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# Ambient Weather WS-1173B Advanced Weather Station User Manual



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## 1 Introduction

Thank you for your purchase of the Ambient Weather WS-1173B Advanced Weather Station with Temperature, Humidity, Barometer, Advanced Forecasting, Sunrise, Sunset and Moonphase. 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/ws1173>

## 2 Product Features

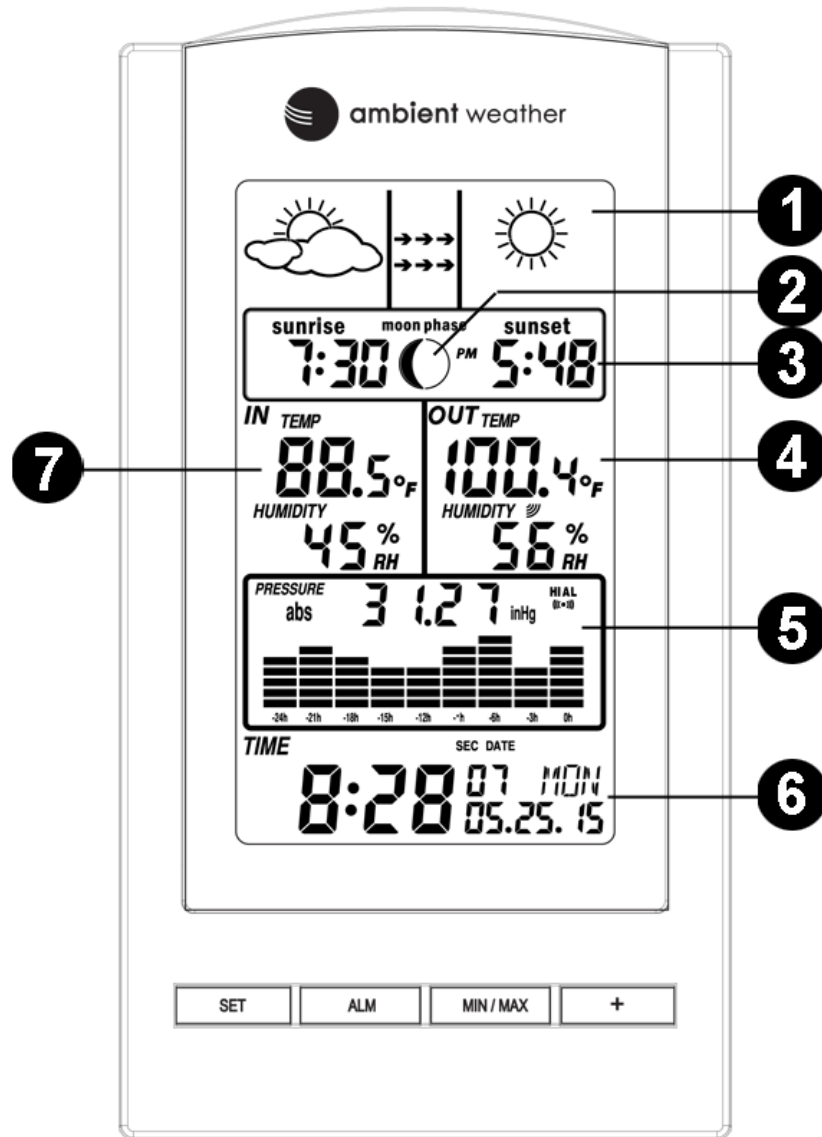



Figure 1

No	Description	No	Description
1	Forecast Icons	5	Barometric Pressure
2	Moonphase	6	Radio Controlled Clock with Perpetual Calendar
3	Sunrise and Sunset	7	Indoor Humidity and Temperature
4	Outdoor Temperature and Humidity		



**Figure 2**

### 3 Getting Started

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

The WS-1173B weather station consists of a display console (receiver), and a thermo-hygrometer (remote transmitter).


#### 3.1 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"

#### 3.2 Recommend Tools

- Philips precision screwdriver
- Drill for mounting bracket

#### 3.3 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 3.

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.

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 3

### 3.4 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 and should remain on for several minutes.

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 8.

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### 3.4.1 Radio Controlled Clock (RCC)

If your console is equipped with the Radio Controlled Clock (RCC), the icon WWVB will appear above the time. WWVB is the NIST time signal radio station near Fort Collins, Colorado.


