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# Ambient Weather WS-1171A Advanced Weather Station User Manual



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## 1 Introduction

Thank you for your purchase of the Ambient Weather WS-1171A Advanced Weather Station with Temperature, Humidity, Barometer and Advanced Forecasting. The following user guide provides step by step instructions for installation, operation and troubleshooting. To download the latest manual and additional troubleshooting tips, please visit:

<http://ambientweather.wikispaces.com/ws1170>

## 2 Getting Started

 **Note:** The power up sequence must be performed in the order shown in this section (remote transmitter first, Display Console second).

The WS-1171A weather station consists of a display console (receiver), and a thermo-hygrometer (remote transmitter).


### 2.1 Parts List

QTY	Item
1	Display Console Frame Dimensions (LxWxH): 7.25 x 4 x 1.25 in LCD Dimensions (LxW): 4.25 x 2.50"
1	Thermo-hygrometer transmitter (WH2B) with mounting bracket Dimensions (LxWxH): 3.5" x 2.5" x 0.9"

### 2.2 Recommend Tools

- Philips precision screwdriver
- Drill for mounting bracket

### 2.3 Thermo-Hygrometer Sensor Set Up

 **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 with a Philips screwdriver (there is only one screw, at the bottom of the unit). Insert two AAA batteries as shown in Figure 1 (we recommend lithium batteries for cold weather climates, but alkaline batteries are sufficient for most climates).

Replace the battery door and set screw. Note that the temperature and humidity will be displayed on the LCD display. Looking at the back of the unit from left to right, the polarity is (-) (+) for the top battery and (+) (-) for the bottom battery.



Figure 1

## 2.4 Display Console Set Up


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

Place the remote thermo-hygrometer about 5 to 10' away from the display console (if the sensor is too close, it may not be received by the display console).

Remove the battery door on the back of the display. Insert three AA (alkaline or lithium, avoid rechargeable) batteries in the back of the display console. Looking at the back of the unit (left to right), the polarity is (+) (-) for the top battery, (-) (+) for the middle battery and (+) (-) for the bottom battery.

The display will beep once and all of the LCD segments will light up for a few seconds to verify all segments are operating properly.


Replace the battery door, and fold out the desk stand and place the console in the upright position.

The console will instantly display indoor temperature, humidity, barometer, tendency, date and time. The remote search icon will turn on in the OUT section of the display . The outdoor temperature and humidity will update on the display within a few minutes.

**Do not touch any buttons** until the remote sensor reports in, otherwise the remote sensor search mode will be terminated and the search icon will turn off. When the remote sensor data has been received, the console will automatically switch to the normal mode, and all further settings can be performed.

If the remote does not update, please reference the troubleshooting guide in Section 7.



### 2.4.1 Radio Controlled Clock (RCC)

The RCC is received by the main console. After the remote sensor is powered up, the sensor will transmit weather data for 30 seconds, and then the sensor will begin radio controlled clock (RCC) reception and the RCC search icon  will turn on. During the RCC time reception period (maximum 10 minutes), no weather data will be transmitted to avoid interference.


If the signal reception is not successful within 1 minute, the signal search will be cancelled, the outdoor temperature and humidity will update as normal, the RCC icon will turn off, and the RCC

