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English

Operating manual

Portable Thermal Printer

HD40.1

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INDEX

INTRODUCTION

The ***HD40.1*** is a lightweight, compact, portable thermal printer. The connection to the instruments or to a PC is made through the RS232 serial input.

A careful design allows you to replace the thermal paper roll in a few seconds.

A four NiMH **rechargeable** battery pack provides power supply and ensures long autonomy: it is possible to print up to 3000 lines at full charge.

Standard thermal paper roll width: 57 mm.
Print resolution :203 dpi
Print characters (each line): 24
Protection degree: IP40.

Portable Thermal Printer

HD40.1

1. **STATUS** Led: shows the printer status.
2. **MENU** key: advances paper by two lines. When you turn on the printer, if you press the Menu key and the ON/OFF key, you activate the printer configuration mode.
3. Cover that gives you access to the paper roll and the printing mechanism.
4. **POWER** Led: provides information on rechargeable battery status.
5. **ON/OFF** Key: switches on and off the printer. If you press it with the MENU key, it gives you access to the configuration mode.
6. Power supply connector. The positive pole is in the middle  .
7. 9-pole D-Sub male connector for RS232 serial connection.

KEYBOARD AND LED DESCRIPTION

ON/OFF key

Press the ON/OFF key until the Status led starts blinking to turn on the printer, then release the key.
Press the ON/OFF key until the Status led remains on to turn off the printer, then release the key.
To access the configuration mode, press the ON/OFF key and the MENU key to turn on the printer: when the paper roll starts advancing, release both keys (see chapter *Printer Configuration*).

MENU key

When the printer is on, press the MENU key to advance paper by two lines.
When you turn on the printer, press the MENU key with the ON/OFF key to activate the printer configuration mode.

POWER Led

The POWER Led provides information on the rechargeable battery status.
When you connect an external power supply, the printer checks rechargeable battery status and, if necessary, it starts charging batteries.
A pre-charge phase may precede the real charge to avoid excessive stress on batteries when they are significantly discharged, or their temperature is too low: in this phase the POWER led blinks every second.
After this first phase, the quick charge starts: the POWER led remains on and it turns off when the battery is fully charged.
At this point, it is possible to disconnect the external power supply and use rechargeable batteries only.

Warning: if you connect an external power supply and the POWER led turns off immediately instead of lighting, it means that there is a fault or there are no batteries.

STATUS Led

The STATUS led shows the printer status. If the led blinks every two seconds, it means that the printer is on and ready to print. If you disable the automatic switch-off, the led blinks twice every two seconds (to set automatic switch-off, see chapter *Configuration*).
To turn off the printer, press the ON/OFF key until the STATUS led stops blinking and remains on: now you can release the key. The printer turns off.
The following table shows different POWER and STATUS led combinations.

STATUS LED	Description
Always off.	Printer is off.
Blinks slowly (every two seconds).	Printer is on and ready to print.
Remains on.	Printer is turning off. When the printer is on, you are pressing the ON/OFF key to turn it off.
Blinks twice every two seconds.	Printer is on and ready to print. You have disabled the automatic switch-off.

POWER LED (*)	Description
Blinks quickly (every second).	Pre-charge followed by quick charge.
Remains on.	Quick charge.
Always off.	Batteries charged; printer ready to print.
Blinks quickly and then it turns off.	Error: no batteries, no connection, faulty batteries.

(*) External power supply connected.

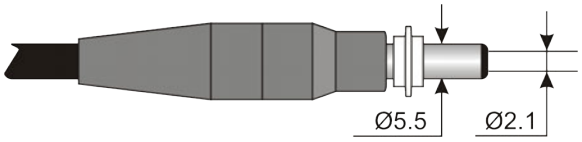
INSTALLATION AND USE

CONNECTIONS

The printer has one input (1) for the battery charger power supply and one plug (2) for RS232 serial connection.

Power supply connector

The power supply connector is 5.5 mm in outer diameter and 2.1 mm in inner diameter.



The positive pole is in the middle

The printer is provided with the **SWD10** power supply which features:

- Output voltage: 12 Vdc
- Maximum current: 1A.

