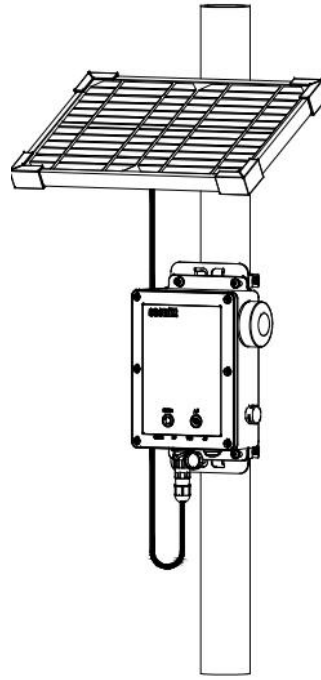
ecowitt®



# 4G & Wi-Fi Weather Station Mobile Gateway

## Model: WS6210

https://s.ecowitt.com/D33XUA

# Content

# 1.Package

The following items comprise the WS6210 and its accessories.

| QTY | Item |
|---|---|
| 1 | WS6210 (4G & Wi-Fi Weather Station Mobile Gateway) |
| 6 | Hose Clamp<br>(3 * Fits pipe diameter: 46-70mm & 3 * Fits pipe diameter: 21-38mm. Choose according to the need) |
| 2 | Hose Clamp Brackets |
| 4 | M5*8 Screws |
| 1 | SD13 to USB power cable, length 50cm(19.7 inch) |
| 1 | Solar panel with cable, length 70cm(27.6 inch) |
| 1 | Galvanized Bracket for solar panel |
| 3 | Screws for solar panel |
| 1 | User Manual |
| 1 | Quick Start |

**Table 1 Central WS6210 unit and accessories**

| QTY | Item |
|---|---|
| 8 | AA rechargeable NiMH batteries |
| 1 | Nano-SIM card |
| 1 | Micro SD card 8G |

**Table 2 Accessories list (included)**

# 2. Construction & Layout

## 2.1 Multiple Views and Size

### 1. WS6210 Size

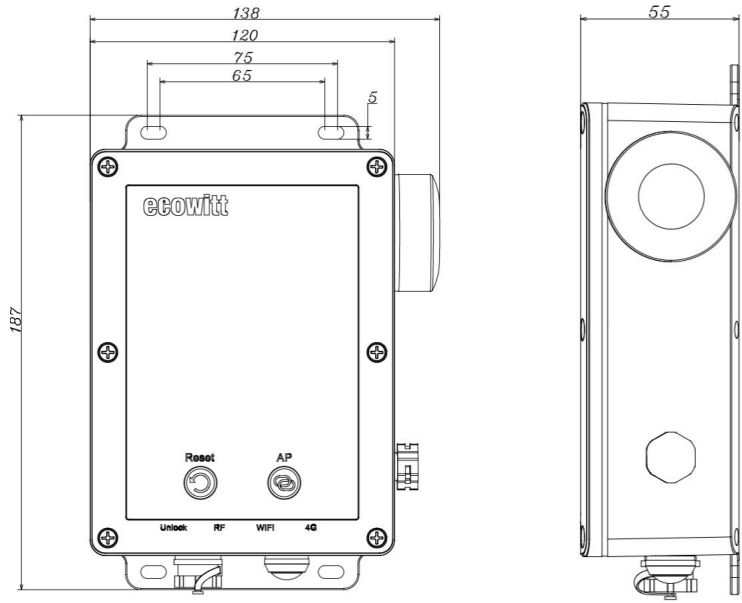
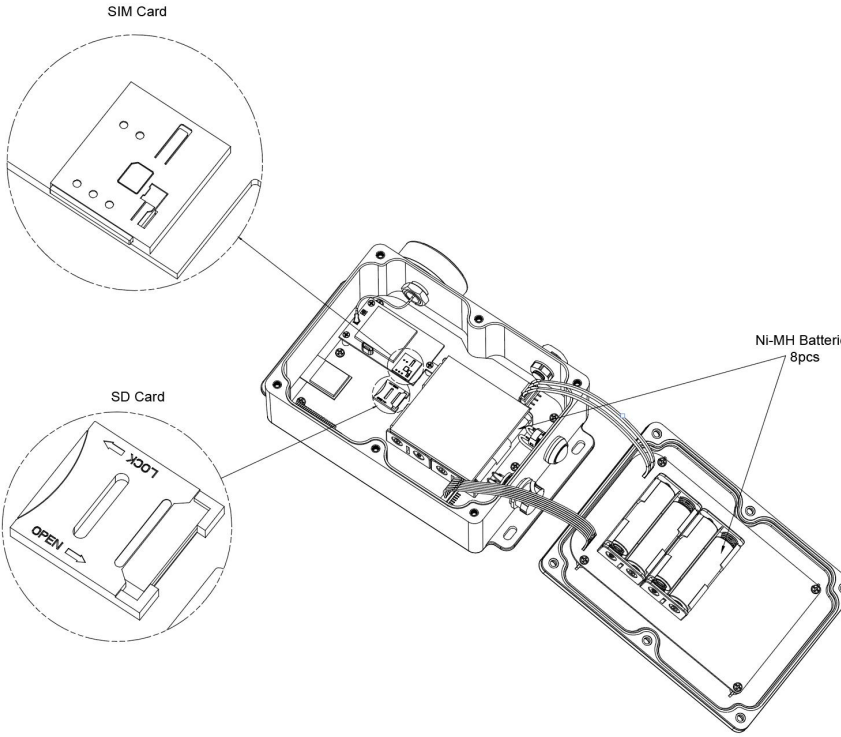



**Figure 1**

## 2.2 Layout

| Inside |
| --- |
|  |

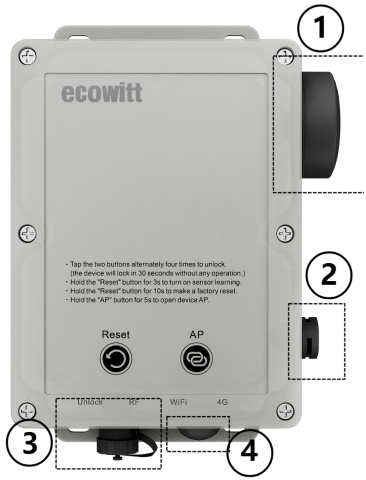
| Outside | |
|---|---|
|  <br>  | ① **2G/4G Antenna**<br>Unable to open<br>② **Pressure Balance Valve**<br>③ **Power Port**<br>Left turn to unlock, right turn to lock<br>④ **Power Switch**<br>Press to power on/off |

**Table 3**

## 2.3 Light Indicators


| Light | Indicators |
|---|---|
| Unlock | ● **Off:** Locked – key operation is prohibited<br>● **On:** Unlocked – key operation is possible. |
| RF | ● **Flashes regularly:** Sensor Learning<br>● **Blinking Once:** A successful reception of sensor signal. |
| Wi-Fi | ● **Continuous blinking:** AP on.<br>● **Off**: Wi-Fi de-activated.<br>● **Fast blinking**: In Wi-Fi provisioning mode<br>● **Slow blinking**: Wi-Fi connected without internet<br>● **Steady on**: Wi-Fi connected with internet access |
| 4G | ● **Off:** Module is not recognized<br>● **Flashes quickly:** The module is under-recognizing<br>● **Blinks slowly:** When registering with the network<br>● **Flashes once every 5 seconds:** Successful network connection |

**Table 4**

## 2.4 Touch Button

The device has two touch buttons： **Reset** and **AP**.

<table>
<tr><td colspan="2">Tap Reset & AP Button alternatively four times (tap interval < 1.5s) to unlock the WS6210. The below button works when in the unlocked state.</td></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td>Reset Button<br>Press and hold the button for:<br>3 seconds: it will turn on the receiver and will be in sensor learning mode. The RF LED will flash two times per second for 3 minutes until the learning process is completed.<br>10 seconds: The gateway reboots to factory default settings. The four LEDs flash two times per second three times, then the device will reboot.</td><td>AP Button<br>Hold for 5 seconds:<br>Turn on the onboard Wi-Fi AP for 5 minutes. The device can be connected via IP address 192.168.4.1and SSID WS6210x-WIFIxxxx.</td></tr>
</table>

**Table 5**

# 3. Brief Introduction

Thank you for purchasing the Ecowitt WS6210 weather station mobile receiver and transmitter. The WS6210 is a versatile wireless communication device supporting various wireless communication protocols. It is suitable for meteorological data collection and transmission. The product supports Wi-Fi and 4G connections for receiving and processing multiple sensor data types.

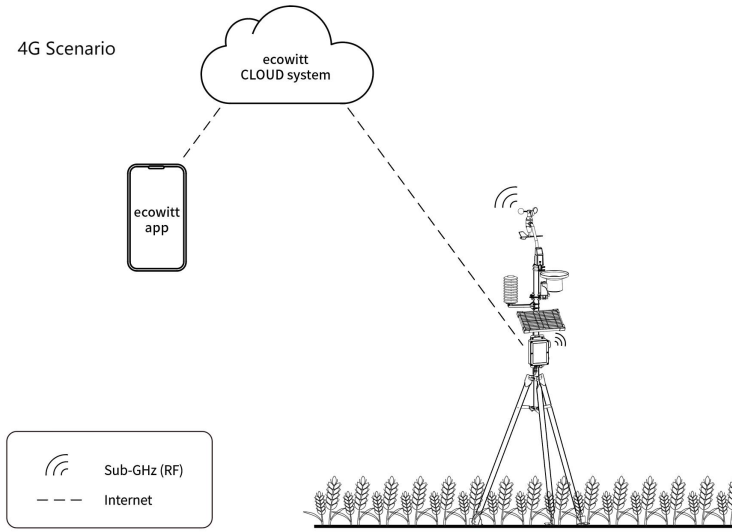



**Figure 2 4G Scenario**

**Outdoor Use:**

The product can use 4G for data transmission when used outdoors without power supply from the grid and without WLAN connectivity.

It can also be used outdoors via an available WLAN connection when permanent power supply via the electricity grid or other means (powerstation) is available.

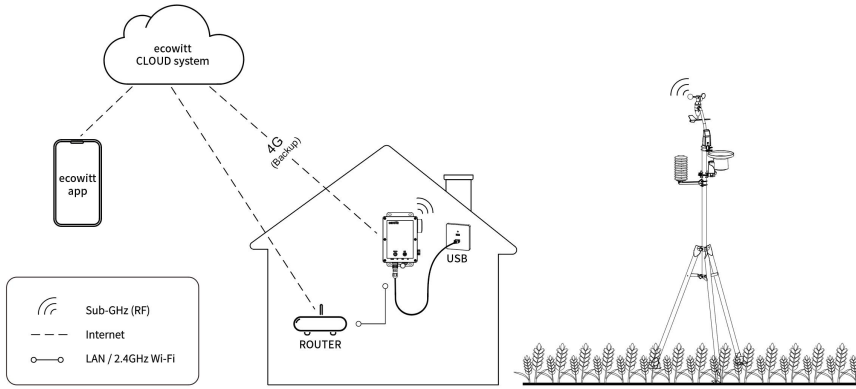



**Figure 3 WIFI + 4G Scenario**

**Indoor Use:**

When used indoors and WLAN connection is available, the product prioritizes Wi-Fi for data transmission. If Wi-Fi disconnects, it switches to 4G to maintain continuous data flow. (This is a configuration option, see chapter 4.3)

The WS6210 is technically speaking a gateway, a display-less console, which needs to be used with optional sensors to obtain weather or other environment related 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 weather station and save it for future reference.

**General Terms Used in the Manual:**

**Weather Station:** Includes the console and sensors (or sensor array).

**Gateway:** Also known as a hub, it is a Displayless console. Here, refer to the WS6210 device.

**Transmitter:** Refers to the sensor.

**Receiver:** Refers to the console.

**RF:** Radio frequency. It refers to the ISM and SRD SUBG (Industrial, Scientific and Medical and Short Range Devices frequency bands below 1 GHz) for communicating between the gateway and its sensors. This frequency is not the same as the 4G modem or Wi-Fi working frequency. ISM/SRD bands are kept separate from 4G frequencies by national regulations to avoid interferences. Typical ISM/SRD frequencies are 915 (Americas), 868 (Europe), 433 (worldwide), 920 (Japan, Korea).

**4G:** A mobile data network standard (LTE): Long Term Evolution or 4th generation. WS6210 has a built-in 4G modem that can be configured to upload data via a 4G network. It needs a SIM card and the 4G service provider covers the area where you want the WS6210 to be installed.

# 4. First Use

## 4.1 Power on

1、Press the physical Power button to power it on. Four lights will turn on for 3s when powered on successfully. As illustrated below:


**Figure 4**

2、When first used, please charge the WS6210 using the included USB cable. The batteries will be fully charged in 10 hours.

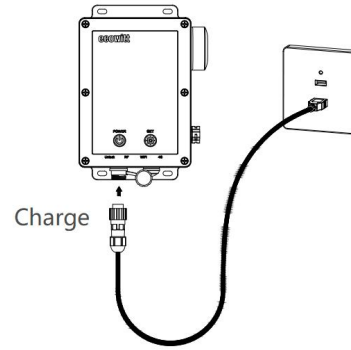



**Figure 5**

**Note: You can also use an external charger, Do not use normal, non-rechargeable**

**batteries ! This could result in battery leakage and will damage the device**

## 4.2 Install the APP

1、Scan the QR code on the body of WS6210 to download the app.

Assure you have the location and Wi-Fi service enabled for this Ecowitt APP.

