HD33[L]MT.4
Data logger for weather station

- Possibility of connecting many sensor types thanks to the 4 analog inputs, the 2 contact inputs and the RS485 MODBSU-RTU and SDI-12 digital inputs
- 4G/3G/GSM(2G)/GPRS module for remote monitoring
- Sending of data via e-mail, FTP and to an HTTP server (for example the Delta OHM Cloud)
- Configurable as Master or Slave MODBUS unit
- Connection to ETHERNET network with **MODBUS TCP/IP** protocol through **optional** module
- PC software for configuration, monitor and data download in a database
- Software option available for compliance to **FDA 21 CFR part 11** recommendations
- 2 contact alarm outputs and alarm notification via e-mail and SMS when configurable measurement thresholds are exceeded
- **IP 65** housing
- Optinal custom LCD
- It can be powered by mains (with optional external power supply unit) or by a solar panel
- **Low power**, it can operate for weeks even in absence of recharging of the internal battery
- Internal clock of high accuracy and stability, with possibility of **automatic time synchronization** with an HTTP or NTP reference server

DESCRIPTIONS

The **HD33[L]MT.4** data logger with 4G/3G/GSM(2G)/GPRS module allows several physical quantities to be monitored remotely in a large variety of application fields. You can monitor, for example, temperature, humidity, atmospheric pressure, solar radiation, rainfall quantity, wind speed and direction, etc.

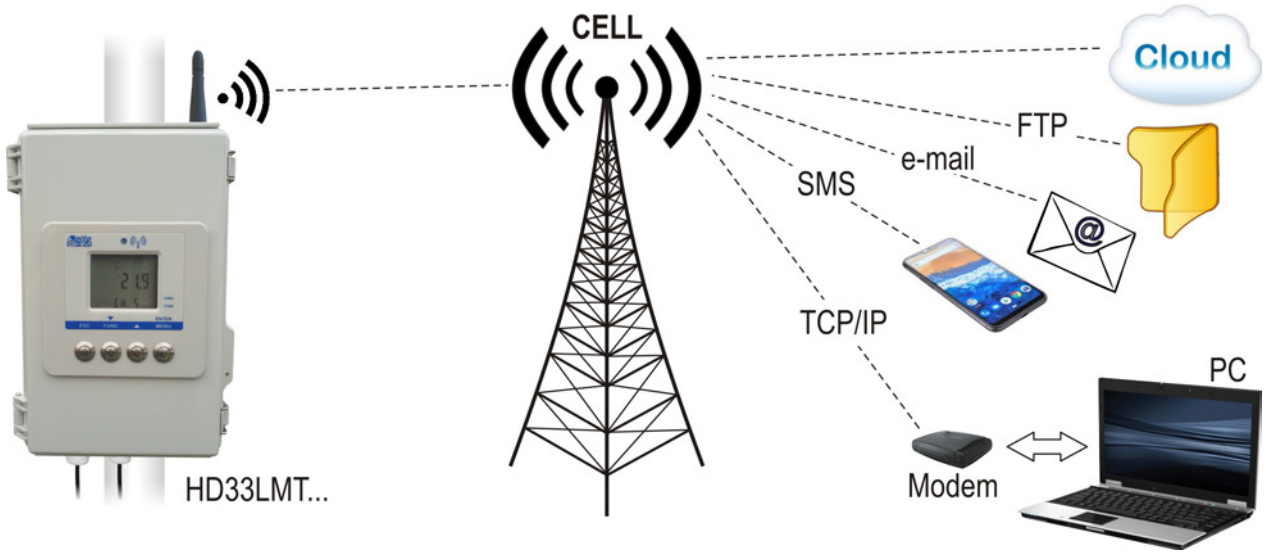
The data logger is equipped with:

- 4 analog independently configurable inputs (0…50 mV, -50…+50 mV, 0…1 V, 0…10 V, 0…20 mA or 4…20 mA, Pt100, Pt1000, thermocouple, potentiometer, pyrgeometer).
- 2 voltage-free counting contact inputs (e.g. a tipping bucket rain gauge and a cup anemometer can be connected).
- One RS485 port with Modbus-RTU protocol configurable as “Master” or “Slave”. Through an **optional** module, the data logger can be connected to an ETHERNET network and communicate with MODBUS TCP/IP protocol.
- One SDI-12 “Master” port compatible with version 1.3 of SDI-12 protocol.
- 2 voltage-free contact alarm outputs.

On request, input with M12 connector for relative humidity and temperature with NTC sensor combined probe or, alternatively, for temperature only probe with NTC sensor. If a relative humidity and temperature probe is connected, the dew point temperature is calculated.

