ecowitt®

Weather Station Receiver Manual

Model: WS3900 ☐

WS3910 ☐

https://s.ecowitt.com/E8FN9Q

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1. Introduction

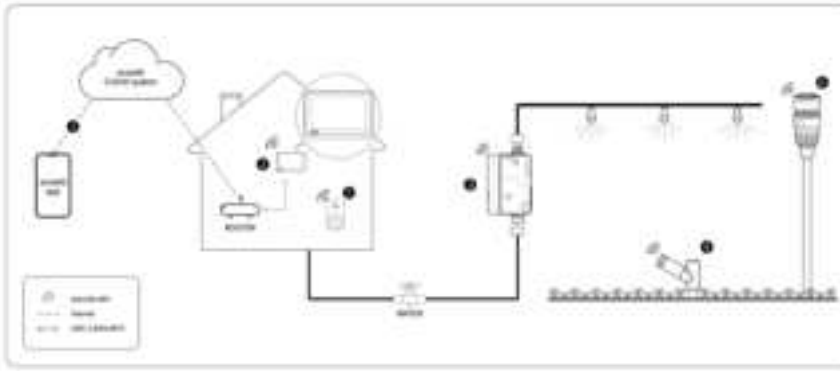


Figure 1 Ecowitt Ecosystem

Thank you for your purchase of Ecowitt WS3900/WS3910 weather station receiver.

Ecowitt WS3900/WS3910 is a brand new 7.5-inch Wi-Fi LCD large screen weather station receiver. Supports monitoring indoor and outdoor conditions, has built-in temperature, humidity, barometric pressure , and CO2(only WS3910) sensors, and can connect almost all Ecowitt transmitters with the same RF frequency to use together, to get accurate weather data including wind speed, wind direction, rainfall, UV, solar radiation, outdoor temperature, outdoor humidity, dew point, feels like, CO2, PM1.0, PM2.5, PM10 and more.

Built-in sensors	WS3900	WS3910
CO2 sensor	×	√
Temperature-Humidity sensor	√	√
Pressure sensors	√	√

Meanwhile, it supports connecting IoT devices, such as WFC01 and AC1100, to achieve smart control through the Ecowitt App, which is a

powerful weather station receiver.

WS3900/WS3910 supports connecting to a 2.4 GHz Wi-Fi network for viewing data from anywhere on your phone, tablet, and computer browser, all for free.

Just so you know, the WS3900/WS3910 needs to be used with sensors to obtain outdoor weather data and is not a standalone product.

The following user guide provides step by step instructions for installation and operation. Use this manual to become familiar with your professional weather station and save it for future reference.

2. Installation

2.1 Part List

1 x WS3900/WS3910 Weather Station Receiver

1 x User Manual

1 x 3.5mm DC to USB Cable

2.2 Wi-Fi Configuration

2.2.1 Power-up

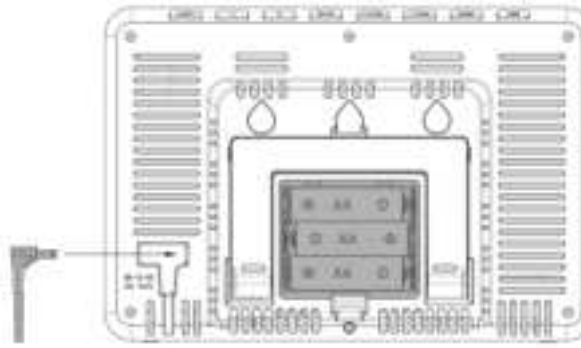


Figure 2: Install the Batteries or Insert the Power Adapter

Plug the 5V 1A Power Adapter into a main outlet, then connect it to the Power socket on the back of the station to power on the device. Then the console will enter automatically into pairing mode.

Optional: Insert 3 fresh AA alkaline or lithium batteries (not included) into the Battery Compartment to power the station for everyday use. Powered on batteries alone the WiFi mode will not be turned on.

The direction of the batteries can not be reversed.
The software version number and frequency are displayed for 1 second, then full-screen displayed for 3 seconds, and finally enter normal mode.
The console automatically opens the hotspot in 5 minutes to be paired by the phone or the laptop, and contact with the wifi.
If the hotspot does not get any action, and will be automatically closed after 5 minutes.

2.2.2 Download the Ecowitt App

Visit the App Store or Google Play Store or scan the QR code below to download the free Ecowitt App onto your mobile device.

Open the Ecowitt App, follow the on-screen setup instructions to create an account, add a new my device, and follow Section 2.2.3 or 2.2.4 below to connect your station to your Wi-Fi network.

Figure 3: Download Ecowitt App

Note: For section 2.2.3 or 2.2.4 below, you'll need your Wi-Fi network name (SSID) and password. Make sure your mobile device is connected to the same Wi-Fi network.

2.2.3 Connect the Station to Wi-Fi via Ecowitt App

（1）Open Ecowitt App, click "Add New Devices", click WS3900/WS3910 icon, and choose WiFi Provisioning：

Figure 4

(2) Hold WS3900/WS3910's button TEMP + − for more than 2s in normal mode will trigger to turn on AP (WS3900/WS3910's hotspot), Wi-Fi icon will flash fast on the screen. Use your mobile phone to connect to the hotspot "WS39xx-WIFIxxxx".

e.g.: WS3900x/WS3910x-WIFIxxxx, the first x represents the frequency, A=868MHz, B=915MHz, C=433MHz, xxxx represents the last 4 digits of the product MAC address.

Figure 5

(3) Fill in the Wi-Fi SSID and Password.

Figure 6

(4) After the gateway setup is successful. Switch to your usual Wi-Fi. WS3900/WS3910 has been successfully added to the App, and you can view the weather data on the App.

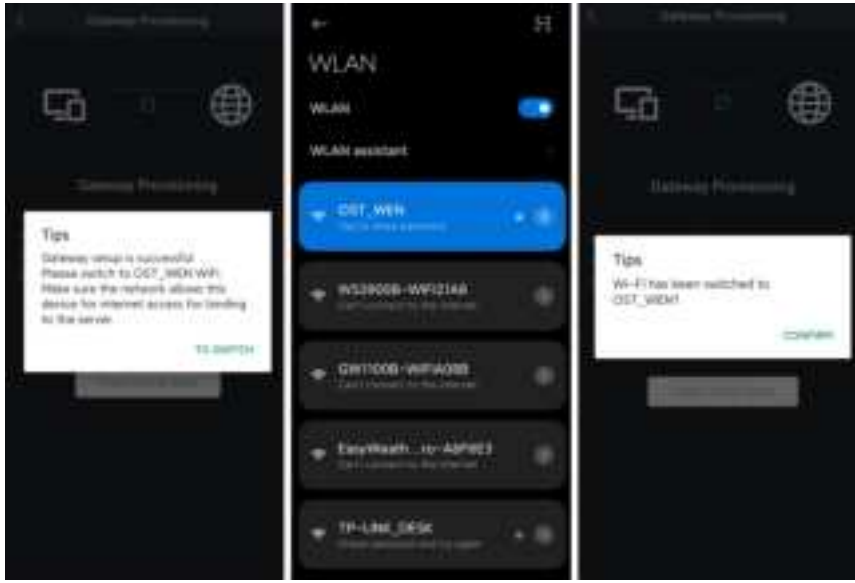


Figure 7

Note: If you are unable to connect the WS3900/WS3910 to Wi-Fi using the Ecowitt App, we recommend using the setup via Embedded Web Page 192.168.4.1.

2.2.4 Web Page 192.168.4.1

(1) Turn on WS3900/WS3910's AP.

The WS39xx's hotspot will be turned on automatically when the product is powered on, if the product is not paired with a network, the AP will be turned on all the time, and the Wi-Fi signal icon flashes fast to indicate.

(2) If WS39xx's hotspot can not be searched, hold TEMP + − for more than 2s in normal mode will trigger to turn on AP, Wi-Fi icon will flash fast.

The above (1)(2)the WIFI hotspot should be in 5-minute pairing mode. If the pairing action does not be taken, so the WIFI hotspot will be closed automatically. If there is a phone or laptop to pair with the WIFI hotspot, the pairing time will be automatically extended to ensure the operation is successful.

Connecting this WS39xx's hotspot on a mobile phone or PC.

e.g.: WS3900x/WS3910x-WIFIxxxx, the first x represents the frequency, A=868MHz, B=915MHz, C=433MHz, xxxx represents the last 4 digits of the product MAC address.

(3) Open the browser and visit 192.168.4.1.

