ambient weather®

Model: WS-1938

Table of Contents

1.Features

1. Built-in CO_2 sensor, temperature, humidity, and air pressure.
2. Displays indoor temperature humidity and trends; support displaying outdoor multi-channel transmitter temperature humidity and the changing trend.
3. Supports receiving and displaying multi-channel sensor transmitters such as the WH31 family.
4. Can be used as a Wi-Fi gateway to support the reception of more sensors' data, which can be viewed via the web.
5. Maximum/minimum data logging
6. Supports Wi-Fi configuration on web page, viewing more sensors' data, setting server, setting calibration parameters, setting Sensor ID.
7. With Wi-Fi function, support for uploading data to a weather station server.

8. Automatic time zone and automatic network time acquisition
9. Tabletop or wall mount.
10. DC power supply supports backlight brightness adjustment.

2. Display Console

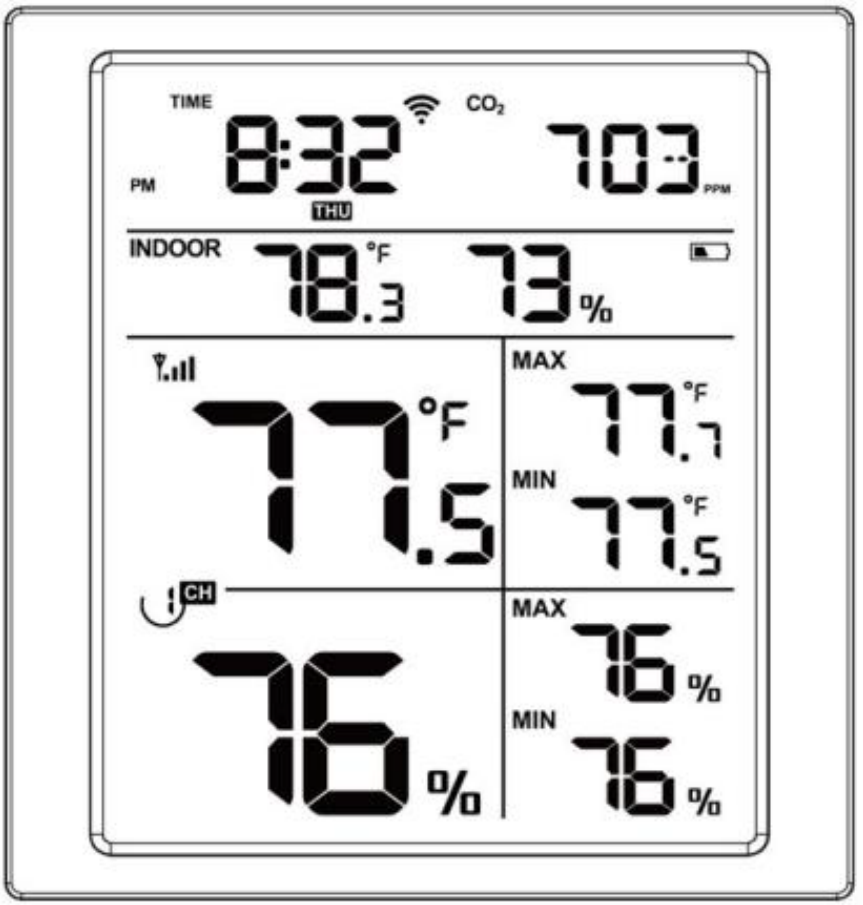


Figure 1

(1) Unfold the desk stand and place the console 5 to 10 feet away from the outdoor sensor.

(2) Remove the battery door on the back of the console and insert 2 x AA good quality

Alkaline or Lithium batteries per Figure 14.

(3) Wait several minutes for the remote sensors to synchronize with the display console.

(4) The temperature and humidity sensors are placed at the antenna end, away from the station body. This is to prevent influence by the small amount of heat generated by the console. Orient the console antenna straight up for accurate indoor temperature and humidity reading.

