



HD2178.1 AND HD2178.2 Pt100 AND TC INPUT THERMOMETERS

HD2178.1 i HD2178.2 prijenosni uređaji za mjerenje temperature opremljeni sa velikim osvijetljenim LCD ekranom i dva ulaza (kanala) za sonde. Mjere temperaturu pomoću ubodnih, uronjivih, kontaktnih i zračnih sonda. Osjetnici koji se koriste su Pt100 (3 ili 4 žice) i Pt1000 (2 žice) i spajaju se na kanal B. A termoparovi tipa K, T, J, N, E spajaju se na kanal A. Sonda su opremljene automatskim modulom za prepoznavanje. kalibracijski podaci (tvornički) su spremeni u istoj. Uređaj HD2178.2 ujedno ima i opciju memoriranja podataka (**data logger**). 80000 mjerenja se može spremi i naknadno prenjeti na PC preko RS232 ili USB ulaza. Ima i opcija za mjerenje u realnom vremenu. Moguće je programirati interval memoriranja, baud interval i printanje. Ima funkcije memoriranja max., min. vrijednosti kao i izračunavanje srednje. Ostale važne funkcije: relativna vrijednost, HOLD (zamrzne očitavanje) te automatsko gašanje uređaja.

Instrument ima klasu zaštite IP66.

TEHNIČKE KARAKTERISTIKE UREĐAJA

Instrument

Dimenzije (D x Š x V)	185x90x40mm
Težina	470g (sa baterijama)
Materijali	ABS, guma
Zaslon	2x4½ znamenka plus simbol
Vidljiva površina:	52x42mm

Radni uvjeti okoliša

Radna temperatura	-5 ... 50°C
Temperatura skladištenja	-25 ... 65°C
Relativna vlaga okoliša	0 ... 90% RH, bez kondenzacije
Klasa zaštite	IP66

Napajanje

Baterije	4 Baterije 1.5V tip AA
Autonomija	200 h sa 1800mAh alkalnim baterijama
Potrošnja struje kada je uređaj isključen	20µA
Vanjsko napajanje	12Vdc / 1000mA

Mjerne jedinice

°C - °F

Postojanost podataka

Neograničeno, ovisno o stanju baterija

Vrijeme

Datum i vrijeme	U realnom vremenu
Točnost	1min/mjesečno max drift

Memorija

model HD2178.2	
Tip	2000 strana, svaka sadrži 40 mjerenja
Količina	Ukupno 80000 mjerenja
Intervali memoriranja selektivni	1,5,10,15,30 s.; 1,2,5,10,15,20,30 min.; 1h

Serijsko sučelje RS232C

Tip	RS232C galvanski odvojeno
Baud rate	može se postaviti od 1200 do 38400 baud
Data bit	8
Parity	Ne
Stop bit	1
Kontrola protoka	Xon/Xoff
Dužina serijskog kabla	Max 15m
Interval printanja	Odmah ili selektivan između: 1,5,10,15,30 s.; 1,2,5,10,15,20,30 min.; 1h

USB sučelje - model HD2178.2

Type	1.1 - 2.0 galvanski odvojeno
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Konekcije

Ulaz za RTD sonde	8-polni muški DIN45326 konektor
Ulaz za termopar sonde	2-polni ženski polarizirani standardni mini konektor
RS232C serijsko sučelje	8-polni MiniDin konektor
USB sučelje	Tip B MiniUSB konektor
Vanjsko napajanje	2-polni konektor(+ u sredini)

Mjerni opsezi i točnost uređaja - RTD

Pt100 mjerni opseg	-200...+650°C
Pt1000 mjerni opseg	-200...+650°C

Rezolucija

Točnost uređaja	0.1°C
Drift nakon 1 godine	±0.05°C
	0.1°C/godina

Mjerni opsezi i točnost uređaja - Termoparovi

TC mjerni opseg: K	-200...+1370°C
TC mjerni opseg: J	-100...+750°C
TC mjerni opseg: T	-200...+400°C
TC mjerni opseg: N	-200...+1300°C
TC mjerni opseg: E	-200...+750°C

Rezolucija

0.1°C

Točnost uređaja

Termopar tip K	±0.1°C up to 600°C ±0.2°C over 600°C
Termopar tip J	±0.1°C up to 400°C ±0.2°C over 400°C
Termopar tip T	±0.1°C
Termopar tip N	±0.1°C up to 600°C ±0.2°C over 600°C
Termopar tip E	±0.2°C over 300°C

Accuracy is referred to the instrument only; error due to the thermocouple or to the cold junction reference sensor is not included.

Temperature drift @20°C 0.02%/°C
Drift after 1 year 0.1°C/year

Thermocouple probes accuracy:

Tolerance of a type of thermocouple corresponds to the maximum acceptable shift from the e.m.f. of any thermocouple of that type, with reference junction at 0°C. The tolerance is expressed in degrees Celsius, preceded by the sign. The percentage tolerance is given by the ratio between the tolerance expressed in degrees Celsius and the measurement junction temperature, multiplied by one hundred. The tolerances refer to the operating temperature expected for the thermocouple, in agreement with the thermo-elements' diameter.
Those thermocouples that comply with the limits for temperatures over 0°C, do not necessarily comply with the limits for ranges below 0°C.

