



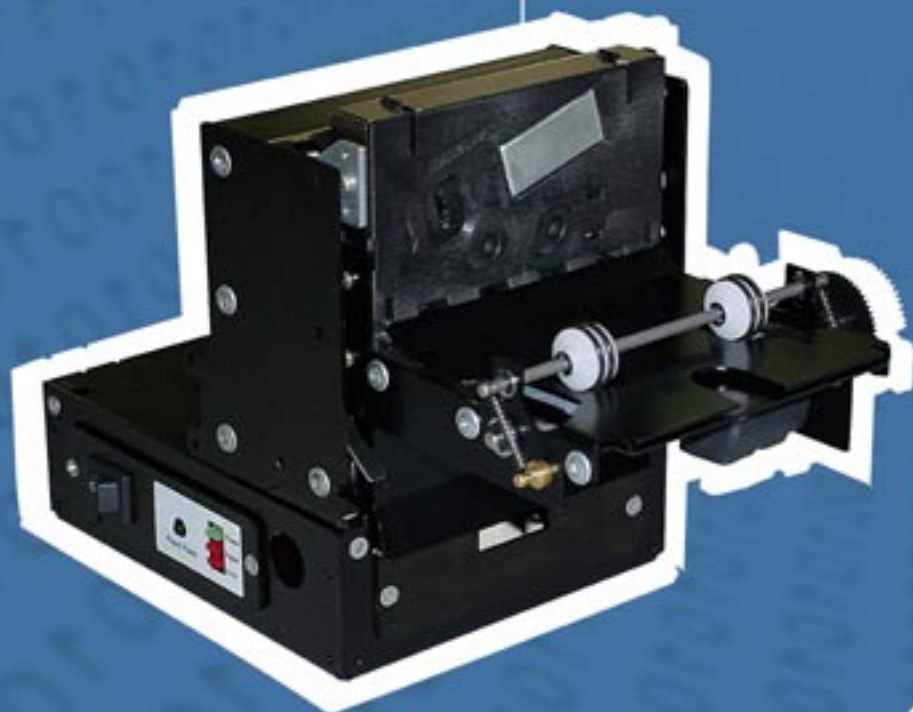
Bematech

USER'S MANUAL



:: Kiosk Printer

KB-1800



KB-1800 User's Manual
P/N: 6187 • Rev.1.3

February 2008

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EMC and Safety Standards Applied

Product Name: KB-1800

Model Name: 11000-XX (all)

*EMC is tested using an EPSON PS180 power supply

Europe:

CE marking

Safety: EN60950

North America:

EMI: FCC Class A

WARNING

The use of non-shielded communication cables as well as unauthorized changes or modifications on the equipment could void the certifications described in this page. Please contact your dealer for further information.

CE Marking

The printer conforms to the following Directives and Norms:

Directive 89/336/EEC

EN 55022 Class B (Conducted and Radiated emission)

EN 55024

IEC 61000-4-2 ESD

IEC 61000-4-3 Radiated immunity

IEC 61000-4-4 EFTB

IEC 61000-4-5 Surge

IEC 61000-4-6 Conducted immunity

IEC 61000-4-11 Voltage Dips

FCC CLASS A

DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with the limits for a Class A digital service, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to the radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Safety Precautions

This section presents important information intended to ensure safe and effective use of this product. Please read this section carefully and store it in an accessible location.



WARNING:

Immediately unplug the equipment if it produces smoke, a strange odor, unusual noise or if foreign matter including water or other liquid falls into the equipment. Continued use may damage it or lead to fire *. Please contact your dealer or a BEMATECH service center for advice.

Never attempt to repair this product yourself. Improper repair work can be dangerous.

Never disassemble or modify this product. Tampering with this product may result in injury or fire *.

Be sure to use the specified power source. Connection to an improper power source may cause malfunction or fire *.



CAUTION:

Do not connect cables in ways other than those mentioned in this manual. Different connections may cause equipment damage and burning *.

Be sure to set this equipment on a firm, stable surface. The product may break or cause injury if it falls.

Do not install this equipment in locations that do not comply with the environmental requirements specified in this manual.

