
Ambient Weather WH31L Lightning Detector



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1. Introduction

Thank you for your purchase of the Ambient Weather WH31L Lightning Detector. 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:

<https://ambientweather.com/faqs/question/tags/tag/WH31L/>

The lightning detector is not a stand-alone device and requires a WS-2000 or WS-5000 weather station to view and upload the data to our cloud hosting service at AmbientWeather.net.

To see if your weather station is compatible, please visit:

<https://ambientweather.com/faqs/question/tags/tag/WH31L/>

The following WS-2000 and WS-5000 console firmware versions or greater support lightning detector:

- Firmware revision number: V1.6.0
- WiFi Firmware: AMBWeatherV4.2.0

For details on updating the firmware, consult your weather station user manual.

2. How It Works

Personal lightning detectors work by detecting the electromagnetic pulse (EMP) emitted by a lightning strike. By measuring the strength of the detected EMP, the device can then estimate how far away the detected strike was.

Have you ever heard the crackling of a lightning strike on your AM radio? A lightning strike has a distinct waveform that can be processed and analyzed by detector hardware and software.

Through the application of electronics and software, personal lightning detectors identify storm activity within 25 miles (40 km) of your location.

3. Features

- Detects lightning within 25 miles (40 kilometers)
- High or low sensor sensitivity selectable to meet different installations
- Long wireless range up to 330 feet (100 meters) in open areas
- Transmits readings every 79 seconds
- Suspension eye for easy mounting

4. Limitations

Do not make important life-threatening decisions based on this lightning detector. We do not recommend this device for safety, both personal and public.

Personal lightning detectors cannot measure the exact location of a lightning strike. Lightning detectors are also sensitive to false alarms. Despite these limitations, personal lightning detectors continue to increase in popularity among individuals and professionals.

Although personal lightning detectors function well with respect to their ability to detect nearby lightning, they are quite basic in functionality when compared to professional lightning detectors.

For example, they cannot tell where a lightning strike was located, or from which direction the lightning is approaching, only that lightning is in the area. Also, since a personal lightning detector is triggered by EMPs, interference from other EMP-emitting devices (such as electronic equipment, appliances, fluorescent lights and even car engines) can sometimes result in either false alarms or missed strikes.

This interference often has the additional effect of preventing personal lightning detectors from functioning properly while indoors or near outdoor electronic equipment.

5. Getting Started

The Ambient Weather WH31L lightning detector includes the following:

5.1 Parts List

QTY	Item
1	Lightning Detector (123 x 42 x 14 mm or 4.8 x 1.6 x 0.5")

QTY	Item
1	User Manual

5.2 Recommend Tools

- Drill for mounting screw

6. Setup Guide

6.1 Batteries and Dip Switches

The lightning detector requires 2 x AA batteries (not included). We recommend Energizer Lithium batteries for longer life and a wider operating temperature range.

- Remove the battery door on the back of the transmitter by removing the battery cover, as shown in Figure 1.

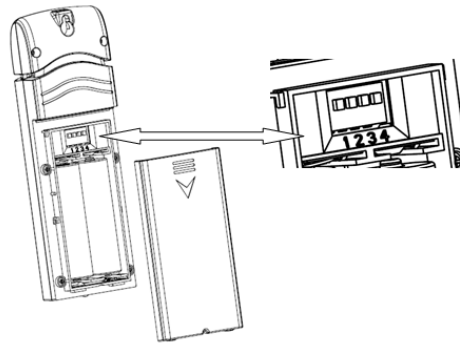
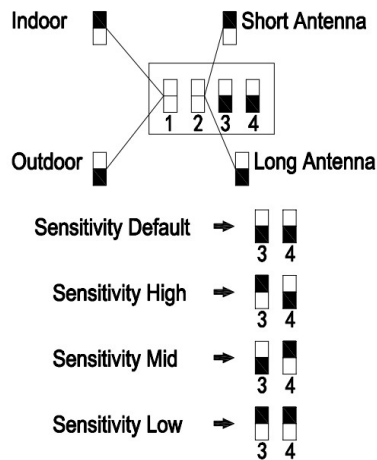


Figure 1

- Before inserting the batteries, locate the dip switches. We do not recommend changing the dip switches from the default position (all four switches in the down position), but we do provide the following customization in the event you are receiving false alarms or missing strikes.





