

# Ambient Weather WS-1550-IP OBSERVER Solar Powered Wireless IP Weather Station User Manual



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## 1. Introduction

Thank you for your purchase of the Ambient Weather WS-1550 Smart Wireless Weather Station with Remote Monitoring. The following user guide provides step by step instructions for installation, operation and troubleshooting. To download the latest manual, firmware upgrades and IP Finder Tools, visit:

<http://www.ambientweather.com/observerip.html>

The product is continuously changing and improving, particularly online services and associated applications. Make sure you download the latest manual. Please visit:

<https://ambientweather.net/product/ws-1550-ip>

## 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 on the ground and inside a building or home. Only install the weather station on a clear, dry day.

## 3. Quick Start Guide

Although the manual is comprehensive, much of the information contained may be intuitive. In addition, the manual does 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, and upload to the internet, along with references to the pertinent sections.

Required		
Step	Description	Section
1	Assemble and power up the sensor array	5.3
2	Power up the indoor thermometer-hygrometer-barometer (optional WH32B sensor)	5.5
3	Program and power up the optional outdoor thermo-hygrometer sensors (optional WH31B).	5.6
4	Power up the ObserverIP, and connect to your router.	6
5	Select the weather station type <b>WS-1550-IP</b> .	6.6.1
6	Mount the sensor array	5.3.7
7	Calibrate the relative pressure to sea-level conditions (local airport) on the ObserverIP module (optional WH32B sensor)	6.9
8	Reset the rain to zero on console	6.7.1
9	Register and upload to Weather Servers	6.8

## 4. Pre-Installation Checkout and Site Survey

### 4.1 Pre Installation Checkout

Before installing your weather station in the permanent location, we recommend operating the weather station for one week in a temporary location with easy access. This will allow you to check out all of the functions, insure proper operation, and familiarize you with the weather station and calibration procedures. This will also allow you to test the wireless range of the weather station.

## 4.2 Site Survey

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 weather station.
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  $4 \times (20 - 6) = 56'$  away.
4. Wireless Range. The radio communication between receiver and transmitter in an open field can reach a distance of up to 330 feet, providing there are no interfering obstacles such as buildings, trees, vehicles, high voltage lines. Wireless signals will not penetrate metal buildings. Under most conditions, the maximum wireless range is 100'.
5. Radio interference such as PCs, radios or TV sets can, in the worst case, entirely cut off radio communication. Please take this into consideration when choosing ObserverIP receiver or mounting locations. Make sure your ObserverIP receiver is at least five feet away from any electronic device to avoid interference.
6. Visit Ambient Weather Mounting Solutions for assistance and ideas for mounting your weather station:

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

## 5. Getting Started

The WS-1550-IP weather station consists of a ObserverIP receiver, and an all in one sensor array.

### 5.1 Parts List

QTY	Item
1	ObserverIP Module
1	Sensor Array
1	Wind Vane
1	5V DC Adaptor
2	Pole mounting U-bolts
2	Pole mounting U-bolt nuts
1	Ethernet Cable
1	Allen wrench
1	ObserverIP Module Reset Tool
1	User manual

### 5.2 Recommend Tools

- Precision screwdriver (for small Phillips screw on battery cover door)
- Adjustable wrench (for mounting pole)
- Compass or GPS (for wind direction calibration)

### 5.3 Sensor Array Set Up

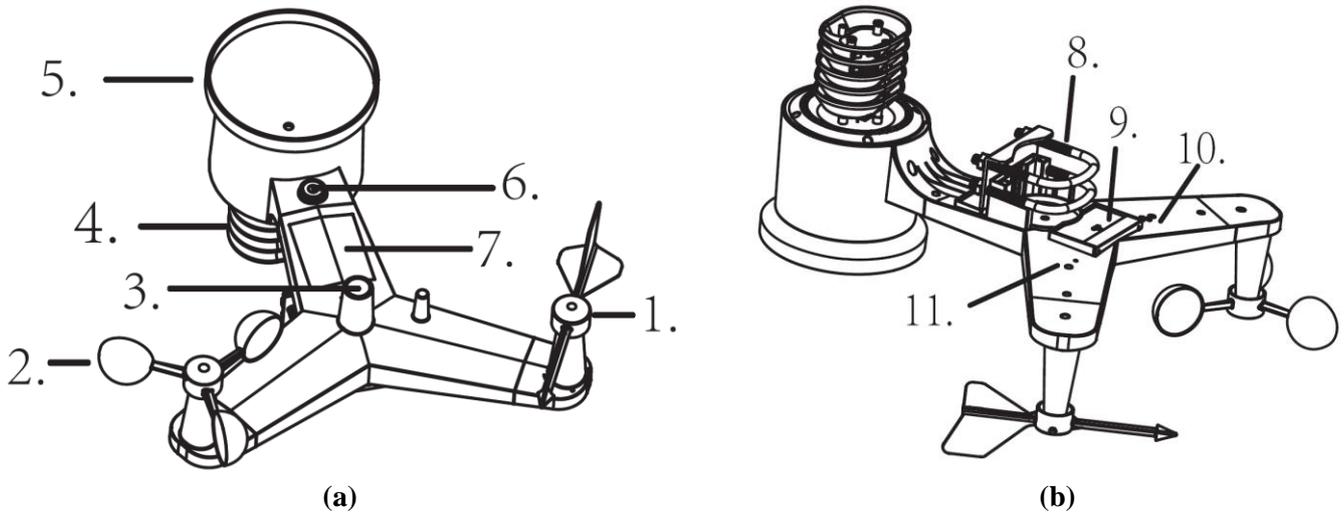


Figure 1

No	Description	No	Description
1	Wind Vane (measures wind direction)	7	Solar panel
2	Wind Speed Sensor (measures wind speed)	8	U-Bolt
3	UV sensor/ Light sensor	9	Battery compartment
4	Thermometer-hygrometer sensor (measures temperature and humidity)	10	Reset button
5	Rain collector	11	LED transmitter Indicator
6	Bubble level		

#### 5.3.1 Install Wind Vane

Reference Figure 2. (a) Locate and align the flat key on the wind vane shaft to the flat key on the wind vane and push the vane on to the shaft. (b) tighten the set screw with a precision screw driver and make sure the wind vane spins freely.

 **Note:** You may need to back out the set screw first before sliding the vane onto the shaft.

 **Note:** The wind vane shaft 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 of the time. The added resistance allows the wind vane to change direction with 2 – 3 mph, providing a much better wind direction tracking.

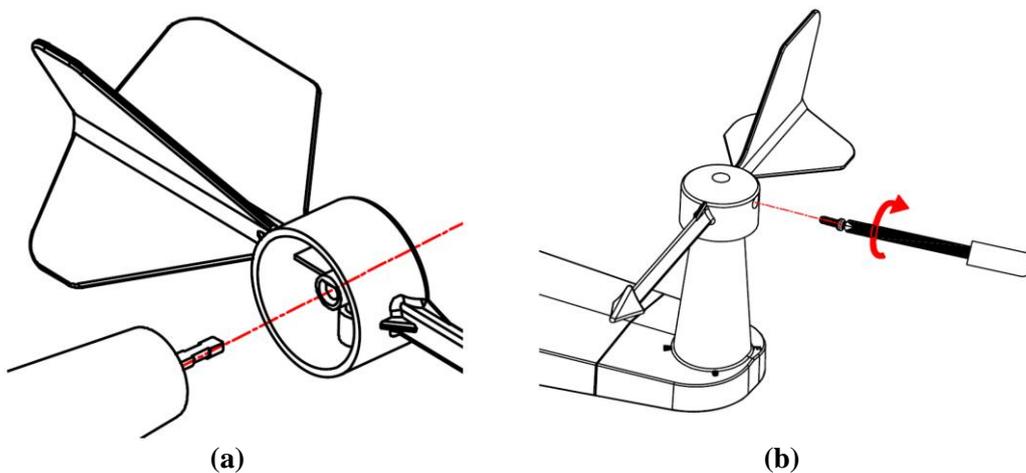


Figure 2

### 5.3.2 Install Wind Cups

Reference Figure 3. (a) push the wind cups on to the shaft. (b) tighten the set screw with a precision screw driver and make sure the wind cups spin freely.

 **Note:** You may need to back out the set screw first before sliding the cups onto the shaft.

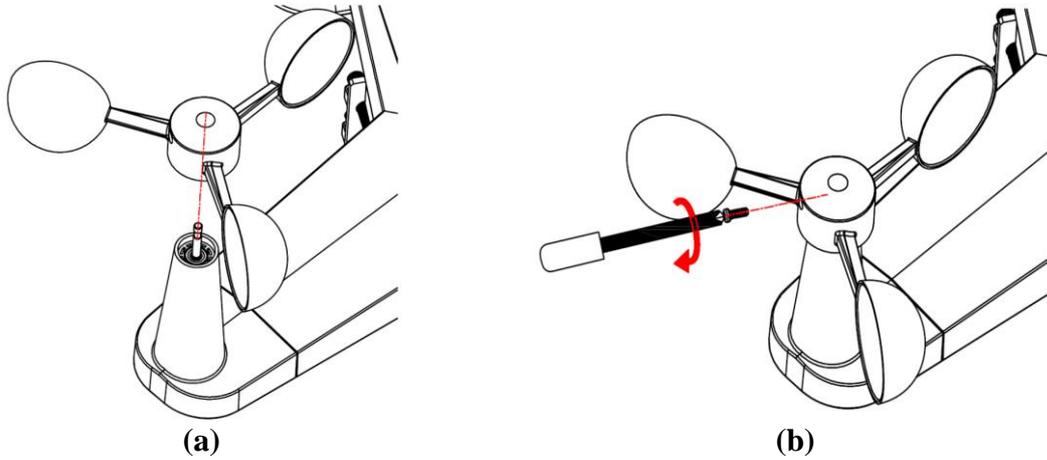
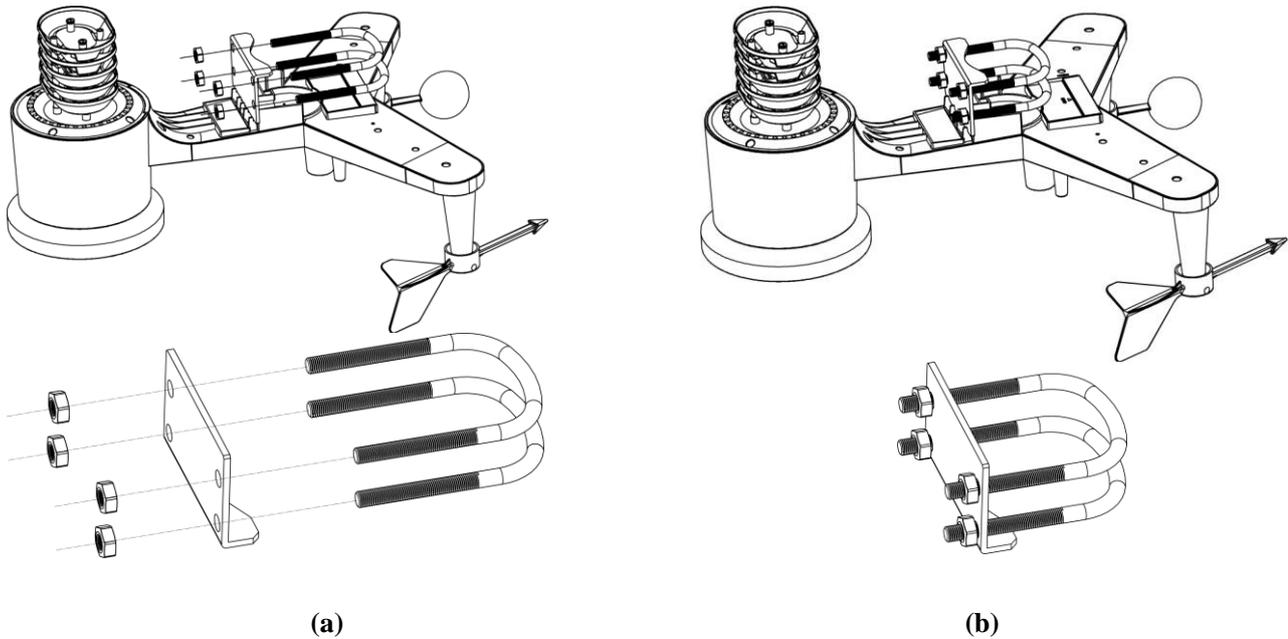


Figure 3

### 5.3.3 Install U-Bolts

Note: Your U-bolts may have come preassembled at the factory.

