# Weather Station User Manual

## Table of Contents

# 1 Introduction

Thank you for your purchase of the Weather Station WH117L with Temperature&Humidity, sensor WH2F. The following user guide provides step by step instructions for installation, operation and troubleshooting.

Product Features



**Figure 1**

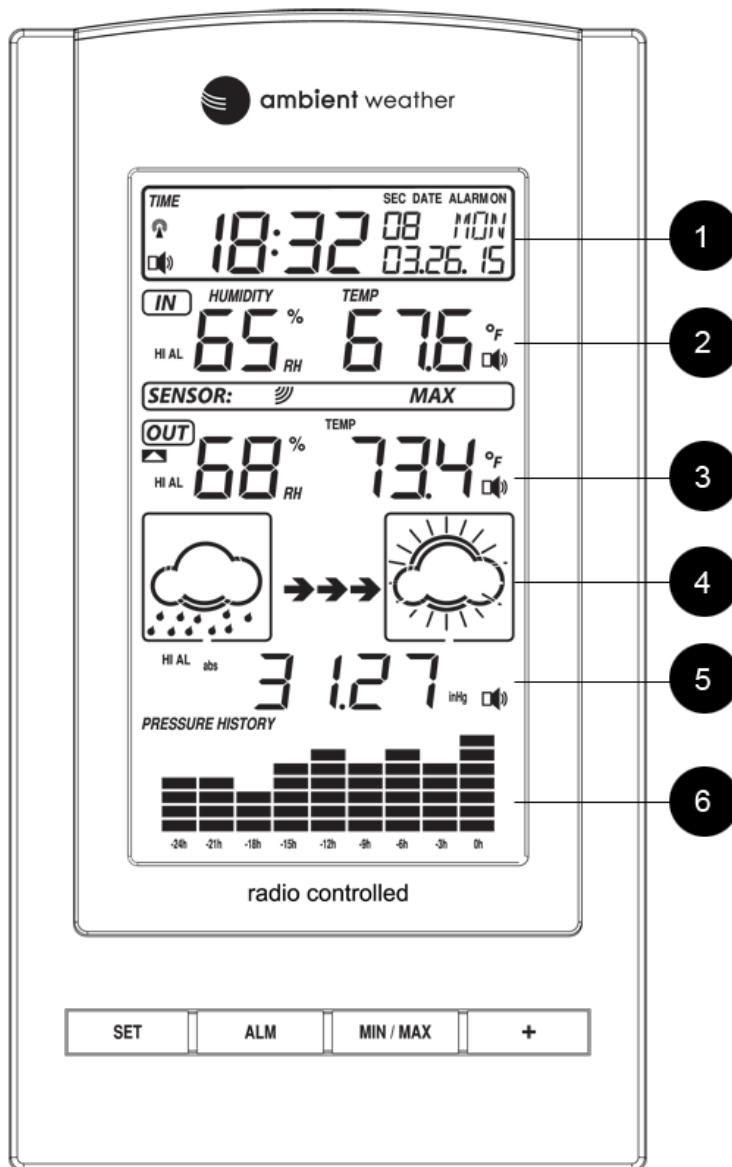| No | Description | No | Description |
|---|---|---|---|
| 1 | Radio Controlled Clock with Perpetual Calendar | 4 | Forecast Icons |
| 2 | Indoor Humidity and Temperature | 5 | Barometric Pressure |
| 3 | Outdoor Humidity and Temperature | 6 | Barograph |

**Figure 2**

# 2 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 WH117L weather station consists of a display console (receiver), and a thermo-hygrometer (remote transmitter).

## 2.1 Parts List

| QTY | Item |
|---|---|
| 1 | Display Console<br>Frame Dimensions (LxWxH): 7.25 x 4 x 1.25 in<br>LCD Dimensions (LxW): 4.25 x 2.50" |
| 1 | Thermo-hygrometer transmitter (WH2F) with mounting bracket<br>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 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**

## 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 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 7.

### 2.4.1 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:

SENSOR: 〽

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 4).

