

Ultrasonic Anemometer with Piezoelectric Rain Gauge, Light & UV, Thermo-hygrometer Sensors

Model: WS90

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- * Please scan the QR code to read English manual and keep it for future reference
- * Bitte scannen Sie den QR-Code zudeutsche Anleitung lesen und aufbewahren füZukunftsbezug
- * Si prega di scansionare il codice QR perleggi il manuale italiano e conservalo perReferenza futura

Quick start, APP, manuals, Compatibility table, firm ware

<https://s.ecowitt.com/MP7YJJ>

Help

Our product is continuously changing and improving, particularly online services and associated applications. To download the latest manual and additional help, please contact our technical support team:

support@ecowitt.com

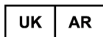
support.eu@ecowitt.net (EU/UK)



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1. Warnings and Cautions

Note:

1. The last firmware in QR code on the box
2. Advance setting on Embedded Web page 192.168.4.1
(You need a computer or phone linking WLAN gateway)

1.1 Optional other accessories (sold separately)

Accessories: 12V/1A power extension cord; Bird spikes

Note: Batteries for the sensor package are not included. You will need 2 AA size battery for the ultrasonic anemometer, which is primarily for startup and backup power purpose. After setup and during normal operation, the unit is getting its power from solar cell.

Note: There's a built-in heat plate in the 7-in-1 sensor package body, if the lowest temperature at your place is below -3°C , or 26.6°F , and the weather is mostly snowy or rainy, then you may need to activate the heater by supplying an external 12V/1A power to the sensor heating element for melting accumulated snow or ice, which can influence wind

measurement accuracy significantly. Please contact us at support@ecowitt.com for the extension cord information if needed.

1.2 Features

- Piezoelectric rain gauge;
- Ultrasonic anemometer (start wind speed 0.3m/s);
- Temperature;
- Humidity;
- Solar light intensity and UV index;
- Waterproof IPX5;
- Heater and additional power supply;

Note: There's a built-in thermostat inside the anemometer sensor to control the power supply for the heat plate, which will automatically turn on below 0°C (30°F) and automatically turn off above 10°C (50°F).

2. Overview

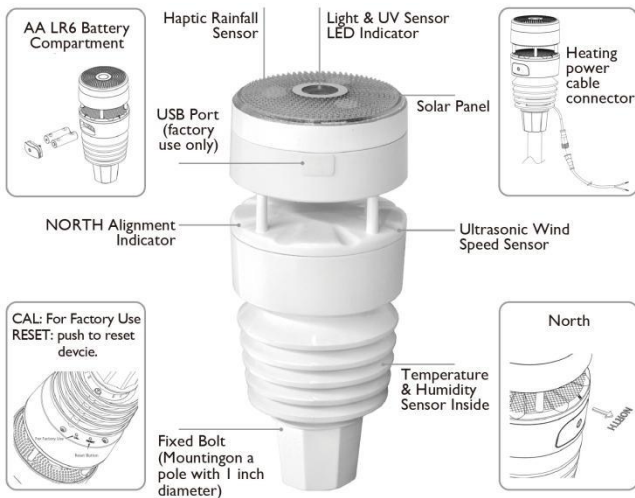


Figure 1: Sensor package assembly components

No	Description	No	Description
1	Piezoelectric rain sensor array	7	Battery compartment
2	Light& UV sensor, LED indicator	8	Temperature & humidity sensor
3	USB port (factory use only)	9	fixed bolt
4	Solar Panel	10	Heating power cable connector
5	Ultrasonic wind speed sensor	11	Calibration button (factory use only)
6	NORTH alignment indicator	12	Reset button

Table 1: Sensor package assembly component list

3. Setup Guide

3.1 Install batteries in sensor package

Open the battery compartment with a screwdriver and insert 2 AA batteries in the battery compartment, and press “Reset” button, the LED indicator on the back of the sensor package (item 4) will turn on for 3 seconds and then flash once every 8.8 seconds indicating sensor data transmission. If you did not pay attention, you may have missed the initial indication. You can always press the reset button to start over. Make sure you see the flash once every 8.8 seconds.

