
Ambient Weather WS-DP02 Digital Psychrometer with Temperature, Humidity, Heat Index, Dew Point, Wet Bulb Temperature and Clock User Manual



Table of Contents

1	Introduction.....	2
2.4	Display Console Set Up	2
2.4.1	Display Console Layout.....	4
2	Display Settings	5
2.1	Set Mode	5
2.2	Dew Point Alarm Set Mode.....	5
2.3	Dew Point Alarm.....	5
2.4	Temperature, Wet Bulb, Heat Index and Dew Point Display	5
2.5	Calibration Adjustment Mode	5
3	Heat Index Safety Discussion	6
4	Glossary of Terms	7
5	Specifications.....	8
5.1	Measurement Specifications	8
5.2	Power Consumption	8
6	Troubleshooting Guide.....	8
7	Accessories	9
8	Liability Disclaimer	9
9	Warranty Information.....	9

1 Introduction

Thank you for your purchase of the Ambient Weather WS-DP02 Digital Psychrometer with Temperature, Humidity, Heat Index, Dew Point, Wet Bulb Temperature and Clock. 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/wsdp02>

2.4 Display Console Set Up

1. Remove the battery door on the back of the sensor, as shown in Figure 1.

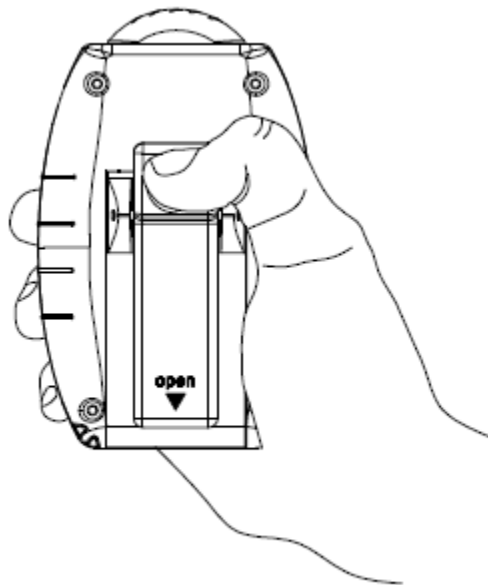


Figure 1

2. Insert two AAA batteries as shown in Figure 2, and close the battery door.

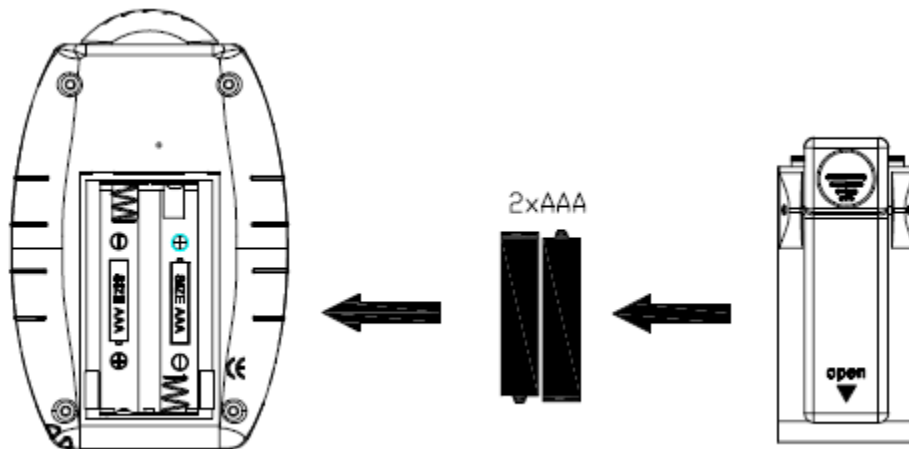


Figure 2

3. Close the battery door, as shown in Figure 3.

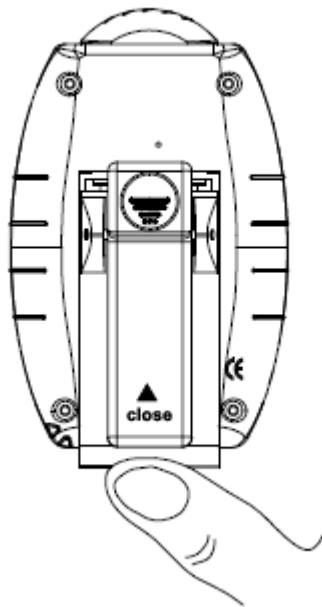


Figure 3

2.4.1 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.