### 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)
2. WWVB Radio Controlled Time
3. Time
4. Radio Controlled Clock reception icon
5. Alarm ON indicator
6. Day of week/ time zone
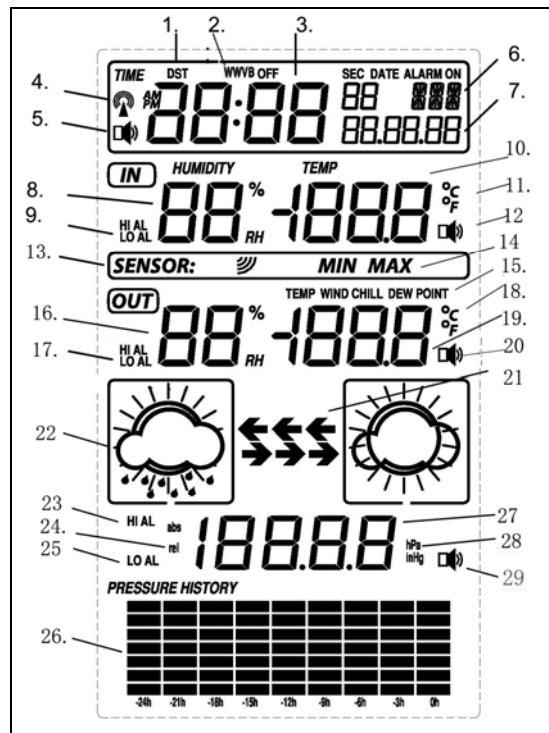7. Date
8. Indoor humidity display
9. Indoor temperature and humidity low alarm and high alarm
10. Indoor temperature display
11. Temperature display units
12. Indoor temperature and humidity alarm on indicator
13. Remote sensor transmit signal indicator
14. MIN/MAX information
15. Dew point temperature display

16. Outdoor humidity display
17. Outdoor temperature and humidity low alarm and high alarm
18. Temperature display units
19. Outdoor temperature display
20. General outdoor alarm icon
21. Weather forecast icon
22. Weather tendency indicator
23. Pressure with 24 hour history graph
24. Pressure high alarm
25. Pressure low alarm
26. Absolute or relative air pressure selection
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 $\pm\,2°F$). 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 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 eve.

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 eve.

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.
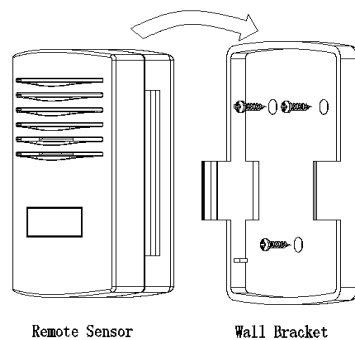


Remote Sensor          Wall Bracket

**Figure 4**

**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

### 4.1.1 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. |

### 4.1.2 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.

## 4.2    Set (Program) Mode

### 4.2.1  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]** | 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 | |

### 4.2.2  Set Mode Operation

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 **+** 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<br>CAT: Central Alaska<br>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<br>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 | Bejing |
| 9 | JST: Japan Standard | Tokyo |
| 10 | GST: Guam Standard | Sydney |
| 11 | --- | Magadan |
| 12 | IDLE: International Date Line East<br>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.  **Change Hour.** Press the **SET** key again to set the hour. Press the + 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 + key or **MIN/MAX** key to adjust the minute.

6.  **Change Year.** Press the **SET** key again to set the calendar year. Press the + 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 + key or **MIN/MAX** key to adjust the calendar month.

8.  **Change Day.** Press the **SET** key again to set the calendar day. Press the + key or **MIN/MAX** key to adjust the calendar day.

