESC M *n*

[Function]   Select character font.

[Format]   ASCII   ESC M *n*
                    Hexadecimal   1B 4D *n*
                    Decimal   27 77 *n*

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

n	Function
0, 48	Character font A (12 × 24) selected.
1, 49	Character font B (9 × 17) selected.

GS B *n*

[Function]   Activate/deactivate black/white reverse printing.

[Format]   ASCII   GS B *n*
                    Hexadecimal   1D 42 *n*
                    Decimal   27 66 *n*

[Description]   Activate/deactivate black/white reverse printing mode.
                    • When the LSB of n is 0, white/black reverse mode is turned off.
                    • When the LSB of n is 1, white/black reverse mode is turned on.

[Details]   Only the lowest bit of n is valid. This command doesn't affect graphic
                    and bitimage commands.

ESC R *n*

[Function]   Select an international character set.

[Format]   ASCII   ESC R *n*
                    Hexadecimal   1B 52 *n*
                    Decimal   27 82 *n*

[Description]   Selects a page n from the character code table:

n	Page
0	U.S.A.
1	France

ESC t *n*

[Function]   Select character code table.

[Format]   ASCII   ESC t *n*
                    Hexadecimal   1B 74 *n*
                    Decimal   27 116 *n*

[Description]   Selects a page n from the character code table:

n	Page
0	PC437 [U.S.A., Standard Europe]
2	PC850 [Multilingual]
3	PC860 [Portuguese]
17	PC866 [Cyrillic]
19	PC858

4.5. Communication

DLE EOT *n*

[Function]	Real-time status transmission.

[Format]	ASCII	DLE EOT *n*
	Hexadecimal	10 04 *n*
	Decimal	16 4 *n*

[Description]   Transmits the selected printer status specified by *n* in real-time, according to the following table:

n	Action
1	Transmit printer status
2	Transmit offline status
3	Transmit error status
4	Transmit paper roll sensor status

[Details]   • The printer transmits the current status. Each status is represented by one-byte data.
• The printer transmits the status without confirming whether the host computer can receive data.
• The printer executes this command upon receiving it.

n = 1: Printer status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Drawer open/close signal is LOW (connector pin 3).
	On	04	4	Drawer open/close signal is HIGH (connector pin 3).
3	Off	00	0	Online.
	On	08	8	Offline.
4	On	10	16	Not used. Fixed to On.
5, 6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

n = 2: Offline status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open.
3	Off	00	0	Paper is not being fed by using the FEED button.
	On	08	8	Paper is being fed by the FEED button.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No paper-end stop.
	On	20	32	Printing is being stopped.
6	Off	00	0	No error.
	On	40	64	Error occurs.
7	Off	00	0	Not used. Fixed to Off.

Bit 5: Becomes on when the paper end sensor detects paper end and printing stops.

n = 3: Error status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2	–	–	–	Undefined
3	Off	00	0	No autocutter error.
	On	08	8	Autocutter error occurs.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurs.
6	Off	00	0	No auto-recoverable error.
	On	40	64	Auto recoverable error occurs.
7	Off	00	0	Not used. Fixed to Off.

Bit 3: If these errors occur due to paper jams or the like, it is possible to recover by correcting the cause of the error and executing DLE ENQ n (1 = n = 2). If an error due to a circuit failure (e.g. wire break) occurs, it is impossible to recover.

Bit 6: When printing is stopped due to high print head temperature until the print head temperature drops sufficiently or when the paper roll cover is open during printing, bit 6 is On.

n = 4: Continuous paper sensor status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Fixed to Off.
1	On	02	2	Not used. Fixed to On.
2, 3	Off	00	0	Paper roll near-end sensor: paper adequate.
	On	0C	12	Paper near-end is detected by the paper roll near-end
4	On	10	16	sensor.
5, 6	Off	00	0	Not used. Fixed to On.
	On	60	96	Paper roll sensor: Paper present.
7	Off	00	0	Paper roll end detected by paper roll sensor.

DLE ENQ *n*

[Function]   Real-time request to printer.

[Format]   ASCII   DLE EOT *n*
                      Hexadecimal   10 05 *n*
                      Decimal   16 5 *n*

[Description]   Responds to a request from the host computer. n specifies the requests as follows:

n	Request
1	Recover from an error and restart printing from the line where the error occurred
2	Recover from an error aft clearing the receive and print buffers

[Details]   • When the printer is disabled with ESC = (Select peripheral device), this command is effective.
                      • This command is effective only when an autocutter error occurs.
                      • The printer starts processing data upon receiving this command.

