Handheld Multifunction Data Logger
HD31

Delta OHM
○ Member of GHM GROUP

○ **ONE** INSTRUMENT - **MANY** MEASUREMENTS

Temperature - Relative Humidity - Atmospheric and differntial pressure - Air speed - Illuminance - Irradiance - CO_2 - Direct voltage and current

○ **GREAT** FLEXIBILITY

Three indipendent input channels - Interchangeable probes - automatic recognition of the probes

○ **DATA IMMEDIATELY AVAILABLE**

Simultaneous display of 3 variables in numerical form Real time visualization on display of the graph of a measured variable

○ **ACCURATE** AND **RELIABLE**

All **probes** are supplied **factory-calibrated** and do not require additional interventions of the user

○ **LONG & SAFE** LOGGING

Data logging function with data storage in CSV format directly into the SD card - Long logging time - Configurable storage interval & automatic switch-off

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HD31 is a **portable multifunctional data logger** instrument with color graphic LCD display.

It is equipped with **3 independent inputs** and each input can be connected to SICRAM probes for the measurement of a **large variety of physical quantities**. The SICRAM module allows the instrument to immediatly recognize the type of probe connected. Moreover, it stores into memory the probe calibration data: in this way the probe can be indifferently connected to the three inputs of the instrument or to another instrument with no need to be recalibrated. All probes are supplied **factory-calibrated** and are interchangeable.

The instrument's inputs can also be connected to non SICRAM probes, by using the relevant interface modules between instrument and probe.

Measurement units are selectable according to the measured physical quantity. The display can show up to 36 quantities, three of which can be displayed simultaneously in numeric format. A real-time measured quantity graph is also shown in the display.

Data logging function with data storing in CSV format directly to the SD type memory card, for a **long duration of the logging**. Storage interval configurable by the user.

USB port with mini-USB connector for PC connection, for configuration and download of the acquired data.

Automatic or manual start and stop of the logging. Storing of date and time of each recorded sample. Automatic creation of measurement **reports in PDF** format on the memory card.
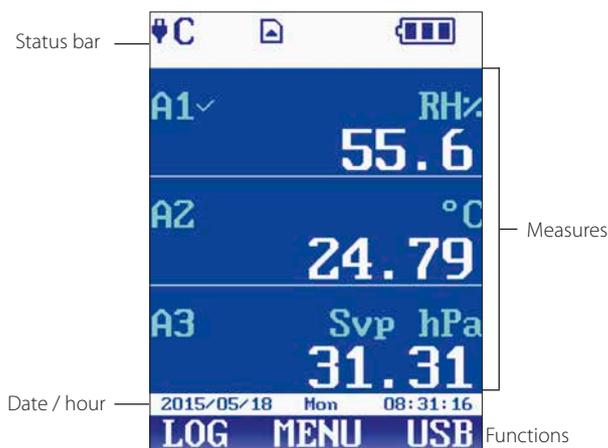
Technical Specifications of the instrument

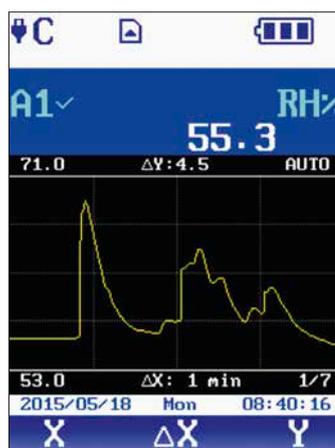|	
Power supply	Rechargeable 3.7 V Li-ion internal battery, 2250 mA/h capacity, 3-pole JST connector. External power supply unit (SWD05), to be connected to the mini-USB connector of the instrument. If connected to PC, it is powered from the computer's USB port (500 mA at least).
Battery autonomy	18 hours of continuous operation (typ. autonomy with full charge battery and three connected Pt100 probes). The effective autonomy depends on the number and type of connected sensors.
Logging interval	1, 5, 10, 15, 30 s 1, 2, 5, 10, 15, 20, 30 m / 1 hour
Storage capacity	SD memory card with capacity up to 8 GB
Inputs	3 inputs 8-pole DIN45326 connector
Accuracy @ 20°C	± 0.02 % of the measure (excluding probes error)
Temperature drift @ 20°C	20 ppm/°C (excluding probes drift)
Long term stability	0.05 %/year (excluding probes stability)
Clock stability	1 min/month maximum drift
Display	Color graphic LCD. Visible area 43 x 58 mm.
USB Connection	1 USB port with mini USB connector.
RS232C Connection	1 RS232C serial output with RJ12 (6P6C) connector for connection of a serial printer. Settable Baud Rate from 1200 to 115200.
Auto-off	Configurable after 2, 5, 10, 15, 20 or 30 minutes from last pressure of a key, with battery supply. It can be disabled. Automatically disabled when powered from external supply.
Operating conditions	-10 … 60 °C, 0 … 85% RH no condensation
Storage temperature	-25…65 °C
Materials	ABS - 55 shore rubber protection lateral bands and protective shell
Dimensions	180 x 102 x 46 mm with rubber shell
Weight	About 400 g. (with batteries and protection shell)
Protection degree	IP 64