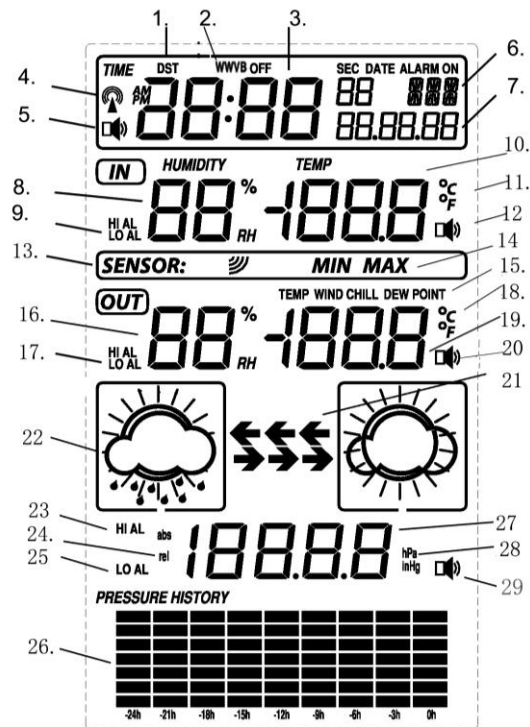
search will automatically resume every two hours until the signal is successfully captured. The regular RF link will resume once RCC reception routine is finished. In some locations, RCC reception may take a couple of days to receive the signal. The temperature and humidity data will continue to transmit during this period.

Once the radio controlled time is received the **WWVB** icon will be present above the time (reference Figure 2).

 **Note:** The RCC search icon  is normally off and will momentarily flash when updated. The signal is passed from the outdoor sensor to the console, and will not update if the outdoor sensor is not updating properly.

## 2.4.2 Display Console Layout

 **Note:** The following illustration shows the full segments of the LCD for description purposes only and will not appear like this during normal operation.



**Figure 2**

- |   |   |
|---|---|
| 1. DST (daylight savings time)                              | 16. Outdoor humidity display                                  |
| 2. WWVB Radio Controlled Time Signal                        | 17. Outdoor temperature and humidity low alarm and high alarm |
| 3. Time   | 18. Temperature display units                                 |
| 4. Radio Controlled Time icon                               | 19. Outdoor temperature display                               |
| 5. Alarm ON indicator                                       | 20. General outdoor alarm icon                                |
| 6. Day of week/ time zone                                   | 21. Weather forecast icon                                     |
| 7. Date   | 22. Weather tendency indicator                                |
| 8. Indoor humidity display                                  | 23. Pressure with 24 hour history graph                       |
| 9. Indoor temperature and humidity low alarm and high alarm | 24. Pressure high alarm                                       |
| 10. Indoor temperature display                              | 25. Pressure low alarm  |
| 11. Temperature display units                               | 26. Absolute or relative air pressure selection               |

- 12. Indoor temperature and humidity alarm on indicator
- 13. Remote sensor transmit signal indicator
- 14. MIN/MAX information
- 15. Dew point temperature display

- 27. Barometer air pressure
  - 28. Pressure display unit (inHg or hPa)
  - 29. Pressure alarm ON indicator
- NOTE:** The snooze key is on the top of the display console

### 2.4.3 Sensor Operation Verification

Verify the indoor and outdoor humidity match closely with the console and sensor array in the same location (about 10' apart). The sensors should be within 10% (the accuracy is  $\pm 5\%$ ). Allow about 30 minutes for both sensors to stabilize.

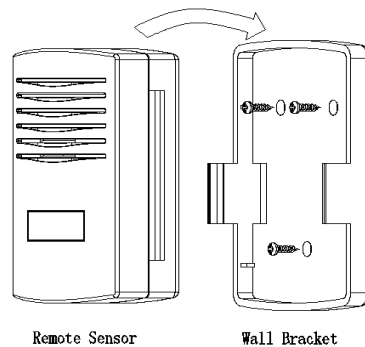
Verify the indoor and outdoor temperature match closely with the console and sensor array in the same location (about 10' apart). The sensors should be within 4°F (the accuracy is  $\pm 2^\circ\text{F}$ ). Allow about 30 minutes for both sensors to stabilize.

## 3 Remote Sensor Installation


### 3.1 Sensor Placement

It is recommended you mount the remote sensor on a 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 3 screws (included) to affix the mounting bracket to the wall with a precision screwdriver. Connect the remote sensor to the wall bracket. It is recommended to drill pilot holes first.



**Figure 2**

 **Note:** Make sure the sensor is mounted vertically and not lying down on a flat surface. This will insure optimum reception.