Thanks to **4G/3G/GSM(2G)/GPRS** transmission, the user will not have to remove the data logger from its position or reach the place where the data logger is installed to download the data

measured with the PC: the instrument can send the data via **e-mail** or **FTP** and can upload the data on an **HTTP** server (for example the Delta OHM portal "**www.deltaohm.cloud**").



The data logger can be controlled remotely either by sending commands via SMS messages or by establishing a direct TCP/IP connection via mobile network with a remote PC connected to the Internet.

For each detected quantity, the user can set two alarm thresholds (high threshold and low threshold), the alarm hysteresis and a delay in the generation of the alarm. The overrun of the thresholds can be signaled by alarm e-mails or SMS messages. Two voltage-free contact alarm outputs are also available.

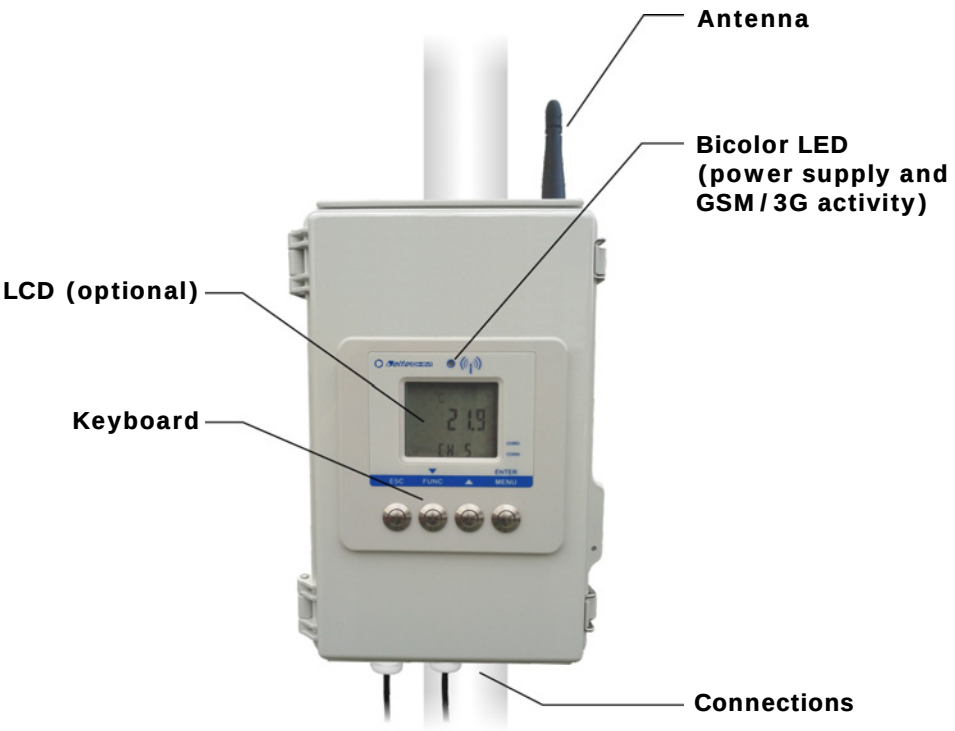
HD35AP-S PC software, downloadable free of charge from the Delta OHM website, allows configuration of data logger, displaying measurements in real time both in graphical and numerical format, data download. The data transferred to the PC are entered into a database.

The internal clock of the data logger has high accuracy and is extremely stable in the whole operating temperature range of the instrument. It supports the **automatic time synchronization** with an HTTP reference server.

The **optional** 12 V / 3.4 Ah rechargeable backup battery to be installed inside the case prevents the loss of recordings in case of no external power supply. The battery charger is integrated in the instrument. The data logger can be powered by a solar panel and is designed to be **low power**: can operate for weeks even in absence of battery recharging from the solar panel. Power supply 18…30 Vdc if the rechargeable battery is used or 7…30 Vdc (without ETHERNET module) / 12…30 Vdc (with ETHERNET module) if the rechargeable battery is not used.

A switched power supply output allows powering the sensors only when measurements have to be taken.

IP 65 housing. **Optional** custom LCD display.

