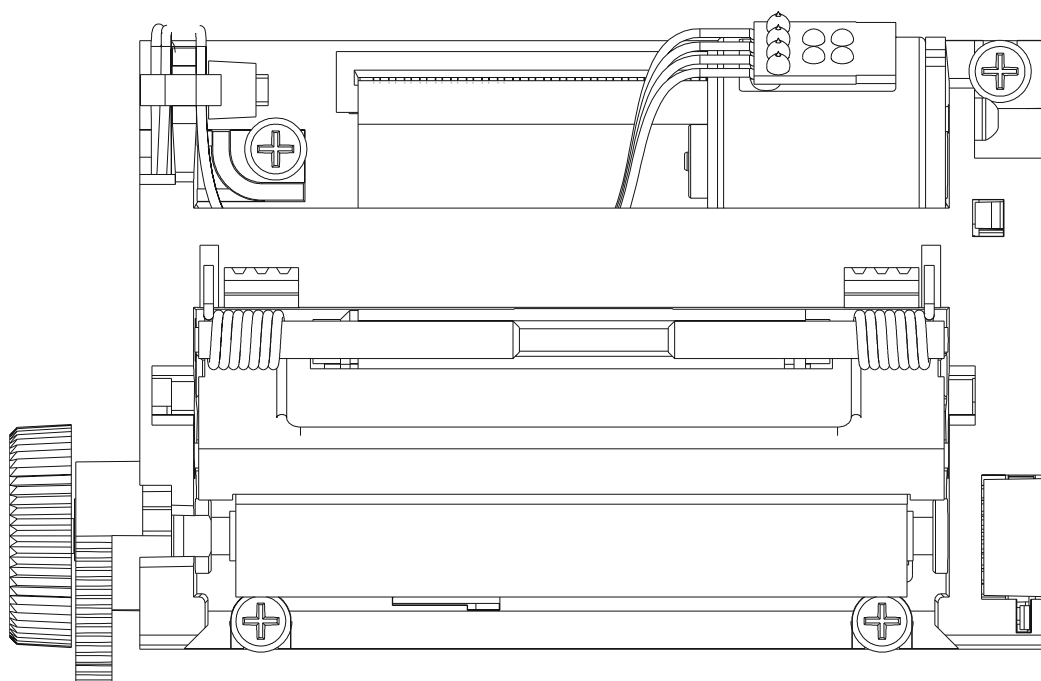


# Control board for MT558

## SCMT558

### User's manual



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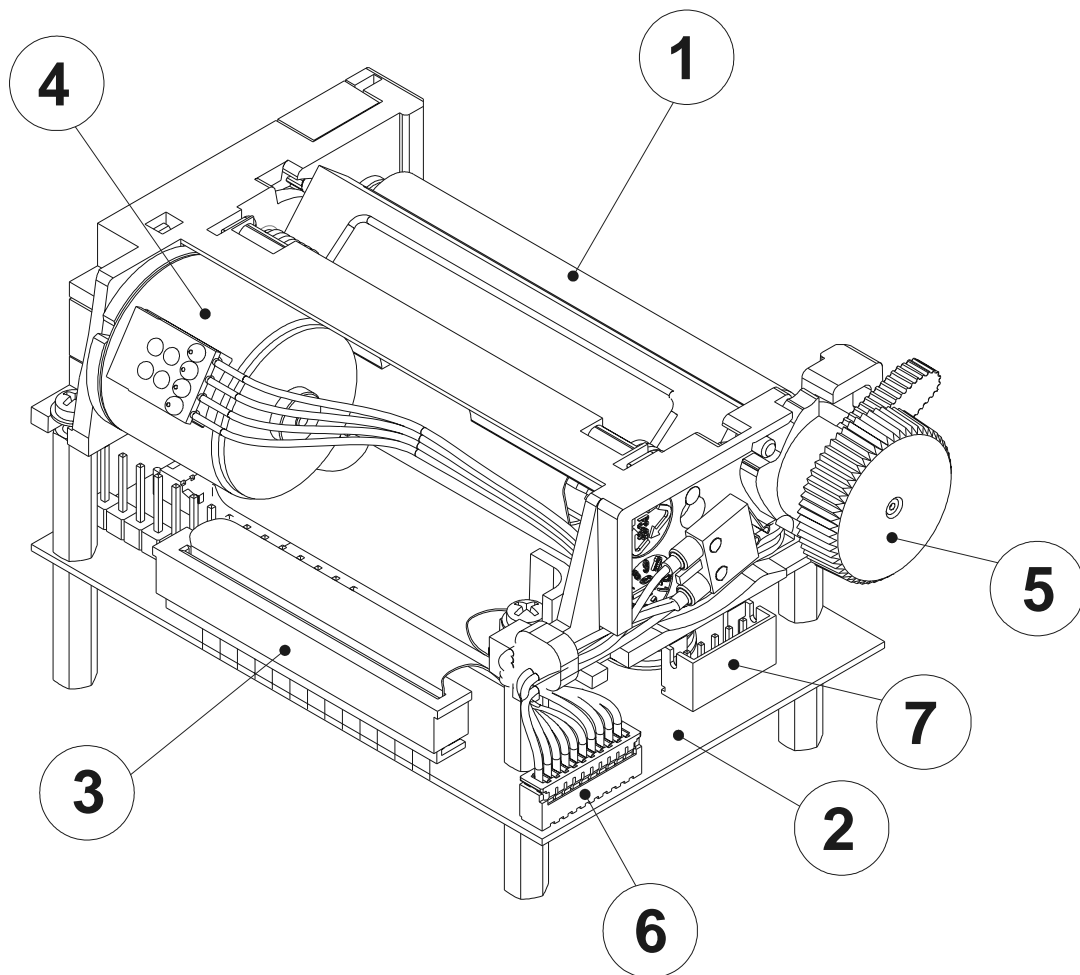
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## Components of control board