Enter the login page, the default password is empty, click Login directly.

(4) Select Local Network.

(5) Select Scan Router, wait for the scanning to complete, and then select the router.

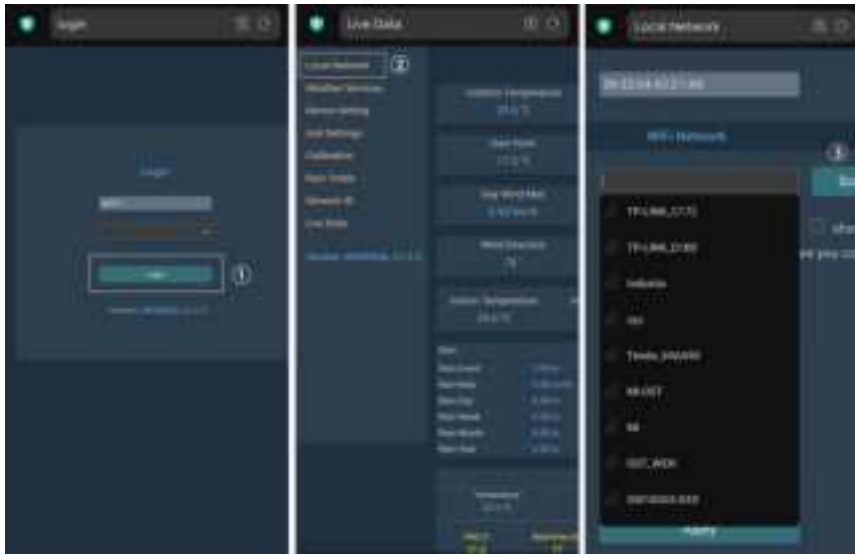


Figure 8: Select the router

(6) After entering the Wi-Fi password, click Apply

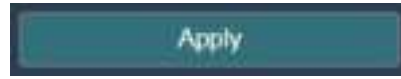


Figure 9

(7) After connecting to the router, it prompts Connection successful.

Figure 10

(8) Wi-Fi configuration is complete. Copy the MAC Address for the following steps.

Figure 11: Copy the MAC address

(9) Open Ecowitt App, click "Add New Devices", click WS3900/WS3910 icon, and choose Manually Adding：

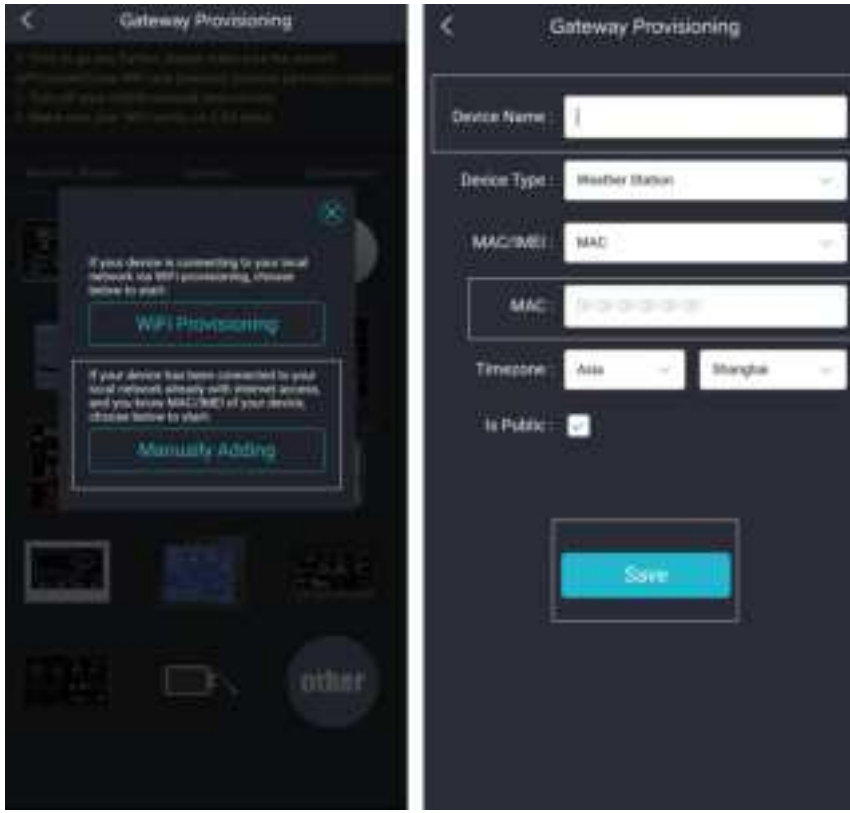


Figure 12

(10) Edit the Device Name and paste the MAC address copied in step (8) into the box, and click "Save", then you can view the data on the App.

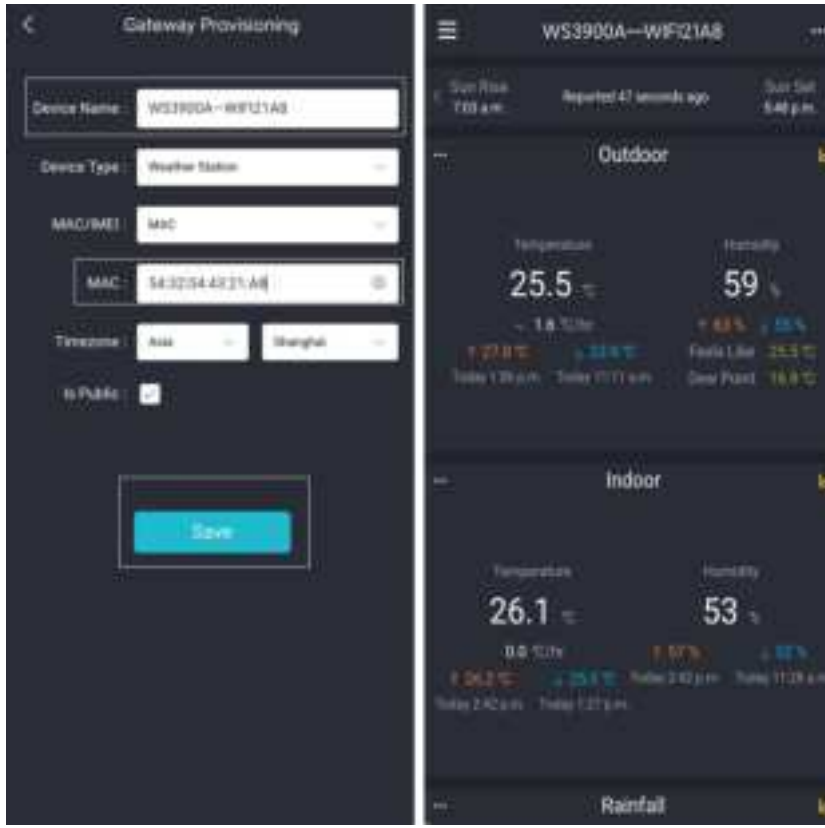


Figure 13

2.2.5 Device Location, Timezone, DST, and Data Public

After completing the Wi-Fi configuration, follow these steps for Device's precise location, Timezone, DST (Daylight Saving Time), and Data public settings.

1. Click on 'My Devices'.
2. Click on the '...' icon in the upper right corner of the gateway module.
3. Set the Device's precise location and Timezone on this interface.
4. Tick 'Auto DST' and 'Is Public' when necessary.
5. Click 'Save', then reboot the WS3900/WS3910 device, the device will automatically synchronize time and DST.

