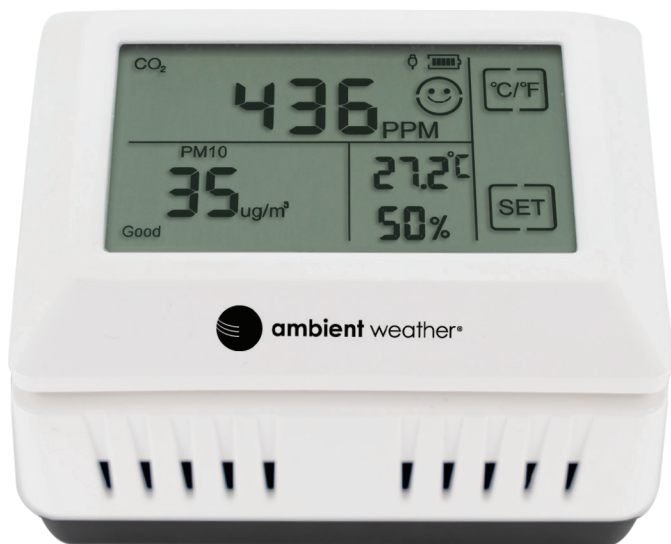




ambient weather®

AQIN PRO WIRELESS INDOOR PARTICULATE MONITOR

Model AQIN Pro



USER MANUAL

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INTRODUCTION

Thank you for your purchase of the Ambient Weather AQIN Pro wireless Indoor Particulate Monitor. The following user guide provides step by step instructions for installation, operation and troubleshooting. To download the latest manual, compatible devices, and additional troubleshooting tips, please visit:

<https://ambientweather.com/aqin-pro-smart-indoor-air-quality-monitor-display>

To sign up for firmware or app update alerts, please visit:

<https://ambientweather.com/firmware-update-alerts>

The following console firmware versions support the AQIN Pro:

- **WS-2000, WS-4000 and WS-5000 Firmware:** V2.1.0 or later and Wi-Fi Firmware V5.2.6 or later
- **WeatherHub Firmware:** V1.0.6 or later
- **WS-1965 Firmware:** V1.3.4 or later

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

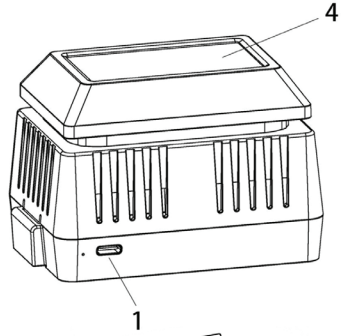
The AQIN Pro sensor measures PM1.0, PM2.5, PM4.0, PM10 and CO2. PM1 refers to particles that are 1.0 microns or smaller in diameter, PM4.0 refers to particles that are 4.0 microns or smaller in diameter and so on up to PM10 for 10 microns. This sensor uses laser scattering to radiate suspending particles in the air, then collects scattering light to obtain the curve of scattering light change with time. The microprocessor calculates equivalent particle diameter and the number of particles with different diameters per unit volume.

WHAT'S INCLUDED

- One Ambient Weather AQIN Pro sensor
- One USB-C power cable

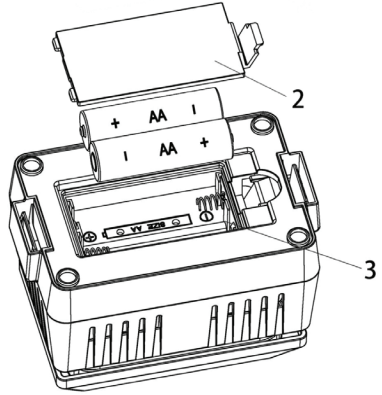
SENSOR DIAGRAM

#	DESCRIPTION
1	AC Adapter USB-C Power Port
2	Battery Compartment Cover
3	Battery Compartment
4	LCD Display



SENSOR SETUP

- Remove the battery cover on the bottom of the sensor, and insert 2× AA Alkaline batteries (not included)
- Close the battery door.
- Remove the USB-C port cover and connect the AC power adapter.



