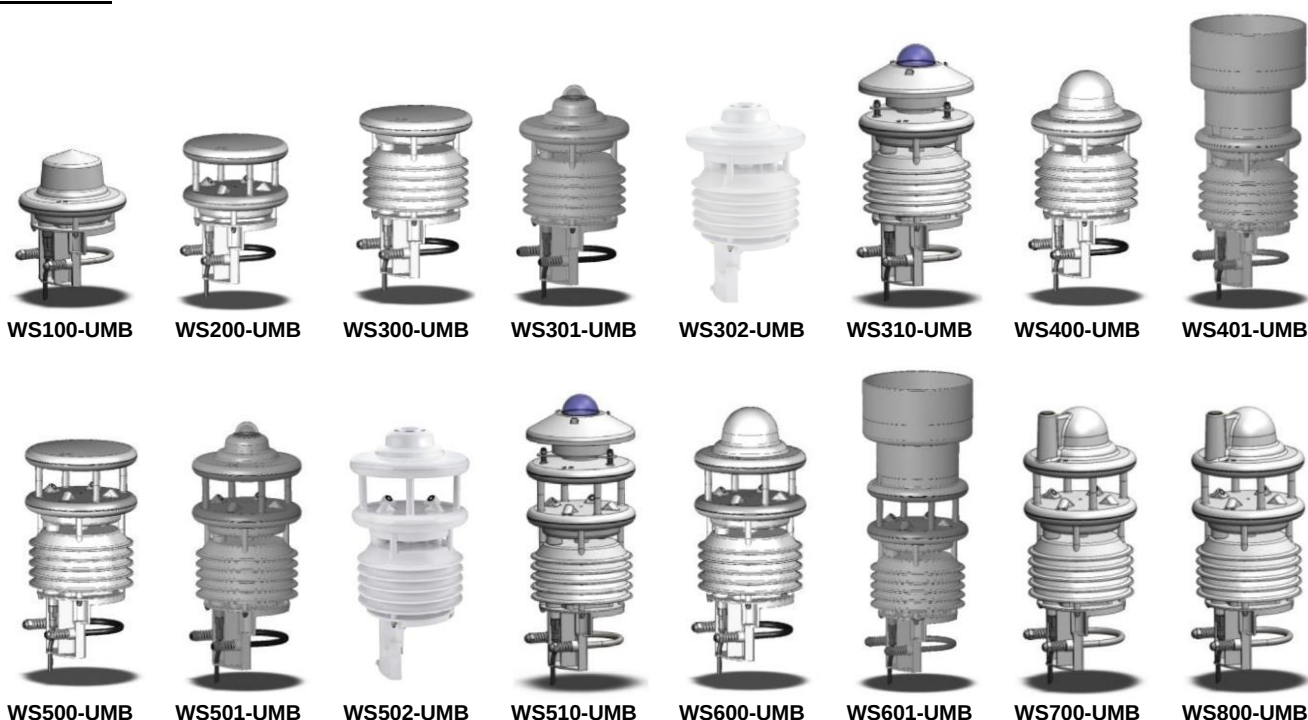


Overview :



	Precip. type	Precip. Qty.	WS	WD	Comp.	T°	RH	BP	Rad.	Lightn.
WS100-UMB	•	•								
WS200-UMB			•	•	•					
WS300-UMB						•	•	•		
WS301-UMB						•	•	•	•	
WS302-UMB						•	•	•	•	
WS310-UMB						•	•	•	•	
WS400-UMB	•	•				•	•	•		
WS401-UMB		•				•	•	•		
WS500-UMB			•	•	•	•	•	•		
WS501-UMB			•	•	•	•	•	•	•	
WS502-UMB			•	•	•	•	•	•	•	
WS510-UMB			•	•	•	•	•	•	•	
WS600-UMB	•	•	•	•	•	•	•	•		
WS601-UMB		•	•	•	•	•	•	•		
WS700-UMB	•	•	•	•	•	•	•	•	•	
WS800-UMB	•	•	•	•	•	•	•	•	•	•

Details :

WS100-UMB • Precipitation Radar • Impulse Output for Rain gauge Simulation	
WS200-UMB • Wind Speed • Wind Direction • Compass	
WS300-UMB • Air Temperature • Relative Humidity • Air Pressure	
WS301-UMB • Air Temperature • Relative Humidity • Air Pressure • Global Radiation (Kipp&Zonen class C pyranometer)	
WS302-UMB • Air Temperature • Relative Humidity • Air Pressure • Global Radiation (Lufft class B pyranometer)	
WS310-UMB • Air Temperature • Relative Humidity • Air Pressure • Global Radiation (Kipp&Zonen class A pyranometer)	
WS400-UMB • Precipitation Radar • Air Temperature • Relative Humidity • Air Pressure	