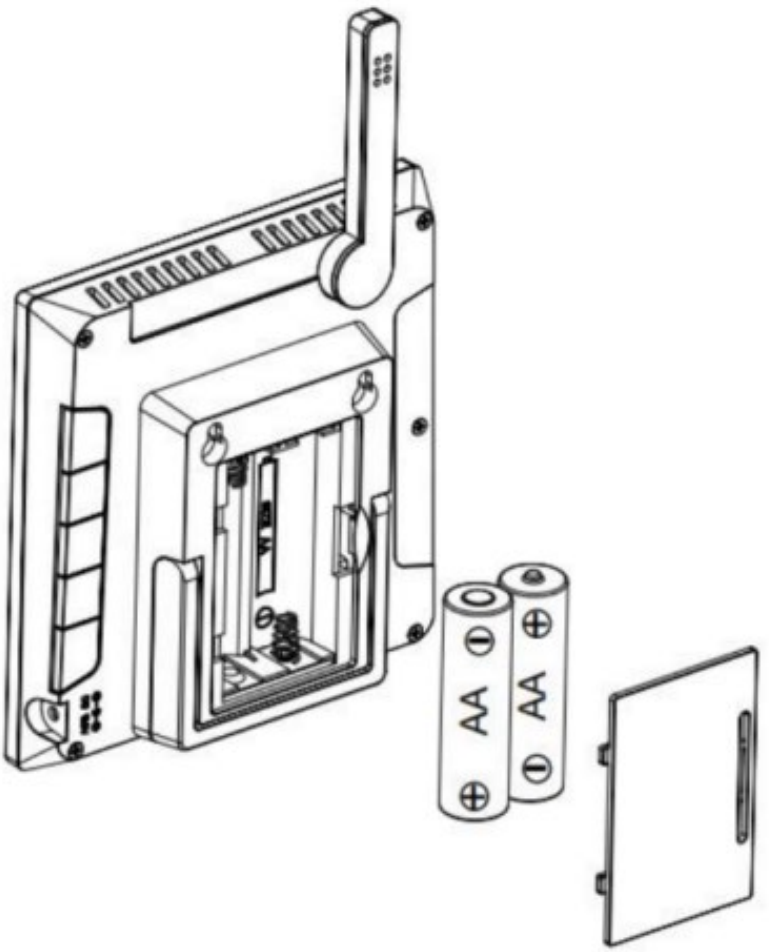


Figure 2

Built-in Sensors:

1. Thermometer & Hygrometer Sensor
2. CO_2 Sensor
3. Barometer

3. Screen Display

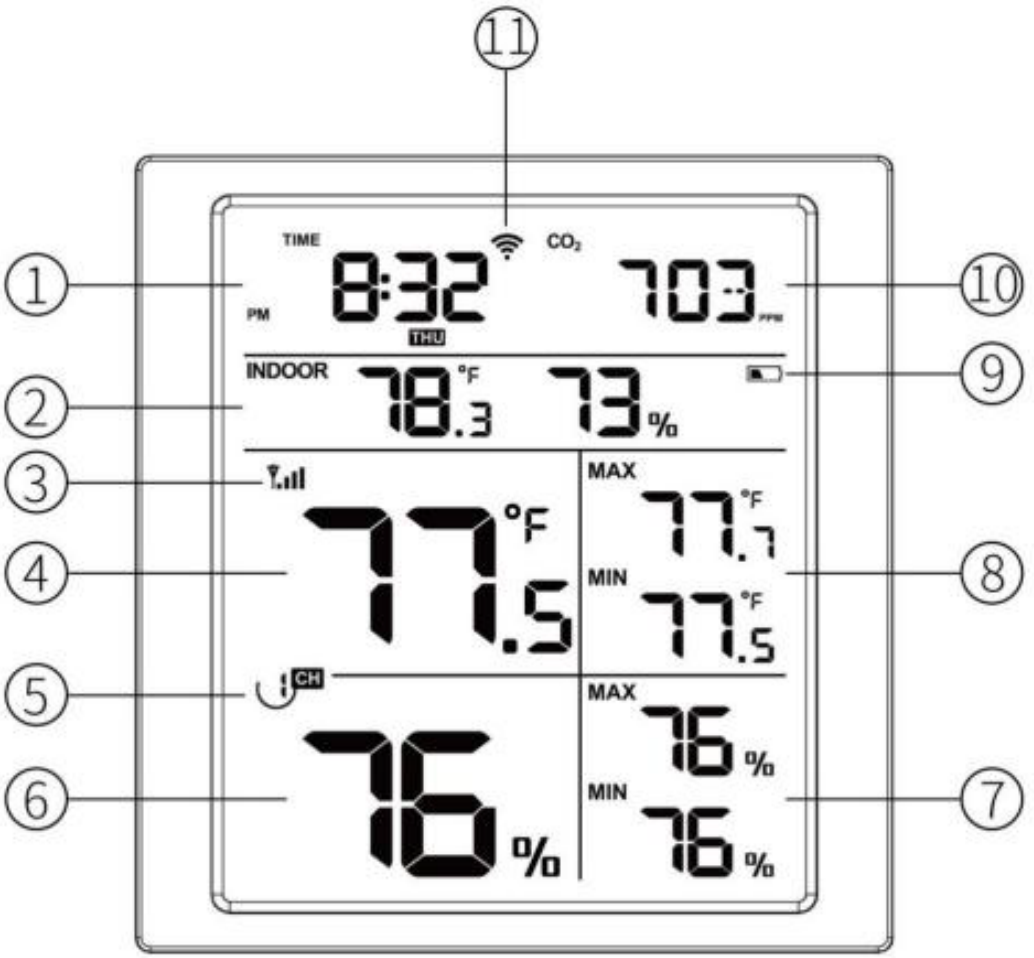


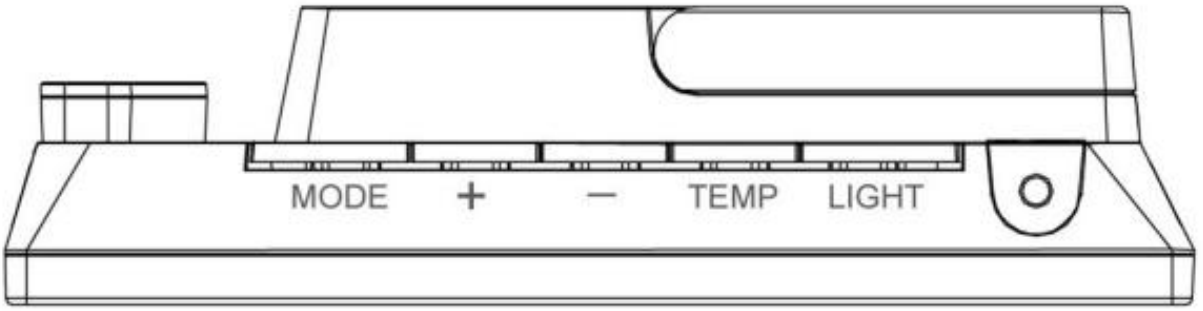
Figure 3

① Time
② Indoor Temp/Relative Humidity and
Shared with Soil Moisture, Leaf Sensor
③ Signal Icon

④ WH31E Temperature and Humidity Sensor
⑤ Channel Number
⑥ WH31E MAX&MIN Humidity (Included External Sensor)
⑦ WH31E MAX&MIN Temperature (Included External Sensor)
⑧ Power Status
⑨ CO_2 Level (parts per million)
⑩ Wi-Fi Icon

4. Key Function

The console has five keys for easy operation.



□ MODE□ :

(1) Press to switch between Normal Mode, Alarm Clock Hour-Setting Mode, Alarm Clock Minute-Setting Mode, MAC Address Display Mode.

(2) Press and hold for two seconds to enter the Set Mode.

【+】:

(1) While in Normal Mode, press this button to shift the display in CO_2 display Section, the sequency is date, CO_2, CO_2 24hAVG,

CO_2 1hMAX, CO_2 24hMAX and CO_2 MAX.

(2) While displaying the CO_2 24hAVG/ 1hMAX/24hMAX/MAX, long press this button to reset max data.

【-】:

(1) While in Normal Mode, press the (-) button to shift the display in indoor temp/humidity section.

(2) While in single channel of the above operation, long press this button 5 seconds to re-register the corresponding CH sensor.

(3) While in Auto cycle mode, press the (-) button for 5 seconds to re-register the CH1~8 sensors.

