



## WS6817 – Weather Sensor

Compact metrological sensor with Modbus RTU communication

### WS6817

- Temperature
- Relative humidity
- Atmospheric pressure
- Wind speed
- Wind direction
- Precipitation (rain fall)
- Illuminance (light level)

### WS6899

- Optional accessory: Wall mount adapter bracket for WS6817

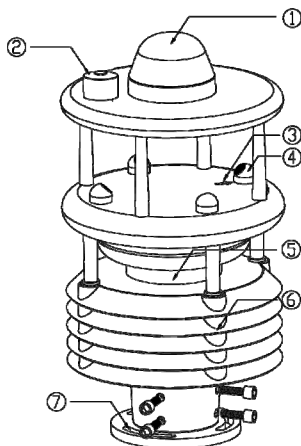
## Applications

- Common outdoor conditions data for site-wide HVAC control
- Outdoor light-level based security lighting control
- Fresh air louvre control based on wind speed and/or direction, and rain presence
- Agricultural use such as greenhouse ventilation and outdoor irrigation demand
- Road / bridge condition monitoring

## Design

Compact, with high precision and reliable performance, suitable for harsh outdoor environments. Ultrasonic wind status sensing and optical rain level monitoring.

Modbus RTU comms allow real time data gathering with the minimum of wiring considerations; 2-wire comms + 2-wire power supply via the supplied 4-pole cable (3m) with DIN plug



1. Rainfall sensor
2. Illuminance sensor
3. North alignment arrow
4. Ultrasonic probe (1 of 4)
5. Electronics housing
6. Thermometer shelter (temperature, humidity, air pressure sensor location)
7. Mounting flange for pole or wall mount adapter bracket



## Measured Quantities

Attribute	Principle	Range	Accuracy	Resolution
Temperature	Energy gap method	-40... 60°C	±0.01°C	±0.3°C (V=25°C)
Humidity	Capacitance method	0... 100% rH	±0.01%	±3%RH (10%-80%, non-condensing)
Atmospheric Pressure	Piezoresistive	500... 1,100 hPa	±0.5 hPa (0... 30°C) (950... 1,100 hPa)	0.1hPa
Wind Speed	Ultrasonic	0... 60 m/s	± (0.3+0.03V) M/S; V≤30M/S ± (0.3+0.05V) M/S; V≥30M/S	0.01m/s
Wind Direction	Ultrasonic	0... 359.9°	±3° @ 10m/s	0.1°
Rainfall	Optical	0... 200 mm/h	±15%	0.1mm
Illuminance	Photodiode	0... 100 kLux	0.03V or 1% FS	10 Lux

## Modbus Protocol

### Defaults

- Baud rate 9600
- Data configuration 8N1
- Device address 247

### Register format

- Holding Register (F03)
- Integer, unsigned
- 1 Word (2 byte, 16 bit)

### Address setting

If required to change the default address 247 then send the new address value to the device System Address 0, Register 0, using Function 6 (F06 / Write single register).

For example to change the device address to 12 (HEX 0C), then the following write command is sent (where xx xx = the message Checksum):

- 00 06 00 00 00 0C xx xx



## Register Addresses

Address (Modicon / Dec. / HEX)	Attribute	Quantity / Units / Reading Factor	Note
40010 / 09 / 00 09	Read-only	Temperature °C * 0.01 - 40	
40011 / 10 / 00 0A	Read-only	Relative humidity %rH * 0.01	
40012 / 11 / 00 0B	Read-only	Atmospheric pressure hPa * 0.1	
40013 / 12 / 00 0C	Read-only	Wind speed m/s * 0.01	
40014 / 13 / 00 0D	Read-only	Wind direction ° * 0.1	0° = North
40015 / 14 / 00 0E	Read-only	Rainfall, last 10 minutes mm * 0.1	
40017 / 16 / 00 10	Read-only	Illumination kLux * 0.01	
40034 / 33 / 00 21	Read-only	Pitch angle 1	Only with Electronic Compass option: WS6817EC
40035 / 34 / 00 22	Read-only	Pitch angle 2	
40036 / 35 / 00 23	Read-only	Pitch angle 3	
40037 / 36 / 00 24	Read-only	Longitude 1	
40038 / 37 / 00 25	Read-only	Longitude 2	
40039 / 38 / 00 26	Read-only	Latitude1	
40040 / 39 / 00 27	Read-only	Latitude2	
40041 / 40 / 00 28	Read-only	Altitude	