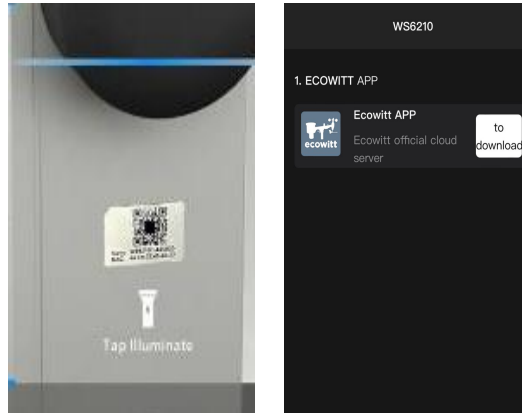



**Figure 6**

2、Run the “ecowitt” APP and register your account

3、Open the APP, tap on “menu” – “device” – “+add a new device”- choose the model of ws6210 from the product listing

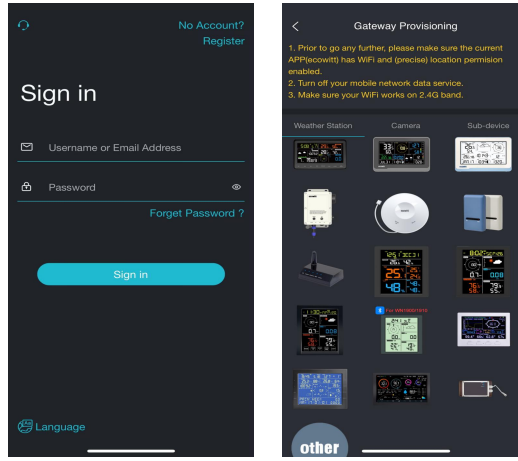


**Figure 7**

## 4.3 Working Mode

WS6210 has three working modes available for uploading the data to weather services, like www.ecowitt.net, weather underground, wow, weather cloud, and custom server is possible too.

1. **Ecowitt SIM**: The device comes with a SIM card pre-installed in the factory. You can use the SIM card to upload data. The default package includes a prepaid **90-day (300MB)** service. If you want to use this for data uploading, please refer to **section 4.3.1** for the activation. You may extend the cellular data service by going through the SIM card renewal process on the "ecowitt" app before the data service expires.

2. **User SIM**: Open the housing of WS6210, remove the pre-installed SIM card, and replace it with your SIM card. Please refer to **section 4.3.2** for the setup.

3. **Wi-Fi:** If your location has Wi-Fi and USB power access, you may refer to **section 4.3.3** for the setup.

Cellular Service and Wi-Fi can both be set at the same time. When both connections are present, the Wi-Fi connection has higher priority, and it will only switch using the SIM cellular connection when the Wi-Fi connection is unavailable. Select the mode that is appropriate for you.

### 4.3.1 Ecowitt SIM

Ensure the provided Ecowitt SIM card is compatible with the operating

service provider in your country. If the built-in SIM card is not supported in your region, replace the SIM card with yours. Refers to **Section 4.3.2**

| Country/Region | Operator |
|---|---|
| Albania | Vodafone |
| Australia | Vodafone |
| Austria | H3G |
| Brazil | Telefonica |
| Cambodia | Smart |
| Canada | Rogers |
| Chile | Entel |
| China | ChinaMobile/Unicom |
| CongoDR | Vodafone |
| Czech Republic | Vodafone |
| Denmark | H3G |
| France | Bouygues Telecom/Orange |
| Germany | Vodafone |

| Country/Region | Operator |
|---|---|
| Macau, China | H3G |
| Malaysia | Celcom/Mi3G-U Mobile |
| Malta | Vodafone |
| Mozambique | Vodafone |
| Myanmar | MPT |
| Netherlands | Vodafone |
| New Zealand | Vodafone |
| Philippines | Smart |
| Portugal | Vodafone |
| Romania | Vodafone |
| Russian Federation | MTS |
| Saudi Arabia | STC |
| Singapore | Starhub |

| | | | |
|---|---|---|---|
| Ghana | Vodafone | South Africa | Vodafone |
| Greece | Vodafone | South Korea | SKTelecom |
| Hong Kong, China | H3G | Spain | Vodafone |
| Hungary | Vodafone | Sweden | H3G |
| Indonesia | Indosat | Taiwan, China | CHT/FET |
| Ireland | H3G/Vodafone | Tanzania | Vodafone |
| Israel | Partner/Pelephone | Thailand | AIS/Truemove |
| Italy | H3G/Vodafone | Turkey | Vodafone-Telsim |
| Japan | KDDI AU | UAE | Etisalat |
| Lesotho | Vodafone | Vitenam | Vitenam Mobile |

**Table 6 Regions where the built-in SIM card service is supported**

**1.** Tap on “menu” – “device” – “+add a new device”- choose the model of ws6210 from the product listing.

**2.** Tap on the button marked with “Ecowitt SIM Card.”

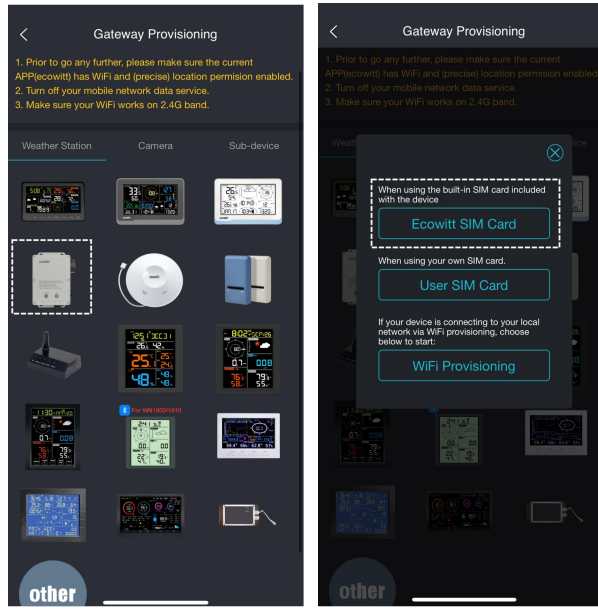



**Figure 8**

**3**. Scan the QR code on the device and bind it simultaneously.

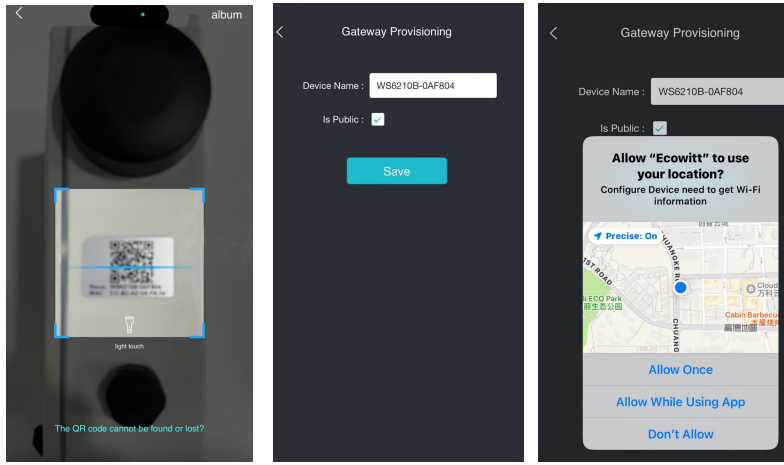



**Figure 9**

**4.** Select the country or region for the SIM card usage.

（*** Note**: that it cannot be changed once activated）

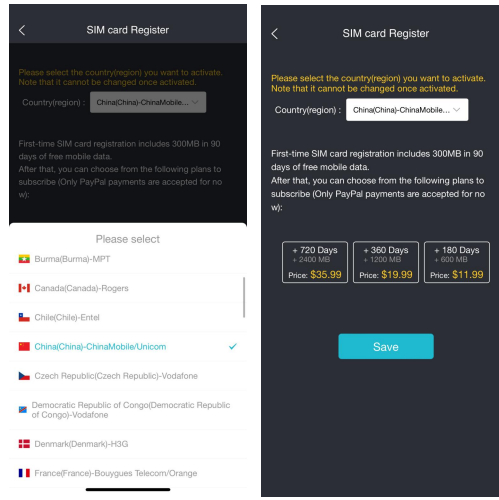



**Figure 10**

4. Wait approximately 30-60 minutes for the data to upload.

You can see the battery level on dashboard.

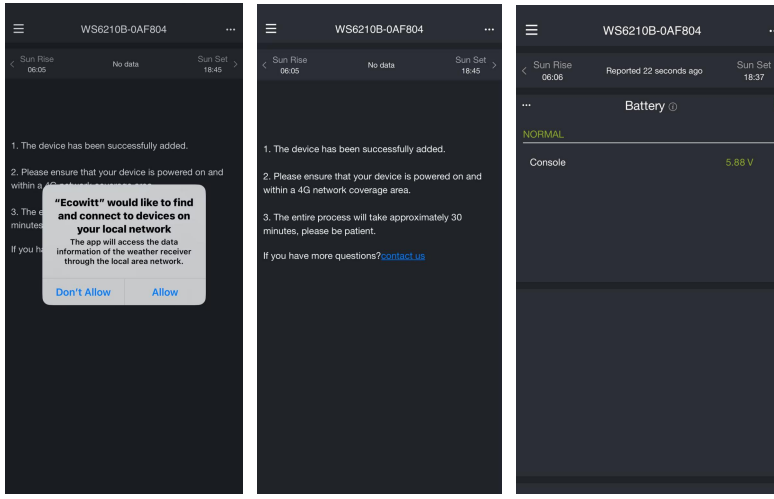



**Figure 11**

**Note:** If there is no data for more than 60 minutes, go to the **8.9** interface

for detailed analysis.

### 4.3.2 User's SIM Card

**4.3.2.1**. Replace the SIM Card

(Note: Please refer to **section11.1** for specific operations)

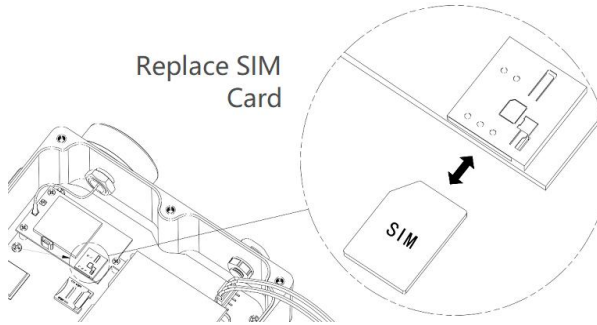



**Figure 12**

**4.3.2.2**. Tap on the cell marked with "User SIM Card"

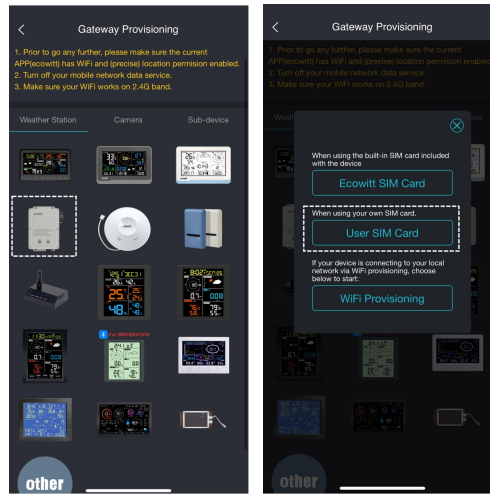



**Figure 13**

**4.3.2.3**. Fill out APN Settings and wait for the data to be uploaded.

**APN:** Access Point Name, used for data communication and can be edited. Correct APN settings are necessary for proper use if using a custom SIM card.

You can see the battery level on dashboard.

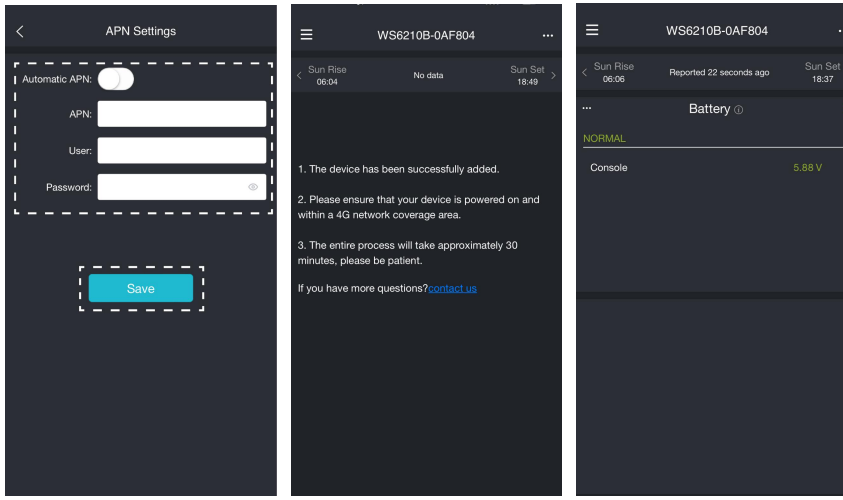



**Figure 14**

## 4.3.3 Wi-Fi Provisioning

**Note1:** Using Wi-Fi for data uploading consumes much power and requires the WS6210 console to be powered by connecting to a USB power socket instead of a solar panel.

**Note2**: Disabling your phone's mobile data service will help avoid many unknown problem during the registration of the gateway with your network router.（As shown in the figure below）


**Figure 15**

### 4.3.3.1. Turn on the WS6210's AP

Make sure WS6210 is unlocked. Holding the AP Button for 5 seconds will turn on WS6210's Wi-Fi AP for 5 minutes.


**Figure 16**

### 4.3.3.2. AP: access point.

The WS6210 has a built-in WiFi access point (SSID WS6210x-WIFInnnn) which can be used to access the device for configuration and data viewing (IP address 192.168.4.1).

It can also be used to connect the device to a local wireless network (WLAN) by providing the router login credentials (SSID, password) and via that to the internet. The connection to the local network once

established will also be maintained when the AP is switched off.