> • This command is executed even when the printer is offline, the receive buffer is full, or there is an error status with a serial interface model.

GS I *n*

[Function]   Transmit printer ID.

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

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

n	Printer ID	Specification	ID (hexadecimal)
1, 49	Printer model ID	TM-T88II series	20
2, 50	Type ID	See table below.	
3, 51	ROM version ID	Depends on ROM version.	
65	Firmware version	Depends on Firmware version.	
66	Manufacturer	BEMATECH	
67	Printer name	MP-4000	
68	Serial number	Depends on serial number.	
69	Type of model	INTERNATIONAL	

n = 2, Type ID

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Two-byte character code not supported.
	On	01	1	Two-byte character code supported.
1	On	02	2	Autocutter equipped.
2	Off	00	0	Not used. Fixed to Off.
3	Off	00	0	Not used. Fixed to Off.
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

[Details]   • The printer ID is transmitted when the data in the receive buffer is developed. Therefore, there may be a time lag between receiving this command and transmitting the status, depending on the receive buffer status.
• When the printer ID transmission is specified with (1 = n = 3) or (49 = n = 51), one byte code is transmitted.
• When Auto Status Back (ASB) is enabled using GS a, the printer ID transmitted by GS I and the ASB status must be differentiated using the table in Appendix III.

GS a *n*

[Function]   Enable/Disable Automatic Status Back (ASB).

[Format]   ASCII   GS a *n*
                  Hexadecimal   1D 61 *n*
                  Decimal   29 97 *n*

[Description]   Enables or disables ASB and specifies the status items to include, using n as follows:

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Drawer kick-out connector pin 3 status disabled.
	On	01	1	Drawer kick-out connector pin 3 status enabled.
1	Off	00	0	Online/offline status disabled.
	On	02	2	Online/offline status enabled.
2	Off	00	0	Error status disabled.
	On	04	4	Error status enabled.
3	Off	00	0	Paper roll sensor status disabled.
	On	08	8	Paper roll sensor status enabled.
4-7	-	-	-	Undefined.

[Details]   • If any of the status items in the table above are enabled, the printer transmits the status when this command is executed. The printer automatically transmits the status whenever the enabled status item changes. The disabled status items may change, in this case, because each status transmission represents the current status.
• If all status items are disabled, the ASB function is also disabled.
• Since this command is executed after the data is processed in the receive buffer, there may be a time lag between data reception and status transmission.
• When the printer is disabled by ESC = (Select peripheral device), the four status bytes are transmitted whenever the status changes.
• When using DLE EOT, GS I, or GS r, the status transmitted by these commands and ASB status must be differentiated, according to the procedure in Appendix III, Transmission Status Identification.
• The status to be transmitted are as follows:

First byte - Printer Information

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Not used. Fixed to Off.
1	Off	00	0	Not used. Fixed to Off.
2	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	On	04	4	Drawer kick-out connector pin 3 is HIGH.
3	Off	00	0	Online.
	On	08	8	Offline.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	Cover is closed.
	On	20	32	Cover is open.
6	Off	00	0	Paper is not being fed by using the PAPER FEED button.
	On	40	64	Paper is being fed by using the PAPER FEED button.
7	Off	00	0	Not used. Fixed to Off.

Second byte - Printer Information

Bit	Off/On	Hex	Decimal	Status for ASB
0	-	-	-	Undefined.
1	-	-	-	Undefined.
2	-	-	-	Undefined.
3	Off	00	0	No autocutter error.
	On	08	8	Autocutter error occurred.
4	Off	00	0	Not used. Fixed to Off.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	Off	00	0	No automatically recoverable error.
	On	40	64	Automatically recoverable error occurred.
7	Off	00	0	Not used. Fixed to Off.

Bit 3: If these errors occur due to paper jams or the like, it is possible to recover by correcting the cause of the error and executing DLE ENQ n (1 = n = 2). If an error due to a circuit failure (e.g. wire break) occurs, it is impossible to recover.

Bit 6: When printing is stopped due to high print head temperature until the print head temperature drops sufficiently or when the paper roll cover is open during printing, bit 6 is On.