- (a) Insert the U-Bolts into the sensor array mounting bracket and hand tighten the nuts.
- (b) Tighten the nuts to fit the size of your mounting pole (between 1" and 2" diameter)
- (c) Insert the sensor array and U-Bolt assembly onto the mounting pole.
- (d) Tighten the U-Bolts around the pole with an adjustable wrench. Make sure the sensor array is level.



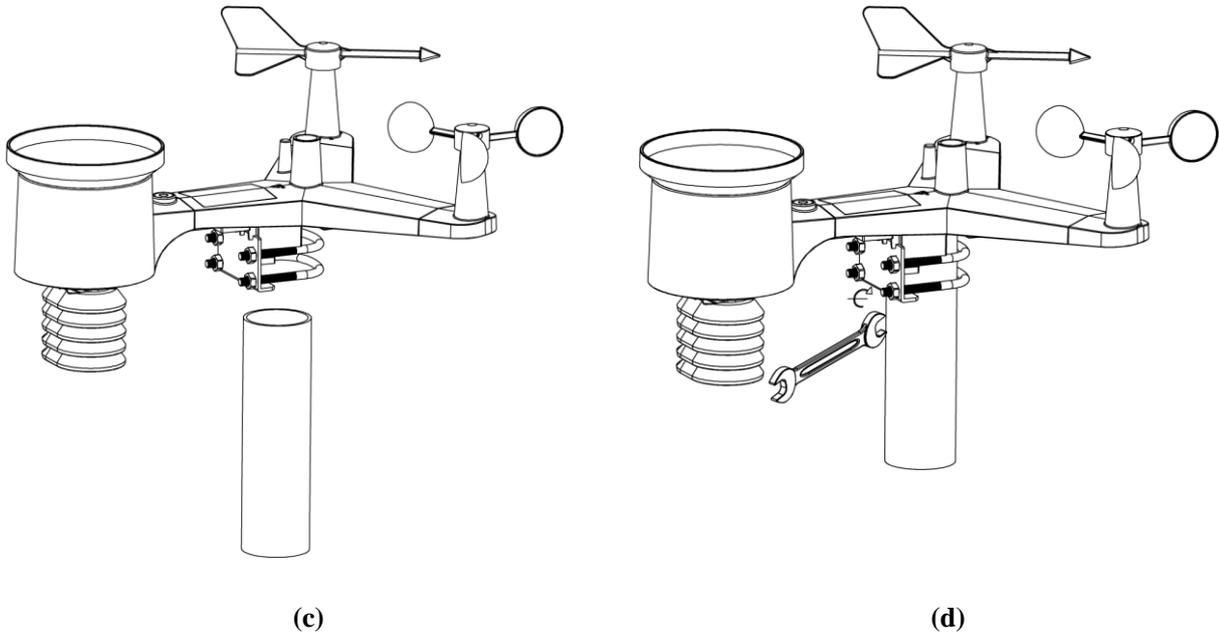


Figure 4

### 5.3.4 Install the Rain Gauge Funnel

Reference Figure 5. Install the rain gauge funnel. Rotate clockwise to attach the funnel to the sensor array.

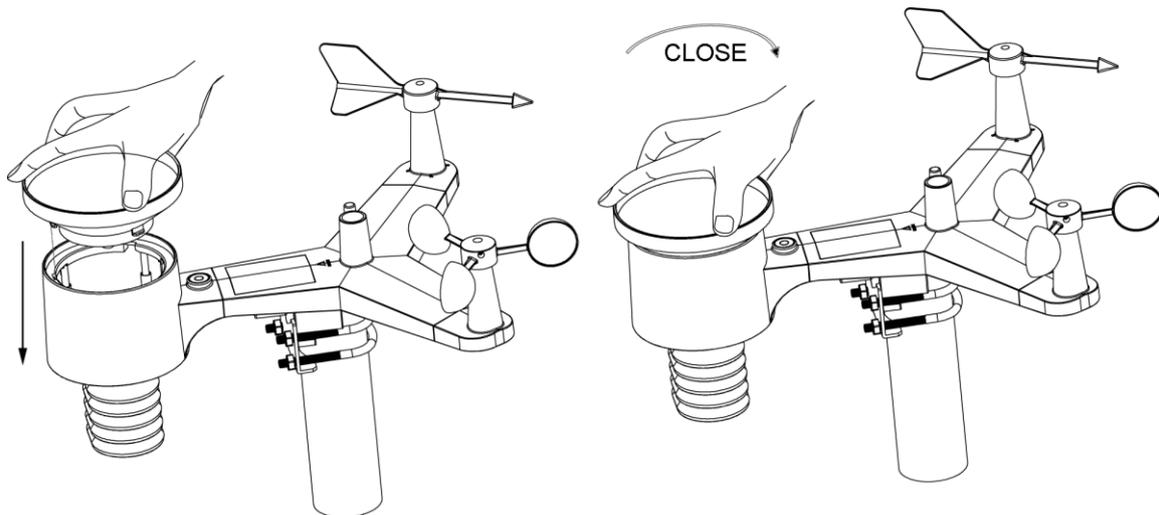
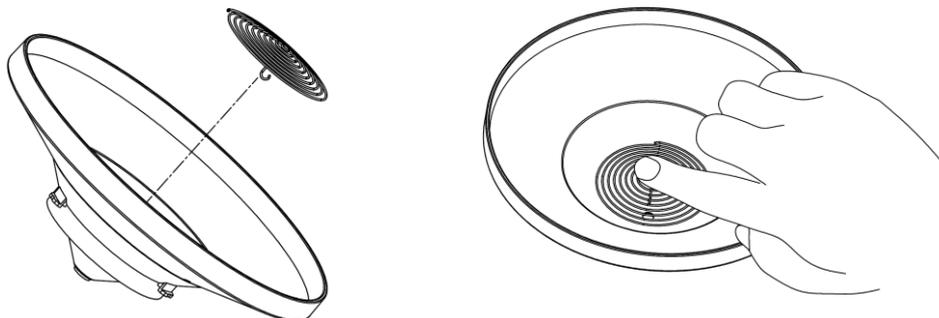


Figure 5

### 5.3.5 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.



### 5.3.6 Install Batteries

Reference Figure 6. Insert 2 x AA non-rechargeable batteries (not included) into the battery compartment. The LED indicator on the back of the transmitter will turn on for four seconds, and then flash once every 16 seconds (the sensor transmission update period).

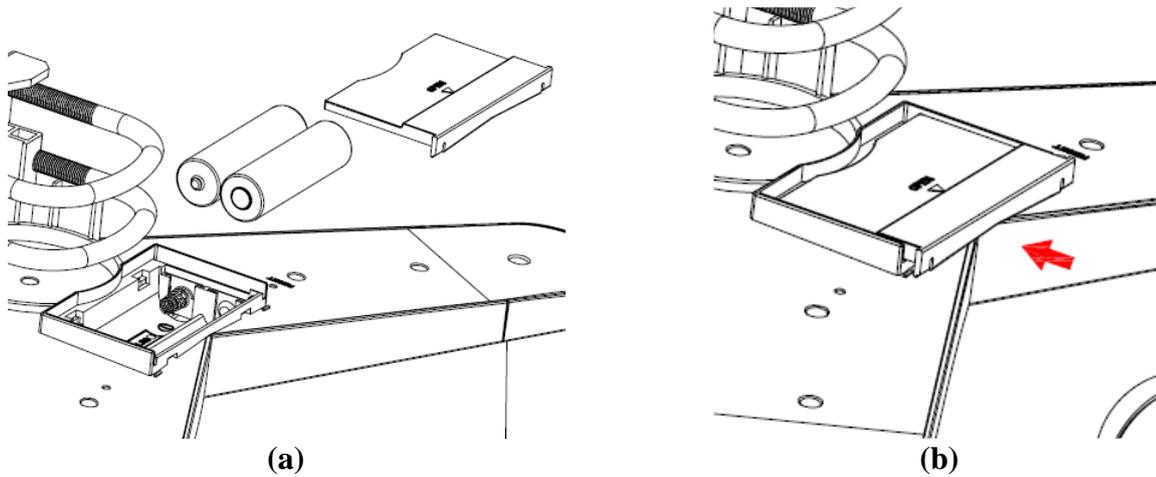


Figure 6

 **Note:** If the LED does not light up, or stays on permanently, make sure the battery polarity is correct, or the batteries are fresh. Do not install the batteries backwards. You can permanently damage the thermo-hygrometer.

 **Note:** We recommend lithium batteries for cold weather climates, but alkaline batteries are sufficient for most climates. We do not recommend rechargeable batteries. They have lower voltages, do not operate well at wide temperature ranges, and do not last as long, resulting in poorer reception.

### 5.3.7 Install Mounting Pole

Reference Figure 7. 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.

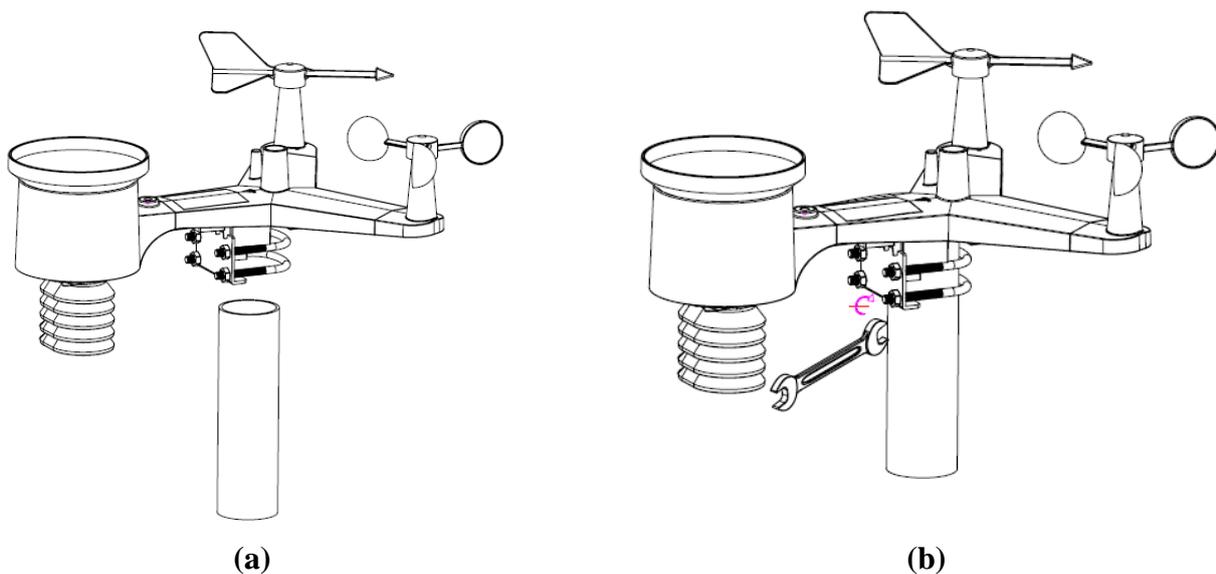


Figure 7

Use the bubble level next to the rain sensor to make sure the sensor array is completely level. If the sensor array is not

level, the rain gauge, UV and solar radiation sensors will not measure properly.

 **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.

### 5.3.7.1 Aligning the Wind Direction

Locate the four wind vane compass rose indicators of N, E, S, W (representing North, East, South and West) at the base of the wind vane. Align the compass rose direction upon final installation with a compass or GPS.

## 5.4 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 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%

## 5.5 Indoor Thermo-Hygrometer-Barometer Transmitter (Optional WH32B)

The indoor thermometer, hygrometer and barometer measures and displays the indoor temperature, humidity and pressure and transmits this data to the ObserverIP receiver.

 **Note:** Do not install the thermo-hygrometer-barometer transmitter outside. This will cause errors in the barometric pressure due to large variations in temperature (barometric pressure is temperature compensated for accuracy). Note that pressure readings made inside your home, business, or facility will correspond closely to the actual barometric pressure outside.

 **Note:** The thermo-hygrometer-transmitter transmits directly to the ObserverIP receiver. For best results, place between 5 to 20 feet from the ObserverIP receiver.