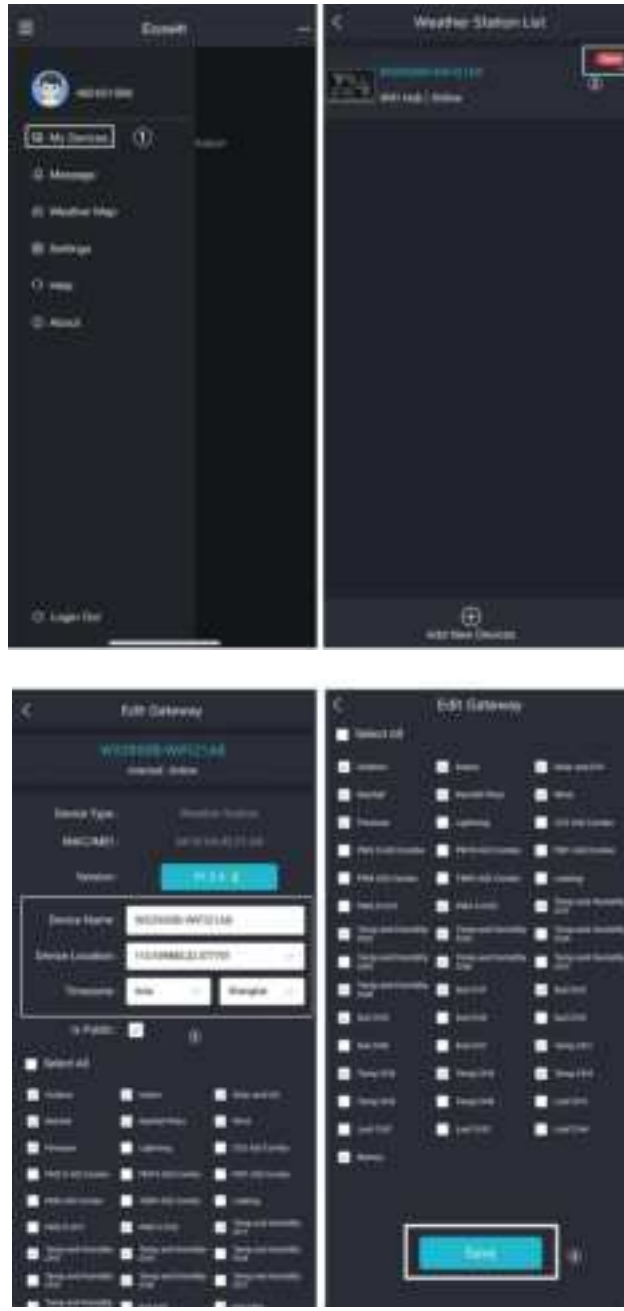


Figure 14: Related settings via Ecowitt App

Note: After completing the above Wi-Fi configuration and related settings, the WS3900/WS3910 screen will display a stable Wi-Fi signal tower, auto time zone, and DST (when necessary).

Figure 15: WS3900/WS3910 sync App related settings

2.2.6 Replacing Wi-Fi Router

If you want to change your router, follow these steps again after restoring the gateway to its factory settings (Hold SET + LIGHT for a factory reset).

2.3 Adding Sensors

To pair the optional sensors (refer to Section 4 for more optional sensors) with the WS3900/WS3910 display console, please do as follows:

1.Place the optional sensor next to the console.

2.Install batteries on the sensor and wait for 1-2 minutes.

3.Check whether the console will pick up the sensor data automatically and display it on the screen or App.

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

5.If data is not received, try the following: after making sure the phone and WS3900/WS3910 are connected to the same Wi-Fi network, open the Ecowitt App, find Sensors ID, and enter the Edit Gateway page.

6.In the Edit Gateway page, find the sensor you want to pair - select the ID number box and register it.

7.Once successful, you may return to the main interface to check the data.

8.If you know exactly the sensor ID, and want the console to pair that sensor only, you may enter the sensor ID, and save the change to make it effective.

Figure 16: Sensor ID page

2.4 Upload Data to Server

After the Wi-Fi configuration is successful, data can be uploaded to the following weather station servers:

A. ecowitt.net (Default upload to this server)

B. wunderground.com

C. weathercloud.net

D. wow.metoffice.gov.uk

E. Customized servers

Upload servers management:

(1) Ensure that the mobile phone and WS3900/WS3910 receiver are using the same Wi-Fi.

(2) Ecowitt App - "..." at the top right corner - "Others" - "DIY Upload Servers"

Figure 17: Upload data to server

3. Instructions for Use

3.1 Multiple Views and Size

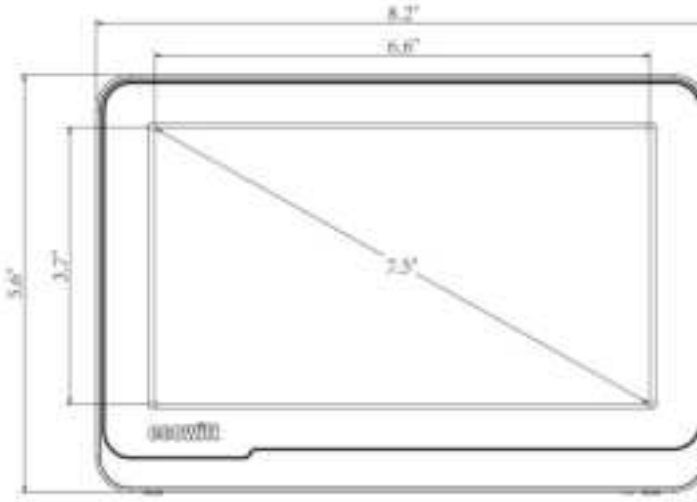


Figure 18: Main view

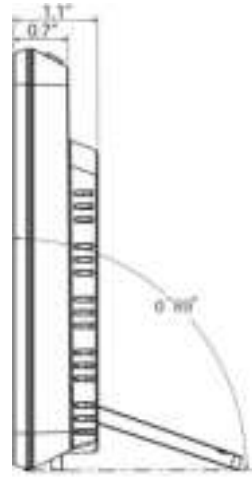


Figure 19: Right view

Figure 20: Top view

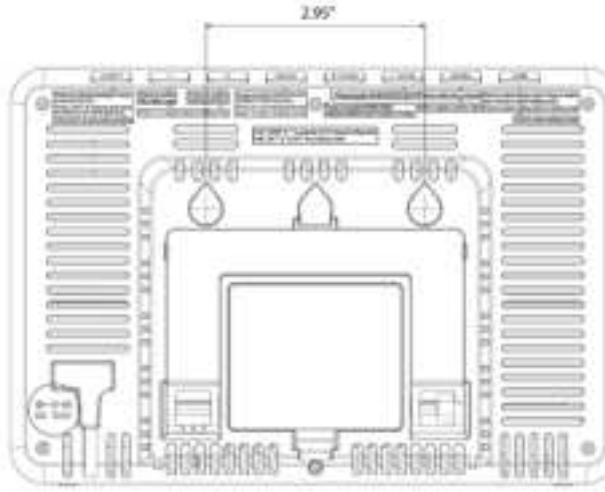


Figure 21: Rear view (Refer to 3.4 for Button functions)

3.2 Features

- 7.5" LCD color display
- 8 physical buttons
- Support DC powered and 3 x AA battery powered (Battery not included. Tested to run for about 15-25days on battery power alone. Battery only used as a short-term backup power)
- Calendar, date, time, moon phase, sunrise, and sunset
- Built-in temperature humidity sensor, and barometric pressure, CO2(only WS3910) sensors
- Support displaying indoor temperature, humidity, pressure, and changing trend
- Support receiving and displaying 8 channels of temperature and humidity sensor data
- Support receiving and displaying wind speed, wind direction, rainfall, UV, solar radiation, feels like, dew point, CO2, PM1.0, PM2.5, PM10 and AQI data
- Weather forecast: Sunny, Partly Cloudy, Cloudy, Rainy, Stormy,

Snowy and Storm Snowy.

- Alarm/Snooze function
- Support unit setting
- Support DST (Daylight Saving Time)
- RST function (Clear daily max/min values)
- Support backlight adjustment under DC power supply
- Max value of outdoor/indoor temperature & humidity, pressure, rainfall, wind speed, gust speed, UV, solar radiation, feels like, and dew point
- Min value of outdoor/indoor temperature & humidity, pressure, feels like, and dew point
- Can be used as a Wi-Fi gateway to support the reception of more sensors' data, which can be viewed through the web page
- Support Wi-Fi configuration on the web page (192.168.4.1), view more sensor data, set up server, set up calibration parameters, set up sensor ID
- Data storage on Ecowitt server: https://ecowitt.net
- Support uploading data to the weather station server after connecting to Wi-Fi network:
  - ecowitt.net (Default upload to this server)
  - wunderground.com
  - weathercloud.net
  - wow.metoffice.gov.uk
  - Customized servers
- Supports additional sensors, please refer to Section 4.

3.3 Icon Explanation

See Figure 22 to help you identify icons of the console's display screen.