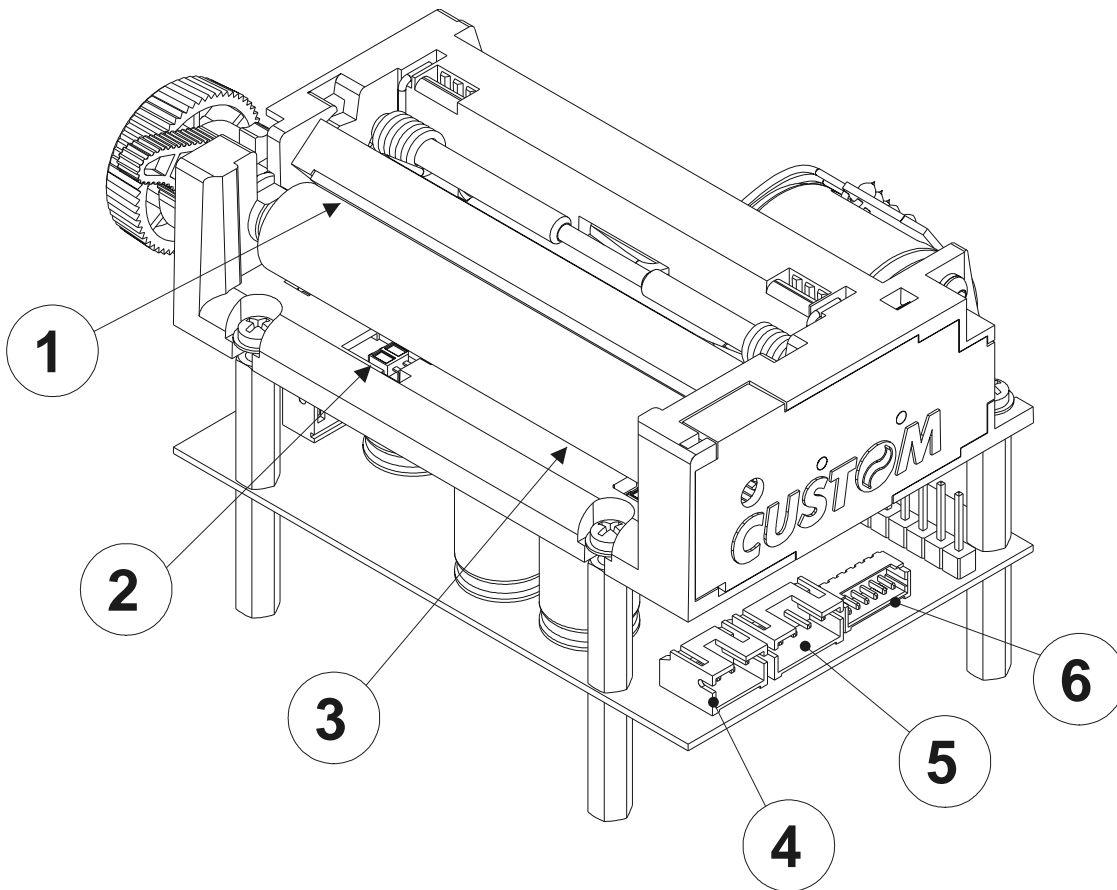
### A. Front exterior view

- 1-Printing mechanism
- 2-Control board
- 3-Printing mechanism connector
- 4-Motor
- 5-Knob paper feed
- 6-Connector of motor/paper control
- 7-Connector of Feed/Print keys and externals leds



## B. Front exterior view of side connectors

- 1-Paper outfeed
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- 3-Paper input
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- 5-I/O rewinder connector
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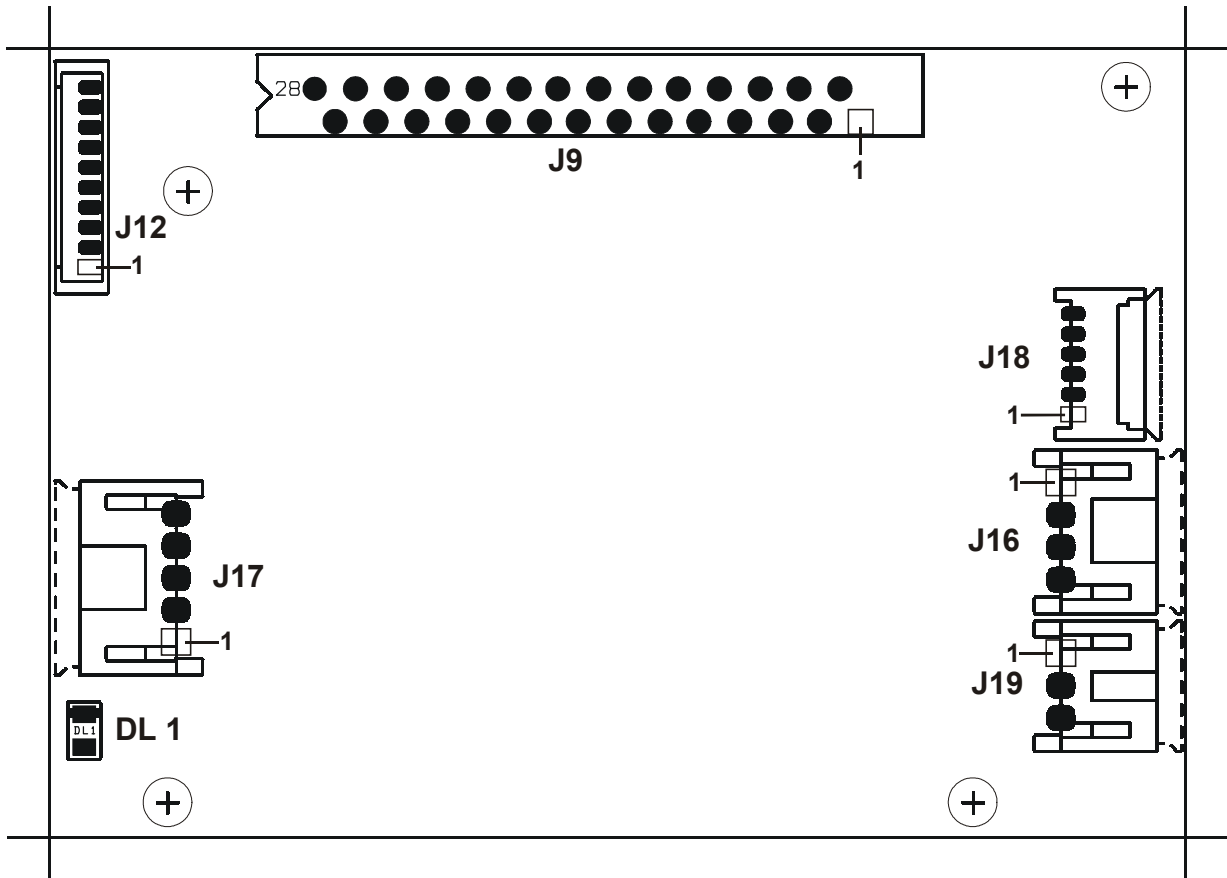
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# 1. INSTALLATION AND USE

## 1.1 BOARD CONNECTIONS

(Fig.1.1)



### 1.1.1 Power supply connector

#### J19 (CN3)

Model no. type : Header: S3B-PH-K (JST)

Housing: PHR-3 (JST) or equivalent

Pin no.	Signal	Notes
1	+ VC	5V power supply
2	+ VP	power supply
3	GND	Signal ground

(Tab.1.1)



#### WARNING

Respect the polarity of the power supply.