 **Note:** To avoid permanent damage, please take note of the battery polarity before inserting the batteries.

Remove the battery door on the back of the sensor by sliding off the battery door. Insert two AA batteries as shown in Figure 2, and close the battery door. Note that the temperature, humidity and barometer will be displayed on the LCD display.

## 5.6 Indoor / Outdoor 8-Channel Thermo-Hygrometer Transmitter (Optional

## WH31B)

 **Note:** The 8-channel sensors only appear on AmbientWeather.net. They are not supported on Weather Underground. Unlike other sensors, they cannot be calibrated or adjusted from the ObserverIP modules User Interface.

 **Note:** Do not use rechargeable batteries. We recommend fresh alkaline batteries for outdoor temperature ranges between -4 °F and 140 °F and fresh lithium batteries for outdoor temperature ranges between -40 °F and 140 °F.

1. Remove the battery door on the back of the transmitter(s) by sliding down the battery door, as shown in Figure 8.

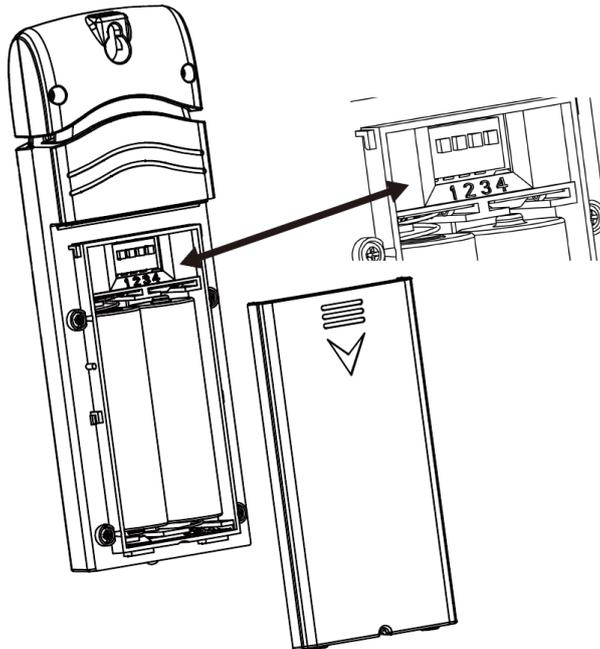


Figure 8

2. **BEFORE** inserting the batteries, locate the dip switches on the inside cover of the lid of the transmitter.
3. **Channel Number:** The ObserverIP supports up to eight transmitters. To set each channel number (the default is Channel 1), change Dip Switches 1, 2 and 3, as referenced in Figure 8.
4. **Temperature Units of Measure:** To change the transmitter display units of measure (°F vs. °C), change Dip Switch 4, as referenced in Figure 8.  
 Switch in down position.  Switch in up position.

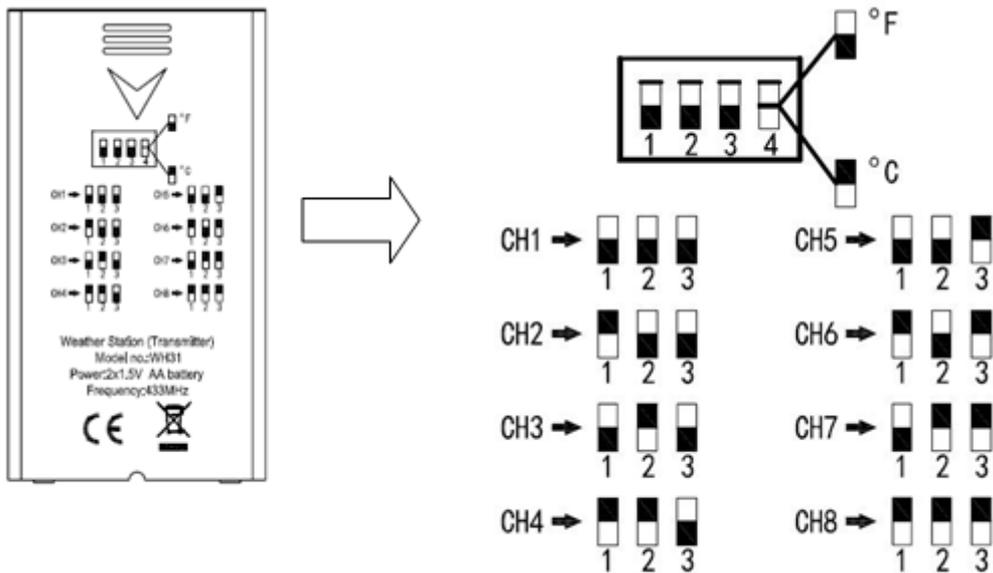


Figure 9

5. Insert two AA batteries.
6. Verify the correct channel number (CH) and temperature units of measure (°F vs. °C) are on the display, as shown in Figure 10.

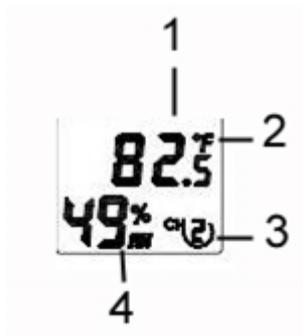


Figure 10

- (1) temperature
- (2) temperature units (°F vs. °C)
- (3) channel number
- (4) relative humidity

7. Close the battery door.
8. Repeat for the additional remote transmitters, verifying each remote is on a different channel.

## 5.7 Mounting the WH32B and WH31B Sensors

 **Note:** If you mount the sensor outside, It is recommended you mount the remote sensor on an outside north facing wall, in a shaded area, at a height at or above the receiver. Direct sunlight and radiant heat sources will result in inaccurate temperature readings. Although the sensor is weatherproof, it is best to mount in a well protected area, such as an eave.

Use a small nail or screw (included) to mount to a vertical surface, as shown in Figure 11.

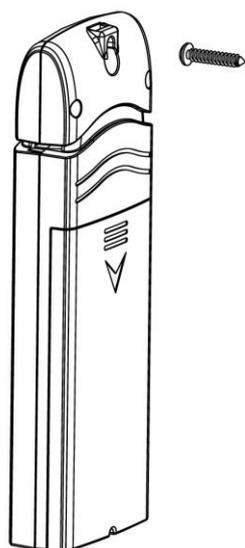


Figure 11

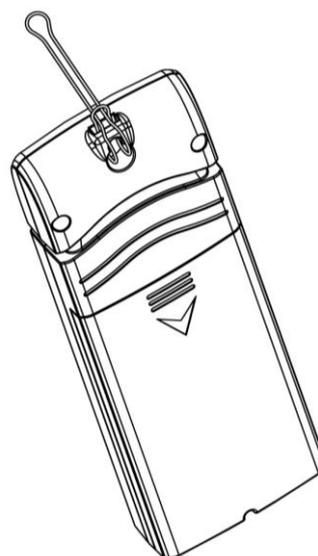


Figure 12

The sensor can also be hung from a nylon zip tie (included) or string (not included).

## 5.8 PM2.5 Air Quality Sensor

The ObserverIP module supports one PM2.5 Air Quality sensor. For more information, please visit:

<https://ambientweather.net/product/pm25>

## 6. Programming the ObserverIP Receiver

### 6.1 Hardware Requirements

1. Broadband router
2. An “always-on” connection to the Internet. A high speed DSL or cable internet connection that maintains constant connection to the internet.

### 6.2 Software Requirements

An IP scan tool is required to locate the ObserverIP on the network.

**Important Note:** Download ObserverIP tools at the following location:

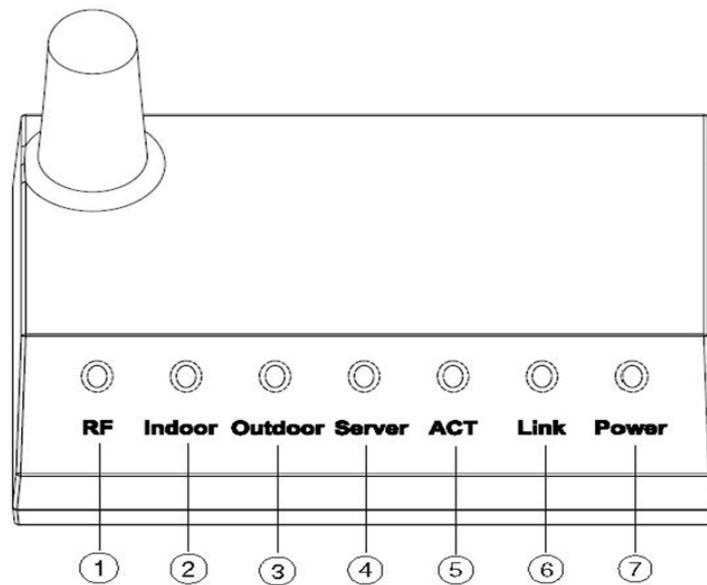
[www.AmbientWeather.com/observerip.html](http://www.AmbientWeather.com/observerip.html)

### 6.3 ObserverIP Physical Connections

Connect the ObserverIP receiver power jack to AC power with the power adapter (included), as shown in Figure 14, reference 10.

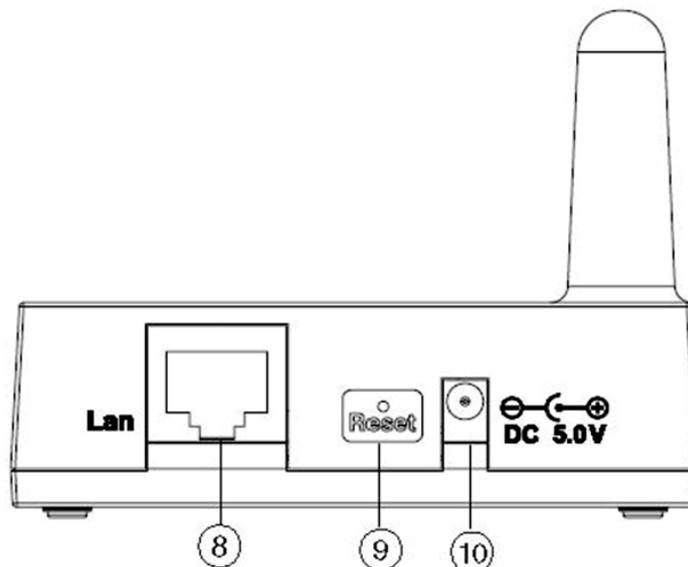
Connect the ObserverIP receiver to your router using the Ethernet cable (included), as shown in Figure 14, reference 8.

Place the sensor array and indoor thermo-hygrometer transmitter about 5 to 10 feet from the ObserverIP receiver and wait several minutes for the remote sensors to synchronize with the receiver. Once synchronized, the Indoor blue LED (Figure 13, reference 2) and Outdoor blue LED (Figure 13, reference 3) will be illuminated.



Ref.	LED	Description
1	RF	On when radio frequency receiver is operating properly
2	Indoor	On when indoor sensor received
3	Outdoor	On when outdoor sensor array received
4	Server	On when connected to Wunderground.com® internet hosting service
5	ACT	Flashes when there is internet activity
6	Link	Connected to the Internet (or router)
7	Power	AC Power connected

Figure 13



Ref.	Description
8	LAN connection (connect to router)
9	Reset button (use IP Module reset tool or open ended paper clip)
10	AC Power connection

Figure 14

## 6.4 Finding the ObserverIP on the Network from your Computer

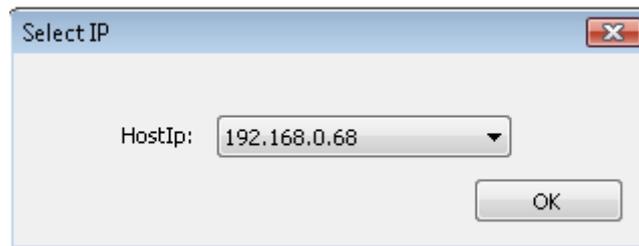
### 6.4.1 PC Users

To find the ObserverIP receiver, launch the IP Tools application downloaded here:

[www.AmbientWeather.com/observerip.html](http://www.AmbientWeather.com/observerip.html)

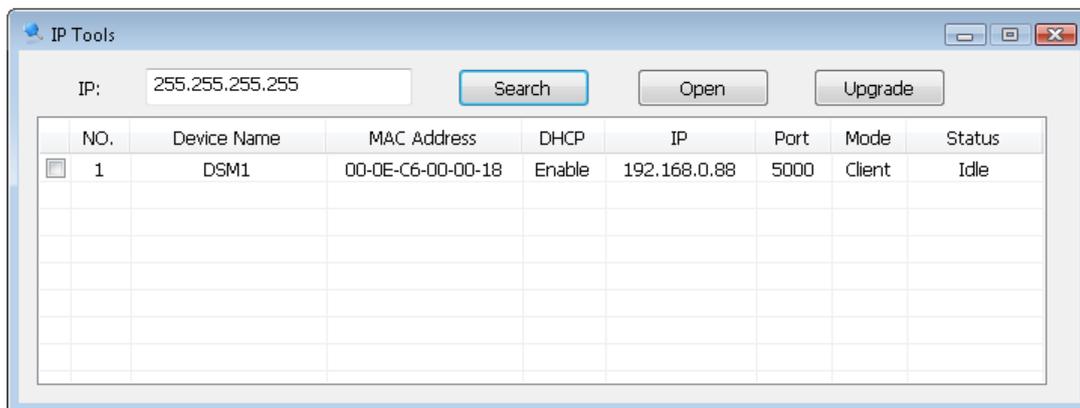


The HostIP (your computers IP address) will be displayed. Press the **OK** button to continue.