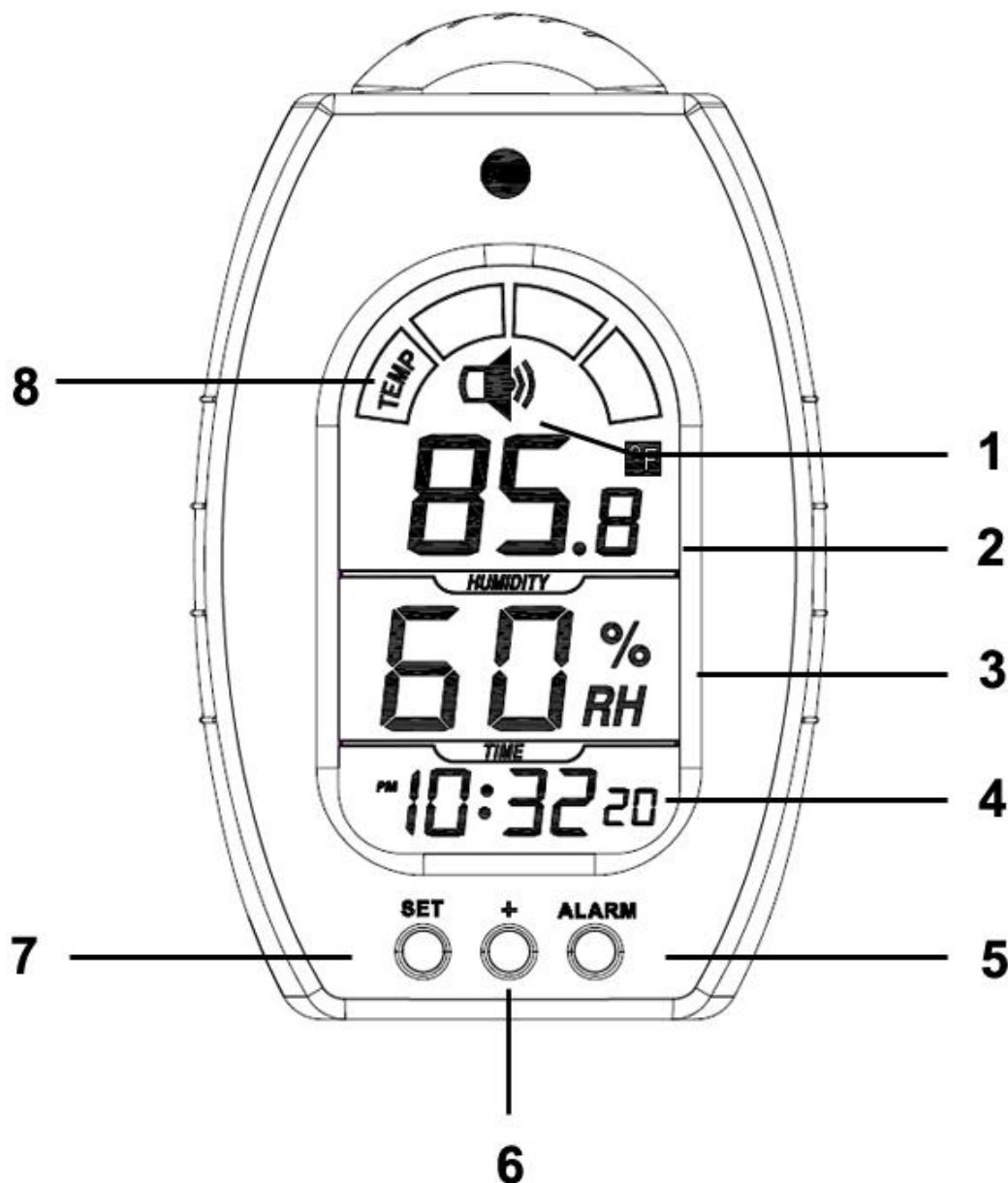


Figure 4

- | | |
|--|---|
| 1. Dew Point Alarm | 5. Alarm Button (also serves as – button) |
| 2. Temperature, Wet Bulb Temperature, Heat Index or Dew Point (°F or °C) | 6. + Button |
| 3. Relative Humidity (%) | 7. SET Button |
| 4. Time of Day (HH:MM:SS) | 8. TEMP/WET BULB/HEAT INDEX/DEW POINT Indicator |

2 Display Settings

 **Note:** The console has three buttons for easy operation: **SET** button, + button, and **ALARM** button (which also serves as the – button).

2.1 Set Mode

To set the time and units of measure, press and hold the **SET** button 3 seconds or longer, and let go of the **SET** button.

