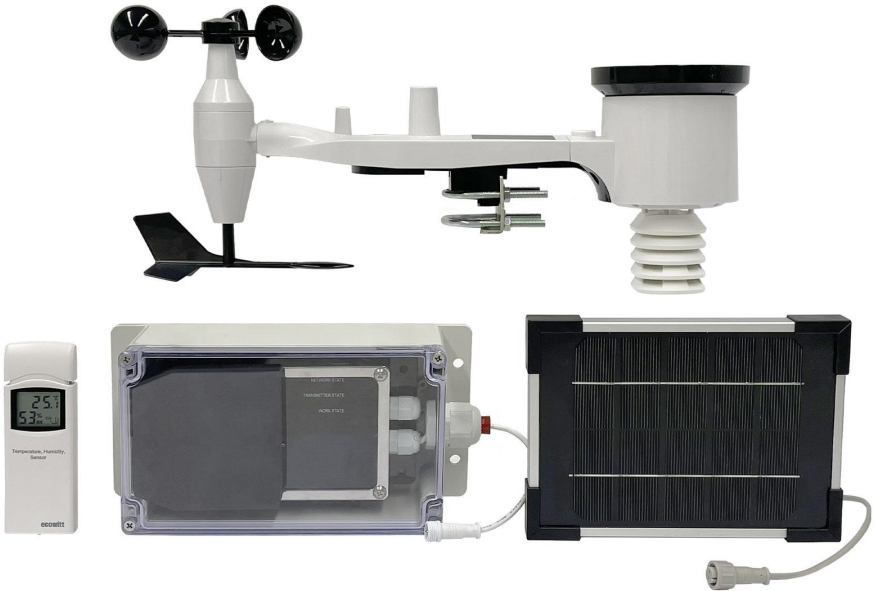


ecowitt[®]



Professional 4G Cellular Weather Station

Model: WS6006



<https://s.ecowitt.com/DCKHRG>

Table of Contents

1. Introduction	5
2. Package	7
3. Construction & Layout	9
3.1 Multiple Views and Size	9
3.1.1 WS6006 gateway with waterproof box Outside	9
3.1.2 WS69 outdoor 7-in-1 sensor array	11
3.1.3 Indoor Sensor	13
3.1.4 Solar Panel Unit	14
4. Initial Setup and Usage	15
4.1 Accessing the Gateway for Setup	15
4.2 USB Configure Tool Operation	17
4.2.1 Setup	19
4.2.2 Record	26
4.2.3 Upload	29
4.2.4 Reset	31
4.2.5 Update Firmware	31
4.2.6 About	32
5. SMS Functions	32
5.1 SMS data from station	35
5.2 Low Power alarm	35
6. Optional Weather Servers	37
6.1 Viewing Data on www.ecowitt.net	37
6.2 Registering with and using wunderground.com	40
6.3 Viewing data on wunderground.com	44
6.4 Viewing data on weathercloud	45

6.5 Viewing data on Weather Observations Website (WOW)	45
7. Installation	49
7.1 Assembling the WS69 Sensor Array	49
7.1.1 Installing U-bolts and Metal Plate	49
7.1.2 Installing the Wind Vane	51
7.1.3 Installing the Wind Speed Cup	51
7.1.4 Install Batteries in WS69 Sensor	52
7.1.5 Mounting On a Pole	54
7.1.6 Reset Button and Transmitter LED	57
7.2 Indoor Sensor Set Up	58
7.2.1 Power On the Sensor	58
7.2.2 Sensor Placement	59
7.2.2 Practices for Wireless Communication	60
7.3 Mounting the Solar Panel	62
7.4 Check Device Operating Status	64
8 Features	65
9. Optional Sensors	67
9.1 Sensor Data Reception Priority	67
9.2 Supported Sensors	67
10. Specification	69
10.1 Outdoor Sensor Array	69
10.2 Indoor Sensor	71
10.3 Gateway	72
10.4 Solar Panel	72
11. Troubleshooting Guide	73
12. Maintenance	75

12.1 Clean Rain Gauge	75
12.2 Clean Solar Radiation Sensor and Solar Panel	77
12.3 To Prevent Snow build up	77
13. Warranty Information	78
14. FCC	78
15. Contact Us	80
15.1 After-sales Service	80
15.2 Stay in Touch	81

1. Introduction

Thank you for your purchase of the Ecowitt WS6006 professional 4G cellular weather station.

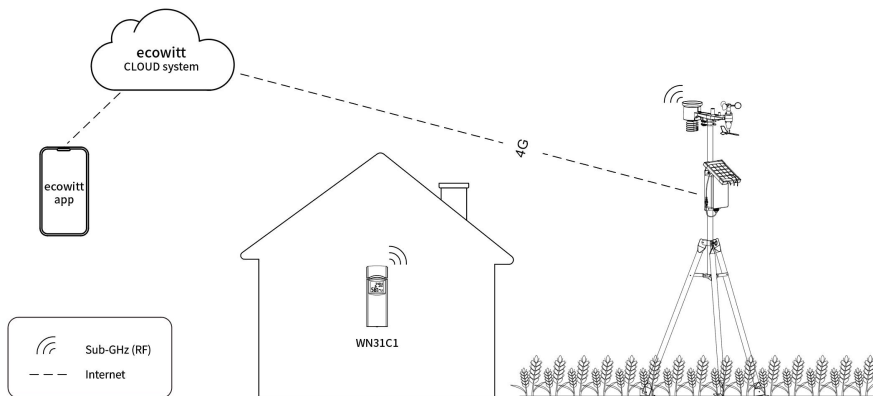


Figure 1: Conceptual Diagram

The Ecowitt WS6006 is a remote weather data logger that operates on 4G WCDMA/GSM networks, enabling stable data transmission via cellular connections. It supports direct upload to the Ecowitt cloud platform (www.ecowitt.net), as well as to third-party services such as WOW, WU, WeatherCloud, or other custom servers. This provides users with flexible options for remote weather monitoring and data management.

