Ambient Weather WS-5000-RAIN Replacement Rain Collector User Manual

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1. Quick Start Guide

Although the manual is comprehensive, much of the information contained may be intuitive.

The following Quick Start Guide provides the necessary steps to install and operate the rain gauge and includes references to the pertinent sections.

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2. Pre-Installation Checkout and Site Survey

2.1   Pre-Installation Checkout

Before installing your rain gauge in the permanent location, we recommend setting up the rain gauge in a temporary location with easy access. This will allow you to check out all the functions, ensure proper operation and familiarize you with the rain gauge and calibration procedures.

2.2   Parts List

QTY	Item
WS-5000-RAIN	
1	Rain Gauge
4	Threaded nuts for U-Bolts (M5 size)
2	Sensor array metal mounting plate to be used with U-Bolts
1	Metal wrench for M5 U-Bolts, nuts and washers
1	Funnel coil filter
User manual	

Note: Batteries are not included. We recommend Alkaline (which operate to 4 °F) or Lithium batteries (for operation to -40 °F) are recommended.

2.3   Rain Gauge Setup

Figure 2

No	Description	No	Description
1	Rain collector and funnel	4	Battery door
2	LED indicator	5	Screw hole
3	Bubble level	6	U-Bolt installation hole

2.3.1 Install the Batteries in the Rain Gauge

Insert 1 x AA battery into the battery compartment. Alkaline (> 4 °F) or Lithium batteries for cold weather climates (> -40 °F) are recommended.
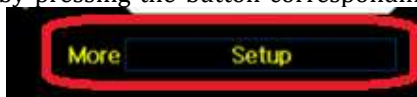
Figure 5
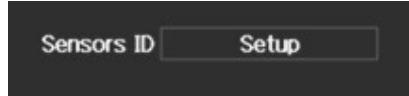
The LED indicator on the top of the rain gauge will turn on for 3 seconds and flash once every 49 seconds (the sensor transmission update period).

If the LED does no light up or flash, make sure the battery polarity is correct. Press the reset button.

2.3.2 Register Rain Gauge on Display Tablet WS-2000/WS-5000

For the WS-2000/WS-5000 weather station, the following sensor IDs are assigned:

WH65:   WS-2902-ARRAY
WS80BN: WS-5000-ARRAY Ultrasonic sensor array
WH40E: WS-5000-RAIN Rain gauge
WH32B: Indoor thermo-hygrometer-barometer

Go to the Sensor ID screen by pressing the button corresponding to the [⚙], then use the [↑] button to navigate to the Setup screen [More   Setup] and press [🔍]. Then, use the [↑] button to navigate to the Sensor ID screen [Sensors ID   Setup] and press [🔍]. Use the [↓] button to navigate to the WH40E (Figure 3) and press [🔍]. Highlight Register (Figure 4) and press [🔍].

Sensor	Signal	ID	CH	Sensor	Signal	ID	CH	Sensor	Signal	ID
WH65		2f	OUT	PM2.5		—	2	WH31SM		c4c6
WH32B		49	IN	PM2.5		—	3	WH31SM		c4a7
WH32E		Disable	1	T&H		ca	4	WH31SM		c4ad
WS80BN		—	2	T&H		77	5	WH31SM		c51b
WH40E		—	3	T&H		11	6	WH31SM		c4b5
WH31L		c4ae	4	T&H		cd	7	WH31SM		c4c5
WH45		0	5	T&H		78	8	WH31SM		c68f
			6	T&H		8e	1	Leak		—
			7	T&H		19	2	Leak		—
			8	T&H		17	3	Leak		—
			1	WH31SM		c4bc	4	Leak		d4a7

Select field		Scroll field up	Scroll field down	return to Setup

Figure 3

Figure 4

When complete press the return to Setup button. Within 3-5 minutes the display should show the WS-

5000-RAIN segment

	Rate	0.03 in/h	Event	1.01 in
			Hourly	1.02 in
0.21 in			Weekly	1.03 in
			Monthly	1.05 in
Daily Rain			Yearly	1.05 in

. See Figure 10 and Figure 11 for an explanation.

2.3.3 Site Survey

General Guidelines:
- Install in an easily accessible location
- Clean the rain gauge every few months
- Change batteries every 2-3 years
- Avoid radiant heat transfer from buildings and structures. In general, install the sensor array at least 5' from the ground or any building, structure, or rooftop.
- Avoid wind and rain obstructions.

Optimal Placement for Wind Speed Measurement:
- On roof, 8-10' above roofline

Optimal Placement for Temperature, Humidity, or Rainfall Measurement:
- 4-6' above the ground, horizontal distance 2-4× the height of the nearest object.