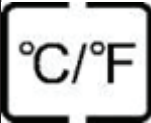

NOTE: After inserting the batteries or connecting AC power, the LCD layout segment will light.

NOTE: The sensor can operate on both battery and AC power, but AC power is preferred as the battery life is limited to about 7 days. The AC power circuit does not charge the back up batteries.







DISPLAY

SCREEN	DESCRIPTION
<p>CO₂ 88888 PPM</p> <p>PM2.5 PM10 PM4.0 PM1.0</p> <p>888 Hazardous ug/m³ Severe</p> <p>Good Moderate Poor Unhealthy</p> <p>100.0°C 88%</p> <p>°C/°F</p> <p>SET</p>	<p>Display Elements <i>(All symbols shown for reference)</i></p>
<p>AbCdE^①</p> <p>101^②</p> <p>915^③</p>	<p>① Sensor ID. The sensor ID consists of the letters A to E and the numbers 0 to 9.</p> <p>② Firmware version</p> <p>③ RF frequency</p>
<p>CO₂ --- PPM</p> <p>PM2.5 --- ug/m³</p> <p>---°C</p> <p>---%</p> <p>°C/°F</p> <p>SET</p>	<p>If no data has been read within 15 seconds, the screen will display "---" until data readings have resumed.</p>
<p>CO₂ 436 PPM</p> <p>PM10 35 ug/m³</p> <p>27.2°C</p> <p>50%</p> <p>°C/°F</p> <p>SET</p>	<p>Example of screen during standard operation.</p>

Buttons

BUTTON	DESCRIPTION
	Press to switch temperature units °C or °F. When in CO ₂ Calibration Mode, single press to confirm the target reading value. (See page 11 For Sensor Calibration.)
	Press to switch PM2.5, PM10, PM4.0, PM1.0. Hold for 5s to enter or exit CO ₂ Calibration Mode. While in CO ₂ Calibration Mode, single press to increase target readings= value in increments of 10ppm.

Icons

ICON	DESCRIPTION
	RF signal
	DC power supply
	Battery status
	$0 < \text{PPM} < 800$
	$800 \leq \text{PPM} < 1200$
	$1200 \leq \text{PPM}$

Labels

"PM_XX" includes PM1.0, PM2.5 and PM4.0

LABEL	DESCRIPTION
"Good"	$0 < PM_{XX} \leq 12$; $0 < PM_{10} \leq 54$
"Moderate"	$12 < PM_{XX} \leq 35.4$ $54 < PM_{10} \leq 154$
"Poor"	$35.4 < PM_{XX} \leq 55.4$ $154 < PM_{10} \leq 254$
"Unhealthy"	$55.4 < PM_{XX} \leq 150.4$ $254 < PM_{10} \leq 354$
"Severe"	$150.4 < PM_{XX} \leq 250.4$ $354 < PM_{10} \leq 424$
"Hazardous"	$250.4 < PM_{XX}$ $424 < PM_{10}$

BASIC AQI GUIDELINES

Air Quality Index (AQI) for PM2.5 Concentration (24hr)

AQI	AIR POLLUTION LEVEL	PM2.5 CONCENTRATION $\mu\text{g}/\text{m}^3$
0 - 50	Good	0.0-12.0
51 -100	Moderate	12.1-35.4
101-150	Poor	35.5-55.4
151-200	Unhealthy	55.5-150.4
201-300	Severe	150.5-250.4
300+	Hazardous	250.5+

Air Quality Index (AQI) for PM10 Concentration (24hr)

AQI	AIR POLLUTION LEVEL	PM10 CONCENTRATION $\mu\text{g}/\text{m}^3$
0 - 50	Good	0-54
51 -100	Moderate	55-154
101-150	Poor	155-254
151-200	Unhealthy	255-354
201-300	Severe	355-424
300+	Hazardous	425+

SENSOR PLACEMENT

Place the sensor on any horizontal surface. Note that the vents must be clear of any obstructions, and we recommend placement away from other electronic devices to prevent interference. Do not place on a metal table to prevent RF signal loss.

Wireless communication is susceptible to interference, distance, walls and metal barriers. We recommend the following best practices for trouble free wireless communication.

