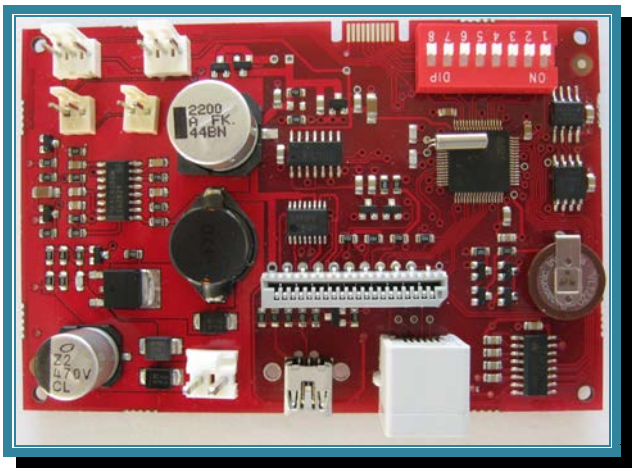
# Product Data Sheet

# MOP1700/50



## MOP1700 series - Martel OEM Thermal Printer Control Board



### Features

- Printer Control Board
- Interfaces: RS232 / USB
- 10-35Vdc standard, 5-8Vdc / low power options
- High reliability
- Settings via 8W DIP Switch or Software Command
- Control Interface for Auto Paper Winder
- Input Interfaces for Paper Feed and Aux Senor
- Sensor Interfaces for Paper Empty and Aux Input
- Versatile, for use with text or graphics
- 12, 16, 24, 32 or 48 characters per line
- Suitable for paper and label printing
- Windows driver for Win 7 / Win 8 / Win 10 / XP / 2000
- Linux and WinCE 5.0 / 6.0 drivers available

| | |
|---|---|
| MOP1700 | 5-8Vdc |
| MOP1750 | 10-35Vdc |

### Options

- Real Time clock with backup battery
- UNICODE UTF-8

### Introduction

The MOP1700 Series is from the latest range of Martel OEM printer products, comprising of separate controller boards and separate thermal printer boards designed for OEM flexibility.

Designed for maximum versatility, the MOP1700 Controller Board series are capable of many different modes of operation. Numerous international character sets and barcodes are selectable and the printers have RS232 serial and USB interfaces as standard. With flash upgrade capability as standard, it provides a flexible method of remotely updating the printer firmware for new customer requirements or requests with minimal delay.

Power supply options include MOP1750 a single 10-35Vdc (standard) or MOP1700 a 5-8Vdc (optional) supply giving fast, high resolution printing whilst a low current version is also available.

In addition to the MOP1700 Controller Board there are separate Thermal Printer Mechanism boards.

Martel manufactures a wide range of cased and compact panel printers and we would be pleased to discuss the possibility of customising any aspect of the printer to your specific requirements.

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## SPECIFICATION:

**General (Depending on Thermal Printer Mechanism used with Controller Board)**

| | |
|---|---|
| Printing system | Direct thermal line head |
| Max Characters per line | 48, 32, 24(default), 16 and 12 |
| Character matrix | 8x24, 12x24 or 16x24 |
| Character size | 3mm x 2mm, 3mm x 1.5mm or 3mm x 1mm (Approx. 13, 17 or 25cpi) |
| Horizontal dot pitch | 0.125mm (Approx. 200dpi) |
| Vertical dot pitch | 0.125mm |
| Text line composition | 384x24 dots |
| Printing width | 48mm |

**Average printing speed**

| | |
|---|---|
| MOP1700/MOP1750 | 10 lines of text per second (max) |

**Power supply**

| | |
|---|---|
| MOP1700 (Optional) | 5V-8Vdc |
| MOP1750 (Standard) | 10-35Vdc |

**Current consumption**

| | |
|---|---|
| MOP1700 | 4A |
| MOP1750 | 2.7A @ 10V, 1.75A @ 15V, 1.5A @ 20V, 1.2A @ 25V, 1.1A @ 30V, 1A @ 35V peak |