2X' to 4X' — X'

Optimal Placement for All-in-One Weather Stations:
- 6-8' off the ground 20-50' away from houses or other structures
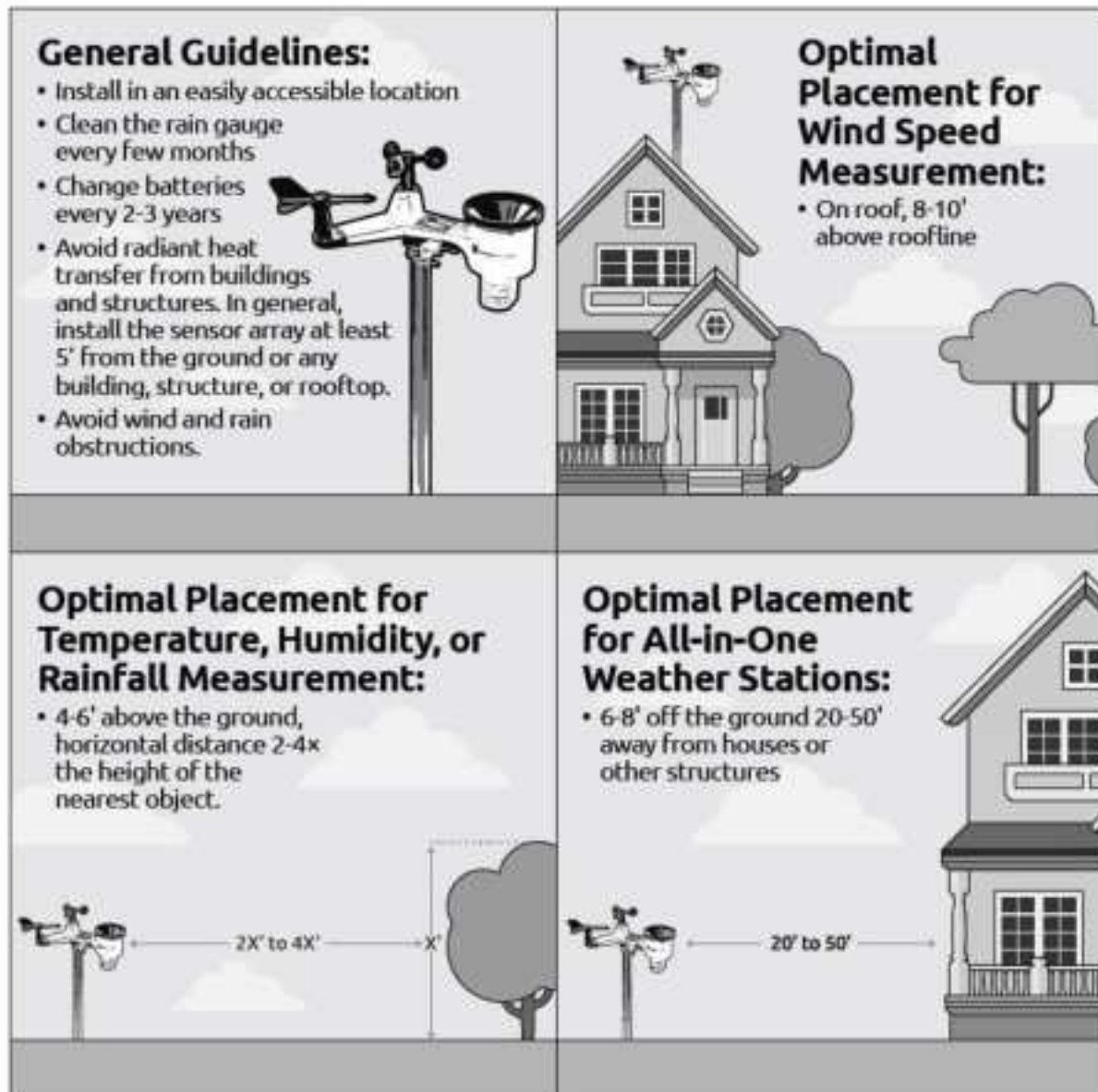
20' to 50'

Figure 5

Perform a site survey before installing the weather station. Consider the following:

1. You must clean the rain gauge every few months and change the batteries every 2-3 years. Provide easy access to the rain gauge and sensor array.
2. Avoid radiant heat transfer from buildings and structures. In general, install the sensor array at least 5' from any building, structure, ground, or roof top.

3. Avoid wind and rain obstructions. The rule of thumb is to install the sensor array at least four times the distance of the height of the tallest obstruction. For example, if the building is 20' tall and the mounting pole is 6' tall, install the sensor array 4 x (20 – 6)' = 56' away.
4. Mount the sensor array in direct sunlight for accurate temperature readings.
5. Installing the weather station over sprinkler systems or other unnatural vegetation may affect temperature and humidity readings. We suggest mounting the sensor array over natural vegetation.
6. Wireless Range. Radio communication between receiver and transmitter in an open field can reach up to 1,000 feet, providing there are no interfering obstacles such as buildings, trees, vehicles and high voltage lines. Wireless signals will not penetrate metal buildings. Under most conditions, the maximum wireless range is 300'.
7. Radio Interference. Computers, radios, televisions and other sources can interfere with radio communications between the sensor array and tablet. Please take this into consideration when choosing tablet or mounting locations. Make sure your display tablet is at least five feet away from any electronic device to avoid interference.
8. Visit Ambient Weather Mounting Solutions for assistance and ideas for mounting your weather station:

http://www.ambientweather.com/amwemoso.html

2.3.4 Rain Gauge Mounting

Install the sensor array plastic mounting bracket to your 1.25" to 2" diameter pole, as shown in Figure 6
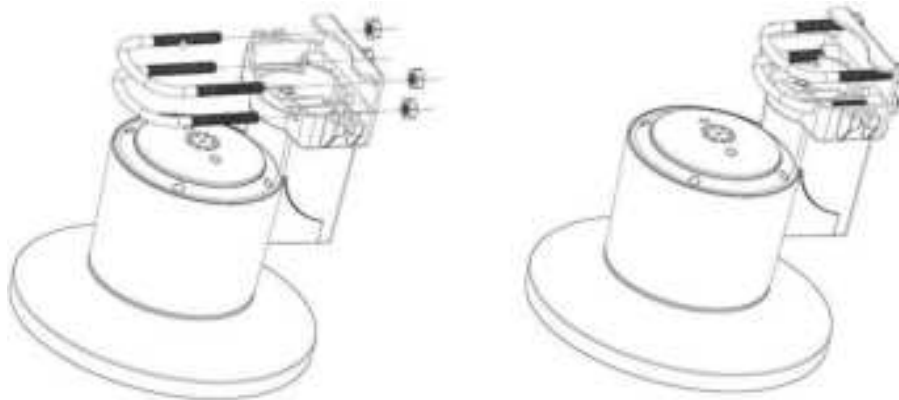

Figure 6

To mount to a wooden post or flat surface, use the two included mounting screws, as shown in Figure 7.

Figure 7

Use the bubble level next to the rain sensor to make sure the sensor array is completely level.

Note: If you cannot read the bubble level due to mounting constraints, place straddle a line or ruler level across the top of the rain gauge for easier viewing.

2.3.5 Install the Funnel Coil Filter

To install the funnel coil filter, press the coil until the hook is inside the hole at the bottom of the funnel, and locked in place. The spring tension will keep the filter sit tight on the funnel.
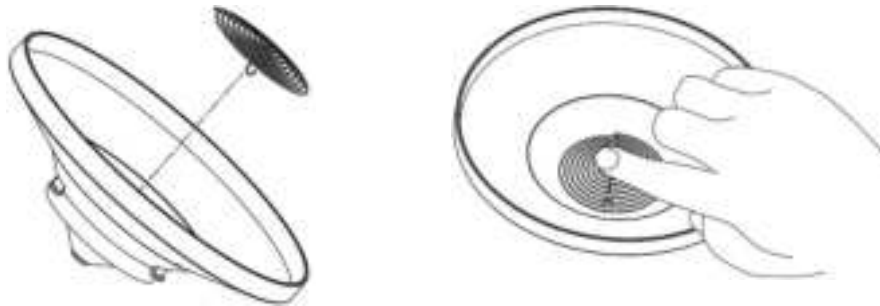
Figure 7

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 tablet several feet away from computer monitors and TVs.
2. **Radio Frequency Interference (RFI).** If you have other 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 1,000 feet line of sight (no interference, barriers or walls) but typically you will get 300 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 tablet 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%

4   Display Tablet Operation

Note: About This Section. The WS-5000-RAIN does not include a display. We include the following section in this manual to inform you how to reset your daily rain total in case the tipping bucket cycles during installation and show basic display rain functions. The display tablet includes buttons at the bottom with icons signifying the menu functions. This manual includes "quick menu boxes" as shown below, signifying how to access a setting from home screen. For example, to access calibration panel, from the home screen, press the Set Key three times to view the calibration panel.
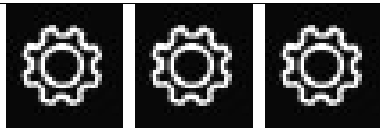
"Menu box" example. From the home screen, press the Set Key 3 times to view the calibration panel.

