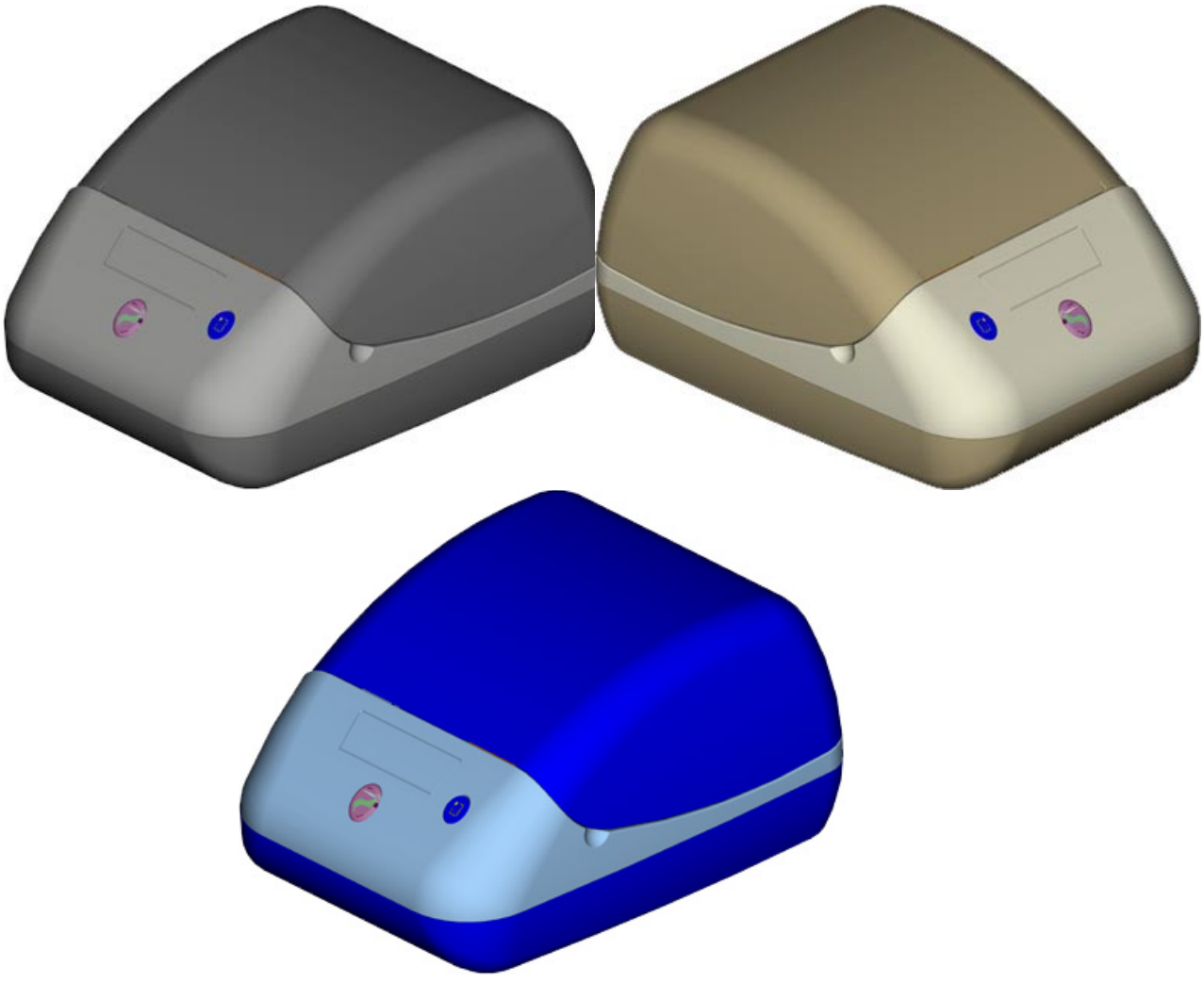
SMICE
Desktop Thermal Printer
112/80 mm
User Manual



COD. DOME - SMICE VERS. 1.00

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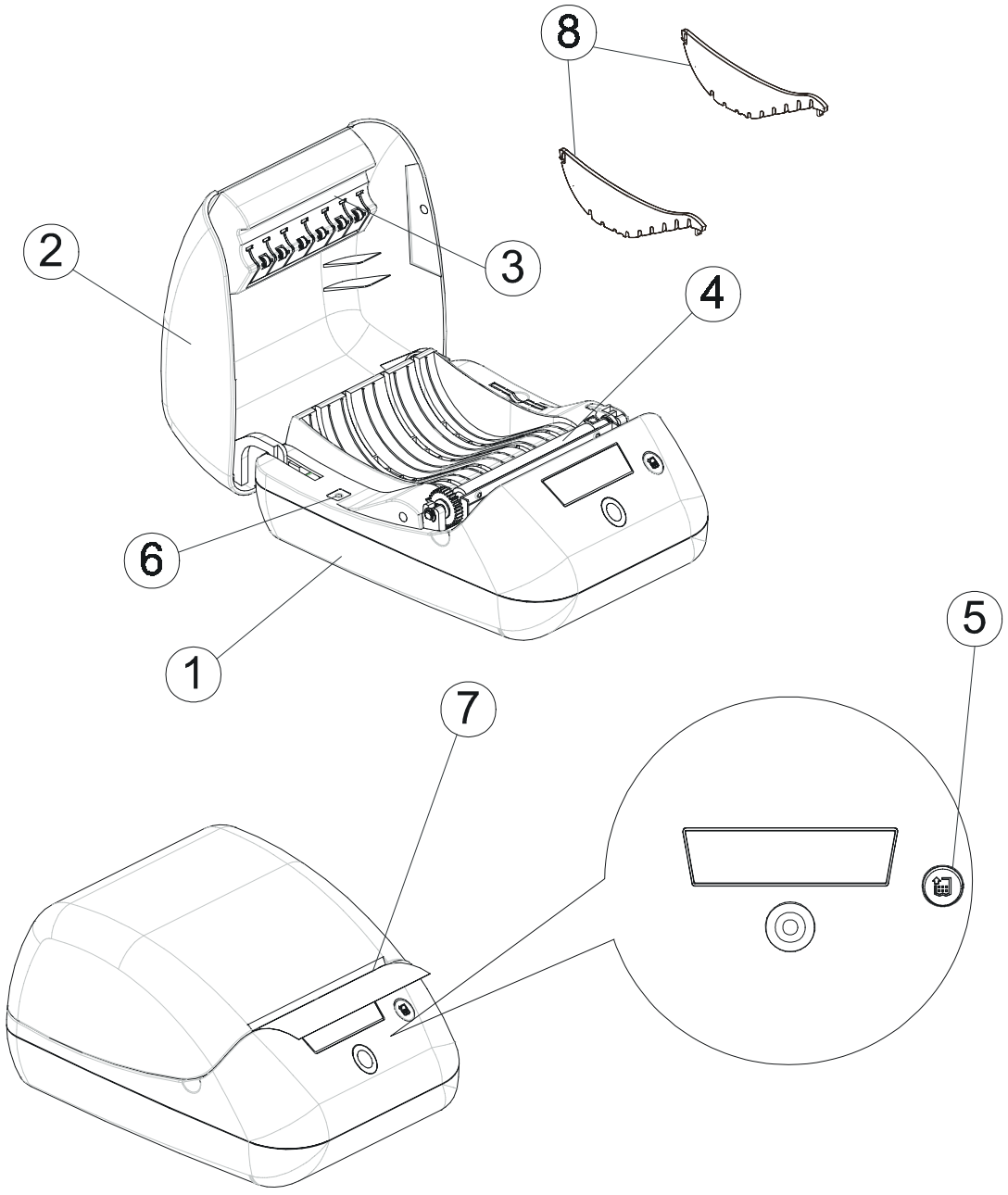
PRINTER COMPONENTS

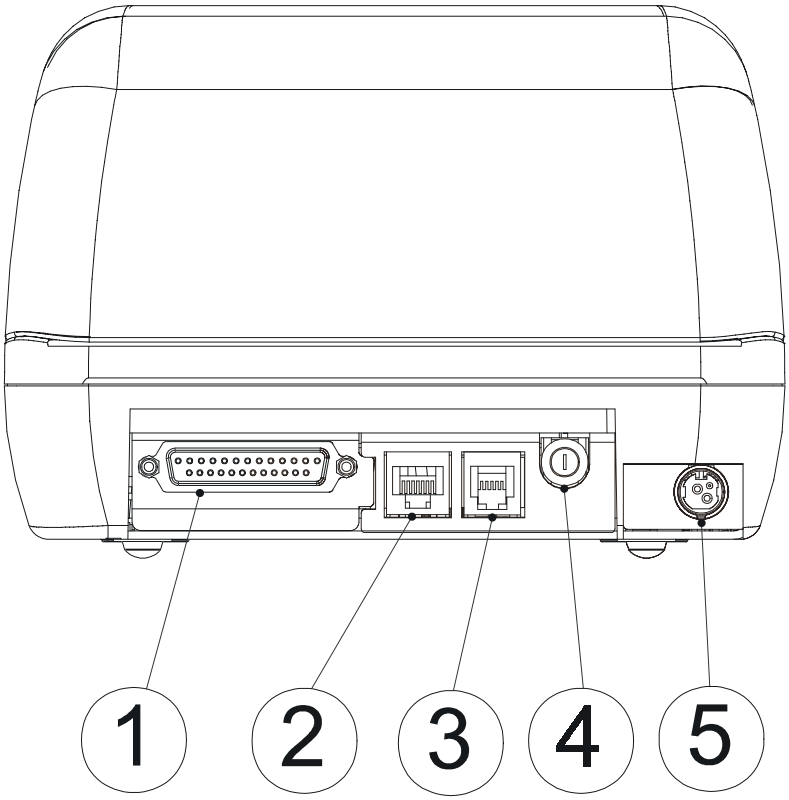
A. SMICE - front exterior view

1- Printer base
2- Cover
3- Paper guide
4- Print mechanism + Cutter
5- Backlighting FEED key
6- Key “KEY2”
7- Paper opening
8- Paper control edges for 80mm roll



B. SMICE - rear view

1- Interface connector
2- Serial 2 connector
3- Drawer 1 and 2 connector
4- ON/OFF switch
5- Power supply connector



MANUAL ORGANIZATION

In addition to the Introduction which contains information regarding the symbols used in the manual, general safety information, instructions for unpacking the printer and a brief description and main characteristics of the machine, this manual is divided into the following chapters:

Chapter 1: Contains the information required for correct printer installation and use

Chapter 2: Contains interface data

Chapter 3: Contains a description of printer controls

Chapter 4: Contains printer technical data

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

SYMBOLS USED IN THE MANUAL

NOTE
Gives important information or suggestions for printer use.

WARNING
Information indicated by this symbol must be followed carefully to avoid damaging the printer.

DANGER
Information indicated by this symbol must be followed carefully to avoid damage or operator injury.

GENERAL SAFETY INFORMATION

- Read and retain the instructions which follow.
- Follow all indications and instructions given on the printer.
- Before cleaning the printer, be sure to pull out the electrical cable.
- Use a damp cloth to clean the printer. Do not use liquid or spray products.
- Do not operate the printer near water.
- Make sure that the surface on which the printer rests is stable. If it is not, the printer could fall, seriously damaging it.

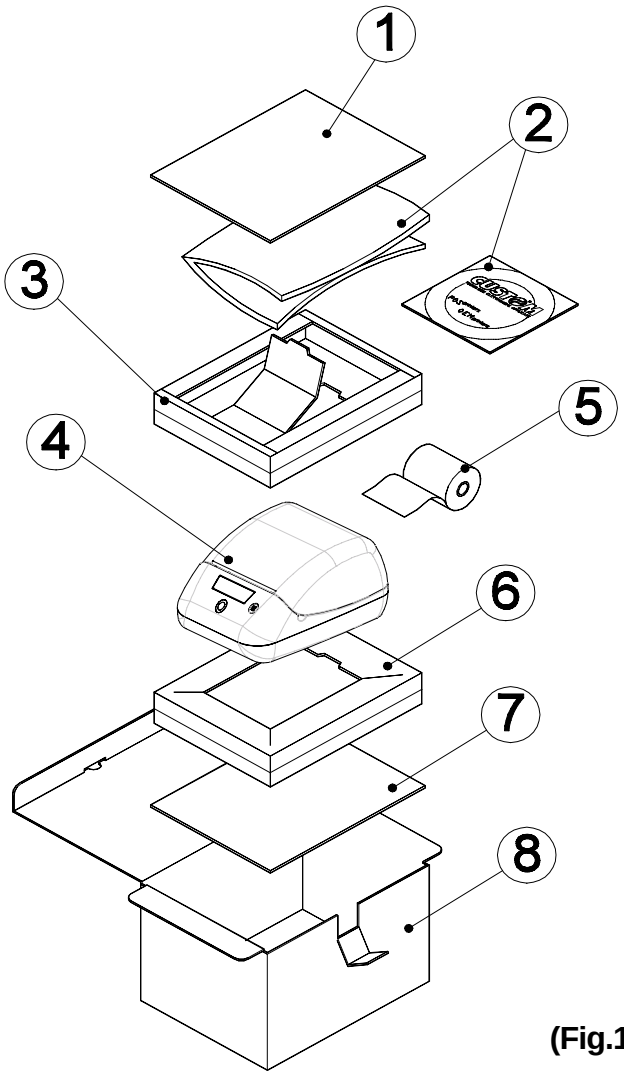
- Make sure that the printer rests on a hard (non-padded) surface and that there is sufficient ventilation.
- When positioning the printer, make sure its cables will not be damaged.
- Use the type of electrical power supply indicated on the printer label. If uncertain, contact your dealer.
- Do not block the ventilation openings.
- Do not insert objects inside the printer as this could cause short-circuiting or damage components that could jeopardize printer functioning.
- Do not spill liquids onto the machine.
- Do not carry out repairs on the machine yourself, except for the normal maintenance operations given in the user manual.
- Unplug the printer from the electrical mains and call a specialized repairman if any of the following conditions should arise:

A. the power supply connector is damaged
B. liquid has spilled into the printer
C. the printer has been exposed to rain or water
D. the printer is not functioning normally despite the fact that all instructions given in the user manual have been followed
E. the printer has been dropped and the cover is damaged
F. printer performance is noticeably reduced
G. the printer is not working

UNPACKING THE PRINTER

Remove the printer from the carton, taking care not to damage the packing materials which should be retained for future shipping/moving.
Make sure all components listed below are present and not damaged. If any part is missing and/or damaged, contact customer service.

