

Ultracompact printer S16SB, S16B-IR User Manual



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COD. DOME - S16SB

VER. PRELIMINARY

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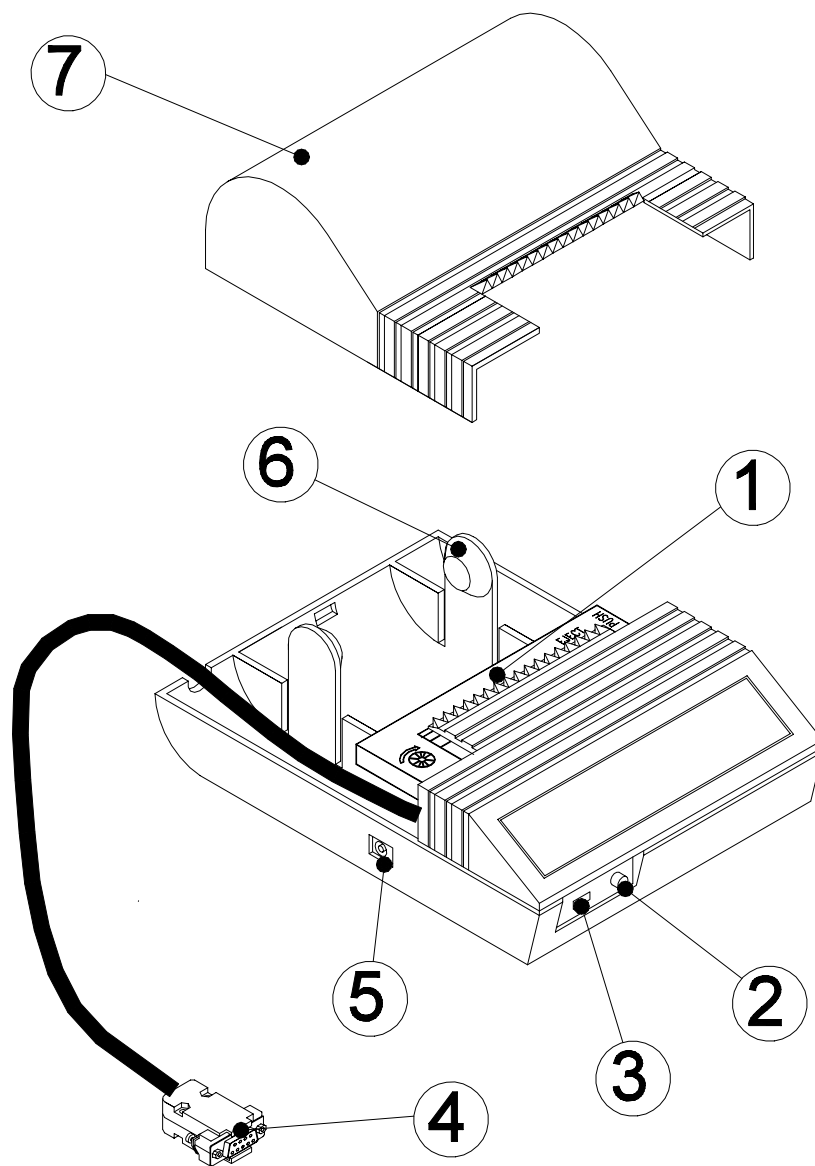
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PRINTER COMPONENTS

A. S16SB - front view

- 1- Printing mechanism
- 2- FEED key
- 3- LED
- 4- RS232 / TTL serial connector
- 5- Battery charger connector
- 6- Paper holder
- 7- Printer cover



PRINTER COMPONENTS

A. S16B-IR front view

- 1- Printing mechanism
- 2- FEED key
- 3- LED
- 4- INFRARED Sensor
- 5- Battery charger connector
- 6- Paper holder
- 7- Printer cover

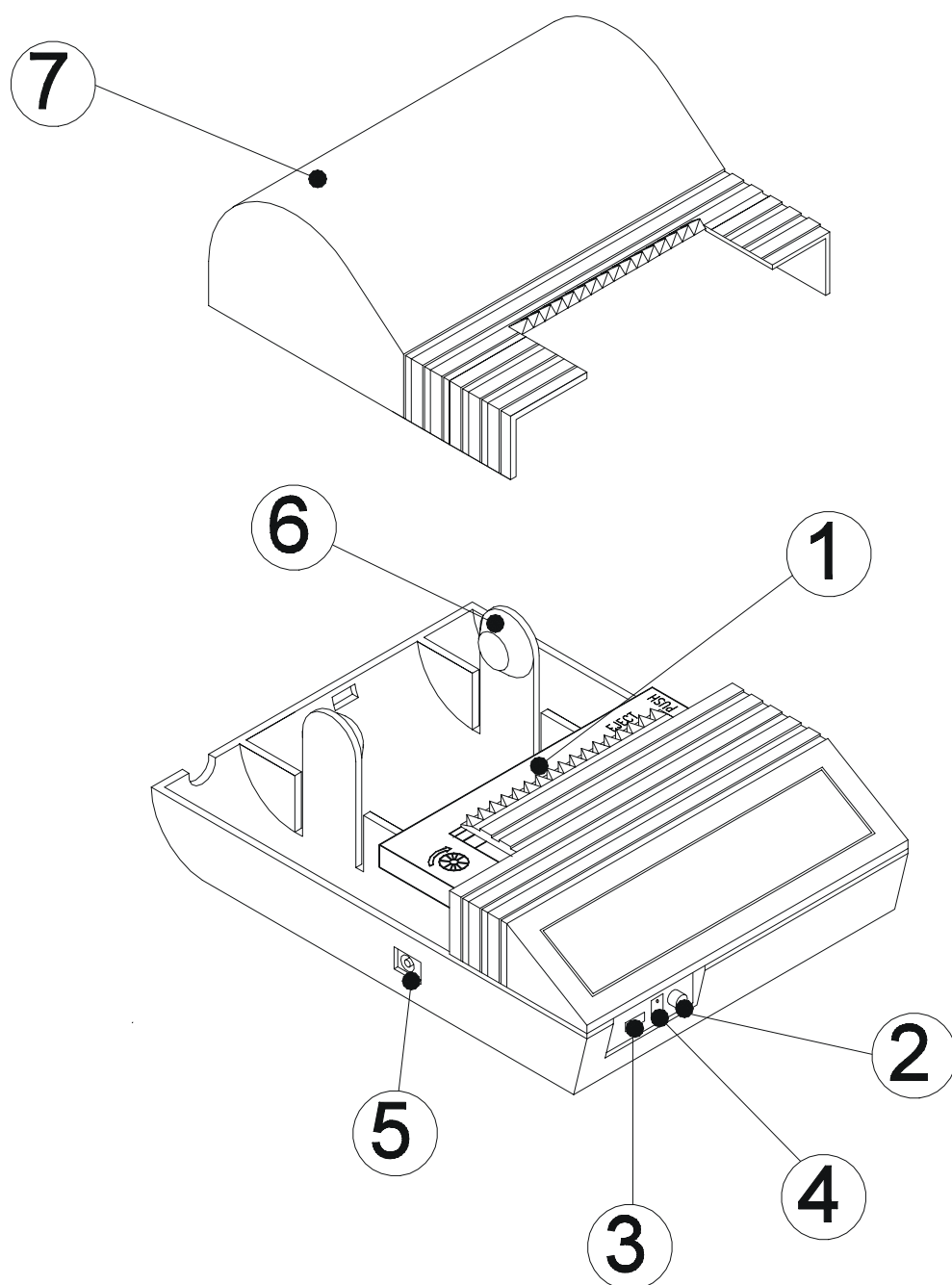


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CONTENTS OF THE MANUAL

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

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

Chapter 2: Containing the specifications of the interfaces

Chapter 3: Containing the description of the printer command set

Chapter 4: Containing the technical specifications of the printer

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

CONVENTIONS USED IN THE MANUAL



N.B.