Figure 22

No	Description	No	Description
1	Auto-Scroll model	2	Circulating multi-channel temperature and humidity
3	Outdoor humidity	4	Outdoor temperature
5	Feels like temperature Apparent temp	6	Dew point
7	RF signal bar and low battery Power indicator for WS69 or WN30/31/36 sensors	8	Gust
9	Direction/ 10min direction icon	10	RF signal bar and low battery power indicator for WS90/WS85/WS80/WS68
11	Rain Rate/Event/Daily/ Weekly/Monthly/Yearly/ Total	12	RF signal bar and low battery power indicator for WH40
13	Rainfall bar graph	14	Sunrise
15	UV index histogram	16	Sunset
17	UVI & Solar radiation	18	Weather forecast, Pressure trend function

19	Moon phase	20	Wi-Fi signal bar
21	Alarm & Snooze	22	DST (Daylight Saving Time)
23	Time	24	ABS/REL pressure
25	RF signal bar and low batter power indicator for WH45/WH46 air quality sensor	26	Date/CO2/PM1.0/PM2.5/ PM10/AQI
27	Indoor humidity	28	Indoor temperature
29	Console low battery power/no battery indicator		

Table 1: Icon explanation

3.3.1 Date & Time

The date and time will be automatically updated when connected to Wi-Fi. (refer to 2.2 for Wi-Fi configuration)

Figure 23: Date & Time

Every 5 seconds, switch the display between the month and day of the week in the same area.

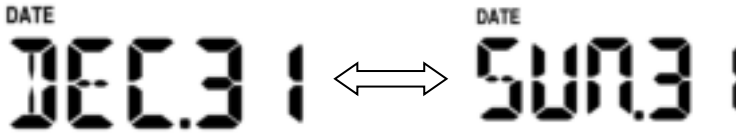


Figure 24: Month & Week

3.3.2 CO2/PM1.0/PM2.5/PM10/AQI

WS3900/WS3910 supports connecting WH45/WH46 air quality sensor and displaying CO2/PM1.0/PM2.5/PM10/AQI data. Air quality data share the same display area with Date, which can be switched by pressing the + button.

Note:

1. The WH46 sensor would show the data of the Temperature-Humidity and PM4.0 on the Ecowitt App or the website, but the WS3900/WS3910 console would not show the related data.

2. The WH45 sensor would show the data of Temperature-Humidity on the Ecowitt App or the website, but the WS3900/WS3910 console would not show the related data.

The WS3900/WS3910 connect a WH46, the data of the CO2 PM1.0 PM2.5 PM10 AQI will display with signal indicators. As the picture shows:

Figure 25

The WS3910 just uses the built-in CO2 sensor alone, and would just shows the data of the CO2 without the signal indicators, as in the picture:

Figure 26

3.3.3 Weather Forecast

Weather forecast is based on learning the local air pressure over a period (at least one month) and then making a prediction of the weather for the day ahead based on the change in air pressure.

There are seven weather conditions: Sunny, Partly Cloudy, Cloudy, Rainy, Stormy, Snowy and Storm Snowy.

Rain/snow will blink when in a Stormy/Storm Snowy condition. When the outdoor temperature is below 32°F (0°C) and the weather forecast is Rainy or Stormy, the display will show the Snowy condition.

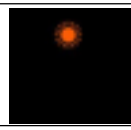
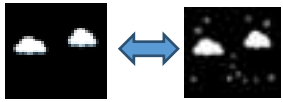
Sunny	Partly Cloudy	Cloudy
		
Pressure increases for a sustained period of time	Pressure increases slightly or initial power up	Pressure decreases slightly
Rainy	**Stormy**	**Snowy**
Pressure decreases for a sustained period of time	Pressure rapidly decreases	Pressure decreases for a sustained period of time, and temperature ≤0°C
Storm Snowy		
		
Pressure rapidly decreases, and temperature ≤0°C		

Table 2: Weather forecast

3.3.4 Pressure Trend Function

Indicates the difference between the current barometric pressure and the average barometric pressure over the past 30 days.

Figure 27: Pressure

3.3.5 Wi-Fi Icon

Wi-Fi Icon Status	Description
Flash	Situation 1: AP switched on after power up or TEMP + − button activation. Situation 2: WS3900/WS3910 is not connected to the router.
Slow flash	WS3900/WS3910 is connected to the router. But the data hasn't been successfully uploaded.
Constant light	The data has been uploaded to the server. The Wi-Fi icon indicates the signal strength.

Table 3：Wi-Fi icon

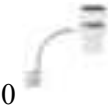
3.3.6 Indoor Temperature, Humidity, and Pressure

WS3900/WS3910 has a built-in temperature & humidity sensor, and barometric pressure sensor, but the WN32P sensor also could receive the data, and be used to replace the indoor temperature, humidity, and air pressure.

Figure 28: Indoor temperature, humidity and pressure

3.3.7 Outdoor Temperature and Humidity

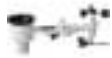
Temperature and humidity display priority:

WN32 > WS90 > WS80  > WS69

3.3.8 Wind

1. Wind display priority:

WS85 >WS90 > WS80 > WS68 >

WS69 

2. Wind values and wind units:

When the wind speed unit is selected via buttons (refer to Section 3.5.2 to adjust the unit) or web page 192.168.4.1 (Unit Settings), the WS3900/WS3910 will display the corresponding unit and value on the screen. Units set by the Ecowitt App or Ecowitt.net website will not be synchronized to the WS3900/WS3910.

3.3.9 Rainfall

1. Rainfall Definition:

Rate/H: The last 10 minutes of rainfall multiplied by 6.

Event: If the last 24-hour rainfall is less than 1 mm and the last 1 hour has

not had rainfall, the rain event is over.

Daily: Rainfall from 0:00 to 24:00, reset time can be set on the App.

Weekly: The rainfall of Sunday ~ Saturday/Monday ~ Sunday, the start time can be set.

Monthly: Rainfall of a natural month.

Yearly: Rainfall of a year, the start month can be set.

Total: Running total since station was powered up.

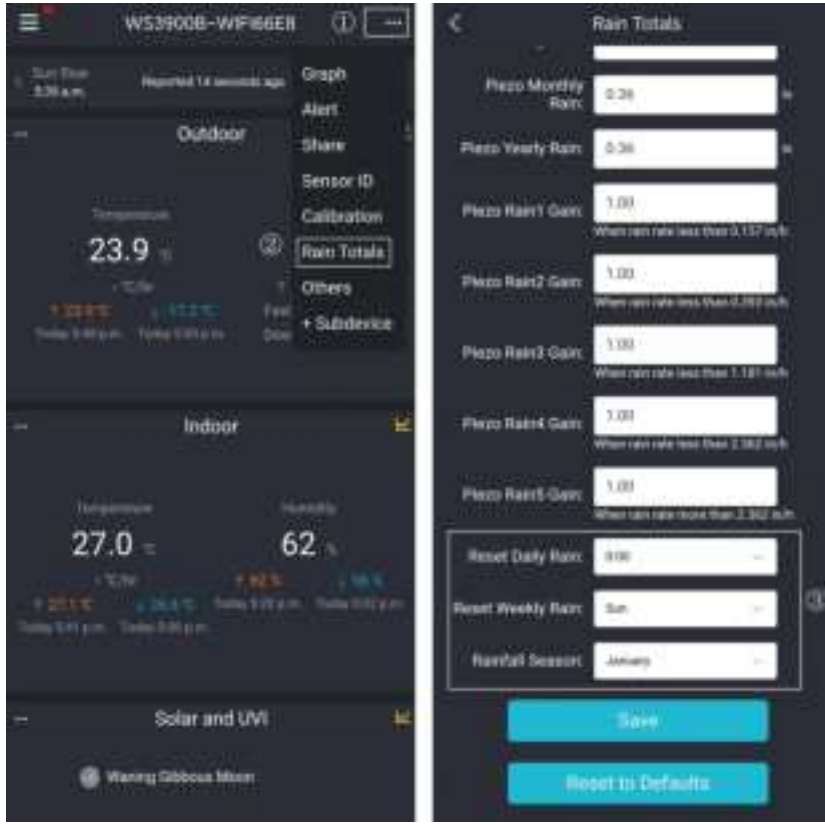


Figure 29: Reset Daily, Weekly and Rainfall Season

2. Rainfall display priority:

Traditional rainfall: WH40 > WS69

Piezoelectric rainfall: WS85 > WS90

3. Display rules

The WS3900/WS3910 can display either rainfall or piezoelectric rainfall, simply by selecting the rainfall rule you want to display via the "Rainfall data priority" on the App or web page.

4. Units

When the rainfall unit is selected via buttons (refer to Section 3.5.2 to adjust the unit) or web page 192.168.4.1 (Unit Settings), the WS3900/WS3910 will automatically calculate and display the corresponding unit and value on the screen. Units set by the Ecowitt App or Ecowitt.net website will not be synchronized to the WS3900/WS3910.

3.3.10 UVI

The UV index varies between 0 ~ 15. The bar graph is divided into 6 levels of display.