## 1.1.2 RS232 serial connector

### J18 (CN6)

Model no. type : Header: Molex 53048-0610 (90°)

Housing: Molex 51021-0600 (Vertical)

Pin no.	Signal	Notes
1	DTR	Data terminal ready
2	TX	Data transmission
3	RX	Data reception
4	GND	Signal ground
5	N.C.	Not connected
6	N.C.	Not connected

(Tab.1.2)

## 1.1.3 I/O rewinder connector

### J16 (CN4)

Model no. type : Header: S4B-PH-K (JST)

Housing: PHR-4 (JST) or equivalent

Pin no.	Signal	Notes
1	+VP	Power supply
2	EN-AVV	Output rewinder
3	SET-EN	Not used
4	GND	Signal ground

(Tab.1.3)

## 1.1.4 Connector for Feed/Print keys and externals led

### J17 (CN5)

Model no. type : Header: S5B-PH-K (JST)

Housing: PHR-5 (JST) or equivalent

Pin no.	Signal	Notes
1	TPRINT	Print key
2	TFEED	Feed key
3	GND	Signal ground
4	VCC	Power supply
5	LED-S	Status led

(Tab.1.4)

## 1. INSTALLATION AND USE

STATUS LED: displays printer hardware status. In case of malfunction, the color and flash frequency changing as follows:

(Tab.1.5)

<b>PIN</b>	<b>STATUS LED</b>	<b>DESCRIPTION</b>
<b>DL1</b>	Always On	Normal functioning
	Fast Flashing	Voltage error or head temperature error
	Slow Flashing	Paper end or head lifted

### 1.1.5 Connector for paper control / motor J12 (CN10)

Model no. type : Header :Molex 53047-1010 (Vertical)

Housing:Molex 51021-1000 (Vertical)

<b>Pin no.</b>	<b>Signal</b>	<b>Notes</b>
<b>1</b>	PH4	MOTA+
<b>2</b>	PH3	MOTB+
<b>3</b>	PH2	MOTA-
<b>4</b>	PH1	MOTB-
<b>5</b>	PAPER	Paper
<b>6</b>	GND	Signal ground
<b>7</b>	VCC	Power supply
<b>8</b>	GND	Signal ground
<b>9</b>	HEAD-UP	HEAD-UP
<b>10</b>	GND	Signal ground

(Tab.1.6)

**1.1.6 Printing head connector  
J9 (CN28)**

<b>Pin no.</b>	<b>Signal</b>
<b>1</b>	+VP
<b>2</b>	+VP
<b>3</b>	+VP
<b>4</b>	N.C.
<b>5</b>	HD-LATCH
<b>6</b>	HD-SCK
<b>7</b>	VCC
<b>8</b>	STROBE1
<b>9</b>	STROBE2
<b>10</b>	STROBE3
<b>11</b>	THERM
<b>12</b>	GND
<b>13</b>	GND
<b>14</b>	GND

<b>Pin no.</b>	<b>Signal</b>
<b>15</b>	GND
<b>16</b>	GND
<b>17</b>	GND
<b>18</b>	GND
<b>19</b>	N.C.
<b>20</b>	N.C.
<b>21</b>	STROBE4
<b>22</b>	STROBE5
<b>23</b>	STROBE6
<b>24</b>	N.C.
<b>25</b>	HD-DATA
<b>26</b>	+VP
<b>27</b>	+VP
<b>28</b>	+VP

**(Tab.1.7)**

# 1. INSTALLATION AND USE

## 1.2 CONFIGURATION

It's necessary connects the PRINT and FEED keys to J17 connector, located on board (see fig. 2.1), to make the parameters configuration. This procedure is enabled by holding down the PRINT and FEED keys while switching on. The parameters affected during configuration are:

- Print direction (normal or reverse)
- Selection of the character dimensions (normal, double width, double height, expanded)
- Selection of the font (font 1 or font 2)
- Enabling or disabling of the CR command
- AUTOFEED enabling or disabling : if the function is enabled when the printer receives a characters number equal to the line buffer the next character will place on the left margin in a new line
- Selection of the print speed in function of the absorption
- Selection of the red intensity : using two-colour thermal paper is possible to set different red tonality
- Selection of the parameters for serial communication
- Enabling or disabling of the 1Kbyte buffer

The settings made are saved on the EEPROM (non volatile memory). During power-up, if the PRINT and FEED keys are held down, the printer enters the autotest routine and prints out the setup report. The printer will remain in standby in Hexadecimal dump mode (see section 1.3) until another key is pressed or characters are received through the printer communication port.

After this, each time the PRINT key is pressed, the parameter is modified and its current value is printed. Once the required value has been obtained, press the FEED key to proceed to the next parameter, and so on. Once all the parameters have been run through, the printing of a message signals the end of the setting procedure.

## 1.3 AUTOTEST

To run the autotest, hold down the FEED key, while switching on the printer. The autotest causes the printing of the printer's current setting data and the printing of the complete ASCII character set.

## 1.4 HEXADECIMAL DUMP

If the PRINT key is held down during switching on, the printer enters Hexadecimal Dump mode. This function is used for the diagnostics of characters received in serial or parallel. In fact, these are printed in hexadecimal code together with the corresponding ASCII code.

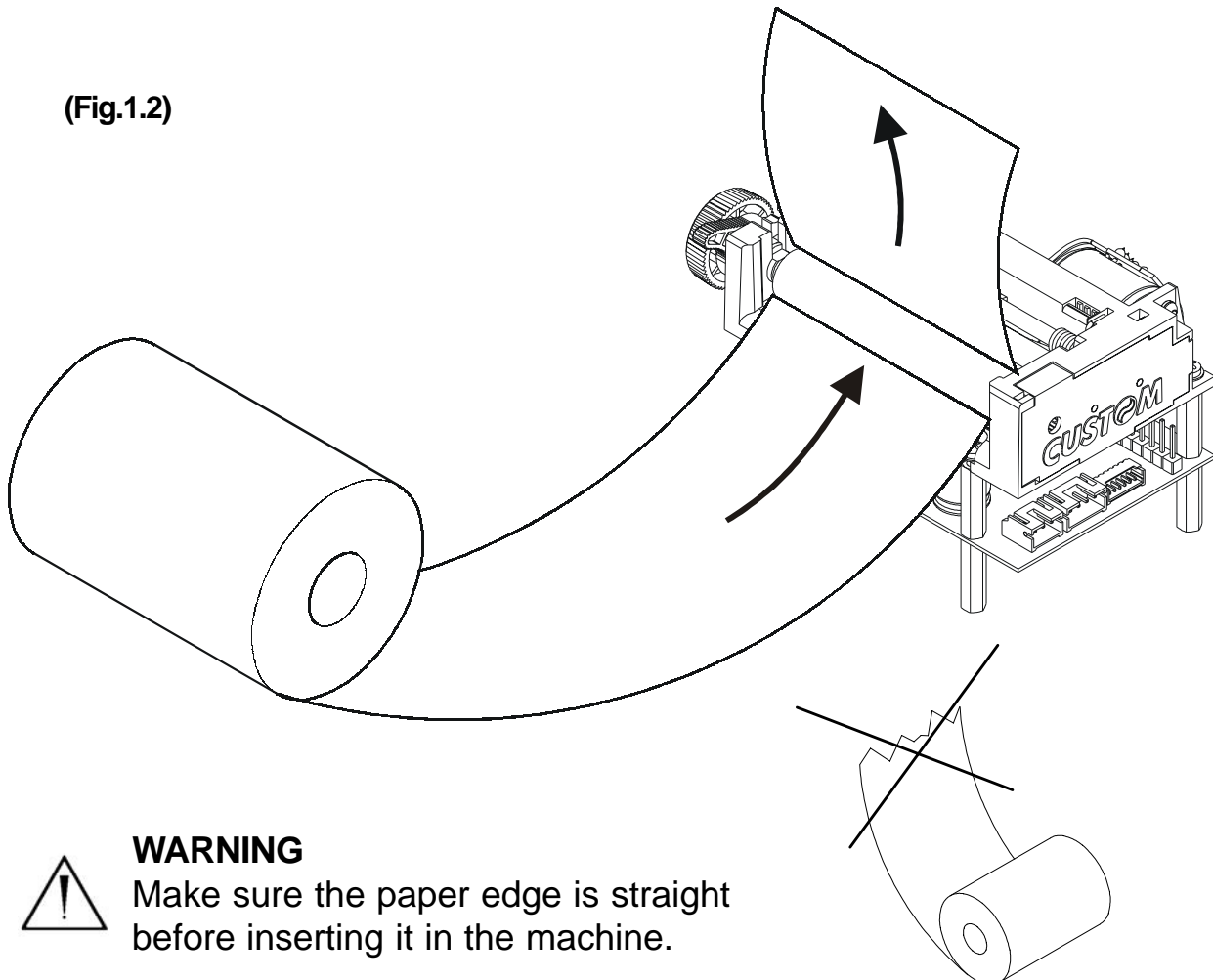
## 1.5 MAINTENANCE

### 1.5.1 Changing the paper roll

To change the paper roll, proceed as follows:

- 1) Insert the end of the paper roll in the slit of the print mechanism and position the paper roll so that it rotates in the right direction, as shown in the figure 1.2;
- 2) The paper is automatically pulled by the roller for 3 or 4 centimetres;
- 3) Tear off the paper.

(Fig.1.2)



### WARNING

Make sure the paper edge is straight before inserting it in the machine.

## 2. PRINTER FUNCTIONS

### 2.1 CONTROL CHARACTERS

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

(Tab.2.1)

**COMMAND TABLE**

<b>ASCII Com.</b>	<b>HEX Com.</b>	<b>Description</b>
	\$00	Prints in small characters
	\$01	Prints in double width
	\$02	Prints in double height
	\$03	Expanded printing
	\$04	Restores small character printing
	\$0A	Forward feeds one line
	(n) \$0B	Forward feeds (n) line
	\$0D	Prints line buffer
	\$0F	Sets CRLF mode
	\$11	Graphic mode
	\$17	Prints 1st programmable character
	\$18	Prints 2nd programmable character
	\$19	Prints 3rd programmable character
	\$1A	Prints 4th programmable character
	\$1C	Prints 5th programmable character
	\$1D	Prints 6th programmable character
	\$1E	Prints 7th programmable character
	\$1F	Prints 8th programmable character
ESC # n	\$1B \$23 n	Transmits printer ID
ESC @	\$1B \$40	Resets the printer

## 2. PRINTER FUNCTIONS

<b>ASCII Com.</b>	<b>HEX Com.</b>	<b>Description</b>
ESC A	\$1B \$41	Executes [n] dots line feed
(dd) ESC G	(dd) \$1B \$47	Writes value (dd) in option register
ESC I	\$1B \$49	Selects 24 columns
ESC J (n)	\$1B \$4A	Loads programmable character
(dd) ESC K	(dd) \$1B \$4B	Writes value (dd) in option register 1
(dd) ESC M	(dd) \$1B \$4D	Writes value (dd) in print mode
ESC N	\$1B \$4E	Sets normal mode printing
ESC Q	\$1B \$51	Enables underlining
ESC R	\$1B \$52	Sets reverse mode printing
ESC W	\$1B \$57	Prints graphic line of 200 dpi
ESC X	\$1B \$58	Prints in red
(dd) ESC a	\$1B \$61	Selects number of dot spaces
ESC c	\$1B \$63	Management of bar code printing
ESC i	\$1B \$69	Selects 40 columns
ESC j	\$1B \$6A	Selects 32 columns
ESC k	\$1B \$6B	Transmits option register 1 in serial
ESC m	\$1B \$6D	Transmits print mode in serial
ESC p	\$1B \$70	Transmits option register in serial
ESC q	\$1B \$71	Disables underlining
(aa) ESC r	(aa) \$1B \$72	Reads data at an address (aa)
ESC s	\$1B \$73	Transmits next character in serial
ESC v	\$1B \$76	Transmits a printer status
(aadd) ESC w	(aadd) \$1B \$77	Writes data (dd) in an address (aa)
ESC x	\$1B \$78	Prints in black
ESC · xH xL yH yL	\$1B \$FA xH xL yH yL	Print graphic
GS \$ n	\$1D \$24 n	Set absolute shift into a graphic line
GS I n	\$1D \$49 n	Transmits the printer ID
GS W n	\$1D \$57 n	Prints n byte of a 200 dpi graphic line

## 2. PRINTER FUNCTIONS

A more detailed description of the single commands can be found below.

### 00H

[Name]	<b>Small character print</b>
[Format]	ASCII - Hex 00 Decimal 0
[Description]	The printer prints in small(normal) format
[Notes]	<ul style="list-style-type: none"><li>• The commands from 00H to 09H do not erase the print buffer</li><li>• The commands that modify the direction of the characters are only enabled at the beginning of the line</li></ul>
[Default]	Setting in the option register using the front keys
[Reference]	<b>01H, 02H, 03H, 04H</b>
[Example]	

### 01H

[Name]	<b>Double width print</b>
[Format]	ASCII - Hex 01 Decimal 1
[Description]	The printer prints in double width format
[Notes]	<ul style="list-style-type: none"><li>• The commands from 00H to 09H do not erase the print buffer.</li><li>• The commands that modify the direction of the characters are only enabled at the beginning of the line.</li></ul>
[Default]	Setting in the option register using the front keys.
[Reference]	<b>00H, 02H, 03H, 04H</b>
[Example]	

### 02H

[Name]	<b>Double height print</b>
[Format]	ASCII - Hex 02 Decimal 2
[Description]	The printer prints in double height format
[Notes]	<ul style="list-style-type: none"><li>• The commands from 00H to 09H do not erase the print</li></ul>

buffer.

- The commands that modify the direction of the characters are only enabled at the beginning of the line

[Default] Setting in the option register using the front keys

[Reference] **00H, 01H, 03H, 04H**

[Example]

### 03H

[[Name] **Expanded printing**

[Format] ASCII -  
Hex 03  
Decimal 3

[Description] The printer prints in expanded character mode

[Notes] 

- The commands from 00H to 09H do not erase the print buffer
- The commands that modify the size of the characters are only enabled at the beginning of the line

[Default] Setting in the option register using the front keys

[Reference] **00H, 01H, 02H, 04H**

[Example]

### 04H

[Name] **Reset small character print**

[Format] ASCII -  
Hex 04  
Decimal 4

[Description] The printer resumes printing with small characters

[Notes] 

- The commands from 00H to 09H do not erase the print buffer
- The commands that modify the size of the characters are only enabled at the beginning of the line

[Default] Setting in the option register using the front keys

[Reference] **00H, 01H, 02H, 03H**

[Example]

## 2. PRINTER FUNCTIONS

### 0AH

[Name]	<b>Forward feed one line</b>
[Format]	ASCII - Hex 0A Decimal 10
[Description]	Forward feeds one line equivalent to a line of print
[Notes]	<ul style="list-style-type: none"><li>• This command prints the contents of the buffer</li></ul>
[Default]	
[Reference]	<b>0BH</b>
[Example]	

### (n) 0BH

[Name]	<b>Forward feed (n) lines</b>
[Format]	ASCII - Hex 0B Decimal 11
[Description]	Carries out the number of line feeds specified in n
[Notes]	<ul style="list-style-type: none"><li>• The number must be ASCII and between 0 and 9 (when n=0 the command is ignored)</li><li>• This command erases the line buffer</li></ul>
[Default]	
[Reference]	<b>0AH</b>
[Example]	If you wish to forward feed rapidly by 5 lines, simply transmit: \$35 \$0B (or 5 and the command \$0B)

### 0DH

[Name]	<b>Print the line buffer</b>
[Format]	ASCII - Hex 0D Decimal 13
[Description]	This command prints the line buffer
[Notes]	<ul style="list-style-type: none"><li>• If the buffer is empty, the command is ignored</li><li>• If the CRLF option is set, this command is ignored and the printer only prints when the command \$0A is transmitted</li></ul>
[Default]	

[Reference]    **0FH**

[Example]

### **0FH**

[Name]        **Set CRLF mode**

[Format]      ASCII     -  
                  Hex        0F  
                  Decimal  15

[Description] It inhibits the command \$0D, maintaining only the command \$0A enabled for printing.