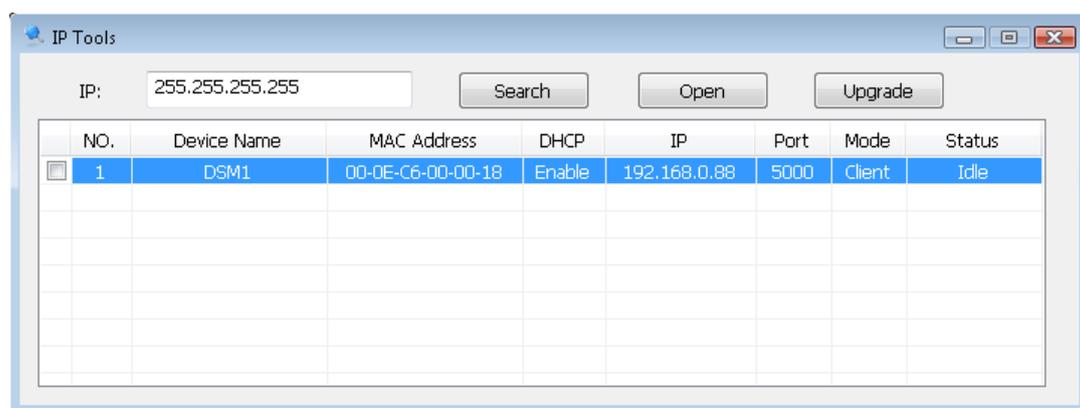
**Figure 15**

Select the **Search** button to find the ObserverIP on your local area network.



**Figure 16**

Select the ObserverIP module on your network as shown in Figure 17 (the field will be highlighted) and select the **Open** button (or double click this field) to view the ObserverIP module's webpage within your browser. Alternately, you can type the IP address in your web browser address bar (example, Figure 18):



**Figure 17**

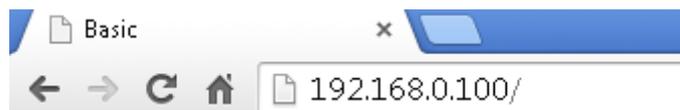


Figure 18

You are now communicating directly to the ObserverIP and can proceed to Section 6.4.

### 6.4.2 Mac Users

To find the ObserverIP receiver, launch the IP Tools application downloaded here:

[www.AmbientWeather.com/observerip.html](http://www.AmbientWeather.com/observerip.html)

The file is compressed as a zip file and must be extracted to run.



Select the **Search** button to find the ObserverIP on your local area network.

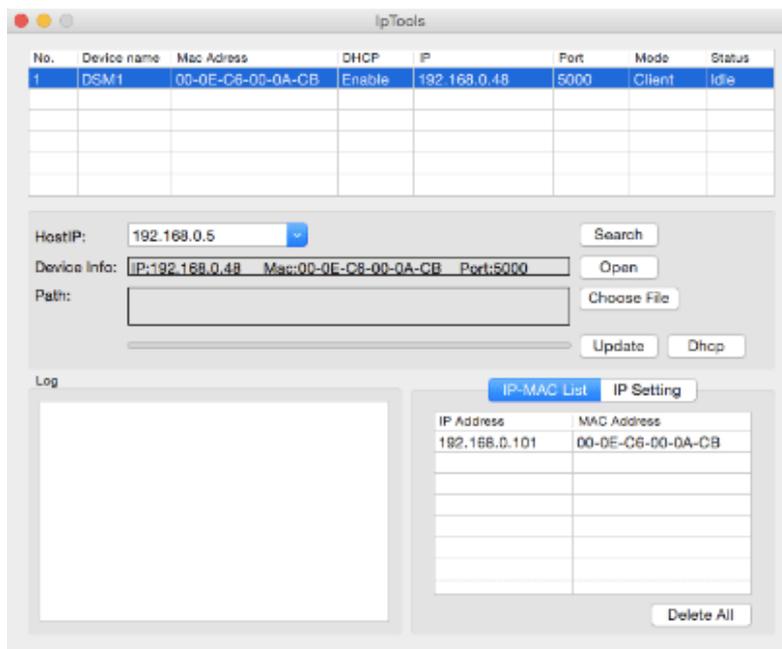


Figure 19

Select the ObserverIP module on your network as shown in Figure 19 (the field will be highlighted) and select the **Open** button (or double click this field) to view the ObserverIP module's webpage within your browser. Alternately, you can type the IP address in your web browser address bar (example, Figure 18):

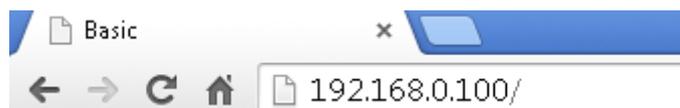


Figure 20

You are now communicating directly to the ObserverIP and can proceed to Section 6.4.

### 6.4.3 Linux Users

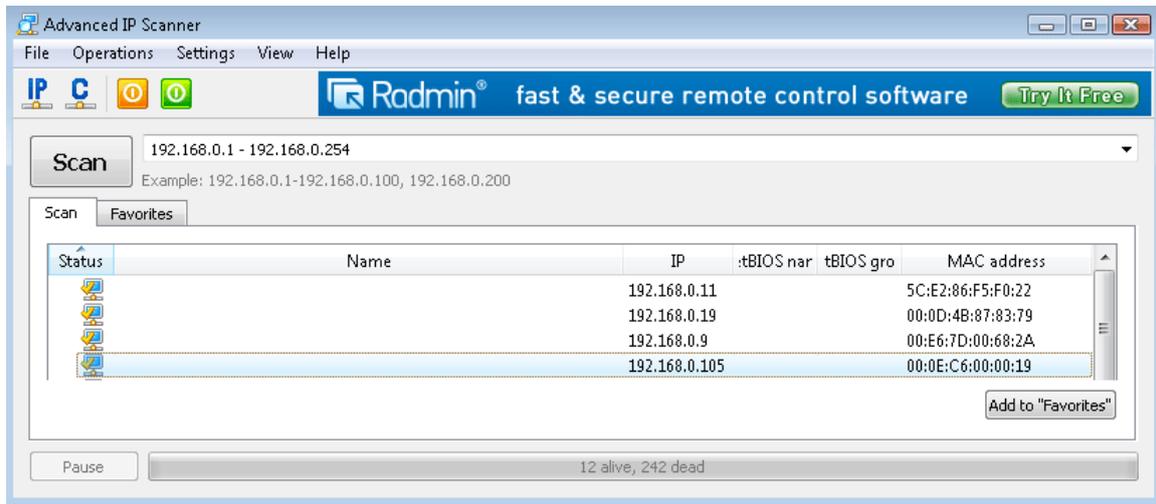
If you use an Apple or Linux operating system, download any commercially available IP scan tool, such as AngryIP Scanner and find the MAC address of the ObserverIP. The MAC address is a unique identifier for internet enabled devices.

The MAC address will be printed on the bottom of the ObserverIP receiver. An example MAC address is 00:0E:C6:00:00:19.

We have included links to free IP Scan Tool applications here:

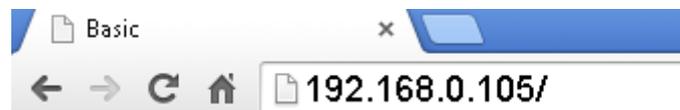
[www.AmbientWeather.com/observerip.html](http://www.AmbientWeather.com/observerip.html)

Figure 21 shows typical scan results. Locate the IP address of the ObserverIP by cross referencing the Mac address. In the example below, the IP address is 192.168.0.105.



**Figure 21**

Type the IP address you located from the IP Scan Tool into your web browser (example, Figure 22):



**Figure 22**

You are now communicating directly to the ObserverIP and can proceed to Section 6.4.

## 6.5 Local Device Network Settings

From your web browser, access the ObserverIP from the IP address obtained in the previous section.

Basic users will not normally need to change any of the settings on this panel.

For Advanced Users:

Select the **Local Network** tab to program the local network settings. Reference Figure 23:

- 1. IP Address.** The default setting is receive automatically (DHCP), which is recommended. The network will assign an IP address. To statically assign an IP address, select **Static** from the pull down menu. This will prevent the IP address from changing each time you power up the ObserverIP receiver.
- 2. Static IP Address.** If Static is selected as the IP address, enter the IP address you wish to access the ObserverIP device.
- 3. Static Subnet Mask.** Default is 255.255.255.0. This should not be changed unless you are familiar with networking and subnet masking.
- 4. Static Default Gateway.** This is typically the IP address of your router.
- 5. Static DNS Server.** This is your DNS Server setting based on your router connection.
- 6. Server Listening Port.** Default is 5000. Enter an integer between 1024 – 65535.

If you made any Static IP Address changes (not recommended), to confirm these changes, select **Apply** and **Reboot**.

**Note:** If you incorrectly set the static IP settings and can no longer access the ObserverIP, press the reset button on the

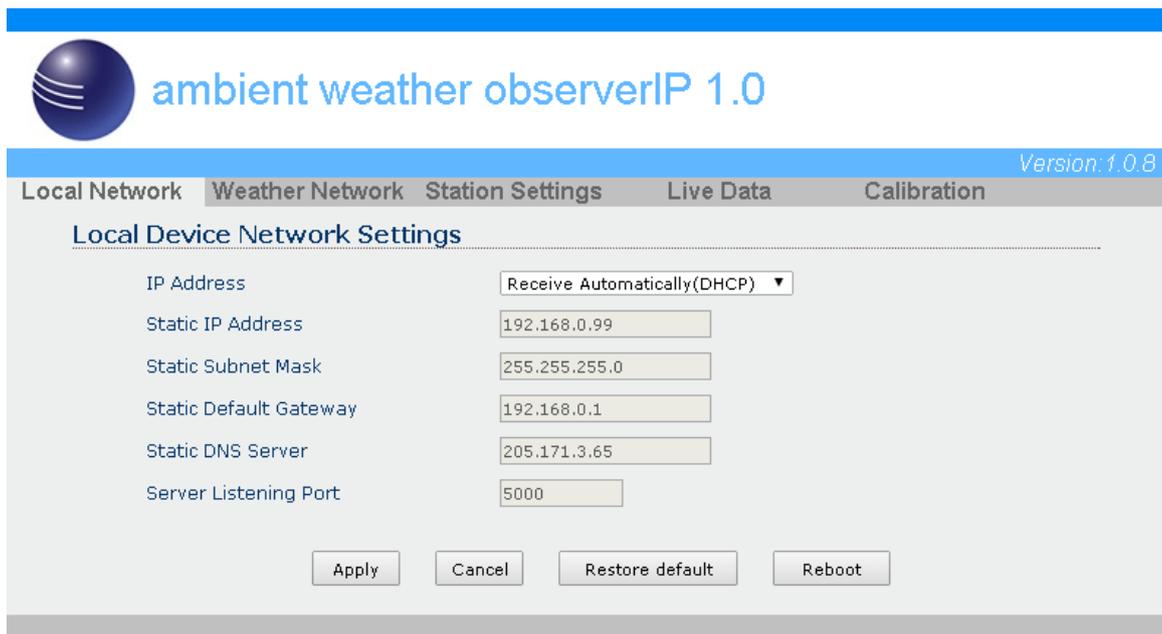


Figure 23

## 6.6 Station Settings

Select **Apply** to confirm any of the changes in this section.