### 3.2 Wireless Reception Considerations


Wireless signals are impacted by distance, interference (other weather stations, wireless phones, wireless routers, TVs and computer monitors), and transmission barriers, such as walls. In general, wireless signals will not penetrate solid metal and earth (down a hill, for example).

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 Console Operation

 **Note:** The console has four keys for easy operation: **SET** key, **ALARM** key, **MIN/MAX** key and **+** key. There are four program modes: Quick Display Mode, Set Mode, Alarm Mode and Min/Max Mode.

Any program mode can be exited at any time by either pressing the **SNOOZE/LIGHT** key (on the top of the display console), or waiting for the 10-second time-out to take effect.

### 4.1 Quick Display Mode

A quick reference guide for the Quick Set Mode is available in Section 13.1.


While in Normal Mode, press the **SET** key to enter the Quick Display Mode as follows (once for outdoor temperature and dew point and twice for absolute pressure and relative pressure):


1. **Display Outdoor Temperature and Dew Point.** Press the **MIN/MAX** or **+** key to toggle between outdoor temperature and dew point.
2. **Absolute Pressure and Relative Pressure.** Press the **MIN/MAX** or **+** key to toggle between absolute pressure and relative pressure.

### 4.2 Set (Program) Mode

A quick reference guide for the Set Mode is available in Section 13.2.

While in Normal Mode, press and hold the **SET** key for at least three seconds to enter the Set Mode. The first setting will begin flashing. You can press the **SET** key again to skip any step, as defined below.

 **Note:** In the Set mode, press the **+** key or **MIN/MAX** key to change or scroll the value. Hold the **+** key or **MIN/MAX** key for 3 seconds to increase/decrease rapidly.

 **Note:** Press the **SNOOZE** key (or wait 30 seconds for the programming mode to timeout), and the Set Mode will return to Normal Mode.

1. **Daylight Savings Time (DST).** The **DST** (ON or OFF) setting will begin flashing. Press the **+** key to toggle between DST ON and DST OFF.
2. **Time Zone Settings.** Press the **SET** key again to adjust the Time Zone (TZ) setting.

Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the time zone from -12 to 12, based on the number of hours from Coordinated Universal Time, or Greenwich Mean Time (GMT).

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

3. **12/24 Hour Format.** Press the **SET** key again to adjust the 12/24 hour format setting. Press the  $\boxed{+}$  key to change between 12 hour and 24 hour format.
4. **Change Hour.** Press the **SET** key again to set the hour. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the hour up or down.
5. **Change Minute.** Press the **SET** key again to set the minute. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the minute.
6. **Change Year.** Press the **SET** key again to set the calendar year. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the calendar year.
7. **Change Month.** Press the **SET** key again to set the calendar month. Press the  $\boxed{+}$  key or

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**MIN/MAX** key to adjust the calendar month.

8. **Change Day.** Press the **SET** key again to set the calendar day. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the calendar day.
9. **Temperature Units** (Celsius or Fahrenheit). Press the  $\boxed{+}$  key again to toggle the temperature units from Celsius to Fahrenheit.
10. **Indoor Temperature Calibration** (default is measured indoor temperature). Press the **SET** key to adjust the indoor temperature. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the temperature up or down in 0.1 degC (0.18 degF) increments.

To view the uncalibrated value, press the **ALARM** key while the temperature is flashing.

Reference Section **4.2.3 Setting Calibrated Temperature** for more details on this function.

11. **Indoor Humidity Calibration** (default is measured indoor humidity). Press the **SET** key to adjust the indoor humidity. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the relative humidity up or down in 1% increments.

To view the uncalibrated value, press the **ALARM** key while the humidity is flashing.

Reference **4.2.2 Setting Calibrated Humidity** for more details on this function.

12. **Outdoor Temperature Calibration** (default is measured outdoor temperature). Press the **SET** key to adjust the outdoor temperature. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the temperature up or down in 0.1 degC (0.18 degF) increments.