1. Upper tray
2. Manual (or CD-rom)
3. Upper packing frame
4. Printer
5. Paper roll (inside printer)
6. Lower packing frame
7. Lower tray
8. Carton



(Fig.1)

- Open the printer packaging
- Remove the protective tray
- Lift off the upper packing frame and remove the manual (or CD-rom)
- Lift out the printer and remove it from the plastic bag
- Store the carton, trays and other packing materials for future shipping/ moving

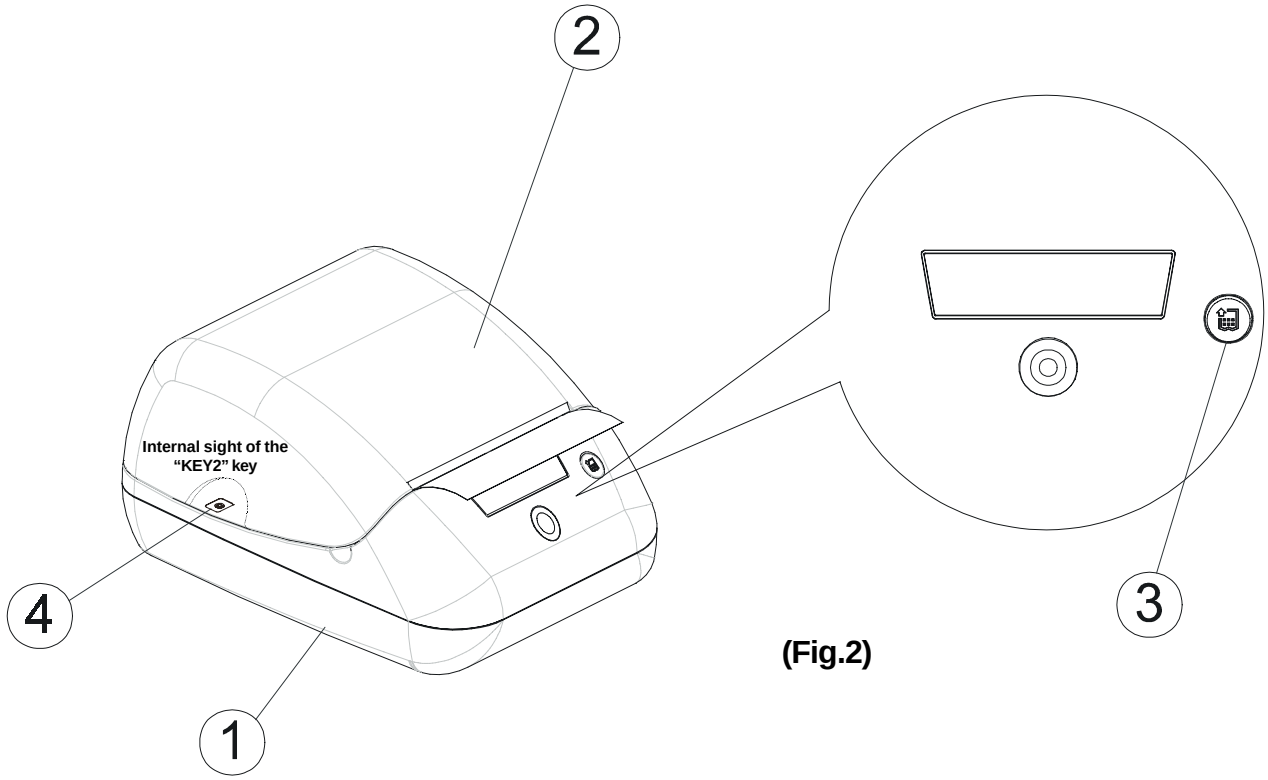
MAIN CHARACTERISTICS

The SMICE is a practical, easy-to-use, tabletop printer.
It offers an excellent solution for all industrial, professional and laboratory applications that require immediate data printout onto a receipt: POS, weighing systems, cashier systems, bookkeeping, receipts or fiscal documents, security, checking and diagnosis.
It is equipped with a 200 dpi (8 dots/mm) thermal printing mechanism that utilizes 112mm-wide paper rolls. In addition to normal printing features, the SMICE includes a wide range of added functions:

- High-speed printing: 120 mm/sec (normal), 160 mm/sec. (High speed).
- Easy paper changing (automatic paper loading)
- ESC/POS™ emulation
- Paper width : 112/80 mm.
- Bar code UPC-A, UPC-E, EAN13, EAN8, CODE39, ITF, CODABAR, CODE93, CODE128 and CODE32
- 3 standard and international character fonts
- Programmable fonts
- Widht and height characters setting from 1 to 8, boldtype, italic, underlined, rotated 90°/180°
- Possibility to define function macros for automatic operation repetition
- Graphic printing
- Printing density (from -50% to +150%)
- 1 programmable logo (832 x 630 dots).
- Serial interfaces (from 1200 to 230400 bps) : RS232, RS422, RS485, TTL.
- Alternatives interfaces : CENTRONICS, USB, IRDA, RADIO.
- Reception buffer : from 16 bytes to 8 Kbytes.
- Serial 2 : RS232 (from 1200 to 38400 bps).

PRINTER DESCRIPTION

The SMICE printer (fig.2) consists of a shell in ABS-V0 (1) equipped with a cover (2) that provides access to the paper roll and printing mechanism.
On the front are the backlighting FEED key (3); the “KEY2” key is located inside of the printer by side of the roll holder opening (4).



(Fig.2)

- FEED key. When the FEED key is pressed, the printer advances the paper in order to insert it into the printing mechanism. During machine power-up, if the FEED key is pressed, the printer will perform the logo's print located in the flash memory and the FONT TEST.

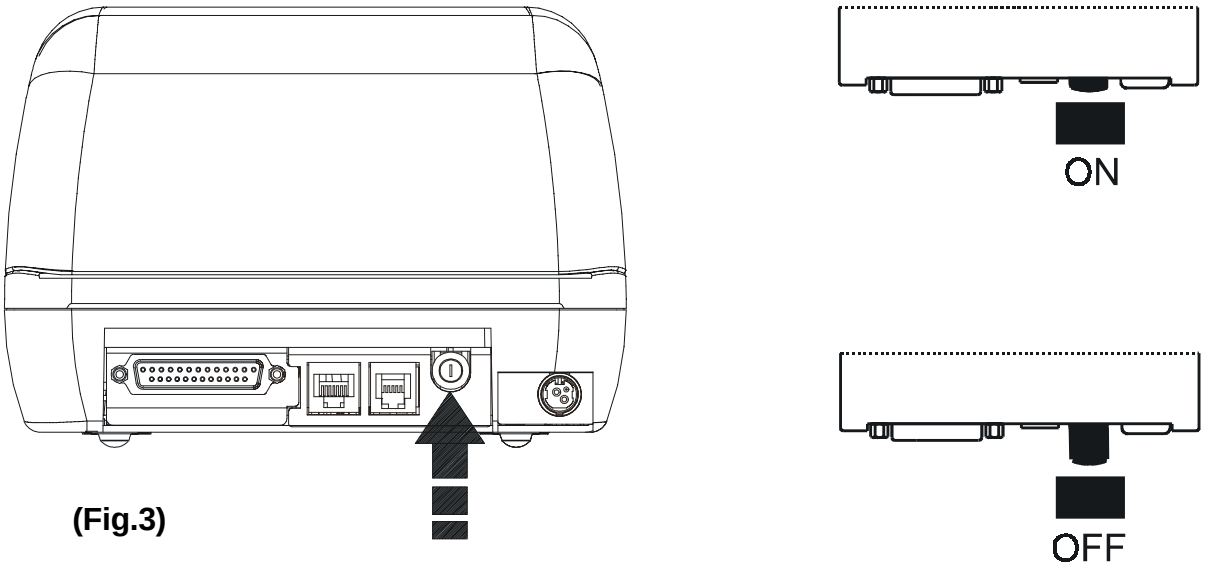
- During machine power-up, if the" KEY2" key is pressed, the printer goes in the SETUP procedure.

- The backlighting of the key displays printer hardware status. Monitoring is carried out "on-line", i.e., in case of malfunction, the color changing as follows:

(Tab.1)

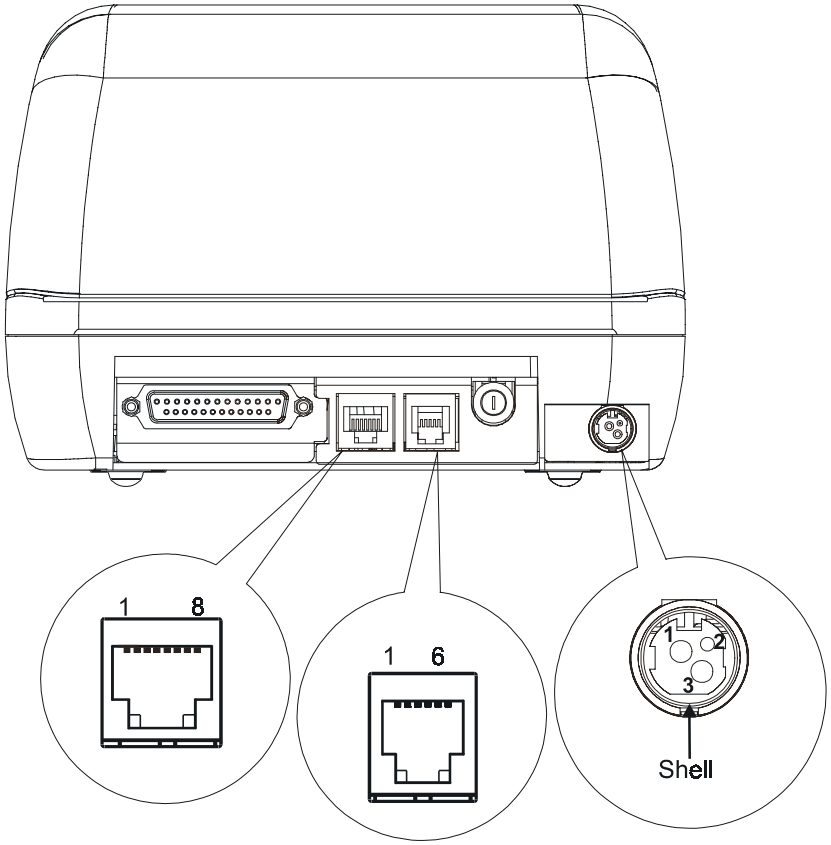
LED status	Description
None	Printer OFF
Green	Printer ON : no error
	Flashing : Data processing phase
Yellow	Printer in warning status : paper out, cover opened
Red	Printer in error status : power supply voltage incorrect, heading over temperature.

- ON/OFF key. When pressed, it turns on the printer (fig.3); when released, the printer shuts off.



(Fig.3)

1.1 CONNECTIONS



(Fig.1.1)

1.1.1 Power supply

The SMICE printer is equipped to an external supply electrical power. The functions assigned to the pins in the connector are as follows:

PIN	SIGNAL
1	+ 24 V
2	GND
3	GND
4	Frame GND

(Tab.1.1)

WARNING:
Be sure to observe the correct polarity for the power supply.

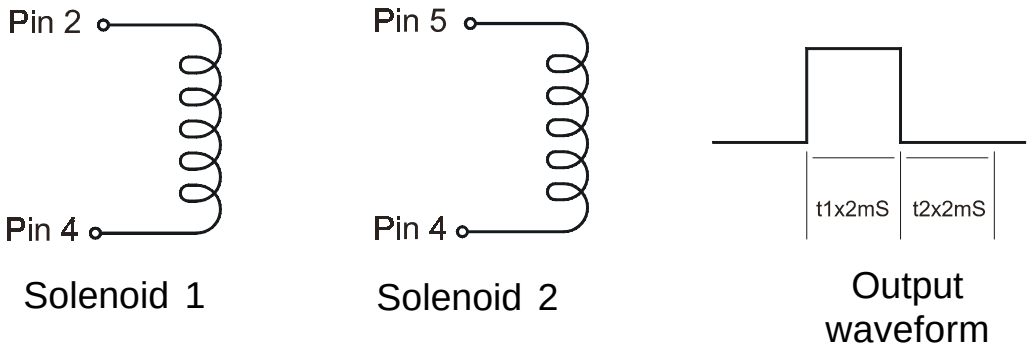
1.1.2 Connectors for Drawers 1 and 2

The impulse specified by the **ESC P** command is in output at these connectors. The host can confirm the status of input signals through the **DLE EOT**, **ESC u**, **GS r** commands.
The functions assigned to the pins in the connector are as follows:

PIN	SIGNAL	IN / OUT
1	GND	
2	TILL KICK-OUT DRIVE 1 SIGNAL	OUT
3	TILL OPEN/CLOSE SIGNAL	IN
4	+ 24 V	
5	TILL KICK-OUT DRIVE 2 SIGNAL	OUT
6	GND	

(Tab.1.2)

The solenoid must be connected between connector pins 2 or 5 and 4.



Solenoid 1 Solenoid 2 Output waveform

(Fig.1.2)

WARNING:
To avoid current overload, the resistance of the drawer kick-out solenoid must be ≥ 24 Ω.

Drawer kick-out drive signal
Current: 1A (max 10 sec.) or less
Output waveform: t1 (ON time) and t2 (OFF time) are specified by **ESC P.**
In ON time phase (t1), output voltage is approx. 0V.
In OFF time phase (t2), the output signal is at high impedance.

