



Member of GHM GROUP



## Environmental Technology.

Uncompromising quality is part of our nature.

# Editorial. Specialists by Competence.

*„In no other area can the collected data take on such grave importance as in the field of environmental measuring technology. Since 40 years at Delta OHM we dedicate ourselves with a top-quality product portfolio and with the appropriate scientific expertise to drive the development of sustainable meteorological components forward every day.“*



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**ACCREDIA**   
L'ENTE ITALIANO DI ACCREDITAMENTO  
ACCREDIA LAT N° 124 laboratory  
Temperature – Humidity – Pressure – Air speed  
Photometry/Radiometry – Acoustics



## Dear Readers.

A conscious society is the one that protects the life and the diversity of our planet. Only those who are able to grasp the changes can play an important role in the environmental challenges for the most important sustainability of our time.

Technology, innovation and cooperation are the tools that a responsive society must use to change the paradigm of development, towards sustainable, environmentally-friendly growth. In the country that was the birthplace of people such as Leonardo da Vinci, Galileo Galilei, Alessandro Volta, Guglielmo Marconi, we, as the specialists at Delta OHM in Padua near Venice, dedicate ourselves with a top-quality portfolio and with the appropriate expertise to operate in the development of sustainable meteorological components forward every day.

We as Delta OHM strongly believe in sustainability. We believe that we have a responsibility to our earth and we take this serious. Where possible we want to strive to becoming a green company.

In the 40 year of its existence, Delta OHM has become one of the leading innovators in the field of Meteorology. Through our worldwide network we supply and service our solutions everywhere on this globe.





## Uncompromising quality is part of our nature

Since ancient times, humans felt the need to measure those physical quantities used in his everyday life, such as lengths, areas, volumes, weights or time intervals. This need, which has been essential for the regulation and development of trades, has meant that every people in the past invented a system of unity of measures. The main limitations of such measurement systems were insufficient accuracy and non-conformity between different populations, which brought to the necessity of having international recognized samples intending to provide a reference to one or more quantities. Its task is to define, construct, store and reproduce units of measurement.

Having in Padua one of the most important measure reference system of the Middle Age, it is no coincidence that several state-of-the-art accredited Calibration Laboratories (ILAC MRA, ISO 17025) are within our site for measuring temperature, moisture and pressure as well as air speed, photometry, radiometry and acoustics.

The factory calibration gives us the opportunity to sell high quality and reliable products issuing calibration certificates recognized by the ILAC Mutual Recognition Arrangement (ILAC MRA) and valid all over the world.

## Solutions of Delta OHM deliver convincing results in many industries

### Agriculture

In agricultural and forestry operations our applications ensure healthy growth.

### Buildings

Through innovative procedures we open new doors to environmental measuring technology in buildings.

### Renewables

Through made-to-measure solutions we support utilities with all our energy.

### Industrial

We provide accurate reliable solutions to ensure uninterrupted processes.

# Climate changes.

Are climate changes real, is the world as we know it changing? The average temperature rises. Is the agreement to reduce CO the way to go forward? Flooding, hurricanes, CO<sub>2</sub>, melting ice are some examples of recently weather changes around the world seem to become more extreme.

There is only one way of being sure: measure it, gather the data, document and analyze what is happening. For this, our meteorological institutes need accurate and reliable equipment. They need to be sure that what they measure is the truth.

Delta OHM is the partner for these institutes. Our equipment is designed to measure accurate, to be low maintenance, to measure exact. Year after year. Reliable and traceable to the highest standards according to WMO (World Meteorological Organization) recommendations for the technical construction.





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# Environmental Technology.



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## Meteorological – Weather and Climate

In almost all areas of life, from industrial to agricultural, from commercial to transport, our activities are directly or indirectly influenced by weather and climate conditions. The atmosphere in which we live influences and sustains human life, animals, micro-organisms, plants, forests and marine culture at all times during every stage of growth and development. Meteorology therefore has a significant influence on every human activity in modern life.