## System Registers (System Device Address 0)

### Register 0 / Modbus network address

Modify network address to 33 (HEX 21): 00 06 00 00 00 21 xx xx

00	06	00 00	00 21	xx xx
System address	Function code	Register address	New address	CRC16 checksum

Response: 00 06 00 00 00 21 xx xx (Indicates successful modification)

### Register 258 / Modbus Baudrate

Modify baud rate to 19200 (option 3 / HEX 03): 00 06 01 02 00 03 xx xx

00	06	01 02	00 03	xx xx
System address	Function code	Register address	New baud rate	CRC16 checksum

Response: 00 06 01 02 00 03 xx xx (Indicates successful modification)



---

Register 263 / Set time of rainfall accumulation

Modify accumulation time period to 10 minutes: 00 06 01 07 00 0A xx xx

00	06	01 07	00 0A	xx xx
System address	function code	Start address	Time accumulation(min)	CRC16 check bit

Response: 00 06 01 07 00 0A xx xx (Indicates successful modification)

**Note:** The default immediate time is 10 mins. If the accumulation time of rainfall is set to 0, the value does not automatically reset, but accumulates continuously. In this case only a power reset will reset the rain value to zero

Register 262 / Set magnetic declination correction (only for optional electronic compass)

Modify correction angle to 5°: 00 06 01 06 00 05 xx xx

00	06	01 06	00 05	xx xx
System address	Function code	Register Address	Positive Correction angle	CRC16 check bit

Response: 00 06 01 06 00 05 xx xx (Indicates successful modification)





**Note:** The high byte indicates the direction of correction; 00 represents positive correction / 01 represents negative correction. The low byte is the angle of correction. For example, 00 05 means that the output value needs to be increased by 5 degrees whereas 01 03 means that the output value needs to be reduced by 3 degrees

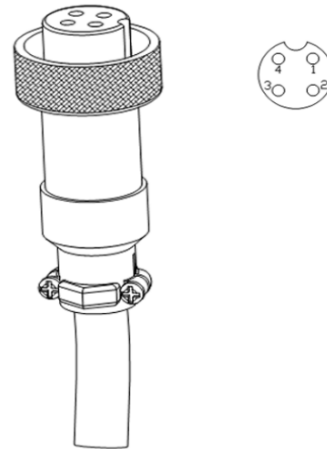


---

## Connections

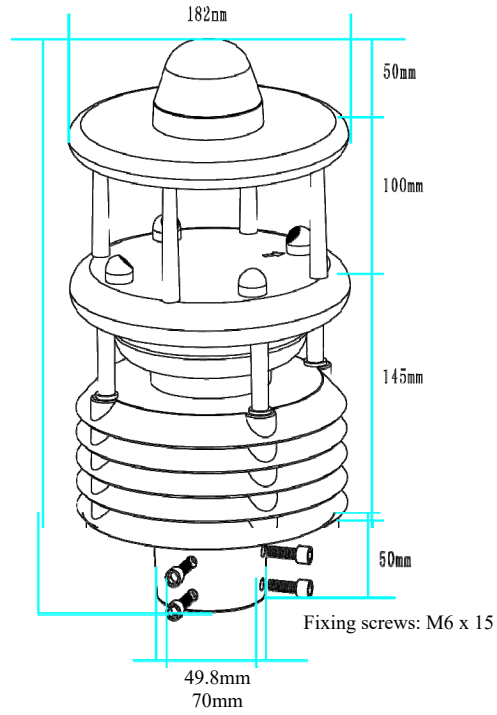
The sensor is supplied with a 4- pole cable, 3m long, with 4-pole DIN connector at sensor end and colour coded fly wires at remote end.