To view the uncalibrated value, press the **ALARM** key while the temperature is flashing.

Reference Section **4.2.3 Setting Calibrated Temperature** for more details on this feature.

13. **Outdoor Humidity Calibration** (default is measured outdoor humidity). Press the **SET** key to adjust the outdoor humidity. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the relative humidity up or down in 1% increments.

To view the uncalibrated value, press the **ALARM** key while the humidity is flashing.

Reference **4.2.2 Setting Calibrated Humidity** for more details on this function.

14. **Barometric Pressure Display Units** (hPa or inHg). Press the **SET** key again to toggle the pressure units between hPa or inHg.


15. **Relative Pressure Calibration** (default is 29.92 inHg). Press the **SET** key to adjust the relative barometric pressure. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the relative barometric pressure up or down. Reference **Section 4.5.5** for more details on this function.

16. **Pressure Threshold Setting** (default level 2). Press the **SET** key again to adjust the pressure threshold setting. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the pressure threshold up or down. Reference **Section 4.5.3** for more details on this function.


17. **Storm Threshold Setting** (default level 4). Press the **SET** key again to adjust the storm



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threshold setting. Press the  key or **MIN/MAX** key to adjust the storm threshold up or down. Reference **Section 4.5.4** for more details on this function.

### 4.2.1 Setting Barometric Pressure

 **Note:** This is a continuation of the previous section. To enter this mode, you must start at the beginning of this section.


The display console 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.


To change the relative pressure in the **SET** mode, press the  key or **MIN/MAX** key to increase or decrease the relative pressure setting to match the official reporting station.


### 4.2.2 Setting Calibrated Humidity

 **Note:** This is a continuation of the previous section. To enter this mode, you must start at the beginning of this section.

The display console allows you to calibrate both the indoor and outdoor humidity. Humidity is a difficult parameter to measure accurately and drifts over time. The calibration feature allows you to zero out this error. To calibrate humidity, you will need an accurate source, such as a sling psychrometer or Humidipaks One Step Calibration kit, available from Ambient Weather, which uses a salt bath.

To calibrate indoor humidity, in the Set Mode with indoor humidity flashing, press the  key or **MIN/MAX** key to increase or decrease the humidity setting (in increments of 1%) to match the calibrated or known humidity source. To return the indoor humidity to the measured value, press and hold the SET key for 3 seconds and the humidity will return to the uncalibrated value.

 **Note:** The remote (outdoor) thermo-hygrometer will always display the measured humidity level and not the calibrated humidity level. Only the console will show the calibrated value.

 **Note:** The dew point calculation is based on the calibrated humidity level.

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### 4.2.3 Setting Calibrated Temperature


Temperature is measured by a resistive thermal device (RTD) and is subject to electronic variation.


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

To calibrate the indoor or outdoor temperature, we recommend a mercury or red spirit (fluid) thermometer. Bi-metal (dial) and other digital thermometers 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 24 hours. Compare this temperature to the fluid thermometer and adjust the console to match the fluid thermometer.

To calibrate indoor or outdoor temperature, in the Set Mode with indoor or outdoor temperature flashing, press the  key or **MIN/MAX** key to increase or decrease the temperature setting (in increments of 0.1 degC or 0.18 degF) to match the calibrated or known temperature source.


 **Note:** The remote (outdoor) thermo-hygrometer will always display the measured temperature level and not the calibrated temperature level. Only the console will show the calibrated value.

 **Note:** The dew point calculation is based on the calibrated temperature level.

## 4.3 Alarm Mode

### 4.3.1 Alarm Display

While in Normal Mode, press the **ALARM** key to enter the High Alarm Mode. Press the **ALARM** key again to enter the Low Alarm Mode. Press the **ALARM** key again to return to normal mode (or wait 30 seconds for the programming mode to timeout).

