F009RT/WT Professional Weather Station User Manual

1 Introduction

Thank you for your purchase of the F009RT/WT Weather Station. The following user guide provides step by step instructions for installation, operation and troubleshooting.

2 Warnings and Cautions

Warning: Any metal object may attract a lightning strike, including your weather station mounting pole. Never install the weather station in a storm.

Warning: Installing your weather station in a high location may result in injury or death. Perform as much of the initial check out and operation

3. Quick Start Guide

Although the manual is comprehensive, much of the information contained may be intuitive. In addition, the manual may not flow properly because the sections are organized by components. The following Quick Start Guide provides only the necessary steps to install, operate the weather station, along with references to the pertinent sections.

Required		
Step	**Description**	**4.3**
1	Assemble and power up the sensors	**4.4.2**
2	Power up the display console and synchronize with wind sensor, rain sensor and thermo-hygrometer sensor	**6**
3	Mount the sensor array	**8.2**
4	Set date and time on console	**4.3**

4 Getting Started

The FT0200 weather station consists of a display console (receiver), a sensor array with thermo-hygrometer, rain gauge, wind sensor, and mounting hardware.

4.1 Parts List

The FT0200 weather station consists of the following parts (as referenced in Figure 1 and Figure 2).

QTY	Item

1	Display Console Frame Dimensions (LxHxW): 196X32X136mm LCD Dimensions (LxW): 130 x 110mm
1	Thermo-hygrometer / Rain Gauge / Wind Vane / Wind Speed Sensor
1	Sensor mounting bracket / foot-mounting / fixed mount
2	Pole mounting U-bolt / nuts (M5)
4	Pole mounting nuts (M5) / bolts (∅5)
2	Pole mounting nuts (M3) / bolts (∅3)
4	Tapping screw

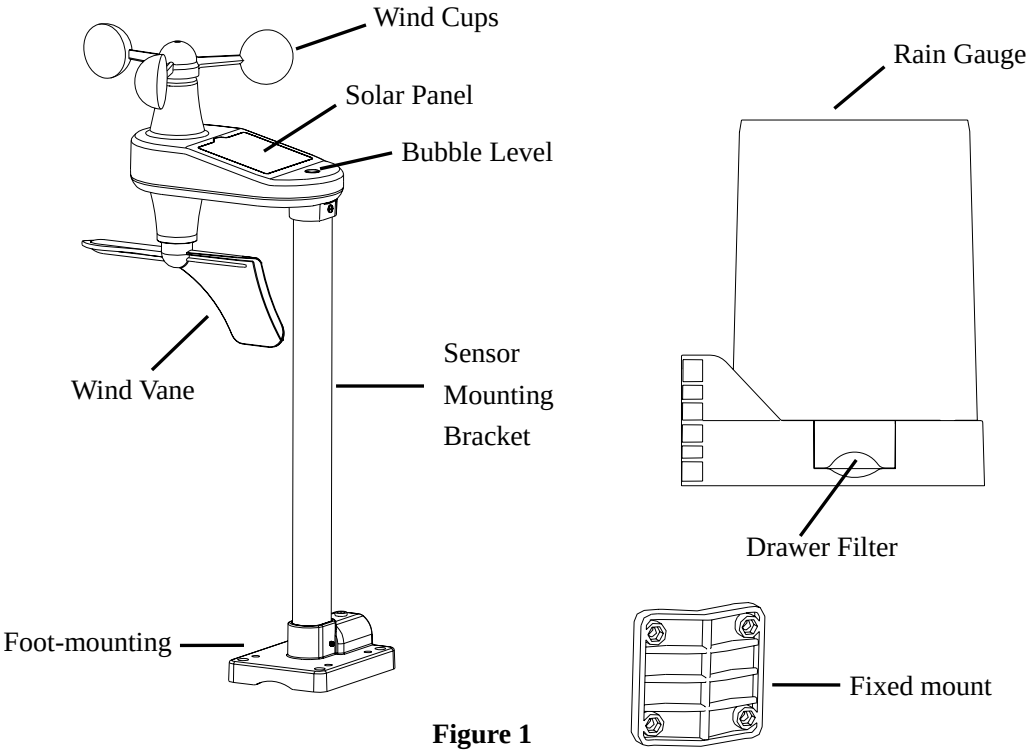
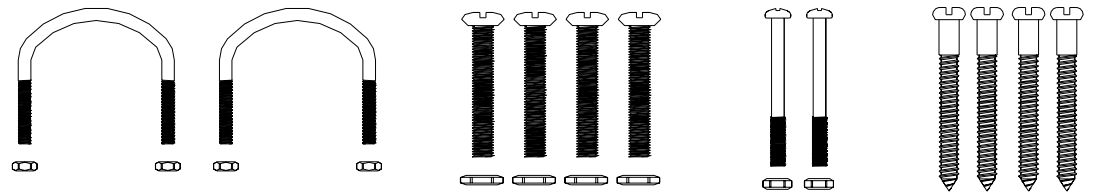