When paired with compatible wireless sensors, the WS6006 allows real-time monitoring of multiple outdoor environmental parameters, including temperature, humidity, wind speed and direction, barometric pressure, rainfall, solar radiation, and UV index.

In addition, the device is equipped with a micro SD card slot (SD card not included), enabling local archiving and backup of both current and historical weather data.

We at Ecowitt are very conscientious about your possible concerns regardin

g sending your data into a cloud. Not only do we not share your data with any third party, we also offer you a possibility to manage your data locally by the help of a special tool-the WS View Plus app. You may refer to the WSView Plus APP instruction for more details.

This user guide provides step-by-step instructions for installing and operating the WS6006, including detailed descriptions of its features and functions. Use this manual to become familiar with your professionally designed weather station and keep 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 display-less console

Transmitter: Refers to the sensor.

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 console and its sensors. This frequency is not the same as the 4G modem (LTE) or Wi-Fi working frequencies (2.4 GHz, 5 GHz.) ISM/SRD bands are kept separate from 4G frequencies by national regulations to avoid interferences. Typical ISM/SRD frequencies are 915MHz (Americas), 868MHz (Europe), 433MHz(worldwide), 920MHz (Japan, Korea).

Important: Please read this manual carefully before installation and use.

2. Package

QTY	Item
1	WS6006 Weather Station Gateway with Waterproof Enclosure
1	18650 li-ion battery (pre-installed in gateway)
1	USB cable
2	M6.0*16 Screw Stainless steel
2	M6 Hex Nuts
4	PA4.8*32 Screw stainless steel
4	Expansion Nails Plug-Φ7.2*36.5 Nylon
1	User manual

Table 1: Device Items

QTY	Item
1	WN31C1 Indoor Temperature & Humidity Sensor
2	PA3.0*15 Screw stainless steel
7	Nylon Cable Ties 4.8*300mm

Table 2: WN31C1 Indoor Sensor

QTY	Item
1	WS69 Outdoor Sensor Array
2	U-Bolts for mounting on a pole WS69
1	Metal mounting plate to be used with U-Bolts
4	M6 Hex Nuts for U-Bolts
1	Wrench for M6 Nuts

Table 3: WS69 Outdoor Sensor Array

QTY	Item
1	Solar Panel
1	5 meters connection cable for solar panel to connect to gateway
1	Metal mounting plate
1	Mounting hose clamp (Fits pipe diameter:46-70mm)
5	PWA3.0*10 Screw stainless steel

Table 4: Solar Panel

Notes

1. Batteries for the outdoor sensor package are not included. You will need 2 AA size batteries, alkaline or Lithium batteries (Lithium recommended for colder climates).
2. The gateway is powered by a 18650 li-ion battery or USB charger. And also with a solar panel as backup power supply. All included.
3. When select the SIM card, please check the following supported frequency band first (you may confirm that with your mobile network service provider):

- **Global:**

4G LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B17/B18/B19/
B20/B25 /B26/B28/B66
4G LTE-TDD: B34/B38/B39/B40/B41
2G GSM: 850/900/1800/1900GSM:850/900/1800/1900