[Notes]        • To disable this option, reset the printer  
                  • This command erases the line buffer  
                  • When the printer is switched on, the default value is in the Option Register

[Default]      Setting in the option register using the front keys

[Reference]    **0DH**

[Example]

### **11H**

[Name]        **Graphic mode**

[Format]      ASCII     -  
                  Hex        11  
                  Decimal  17

[Description] Enables graphic mode:  
 one line in 24 column mode is equivalent to 144 horizontal dots divided into 24 6-dot blocks; one line in 40 column mode is equivalent to 240 horizontal dots divided into 40 6-dot blocks.

[Notes]        To print in graphic mode, send the command \$11 at the beginning of each line. The byte pattern in the graphic configuration is:

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

where:

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

**R** must be set at level 1;

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

## 2. PRINTER FUNCTIONS

The bit P6 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 illustrated:

**The 1st byte →**      **The 2nd byte →**      **The 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:  
 \$11, n x \$7F (where n is the number of characters per line),  
 \$0D.  
 To print an empty line, transmit:  
 \$11, \$40, \$0D.

### 17H,...1FH

[[Name]      **Print the 1st (...8th) programmable character**

[Format]      ASCII      -  
                  Hex        17, ...1F  
                  Decimal    23, ...31

[Description] This command causes the printing of the corresponding programmable character.

[Notes]

[Default]      BIT MAP contained in flash

[Reference]    **17H, 18H, 19H, 1AH, 1CH, 1DH, 1EH, 1FH**

[Example]

### ESC # n

[Name]      **Transmit printer ID**

[Format]      ASCII      ESC      #      n  
                  Hex        1B        23      n  
                  Decimal    27        73      n

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

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

n	Printer ID	Specification
1, 49	Printer model ID	1AH
2, 50	Not used	Fixed to 00H
3, 51	ROM version ID	Depends on ROM version (4 character)

[Notes]           • This command is executed when the data is processed in the data buffer. Therefore, there could be a time lag between command reception and data transmission, depending on data buffer status.

[Default]

[Reference]

[Example]

### ESC @

[Name]           **Resets the printer**

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

[Description]   Cancels all the data in the print buffer and resets the printer mode, restoring the mode which was enabled at the moment of switching on

[Notes]           • Same as hardware reset  
 • After the command has been transmitted, 1.5 seconds elapse before the printer is enabled

[Default]

[Reference]

[Example]       This can be useful during switching on in order to avoid the sending of false characters during initialization by the master device

## 2. PRINTER FUNCTIONS

### ESC A [nH] [nL]

[Name]	<b>Executes [n] dots line feed</b>				
[Format]	ASCII	ESC	A	nH	nL
	Hex	1B	41	nH	nL
	Decimal	27	65	nH	nL
[Description]	Executes [n] dots line feed.				
[Notes]					
[Default]					
[Reference]					
[Example]					

### (dd) ESC G

[Name]	<b>Write the value (dd) in the option register</b>				
[Format]	ASCII	dH	dL	ESC	G
	Hex	dH	dL	1B	47
	Decimal	dH	dL	27	71
[Description]	Modify the configuration register. (dd) are two ASCII CHARACTERS that represent the hexadecimal code for the programming of the register.				
	(dd)	<b>bit=0</b>	<b>bit=1</b>		
	<b>bit0:</b> setting of real time clock	disabled	enabled		
	<b>bit1:</b> print direction	normal	reverse		
	<b>bit2:-</b>				
	<b>bit3:</b> printing of seconds	disabled	enabled		
	<b>bit4:</b> CR (\$0D)	enabled	disabled		
	<b>bit5:</b> -				
	<b>bit6:</b> font selection	font 1	font 2		
	<b>bit7:</b> reception buffer	1Kbyte	N° columns		
[Notes]	• The setting is stored in the EEPROM and assumed as default value the next time the printer is switched on				
[Default]					
[Reference]					
[Example]	To send the setting byte 00001001 (\$09): \$30 \$39 \$1B \$47				

### ESC I

[Name]	<b>Selects 24 columns</b>
[Format]	ASCII      ESC    I Hex        1B    49 Decimal    27    73
[Description]	On receiving this command the printer enters 24-columns for line printing mode.
[Notes]	
[Default]	
[Reference]	<b>ESC i</b>

### ESC J (n) 10\*(d)

[Name]	<b>Load the programmable character</b>																		
[Format]	ASCII      ESC    J      (n) Hex        1B    4A      (n) Decimal    27    74      (n)																		
[Description]	<p>(n) corresponds to the number of characters which can vary from 1 to 8.</p> <p>The bit map representing the character is contained in the 10 bytes that follow, expressed in binary code. The formatting of these bytes is as follows:</p> <table border="0" style="margin-left: 20px;"> <tr> <td style="padding-right: 10px;">bit</td> <td style="padding-right: 10px;">7</td> <td style="padding-right: 10px;">6</td> <td style="padding-right: 10px;">5</td> <td style="padding-right: 10px;">4</td> <td style="padding-right: 10px;">3</td> <td style="padding-right: 10px;">2</td> <td style="padding-right: 10px;">1</td> <td style="padding-right: 10px;">0</td> </tr> <tr> <td></td> <td>0</td> <td>1</td> <td>d</td> <td>d</td> <td>d</td> <td>d</td> <td>d</td> <td>d</td> </tr> </table>	bit	7	6	5	4	3	2	1	0		0	1	d	d	d	d	d	d
bit	7	6	5	4	3	2	1	0											
	0	1	d	d	d	d	d	d											
[Notes]																			
[Default]	The 8 characters present when the printer is switched on are loaded with a bit map contained in the printer flash. Any user who wishes to modify these bit maps must upgrade the firmware.																		
[Reference]																			
[Example]	If you wish the symbol of the code \$1F to be #, transmits ESC J 2 followed by the 10 bytes making up the character : \$1B \$4A \$32 \$52 \$52 \$52 \$7F \$52 \$52 \$7F \$52 \$52 \$52																		



### ESC N

[Name]	<b>Set normal mode printing</b>		
[Format]	ASCII	ESC	N
	Hex	1B	4E
	Decimal	27	78
[Description]	Select normal mode printing:the receipt feeds out of the printer with the printing upside down running from right to left		
[Notes]			
[Default]	Setting in option register by means of front keys		
[Reference]	<b>ESC R</b>		
[Example]			

### ESC Q

[Name]	<b>Enable underlined printing</b>		
[Format]	ASCII	ESC	Q
	Hex	1B	51
	Decimal	27	81
[Description]	After this command has been received, the characters are printed underlined		
[Note]			
[Default]			
[Reference]	<b>ESC q</b>		
[Example]			

### ESC R

[Name]	<b>Set the printer in reverse mode</b>		
[Format]	ASCII	ESC	R
	Hex	1B	52
	Decimal	27	82
[Description]	Selects reverse mode printing: the ticket feeds out of the printer with the printing the right way up, running from left to right		
[Notes]			
[Default]	Setting in the option register using the front keys		
[Reference]	<b>ESC N</b>		

## 2. PRINTER FUNCTIONS

[Example]

### ESC W

[Name] **Prints a graphic line at 200 dpi**

[Format] ASCII    ESC    W  
Hex        1B     57  
Decimal    27     87

[Description] After receiving this command, the printer waits for 48 bytes which correspond to an entire graphic line. In fact, 48 bytes of 8 bits each correspond to 384 dots per line.

