

Control Codes and Escape Sequences (HP IR Mode)

| Function | Code | Decimal | Hex |
|---------------------------------------|----------------------------------|-------------------------------|--------------------------------|
| Horizontal tab | HT | 9 | 09 |
| Line feed | LF | 10 | 0A |
| Form feed | FF | 12 | 0C |
| Carriage return | CR | 13 | 0D |
| Cancel | CAN | 24 | 18 |
| Double width on | SO | 14 | 0E |
| Double width off | SI | 15 | 0F |
| Set print mode | ESC NULL ! n | 27 0 33 n | 1B 00 21 n |
| Set barcode start position | ESC NULL \$ n1 n2 | 27 0 36 n1 n2 | 1B 00 24 n1 n2 |
| Set bit image (8 pin single density) | ESC NULL * 0 n1 n2 [d] | 27 0 42 0 n1 n2 [d] | 1B 00 2A 0 n1 n2 [d] |
| Set bit image (8 pin double density) | ESC NULL * 1 n1 n2 [d] | 27 0 42 1 n1 n2 [d] | 1B 00 2A 01 n1 n2 [d] |
| Set bit image (24 pin single density) | ESC NULL * 32 n1 n2 [d] | 27 0 42 32 n1 n2 [d] | 1B 00 2A 20 n1 n2 [d] |
| Set bit image (24 pin double density) | ESC NULL * 33 n1 n2 [d] | 27 0 42 33 n1 n2 [d] | 1B 00 2A 21 n1 n2 [d] |
| Underline on | ESC NULL - 1 | 27 0 45 1 | 1B 00 2D 01 |
| Underline off | ESC NULL - 0 | 27 0 45 0 | 1B 00 2D 00 |
| Reset | ESC NULL @ | 27 0 64 | 1B 00 40 |
| Set page length | ESC NULL C n | 27 0 67 n | 1B 00 43 n |
| Set horizontal tabs | ESC NULL D n | 27 0 68 n | 1B 00 44 n |
| Set bit image | ESC NULL K n1 n2 [d] | 27 0 75 n1 n2 [d] | 1B 00 4B n1 n2 [d] |
| Country select | ESC NULL R n | 27 0 82 n | 1B 00 52 n |
| Double width on | ESC NULL W 1 | 27 0 87 1 | 1B 00 57 01 |
| Double width off | ESC NULL W 0 | 27 0 87 0 | 1B 00 57 00 |
| Compressed bit image graphics | ESC NULL Z n1 [d1] ... n24 [d24] | 27 0 90 n1 [d1] ... n24 [d24] | 1B 00 5A n1 [d1] ... n24 [d24] |
| Print & feed paper | ESC NULL d n | 27 0 100 n | 1B 00 64 n |
| Label advance | ESC NULL f | 27 0 102 | 1B 00 66 |
| Reversed on | ESC NULL i 1 | 27 0 105 1 | 1B 00 69 01 |
| Reversed off | ESC NULL i 0 | 27 0 105 0 | 1B 00 69 00 |
| Double height on | ESC NULL w 1 | 27 0 119 1 | 1B 00 77 01 |
| Double height off | ESC NULL w 0 | 27 0 119 0 | 1B 00 77 00 |
| Inverse on | ESC NULL { 1 | 27 0 123 1 | 1B 00 7B 01 |
| Inverse off | ESC NULL { 0 | 27 0 123 0 | 1B 00 7B 00 |
| Graphics | ESC n [d] | 27 n [d] | 1B n [d] |
| Roman 8 character set | ESC <248> | 27 248 | 1B F8 |
| ECMA 94 character set | ESC <249> | 27 249 | 1B F9 |
| Underline off | ESC <250> | 27 250 | 1B FA |
| Underline on | ESC <251> | 27 251 | 1B FB |
| Normal width on | ESC <252> | 27 252 | 1B FC |
| Double width on | ESC <253> | 27 253 | 1B FD |
| Self test | ESC <254> | 27 254 | 1B FE |
| Reset | ESC <255> | 27 255 | 1B FF |
| Set barcode height (1 ≤ n ≤ 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 UPC-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 03 [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 ≤ n ≤ 4) | GS w n | 29 119 n | 1D 77 n |

International Character Sets (HP IR Mode)

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

Warranty

The printer is warranted against defects in materials and workmanship for a period of one year from original purchase date. We will replace or repair without charge, at our option, provided the product has not been misused or modified. We shall not be liable for consequential damages.