Third byte - Paper Sensor Information

Bit	Off/On	Hex	Decimal	Status for ASB
0,1	Off	00	0	Paper roll near-end sensor: paper adequate.
	On	03	3	Paper roll near-end sensor: paper near end.
2, 3	Off	00	0	Paper roll end sensor: paper present.
	On	0C	12	Paper roll end sensor: paper not present.
4	Off	00	0	Not used. Fixed to Off.
5, 6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Fourth byte - Paper Sensor Information

Bit	Off/On	Hex	Decimal	Status for ASB
0-3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5, 6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

GS r *n*

[Function]	Transmit status.

[Format]

	ASCII	GS r *n*
	Hexadecimal	1D 72 *n*
	Decimal	29 114 *n*

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

n	Function
1, 49	Transmits paper sensor status
2, 50	Transmits drawer kick-out connector status

[Details]   • This command is executed when the data in the receive buffer is developed. Therefore, there may be a time lag between receiving

this command and transmitting the status, depending on the receive buffer status.
- When Auto Status Back (ASB) is enabled using GS a, the status transmitted by GS r and the ASB status must be differentiated using the table in Appendix III.
- The status types to be transmitted are shown below:

Paper sensor status (*n* = 1, 49):

Bit	Off/On	Hex	Decimal	Status for ASB
0, 1	Off	00	0	Paper roll near-end sensor: paper adequate.
	On	03	3	Paper roll near-end sensor: paper near end.
2, 3	Off	00	0	Paper roll end sensor: paper adequate.
4	On	(0C)	(12)	Paper roll end sensor: paper near end.
5, 6	Off	00	0	Not used. Fixed to Off.
	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Bits 2 and 3: When the paper end sensor detects a paper end, the printer goes offline and does not execute this command. Therefore, bits 2 and 3 do not transmit the status of paper end.

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

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	On	01	1	Drawer kick-out connector pin 3 is HIGH.
1-3	-	-	-	Undefined.
4	Off	00	0	Not used. Fixed to Off.
5, 6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

4.6. Data Control

CAN

[Function]   Cancel print data

[Format]   ASCII   CAN

                    Hexadecimal   18

                    Decimal   24

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

4.7. Barcodes

ESC/POS barcode functions are the same defined on ESC/Bema commands. Please, refer to ESC/Bema commands.

4.8. Bit images and graphics

ESC/POS Bit images and graphics functions are the same defined on ESC/Bema commands. Please, refer to ESC/Bema commands.

Appendix I – Tables

Table 1 - Characters Per Line

58 mm

Characters per line	Character per inch	Command (after ESC @)
32	17	default
42	22	ESC SI or SI
16	8	ESC W 1
21	11	ESC SI or SI plus ESC W 1

76 or 80 mm

Characters per line	Character per inch	Command (after ESC @)
48	17	default
64	22	ESC SI or SI
24	8	ESC W 1
32	11	ESC SI or SI plus ESC W 1

112 mm

Characters per line	Character per inch	Command (after ESC @)
69	17	default
92	22	ESC SI or SI
34	8	ESC W 1
46	11	ESC SI or SI plus ESC W 1

Table 2 - Paper Width

Paper width	58 mm	76mm	80mm	82.5 mm
N	384	576	608	640

Appendix II – Character Tables

ASCII

The codes from 00h up to 7Fh are shown below:

Code (Hex)	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL							BEL	BS	HT	LF	VT	FF	CR	SO	SI
1		DC1	DC2	DC3	DC4				CAN			ESC				
2	SP	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	A	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{			}	~	DEL

Code Page 437

Code (Hex)	2_	3_	4_	5_	6_	7_	8_	9_	A_	B_	C_	D_	E_	F_
_0	(space)	0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
_1	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
_2	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
_3	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
_4	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
_5	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
_6	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
_7	`	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
_8	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
_9	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	∙
_A	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
_B	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
_C	,	<	L	\	l	¦	î	£	¼	╝	╠	▄	∞	ⁿ
_D	-	=	M	]	m	}	ì	¥	¡	╜	=	▌	φ	²
_E	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ε	■
_F	/	?	O	_	o		Å	ƒ	»	┐	╧	▀	∩	

Code Page 850

Code Page 850 character set is from 00h up to 7Fh and is the same characters as the ASCII table. Characters between 80h and FFh are available for use for international languages.