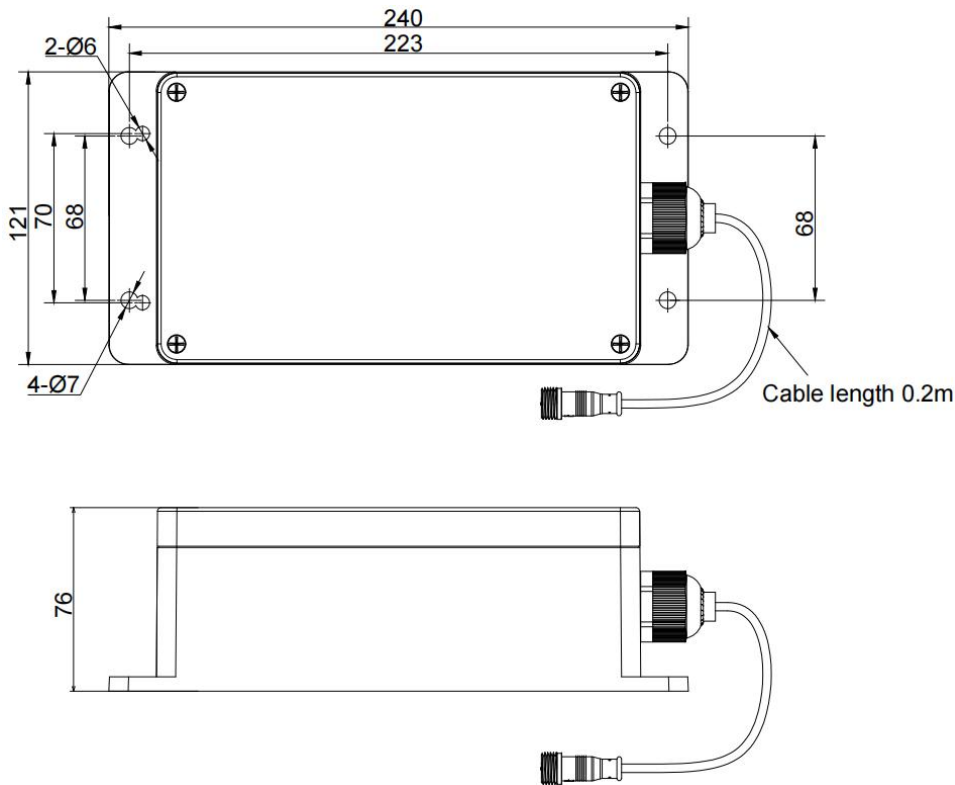
- **Europe:**

LTE-FDD: B1/B3/B5/B7/B8/B20
LTE-TDD: B40
WCDMA: B1/B5/B8
GSM: 850/900/1800/1900

3. Construction & Layout

3.1 Multiple Views and Size

3.1.1 WS6006 gateway with waterproof box Outside



Inside

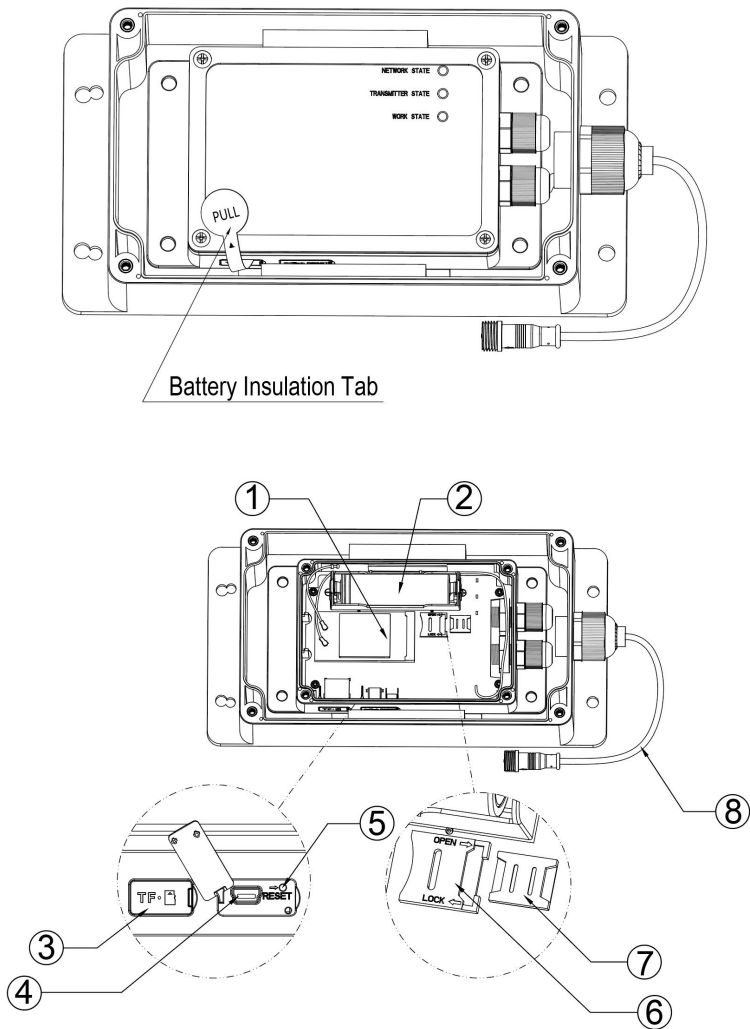


Figure 2: Gateway View

No.	Description	No.	Description
1	4G Module	2	Battery
3	TF card slot	4	USB interface
5	Reset button	6	Micro SIM card slot
7	Nano SIM card slot	8	Connector for solar power unit

Table 5

3.1.2 WS69 outdoor 7-in-1 sensor array

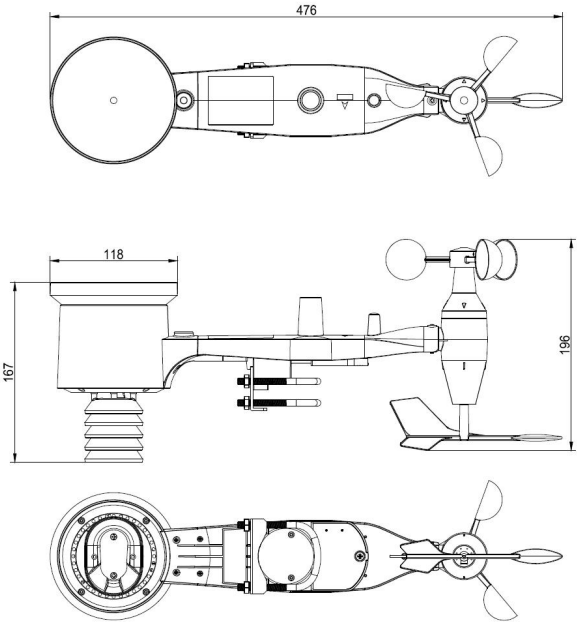


Figure 3: Sensor Array View

■ **Parts Identification**

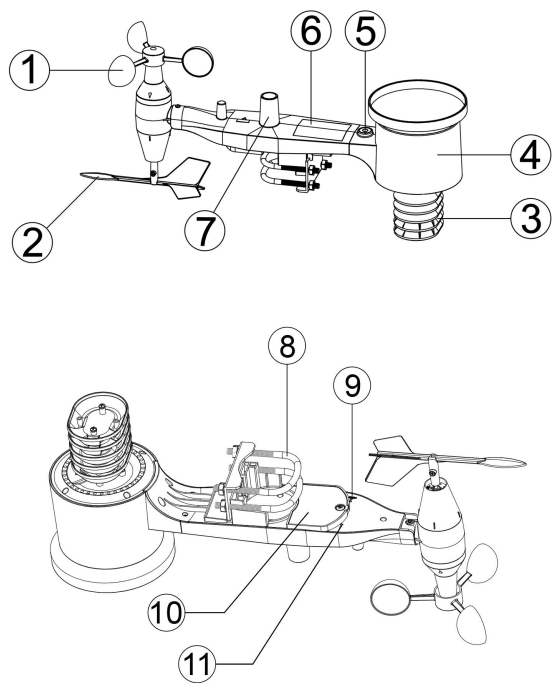


Figure 4: Parts Identification

No	Component	No	Component
1	Wind Speed Cups	2	Wind Vane
3	Temperature and Humidity Sensors	4	Rain Collector
5	Bubble Level	6	Solar Panel
7	Light sensor and UV sensor	8	U-Bolts
9	Reset Button	10	Battery compartment door
11	Red LED Indicator for Data Transmission		