Midtronics, Inc.
7000 Monroe Street
Willowbrook, IL 60527
U.S.A.
Phone: 630 323 2800
Fax: 630 323 2844
ISO 9001 Certified

Midtronics Canada, Inc.
54 Ferris Drive
P.O. Box 746
North Bay, Ontario
P1B 8J8 Canada
Phone: 705 476 9228
Fax: 705 476 9255

Midtronics, b.v.
Lage Dijk-Noord 6
3401 VA IJsselstein
The Netherlands
Phone: +31 306 868 150
Fax: +31 306 868 158
ISO 9001 Certified

182-003A/UG/B

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INSTRUMENTS

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www.midtronics.com
Toll free in North America: (800) 776-1995

182-003A IR/RS232 THERMAL PRINTER User Guide



Features

- Infra-Red (HP IR, IrDA) and RS232 interfaces.
- High-speed, high resolution printing capability.
- Quiet, non-impact system
- Maintenance-free
- Compact and lightweight
- High reliability line head mechanism
- Versatile for use with text or graphics
- 24, 32 or 48 characters per line
- Barcode capability
- Auto off
- Supports labels and dual ply paper

Model 182-003A is a compact and lightweight portable thermal printer with an Infra-red interface compatible with HP IR format in a new elegant enclosure.

Designed for maximum versatility, the printer is compatible with existing systems while allowing many upgrades in terms of printing speed and functionality, with the addition of IrDA and RS232 interfaces.

It is powered from Nickel-Metal Hydride batteries and has maintenance free operation only available with thermal printers. The standard unit may be continuously trickle charged from a mains power adapter, and a fast charge facility is incorporated. US(157-001A), Euro(157-002A) and UK(157-003A) versions of the power adaptor are available.

Many different modes of operation are possible, including numerous character sets, all selectable by software commands.

The 182-003A is one of a family of thermal printers designed and manufactured in the UK by Martel Instruments Ltd (www.martelinstruments.com).

Specification

| | |
|-------------------------|--|
| Printing system | Thermal line head system |
| Max characters per line | 48 (Default 24) |
| Character matrix | 24x16, 24x12 or 24x8 |
| 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 | 24x384 dots |
| Printing width | 48mm |
| Average printing speed | 10 lines per second (max) |

| | |
|-----------------------|--|
| Dimensions | 91mm x 185mm x 58mm |
| Weight | Approx. 425 grammes |
| Internal power supply | 4 X 1.2V NiMH 1600mAH, AA cells |
| Paper width | 58mm |
| Character set | Roman 8, ECMA 94, Arial |
| Country codes | USA, France, Germany, UK, Denmark I/II, Sweden, Italy, Spain & Japan |

| | |
|-------------|---|
| Interface | |
| Data format | a) RS232, (1 start bit, 8 data, 1 stop, no parity). b) HP IR (1 start, 8 data, 4 error detection). c) IrDA (V1.0 physical layer). 6 Kbytes |

Buffer size

Environmental Conditions
Operating range
Storage range
Charging range
MTBF

0°C to +50°C
-20°C to +60°C
+10°C to +45°C
Approx. 10 million lines (20°C, print ratio = 25%)

Infra-red interface

The transmit/receive requirements for interfacing with the 182-003A are compatible with existing systems, however higher transmission speeds and printing speeds are possible due to the incorporation of a large 6Kbyte buffer and a high speed thermal fixed head printer mechanism.

Higher print speed can be achieved by minimizing the inter-frame delays in the transmission software, previously required when using a slower printer mechanism.

Maximum distance for reliable infra-red communication between printer and host equipment is 45cm (18in). The infra-red port at the front of the printer should be pointed directly at, and horizontal to, the port on the host equipment and the beam should not be obstructed.

RS232 interface

An RJ12 socket is provided for applications requiring RS232 interface with connections as detailed below:

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

1 — 6



Printer Mechanism

The printer mechanism comprises a 384 element, thin film head and stepper motor driven transport. Battery voltage and head temperature compensation is utilized to provide constant print quality across the range of operating conditions.

Paper out: The printer will automatically detect when the printer paper has run out. The Status indicator will flash repeatedly to denote that the paper has run out. Use the Mode button to feed through the last few centimetres of paper and fit a new roll as described the bottom of page 2.

Head thermal limit: After extensive printing the print head temperature may rise to an unusable level. If this occurs, the Status indicator will flash twice repeatedly and printing will be suspended until the head temperature returns to normal levels.

Power Supply

Power is supplied to the printer from four Nickel-Metal Hydride AA cells. The Status indicator will flash three times repeatedly to show the batteries are nearly exhausted and in need of re-charging. The mains power adapter will trickle charge (16 hours) the printer when it is switched on, and will fast charge (up to 4 hours) the printer when it is switched off. Operation of the fast charge algorithm is indicated by a short flash of the status indicator every second. There may be a delay before fast charging commences following switch off.

Power consumption

| | |
|--------------|----------------|
| Off | 50uA (Typical) |
| Standby | 30mA |
| Running -Min | 0.4A |
| Ave | 1.3A |
| Max | 2.8A |

Note: The peak current can reach a maximum of 4A.

Battery Pack

Charge life Approx. 6000 lines (18m) of continuous printing

The printer should only be used in conjunction with 157-001A (US), 157-002A (Euro) or 157-003A (UK) power adaptor.

The use of an unapproved source may void the printer's warranty.