The RCC is received by the wireless transmitter, and passed to the 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. The sensor search icon  will remain 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 (normally during the day due to solar interference), the sensor search will be cancelled, the outdoor temperature and humidity will update as normal, 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 RCC reception icon  will turn on (reference Figure 5).

### 3.4.2 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.

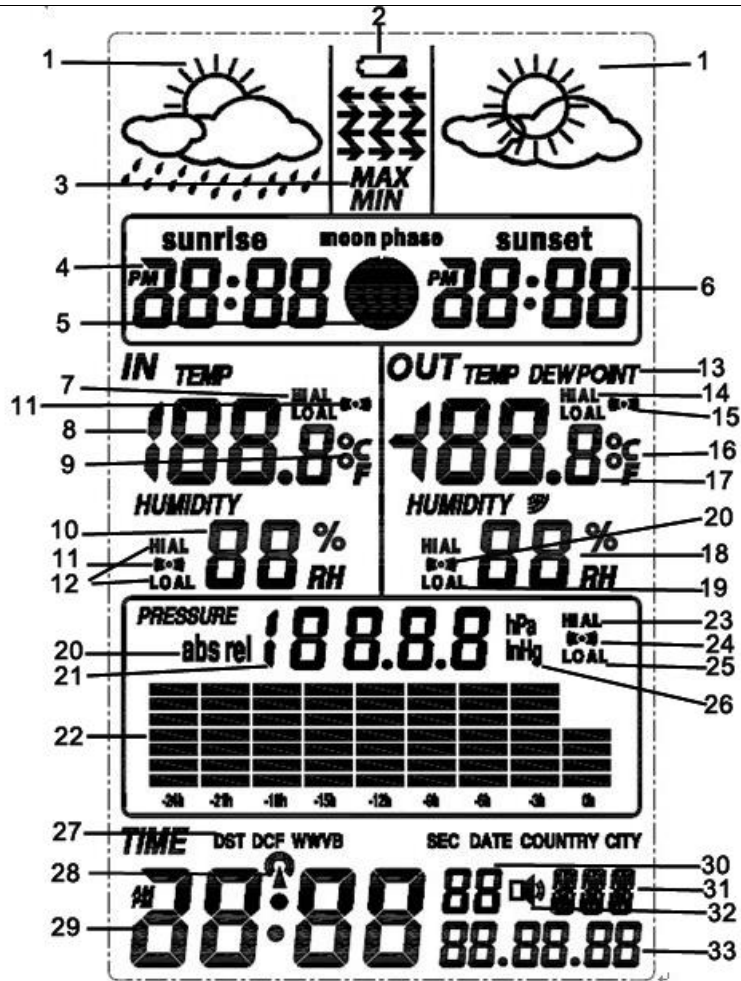


Figure 4

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. Weather forecast icon</li> <li>2. low battery indicator</li> <li>3. MIN/MAX information</li> <li>4. Sunrise time</li> <li>5. Moon phase indicator</li> <li>6. Sunset time</li> <li>7. Indoor temperature low / high alarm</li> <li>8. Indoor temperature display</li> <li>9. Temperature display unit</li> <li>10. Indoor humidity display</li> <li>11. Indoor temperature and humidity alarm on indicator</li> <li>12. Indoor humidity low / high alarm</li> <li>13. Dew point temperature display</li> <li>14. Outdoor temperature low/high alarm</li> <li>15. Outdoor temperature and humidity alarm on indicator</li> <li>16. Temperature display unit</li> <li>17. Outdoor temperature display</li> </ol> | <ol style="list-style-type: none"> <li>18. Outdoor humidity display</li> <li>19. Outdoor humidity low/high alarm</li> <li>20. Absolute or relative air pressure selection</li> <li>21. Barometer air pressure</li> <li>22. Pressure with 24 hour history graph</li> <li>23. Pressure high alarm</li> <li>24. Pressure alarm on indicator</li> <li>25. Pressure low alarm</li> <li>26. Pressure display unit (inHg or hPa)</li> <li>27. DST (daylight savings time), WWVB indicator (radio controlled or atomic time received from Colorado), or DCF (Europe only)</li> <li>28. Radio Controlled Time icon (flashes when updated)</li> <li>29. Time</li> <li>30. Second</li> <li>31. Day of week/ time zone</li> <li>32. Alarm on indicator</li> <li>33. Date (M / D / Y)</li> </ol> |
|--|---|