1.2 SETUP

The SMICE printer can be configured with default parameters which are:

- **Paper width:** 112ᴰ, 80.
- **Printer emulation:** ESC/POS™.
- **Baud Rate:** 230400, 115200, 57600, 38400, 19200, 9600ᴰ, 4800, 2400, 1200.
- **Data length:** 7, 8ᴰ bits/char.
- **Parity:** Noneᴰ, even or odd.
- **Handshaking:** XON/XOFFᴰ or Hardware.
- **Reception buffer dimension:** 16, 64, 1K, 4K, 8Kᴰ.
- **Serial 2 Baud Rate:** 38400, 19200, 9600ᴰ, 4800, 2400, 1200.
- **Serial 2 data length:** 7, 8ᴰ bits/char.
- **Serial 2 parity:** Noneᴰ, even or odd.
- **Serial 2 handshaking:** XON/XOFFᴰ o Hardware.
- **Autofeed:** CR disabledᴰ or CR enabled.
- **Front panel keys:** Enabledᴰ or disabled.
- **Print mode:** Normalᴰ or Reverse.
- **Height mode:** x1ᴰ, x2, x3, x4, x5, x6, x7 and x8.
- **Width mode:** x1ᴰ, x2, x3, x4, x5, x6, x7 and x8.
- **Characters/inch:** A=11 B=15 cpiᴰ, A=15 B=20 cpi .
- **Justification:** Flush leftᴰ, centered or flush right.
- **Speed/Quality:** Normalᴰ, Draft or High Quality.
- **Red Printing:** Disabledᴰ or enabled.
- **Print Density:** -50%, -37%, -25%, -12%, Normaleᴰ, +12%, +25%, +37%, +50%, +62%, +75%, +87%, +100%, +112%, +125%, +137%, +150%.

Notes : The parameters indicates with a ᴰ symbol are the default values.

The operational settings are saved as EEPROM (non volatile memory). During power-up, if the “KEY2” key is held down, the printer switches to setup mode and prints out the machine setup report. After which the printer will wait until a key is pressed or characters are received from the port: for each 10 characters, it prints hexadecimal and ASCII codes (if the characters appear underlined, the buffer is full); see Hexadecimal dump.
When the FEED key is pressed, the printer skips the setup mode and ends the Hexadecimal dump function.

1.3 HEXADECIMAL DUMP

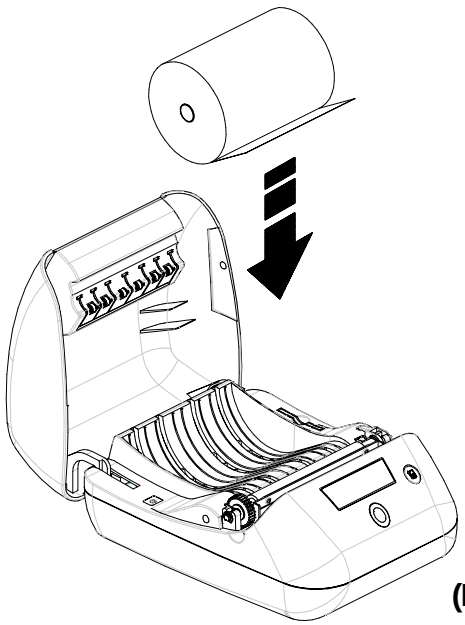
Once the autotest procedure has been completed, the printer switches to the Hexadecimal Dump mode. This function is used for diagnostics of characters received from the communication port which are printed out in hex and corresponding ASCII codes.
Figure 1.3 shows a sample printer Setup printout.

```
48 65 78 61 64 65 63 69 6D 61    Hexadecima
6C 20 64 75 6D 70 20 66 75 6E    l dump fun
63 74 69 6F 6E 20 30 31 32 33    ction 0123
34 35 36 37 38 39 61 62 63 64    456789abcd
65 66 67 68 69 6A 6B 6C 6D 6E    efghijklmn
6F 70 71 72 73 74 75 76 77 78    opqrstuvwx
79 7A                            yz
```

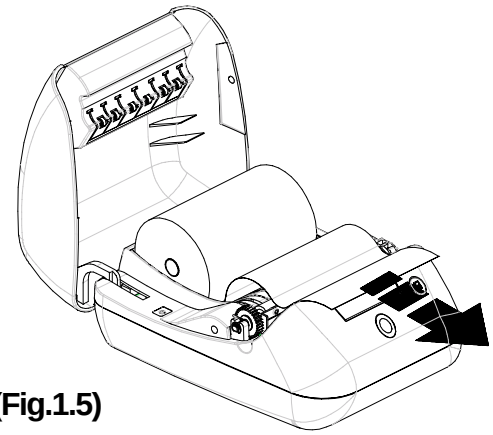
1.4 MAINTENANCE

1.4.1 Changing the paper roll

To change the paper roll in a SMICE printer, proceed as follows:
1) Open the printer cover and position the paper roll in its seating guides, making sure it unrolls in the proper direction (fig.1.4);
2) Pull the roll until the paper emerges from the upper edge of the rest plate (fig.1.5);

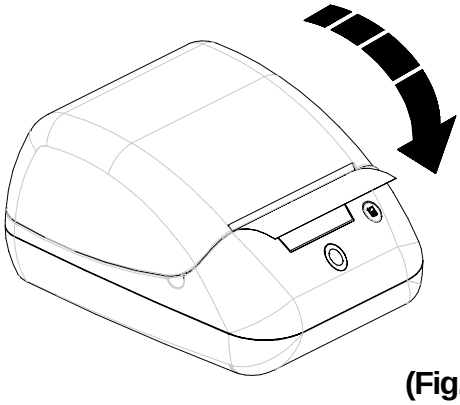


(Fig.1.4)

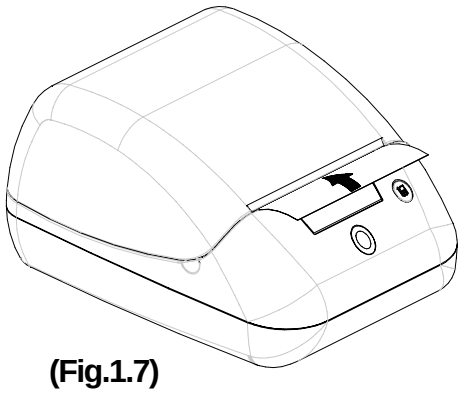


(Fig.1.5)

3) Close the cover (fig.1.6);
4) This starts the AUTOLOAD function: the paper will first recede back into the printer and then re-emerge (fig.1.7);

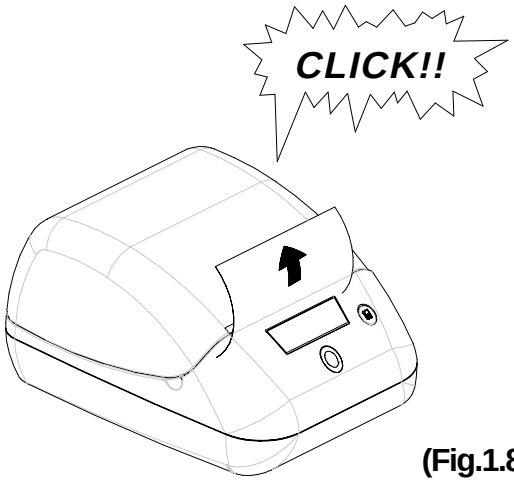


(Fig.1.6)

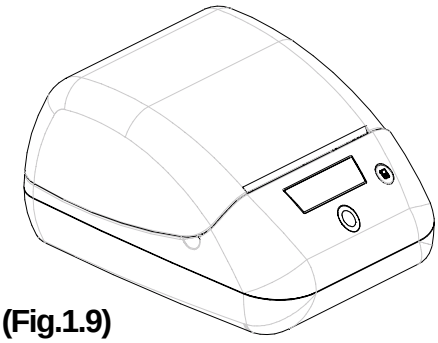


(Fig.1.7)

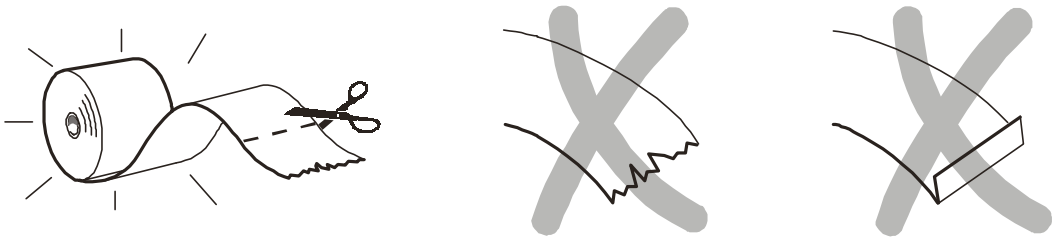
5) When the paper has advanced a few centimeters, the cutter will cut the paper (fig.1.8);
6) Remove the slip of paper. The printer is ready for use (fig.1.9).



(Fig.1.8)



(Fig.1.9)

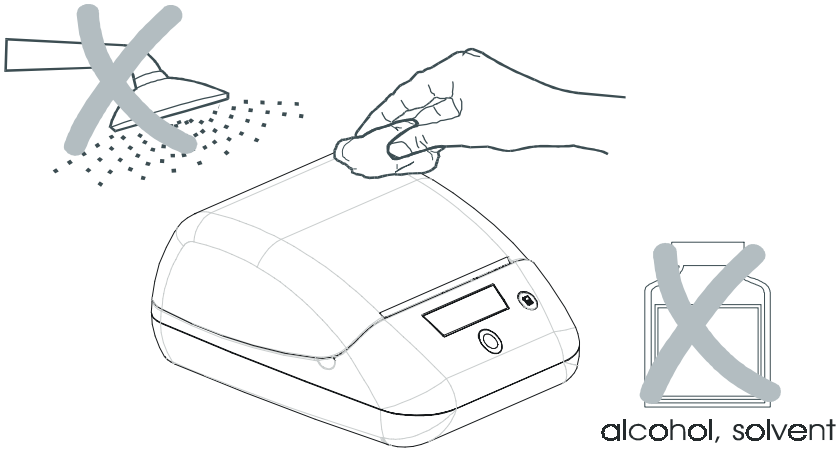


(Fig.1.10)

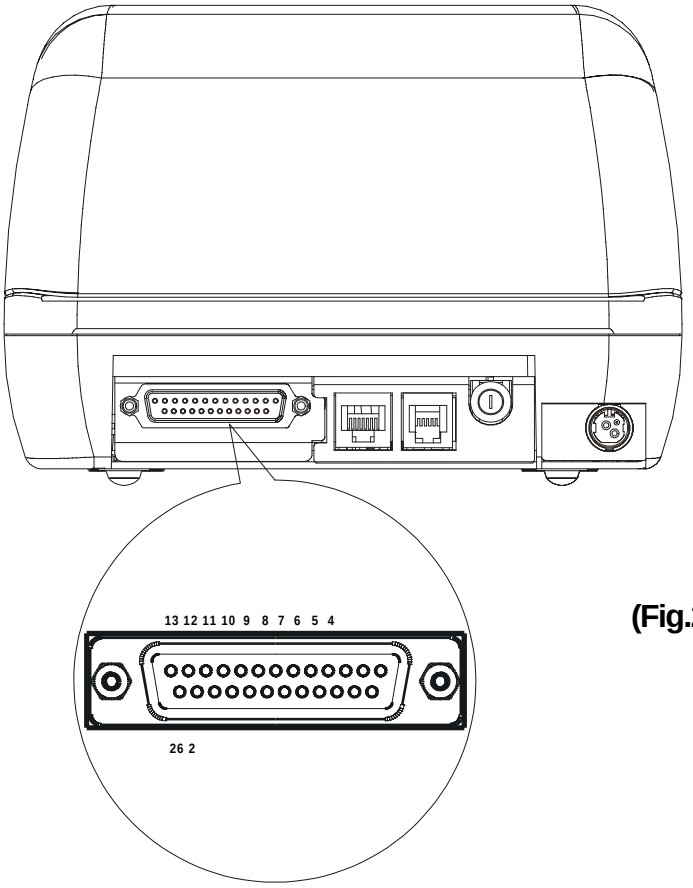
WARNING
Before inserting the paper, maker sure it has a cleanly-cut edge.

1.4.2 Cleaning

To clean the printer, use a vacuum cleaner or soft cloth.
Before cleaning the printer, unplug the electrical power supply cable.
Do not use alcohol, solvents or stiff-bristled brushes.
Do not let water or other liquids seep into the printer.



(Fig.1.11)



(Fig.2.1)

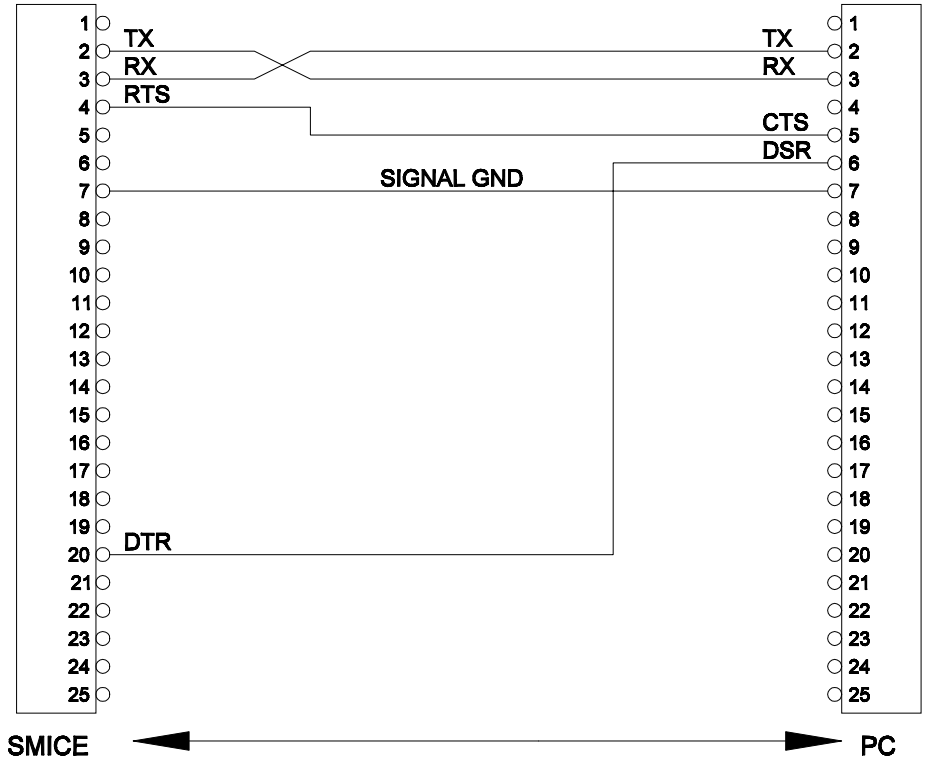
2.1 SERIAL - RS232 / TTL

The SMICE has an RS232 or TTL serial interface with a rectangular 25-pin female connector. The signals on the connector pins and their connection to the PC are shown in the following table.