The importance of this has been one of the drives for Delta OHM to invest in developing a wide range of meteorological instruments and systems. To invest in quality and to invest in traceability.

Why do we think this is necessary? Because we strive for constant quality, repeatability and guaranteed performance.

All Delta OHM sensors are the result of our own R&D: we produce everything in our own factories and we are one of the few suppliers that has invested in its own accredited ISO 17025 calibration. Thus allowing us to provide our customers with measuring instrument that have a guaranteed performance.

To capture and secure the data from our sensors we have developed a range of data loggers. Also we have developed our own software: not only with local secured database structures, but also for secured cloud applications. We stand for quality! We stand for innovation!



# Meteorological – Weather and Climate.

## Measure rain, hail and snow

### HD2013/ HD2015

Weather monitoring is of great importance. Not only to clarify what is happening over a longer period of time, but also to be able to prevent or minimize damage by using the possibilities of direct alerts. Our rain gauges are part of 'cloud' based warning systems to identify heavy rainfall and provide instantly alerts on risk of flooding.



HD2015  
rain gauge 200 cm<sup>2</sup>

- smart design for long stability performance
- individual calibration assures very high accuracy
- corrosion resistance materials, rugged design
- no power supply needed
- optional heating version to measure all kind of precipitation
- several sizes available, all in accordance with WMO recommendations
- possible pole mounting



HD2013  
rain gauge 400 cm<sup>2</sup>



bird spikes

internal leveling device  
for setup without any  
additional tools

adjustable feet to place it  
directly perfectly horizontal



different mounting  
possibilities

# Meteorological – Weather and Climate.

## Measure rain, hail and snow

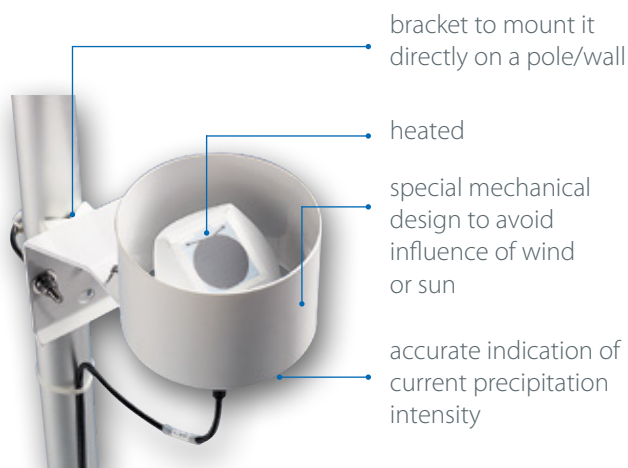
HD2016/ HD2013.2



HD2016  
weighing rain gauge



- unique self-emptying mechanism
- no influence from wind and vibration
- high resistant material
- no derive assures extended calibration – minimize maintenance cost



HD2013.2  
rain detector

- simple and rugged design
- multi measurement in one instrument
- materials corrosion resistant