### 3.4.3 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.

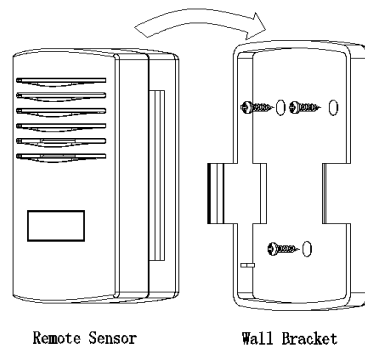
## 4 Remote Sensor Installation

### 4.1 Sensor Placement


It is recommended you mount the remote sensor outside on a north facing wall, in a shaded area, at a height at or above the receiver. If a north facing wall is not possible, choose a shaded area, under an eave.

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 5**

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

### 4.2 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%

## 5 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.



### 5.1 Quick Display Mode

#### 5.1.1 Quick Display Mode Quick Reference Guide

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.

#### 5.1.2 Quick Display Mode Operation

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.




## 5.2 Set (Program) Mode


### 5.2.1 Set Mode Quick Reference Guide

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]	Latitude Location Hemisphere (LA)	Press [+] to toggle between Northern (Nth) and Southern hemisphere (Sth)
[ALARM]	Latitude (whole number)	Press [+] to increase. [MIN/MAX] to decrease
[ALARM]	Latitude (decimal number)	Press [+] to increase. [MIN/MAX] to decrease
[SET]	Longitude Location Hemisphere (LO)	Press [+] to toggle between Western (WST) and Eastern (EST) hemisphere
[ALARM]	Longitude (whole number x 100)	Press [+] to toggle between 1 and 0
[ALARM]	Longitude (whole number)	Press [+] to increase. [MIN/MAX] to decrease
[ALARM]	Longitude (decimal number)	Press [+] to increase. [MIN/MAX] to decrease
[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	


### 5.2.2 Set Mode Operation

While in Normal Mode, press and hold the **SET** key for at least three seconds (until it beeps) to enter the Set Mode. The first setting will begin flashing. You can press the **SET** key again to advance to the next 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 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.



 **Note:** The DST should always be **ON** unless you live in Arizona or Hawaii, which do not observe DST. If you turn this feature ON, it will automatically adjust time after daylight savings and standard time changes. 1

2. **Time Zone Settings.** Press the **SET** key again to adjust the Time Zone (TZ) setting.

Press the  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  key to change between 12 hour and 24 hour format.
4. **Latitude Location.** Press the **SET** key again to adjust the Northern and Southern Hemisphere settings. The icon **LA** (latitude) will appear in the Time and Date field. Press the  key to change between **NTH** (northern hemisphere) and **STH** (southern hemisphere).

Next, press the **ALARM** key to adjust the latitude whole number. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the latitude whole number up or down.

Press the **ALARM** key again to adjust the latitude decimal number. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the latitude decimal number up or down.

 **Note:** North America is located in the northern hemisphere. Therefore, there is no need to change this setting for the United States and Canada.

 **Note:** To determine your latitude and longitude, we recommend visiting:

<http://www.bing.com/maps/>

and enter your street address. For more detailed information on determining and entering longitude and latitude, reference section 5.5.9.

5. **Longitude Location.** Press the **SET** key again to adjust the Eastern and Western Hemisphere settings. The icon **LO** (longitude) will appear in the Time and Date field. Press the  $\boxed{+}$  key to change between **EST** (eastern hemisphere) and **WST** (western hemisphere).

Next, press the **ALARM** key to adjust the longitude whole number x 100. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the longitude whole number x 100 up or down.

Press the **ALARM** key again to adjust the longitude decimal number. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the longitude decimal number up or down.

 **Note:** North America is located in the western hemisphere. Therefore, there is no need to change this setting for the United States and Canada.

6. **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.
7. **Change Minute.** Press the **SET** key again to set the minute. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the minute.
8. **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.
9. **Change Month.** Press the **SET** key again to set the calendar month. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the calendar month.
10. **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 (note that the display format is Month/Day/Year).
11. **Temperature Units** (Celsius or Fahrenheit). Press the **SET** key again to toggle the temperature units from Celsius to Fahrenheit.
12. **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 **5.2.5 Setting Calibrated Temperature** for more details on this function.