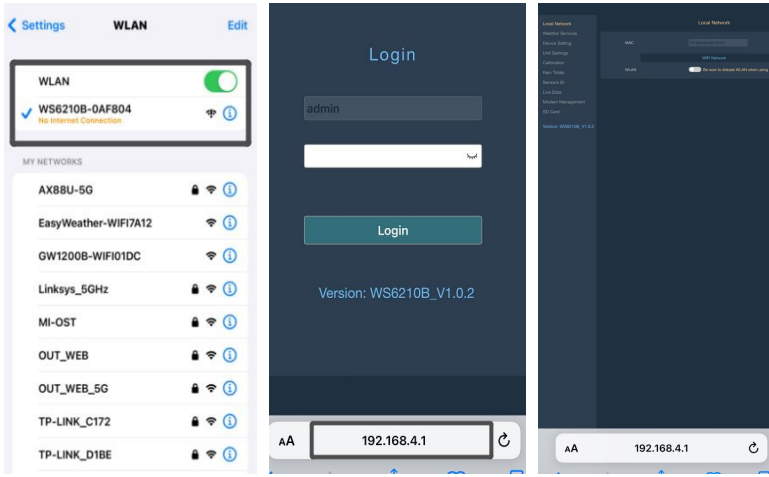



**Figure 17**

### 4.3.3.3.

Tap on “menu”-“devie”-“+add a new device”-choose the model of WS6210 from the Product listing.

Tap on the cell marked with “WIFI provisioning”.

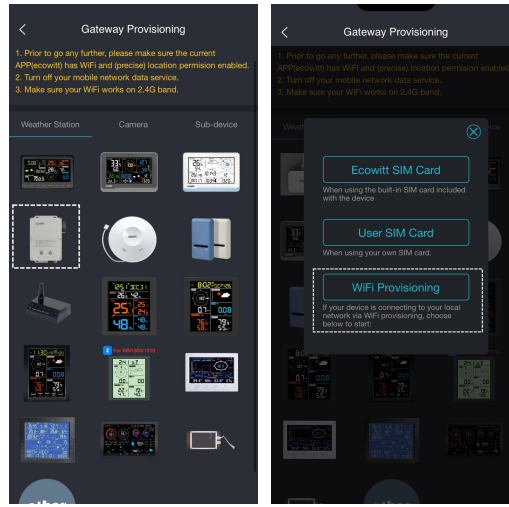



**Figure 18**

### 4.3.3.4. Connect to WS6210's AP

In the wireless network list of your device (PC, tablet, Smartphone) select the SSID of the WS6210 (WS6210x-WIFIxxxx). Keep the Wi-Fi connection even without an internet connection.

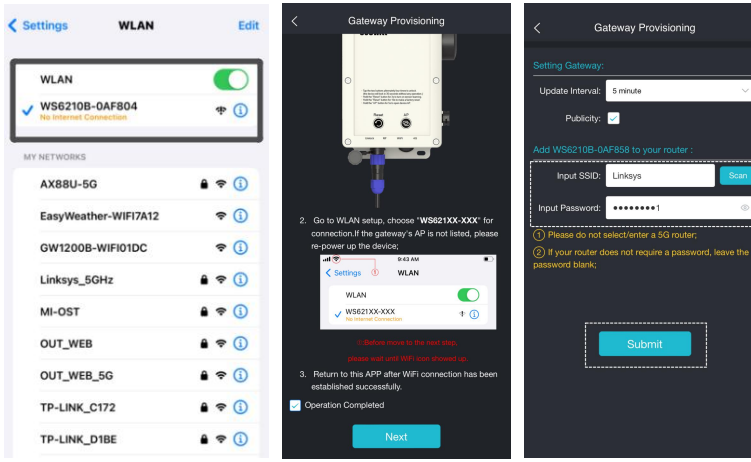



**Figure 19**

### 4.3.3.5. Switch the cellphone's WIFI to the same one as the WS6210.

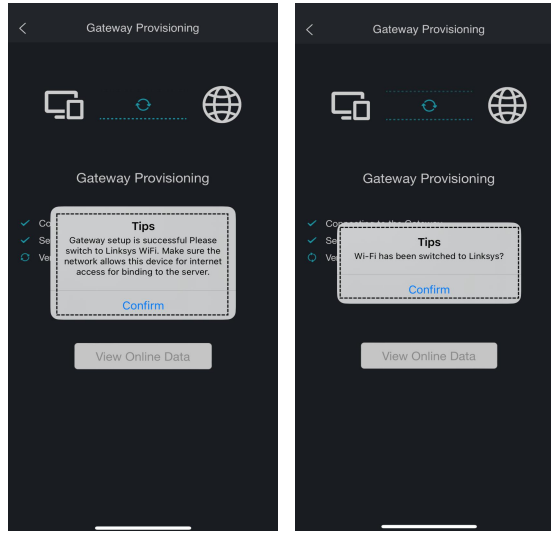


**Figure 20**

### 4.3.3.6. Wait for the data to be uploaded

You can see the battery level on dashboard.

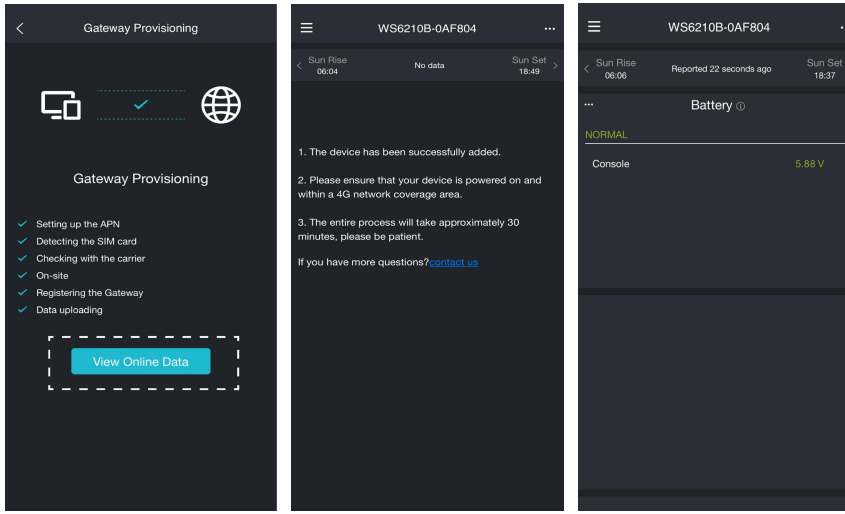
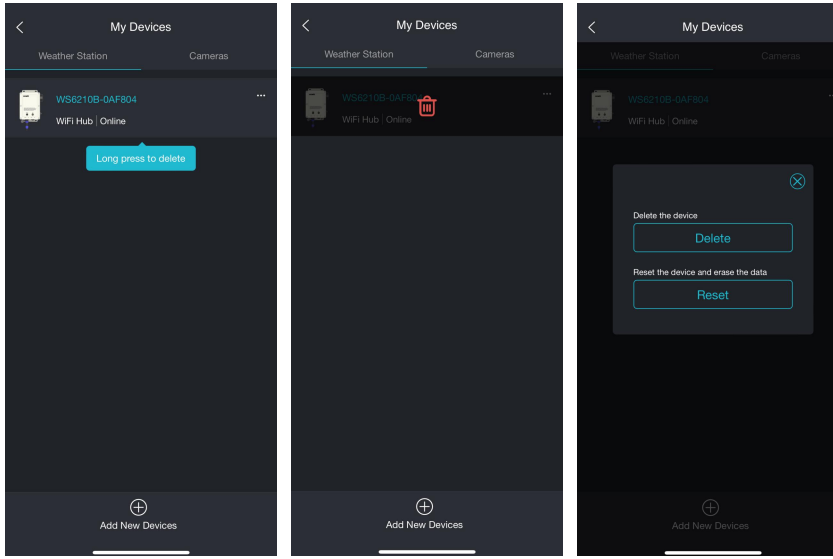



**Figure 21**

## 4.4 How to delete and reset WS6210

Long press the WS6210 till the delete icon appears, press it, then choose Delete or Reset.




# 5. General Setting and Checkup

After completing the Network configuration, you can set the device for its' device name, location, Time zone, DST (Daylight Saving Time), and Data public settings.

1. Device Type and MAC cell cannot be edited.
2. Tap on Menu and then click on "My Devices".
3. Click the "... with a red new" icon to open the editing page.

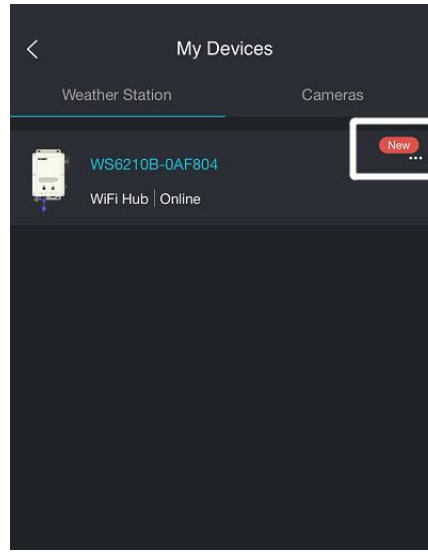



**Figure 22**

**Version**: The current firmware version is displayed here. If an update is available, a “yellow arrow” will appear next to the version number. Tap on the version button to start the upgrade.

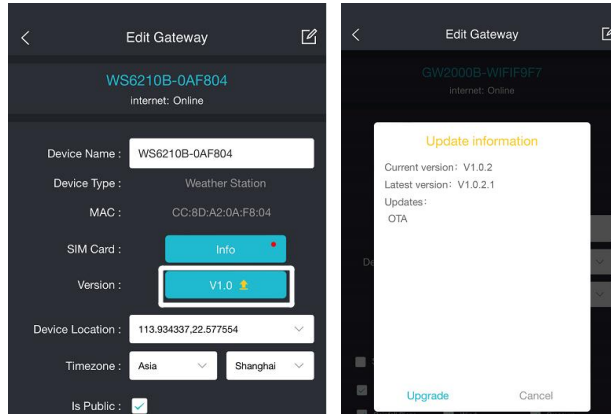



**Figure 23**

**Device Name**: You can edit your device name here if the default name needs to be changed.

**Device Location**: Your device’s weather map location is determined by

its coordinates. You can change its location by tapping the location cell to open the weather map. You can drag and drop your WS6210 gateway on the map; its coordinates will be updated automatically.

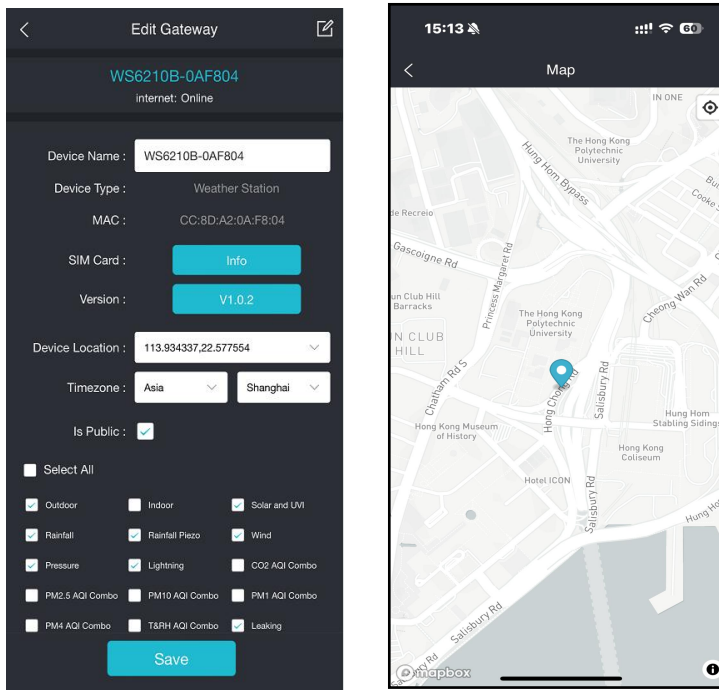



**Figure 24**

**Note 1**: After the above device setting is completed, return to the dashboard. If the network connection is successful, the dashboard will display as follows:


**Figure 25 Connection is Succeed**

**Note 2**: The above dashboard should appear immediately with a Wi-Fi connection, and a cellular connection will be activated within 60 minutes. If the device shows an offline status, please refer to **section 8.9** for more details.

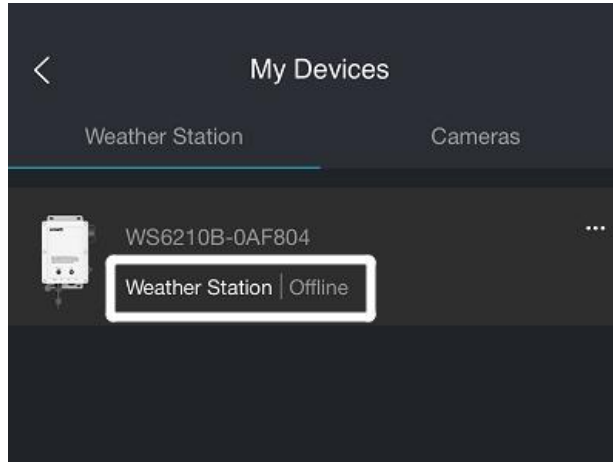



**Figure 26 Connection is failed**

# 6. Sensor start up

**1. Ensure the gateway is in sensor learning mode.**

Hold the Reset button for 3 seconds will turn on the receiver and will be in sensor learning mode. The RF LED will flash two times per second for 3 minutes until the learning process is completed.

**2. Power up the sensor.**

Power up your sensor array, and the Web-UI dashboard should be able to show up the sensor data on the dashboard immediately after registration .

If all data looks normal, you can temporarily store the gateway and sensor to ensure the system works. Then, refer to **section 7** and complete the installation in its permanent location.

For sensor mounting, you may refer to the specific sensor instruction manual.