 Switch in down position.
  Switch in up position.

Figure 2

Dip Switch	Function	Description
1	Indoor / Outdoor	We recommend installing your lightning detector outside. In the event you must install it in an enclosed location, the indoor setting
2	Long Antenna	Do not change this setting. The long antenna option (default) is the only configuration available.
3	Sensitivity	The default sensitivity is between Mid and High. If you receive false strikes, we recommend mid to low. If you miss strikes, we recommend the High setting. If you continue to miss strikes on the High setting, we recommend setting Dip Switch 1 to indoor.
4		

Note: After changing dip switch positions, for the changes to take effect, remove the batteries, wait 30 seconds, and inset the batteries.

- Insert 2 x AA batteries (not included). The LED indicator will turn on for four seconds and normally flash once every 79 seconds (the sensor transmission update period).

Note: If the LED does not light up, or stays on permanently, make sure the battery orientation is correct. Do not install the batteries backwards. You can permanently damage the sensor.

- Close the battery door.

6.2 LED Indicator

The LED on the front of the lightning detector indicates the following:

Momentary Flash: Indicates one packet of RF data from the sensor was sent, or one lightning strike was detected.

Flash for 2 seconds: Notifies detection of noise signals, indicating the current location has a high EMP noise level. You can either set dip switches to 3 and 4 to mid or low sensitivity levels, which increases noise filtering, or re-locate your detector away from electronic devices and machinery.

Steady on (longer than 2 seconds): Indicates detection of interference signals. It means there is lightning like signals around. You should try to find interference sources like motors, switches for all types of electrical appliances, and place the sensor far away from these interference sources.

Steady Off: Indicates no triggering of lightning signal, noise, or interference.

Steady On: The battery orientation is reverse, or the sensor is malfunctioning and must be replaced.

7. Sensor Placement

We recommend installing the sensor outdoors, away from electronic devices or machinery.

To mount or hang the sensor:

- Use a screw or nail to affix the remote sensor to the wall, as shown in Figure 3 (a) or
- Hang the sensor using a string or zip tie, as shown in Figure 3 (b).



Figure 3

- We also have a separate accessory the WH31SRS which will provide protection for your sensor and allow installation in a wide array of locations. The WH31SRS can be installed in two different configurations reference Figure 4 (a) and (b)

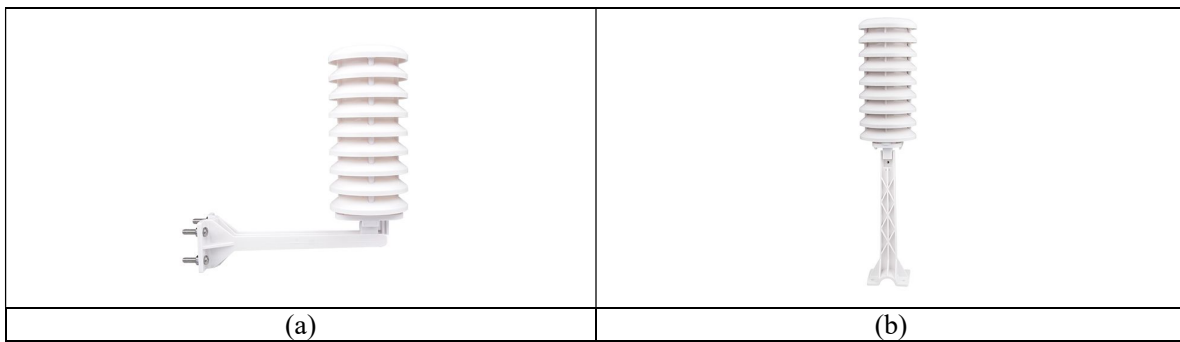


Figure 4

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

Do not mount the sensor to a metal surface, as metal will shield the sensor from lightning strikes.