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



WARNING

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



DANGER

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

GENERAL INFORMATION REGARDING SAFETY

- Read and keep the following instructions.
- Observe all warnings and follow all instructions attached to the printer.
- Before cleaning the printer, disconnect the feed cable.
- Clean the printer with a damp cloth. Do not use liquid or spray products.
- Do not operate the printer near to water.
- Do not place the printer on unsteady surfaces. It could fall and get seriously damaged.

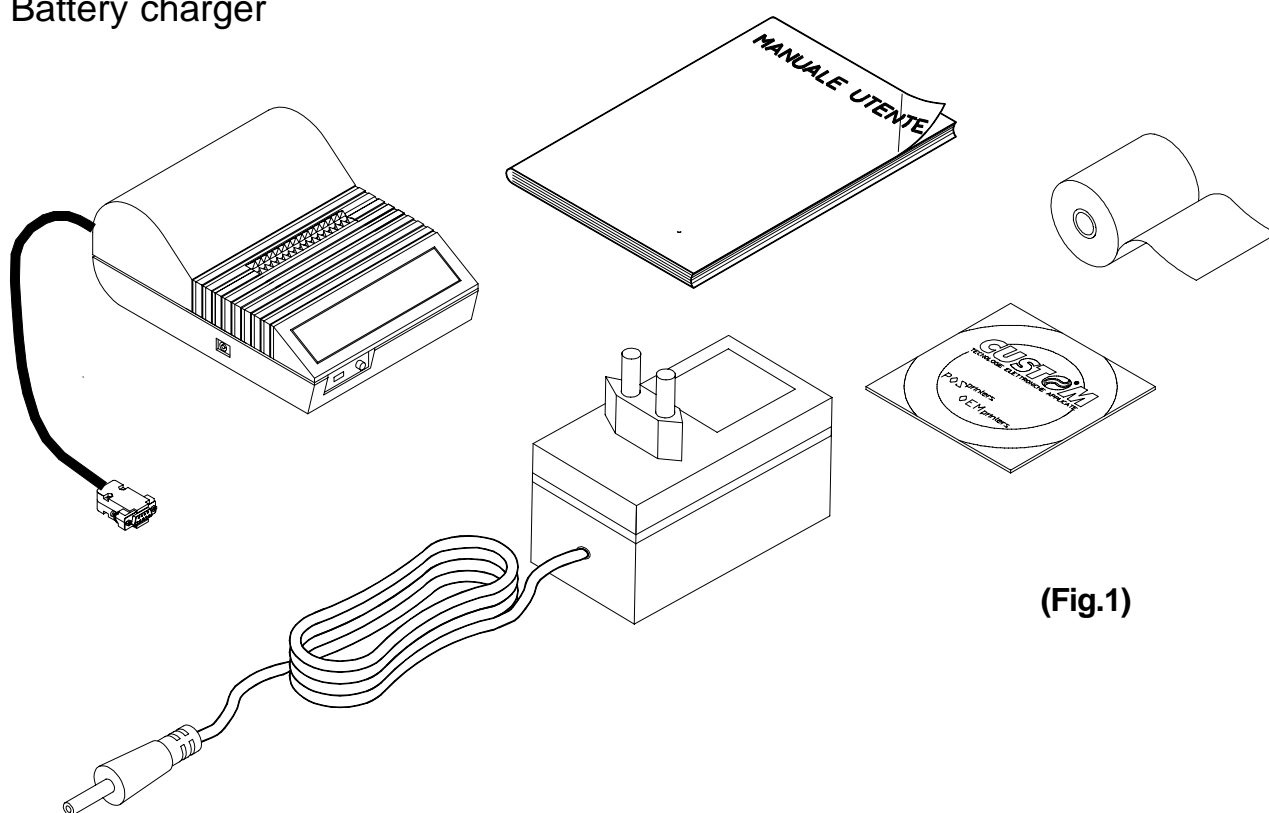
- Use the type of electricity supply marked on the printer label. In the event of uncertainty, contact the seller.
- Position the printer in such a way as to ensure that the cables connected to it will not be damaged.
- Ensure that the maximum absorbed current of the printer does not exceed the maximum acceptable current for the type of feed cable used.
- Do not put objects of any kind inside the printer as they could cause a short circuit or damage parts which could affect its performance.
- Do not spill liquids on the printer.
- Do not carry out technical operations on the printer with the exception of the scheduled maintenance operations specifically indicated in the user's manual.
- Disconnect the printer from the electricity supply and have it repaired by a specialized technician should any of the following conditions occur:
 - A. The feed connector has been damaged.
 - B. Liquid has penetrated to the inside of the printer;
 - C. The printer has been exposed to rain or water;
 - D. The printer is not operating normally despite the instructions in the user's manual having been followed.
 - E. The printer has been dropped and its case damaged.
 - F. The performance of the printer is poor.
 - G. The printer does not work.

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.

Printer
Manual (or CD-Rom)
Paper roll (inside printer)
Battery charger



(Fig.1)

GENERAL FEATURES

The S16SB (Fig.2) is an extremely practical, easy-to-use desk or panel printer. It is the ideal solution for all those applications, whether they be industrial, professional or laboratory-related, in which data has to be immediately printed out in ticket form: measuring systems, receipts (not for tax purposes), security, control, diagnosis purposes, vehicles (taxis, trucks), portable version for measuring and reports of all kinds, and any other circumstances in which high performance printing is required in tight spaces.

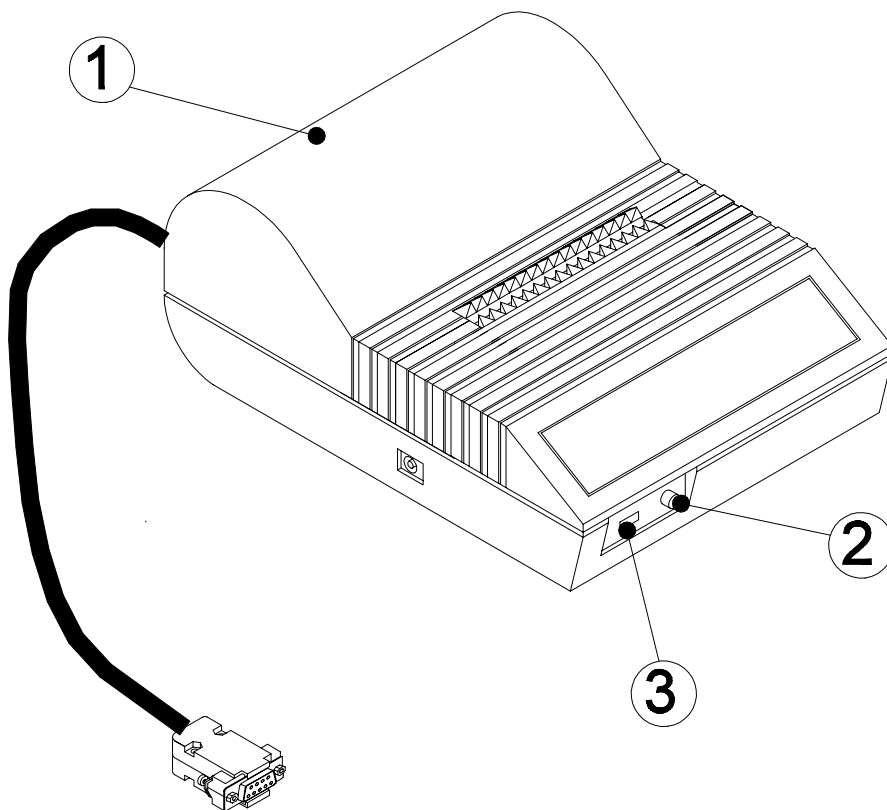
The printer is equipped with a 4-pin impact mechanism which uses ordinary 44.5mm paper rolls with a maximum of 16 columns per line, and housed inside it is a battery which means the printer can be operated without being connected to an electrical outlet.

The S16SB is so compact, lightweight and economical that it can be installed extremely easily on any type of equipment. It has a standard RS232 serial interface.