Electro-Magnetic Interference (EMI): Keep the sensor several feet away from computer monitors and TVs.

Radio Frequency Interference (RFI): If you have other 915 MHz devices and communication is intermittent, try turning off these other devices for troubleshooting purposes. You may need to relocate the transmitters or receivers to avoid intermittent communication.

Line of Sight Rating: This device is rated at 300 feet line of sight (no interference, barriers or walls) but typically you will get 100 feet maximum under most real-world installations, which include passing through barriers or walls.

Metal Barriers: Radio frequency will not pass-through metal barriers such as aluminum siding.

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%

CONSOLE COMPATIBILITY

The AQIN Pro sensor is currently natively supported by the consoles of the WS-2000, WS-4000, and WS-5000 weather stations:

The sensor can also “pass through” data to AWN via the consoles of the WS-1965, WS-1938, WeatherHub, WS-1553-IP, and WS-5000-IP3:

Connecting AQIN to your WS-2000, WS-4000, or WS-5000 console

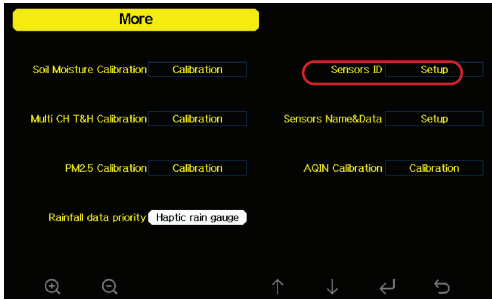
1. Press the gear button  to enter Setup Mode.




2. Use the arrow buttons to navigate to **More: Setup**, press .



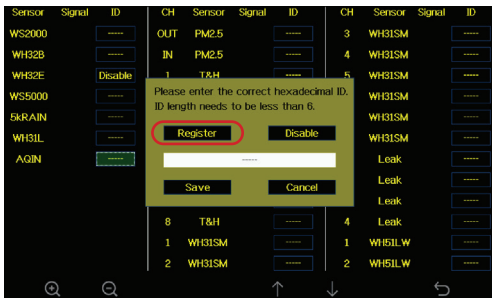
3. Use the arrow buttons to navigate to **Sensors ID: Setup** and press .



4. Use the arrow buttons to navigate to **AQIN**, press .



5. Select "Register" to register the sensor to the console.



AQIN Pro Data on Your Console Display

The CO₂, PM1.0, PM2.5, PM4.0, PM10 data automatically cycles every 5 seconds

- AQCO2: 903 ug/m³**
- AQ1.0: 11 ppm**
- AQ2.5: 11 ug/m³**
- AQ4.0: 11 ug/m³**
- AQ10: 11 ug/m³**



You can also display the data from your AQIN Pro in "Optional Sensor Display Mode" by pressing **↑↓** four times from your home screen.

AQIN		T&H CH2	T&H CH3	T&H CH4	T&H CH5	T&H CH7	T&H CH8
T&H 25.7 °C 33 %	CO2 636 ppm	26.2 °C 38 %	27.3 °C 41 %	25.7 °C 39 %	24.8 °C 41 %	26.2 °C 41 %	27.1 °C --
PM2.5 36 ug/m ³ Poor	PM10 36 ug/m ³ Good	Indoor 26.0 °C 51 %	Soil CH1 0 %	Soil CH2 0 %	Soil CH3 0 %	Soil CH4 0 %	Soil CH5 0 %
PM1.0 34 ug/m ³ Moderate	PM4.0 36 ug/m ³ Poor	Soil CH6 0 %	Soil CH7 0 %	Soil CH8 0 %	Water CH2 Normal	Water CH3 Normal	Thunder -- min ago Dis: -- Cnt: 0
AQI 24H 104	AQI 24H 104	WN34 CH3 24.0 °C	WN35 CH1 0 %	WN35 CH2 0 %	LDS CH2 air 87 mm depth 13 mm	LDS CH3 air 84 mm depth 116 mm	LDS CH4 air 587 mm depth --
AQI 24H 98	AQI 24H 104	WN34 CH1 26.5 °C	WN34 CH2 25.8 °C				

SENSOR CALIBRATION

CO₂: To find if the CO₂ sensor accuracy has drifted or not: put the sensor in an outdoor, open air location, away from any sources of combustion or exhaust and wait 30 minutes. You should see the CO₂ reading at 430ppm +/-10. If it deviates from this reading, wait a bit longer or test it at night to confirm. Once it is confirmed that the sensor needs calibration, return to the same outdoor environment and:

- Press and hold the “Set” button on the display for 5 seconds. “Cal” will come up with a flashing “400”.
- Tap the “Set” button to increase the calibration baseline in increments of 10 ppm.