【TEMP】:

(1) While in Normal Mode, press the (Temp) button to switch shift the display in outdoor temperature and humidity section.
(2) While in single WH31 CH mode, press this button for 5 seconds to re-register the corresponding CH sensor.
(3) While in Auto cycle mode, long press this button for 5 seconds to re-register WH31 CH1~8 sensor.

【Light】:
When powered by DC adaptor, press this button to adjust the level between High, Middle, Low, and Off.

Combination Button
MODE/Light : long press these 2 buttons at the same time for 5 seconds to restore factory settings and reboot.
+/TEMP : long press these 2 buttons at the

same time over 2 seconds to trigger Soft-AP and the Wi-Fi icon will fast flash; you can use PC or phone to connect its hotspot.

5. Modes

There are 5 modes：Normal Mode, Setting Mode, Alarm Clock Hour-Setting Mode, Alarm Clock Minute-Setting Mode, MAC Address Display Mode

5.1 Normal Mode

While power on, the device enters into the normal mode in default. While in other modes, the device will automatically enter into the normal mode after 30 seconds of no operation Press the button LIGHT (Not hold) to enter into normal mode.

5.2 Alarm Clock Hour-Setting Mode

1. While in Alarm Clock Hour-Setting Mode, Adjust the hour by pressing the buttons + and -
2. Power on/off the alarm clock by pressing the button TEMP

5.3 Alarm Clock Minute-Setting Mode

1. While in Alarm Clock Minute-Setting Mode,

Adjust the minute by pressing the buttons + and -.

2. Power on/off the alarm clock by pressing the button TEMP.

5.4 MAC Address Display Mode

Press the button MODE to display the MAC Address. MAC address is also on a sticker on the rear of the console.

5.5 Setting Mode

Press and hold the **MODE** button for two seconds to enter the Setting Mode. To proceed to the next setting, press (do not hold) the **MODE** button.
To exit the SET mode at any time, press the **LIGHT** button.

Table 8 summarizes the set mode sequence and commands.

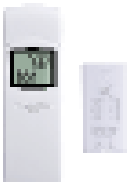
Command	Mode	Settings
[MODE] + 2 seconds	Enter Setting Mode, Beep On or Off	Press [+] or [-] to switch OFF and ON. This will prevent the beep from sounding when pressing any button.
[MODE]	Clear Max/Min	Press [+] or [-] to switch OFF and ON. When set to ON, the minimum and maximum values reset every day at midnight (00:00). When set to OFF, the minimum and maximum values must be reset manually.
[MODE]	12 hour / 24 Hour Format	Press [+] or [-] to switch hour format between 12 hour and 24-hour format.
[MODE]	Hour	Press [+] or [-] to adjust hour up or down.
[MODE]	Minute	Press [+] or [-] to adjust

		minute up or down.
[MODE]	Year	Press [+] or [-] to adjust year up or down
[MODE]	Month	Press [+] or [-] to adjust month up or down
[MODE]	Day	Press [+] or [-] to adjust day up or down
[MODE]	Temperature Units of Measure	Press [+] or [-] to change temperature units of measure between °F and °C.
[MODE]	CO_2 Calibration	Press [TEMP] to switch OFF and ON.

6. Display Console

6.1 List of sensors that can be

displayed on the screen.

Item Number	Number of Channels	Description	Image
WH 31E	8	Multi-Channel Thermometer and Hygrometer Sensor	
WH 31 SM	16	Soil Moisture Sensor	
WH 51 LW	8	Leaf wetness sensor	
WH 31P	8	Waterproof probed thermometer	

6.2 CO_2 Concentration

1. The device will automatically display the CO levels in units of Parts Per Million when

powered on.

2. While in Normal Mode, press this button to switch between date, CO_2 live data, CO_2 24h AVG, CO_2 1h MAX, CO_2 24h MAX and CO_2 MAX.

6.3 CO_2 Calibration

In Normal Mode, hold the button Mode 2 seconds to enter into the Setting Mode, and press the button Mode until CO_2 calibration mode is presented. Put the console in outdoor air location, or at least with normal fresh outdoor air submerged.