### 6.6.1 Weather Station Settings

**Weather Station Model Number:** Enter your weather station model number WS-1550-IP:



Figure 24

### 6.6.2 Time Zone Setting

Enter your local time zone and daylight Savings Time.

The following table provides times zones throughout the world. Locations in the eastern hemisphere are positive, and locations in the western hemisphere are negative.

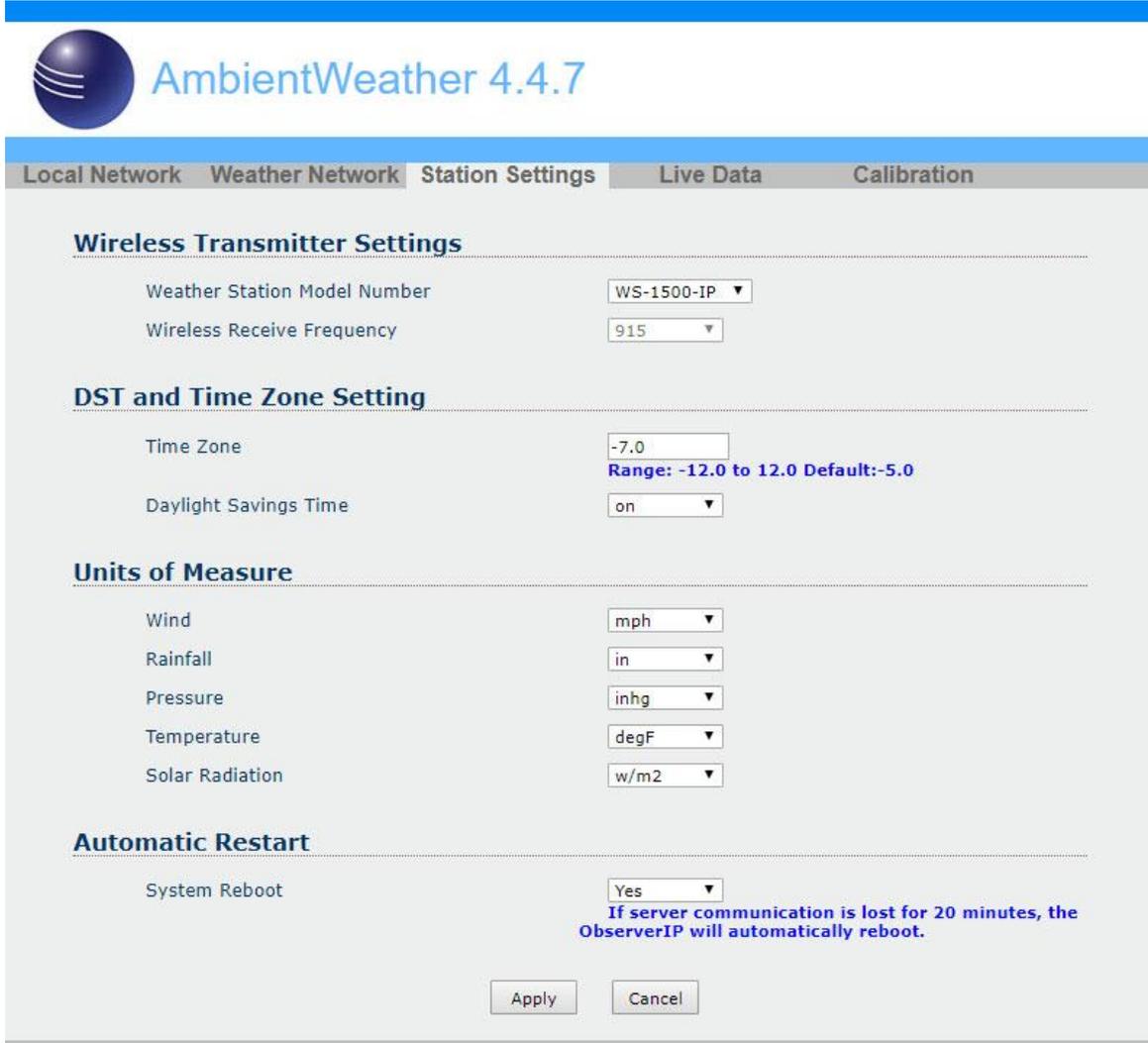
Hours from GMT	Time Zone	Cities
-12	IDLW: International Date Line West	---
-11	NT: Nome	Nome, AK
-10	AHST: Alaska-Hawaii Standard CAT: Central Alaska HST: Hawaii Standard	Honolulu, HI
-9	YST: Yukon Standard	Yukon Territory
-8	PST: Pacific Standard	Los Angeles, CA, USA
-7	MST: Mountain Standard	Denver, CO, USA
-6	CST: Central Standard	Chicago, IL, USA
-5	EST: Eastern Standard	New York, NY, USA
-4	AST: Atlantic Standard	Caracas
-3	---	São Paulo, Brazil
-2	AT: Azores	Azores, Cape Verde Islands
-1	WAT: West Africa	---
0	GMT: Greenwich Mean WET: Western European	London, England
1	CET: Central European	Paris, France
2	EET: Eastern European	Athens, Greece
3	BT: Baghdad	Moscow, Russia
4	---	Abu Dhabi, UAE
5	---	Tashkent
6	---	Astana
7	---	Bangkok
8	CCT: China Coast	Beijing
9	JST: Japan Standard	Tokyo
10	GST: Guam Standard	Sydney
11	---	Magadan
12	IDLE: International Date Line East NZST: New Zealand Standard	Wellington, New Zealand

### 6.6.2.1 Daylight Savings Time

Enter **off** if you live in Hawaii or Arizona, where DST is not observed. Enter **on** if you live anywhere else, even if you are currently observing standard time.

### 6.6.2.2 Units of Measure

Enter your preferred units of measure for each parameter.



The screenshot shows the 'Station Settings' tab in the AmbientWeather 4.4.7 interface. The page is divided into several sections:

- Wireless Transmitter Settings:**
  - Weather Station Model Number: WS-1500-IP
  - Wireless Receive Frequency: 915
- DST and Time Zone Setting:**
  - Time Zone: -7.0 (Range: -12.0 to 12.0 Default: -5.0)
  - Daylight Savings Time: on
- Units of Measure:**
  - Wind: mph
  - Rainfall: in
  - Pressure: inhg
  - Temperature: degF
  - Solar Radiation: w/m2
- Automatic Restart:**
  - System Reboot: Yes (Note: If server communication is lost for 20 minutes, the ObserverIP will automatically reboot.)

At the bottom of the settings page are 'Apply' and 'Cancel' buttons.

Figure 25

## 6.7 Live Data

Select the **Live Data** tab to view your live data from the weather station. To freeze the live data updates, select the **Stop Refresh** button.

### 6.7.1 Reset and Change Rain Totals

During the installation of your weather station, you may report false rain do to vibration of the tipping mechanism. To reset the rain to 0.00, select the **Rain Reset** button as shown in Figure 26.

During rain gauge cleaning, the tipping mechanism may record false rain. Before rain gauge cleaning, record the rain totals before and after the cleaning procedure, and then correct the daily, weekly, monthly and yearly totals.

 ambient weather observerIP 3.0

Version: 3.0.3

Local Network Weather Network Station Settings **Live Data** Calibration

**Live Data**

Receiver Time:	<input type="text" value="06:38 05/19/2015"/>	
Indoor Sensor ID and Battery	<input type="text" value="0xfb"/>	<input type="text" value="Normal"/>
Outdoor Sensor ID and Battery	<input type="text" value="0x1f"/>	<input type="text" value="Normal"/>
Indoor Temperature	<input type="text" value="77.0"/>	
Indoor Humidity	<input type="text" value="28"/>	
Absolute Pressure	<input type="text" value="28.57"/>	
Relative Pressure	<input type="text" value="29.94"/>	
Outdoor Temperature	<input type="text" value="65.5"/>	
Outdoor Humidity	<input type="text" value="51"/>	
Wind Direction	<input type="text" value="15"/>	
Wind Speed	<input type="text" value="0.0"/>	
Wind Gust	<input type="text" value="0.0"/>	
Solar Radiation	<input type="text" value="323.06"/>	
UV	<input type="text" value="327"/>	
UVI	<input type="text" value="1"/>	
Hourly Rain Rate	<input type="text" value="0.00"/>	
Daily Rain	<input type="text" value="0.00"/>	
Weekly Rain	<input type="text" value="0.00"/>	
Monthly Rain	<input type="text" value="0.83"/>	
Yearly Rain	<input type="text" value="0.83"/>	

Figure 26

## 6.8 Weather Network Settings

Select the **Weather Network** tab to program the Weather Underground station settings and Ambient Weather Network settings (AmbientWeather.net requires firmware Version 4.0 or greater). Reference Figure 27:

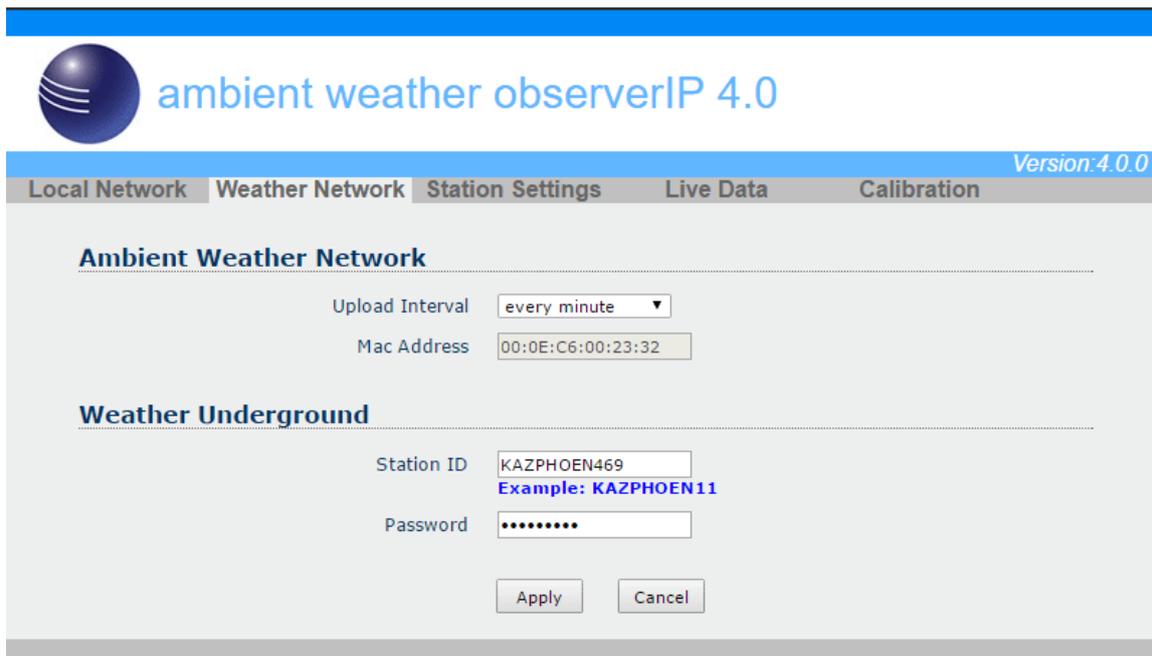


Figure 27

## 6.8.1 WeatherUnderground.com

Enter the Station ID and Station Key obtained from Wunderground.com®. Select the **Apply** button to confirm changes.

### 6.8.1.1 Creating a WeatherUnderground.com Account

Note: The Weather Underground website is subject to change.

1. Visit [Wunderground.com](http://Wunderground.com), and select the [Join](#) link in the upper right and corner and create a Free Account.
2. From the menu, Select **More | Add a Weather Station**, or visit: <https://www.wunderground.com/personal-weather-station/signup>
3. Click **Send Validation Email**. Respond to the validation email from Wunderground (it may take a several minutes).
4. Revisit **More | Add a Weather Station**, or visit: <https://www.wunderground.com/personal-weather-station/signup> again and enter all of the information requested.
5. Once registered, you receive a station ID and password. Make a note of this. You will need to enter it into your weather station web interface, as shown in Figure 28 (Figure 28 is an example and your station ID and password will be different).