**Language support**

| | |
|---|---|
| Character set | UK / United States (437) |
| Country codes | USA, France, Germany, UK, Denmark I/II, Sweden, Italy, Japan, Norway, Spain I |
| UNICODE UTF-8 (Optional) | Bulgarian, Chinese (GB2312), Croatian, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Italian, Japanese (Kanji/Katakana), Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Slovene, Slovak, Spanish, Swedish, Turkish |

**Data and Interface**

| | |
|---|---|
| USB | USB v2.0 |
| Serial | |
| Data format | RS232 (Default, 1 Start, 8 Data, 1 Stop, No Parity) |
| Baud rates | 300, 600, 1200, 2400, 4800, 9600 & 19200, 38400, 57600 & 115200 |
| Handshaking | Hardware or Software (XON/XOFF) |
| Buffer size | 5 Kbytes |

**Dimensions**

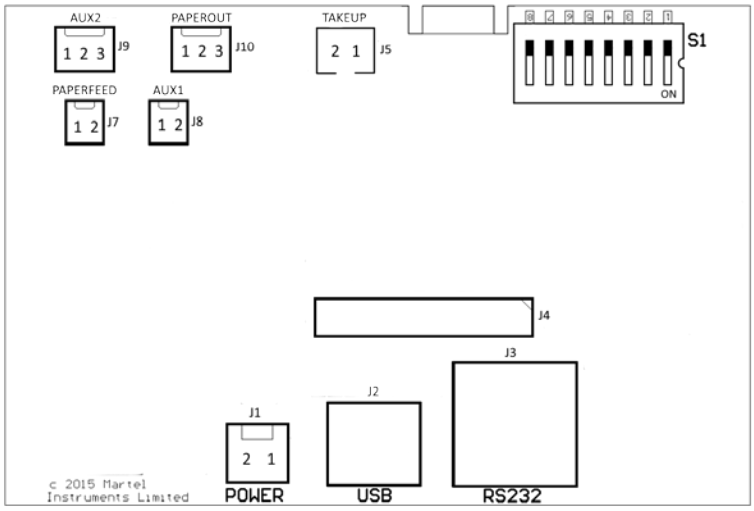
| | |
|---|---|
| MOP1700 Series | 96mm x 64mm x 17mm (WxHxD)<br>Mounting Holes: 4x M2.5<br>Fixings: 87.5 x 56mm (WxH) |

# Product Data Sheet

# MOP1700/50



## ELECTRICAL CONNECTIONS:




| POWER | | |
|---|---|---|
| J1 | 1 | GND |
| | 2 | Vin (10v TO 35V) |

| USB | | |
|---|---|---|
| J2 | 1 | Vusb (5V) |
| | 2 | D- |
| | 3 | D+ |
| | 4 | GND |

| RS232 | | |
|---|---|---|
| J3 | 1 | GND |
| | 2 | TXD (from Printer) |
| | 3 | RXD (to Printer) |
| | 4 | N/C |
| | 5 | DSR (to Printer) |
| | 6 | DTR (from Printer) |

| PRINTER | | |
|---|---|---|
| J4 | 1 | Vcc (3.3V) |
| | 2 | PAPER FEED (PF) |
| | 3 | LED |
| | 4 | DATA |
| | 5 | CLOCK |
| | 6 | LATCH |
| | 7 | THERMISTER |
| | 8 | VPS |
| | 9 | GND |
| | 10 | GND |
| | 11 | GND |
| | 12 | PS |
| | 13 | !B |
| | 14 | DST |
| | 15 | B |
| | 16 | Vp (5V) |
| | 17 | !A |
| | 18 | Vp (5V) |
| | 19 | A |
| | 20 | Vp (5V) |

| TAKEUP | | |
|---|---|---|
| J5 | 1 | TAKEUP SIGNAL (OUT) |
| | 2 | 5V |

| PAPER FEED | | |
|---|---|---|
| J7 | 1 | PAPERFEED SIGNAL (IN) |
| | 2 | GND |

| AUX1 | | |
|---|---|---|
| J8 | 1 | AUX1 SIGNAL (IN) |
| | 2 | GND |

| AUX2 | | |
|---|---|---|
| J9 | 1 | AUX2 SIGNAL (IN) |
| | 2 | GND |
| | 3 | Vcc (3.3V) |

| PAPEROUT | | |
|---|---|---|
| J10 | 1 | PAPEROUT SIGNAL (OUT) |
| | 2 | GND |
| | 3 | Vcc (3.3V) |

The printer incorporates a number of configurable *options*, each of which has a number of *settings*. The default settings of the standard printer are detailed in the table below in bold. To change the setting of any option, follow the procedure below:

1. Ensure the printer is OFF.
2. Press and hold the Paper Feed button whilst powering the printer ON. After about five seconds, the Status light will flash five times to show that the printer is in *configuration mode*. Release the Paper Feed button.
3. Press the Paper Feed button the same number of times as the *option* that you wish to change (for example to change baud rate, press the Paper Feed button twice).
4. After a short delay, the Status light will flash the same number of times as the option that you have chosen. If you have made a mistake at this stage, simply wait: after a delay, the printer will power-on without changing any options.
5. To proceed with configuration, press the Paper Feed button the same number of times as the *setting* that you wish to make (for example, to set the baud rate to 19200, press the Paper Feed button four times).
6. After a short delay, the Status light will flash the same number of times as the setting that you have made.
7. After a further delay, the printer will power-on with the new setting.

| | Option | Setting Number(default in bold) | Setting (default in bold) |
|---|---|---|---|
| 1 | **RS232 Protocol** | **1** | **8, No parity** |
| | | 2 | 8, Odd parity |
| | | 3 | 8, Even parity |
| | | 4 | 7, Odd, parity |
| | | 5 | 7, Even Parity |
| 2 | **RS232 Baud Rate** | 1 | 115200 baud |
| | | 2 | 57600 baud |
| | | 3 | 38400 baud |
| | | 4 | 19200 baud |
| | | **5** | **9600 baud** |
| | | 6 | 4800 baud |
| | | 7 | 2400 baud |
| | | 8 | 1200 baud |
| | | 9 | 600 baud |
| | | 10 | 300 baud |
| 3 | **RS232 Handshake** | **1** | **None** |
| | | 2 | Software |
| | | 3 | Hardware |

## Configuration & Setup



| | | | |
|---|---|---|---|
| 4 | **Default Font** | **1** | **Arial 16, 24 CPL** |
| | | 2 | Arial 12, 32 CPL |
| | | 3 | Arial 8, 48 CPL |
| 5 | **Character Format** | **1** | **Normal** |
| | | 2 | Double Width |
| | | 3 | Double Height |
| | | 4 | Double Width and Height |
| 6 | **Print Density** | **1** | **Lowest** |
| | | 2 | |
| | | 3 | |
| | | 4 | Highest |
| 7 | **Printer Current** | **1** | **Highest** |
| | | 2 | |
| | | 3 | |
| | | 4 | Lowest |
| 8 | **Print Format** | **1** | **Standard paper, normal printing** |
| | | 2 | Standard paper, upside down printing |
| | | 3 | Labels, normal printing |
| | | 4 | Labels, upside down printing |

### DIP Switch Settings

SW **Switch S1**

| | | | |
|---|---|---|---|
| 1 | Use DIPSW Settings | Disabled | Enabled |
| 2 | Baud Rate #1 | See Baud Rate Settings | |
| 3 | Baud Rate #2 | | |
| 4 | Flow Control #1 | Disabled | Enabled |
| 5 | Flow Control #2 | Hardware | Software |
| 6 | Characters per Line | 24 | 48 |
| 7 | Character Height | Normal | Double |
| 8 | Character Width | Normal | Double |

**Baud Rate Settings:**

| SW3 / #2 | SW2 / #1 | Baud Rate |
|---|---|---|
| 0 | 0 | 9600 |
| 0 | 1 | 4800 |
| 1 | 0 | 19,200 |
| 1 | 1 | 115,200 |

## Software Selectable Functions

Underline
Double height
Double width
Graphics
Horizontal tab, plus setting
Form feed, plus setting
11 selectable international character sets
Reverse printing
Inverse printing
Reset
Barcodes