Level 5: 12 < value < =15, EXTREME
Level 4: 9 < value < =12, VERY HIGH
Level 3: 6 < value < =9, HIGH
Level 2: 3 < value <= 6, MODERATE
Level 1: 0 < value < =3, LOW
Level 0: 0 = value, (no display)
e.g.:

Figure 30: UVI

In normal mode, hold ⊟ to switch to UVI/Solar radiation/Sunrise/Sunset display.

3.3.11 Moon Phase

Configure the default northern and southern hemispheres based on RF frequency:

915/868MHz: Northern Hemisphere

433MHz: Southern Hemisphere

The following moon phases are displayed based on the calendar date.

Northern Hemisphere:

New Moon	Waxing Crescent	First Quarter	Waxing Gibbous	Full Moon	Waning Gibbous	Third Quarter	Waning Crescent	New Moon

Southern Hemisphere:

New Moon	Waxing Crescent	First Quarter	Waxing Gibbous	Full Moon	Waning Gibbous	Third Quarter	Waning Crescent	New Moon

Note: When the new moon comes, our display will show a circle arc.

Figure 31: The New Moon

3.3.12 Feels Like

Feels Like measurement range: -40°F ~ 140°F (-40°C ~ 60°C).

When the outdoor temperature is less than 50°F (10°C), the value of Feel s Like is wind chill.

When the outdoor temperature is greater than or equal to 50°F(10°C) and less than or equal to 80°F (26.7°C), the value of Feels Like is the outdoor temperature.

When the outdoor temperature is greater than 80°F (26.7°C), the value of Feels Like is the heat index.

Users have the option to choose between "Feels Like Temperature" and " Apparent Temperature" on the App or ecowitt.net.

Take the App as an example: Open Ecowitt App → "Menu" → "Settings" → "Temp Index"→"Feels Like Temperature" or "Apparent Temperature ".

If the user selects "Apparent Temperature", the numerical value for "Feel s Like" on the LCD screen will be displayed as the value of "Apparent Te mperature".

3.3.13 LCD Display Brightness

The WS3900/WS3910 has 5 levels of brightness, which are Max -> High -> Medium -> Low -> Off.

3.3.13.1 When Battery Powered:

When the battery power is supplied, pressing any button will turn on the backlight, and the backlight will turn off automatically after 15s without button operation. When only battery powered, the backlight is only "Medium " and "Off".

Note: Run on 3 x AA battery power alone for about 15-25 days.

3.3.13.2 When DC Powered:

1. The backlight will be adjusted to "Medium" automatically when DC power supply is just connected.

2. After disconnecting the DC power supply, the backlight will keep the brightness for 15s and then turn off.

3. When DC power is supplied, press LIGHT briefly to adjust the backlight: Max -> High -> Medium -> Low -> Off.

3.3.13.3 Automatic Control Backlight:

Version 1.3.0 and later support automatic backlight settings for web pages. Please refer to **section 2.2.4** to access webpage settings.

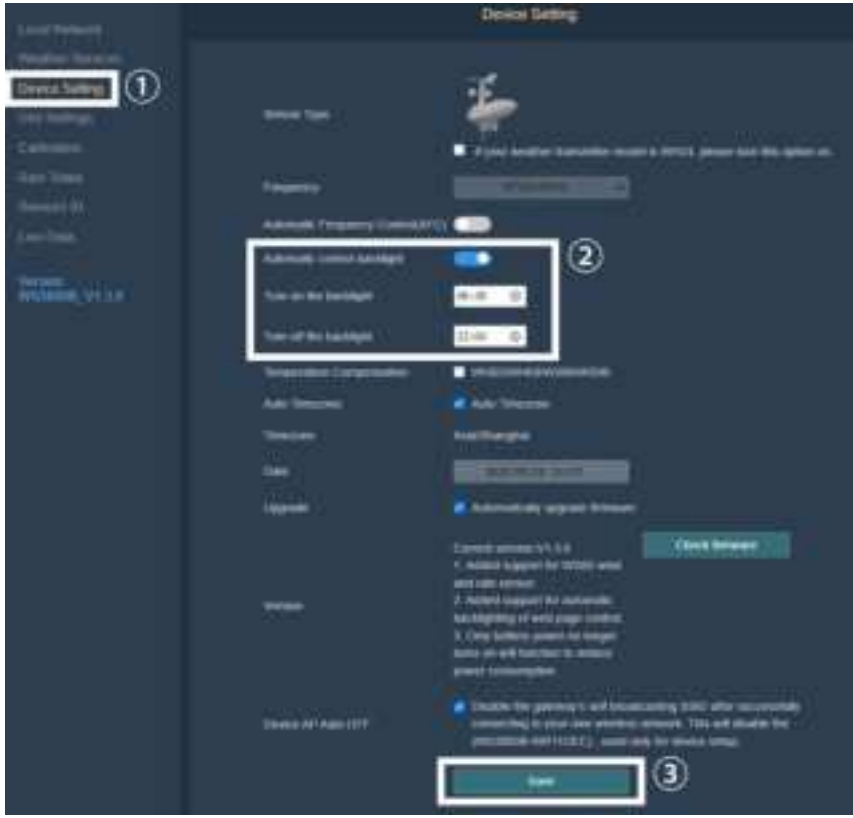


Figure 32: Automatic Control Backlight

3.3.14 DATE and CO2 Display switching

1. When the device accesses to power supply, it will first show DATE and sunrise and sunset time for about 20S (search the sensors), and then switch to show CO2 and solar&UVI.

Figure 33

2. If the device does not include the indoor co2 and also does not receive the sign of other CO2 sensor, then press [+] will not toggle and only the DATE will be shown.

How to distinguish the built-in CO2 sensor and the WH46/WH45 CO2 sensor:

The built-in CO2 sensor does not show the RF signal bar.

Figure 34

The WH46/WH45 CO2 sensor shows the RF signal bar.

Figure 35

3. When in the "DATE" state, the day of the week and month are displayed automatically switched after 5S. When in the "CO2" state, the day of the week and month are not shown and do not switch.

Figure 36: Display: month -> July

Figure 37: Display: day of week -> Monday

Figure 38: Display: CO2 -> 984 ppm

3.4 Buttons

There are 8 buttons in total: SET, TEMP, RAIN1, RAIN2, WIND, +, –, LIGHT.

Figure 39: 8 Buttons

There are eight buttons on the top of the display console. The following tables briefly explain the function of these buttons.

Buttons	Functions
SET	**Setting button** Press to switch display mode. Press to switch hour/minute in alarm setting mode. Press to switch setting option in setting mode. Hold to enter setting mode. Hold SET + LIGHT for a factory reset.
TEMP	**Temperature display button** Press to switch temp channel. Hold to register weather data. Hold "TEMP" & "-" to activate Wi-Fi hots pot/configuration
RAIN1	**Rain display button** Press to switch RAIN RATE/EVENT.
RAIN2	**Rain2 display button** Switch RAIN DAILY/WEEKLY/MONTHLY/YEARLY/TOTAL.
WIND	**Wind display button** Press to switch WIND/GUST/DIRECTION/10min dir. Press to activate/deactivate alarm in alarm setting mode.
+	**Plus button** Press to switch display interface. Press + to adjust value in setting mode.
-	**Reduce button** Press to switch REL/ABS mode. Press - to adjust value in setting mode. Hold to switch UVI/sunrise & sunset.

LIGHT	**Brightness adjustment button** Press to adjust backlight when powered by DC. Press LIGHT to snooze and press the other to exit while alarming. Hod LIGHT to exit while snoozing.

Table 5: Button functions

3.5 Product Modes

There are 5 modes in total: Normal mode, Setting mode, Max/Min value mode, Alarm setting mode, MAC address display.

3.5.1 Normal Mode

1. The product will enter the main page of Normal mode by default when it is normally powered on. In other modes, no button operation for 30 seconds or press LIGHT can also return to the main page of normal mode.

2. In Normal mode, press SET to change the mode.

Sequence: Normal mode -> Maximum value -> Minimum value -> Alarm setting -> MAC address display.

3. Press TEMP in Normal mode to switch the display: OUTDOOR -> FEELSLIKE -> DEW -> CH1 -> CH2 -> CH3 -> CH4 -> CH5 -> CH6 -> CH7 -> CH8 -> Auto-Scroll mode.

4. When the OUTDOOR, FEELSLIKE and DEW show the states, hold the TEMP for 5 seconds to re-register the outdoor temperature and humidity sensors.