1. Display real-time CO_2 concentration data, updates once every 5 seconds.
2. When "ON" flashes to indicate that CO_2 calibration is currently in progress; when "OFF" flashes to indicate that CO_2 calibration is not currently in progress.

Default value 420 PPM will be displayed. **Only adjust this value if you have other reliable reference reading available**.

3. Before calibration is completed, the calibration value can be adjusted by pressing the button.
4. After calibration, "OK" flashes to indicate successful CO_2 calibration; when "NG" flashes to indicate failure of CO_2 calibration.
5. In the CO_2 calibration page, it will not return to the main page automatically.

6.4 Wi-Fi Icon

Wi-Fi Icon	State
Fast Flash	Soft-AP switched on after power up or key activation
Solid OFF	Device lost connection with the router
Slow Flash	Device successfully

	connects with the router
Solid ON	Data has been uploaded to the server.

6.5 Host Battery Low Voltage Icon

1. The display will show the low voltage icon if no batteries are presented on console.
2. When the battery voltage of the device is less than or equal to 2.5V, the low voltage icon will be displayed.
3. If the device's battery is higher than 2.5V, the low voltage icon will not be displayed (when recovering from low voltage, it needs to be above 2.6V before the low voltage icon will not be displayed).
4. The battery is purely for backup purpose, and with battery power, the device can work for 24hours.

7. Live Internet Publishing

Your console can send your sensor data to different cloud weather services. The supported services are shown in the table below:

Hosting Service	Website	Description
Ambient Weather	Ambientweather.net	Ambient is a weather server that can host many sensors that other services don't support.
Customized Server		Supports uploading to your customized server, if it has the same protocol with Ambient

7.1 Wi-Fi Configuration

7.1.1 Wi-Fi Configuration via Web Page

1. Turn on Soft-AP

   The device will automatically turn on this mode when powered on. If the product is not configured Wi-Fi, the Wi-Fi icon flashes. You can also press "+/TEMP"

button at the same time for 2s to activate this Wi-Fi access point mode.

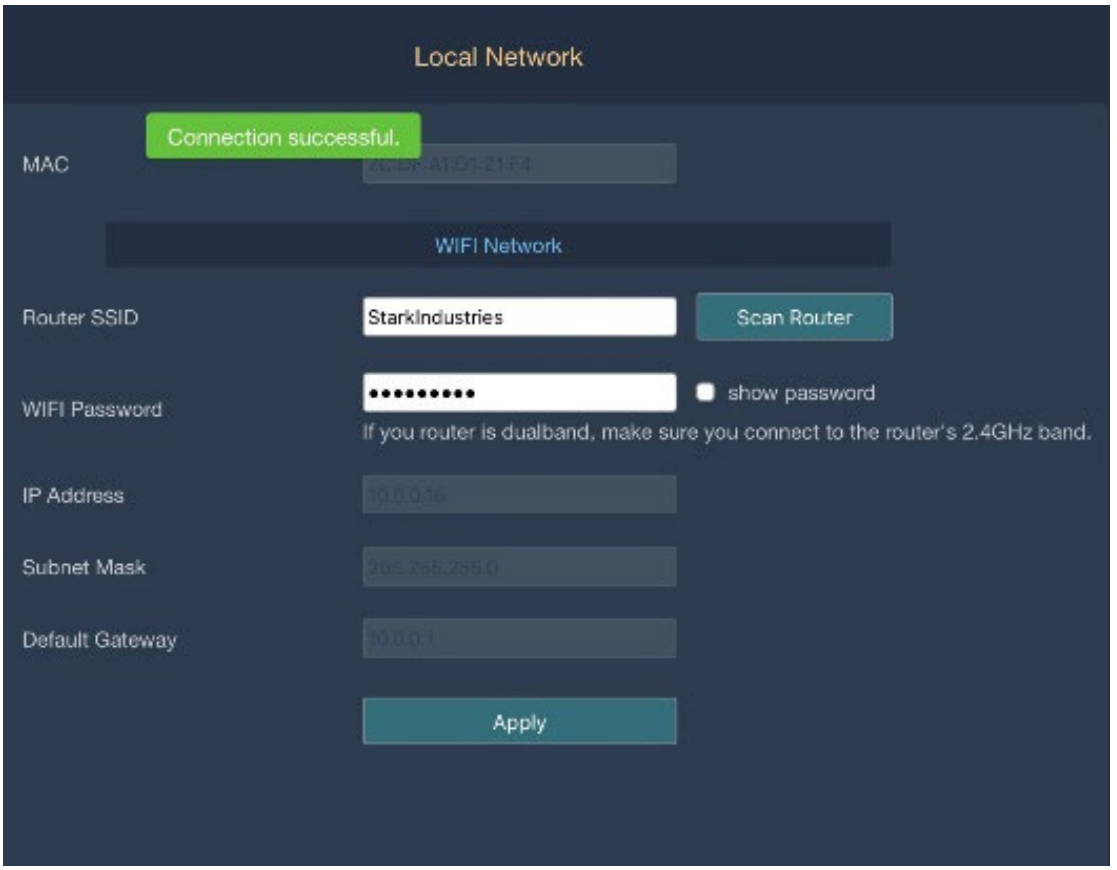
2. PC or mobile phone connect to this Wi-Fi network.