 **Note:** After entering the **ALARM** mode, the console will display the high and low alarm settings. If the value reads --.-- (dashes), the alarm is not active.

### 4.3.2 Alarm Programming

While in Alarm Mode, press the **SET** key to set the alarms. The following are high and low alarms:

#### High Alarm Limits:


- Time alarm (hour/minute)
- Indoor humidity high alarm
- Indoor temperature high alarm
- Outdoor humidity high alarm
- Outdoor temperature / dew point high alarm
- Pressure high alarm

#### Low Alarm Limits:

- In the Low Alarm Mode press the SET key to select the following alarm modes:
- Time alarm (hour/minute)

- Indoor humidity low alarm
- Indoor temperature low alarm
- Outdoor humidity low alarm
- Outdoor temperature / dew point low alarm
- Pressure low alarm

In the alarm mode, Press the  key or **MIN/MAX** key to change or scroll the alarm value.

Hold the  key or **MIN/MAX** key for 3 seconds to change the number rapidly. Press the **ALARM** key to select the alarm on or off (if alarm is enabled, the speaker icon on the LCD will be turned on indicating the alarm function has been enabled).

Press the **SET** key to confirm the setting and continue pressing the **SET** key to toggle through each alarm mode until it returns to the normal display mode.

Press the **SNOOZE** key or wait 30 seconds for the programming mode to timeout, and the alarm mode will return to the normal mode.

### 4.3.3 Cancelling the Alarm

When an alarm condition has been activated, the specific alarm will sound and flash for 120 seconds. Press any key to cancel the alarm.

When an alarm condition is activated again within 10 minutes, the alarm will not sound but will continue to flash until the weather condition is stable. This feature is useful to avoid repeated triggering for the same alarm value.

The alarm will reset automatically once the value has fallen below the set value, or if a new value is entered.

### 4.3.4 Outdoor Alarm – Temperature vs. Dew Point

When the outdoor weather alarm has been triggered, it will flash on the LCD display and the general outdoor alarm icon and high/low alarm icon will flash. For example, in the outdoor temperature display mode, when dew point high alarm is triggered the **DEW POINT** icon will flash along with general outdoor alarm icon and high alarm icon, indicating that the current alarm source is from dew point.

Temperature display mode

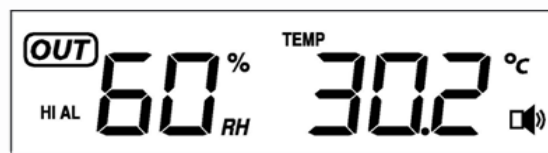




Figure 4

## 4.4 Min/Max Mode

While in Normal Mode, press the **MIN/MAX** key to enter the maximum mode, and the **MAX** icon and maximum records will be displayed and begin flashing.

Press **MIN/MAX** key again to enter the minimum mode, and the **MIN** icon and minimum records will be displayed and begin flashing.

Press **MIN/MAX** key again to return the Normal Mode.

In the maximum (or minimum) reading Mode, press the **+** key to display the specific maximum (or minimum) value you wish to reset. This value will begin flashing with the time and date time stamp at which the maximum (or minimum) value occurred. Select the **+** key again to proceed to the next parameter, in the following order:

1. Indoor humidity maximum (or minimum)
2. Indoor temperature maximum (or minimum)
3. Outdoor humidity maximum (or minimum)
4. Outdoor temperature maximum (or minimum)
5. Pressure maximum (or minimum)


Press the **SET** key for two seconds to reset the specific value (that is flashing) and associated date and time to the current reading.

Press the **SNOOZE** key or wait 30 seconds for the programming mode to timeout, and the Min/Max mode will return to Normal Mode.

## 4.5 Other Console Features

The following section describes additional console features.