[Notes]

[Default]

[Reference]

[Example]

### ESC X

[Name] **Prints in red**

[Format] ASCII    ESC    X  
Hex        1B     58  
Decimal    27     88

[Description] After receiving this command, the printer prepares itself to print in red.

[Notes]

[Default]

[Reference]

[Example]

### (dd) ESC a

[Name] **Selects the number of dot spaces**

[Format] ASCII    (dd)    ESC    a  
Hex        (dd)    1B     61  
Decimal    (dd)    27     97

[Description] (dd) are two ASCII characters which identify a hexadecimal byte and correspond to the number of dot lines between one print line and another



## 2. PRINTER FUNCTIONS

Bit 1	Function	Description
-	Not used	-

Bit 3	Bit 2	Function	Description
0	0	No	HRI position
0	1	Above	
1	0	Below	
1	1	Above & below	

Bit 5	Bit 4	Function	Description
0	0	Normal	Barcode width
0	1	Double	
1	0	Triple	
1	1	Not used	

Bit	Function	Description
6	Not used	-
7	Not used	-

[length] Specify the characters number to print trough a byte; in following are listed the maximum lengths allowed :

Interleaved 2/5 = 12 characters

Code 39 = 10 characters

CodaBar = 10 characters

EAN8 = 8 characters

EAN13 = 13 characters

[data] Specify the characters to print expressed in ASCII

[Notes]

[Default]

[Reference]

[Example] In the following example is indicated the command sequence to print a barcode :

\$1B, 'N', \$1B, 'c', 'C', \$50, \$3C, \$14, \$06, 'SCMT558'

where :

\$1B, 'N' (sets the printing in normal mode )  
 \$1B, 'c', (bar code printing command)  
 'C', (barcode type = Code 39)  
 \$50, (barcode heigth = 10 mm)  
 \$3C, (starting position = 7,5 mm)  
 \$14, (HRI printing below, barcode width double)  
 \$06, (characters number to print)  
 'SCMT558' (characters to print)

### ESC i

[Name]	<b>Select 40 columns</b>		
[Format]	ASCII	ESC	i
	Hex	1B	69
	Decimal	27	105
[Description]	On receiving this command, the printer enters 40-columns for line printing mode		
[Notes]			
[Default]			
[Reference]	<b>ESC I</b>		
[Example]			

### ESC j

[Name]	<b>Select 32 columns</b>		
[Format]	ASCII	ESC	j
	Hex	1B	6A
	Decimal	27	106
[Description]	On receiving this command, the printer enters 32-columns for line printing mode		
[Notes]			
[Default]			
[Reference]	<b>ESC I, ESC i</b>		
[Example]			

## 2. PRINTER FUNCTIONS

### ESC k

[Name]	<b>Transmit the second configuration register in serial</b>		
[Format]	ASCII	ESC	k
	Hex	1B	6B
	Decimal	27	107
[Description]	Transmits in serial the value of the second configuration register in ASCII format on two characters which represents the hexadecimal value.		
[Notes]	• If the parallel protocol is in use, nothing will be transmitted		
[Default]			
[Reference]	<b>ESC K</b>		
[Example]	The response is on two bytes. For example, if you receive: \$30 \$39 it means that the default configuration is 00001001		

### ESC m

[Name]	<b>Transmits the print mode in serial</b>		
[Format]	ASCII	ESC	m
	Hex	1B	6D
	Decimal	27	109
[Description]	Transmits the print mode configuration on the serial port		
[Notes]	• If the printer is using the parallel protocol, nothing will be transmitted		
[Default]	Setting in the option register by means of the front keys		
[Reference]	<b>ESC B</b>		
[Example]	The response is on two bytes. E.g. if you receive: \$30, \$32 it means that printing is in double height mode		

### ESC p

[Name]	<b>Transmit the configuration register in serial</b>		
[Format]	ASCII	ESC	p
	Hex	1B	70
	Decimal	27	112
[Description]	Transmits the option register byte on the serial port		

[Notes]	• If the parallel protocol is in use, nothing will be transmitted
[Default]	
[Reference]	<b>ESC G</b>
[Example]	The response is on two bytes. For example, if you receive: \$30 \$39 it means that the default configuration is 00001001

### ESC q

[Name]	<b>Disables underlined printing</b>		
[Format]	ASCII	ESC	q
	Hex	1B	71
	Decimal	27	113
[Description]	Annuls underlined printing		
[Notes]			
[Default]			
[Reference]	<b>ESC Q</b>		
[Example]			

### (aa) ESC r

[Name]	<b>Read data at an address (aa)</b>				
[Format]	ASCII	aH	aL	ESC	r
	Hex	aH	aL	1B	72
	Decimal	aH	aL	27	114
[Description]	Read a memory location (EEPROM) at address a: aH is the most significant nibble of a expressed in ASCII aL is the least significant nibble of a expressed in ASCII				
[Notes]	• There are 256 legible locations (from \$00 to \$FF)				
[Default]					
[Reference]	ESC w				
[Example]	To read address \$01, transmit in ASCII : \$30 \$31 \$1B \$72 if address \$01 contains \$A5, we will receive: \$41 \$35				

## 2. PRINTER FUNCTIONS

### ESC s

[Name]	<b>Transmits the next character in serial</b>		
[Format]	ASCII	ESC	s
	Hex	1B	73
	Decimal	27	115
[Description]	Transmits the next character it receives on the serial port		
[Notes]			
[Default]			
[Reference]			
[Example]	If you transmit:       ESC s A the last character, A, will not be printed but immediately transmitted on the serial line		

### ESC v

[Name]	<b>Transmit paper sensor status</b>		
[Format]	ASCII	ESC	v
	Hex	1B	76
	Decimal	27	118
[Description]	When this command is received, transmit the current status of the paper sensor.		
[Notes]	<ul style="list-style-type: none"><li>• This command is executed immediately, even when the data buffer is full (Busy ).</li></ul> The status to be transmitted is shown in the table below:		

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	Paper present
	On	04	4	Paper not present
3	Off	00	0	Head position correct
	On	08	8	Testina sollevata
4	On	10	16	Not used. Fixed to Off
5	Off	00	0	Head temperature correct
	On	20	32	Head overtemperature error
6	Off	00	0	Voltage correct
	On	40	64	Voltage error (High / Low)
7	Off	00	0	Not used. Fixed to Off