# 7. Mounting

## 7.1 Solar Panel Size

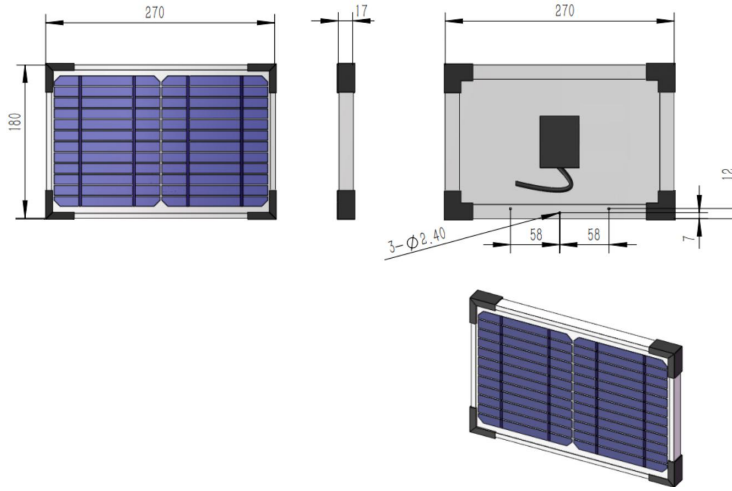



**Figure 27**

## 7.2 Mounting

Before installation, please ensure that the product has been set up correctly. You may skip this part until the setup is completed.

The accessory supports two range of pole widths. Prepare a support pole with a diameter of 1.8-2.75 inches (46mm-70mm) or 0.83-1.50 inches (21mm-38mm) in an open field with adequate lighting. Ensure the outdoor environment's 4G cell phone signal is sufficiently strong.

**Tip:** It is recommended to fully charge the device via USB cable before mounting.

**1. Mount the Solar Panel onto the pole**

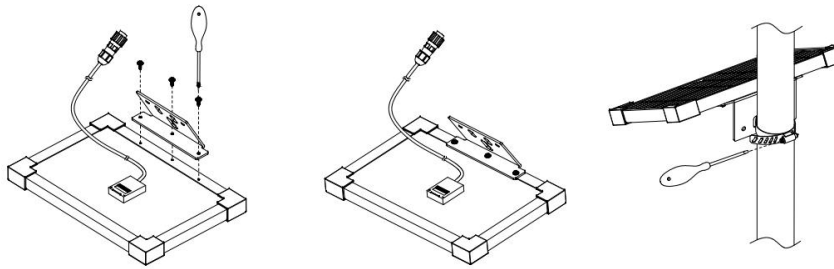


**Figure 28**

**2. Tighten the screws to secure the enclosure**

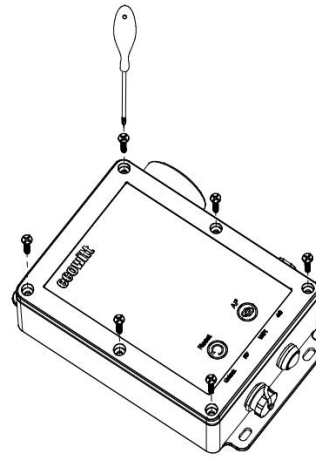


**Figure 29**

The enclosure is closed by default. If you need to replace the SD card or SIM card, you will need to open it. Otherwise, it should remain closed.

**3. Mount the WS6210 onto the pole**

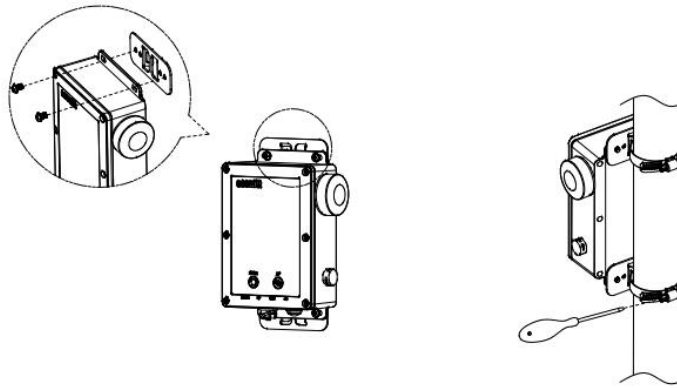


**Figure 30**

## 4. Mounting completed

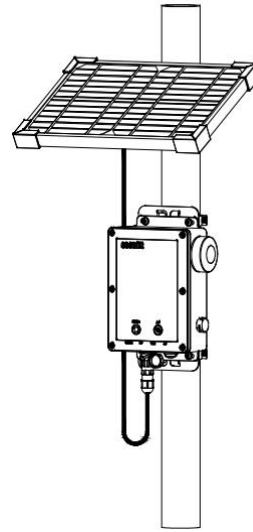


**Figure 31**

# 8. Web UI On WS6210

The Web UI is an essential tool for managing the device. You can use it to check the network connection status, set up weather services (WU, WOW, Weather Cloud, custom server), view live data, manage sensors, make calibrations, manage SD card files, and more.

How to Access the Web UI:

Make sure WS6210 is unlocked. Holding the AP Button for 5 seconds will turn on its Wi-Fi AP for 5 minutes. Connect to the WS6210's AP. Enter 192.168.4.1 in the browser. Log in with the default username and password, which are blank.

If your gateway is connected to a local network, the WebUI can also be reached via the IP address the gateway has received or has been configured:

http://IP-address-of-the-gateway (e.g. http://192.168.1.123)

Settings changes, such as registered Sensor IDs, are saved three minutes after power-up. However, changes made via the web interface are saved immediately and retained even if power is lost.

## 8.1 Local Network

This page supports viewing or setting：

(1) MAC address

(2) WLAN: WLAN is the function of the gateway's Wi-Fi connection router, which is disabled by default

**Note:** Make sure to deactivate the WLAN when the system is powered up by the solar panel.

(3) IP Address Mode: Receive Automatically (DHCP) or Static

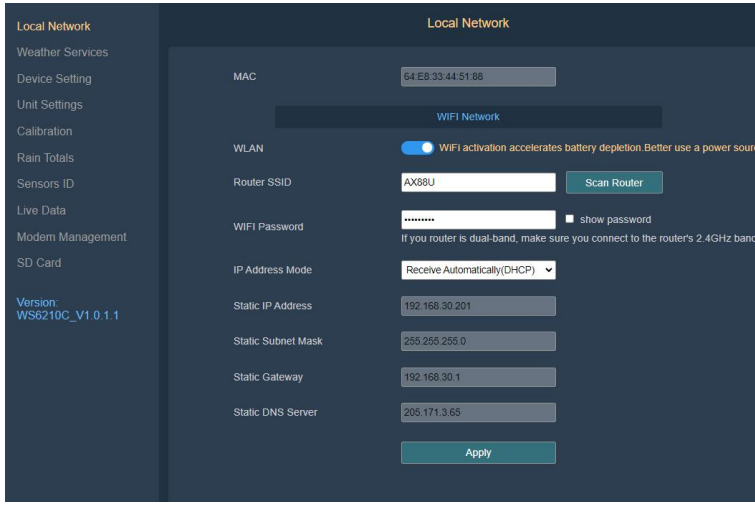



**Figure 32**

## 8.2 Weather Services

After the Network 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. one Customized server of your choice

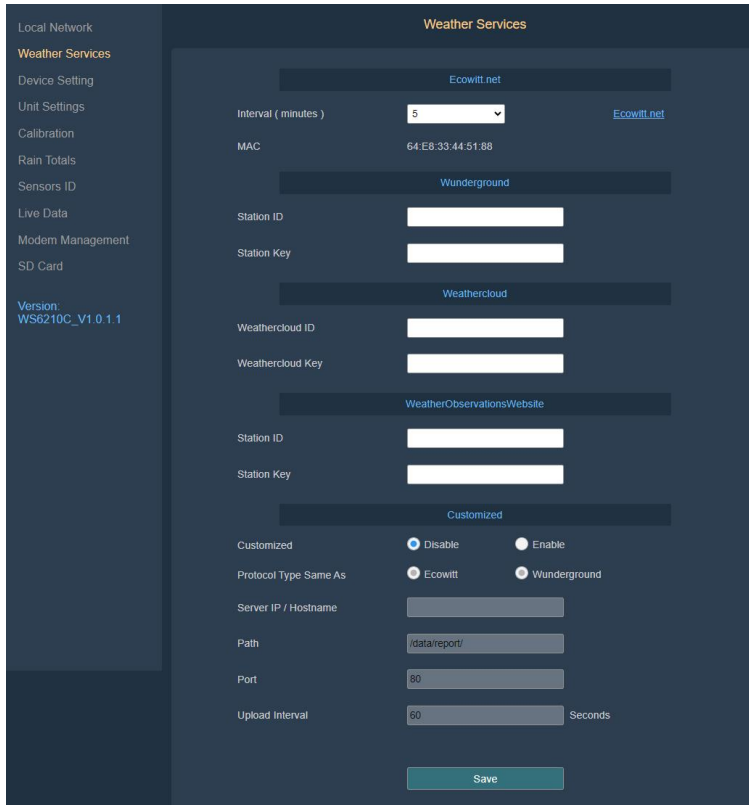



**Figure 33**

## 8.3 Device Setting

This page supports viewing or setting:

(1) Device sensor reception frequency (view only)

(2) Automatic Frequency Control (AFC): turn this option on when your location is busy on the sensor radio spectrum to improve signal reception.

(3) Temperature Compensation: Turn on this option to minimize sun light influence on outdoor temperature measurement if the outdoor temperature and humidity sensor installation site is not ideal. This option works with sensor arrays like WS69, WS80, WS90 and WS85.

(4) Auto Time zone: Your time zone setting on ecowitt.net will be applied here.

(5) Automatic firmware upgrade

(6) Device AP Auto OFF: Enabled by default, the AP automatically shuts down when no terminals are connected; disabling this option keeps the AP continuously running. If using the system only solar-powered, do not disable this setting.

(7) Login & AP Password

(8) Restore default: During factory Reset, all indicators will flash 3 times (ON: 500ms; OFF: 500ms), followed by an automatic restart upon completion.

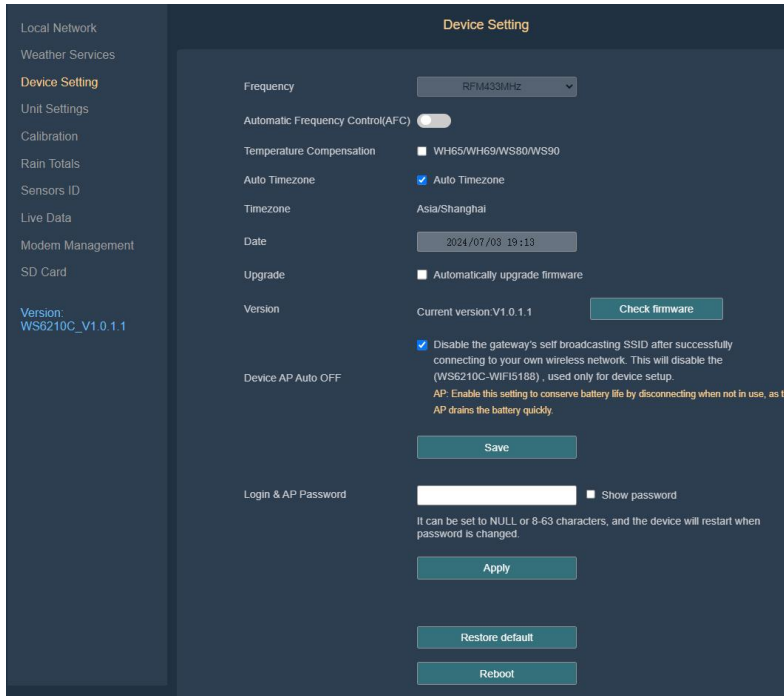



**Figure 34**

## 8.4 Unit Settings

Supports the following unit settings:

(1) Temperature: ℃,℉

(2) Pressure: hPa, inHg, mmHg

(3) Wind: m/s, km/h, mph, knots

**Note:** Lightning distance units are the same as wind speed units:

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

**Table 7**

(4) Rain: mm, in

(5) Solar Irradiance: Klux, W/㎡, Kfc

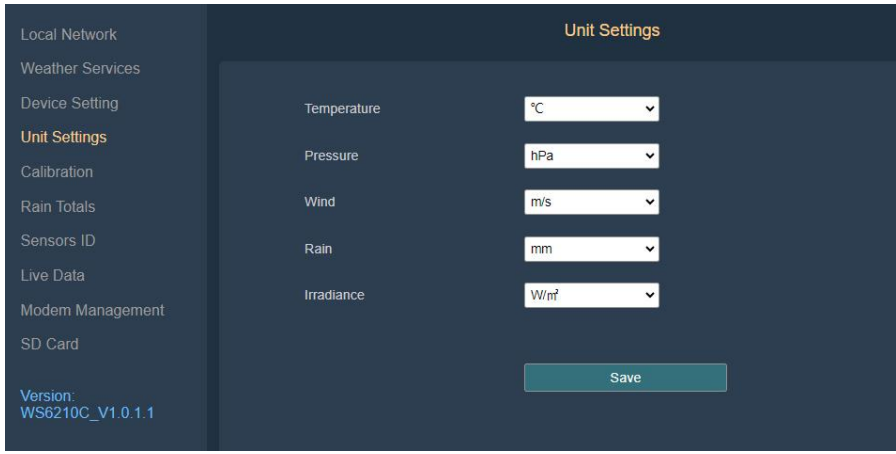



**Figure 35**

## 8.5 Calibration

This page supports the following data calibration:

(1) Solar Irradiance

(2) UV

(3) Wind Speed

(4) Indoor Temperature

(5) Indoor Humidity

(6) Absolute Pressure

(7) Relative Pressure

(8) Outdoor Temperature

(9) Outdoor Humidity

(10) Wind Direction

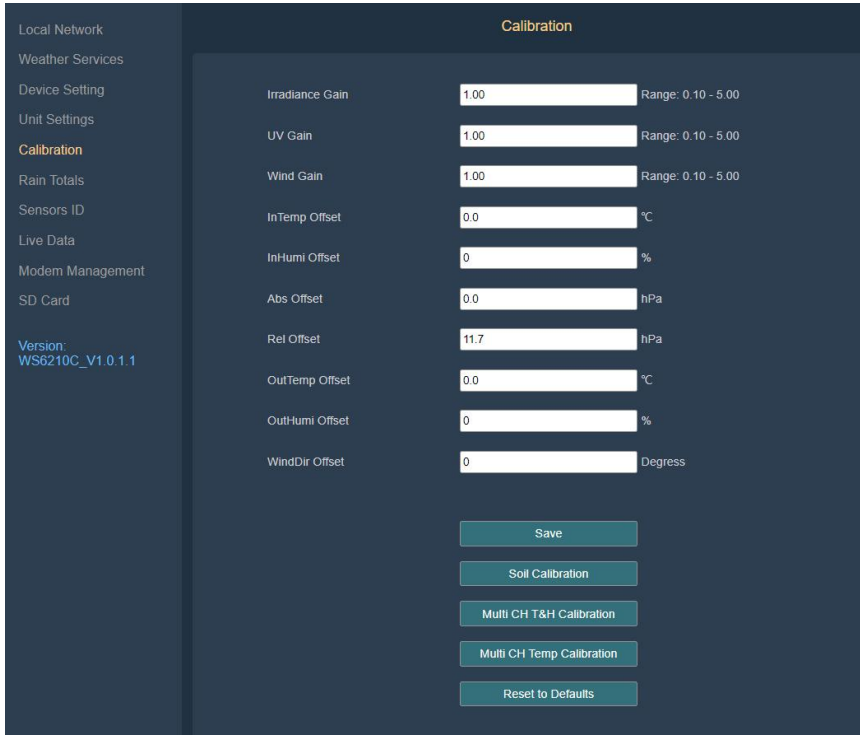



**Figure 36**

As well as:

(11) Soil Moisture

(12) Multi-Channel Temperature & Humidity

(13) Multi-Channel Temperature

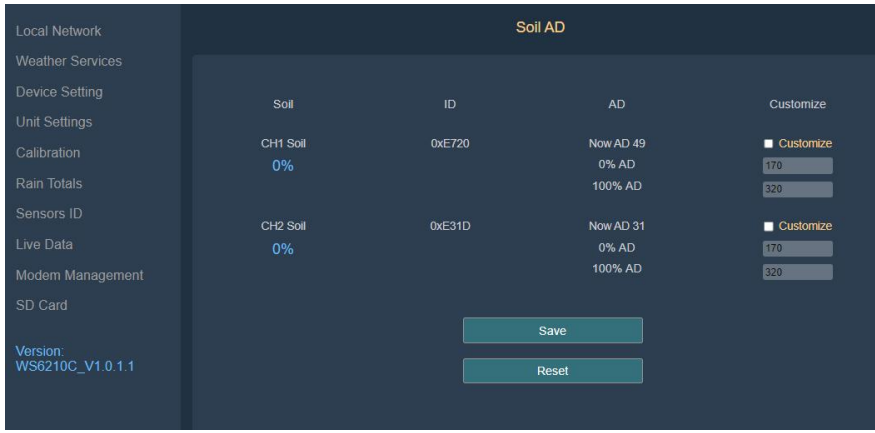



**Figure 37**

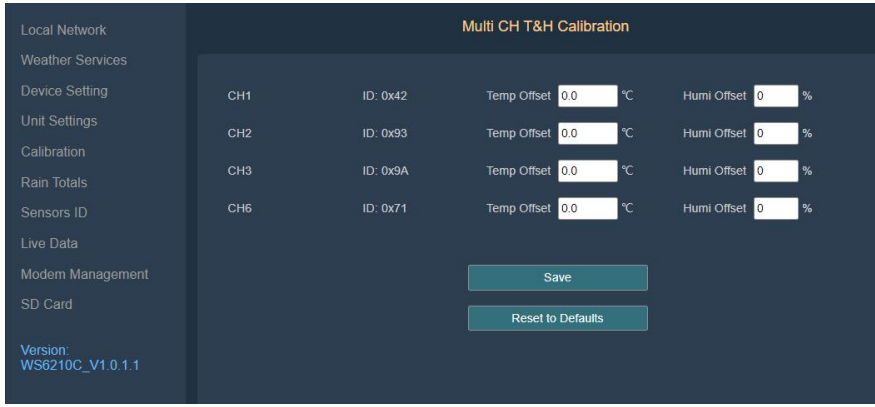



**Figure 38**


**Figure 39**

## 8.6 Rain Totals

This page supports settings such as:

(1) Choose traditional or piezoelectric rain gauge data to be uploaded to the WU server, as only one rain gauge data can be accepted when you have both our haptic rain gauge and tipping bucket type rain gauge.

(2) Rainfall calibration

(3) Rain reset time for **Daily Rain/Weekly Rain/Rainfall Season**

(4) For Piezo Rain1~5 Gain calibration

Piezoelectric rain gauge working principle: raindrops fall on the sensor's surface so that the monitoring panel produces small mechanical vibration, the vibration of the mechanical stress, and the sensor produces a voltage difference corresponding to the amount of rainfall.

In practice, the measurement of precipitation by piezoelectric rain gauges is influenced by environmental factors such as wind, terrain, and debris. In the case of large rainfall intensity, rainfall intensity

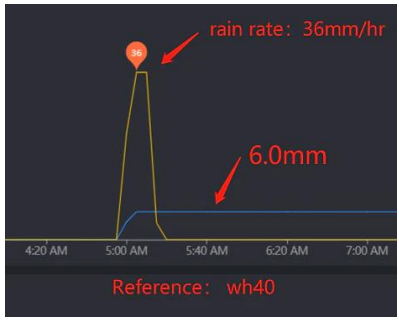
can be measured by the piezoelectric rain gauge, but the raindrops landing may have two impacts on the monitoring panel so that the measured rainfall value is larger; for minimal rainfall intensity, due to the vertical momentum is too small, so that the measured rainfall value is small. Therefore, it is necessary to calibrate the piezoelectric sensors for different rainfall intensities depending on the environment in which they are located.

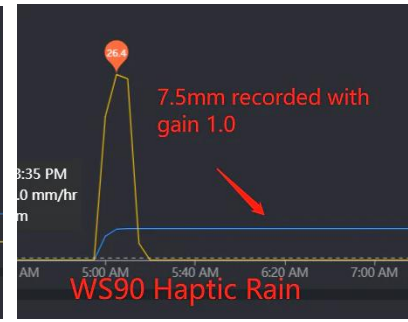
WS90 and WS85 are weather stations equipped with piezoelectric rain gauges. To make your rain data more accurate, you can calibrate the rain sensor accuracy by yourself:

1. A reference is needed to record the rainfall value, and it is also important to be able to record the rain rate. Our WH40 rain sensor can be used for this purpose.

2. You can set five rain gain parameters: Piezo Rain1: Rain5. We usually leave Rain1 as it is unless you can confirm it consistently produces the same result, and then you can adjust this.

3. Please ensure that you record rain data as follows: set rain4 gain to 6/7.5, which equals 0.8. For easier management, set rain2, rain3, and rain5 all to 0.8 for now. Only when different rain rates are recorded, divide the ws90 rain by 0.8 to get 1.0 rain, and then recalculate (reference/ws90/0.8) to precisely adjust the corresponding rain gain setting.



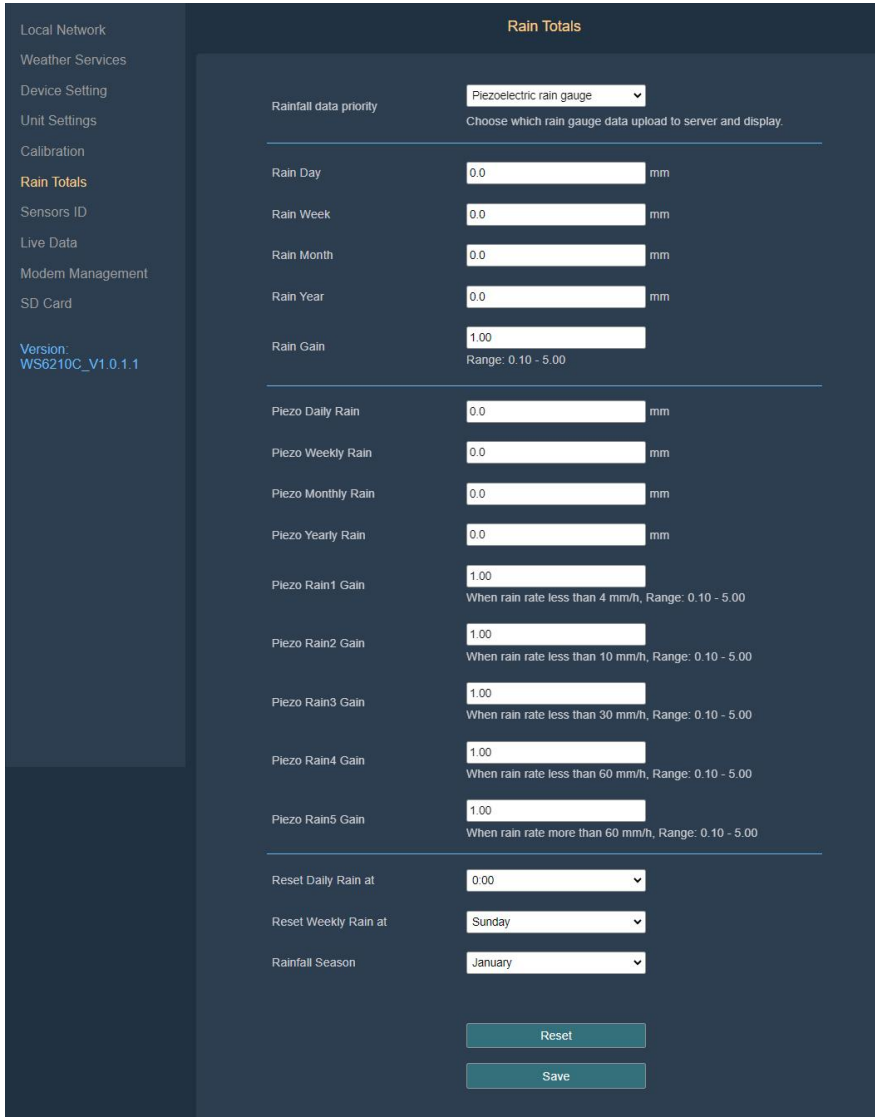

Local Network
Weather Services
Device Setting
Unit Settings
Calibration
Rain Totals
Sensors ID
Live Data
Modem Management
SD Card
Version:
WS6210C_V1.0.1.1
Rain Totals
Rainfall data priority
Piezoelectric rain gauge
Choose which rain gauge data upload to server and display.
Rain Day
0.0
mm
Rain Week
0.0
mm
Rain Month
0.0
mm
Rain Year
0.0
mm
Rain Gain
1.00
Range: 0.10 - 5.00
Piezo Daily Rain
0.0
mm
Piezo Weekly Rain
0.0
mm
Piezo Monthly Rain
0.0
mm
Piezo Yearly Rain
0.0
mm
Piezo Rain1 Gain
1.00
When rain rate less than 4 mm/h, Range: 0.10 - 5.00
Piezo Rain2 Gain
1.00
When rain rate less than 10 mm/h, Range: 0.10 - 5.00
Piezo Rain3 Gain
1.00
When rain rate less than 30 mm/h, Range: 0.10 - 5.00
Piezo Rain4 Gain
1.00
When rain rate less than 60 mm/h, Range: 0.10 - 5.00
Piezo Rain5 Gain
1.00
When rain rate more than 60 mm/h, Range: 0.10 - 5.00
Reset Daily Rain at
0:00
Reset Weekly Rain at
Sunday
Rainfall Season
January
Reset
Save

**Figure 40**

## 8.7 Sensors ID

(1) Supports viewing and registering sensor ID.

(2) Viewing battery status and signal quality.

(3) By entering the "Edit" sub-page of a particular sensor, you may register the sensor by entering the sensor ID so that this sensor can be mandatorily assigned. You can also choose to disable the sensor.

It is good practice to disable all sensor ID slots of sensors which you don't have or don't use with your console/gateway in order to avoid the reception of "ghost" sensors from other weather stations in your neighbourhood.

(4) By entering the "Re-register," the gateway will learn the sensor again to ensure its presence. If a new sensor is discovered, it will be displayed here with its sensor ID updated.