Code (Hex)	2_	3_	4_	5_	6_	7_	8_	9_	A_	B_	C_	D_	E_	F_
_0	(space)	0	@	P	`	p	Ç	É	á	░	└	ð	Ó	-
_1	!	1	A	Q	a	q	ü	æ	í	▒	┴	Ð	ß	±
_2	"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	═
_3	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ò	¾
_4	$	4	D	T	d	t	ä	ö	ñ	┤	─	È	õ	¶
_5	%	5	E	U	e	u	à	ò	Ñ	Á	┼	ı	Õ	§
_6	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
_7	`	7	G	W	g	w	ç	ù	º	À	Ã	Î	Þ	¸
_8	(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	þ	°
_9	)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
_A	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Û	·
_B	+	;	K	[	k	{	ï	ø	½	╗	╦	█	Ù	¹
_C	,	<	L	\	l	|	î	£	¼	╝	╠	▄	ý	³
_D	-	=	M	]	m	}	ì	Ø	¡	¢	=	¦	Ý	²
_E	.	>	N	^	n	~	Ä	×	«	¥	╬	Ì	‾	■
_F	/	?	O	_	o		Å	ƒ	»	┐	¤	■	´	■

Code Page 858

Code (Hex)	2_	3_	4_	5_	6_	7_	8_	9_	A_	B_	C_	D_	E_	F_
_0	(space)	0	@	P	`	p	Ç	É	á	░	└	ð	Ó	-
_1	!	1	A	Q	a	q	ü	æ	í	▒	┴	Ð	ß	±
_2	"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	=
_3	#	3	C	S	c	s	â	ô	ú	│	├	Ë	Ò	¾
_4	$	4	D	T	d	t	ä	ö	ñ	┤	─	È	õ	¶
_5	%	5	E	U	e	u	à	ò	Ñ	Á	┼	€	Õ	§
_6	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
_7	`	7	G	W	g	w	ç	ù	º	À	Ã	Î	Þ	¸
_8	(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	þ	°
_9	)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
_A	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Û	·
_B	+	;	K	[	k	{	ï	ø	½	╗	╦	■	Ù	¹
_C	,	<	L	\	l	¦	î	£	¼	╝	╠	▬	ý	³
_D	-	=	M	]	m	}	ì	Ø	¡	¢	=	¦	Ý	²
_E	.	>	N	^	n	~	Ä	×	«	¥	╬	Ì	‾	■
_F	/	?	O	_	o		Å	ƒ	»	┐	¤	■	´	

Code Page 860

Code (Hex)	2_	3_	4_	5_	6_	7_	8_	9_	A_	B_	C_	D_	E_	F_
_0	(space)	0	@	P	`	p	Ç	É	á	░	└	╨	α	≡
_1	!	1	A	Q	a	q	ü	À	í	▒	┴	╤	ß	±
_2	"	2	B	R	b	r	é	È	ó	▓	┬	╥	Γ	≥
_3	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
_4	$	4	D	T	d	t	ã	õ	ñ	┤	─	╘	Σ	⌠
_5	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
_6	&	6	F	V	f	v	Á	Ú	ª	╢	╞	╓	µ	÷
_7	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
_8	(	8	H	X	h	x	ê	Ì	¿	╕	╚	╪	Φ	°
_9	)	9	I	Y	i	y	Ê	Õ	Ò	╣	╔	┘	Θ	·
_A	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
_B	+	;	K	[	k	{	Í	¢	½	╗	╦	█	δ	√
_C	,	<	L	\	l	¦	Ô	£	¼	╝	╠	▄	∞	ⁿ
_D	-	=	M	]	m	}	ì	Ù	¡	╜	═	▌	φ	²
_E	.	>	N	^	n	~	Ã	Pₜ	«	╛	╬	▐	ε	■
_F	/	?	O	_	o		Â	Ó	»	┐	╧	▀	∩	

Code Page 866

Code Page 866 character set is from 00h up to 7Fh and is the same characters as the ASCII table. Characters between 80h and FFh are available for use for cyrillic languages (Russian, Bulgarian, Serbian, etc.).