Power Supply:	1	Red		+ve	12...24Vdc
	2	Black		-ve	12...24Vdc
Modbus:	3	Yellow		+ / A	RS485
	4	Blue		- / B	RS485

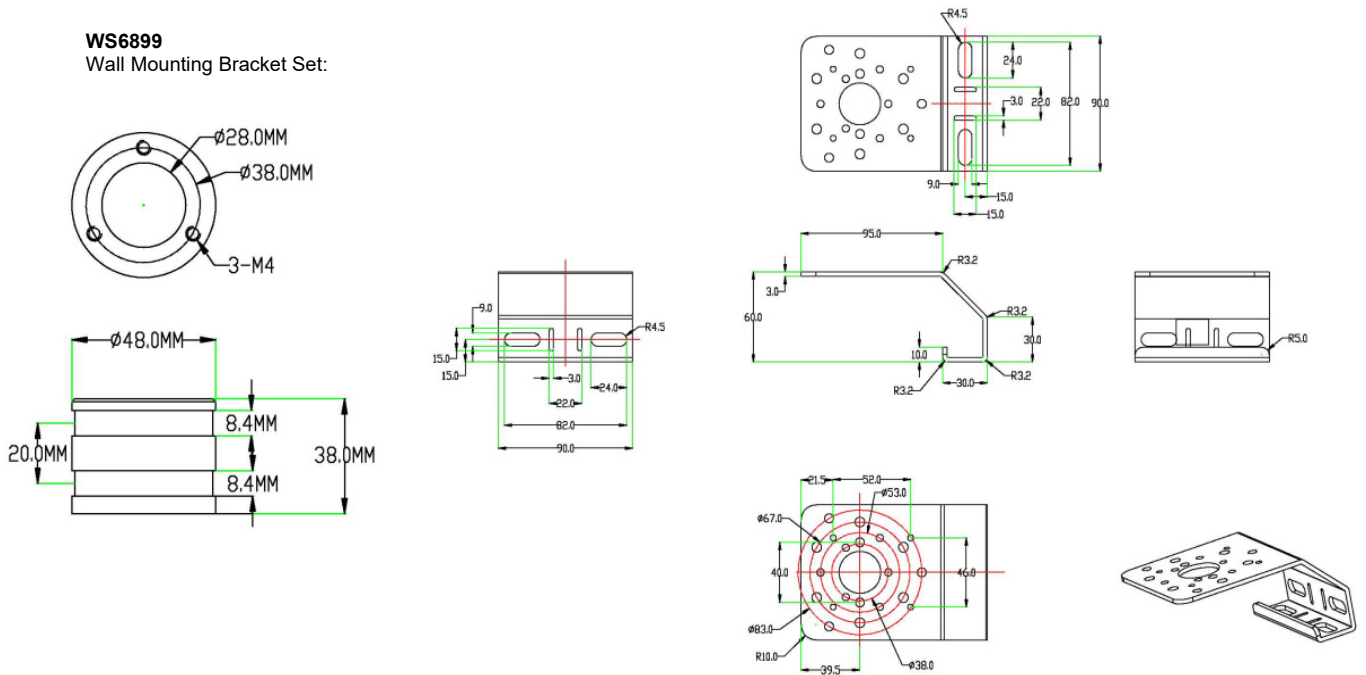




**Dimensions**



**WS6899**  
Wall Mounting Bracket Set:





---

## Technical Data

Power Supply: 12... 24Vdc  
Output (RS485): Modbus RTU  
Power Rating: 1W @ 12Vdc  
Response time:  $\leq 30$  sec  
Warmup time: 30 sec  
Operating Temperature range:  $-40^{\circ}\text{C} \dots +70^{\circ}\text{C}$   
Storage Temperature range:  $-40^{\circ}\text{C} \dots +60^{\circ}\text{C}$   
Operating Humidity range: 10...90% rH non-condensing  
Housing material: ASA engineering plastic  
Housing protection: IP65  
Dimensions (mm): 345 H x 182  $\varnothing$   
Mounting sleeve (mm): 49.8  $\varnothing$  internal