

## Replacing Paper Roll

If the paper roll needs replacing, open the paper cup lid (squeeze cup lid as shown in Fig. 3) and remove the remaining paper using the paper feed button, **do not pull paper through the printer mechanism**. Reel off a few centimetres from a new roll of paper and check that the end has a clean straight edge (see Fig. 4). Slide the leading edge of the paper through the paper entry slot, with the leading edge of the paper feeding forwards from the bottom of the roll, until you feel resistance. Press the paper feed button and feed the paper through the printer mechanism (see Fig. 5). Keep the paper feed button depressed until enough paper is fed through the printer mechanism to pass through the paper exit slot. Sit the new paper roll in the paper cup and close the lid.

Should the paper become creased or out of line when feeding in a new roll, cut the end off the paper roll, feed out the creased paper using the Paper Feed button, and reload ensuring the paper has a clean straight edge.

Fig 3: Squeeze cup lid to gain access to paper roll

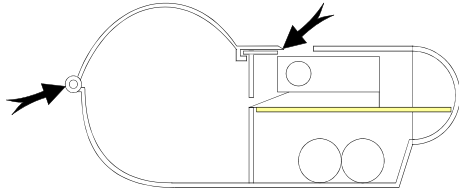


Fig 4: Cut the end off the paper roll so that the end has a clean straight edge

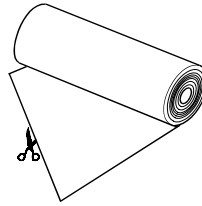
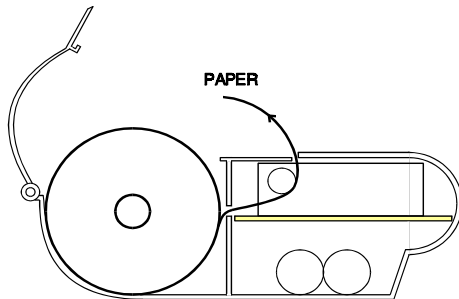


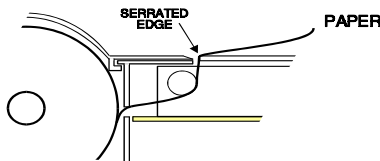
Fig 5: Position of paper roll in printer



## Paper Tear Procedure

When removing printout from the printer, pull the printout toward the front of the printer and tear from one side to the other across the serrated edge (see Fig. 6).

Fig 6: Using serrated edge to tear paper



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INSTRUMENTS

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## MCP9800 THERMAL PRINTER User Guide



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## Features

- High print quality
- Quiet, non-impact system
- Maintenance-free
- Compact and lightweight
- High reliability
- Battery powered
- Versatile, for use with text or graphics

The MCP9800 is a compact and lightweight portable thermal printer with an RS232C serial interface via a 9-way D-type connector.

It is powered from internal Ni-MH batteries and has maintenance free operation, only available with thermal printers. The standard unit is intended to be trickle charged from a mains power adapter. UK, Euro and US versions of the power adapter are available.

Designed for maximum versatility, the MCP9800 is capable of many different modes of operation with numerous character sets. Operation is controlled by a combination of switch settings and external software commands.

The MCP9800 is one of a family of thermal printers designed and manufactured in the UK by Martel. All units are built into robust ABS housings, with a choice of colours. We would be pleased to discuss the possibility of customising any aspect of the printer to specific requirements.

## Specification

Printing system	Thermal serial head system
Max characters per line	27
Character matrix	8x6, (8 x 12 double width)
Character size	2.8mm x 1.68mm (approx. 15cpi)
Horizontal dot pitch	0.28mm (Approx. 90dpi)
Vertical dot pitch	0.35mm
Text Line composition	8x116 dots
Printing width	46mm
Average Printing speed	Approx. 0.8 lines per second
Dimensions	135mm x 130mm x 64mm
Weight	Approx. 350 grammes
Internal power supply	4.8V (600mAh, Ni-MH battery pack)
Paper width	58mm (+0mm -1mm)
Character set	UK/United States (437)
Country codes	USA, France, Germany, UK, Denmark I/II, Sweden, Italy, Spain & Japan
Interface	8 bit serial RS232C (1 Stop Bit, No Parity)
Input data format	9-way D-type socket
Connector	1200, 2400, 4800 & 9600
Baud rates	Hardware (CTS line) or Software (XON/XOFF)
Handshaking	
Environmental Conditions	
Operating range	0°C to +50°C
Storage range	-40°C to +60°C
Charging range	+10°C to +45°C
MTBF	500,000 lines

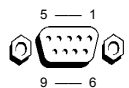
## Serial Interface

The RS232 standard is used, and the baud rate is selectable from 1200, 2400, 4800 and 9600 bits per second via the DIP switches. 110, 300, 600 and 19200 baud rates can be made available as an option.

The printer is fitted with a 9-way D-type socket (Fig 1 illustrates the pin numbers for the connector), the pin assignments and interface signals are defined below.

