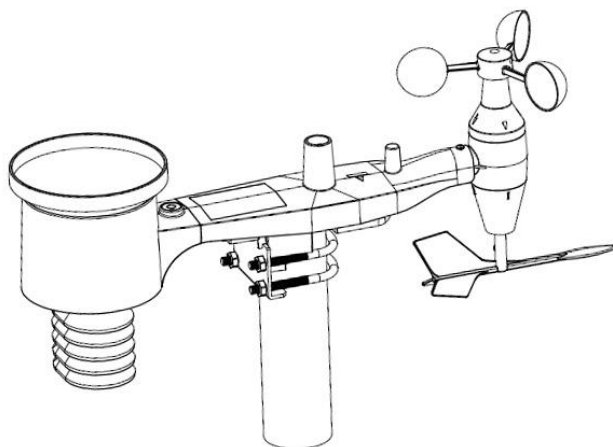


PROFESSIONAL WEATHER STATION WITH SOLAR POWERED

Model: WS14CN



Note: The mounting pole for outdoor sensor array is **not included**.

1 Contents

QTY	Item
1	All-in-one outdoor sensor (Thermo-hygrometer / Rain Gauge / Wind Speed Sensor /Transmitter)
1	Wind Vane
1	U-bolt with mounting clamps
1	Zip bag for 1pc 10mm single-head wrench

2. Overview

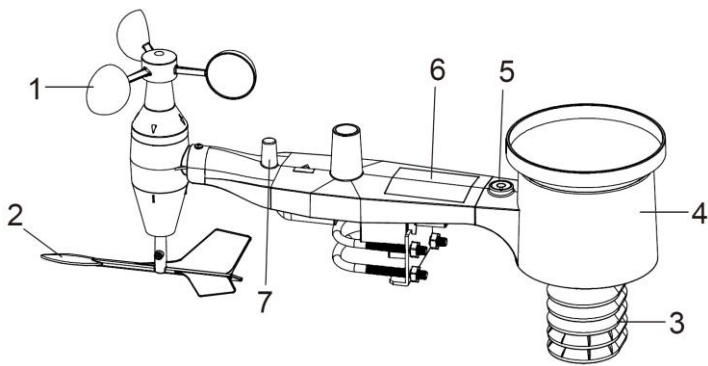


Figure 1

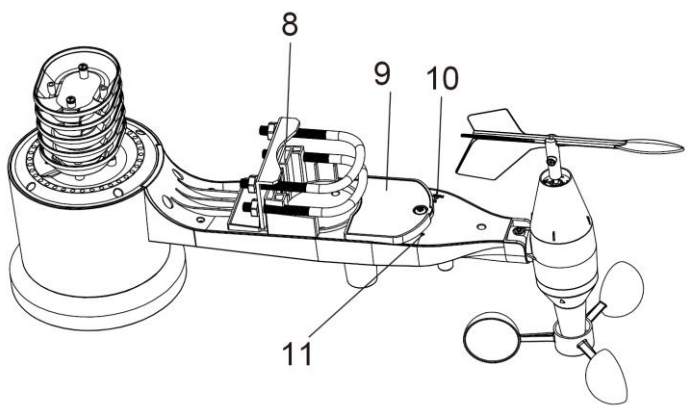


Figure 2

1. Wind Speed Sensor

2. Wind Vane
3. Thermo-hygro sensor
4. Rain collector
5. Bubble level
6. Solar panel
7. Antenna
8. U-Bolt
9. Battery compartment
10. Reset button
11. LED Indicator: light will turn on for 4s when the unit is powered up. Then the LED will flash once every 48 seconds (the sensor transmission update period).

3. Setting Started

3.1. Install U-bolts and mounting pole

Installation of the U-bolts, which are in turn used to mount the sensor package on a pole, requires installation of an included metal plate to receive the U-bolt ends. The metal plate, visible in Figure 3 has four holes through which the ends of the two U-Bolts will fit. The plate itself is inserted in a groove on the bottom of the unit (opposite side of solar panel). Note that one side of the plate has a straight edge (which goes into the groove), the other side is bent at a 90-degree angle and has a curved profile (which will end up “hugging” the mounting pole). Once the metal plate is inserted, insert both U-bolts through the respective holes of the metal plate as shown in Figure 3.