WS401-UMB • Precipitation Rain Gauge • Air Temperature • Relative Humidity • Air Pressure	
WS500-UMB • Wind Speed • Wind Direction • Compass • Air Temperature • Relative Humidity • Air Pressure	
WS501-UMB • Wind Speed • Wind Direction • Compass • Air Temperature • Relative Humidity • Air Pressure • Global Radiation (Kipp&Zonen class C pyranometer)	
WS502-UMB • Wind Speed • Wind Direction • Compass • Air Temperature • Relative Humidity • Air Pressure • Global Radiation (Lufft class B pyranometer)	
WS510-UMB • Wind Speed • Wind Direction • Compass • Air Temperature • Relative Humidity • Air Pressure • Global Radiation (Kipp&Zonen class A pyranometer)	
WS600-UMB • Precipitation Radar • Wind Speed • Wind Direction • Compass • Air Temperature • Relative Humidity • Air Pressure	

WS601-UMB • Precipitation Rain Gauge • Wind Speed • Wind Direction • Compass • Air Temperature • Relative Humidity • Air Pressure	
WS700-UMB • Precipitation Radar • Wind Speed • Wind Direction • Compass • Air Temperature • Relative Humidity • Air Pressure • Global Radiation (Lufft class B pyranometer)	
WS800-UMB • Precipitation Radar • Wind Speed • Wind Direction • Compass • Air Temperature • Relative Humidity • Air Pressure • Global Radiation (Lufft class B pyranometer) • Lightning Sensor	

Advantages of the Smart series Weather Sensors :

- All-in-one housing concept of a compact weather sensor combining a number of measurement parameters in one housing with only one cable connection
- Built-in data pre-processing, universal interfaces and selectable output protocols (RS485, UMB-Binary, UMB-ASCII, Modbus-RTU, Modbus-ASCII, SDI-12)
- Compatible with many commercially available Met/HydroMet dataloggers and PLS systems thanks to an open communication protocol
- Maintenance-free operation – no moving parts that can wear out
- Suitable for all climate zones; also for solar-powered automatic meteorological stations
- Ventilated temperature and humidity measurement according to WMO guidelines (depending on model)
- Integrated heater that can be switched on if there is danger of frost (depending on model)

Common technical data :

Electrical	
Operating Voltage	12 – 24 VDC (16...160 mA) / Heater: 24 VDC (20 VA)
Operating temperature	-50°C...+60°C
Degree of protection	IP66

Mechanical	
Housing material	Plastic
Fastening	Stainless steel mast bracket for Ø 60...76 mm
Overall Dimensions	Ø 150...164 mm / Height 190...445 mm (depending on model)
Weight	0,6...1,7 kg (depending on model)

Interface	
Type	RS485 interface, 2 wire, half-duplex
Data bits	8 (in SDI-12 mode: 7)
Stop bit	1
Parity	No (in SDI-12 mode: even, Modbus mode none or even)
Tri-state	2 bits after stop bit edge
Baud rates (adjustable)	1200, 2400, 4800, 9600, 14400, 19200, 28800, 57600 bd

Parameters data :

Precipitation with Radar Sensor (WS100 / 400 / 600 / 700 / 800-UMB)	
Measuring element	Radar Sensor
Measuring range (drop size)	0,3...5,0 mm
Liquid precipitation resolution	0,01 mm
Precipitation types	Rain, snow
Repeatability	Typically > 90 %
Response threshold	0,002 mm
Sampling rate	Event-dependent on reaching response threshold
Precipitation intensity	0...200 mm/h; Sampling rate 1 min, Resolution 0,01 mm/h

Precipitation with Rain Gauge (WS401 / 601-UMB)	
Measuring element	Tipping Bucket Rain Gauge
Liquid precipitation resolution	0,2 mm / 0,5 mm (with reduction ring)
Precipitation types	Rain
Accuracy	2 %
Response threshold	0,002 mm
Sampling rate	1 minute
Max. intensity	360 mm/h / 144 mm/h (with reduction ring)

Wind Speed (WS200 / 500 / 501 / 502 / 510 / 600 / 601 / 700 / 800-UMB)	
Measuring element	Ultrasonic
Measuring range	0...75 m/s (WS601-UMB: 0...30 m/s)
Accuracy	$\pm 0,3$ m/s or ± 3 % (0...35 m/s) / ± 5 % (>35 m/s) RMS
Resolution	0,1 m/s
Response threshold	0,3 m/s
Instantaneous value	1 sec. / 10 sec.
Output rate f. average & gust	1 min – 10 min (peak calculated from 1 sec. values)
Units	m/s; km/h; mph; kts

Wind Direction (WS200 / 500 / 501 / 502 / 510 / 600 / 601 / 700 / 800-UMB)	
Measuring element	Ultrasonic
Measuring range	0...359,9 degrees
Accuracy	< 3 degrees (> 1m/s) RMSE
Resolution	0,1 degrees
Response threshold	0,3 m/s
Instantaneous value	1 sec. / 10 sec.
Output rate f. average & gust	1 min – 10 min (peak calculated from 1 sec. values)

Air Temperature (all sensors except WS100 / 200-USB)	
Measuring element	NTC
Measuring range	-50°C...+60°C
Sensor accuracy	$\pm 0,2$ °C (-20°C...+50°C)
Resolution	0,1°C
Sampling rate	1 minute
Baud rates (adjustable)	1200, 2400, 4800, 9600, 14400, 192003, 28800, 57600 bd