Tolerance classes for thermocouples (reference junction at 0°C)

Type of thermocouple	Tolerance Class 1	Tolerance Class 2	Tolerance Class 3 ⁽¹⁾
Type T Temperature interval Tolerance Temperature interval Tolerance	from -40 to +125°C ± 0.5°C from 125 to 350°C ± 0.004 · t	from -40 to +133°C ± 1°C from 133 to 350°C ± 0.0075 · t	from -67 to +40°C ± 1°C from -200 to -67°C ± 0.015 · t
Type E Temperature interval Tolerance Temperature interval Tolerance	from -40 to +375°C ± 1.5°C from 375 to 800°C ± 0.004 · t	from -40 to +333°C ± 2.5°C from 333 to 900°C ± 0.0075 · t	from -167 to +40°C ± 2.5°C from -200 to -167°C ± 0.015 · t
Type J Temperature interval Tolerance Temperature interval Tolerance	from -40 to +375°C ± 1.5°C from 375 to 750°C ± 0.004 · t	from -40 to +333°C ± 2.5°C from 333 to 750°C ± 0.0075 · t	- - - -
Type K Temperature interval Tolerance Temperature interval Tolerance	from -40 to +375°C ± 1.5°C from 375 to 1000°C ± 0.004 · t	from 40 to +333°C ± 2.5°C from 333 to 1200°C ± 0.0075 · t	from -167 to +40°C ± 2.5°C from -200 to -167°C ± 0.015 · t

⁽¹⁾ Materials for thermocouples are generally supplied so to comply with the factory tolerances specified in the table for temperatures over -40°C. However these materials can sometimes not comply with the factory tolerances for the low temperatures reported under Class 3, for thermocouples of T, E, K and N type, when thermocouples have to comply at the same time the limits of Class 3 and Class 1 and/or Class 2.

TECHNICAL DATA OF PROBES AND MODULES EQUIPPED WITH INSTRUMENT
Temperature probes Pt100 sensor with SICRAM module

Model	Type	Application field	Accuracy
TP472I	Immersion	-196°C...+500°C	±0.25°C (-196°C...+300°C) ±0.5°C (+300°C...+500°C)
TP472I.0 1/3 DIN Thin Film	Immersion	-50°C...+300°C	±0.25°C (-50°C...+300°C)
TP473P.I	Penetration	-50°C...+400°C	±0.25°C (-50°C...+300°C) ±0.5°C (+300°C...+400°C)
TP473P.0 1/3 DIN Thin Film	Penetration	-50°C...+300°C	±0.25°C (-50°C...+300°C)
TP474C.I	Contact	-50°C...+400°C	±0.3°C (-50°C...+300°C) ±0.5°C (+300°C...+400°C)
TP474C.0 1/3 DIN Thin Film	Contact	-50°C...+300°C	±0.3°C (-50°C...+300°C)
TP475A.0 1/3 DIN Thin Film	Air	-50°C...+250°C	±0.3°C (-50°C...+250°C)
TP472I.5	Penetration	-50°C...+400°C	±0.3°C (-50°C...+300°C) ±0.6°C (+300°C...+400°C)
TP472I.10	Penetration	-50°C...+400°C	±0.30°C (-50°C...+300°C) ±0.6°C (+300°C...+400°C)
TP49A.0 Class A Thin Film	Immersion	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP49AC.0 Class A Thin Film	Contact	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP49AP.0 Class A Thin Film	Penetration	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP875.I	Globe-thermometer Ø150mm	-30°C...+120°C	±0.25°C
TP876.I	Globe-thermometer Ø50mm	-30°C...+120°C	±0.25°C
TP87.0 1/3 DIN Thin Film	Immersion	-50°C...+200°C	±0.25°C
TP878.0 1/3 DIN Thin Film TP878.1.0 1/3 DIN Thin Film	Photovoltaic	+4°C...+85°C	±0.25°C
TP879.0 1/3 DIN Thin Film	Compost	-20°C...+120°C	±0.25°C

Common features
Temperature drift @20°C 0.003%/°C

4 wires Pt100 and 2 wires Pt1000 Probes

Model	Type	Application field	Accuracy
TP47.100.0 1/3 DIN Thin Film	4 wires Pt100	-50...+250°C	1/3 DIN
TP47.1000.0 1/3 DIN Thin Film	2 wires Pt1000	-50...+250°C	1/3 DIN
TP87.100.0 1/3 DIN Thin Film	4 wires Pt100	-50...+200°C	1/3 DIN
TP87.1000.0 1/3 DIN Thin Film	2 wires Pt1000	-50...+200°C	1/3 DIN

Common features
Temperature drift @20°C
Pt100 0.003%/°C
Pt1000 0.005%/°C



Temperature

ORDERING CODES

HD2178.1: The kit consists of instrument HD2178.1, 4 per 1.5V alkaline batteries, instruction manual and case, software DeltaLog9. **Probes and cables have to be ordered separately**

HD2178.2: The kit consists of instrument **data logger** HD2178.2, 4 per 1.5V alkaline batteries, instruction manual and case, software DeltaLog9. **Probes and cables have to be ordered separately**

HD2110CSNM: 8-pole connection cable MiniDin - Sub D 9-pole female for RS232C.