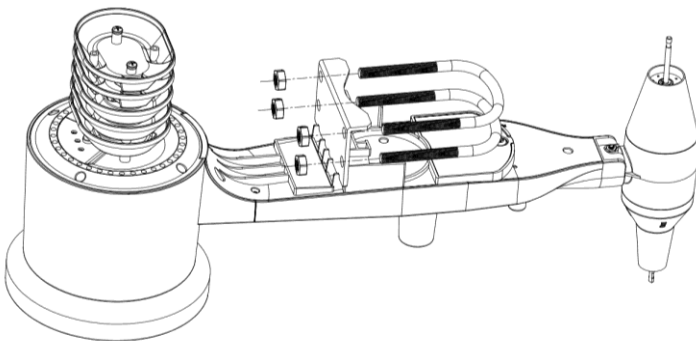


Figure 3: U-Bolt installation

Loosely screw on the nuts on the ends of the U-bolts. You will tighten these later during final mounting. Final assembly is shown in Figure 4.

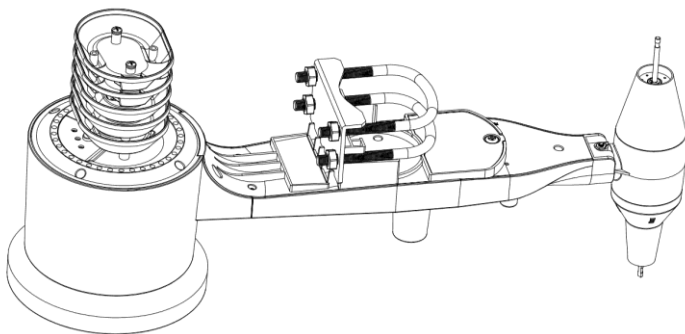


Figure 4: U-Bolts and nuts installed

The plate and U-Bolts are not yet needed at this stage but doing this now may help avoid damaging the wind vane and the wind speed cups later on. Handling of the sensor package with wind vane and speed cups installed to install these bolts is more difficult and more likely to lead to damage.

3.2 Install wind speed cups

Push the wind speed cup assembly onto the shaft on the top side of the sensor package, as shown in Figure 5 (left side image). Tighten the set screw, with a Philips screwdriver (size PH0) (right side image). Make sure the cup assembly can rotate freely. There should be no noticeable friction when it is turning.

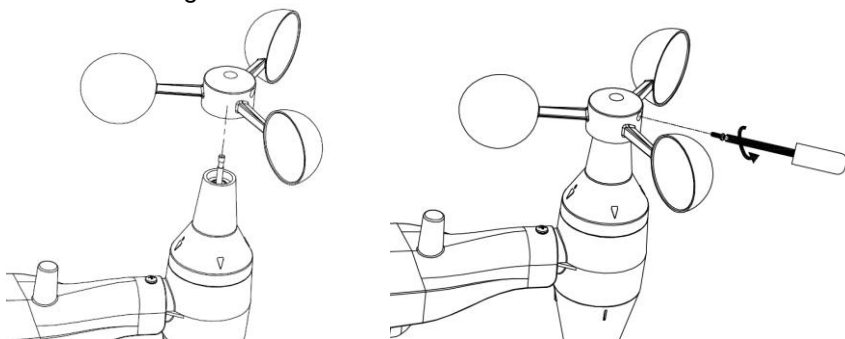


Figure 5: Wind speed cup installation diagram

3.3 Install wind vane

Push the wind vane onto the shaft on the opposite side to the wind cups, until it goes no further, as shown in Figure 6 (left side image). Next, tighten the set screw, with a Philips screwdriver (size PH0) (right side image) until the wind vane cannot be removed from the axle. Make sure the wind vane

can rotate freely. The wind vane's movement has a small amount of friction, which is helpful in providing steady wind direction measurements.