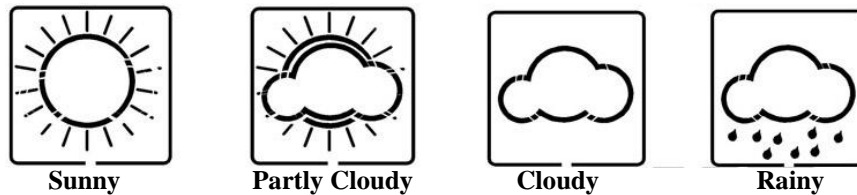
### 4.5.1 Weather Forecasting

 **Note:** The weather forecast or pressure tendency is based on the rate of change of barometric pressure. In general, when the pressure increases, the weather improves (sunny to partly cloudy) and when the pressure decreases, the weather degrades (cloudy to rain).

It may take several days to begin forecasting the weather. In the mean time, there may be no trend arrows and the both icons display partly cloudy.

The weather forecast is an estimation or generalization of weather changes in the next 24 to 48 hours, and varies from location to location. The tendency is simply a tool for projecting weather conditions and is never to be relied upon as an accurate method to predict the weather.

## 4.5.2 Weather Icons



The four weather icons are Sunny, Partly Cloudy, Cloudy and Rainy. There are also two weather tendency indicators to show the air pressure tendency between the weather icons.

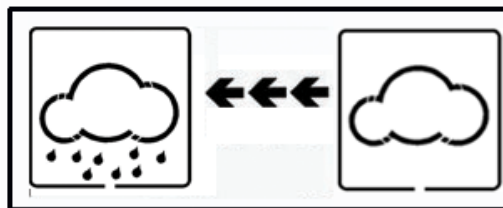
### 4.5.3 Weather tendency indicator

The weather tendency arrow is located between the weather icons to show the air pressure tendency and provide a forecast based on increasing or decreasing air pressure.

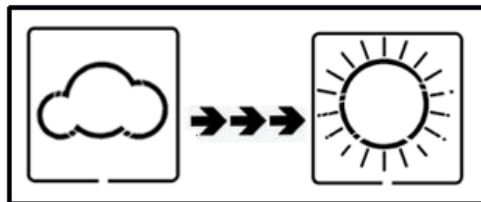
The arrow pointing to the right indicates that the air pressure is increasing and the weather is expected to improve. The arrow pointing the left indicates that the air pressure is decreasing and the weather is expected to deteriorate.

The weather tendency is based on the pressure change since last six hours. If the weather is changing, the weather tendency indicator (animated arrows) will flash for three hours, indicating the weather is expected to change. If the weather conditions become stable and no new weather change conditions are met, then the arrows will be fixed.

**Example 1:** Pressure is decreasing, weather is deteriorating.



**Example 2:** Pressure is increasing, weather is improving.

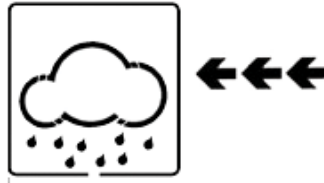


### 4.5.4 Storm threshold indicator

The storm threshold (the negative rate of pressure change signifying a storm is expected) can be adjusted by the user from level 3 to level 9 (the default level 4 mbar/hour).

When negative rate of change of pressure is exceeded for 3 hours, the storm warning indicator will be

activated, and the clouds with rain icon and tendency arrows will flash for 3 hours indicating the storm warning feature has been activated.




#### 4.5.5 Pressure threshold setting

The pressure threshold (the negative or positive rate of change of pressure signifying a change in the weather) can be adjusted by the user from level 2 to level 4 (default level 2 mbar/hour).



The lower the level pressure threshold setting, the higher sensitivity for weather forecast changes. Locations that experience frequent changes in air pressure require a higher setting compared to locations where the air pressure is typically stagnant.

#### 4.5.6 Pressure Graph

 **Note:** The weather station bar graph flashes from right to left to prevent screen burn in. This feature cannot be turned off.

The pressure graph displays the barometric pressure for the last 24 hours. Each bar represents three hours.