1. **12/24 Hour.** 12 Hr or 24 hour will begin flashing. Press the + button to switch between 12 hour and 24 hour display mode. Press the **SET** button (do not hold) to advance to the next setting.
2. **Hour of Day.** The hour of day will begin flashing. Press the + button to increase the hour, and the **ALARM** button to decrease the hour. Press the **SET** button (do not hold) to advance to the next setting.
3. **Minute of Day.** The minute of day will begin flashing. Press the + button to increase the minute, and the **ALARM** button to decrease the minute. Press the **SET** button (do not hold) to advance to the next setting.
4. **Temperature Units of Measure.** The °F or °C icon will begin flashing. Press the + button to switch between °F and °C. Press the **SET** button (do not hold) to exist the Set Mode.

2.2 Dew Point Alarm Set Mode

To set the Dew Point Alarm, press and hold the **ALARM** button for 3 seconds or greater, and the dew point alarm set point will begin flashing. To increase the dew point alarm set point, press the + button. To increase rapidly, press and hold the + button. To decrease the dew point alarm set point, press the **ALARM** button. To decrease rapidly, press and hold the **ALARM** button.

To confirm the Alarm setting and return to normal mode, press the **SET** button (do not hold).

2.3 Dew Point Alarm

To turn on the Dew Point Alarm, press (do not hold) the **ALARM** button. The alarm icon  will appear. To turn off the alarm, press the **ALARM** button again, and the alarm icon will disappear.

2.4 Temperature, Wet Bulb, Heat Index and Dew Point Display

Press the **SET** button (do not hold) to switch the display between temperature, heat index and dew point, or:

temperature→wet bulb→heat index→dew point→ temperature

2.5 Calibration Adjustment Mode

The purpose of calibration is to fine tune or correct for any sensor error associated with the devices margin of error. The measurement can be adjusted from the console to calibrate to a known source.

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

To calibrate temperature and humidity, press and hold the **SET** button for 9 seconds and the temperature will start flashing.

1. **Temperature Calibration.** To increase the temperature to match your calibration source, press the + button. To increase rapidly, press and hold the + button. To decrease the temperature, press the **ALARM** button. To decrease rapidly, press and hold the **ALARM** button.

To confirm the temperature calibration, press the **SET** button (do not hold), and the humidity will begin flashing.

2. **Humidity Calibration.** To increase the humidity to match your calibration source, press the + button. To increase rapidly, press and hold the + button. To decrease the humidity, press the **ALARM** button. To decrease rapidly, press and hold the **ALARM** button.

To confirm the humidity calibration and return to normal mode, press the **SET** button (do not hold).



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

To calibrate temperature, we recommend a mercury or red spirit (fluid) thermometer. Bi-metal (dial) and 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.



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

Official stations recalibrate or replace humidity sensors on a yearly basis. Due to manufacturing tolerances, the humidity is accurate to $\pm 5\%$. To improve this accuracy, the indoor and outdoor humidity can be calibrated using an accurate source, such as a sling psychrometer or one step humidpak calibration kits (reference Section 7).

3 Heat Index Safety Discussion

The following section is courtesy of the United States National Weather Service Office of Climate, Water and Weather Services.

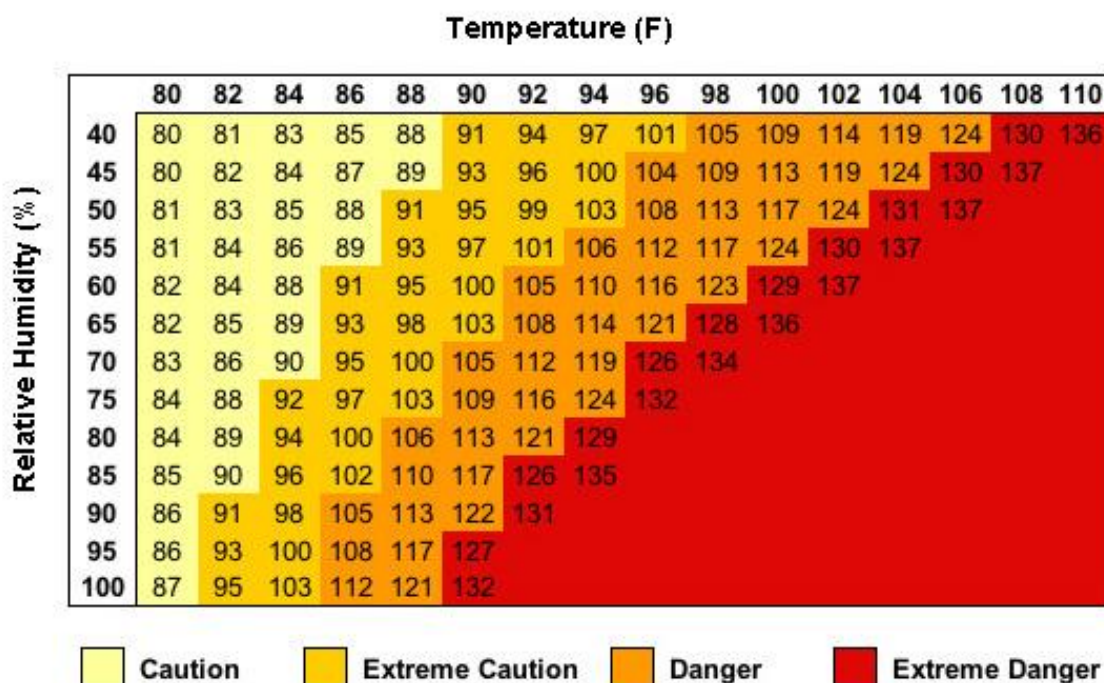
The Heat Index, sometimes referred to as the apparent temperature is given in degrees Fahrenheit. The Heat Index is a measure of how hot it really feels when relative humidity is factored with the actual air temperature.