e.g. WS1938-WIFI stands for the product model. To prevent phone switching back to cellular network, please switch off your phone cellular data service, which can prevent many unknown problems.

3. Open your browser and visit 192.168.4.1

   Enter the login page. **There is no password needed**, click Login.

4. Select the Local Network
5. Select “Scan Router”, then select the router that is to be connected to
6. Enter your router password and click “Apply” to save the inputs
7. When successfully connected with the router, a success message will be prompted



8. Complete the Wi-Fi configuration

You may come back to this embedded webpage anytime with the newly assigned IP address. Sensor management, sensor calibration, live data etc. can all be handled here.

Connect to Ambientweather.net

1. Obtain your console's MAC address

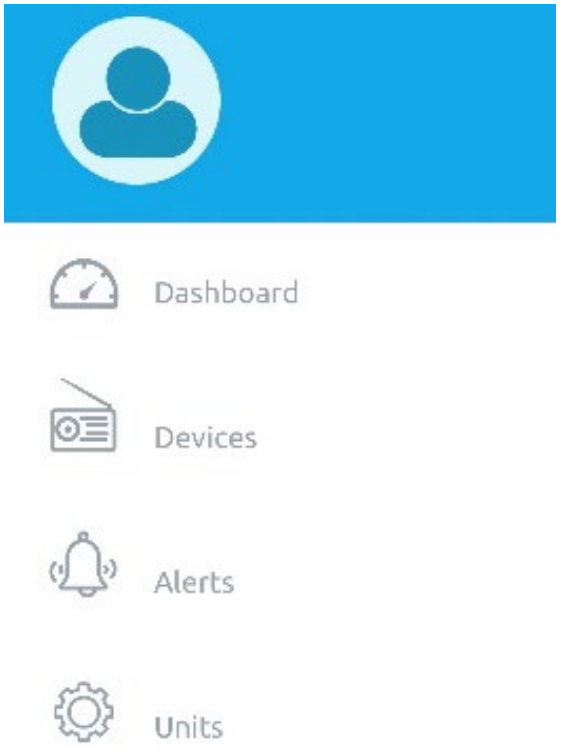
2. Visit Ambientweather.net and if needed, create an account.

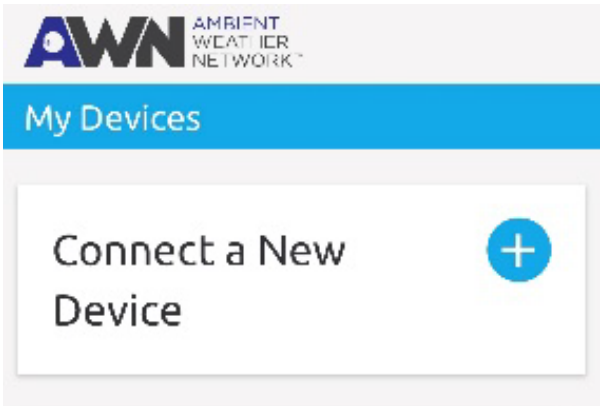
3. Click "Devices" tab and then "Connect a new device". On that page, enter your console's MAC address and hit "next"