# Meteorological – Weather and Climate.

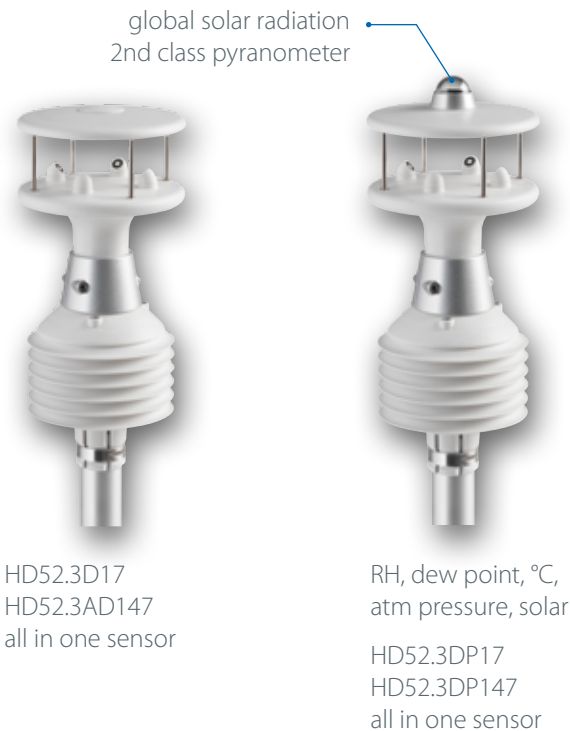
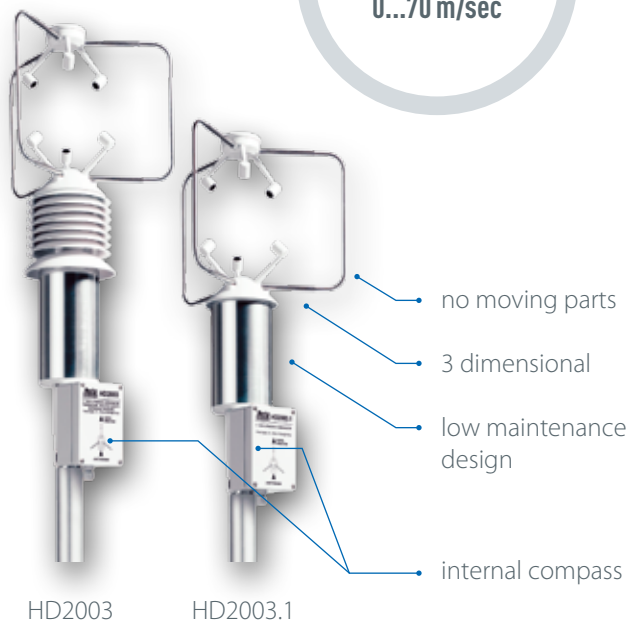
## Wind measurement

HD52.3D/ HD2003

Recently the whole world has been witnessing the destructive powers of yet another hurricane. Flooding, destroyed buildings, human casualties. It is clear that the power of the wind can be beyond our imagination. In cases where we are able to use this power by generating electricity, the wind brings us great advantages and helps to make our world greener. In both cases monitoring, measuring, collecting and analyzing data is of high importance.

- guaranteed long term stability
- smart materials, corrosion resistant
- quick installation: internal compass
- designed to operate on solar power
- direction, speed, gusts, averages
- available as complete integral solution
- no moving parts, no wear: designed to reduce your maintenance costs
- heated versions available