PRINTER DESCRIPTION

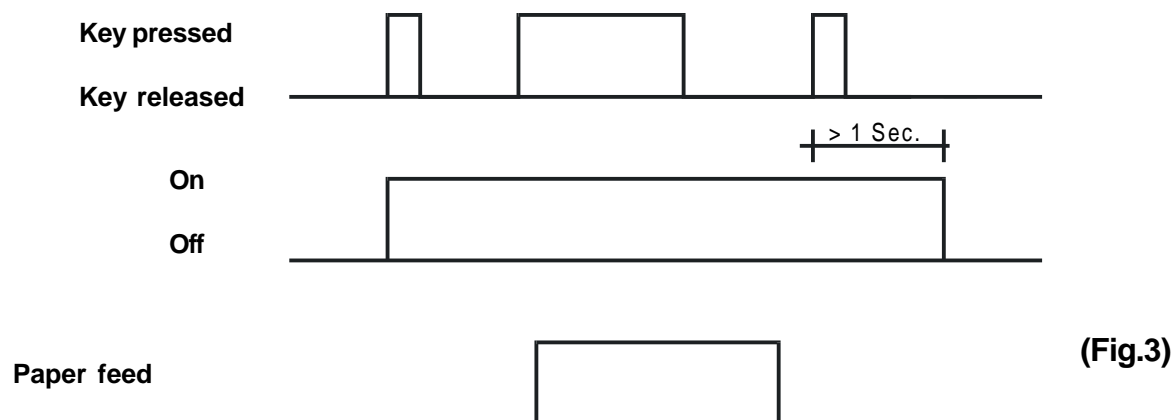
The printer has an ABS casing with a cover which opens to allow access to the paper roll and print head.

On the front of the panel there is a ON-OFF / FEED key and an LED.

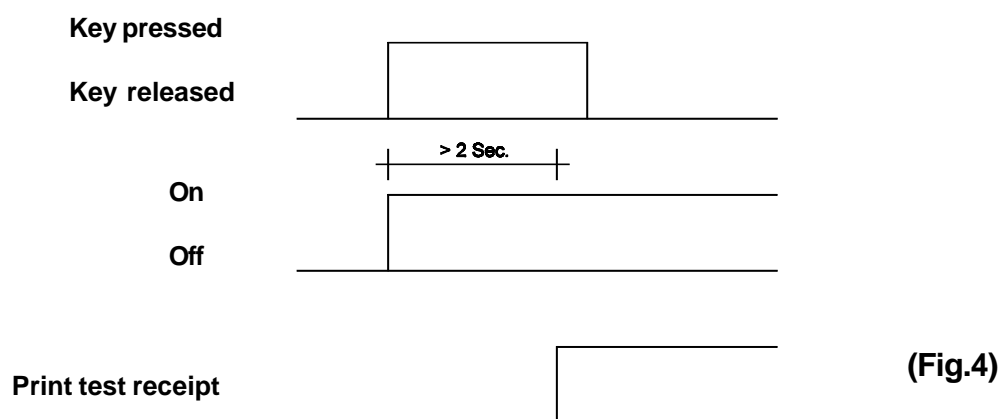


(Fig.2)

- 1) ON-OFF / FEED key. If the printer is off (green LED off), when this key is pressed briefly, power is turned on to the printer (green LED blinking). To turn off the printer, press the key briefly (the LED starts to blink faster) and if the key is not pressed again within a second the printer shuts off, otherwise it returns to operational status.

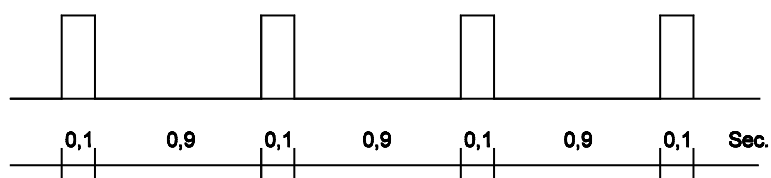


If the key is held down during power up, a test receipt will be printed out giving the default parameters and character font.



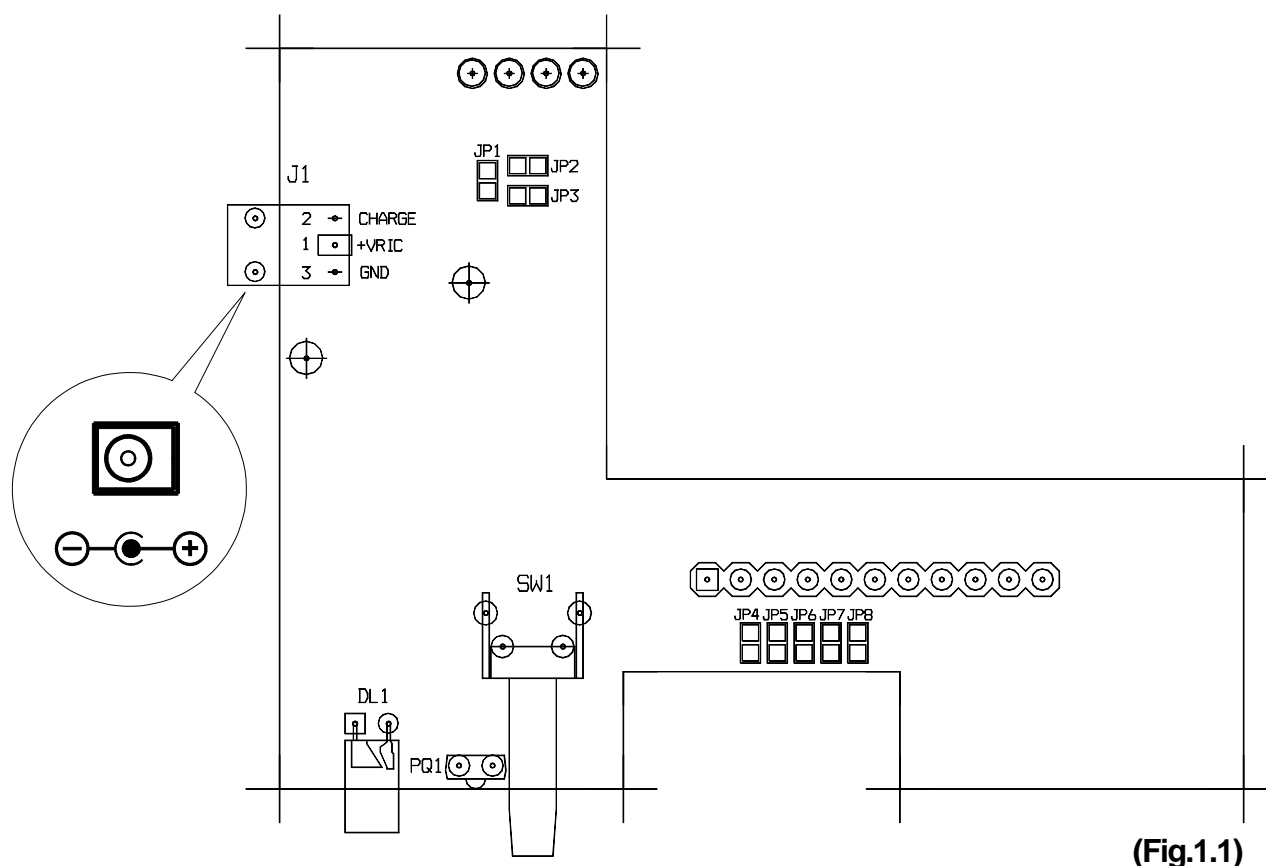
If the key is pressed when the printer is on, the paper can be fed manually.

- **GREEN LED:** Intermittent blinking of the LED indicates that the printer is functioning.



(Fig.5)

1.1 CONNECTIONS



1.1.1 Power supply

The printer is equipped with an autonomous, rechargeable battery pack for printing. Recharging is carried out using the J1 mod. DC 1.3mm power plug which requires a supply voltage of between 9 and 15V.