The printer is supplied with a four 1.2V rechargeable battery pack located in the battery compartment: the printer does not work without batteries.

See at the following chapters how to charge batteries.

RS232 serial connector

The printer is equipped with an RS232 serial communication interface with 9-pole D-sub male connector (2).

A **null modem** cable is necessary to connect the printer to the instrument: use the **HD2110CSNM** cable for instruments with 8-pole Mini DIN connector (e.g. HD21… series).

Use the **9CPRS232** cable for instruments with 9-pole connector (e.g. HD25.2, etc.).

HOW TO LOAD THE PAPER

The printer uses thermal paper rolls which are 57 mm wide and max. 32 mm in diameter. Loading thermal paper roll is easy and quick.

Follow the steps below to replace the paper roll:

1) Pull the lid to open the cover.

2) Insert the paper roll according to the sense of rotation as shown below.

3) Pull the paper and close the cover centring the paper roll.

4) Tear off excess paper. The printer is ready.

BATTERIES

HOW TO CHARGE BATTERIES

Use the **SWD10** battery charger supplied with the printer to charge batteries.
Follow the steps below:

- Connect the battery charger plug to the mains and the battery charger connector to the socket in the rear of the printer.
- If batteries are extremely discharged or temperature is too low, the POWER led blinks for a few seconds (pre-charge) and then it remains on to indicate printer quick charge.
- Charge the batteries until the POWER led turns off.
- Now the printer is ready: disconnect the battery charger cable.

Note: The first time you use the printer, you need to fully charge batteries.

NOTES ON BATTERY USAGE

- A new NiMH battery performs best only after fully discharging and charging it at least twice or three times.
- Battery autonomy changes significantly depending on printing intensity and quantity. Even a charged battery will eventually discharge if unused.
- The battery may be charged and discharged hundreds of times, but the battery will eventually become exhausted. When autonomy (both when printing and waiting) is far lower than usual, battery pack needs replacing.
- Use only the **BAT-40** Delta OHM battery pack and charge it by using the **SWD10** battery charger, or alternatively, one complying with our technical specifications.
- NiMH batteries last longer if you discharge them completely from time to time.
- Extreme temperatures may negatively affect battery performance.

HOW TO REPLACE BATTERY BACK

Follow the steps below to replace the battery pack:

- Disconnect the external power supply and turn off the printer.
- Unscrew (2) the battery compartment cover located at the bottom of the printer (1).

- Remove the connector. Make sure you don't tear wires.
- Remove the battery pack.
- Plug the connector to your new battery pack: a notch on the connector will help you insert it correctly.
- Position the pack in the battery compartment.
- Screw the battery compartment.

BATTERY DISPOSAL

Recycle or dispose of batteries properly.
Do not throw batteries in the dustbin.
Do not throw batteries into fire.

PRINTER CONFIGURATION

The printer operating parameters are as follows (factory values have been underlined):

1. **Interface selection**: RS232
2. **RS232 serial communication baud rate**: 9600, 19200 or <u>38400</u>.
3. **Automatic switch-off delay**: 0, <u>5</u>, 10 or 15 minutes.
4. **Printing density**: -2, -1, <u>0</u>, +1, +2.

Please follow the steps below to change these parameters:

- When the printer is off, press the MENU key and the ON/OFF key until the printer turns on and the paper roll advances. The first parameter you want to change will appear.
- Press the MENU key to change a parameter: the new value is printed.
- Press the ON/OFF key to confirm a parameter that you selected and go to the next one.
- Finally, after confirming the last parameter, the printer exits the configuration menu.

PRINTING PARAMETERS IN DETAIL

1. Baud Rate

The baud rate is the RS232 serial port communication rate, expressed as bit/second.

The following values are available: 9600, 19200 and 38400 baud.

2. Automatic switch-off delay

When this interval of time has elapsed, the printer turns off automatically if you have neither entered any command nor pressed any key.