**High accuracy –  
1% of readings  
0...70 m/sec**

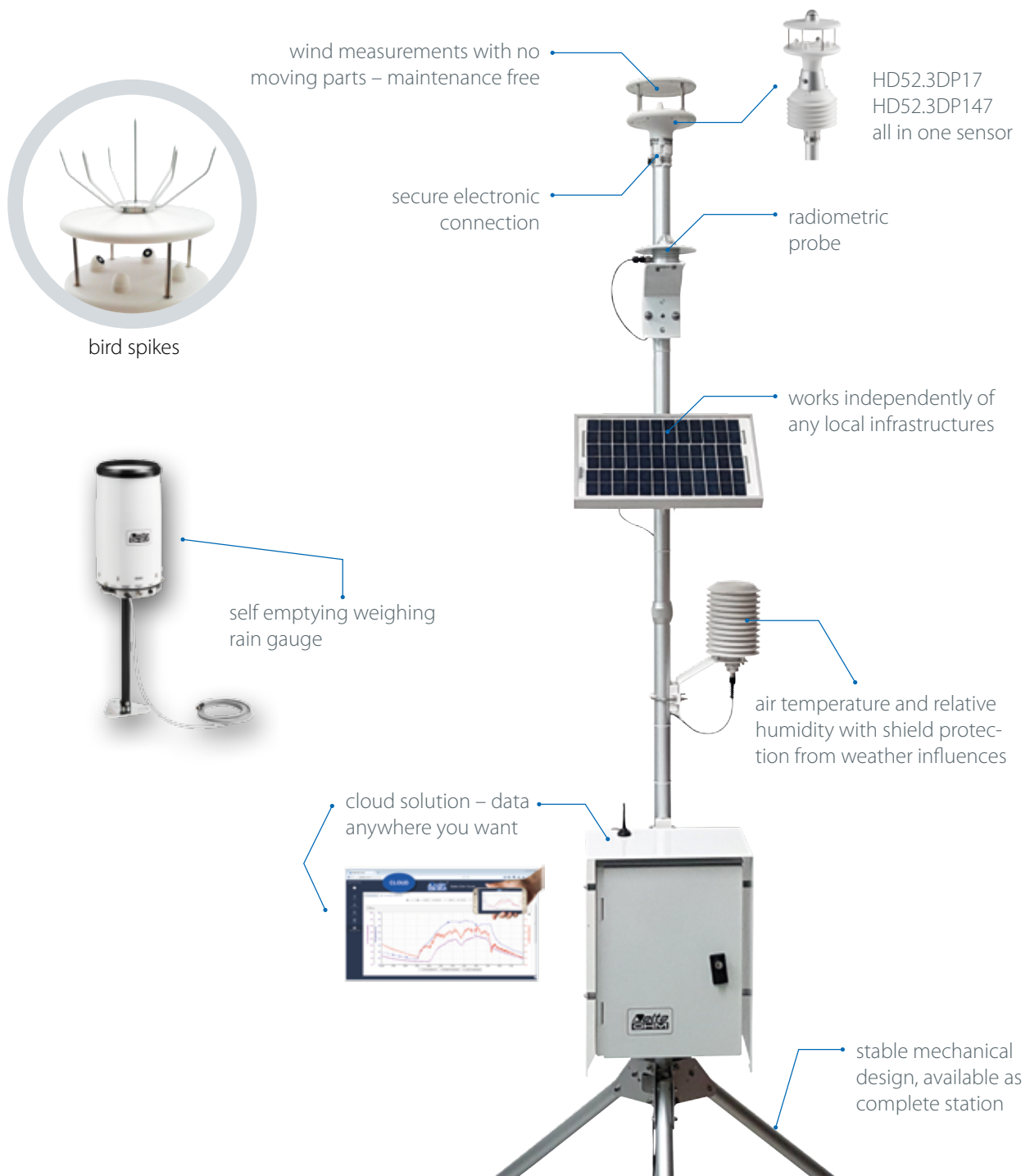





# Meteorological – Weather and Climate.

## Wind measurement

HD52.3D/ HD2003



# Meteorological – Weather and Climate.

## Solar measurement

LP PYRA 02/ LP PYRA 03/ LP PYRA 10

The sun. It provides our world with daylight, it controls the temperature on our planet. It provides energy, it makes plants grow. We also learned the negative sides of what the sun can do. How it can bring life and destroy it at the same time. It illustrates that measuring the radiation is of high importance.

- in accordance with ISO 9060 classification
- mechanical and rugged design
- easy set-up and quick installation with leveling device for perfect position
- high class optical glass and standard quartz diffusers
- calibration certificate included
- universal, can be connected to any system
- minimize maintenance costs thanks to internal desiccant cartridge
- wide choice of accessories for any installation mode

Delta OHM	LP PYRA 02	LP PYRA 03	LP PYRA 10
WMO standards	first class	second class	secondary standard