Relative Humidity (all sensors except WS100 / 200-USB)	
Measuring element	Capacitive
Measuring range	0...100 % RH
Sensor accuracy	± 2 %
Resolution	0,1 %
Sampling rate	1 minute

Dew point (all sensors except WS100 / 200-USB)

Measuring process	Passive, calculated from temperature and humidity
Measuring range	-50°C...+60°C
Sensor accuracy	Computed, $\pm 0,7^{\circ}\text{C}$
Resolution	0,1°C

Air Pressure (all sensors except WS100 / 200-USB)

Measuring element	MEMS sensor - capacitive
Measuring range	300...1200 hPa
Sensor accuracy	$\pm 0,5$ hPa (0...40°C)
Resolution	0,1 hPa
Sampling rate	1 minute

Compass (WS200 / 500 / 501 / 502 / 510 / 600 / 601 / 700 / 800-UMB)

Measuring element	Integrated electronic compass
Measuring range	0...359 degrees
Sensor accuracy	± 10 degrees
Resolution	1,0 degree
Sampling rate	5 minutes

Global Radiation with class A pyranometer (WS310 / 510-UMB)

Measuring element	Thermopile
Measuring range	0...4000 W/m ²
Overall accuracy	± 2 %
Sampling rate	10 sec.
Response time	< 5 s (95%)

Global Radiation with class B pyranometer (WS302 / 502 / 700 / 800-UMB)

Measuring element	Thermopile
Measuring range	0...2000 W/m ²
Overall accuracy	± 5 %
Sampling rate	10 sec.
Response time	< 1 s (95%)

Global Radiation with class C pyranometer (WS301 / 501-UMB)

Measuring element	Thermopile
Measuring range	0...2000 W/m ²
Overall accuracy	± 10 %
Sampling rate	10 sec.
Response time	< 18 s (95%)

Lightning (WS800-UMB)

Measuring element	Radio wave emission analyzing sensor
Coverage area	5 – 10 km
Sum	1 – 10 minutes
Sampling rate	1 minute

External Rain Gauge WTB100

Measuring element	Tipping bucket with bounce-free reed contact (normally closed)
Collecting area	200 cm ²
Precipitation types	Rain only (no heater)
Sensor accuracy	± 2 %
Resolution	0,2 or 0,5 mm (with reduction ring)
Maximum intensity	144 mm/h / with reduction ring: 360 mm/h
Sampling rate	1 minute
Dimensions & Weight	Ø 165 mm, height 285 mm / 930 g
Mounting	On mast, Ø 60 – 76 mm

External Temperature Sensors WT1 / WST 1

Measuring element	NTC
Measuring range	-40°C...+80°C
Sensor accuracy	± 1°C / WST1: ± 0,3 °C (-10...+10°C)
Resolution	0,25°C
Sampling rate	1 minute
Baud rates (adjustable)	1200, 2400, 4800, 9600, 14400, 192003, 28800, 57600 bd

Available accessories :

Power Supply 8366.USV1 • 230 VAC / 24 VDC – 4 A • DIN Rail mounting	
Power Supply 8366.USV2 • 230 VAC / 24 VDC – 10 A • DIN Rail mounting	
Communication module Isocon-UMB • Suitable for all UMB sensors • Converts RS485 into RS232 • Galvanic isolation • Operating voltage : 24 VDC, 50 mA • Supply outputs f. sensors : 24 VDC/2 A & 12 VDC/150 mA	
Digital-Analog- Converter Dacon8-UMB • Suitable for up to 8 UMB sensor channels • Converts digital UMB sensor signals to up to 8 analog signals (0/4...20mA or 0/2...10V) • 16-bit resolution • Operating voltage : 24 VDC, 130 mA	
Surge protection for UMB - Weather sensors 8379.USP • DIN Rail mounting • Communication path : 33 V /100 mA max. • Power path : 25 V / 6 A max.	
Tipping Bucket Rain Gauge WTB100 • Connectable to any WS-UMB sensor without rain sensor • Collecting area : 200 cm² • Impulse output (reed contact) • Resolution : 0,2 or 0,5 mm (with reduction ring)	
Remote Temperature Probe WT1 • Remote temperature measurement for PV modules • Smart sensor for connection to a WS-UMB sensor • NTC 5K element - Resistance tolerance : $\pm 0,1^{\circ}\text{C}$ • Accuracy : $\pm 1^{\circ}\text{C}$ • Dimensions : $\varnothing 30$ mm / height 8 mm • Delivered with 10 m cable	
Passive Road Surface Temperature Sensor WST1 • Measurement of road or runway temperature • Smart sensor for connection to a WS-UMB sensor • NTC measurement element • Accuracy : $\pm 0,3^{\circ}\text{C}$ ($-10...+10^{\circ}\text{C}$), otherwise $\pm 1,0^{\circ}\text{C}$ • Dimensions : $\varnothing 60$ mm / height 40 mm • Delivered with 50 m cable	