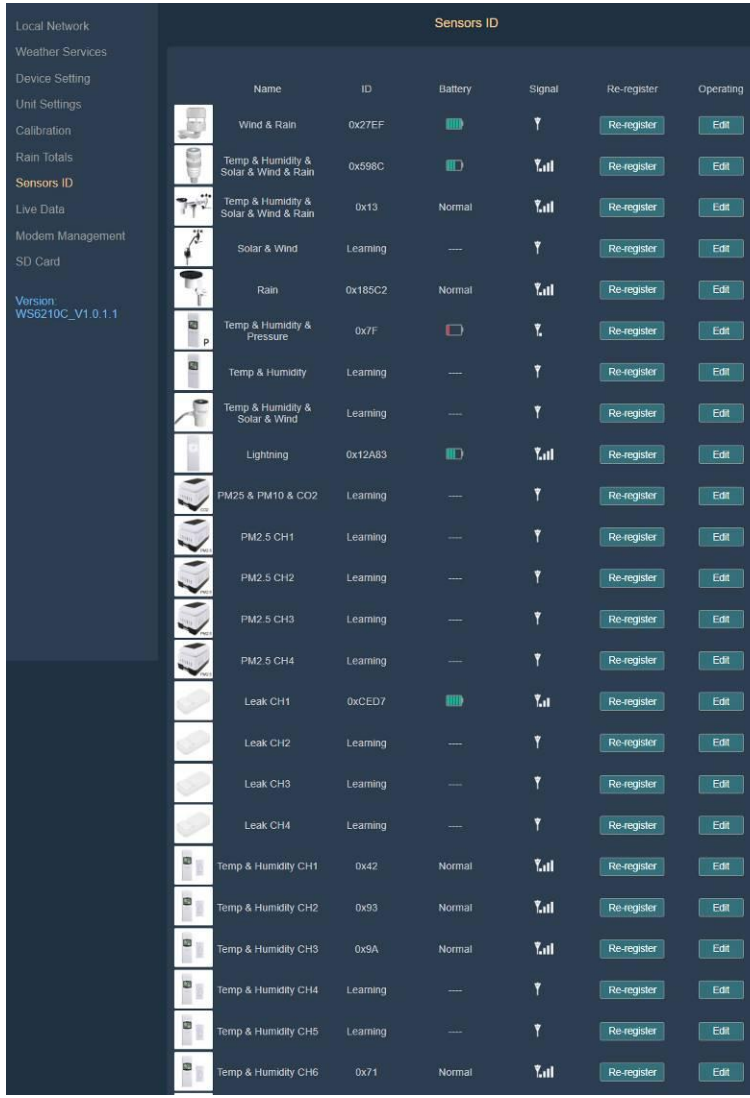

Local Network
Weather Services
Device Setting
Unit Settings
Calibration
Rain Totals
Sensors ID
Live Data
Modem Management
SD Card
Version:
WS6210C_V1.0.1.1
Sensors ID
Name
ID
Battery
Signal
Re-register
Operating
Wind & Rain
0x27EF
Re-register
Edit
Temp & Humidity & Solar & Wind & Rain
0x598C
Re-register
Edit
Temp & Humidity & Solar & Wind & Rain
0x13
Normal
Re-register
Edit
Solar & Wind
Learning
----
Re-register
Edit
Rain
0x185C2
Normal
Re-register
Edit
Temp & Humidity & Pressure
0x7F
Re-register
Edit
Temp & Humidity
Learning
----
Re-register
Edit
Temp & Humidity & Solar & Wind
Learning
----
Re-register
Edit
Lightning
0x12A83
Re-register
Edit
PM25 & PM10 & CO2
Learning
----
Re-register
Edit
PM2.5 CH1
Learning
----
Re-register
Edit
PM2.5 CH2
Learning
----
Re-register
Edit
PM2.5 CH3
Learning
----
Re-register
Edit
PM2.5 CH4
Learning
----
Re-register
Edit
Leak CH1
0xCED7
Re-register
Edit
Leak CH2
Learning
----
Re-register
Edit
Leak CH3
Learning
----
Re-register
Edit
Leak CH4
Learning
----
Re-register
Edit
Temp & Humidity CH1
0x42
Normal
Re-register
Edit
Temp & Humidity CH2
0x93
Normal
Re-register
Edit
Temp & Humidity CH3
0x9A
Normal
Re-register
Edit
Temp & Humidity CH4
Learning
----
Re-register
Edit
Temp & Humidity CH5
Learning
----
Re-register
Edit
Temp & Humidity CH6
0x71
Normal
Re-register
Edit

**Figure 41**


Temp & Humidity CH7 Learning ---- Re-register Edit
Temp & Humidity CH8 Learning ---- Re-register Edit
Soil moisture CH1 0xE720 Normal Re-register Edit
Soil moisture CH2 0xE31D Normal Re-register Edit
Soil moisture CH3 Learning ---- Re-register Edit
Soil moisture CH4 Learning ---- Re-register Edit
Soil moisture CH5 Learning ---- Re-register Edit
Soil moisture CH6 Learning ---- Re-register Edit
Soil moisture CH7 Learning ---- Re-register Edit
Soil moisture CH8 Learning ---- Re-register Edit
Temp CH1 0x2CBD Re-register Edit
Temp CH2 0x2CB5 Re-register Edit
Temp CH3 Learning ---- Re-register Edit
Temp CH4 Learning ---- Re-register Edit
Temp CH5 Learning ---- Re-register Edit
Temp CH6 Learning ---- Re-register Edit
Temp CH7 Learning ---- Re-register Edit
Temp CH8 Learning ---- Re-register Edit
Leaf Wetness CH1 0x3013 Re-register Edit
Leaf Wetness CH2 0x3031 Re-register Edit
Leaf Wetness CH3 Learning ---- Re-register Edit
Leaf Wetness CH4 Learning ---- Re-register Edit
Leaf Wetness CH5 Learning ---- Re-register Edit
Leaf Wetness CH6 Learning ---- Re-register Edit
Leaf Wetness CH7 Learning ---- Re-register Edit
Leaf Wetness CH8 Learning ---- Re-register Edit

**Figure 42**

## 8.8 Live Data

(1) Display connected sensor data.

(2) Show WS6210's battery voltage and solar charging power supply voltage.

(3) You can edit the sensor name by clicking the pencil icon. This name is only reflected on this device, it will not update your dashboard tile name at ecowitt.net.

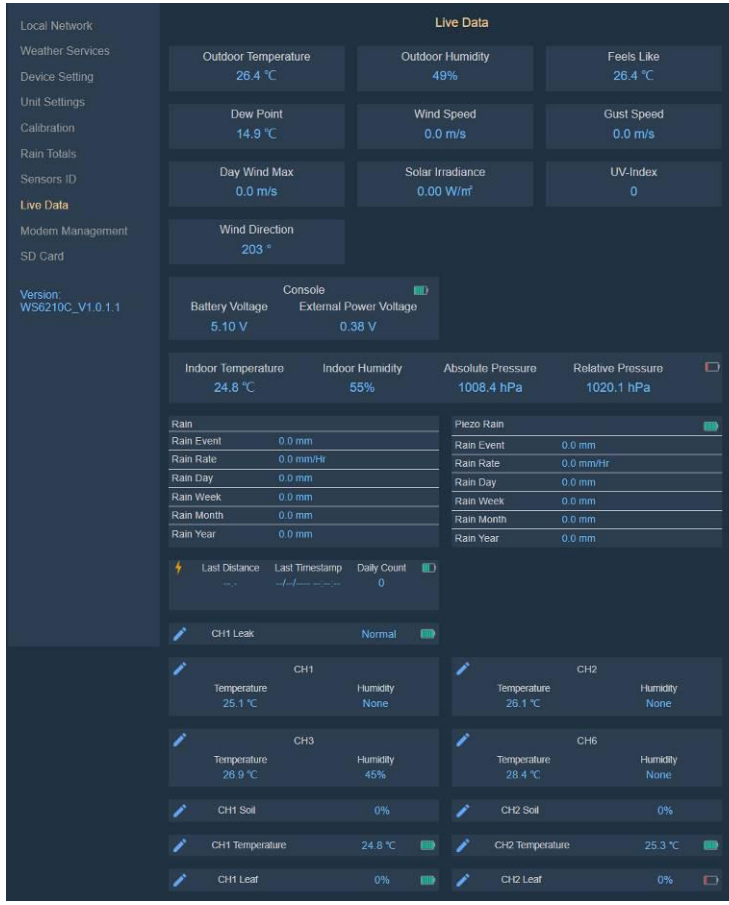



**Figure 43**

## 8.9 Modem Management

### **7.9.1** Management Page Description

(1) Display basic information of the Modem:

① **SIM Card:** Inserted or Not Inserted

② **RSSI:** Signal strength, used to measure signal quality

③ **IMSI:** International Mobile Subscriber Identity, used to identify a SIM card uniquely

④ **IMEI:** International Mobile Equipment Identity, used to identify a 4G module uniquely

⑤ **ICCID:** Integrated Circuit Card Identifier, a unique identifier for the SIM card

⑥ **IP address:** Currently assigned local area network IP address

⑦ **Registered Operator:** The operator with which the device is registered

⑧ **Network Standard:** Network protocol and frequency bands supported by the device

⑨ **APN:** Access Point Name, used for data communication and can be edited. Correct APN settings are necessary for proper use if using a custom SIM card

⑩ **Modem Model:** Model of the 4G module

⑪ **Modem Version:** Firmware version of the 4G module

(2) Support real-time display of Modem Log

(3) Support downloading Modem Log to local storage

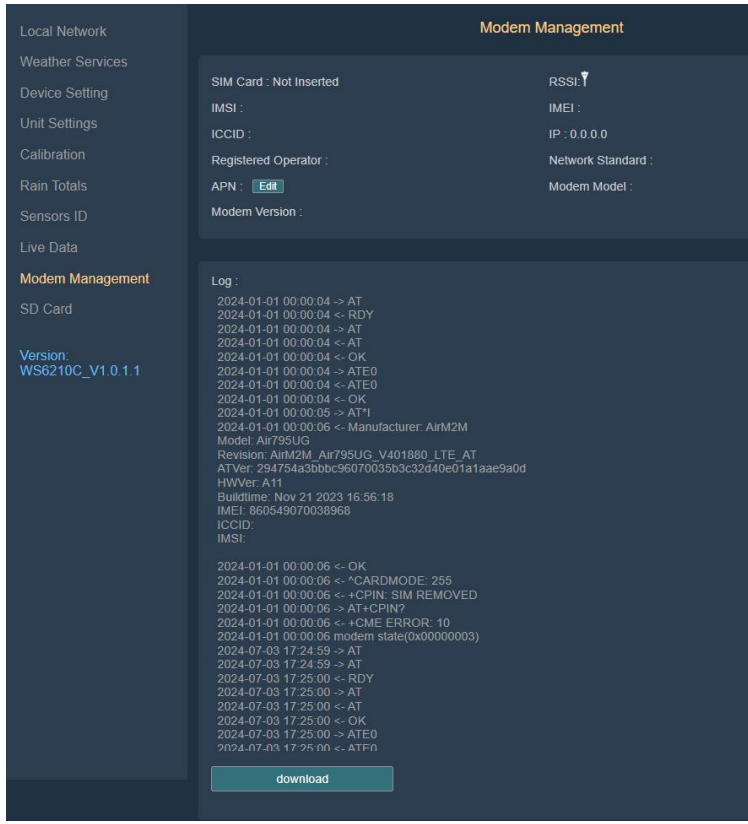



**Figure 44**

Check the top section to see if it was successful.

Click "Download" to download the SIM card data log.

The log file reveals the cellular network connection status in detail. It is useful when you need to investigate the connection in detail. Thus, downloading the log and sending it to customer support is quite useful when you seek help.

## 8.9.2 Troubleshooting Modem Issues

(1) Communication Issue with 4G Module

**Symptom**: On the Modem Management page of the WebUI, SIM Card status shows "Not Inserted" and the Log only displays "-> AT".

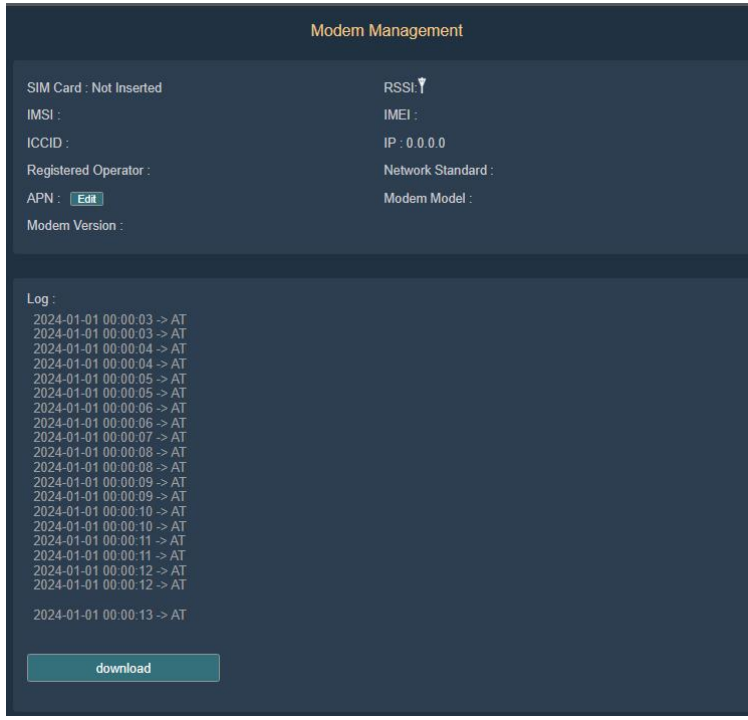



**Figure 45**

**Analysis**: Failure in communication between the main control and the module.

**Solution**: Try power cycling the device. If the issue persists, the 4G module may be damaged or there could be a circuitry issue, requiring replacement of the 4G module board.

(2) SIM Card Not Detected

**Symptom**: On the Modem Management page of the WEB UI, SIM Card status shows "Not Inserted" and the Log shows "-> AT+CPIN?" followed by "<- +CME ERROR: 10".

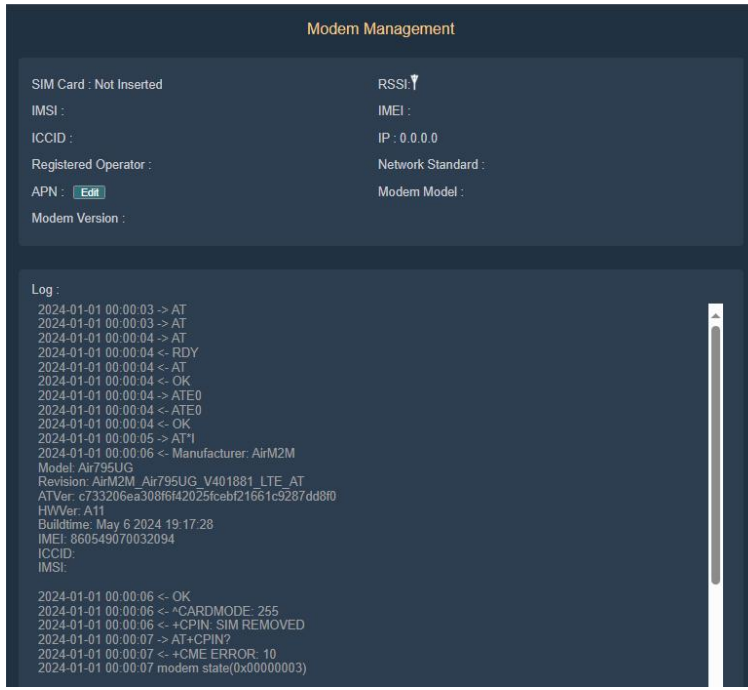



**Figure 46**

**Analysis**: Possible reasons include SIM card not inserted properly, loose SIM card, damaged SIM card, or faulty 4G module board.