LP PYRA 02  
first class pyranometer



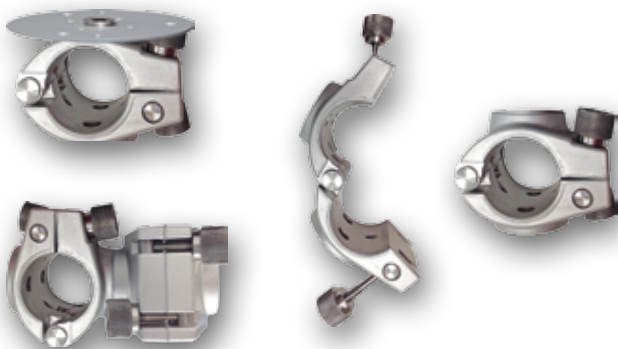
LP PYRA 03  
second class pyranometer

protected leveling device

special construction to minimize effects of wind and temperature



LP PYRA 10  
secondary standard pyranometer

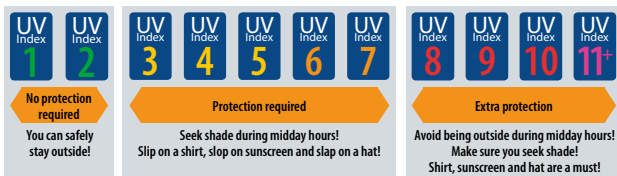


aluminum accessories for installation:  
flexible and durable

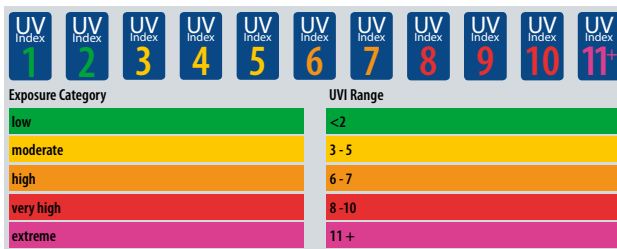
# Meteorological – Weather and Climate.

## Solar measurement

### UV index & LP SD18



WHO prescription according to the UV index



UV index and exposure category



LP UVI 02  
radiometer UV index

- according to WMO recommendations
- output directly linear to UV Index
- excellent cosine response, wide angle measurement
- early detection of potential danger
- monitor climate change measuring UV-A-B reaching the ground



LP SD18  
sunshine duration

- measures duration according to WMO
- heavy duty mechanical design
- no moving parts, no maintenance
- additional measurement of direct radiation
- easy to mount using the installation supports
- 16 sensors, high resolution measurements

Measures the sunshine duration over a threshold of  $120 \text{ W/m}^2$  – according to WMO latest edition.



# Meteorological – Weather and Climate.

## Temperature and humidity measurement

### HD9008/ HD9009/ TP32MTT.03

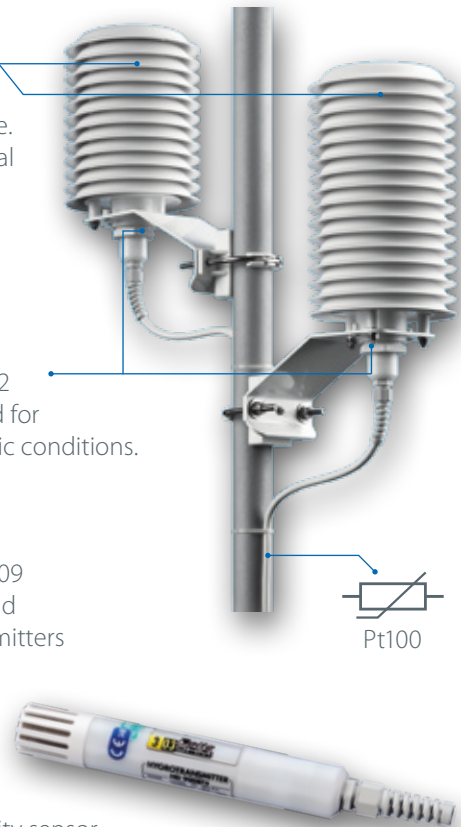
Humidity and temperature are being considered as 'basic' measurements. It is difficult to find a supplier that doesn't provide some kind of a solution for this. True. We at Delta OHM consider it a challenge to work on improvement of even these basic measurements: make them more reliable, more stable. By doing this we assist you in bringing down your maintenance costs.

- sensor has a strong mechanical design
- reliable and field proven construction
- output with high repeatability
- radiation shields for stable measuring results
- humidity, dew point, temperature
- reduce down time thanks to on-site recalibration

Designed pursuant to WMO guide line. Reduces thermal and wind influences.