To find the Heat Index temperature, look at the Heat Index chart below. As an example, if the air temperature is 96°F and the relative humidity is 65%, the heat index (how hot it feels) is 121°F.

IMPORTANT: Since heat index values were devised for shady, light wind conditions, exposure to

full sunshine can increase heat index values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

The Heat Index Chart shaded zone above 105°F shows a level that may cause increasingly severe heat disorders with continued exposure or physical activity.



Effects of the heat index (shade values):

Level	Heat Index Range (°F)	Notes
Caution	80-90	Fatigue is possible with prolonged exposure and activity. Continuing activity could result in heat cramps.
Extreme Caution	90-105	Heat cramps and heat exhaustion are possible. Continuing activity could result in heat stroke.
Danger	105-130	Heat cramps and heat exhaustion are likely; heat stroke is probable with continued activity.
Extreme Danger	Over 130	Heat stroke is imminent.

4 Glossary of Terms

Term	Definition
Accuracy	Accuracy is defined as the ability of a measurement to match the actual value of the quantity being measured.
Dew Point	The dew point is the temperature at which a given parcel of humid air must be cooled, at constant barometric pressure, for water vapor to condense into water. The condensed water is called dew. The dew point is a saturation temperature.
Heat Index	The Heat Index, sometimes referred to as the apparent temperature, is a

Term	Definition
	measure of how hot it really feels when relative humidity is factored with the actual air temperature.
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.
Psychrometer	A Psychrometer is an instrument used for measuring the water vapor content of the atmosphere; a type of hygrometer. It consists of two thermometers, one of which (the dry bulb) is an ordinary glass thermometer, while the other (wet bulb) has its bulb covered with a jacket of clean muslin which is saturated with distilled water prior to an observation. A digital psychrometer differs in that it measures humidity directly (rather than wet and dry bulb temperature) and calculates wet bulb temperature. Some HVAC analysis tables still use wet and dry bulb temperature.
Range	Range is defined as the amount or extent a value can be measured.
Wet Bulb Temperature	The wet-bulb temperature is the lowest temperature that can be reached under current ambient conditions by the evaporation of water only; it is the temperature felt when the skin is wet and exposed to moving air. Wet-bulb temperature is largely determined by both actual air temperature (dry-bulb temperature) and humidity, the amount of moisture in the air.

5 Specifications

5.1 Measurement Specifications

The following table provides specifications for the measured parameters.

Measurement	Range	Accuracy	Resolution
Temperature	14 to 140 °F	± 2 °F	0.1 °F
Humidity	20 to 99 %	± 5%	1 %
Note: when temperature or humidity read out of range, the display will read LL (out of range low) or HH (out of range high).			

5.2 Power Consumption

- 2 x AA 1.5V Alkaline or Lithium batteries (not included)
- Battery life: Approximately one year

6 Troubleshooting Guide

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

1. Email Support: support@ambientweather.com
2. Live Chat Support: www.ambientweather.com/chat.html (M-F 8am to 4pm Arizona Time)

3. Technical Support: 480-346-3380 (M-F 8am to 4pm Arizona Time)

Problem	Solution
Display console contrast is weak	Replace console batteries with a fresh set of batteries.
Temperature or humidity is inaccurate	Use the humidity and temperature calibration to match your calibration source.
Temperature, Heat Index appear to read high	Since heat index values were devised for shady conditions, exposure to full sunshine can increase heat index values by up to 15°F. Make sure you take your readings in a shaded area if possible.

7 Accessories

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

Accessory	Image	Description
Ambient Weather Humidity Calibration Kits		One step calibration kits for digital hygrometers use salt slurry formula to accurately calibrate the indoor and outdoor hygrometers.

8 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.

9 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.