Congratulations. Your station is now registered with Wunderground!

You are almost done. Now go to your weather station software and add the following:

Your Station ID:  
**KAZPHOEN424**  
 Your Station Key/Password:  
**mdreeley**

Figure 28

**Note:** Your station ID will have the form: KSSCCCC###, where K is for USA station (I for international), SS is your state, CCCC is your city and ### is the station number in that city.

In the example above, KAZPHOEN424 is in the USA (K), State of Arizona (AZ), City of Phoenix (PHOEN) and #424.

### 6.8.1.2 Viewing your Data on Wunderground.com

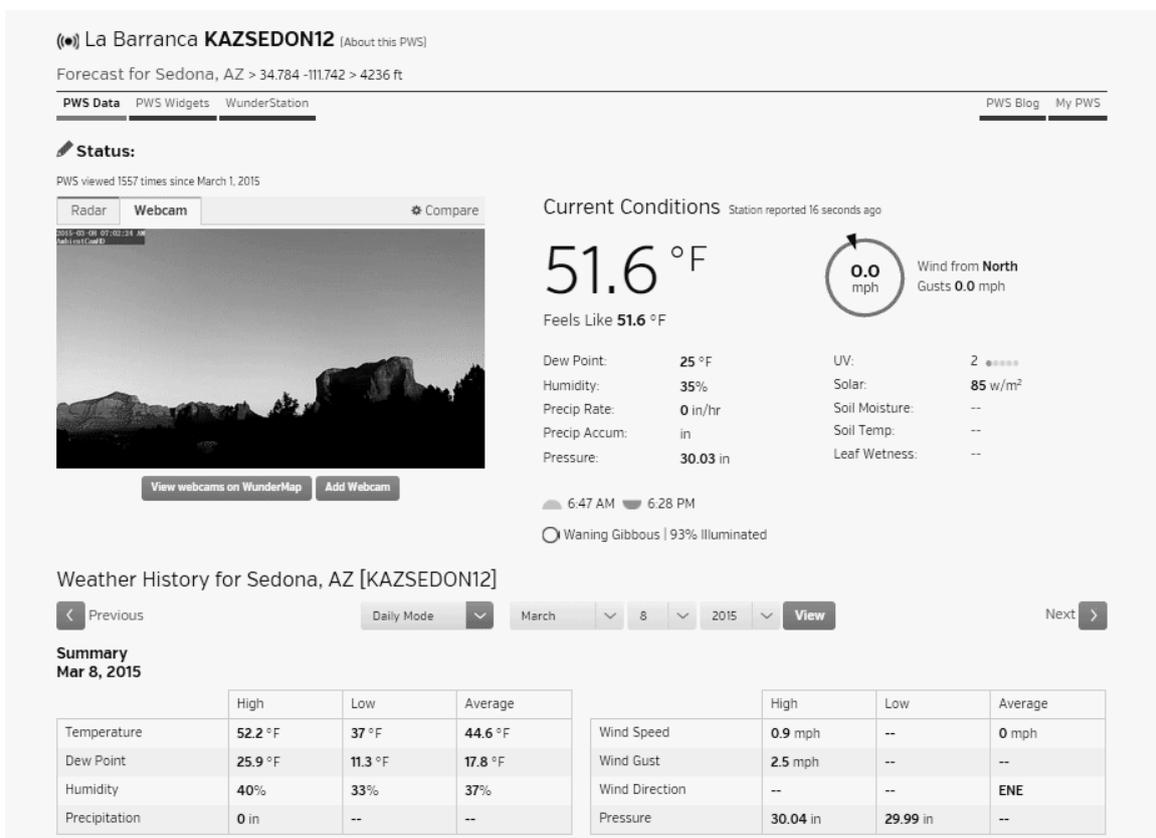
There are several ways to view your data on Wunderground:

#### 6.8.1.2.1 Web Browser

Visit:

<http://www.wunderground.com/personal-weather-station/dashboard?ID=STATIONID>

where **STATIONID** is your personal station ID (example, KAZSEDON12).



**Figure 29**

#### 6.8.1.2.2 WunderStation iPad App

Visit:

<http://www.WunderStation.com>

to download the WunderStation iPad app.

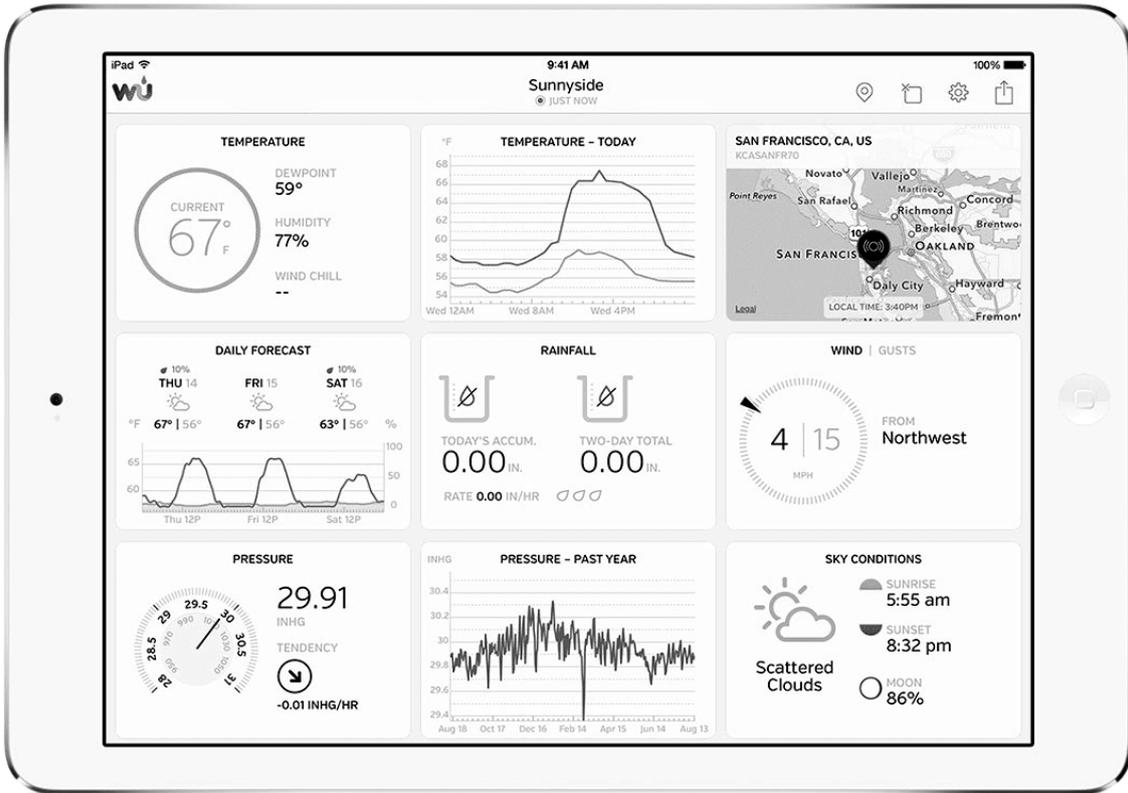


Figure 30

### 6.8.1.2.3 Mobile Apps

Visit:

<http://www.wunderground.com/download/index.asp>

for a complete list of Mobile apps for iOS and Android. Alternately, you can find your data on your mobile device's web browser.



Figure 31

## 6.8.2 AmbientWeather.net

Reference Figure 27. Enter and update schedule and select **Apply**. Make a note of the MAC address. It will be required when you sign up at AmbientWeather.net.

### 6.8.2.1 Creating an AmbientWeather.net Account

Visit: [www.AmbientWeather.net](http://www.AmbientWeather.net) to create an account and select Add Device, as shown in Figure 32.



Figure 32

Next, enter the MAC address found on your IP Module Weather Network Panel (Figure 27), as shown in Figure 33. Note that this is an example only and your MAC address will be different.

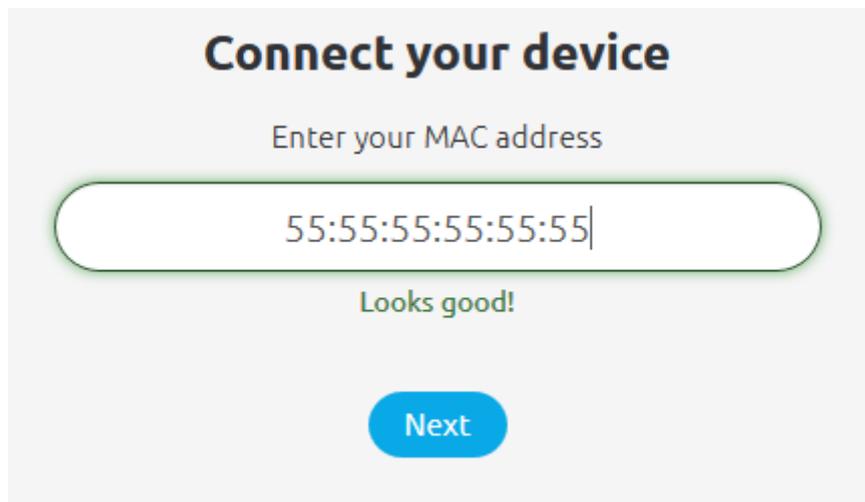
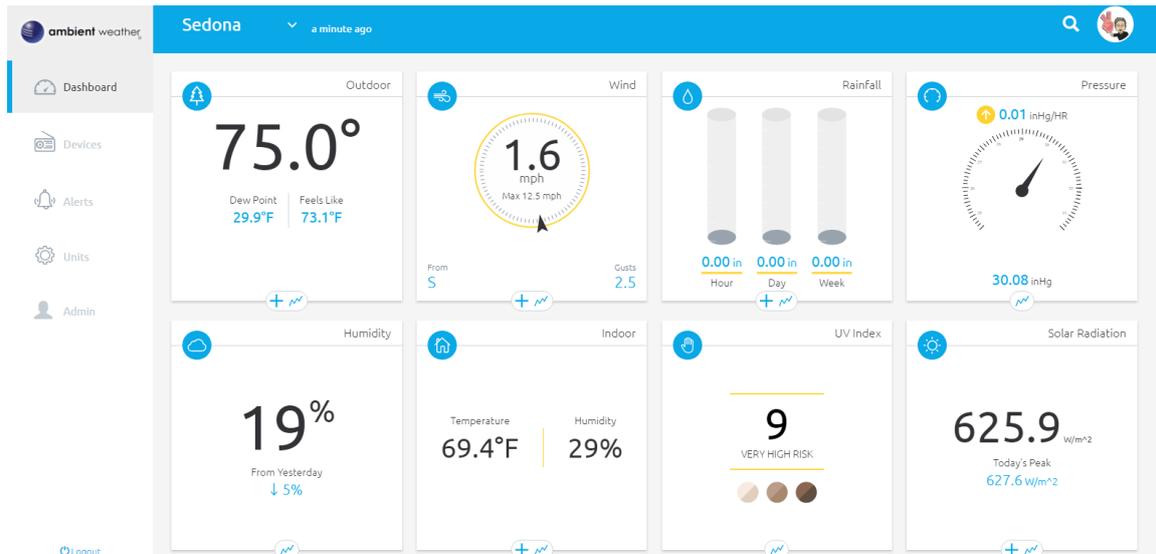


Figure 33

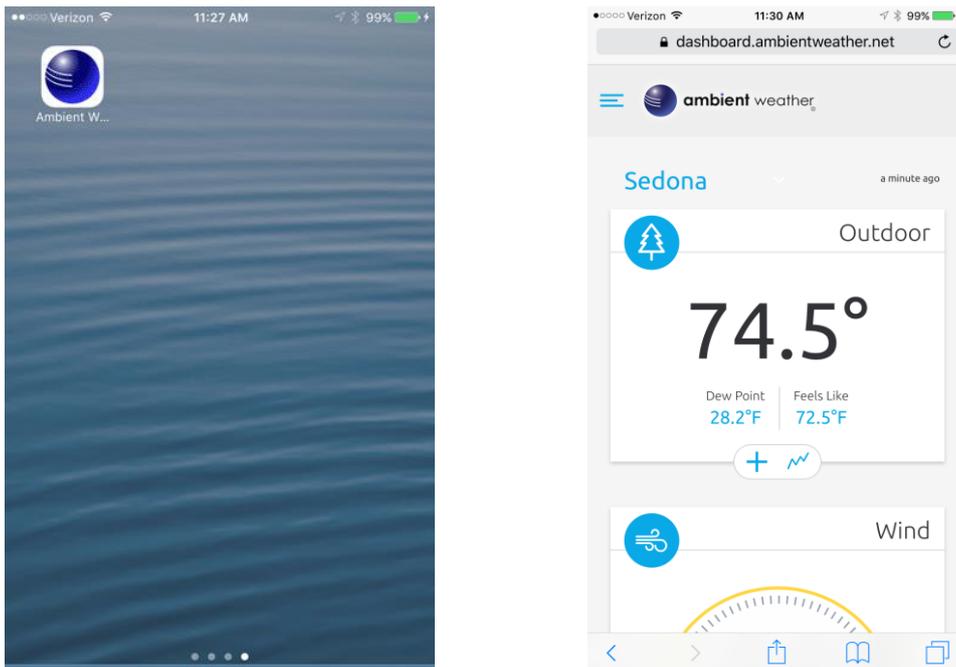
Register an account on AmbientWeather.net (email address and password).

