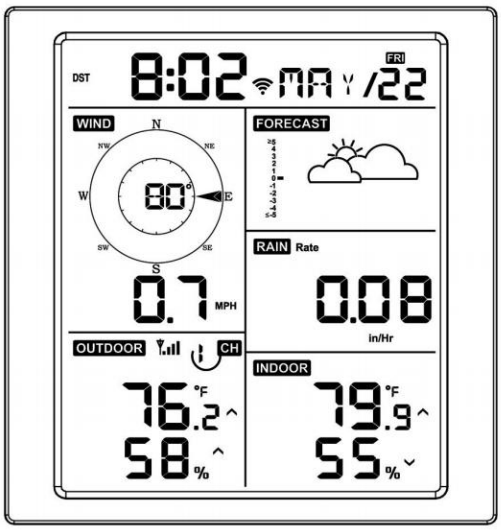
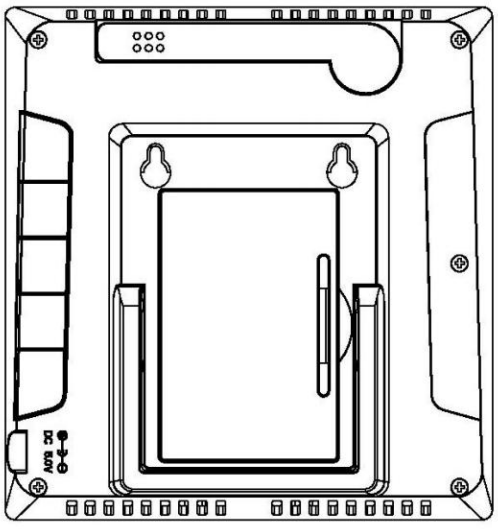
一. Feature

1. Built-in sensors for detecting CO2 concentration, temperature and humidity, and air pressure.
2. Support displaying indoor temperature&humidity and the changing trend; support displaying outdoor multi-channel transmitter temperature&humidity and the changing trend.
3. Support receiving and displaying multi-channel temperature and humidity sensor/transmitters, such as WH31, WN34, WN35, WH51.
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, supports for uploading data to the weather station server.
8. Automatic time zone and automatic network time acquisition
9. Supports unit setting
10. DC power supply, supports backlight brightness adjustment.

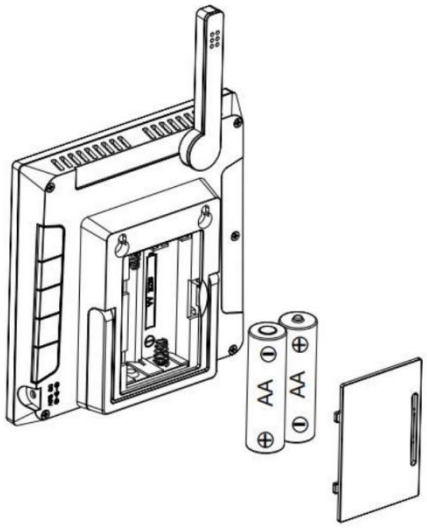
二.

1. Display Console





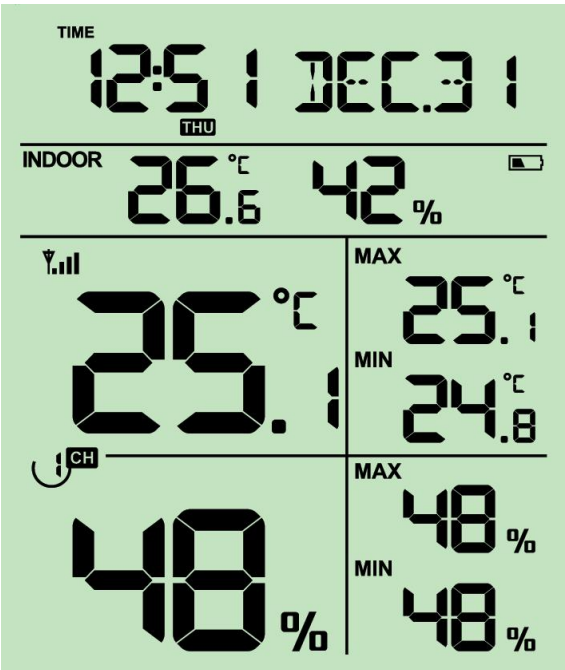
(1) Unfold the desk stand and place the console 5 to 10 feet away from the outdoor sensor.
(2) Remove the battery door on the back of the console and insert 2 x AA good quality Alkaline or Lithium batteries per Figure 14.
(3) Wait several minutes for the remote sensors to synchronize with the display console.
(4) In order to prevent the display console's own temperature rising from affecting the accurate reading of temperature and humidity, the temperature and humidity sensor is placed at the antenna end, away from the station body. Orient the console antenna straight up for accurate indoor temperature and humidity reading.