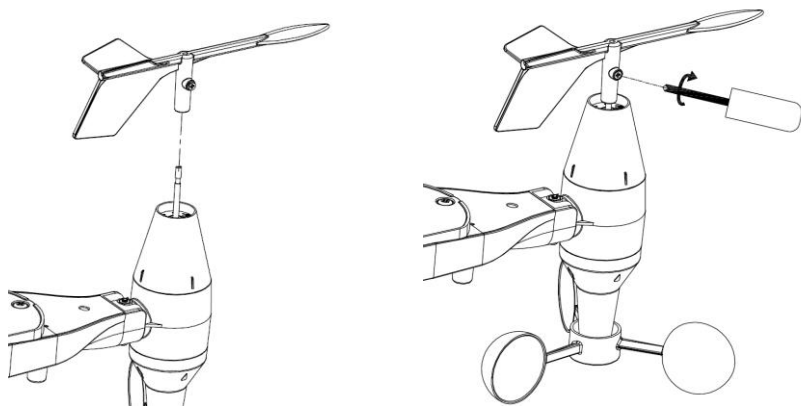


Figure 6: Wind vane installation diagram

3.4 Install Batteries

Open the battery compartment with a screwdriver and insert 2 AA batteries in the battery compartment. The LED indicator on the back of the sensor package will turn on for four seconds and then flash once every 48 seconds indicating sensor data transmission (the sensor transmission update period).

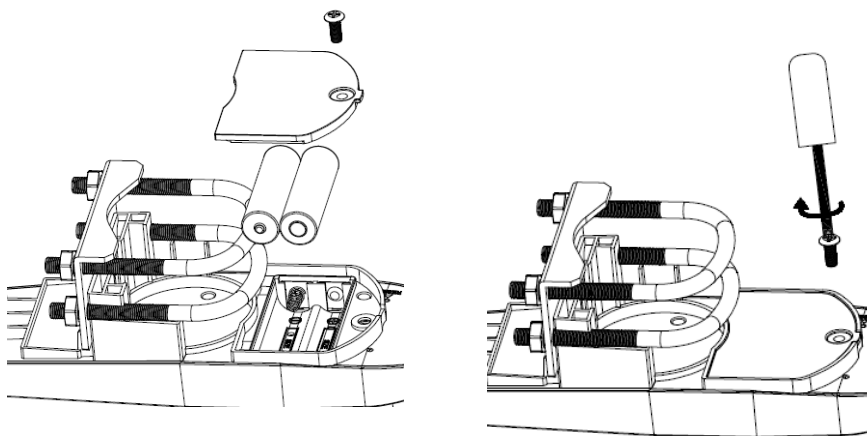


Figure 7: Battery installation diagram

Note: If LED does not light up or is on permanently, make sure the battery is inserted the correct way and inserted fully, starting over if necessary. Do not install the batteries backwards as it may permanently damage the outdoor sensor.

Note: We recommend Lithium batteries for cold weather climates, but alkaline batteries are sufficient for most climates. Rechargeable batteries have lower voltages and should never be used.

3.5 Mount outdoor sensor

3.5.1 Before you mount

Before proceeding with the outdoor mounting detailed in this section, you need to make sure the base station can receive the data from outdoor sensor, while you keep the assembled outdoor sensor package nearby (although preferably not closer than 1.5m from the console). This will make any troubleshooting and adjustments easier and avoids any distance or interference related issues from the setup.

After setup is complete and everything is working, return here for outdoor mounting. If issues show up after outdoor mounting they are almost certainly related to distance, obstacles etc.

3.5.2 Mounting

Reference Figure 8, the mounting assembly includes two U-Bolts and a bracket that tightens around a 1 to 2" diameter pole (not included) using the four U-Bolt nuts.