13. **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 humidity up or down in 1% increments.

Reference Section **5.2.4 Setting Calibrated Humidity** for more details on this feature.

14. **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 **5.2.5 Setting Calibrated Temperature** for more details on this feature.

15. **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 humidity up or down in 1% increments.

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

Reference Section **5.2.4 Setting Calibrated Humidity** for more details on this feature.


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

17. **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 5.2.3 Setting Barometric Pressure** for more details on this function.

18. **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 5.5.5** for more details on this function.

19. **Storm Threshold Setting** (default level 4). Press the **SET** key again to adjust the storm threshold setting. Press the  $\boxed{+}$  key or **MIN/MAX** key to adjust the storm threshold up or down. Reference **5.5.5** for more details on this function.

### 5.2.3 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.


### 5.2.4 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.


### 5.2.5 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.

## 5.3 Alarm Mode

### 5.3.1 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.

### 5.3.2 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.

### 5.3.3 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.

### 5.3.4 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.

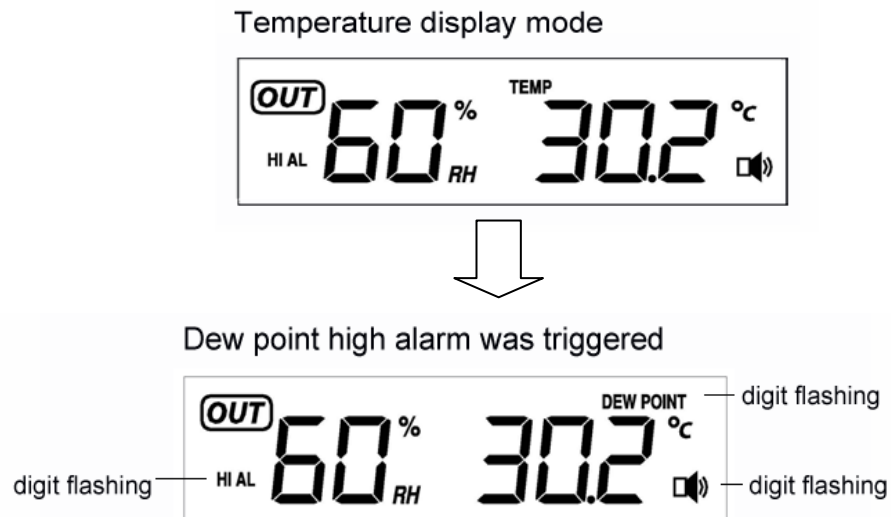



Figure 4

## 5.4 Min/Max Mode

 **Note:** The min and max settings cannot be reset at the same time. They must be reset on an individual basis.

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.

## 5.5 Other Console Features

The following section describes additional console features.

### 5.5.1 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 meantime, there may be no trend arrows and the both icons display partly cloudy.

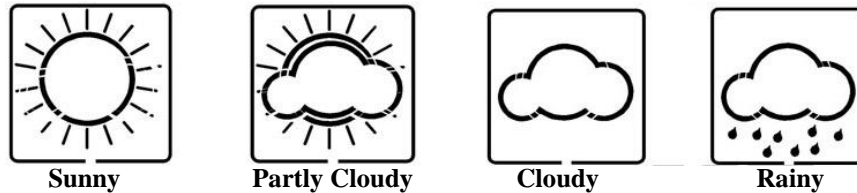
The weather forecast is an estimation or generalization of weather changes in the next 24 to 48 hours, and varies from location to location. The tendency is simply a tool for projecting weather conditions and is never to be relied upon as an accurate method to predict the weather.

### 5.5.2 Weather Forecast Initialization

When the console is powered up, the forecast prediction is in the “learning mode”. Two partly cloudy icons will be displayed, as shown below. When there is a change in barometric pressure over 24 to 72 hours, the forecast icons will exit the learning mode.



### 5.5.3 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.

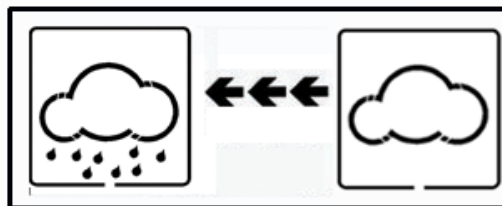
### 5.5.4 Weather tendency indicator

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.