Do not place heavy objects on top of this product. Never stand or lean on this product. Equipment may fall or collapse, causing breakage and possible injury.

To ensure safety, unplug this product before leaving it unused for an extended period. In this case, please be sure to place a piece of paper between the platen and the paper roll, in the thermal mechanism, to avoid damage when restarting the printer.

* Note that this equipment was developed complying with international safety standards and therefore contains only limited flammability components.

Summary

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Chapter 1

Forward

The objective of this manual is to give to users all necessary information to properly operate the KB-1800 Printer

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

www.bematech.com

Programmer's Manual - Contains all necessary information to properly program and integrate the kiosk printer into a system.



Outline drawings – Contains dimensions and assemblies.

Chapter 2

Technical Specifications KB-1800

| Characteristics | Specifications |
|--------------------|--|
| Printing | <p>Method: Thermal Line Printing</p> <p>Dot Density: 8 dots/mm (203 dpi x 203 dpi)</p> <p>Print Width: 72 mm (2.83") (576 dot-positions)</p> <p>Print Speed: 100 mm/s (3.94"/s) (fastest printing ASCII)</p> <p>Characters per line: 24, 32, 48 and 64</p> <p>Character Set: Alphanumeric Code Page 437, Code Page 850, Code Page 858 and Code Page 860</p> |
| Features | <p>Modular, flexible and lightweight design</p> <p>Automatic cutter (full and partial cut)</p> <p>High reliability</p> <p>Low paper sensor (paper near end)</p> <p>Automatic paper loading</p> <p>Downloadable firmware – update your printer software on site</p> <p>Bar code type: UPC-A, UPC-E, EAN13, EAN8, CODE 39, ITF, CODABAR, CODE 93, CODE 128, ISBN, MSI, PLESSEY, PDF-417</p> |
| Communication | <p>Buffer Capacity: 32K Bytes</p> <p>Interface: Parallel (Unidirectional), Serial(RS-232) and USB 1.1</p> <p>Serial interface specification:</p> <p style="margin-left: 20px;">Baud rate: 9600 or 115200</p> <p style="margin-left: 20px;">Start bit: 1 bit</p> <p style="margin-left: 20px;">Data bits: 7 or 8 bits</p> <p style="margin-left: 20px;">Parity bit: odd / even or no parity</p> <p style="margin-left: 20px;">Stop bit: one bit or two bits</p> |
| Power Requirements | <p>Voltage: 24 VDC ± 10%</p> <p>Current: 2 A nominal</p> |
| Environment | <p>Operating temperature: 0 to +45°C (+32 to +113°F)</p> <p>Storage temperature: -20 to +60°C (-4 to +140°F) (except for paper)</p> <p>Operating humidity: 35 to 85% RH, non condensing</p> <p>Storage humidity: 10 to 90% RH, non condensing (except for paper)</p> |
| Reliability | <p>Print head service life: 100 Km, hundred million pulses</p> <p>Cutter lifetime: 1.5 x 10⁶ cuts (Using paper Votorantin KPH756)</p> <p>Type: Single-ply thermal paper roll</p> <p>Thickness: 60 to 100 um</p> <p>Width: 79.0~80.0 mm (3.11~ 3.15")</p> <p>Roll diameter: External 8" (maximum) with internal 1" core. Please contact your dealer for more details. * Thermal side is on the outside of the roll</p> |
| Media | <p>Recommended paper brand:</p> <ul style="list-style-type: none"> • TF50KS-E made by NIPPON SEISHI or equivalent • AF50KS-E made by JUJOTHERMAL • KF50 made by KANZAN • P350 made by KSP • KPH756 made by VCP • KPH856 made by VCP • KPH868 made by VCP |