Figure 1



U-bolts and nuts bolts and nuts bolts and nuts Tapping screw

Figure 2

4.2 Recommend Tools

- Precision screwdriver (for small Phillips screws)
- Compass or GPS (for wind direction calibration)
- Adjustable Wrench

- Hammer and nail for hanging remote thermo-hygrometer transmitter.

4.3 Sensor Assembly Set Up

4.3.1 Insert batteries into the anemometer transmitter. Locate the battery boor on the wind transmitter, push and open the battery compartment, arrow direction as show in Figure 3.

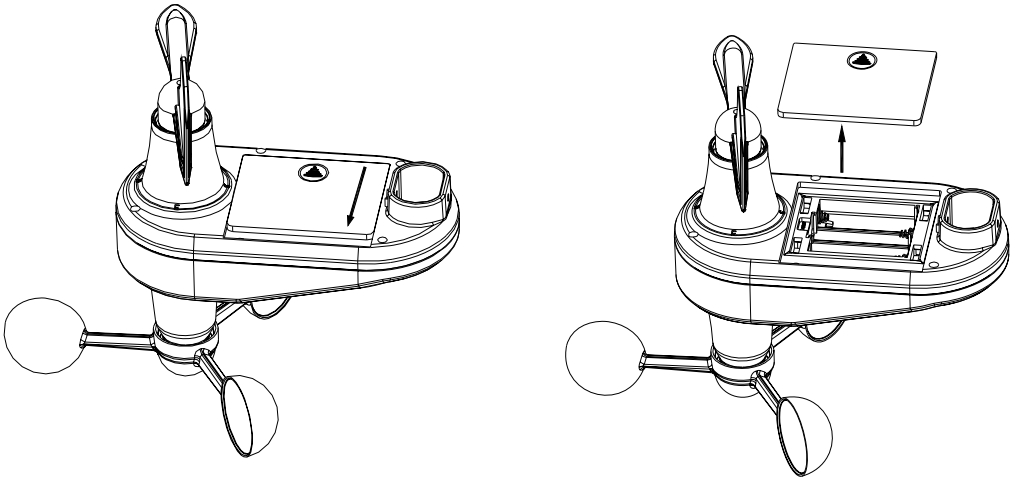


Figure 3

Inserting 4xAAA batteries in the battery compartment, as show in Figure 4.