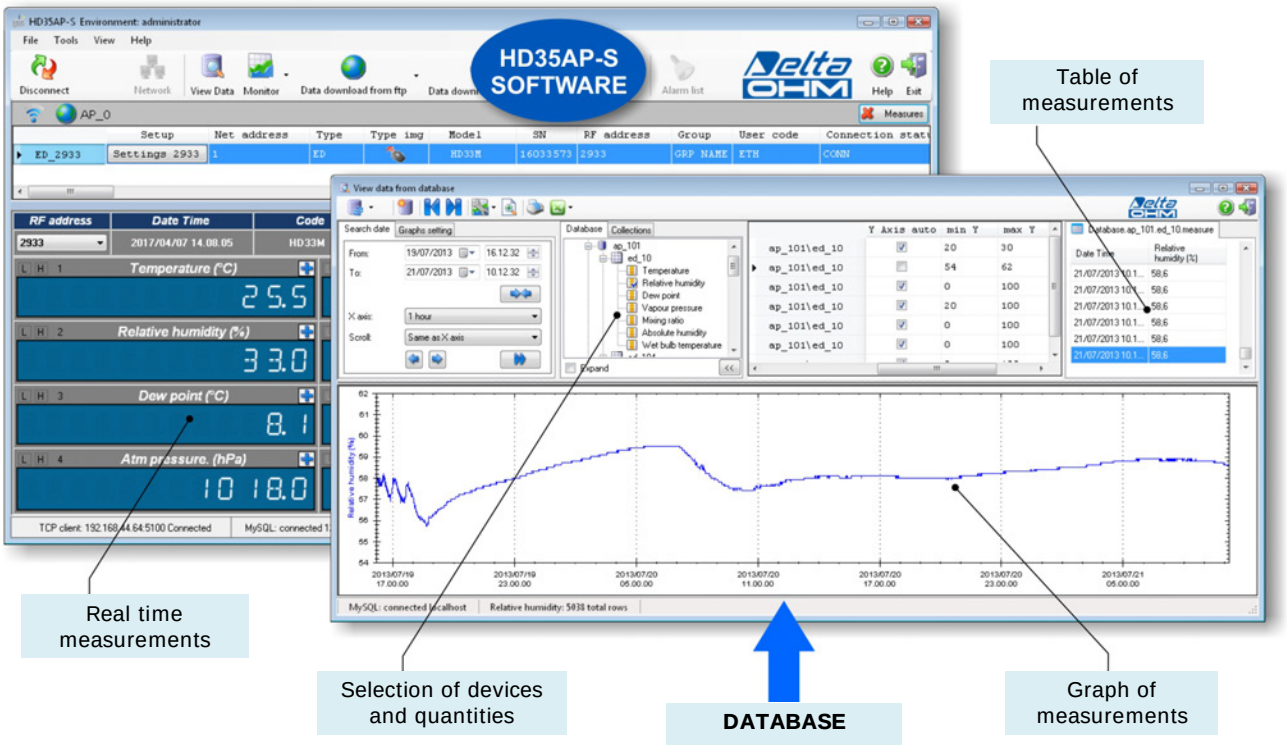


CLOUD

The data logger can automatically send, at regular intervals, the data to an HTTP server, and in particular to the Delta OHM portal "**www.deltaohm.cloud**". This allows you to view the data from anywhere in the world, even by using mobile devices (tablet, smartphone, notebook), simply having an Internet connection and using a web browser. The data sending interval is configurable.

PC APPLICATION SOFTWARE

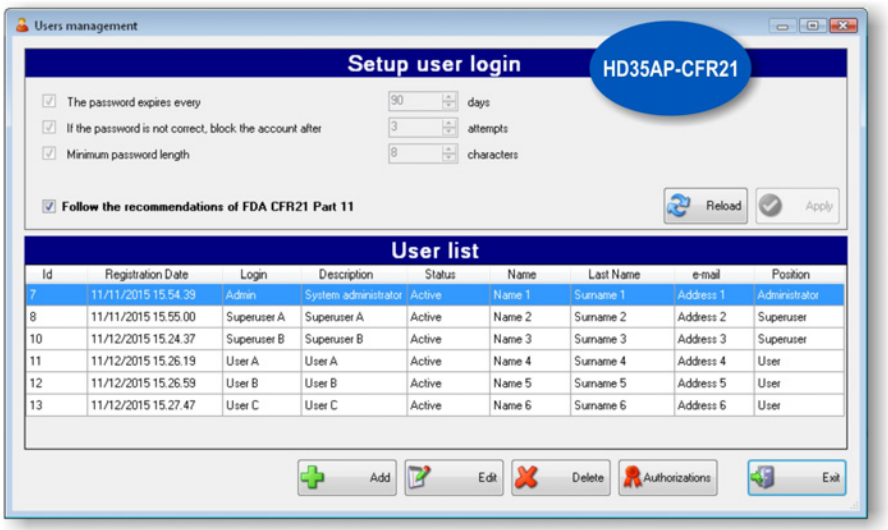
The PC software **HD35AP-S** allows configuring the data logger, viewing the real time measurements both graphically and numerically, downloading the data in a database. The data can be downloaded automatically, at regular intervals, or upon user request.