## Control Codes and Escape Sequences

| Function | Code | Decimal | Hex |
|---|---|---|---|
| Horizontal tab | HT | 9 | 09 |
| Line feed | LF | 10 | 0A |
| Form feed | FF | 12 | 0C |
| Carriage return | CR | 13 | 0D |
| Double width on | SO | 14 | 0E |
| Double width off | SI | 15 | 0F |
| Cancel | CAN | 24 | 18 |
| Set print mode | ESC ! *n* | 27 33 *n* | 1B 21 *n* |
| Set barcode start position | ESC $ *n1 n2* | 27 36 *n1 n2* | 1B 24 *n1 n2* |
| Set bit image (8 pin single density) | ESC * 0 *n1 n2 [d]* | 27 42 0 *n1 n2 [d]* | 1B 2A 00 *n1 n2 [d]* |
| Set bit image (8 pin double density) | ESC * 1 *n1 n2 [d]* | 27 42 1 *n1 n2 [d]* | 1B 2A 01 *n1 n2 [d]* |
| Set bit image (24 pin single density) | ESC * 32 *n1 n2 [d]* | 27 42 32 *n1 n2 [d]* | 1B 2A 20 *n1 n2 [d]* |
| Set bit image (24 pin double density) | ESC * 33 *n1 n2 [d]* | 27 42 33 *n1 n2 [d]* | 1B 2A 21 *n1 n2 [d]* |
| Underline on | ESC – 1 | 27 45 1 | 1B 2D 01 |
| Underline off | ESC – 0 | 27 45 0 | 1B 2D 00 |
| Reset | ESC @ | 27 64 | 1B 40 |
| Set page length | ESC C *n* | 27 67 *n* | 1B 43 *n* |
| Set horizontal tabs | ESC D *n* | 27 68 *n* | 1B 44 *n* |
| Bold on | ESC G | 27 71 | 1B 47 |
| Bold off | ESC H | 27 72 | 1B 48 |
| Set bit image | ESC K *n1 n2 [d]* | 27 75 *n1 n2 [d]* | 1B 4B *n1 n2 [d]* |
| Country select | ESC R *n* | 27 82 *n* | 1B 52 *n* |
| Set black line recognition | ESC L | 22 76 | 1B 4C |
| Double width on | ESC W 1 | 27 87 1 | 1B 57 01 |
| Double width off | ESC W 0 | 27 87 0 | 1B 57 00 |
| Compressed bit image graphics | ESC Z *n1 [d1] … n24 [d24]* | 27 90 *n1 [d1] … n24 [d24]* | 1B 5A *n1 [d1] … n24 [d24]* |
| Print & feed paper | ESC d *n* | 27 100 *n* | 1B 64 *n* |
| Reversed on | ESC i 1 | 27 105 1 | 1B 69 01 |
| Feed to start of next label | ESC f | 27 102 | 1B 66 |
| Reversed off | ESC i 0 | 27 105 0 | 1B 69 00 |
| Send Printer Status | ESC v | 27 119 | 1B 76 |
| Double height on | ESC w 1 | 27 119 1 | 1B 77 01 |
| Double height off | ESC w 0 | 27 119 0 | 1B 77 00 |
| Inverse on | ESC { 1 | 27 123 1 | 1B 7B 01 |
| Inverse off | ESC { 0 | 27 123 0 | 1B 7B 00 |
| Set barcode height ($1 \leq n \leq 255$) | GS h *n* | 29 104 *n* | 1D 68 *n* |
| Print UPC-A barcode | GS k 0 *[d]* NULL | 29 107 0 *[d]* 0 | 1D 6B 00 *[d]* 00 |
| Print UCP-E barcode | GS k 1 *[d]* NULL | 29 107 1 *[d]* 0 | 1D 6B 01 *[d]* 00 |
| Print EAN13 barcode | GS k 2 *[d]* NULL | 29 107 2 *[d]* 0 | 1D 6B 02 *[d]* 00 |
| Print EAN8 barcode | GS k 3 *[d]* NULL | 29 107 3 *[d]* 0 | 1D 6B 02 *[d]* 00 |
| Print Code 39 barcode | GS k 4 *[d]* NULL | 29 107 4 *[d]* 0 | 1D 6B 04 *[d]* 00 |
| Print 2 of 5 barcode | GS k 5 *[d]* NULL | 29 107 5 *[d]* 0 | 1D 6B 05 *[d]* 00 |
| Print Codabar barcode | GS k 6 *[d]* NULL | 29 107 6 *[d]* 0 | 1D 6B 06 *[d]* 00 |
| Print CODE128 barcode | GS k 7 *n [d]* | 29 107 7 *n [d]* | 1D 6B 07 *n [d]* |
| Set barcode magnification ($2 \leq n \leq 4$) | GS w *n* | 29 119 *n* | 1D 77 *n* |