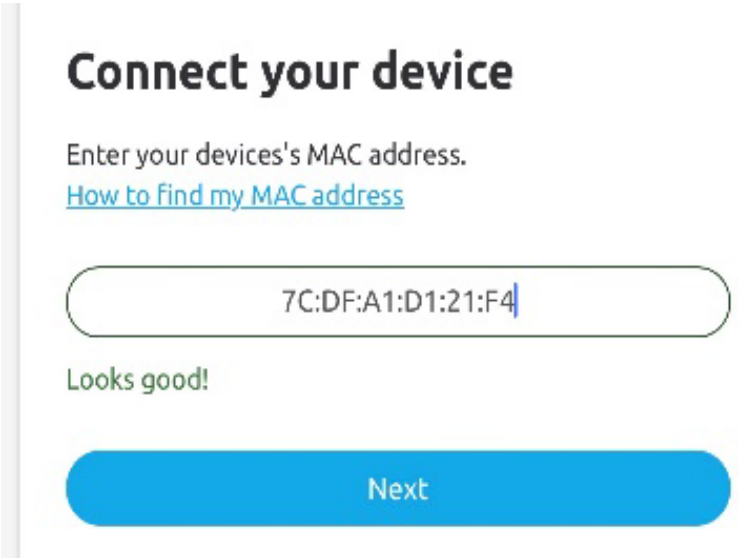
4. Next, you may name your console, enter its address, and set barometer.

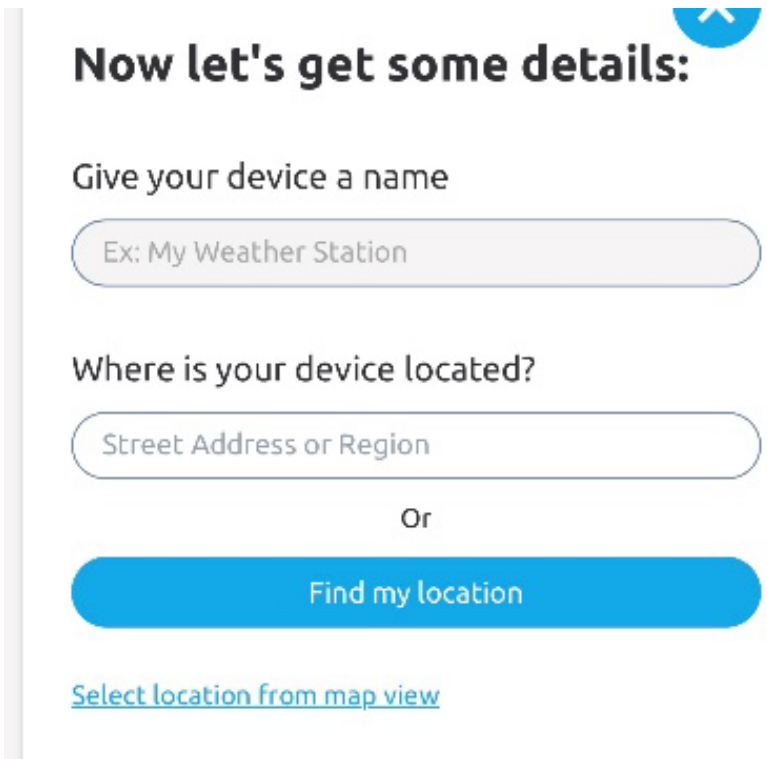
5. You will be informed when your device is set up. From here, you may click the green circled arrow to share various readings or keep some private.

Please see these screenshots for additional guidance.









8. Backlight

* When powered by batteries, the backlight will turn off after the product is powered on 15s.
* When powered by batteries, the backlight will on by pressing any button, and the backlight will turn off automatically after 15s of no button operation.
* When powered by DC power supply, the backlight will be automatically adjusted to medium.
* After disconnecting with DC power supply, the brightness will maintain for 15s and then automatically turn off.
* When powered by DC power supply, short press LIGHT to adjust the backlight : High -> Medium -> Low -> Off.