You can set the following intervals: 0 or 5, 10 or 15 minutes. **If you choose 0, the automatic switch off is disabled and the printer turns off only if you press the ON/OFF key.**

3. Printing density

This parameter allows changing the intensity of print character. “0” is the standard value, -2 and -1 reduce intensity, +1 and +2 increase it.

RS232 SERIAL INTERFACE

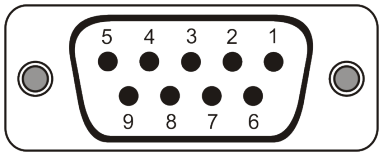
The printer has an RS232 serial interface with a 9-pole RS232 connector located in the rear of the printer. Two different connection cables are available on request according to the device you want to connect - instrument or PC -:

- **9CPRS232**: is a 9 pole – 9 pole cable for any instrument with standard serial connector and for PC connection. It is also suitable for other brand instruments.
- **HD2110CSNM**: is a 9 pole – 8 pole MiniDIN cable for Delta OHM instruments equipped with this connector (e.g. HD21…).

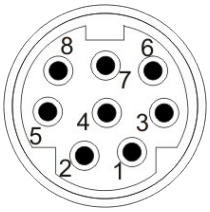
Printer Connector	Device Connector	Cable Code
DB9 male	Instrument with DB9 male	9CPRS232
DB9 male	Instrument with MiniDIN	HD2110CSNM
DB9 male	Computer with DB9 male	9CPRS232

Both cables are **null modem**.

Front view of DB9 male connector pin assignment:



Front view of MiniDIN male circular connector pin assignment:



The following tables show cable connections.

9CPRS232 Cable

DB9 to instrument or PC	DB9 to printer
1	4
2	3
3	2
4	1
5	5
6	Disconnected
7	8
8	7
9	9

HD2110CSNM Cable

MiniDIN to instrument	DB9 to printer
1	9
2	1, 6
3	4
4	8
5	2
6	3
7	5
8	7

INSTRUMENT STORAGE

Instrument storage conditions:

- Temperature: -25…+65°C.
- Humidity: less than 90%RH without condensation.
- Do not store the instrument in places where:
    - humidity is high;
    - the instrument may be exposed to direct sunlight;
    - the instrument may be exposed to a source of high temperature;
    - the instrument may be exposed to strong vibrations;
    - the instrument may be exposed to steam, salt or any corrosive gas.

The instrument case is made of ABS plastic: do not use any incompatible solvent for cleaning.

SAFETY INSTRUCTIONS

Authorized use

The technical specifications as given in chapter TECHNICAL SPECIFICATIONS must be observed. Only the operation and running of the measuring instrument according to the instructions given in this operating manual is authorized. Any other use is considered unauthorized.

General safety instructions

This measuring system is constructed and tested in compliance with the EN61010-1 “Safety requirements for electrical equipment for measurement, control and laboratory use” and has left the factory in perfect safety technical conditions.
The smooth functioning and operational safety of the measuring system can only be guaranteed if the generally applicable safety measures and the specific safety instructions in this operating manual are followed during operation.
The smooth functioning and operational safety of the instrument can only be guaranteed under the environmental and electrical operating conditions that are in specified in chapter TECHNICAL SPECIFICATIONS.

Do not use or store the product in places such as listed below:

- Rapid changes in ambient temperature which may cause condensation.
- Corrosive or inflammable gases.
- Direct vibration or shock to the instrument.
- Excessive induction noise, static electricity, magnetic fields or noise.

If the measuring system was transported from a cold environment to a warm environment, the formation of condensate can impair the functioning of the measuring system. In this event, wait until the temperature of the measuring system reaches room temperature before putting the measuring system back into operation.

