

HD2106.1 - HD2106.2



HD2106.1, HD 2106.2 CONDUCTIVITY METERS - THERMOMETERS

HD2106.1 and HD2106.2 are portable instruments with LCD display. They measure **conductivity**, **liquid resistivity**, **total dissolved solids (TDS)**, and **salinity** using combined 4-ring and 2-ring conductivity/temperature probes. Temperature only is measured by Pt100 or Pt1000 immersion, penetration, contact or air probes.

The probe calibration can be performed automatically in one or more than one of the 147 $\mu\text{S}/\text{cm}$, 1413 $\mu\text{S}/\text{cm}$, 12880 $\mu\text{S}/\text{cm}$ or 111800 $\mu\text{S}/\text{cm}$ conductivity calibration solutions.

The temperature probes are equipped with an automatic recognition module and factory calibration data are stored inside.

The HD2106.2 is a **datalogger**. It memorizes up to 36,000 conductivity and temperature samples which can be transferred from the instrument connected to a PC via the RS232C and USB 2.0 serial ports. The storing interval, printing, and baud rate can be configured using the menu.

Both models are fitted with an RS232C serial port and can transfer to a PC the acquired measurements or to a portable printer in real time.

The **Max**, **Min** and **Avg** function calculates the maximum, minimum or average values.

Other functions include: the relative measurement REL, the Auto-HOLD function, and the automatic turning off which can also be excluded.

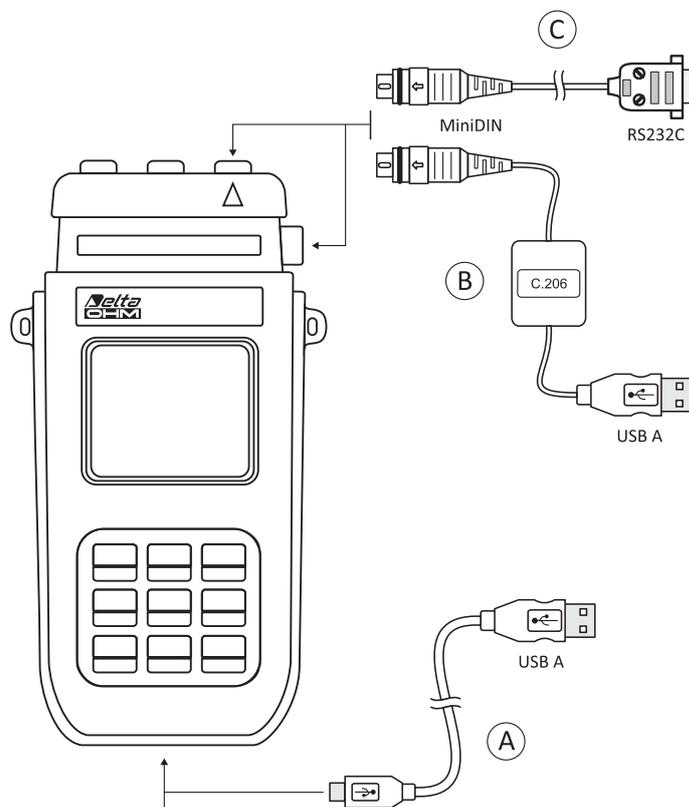
The instruments have IP66 protection degree.