Built-in Sensors :

1. Indoor Thermometer&Hygrometer Sensor
2. CO2 Concentration Detecting Sensor
3. Air Pressure Sensor

Screen Display

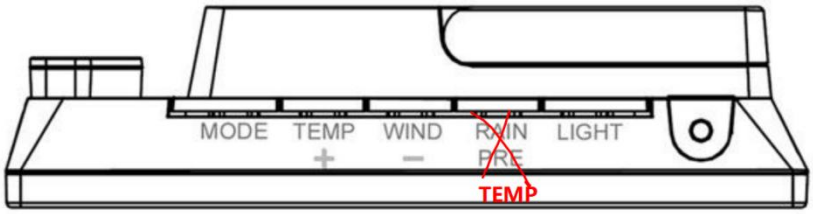


1. Indoor Temperature
2. Outdoor Temperature

3. Outdoor Humidity
4. Min of Outdoor Humidity
5. Max of Outdoor Humidity
6. Min of Outdoor Temperature
7. Max of Outdoor Temperature
8. Indoor Humidity
9. CO2 Concentration
10. Time

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 switch between date, CO2 live data, CO2 24hAVG, CO2 1hMAX, CO2 24hMAX and CO2 MAX.

(2). While displaying the CO2 24hAVG/1hMAX/24hMAX/MAX, long press this button to clear the historical data.

-

(1). While in Normal Mode, press this button to switch between Indoor, WN34 CH1, WN34 CH2, WN34 CH3, WN34 CH4, WN34 CH5, WN34 CH6, WN34 CH7, WN34 CH8, WN35 CH1, WN35 CH2, WN35 CH3, WN35 CH4, WN35 CH5, WN35 CH6, WN35 CH7, WN35 CH8, WH51 CH1, WH51 CH2, WH51 CH3, WH51 CH4, WH51 CH5, WH51 CH6, WH51 CH7, WH51 CH8, ⏱ , INDOOR.

(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 ⏱ mode, long press this button 5 seconds to re-register the WN34/WN35/WH51 CH1~8 sensors.

TEMP

(1). While in Normal Mode, press this button to switch WH31 area displaying content, the sequence is from WH31 CH1, WH31 CH2, WH31 CH3, WH31 CH4, WH31 CH5, WH31 CH6, WH31 CH7, WH31 CH8, ⏲ .

(2). While in single WH31 CH mode, long press this button 5 seconds to re-register the corresponding CH sensor.

(3). While in ⏲ mode, long press this button 5 seconds to re-register WH31 CH1~8 sensor.

Light

When powered by DC , press this button to switch between High, Middle, Low, 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.

6. Modes

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

6.1 Normal Mode

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

6.2 Alarm Clock Hour-Setting Mode

6.2.1 While in Alarm Clock Hour-Setting Mode, Adjust the hour by pressing the button + and -

6.2.2 Power on/off the alarm clock by pressing the button TEMP

6.3 Alarm Clock Minute-Setting Mode

6.3.1 While in Alarm Clock Minute-Setting Mode, Adjust the minute by pressing the button + and -

6.3.2 Power on/off the alarm clock by pressing the button TEMP

6.4 MAC Address Display Mode

Press the button MODE to enter the MAC Address Display Mode to check the mac address.

6.5 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]	CO2 Calibration	Press [TEMP] to switch OFF and ON.