Inside the printer is a battery recharge circuit. To guarantee optimum battery recharging, we suggest that the pack be recharged for 8-10 hours.



WARNING

Be sure to follow the battery charger polarity.

(Tab.1.1)

| PIN | SIGNAL | IN / OUT | DESCRIPTION |
|-----|----------|----------|------------------|
| 1 | 9 - 15 V | IN | Battery recharge |
| 3 | GND | POWER | Signal Ground |

1.1.2 Character bit selection

Jumper JP6 (fig.1.1) enables data to be sent to the printer (8 bits per piece of data, 1 stop bit, parity none), in which the most significant bit is not handled. Jumper setting is given in Table 1.2.

| JP6 | Bits per character |
|--------|----------------------|
| Closed | 7 bits per character |
| Open | 8 bits per character |

(Tab.1.2)

1.1.3 Carriage Return selection

Jumper JP8 (Fig. 1.1) enables the carriage return. If jumper JP8 is closed, the printer management software ignores the \$0D (carriage return) command code. This procedure is also run by the \$0F (CRLF) command. Jumper setting is given in Table 1.3.

| JP8 | Carriage Return |
|--------|-----------------|
| Closed | Disabled |
| Open | Enabled |

(Tab.1.3)

1.1.4 Print direction selection

By means of the jumper JP7 (Fig.1.1), Normal or Reverse print directions may be selected. In normal printing mode, the characters are printed from left to right, while in reverse mode the characters are printed upside down and from right to left. It is always possible to vary this configuration using the software commands ESC R and ESC N.

| JP7 | Print direction |
|--------|-----------------|
| Closed | Normal |
| Open | Reverse |

(Tab.1.4)

1. INSTALLATION AND USE

1.1.5 Turning the printer ON and OFF

To turn the printer ON

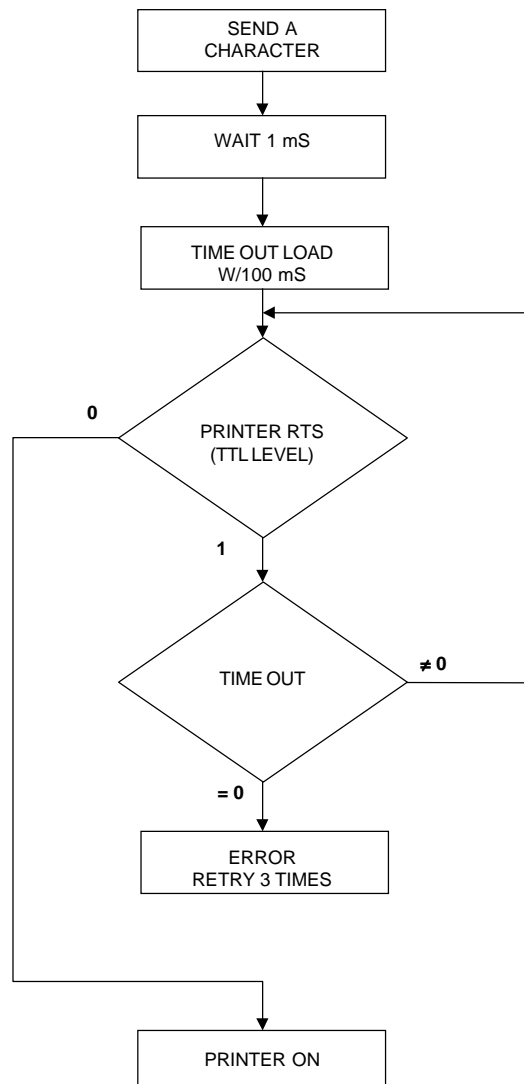
- Briefly press the FEED key
- Send a character through the serial interface

To turn the printer OFF

- Briefly press the FEED key
- Send the ESC 0 character through the serial interface
- Automatically turns off after 5 minutes of inactivity

Using software commands to turn the printer ON and OFF

If the printer is OFF, sending a character through the serial interface will turn it ON. Use the following diagram as reference:



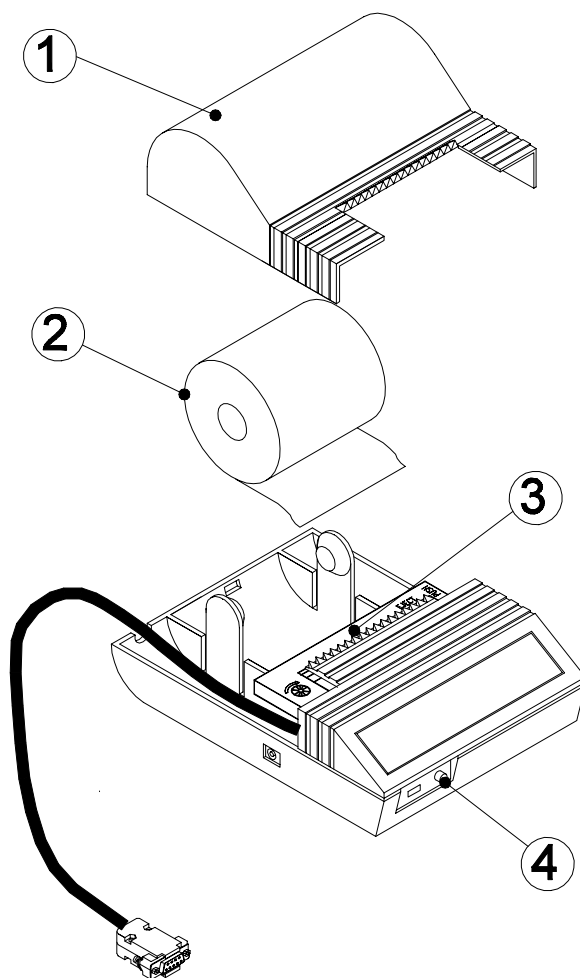
(Fig.1.2)

1.2 MAINTENANCE

1.2.1 Changing the paper roll

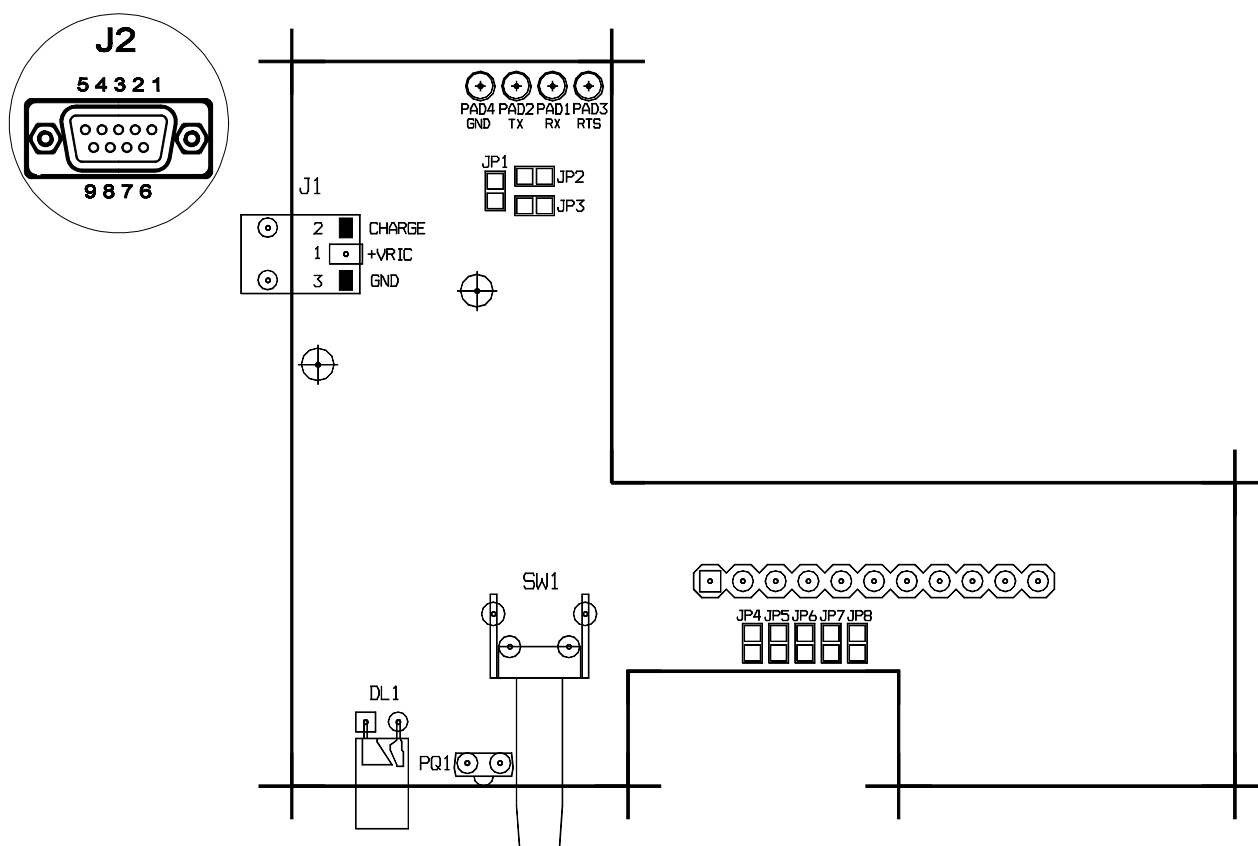
To change the paper roll, proceed as follows:

- 1) Remove the upper cover (1) of the printer by pressing from behind.
- 2) Position the paper roll (2) making sure it unrolls in the direction indicated in the drawing below.
- 3) Insert the end in the printing mechanism opening (3) and press the FEED key (4) until the paper edge emerges 3 or 4 centimeters.
- 4) Replace the upper cover and tear off the paper.



(Fig.1.3)

2. INTERFACES



2.1 RS232 / TTL SERIAL

(Fig.2.1)

The printer is equipped with an RS232 or TTL serial interface that is connected using a 9-pin female connector. In the serial protocol, the signals relating to communication are RX and RTS. The reception format is fixed at 8 data bits, 1 stop bit, parity none. It is, however, possible to vary reception speed by using jumpers JP1 and JP2. The table below describes the pins of the 9-pin external rectangular connector, or the points to which the user must connect, if not using the connector:

| No. pins on DB9 | Pad on CS | SIGNAL | DIRECTION | DESCRIPTION |
|-----------------|-----------|--------|-----------|-----------------|
| 3 | Pad 1 | RX | Input | Receive Data |
| 2 | Pad 2 | TX | Output | Transmit Data |
| 8 | Pad 3 | RTS | Output | Request to send |
| 5 | Pad 4 | GND | - | Signal Ground |

Jumpers JP4 and JP5 select the speed at which the RS232 receives the data. This setting is read by the printer software immediately after a reset (hardware or software). Any changes made in the configuration while the printer is operating will not, therefore, produce any effect.

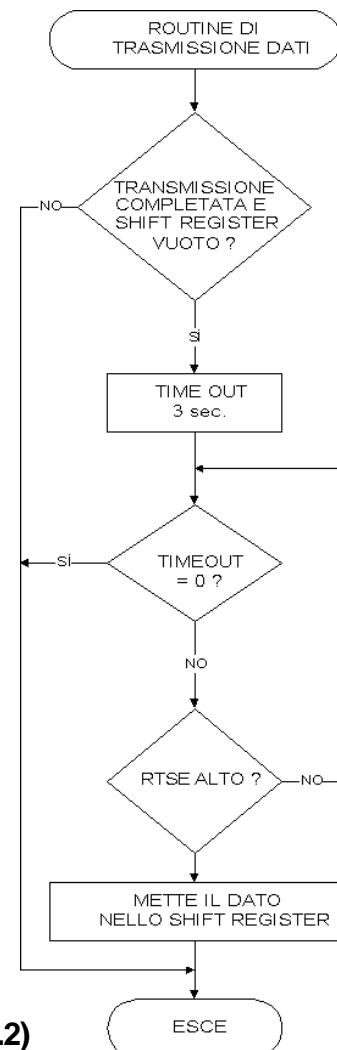
(Tab.2.1)

| JP4 | JP5 | BAUD RATE |
|--------|--------|-----------|
| CLOSED | CLOSED | 1200 |
| OPEN | CLOSED | 2400 |
| CLOSED | OPEN | 4800 |
| OPEN | OPEN | 9600 |

As can be seen in figures 2.3 and 2.4 the RS232 standard signal (+12 / -12 V) is inverted with respect to the TTL standard signal (0 - 5 V). During data transmission it is extremely important to test the RTS line in order to check whether the printer can receive data. When the printer is ready to receive, the RTS line is in a “high” logic state (+12 V) for the RS232 standard (Fig.2.3) and in a “low” logic state (0 V) for the TTL standard (Fig.2.4); when the printer is busy, the RTS line is in a “low” logic state (-12 V) for the RS232 standard (Fig.2.3) and in a “high” logic state (+5 V) for the TTL standard (Fig.2.4).

Before sending any data, the device which transmits data to the printer must ensure that the RTS line is in a “high” logic state when the RS232 standard is used, or in a “low” logic state when the TTL standard is used.

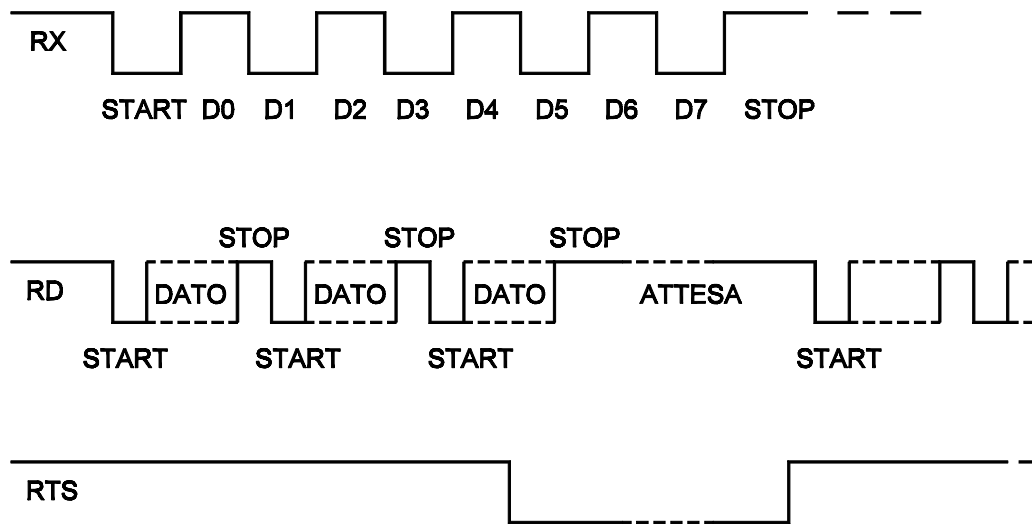
If this structure is not adhered to, data could be lost. Fig.2.2 gives a sample flow chart for data transmission using RS232 standard.