9. Alarm Clock

9.1 Alarm Clock Function

After the alarm is triggered, the alarm will continue to ring for 2 mins without any button operation, and the alarm will ring more and more rapidly during the 2 mins.

9.2 Snooze Function

* When you set the alarm and the it is triggered, short press LIGHT to enter snooze mode and the icon will be displayed at the alarm. 10 minutes later the alarm will sound again.
* Press and hold any button for 2 seconds after entering snooze mode to exit snooze mode.

10. Trend Arrow Function

* Only indoor temperature and humidity, WH31E temperature and humidity have the trend arrow function.

* The algorithm is as follows:
3 hrs comparison which changes on every ½ hour
Eg.: At 3:00 - compare to 12:00 data; at 3:30 - compare to 12:30 …. etc

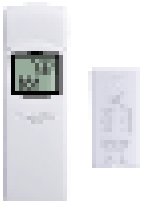
Tendency indicators	Humidity	Temperature
	Rising > 3%	Rising >= 1C/2F
	Falling > 3%	Falling >= 1C/2F

11. RF Reception Function

* The RF icon will decrease the signal by one frame if data is not received from a registered sensor; if data is received, the RF icon will increase the signal by one frame.

* The RF reception function will always be on to receive data from multiple sensors at any time. With Ambient APP, you will get more powerful data service functions.
* When powered by DC supply, the device supports these sensors as below:

Sensor Model	Qty max	Picture	Function
WH31E	8		Temperature and Humidity
WH31P	8		Waterproof Temp Probe
WH51LW	1		Leaf Wetness Sensor
PM25, PM25IN, AQIN	2		Particulate Monitor (PM25), Indoor Particulate Monitor (PM25IN), or Indoor Air Quality Monitor (AQIN)

WH31PF	8		Pool Float
WH31LA	4		Leak Detector
WH31L	1		Lightning Detector
WH31SM	16		Soil Moisture
WH32B	8		Indoor Thermometer, Barometer, Hygrometer

12. Storage Function

* Once powered on, the device will save the changed settings after 3 mins, and the

product will restore the previous setting items when re-powered.

* If you change the setting parameters via its embedded web page, it will save them immediately and the settings will not be lost when powered off.

* The following settings can be saved:

1. Turn on/off the alarm clock, set the hour and minute of the alarm clock.
2. BEEP on/off
3. RST daily maximum/minimum on/off
4. 12/24H hour format
5. Temperature unit setting

* After the device completes an upgrade it will save the built-in CO_2, WH31 1~8 maximum and minimum value data, including

1. MAX, 1H MAX, 24H MAX, 24H AVG for CO_2
2. WH31 1~8 MAX/MIN temperature and

humidity

* After finishing CO_2 calibration, the CO_2 calibration value will be saved in the NVS, and the next power-up will read the latest CO_2 calibration value after a successful calibration.

13. Cloud Functions

* Only after Wi-Fi configuration can the upload function be utilized.
* Weather servers support below servers after successful Wi-Fi configuration;
  A. Ambientweather.net
  B. Custom server
* Automatically get the network time every

hour automatically.

* If you have set up automatic firmware updates on the web page, every time a new firmware is available, the product goes into OTA and the "OTA" character and the update progress are displayed on the screen. After a successful automatic firmware update, "OTA OK" is displayed and the product is automatically rebooted. (The automatic update interval is 24 hours)

14. Specification

CO_2 Range: 0-40000ppm
CO_2 Accuracy: ± (50 ppm + 5% of reading)
CO_2 Resolution: 1ppm
Indoor temperature range: 0°C to 60°C (32°F to 140°F)
Indoor temperature Accuracy: ±0.2°C
Indoor Temperature Resolution: 0.1°C

Indoor Humidity range: 1%-99%
Indoor Humidity Accuracy: ±1.8%
Indoor Humidity Resolution: 1%
Air Pressure Range: 300hpa-1100hpa
Air Pressure Accuracy: ±1.5hpa (absolute pressure); ±2hpa (relative pressure)
Air Pressure Resolution: 0.1hpa

Power consumption

- Base station : 5V DC (USB to 2.5*0.7mm DC 5V power plug connector cable included)
- Base station : 2 x AA batteries (not included)