5. If the TEMP is held for more than 5s in single CH mode, the corresponding CH sensor transmitter will be re-registered.

6. If the TEMP is held for more than 5s in Auto-Scroll mode, it will re-register the Outdoor and CH1~CH8 sensors. Same as 4. above, need to DISABLE other registered priority transmitters first.

① Press RAIN1 to switch RAIN RATE/EVENT. The bar chart on the right side synchronizes the graphical display of its values.

② Press RAIN2 to switch RAIN DAILY/ WEEKLY/ MONTHLY/ YEARLY/ TOTAL.

7. Press WIND can switch WIND/GUST/DIRECTION/10min direction display. Numbers indicate the angle of the wind direction.

8. Press + to switch Date/CO2/PM1.0/PM2.5/PM10/AQI display.

9. Hold − to switch to UVI/Solar radiation/Sunrise/Sunset display. The exponential intensity graph on the right side synchronizes the display of UVI values.

Press − to switch PERSSURE REL/ABS.

10. When DC power is supplied, press LIGHT on the main page to adjust the backlight in 5 levels: MAX -> High -> Medium -> Low -> Off.

11. Hold TEMP + − for more than 2s to open AP, Wi-Fi signal icon fast flash, you can connect to this hotspot on a mobile phone or PC.

12. Hold SET + LIGHT for 5 seconds the device will restore factory settings and reboot, all setup parameters will be cleared.

Notes:

*** In Auto-Scroll mode, only registered sensors are displayed.**

Figure 40

*** Max and Min values will be cleared together if the multi-channel temperature and humidity sensor is re-registered.**

3.5.2 Setting Mode

In Normal mode, hold SET for more than 2s to enter Setting mode. Then press SET to switch the setting item, press the + or − button to adjust the setting value:

① Beep sound (ON/OFF)

② Hour format (12 hours/24 hours)

③ Hour setting

④ Minute setting

⑤ Year setting

⑥ Month setting

⑦ Day setting

⑧ Pressure unit selection (hPa, mmHg, inHg)

⑨ Relative pressure setting (700hPa-1100hPa)

⑩ Temperature unit selection (°C/°F)

⑪ Wind speed unit selection (m/s, km/h, mph, knots, BFT)

⑫ Rainfall unit selection (in/mm)

⑬ Solar Light unit selection (W/m2, Kfc, Klux)

⑭ Selection of the northern and southern hemispheres (NTH, North)

⑮ RST daily High and Low reset switch

⑯ CO2 Calibrations

3.5.3 Max/Min Value Mode

In Normal mode, press SET to enter Max/min value mode.

Sequence: Normal mode -> Maximum value -> Minimum value.

Max value: outdoor/indoor temperature & humidity, feels like, dew point, pressure, rainfall, wind speed, gust speed, UVI and solar radiation.

Min value: outdoor/indoor temperature & humidity, feels like, dew point, and pressure.

Figure 41：Max/Min values

3.5.4 Alarm Setting Mode

3.5.4.1 Alarm Function

In Normal mode, press SET to enter Alarm setting mode.

Sequence: Normal mode -> Maximum value -> Minimum value -> Alarm setting.

In the alarm setting mode, press SET to switch the alarm clock setting item:

① Alarm hour setting

② Alarm minute setting

Press + or − to adjust the value. Press WIND to switch on/off the alarm clock.

After the alarm is triggered, the alarm will continue to sound for 2 minutes when no button is pressed, and the alarm will become more and more rapid within these 2 minutes.

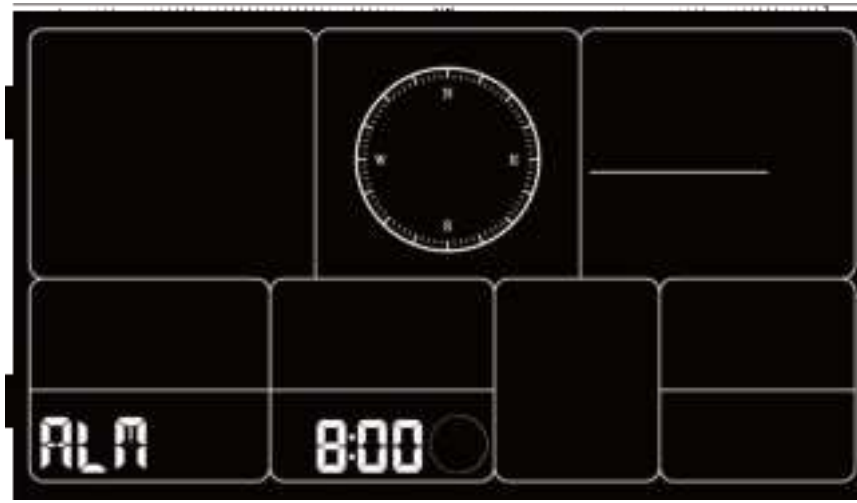


Figure 42: Alarm setting

3.5.4.2 Snooze Function

When the alarm clock is set and the alarm is triggered, press LIGHT to

enter snooze mode, the snooze icon will be displayed near the alarm clock icon, and the alarm will sound again after 10 minutes.

Hold any button for 2 seconds after entering snooze mode will exit snooze mode.

Figure 43: Snooze function

3.5.5 MAC Address Display

In Normal mode, press SET to change the mode.

Sequence: Normal mode -> Maximum value -> Minimum value -> Alarm setting -> MAC address display.

Figure 44: MAC address

3.5.6 Built-in CO2 sensor Calibration(Only WS3910)

The CO2 calibration has two ways.

1. Select the setup to enter from the setup mode.

2. Press and Hold the SET button and then power on, directly into the calibration interface.

In the calibration interface, press + or - button to set the desired calibration value. Press WIND button to start/stop the calibration process.
3. Calibration process steps:
Press + or - to set the desired calibration value.
Press WIND to start calibration, the screen displays ON and blinks.
The left side show the current collected CO2 value (528) and the top side displays the calibration value to be set (580)

Figure 45: Only WS3910 CO2 Calibration

Keep the device for 3 to 5 minutes in a stable environment, when the left of the screen will be shown OK at the bottom, the calibration is complete.

Figure 46

If NG is shown, the calibration has failed, and needs to be re-calibrated.

Figure 47

Note: The calibration costs five minutes to complete base on the stability of the environment. If the environment is unstable or great change, it will take more time.

3.6 Historical Data Export and Clear

3.6.1 Export History Data:

WS3900/WS3910 doesn't support a memory card to store data, when the

Wi-Fi configuration (refer to 2.2 for Wi-Fi Configuration) is completed, you can log in to Ecowitt.net to export the data in xlsx file format.

Figure 48: Export Historical Data from Ecowitt.net

Note:
Data with a query period of days/24 hours is retained for 3 months.
Data with a weekly query period is retained for 1 year.
Data with a monthly query period is retained for 2 years.
Data with a yearly query period is retained for 4 years.

3.6.2 Clear History Data:

Under "menu" - "devices" - "..." button to reset history data.

Figure 49

Figure 50: Clear History Data

3.7 Firmware Upgrade

Method 1: Via Ecowitt App

Open Ecowitt App – My Devices – "…" (Open the edit gateway page) – tap the firmware version number to upgrade if there is a new version available. When the upgrade is complete, the WS3900/WS3910 will reboot into the latest version.

Figure 51: Firmware Upgrade on the App

Method 2: Via web page 192.168.4.1

If you choose "Automatically upgrade firmware" on the web page 192.168.4.1, WS3900/WS3910 will enter OTA every time when there is a new firmware, and the screen will display the "OTA" character. When the automatic firmware update is successful, it will display "OTA OK" and reboot automatically. (Automatic update interval is 24 hours).