If sensor has been put outside for some time, and solar panel has charged up the internal accumulator fully or partially, if you install the 2 AA backup battery, the system might not start up properly. So you can always make a system reset by press the “Reset” button.

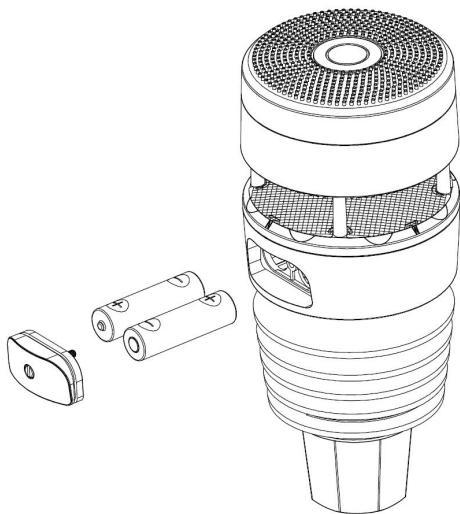


Figure 2: Battery installation diagram

Note: Please make sure the battery is inserted correctly for its polarity as the system needs its initial power from this backup battery to start up the system before solar panel charges

up the accumulator and supply system power afterwards. when in high altitude area,during wintertime, sunshine time is short, thus system needs to be powered from this backup battery, we recommend Lithium batteries to be used for cold weather climates. Please avoid alkaline batteries, especially when internal heater is to be activated during cold and wet weather conditions as when heater activated, the trapped heat inside will warm up internally, and alkaline batteries are extremely susceptible to leakage when temperature is over certain limits.

3.2 Mount ultrasonic anemometer with piezoelectric assembly

3.2.1 Before you mount

Before installing your outdoor sensor in the permanent location, we recommend operating the device for one week in a temporary location with easy access. This will allow you to check out all of the functions, ensure proper operation and familiarize you with the device performance.

3.2.2 Mounting

You can attach a pole (not included) to a permanent structure and then attach the sensor package to it (see [Figure 3](#)).

The install hole will accommodate a pole diameter of 1.0 inch (pole not included).

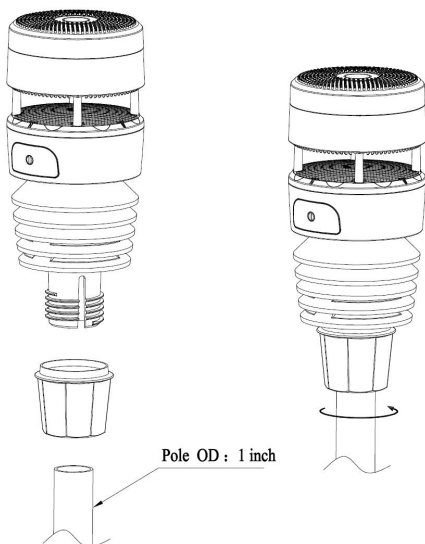


Figure 3: Sensor package mounting diagram 6-1

Make sure the mounting pole is vertical, or very close to it. Use a level as needed.

1. If optional extension cord is added, connect the cord to the connector and insert the USB port into the AC adaptor as Figure 4 show:

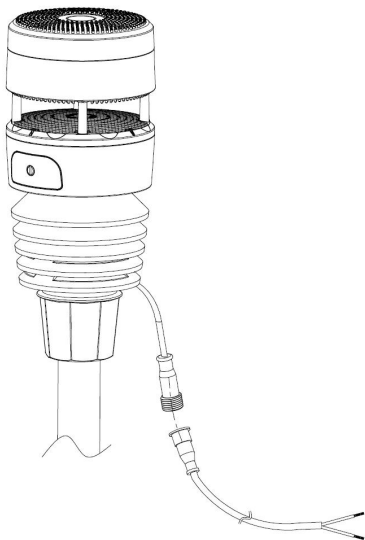


Figure 4: Sensor package mounting diagram 6-2

Now you will need to align the whole package in the proper direction by rotating it on top of the mounting pipe as needed. Locate the arrow labeled “NORTH” that you will find on top of the connector tube of the sensor package (item 6). You must rotate the whole sensor package until this arrow points due north. To achieve proper alignment, it is helpful to use a compass (many cell phones have a compass application).

Note: In Southern hemisphere, it is not necessary to change the orientation to SOUTH as its solar panel is a rounded type and it is orientation free for its charging capability.

Make sure the mounting tube for the sensor package is installed vertically (use a level at 90-degree offsets around the tube). Adjust the mounting pipe as necessary. Next also make sure the mounting of the anemometer body on the pipe is level. If it is not, wind direction and speed readings may not operate correctly or accurately. Adjust the mounting assembly as necessary.

Make sure you check, and correct if necessary, the north orientation again, as the final installation step, and now tighten the bolts. Do not over tighten, but make sure strong wind and/or rain cannot move the sensor package.

3.2.3 Reset Button and Transmitter LED

In the event the sensor package is not transmitting, reset the sensor.

Using a bent-open paperclip, press and hold the RESET BUTTON (item 12) to affect a reset: the LED turns on while the RESET button is depressed, and you can now let go. The LED should then resume as normal, flashing approximately once every 8.8 seconds.

4. Specification

4.1 Transmission between gateway and sensor

Transmission distance in open field: 150 m (500 ft.)
depend on environment

RF frequency: 433/868/915/920 MHz depending on location

Sensor reporting interval: 8.8 seconds

Note:

- The wind speed is detected by every 2s.
- The wind speed reading will be a real-time value (The latest sampling data will be reporting to the receiver).

- The wind gust reading will be the max wind speed in the past 28s.
- When the wind speed is lower than 5m/s, the dispersion of wind direction will increase.

4.2 Measurement Specification

Measurement	Range	Accuracy	Resolution
Wind speed	0m/s to 40m/s	<10m/s, $\pm 0.5\text{m/s}$; $\geq 10\text{m/s}$, $\pm 5\%$	0.1m/s
Wind direction	0° to 359°	<2m/s, $\pm 10^\circ$; $\geq 2\text{m/s}$, $\pm 7^\circ$	1°
Temperature	-40° C to 60° C	$\pm 0.3^\circ \text{ C}$ ($\pm 0.6^\circ \text{ F}$)	0.1° C ($\pm 0.2^\circ \text{ F}$)
Humidity	1 to 99%	$\pm 3.5\%$	1%
Light	0 to 200Klux	$\pm 15\%$	0.1Klux
UVI	1 to 15	± 2	1
Rain	0 to 9999	TBA	0.1mm

4.3 Power consumption

Power	Specification
Anemometer sensor	Solar panel (built-in): 6.5V/4mA
Anemometer sensor (backup)	2 x AA 1.5V battery (not included)

Note: The primary power source for the sensor is the solar panel. When available solar power (light over recent period) is insufficient, the batteries will be used.

5. Warranty Information

We disclaim any responsibility for any technical error or printing error, or the consequences thereof.

All trademarks and patents are recognized.

We provide a 1-year limited warranty on this product against manufacturing defects, or defects in materials and workmanship.

This limited warranty begins on the original date of purchase, is valid only on products purchased, and only to the original purchaser of this product. To receive warranty service, the purchaser must contact us for problem determination and service procedures.

This limited warranty covers only actual defects within the product itself and does not cover the cost of

installation or removal from a fixed installation, normal set-up or adjustments, or claims based on misrepresentation by the seller, or performance variations resulting from installation-related circumstances.