7. Display Console

7.1 List of sensors that can be displayed on the screen

Item Number	Number of Channels	Description	Image
WH31	8	Multi-Channel Thermometer and Hygrometer Sensor	
WH51	8	Wireless Soil Moisture Sensor	
WN35	8	Leaf wetness sensor	
WN34	8	WN34S stainless-steel probe therm ometer for soil WN34L wire probe thermometer for water	

7.2 CO2 Concentration

7.2.1 If this device built-in CO2 concentration detection sensor, it will automatically switch to display the real-time CO2 concentration value when the product is powered up and detect the CO2 concentration.

7.2.2 While in Normal Mode, press this button to switch between date, CO2 live data, CO2 24hAVG, CO2 1hMAX, CO2 24hMAX and CO2 MAX.

7.3 CO2 Calibration

In Normal Mode, hold the button Mode 2 seconds to enter into the Setting Mode, and press the button Mode to switch to the CO2 calibration mode.

7.3.1. Display real-time CO2 concentration data, updates once every 5 seconds.

7.3.2. When "ON" flashes to indicate that CO2 calibration is currently in progress; when "OFF" flashes to indicate that CO2 calibration is not currently in progress.

7.3.3. Before calibration is completed, the calibration value can be adjusted by pressing the button.

7.3.4. After calibration, "OK" flashes to indicate successful finish CO2 calibration; when "NG" flashes to indicate failure of CO2 calibration.

7.3.5. In the CO2 calibration page, it will not return to the main page automatically.

7.4 Wi-Fi Icon

Wi-Fi Icon	State
Fast Flash	State 1 : Within 30 seconds of the Soft-AP being switched on by

	button-trigger. State 2 : Device lose connection with the router.
Slowly Flash	Device successfully connect with the router.
Keeping Flash	Data has been uploaded to the server. The Wi-Fi icons indicate signal strength and are divided into 5 levels, corresponding to the icons 0 frame, 1 frame, 2 frame, 3 frame and 4 frame. 0 frame: switch to fast flash after dropping 0 frames 1 frame: RSSI < -85 2 frames: -85 <= RSSI < -75 3 frames: -75 <= RSSI < -65 4 frames: -65 <= RSSI < 10

7.5 Host Battery Low Voltage Icon

7.5.1. The display will show the low voltage icon if no battery.

7.5.2. When the battery voltage of the device is less than or equal to 2.5V, the low voltage icon will be displayed

7.5.3. 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)

8. Live Internet Publishing

8.1 Your console is capable of sending your sensor data to select internet-based weather services. The supported services are shown in the table below:

Hosting Service	Website	Description
Ecowitt Weather	https://www.ecowitt.net	Ecowitt is a new weather server that can host a bunch of sensors that other services don't support.
Weather Underground	WeatherUndeground.com	Weather Underground is a free weather hosting service that allows you to send and view your weather station data real-time, view graphs and gauges, import text data for more detailed analysis and use iPhone, iPad and Android applications available at Wunderground.com. Weather Underground is a subsidiary of The Weather Channel and IBM.
Weather	WeatherCloud.net	Weathercloud is a real-time weather

Cloud		social network formed by observers from around the world
Weather Observation Website (WOW)	http://wow.metoffice.gov.uk/	WOW is a UK based weather observation website. WOW allows anyone to submit their own weather data, anywhere in the world.
Customized Website		Supports uploading to your customized website, if the website has the same protocol with Wunderground or Ecowitt

8.2 Wi-Fi Configuration

8.2.1 Wi-Fi Configuration via Web Page

8.2.1.1 Turn on Soft-AP

The device will automatically turn on Soft-AP when powered on. If the product is not configured Wi-Fi, the Soft-AP of this device will always be on and the Wi-Fi icon flashing indication.

8.2.1.2 PC or mobile phone connect device's Soft-AP

e.g. WN18xx-WIFIxxxx, x stands for the product model, xxxx stands for the last 4 digits of the product MAC address.

8.2.1.3 Open your browser and visit 192.168.4.1

Enter into the login page and there is no password needed, directly click Login.