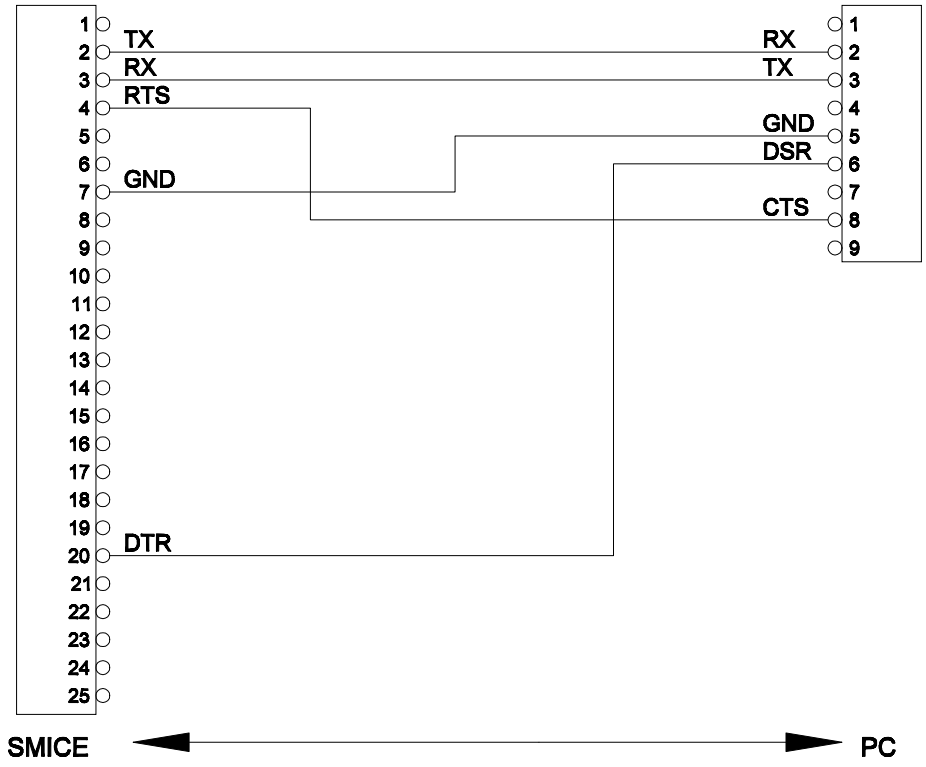
PIN	SIGNAL	IN/OUT	A	DESCRIPTION
2	TX	OUT	RX	Receive data. Serial output (from host)
3	RX	IN	TX	Transmit data. Serial input (towards host)
4	RTS	OUT	CTS	Ready to send. Ready to receive data (active at RS232 high level)
7	GND	-	GND	Signal ground
20	DSR	OUT	DSR	Data set ready. Printer is on and functioning (active at RS232 high level)

(Tab.2.1)

The diagrams below illustrate a sample connection between the printer and the Personal Computer using a 25- and 9-pin female connector.



(Fig.2.2)



(Fig.2.3)

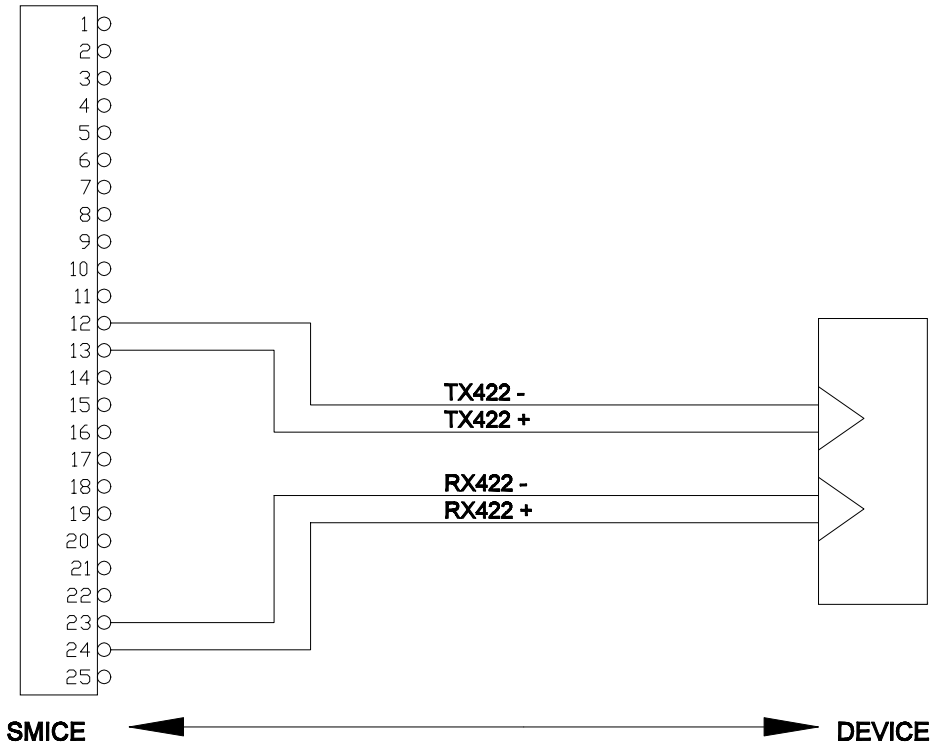
2.2 SERIAL - RS422

The SMICE has an RS422 serial interface with a rectangular 25-pin female connector. The signals on the connector pins and their connection to a device are shown in the following table.

(Tab.2.2)

PIN	SIGNAL	IN/OUT	DESCRIPTION
12	TX422-	OUT	Receive data. Serial output (from host)
13	TX422+	OUT	Receive data. Serial output (from host)
23	RX422-	IN	Transmit data. Serial input (towards host)
24	RX422+	IN	Transmit data. Serial input (towards host)

The diagram below illustrates the connection between the printer and a device using an RS422 interface.



(Tab.2.2)

(Fig.2.4)

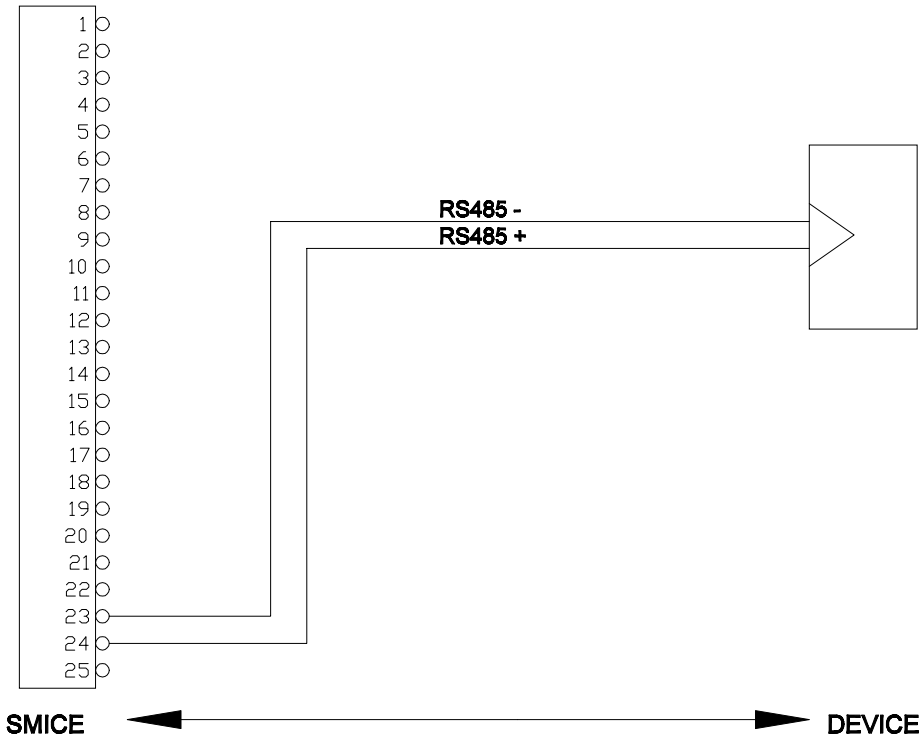
2.3 SERIAL - RS485

The SMICE has an RS485 serial interface with a rectangular 25-pin female connector. The signals on the connector pins and their connection to a device are shown in the following table.

(Tab.2.3)

PIN	SIGNAL	IN/OUT	DESCRIPTION
23	RS485-	IN	Transmit data. Serial input (towards host)
24	RS485+	OUT	Receive data. Serial output (from host)

The diagram below illustrates the connection between the printer and a device using an RS485 interface.



(Fig.2.5)

2.4 PARALLEL - CENTRONICS

The printer has a Centronics parallel interface with a rectangular 25-pin female connector that uses a 25-pin female connector.
The connector signals are given in the table below.

(Tab.2.4)

PIN	SIGNALE	DIRECTION
1	Strobe	In
2	Data bit 0	In
3	Data bit 1	In
4	Data bit 2	In
5	Data bit 3	In
6	Data bit 4	In
7	Data bit 5	In
8	Data bit 6	In
9	Data bit 7	In
10	ACK	Out
11	BUSY	Out
12	PAPER END	Out
13	SELECT	Out
14	AUTO FEED	In
15	FAULT	Out
16	RESET	In
17	SELECT INPUT	In
18-25	GND	-

3.1 COMMAND DESCRIPTIONS

3.1.1 ESC/POS Emulation

The following table lists all the commands for function management in ESC/POS™ Emulation of the SMICE printer. The commands can be transmitted to the printer at any moment, but they will only be carried out when the commands ahead of them have been executed. The commands are carried out when the circular buffer is free to do so

.

(Tab.3.1) COMMAND DESCRIPTION TABLE

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

ASCII	HEX	Description
ESC D n1...nk NUL	$1B $44 n1...nk 00	Set horizontal tab positions
ESC E n	$1B $45 (n)	Select emphasized mode
ESC G n	$1B $47 (n)	Select double-strike mode
ESC J n	$1B $4A (n)	Print and feed paper
ESC R n	$1B $52 (n)	Select international character set
ESC V n	$1B $56 (n)	Select print mode 90° turned
ESC \ nL nH	$1B $5C nL nH	Set relative print position
ESC a n	$1B $61 (n)	Select justification
ESC c 5 n	$1B $63 $35 (n)	Enable/disable front panel buttons
ESC d n	$1B $64 (n)	Print and feed paper n lines
ESC i	$1B $69	Total cut
ESC m	$1B $6D	Partial cut
ESC p m t1 t2	$1B $70 m t1 t2	Generate pulse
ESC r n	$1B $72 (n)	Set/reset red printing mode
ESC t n	$1B $74 (n)	Select character code table
ESC u n	$1B $75 (n)	Transmit peripheral device status
ESC v	$1B $76	Transmit printer status
ESC { n	$1B $7B (n)	Set/cancel upside-down character printing
ESC · n xL xH yH yL	$1B $FA n xL xH yH yL	Print graphic
ESC ¹ nL nH	$1B $FB nL nH	Transmit graphic page to communication port
ESC ³ n	$1B $FC (n)	Transfer flash bank into graphic page
ESC ² nL nH	$1B $FD nL nH	Receive graphic page from communication port
ESC ¦ n	$1B $FE (n)	Transfer graphic page into flash bank
GS ! n	$1D $21 (n)	Select character size
GS :	$1D $3A	Set start/end of macro definition
GS B n	$1D $42 (n)	Turn white/black reverse printing mode on/off
GS C 0 n m	$1D $43 $30 n m	Select counter print mode
GS C 1 aL aH bL bH n r	$1D $43 $31 aL aH bL bH n r	Select count mode (A)

ASCII	HEX	Description
GS C 2 nL nH	$1D $43 $32 nL nH	Select counter
GS C ; sa ; sb ; sn ; sr ; sc ;	$1D $43 $3B sa $3B sb $3B sn $3B sr $3B sc $3B	Select count mode (B)
GS H n	$1D $48 (n)	Select printing position of HRI characters
GS I n	$1D $49 (n)	Transmit printer ID
GS L nL nH	$1D $4C nL nH	Set left margin
GS P x y	$1D $50 x y	Set horizontal and vertical motion units
GS W nL nH	$1D $57 nL nH	Set printing area width
GS ^ r t m	$1D $5E r t m	Execute macro
GS c	$1D $63	Print counter
GS f n	$1D $66 (n)	Select font for HRI characters
GS h n	$1D $68 (n)	Select height of bar code
GS k m NUL	$1D $6B m 00	Print bar code
GS r n	$1D $72 (n)	Transmit status
GS w n	$1D $77 (n)	Select horizontal side (enlargement) of bar code
GS | n	$1D $7C (n)	Set printing density
GS ~ n	$1D $7E (n)	Set superscript/subscript
GS - n	$1D $F0 (n)	Set printing speed
GS ± n	$1D $F1 (n)	Set current print consumption

Given below are more detailed descriptions of each command.

HT

[Name] **Horizontal tab**

[Format] ASCII HT

Hex 09

Decimal 9

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

[Notes] • Ignored unless the next horizontal tab position has been set.
• If the command is received when the printing position is at the right margin, the printer executes print buffer full printing and horizontal tab processing from the beginning of the next line.
• Horizontal tab positions are set using ESC D**.**

[Default]

[Reference] **ESC D**

[Example]

LF

[Name] **Print and line feed**

[Format] ASCII LF
Hex 0A
Decimal 10

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

[Notes] • Sets the print position to the beginning of the line.

[Default]

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

[Example]

BS

[Name] **Back space**

[Format] ASCII BS
Hex 08
Decimal 8

[Description] Moves print position to previous character.

[Notes] Can be used to put two characters at the same position.