#### 4.5.7 Restoring Lost Outdoor Temperature and Humidity Sensor

If the signal is lost between the remote sensor (or transmitter) and the display console (or the receiver), to resynchronize, while in normal mode, press and hold the  key for 10 seconds. The transmitter search icon will appear in the outdoor temperature and humidity section. Please wait several minutes for the search icon  to turn off and the remote sensor reports in. Do not touch any buttons until synchronization is complete.

## 5 Glossary of Terms

Term	Definition
Absolute Barometric Pressure	Relative barometric pressure, 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.
Accuracy	Accuracy is defined as the ability of a measurement to match the actual value of the quantity being measured.
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
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.

## 6 Specifications

### 6.1 Wireless Specifications

- Line of sight wireless transmission (in open air): 300 feet
- Frequency: 433 MHz
- Update Rate: 48 seconds

### 6.2 Measurement Specifications

The following table provides specifications for the measured parameters.

Measurement	Range	Accuracy	Resolution
Indoor Temperature	32 to 140 °F	± 2 °F	0.1 °F
Outdoor Temperature	-40 to 149 °F	± 2 °F	0.1 °F
Indoor Humidity	1 to 99 %	± 5% (only guaranteed between 20 to 90%)	1 %
Outdoor Humidity	1 to 99%	± 5% (only guaranteed between 20 to 90%)	1 %
Barometric Pressure	8.85 to 32.50 inHg	± 0.08 inHg (within range of 27.13 to 32.50 inHg)	0.01 inHg



### 6.3 Power Consumption

- Base station : 3 x AA 1.5V Alkaline batteries
- Remote sensor : 2 x AAA 1.5V Alkaline batteries
- Battery life: Minimum 12 months for base station  
Minimum 24 months for thermometer-hygrometer sensor (use lithium batteries in cold weather climates)

## 7 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. Live Chat Support: [www.ambientweather.com/chat.html](http://www.ambientweather.com/chat.html) (M-F 8am to 4pm Arizona Time)
3. Technical Support: 480-283-1644 (M-F 8am to 4pm Arizona Time)

Problem	Solution
Wireless remote (thermo-hygrometer) not reporting in to console.	1. <b>Resync the unit.</b> Press and hold the  key for 10 seconds to resynchronize. The remote sensor search icon  will turn on. Wait several

<p>There are dashes (--) on the display console.</p>	<p>minutes for the remote sensor to report in, or the search icon to turn off. Do not press any buttons while in the search mode.</p> <ol style="list-style-type: none"> <li>2. Check the remote sensor is powered up and displaying the temperature and humidity on the LCD display.</li> <li>3. Install a fresh set of batteries in the remote thermo-hygrometer. For cold weather environments, install lithium batteries.</li> <li>4. The maximum line of sight communication range is 300'. Move the sensor assembly closer to the display console.</li> <li>5. If the sensor assembly is too close (less than 5-10'), move the sensor assembly away from the display console.</li> <li>6. Make sure the remote sensors are not transmitting through solid metal (acts as an RF shield), or earth barrier (down a hill).</li> <li>7. Move the display console around electrical noise generating devices, such as computers, TVs and other wireless transmitters or receivers.</li> <li>8. Move the remote sensor to a higher location. Move the remote sensor to a closer location.</li> <li>9. Radio Frequency (RF) Sensors cannot transmit through metal barriers (example, aluminum siding) or multiple, thick walls.</li> </ol>
<p>Temperature sensor reads too high in the day time.</p>	<p>Make sure the thermo-hygrometer is mounted in a shaded area on the north facing wall. Consider the following radiation shield if this is not possible:  <a href="http://www.ambientweather.com/amwespatean.html">http://www.ambientweather.com/amwespatean.html</a></p>
<p>Indoor and Outdoor Temperature do not agree</p>	<ol style="list-style-type: none"> <li>1. Allow up to one hour for the sensors to stabilize due to signal filtering. The indoor and outdoor temperature sensors should agree within 4 °F (the sensor accuracy is <math>\pm 2</math> °F).</li> <li>2. Perform a temperature calibration (reference Section 4.2.3)</li> </ol>
<p>Indoor and Outdoor Humidity do not agree</p>	<ol style="list-style-type: none"> <li>1. Allow up to one hour for the sensors to stabilize due to signal filtering. The indoor and outdoor humidity sensors should agree within 10 % (the sensor accuracy is <math>\pm 5</math> %)</li> <li>2. Perform a humidity calibration (reference Section 4.2.2)</li> </ol>
<p>Console outdoor humidity and remote humidity do not agree.</p>	<p>The console displays the calibrated humidity. The remote displays the measured humidity only. Refer to 4.2.2 to set and reset the humidity calibration.</p>
<p>Relative pressure does not agree with official reporting station</p>	<ol style="list-style-type: none"> <li>1. You may be viewing the relative pressure, not the absolute pressure.</li> <li>2. Make sure you properly calibrate the barometer to an official local weather station (reference Section 4.2.1)</li> <li>3. The barometer is only accurate to <math>\pm 0.08</math> inHg</li> </ol>