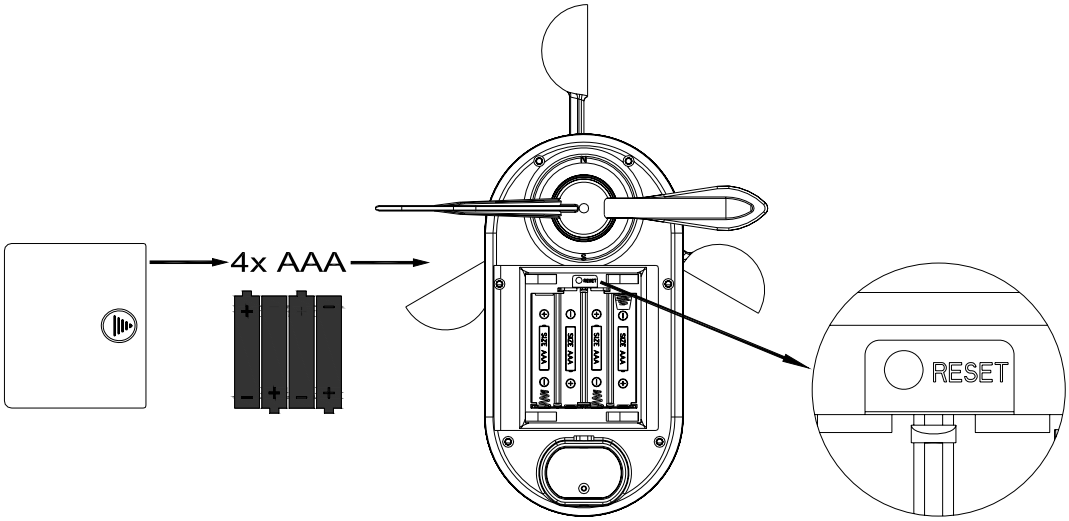


Figure 4

Note: Do not install the batteries backwards. You can permanently damage the thermo-hygrometer. Do not use rechargeable batteries.

Note: We recommend installing Lithium AA batteries.

Reinsert the battery door into anemometer transmitter and push to tighten it.

The wind sensor LED indicator will light for 3 seconds, and then flash once per 16 seconds thereafter. Each time it flashes, the sensor is transmitting data.

Note: If the wind sensor does not power up after inserting the batteries, press the reset button shown in Figure.

4.3.2 Insert batteries into the rain gauge transmitter. Rotate and detach the upside bucket, arrow direction as show in figure 5.

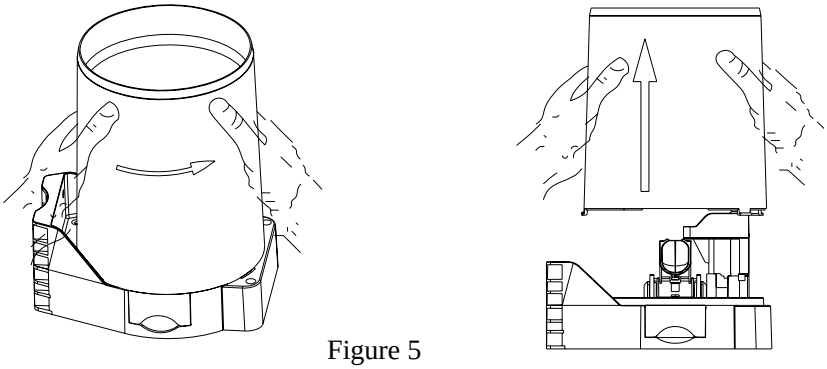


Figure 5

Locate the battery boor on the rain gauge transmitter, pull out the battery compartment, as show in Figure 6.

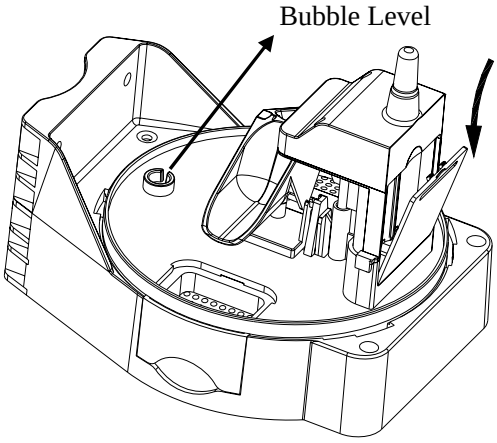


Figure 6

Inserting 4xAAA batteries in the battery compartment, as show in Figure 7.