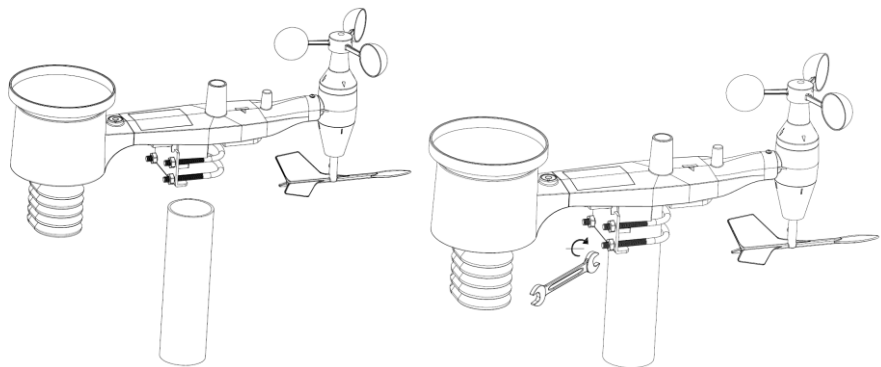


Figure 8: Sensor package mounting diagram

Note

Beside the antenna, there is an arrow icon with “WEST” words (Figure 9) representing the direction of west. The sensor body has to be adjusted so that the “WEST” indication is facing to real west direction in your location. A compass device is recommended to help adjust direction. Permanent wind

direction error will be introduced when the outdoor sensor is not installed in right direction.

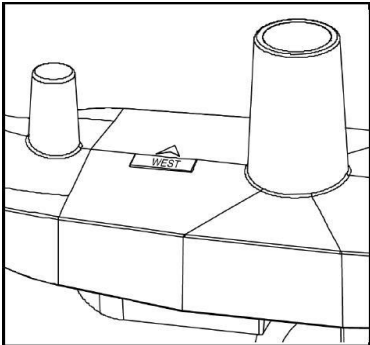


Figure 9

Now look at the bubble level. The bubble should be fully inside the red circle. If it is not, wind direction, speed, and rain readings may not operate correctly or accurately. Adjust the mounting pipe as necessary. If the bubble is close, but not quite inside the circle, and you cannot adjust the mounting pipe, you may have to experiment with small wooden or heavy cardboard shims between the sensor package and the top of the mounting pole to achieve the desired result (this will require loosening the bolts and some experimentation).

Make sure you check, and correct if necessary, the westly orientation as the final installation step, and now tighten the bolts with a wrench.

3.6 Reset Button and Transmitter LED

Using a bent-open paperclip, press and hold the RESET BUTTON (see Figure 10) 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 48 seconds.

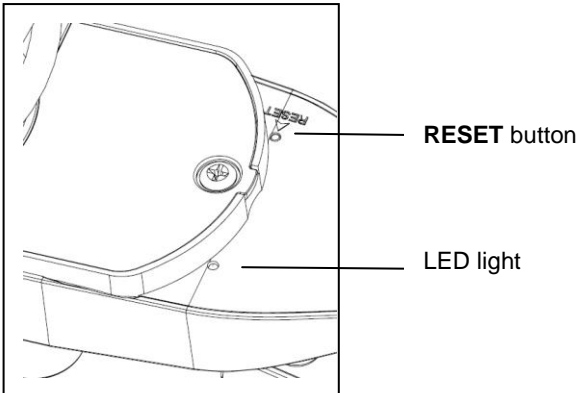


Figure 10

3.7 Best Practices for Wireless Communication

Note: To ensure proper communication, mount the remote sensor(s) upright on a vertical surface, such as a wall. **Do not lay the sensor flat.**

Wireless communication is susceptible to interference, distance, walls and metal barriers. We recommend the following best practices for trouble free wireless communication.