**Solution**: Verify SIM card readiness, replace SIM card if necessary, or replace the 4G module board.

(3) Poor Network Signal Strength

**Symptom**: On the Modem Management page of the WEB UI, SIM Card status shows "Inserted" and the Log repeatedly shows "-> AT+CSQ" followed by "<- +CSQ: 99,99".

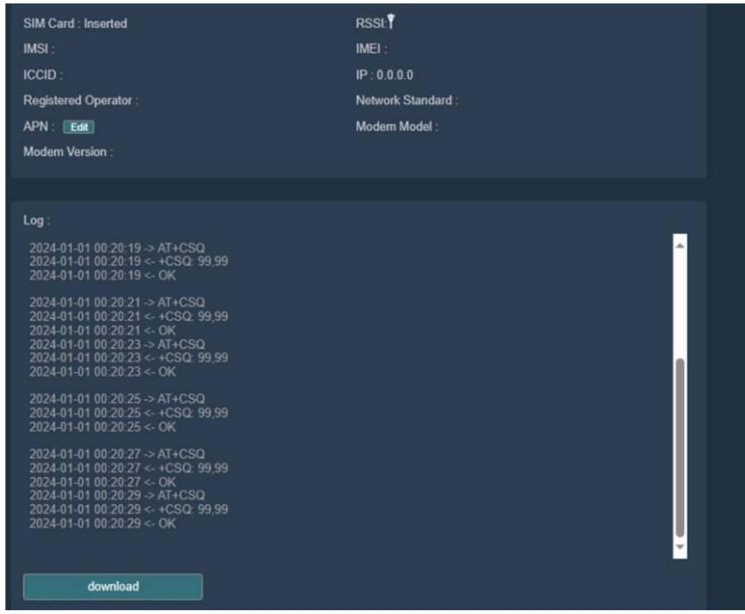



**Figure 47**

**Analysis**: Repeated occurrences of "-> AT+CSQ" and "<- +CSQ: 99,99" indicate poor network signal quality.

**Solution**: Check the antenna connection and verify SIM card quality.

(4) SIM Card Attach to Network Failure

**Symptom**: On the Modem Management page of the WEB UI, SIM Card status shows "Inserted" and the Log shows multiple occurrences of "<- +CREG: 0,5", "<- +CREG: 0,1", and "<- +CGATT: 0".

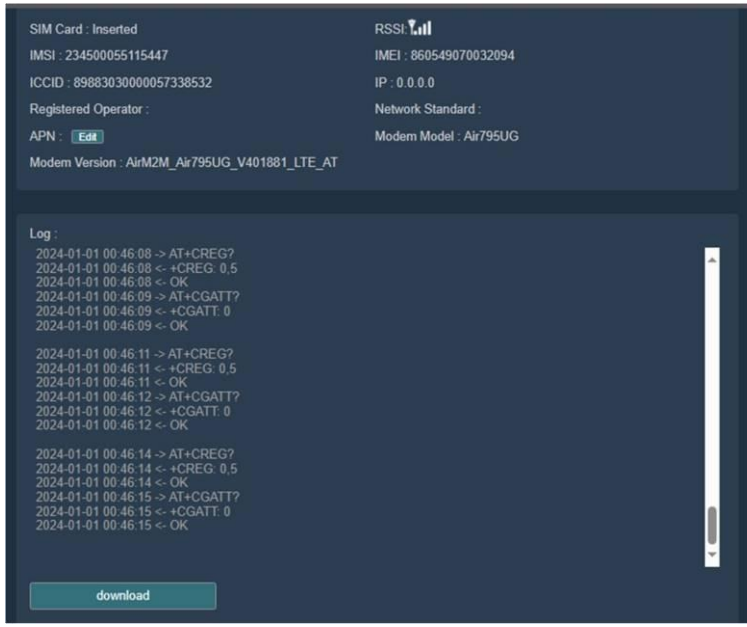



**Figure 48**

**Analysis**: "<- +CREG: 0,5" and "<- +CREG: 0,1" indicate successful registration, while "<- +CGATT: 0" indicates failure to attach to the network. This could be due to SIM card being tied to a specific IMEI or running out of data.

**Solution**: Check SIM card status (payment, validity) or replace SIM card if necessary.

(5) SIM Card Internet Connection Issue

**Symptom**: On the Modem Management page of the WebUI, SIM Card status shows "Inserted" and the 4G module obtains an IP address, but the Log displays "<- +CDNSGIP: 0,8".

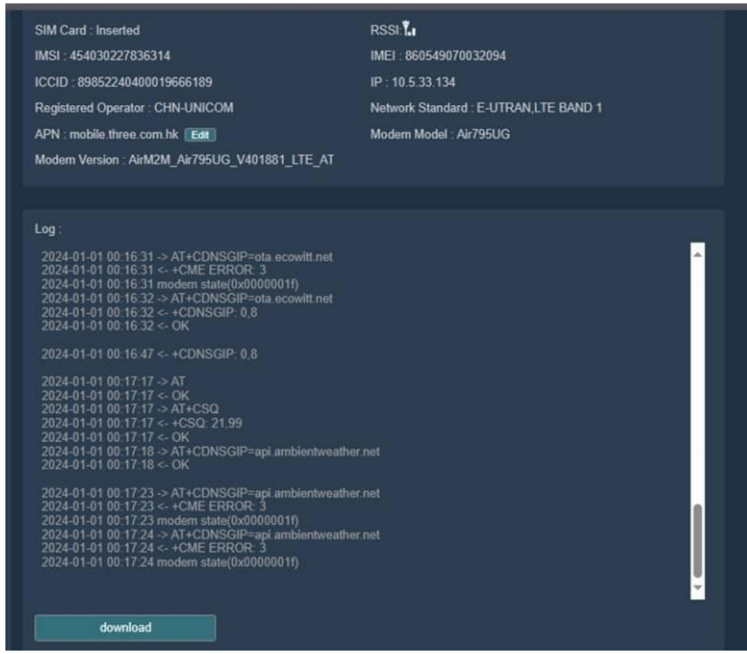



**Figure 49**

**Analysis**: Indicates a problem with the SIM card.

**Solution**: Check SIM card status (payment, validity) or replace SIM card if necessary.

## 8.10 SD Card Management

(1) **SD card file system format**: Only FAT32 is supported. For cards larger than 32GB, use the Rufus tool to format the SD card to FAT32. Download the tool from https://rufus.ie/en/.

**Tip:** When replacing with a higher-capacity card, please be mindful of the memory card's maximum read/write cycles and lifespan.

(2) **Real-time status display and hot-swap support**: The system monitors the SD card's status in real-time and allows for its insertion or removal without restarting the device.

(3) **SD card information display**: The interface shows detailed SD card information, including storage capacity and read/write frequency.

(4) **Multi-level directory management**: The system adopts a multi-level directory structure for easy file categorization and management by users.

(5) **Sensor data storage**: Data collected by sensors is saved in .csv format in the root directory of the SD card, facilitating direct access and analysis of data.

(6) **Log file management**: The system generates new log files daily, saved in .txt format. All log files are automatically categorized and stored in respective folders by month, facilitating retrieval and management of historical data.

(7) **File filtering mechanism**: The system automatically filters out non-gateway-generated files, ensuring storage space is allocated for important data and avoiding unnecessary data redundancy.

(8) **File operations support**: Users can download and delete individual files, providing flexible file management capabilities.

(9) **Customizable save intervals**: The system allows users to adjust save intervals for data and log files according to specific recording needs.

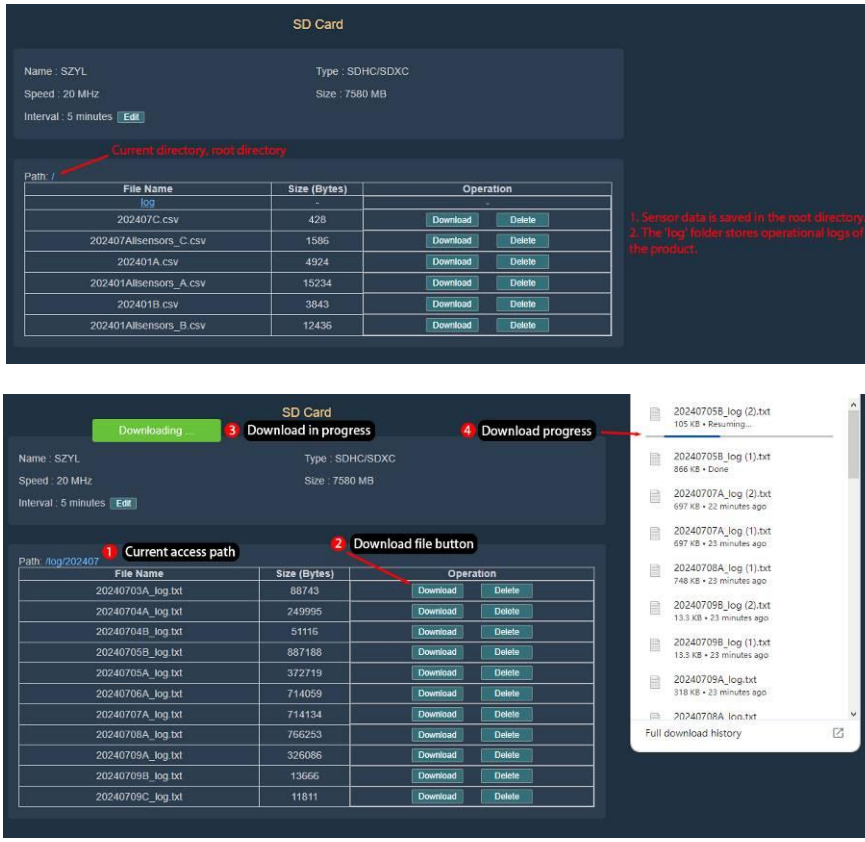

SD Card
Name : SZYL
Type : SDHC/SDXC
Speed : 20 MHz
Size : 7580 MB
Interval : 5 minutes
Edit
Current directory, root directory
Path: /
File Name
Size (Bytes)
Operation
log
202407C.csv
428
202407Allsensors_C.csv
1586
202401A.csv
4924
202401Allsensors_A.csv
15234
202401B.csv
3843
202401Allsensors_B.csv
12436
Download
Delete
1. Sensor data is saved in the root directory.
2. The 'log' folder stores operational logs of the product.
SD Card
Downloading...
3 Download in progress
4 Download progress
Name : SZYL
Type : SDHC/SDXC
Speed : 20 MHz
Size : 7580 MB
Interval : 5 minutes
Edit
1 Current access path
2 Download file button
Path: /log/202407
File Name
Size (Bytes)
Operation
20240703A_log.txt
88743
20240704A_log.txt
249995
20240704B_log.txt
51116
20240705B_log.txt
887188
20240705A_log.txt
372719
20240706A_log.txt
714059
20240707A_log.txt
714134
20240708A_log.txt
766253
20240709A_log.txt
326086
20240709B_log.txt
13666
20240709C_log.txt
11811
Download
Delete
20240705B_log (2).txt
105 KB • Resuming...
20240705B_log (1).txt
866 KB • Done
20240707A_log (2).txt
697 KB • 22 minutes ago
20240707A_log (1).txt
697 KB • 23 minutes ago
20240708A_log (1).txt
748 KB • 23 minutes ago
20240709B_log (2).txt
13.3 KB • 23 minutes ago
20240709B_log (1).txt
13.3 KB • 23 minutes ago
20240709A_log.txt
318 KB • 23 minutes ago
Full download history

**Figure 50**

## 8.11 Firmware updates

Firmware Automatic Upgrade: If automatic firmware update is enabled on the web interface and new firmware is detected, the product will enter OTA (over the air, here: WiFi or 4G) mode and automatically restart upon completion. (Automatic update check interval is 24 hours)

Manual Upgrade: Access the local web page (either via the gateway AP 192.168.1.4 or via the local network http://IP-address-of-the-gateway, navigate to the device settings page, click on 'Check Version,' and if a new version is found, click “Upgrade Version.”

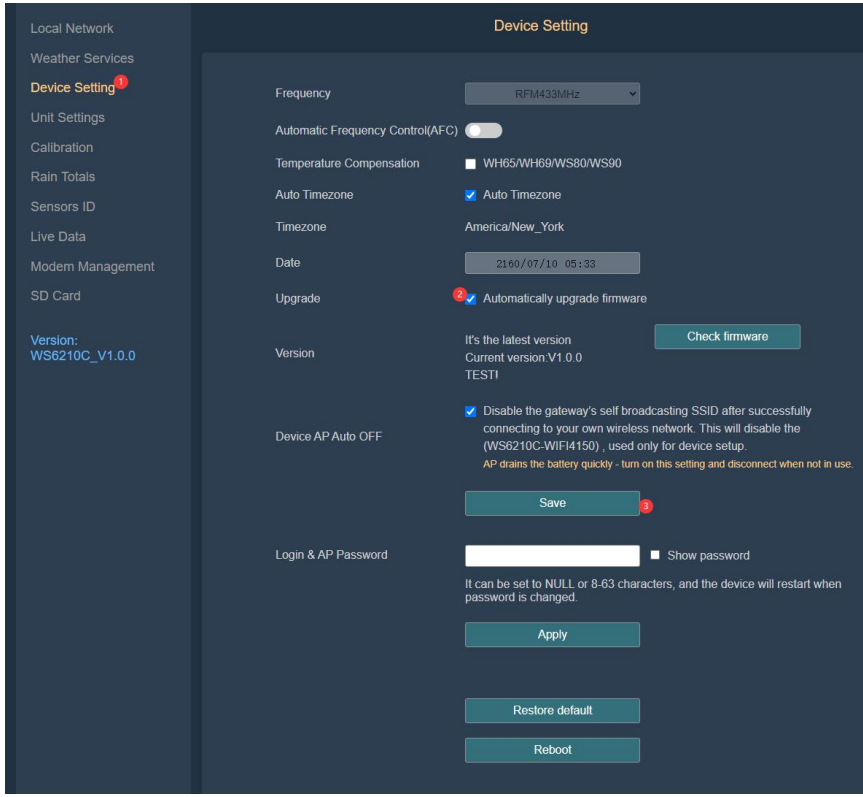



**Figure 51**

## 9. Product Features

- Networking: Supports Wi-Fi and 4G, prioritizing Wi-Fi for data upload to the weather station server if available.
- Sensor Support: Receives data from almost all ecowitt sensors, viewable via a web interface and Ecowitt app.
- Web Functions: Supports web configuration, sensor data viewing, server settings, calibration parameters, and Sensor ID settings.
- IoT Functionality: Compatible with IoT devices: WFC01 and AC1100.
- Automation: Automatic time zone and network time acquisition, unit settings.
- Models for 433MHz, 868MHz, 915MHz (and 920.9MHz) available.
- Integrated SD card data management: no extra APP or tools needed.