Instrument description

Inputs

Graphic colour LCD display

Keyboard

SD card

USB port

Serial output for printer

LCD description

Status bar

Measures

Date / hour

Functions

Real time measurement graph

HELP functions on the display

Probes and modules in line with the instrument

The probes of the instrument are equipped with an "intelligent" module acting as interface between the probe and the instrument. Inside the module there is a microprocessor circuit with permanent memory performing different functions:

- allows the instrument to recognize the type of connected probe
- stores into memory the probe calibration data
- recognizes the instrument with which it was calibrated
- maintains the factory-calibration and the last calibration data
- stores into memory a serial number allowing the unique identification of the probe.

TEMPERATURE PROBES

Temperature with platinum sensors (PRT)

- 4-wire Pt100 sensor temperature probes with SICRAM module
- For probes without SICRAM module, following modules are available:

TP471 "intelligent" module with microprocessor and permanent memory, designed for 4-wire Pt100 sensors

TP47 connector without microprocessor and memory, designed for 4-wire Pt100 and 2 or 4-wire Pt1000 sensors.

Thermocouple probes

K, J, T, E, R, S, B and N-type thermocouple temperature probes can be connected. A SICRAM module has to be placed between the probe and the instrument:

TP471D0: 1-input module without cold junction compensation.

TP471D: 1-input module with internal sensor for cold junction compensation.

TP471D1: 2-input module with internal sensor for cold junction compensation

RELATIVE HUMIDITY AND TEMPERATURE COMBINED PROBES

The relative humidity and temperature combined probes of the HP47… and HP48… series use a capacitive sensor for the measurement of relative humidity and a Pt100 sensor for the measurement of temperature. By connecting these probes, the instrument can also display the following derived humidity quantities: **Saturated vapor pressure** (Svp) in hPa; **Partial vapor pressure** (Pvp) in hPa; **Mixing ratio** in g/kg (vapor grams in 1 kg of dry air); **Enthalpy** in J/g; **Absolute humidity** in g/m^3 (vapor grams in 1 cubic meter of dry air); **Dew point Temperature** (Td); **Wet bulb Temperature** (Tw); **Discomfort index** (DiscIdx); **NET index** (NetIdx).

PRESSURE PROBES

For the measurement of pressure, following possibilities are available:
- **PP471:** SICRAM module for the measurement of absolute, relative and differential pressures. **Operates with TP704… and TP705… series** pressure probes.
- **PP472:** module for the detection of the **barometric pressure in the range 600…1100 hPa.**
- **PP473S…:** series of modules for the measurement of the **differential pressure.** Available full scale values: 2.5 (with auto-zero circuit) / 10 / 20 / 50 / 100 / 200 / 500 / 1000 / 2000 mbar.

AIR SPEED PROBES

Following probes can be connected to the instrument:
- **AP471S…:** hot-wire air speed SICRAM probes.
- **AP472S…:** vane air speed SICRAM probes.
- **AP473S…:** SICRAM modules for Pitot tubes.

PHOTOMETRIC AND RADIOMETRIC PROBES

The photometric and radiometric probes of **LP471… series** can be connected to the instrument. According to the probe used, the instrument can measure:

- illuminance,
- luminance,
- PAR (photon flux in the PAR chlorophyll field),
- irradiance, UVA - UVB - UVC and UVBC irradiance,
- effective irradiance in blue light spectral band,
- the combination of illuminance and of UVA irradiance,
- the weighted effective total irradiance according to UV action curve,
- global solar irradiance.

The connection of **pyranometers and albedometers** is also possible and can be done through the **VP472 module.** When connecting a pyranometer, the instument displays the mV signal generated by the thermopile and the global radiation in W/m^2. When connecting an albedometer, the HD31 displays the mV signal generated by the thermopile detecting incident and reflected light, the net radiation in W/m^2 and the albedo.

CO$_2$ PROBES

HD31.B3 and **HD31.B3-10** are the probes available for the CO$_2$ measurement in the the ranges **0…5,000 or 0…10,000 ppm.** The probes use a double wavelength infrared sensor with NDIR technology (Non-Dispersive Infrared Technology). The use of a double filter and of a particular measuring technique ensures accurate and stable measurement for a long time.