Physical

| Configuration * | | Dual | USB |
|---|---|--|--|
|  | Printer with presenter (stacked version) | Height: 149.1 mm (5.87''') Width: 130.0 mm (5.12''') Depth: 238.0 mm (9.37''') Weight: 1.74 Kg (3.836 lbs) | Height: 149.1 mm (5.87''') Width: 130.0 mm (5.12''') Depth: 229.0 mm (9.02''') Weight: 1.74 Kg (3.836 lbs) |
|  | Printer without presenter (Stacked Version) | Height: 149.1 mm (5.87''') Width: 130.0 mm (5.12''') Depth: 154.1 mm (6.07''') Weight: 1.47 Kg (3.241 lbs) | Height: 138.1 mm (5.43''') Width: 130 mm (5.11''') Depth: 152.8 mm (6.01''') Weight: 1.55 Kg (3.41 lbs) |
|  | Printer with presenter (Low Profile) | Height: 106.1 mm (4.18''') Width: 136.3 mm (5.37''') Depth: 292.0 mm (11.50''') Weight: 1.74 Kg (3.836 lbs) | Height: 106.1 mm (4.18''') Width: 136.3 mm (5.37''') Depth: 283.0 mm (11.14''') Weight: 1.74 Kg (3.836 lbs) |
|  | Printer without presenter (Low Profile) | Height: 106.1 mm (4.18''') Width: 136.3 mm (5.37''') Depth: 208.1 mm (8.19''') Weight: 1.47 Kg (3.241 lbs) | Height: 106.1 mm (4.18''') Width: 136.3 mm (5.37''') Depth: 199.0 mm (7.83''') Weight: 1.47 Kg (3.241 lbs) |
|  | Printer with presenter (Side Mount) | Height: 147.6 mm (5.81''') Width: 192.3 mm (7.57''') Depth: 210.3 mm (8.28''') Weight: 1.74 Kg (3.836 lbs) | Height: 147.6 mm (5.81''') Width: 192.3 mm (7.57''') Depth: 201.3 mm (7.93''') Weight: 1.74 Kg (3.836 lbs) |
|  | Printer without presenter (Side Mount) | Height: 147.6 mm (5.81''') Width: 192.3 mm (7.57''') Depth: 131.9 mm (5.19''') Weight: 1.47 Kg (3.241 lbs) | Height: 147.6 mm (5.81''') Width: 192.3 mm (7.57''') Depth: 117.0 mm (4.61''') Weight: 1.47 Kg (3.241 lbs) |
|  | Printer without presenter (Cut & Drop) | Height: 71.1 mm (2.80''') Width: 136.3 mm (5.37''') Depth: 236.4 mm (9.31''') Weight: 1.47 Kg (3.241 lbs) | Height: 71.1 mm (2.80''') Width: 136.3 mm (5.37''') Depth: 217.3 mm (8.95''') Weight: 1.47 Kg (3.241 lbs) |
|  | Paper Holder 6''/8'' | Height: 123 mm (4.8'') | Height: 123 mm (4.8'') |
| | | Width: 114,7 mm (4.5'') | Width: 114,7 mm (4.5'') |
| | | Depth: 78 mm (3.1'') | Depth: 78 mm (3.1'') |
| | | Weight: 0.30 Kg (0.6 lbs) | Weight: 0.30 Kg (0.6 lbs) |

* You are not authorized to change the printer configuration. This may void the EMC and Safety certifications and may cause malfunction or injury. For further information, please contact your dealer.

Chapter 3

Getting Started

The Printer

The communication connectors, DC connector, On/Off switch and key panel can be found in different locations of the printer, according to the selected assembly.