PIN	Signal	I/O	Definition
1	n/c	N/A	No connection
2	TxD	0	Transmitted data to host
3	RxD	1	Received data from host
4	n/c	N/A	No connection
5	GND	N/A	Signal ground
6	n/c	N/A	No connection
7	n/c	N/A	No connection
8	CTS	0	Clear to send
9	n/c	N/A	No connection

Fig 1: Pin Numbers for Serial Interface Connector



## Printer Mechanism

The printer mechanism comprises an eight element, thin film head and DC motor driven transport. Head position is derived from a home switch and tachometer, allowing high accuracy printing independent of battery voltage.

**Head energy:** Internal temperature compensation automatically controls the print pulse width to regulate the energy applied to the head.

**Paper jam:** The printer will automatically detect any paper jam which has caused the head to stop moving. If a jam occurs, printing is aborted and the Status indicator will flash. Turn the printer off, remove the paper jam and turn the printer back on before continuing printing.

## Power Supply

Power is supplied to the printer from a 4.8V internal Nickel-Metal Hydride battery pack or from the external mains adapter. The mains adapter will trickle charge the batteries when the printer is turned on or off (charge time approx. 16 hours). The Status indicator will light to show that the battery pack is nearly exhausted.

Power consumption		Battery Pack	
Standby	30mA	Capacity	600mAh
Running -Min	160mA	Charge current	50mA
	Ave 300mA	Weight	100g
	Max 700mA	Battery life	Approx. 2 hours of continuous operation

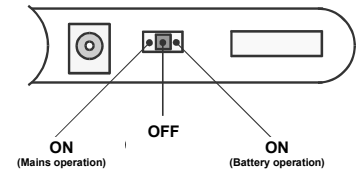
Note: The peak current can reach a maximum of 3A.

The MCP9800 should only be used in conjunction with an MPS101(UK), MPS102(EURO) or MPS103(US) power adapter. Users wishing to provide their own power source must contact Martel. **The use of an unapproved source may void the printer's warranty.**

## Power on Procedure

Check the batteries are sufficiently charged or that the power supply is correctly fitted and operational. Open the paper cup lid and ensure that the roll is present and that there are no foreign objects inside the paper cup. Close the lid, ensuring that the paper passes through the paper exit slot. Switch on the printer using the power switch located on the left hand side of the printer. The Power indicator will light and the printer mechanism will reset.

## Power Switch



Trickle charge will take place when the switch is in the OFF position or ON (Mains operation) position.

## Hardware Selectable Functions

These are set using the DIP switches and are only read when the printer is turned on.

SW	Print format	Default settings	
SW 1:	Print format	Print format	Normal
SW 2:	Handshake protocol	Handshake protocol	Hardware
SW 3:	Baud rate	Baud rate	9600
SW 4:	Baud rate	Character height	Normal
SW 5:	Character height	Character width	Normal
SW 6:	Character width	Print mode	Text
SW 7:	Print mode		
SW 8:	Print mode		

Fig 2: DIP switch default settings



See below for a detailed explanation of the DIP switch settings (Fig 2: illustrates the default DIP switch settings). To change the DIP switch settings, (make sure the printer is off before making any changes), use a pencil or similar thin pointed object.

	SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7	SW 8
Normal printing	ON							
Inverted Printing	OFF							
Software handshake	ON							
Hardware handshake	OFF							
1200 Baud			OFF	OFF				
2400 Baud			ON	ON				
4800 Baud			OFF	ON				
9600 Baud			ON	OFF				
Normal height					ON			
Double height					OFF			
Normal width						ON		
Double width						OFF		
Text mode							ON	ON
Graphics mode							OFF	ON
Hex mode							ON	OFF
Diagnostic mode							OFF	OFF

## Software Selectable Functions

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

## Mode of Operation

**Text mode** is the default mode of operation for the printer. In this mode text characters can be printed in normal, double width, double height, inverted, reversed, bold, and underlined format. Graphics can also be printed using the 'Escape K' sequence.

**Graphics mode** causes all incoming bytes to be passed directly to the print head, allowing elaborate graphics patterns to be printed. Printing occurs after 166 bytes have been received or when the paper feed button is pressed. The least significant bit of received bytes corresponds to the lowest dot of the print head.

**Hex mode** causes all incoming characters to be printed as their hexadecimal value. Printing occurs after eight characters have been received or when the paper feed button is pressed.

**Diagnostic mode** is used to perform various tests on the printer hardware using a terminal device connected to the serial port. This mode is only intended for use by Martel.

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

## 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
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
Define 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
Double width on	ESC W 1	27 87 1	1B 57 01
Double width off	ESC W 0	27 87 0	1B 57 00
Print & feed paper	ESC d n	27 100 n	1B 64 n
Revised on	ESC i 1	27 105 1	1B 69 01
Revised off	ESC i 0	27 105 0	1B 69 00
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
Delete	DEL	127	7F