Power On Procedure

Check to insure that the batteries are sufficiently charged or that the power adapter is correctly fitted and operational. Open the paper cup lid and ensure that the roll is present and there are no foreign objects inside the paper cup. Close the lid, ensuring that the paper passes through the paper exit slot.

When the status indicator is off, the printer is off. A brief press of the Mode button turns the printer on, the status indicator will illuminate and the printer mechanism will reset. A brief press of the Mode button will turn the printer off.

Power On Self Test

The self test procedure will check most of the printer functions, except for the serial interface, i.e: Printer mechanism, Control circuitry, Firmware version, Print quality. When the printer is off, press and hold the Mode button for approximately 2 seconds. Release the button, the printer will power on and print a self-test report.

Battery Charging

Connect the printer to the power adaptor and recharge the battery pack as soon as the Status indicator flashes three times repeatedly during printing.

If the batteries in the printer become exhausted, printing will become faint, erratic or not possible at all. **Turn off** the printer and recharge the batteries for at least 15 minutes before attempting further printing. The adapter cannot supply the full power requirements during printing, so the batteries must be partially charged before printing is possible.

When the printer is first delivered there may be little or no charge in the printer's batteries. The printer should be **turned off**, connected to the power adaptor and allowed to charge for 16 hours before it is used for the first time.

It is permissible to leave the printer permanently connected to the power adaptor to trickle charge the batteries. If the printer is asleep it will wake up when the adapter is connected and will not sleep while it is connected. To fast charge the batteries the printer must be off. The Status indicator will flash every second while fast charge is operating.

Auto Off Mode

The printer incorporates a auto-off mode which minimizes the printer's power consumption after approximately two minutes of inactivity.

Paper Feed

When the printer is on, paper can be fed manually by pressing and holding the Mode button for more than one second.

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

Replacing Paper Roll

If the paper roll needs replacing, open the paper cup lid and when the printer is switched on remove the remaining paper using the Mode 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. Slide the leading edge of the paper into the entry point of the mechanism just below the roller, with the leading edge of the paper feeding forward from the bottom of the roll.

The paper will be detected and the auto-feed function will draw it through to the correct position for printing.

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 Mode button, and reload ensuring the paper has a clean straight edge.

Changing to HPIR Mode

1. Ensure the printer is OFF.
2. Press and hold the mode button, after about five seconds the status light will flash five times.
3. Now release the mode button and briefly press it once. Wait until the light flashes once.
4. Briefly press the mode button three times then wait again. After a short delay, the status light should flash three times and the printer should power-on.
5. Switch the printer off again by briefly pressing the mode button.
6. Press and hold the mode button, after about five seconds, the status light will flash five times.
7. Release the mode button and briefly press it four times. Wait until the light flashes four times.
8. Again press the mode button four times then wait. After a short delay, the status light should flash four times and the printer should power-on.
9. The printer will now power-on in HPIR mode.

Changing to IrDA Mode

1. Ensure the printer is OFF.
2. Press and hold the mode button, after about five seconds the status light will flash five times.
3. Now release the mode button and briefly press it once. Wait until the light flashes once.
4. Next briefly press the mode button twice then wait. After a short delay, the status light should flash twice and the printer should power-on.
5. Switch the printer off again by briefly pressing the mode button.
6. Press and hold the mode button after about five seconds, the status light will flash about five times.
7. Release the mode button, and briefly press it four times. Wait until the light flashes four times.
8. Briefly press the mode button once and then wait. After a short delay, the status light should flash once and the printer should power-on.
9. The printer will now power-on in IrDA mode.

Control Codes and Escape Sequences (IrDA/RS232 Mode)

| 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 1A 20 n1 n2 [d] |
| Set bit image (24 pin double density) | ESC * 33 n1 n2 [d] | 27 42 33 n1 n2 [d] | 1B 1A 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] |

| Function | Code | Decimal | Hex |
|---------------------------------------|----------------------------|----------------------------|----------------------------|
| 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 |
| Compress 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 |
| Label advance | ESC f | 27 102 | 1B 66 |
| Reversed on | ESC i 1 | 27 105 1 | 1B 69 01 |
| Reversed 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 |
| Set barcode height (1 ≤ n ≤ 225) | 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 UPC-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 ≤ n ≤ 4) | GS w n | 29 119 n | 1D 77 n |

Print Mode (ESC!)

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

| Print Density | | Bit 3 | Bit 2 | Character Font | | Bit 1 | Bit 0 |
|---------------|-------------------|-------|-------|----------------|---------------|-------|-------|
| | | | | | | | |
| Light | 1 (Default) | 0 | 0 | Roman 8 | 24 chars/line | 0 | 0 |
| | 2 | 0 | 1 | Arial | 48 chars/line | 0 | 1 |
| | 3 (Label Default) | 1 | 0 | Arial | 32 chars/line | 1 | 0 |
| Dark | 4 | 1 | 1 | ECMA 94 | 24 chars/line | 1 | 1 |

International Character Sets (IrDA/RS232 Mode)

| 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 |