## 2. PRINTER FUNCTIONS

### ESC · n1 n2

[Name]	<b>Print graphic bank ( 384 × 597 dots).</b>				
[Format]	ASCII	ESC	.	n1	n2
	Hex	1B	FA	n1	n2
	Decimal	27	250	n1	n2
[Range]	$0 \leq xH, xL, yH, yL \leq 255$				
[Description]	Prints the graphics bank from flash. <i>n</i> can be assumed the value of \$01 or \$31. <i>xL</i> + <i>xH</i> × 256 specifies the starting dot line ( 1 , 597 ). <i>yL</i> + <i>yH</i> × 256 specifies the number of lines to print.				
[Notes]	<ul style="list-style-type: none"><li>• If (<i>xL</i> + (<i>xH</i> × 256)) &gt; 597 the printer does not execute the command.</li><li>• If ( <i>xL</i> + ( <i>xH</i> × 256 ) + <i>yL</i> +( <i>yH</i> × 256 )) &gt; 597 the printer only prints 597 - <i>xL</i> + ( <i>xH</i> × 256 ) +1 dotlines.</li></ul>				
[Default]					
[Reference]					
[Example]	To print from ram bank dotline 100 to dotline 299, send: 1BH FAH 00H 00H 64H 00H C7H				

### GS \$ n

[Name]	<b>Set absolute shift into a graphic line.</b>				
[Format]	ASCII	GS	\$	n	
	Hex	1D	24	n	
Decimal	29	36	n		
[Range]	$0 \leq n \leq 47$				
[Description]	Set the print beginning position into a graphic line based on the current value of <i>n</i> that indicate the byte number of shift from left margin.				
[Notes]	<ul style="list-style-type: none"><li>• Settings outside the specified printable area are ignored.</li></ul>				
[Default]					
[Reference]					
[Example]					

### GS I n

[Name]	<b>Transmit printer ID.</b>			
[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 <i>n</i> follows:			

n	Printer ID	Specification
1, 49	Printer model ID	1AH
2, 50	Not used	Fixed to 00H
3, 51	ROM version ID	Depends on ROM version (4 character)

[Notes]      • This command is executed when the data is processed in the data buffer. Therefore, there could be a time lag between command reception and data transmission, depending on data buffer status.

[Default]

[Reference]

[Example]

### GS W n d1 ...dn

[Name]	<b>Prints n byte of a 200 dpi graphic line</b>				
[Format]	ASCII	GS	W	n	d1... dn
	Hex	1D	57	n	d1... dn
	Decimal	29	87	n	d1... dn

[Range]       $1 \leq n \leq 48$   
 $0 \leq d1 \dots dn \leq 255$

[Description] Print n byte of a 200 dpi graphic line where :

- n specifies the number of byte to print;
- d1...dn specify the bytes to print.

[Notes]      • If the bit image data input exceeds the number of dots to be printed on a line, the excess data are processed as printable characters.

## 2. PRINTER FUNCTIONS

- *d* indicates the bit image data. Set a corresponding bit to 1 to print a dot, or to 0 to not print the dot.
- This command is not affected by the emphasized, double-strike, underline (etc.) print modes, except for the upside-down mode.

[Default]

[Reference]

[Example]

For printing 12 bytes the command sequence is :  
1D 57 0C FF 00 FF 00 FF 00 FF 00 FF 00 FF 00

Blank page

### 3. TECHNICAL SPECIFICATIONS

#### 3.1 TECHNICAL SPECIFICATIONS

The main technical features of the printer are listed in Table 3.1.

Table 3.1

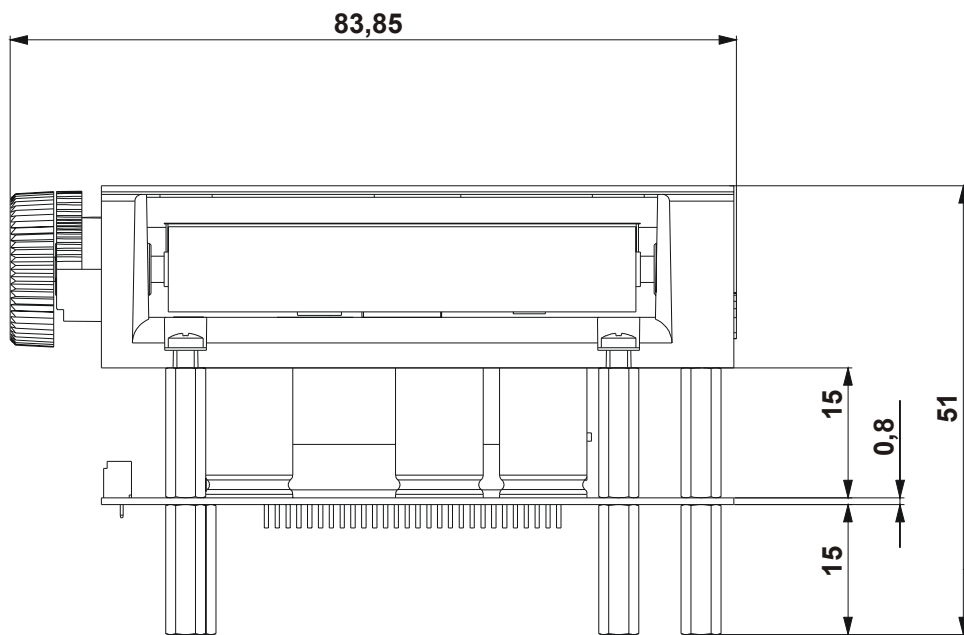
<b>Columns</b>	<b>24</b>	<b>40</b>
<b>Character (L x H mm)</b>		
Normal	2x3	1x3
Double height	2x6	1x6
Double width	4x3	2x3
Expanded	4x6	2x6
<b>Graphic dot</b>	0,125 x 0,125	0,125 x 0,125
<b>Custom emulation dots per line</b>	144	240
<b>Print speed (speed/current = normal)</b>		
Lines/sec	16.25	16.25
Characters/sec	390	650
Feed (lines/sec)	16.25	16.25
<b>Line buffer</b>	24 byte	40 byte
<b>Print buffer</b>	128 byte	
<b>Print method</b>	Thermal	
<b>Character matrix</b>	16 x 24	8x24
<b>Print direction</b>	Normal or reverse	
<b>Character set</b>	Normal and extended	
<b>Paper width</b>	58 +/- 1mm x Ø50 mm max	
<b>Standard interfaces</b>	RS232-TTL	
<b>Power supply</b>	Vdc 5 ± 5% VT 5 ÷ 7.5V	
<b>Absorption (with 5 Volt power supply)</b>		
Printing	4.5 A	
Stand by	100 mA	
In feed	750 mA	