Table 6: Component Identification

3.1.3 Indoor Sensor

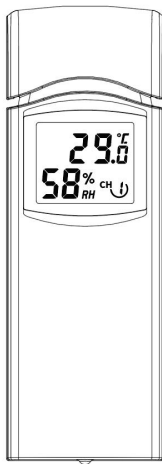


Figure 5: Main View

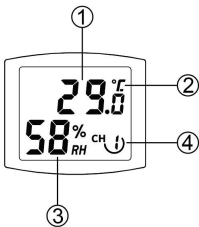


Figure 6: Sensor Display Layout

- ① Temperature reading
- ② Temperature unit (°F vs °C)
- ③ Relative humidity (%)
- ④ Channel number

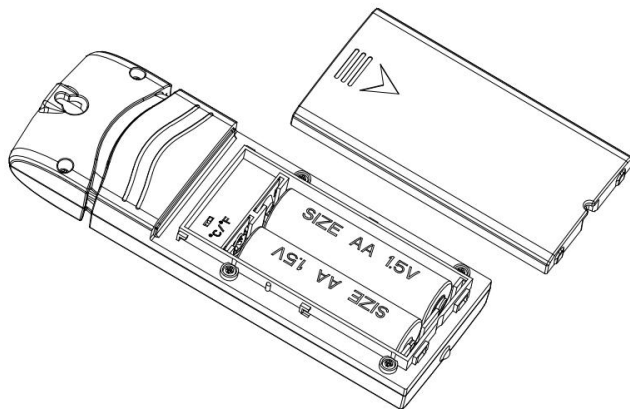


Figure 7: Rare View(batteries are not included)

3.1.4 Solar Panel Unit

The solar panel base is to be connected to the power connector for receiver via a 2 core 5 meter extending cable(included).

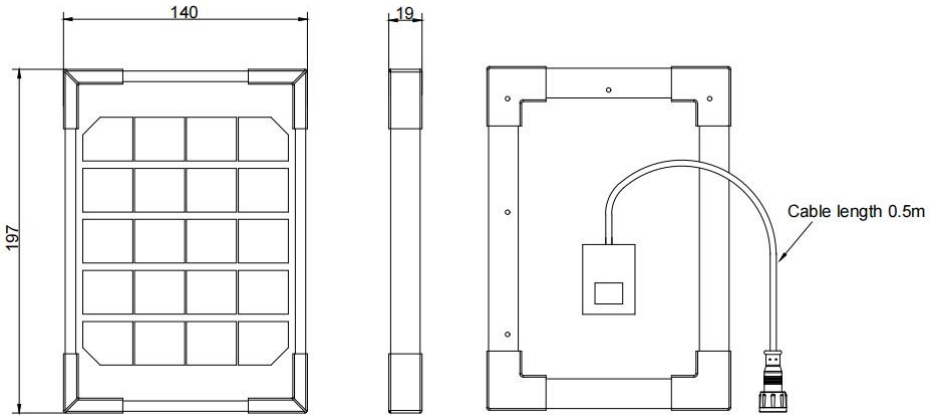


Figure 8: Solar Panel Layout

4. Initial Setup and Usage

- Before placing and installing all components of the weather station at their final destination, please set up the weather station with all parts being nearby for testing the correct function. Also please note configuring parameters on PC software is necessary before permanent installation.

To complete assembly you will need two Philips screwdrivers (size PH1 and PH2) and a wrench (included).

4.1 Accessing the Gateway for Setup

The gateway comes with a waterproof enclosure for outdoor protection. Please follow the steps below to access the internal components and install cards as needed:

❖ Installation Steps:

- ① Use a Phillips screwdriver to loosen the screws on the transparent cover, then open the top cover of the clear waterproof enclosure(**Figure 9**).

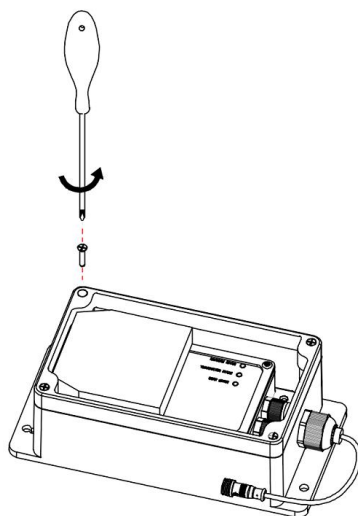


Figure 9

- ② After opening the cover, remove the EVA foam pad(do not discard; keep it for future use)(**Figure 10**).

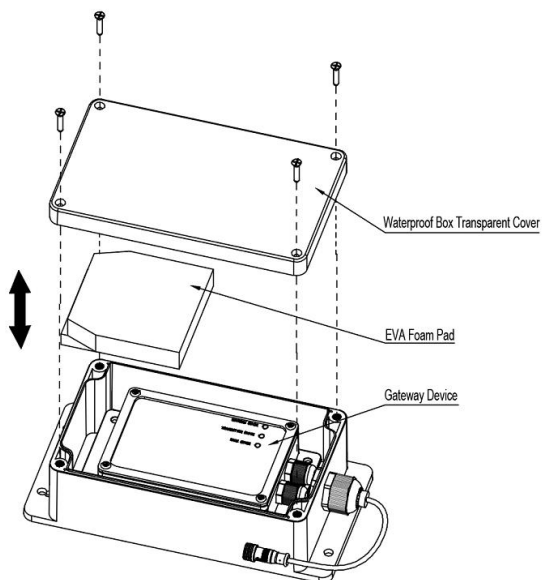


Figure 10

- ③ Use a Phillips screwdriver to open the top cover of the gateway device, pull out the battery insulation tab(PULL), and based on your configuration needs, insert a Micro SIM card or a Nano SIM card into the corresponding slot on the gateway board (**Figure 11**).
- ④ Please refer to Section 3.1.1 inside for the gateway components.