8.2.1.4 Select the Local Network

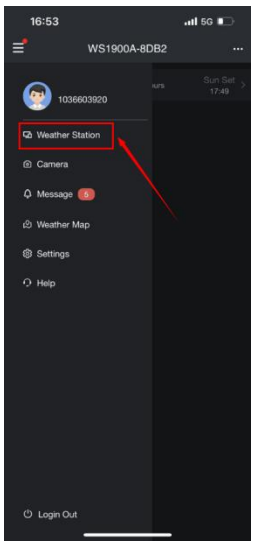
8.2.1.5 Select Scan Router, then select the router

8.2.1.6 Enter the Wi-Fi password and click Apply

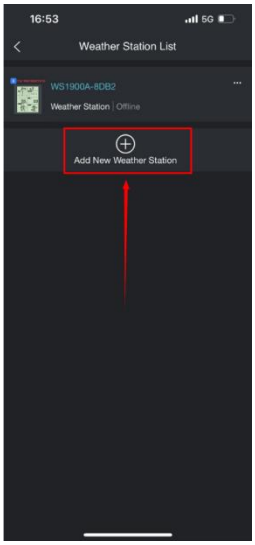
8.2.1.7 When successfully connected with the router, you will be prompted to connect successful.

8.2.1.8 Complete the Wi-Fi configuration.

8.2.2 **Configure Device on Ecowitt APP**



① Enter into Ecowitt APP and click Weather Station

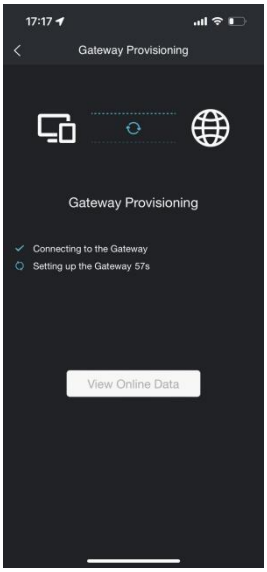


②Click Add New Weather Station

③Click WN1821

④ Please follow the steps of the Gateway Provisioning.

⑤ After finishing the above steps, please type your Router ID and Wi-Fi password, then click Submit.



⑥ Finish Gateway Provisioning.

9. 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

10. Alarm Clock

10.1. 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.

10.2. 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.

11. Trend Arrow Function

* Only indoor temperature and humidity, WH31 WN34 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
v	Falling > 3%	Falling >= 1C/2F

12. 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 WS View Plus APP and Ecowitt APP, you will get more powerful data service functions.
* When powered by DC supply, the device supports these sensors as below :

Sensor Model	Quantity	Picture	Function
WS90	1		Haptic rain sensor, ultrasonic wind speed and direction, temperature and humidity, light UV transmitter, 4.75s once FamilyCode = 0x80 Start wind speed 0.5m/s
WH65/69/67	1		Outdoor temperature and humidity, light UV, wind speed and direction, rainfall
WS68	1		Wind speed and direction, light UV
WH40	1		Rainfall
WH26	1		Outdoor temperature and humidity
WS80	1		Ultrasonic wind speed and direction, UV light, outdoor temperature and humidity
WH57	1		Lightning detection
WH45	1		CO2, PM2.5, PM10, temperature and humidity
WH41/42	4		PM2.5
WH55	4		Water leaking detection

WH31/WH30/WN36	8		WH31 thermometer and hygrometer WH30 thermometer WN36 pool thermometer
WH51	8		Soil moisture
WN34	8		thermometer
WN35	8		Leaf wetness sensor
WH25	1		Indoor thermometer and hygrometer

13. 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 changes the setting parameters on 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 status
3. RST daily maximum/minimum on/off
4. 12/24H hour format
5. Temperature unit setting

* After the device completes upgrade it will save the built-in CO2, WH31 1~8 maximum and minimum value data, including

1, MAX, 1H MAX, 24H MAX, 24H AVG for CO2

2, WH31 1~8 MAX/MIN temperature and humidity

* After finishing CO2 calibration, the CO2 calibration value will be saved in the NVS, and the next power-up will read the latest CO2 calibration value after a successful calibration.

14. Cloud Functions

* Only after Wi-Fi configuration can use the upload function.

* Weather servers support below servers after successful Wi-Fi configuration;
A.Ecowitt.net
B.Wunderground
C.Weathercloud
D.WeatherObservationsWebsite
E.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)

15. Specification
CO2 Range : 0-40000ppm
CO2 Accuracy : ± (50 ppm + 5% of reading)
CO2 Resolution : 1ppm
Indoor temperature range : 0° C to 60° C (32° F to 140° F)
Indoor temperature Accuracy : ±0.2℃
Indoor Temperature Resolution : 0.1℃
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)