4.3   Initial Display Tablet Operation

Figure 10

4.4 Home Screen Display

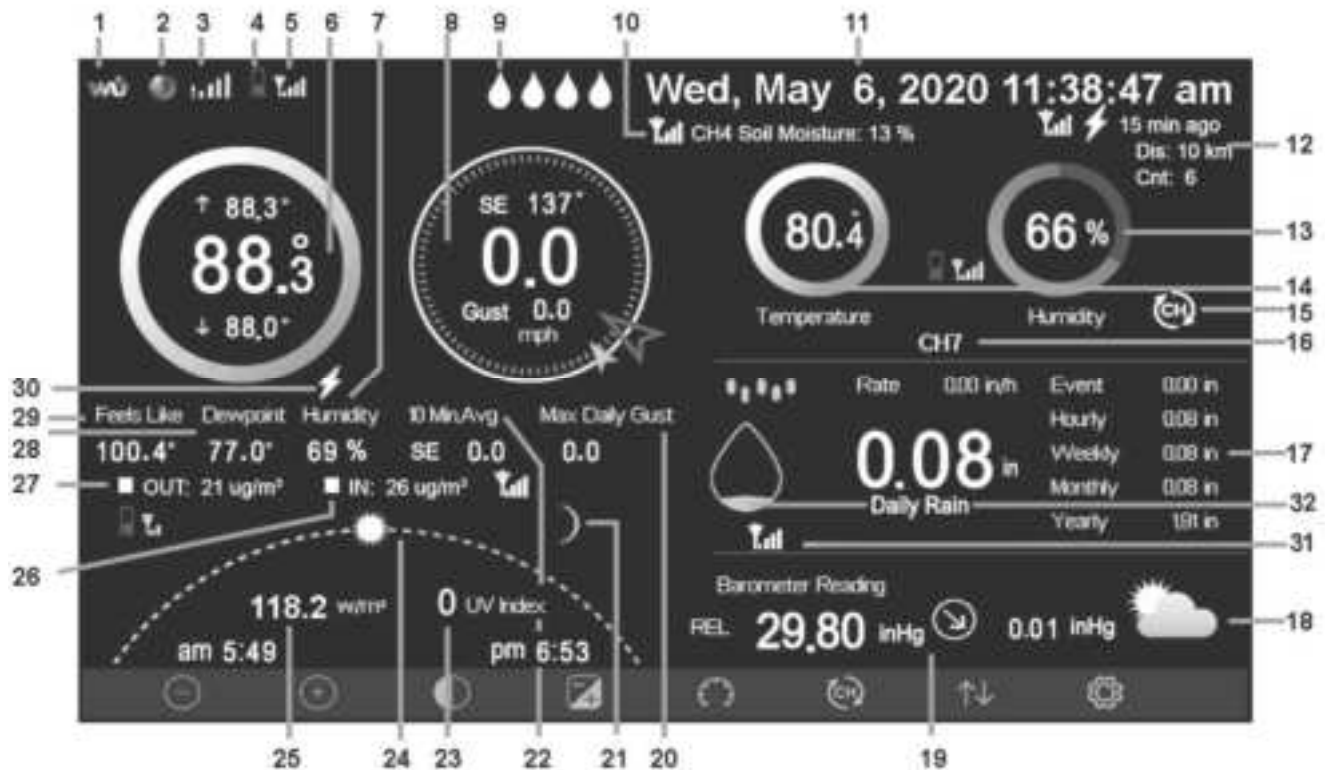The display tablet home screen layout is shown in Figure .

Figure 11

No	Description	No	Description
1	WeatherUnderground.com connection icon	16	Channel indicator
2	AmbientWeather.net connection icon	17	Rain rate, daily, hourly, weekly, monthly and yearly rain
3	Wi-Fi signal strength icon. An exclamation point ! indicates the display is connected to Wi-Fi but not the Internet.	18	Forecast icon based on rate of change of pressure
4	Outdoor Sensor Array Low Battery Indicator	19	Barometric pressure (REL or ABS), rate of change and rate of change arrow
5	Outdoor Sensor Array Signal Quality	20	Max daily wind gust
6	Current, high and low outdoor temperature	21	Moon Phase
7	Humidity	22	10-minute average wind speed and direction
8	Wind speed, wind gust, current wind direction (blue arrow), 10-minute average wind direction (larger gray arrow).	23	UV Index
9	Leak detector status (channels 1-4)	24	Sunrise, sunset, sun arc
10	Soil moisture (channels 1-8)	25	Solar Radiation
11	Current date and time	26	Indoor PM2.5 sensor
12	Lighting detector last strike, last strike time and strikes per hour	27	Outdoor PM2.5 sensor
13	Indoor, Channel 1-8 humidity	28	Dew Point
14	Indoor, Channel 1-8 temperature	29	Feels Like Temperature
15	Channel scroll mode indicator	30	Lightning icon appears when then Dew Point

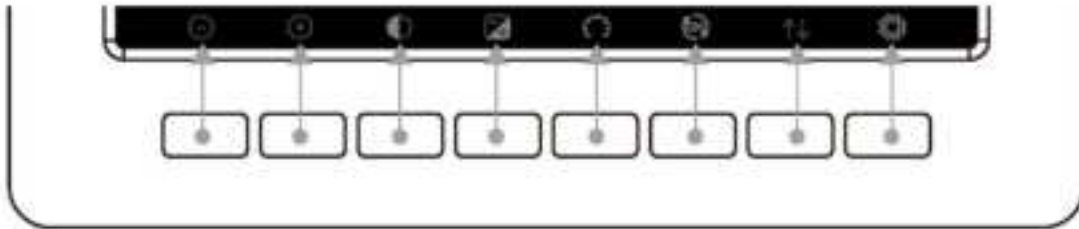| No	Description	No	Description
			exceeds 70 ºF, which signifies conditions may be possible for lightning storms to form in the area.
		31	5000-RAIN signal strength
		32	Hourly Rain Icon