[Default]

[Reference]

[Example]

CR

[Name] **Print and carriage return**

[Format]

ASCII	CR	
Hex	0D	
Decimal	13	

[Description] When autofeed is “CR enabled”, this command functions in the same way as **LF**, otherwise it is disregarded.

[Notes] • Sets the print position to the beginning of the line.

[Default] See “Autofeed in setup” parameter.

[Reference] **LF**

[Example]

DLE EOT n

[Name] **Real-time status transmission**

[Format]

ASCII	DLE	EOT	n
Hex	10	04	n
Decimal	16	4	n

[Range] $1 \leq n \leq 17$

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

n = 1 transmit printer status
n = 2 transmit off-line status
n = 3 transmit error status
n = 4 transmit paper roll sensor status
n = 17 transmit print status

[Notes] • Immediately executed even when the data buffer is full. This status is transmitted whenever data sequence 10H 04H n (1≤n≤17) is received.

[Default]

[Reference] See tables below.

[Example]

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 kick-out signal Low (pin 3).
	On	04	4	Drawer kick-out signal High (pin 3).
3	Off	00	0	On-line.
	On	08	8	Off-line.
4	On	10	16	Not used. Fixed to On.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

n=2: Off-line 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 open.
	On	04	4	Cover close.
3	Off	00	0	Paper is not being fed by FEED button.
	On	08	8	Paper is being fed by FEED button.
4	On	10	16	Not used. Fixed to On.
5	Off	00	0	No paper end stop.
	On	20	32	Printing stops due to paper end.
6	Off	00	0	No error.
	On	40	64	Error.
7	Off	00	0	Not used. Fixed to Off.

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	Off	00	0	Not used. Fixed to Off.
3	Off	00	0	Cutter OK.
	On	08	8	Cutter error.
4	On	10	16	Not used. Fixed to On
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurs (cutter, memory, RTCK,FPGA).
6	Off	00	0	No auto-recoverable error.
	On	40	64	Auto-recoverable error (overtemperature, parity, wrong command).
7	Off	00	0	Not used. Fixed to Off

n=4: Paper roll 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	Off	00	0	Not used. Fixed to Off.
3	Off	00	0	Not used. Fixed to Off.
4	On	10	16	Not used. Fixed to On
5, 6	On	60	96	Fixed to On. Paper end detected by paper end sensor.
7	Off	00	0	Not used. Fixed to Off

n=17: Print 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	Paper drag motor off.
	On	04	4	Paper drag motor on
3	Off	00	0	Not used. Fixed to Off.
4	On	10	16	Not used. Fixed to On
5	Off	00	0	Paper adeguate
	On	20	32	The print is stopped; paper out error occurs.
6	Off	00	0	Motor temperature OK
	On	40	64	Overtemperature motor error occurs
7	Off	00	0	Not used. Fixed to Off

CAN

[Name] **Cancel print data buffer**

[Format]

ASCII	CAN	
Hex	18	
Decimal	24	

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

[Notes] Sets the print position to the beginning of the line.

[Default]

[Reference]

[Example]

ESC SP n

[Name] **Set right-side character spacing**

[Format]

ASCII	ESC	SP	n
Hex	1B	20	n
Decimal	27	32	n

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

[Description] Sets the character spacing for the right side of the character to [n x horizontal or vertical motion units].

[Notes]
- The right character spacing for double-width mode is twice the normal value.
  When the characters are enlarged, the right side character spacing is m (2 or 4) times the normal value.
- The horizontal and vertical motion units are specified by **GS P**. Changing the horizontal or vertical motion units does not affect the current right side spacing.
- The **GS P** command can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount.
- In standard mode, the horizontal motion unit is used.
- The maximum right side spacing is 255/200 inches.

[Default] n = 0

[Reference] **GS P**

[Example]

ESC ! n

[Name] **Select print modes**

[Format]

ASCII	ESC	!	n
Hex	1B	21	n
Decimal	27	33	n

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

[Description] Selects print modes using *n* (see table below):

Bit	Off/On	Hex	Decimal	Function	11/15 cpi	15/20 cpi
0	Off	00	0	Character font A selected.	18 x 24	13 x 24
	On	01	1	Character font B selected.	13 x 24	10 x 24
1	-	-	-	Undefined.		
2	-	-	-	Undefined.		
3	Off	00	0	Expanded mode not selected.		
	On	08	8	Expanded mode selected.		
4	Off	00	0	Double-height mode not selected.		
	On	10	16	Double-height mode selected.		
5	Off	00	0	Double-width mode not selected.		
	On	20	32	Double-width mode selected.		
6	Off	00	0	Italic mode not selected.		
	On	40	64	Italic mode selected.		
7	Off	00	0	Underline mode not selected.		
	On	80	128	Underline mode selected.		

[Notes]

- The printer can underline all characters, but cannot underline the spaces set by **HT**, **ESC $**, **ESC ** and 90°/270° rotated characters.
- When characters are enlarged to different heights on one line, the characters are aligned at the baseline or topline (see **GS ~**).
- This command resets the left and right margin at default value (see **GS L**, **GS W**).
- **ESC E** can also be used to turn the emphasized mode on/off. However, the last-received setting command is the effective one.
- **ESC -** can also be used to turn the underlining mode on/off. However, the last-received setting command is the effective one.
- **ESC 4** can also be used to turn the italic mode on/off. However, the last-received setting command is the effective one.
- **GS !** can also be used to select character height/width.

However, the last-received setting command is the effective one.

[Default] n = 0

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

[Example]

ESC $ nL nH

[Name] **Set absolute print position**

[Format]

ASCII	ESC	$	nL	nH
Hex	1B	24	nL	nH
Decimal	27	36	nL	nH

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

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

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

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

[Default]

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

[Example]

ESC % n

[Name] **Select/cancel user-defined characters**

[Format]

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

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

[Description] Selects or cancels the user-defined character set.
When the Least Significant Bit (LSB) of n is 0, the user-defined character set is canceled.
When the LSB of n is 1, the user-defined character set is selected.

[Notes]
- Only the LSB of n is applicable.
- When the user-defined character set is canceled, the internal character set is automatically selected.

[Default] n=0

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

[Example]

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

[Name] **Defines user-defined characters**

[Format]

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

[Range]
$y = 3$
$32 \le c1 \le c2 \le 126$
$0 \le x \le 16$ (Font (18×24))
$0 \le x \le 10$ (Font (10×24))
$0 \le x \le 8$ (Font 8×24)
$0 \le d1 \ldots d (y \times xk) \le 255$
$k = c2 - c1 + 1$

[Description] Defines user-defined characters.
Y specifies the number of bytes in the vertical direction.
C1 specifies the beginning character code for the definition, and C2 specifies the final code.
X specifies the number of dots in the horizontal direction.

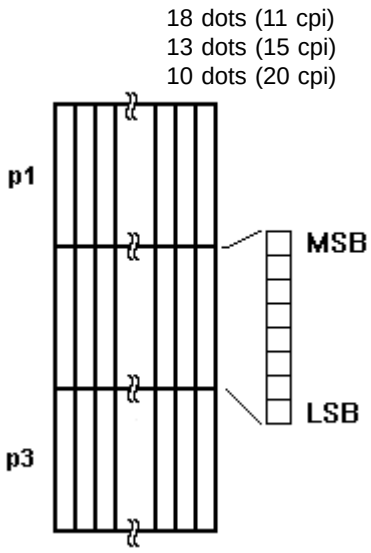
[Notes]
- The allowable character code range is from ASCII 20H (32) to 7EH (126) (95 characters).

• It is possible to define multiple characters for consecutive character codes. If only one character is desired, use c1 = c2.
• If c2 < c1, the command is not executed.
• d is the dot data for the characters. The dot pattern is in the horizontal direction starting from the left. Any remaining dots on the right remain blank.
• The data to define a user-defined character is (x x y) bytes.
• To print a dot, set the corresponding bit to 1; to not have it print, set to 0.
• This command can define different user-defined character patterns for each font. To select the font, use **ESC !**.
• A user-defined character and a downloaded bit image cannot be defined simultaneously. When this command is executed, the downloaded bit image is cleared.
• The user-defined character definitions are cleared when:
ESC @ or
GS * or
ESC ? are executed or
the printer is reset or the power shut off.

[Default] Internal character set.

[Reference] **ESC %, ESC ?**

[Example]



ESC * m nL nH d1...dk

[Name] **Select bit image mode**

[Format]

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

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

$0 \le nL \le 255$

$0 \le nH \le 3$

$0 \le d \le 255$

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

m		Vertical direction		Horizontal direction (*1)	
		N. dots	DPI	DPI	N. of Data (k)
0	8 dot single density	8	67	100	nL + nH x 256
1	8 dot double density	8	67	200	nL + nH x 256
32	24 dot single density	24	200	100	(nL + nH x 256) x 3
33	24 dot double density	24	200	200	(nL + nH x 256) x 3

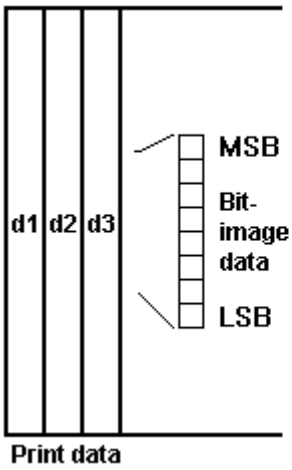
[Notes]

- The *nL* and *nH* commands indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated using: nL + nH $\times$ 256.
- If the bit image data input exceeds the number of dots to be printed on a line, the excess data is ignored.
- *d* indicates the bit image data. Set a corresponding bit to 1 to print a dot, or to 0 to not print the dot.
- If the value of *m* is outside the specified range, *nL* and data following it are processed as normal data.
- If the width of the printing area set by **GS L** and **GS W** is less than the width required by the data set using **ESC *** , the excess data are ignored.
- To print the bit image use **LF**, **CR**, **ESC J** or **ESC d**.
- After printing a bit image, the printer returns to normal data processing mode.

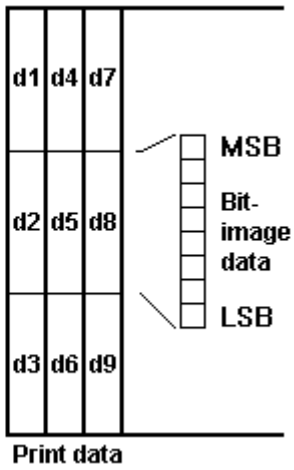
• This command is not affected by the emphasized, double-strike, underline (etc.) print modes, except for the upside-down mode.

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

8-dot bit image



24-dot bit image



[Default]

[Reference]

[Example]

ESC - n

[Name] **Turn underline mode on/off**

[Format]

ASCII	ESC	-	n
Hex	1B	2D	n
Decimal	27	45	n

[Range] $0 \le n \le 2, 48 \le n \le 50$

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

n = 0, 48 Turns off underline mode
n = 1, 49 Turns on underline mode (1-dot thick)
n = 2, 50 Turns on underline mode (2-dot thick)

[Notes] • The printer can underline all characters, but cannot underline the space set by **HT** and right-side character spacing.

• The printer cannot underline 90°/270° rotated characters and white/black inverted characters.
• When underline mode is turned off by setting the value of *n* to 0 or 48, the data which follows is not underlined.
• Underline mode can also be turned on or off by using **ESC !**. Note, however, that the last received command is the effective one.

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

ESC 0

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

ESC 2

[Name] **Select 1/6-inch line spacing**
[Format] ASCII ESC 2
Hex 1B 32
Decimal 27 50
[Description] Selects 1/6-inch line spacing.
[Notes]
[Default]
[Reference] **ESC 0, ESC 3**
[Example]

ESC 3 n

[Name] **Set line spacing**

[Format]

ASCII	ESC	3	n
Hex	1B	33	n
Decimal	27	51	n

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

[Description] Sets line spacing to [*n* × (vertical or horizontal motion unit)] inches.

[Notes]
- The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current line spacing.
- The **GS P** command can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum vertical movement amount.
- In standard mode, the vertical motion unit is used.

[Default] n = 64 (1/6 inch)

[Reference] **ESC 0, ESC 2, ESC P**

[Example]

ESC 4 n

[Name] **Set/reset italic mode**

[Format]

ASCII	ESC	4	n
Hex	1B	34	n
Decimal	27	52	n

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

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

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

[Notes]
- The printer can print any character in italic mode.
- When italic mode is turned off by setting the value of *n* to 0 or 48, the data which follows is printed in normal mode.
- Italic mode can also be turned on or off using **ESC !**. Note, however, that the last received command is the effective one.

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

ESC = n

[Name] **Select peripheral device**
[Format] ASCII ESC = n
Hex 1B 3D n
Decimal 27 61 n
[Range] 0 ≤ n ≤ 255
[Description] Select the device to which the host computer sends data, using *n* as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Printer disabled
	On	01	1	Printer enabled
1	-	-	-	Undefined
2	-	-	-	Undefined
3	-	-	-	Undefined
4	-	-	-	Undefined
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Pass-trough function disabeld
	On	80	128	Pass-trough function enabeld

[Notes] • When the printer is disabled, it ignores all transmitted data until the printer is enabled through this command.
• When the Pass-trough function is enabled, all transmitted data are sent on the 2nd serial.
[Default] n = 1
[Reference]
[Example]

ESC ? n

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

[Format]

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

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

[Description] Cancels user-defined characters.

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

[Default]

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

[Example]

ESC @

[Name] **Initialize printer**

[Format]

ASCII	ESC	@
Hex	1B	40
Decimal	27	64

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

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

[Default]

[Reference]

[Example]

ESC D [n1...nk] NUL

[Name] **Set horizontal tab positions**

[Format]

ASCII	ESC	D	n1...nk	NUL
Hex	1B	44	n1...nk	00
Decimal	27	68	n1...nk	0

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

$0 \le k \le 32$

[Description] Sets horizontal tab positions

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

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

[Notes]

• The horizontal tab position is stored as a value of [character width x *n*] measured from the beginning of the line. The character width includes the right-side character spacing and double-width characters are set with twice the width of normal characters.

• This command cancels previous tab settings.

• When setting n = 8, the print position is moved to column 9, by sending **HT**.

• Up to 32 tab positions (*k* = 32) can be set. Data exceeding 32 tab positions is processed as normal data.