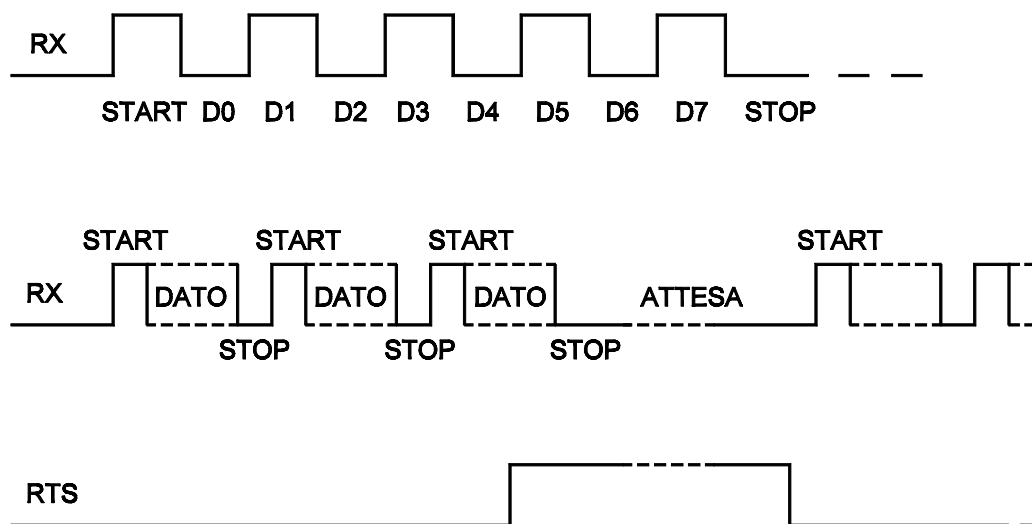
(Fig.2.2)

2. INTERFACES

The diagram in Fig.2.3 illustrates the status of the RX and RTS lines required to ensure good communication with RS232 standard, and Fig.2.4 illustrates the status for good communication using TTL standard:



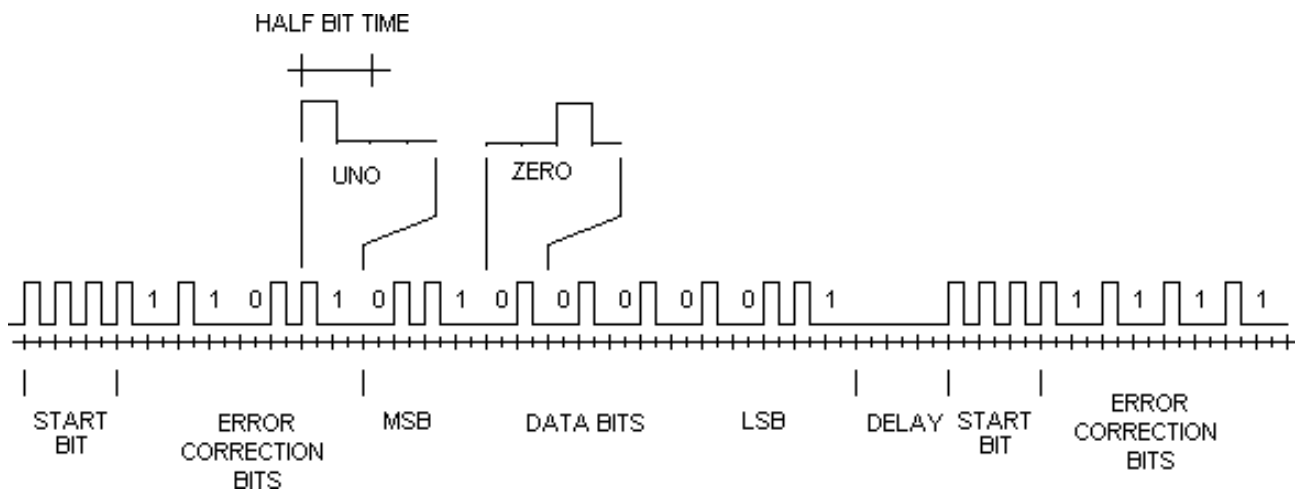
(Fig.2.3)



(Fig.2.4)

2.2 INFRARED

Data is received through an infrared photo transistor that normally has a band width of 890nm. The transmitter, whose band must be equal to that of the receiver, can be a photodiode or traditional light source such as an LED or 7-section red display. The distance of the optic link depends on the brightness of the source: if a photodiode is used, this distance is with a power supply current of; if an LED or red display is used, this distance is reduced according to the characteristics of the transmitters.



“1” is defined as signal presence at the start of the first half of the half bit time followed by signal absence for the second half of the half bit time.

“0” is defined as signal absence at the start of the first half of the half bit time followed by the signal for the second half of the half bit time.

The time of a half bit is 2mSec, therefore a signal pulse lasts 1mSec and a time bit lasts 4mSec.

The start bit is composed of three signals at the start of the first half of the half bit time. After having transmitted an entire data item, an interval equal to 3 half bit times must elapse before sending the next one (Delay).

A character is composed of 8 data bits and 4 error correction bits for a total of 12 bits. The correction bits are codified in the same way as the data bits. Each correction bit is used as an even parity bit for four distinct groups of data bits. These four groups are indicated in Table 2.2.

2. INTERFACES

(Tab.2.2)

| Error Correction Bits | | | | Data Bits | | | | | | | |
|-----------------------|----|---|---|-----------|---|---|---|---|---|---|---|
| 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| X | | | | | X | X | X | X | | | |
| | X | | | X | X | X | | | X | X | |
| | | X | | X | X | | X | | X | | X |
| | | | X | X | | | | X | | X | X |

For example, the first correction bit (bit 11) must be transmitted as 1 if the number of 1 in bits 6, 5, 4 and 3 is uneven, making the total of 1 an even number.

Example: if we wish to transmit ASCII character “A” corresponding to the binary configuration “01000001”, the error recovery code will be “1101”. The complete frame will thus become “110101000001”.

(Tab.2.3)

| Error Correction Bits | | | | Data Bits | | | | | | | |
|-----------------------|----|---|---|-----------|---|---|---|---|---|---|---|
| 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | | | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1 | | | | | 1 | 0 | 0 | 0 | | | |
| | 1 | | | 0 | 1 | 0 | | | 0 | 0 | |
| | | 0 | | 0 | 1 | | 0 | | 0 | | 1 |
| | | | 1 | 0 | | | | 0 | | 0 | 1 |
| 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |

Before starting to transmit a data sequence, a start of string character must be transmitted to synchronize the reception hardware. This character is ASCII “SYN” corresponding to decimal code 22 or hexadecimal 16. For example, to send the string Custom, transmit:

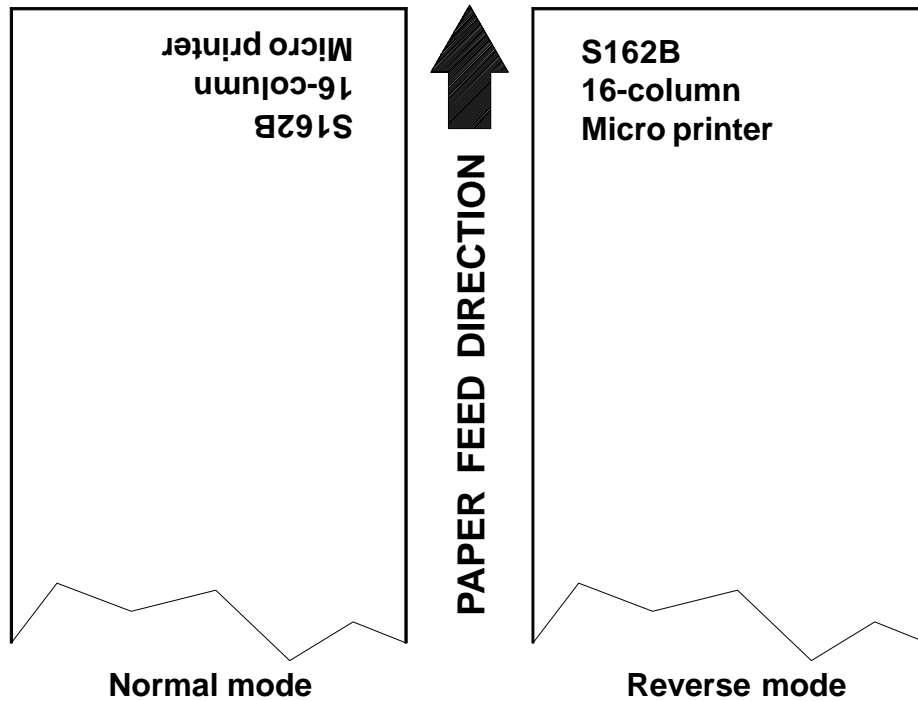
“SYN” “C” “u” “s” “t” “o” “m”

Each time data transmission is interrupted for more than 50mSec, the “SYN” character must be used to re-synchronize reception.