4.5 Display Buttons

Figure 12

Icon	Description
	Brightness control key Press this key to enhance the brightness
	Brightness control key Press this key to decrease the brightness
	Backlight on/off key Press this key to turn on/off the display
	Background key Press this key to choose between dark background display and light background display
	Pressure display key Press this key to choose the display between Absolute pressure and Relative pressure.
	Channel key Press this key to change the display between indoor temperature & humidity, multiple channel temperature & humidity and scroll mode, where the channels scroll every 5 seconds.
	History key Press this key to enter History Mode
	Set key Press this key to enter Set Mode

4.6 Hourly Rain Icon

The Hourly Rainfall Icon shows the accumulated rainfall for the last hour (60 mins). For the purpose of this icon, the console stores the rainfall every 5 minutes and displays the sum of the last 12 measurements (trailing 60-minute summary).

Hourly Rain (in)	Icon	Hourly Rain (in)	Icon
0.0		0.6 to 0.8	
0 to 0.2		0.8 to 1	
0.2 to 0.4		1 to 1.2	
0.4 to 0.6		1.2 to 1.4	

Figure 13

4.7 Set Mode
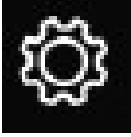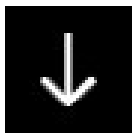
The Set Mode allows you to customize your display, manage archive data, and connect your display tablet to the Internet.

Enter the Setup Mode

Figure 14
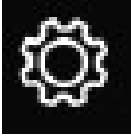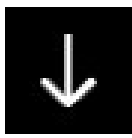
Select units of measure or scroll value up	Select units of measure or scroll value down	Select value	Select value	Scroll field up	Scroll field down	Select next Set Page	return to home

4.7.4 Rainfall Units of Measure

x 7
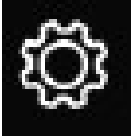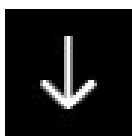
Press to change the rainfall units of measure between in and mm.

4.7.5 Reset Weekly Rain at

x 12
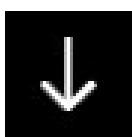
Press to change the day the display resets weekly rain total to Sunday or Monday.

4.7.6 Rainfall Season

x 13
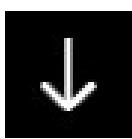
Press to change the beginning of the rainfall yearly season month. The default is January.

4.7.7 Reset Daily Rain at

x 17

Press Plus to set the what time the daily rain resets available times 00:00-23:00

4.7.8 More

x 18

Press Plus to view additional settings. Note: You must be running Firmware Version 1.5.3 or greater.

⊕	⊖	↑	↓	↺
Select field		Scroll field up	Scroll field down	return to Setup

Figure 15

4.8   Calibration Mode

Press ⊕ to Enter the Calibration (Correct) Mode

Figure 16

Increase calibrated value	Decrease calibrated value	Select value	Select value	Scroll field up	Scroll field down	Enter sub-setup mode	return to home

To adjust the parameter, press ⬇ to scroll to the parameter you wish to change. Press ➡ to highlight the

sign (positive vs. negative, if applicable) and significant digit. Press 🔍 or 🔍 to change the calibrated value.

Parameter	Type of Calibration	Default	Typical Calibration Source
Temperature	Offset	Current Value	Red Spirit or Mercury Thermometer (1)
Humidity	Offset	Current Value	Sling Psychrometer (2)
ABS Barometer	Offset	Current Value	Calibrated laboratory grade barometer
REL Barometer	Offset	Current Value	Local airport (3)
Wind Direction	Offset	Current Value	GPS, Compass (4)
Solar Radiation	Gain	1.00	Calibrated laboratory grade solar radiation sensor
1 w/m^2	Gain	126.7 lux	Solar radiation conversion from lux to w/m^2 for wavelength correction (5)
Wind	Gain	1.00	Calibrated laboratory grade wind meter (6)
Rain	Gain	1.00	Sight glass rain gauge with an aperture of at least 4" (7)
Daily Rain	Offset	Current Value	Apply an offset if the weather station was not operating for the entire day.
Weekly Rain	Offset	Current Value	Apply an offset if the weather station was not operating for the entire week.
Monthly Rain	Offset	Current Value	Apply an offset if the weather station was not operating for the entire month.
Yearly Rain	Offset	Current Value	Apply an offset if the weather station was not operating for the entire year.

(1) Temperature errors can occur when a sensor is placed too close to a heat source (such as a building structure, the ground or trees).

To calibrate temperature, we recommend a mercury or red spirit (fluid) thermometer. Bi-metal (dial) and digital thermometers (from other weather stations) are not a good source and have their own margin of error. Using a local weather station in your area is also a poor source due to changes in location, timing (airport weather stations are only updated once per hour) and possible calibration errors (many official weather stations are not properly installed and calibrated).