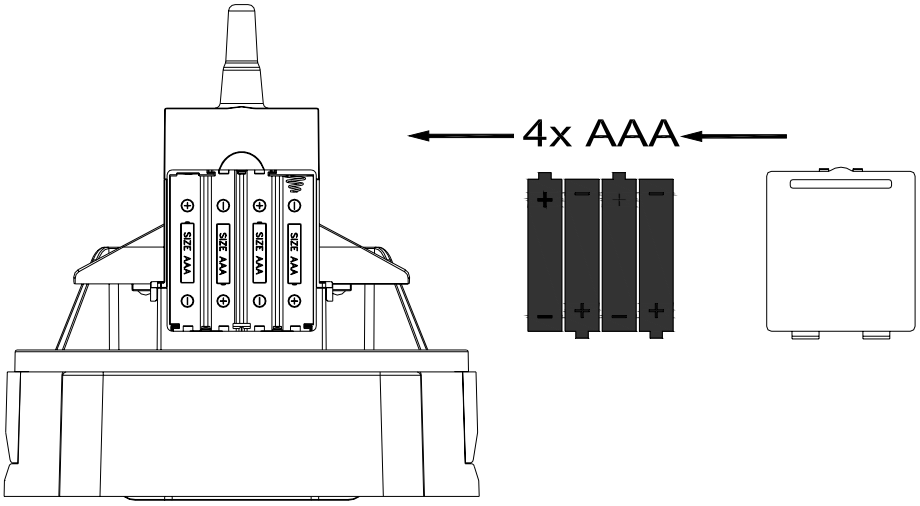


Figure 7

5.3 Best Practices for Wireless Communication

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 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%

6. Final Installation of Sensors

6.1 Wind transmitter instatllation. Prior to installation, you will need to calibrate the wind direction. There is a “S” indicator on the wind vane that indicates South, as shown in Figure 14. Align this “S” marker in the direction of South.

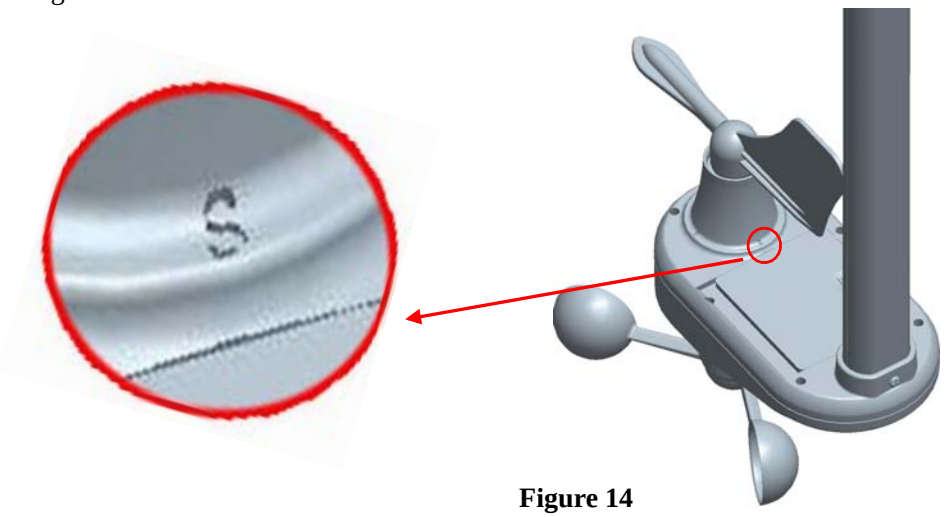


Figure 14

Fasten the wind transmitter to mounting pole brackets with foot-mounting, two ¢3 bolts and M3 nuts , as shown in Figure 15.

Tighten the mounting pole to your mounting pole (purchased separately) with the four¢5 Bolts and M5 Nuts assembly, as shown in Figure 16.