3. PRINTER FUNCTIONS

3.1 PRINTING MODES

The S16SB printer features two printing modes selectable through the normal and reverse control characters.



(Fig.3.1)

3.2 CONTROL CHARACTERS

The table below lists all the commands used to run the S16SB printer functions. These commands can be transmitted to the printer through the RS232 serial interface.

(Tab.3.1)

TABLE OF COMMANDS

| ASCII | HEX | Description |
|--------|-------------------|--|
| | \$00 | Small character print |
| | \$01 | Double width print |
| | \$02 | Double height print |
| | \$03 | Expanded print |
| | \$04 | Reset small character print |
| LF | \$0A | Forward feed one line |
| (n) VT | (n) \$0B | Forward feed \nearrow lines |
| CR | \$0D | Print the line buffer (if enabled) and forward feed one line |
| CRLF | \$0F | Set the CRLF mode |
| | \$11 [d] k \$0D | Graphic mode |
| ESC @ | \$1B \$40 | Reset software |
| ESC N | \$1B \$4E | Set printing in normal mode |
| ESC R | \$1B \$52 | Set printing in reverse mode |
| ESC 0 | \$1B \$30 | Printer power OFF |

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

3. PRINTER FUNCTIONS

00H

[Name] **Small character print**

[Format] ASCII -
Hex 00
Decimal 0

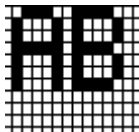
[Range]

[Description] Sets the small print mode.

[Notes] • This command clears the print buffer so that previously received data (if not already printed) is lost. You are, therefore, advised to transmit the <0D>H code first.

[Default] 00H.

[References] **01H, 02H, 03H, 04H.**

[Example] 

01H

[Name] **Double width print**

[Format] ASCII -
Hex 01
Decimal 1


[Range]

[Description] Sets the double width print mode.

[Notes] • This command clears the print buffer so that previously received data (if not already printed) is lost. You are, therefore, advised to transmit the <0D>H code first.

[Default] 00H.

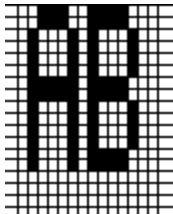
[References] **00H, 02H, 03H, 04H.**

[Example] 

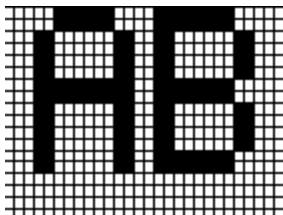
02H

[Name] **Double height print**

[Format] ASCII -
Hex 02
Decimal 2

| | |
|---------------|---|
| [Range] | |
| [Description] | Sets double height print mode. |
| [Notes] | <ul style="list-style-type: none"> This command clears the print buffer so that previously received data (if not already printed) is lost. You are, therefore, advised to transmit the <0D>H code first. |
| [Default] | 00H. |
| [References] | 00H, 01H, 03H, 04H. |
| [Example] |  |

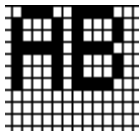
03H

| | |
|---------------|---|
| [Name] | Expanded print |
| [Format] | ASCII - Hex 03 Decimal 3 |
| [Range] | |
| [Description] | Sets expanded print mode. |
| [Notes] | <ul style="list-style-type: none"> This command clears the print buffer so that previously received data (if not already printed) is lost. You are, therefore, advised to transmit the <0D>H code first. |
| [Default] | 00H. |
| [References] | 00H, 01H, 02H, 04H. |
| [Example] |  |

04H

| | |
|---------------|--|
| [Name] | Resets small print |
| [Format] | ASCII - Hex 04 Decimal 4 |
| [Range] | |
| [Description] | Sets small print mode. |

3. PRINTER FUNCTIONS

| | |
|--------------|---|
| [Notes] | • This command clears the print buffer so that previously received data (if not already printed) is lost. You are, therefore, advised to transmit the <0D>H code first. |
| [Default] | 00H. |
| [References] | 00H, 01H, 02H, 03H. |
| [Example] |  |

LF

| | | |
|---------------|---|----|
| [Name] | Print and line feed | |
| [Format] | ASCII | LF |
| | Hex | 0A |
| | Decimal | 10 |
| [Range] | | |
| [Description] | Prints the data contained in the buffer and feeds one line. | |
| [Notes] | If the buffer is empty, it simply forward feeds one line. | |
| [Default] | | |
| [References] | CR | |
| [Example] | | |

(n) VT

| | | | |
|---------------|-------------------------------|---|----|
| [Name] | Vertical tabs | | |
| [Format] | ASCII | n | VT |
| | Hex | n | 0B |
| | Decimal | n | 11 |
| [Range] | $0 < n \leq 9$ | | |
| [Description] | Forward feeds <i>n</i> lines. | | |
| [Notes] | | | |
| [Default] | | | |
| [References] | | | |
| [Example] | | | |

CR

| | | |
|---------------|--|----|
| [Name] | Print and forward feed one line | |
| [Format] | ASCII | CR |
| | Hex | 0D |
| | Decimal | 13 |
| [Range] | | |
| [Description] | Prints the data contained in the buffer and forward feeds one line. | |
| [Notes] | <ul style="list-style-type: none">• If the buffer is empty, nothing is executed. Command \$0D is disabled by code \$0F (CRLF). | |
| [Default] | When jumper JP5 is open, command \$0D is enabled, and disabled when closed. | |
| [References] | LF, CRLF | |
| [Example] | | |

CRLF

| | | |
|---------------|--|------|
| [Name] | Set the CRLF mode | |
| [Format] | ASCII | CRLF |
| | Hex | 0F |
| | Decimal | 15 |
| [Range] | | |
| [Description] | Disables the \$0D command. | |
| [Notes] | This command can only be zero-set either by physically re-setting the printer or by using the ESC @ command. | |
| [Default] | When jumper JP5 is closed the CRLF command is enabled. | |
| [References] | CR | |
| [Example] | | |

11H [d] k 0DH

| | | | | | |
|----------|---------------------|-----|---|---|-----|
| [Name] | Graphic mode | | | | |
| [Format] | ASCII | - | | | |
| | Hex | 11H | d | k | 0DH |
| | Decimal | 17 | d | k | 13 |
| [Range] | 40H<d<7FH | | | | |
| | 1<k<16 | | | | |

3. PRINTER FUNCTIONS

[Description] Prints a graphic line.

[Notes] • This command clears the print buffer so that previously received data (if not already printed) is lost. You are, therefore, advised to transmit the <0D>H code first. It also sets the printer to small print mode.

[Default]

[References]

[Example] To print in graphic mode, the command 11H must be transmitted at the beginning of each line.
The byte format in graphic mode is:

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

where:

X is not used

R must be set at level 1

P1...P6 is the data for the graphic dots (1 print, 0 non-print).

Bit P6 of the string of transmitted points is printed at the left and the ones which follow (P5, P4, P3, P2, P1) to the right, as shown:

| | | |
|-------------------------------|-------------------------------|-------------------------------|
| 1st byte is | 2nd byte is | 3rd byte is |
| P6 P5 P4 P3 P2 P1 | P6 P5 P4 P3 P2 P1 | P6 P5 P4 P3 P2 P1 |

To print a dotline, transmit:

11H Nx7FH (where N is the number of columns per line)
0DH.

To print a blank line, transmit:

11H 40H 0DH.

ESC @

[Name] **Reset Software**

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

[Range]

[Description] Generates a software reset identical to the hardware reset and can be used for re-initializing the printer parameters. Obviously, after this command has been sent the reception buffer is zero-set with consequent loss of all the data transmitted to the printer.

[Notes]

[Default]

[References]

[Example]

ESC N

[Name] **Sets the printer to Normal print direction**

| | | | |
|----------|---------|-----|----|
| [Format] | ASCII | ESC | N |
| | Hex | 1B | 4E |
| | Decimal | 27 | 78 |

[Range]

[Description] Selects the normal print direction.