	within the following relative pressure range: 27.13 to 32.50 inHg, which corresponds to an altitude of -2,200 to 2,700 feet. At higher altitudes, expect some non-linearity or error.
The forecast icon is not accurate	The weather station console must run for several days to trend barometric pressure.  The weather forecast is an estimation or generalization of weather changes in the next 24 to 48 hours, and varies from location to location. The tendency is simply a tool for projecting weather conditions and is never to be relied upon as an accurate method to predict the weather.
Display console contrast is weak	Replace console batteries with a fresh set of batteries.

## 8 Accessories

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

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

## 9 Product Revisions

Revision	Description
WS-1170	Initial Release
WS-1171	<ul style="list-style-type: none"> <li>Added humidity calibration</li> </ul>
WS-1171A	<ul style="list-style-type: none"> <li>Added temperature calibration</li> <li>Increased programming timeout from 10 seconds to 30 seconds</li> <li>Changed barograph from scrolling to non-scrolling.</li> <li>Added function to reacquire lost remote signal without powering down and up console.</li> </ul>

## 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

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wild country and/or in unauthorized grounds strongly damages the environment.

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

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

The specifications of this product may change without prior notice.

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

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 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.

## 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 a Ambient, LLC. The original dated bill of sale must be presented upon request as proof of purchase to Ambient, LLC.

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

This warranty covers only actual defects within the product itself, and does not cover the cost of installation or removal from a fixed installation, normal set-up or adjustments, claims based on misrepresentation by the seller or performance variations resulting from installation-related circumstances.

## 13 Appendix

### 13.1 Quick Set Mode

Command	Mode	Settings
[SET]	Enter Quick Set Mode, Outdoor Temperature vs Dew Point	Press [+] to toggle between outdoor temperature and dew point.
[SET]	Relative Pressure vs Absolute Pressure	Press [+] to toggle between relative pressure and absolute pressure.

## 13.2 Set Mode

Command	Mode	Settings
[SET] + 3 seconds	Enter Set Mode, Daylight Savings Time (DST)	Press [+] to toggle OFF and ON
[SET]	Time Zone (TZ)	Press [+] to increase. [MIN/MAX] to decrease
[SET]	12/24 Hour Format	Press [+] to toggle between 12 hour (12h) and 24 hour (24h) format
[SET]	Hour of Day	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Minute of Day	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Year	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Month of Year	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Day of Month	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Temperature Units of Measure	Press [+] to toggle between degF and degC
[SET]	Indoor Temperature Calibration	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Indoor Humidity Calibration	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Outdoor Temperature Calibration	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Outdoor Humidity Calibration	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Barometric Pressure Units of Measure	Press [+] to toggle between inHg and hPa
[SET]	Relative Pressure Calibration	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Pressure Threshold for Forecast	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Storm Threshold for Forecast	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Exit Set Mode	