8. Console

The most recent strike time elapsed, the strike distance (in miles or km) and the number of strikes per day are displayed in the upper right-hand corner of the display console, as shown in Figure 4.

This data is sent to AmbientWeather.net, where the data can be viewed, graphed, and alerted.

When a lightning strike occurs, the lightning icon will flash on the display for 30 minutes.

8.1 Distance Units of Measure

The lightning strike distance can be displayed in kilometers (km) and miles. When mph is selected as the wind speed units of measure, the lightning strike distance is displayed in miles. Otherwise, the distance is displayed in km.

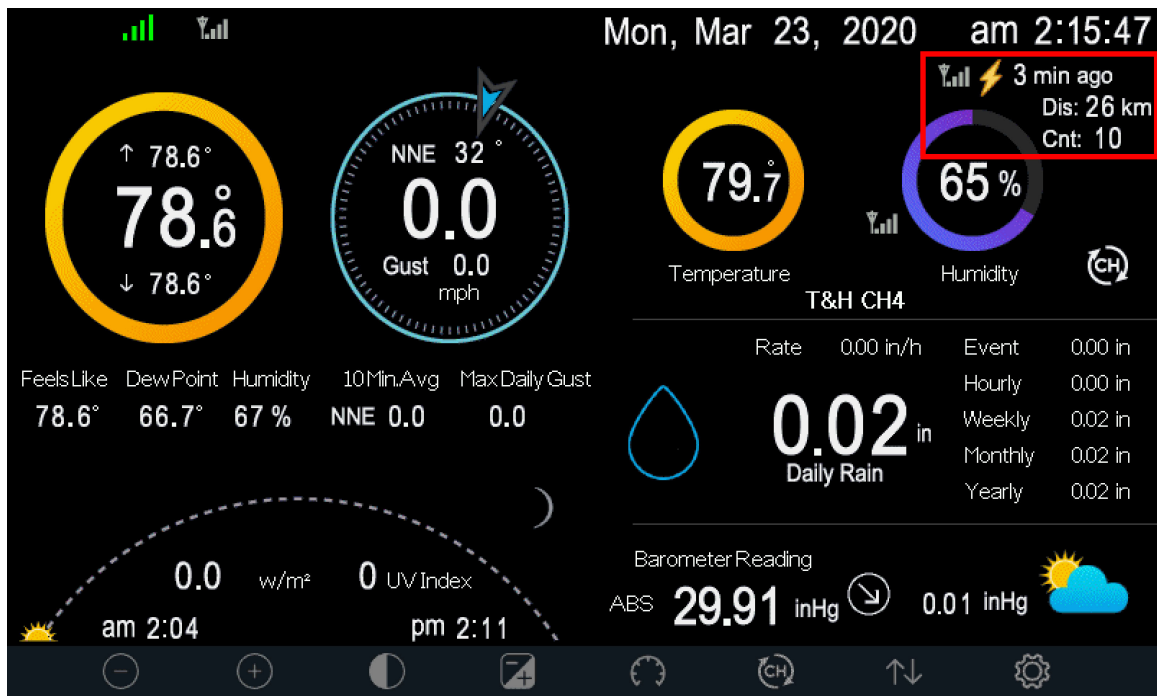


Figure 4

9. Specifications

9.1 Wireless Specifications

- Line of sight wireless sensor array RF transmission (in open air): 330 feet, 100 feet under most conditions
- Update Rate: Outdoor Sensor: 79 seconds
- RF Frequency: 915 MHz
- Lightning detection range: 0 - 25 miles (0 – 40 km)
- Working temperature: 0 – 50 C (32 - 122F)

9.2 Power Consumption

- 2 x AA batteries (not included).

10. Troubleshooting

- Email Support: support@ambientweather.com
- Technical Support: 480-346-3380 (M-F 8am to 4pm Arizona Time)
- Online Help: <https://ambientweather.com/faqs/question/tags/tag/WH31L/>

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 safety information.

The specifications of this product may change without prior notice.

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

No part of this manual may be reproduced without written authorization of the manufacturer.

