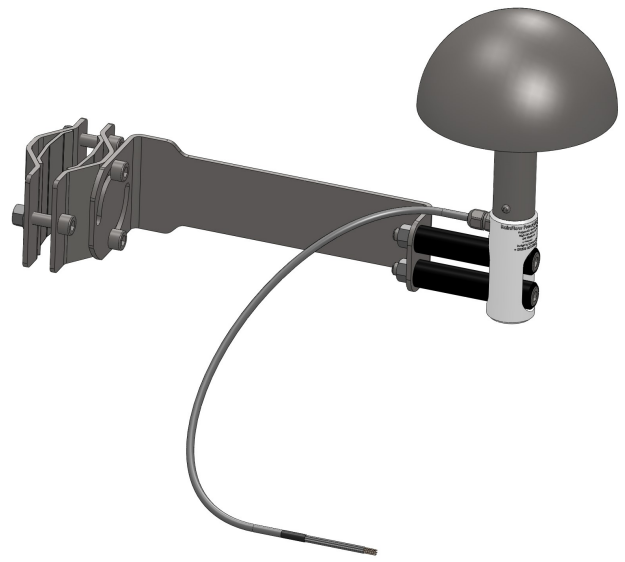


# RHD

## Rain disdrometer and hail detection sensor



The RHD is a low-cost, high precision, ultra-robust rain gauge. It features very low- power consumption, is maintenance- free and has a completely sealed acoustic sensor with no moving parts. The sensing device is a polished stainless steel hemisphere supported by a strong stainless steel arm. It detects changes of the acoustic pressure that are induced by the impact of raindrops or hailstones. The RHD also includes a distrometer that return the drop size distribution.

It features continuous or pulse analog voltage outputs and supports SDI-12 communication, serial RS-232, and Modbus RTU RS485 (using an optional adapter). The full configuration of the sensor can be customized at any time with a Plug-and-Play PC connection or remotely, using serial commands.

### Versions

Art	Version
21278	Rain disdrometer and hail detection sensor with mounting kit and 3m signal cable

### Scope of delivery

Ref.	Description	Quantity
RHD	Rain & Hail sensor	1
-	Mounting arm	1
UDONG	USB dongle	1

### Accessories

Art	Accessory
21423	Signal converter 0-10 VDC to 4-20 mA
21431	RS-232-ModbusRTU adapter
21521	Extension cable in custom length per meter, min. 10 m
21520	Junction box for cable extension

# Specifications

## Measurement characteristics

Measuring surface	160 mm outer diameter hemisphere (402 cm <sup>2</sup> )
Precipitation detected by the sensor	Liquid (undifferentiated): rain, drizzle/rain, mixed rain/snow, sleet. Solid: hail.
Rain Intensity accuracy	± 5% at 100% duty-cycle (most global precision and accuracy criteria)
Rain DSD	27 classes from ≤ 0.75 mm to ≥ 7.0mm with a detection threshold (minimum detectable diameter) of about 0.5 mm
Measurement accuracy (liquid only)	A spatially distributed flux of controlled drops of a nominal diameter equal to the centre diameter of the class ± 20% produces an output centred in the corresponding class with typically ± 50% of the flux concentrated into the two lateral size-classes.
Hail detection*	Counting of the number of hailstone impacts up to 5 impacts per second and for hailstone diameter detection threshold of 0.5 cm.
Particle velocity	Not measured.

\*Note: For more specific hail detection, use the HDI hail disdrometer, variant of the RHD specialized for hail detection.

## Voltage ranges and measurement scales

Voltage outputs	Continuous analogue voltage or pulse analog voltage, user selectable +0 to +2.5V or +0 to +5V are available. Pulse threshold, integrator timeout and duration are also user selectable. The continuous analog voltage persists on the outputs so that output voltages can be read at any time.
Rain intensity scaling	Sensitivity @voltage range +2.5V: [10 mV/(mm/h)] i.e. +2.5V corresponds to 250 mm/h Sensitivity @voltage range +5V: [20 mV/(mm/h)] i.e. +5V corresponds to 250 mm/h
Hail	Sensitivity @voltage range +2.5V or +5V: 5 hit/s

## Power supply

Supply	Ratings
Voltage	6 V to 30 V DC (9.6 V and 16 V DC in case of powering through the SDI-12 terminals)
Current	< 1 mA in stand-by mode and 20 mA max in acquisition mode. For a typical nominal duty-cycle of 10%: 2.1 mA (20 mA for duty-cycle of 100%).

## Interfaces

Mode	Description
Analog	Pulse and continuous (and persistent) voltages, 0-2.5V or 0-5V
SDI-12	Yes, V1.3 (distrometer output via extended SDI-12 commands)
RS-232 TTL	Yes
Modbus RTU (RS485)	Yes (Note: requires the Modbus adapter accessory)

## Physical properties

Material	Stainless steel and aluminium Ematal anodized (breakdown voltage > 40 V/ $\mu$ m)
Weight	1.4 kg (without mounting kit)
Dimension (H x W x D)	260 mm x 430 mm x 160 mm (with mounting kit)
Installation	Universal mounting kit provided

## Environmental conditions

Temperature range	-40°C to +80°C
Relative humidity	0 to 100%
Protection	IP67, survive to 1 m temporary immersion in salt water
Standards	EN 61326-1: 2013, CE compliant 2014/30/EU, CE compliant