Place the sensor in a shaded, controlled environment next to the fluid thermometer, and allow the sensor to stabilize for 48 hours. Compare this temperature to the fluid thermometer and adjust the tablet to match the fluid thermometer.

(2) Humidity is a difficult parameter to measure electronically and drifts over time due to contamination. In addition, location has an adverse effect on humidity readings (installation over dirt vs. lawn for example).

Official stations recalibrate or replace humidity sensors on a yearly basis. Due to manufacturing tolerances, the humidity is accurate to ± 5%. To improve this accuracy, the indoor and outdoor humidity can be calibrated using an accurate source, such as a sling psychrometer.

(3) The display tablet displays two different pressures: absolute (measured) and relative (corrected to sea-level).

To compare pressure conditions from one location to another, meteorologists correct pressure to sea-level conditions. Because the air pressure decreases as you rise in altitude, the sea-level corrected pressure (the pressure your location would be at if located at sea-level) is generally higher than your measured pressure.

Thus, your absolute pressure may read 28.62 inHg (969 mb) at an altitude of 1000 feet (305 m), but the relative pressure is 30.00 inHg (1016 mb).

The standard sea-level pressure is 29.92 in Hg (1013 mb). This is the average sea-level pressure around the world. Relative pressure measurements greater than 29.92 inHg (1013 mb) are considered high

pressure and relative pressure measurements less than 29.92 inHg are considered low pressure.

To determine the relative pressure for your location, locate your local "official" barometric pressure reading on www.AmbientwWeather.net/baro or scan QR code below. To access the pressure relative pressure calibration screen of your console, see Section 6.11 / Figure 56 to enter the value.

Note: Calibration setting is saved until console is factory reset. If the console location elevation changes it will need to be recalibrated.

(4) Only use this if you improperly installed the weather station sensor array and did not point the direction reference to true north.

(5) The default conversion factor based on the wavelength for bright sunlight is 126.7 lux / w/m^2 . This variable can be adjusted by photovoltaic experts based on the light wavelength of interest, but for most weather station owners, is accurate for typical applications, such as calculating evapotranspiration and solar panel efficiency.

(6) Wind speed is the most sensitive to installation constraints. The rule of thumb for properly installing a wind speed sensor is 4 x the distance of the tallest obstruction. For example, if your house is 20' tall and you mount the sensor on a 5' pole:

Distance = 4 x (20 – 5)' = 60'.

Many installations are not perfect and installing the weather station on a roof can be difficult. Thus, you can calibrate for this error with a wind speed multiplier.

In addition to the installation challenges, wind cup bearings (moving parts) wear over time.

Without a calibrated source, wind speed can be difficult to measure. We recommend using a calibrated wind meter (available from Ambient Weather) and a constant speed, high speed fan.

(7) The rain collector is calibrated at the factory based on the funnel diameter. The bucket tips every 0.004" of rain (referred to as resolution). The accumulated rainfall can be compared to a sight glass rain gauge with an aperture of at least 4". The following is a link to an accurate sight glass rain gauge:

http://www.ambientweather.com/stprraga.html

Make sure you periodically clean the rain gauge funnel.

Note: The purpose of calibration is to fine tune or correct for any sensor error associated with the devices margin of error. Errors can occur due to electronic variation (example, the temperature sensor is a resistive thermal device or RTD, the humidity sensor is a capacitance device), mechanical variation, or degradation (wearing of moving parts, contamination of sensors).

Calibration is only useful if you have a known calibrated source, you can compare it against and is optional. This section discusses practices, procedures, and sources for sensor calibration to reduce manufacturing and degradation errors. Do not compare your readings obtained from sources such as the internet, radio, television, or newspapers. The purpose of your weather station is to measure conditions of your surroundings, which vary significantly from location to location.

5   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.
Calibration	Calibration is a comparison between measurements – one of known magnitude or correctness of one device (standard) and another measurement made in as similar a way as possible with a second device (instrument).
Rain Gauge	A rain gauge is a device that measures liquid precipitation (rain), as opposed to solid precipitation (snow gauge) over a set period. All digital rain gauges are self-emptying or self-dumping (also referred to as tipping rain gauge). The precision of the rain gauge is based on the volume of rain per emptying cycle.
Resolution	Resolution is defined as the number of significant digits (decimal places) to which a value is being reliably measured.
Solar Radiation	A solar radiation sensor measures solar energy from the sun. Solar radiation is radiant energy emitted by the sun from a nuclear fusion reaction that creates electromagnetic energy. The spectrum of solar radiation is close to that of a black object with a temperature of about 5800 K. About half of the radiation is in the visible short-wave part of the electromagnetic spectrum. The other half is mostly in the near-infrared part, with some in the ultraviolet part of the spectrum.
Thermometer	A thermometer is a device that measures temperature. Most digital thermometers are resistive thermal devices (RTD). RTDs measure changes in temperature as a function of electrical resistance.
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.