HD9007A-1/ A-2 Radiation shield for different climatic conditions.

HD9008/ HD9009 temperature and humidity transmitters



high repeatability sensor

- perfect thermal insulation between the sensors
- visible indication on top of sensor reliable and field proven construction
- groundwater profiling and ground temperature profiling – max. 7 points
- output with high repeatability

TP32MTT.03 probes for soil thermal profile measurements – 7 points



Measures ground temperature at specified depth following WMO recommendations.

TP32MTT.03.1 probes for soil thermal profile measurements – 6 points

# Meteorological – Weather and Climate.

## Pressure measurement

HD9408.3B/ HD 9408T Baro/ HD 4V8T Baro

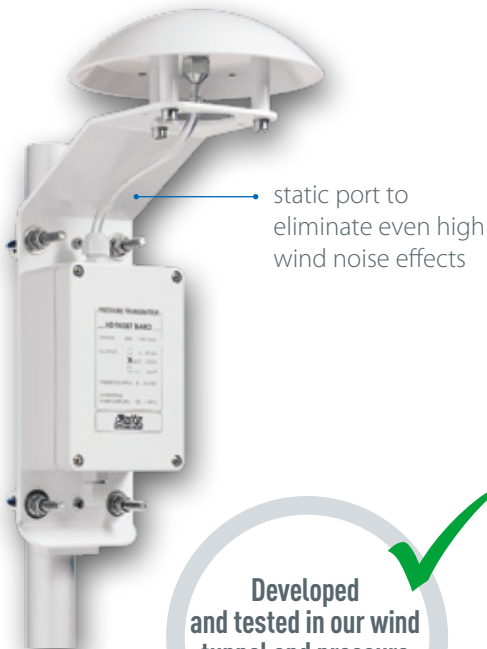


high stability and repeatability

HD9408.3B  
high quality barometer

A wide range of transmitters for barometric pressure, designed with only one goal. Optimal reliability, to be installed under any climatic condition. Perfect to use in standalone conditions or in combination with complete weather stations. Install and forget: it works.

- meteorological pressure transmitters
- temperature compensated for high stability
- designed for reliability
- no maintenance required
- customizable range for any installation condition



static port to eliminate even high wind noise effects

Developed and tested in our wind tunnel and pressure laboratories

HD 9408 PS50K  
static port for barometric measurements



robust, simple, reliable

HD4V8T Baro  
pressure transmitter

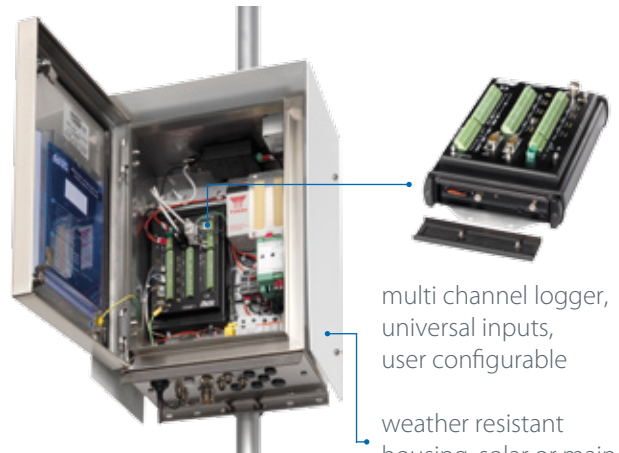
# Meteorological – Weather and Climate.

## Data gathering, logging

HD35EDLM.GSM/ HD32MT.1

Your measurement data is important: too important to risk losing it. That is why in all our data loggers we have full backup, even with power loss. Analyzing your data can be done how and where you want it. Local database connection, cloud solution with all information on your tablet PC or smart phone, we provide you what you need. Secured, stable, simple.