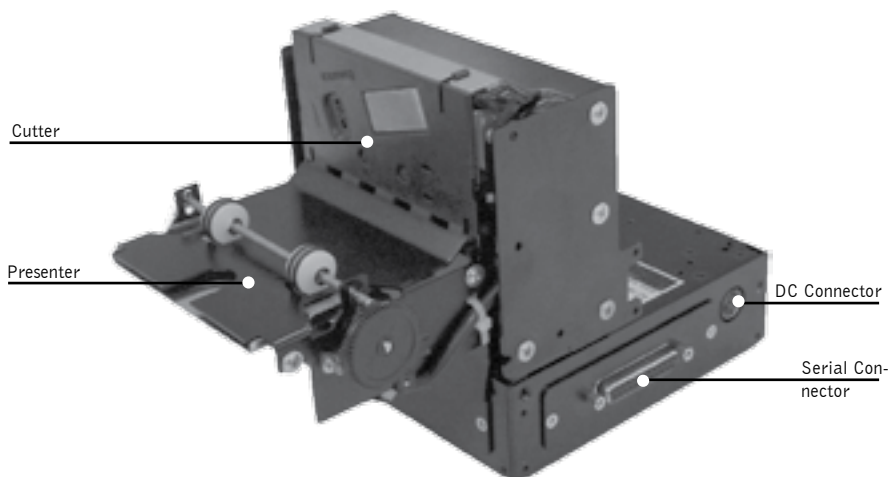


Figure 1

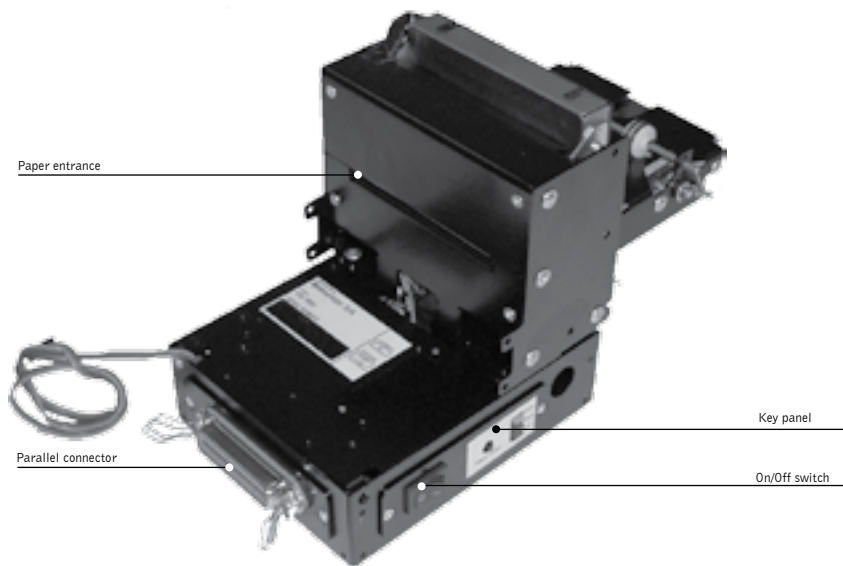


Figure 2

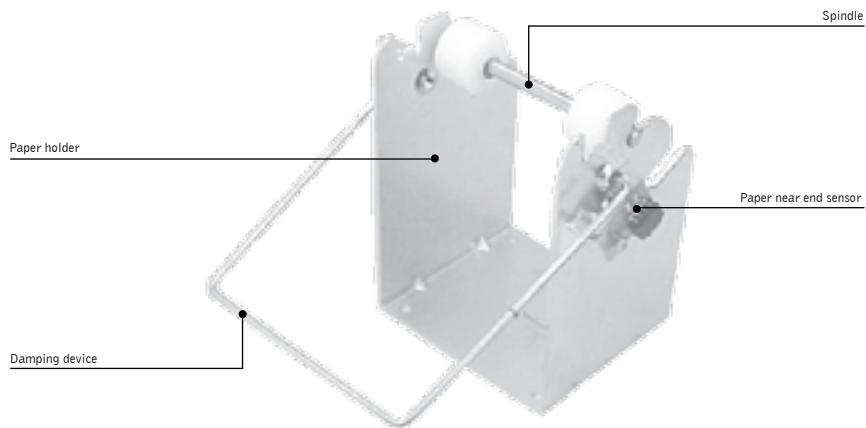


Figure 3

Unpacking

Take the printer out of its box and verify that the following items are included:

- Printer
- User's Manual

Keep the box and packing materials for future use if necessary.

Paper roll is not included – the appropriate thermal paper should be used. Refer to the Technical Specifications section in this manual for paper details.