9.  **Temperature Units** (Celsius or Fahrenheit). Press the + 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 + 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 **4.2.5 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 + 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 **4.2.4 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 + 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 **4.2.5 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 + 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 **4.2.4 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 + key or **MIN/MAX** key to adjust the relative barometric pressure up or down. Reference **Section 4.5.6** 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 + key or **MIN/MAX** key to adjust the pressure threshold up or down. Reference **Section 4.5.4** for more details on this function.

17. **Storm Threshold Setting** (default level 4). Press the **SET** key again to adjust the storm threshold setting. Press the + key or **MIN/MAX** key to adjust the storm threshold up or down. Reference **Section 4.5.5** for more details on this function.

## 4.2.3 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.

## 4.2.4 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.

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.

## 4.2.5 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.

## 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.
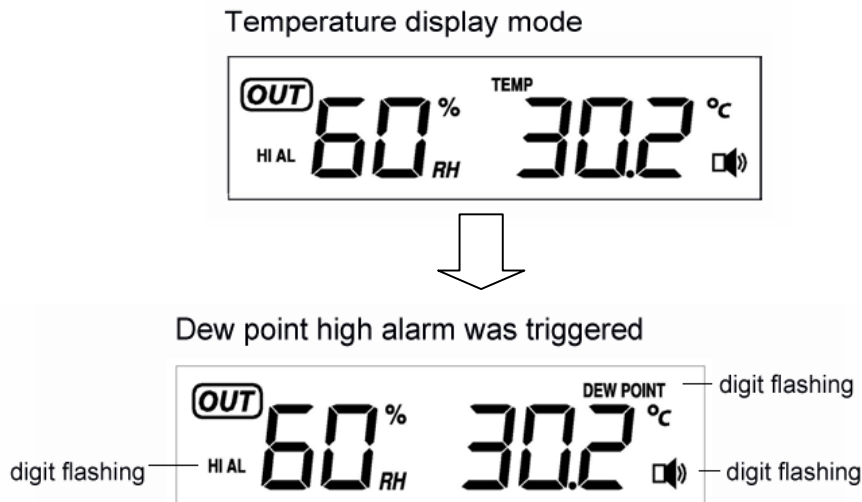


**Figure 4**

## 4.4 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.

## 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 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.

### 4.5.2  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.

### 4.5.3  Weather Icons
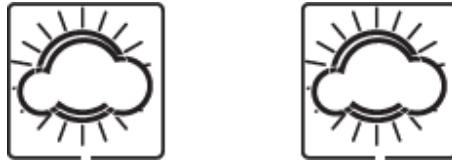


| Sunny | Partly Cloudy | Cloudy | Rainy |
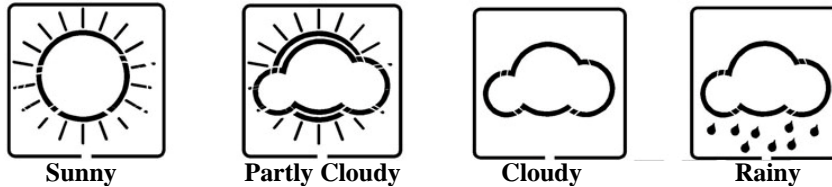
The four weather icons are Sunny, Partly Cloudy, Cloudy and Rainy. There are also two weather tendency indicators to show the air pressure tendency between the weather icons.

### 4.5.4  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.
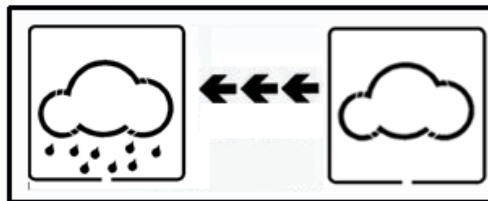


**Example 2:** Pressure is increasing, weather is improving in 24-48 hours.
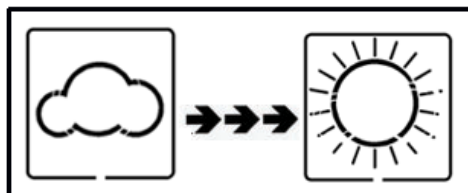
### 4.5.5  Storm threshold indicator

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.