• Send [*n*] *k* in ascending order and place a 0 NUL code at the end. When [*n*] *k* is less than or equal to the preceding value [*n*] *k*-1, the setting is complete and the data which follows is processed as normal data.

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

• The previously specified horizontal tab position does not change, even if the character width is modified.

[Default] Default tab positions are set at intervals of 8 characters (columns 9, 17, 25, …) for Font A when the right-side character spacing is 0.

[Reference] **HT**

[Example]

ESC E n

[Name] **Turn emphasized mode on/off**

[Format]

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

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

[Description] Turns emphasized mode on/off.
- When the LSB of *n* is 0, the emphasized mode is off.
- When the LSB of *n* is 1, the emphasized mode is on.

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

[Default] n = 0

[Reference] **ESC !**

[Example]

ESC G n

[Name] **Turn double-strike mode on/off**

[Format]

ASCII	ESC	G	n
Hex	1B	47	n
Decimal	27	71	n

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

[Description] Turns double-strike mode on or off.
- When the LSB of *n* is 0, the double-strike mode is off.
- When the LSB of *n* is 1, the double-strike mode is on.

[Notes]
- Only the LSB of *n* is effective.
- Printer output is the same in double-strike and emphasized mode.

[Default] n = 0

[Reference] **ESC E**

[Example]

ESC J n

[Name] **Print and paper feed**

[Format]

ASCII	ESC	J	n
Hex	1B	4A	n
Decimal	27	74	n

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

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

[Notes]
- After printing has been completed, this command sets the print starting position to the beginning of the line.
- The paper feed amount set by this command does not affect the values set by **ESC 2** or **ESC 3**.
- The horizontal and vertical motion units are specified by **GS P**.
- **GS P** can change the vertical (and horizontal) motion unit. However, the value cannot be less than the minimum vertical movement amount.
- In standard mode, the vertical motion unit is used.
- The maximum paper feed amount is 4095 mm (161 inches).

[Default]

[Reference] **GS P**

[Example]

ESC R n

[Name] **Select an international character set**

[Format]

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

[Range] $0 \le n \le 10$

[Description] Selects the international character set *n* according to the table below:

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

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

ESC V n

[Name] **Set 90° rotated print mode.**

[Format]

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

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

[Description] Turns 90° rotation mode on/off.

n is used as follows :

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

[Notes]
- When underlined mode is turned on, the printer does not underline 90° rotated characters. All the same it's possible select the underline mode.
- Double-width and double-height commands in 90° rotation mode enlarge characters in the opposite directions from double-height *and* double-width commands in normal mode.
- This command is not available in Page mode.
- If this command is entered in Page mode, the printer all the same save the setting.

Default] n = 0

[Reference] **ESC !, ESC -**

ESC \ nL nH

[Name] **Set relative print position**

[Format]

ASCII	ESC	\	nL	nH
Hex	1B	5C	nL	nH
Decimal	27	92	nL	nH

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

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

[Notes]
- Any setting that exceeds the printable area is ignored.
- When the starting position is specified by *n* motion units to the right:
$nL + nH \times 256 = n$
When the starting position is specified by *n* motion units to the left (negative direction), use the complement of 65536:
$nL + nH \times 256 = 65536 - n$

• If setting exceeds the printing area width, the left or right margin is set to the default value.
• The horizontal and vertical motion unit are specified by **GS P**.
• **GS P** can change the horizontal (and vertical) motion units. However, the value cannot be less than the minimum horizontal movement amount.
• In standard mode, the horizontal motion unit is used.

[Default]

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

[Example]

ESC a n

[Name] **Select justification**

[Format]

ASCII	ESC	a	n
Hex	1B	61	n
Decimal	27	97	n

[Range] $0 \le n \le 2, 48 \le n \le 50$

[Description] Aligns all data in one line to the specified position.
n selects the type of justification as follows:

n	Justification
0, 48	Flush left
1, 49	Centered
2, 50	Flush right

[Notes]
• This command is only enabled when inserted at the beginning of a line.
• Lines are justified within the specified printing area.
• Spaces set by **HT**, **ESC $** and **ESC ** will be justified according to the previously-entered mode.

[Default] n = 0

[Reference]

[Example]

Flush left

```
ABC
ABCD
ABCDE
```

Centered

```
 ABC
 ABCD
ABCDE
```

Flush right

```
  ABC
 ABCD
ABCDE
```

ESC c 5 n

[Name] **Enable/disable front panel buttons**

[Format]

ASCII	ESC	c	5	n
Hex	1B	63	35	n
Decimal	27	99	53	n

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

[Description] Enables/disables the buttons on the front panel.
- When the LSB of *n* is 0, the panel buttons are enabled.
- When the LSB of *n* is 1, the panel buttons are disabled.

[Notes]
- Only the LSB of *n* is effective.
- On the printer, the panel buttons are FEED and KEY2.
- When the panel buttons are disabled, the buttons may only be used after the printer has been reset.

[Default] n = 0

[Reference] See “Panel Key” parameter from setup.

[Example]

ESC d n

[Name] **Print and feed paper *n* rows**

[Format]

ASCII	ESC	d	n
Hex	1B	64	n
Decimal	27	100	n

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

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

[Notes]
- Sets the print starting position at the beginning of the line.
- This command does not affect the line spacing set by **ESC 2** or **ESC 3**.
- The maximum paper feed amount is 254 rows. Even if a paper feed amount of more than 254 rows is set, the printer feeds the paper only 254 rows.

[Default]

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

[Example]

ESC i

[Name] **Total cut**

[Format]

ASCII	ESC	i
Hex	1B	69
Decimal	27	105

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

[Notes]
- The printer waits to complete all paper movement commands before it executes a total cut.
- With the SMICE printer, the type of cutter determines whether a total or partial cut is made.

[Default]

[Reference]

[Example]

ESC m

[Name] **Partial cut**

[Format]

ASCII	ESC	m
Hex	1B	6D
Decimal	27	109

[Description] This command enables cutter operation.

[Notes]
- The printer waits to complete all paper movement commands before it executes a total cut.

[Default]

[Reference]

[Example]

ESC p m t1 t2

[Name] **Generate pulse**

[Format]

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

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

$0 \leq t1 \leq 255$

$0 \le t2 \le 255$

[Description] Outputs the pulse specified by t1 and t2 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

[Notes]
- 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].

[Default]

[Reference]

ESC r n

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

[Format]

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

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

[Description] Sets and resets red printing mode.

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

[Notes]
- The printer prints only entire lines in red, not individual characters.
- The printer prints red only if enabled (see Setup).

[Default] *n* = 0

[Reference]

[Example]

ESC t n

[Name] **Select character code table**

[Format]

ASCII	ESC	t	n
Hex	1B	74	n
Decimal	27	116	n

[Range] n = 0, 255

[Description] Selects a page *n* from the character code table, as follows:

n	Page
0	0 (PC437 [U.S.A., Standard Europe])
2	2 (PC850 [Multilingual])
3	3 (PC860 [Portuguesel])
4	4 (PC863 [Canadian-French])
5	5 (PC865 [Nordic])
255	Space page

[Notes]

[Default] n = 0

[Reference] See character code tables

[Example]

ESC u n

[Name] **Transmit peripheral device status**

[Format]

ASCII	ESC	u	n
Hex	1B	75	n
Decimal	27	117	n

[Range] *n* = 0, 48

[Description] Transmits the status of connector pin *n* upon receiving this command, using *n* as follows:

n	Connector Pin
0, 48	Drawer kick-out connector pin 3

[Notes]
- This command is executed when the data is processed in the data buffer. There may be a time lag between receiving the command and transmitting the status, depending on data buffer status.
- When the connector is not used, the bit 0 value is always 1.
- The status to be transmitted is shown in the table below:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Pin 3 low level
	On	01	1	Pin 3 high level
1	-	-	-	Undefined
2	-	-	-	Undefined
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to Off.

[Default]

[Reference] **DLE EOT, GS r**
See drawer connector

[Example]

ESC v

[Name] **Transmit paper sensor status**

[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]
- This command is executed immediately, even when the data buffer is full (Busy).

The status to be transmitted is shown in the table below:

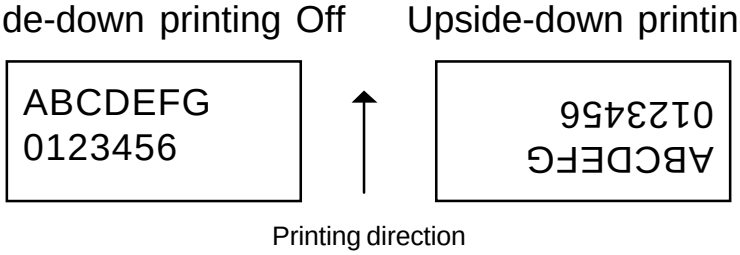
Bit	Off/On	Hex	Decimal	Function
0,1	Off	00	0	Not used
	On	03	3	Not used
2,3	Off	00	0	Paper-end sensor: Paper present
	On	(0C)	(12)	Paper-end sensor: Paper not present
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to Off.

[Default]
[Reference] **DLE EOT**
[Example]

ESC { n

[Name] **Turn upside-down printing mode on/off**
[Format] ASCII ESC{ n
Hex 1B 7B n
Decimal 27 123 n
[Range] $0 \le n \le 255$
[Description] Turns upside-down printing mode on or off.
• When the LSB of *n* is 0, the upside-down printing mode is off.
• When the LSB of *n* is 1, the upside-down printing mode is on.
[Notes] • Only the LSB of *n* is effective.
• This command is valid only if entered at the beginning of a line.
• In upside-down printing mode, the printer rotates the line to be printed 180° and then prints it.
[Default] n = 0
[Reference]

[Example]



ESC · n xH xL yH yL

[Name] **Print graphic.**

[Format]

ASCII	ESC	·	n	xH	xL	yH	yL
Hex	1B	FA	n	xH	xL	yH	yL
Decimal	27	250	n	xH	xL	yH	yL

[Range] $0 \le n \le 3$

$0 \le xH, xL, yH, yL \le 255$

[Description] Prints graphic logo from flash or current graphic page located in ram.

n selects the graphic source as follows:

n	Function
0	Print graphic page from ram (used at the moment)
1	Print logo 1 from flash

The maximum printable vertical dimension *dhmax* is :

- if paper width is 112mm *dhmax* = 630
- if paper width is 80mm *dhmax* = 819

xL + *xH* × 256 specifies the starting dotline (1 ÷ *dhmax*).
yL + y*H* × 256 specifies the number of lines to print.

[Notes]
- If (*xL* + (*xH* × 256)) > *dhmax* the printer does not execute the command.
- If (*xL* + (*xH* × 256) + *yL* +(y*H* × 256))> *dhmax* the printer prints only *dhmax* - *xL* + (*xH* × 256) +1 dotline.

[Default]

[Reference] **ESC ³, ESC ², ESC ¦**

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

ESC ¹ nL nH

[Name] **Transmit graphic page to communication port**

[Format]

ASCII	ESC	¹	nL	nH
Hex	1B	FB	nL	nH
Decimal	27	251	nL	nH

[Description] Transmits [*nL* + (*nH* × 256)] word of graphic page used at the moment to the communication port.

[Default]

[Reference] **ESC ³, ESC ², ESC ¦**

[Example]

ESC ³ n

[Name] **Transfer flash bank into graphic page**

[Format]

ASCII	ESC	³	n
Hex	1B	FC	n
Decimal	27	252	n

[Range] 1 ≤ n ≤ 3

[Description] Transfers flash bank into graphic page used at the moment (65520 bytes).
n selects the flash bank as follows:

n	Function
1	Transfers flash bank logo 1 into ram

[Notes]

[Default]

[Reference] **ESC ·, ESC ², ESC ¦**

[Example]

ESC ² nL nH

[Name] **Receive graphic page from communication port**

[Format]

ASCII	ESC	²	nL	nH
Hex	1B	FD	nL	nH
Decimal	27	253	nL	nH

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

[Description] Receives [*nL* + (*nH* × 256)] words from the port and puts them into the ram bank.

[Notes]
- The number of data bytes received is [*nL* + (*nH* × 256)] × 2.
- Each word is first received as MSByte and then as LSByte.
- If [*nL* + (*nH* × 256)] is greater than 32768, the data which follows is processed as normal data.
- The flash bank dimensions for the graphic print are :

with 112mm paper width have 832 horizontals dots (104 bytes/dot line) x 630 verticals dots (65520 bytes).

with 80mm paper width have 640 horizontals dots (80 bytes/ dot line) x 819 verticals dots (65520 bytes).

[Default]

[Reference] **ESC ·, ESC ³, ESC ¦**

[Example]

ESC ¦ n

[Name] **Transfer graphic page into flash bank**

[Format]

ASCII	ESC	¦	n
Hex	1B	FE	n
Decimal	27	254	n

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

[Description] Transfers the graphic page used at the moment into the flash bank (65520 bytes).
n selects the bank as follows:

n	Function
1	Transfers graphic page used at the moment into flash bank logo 1

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

GS ! n

[Name] **Select character size**
[Format] ASCII GS ! n
Hex 1D 21 n
Decimal 29 33 n
[Range] $0 \le n \le 255$
[Description] Selects character height and width, as follows:
• Bits 0 to 3: to select character height (see table 2).
• Bits 4 to 7: to select character width (see table 1).

Table 1 Select Character Width

Hex	Decimal	Width
00	0	1 (normal)
10	16	2 (width = 2x)
20	32	3 (width = 3x)
30	48	4 (width = 4x)
40	64	5 (width = 5x)
50	80	6 (width = 6x)
60	96	7 (width = 7x)
70	112	8 (width = 8x)

Table 2 Select character height

Hex	Decimal	Height
00	0	1 (normal)
01	1	2 (height = 2x)
02	2	3 (height = 3x)
03	3	4 (height = 4x)
04	4	5 (height = 5x)
05	5	6 (height = 6x)
06	6	7 (height = 7x)
07	7	8 (height = 8x)

[Notes]
• This command is effective for all characters (except HRI characters).
• If *n* falls outside the defined range, this command is ignored.
• Characters enlarged to different heights on the same line are aligned at the baseline or topline (see **GS ~**).
• **ESC !** can also be used to select character size. However, the setting of the last received command is the effective one.