NOTE: *As of this writing, the monthly atmospheric average is 430ppm.*

- Set the sensor to 430ppm, then press the [°C/°F] button to confirm.

The unit will then display a spinning symbol for up to about 1 minute as it senses the stable CO₂ levels. Once the spinning symbol is gone, the unit is calibrated.

NOTE: *When the CO₂ sensor in calibration state, please do not stand near the sensor, otherwise it will affect the calibration result.*

NOTE: *To exit calibration without finishing, press and hold “Set” for 5 seconds.*



SPECIFICATIONS

Wireless Specifications

Transmission distance in open field: 300 feet line of sight, 100 feet under most conditions.

Line of sight Wi-Fi RF transmission (in open air): 80'

Frequency: 915 MHz

Sensor reporting interval: 1 minute (AC); 10 minutes (battery)

Measurement Specifications

The following table provides the specifications for the measured parameters.

MEASUREMENT	RANGE	ACCURACY	RESOLUTION
PM 2.5	0- 999 $\mu\text{g}/\text{m}^3$	$>100\mu\text{g}/\text{m}^3, \pm 15\%$ $<100\mu\text{g}/\text{m}^3, \pm 15\mu\text{g}/\text{m}^3$	$1\mu\text{g}/\text{m}^3$
PM 10	0- 999 $\mu\text{g}/\text{m}^3$	$>100\mu\text{g}/\text{m}^3, \pm 25\%$ $<100\mu\text{g}/\text{m}^3, \pm 25\mu\text{g}/\text{m}^3$	$1\mu\text{g}/\text{m}^3$
CO2	0- 40000 ppm	400-10000ppm $\pm(30\text{ppm}\pm 3\%)$	1ppm
Temperature	-40.0-60.0°C (-40°F-140°F)	$\pm 1^\circ\text{C}$ or 2°F	0.1°C or 0.1°F
Humidity	0-99%	$\pm 5\%$	1%

Power Specifications

AQIN Pro Sensor: AC power, 2x AA backup batteries (not included).

NOTE: *If you have other PM2.5 sensors (Ambient Weather brand or otherwise), the PM2.5 readings/AQI at low levels may vary due to differing sensitivities set by the manufacturer.*

MEASUREMENT VARIANCE

This device is mainly used to detect the particle concentration in air. The accuracy for temperature and humidity reading may vary due to different environment:

- When the sensor is placed in unventilated environments, the temperature reading may be 2 degrees high.
- When the sensor is placed in well-ventilated environments, the temperature and humidity reading may be lower than actual.

HIGH MOISTURE LIMITATIONS

High moisture should not be an issue when the sensor is placed indoors, but the following section is included in the event the sensor is placed in a high moisture environment, like a greenhouse.

Fog and aerosolized water vapor can interfere with the way AQIN Pro sensors measure the transmission of light through the atmosphere, and can result in a higher reading. This characteristic is inherent to the sensor design.

The condition occurs during rainy or foggy weather, where:

Outdoor Temperature - Dew Point Temperature $\leq 2^{\circ}\text{C}$ (3.6 $^{\circ}\text{F}$)

Thus, when the air is nearly saturated, the data is invalid.

Do your best to mount the sensor in a well-drained area which is less prone to moisture condensation if possible.

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 this 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.

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:

- This device may not cause harmful interference.
- 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 a dealer or an experienced radio/TV technician for help.

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 an 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.

CALIFORNIA PROP 65

WARNING: *Use of this Ambient Weather product 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>

CUSTOMER SERVICE

Email Support:
support@ambientweather.com

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

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MADE IN CHINA