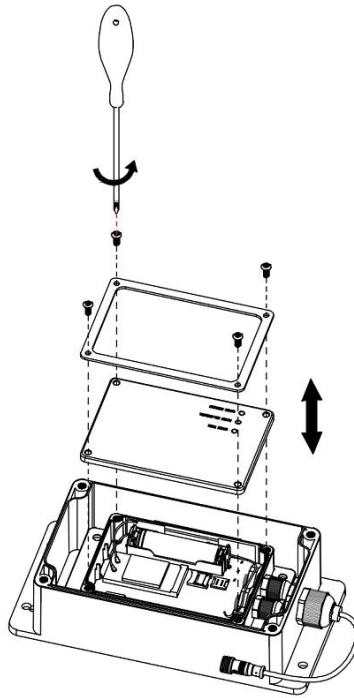


Figure 11

Notes:

- The EVA foam pad is used to secure the gateway inside the waterproof enclosure and to prevent damage caused by collision.
- Ensure the SIM card is inserted in the correct orientation.
- Use only the specified type of SIM card.

4.2 USB Configure Tool Operation

Before installing the gateway, make sure to complete the initial configuration using the “WEATHER LOGGER” PC software.

This step is required before you can start using the weather station.

Note: any future changes or settings adjustments must also be made via the PC software.

① Download the latest PC software on this link:

<http://download.ecowitt.net/down/softwave?n=WeatherLogger>

② Decompress the Weather Logger file, open the Weather Logger Setup.exe to install the software.

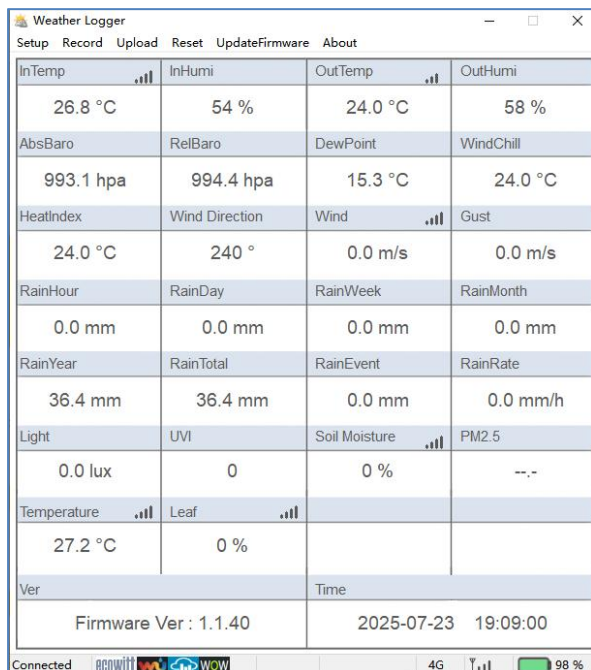
③ Connect the gateway device to PC via an USB cable, then launch the software.

④ Power on the WS69 sensor array and the WN31C1 sensor.

Please refer to Section 7.1 and 7.2 for detailed instructions on how to power on these devices, then the data can be displayed in the PC software interface.

The connection status is displayed at the bottom of the screen: “Connected” indicates that the gateway is properly linked to the PC, while “Unconnected” means no connection has been detected.

Main software UI



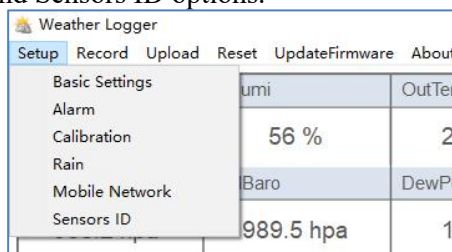
Weather Logger			
Setup Record Upload Reset UpdateFirmware About			
InTemp	InHumi	OutTemp	OutHumi
26.8 °C	54 %	24.0 °C	58 %
AbsBaro	RelBaro	DewPoint	WindChill
993.1 hpa	994.4 hpa	15.3 °C	24.0 °C
HeatIndex	Wind Direction	Wind	Gust
24.0 °C	240 °	0.0 m/s	0.0 m/s
RainHour	RainDay	RainWeek	RainMonth
0.0 mm	0.0 mm	0.0 mm	0.0 mm
RainYear	RainTotal	RainEvent	RainRate
36.4 mm	36.4 mm	0.0 mm	0.0 mm/h
Light	UVI	Soil Moisture	PM2.5
0.0 lux	0	0 %	--.-
Temperature	Leaf		
27.2 °C	0 %		
Ver		Time	
Firmware Ver : 1.1.40		2025-07-23 19:09:00	
Connected		4G 98 %	

Figure 12: Software UI Interface

- The following parts introduce the functions and settings of the software UI, including Setup, Record, Upload, Reset, Update Firmware and About, as well as the display of some status.

4.2.1 Setup

Click Setup menu, there are Basic Settings, Alarm, Calibration, Rain, Mobile Network and Sensors ID options.



4.2.1.1 Basic Settings

Click Basic Settings option to enter setting menu. Units of weather parameters, time zone, DST on/off, data logging interval can be configured here. Once you made your choice, press Save to make the setting effective.