Powering

Make sure that the printer is turned off. Connect the power cord to the power supply's AC connector and to an electrical outlet. This outlet must have its ground pin connected as shown on the right:

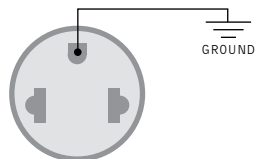


Figure 4

Connect the DC cable of the power supply in the printer as shown below – note that the arrow in the connector must be facing down:

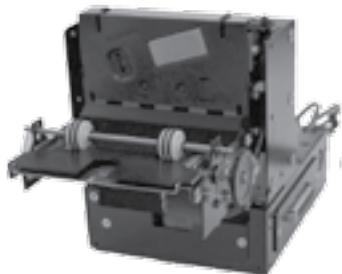


Figure 5



Figure 6

Turn on the printer using the on / off switch located on the printer. Check, also in the panel, if the Power LED is lit. If no paper is present, the Paper LED will also be lit.

DC Cable Specification

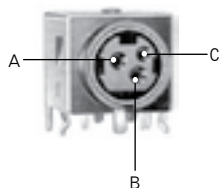


Figure 7

| Connector | Specification |
|-----------|---------------|
| A | 24VDC |
| B | GND |
| C | N.C. |

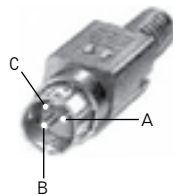


Figure 8

Paper Handling

Loading Paper

To insert a new paper roll, please do as follows:

The end of the paper roll must be cut evenly, as shown on the right.

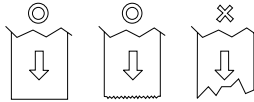


Figure 9

Be sure that the presenter is in the locked position.

Place the spindle in the paper roll's core and then place the roll and spindle in the paper holder as shown.

Note that the paper must go under the damping device.

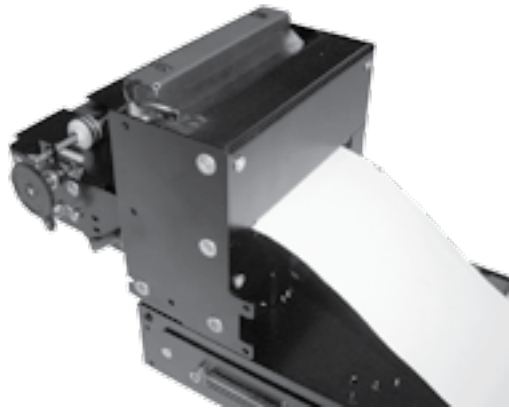


Figure 10

Gently push the paper into the paper entrance. The printer will automatically pull the paper, and turn off the Paper LED.



Figure 11

Removing Jammed Paper

If a paper jam occurs, follow the steps below:

1. Cut the paper at the paper entrance.
2. Unlock the presenter mechanism using the presenter lock.

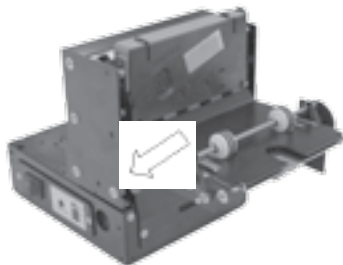


Figure 12

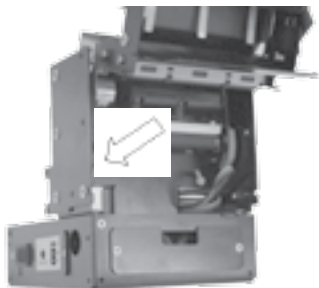


Figure 13

3. Unlock the head up switch raising the print head.



Figure 14

4. Gently pull the paper out of the mechanism.
5. Lock the head up switch back to initial position.
6. Lock the presenter.

ATTENTION!

In case your print is kept off for a period longer than 30 days, is recommended to keep the paper in the mechanism.

With this, the mechanism will be always in perfect conditions of use.

Key Panel

The key panel gives visual printer status and manual control to the operator. These functions are accomplished using one switch and LEDs, described below:

- **POWER LED:** This green Led will be on whenever power is applied to the printer and the power switch is on.
- **PAPER LED:** This red Led will be on when the printer is without paper. If the print head is up, this red LED will blink.
- **ERROR LED:** This red Led will also be lit in error conditions.
- **PAPER FEED BUTTON:** Use to feed paper line by line with fast button touches or feed paper continuously, by pressing and holding down the button.