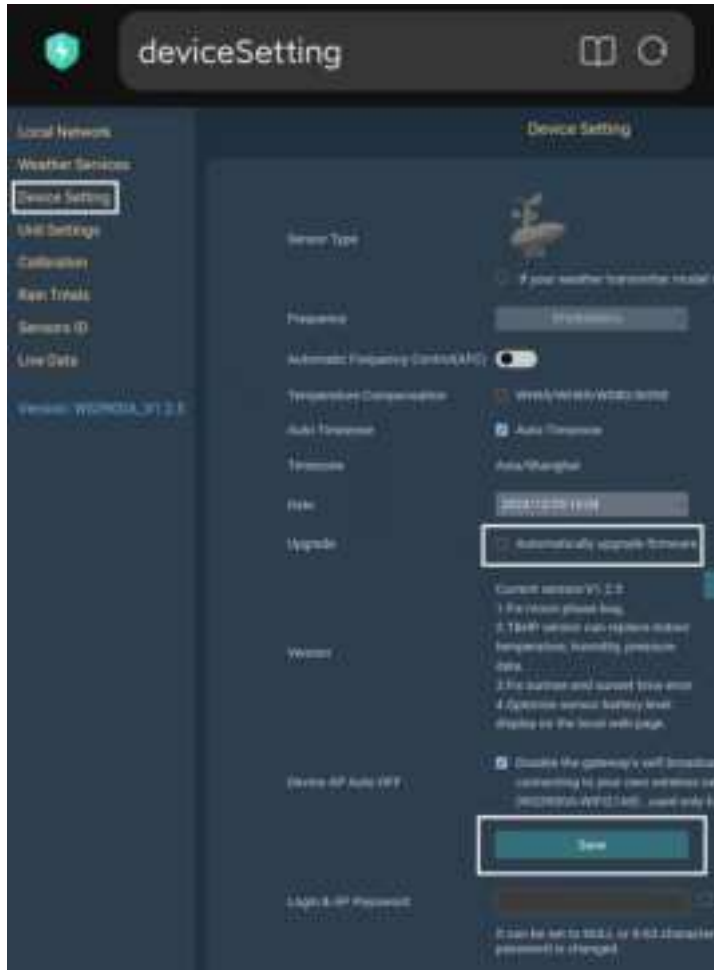


Figure 52: Automatically upgrade firmware setting on the web page

4. Optional Sensors

The RF reception function will always be turned on to receive data from multiple sensors at any time.

4.1 Sensors：

When powered by DC or battery, the device supports these sensors as below, power consumption can be high if only battery power is available.

The following sensors can be purchased separately. For more information, please visit our website: http://www.ecowitt.com. Make sure to select the model of the units with the same RF frequency as your gateway or display (the frequency is different for various countries because of regulations).

Note: Max QTY of the following table means the maximum number of different sensors that can be connected to the WS3900 or WS3910.

4.1.1 Sensor Data Can be Displayed on the WS3900/WS3910:

Sensor Model	Max QTY	Picture	Functions
WS90	1		Outdoor temperature & humidity, light, UV, wind speed/direction, rainfall
WS80	1		Outdoor temperature & humidity, light, UV, wind speed/direction
WS69	1		Outdoor temperature & humidity, light, UV, wind speed/direction, rainfall
WS85	1		wind speed/direction, rainfall
WS68	1		Light, UV, wind speed/ direction,

WH40	1		Rainfall
WN32P	1		Indoor temperature, humidity and pressure
WN32	1		Outdoor temperature and humidity
WH45/WH46	1		WH45: CO2, PM2.5, PM10, temperature and humidity WH46: CO2, PM1.0, PM2.5, PM4.0, PM10, temperature and humidity
WN31/WN30/ WN36	8		WN31: Temperature and humidity WN30: Temperature WN36: Pool temperature

Table 6: Optional sensors

Note:

1. Some data of WS90/85/80/69/68/WH40/WN32 exist display priority, please refer to Section 3.3.7~3.3.9.

2. Some data of WH45/WH46 would not show on the WS3900/3910 (uploading the data). Please refer to Section 3.3.2.

4.1.2 Sensor Data Can Only be Uploaded to the Cloud：

Sensor Model	Max QTY	Picture	Functions
WH57	1		Lightning detection
WH41/WH43	4		PM2.5
WH55	4		Water leak detection
WH51L	16		Soil moisture
WH51			
WN34L/S/D	8		Soil/liquid temperature
WN35	8		Leaf wetness

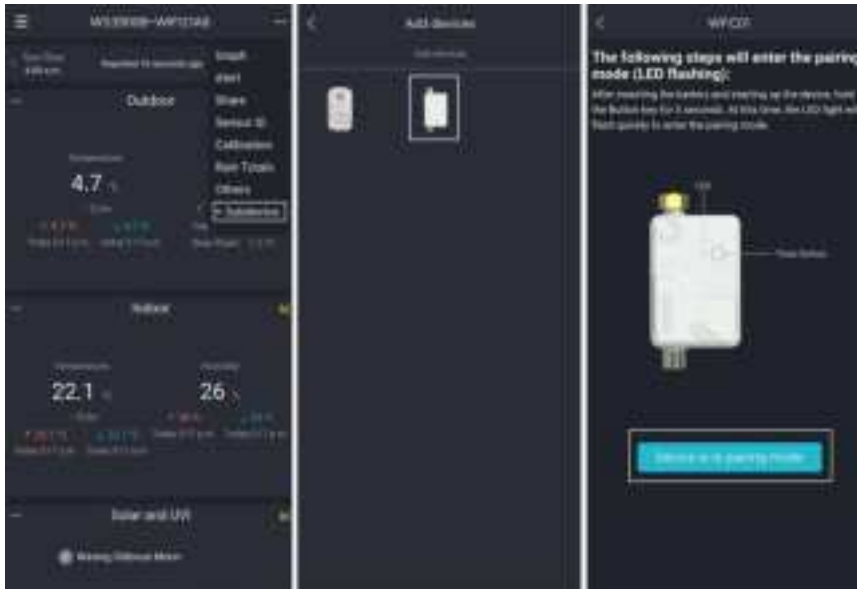
Table 7: Optional sensors

4.2 IoT Device：

Sensor Model	Max QTY	Picture	Functions
WFC01	16		Smart water timer
AC1100			Smart plug

Table 8: IoT device

After the Wi-Fi configuration of WS3900/WS3910 is finished (refer to 2.2), IoT products can be connected to the App. Take WFC01 for an example:



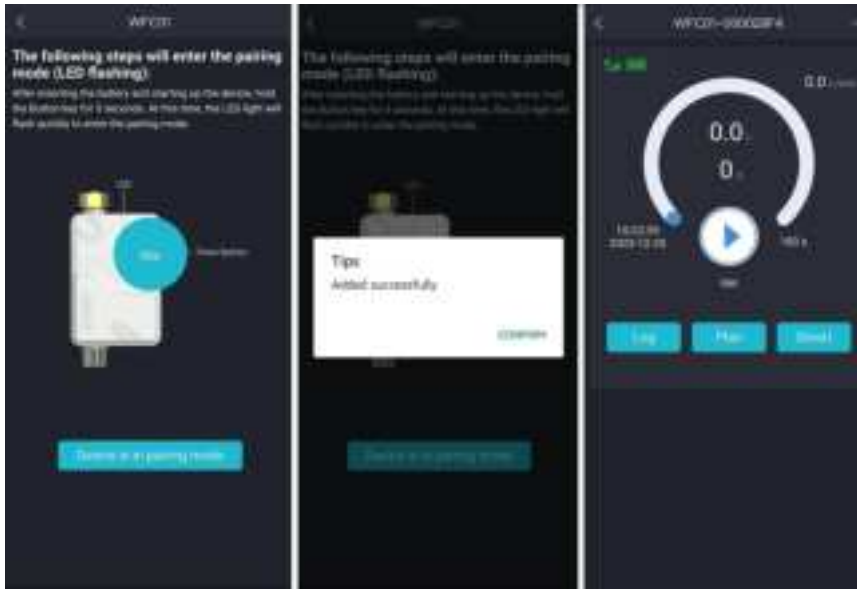


Figure 53

4.3 Calibrate the WH46/WH45 CO2 Sensor

If you have relatively accurate CO2 data. You can use the data to do the calibration.

1. Make sure your mobile device is connected to the same Wi-Fi network.

2. Click "…" on the top right corner and choose "Calibration".

3. Calculate the offset of data for the WH45/WH46 CO2 sensor.

4. Fill in the offset from step3, click Save.

5.The Ecowitt sensors also can be calibrated when compared with other accurate data of the same type.
sensors.

Figure 54

4.4 Rainfall Calibration

The access steps are shown in **Figure 55.**

Take the **Piezoelectric rain gauge** as an example:

Suppose your device measures a daily rainfall of 2.5mm, while another device (assuming it's a super pro device) measures a daily rainfall of 2.6mm. Therefore, we calibrate the "**Rain Day"** to 2.6mm.

Or we set **Rain Gain** to 2.6/2.5 = 1.04. Then the rainfall will be calibrate to: 2.5*1.04=2.6mm. Only when different rainfall is recorded does the gain index take effect.

Figure 55: Rainfall Calibration

5. Others

5.1 Lightning Distance Unit

WS3900/WS3910 can connect WH57 lightning sensor, and the lightning data can only be viewed through Ecowitt App, website, and web page, if you need to modify the lightning distance unit, you can modify it by modifying the wind speed unit on App, website or web page.