Obligations of the purchaser

The purchaser of this measuring system must ensure that the following laws and guidelines are observed when using dangerous substances:

- EEC directives for protective labour legislation
- National protective labour legislation
- Safety regulations

TECHNICAL SPECIFICATIONS

Printing method	Thermal
Resolution	203 DPI (8 dot/mm)
Printing width	48 mm centred in the paper roll
Paper roll width	57...58 mm
Max. paper roll diameter	32 mm
Number of columns	24
Printing speed	Up to 90 mm/sec (depending on battery charge and ambient conditions)
Sensors	Paper detection
Character set	IBM II 858 table
Printing formats	Normal or extended
Character font	1 (16 x 24 dot – 2 mm x 3 mm)
Thermal head durability	
Mechanism life	100 million pulses (temperature: 20...25 °C)
Abrasion resistance	50 km of paper (temperature: 20...25 °C)
Cover group durability	2000 opening/closing cycles or more
Communication interface	RS232
Baud rate	9600, 19200 and 38400 baud (the factory parameter is 38400 baud)
Mains power supply (SWD10)	100-240 Vac/12 Vdc-1A mains battery charger
Batteries	Four 1.2 V AA rechargeable batteries (NiMH)
Printing autonomy	3000 lines 24 characters each. It prints one line every 10 seconds
Switch-off function	0, 5, 10 or 15 minutes
Dimensions	103 mm x 163 mm x 52 mm
Weight	380 gr. (with batteries and paper roll)
Material	ABS
Operating conditions	
Operating temperature	0…+50 °C
Operating relative humidity	20…80 %RH not condensing
Storage conditions	-25...+70 °C / 10...90 %RH not condensing
Protection degree	IP40

Connections

Serial interface	9-pole D sub male connector
Battery charger power supply	2-pole connector (positive in the middle)

ORDERING CODES

HD40.1 The kit includes: 24-column portable thermal printer, **serial interface**, battery pack, SWD10 power supply, instruction manual, 5 thermal paper rolls.

The serial cable for PC/instrument connection must be ordered separately.

HD2110CSNM RS232C 8-pole MiniDin - 9-pole D Sub female null-modem cable for connecting the printer to instruments with MiniDIN connector.

9CPRS232 RS232C 9-pole – 9-pole D Sub female null-modem cable for connecting the printer to instrument with 9-pole D Sub connectors.

SWD10 100-240 Vac/12 Vdc-1A Mains battery charger.

BAT-40 Spare battery pack.

RCT The kit includes 4 thermal paper rolls 57 mm wide and 32 mm in diameter.

Delta OHM metrological laboratories LAT N° 124 have been ISO/IEC 17025 accredited by ACCREDIA in Temperature, Humidity, Pressure, Photometry/Radiometry, Acoustics and Air Speed. They can provide calibration certificates for the accredited quantities.

Notes

NOTES

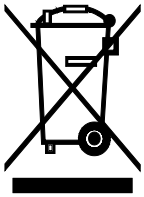
WARRANTY

The manufacturer is required to respond to the "factory warranty" only in those cases provided by Legislative Decree 6 September 2005 - n. 206. Each instrument is sold after rigorous inspections; if any manufacturing defect is found, it is necessary to contact the distributor where the instrument was purchased from. During the warranty period (24 months from the date of invoice) any manufacturing defects found will be repaired free of charge. Misuse, wear, neglect, lack or inefficient maintenance as well as theft and damage during transport are excluded. Warranty does not apply if changes, tampering or unauthorized repairs are made on the product. Solutions, probes, electrodes and microphones are not guaranteed as the improper use, even for a few minutes, may cause irreparable damages.
The manufacturer repairs the products that show defects of construction in accordance with the terms and conditions of warranty included in the manual of the product. For any dispute, the competent court is the Court of Padua. The Italian law and the "Convention on Contracts for the International Sales of Goods" apply.

TECHNICAL INFORMATION

The quality level of our instruments is the result of the continuous product development. This may lead to differences between the information reported in the manual and the instrument you have purchased.
We reserves the right to change technical specifications and dimensions to fit the product requirements without prior notice.

DISPOSAL INFORMATION



Electrical and electronic equipment marked with specific symbol in compliance with 2012/19/EU Directive must be disposed of separately from household waste. European users can hand them over to the dealer or to the manufacturer when purchasing a new electrical and electronic equipment, or to a WEEE collection point designated by local authorities. Illegal disposal is punished by law.

Disposing of electrical and electronic equipment separately from normal waste helps to preserve natural resources and allows materials to be recycled in an environmentally friendly way without risks to human health.

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