DIRECT VOLTAGE AND CURRENT

VP473 SICRAM module measures the **direct voltage** applied at the input in the range -20 Vdc to +20 Vdc. The module input impedance is 1 MΩ.

IP472 SICRAM module measures the **direct current** applied at the input in the range 0…24 mA. The module input impedance is 25 Ω.
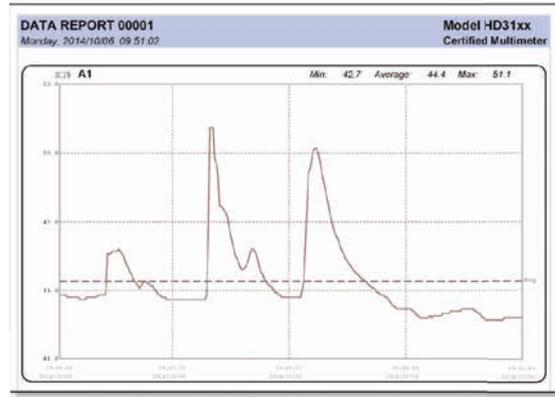
DeltaLog9 software

Deltalog9 application software can be easily download through the Delta OHM website. Once installed, it allows to manage the instrument simply and intuitively from your PC.
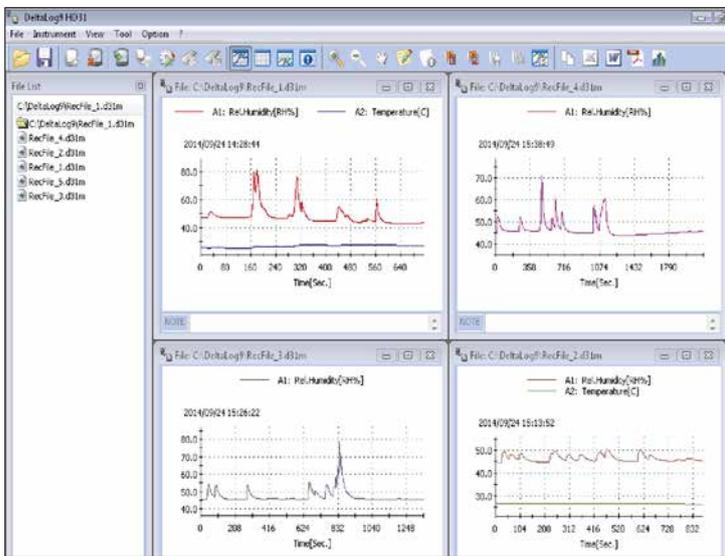
- Start and stop recording
- Direct download from PC of all the data contained in the instrument's memory card
- Parameters setting
- Data display as a table or a graph
- Real time display of the measurement data detected by the instrument and possibility to save, print and export in different format
- Reading of battery's charge status

Reading the measurements on the PC in real time (Monitor)

The instrument **Monitor function** displays the measurements registered by the instrument in real time on the PC's monitor, both graphically and numerically. The data input into the instrument are read and displayed according to a set update time from 1 second to 60 minutes. The data can be sent, according to set intervals, to an email address. The data received using the Monitor function are **analysed in real time**. **Two alert limits** can be associated to each measurement variable: an upper limit (High Level) and a lower limit (Low Level).

Examples of reports in PDF format with graphs and tables automatically created by the instrument on the memory card.

The HD31 is supplied with a **strong and protective rubber housing**, provided with a removable back support and a magnet.

Ordering codes

HD31 is supplied with lithium ion rechargeable battery, SD card, rubber protection shell with magnet, CP31 USB cable, SWD05 power supply and carrying case.

DeltaLog9 software is downloadable from Delta OHM website.

Modules, probes and serial cable for the printer have to be ordered separately.

CP31	USB cable with male mini-USB connector on instrument side and male A type USB connector on PC side.
CP31RS	RS232C connection cable for serial printer connection. RJ12 connector on the instrument side and Sub-D 9-pole female connector on the printer side.
SWD05	100-240 Vac / 5 Vdc-1 A stabilized mains power supply. Output with A type USB connector.
HD35-BAT1	Spare lithium ion rechargeable battery, 3.7 V, capacity 2250 mA/h, 3-pole JST connector.
HD40.1	Kit including 24-column portable thermal printer, serial interface, paper width 57mm, NiMH rechargeable battery pack, SWD10 power supply unit, 5 thermal paper rolls and instruction manual.
BAG31	Spare carrying case.

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In order to ensure the quality of our instruments, we are constantly re-evaluating our products. Improvements can imply changes in specification; we advise you to always check our website for the newest version of our documentation.