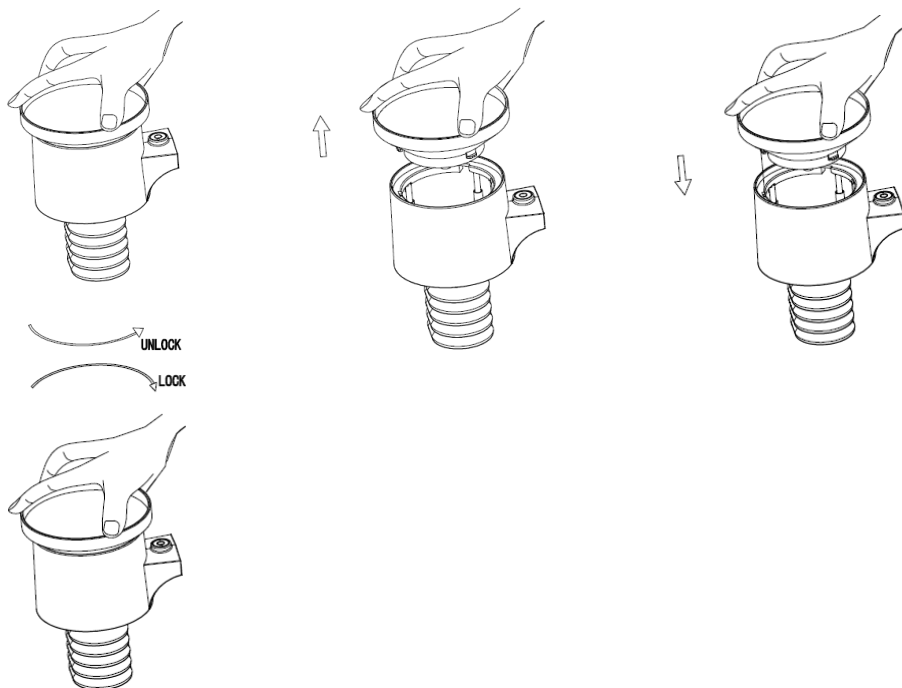
1. **Electro-Magnetic Interference (EMI).** Keep the console several feet away from computer monitors and TVs.
2. **Radio Frequency Interference (RFI).** If you have other 433/868/915 MHz devices and communication is intermittent, try turning off these other devices for troubleshooting purposes. You may need to relocate the transmitters or receivers to avoid intermittent communication.
3. **Line of Sight Rating.** This device is rated at 300 feet line of sight (no interference, barriers or walls) but typically you will get 100 feet maximum under most real-world installations, which include passing through barriers or walls.
4. **Metal Barriers.** Radio frequency will not pass through metal barriers such as aluminum siding. If you have metal siding, align the remote and console through a window to get a clear line of sight.

The following is a table of reception loss vs. the transmission medium. Each “wall” or obstruction decreases the transmission range by the factor shown below.

Medium	RF Signal Strength Reduction
Glass (untreated)	5-15%
Plastics	10-15%
Wood	10-40%
Brick	10-40%
Concrete	40-80%
Metal	90-100%

Maintenance

1. Clean the rain gauge once every 3 months. Rotate the funnel counter-clockwise and lift to expose the rain gauge mechanism, and clean with a damp cloth. Remove any dirt, debris and insects. If bug infestation is an issue, spray the array lightly with insecticide.



2. Clean the solar panel every 3 months with damp cloth.
3. Replace batteries every 1-2 years. If left in too long, the batteries may leak due to environmental challenges. In harsh environments, inspect the batteries every 3 months (when cleaning the solar panel).
4. When replacing the batteries, apply a corrosion preventive compound on the battery terminals, available at most hardware stores.
5. In snowy environments, spray the top of the weather station with anti-icing silicon spray to prevent snow build up.

Specifications

Transmission distance in open field	: 100m (300 feet)
Frequency	: 433MHz
Temperature range	: -40°C--60°C (-40°F to +140°F)
Accuracy	: + / - 1 °C
Resolution	: 0.1°C
Measuring range rel. humidity	: 10% ~ 99%
Accuracy	: +/- 4% in range 20-80%RH, +/- 6% in OTHER ranges
Rain volume display	: 0 – 9999mm (show --- if outside range)
Accuracy	: + / - 6%
Resolution	: 0.3mm (if rain volume < 1000mm) 1mm (if rain volume > 1000mm)
Wind speed	: 0-50m/s (0~100mph) (show --- if outside range)
Accuracy	: +/- 1m/s (wind speed< 5m/s) : +/-10% (wind speed > 5m/s)
Measuring interval thermo-hygro sensor	: 48 sec
Water proof level	: IPX3

Power consumption

2xAA 1.5V LR6Alkaline batteries (not included)



Please help in the preservation of the environment and return used batteries to an authorized depot.

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FCC Statement

Statement according to FCC part 15.19:

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Statement according to FCC part 15.21:

Modifications not expressly approved by this company could void the user's authority to operate the equipment.

Statement according to FCC part 15.105:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.