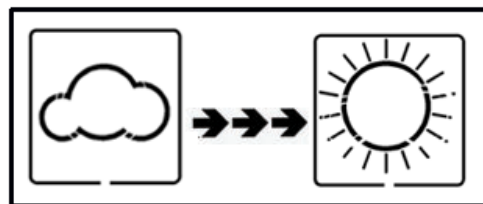
The arrow pointing to the right indicates that the air pressure is increasing and the weather is expected to improve. The arrow pointing the left indicates that the air pressure is decreasing and the weather is expected to deteriorate.

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 in 24-48 hours.



**Example 2:** Pressure is increasing, weather is improving in 24-48 hours.



### 5.5.5 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.



### 5.5.6 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.

### 5.5.7 Pressure Graph

The pressure graph displays the barometric pressure for the last 24 hours. Each bar represents three hours. The vertical scale of the graph is auto-scaled. There is not fixed pressure level for each bar, and is intended for visualizing trends only.

### 5.5.8 Moon Phase

The following moon phases are displayed based on the calendar date.

								
New	Waxing Crescent	First Quarter	Waxing Gibbous	Full	Waning Gibbous	Third Quarter	Waning	New

### 5.5.9 Sunrise and Sunset

To determine your longitude and latitude, we recommend the following website:

[www.bing.com/maps](http://www.bing.com/maps)

Reference Figure 6 below:

1. Enter your address and select the search button
2. The latitude (first number) and longitude (second number) are returned. In this example:

Latitude = 33.2981181889772  
 Longitude = -111.960209459066

The table below defines the hemisphere based on the positive or negative sign:

Position	Positive	Negative
Latitude	Northern	Southern
Longitude	Eastern	Western

3. In this example, the location entered into the display is as follows:

Latitude = 33.30 North  
 Longitude = 111.96 West  
 after rounding to two significant digits.

Record your longitude and latitude here for future reference:

Longitude:
Latitude:

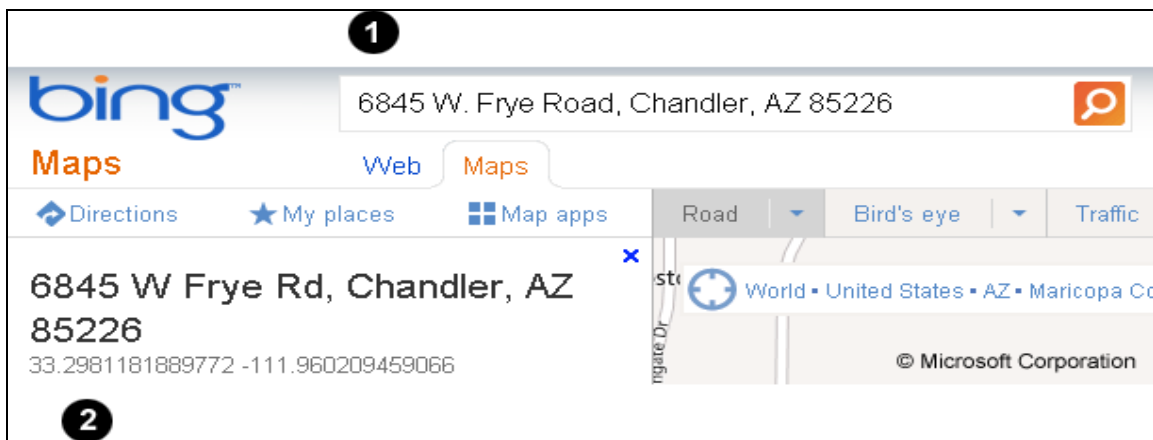



Figure 6

### 5.5.10 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 **[SET]** key for 10 seconds. The transmitter search icon  will appear.

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.

If the synchronization fails, reset the console by removing one battery from the display console, wait 10 seconds, and reinsert the battery, as specified in **Section 3.4 Display Console Set Up**.


### 5.5.11 Factory Reset

If memory is corrupted, you may need to restore the console to factory default.

To restore the console to factory reset and resync the remote sensor to the console:

1. Remove one battery from the battery compartment. Wait 10 seconds for the console to go completely blank.
2. Press and hold the **[SET]** and **[MIN/MAX]** buttons at the same time and reinsert the battery.