The screenshot shows the 'Setting' dialog box with the following sections and controls:

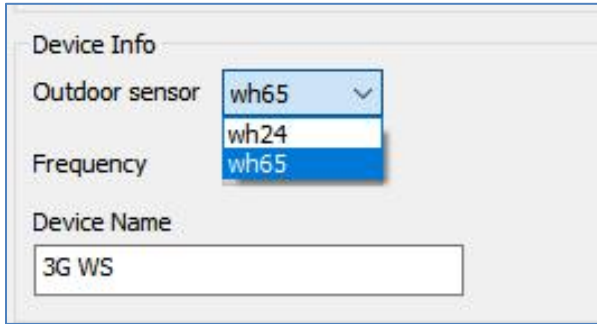
- Unit Section:** Contains dropdown menus for 'Temperature' (set to °C), 'Light' (set to w/m2), 'Wind' (set to m/s), 'Pressure' (set to hpa), and 'Rain' (set to mm).
- Time Section:** Includes a 'TimeZone' dropdown menu (set to '(UTC)Dublin,Edinburgh,Lisbon,London'), a 'Sync Time' button, a checked checkbox for 'Automatically adjust clock for daylight saving time', and a 'Data Logger Interval' set to '2 Minute'.
- Device Info Section:** Includes an 'Outdoor sensor' dropdown (set to 'wh65'), a 'Frequency' dropdown (set to '433MHz'), and a 'Device Name' text input field containing '3G WS'.
- Buttons:** 'Save' and 'Cancel' buttons are located at the bottom right of the dialog.

- Device Info

Only one outdoor sensor can be learned by the gateway.

- Device Name

The device name can be edited here.



The screenshot shows a 'Device Info' configuration window. It contains three fields: 'Outdoor sensor' with a dropdown menu showing 'wh65' (selected), 'wh24', and 'wh65'; 'Frequency' with a dropdown menu showing 'wh65'; and 'Device Name' with a text input field containing '3G WS'.

Note:

Whenever any one of the settings changed, a new log file will be created on SD card (in case a card has mounted on machine) and having history data recorded with the newly selected units effected.

4.2.1.2 Alarm

Alarm function is referring to sending alert SMS message to your mobile phone when alarm condition is triggered.

Please refer to Section 5 for instructions on using the mobile phone function via SMS.

Click Alarm option to enter setting menu. The check box is to enable the corresponded alarm condition.

Alarm

High Alarm

SelectAll

Indoor Temp

25.0

°C

Indoor Humi

65

%

Outdoor Temp

25.0

°C

Outdoor Humi

65

%

DewPoint

25.0

°C

Wind

10.0

m/s

Gust

10.0

m/s

RainRate

10.0

mm/h

RainDay

10.0

mm

Low Alarm

SelectAll

Indoor Temp

10.0

°C

Indoor Humi

35

%

Outdoor Temp

10.0

°C

Outdoor Humi

35

%

DewPoint

10.0

°C

Master Alarm On:

Enable

Save

Cancel

4.2.1.3 Calibration

Click Calibration option to enter setting menu.

If the data measured by device is found not in complete accord with official data, a reference coefficient can be configured here to make it as accurate as possible.

Calibration

Relative Pressure

0.0

hpa

Wind Gain

1.00

Absolute Pressure

0.0

hpa

Rain Gain

1.00

Wind Direction

0

°

Light Gain

1.00

InTemp

0.0

°C

OutTemp

0.0

°C

InHumi

0

%

OutHumi

0

%

Save

Cancel

Parameter	Type of Calibration	Default	Typical Calibration Source
REL Barometer	Offset	Current Value	Local airport (3)
ABS Barometer	Offset	Current Value	Calibrated laboratory grade barometer
Wind Direction	Offset	Current Value	GPS, Compass (4)
Temperature	Offset	Current Value	Red Spirit or Mercury Thermometer (1)
Humidity	Offset	Current Value	Sling Psychrometer (2)
Wind	Gain	1.00	Calibrated laboratory grade wind meter (6)
Rain	Gain	1.00	Sight glass rain gauge with an aperture of at least 4" (7)
Solar Radiation	Gain	1.00	Calibrated laboratory grade solar radiation sensor

Table 7: Calibration

- (1) The receiver displays two different pressures: absolute (measured) and relative (corrected to sea-level).

To compare pressure conditions from one location to another, meteorologists correct pressure to sea-level conditions. Because the air pressure decreases as you rise in altitude, the sea-level corrected pressure (the pressure your location would be at if located at sea-level) is generally higher than your measured pressure.

Thus, your absolute pressure may read 28.62 inHg (969mb) at an altitude of 1000 feet (305m), but the relative pressure is 30.00 inHg (1016mb).

The standard sea-level pressure is 29.92 inHg (1013mb). This is the average sea-level pressure around the world. Relative pressure measurements greater than 29.92 inHg (1013mb) are considered high pressure and relative pressure measurements less than 29.92 inHg are

considered low pressure.

To determine the relative pressure for your location, locate an official reporting station near you (the internet is the best source for real time barometer conditions, such as Weather.com or Wunderground.com®), and set your weather station to match the official reporting station.

- (2) Only use this if you improperly installed the weather station sensor array, and did not point the direction reference to true north.
- (3) Temperature errors can occur when a sensor is placed too close to a heat source (such as a building structure).

To calibrate temperature, we recommend a mercury or red spirit (fluid) thermometer. Bi-metal (dial) and digital thermometers (from other weather stations) are not a good source and have their own margin of error. Using a local weather station in your area is also a poor source due to changes in location, timing (airport weather stations are only updated once per hour) and possible calibration errors (many official weather stations are not properly installed and calibrated).

Place the sensor in a shaded, controlled environment next to the fluid thermometer, and allow the sensor to stabilize for 48 hours. Compare this temperature to the fluid thermometer and adjust the ObserverIP receiver to match the fluid thermometer.

- (4) Humidity is a difficult parameter to measure electronically and drifts over time due to contamination. In addition, location has an adverse affect on humidity readings (installation over dirt vs. lawn for example).

Official stations recalibrate or replace humidity sensors on a yearly basis. Due to manufacturing tolerances, the humidity is accurate to $\pm 5\%$. To improve this accuracy, the indoor and outdoor humidity can be calibrated using an accurate source, such as a sling psychrometer.