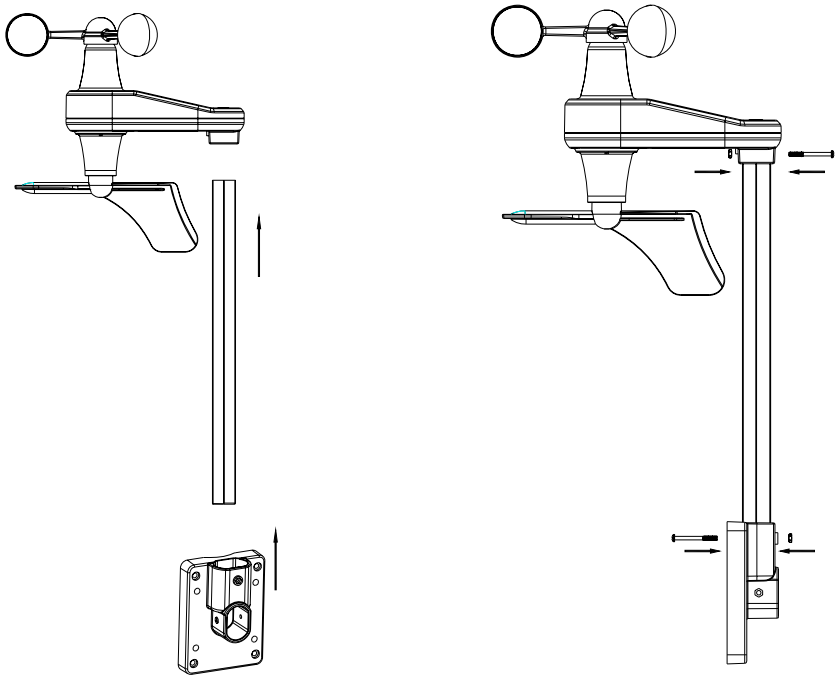


Figure 15

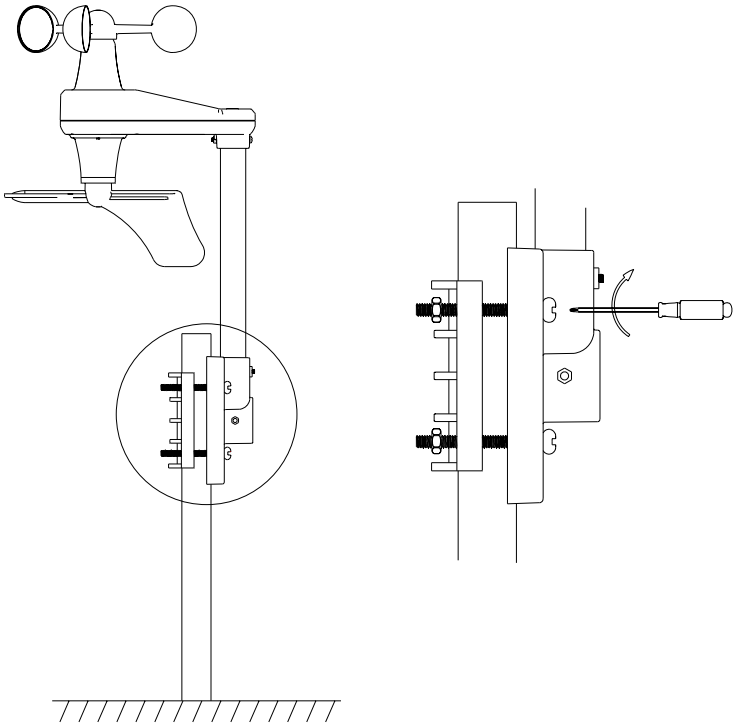


Figure 16

6.2 Rain Gauge Transmitter Installation. Take out of the upside rain bucket before fasten to your mounting pole or bracket (purchased separately).

Tighten rain gauge transmitter to your mounting pole or bracket with two U-bolts and four M5 nuts , as shown in Figure 17.