### 3. TECHNICAL SPECIFICATIONS

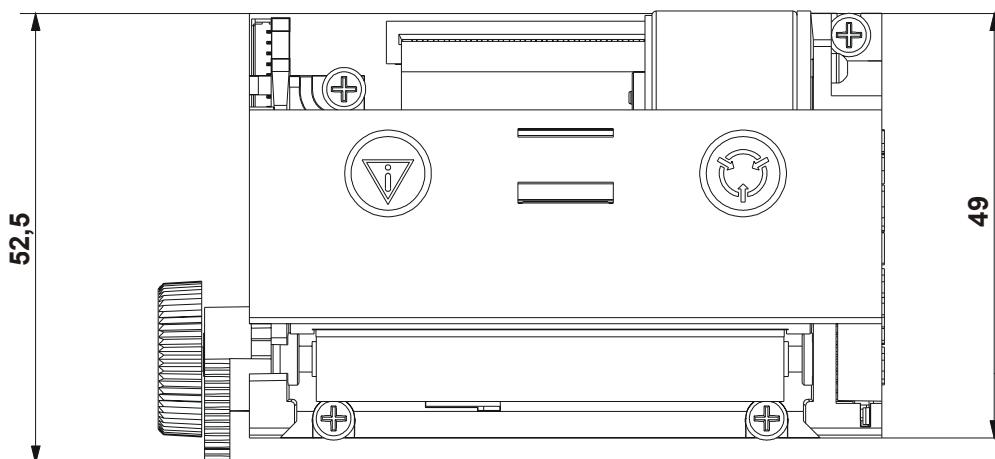
Environmentals conditions	
Operating temperature	0°C - 50°C
Operating humidity	20% - 85% (no condensing)
Storage temperature / humidity	-25°C - +70°C / 10% - 90%

#### 3.2 DIMENSIONS

In the figure below are shown the dimensions of the kit control board with mechanism.

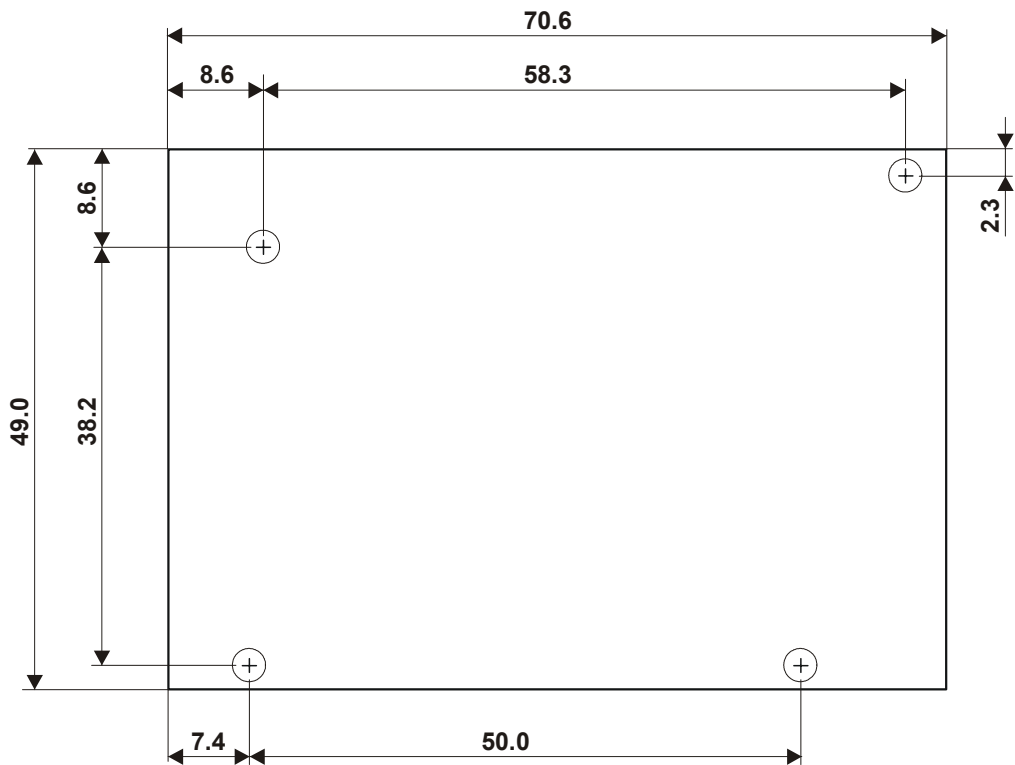


(Fig.3.1)



### 3. TECHNICAL SPECIFICATIONS

In the figure below are shown the dimensions of the control board.



(Fig.3.2)

Blank page

## 4. CHARACTER SETS

### 4.1 CHARACTER SETS

Has two characters sets, each containing 224 characters (font 1 and font 2), which can be called up through the programming (paragraph 1.2) or through the control characters (paragraph 2.1).

FONT 1

	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	@	P	φ	p	Ç	É	ä	⋮	⌘	α	≡			
1	!	1	A	Q	a	q	Ü	æ	i	⌘	β	±			
2	"	2	B	R	b	r	ë	æ	ó	⌘	γ	≥			
3	#	3	C	S	c	s	ä	ö	ü	⌘	π	≤			
4	\$	4	D	T	d	t	ä	ö	ñ	-	ε	Σ			
5	%	5	E	U	e	u	ä	ö	ñ	+	F	O			
6	&	6	F	V	f	v	ä	ö	ñ	⌘	μ	÷			
7	⌘	'	7	G	W	g	w	ç	ü	⌘	τ	≈			
8	⌘	(	8	H	X	h	x	ë	ÿ	⌘	ø	°			
9	⌘	)	9	I	Y	i	y	ë	ÿ	⌘	θ	·			
A	⌘	*	:	J	Z	j	z	è	ü	-	Ω	λ			
B	⌘	+	;	K	[	k	°	ï	¼	⌘	δ	√			
C	⌘	<	L	\	l	±	î	¾	⌘	ε	∞	n			
D	⌘	=	M	]	m	μ	ï	¾	⌘	∅	Z				
E	⌘	.	>	N	^	n	Ω	Ä	R	⌘	€	Δ			
F	⌘	/	?	0	_	o	≠	À	ƒ	⌘	∞	†			

(Fig.4.1)

FONT 2

	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	@	P	'	p	A	P	a	⋮	⌘	P	0			
1	!	1	A	Q	a	q	ß	ó	⋮	⌘	C	±			
2	"	2	B	R	b	r	B	T	B	⋮	T	≥			
3	#	3	C	S	c	s	Γ	Υ	Γ	⋮	Y	≤			
4	\$	4	D	T	d	t	∏	Φ	∏	-	Φ				
5	%	5	E	U	e	u	E	X	e	+	X				
6	&	6	F	V	f	v	∏	∏	∏	⌘	∏	÷			
7	⌘	'	7	G	W	g	w	3	4	3	⌘	∏			
8	⌘	(	8	H	X	h	x	∏	∏	∏	⌘	∏			
9	⌘	)	9	I	Y	i	y	∏	∏	∏	⌘	∏			
A	⌘	*	:	J	Z	j	z	K	б	K	⌘	б			
B	⌘	+	;	K	[	k	°	∏	∏	∏	⌘	∏			
C	⌘	<	L	\	l	±	∏	∏	∏	⌘	∏	n			
D	⌘	=	M	]	m	μ	∏	∏	∏	⌘	∏	3			
E	⌘	.	>	N	^	n	∏	∏	∏	⌘	∏	∏			
F	⌘	/	?	0	_	o	∏	∏	∏	⌘	∏	∏			

(Fig.4.2)