INSTRUMENT TECHNICAL CHARACTERISTICS		
Measured quantities	χ , Ω , TDS, NaCl, °C, °F	
Measurement of conductivity		Resolution
Measuring range Kcell=0.01	0.0000...1.999 $\mu\text{S}/\text{cm}$	0.001 $\mu\text{S}/\text{cm}$
Measuring range Kcell=0.1	0.00...19.99 $\mu\text{S}/\text{cm}$	0.01 $\mu\text{S}/\text{cm}$
Measuring range Kcell=1	0.0...199.9 $\mu\text{S}/\text{cm}$	0.1 $\mu\text{S}/\text{cm}$
	200...1999 $\mu\text{S}/\text{cm}$	1 $\mu\text{S}/\text{cm}$
	2.00...19.99 mS/cm	0.01 mS/cm
Measuring range Kcell=10	20.0...199.9 mS/cm	0.1 mS/cm
	200...1999 mS/cm	1 mS/cm
Accuracy (conductivity)	$\pm 0.5\% \pm 1$ digit	
Measurement of resistivity		
Measuring range Kcell=0.01	till 1 $\text{G}\Omega\text{-cm}$ (*)	
Measuring range Kcell=0.1	till 100 $\text{M}\Omega\text{-cm}$ (*)	
Measuring range Kcell=1	5.0...199.9 $\Omega\text{-cm}$	0.1 $\Omega\text{-cm}$
	200...999 $\Omega\text{-cm}$	1 $\Omega\text{-cm}$
	1.00 k...19.99 $\text{k}\Omega\text{-cm}$	0.01 $\text{k}\Omega\text{-cm}$
Measuring range Kcell=10	20.0 k...99.9 $\text{k}\Omega\text{-cm}$	0.1 $\text{k}\Omega\text{-cm}$
	100 k...999 $\text{k}\Omega\text{-cm}$	1 $\text{k}\Omega\text{-cm}$
Measuring range Kcell=10	1...10 $\text{M}\Omega\text{-cm}$	1 $\text{M}\Omega\text{-cm}$
	0.5...5.0 $\Omega\text{-cm}$	0.1 $\Omega\text{-cm}$
Accuracy (resistivity)	$\pm 0.5\% \pm 1$ digit	
Measurement of total dissolved solids (with coefficient $\chi/\text{TDS}=0.5$)		
Measuring range Kcell=0.01	0.000...19.999 mg/l	0.005 mg/l
Measuring range Kcell=0.1	0.00...19.99 mg/l	0.05 mg/l
Measuring range Kcell=1	0.0...199.9 mg/l	0.5 mg/l
	200...1999 mg/l	1 mg/l
	2.00...19.99 g/l	0.01 g/l
Measuring range Kcell=10	20.0...99.9 g/l	0.1 g/l
	100...999 g/l	1 g/l
Accuracy (total dissolved solids)	$\pm 0.5\% \pm 1$ digit	
Measurement of salinity		
Measurement range	0.000...1.999 g/l	1 mg/l
	2.00...19.99 g/l	10 mg/l
	20.0...199.9 g/l	0.1 g/l
Accuracy (salinity)	$\pm 0.5\% \pm 1$ digit	
Measurement of temperature		
Pt100 measuring range	-50...+200 °C	
Pt1000 measuring range	-50...+200 °C	
Resolution	0.1 °C	
Accuracy	± 0.25 °C	
Drift after 1 year	0.1 °C/year	
Temperature compensation automatic/manual	0...100 °C with α_T selectable from 0.00 to 4.00%/ °C	
Reference temperature	20 °C o 25 °C	
χ / TDS conversion factor	0.4...0.8	
Preset cell constant values: (cm^{-1})	K=0.01 K=0.1 - K=0.7 - K=1 - K=10	

Standard solutions automatically detected @25°C	147 $\mu\text{S}/\text{cm}$ 1413 $\mu\text{S}/\text{cm}$ 12880 $\mu\text{S}/\text{cm}$ 111800 $\mu\text{S}/\text{cm}$
Power Supply	
Batteries	4 1.5V type AA batteries
Autonomy	200 hours with 1800 mAh alkaline batteries
Power absorbed with instrument off	20 μA
Mains (SWD10)	Output mains adapter 12 Vdc / 1A
Security of memorized data	Unlimited, independent of battery charge conditions
Measured values storage - model HD 2106.2	
Type	2000 pages containing 18 samples each
Quantity	36000 pairs of measurements [$X\text{-}^{\circ}\text{C}$], [$\Omega\text{-}^{\circ}\text{C}$], [$\text{TDS}\text{-}^{\circ}\text{C}$] or [$\text{Sal}\text{-}^{\circ}\text{C}$]
Selectable storage interval	1, 5, 10, 15, 30 s 1, 2, 5, 10, 15, 20, 30 min 1 hour
Serial interface RS232C	
Type	RS232C electrically isolated
Baud rate	can be set from 1200 to 38400 baud
Data bit	8
Parity	None
Stop bit	1
Flow Control	Xon/Xoff
Serial cable length	Max 15m
Print interval	immediate or selectable between: 1, 5, 10, 15, 30 s 1, 2, 5, 10, 15, 20, 30 min 1 hour
USB interface - model HD 2106.2	
Type	1.1 - 2.0 electrically isolated
Connections	
Temperature input	8-pole male DIN45326 connector
Conductivity input	8-pole male DIN45326 connector
Serial interface and USB	8-pole MiniUSB type B
Mains adapter	2-pole connector (positive at centre)
Time	
Date and time	in real time
Accuracy	1min/month max error
Operating conditions	
Working temperature	-5...50 $^{\circ}\text{C}$
Storage temperature	-25...65 $^{\circ}\text{C}$
Working relative humidity	0...90% RH without condensation
Protection degree	IP66
Instrument	
Dimensions (Length x Width x Height)	185 x 90 x 40 mm
Weight	470 g (complete with batteries)
Material	ABS, rubber
Display	2x4½ digits plus symbols Visible area: 52x42 mm

(*) The resistivity measurement is obtained from the reciprocal of conductivity measurement. Close to the bottom of the scale, the indication of resistivity appears like reported in the table below:

K cell = 0.01 cm^{-1}		K cell = 0.1 cm^{-1}	
Conductivity ($\mu\text{S}/\text{cm}$)	Resistivity ($\text{M}\Omega\text{-cm}$)	Conductivity ($\mu\text{S}/\text{cm}$)	Resistivity ($\text{M}\Omega\text{-cm}$)
0.001 $\mu\text{S}/\text{cm}$	1000 $\text{M}\Omega\text{-cm}$	0.01 $\mu\text{S}/\text{cm}$	100 $\text{M}\Omega\text{-cm}$
0.002 $\mu\text{S}/\text{cm}$	500 $\text{M}\Omega\text{-cm}$	0.02 $\mu\text{S}/\text{cm}$	50 $\text{M}\Omega\text{-cm}$
0.003 $\mu\text{S}/\text{cm}$	333 $\text{M}\Omega\text{-cm}$	0.03 $\mu\text{S}/\text{cm}$	33 $\text{M}\Omega\text{-cm}$
0.004 $\mu\text{S}/\text{cm}$	250 $\text{M}\Omega\text{-cm}$	0.04 $\mu\text{S}/\text{cm}$	25 $\text{M}\Omega\text{-cm}$



A In the **HD2106.2** models of portable data logger, a new serial port miniUSB type HID (Human Interface Device) has been implemented. When making the connection to the PC by the USB cable Type A - Mini USB B-type coded CP23, no USB driver installation is requested.

B For the connection of the models **HD2106.1** to the RS232 port of your PC, the USB/serial converter is available (code **C.206**). The converter is equipped with its own drivers that have to be installed before connecting the converter to the PC.

C The port with the MiniDIN connector which is present on every model is an RS232C type. By means of the cable coded HD2110CSNM, an RS232C port of a PC or the HD40.1. printer can be connected.



CONDUCTIVITY PROBES		
ORDER CODE	MEASUREMENT RANGE	DIMENSIONS
SP06T	K=0.7 5 $\mu\text{S}/\text{cm}$... 100 mS/cm 0...90 °C 4-electrode cell in PBT/Platinum General use No heavy tasks Max pressure 5 bar	
SPT01G	K=0.1 0.1 $\mu\text{S}/\text{cm}$... 500 $\mu\text{S}/\text{cm}$ 0...80 °C 2-electrode cell in Glass/Platinum Pure water Max pressure 5 bar	
SPT1G	K=1 10 $\mu\text{S}/\text{cm}$... 10 mS/cm 0...80 °C 2-electrode cell in Glass/Platinum General heavy tasks, average conductivity Max pressure 5 bar	
SPT10G	K=10 500 $\mu\text{S}/\text{cm}$... 200 mS/cm 0...80 °C 2-electrode cell in Glass/Platinum General heavy tasks, high conductivity Max pressure 5 bar	

ORDERING CODES

HD2106.1: The kit is composed by the instrument HD2105.1, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software downloadable from Delta OHM website.

HD2106.2: The kit is composed by the instrument HD2105.2 **data logger**, 4 1.5V alkaline batteries, USB cable CP23, operating manual, case and DeltaLog9 software downloadable from Delta OHM website

Conductivity probes, calibration solutions and temperature probes have to be ordered separately.

Accessories

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

C.206: Cable for instruments of the series HD21...1 for direct connection to the USB input of a PC.

SWD10: Stabilized power supply at 100-240Vac/12Vdc-1A mains voltage.

HD40.1: The kit includes: 24-column portable thermal printer, serial interface RS232, 57mm paper width, four NiMH 1.2V rechargeable batteries, SWD10 power supply, instruction manual, 5 thermal paper rolls. It uses the optional cable HD2110 CSNM.

HD8700C: ACCREDIA ISO 17025 certified standard solutions kit: 0.001 mol/l (147 $\mu\text{S}/\text{cm}$ @ 25 °C) + 0.01 mol/l (1413 $\mu\text{S}/\text{cm}$ @ 25 °C) + 0.1 mol/l (12880 $\mu\text{S}/\text{cm}$ @ 25 °C).

Two 50 ml bottles for each type (6 bottles in total).

HD22.2: Laboratory electrode holder composed of base plate with built-in magnetic stirrer, shaft and replaceable electrode holder. Suitable diameter 12mm. It holds up to 5 electrodes at the same time. Powered by power supplier SWD10 (**optional**).

HD22.3: Laboratory electrode holder composed of base plate. Flexible arm for free positioning. Suitable for electrodes with diameter 12mm. It holds up to 5 electrodes at the same time.

Conductivity Probes

SP06T: Conductivity and temperature combined probe. Cell constant 0.7.

SPT01G: Conductivity and temperature combined probe, glass body, 2 platinum wire electrodes, cell constant 0.1.

SPT1G: Conductivity and temperature combined probe, glass body, 2 platinum wire electrodes, cell constant 1.

SPT10G: Conductivity and temperature combined probe, glass body, 2 platinum wire electrodes, cell constant 10.

Temperature probes of the series TP87 and TP47... are suitable.