Ambient, LLC WILL NOT ASSUME LIABILITY FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE, OR OTHER SIMILAR DAMAGES ASSOCIATED WITH THE OPERATION OR MALFUNCTION OF THIS PRODUCT.

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); (3) damage resulting from failure to follow instructions contained in your owner's manual; (4) damage resulting from the performance of repairs or alterations by someone other than an authorized Ambient, LLC authorized service center; (5) units used for other than personal use (6) applications and uses that this product was not intended (7) the products inability to receive a signal due to any source of interference or metal obstructions and (8) 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.

14. California Prop 65

WARNING: Use of the Ambient Weather Products can expose you to chemicals, including lead and lead compounds, which are known to the State of California to cause cancer and bisphenol A (BPA), and phthalates DINP and/or DEHP, which are known to the State of California to cause birth defects or other reproductive harm.

Can I Trust that Ambient Weather Products are Safe Despite this Warning?

In 1986, California voters approved the Safe Drinking Water and Toxic Enforcement Act known as Proposition 65 or Prop 65. The purpose of Proposition 65 is to ensure that people are informed about exposure to chemicals known by the State of California to cause cancer, birth defects and/or other reproductive harm. A company with ten or more employees that operates within the State of California (or sells products in California) must comply with the requirements of Proposition 65. To comply, businesses are: (1) prohibited from knowingly discharging listed chemicals into sources of drinking water; and (2) required to provide a "clear and reasonable" warning before knowingly and intentionally exposing anyone to a listed chemical. Proposition 65 mandates that the Governor of California maintain and publish a list of chemicals that are known to cause cancer, birth defects and/or other reproductive harm. The [Prop 65 list](#), which must be updated annually, includes over 1,000 chemicals, including many that are commonly used in the electronics industry.

Although our manufacturing process is "lead-free" and RoHS compliant, it remains possible that trace amounts of lead could be found in components or subassemblies of Ambient Weather Products. Bisphenol A (BPSA) could conceivably be present in minute amounts in our plastic housings, lenses, labels or adhesives, and DEHP & DINP (phthalates) could possibly be found in PVC wire coatings of our cables, housings, and power cords. Unlike RoHS, Prop 65 does not establish a specific threshold for reporting on the substances of concern and instead sets forth a much less definitive standard requiring that the business demonstrate with certainty that there is "no significant risk" resulting from exposure. With respect to carcinogens, the "no significant risk" level is defined as the level which is calculated to result in not more than one excess case of cancer in 100,000 individuals exposed over a 70-year lifetime. In other words, if you are exposed to the chemical in question at this level every day for 70 years, theoretically, it will increase your chances of getting cancer by no more than 1 case in 100,000 individuals so exposed. With respect to reproductive toxicants, the "no significant risk" level is defined as the level of exposure which, even if multiplied by 1,000, will not produce birth defects or other reproductive harm. In other words, the level of exposure is below the "no observable effect level," divided by 1,000. (The "no observable effect level" is the highest dose level which has not been associated with observable reproductive harm in humans or test animals.) Proposition 65 does not clarify whether exposure is to be measured only in normal operation, or in the event of misuse such as intentionally damaging, incinerating or consuming an Ambient Weather Product or component and Ambient Weather has not attempted to evaluate the level of exposure.

A Proposition 65 warning means one of two things: (1) the business has evaluated the exposure and has concluded that it exceeds the "no significant risk level"; or (2) the business has chosen to provide a warning simply based on its knowledge about the presence of a listed chemical without attempting to evaluate the exposure. The California government has itself clarified that "The fact that a product bears a Proposition 65 warning does not mean by itself that the product is unsafe." The government has also explained, "You could think of Proposition 65 more as a 'right to know' law than a pure product safety law."

While using Ambient Weather Products as intended, we believe any potential exposure would be negligible or well within the "no significant risk" range. However, to ensure compliance with California law and our customers' right to know, we have elected to place the Proposition 65 warning signs on Ambient Weather Products.

For further information about California's Proposition 65, please visit <https://oehha.ca.gov/prop65/background/p65plain.html>