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

GS :

[Name] **Start/end macro definition**
[Format]

ASCII	GS	:
Hex	1D	3A
Decimal	29	58

[Description] Starts or ends macro definition.
[Notes]
• Macro definition starts when this command is received during normal operation.
• When **GS ^** is received during macro definition, the printer ends macro definition and clears all definitions.
• Macros are not defined when power is turned on to the machine.
• Macro content is not cancelled by the **ESC** @ command. Therefore, **ESC** @ may be included in the content of macro definitions.
• If the printer receives **GS :** a second time after previously receiving **GS :**, the printer remains in macro undefined status.
• The contents of the macro can be defined up to 1024 bytes. If the macro definition exceeds 1024 bytes, excess data is not stored.
[Default]
[Reference] **GS ^**
[Example]

GS B n

[Name] **Turn white/black reverse printing mode on/off**
[Format]

ASCII	GS	B	n
Hex	1D	42	n
Decimal	29	66	n

[Range] $0 \leq n \leq 255$
[Description] Turns white/black reverse printing mode on or off.
• When the LSB of *n* is 0, white/black reverse printing is

turned off.
• When the LSB of *n* is 1, white/black reverse printing is turned on.

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

[Default] n = 0

[Reference]

[Example]

GS C 0 n m

[Name] **Select counter print mode**

[Format]

ASCII	GS	C	0	n	m
Hex	1D	43	30	n	m
Decimal	29	67	48	n	m

[Range] $0 \le n \le 5$
m = 0, 1, 2, 48, 49, 50

[Description] Selects a print mode for the serial number counter.
• *n* specifies the number of digits to be printed as follows:
when *n* = 0, the printer prints the actual digits indicated by the numeric value.
when *n* = 1 to 5, the command sets the number of digits to be printed.
• m specifies the printing position within the entire range of printed digits as follows:

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

[Notes] • If *n* or *m* is out of the defined range, the previously set print mode is not changed.
• If *n* = 0, *m* is not applicable.

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

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

[Example]

n = 3,m = 0	n = 3, m = 1	n = 3, m=2
☐☐1	001	1☐☐

☐ indicates a space

GS C 1 aL aH bL bH n r

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

[Format]

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

[Range] 0 ≤ aL, aH ≤ 255
0 ≤ bL, bH ≤ 255
0 ≤ n, r ≤ 255

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

[Notes] • Count-up mode is specified when:
[a*L* + (a*H* × 256)] < [b*L* + (b*H* × 256)] and $n \neq 0$ and $r \neq 0$
• Count-down mode is specified when:
[a*L* + (a*H* × 256)] > [b*L* + (b*H* × 256)] and $n \neq 0$ and $r \neq 0$
• Counting stops when:
[a*L* + (a*H* × 256)] = [b*L* + (b*H* × 256)] or *n* = 0 or *r* = 0
• Setting the count-up mode, the minimum counter value is [a*L* + (a*H* × 256)] and the maximum value is [b*L* + (b*H* ×

256)]. If the counting up reaches a value that exceeds the maximum, it resets to the minimum value.
• Setting the count-down mode, the maximum counter value is [a*L* + (a*H* × 256)] and the minimum value is [b*L* + (b*H* × 256)]. If the counting down reaches a value less than the minimum, it resets to the maximum value.
• When this command is executed, the internal count that indicates the repetition number specified by *r* is cleared.

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

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

[Example]

GS C 2 nL nH

[Name] **Set counter**

[Format]

ASCII	GS	C	2	nL	nH
Hex	1D	43	32	nL	nH
Decimal	29	67	50	nL	nH

[Range] 0 ≤ nL, nH ≤ 255

[Description] Sets the serial number counter value.
• *nL* and *nH* determine the value of the serial number counter set by [*nL* + (*nH* × 256)].

[Notes] • In count-up mode, if the counter value specified by this command goes out of the counter operation range specified by **GS C 1** or **GS C ;** it is forced to convert to the minimum value through **GS c**.
• In count-down mode, if the counter value specified by this command goes out of the counter operation range specified by **GS C 1** or **GS C ;** it is forced to convert to the maximum value through **GS c**.

[Default] nL = 1, nH = 0

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

[Example]

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

[Name] **Select count mode (B)**

[Format]

ASCII	GS	C	;	sa	;	sb	;	sn	;	sr	;	sc	;
Hex	1D	43	3B	sa	3B	sb	3B	sn	3B	sr	3B	sc	3B
Decimal	29	67	59	sa	59	sb	59	sn	59	sr	59	sc	59

[Range] $0 \leq$ sa, sb, sc ≤ 65535

$0 \leq$ sn, sr ≤ 255

These values are all character strings.

[Description] Selects a count mode for the serial number counter and specifies the value of the counter.

- *sa*, *sb*, *sn*, *sr* and *sc* are all displayed as ASCII characters using codes from '0' to '9'.
- *sa* and *sb* specify the counter range.
- *sn* indicates the unit amount for counting up or down.
- *sr* indicates the repetition number when the counter value is fixed.
- *sc* indicates the counter value.

[Notes]

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

[Default] sa = 1, sb = 65535, sn = 1, sr = 1, sc = 1
[Reference] **GS C 0, GS C 2, GS C 1, GS c**
[Example]

GS H n

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

ASCII	GS	H	n
Hex	1D	48	n
Decimal	29	72	n

[Range] $0 \le n \le 3, 48 \le n \le 51$
[Description] Selects the printing position of HRI characters when printing bar codes.
n selects the printing positions as follows:

n	Function
0, 48	Not printed
1, 49	Above the bar code
2, 50	Below the bar code
3, 51	Both above the below the bar code

[Notes] • HRI characters are printed using the font specified by **GS f**.
[Default] n = 0
[Reference] **GS f, GS k**
[Example]

GS I n (ONLY WITH SERIAL INTERFACE)

[Name] **Transmit printer ID**
[Format]

ASCII	GS	I	n
Hex	1D	49	n
Decimal	29	73	n

[Range] $1 \le n \le 4, 49 \le n \le 52$
[Description] Transmits the printer ID specified by *n* follows:

n	Printer ID	Specification
1, 49	Printer model ID	30H
2, 50	Type ID	See table below
3, 51	ROM version ID	Depends on ROM version (4 character)
4, 52	Printer version ID	See table below

n = 2, Type ID

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	2-byte character codes not supported
1	Off	00	0	Autocutter not supplied
				Autocutter supplied
2	Off	00	0	Thermal paper w/o label
	On	04	4	Thermal paper w/label
3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed to Off.
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to Off.

[Notes]

- When the DTR/DSR command is selected, the printer only transmits 1 byte (printer ID) following confirmation that the host is ready to receive data. If the host is not ready, the printer waits until it is ready.
- When the XON/XOFF command is selected, the printer only transmits 1 byte (printer ID) without confirmation that the host is ready to receive data.
- 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 L nL nH

[Name] **Set left margin**

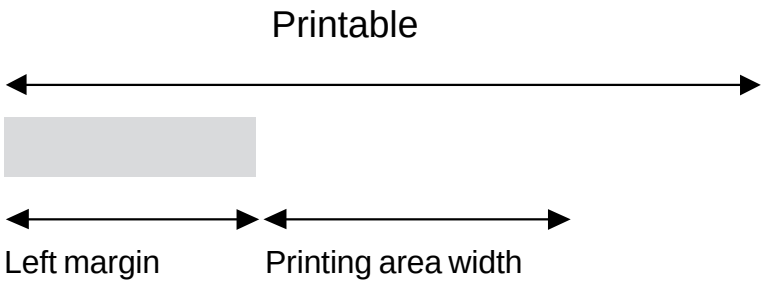
[Format]

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

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

[Description] Sets the left margin.

• The left margin is set to [(nL + nH × 256) × (horizontal motion unit)] inches.



[Notes]

• This command is enabled only if set at the beginning of the line.

• If the setting exceeds the printable area, the maximum value of the printable area is used.

• If the left margin + printing area width is greater than the printable area, the printing area width is set at maximum value.

• The horizontal and vertical motion unit are specified by **GS P**. Changing the horizontal or vertical motion unit does not affect the current left margin.

• The **GS P** command can change the horizontal (and vertical) motion unit.

• However, the value cannot be less than the minimum horizontal movement amount and it must be in even units of the minimum horizontal movement amount.

[Default]

[Reference] **GS P, GS W**

[Example]

GS P x y

[Name] **Set horizontal and vertical motion units**

[Format]

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

[Range] 0 ≤ nL, nH ≤ 255

[Description] Sets the horizontal and vertical motion units to 1/x inch and 1/y inch respectively.
When *x* is set to 0, the default setting value is used.
When *y* is set to 0, the default setting value is used.

[Notes]
• The horizontal direction is perpendicular to the paper feed direction.
• In standard mode, the following commands use *x* or *y*, regardless of character rotation (upside-down or 90° clockwise rotation):
① **Commands using *x* :** ESC SP, ESC $, ESC \, GS L, GS W**.**
② **Commands using y :** ESC 3, ESC J**.**
• This command does not affect the previously specified values.
• The calculated result from combining this command with others is truncated to the minimum value of the mechanical pitch or an exact multiple of that value.

[Default] x = 204, y = 408

[Reference] **ESC SP, ESC $, ESC \, ESC 3, ESC J, GS L, GS W**

[Example]

Œ GS V m, , GS V m n

[Name] **Select cut mode**

[Format] ① ASCII GS V m
Hex 1D 56 m
Decimal 29 86 m
② ASCII GS V m n
Hex 1D 56 m n
Decimal 1D 86 m n
Decimal 29 86 m n

[Range] ① m = 0, 1, 48, 49
② m = 65, 66, 0 ≤ n ≤ 255

[Description] Selects cut mode and executes the cut command.
m selects cut mode as follows:

m	Function
0, 48	Total cut.
1, 49	Partial cut.
65	Form feed (cut position + [n x vertical motion unit]) and total cut
69	Form feed (cut position + [n x vertical motion unit]) and partial cut

[Notes] • This command is only enabled if set at the beginning of the line.
• The horizontal and vertical motion units are specified by **GS P**.

[Default]

[Reference] **ESC i, ESC m**

[Example]

GS W nL nH

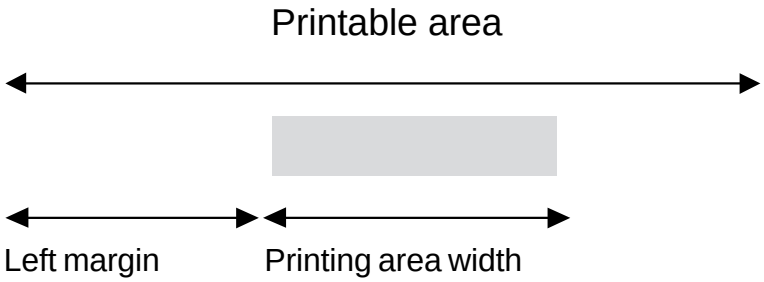
[Name] **Set printing area width**

[Format] ASCII GS W nL nH
Hex 1D 57 nL nH
Decimal 29 87 nL nH

[Range] 0 ≤ nL, nH ≤ 255
0 ≤ nL + nH x 256) ≤ 832

[Description] Sets the printing area width to the area specified by *nL* and *nH*.

• The left margin is set to [(nL + nH × 256) × (horizontal motion unit)] inches.



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

[Default]

[Reference] **GS L, GS P**

[Example]

GS ^ r t m

[Name] **Execute macro**

[Format]

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

[Range] 0 ≤ r, t ≤ 255
0 ≤ m ≤ 1

[Description] Executes a macro.
• *r* specifies the number of times to execute the macro.
• *t* specifies the waiting time for executing the macro.
The waiting time is *t* × 100 msec. for each macro execution.
• *m* specifies macro executing mode:

When the LSB of *m* = 0, the macro is executed *r* times continuously at the interval specified by *t*.
When the LSB of *m* = 1, after waiting for the period specified by *t*, the LED indicator blinks and the printer waits for the FEED button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats the operation *r* times.

[Notes]
- This command has an interval of ($t \times 100$ msec.) after a macro is executed by *t*.
- If this command is received while a macro is being defined, the macro definition is aborted and the definition is cleared.
- If the macro is not defined or if *r* is 0, nothing is executed.
- When the macro is executed by pressing the FEED button (*m*=1), the paper cannot be fed using the FEED button.

[Default]

[Reference] **GS :**

[Example]

GS c

[Name] **Print counter**

[Format]

ASCII	GS	c
Hex	1D	63
Decimal	29	99

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

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

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

GS f n

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

[Format]

ASCII	GS	f	n
Hex	1D	66	n
Decimal	29	102	n

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

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

n	Font
0, 48	Font A
1, 49	Font B

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

[Default] n = 0
[Reference] **GS H, GS k**
[Example]

GS h n

[Name] **Set bar code height**

[Format]

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

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

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

[Notes]
[Default] n = 162 (20.25 mm)
[Reference] **GS k**
[Example]

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

[Name] **Print bar code**

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

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

[Range] ① 0 ≤ m ≤ 20
② 65 ≤ m ≤ 90

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

	m	Bar code system	No. of characters	Remarks
Œ	0	UPC-A	11 ≤ k ≤ 12	48 ≤ d ≤ 57
	1	UPC-E	11 ≤ k ≤ 12	48 ≤ d ≤ 57
	2	EAN13 (JAN)	12 ≤ k ≤ 13	48 ≤ d ≤ 57
	3	EAN8 (JAN)	7 ≤ k ≤ 8	48 ≤ d ≤ 57
	4	CODE39	1 ≤ k	48 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37, 43, 45, 46, 47
	5	ITF	1≤ k (even number)	48 ≤ d £ 57
	6	CODABAR	1 ≤ k	48 ≤ d ≤ 57, 65 ≤ d1 ≤ 68, 36, 43, 45, 46, 47, 58
	7	CODE93	1 ≤ k ≤ 255	1 ≤ d ≤ 127
	8	CODE128	2 ≤ k ≤ 255	1 ≤ d ≤ 127
	20	CODE32	8 ≤ k ≤ 9	48 ≤ d ≤ 57

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

[Notes]

• If *d* is outside of the specified range, the printer prints the following message: “BAR CODE GENERATOR IS NOT OK!” and processes the data which follows as normal data.
• If the horizontal size exceeds the printing area, the printer only feeds the paper.
• This command feeds as much paper as is required to print the bar code, regardless of the line spacing specified by **ESC 2** or **ESC 3**.
• After printing the bar code, this command sets the print position to the beginning of the line.
• This command is not affected by print modes (emphasized, double-strike, underline or character size), except for upside-down and justification mode.