- easy to use anywhere: completely independent
- factory configured according to your demand
- stable and reliable



multi channel logger, universal inputs, user configurable

weather resistant housing, solar or main powered

HD32MT.1 high quality barometer

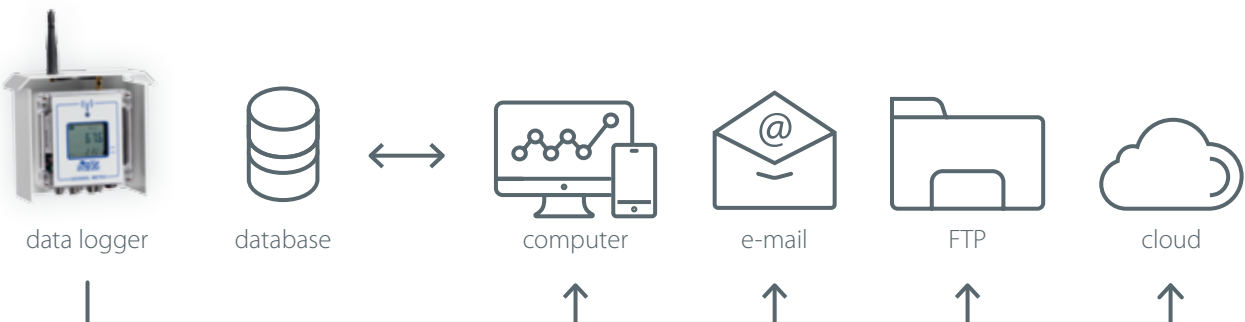


data management



integrated modem, cloud solutions, your data available everywhere

HD35EDLM.GSM data logger

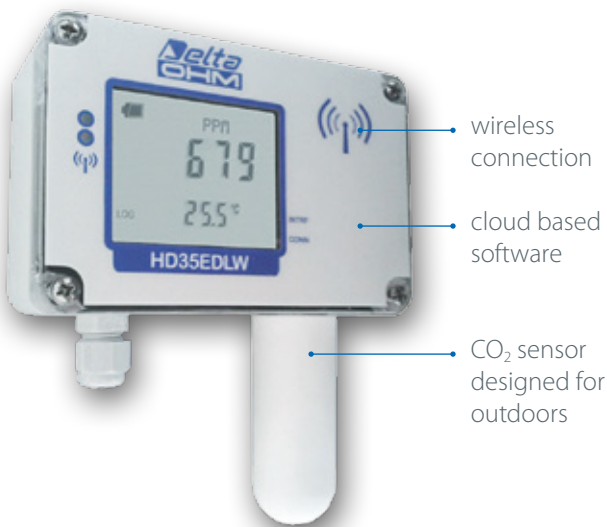




# Meteorological – Weather and Climate.

## Data gathering, logging

HD35EDLW

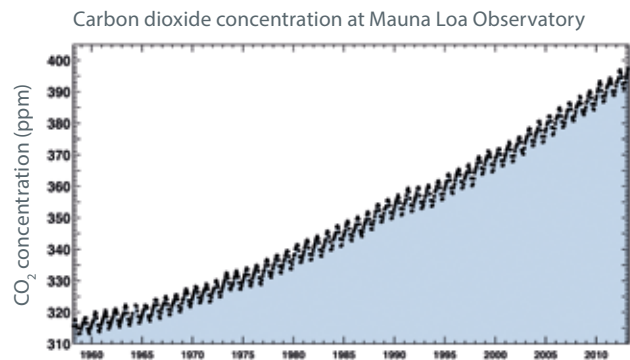


HD35EDLW1NBTV  
high quality temperature, relative humidity  
and CO<sub>2</sub> wireless data logger

Environmental studies show a rising curve of CO<sub>2</sub> concentration levels since the beginning of the industrial revolution. The combustion of fossil fuels generates carbon dioxide, which is believed to be one of the major reasons for global warming.

For that reason, it is of high importance to keep a close watch on this. In the Paris Climate agreement, most countries agreed to take measures to slowdown or even stop the uprising trend of CO<sub>2</sub> concentration.