[Notes]

[Default] Jumper JP4 (See paragraph on Selection of print direction)

[References] **ESC R**

[Example]

ESC R

[Name] **Sets the printer to Reverse print direction**

| | | | |
|----------|---------|-----|----|
| [Format] | ASCII | ESC | R |
| | Hex | 1B | 52 |
| | Decimal | 27 | 82 |

[Range]

[Description] Selects the reverse print direction.

[Notes]

[Default] Jumper JP4 (See paragraph on Selection of print direction)

[References] **ESC N**

[Example]

ESC 0

| | | | |
|---------------|--------------------------|-----|----|
| [Name] | Printer power OFF | | |
| [Format] | ASCII | ESC | 0 |
| | Hex | 1B | 30 |
| | Decimal | 27 | 48 |
| [Range] | | | |
| [Description] | Turns off the printer. | | |
| [Notes] | | | |
| [Default] | | | |
| [References] | | | |
| [Example] | | | |

4. TECHNICAL SPECIFICATIONS

4.1 TECHNICAL SPECIFICATIONS

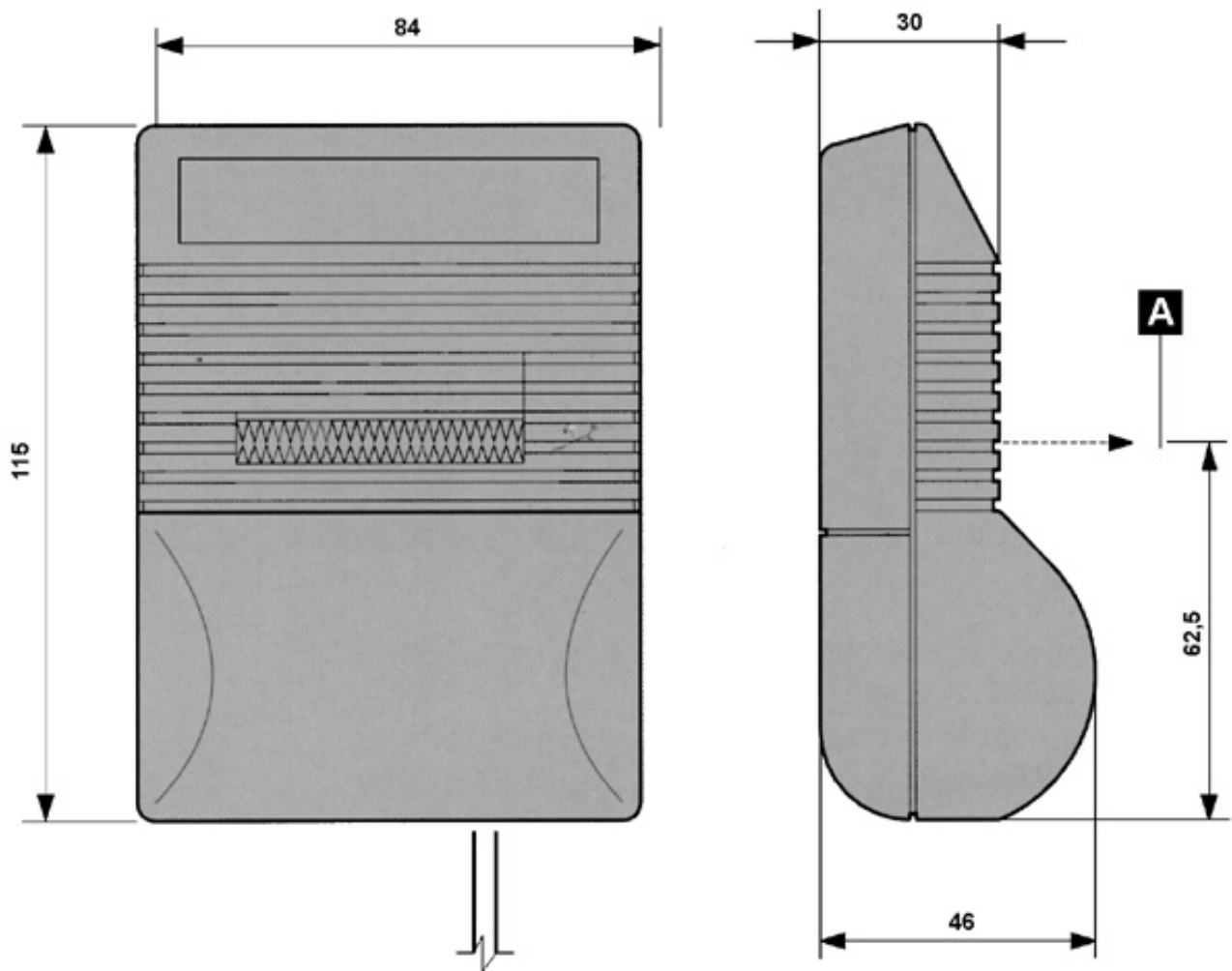
The main technical features of the S16SB serial printer are listed in Table 4.1.

(Tab.4.1)

| | |
|---|---------------------|
| Model | S16SB |
| Columns | 16 |
| Character (L x H mm) | |
| Normal | 1,8 x 2,5 |
| Double height | 1,8 x 5 |
| Double width | 3,6 x 2,5 |
| Expanded | 3,6 x 5 |
| Graphic dot (L x H mm) | 0,35 x 0,35 |
| Dots per line | 96 |
| Print speed (speed/current=normal) | |
| Lines / sec | 1 |
| Characters / sec | 16 |
| Line buffer | 16 byte |
| Print method | Impact dot matrix |
| Printing mode | Normal or Reverse |
| Characters set | HALF ASCII STANDARD |
| Standard interfaces | RS232 serial / TTL |
| Power supply | |
| Recharge voltage battery (max.) | 12 V |
| Recharge current battery (max.) | 100 mA |
| Battery life | 30.000 dots lines |
| Absorptions | |
| Stand-by | 10 mA |
| Medium in printing | 0.8A |
| Impulsive in printing | 2A |
| Environmental conditions | |
| Operating temperature | 0°C - +50°C |
| Operating humidity | 10% - 50% |
| Storage temperature / humidity | -20°C - +70°C |
| CUSTOM | 4-1 |
| S16SB/S16B-IR | |

4.2 DIMENSIONS

The dimensions of the S16SB printer are shown in the figure 4-1.



(Fig.4.1)

5.1 CHARACTER SETS

The S16SB printer has one characters set of 96 characters (HALF ASCII STANDARD).

S16SB

REL. 1.00

BAUD RATE 9600
8 BIT PER CHR
PRINT REVERSE
CRLF PROCESS CR

!"#\$%&'()*+,-./
0123456789:;<=>
@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_
`abcdefghijklmnopqrstuvwxyz°±µ¶

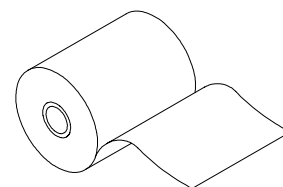


(Fig.5.1)

A.1 SPARE PARTS

(Tab.A.1)

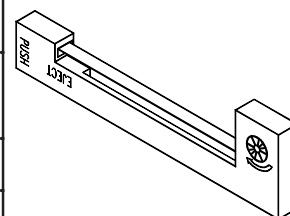
| RCN44X40 | | Normal paper roll | | |
|----------------------|---|-------------------|------|------|
| | Quantity recommended for number of appliances purchased | | | |
| N° appliances | <10 | <50 | <100 | >100 |
| Quantity recommended | 5 | 30 | 60 | 90 |



(Fig.A.1)

(Tab.A.2)

| ERC 05P | | Ink ribbon | | |
|----------------------|---|------------|------|------|
| | Quantity recommended for number of appliances purchased | | | |
| N° appliances | <10 | <50 | <100 | >100 |
| Quantity recommended | 5 | 30 | 60 | 90 |



(Fig.A.2)