Continue to hold. The backlight will flash 12 times.

3. When the flashing is complete, let go of the buttons. The console has now been restored to factory default.
4. Wait several minutes before pressing any buttons for the remote sensor to sync to the console.
5. With the remote and console 10 feet away from each other, remove the batteries from the display console and wait 10 seconds. Put the batteries back in.
6. Do not touch any buttons for several minutes.
7. The remote sensor search icon  will appear near where the outdoor temperature and humidity would normally be. Wait several minutes for this icon to turn off.

## 6. Glossary of Terms

<b>Term</b>	<b>Definition</b>
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.

## 7. Specifications

### 7.1 Wireless Specifications

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

## 7.2 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



## 7.3 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)

## 8. 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: 480-346-3380 (M-F 8am to 3pm Arizona Time)

Problem	Solution
<p>Wireless remote (thermo-hygrometer) not reporting in to console.</p> <p>There are dashes (--) on the display console.</p>	<ol style="list-style-type: none"> <li>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 minutes for the remote sensor to report in, or the search icon to turn off.  If the synchronization fails, reset the console by removing one battery from the display console, wait 10 seconds, and reinsert the battery. Do not press any buttons while in the search mode.</li> <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> </ol>

	<ol style="list-style-type: none"> <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>
Temperature sensor reads too high in the day time.	Make sure the thermo-hygrometer is mounted in a shaded area on the north facing wall.
Indoor and Outdoor Temperature do not agree	<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 5.2.5)</li> </ol>
Indoor and Outdoor Humidity do not agree	<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 5.2.4)</li> </ol>
Console outdoor humidity and remote humidity do not agree.	The console displays the calibrated humidity. The remote displays the measured humidity only. Refer to 5.2.4 to set and reset the humidity calibration.
Relative pressure does not agree with official reporting station	<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 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.</li> </ol>
The forecast icon is not accurate	<p>The weather station console must run for several days to trend barometric pressure.</p> <p>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.</p>
Moon phase is not correct	Check your calendar date and make sure it is correct
Sunrise and Sunset is not correct	Check your longitude and latitude. The most common issues are:

	<ol style="list-style-type: none"> <li>1. The longitude and latitude are reversed</li> <li>2. The incorrect hemisphere is selected</li> <li>3. The incorrect time zone is selected.</li> <li>4. The date is incorrect.</li> </ol>
Sunrise and Sunset are off by one hour.	<p>When you first set up the console, the atomic radio controlled time (WWVB) may not update immediately due to solar interference and other factors (since the signal is generated in Boulder, CO and bounces off the ionosphere).</p> <p>If you entered the time zone and daylight savings time (DST) properly, it is waiting for the RCC to update the DST flag.</p> <p>Once the DST updates, the WWVB icon will appear on the display and the sunrise and sunset are corrected.</p> <p>Wait for the radio controlled clock (RCC) time signal to update the clock, correcting for the hour offset generated by the daylight savings time.</p> <p>This can take a few days to update.</p> <p>As a temporary work around, to offset the hour normally accounted for by DST, add one hour to your time zone setting. For example, if you live in the Eastern Time Zone, the time zone setting is -5. Change to -4 and manually correct this time. This will correct your sunrise and sunset. You will need to perform this operation twice per year (each time DST changes).</p>
Display console contrast is weak	Replace console batteries with a fresh set of batteries.
Console beeps and resets	Replace console batteries with a fresh set of batteries.

## 9. Accessories

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

Accessory	Description
<a href="#">Energizer AA Lithium Battery (2-pack) - Batteries for Long Life and Cold Climates</a>	AA lithium batteries for cold weather climates.
Ambient Weather <a href="#">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.

## 10. Product Revisions

Revision	Description
WS-1170	Initial Release
WS-1173	<ul style="list-style-type: none"> <li>• Added humidity calibration</li> </ul>
WS-1173A	<ul style="list-style-type: none"> <li>• Added temperature calibration</li> </ul>



Revision	Description
	<ul style="list-style-type: none"> <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>
WS-1173B	<ul style="list-style-type: none"> <li>• Moved RCC receiver from the console to the transmitter to improve RCC reception.</li> </ul>

## 11. Liability Disclaimer

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

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

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

The specifications of this product may change without prior notice.

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

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.

## 12. 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.

### 13. 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.