- multiple sensor network, flexible to set up
- to be combined with any environmental sensors
- cloud based: information available where you need it
- low maintenance thanks to very low drift (5% / 5 years)



The Keeling Curve 1958-2017 – atmospheric carbon dioxide (CO<sub>2</sub>) concentrations from 1958 to 2017



## Agriculture and Agrometeorology

The total number of people to be fed today is around 7.5 billion, with an expected increase of a further billion in the next 10 years. This is undoubtedly a huge number of people to ensure healthy and nutritious food. Changes and advances in the agriculture systems allow farmers nowadays to use the right and advanced technology to make advances in producing more food for a growing world.

In this field, measured data are relevant for pest management, disease prediction, development and growth times and frost forecasting. In fact, these measurements and calculations can be distributed and shown in a variety of ways that help agronomists, farmers, winegrowers, horticulturists, field specialists to determine and apply irrigation and use of antiparasitic treatments ensuring the health of plants and flowers.

The sensors used in our agricultural research systems (micrometeorology) include ultrasonic anemometers, leaf wetness, hygrometers, thermometers, soil moisture, PAR (Photo Synthetically Active Radiation).

The sensors work with Delta OHM data loggers or connect to standard controlling systems.

We are active in the following applications: smart farming – analysis of the planning of interventions and programming of cultivation operations agronomy – physiological and phenological studies of crops, forestry, viticulture, horticulture, fruit growing, calculation of evapotranspiration and greenhouses.





## Geology, Hydrology – Flooding and Landslide

Two thirds of the earth's surface is covered with water. This fact makes it clear that water has to be considered one of the main elements of life on earth.

However, water does not always mean life! Nowadays, there are more and more risks associated with water and adverse weather conditions, such as flooding of surface water, sudden floods, sludge flows or landslides caused by precipitation, river floods or coastal flooding. Keeping water under control is important because its power and kinetic energy in some cases can be really dangerous for humans.

Being prepared to recognize natural hazards together with the promotion of a culture of prevention are key factors in reducing their impact on the society. Early warning systems are essential in handling these important phenomena and preventing losses: weather forecasts, for example, have

become the basis of several flood alarm systems and allow hazard detection with sufficient time to prepare effective contingency and response plans.

Our early warning system solutions are customizable in all geology, hydrology, flooding and landslide applications. Forecast, prevent and alert people in time can make the difference!





## Infrastructure

Every year more than 20% of car accidents are weather-related and the number is increasing. Bad weather like fog, rain, ice, wind or snow seriously put safety of users of the roads at risk. Besides this, operating and maintenance costs, traffic management, emergency management as well as commercial operations can be hardly effected.

Early warning systems on roads, airports, bridges, harbors or railways are used to generate a forecast in an early stage, so the impact of potentially dangerous situations can be minimized by sending out alerts. For such early warning systems, a complete chain of information gathering systems, sensors and smart algorithms is a must.

It is clear that, no matter how advanced a system is and no matter how smart the software would be, the sensors are in fact the most critical part of the chain: we at Delta OHM know that.

It is what we do: providing you with reliable solutions that will work. No matter what the conditions may be.

We are active in the following application: airports, harbors, roads and highways.





wind tunnel – test bench

## Accurately measuring is our standard

The Calibration Center of Delta OHM is based on six modern laboratories equipped with a state-of-the-art equipment and part of the international circuit ILAC MRA.

The high quality standard is certified by the ISO 17025 accreditation.

## The calibration center offers

- ILAC ACCREDIA Certificates
- calibration reports ISO 9001 recognized
- internal support to R&D for testing new high quality products and speeding up the development
- factory calibration for high quality Delta OHM products



ACCREDIA LAT N° 124 laboratory  
 Temperature – Humidity – Pressure – Air speed  
 Photometry/Radiometry – Acoustics

ACCREDIA is the Italian national accreditation body appointed by the Italian state to perform accreditation activity.

## Our laboratories

- temperature
- humidity
- air speed
- pressure
- acoustics
- photo-radiometry



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