C.206: Cable for instruments of the serie HD21...1 to connect directly to USB input of PC.

CP23: Connection cable USB 2.0 connector type A- Mini USB type B.

DeltaLog9: Software for download and management of the data on PC using Windows® operating systems.

SWD10: Stabilized power supply at 230Vac/12Vdc-1000mA mains voltage.

HD40.1: Upon request, portable, serial input, 24 column thermal printer, 58mm paper width. Use cable HD 2110 CSNM (option).

Probes equipped with SICRAM module

TP472I: Immersion probe, Wire Wound Pt100 sensor. Stem Ø 3 mm, length 300 mm. Cable 2 meters long.

TP472I.0: Immersion probe, Thin Film Pt100 sensor. Stem Ø 3 mm, length 230 mm. Cable 2 meters long.

TP473P.I: Penetration probe, Wire Wound Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable 2 meters long.

TP473P.0: Penetration probe, Thin Film Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable 2 meters long.

TP474C.I: Contact probe, Wire Wound Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable 2 meters long.

TP474C.0: Contact probe, Thin Film Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable 2 meters long.

TP475A.0: Air probe, Thin Film Pt100 sensor. Stem Ø 4mm, length 230mm. Cable 2 meters long.

TP472I.5: Penetration probe, Thin Film Pt100 sensor. Stem Ø 6mm, length 500 mm. Cable 2 meters long.

TP472I.10: Penetration probe, Thin Film Pt100 sensor. Stem Ø 6mm, length 1000mm. Cable 2 meters long.

TP49A.0: Immersion probe, Thin Film Pt100 sensor. Stem Ø 2.7mm, length 150mm. Cable 2 meters long. Aluminium handle.

TP49AC.0: Contact probe, Thin Film Pt100 sensor. Stem Ø 4 mm, length 150mm. Cable 2 meters long. Aluminium handle.

TP49AP.0: Penetration probe, Thin Film Pt100 sensor. Stem Ø 2.7mm, length 150mm. Cable 2 meters long. Aluminium handle.

TP875.I: Globe thermometer Ø 150 mm with handle. Wire Wound Pt100 sensor complete of SICRAM module. Cable 2 meters long.

TP876.I: Globe thermometer Ø 50 mm with handle. Wire Wound Pt100 sensor complete of SICRAM module. Cable 2 meters long.

TP87.0: Immersion probe, Thin Film Pt100 sensor. Stem Ø 3 mm, length 70 mm. Cable 2 meters long.

TP878.0: Contact probe for solar panels. Thin Film Pt100 sensor. Cable 2 meters long.

TP878.1.0: Contact probe for solar panels. Thin Film Pt100 sensor. Cable 5 meters long

TP879.0: Penetration probe for compost. Thin Film Pt100 sensor. Stem Ø 8 mm, length 1000mm. Cable 2 meters long.

Temperature probes without SICRAM module

TP47.100.0: Immersion probe, Thin Film Pt100 sensor probe. Stem Ø 3 mm, length 230mm. 4 wires connection cable with connector, 2 meters long.

TP47.1000.0: Thin Film Pt1000 sensor immersion probe. Stem Ø 3 mm, length 230mm. 2 wires connection cable with connector, 2 meters long.

TP47: Only connector for probe connection without SICRAM module: direct 3 and 4 wires Pt100, 2 wires Pt1000.

TP87.100.0 Immersion probe, Thin Film Pt100 sensor. Stem Ø 3 mm, length 70mm. Cable 2 meters long. 4 wires connection cable with connector 1 meter long.

TP87.1000.0 Immersion probe, Thin Film Pt100 sensor. Stem Ø 3 mm, length 70mm. Cable 2 meters long. 2 wires connection cable with connector 1 meter long.

A To the portable data loggers of the series **HD21....2** a serial port mini USB type HID (Human Interface Device) has been inserted.

For the connection to a PC with the cable USB type A - MiniUSB type B code CP23, **it is not necessary to load any driver USB.**

B For the connection of the models **HD21....1** to the USB port of a PC, is necessary the USB/serial converter **C.206**. The converter is supplied with its own drivers which must be installed before the connection of the converter to the PC.(see details in the Cd-Rom supplied with the converter).

C The port with the miniDin connector included in all the models, is a serial port type RS232C. The serial port RS232C of a PC or the printer HD40.1 can be connected by the cable HD2110CSNM.