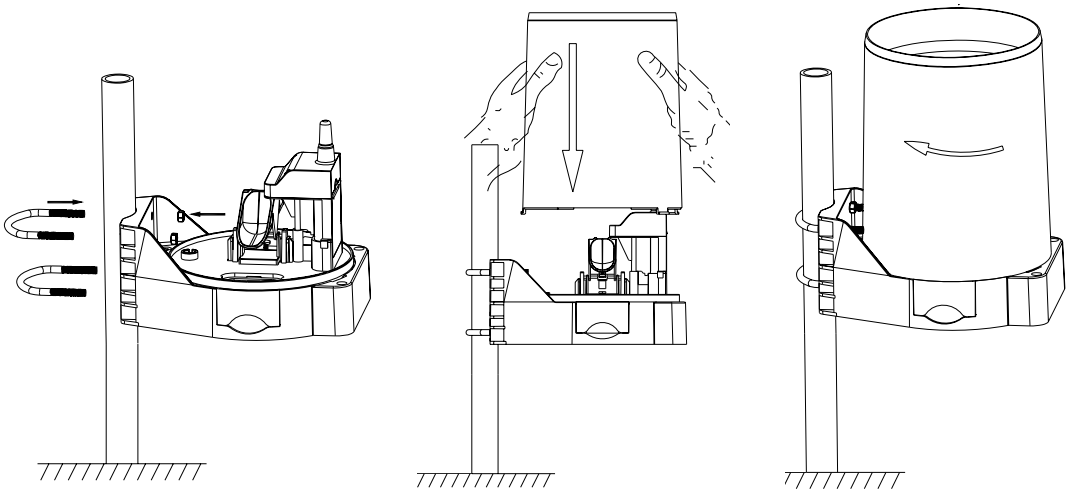


Figure 17

11. Glossary of Terms

Term	Definition
Accuracy	Accuracy is defined as the ability of a measurement to match the actual value of the quantity being measured.
Hygrometer	A hygrometer is a device that measures relative humidity. Relative humidity is a term used to describe the amount or percentage of water vapor that exists in air.
Range	Range is defined as the amount or extent a value can be measured.
Resolution	Resolution is defined as the number of significant digits (decimal places) to which a value is being reliably measured.
Wind Vane	A wind vane is a device that measures the direction of the wind. The wind vane is usually combined with the anemometer. Wind direction is the direction from which the wind is blowing.

12. Specifications

12.1 Wireless Specifications

- Line of sight wireless transmission (in open air): 300 feet.
- Frequency: 433 MHz
- Update Rate: 60 seconds for rain sensor and thermo-hygrometer sensor, 16s for wind sensor.

12.2 Measurement Specifications

The following table provides specifications for the measured parameters.

Measurement	Range	Accuracy	Resolution
Indoor Temperature	0 to 60 °C	± 1 °C	0.1 °C
Outdoor Temperature	-40 to 60 °C	± 1 °C	0.1 °C
Indoor Humidity	10 to 99 %	± 5% (only guaranteed between 20 to 90%)	1 %
Outdoor Humidity	10 to 99%	± 5% (only guaranteed between 20 to 90%)	1 %
Rain	0 to 394 in.	± 5%	0.01 in
Wind Direction	0 - 360 °	45° (8 point compass)	45° (8 point compass)
Wind Speed	0 to 110 mph	± 1m/s or 10% (whichever is greater)	0.1m/s

12.3 Power Consumption

- Base station (display console) : 4 x AA 1.5V Alkaline or Lithium batteries (not included)
- Thermo-hygro Sensor : 2 x AAA alkaline batteries or Lithium batteries (not included)
- Rain sensor: 4xAAA alkaline batteries or Lithium batteries (not included)
- Wind sensor: 4xAAA alkaline batteries or Lithium batteries (not included)
- Battery life: Minimum 12 months for base station with excellent reception. Intermittent reception and multiple sensors may reduce the battery life.
  Minimum 12 months for sensors (use lithium batteries in cold weather climates less than -4 °F)

13. Maintenance

1. Clean the rain gauge once every 3 months
2. Replace the wind, rain and thermo-hygrometer transmitter batteries once every 1-2 years

14 Troubleshooting Guide

Problem	**Solution**
Wireless remote not reporting in to console. There are dashes (--.-) on the display console.	If any of the sensor communication is lost, dashes (--.-) will be displayed on the screen. To reacquire the signal, press and hold the **CHANNEL/+** button for 3 seconds, choose the lost sensor and press **SET** button, and the remote search icon will be constantly displayed. Once the signal is reacquired, the remote search icon will turn off, and the current values will be displayed. The maximum line of sight communication range is 300 feet and 100 feet under most conditions. Move the sensor assembly closer to the display console. If the sensor assembly is too close (less than 1.5m), move the sensor assembly away from the display console. Make sure the remote sensor LCD display is working and the transmitter light is flashing once per 60 seconds. Install a fresh set of batteries in the remote thermo-hygrometer. For cold weather environments, install lithium batteries. Make sure the remote sensors are not transmitting