The database functions allow viewing the data coming from multiple data loggers simultaneously. The connection to the database is **multi-client**: it is possible to store the data in a remote database on the local network to which the PC is connected, and the data can be viewed from any PC on the network via the HD35AP-S software.

The **HD35AP-CFR21** option (enabled by a USB hardware key to be connected to any PC connected to the same local network of the PC in which the HD35AP-S software is installed) allows, in addition to the features of the basic software, the protection of recorded data and configuration in response to **FDA 21 CFR part 11** recommendations. In particular become available:

- The traceability of activities (audit trail) performed with the software; for example, which users connected and what changes were possibly made to the configuration of the data logger.
- The management of users access for the data logger configuration and viewing of data in the database. Each user can be assigned a different password for using the software. There are also three levels of access (Administrator, Super-user and standard User); for each level, the allowed operations can be defined.



TECHNICAL SPECIFICATIONS

Power supply	If the rechargeable battery is used: 18…30 Vdc If the rechargeable battery is not used: 7…30 Vdc without ETHERNET module 12…30 Vdc with ETHERNET module
Power consumption @ 12 Vdc	< 3 mA without ETHERNET module and with no GSM/3G activity ~ 200 mA with ETHERNET module and with no GSM/3G activity < 1 A peak during GSM/3G activity
Battery	Optional internal lead 12 V / 3.4 Ah. Maximum charge current 1 A. The autonomy depends on the number and type of sensors connected.
Switched power supply output	If the data logger is powered by a solar panel (+Vpanel input), the output is equal to the voltage of the internal lead battery (nominal 12 V). If the data logger is powered by the +Vdc input, the output is equal to the voltage of the +Vdc input. The output is active only when the external sensors have to be powered.
Antenna	External
Measuring interval	1, 2, 5, 10, 15, 30 s / 1, 2, 5, 10, 15, 30, 60 min
Logging interval	1, 2, 5, 10, 15, 30 s / 1, 2, 5, 10, 15, 30, 60 min
Internal memory	Circular management or stop logging if memory is full. Number of samples: from 242,850 to 858,070 depending on the number of detected quantities.
Alarm	Sending of alarm e-mail and SMS. Two voltage-free normally open (NO) contact alarm outputs. Max 300 mA @ 30 Vdc resistive charge.
Display	**Optional** custom LCD
LED indicator	2-color LED: power on (blinks red), GSM/3G activity (blinks green)
Connection to PC	USB port with mini-USB connector
ETHERNET connection	RJ45 connector (only if the optional ETHERNET module is present)
Internal clock drift	± 2 ppm (0…+40 °C) / ± 5 ppm (-40…+70 °C)
Operating conditions	-40…+70 °C / 0…100 %RH for the version without LCD -20…+70 °C / 0…100 %RH for the version with LCD
Weight	1 kg approx.
Housing	Dimensions: 270 x 170 x 110 mm (excluding external antenna) Material: Polycarbonate (PC) Protection degree: IP 65 (with protective cap on the USB connector)
Installation	Fixing to a 40 mm diameter mast.

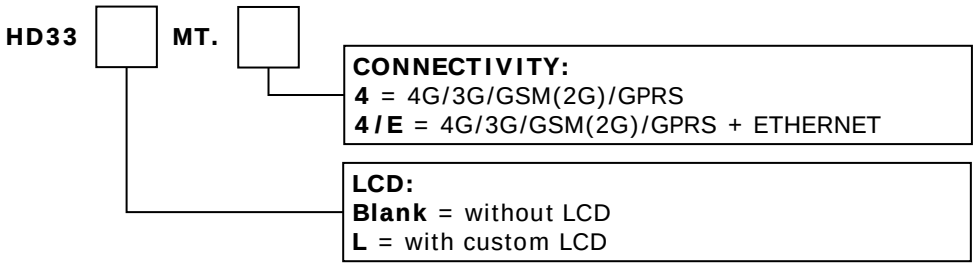
Measurement characteristics:

Temperature (*instrument in line with the probe HP3517WTC… or TP350NTC…*)	
Sensor	NTC 10 kΩ @ 25 °C
Measuring range	-40…+105 °C
Resolution (of instrument)	0.1 °C
Accuracy	± 0.3 °C in the range 0…+70 °C / ± 0.4 °C outside
Stability	0.1 °C / year
Relative Humidity (*instrument in line with the probe HP3517WTC …*)	
Sensor	Capacitive
Measuring range	0…100 %RH
Resolution (of instrument)	0.1 %
Accuracy	± 1.8 %RH (0…85 %RH) / ± 2.5 %RH (85…100 %RH) @ T=15…35 °C ± (2 + 1.5% measure)% @ T=remaining range
Sensor operating temperature	-40…+80 °C
Response time	T_{90} < 20 s (air speed = 2 m/s, without filter)
Temperature drift	±2% over the whole operation temperature range
Stability	1% / year

Calculated quantities	Dew Point
Atmospheric pressure	
Sensor	Piezoresistive
Measuring range	300…1100 hPa
Resolution (of instrument)	0.1 hPa
Accuracy	± 0.5 hPa (800…1100 hPa) @ T=25°C ± 1 hPa (300…1100 hPa) @ T=0…50°C
Stability	1 hPa / year
Temperature drift	±3 hPa tra -20…+60 °C
Pt100/Pt1000	
Measuring range	-200…+650 °C
Resolution	0.1 °C
Accuracy	± 0.1 °C (excluding probe error)
Sensor coefficient	α=0.00385 °C^{-1}
Connection	2, 3 or 4 wires
Thermocouple	
Thermocouple type	K, J, T, N, E. The inputs are not isolated, **use thermocouples with isolated hot junction**.
Measuring range	type **K**: -200…+1370 °C type **J**: -100…+750 °C type **E**: -200…+750 °C type **T**: -200…+400 °C type **N**: -200…+1300 °C
Resolution	0.1 °C
Accuracy (excluding probe error)	type **K**: ± 0.1 °C (< 600 °C) type **E**: ± 0.1 °C (< 300 °C) ± 0.2 °C (> 600 °C) ± 0.2 °C (> 300 °C) type **N**: ± 0.1 °C (< 600 °C) type **J**: ± 0.1 °C ± 0.2 °C (> 600 °C) type **T**: ± 0.1 °C
0/4…20 mA input	
Shunt resistance	Internal (50 Ω)
Resolution	16 bit
Accuracy	± 2 µA
Inputs 0…50 mV / -50…50 mV / 0…1 V / 0…10 V	
Input Resistance	100 MΩ
Resolution	16 bit
Accuracy	± 0.01% f.s.
Inputs for counting the switchings of a voltage-free contact	
Switching frequency	50 Hz max.
Hold Time	10 ms min.
Potentiometer input	
Potentiometer	Typically 10 kΩ
Resolution	16 bit
Accuracy	± 0.01% f.s.
Rainfall measurement	
The data logger can record: • Maximum rainfall rate • Daily rainfall • Total rainfall • Amount of rainfall which has fallen in the logging interval	

ORDERING CODES

HD33[L]MT.... Data logger for weather station with mobile communication module. Stores measurements in the internal memory. Transmits the acquired data via FTP, via e-mail or to an HTTP server (Cloud). **Optional** LCD Display. SDI-12 and Master or Slave RS485 MODBUS-RTU connection. Connection to ETHERNET network with MODBUS TCP/IP protocol through **optional** module. Alarm functions. It includes **HD35AP-S** software downloadable from Delta OHM web site.
The battery, the probes and the USB cable CP23 have to be ordered separately. SIM card not included.



ACCESSORIES

HD35AP-CFR21 Advanced version of the HD35AP-S software for the management of the data logging system in accordance with the **FDA 21 CFR part 11 recommendations**.

CP23 Direct USB connection cable with mini-USB male connector on the instrument side and A-type USB male connector on the PC side.

HD32MT.SWD 100...240 Vac / 24 Vdc (adjustable) power supply unit with switch. IP 65 housing. Suitable for fastening to a rod. Includes fastening accessories.

BAT12V-3.4A 12 V / 3.4 Ah lead-acid rechargeable battery.

HD2005.20 Tripod kit with adjustable legs for installing environmental sensors (pyranometers, temperature and humidity, etc.). Material: anodized aluminum. Max. height 2 m. It can be fixed on a flat base with screws or to the ground with pegs. Foldable legs for the transport.

HD2005.20.1 Tripod kit with adjustable legs for installing environmental sensors (pyranometers, temperature and humidity, etc.). Material: anodized aluminum. Max. height 3 m. It can be fixed on a flat base with screws or to the ground with pegs. Foldable legs for the transport.

Delta OHM has a wide range of sensors for measuring environmental physical quantities. Please visit www.deltaohm.com or contact Delta OHM directly.

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