### 4.5.6  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.
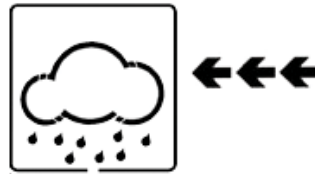
### 4.5.7  Pressure Graph

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.

### 4.5.8  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:



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 2.4 Display Console Set Up**.

# 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.<br>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: 433.92 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

| Problem | Solution |
|---|---|
| Wireless remote (thermo-hygrometer) not reporting in to console. | 1.  **Resync the unit.**   Press and hold the + key for 10 seconds to resynchronize. The remote sensor search icon |

| There are dashes (--) on the display console. | **SENSOR:** 〰️ |
|---|---|
| | 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. |
| | 2. Check the remote sensor is powered up and displaying the temperature and humidity on the LCD display. |
| | 3. Install a fresh set of batteries in the remote thermo-hygrometer. For cold weather environments, install lithium batteries. |
| | 4. The maximum line of sight communication range is 300'. Move the sensor assembly closer to the display console. |
| | 5. If the sensor assembly is too close (less than 5-10'), move the sensor assembly away from the display console. |
| | 6. Make sure the remote sensors are not transmitting through solid metal (acts as an RF shield), or earth barrier (down a hill). |
| | 7. Move the display console around electrical noise generating devices, such as computers, TVs and other wireless transmitters or receivers. |
| | 8. Move the remote sensor to a higher location. Move the remote sensor to a closer location. |
| | 9. Radio Frequency (RF) Sensors cannot transmit through metal barriers (example, aluminum siding) or multiple, thick walls. |
| 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 | 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 ± 2 °F). |
| | 2. Perform a temperature calibration (reference Section 4.2.5) |
| Indoor and Outdoor Humidity do not agree | 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 ± 5 %) |
| | 2. Perform a humidity calibration (reference Section 4.2.4) |
| Console outdoor humidity and remote humidity do not agree. | The console displays the calibrated humidity. The remote displays the measured humidity only.    Refer to 4.2.4 to set and reset the humidity calibration. |
| Relative pressure does not agree with official reporting station | 1. You may be viewing the relative pressure, not the absolute pressure. |
| | 2. Make sure you properly calibrate the barometer |

| | to an official local weather station (reference Section 4.2.1) |
|---|---|
| | 3. The barometer is only accurate to ± 0.08 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. |
| The forecast icon is not accurate | The weather station console must run for several days to trend barometric pressure.<br><br>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. |
| Console beeps and resets | Replace console batteries with a fresh set of batteries. |

# 8  Accessories

| Accessory | Description |
|---|---|
| Energizer AA Lithium Battery (2-pack) - Batteries for Long Life and Cold Climates | AA lithium batteries for cold weather climates. |
| Ambient Weather SRS100LX Temperature and Humidity Solar Radiation Shield | Solar Radiation Shield improves temperature accuracy for hot weather climates. Remove the rain guard and install over thermo-hygrometer. |

# 9  Product Revisions

| Revision | Description |
|---|---|
| WS-1170 | Initial Release |
| WS-1171 | • Added humidity calibration |
| WS-1171A | • Added temperature calibration<br>• Increased programming timeout from 10 seconds to 30 seconds<br>• Changed barograph from scrolling to non-scrolling.<br>• Added function to reacquire lost remote signal without powering down and up console. |
| WH117L | • Moved RCC receiver from the console to the transmitter to improve RCC reception. |

# 10 Liability Disclaimer

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

Reading the "User manual" is highly recommended. The manufacturer and supplier cannot accept any

responsibility for any incorrect readings and any consequences that occur should an inaccurate reading take place.

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

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.