Figure 17

6   Specifications

6.3   Wireless Specifications
- Line of sight wireless rain collector RF transmission (in open air): 300 feet, 100 feet under most conditions
- Update Rate: Outdoor Sensor: 49 seconds
- Sensor Array RF Frequency: 915 MHz

6.4 Measurement Specifications

The following table provides the specifications for the measured parameters.

Measurement	Range	Accuracy	Resolution
Rain	0 to 236 in.	± 5%	0.004 in

Figure 18

Transmission distance in open field: 100m (300 ft)
Sensor reporting interval: 49 seconds
RF Frequency: 915 MHz

6.5 Power Consumption

- Rain Gauge: 1 x AA battery (not included)

7 Maintenance

7.3 Array Maintenance

1. Clean the rain gauge once every 3 months. Rotate the funnel counterclockwise 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 radiation sensor and 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 Amazon and most hardware stores.
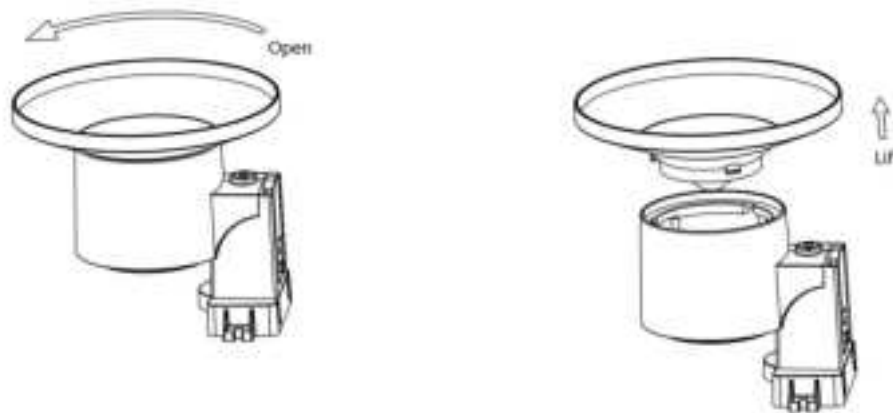5. In snowy environments, spray the top of the weather station with anti-icing silicon spray to prevent snow build up.

Figure 19

8 Troubleshooting Guide

If your question is not answered here, you can contact us as follows:

1. Online Support: https://ambientweather.com/faqs/question/tags/tag/WS-5000/
2. Email Support: support@ambientweather.com
3. Technical Support: 480-346-3380 (M-F 8am to 4pm Arizona Time)

Problem	Solution
Outdoor sensor array does not communicate to the display tablet.	Reset the sensor array. Press the reset button as described in Figure 1 #12. With an open-ended paperclip, press the reset button for 3 seconds to completely discharge the voltage. Take out the batteries and wait one minute, while covering the solar panel to drain the voltage. Put batteries back in and resync the tablet with the sensor array about 10 feet away. The LED next to the battery compartment will flash every 5 seconds. If the LED is not flashing every 5 seconds… Replace the batteries in the outside sensor array. If the batteries were recently replaced, check the polarity. If the sensor is flashing every 5 seconds, proceed to the next step. There may be a temporary loss of communication due to reception loss related to interference or other location factors, or the batteries may have been changed in the sensor array and the tablet has not been reset. The solution may be as simple as powering down and up the tablet (remove AC power, wait 10 seconds, and reinsert AC power).
Temperature sensor reads too high in the daytime.	Make certain that the sensor array is not too close to heat generating sources or strictures, such as buildings, pavement, walls or air conditioning units. Use the calibration feature to offset installation issues related to radiant heat sources. Reference Section 4.8.
Relative pressure does not agree with official reporting station	You may be viewing the absolute pressure, not the relative pressure. Select the relative pressure. Make sure you properly calibrate the sensor to an official local weather station. Reference Section 4.8..
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, level mounting solution.
Data not reporting to Wunderground.com	1. Confirm your station ID and station Key is correct. 2. Make sure the date and time is correct on the tablet. If incorrect, you may be reporting old data, not real time data. 3. Make sure your time zone is set properly. If incorrect, you may be reporting old data, not real time data. 4. Check your router firewall settings. The tablet sends data via Port 80.
No Wi-Fi connection	1. Check for Wi-Fi symbol on the display. If wireless connectivity is successful, the Wi-Fi icon will be displayed in the time field. 2. Make sure your modem Wi-Fi settings are correct (network name, and password). 3. Make sure the tablet is plugged into AC power. The tablet will not connect to Wi-Fi when powered by batteries only.