We here recommend modifying units on the App, the lightning units will be used in daily viewing and exporting data on the website.

Wind Speed Unit	Lightning Distance Unit
m/s, km/h, BFT	km
Knots	nmi
mph, fpm (fpm can only be set in App/website)	mi

Table 9: Corresponding table of wind speed and lightning distance units

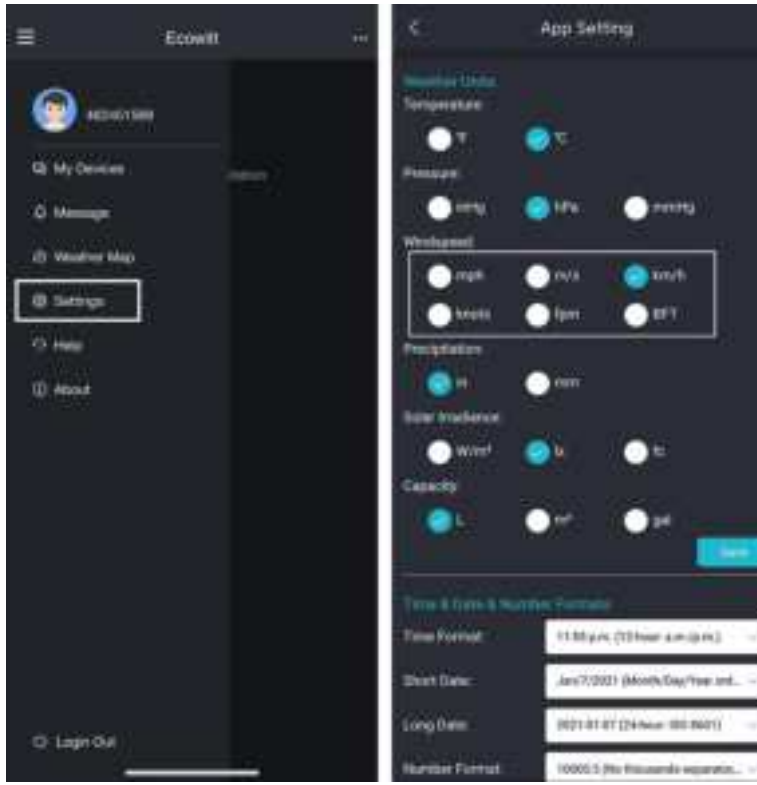


Figure 56: Setting lightning units by setting wind speed units on App

Note: The wind speed units set on the App will not be synchronized to the WS3900/WS3910.

6. Specifications

Model	WS3900
Name	Weather Station (receiver)
Dimensions	209×28.5×142.5(mm)
Screen Size	169×94.5(mm)
Weight	366(g)
Material of Plastic Casing	ABS
Material of Screen	VA-LCD
Temperature Metering Range	-9.9°C to 60°C(14°F to 140°F)
Temperature Metering Accuracy	±0.2°C(±0.4°F)
Temperature Metering Resolution	0.1°C(0.2°F)
Humidity Metering Range	1% to 99%
Humidity Metering Accuracy	±2%
Humidity Metering Resolution	1%
Barometric Pressure Metering range	300 to 1100 hPa (8.85 to 32.5 inHg)
Barometric Pressure Metering accuracy	±1.5hpa(absolute pressure); ±2hpa(relative pressure)
Barometric Pressure Metering resolution	0.1 hPa (0.01 inHg)
Reading Update Interval	About 1 minute
RF Connection Frequency	920/915/868/433MHz (depending on local regulations)
RF Wireless Range	Over 100 meters (in open areas)
WLAN	802.11 b/g/n 2.4 GHz (802.11n, Max 150 Mbps)
WLAN Range	Over 30 meters (in open areas)
Console Operating Temperature	-10°C to 50°C(14°F to 122°F)
Power Supply	DC 5V 1A or 3 AA Alkaline or Lithium Battery (not included)
Battery Life	15-25 Days(Using battery powered)

Model	WS3910
Name	Weather Station (receiver)
Dimensions	209×28.5×142.5(mm)
Screen Size	169×94.5(mm)
Weight	366(g)
Material of Plastic Casing	ABS
Material of Screen	VA-LCD
Temperature Metering Range	-9.9°C to 60°C(14°F to 140°F)
Temperature Metering Accuracy	±0.2°C(±0.4°F)
Temperature Metering Resolution	0.1°C(0.2°F)
Humidity Metering Range	1% to 99%
Humidity Metering Accuracy	±2%
Humidity Metering Resolution	1%
Barometric Pressure Metering range	300 to 1100 hPa (8.85 to 32.5 inHg)
Barometric Pressure Metering accuracy	±1.5hpa(absolute pressure); ±2hpa(relative pressure)
Barometric Pressure Metering resolution	0.1 hPa (0.01 inHg)
Photoacoustic NDIR CO_2 Metering range	0 to 40000 ppm
Photoacoustic NDIR CO_2 Metering accuracy	±(50ppm + 5% of reading) when 400 to 2000 ppm
Photoacoustic NDIR CO_2 Metering resolution	1ppm
Photoacoustic NDIR CO_2 Accuracy drift per year	± (5ppm + 5% of reading)
Reading Update Interval	About 1 minute
RF Connection Frequency	920/915/868/433MHz (depending on local regulations)
RF Wireless Range	Over 100 meters (in open areas)
WLAN	802.11 b/g/n 2.4 GHz (802.11n, Max 150 Mbps)
Power Supply	DC 5V 1A or 3 AA Alkaline or Lithium Battery (not included)
Battery Life	15-25 Days(Using battery powered)

Table 10: Specifications

Note: When working with other transmitters, the screen displays the following range of data:

Indoor temperature	-9.9 to 60℃
Outdoor temperature	-40 to 60°C
Humidity	1% to 99%
Wind speed	0-180km/h
Wind direction	0 to 359 degrees
Rainfall	0 to 9999mm
CO2	0 to 40,000 ppm
PM1.0, PM2.5, PM10	0 to 999 ug/m3
AQI	0 to 500
Illuminance	0 to 300 Klux
UV	0 to 15

Table 11

7. Warranty Information

7.1 Warranty

We disclaim any responsibility for any technical error or printing error or the consequences thereof.

All trademarks and patents are recognized.

We provide a 2-year limited warranty on this product against manufacturing defects or 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 us for problem determination and service procedures.

This limited 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, or claims based on misrepresentation by the seller, or performance variations resulting from installation-related circumstances.

7.2 FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions: (1) this device should not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 to 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.

To maintain compliance with RF Exposure guidelines, This equipment should be installed and operated with a minimum distance between 20cm of the radiator and your body. Use only the supplied antenna.

IC Caution:
English:
This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science, and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two

Conditions:
1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

French:
L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Manufacture: Shenzhen Fine Offset Electronics Co., Ltd.
Address: 4/F, Block C, JiuJiu Industrial City, Shajing Town, Baoan Distri ct, Shenzhen City, China

8. Care and Maintenance

When batteries of different brands or types are used together, or new and old batteries are used together, some batteries may be over-discharged due to a difference in voltage or capacity. This can result in venting, leakage, and rupture and may cause personal injury.

• Do not mix Alkaline, Lithium, standard, or rechargeable batteries.

• Always purchase the correct size and grade of battery most suitable for the intended use.

• Always replace the whole set of batteries at one time, taking care not to mix old and new ones, or batteries of different types.

• Clean the battery contacts and also those of the device prior to battery installation.

• Ensure the batteries are installed correctly with regard to polarity (+ and -).

• Remove batteries from products during periods of non-use. Battery leakage can cause corrosion and damage to this product.

• Remove used batteries promptly.

• For recycling and disposal of batteries, and to protect the environment, please check the internet or your local phone directory for local recycling centers and/or follow local government regulations

9. Contact Us

9.1 After-sales Service

Order Issues:
If you encounter any missing or incorrect shipments of Ecowitt products purchased, please reach out to the respective platform's customer service from the store where you bought the product for assistance.

Usage Inquiries:
Our product is continuously changing and improving, particularly online services and associated applications. To download the latest manual, and additional help, and for any issues related to product usage feel free to contact our customer support team at support@ecowitt.com. We are committed to providing assistance and resolving any concerns you may have.

9.2 Stay in Touch

Ask questions, watch setup videos, and provide feedback on our social media outlets. Follow Ecowitt on Discord, YouTube, Facebook and Twitter.

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