- (5) Wind speed is the most sensitive to installation constraints. The rule of thumb for properly installing a wind speed sensor is $4 \times$ the distance of the tallest obstruction. For example, if your house is 6m tall and you need mount the sensor on a 1.5m pole: $\text{Distance} = 4 \times (6 - 1.5)\text{m} = 18\text{m}$.

Many installations are not perfect and installing the weather station on a roof can be difficult. Thus, you can calibrate for this error with a wind speed multiplier.

In addition to the installation challenges, wind cup bearings (moving parts) wear over time.

Without a calibrated source, wind speed can be difficult to measure. We recommend using a calibrated wind meter and a constant high speed fan.

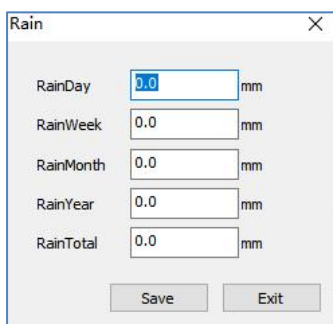
- (6) The rain collector is calibrated at the factory based on the funnel diameter. The bucket tips every 0.01 inch of rain (referred to as resolution). The accumulated rainfall can be compared to a sight glass rain gauge with an aperture of at least 10mm.

Make sure you periodically clean the rain gauge funnel.

- (7) The default conversion factor based on the wavelength for bright sunlight is 126.7 lux / w/m². This variable can be adjusted by photovoltaic experts based on the light wavelength of interest, but for most weather station owners, is accurate for typical applications, such as calculating evapotranspiration and solar panel efficiency.

4.2.1.4 Rain

Rain fall data initial value can be set up here. Setting up as “0” is to zero the rain fall data and restart counting.



The screenshot shows a window titled "Rain" with a close button (X) in the top right corner. Inside the window, there are five input fields, each followed by the unit "mm":

- RainDay: 0.0
- RainWeek: 0.0
- RainMonth: 0.0
- RainYear: 0.0
- RainTotal: 0.0

At the bottom of the window, there are two buttons: "Save" and "Exit".

4.2.1.5 Mobile Network

Before you set up, please inquire SIM card carrier for APN, User, Password information if it is needed by your service provider.

Note 1: If you change a SIM card belongs to a different carrier, APN information needs to be changed as well.

Note 2: Please refer to Section 5 for instructions on using the mobile phone function via SMS.

Telephone: You can set up at most 3 phones to send commands and receive current weather/alarm message via SMS.

MSG Test: It is helpful to tell that system can talk to your phone correctly.

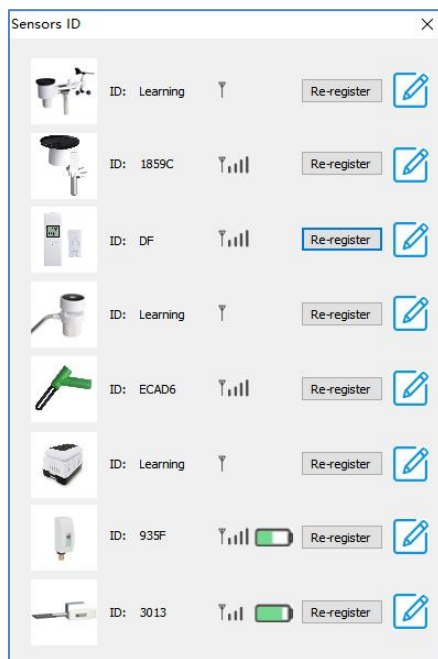
SMS Alarm Interval: The interval of sending alarm SMS triggered by same condition ranges from 10 minutes to 120 minutes. Choose "0" means alarm SMS will be sent only once.

SMS Send Current Interval: The interval of sending current weather data to authorized phone, ranges from 1 minute to 24hours. Set up as "0" means real time weather data will not be sent.

The time interval of SMS message, weather data cloud service upload interval and your cellular network signal quality can significantly influence the battery life. We recommend to set data upload in 10minutes interval, and each day send less than 5 SMS to assure battery power can be balanced from solar panel charging.

4.2.1.6 Sensors ID

Click Sensors ID option to enter the setting menu. All sensors supported by the WS6006 gateway are displayed here.



4.2.2 Record

Click Record menu, there are Max/Min and SD Card File options.

Weather Logger

Setup **Record** Upload Reset Update Firmware About

Max/Min
SDCard File

InTemp	27.0 °C	57 %	OutTemp	24.3 °C	OutHumi	64 %	
AbsBaro	988.6 hpa	RelBaro	989.9 hpa	DewPoint	17.1 °C	WindChill	24.3 °C
HeatIndex	24.3 °C	Wind Direction	315 °	Wind	0.0 m/s	Gust	0.0 m/s
RainHour	0.0 mm	RainDay	0.0 mm	RainWeek	0.0 mm	RainMonth	0.0 mm
RainYear	36.4 mm	RainTotal	36.4 mm	RainEvent	0.0 mm	RainRate	0.0 mm/h
Light	0.0 lux	UVI	0	Soil Moisture	0 %	PM2.5	11.0 ug/m3
Temperature	26.4 °C	Leaf	0 %				
Ver	Firmware Ver : 1.1.40			Time			2025-07-18 18:13:21

Connected 4G 98 %

4.2.2.1 Max/Min

This section is used to display the recorded min and max value.