Error Table

| Error | Number of Blinks | Type | Possible cause |
|------------------------|------------------|-----------------|--|
| Entrance Presenter jam | 16 | Non-recoverable | Paper did not enter in the presenter |
| Exit Presenter jam | 16 | Non-Recoverable | Presenter can not eject the paper |
| Mechanism | 8 | Non-recoverable | Thermal Head is damage or Thermal Head cable is disconnected |
| Power Supply | 11 | Non-recoverable | Power supply less than 10V or higher than 13V |
| Cutter | 12 | Non-recoverable | Cutter can not cut the paper |

Presenter Operation

The presenter mechanism is responsible for the ejection of the receipts printed by the kiosk printer. It is designed so that paper jam is minimized, especially while in operation. However, due to paper feed conditions (wrong paper feeding, paper wrinkles etc.) paper jam may occur, especially when replacing paper. We may, then, consider the following:

- When a paper jam occurs in the presenter entrance, the paper will not reach the presenter sensor (located in the presenter cover) – in this case, the kiosk printer goes into error condition, thus requiring manual intervention. After removing the jammed paper, the printer must be turned off and on again, in order for the printer to come back on line.
- When the paper jam occurs in the presenter paper exit, the kiosk printer will try to force the paper out for 8 seconds. If that does not happen, the printer will wait for 10 seconds, after which it will try a new paper presenting sequence. If the second try is not effective, the printer will go permanently in error condition, thus requiring a manual intervention to remove the paper. This paper jam may occur while replacing paper or if there is vandalizing of the paper exit. However, to prevent that, the presenter has a clutch device that prevents paper jamming if paper exit is blocked.

Reliability of presenter operation without the recommended paper is not guaranteed.

Operation Modes

The printer can be operated in the following modes:

Normal

In this state, the printer is being controlled by the host through the serial or parallel interfaces.

Dump mode

In this mode advanced users and programmers can identify communication problems between the host and the printer or check if a certain programmed data is correctly being sent to the printer, thus being a debugging tool. To start the hexadecimal dumping, turn on the printer while pressing the paper feed switch. A message will be printed on the paper asking you to press once more the paper feed switch if Dump mode is desired.

Self-testing

To run a self-test, turn the printer off. Press and hold the Paper Feed switch and turn it on. When the printer starts printing, the paper feed button can be released. A message will be printed asking you waiting for the self-test. In the self-test you will find the printer firmware version, among other information.

Chapter 4

Communication Interfaces

Communication between a host and the printer can be performed in three communication protocols: USB, Parallel or Serial RS-232, according to the printer model.

Communication cables are not supplied with the printer

Serial Interface

The RS232 serial interface uses a female DB-25 connector. The serial port can operate using the DTR/DSR mode, with 7 or 8 data bits, with or without parity, even or odd parity, one start bit and one or more stop bits. In the RS232 standard, the logic low level corresponds to a +12V voltage level and a logic high level corresponds to -12V.

DTR / DSR mode

In this mode, the printer's DTR line controls the flow of data sent from the host's TX line and received by the printer's RX pin. In this case, when the printer's DTR signal is low (+12V) the printer requests the host to send data. When the DTR signal is high (-12V) the printer tells the host to stop sending data.

DB-25 Serial connector

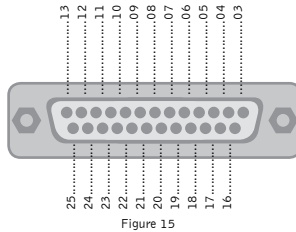


Figure 15

The serial cable needed for the DTR / DSR mode is shown below:

| Printer Side (DB-25) | Host Side (DB-9) |
|----------------------|------------------|
| 2 (TD) | 2 (RD) |
| 3 (RD) | 3 (TD) |
| 6 (DSR) | 4 (DTR) |
| 7 (GND) | 5 (GND) |
| 20 (DTR) | 6 (DSR) |
| | 1-7-8 (jumper) |

| Printer Side (DB-25) | Host Side (DB-25) |
|----------------------|-------------------|
| 2 (TD) | 3 (RD) |
| 3 (RD) | 2 (TD) |
| 6 (DSR) | 20 (DTR) |
| 7 (GND) | 7 (GND) |
| 20 (DTR) | 6 (DSR) |
| | 4-5-8 (jumper) |