Problem	Solution
	through solid metal (acts as an RF shield), or earth barrier (down a hill). Move the display console around electrical noise generating devices, such as computers, TVs and other wireless transmitters or receivers. Move the remote sensor to a higher location. Move the remote sensor to a closer location.
Temperature sensor reads too high in the day time.	Make sure the thermo-hygrometer is mounted in a shaded area. The pre preferred location is a north facing wall because it is in the shade most of the day.
Indoor and Outdoor Temperature do not agree	Allow up to one hour for the sensors to stabilize due to signal filtering. The indoor and outdoor temperature sensors should agree within 2 °F (the sensor accuracy is ± 1 °F). Use the calibration feature to match the indoor and outdoor temperature to a known source.
Indoor and Outdoor Humidity do not agree	Allow up to one hour for the sensors to stabilize due to signal filtering. The indoor and outdoor humidity sensors should agree within 10 % (the sensor accuracy is ± 5 %). Use the calibration feature to match the indoor and outdoor humidity to a known source.
Display console contrast is weak	Replace console batteries with a fresh set of batteries.
Outdoor color does not change as expected.	Make sure the outdoor sensor is assigned to Channel 1.
Rain gauge reports rain when it is not raining	An unstable mounting solution (sway in the mounting pole) may result in the tipping bucket incorrectly incrementing rainfall. Make sure you have a stable mounting solution. Move the rain gauge from the pole mount to a flat, stable mount (fixed, flat structure).
Wind speed appears low	Average wind speed may have the appearance of low wind. Try switching the display to wind gust.

11 Accessories

The following software and hardware accessories are available for this weather station at www.AmbientWeather.com .

Accessory	Description
Energizer AAAS Lithium Battery (2-pack) - Batteries for Long Life and Cold Climates	AAA lithium batteries for cold weather climates.
Ambient Weather SRS100LX Temperature and Humidity Solar Radiation Shield	Solar Radiation Shield improves temperature accuracy for hot weather climates. Remove the rain guard and install over thermo-hygrometer.
Ambient Weather Humidity Calibration Kits	One step calibration kits for digital hygrometers use salt slurry formula to accurately calibrate the indoor and outdoor hygrometers.

12 Liability Disclaimer

Please help in the preservation of the environment and return used batteries to an authorized depot. The electrical and electronic wastes contain hazardous substances. Disposal of electronic waste in wild country and/or in unauthorized grounds strongly damages the environment.

Reading the “User manual” is highly recommended. The manufacturer and supplier cannot accept any responsibility for any incorrect readings and any consequences that occur should an inaccurate reading take place.

This product is designed for use in the home only as indication of weather conditions. This product is not to be used for medical purposes or for public information.

The specifications of this product may change without prior notice.

This product is not a toy. Keep out of the reach of children.

Ambient, LLC WILL NOT ASSUME LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR OTHER SIMILAR DAMAGES ASSOCIATED WITH THE OPERATION OR MALFUNCTION OF THIS PRODUCT.

13 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.

14 Warranty Information

Ambient, LLC provides a 1-year limited warranty on this product against manufacturing 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 Ambient, LLC for problem determination and service procedures.

Warranty service can only be performed by a Ambient, LLC. The original dated bill of sale must be presented upon request as proof of purchase to Ambient, LLC.

Your Ambient, LLC warranty covers all defects in material and workmanship with the following specified exceptions: (1) damage caused by accident, unreasonable use or neglect (lack of reasonable and necessary maintenance); (2) damage resulting from failure to follow instructions contained in your owner’s manual; (3) damage resulting from the performance of repairs or alterations by someone other than an authorized Ambient, LLC authorized service center; (4) units used for other than home use (5) applications and uses that this product was not intended (6) the products inability to receive a signal due to any source of interference or metal obstructions and (7) extreme acts of nature, such as lightning strikes or floods.

This 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, claims based on misrepresentation by the seller or performance variations resulting from installation-related circumstances.