Problem	Solution
	4. The tablet only supports and connects to 2.4 GHz routers. If you own a 5 GHz router, and it is a dual band router, you will need to disable the 5 GHz band, and enable the 2.4 GHz band. 5. The tablet does not support guest networks.
Exclamation point ! next to the Wi-Fi icon	If there is an exclamation point ! next to the Wi-Fi icon on the WS-5000 display, it means the display is connected to Wi-Fi but the Wi-Fi is not connected to the Internet Make sure the 2.4 GHz band on your router is connected to the Internet. If the problem persists, try rebooting your router.
Wind Vane does not spin as freely as the wind cups.	This is by design. The dampening prevents the wind vane from spinning with the slightest breeze, which will result in variable wind all the time. The added resistance allows the wind vane to change direction with 2 – 3 mph, providing a much better wind direction tracking.
Time off by increments of an hour, or date is off by one day.	The time zone is entered incorrectly. Reference Section **Error! Reference source not found.**.

Figure 18

9   Accessories

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

Accessory	Description
Ambient Weather Mounting Solutions - https://ambientweather.com/weather-station-mounting	Ambient Weather provides the most comprehensive mounting solutions for weather stations, including tripods, pole extensions, pole mounting kits, ground stakes and more.

Figure 19

10 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 safety information.
The specifications of this product may change without prior notice.

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

No part of this manual may be reproduced without written authorization of the manufacturer.

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

11 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 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.

12   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 an 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); (3) damage resulting from failure to follow instructions contained in your owner's manual; (4) damage resulting from the performance of repairs or alterations by someone other than an authorized Ambient, LLC authorized service center; (5) units used for other than personal use (6) applications and uses that this product was not intended (7) the products inability to receive a signal due to any source of interference or metal obstructions and (8) 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.

13 California Prop 65

WARNING: Use of the Ambient Weather Products can expose you to chemicals, including lead and lead compounds, which are known to the State of California to cause cancer and bisphenol A (BPA), and phthalates DINP and/or DEHP, which are known to the State of California to cause birth defects or other reproductive harm.

Can I Trust that Ambient Weather Products are Safe Despite this Warning?

In 1986, California voters approved the Safe Drinking Water and Toxic Enforcement Act known as Proposition 65 or Prop 65. The purpose of Proposition 65 is to ensure that people are informed about exposure to chemicals known by the State of California to cause cancer, birth defects and/or other reproductive harm. A company with ten or more employees that operates within the State of California (or sells products in California) must comply with the requirements of Proposition 65. To comply, businesses are: (1) prohibited from knowingly discharging listed chemicals into sources of drinking water; and (2) required to provide a "clear and reasonable" warning before knowingly and intentionally exposing anyone to a listed chemical. Proposition 65 mandates that the Governor of California maintain and publish a list of chemicals that are known to cause cancer, birth defects and/or other reproductive harm. The Prop 65 list, which must be updated annually, includes over 1,000 chemicals, including many that are commonly used in the electronics industry.

Although our manufacturing process is "lead-free" and RoHS compliant, it remains possible that trace amounts of lead could be found in components or subassemblies of Ambient Weather Products. Bisphenol A (BPSA) could conceivably be present in minute amounts in our plastic housings, lenses, labels or adhesives, and DEHP & DINP

(phthalates) could possibly be found in PVC wire coatings of our cables, housings, and power cords. Unlike RoHS, Prop 65 does not establish a specific threshold for reporting on the substances of concern and instead sets forth a much less definitive standard requiring that the business demonstrate with certainty that there is "no significant risk" resulting from exposure. With respect to carcinogens, the "no significant risk" level is defined as the level which is calculated to result in not more than one excess case of cancer in 100,000 individuals exposed over a 70-year lifetime. In other words, if you are exposed to the chemical in question at this level every day for 70 years, theoretically, it will increase your chances of getting cancer by no more than 1 case in 100,000 individuals so exposed. With respect to reproductive toxicants, the "no significant risk" level is defined as the level of exposure which, even if multiplied by 1,000, will not produce birth defects or other reproductive harm. In other words, the level of exposure is below the "no observable effect level," divided by 1,000. (The "no observable effect level" is the highest dose level which has not been associated with observable reproductive harm in humans or test animals.) Proposition 65 does not clarify whether exposure is to be measured only in normal operation, or in the event of misuse such as intentionally damaging, incinerating or consuming an Ambient Weather Product or component and Ambient Weather has not attempted to evaluate the level of exposure.

A Proposition 65 warning means one of two things: (1) the business has evaluated the exposure and has concluded that it exceeds the "no significant risk level"; or (2) the business has chosen to provide a warning simply based on its knowledge about the presence of a listed chemical without attempting to evaluate the exposure. The California government has itself clarified that "The fact that a product bears a Proposition 65 warning does not mean by itself that the product is unsafe." The government has also explained, "You could think of Proposition 65 more as a 'right to know' law than a pure product safety law."

While using Ambient Weather Products as intended, we believe any potential exposure would be negligible or well within the "no significant risk" range. However, to ensure compliance with California law and our customers' right to know, we have elected to place the Proposition 65 warning signs on Ambient Weather Products.

For further information about California's Proposition 65, please visit https://oehha.ca.gov/prop65/background/p65plain.html