Parallel Interface

The unidirectional parallel interface has the following specifications:

- Synchronization: Externally supplied Strobe signal
- Handshaking: Ack and Busy signal
- Signal levels: TTL compatible
- Data transmission: 8-bit parallel

Parallel Interface Pin Assignments

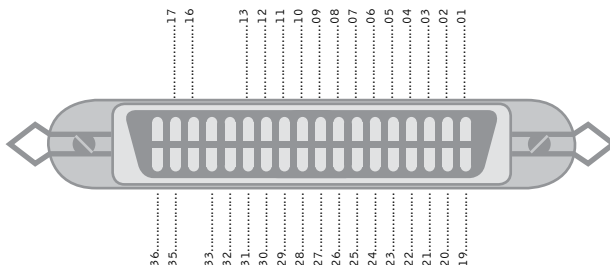


Figura 16

| Signal pin | Associated return pin | Signal | Direction | Description |
|------------|-----------------------|---------|-----------|---|
| 1 | 19 | /STROBE | IN | Strobe pulse for data reading. The pulse's width must be larger than 0.5 us. |
| 2 | 20 | Data 1 | IN | Data in signals (LSB is Data 1). The signal high level corresponds to bit 1 and the low level corresponds to 0. |
| 3 | 21 | Data 2 | | |
| 4 | 22 | Data 3 | | |
| 5 | 23 | Data 4 | | |
| 6 | 24 | Data 5 | | |
| 7 | 25 | Data 6 | | |
| 8 | 26 | Data 7 | | |
| 9 | 27 | Data 8 | | |

| Signal pin | Associated return pin | Signal | Direction | Description |
|-------------|-----------------------|--------|-----------|---|
| 10 | 28 | /ACK | OUT | This pulse is active low and indicates that data sent to the printer has been received. The pulse width must be larger than 10 μ s. |
| 11 | 29 | BUSY | OUT | When high, indicates that the printer cannot receive data. Becomes high in case of: |
| 12 | 30 | PE | OUT | 1 – Paper end. 0 – Near paper end. |
| 13 | | OL OUT | OUT | On line Out. When high, indicates operation in remote mode. When low, indicates operation in local mode. |
| 14,15,18,36 | | NC | | Not connected. |
| 16 | | GND | | Circuit ground. |
| 17 | | Frame | | Frame ground. |
| 19-30 | | GND | | Circuit ground. |
| 31 | | /INIT | IN | When low initializes the printer. It may be larger than 50 μ s. |
| 32 | | /ERROR | OUT | Paper absence. |
| 33 | | GND | | Circuit ground. |
| 34 | | NC | | Not connected. |
| 35 | | PULLUP | OUT | “Pulled Up” to +5V |

USB Interface (optional)

The KB-1800 has an USB interface compatible with the Universal Serial Bus Specification 1.1. It is a 12 Mbps serial channel using the Bulk mode with a “B” receptacle as show below. The USB cable must have in one side an “A” plug to connect in the host, and in the other side an “B” plug to connect in the printer. The printer is self-powered and does not draw power from the standard type B USB interface cable.

Type “B” Receptacle



Figure 17

| Signal pin | Signal |
|------------|--------|
| 1 | NC |
| 2 | DATA+ |
| 3 | DATA- |
| 4 | GND |

Using the USB interface, the printer can be connected in the host even if both parts are powered. The first time you connect the printer in the host, the operational system will ask for the printer driver that you received with the printer. For more details please contact your dealer.