Once registered, select the dashboard to view your data, as shown in Figure 34.



**Figure 34**

AmbientWeather.net is a responsive design and mobile friendly, so there is no need for a mobile app. Simply open your mobile devices web browser, browse to AmbientWeather.net, and bookmark your dashboard. If you save the bookmark to your desktop, it will automatically save the Ambient Weather icon, as shown in Figure 35.



**Figure 35**

### 6.8.2.2 IFTTT

The AmbientWeather.net service connects to IFTTT, the platform that allows devices and services to work together seamlessly.

Here are a few things you can do with IFTTT:

- Turn off your Rachio sprinklers when it rains, there is too much wind, or below freezing.
- Close your Hunter blinds when the sun is too intense.
- Close your garage door when it is too windy.
- Blink your hue lights when it starts raining.
- Connect to other web services, such as Gmail, Facebook, Instagram, or Pinterest.

For more information on IFTTT and how it can work for you, visit:

[https://ifttt.com/ambient\\_weather](https://ifttt.com/ambient_weather)

### 6.8.2.3 Compatible with Alexa

The Ambient Weather skill provides Ambient Weather personal weather station owners with the ability to get real-time, and past weather information generated by the devices they have set up at AmbientWeather.net.

Enable the skill and get started: say "Alexa, ask Ambient Weather for a weather report.". This will provide you with your outdoor weather report, but you can ask for your indoor weather report as well by saying, "Alexa, ask Ambient Weather about the indoor conditions." You can also ask for a report about a specific day, month or year! Just say "Alexa, ask Ambient Weather about the weather yesterday." or "Alexa, ask Ambient Weather about the weather in May".

For more information and to enable this skill, visit:

<https://www.amazon.com/dp/B074PGCM1D/>

### 6.8.2.4 Works with Google Assistant

The Ambient Weather Google Assistant app provides Ambient Weather personal weather station owners with the ability to get real-time, and past weather information generated by the devices they have set up at AmbientWeather.net

Link your account to get started: say 'hey google, Ambient Weather... weather report.' This will provide you with your outdoor weather report. You can ask for your indoor weather report as well by saying, 'indoor conditions'.

You can also link the Ambient Weather app by downloading the Google Assistant.

Here are some sample commands:

- Weather Report
- Outdoor conditions
- Indoor conditions
- Yesterdays weather
- Conditions for October 15, 2017
- Conditions for September 2017
- Conditions for 2016

For more information and to enable this app, visit:

<https://assistant.google.com/services/a/id/668e6f3369f27209/>

## 6.9 Calibration

Select the Calibration tab to view your calibration data from the weather station. Select the **Apply** button to confirm changes.

Calibration of most parameters is not required, with the exception of Relative Pressure, which must be calibrated to sea-level to account for altitude effects. For more information on sea-level pressure calibration, please reference note (3) below.

### 6.9.1 Relative Barometric Pressure Calibration Example

The following is an example of calibrating the relative pressure. Your results will vary.

1. The local relative pressure from TV, the newspaper or the internet for the official station in your area is 30.12 inHg.
2. From the Live Data panel, your absolute pressure (measured, and not corrected to sea-level) reads 28.90 inHg.
3. Reference Figure 36. Enter the following offset in the Calibration panel for Relative Pressure Offset:

$$\text{Relative Pressure Offset} = 30.12 - 28.90 = \mathbf{1.22}$$


ambient weather observerIP 1.0

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Local Network	Weather Network	Station Settings	Live Data	Calibration
<b>Calibration</b>				
Solar Radation Wavelength (w/m <sup>2</sup> vs lux)		<input type="text" value="126.7"/>	<b>Range: 1.0 to 1000.0 Default: 126.7</b>	
Solar Radation Gain		<input type="text" value="1.00"/>	<b>Range: 0.10 to 5.00 Default: 1.00</b>	
UV Gain		<input type="text" value="1.00"/>	<b>Range: 0.10 to 5.00 Default: 1.00</b>	
Wind Speed Gain		<input type="text" value="1.00"/>	<b>Range: 0.10 to 5.00 Default: 1.00</b>	
Rain Gain		<input type="text" value="1.00"/>	<b>Range: 0.10 to 5.00 Default: 1.00</b>	
Indoor Temperature Offset		<input type="text" value="0.0"/>	<b>Range: -10C/-18F to 10C/18F Default: 0.0</b>	
Indoor Humidity Offset		<input type="text" value="0"/>	<b>Range: -10 to 10 Default: 0</b>	
Absolute Pressure Offset		<input type="text" value="0.00"/>	<b>Range: -800hpa/-23.62inhg/-601.50mmhg to 800hpa/23.62inhg/601.50mmhg Default: 0.00</b>	
Relative Pressure Offset		<input type="text" value="1.22"/>	<b>Range: -800hpa/-23.62inhg/-601.50mmhg to 800hpa/23.62inhg/601.50mmhg Default: 0.00</b>	
Outdoor Temperature Offset		<input type="text" value="0.0"/>	<b>Range: -10C/-18F to 10C/18F Default: 0.0</b>	
Outdoor Humidity Offset		<input type="text" value="0"/>	<b>Range: -10 to 10 Default: 0</b>	
Wind Direction Offset		<input type="text" value="0"/>	<b>Range: -180 to 180 Default: 0</b>	
		<input type="button" value="Apply"/>	<input type="button" value="Cancel"/>	<input type="button" value="Default"/>

Figure 36

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 <sup>2</sup>	Gain	126.7 lux	Solar radiation conversion from lux to w/m <sup>2</sup> 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 ObserverIP receiver 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 affect 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  $\pm 5\%$ . To improve this accuracy, the indoor and outdoor humidity can be calibrated using an accurate source, such as a sling psychrometer.

- (3) The ObserverIP receiver 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 an official reporting station near you (the internet is the best source for real time barometer conditions, such as Weather.com or Wunderground.com®), and set your weather station to match the official reporting station.

- (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  $126.7 \text{ lux} / \text{w/m}^2$ . 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:

$$\text{Distance} = 4 \times (20 - 5)' = 60'$$

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 0.01" 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/stpraga.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).

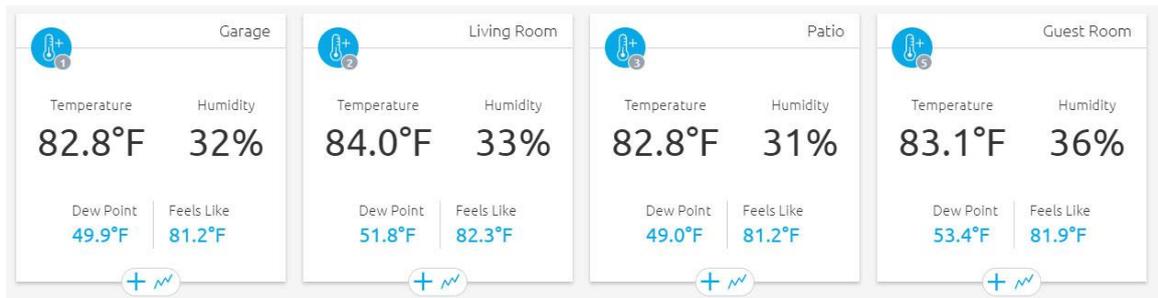
Calibration is only useful if you have a known calibrated source you can compare it against, and is optional. This section discusses practices, procedures and sources for sensor calibration to reduce manufacturing and degradation errors. Do not compare your readings obtained from sources such as the 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.

## 6.10 Adding Additional Sensors

The ObserverIP module supports up to 8 additional thermos-hygrometer sensors (Model WH31B). Place the sensors in and around your home, and monitor on AmbientWeather.net.

The data is automatically passed from the ObserverIP module to AmbientWeather.net based on the channel number.

The channels cannot be calibrated or viewed on the ObserverIP module. The data is transmitted directly to AmbientWeather.net for viewing online.



**Figure 37**

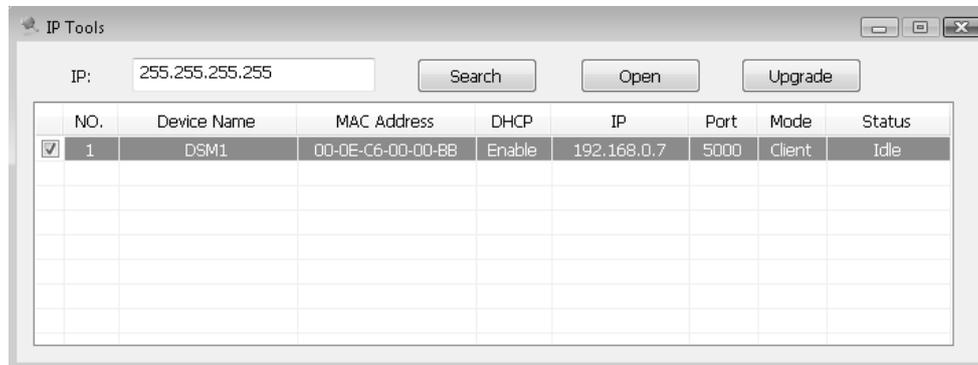
## 7. Updating Firmware

You must own a PC or Mac to update the firmware. Sorry, Linux products are currently not supported. Ambient Weather will update your ObserverIP at no cost (appropriate shipping charges will apply).

1. Download the latest version of firmware at:

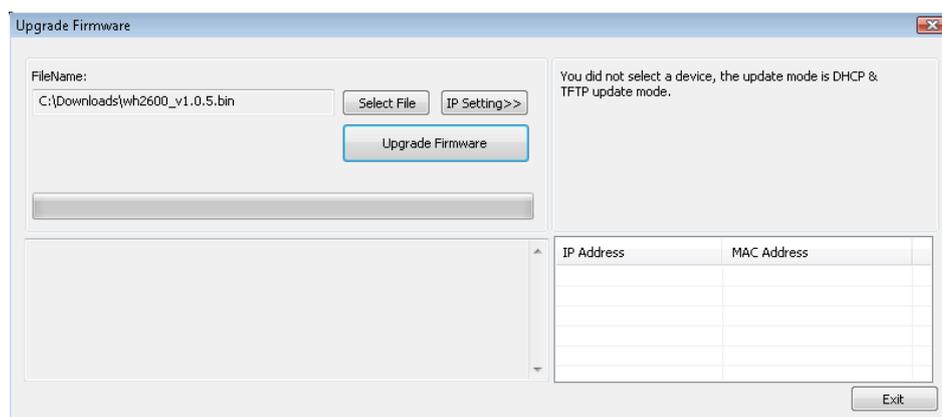
<https://ambientweather.net/help/how-do-i-update-the-firmware-for-the-observerip-module/>

2. **Important Note: Close all of other applications while running the firmware update. This will insure the upgrade process will not be interrupted.**
3. Launch the IP Tools application as referenced in Section 6.4, and locate the ObserverIP on your network. Reference Figure 38. Select the Upgrade button to begin the firmware upgrade. As shown in this figure, the IP address of the ObserverIP is 192.168.0.7. Make a note of your IP address (your results will vary).