[Notes per ①]

• This command ends with a NUL code.
• When the bar code system used is UPC-A or UPC-E, the printer prints the bar code data after receiving 11 (without check digit) or 12 (with check digit) bytes bar code data.
• When the bar code system used is EAN13, the printer prints the bar code data after receiving 12 (without check digit) or 13 (with check digit) bytes bar code data.
• When the bar code system used is EAN8, the printer prints the bar code data after receiving 7 (without check

digit) or 8 (with check digit) bytes bar code data.
• The number of data for ITF bar code must be even numbers. When an odd number of data is input, the printer ignores the last received data.

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

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

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

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

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

GS r n

[Name] **Transmit status**
[Format] ASCII GS r n
Hex 1D 72 n
Decimal 29 114 n
[Range] $1 \le n \le 2, 49 \le n \le 50$
[Description] Transmits the status specified by *n* as follows:

n	Function
1, 49	Transmits paper sensor status (as for **ESC v**).
2, 50	Transmits drawer connector status (as for **ESC u 0**).

Paper sensor status (n = 1, 49)

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

Drawer connector status (n = 2, 50)

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

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

[Default]

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

[Example]

GS w n

[Name] **Set bar code width**

[Format]

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

[Range] $1 \le n \le 6$

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

n	Module width (mm)
1	0.125
2	0.25
3	0.375
4	0.5
5	0.625
6	0.75

[Notes]
[Default] n = 3
[Reference] **GS k**
[Example]

GS | n

[Name] **Set printing density**
[Format]

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

[Range] $0 \le n \le 12$, $48 \le n \le 57$, $65 \le n \le 67$
[Description] Sets printing density.

n specifies printing density as follows:

n	Printing density
0, 48	- 50%
1, 49	- 37.5%
2, 50	- 25%
3, 51	- 12%
4, 52	Normal
5, 53	+ 12.5%
6, 54	+ 25%
7, 55	+ 37.5 %
8, 56	+ 50%
9, 57	+ 62.5 %
10, 65	+ 75%
11, 66	+ 87.5 %
12, 67	+ 100%

[Notes] • Printing density reverts to the default value when the printer is reset or turned off.

[Default] n = 4

[Reference]

[Example]

GS ~ n

[Name] **Set superscript/subscript**

[Format]

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

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

[Description] Sets superscript or subscript character position.
n specifies the position as follows:

n	Function
0, 48	Subscript character position
1, 49	Superscript character position

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

[Default] n = 0

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

[Example]

GS - n

[Name] **Set printing speed**

[Format]

ASCII	GS	-	n
Hex	1D	F0	n
Decimal	29	240	n

[Range] $0 \le n \le 2$

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

n	Printing speed
0	Low
1	Normal
2	High

[Notes] • Printing speed reverts to the default value when the printer is reset or turned off.

[Default] n = 1

[Reference]

[Example]

GS ± n

[Name] **Set current consumption in printing**

[Format]

ASCII	GS	±	n
Hex	1D	F1	n
Decimal	29	241	n

[Range] $0 \le n \le 2$

[Description] Sets current consumption in printing.
n specifies the absorption as follows:

n	Absorption in printing
0	Low (256 maximum dots ON at the same time - 2A rms)
1	Normal (512 maximum dots ON at the same time - 3A rms)
2	High (832 maximum dots ON at the same time - 5A rms)

[Notes]
- The medium current in printing is indicated with 50% dots ON.
- The current absorption in printing reverts to the default value when the printer is reset or turned off.

[Default] n = 1

[Reference]

[Example]

4.1 TECHNICAL DATA

The main technical features of the SMICE printer models are listed in Table 4.1.

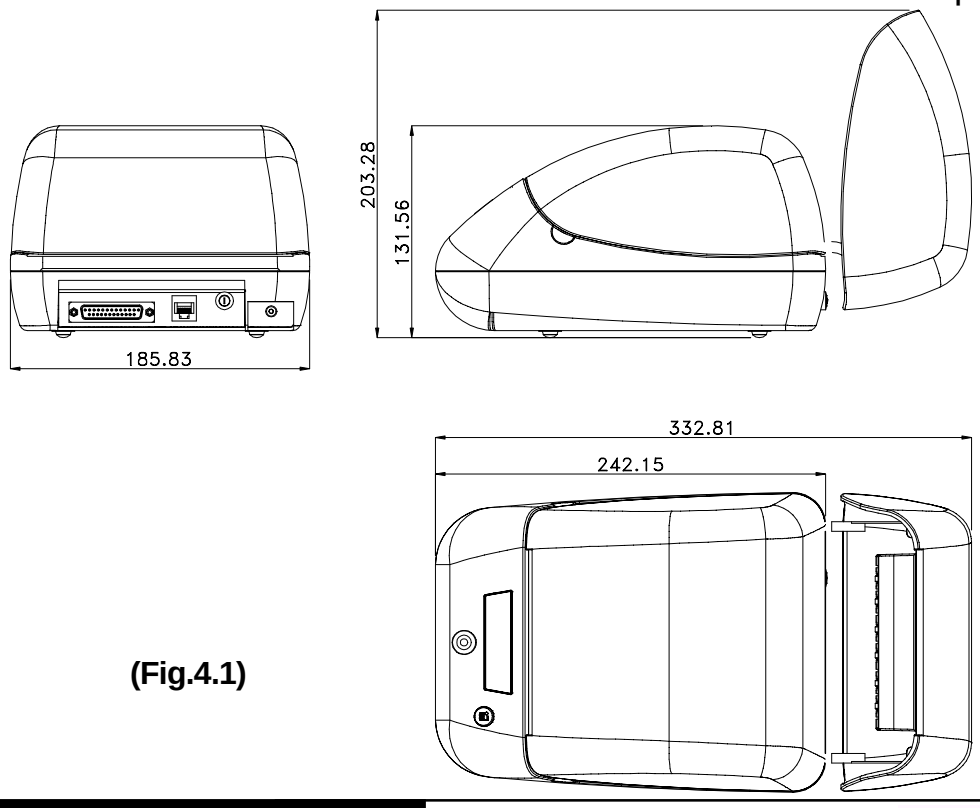
(Tab.4.1)

Resolution	200 DPI (8 dot/mm)
Paper roll dimensions	111.5/79.5 mm ± 0.5mm Ø80 mm ± 0.5mm
Sensors	Paper out, cover open, motor temperature, head temperature
Print method	Thermal fixed head (8 dot/mm)
Print direction	Normal, 90°, 180°, 270°
Print formats	Height/width from 1 to 8, expanded, negative, underlined, script.
Character fonts	PC437, PC850, PC860, PC863, PC865, International.
Available interfaces	RS232, Cash Drawer, 2nd RS232 for MCR
Baud rate	From 1200 to 230400 bps
Reception buffer	From 16 bytes to 8 Kbytes
Flash memory	256 Kbytes
Graphic memory	1 logo of 832 x 630 dots
Printing speed (dotline/sec)	960 (Speed/Quality=normal)
Power supply	24 Vdc +/- 10%
Absorption (with current setting = Normal)	
Stand-by	0.1 A
Average (50% dots ON)	3 A
Peak (100% dots ON)	5 A
Environmental conditions	
Operating temperature	0 °C – 50 °C
Relative humidity	35% – 85% w/o condensation
Storage temperature/humidity	-20 °C – +70 °C / 10% – 90%
Options	RTCK, RS485/422/TTL, Centronics, USB, IRDA, Display, Keyboard
Dimensions	242mm x 186mm x H132mm

ESC/POS™ emulation			
Paper from 112 mm	**11 cpi**	**15 cpi**	**20 cpi**
Number of columns	42	64	80
Characters / sec	1260	1920	2400
Lines / sec	30	30	30
Paper from 80 mm	**11 cpi**	**15 cpi**	**20 cpi**
Number of columns	32	42	56
Characters / sec	960	1260	1680
Lines / sec	30	30	30
Character (W x H mm)			
Normal	2.3 x 3	1.7 x 3	1.2 x 3
Double height	4.6 x 3	9.4 x 3	2.4 x 3
Double width	2.3 x 6	1.7 x 6	1.2 x 6
Double height and width	4.6 x 6	3.4 x 6	2.4 x 6
Quadruple width	3.2 x 3	6.8 x 3	4.8 x 3
Quadruple height	2.3 x 12	1.7 x 12	1.2 x 12
Quadruple height and width	9.2 x 12	6.8 x 12	4.8 x 12

4.2 DIMENSIONS

Figure 4.1 illustrates the overall dimensions for the SMICE tabletop printer.

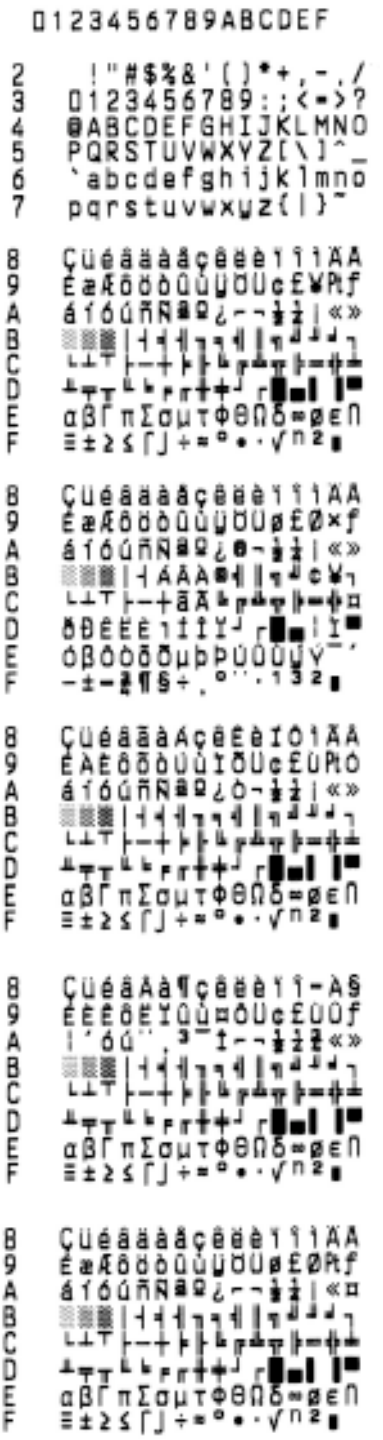


(Fig.4.1)

5.1 CHARACTER SETS

The SMICE printer has three font of different dimension (11 cpi, 15 e 20 cpi), which can be called up through the programming (paragraph 1.2) or through the control characters (paragraph 3.2). Each of these font has the following code table : PC437, PC850, PC860, PC863, PC865.

FONT 11 cpi



PC437
(Usa, Standard Europe)

PC850
(Multilingual)

PC860
(Portuguese)

PC863
(Canadian-French)

PC865
(Nordic)

(Fig.5.1)

FONT 15 cpi

PC437
(Usa, Standard Europe)

PC850
(Multilingual)

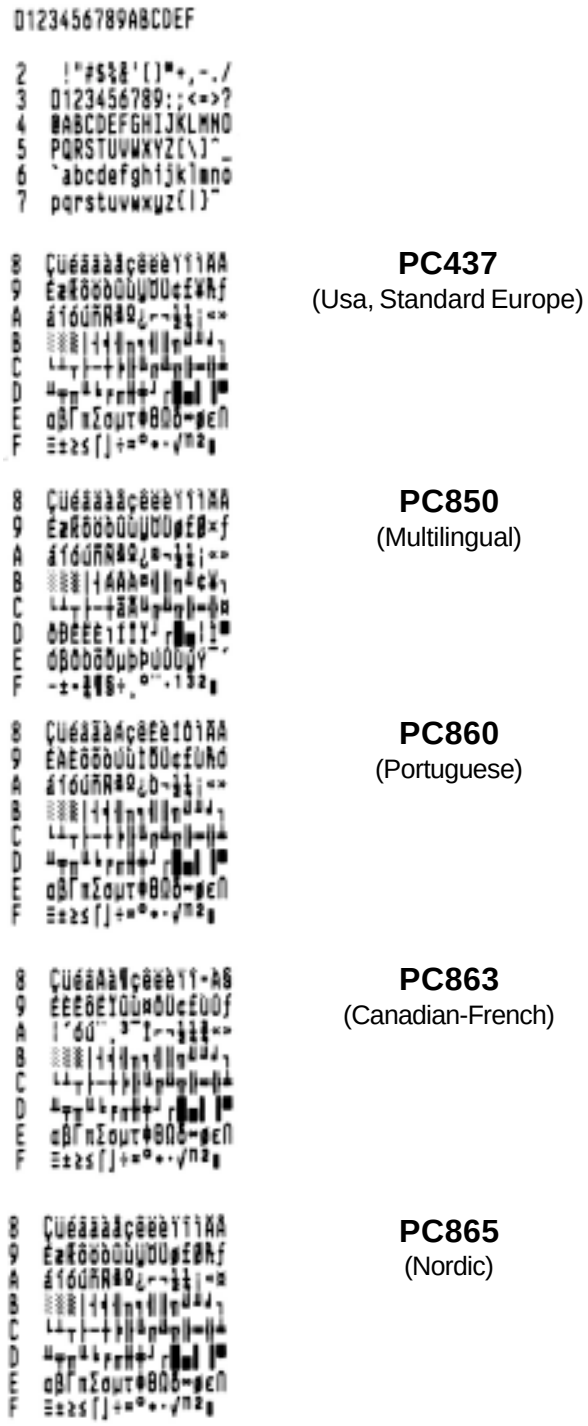
PC860
(Portuguese)

PC863
(Canadian-French)

PC865
(Nordic)

(Fig.5.2)

FONT 20 cpi



PC437
(Usa, Standard Europe)

PC850
(Multilingual)

PC860
(Portuguese)

PC863
(Canadian-French)

PC865
(Nordic)

(Fig.5.3)