Chapter 5

Dip Switch

One set of dip switches is mounted in the control board of the KB-1800. To access these dip switches, please do as follows:

- Turn off the printer
- Remove the paper from the mechanism
- Remove the screws that hold the cover of the control board
- Using the tables below, change the configuration of the dip switches
- Mount the cover of the control board and fasten the screws back

| Dip Switch | Function | |
|------------|------------------|---|
| 1 | Baud Rate | On: 115200 bps ***** Off: 9600 bps * |
| 2 | PNE | On: activated ** Off: not activated |
| 3 | Reserved | Must be in off position |
| 4 | Stop Bits | On: 1 stop bit * Off: 2 stop bits |
| 5 | Character length | On: 7 bits Off: 8 bits * |
| 6 | Parity Select | On: Odd Off: Even * |
| 7 | Parity | On: not used * Off: used |
| 8 | Presenter | On: activated *** Off: not activated ***** |

* Default

** ON - Default or :
 After Esc m: PNE sensor is returned in status bit (serial or USB) or PE line (Parallel)
 After Esc l: Presenter sensor is returned in status bit (serial or USB) or PE line (Parallel)
 OFF - Default or after Esc m: always return paper ok
 After Esc l: always return paper ok

*** Default for printers with presenter

**** Default for printers without presenter

***** If you set 115200bps for baud rate, you must change the dip switch 4 to OFF position, using 2 stop bits for your setup. The spooler driver is setup for 2 stop bits

Chapter 6

Troubleshooting

The following table described some of the problems that might occur while using the printer. For every problem there is a possible cause described here and a suggested procedure to solve the problem.

| Problem | Possible Cause | Possible Cause |
|--|--|--|
| The printer does not turn on. | There is no power in the electric outlet. | Check if there is a central switch for the room / outlets. Connect some other equipment to the outlet to check its operation. |
| | A problem with the power cord – it may be broken or not well connected to the printer and / or outlet. | Turn off the printer, check the power cord's continuity and a perfect connection between the printer and the electric outlet. |
| The printer does not respond to the commands sent. | The parallel / serial / USB cable has one or more lines with faulty connections / broken wires. | Check for a good connection between the printer and the host or change the cable. |
| | Wrong programming sequences. | The programming sequences can be checked in the dump mode. Put the printer in dump mode and run your application again. The printer will show the hexadecimal and ASCII codes of all bytes being received from the host. |
| Parallel communication is faulty. | The parallel cable has one or more lines with faulty connections / broken wires. | Check for a good connection between the printer and the host or change the parallel cable. |
| | The pin layout does not follow the Centronics standard. | Check the correct pin layout in this manual. |
| Serial communication is faulty. | The serial cable has one or more lines with faulty connections / broken wires. | Check for a good connection between the printer and the host or change the serial cable. |
| | The pin layout does not follow the correct protocol. | Check if the pin layout used complies with the protocol being used for data transmission. Remember that the printer uses the DTR/DSR protocol. |
| | The baud rate is incorrectly set. | If the baud rate set on the printer is different from the baud rate of the host, the printer will print random characters or not print at all. Check carefully the host's serial baud rate configuration as well as the printer's DIP switch settings. |

Chapter 7

Preventive Maintenance

Cleaning the Presenter:

Remove debris and paper dust from the presenter by using a vacuum cleaner, or by blowing or by using a dry soft brush. Perform this operation when replacing paper roll.

Printer head cleaning procedure:

Adhesion of dusts of paper and foreign materials may deteriorate the print quality and the lifetime of the head and platen. When they adhere, clean the head according to the following procedures:

1. Take measures against static electricity such as a disposable wrist strap for the work.
2. Cleaning should be done with the presenter or the cutter (depends on your configuration) lifted up and the platen part separated from the head (use the head-up lever).

Note: do not hit the thermal head surface with anything hard!

3. Wipe off the heating element part of the head surface lightly with cotton swabs to which Ethyl-alcohol is applied. Be sure to clean the platen roll as well.
4. After Ethyl-alcohol has completely been dried, set the platen and perform the action check (print a self test ticket and check the printing quality).

Note: do not use anything that may destroy the heating element, such as sandpaper. Do not apply any unnecessary force to the thermal head.

Tests revealed that this procedure becomes necessary more often as the printer head gets used.

Anotations



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