	-0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-A	-B	-C	-D	-E	-F
0-		☺ 263A	☻ 263B	♥ 2665	♦ 2666	♣ 2663	♠ 2660	• 2022	◘ 25D8	○ 25CB	◙ 25D9	♂ 2642	♀ 2640	♪ 266A	♫ 266B	☼ 263C
1-	► 25BA	◄ 25C4	↕ 2195	‼ 203C	¶ 00B6	§ 00A7	▬ 25AC	↨ 21A8	↑ 2191	↓ 2193	→ 2192	← 2190	∟ 221F	↔ 2194	▲ 25B2	▼ 25BC
2-	0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
3-	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
4-	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
5-	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
6-	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
7-	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	⌂ 2302
8-	А 0410	Б 0411	В 0412	Г 0413	Д 0414	Е 0415	Ж 0416	З 0417	И 0418	Й 0419	К 041A	Л 041B	М 041C	Н 041D	О 041E	П 041F
9-	Р 0420	С 0421	Т 0422	У 0423	Ф 0424	Х 0425	Ц 0426	Ч 0427	Ш 0428	Щ 0429	Ъ 042A	Ы 042B	Ь 042C	Э 042D	Ю 042E	Я 042F
A-	а 0430	б 0431	в 0432	г 0433	д 0434	е 0435	ж 0436	з 0437	и 0438	й 0439	к 043A	л 043B	м 043C	н 043D	о 043E	п 043F
B-	░ 2591	▒ 2592	▓ 2593	│ 2502	┤ 2524	╡ 2561	╢ 2562	╖ 2556	╕ 2555	╣ 2563	║ 2551	╗ 2557	╝ 255D	╜ 255C	╛ 255B	┐ 2510
C-	└ 2514	┴ 2534	┬ 252C	├ 251C	─ 2500	┼ 253C	╞ 255E	╟ 255F	╚ 255A	╔ 2554	╩ 2569	╦ 2566	╠ 2560	═ 2550	╬ 256C	╧ 2567
D-	╨ 2568	╤ 2564	╥ 2565	╙ 2559	╘ 2558	╒ 2552	╓ 2553	╫ 256B	╪ 256A	┘ 2518	┌ 250C	█ 2588	▄ 2584	▌ 258C	▐ 2590	▀ 2580
E-	р 0440	с 0441	т 0442	у 0443	ф 0444	х 0445	ц 0446	ч 0447	ш 0448	щ 0449	ъ 044A	ы 044B	ь 044C	э 044D	ю 044E	я 044F
F-	Ё 0401	ё 0451	Є 0404	є 0454	Ї 0407	ї 0457	Ў 040E	ў 045E	° 00B0	∙ 2219	· 00B7	√ 221A	№ 2116	¤ 00A4	■ 25A0	00A0

Appendix III - Transmission Status Identification

Because the specified status bits transmitted from the ESC/POS commands are fixed, the user can confirm the command to which the status belongs, as shown in the following table.

When using Auto Status Back (ASB), however, process the consecutive three-byte code (except for XOFF) as ASB data after confirming the first byte of the ASB. Otherwise, the status transmitted by using the GS r and the status of the second and following bytes of the ASB cannot be differentiated.

Transmission Status Identification

Command & Function	Status Reply
GS I	<0**0****>B
GS r	<0**0****>B
XON	<00010001>B
XOFF	<00010011>B
DLE EOT	<0**1**10>B
ASB (1st byte)	<0**1**00>B
ASB (2nd to 4th bytes)	<0**0****>B

>>> *POS Printer ::* **MP-4000 TH**

The Bematech MP-4000 TH is the ultimate Point of Sale printing solution. Its key features:

- High performance, flexibility and ease of operation;

- Modern design, small footprint and capacity of being horizontally or vertically mounted make it perfect for all retail environments;

- Versatile paper handing allows for paper widths of 58 mm up to 82.5 mm;

- Large paper roll capacity (102 mm diameter) with easy and fast paper loading, resulting in less paper changes and less downtime;

- Very high printing speed (up to 250 mm/s) enables quick, efficient POS transactions and reduced checkout times;

- Top print quality which enhances receipt legibility and brand recognition;

- Exclusive Bematech Easy Recovery System (ERS) that allows for fast and simple recovery in case of paper jamming;

- Easy integration to new or existing POS systems with ESC/POS™ command compatibility, as well as Windows™ and Linux drivers;

- Unique Bematech's Modular Cartridge System (MCS) allows for easy, fast and affordable maintenance due to the complete independence between the control board module and the printing mechanism module. This patented feature also enables easy product upgrades and seamless dedicated fiscal applications;

- Several interface options including Serial RS-232, Parallel Bidirectional, USB 2.0 and Ethernet make it easy to communicate with a wide range of hardware platforms.

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