## International Character Sets

| Country | Code | Decimal | Hex |
|---|---|---|---|
| USA | ESC R 0 | 27 82 0 | 1B 52 00 |
| France | ESC R 1 | 27 82 1 | 1B 52 01 |
| Germany | ESC R 2 | 27 82 2 | 1B 52 02 |
| UK | ESC R 3 | 27 82 3 | 1B 52 03 |
| Denmark I | ESC R 4 | 27 82 4 | 1B 52 04 |
| Sweden | ESC R 5 | 27 82 5 | 1B 52 05 |
| Italy | ESC R 6 | 27 82 6 | 1B 52 06 |
| Spain | ESC R 7 | 27 82 7 | 1B 52 07 |
| Japan | ESC R 8 | 27 82 8 | 1B 52 08 |
| Norway | ESC R 9 | 27 82 9 | 1B 52 09 |
| Denmark II | ESC R 10 | 27 82 10 | 1B 52 0A |

## Print Mode (ESC!)

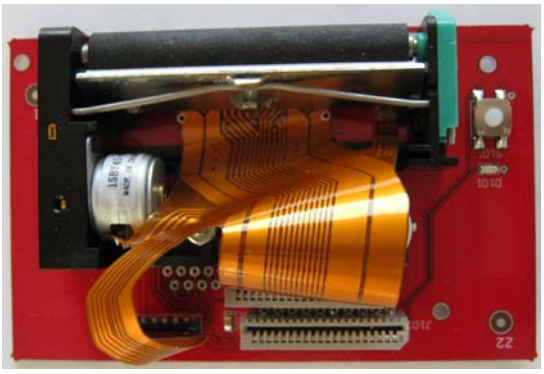
| Bit | Function | 0 | 1 |
|---|---|---|---|
| 0 | Character font | | |
| 1 | (see below) | | |
| 2 | Print density | | |
| 3 | (see below) | | |
| 4 | Double height | Cancelled | Set |
| 5 | Double width | Cancelled | Set |
| 6 | Undefined | | |
| 7 | Underline | Cancelled | Set |

## Send Printer Status (ESC v)

| Bit | Function | 0 | 1 |
|---|---|---|---|
| 2 | Paper Out | False | True |

| Print Density | | Bit 3 | Bit 2 |
|---|---|---|---|
| Light | 1 (Default) | 0 | 0 |
| | 2 | 0 | 1 |
| | 3 | 1 | 0 |
| Dark | 4 | 1 | 1 |

| Character Font | Bit 1 | Bit 0 |
|---|---|---|
| 24 characters per line | 0 | 0 |
| 48 characters per line | 0 | 1 |
| 32 characters per line | 1 | 0 |
| Undefined | 1 | 1 |



## Power On Self Test

The self test procedure is initiated by supplying power to the printer while the Paper Feed button is depressed. When the mode button is released a test print will be produced.

## Status LED

The separate thermal printer module incorporates an LED indicator to report its condition. If there is a fault, the LED will flash in sequence. The fault can be identified by counting the number of flashes.

| LED Indication | Condition | Solution |
|---|---|---|
| On | Printer On | - |
| Off | Printer Off | - |
| * * * | Paper out or door open | Fit new paper |
| ** ** ** | Thermal head too hot | Allow head to cool |
| *** *** *** | Power low | Check power supply & connections |
| **** **** **** | Power low | Check power supply & connections |

## Paper Out

The printer will automatically detect when the printer paper has run out, and report this using the Status LED. Use the Paper Feed button to feed through the last few centimetres of paper and fit a new roll.

## Paper Feed

Depressing the Paper Feed button will allow paper to be fed through the printer.