## 10. Specifications

| **Model** | **WS6210** |
|---|---|
| Name | 4G & Wi-Fi Weather Station Receiver Mobile Gateway |
| Dimensions | 187*138*55(mm) L*W*H |
| Weight | 694.5g (8 batteries involved)<br>457g (WS6210 only) |
| Material of Plastic Casing | PC |
| Sim card | Nano-SIM |

| | |
|---|---|
| SD card | 8G Micro SD |
| Cellular and Wireless | Support LTE 3GPP Rel.13 technology, support 4G network |
| Supported Brand | 4G LTE-FDD B1/B2/B3/B4/B5/B7/B8/B12/B13/B17/B18/B19/B20/B25/B26/B28/B66<br>4G LTE-TDD B34/B38/B39/B40/B41<br>2G GSM 850/900/1800/1900 |
| 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 Wireless Range | Over 30 meters (in open areas) |
| Power Supply | 12V solar panel<br>(or DC power supply with USB connector, input 5-15V, not included) |
| Indicator Light | Unlock, RF, Wi-Fi, 4G |
| Button | Touch button: Reset, AP<br>Physical button: Power |
| Operating Temperature | -20 to 60℃ (-4 to 140°F) |
| Port Material | 2-core waterproof aviation connector |
| Battery Capacity | 4800 mAh @5V |

| | |
|---|---|
| Battery Life | 20 days (5-minute upload interval, AP off, not connected to IoT Sub device)<br>10 days (5-minute upload interval, AP off, connected to IoT Sub device) |
| Power Consumption | 0.06W, 10mA (AP off, not connected to IoT)<br>0.12W, 20mA (AP off, connected to IoT)<br>0.9W, 150mA (AP on, connected to Wi-Fi, not connected to IoT)<br>0.96W, 160mA (AP on, connected to Wi-Fi, connected to IoT)<br>0.8W, 133mA(AP off, connected to WiFi, not connected to loT)<br>0.85W, 142mA（AP off, connected to WiFi, connected to loT)<br>While in a 5-minute upload interval |
| USB charging | 5V, 1A |
| Solar Panel charging power | 7W |
| Solar Panel Size | 270*180*17(mm)L*W*H |
| Posting intervals | By default: 5 minutes<br>The setting range is "off, 1, 2, 3, 4, 5, 10 minutes."<br>Shortening the posting interval will increase power consumption |

**Table 8**

# 11. Miscellaneous

## 11.1 Replacing the SD/SIM Card

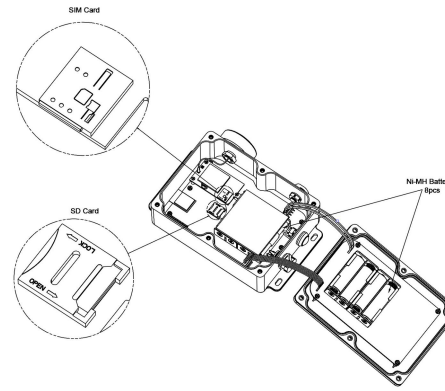
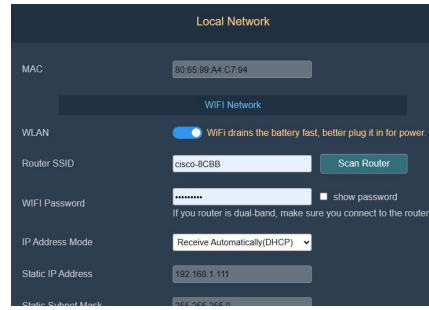
| | |
|---|---|
| **1. Locate the SD/SIM Card Slot**<br>Open the device casing with a Phillips screwdriver as per the manual's instructions |  |
| **2. Access the SD/SIM Card Slot** | Press down on the cover and pry it open gently, using a fingernail or a similar tool. |
| **3. Install the SD/SIM Card** | Insert the SD/SIM card into the slot with the metal contacts facing down. Ensure it aligns correctly. |
| **4. Close the SD/SIM Card Slot Cover** | Push the cover back in place gently. Ensure it closes tightly; if not, recheck the card's placement. |
| **5. Verify Proper Installation** | Check if the SD/SIM card is functioning properly after installation. |
| **6. Secure the Device Casing** | Reattach the device casing securely. |
| **7.Enter the correct APN.** | To configure a new SIM card, please refer to Section **8.9** for instructions. |

**Table 9**

## 11.2 Manually Adding

For users who have already set up the network, follow these steps to manually add the WS6210 device.

| Instructions | Illustration |
| --- | --- |
| 1.Obtaining MAC Address<br>***The MAC address can be found on the label of the device or via Embedded Web Page.** |  <br>**label of the device**<br>  <br>**Embedded Web Page** |

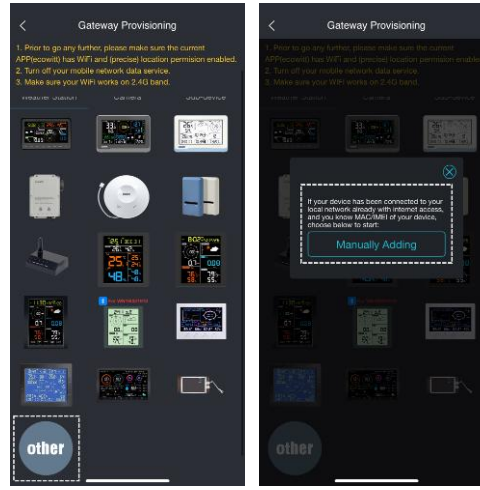
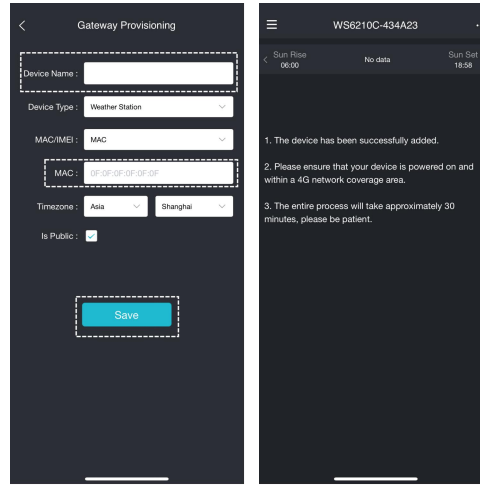
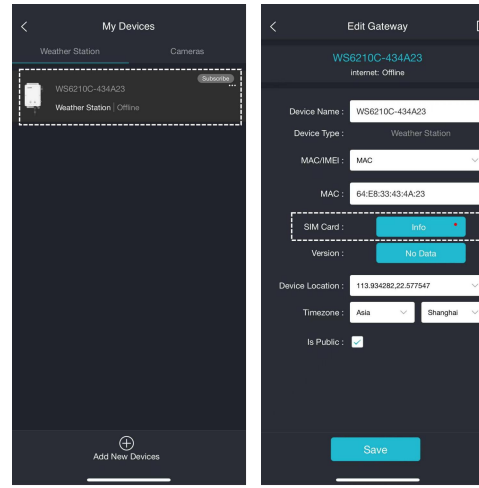
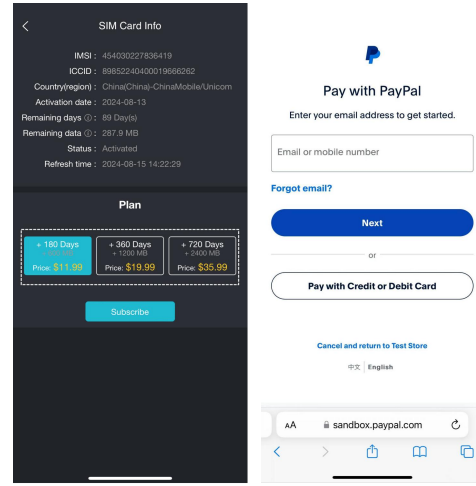
| | |
|---|---|
| 2.Click on Other, and choose Manually Adding. |  |
| 3.Manually Enter the MAC Address. Then wait approximately 30-60 minutes for the data to upload when in 4G mode . |  |

**Table 10**

## 11.3 SIM Card Renewal

| Instructions | Illustration |
| --- | --- |
| 1.When the SIM card is about to expire, the interface will display a "subscribe" icon. Click on the “...”. |  |
| 2.Select the appropriate plan and click "subscribe." |  |

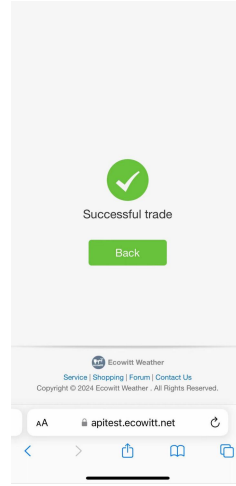
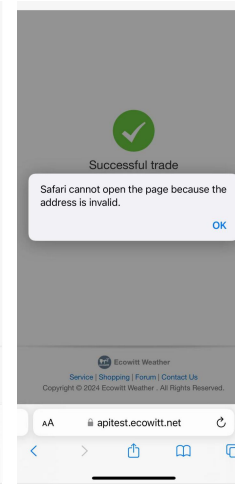
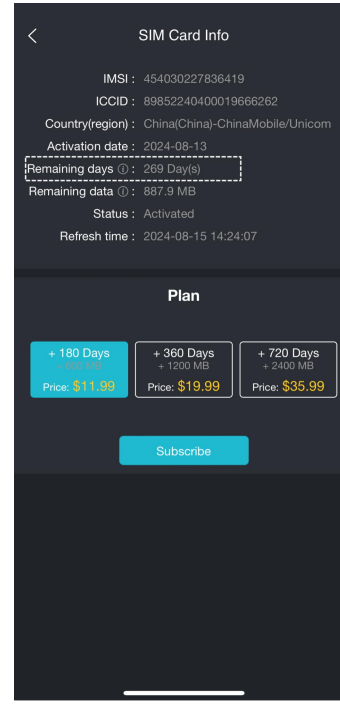
| | |
|---|---|
| 3.After successful payment, click "back." Please note that on ios, you cannot directly return to the Ecowitt app. |   |
| 4.Once the renewal is successful, check if the validity period has been updated. |  |

**Table 11**

# 12. Optional Sensors

The product supports receiving data from various sensors, which can be used with the Ecowitt server for enhanced data services. The RF reception function will always be turned on to receive data from all registered sensors anytime.

## 12.1 Sensor Data Reception Priority

Please note that data processing is prioritized when there is more than one sensor array or a rainfall sensor for outdoor temperature, wind, rain and solar data where applicable registered in the gateway (sensor hierarchy).

Sensor Array Priority:WS85>WS90>WS80>WS68>WS69.

Piezo rainfall priority: WS85>WS90

Traditional rainfall Priority: WH40>WS69.

## 12.2 Sensors

The following sensors can be purchased separately. For more information, please visit our website: http://www.ecowitt.com. 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).

Notes:

(1) The max QTY in the following table indicates the maximum number of the same sensor model or type that can be connected to the WS6210.

(2) Theoretically all the different sensor arrays (WS68, 69, 80, 85, 90) could be connected to one gateway at the same time, but due to the sensor hierarchy (see above) this would only make sense in a few special cases (e.g. WS85 + WS68 (get solar data from WS68). WS85 or WS90 + WS69 (get traditional rain data from the WS69).

| Sensor Model | Max QTY | Picture | Functions |
|---|---|---|---|
| WS90 | 1 |  | Outdoor temperature & humidity, light, UV, wind speed/direction, rainfall |
| WS85 | 1 |  | 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 |
| 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: $CO_2$, PM2.5, PM10, temperature and humidity<br>WH46: $CO_2$, PM1.0, PM2.5, PM4.0, PM10, temperature and humidity |

| | | | |
|---|---|---|---|
| WN31 | 8* |  | Temperature and humidity |
| WN30 | |  | Temperature |
| WN36 | |  | Pool temperature |
| WH57 | 1 |  | Lightning detection |
| WH41/WH43 | 4 |  | PM2.5 |
| WH55 | 4 |  | Water leak detection |
| WH51L | 16* |  | Soil moisture |
| WH51 | |  | Soil moisture |
| WN34L/S/D | 8 |  | Temperature |
| WN35 | 8 |  | Leaf wetness |

**Table 12 Optional sensors**

*—Refers to the maximum number of sensors in this group. Any combin ation that sums up to the number mentioned is possible.

## 12.3 IoT Device

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

**Table 13 IoT device**

*—See Above

# 13. 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 1-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.

**Manufacturer: Shenzhen Fine Offset Electronics Co., Ltd.**
**Address: 4/F, Block C, JiuJiu Industrial City, Shajing Town, Baoan District, Shenzhen City, China**

# 14. FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference (1) this device may 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 into an outlet on a circuit different

from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

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

**IC Caution:**

English:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-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.

## 15. Care and Maintenance

When batteries of different brand or type are used together, or new and old batteries are used together, some batteries may be over-discharged due to a difference of 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 product 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

# 16. Contact Us

## 16.1 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.

## 16.2 Stay in Touch

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