**Figure 38**

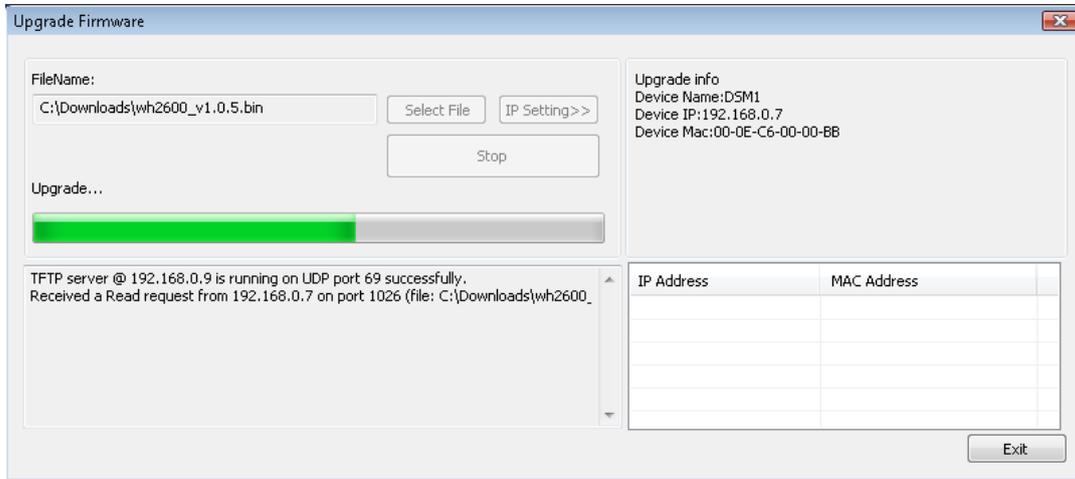
4. Reference Figure 39. Select the **Select File** button, and browse to the location of the file you downloaded in Step 1.



**Figure 39**

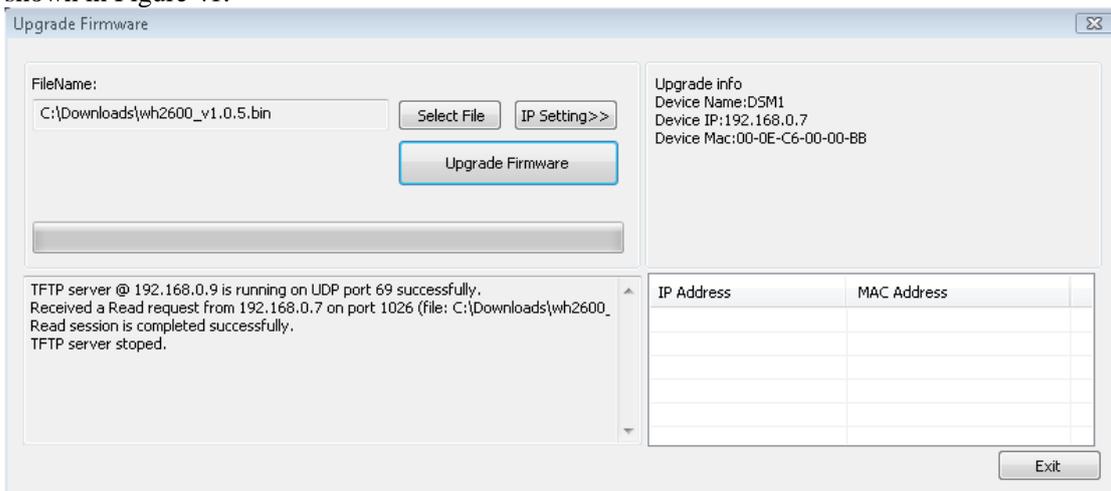
5. Select the Upgrade **Firmware** button. Reference Figure 40. The dialog box will display **Received a Read Request** from the ObserverIP module. A green progress bar will provide you with the upgrade status.

**DO NOT OPERATE THE MOUSE OR KEYBOARD WHEN UPGRADING** to prevent interruption of the upgrade.



**Figure 40**

6. Once the firmware upgrade is complete, the dialog box will display **Read session is completed successfully**, as shown in Figure 41.



**Figure 41**

7. Wait about one minute for the ObserverIP module to reboot. You can now **Exit** the upgrade window, and access the module again, as referenced in Section 6.4.

You may be required to enter some settings, so check all of the panels for completeness.

## 8. Glossary of Terms

Term	Definition
Absolute Barometric Pressure	Absolute pressure is the measured atmospheric pressure and is a function of altitude, and to a lesser extent, changes in weather conditions.  Absolute pressure is not corrected to sea-level conditions. <i>Refer to Relative Barometric Pressure.</i>
Accuracy	Accuracy is defined as the ability of a measurement to match the actual value of the quantity being measured.
Barometer	A barometer is an instrument used to measure atmospheric pressure.
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).
Dew Point	The dew point is the temperature at which a given parcel of humid air must be cooled, at constant barometric pressure, for water vapor to condense into water. The condensed water is called dew. The dew point is a saturation temperature.  The dew point is associated with relative humidity. A high relative humidity indicates that the dew point is closer to the current air temperature. Relative humidity of 100% indicates the dew point is equal to the current temperature and the air is maximally saturated with water. When the dew point remains constant and temperature increases, relative humidity will decrease.
HectoPascals (hPa)	Pressure units in SI (international system) units of measurement. Same as millibars (1 hPa = 1 mbar)
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.
Inches of Mercury (inHg)	Pressure in Imperial units of measure. 1 inch of mercury = 33.86 millibars
Rain Gauge	A rain gauge is a device that measures liquid precipitation (rain), as opposed to solid precipitation (snow gauge) over a set period of time.  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.
Range	Range is defined as the amount or extent a value can be measured.
Relative Barometric Pressure	Measured barometric pressure relative to your location or ambient conditions.
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 body 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 predict change 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.

## 9. Specifications

### 9.1 Wireless Specifications

- Line of sight wireless transmission (in open air): 330 feet, 100 feet under most conditions
- Update Rate: Outdoor Sensor: 16 seconds, Indoor Sensor: 64 seconds

- Frequency: 915 MHz

## 9.2 Measurement Specifications

The following table provides the specifications for the measured parameters.

Measurement	Range	Accuracy	Resolution
Indoor Temperature	14 to 140 °F	± 2 °F	0.1 °F
Outdoor Temperature	-40 to 149 °F (lithium batteries) -23 to 140 °F (alkaline batteries)	± 2 °F	0.1 °F
Indoor Humidity	10 to 99%	± 5%	1 %
Outdoor Humidity	10 to 99%	± 5%	1 %
Barometric Pressure	8.85 to 32.50 inHg	± 0.08 inHg (within range of 27.13 to 32.50 inHg)	0.01 inHg
Light	0 to 200,000 Lux	± 15%	1 Lux
Rain	0 to 394 in.	± 5%	0.01 in
Wind Direction	0 - 360 °	± 10°	1°
Wind Speed	0 to 100 mph (operational)	± 2.2 mph or 10% (whichever is greater)	1.4 mph

## 9.3 Power Consumption

- ObserverIp Receiver : 5V DC Adaptor (included)
- Optional WH31B and WH32B Sensors : 2xAAA batteries (not included)
- Outdoor sensor array: 3xAA batteries (not included)

## 10. 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.

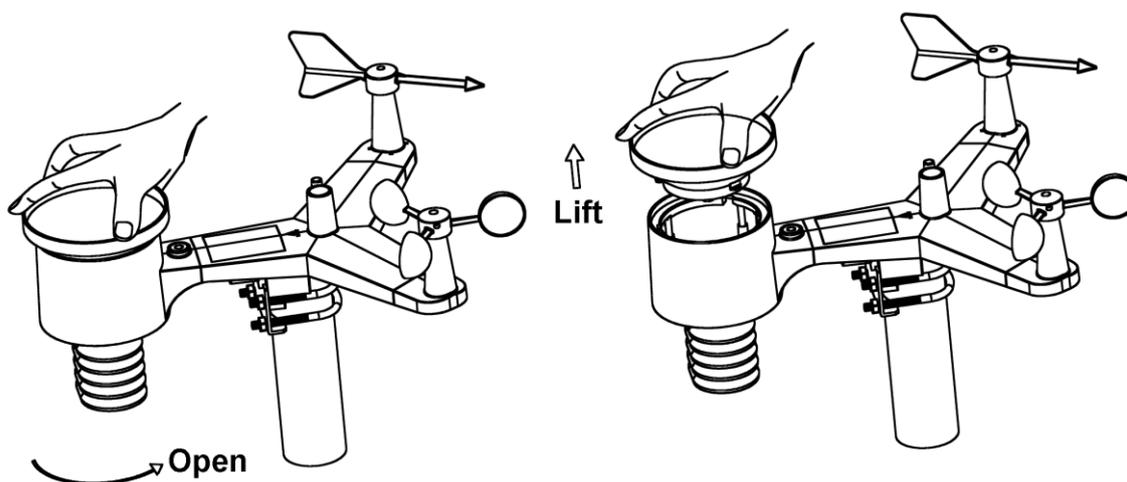


Figure 42

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.

## 11. Troubleshooting Guide

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

1. Email Support: [support@ambientweather.com](mailto:support@ambientweather.com)
2. Technical Support: 480-346-3398 (M-F 8am to 3pm Arizona Time)

Problem	Solution
<p>Outdoor sensor array does not communicate to the display console.</p>	<p>The sensor array may have initiated properly and the data is registered by the console as invalid, and the console must be reset. Press the reset button as described in Figure 1.</p> <p>With an open ended paperclip, press the reset button for 3 seconds to completely discharge the voltage.</p> <p>Take out the batteries and wait one minute, while covering the solar panel to drain the voltage.</p> <p>Put batteries back in.</p> <p>The LED next to the battery compartment will flash every 16 seconds. If the LED is not flashing every 16 seconds...</p> <p>Replace the batteries in the outside sensor array.</p> <p>If the batteries were recently replaced, check the polarity. If the sensor is flashing every 16 seconds, proceed to the next step.</p> <p>There may be a temporary loss of communication due to reception loss related to interference or other location factors,</p> <p>or the batteries may have been changed in the sensor array and the console has not been reset. The solution may be as simple as powering down and up the console (remove AC power and batteries, wait 10 seconds, and reinsert AC power and batteries).</p>
<p>Temperature sensor reads too high in the day time.</p>	<p>Make certain that the sensor array is not too close to heat generating sources or structures, such as buildings, pavement, walls or air conditioning units.</p> <p>Use the calibration feature to offset installation issues related to radiant heat sources.</p>
<p>Relative pressure does not agree with official reporting station</p>	<p>You may be viewing the absolute pressure, not the relative pressure.</p> <p>Select the relative pressure. Make sure you properly calibrate the sensor to an official local weather station. Reference Section 6.9.1 for details.</p>
<p>Rain gauge reports rain when it is not raining</p>	<p>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.</p>
<p>Data not reporting to Wunderground.com</p>	<ol style="list-style-type: none"> <li>1. Confirm your password or key is correct. It is the password you registered on Wunderground.com. Your Wunderground.com password cannot begin with a non-alphanumeric character (a limitation of Wunderground.com, not the station). Example, \$oewkrf is not a valid password, but oewkrf\$ is valid.</li> <li>2. Confirm your station ID is correct. The station ID is all caps, and the most common issue is substituting an O for a 0 (or visa versa). Example, KAZPHOEN11, not KAZPH0EN11</li> <li>3. Make sure the date and time is correct on the console. If incorrect, you may be reporting old data, not real time data.</li> <li>4. Make sure your time zone is set properly. If incorrect, you may be reporting old data, not real time data.</li> </ol>

<b>Problem</b>	<b>Solution</b>
	5. Check your router firewall settings. The console sends data via Port 80.
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 of 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 6.6.2.

## 12. Accessories

The following software and hardware accessories are available for this weather station at [www.AmbientWeather.com](http://www.AmbientWeather.com).

<b>Accessory</b>	<b>Description</b>
<a href="#">Ambient Weather Mounting Solutions</a>	Ambient Weather provides the most comprehensive mounting solutions for weather stations, including tripods, pole extensions, pole mounting kits, guy wires, ground stakes and more.
<a href="#">WH31B</a>	Indoor Thermometer-Barometer-Hygrometer
<a href="#">WH32B</a>	8-channel Indoor / Outdoor Thermo-Hygrometer

## 13. 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.

## 14. 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.

## 15. 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 personal 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.



## 16. 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 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."