MAX/Min

Indoor Temp

Max: 25.8 °C Min: 25.8 °C

Indoor Humi

Max: 71 % Min: 71 %

Outdoor Temp

Max: 25.3 °C Min: 25.3 °C

Outdoor Humi

Max: 65 % Min: 65 %

DewPoint

Max: 18.3 °C Min: 18.3 °C

Absolute Pressure

Max: 1004.1 hpa Min: 1003.7 hpa

HeatIndex

Max: 25.3 °C

WindChill

Min: 25.3 °C

Wind

Max: 0.0 m/s

Gust

Max: 0.0 m/s

RainRate

Max: 0.0 mm/h

RainHour

Max: 0.0 mm

RainDay

Max: 0.0 mm

UVI

Max: 0

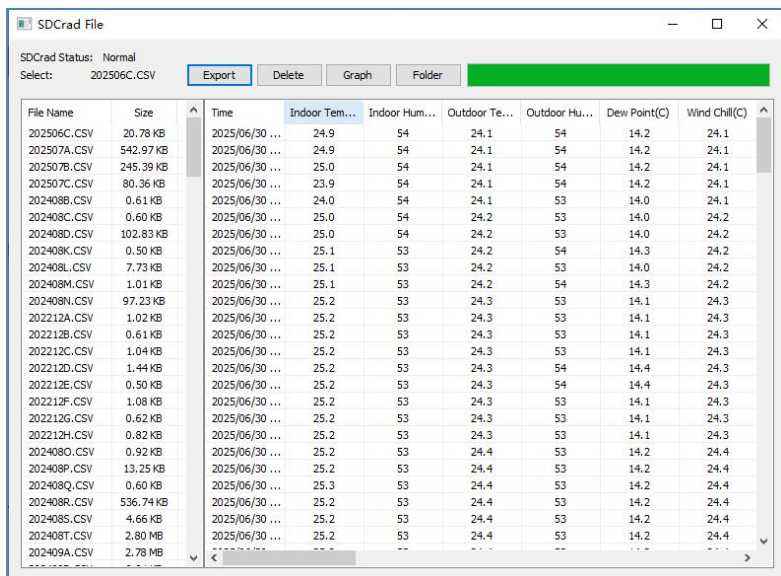
Light

Max: 0.0 lux

Clear Cancel

4.2.2.2 SD Card File

Click SD Card File to download and analyze data stored on the SD Card. Select the file you wish to view from the list and click Export to view the data.

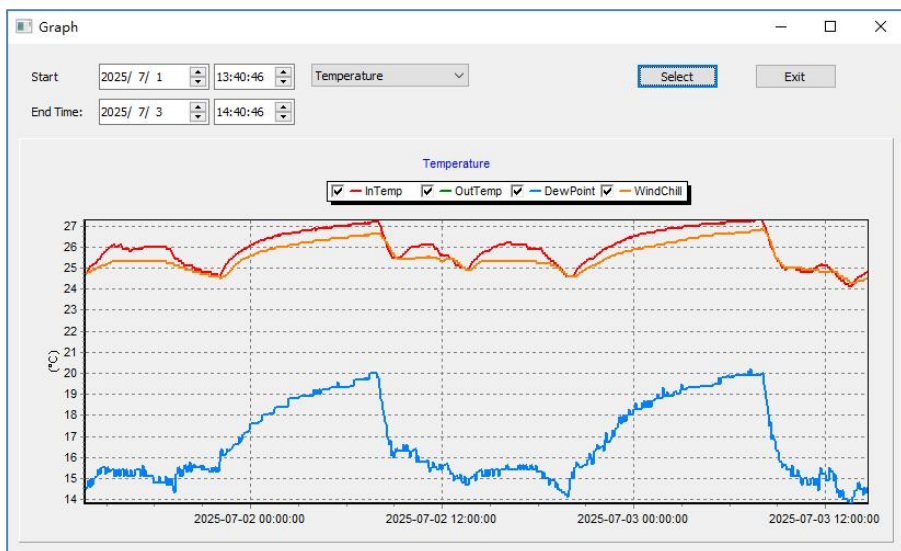


The screenshot shows the 'SDCrad File' window. At the top, it indicates 'SDCrad Status: Normal' and 'Select: 202506C.CSV'. Below this are buttons for 'Export', 'Delete', 'Graph', and 'Folder'. The main area is a table with the following columns: File Name, Size, Time, Indoor Tem..., Indoor Hum..., Outdoor Te..., Outdoor Hu..., Dew Point(C), and Wind Chill(C). The table lists 20 CSV files, all dated 2025/06/30, with various sizes ranging from 0.61 KB to 536.74 KB. The data columns show values for temperature, humidity, and dew point.

File Name	Size	Time	Indoor Tem...	Indoor Hum...	Outdoor Te...	Outdoor Hu...	Dew Point(C)	Wind Chill(C)
202506C.CSV	20.78 KB	2025/06/30 ...	24.9	54	24.1	54	14.2	24.1
202507A.CSV	542.97 KB	2025/06/30 ...	24.9	54	24.1	54	14.2	24.1
202507B.CSV	245.39 KB	2025/06/30 ...	25.0	54	24.1	54	14.2	24.1
202507C.CSV	80.36 KB	2025/06/30 ...	23.9	54	24.1	54	14.2	24.1
202408B.CSV	0.61 KB	2025/06/30 ...	24.0	54	24.1	53	14.0	24.1
202408C.CSV	0.60 KB	2025/06/30 ...	25.0	54	24.2	53	14.0	24.2
202408D.CSV	102.83 KB	2025/06/30 ...	25.0	54	24.2	53	14.0	24.2
202408E.CSV	0.50 KB	2025/06/30 ...	25.1	53	24.2	54	14.3	24.2
202408L.CSV	7.73 KB	2025/06/30 ...	25.1	53	24.2	53	14.0	24.2
202408M.CSV	1.01 KB	2025/06/30 ...	25.1	53	24.2	54	14.3	24.2
202408N.CSV	97.23 KB	2025/06/30 ...	25.2	53	24.3	53	14.1	24.3
202212A.CSV	1.02 KB	2025/06/30 ...	25.2	53	24.3	53	14.1	24.3
202212B.CSV	0.61 KB	2025/06/30 ...	25.2	53	24.3	53	14.1	24.3
202212C.CSV	1.04 KB	2025/06/30 ...	25.2	53	24.3	53	14.1	24.3
202212D.CSV	1.44 KB	2025/06/30 ...	25.2	53	24.3	54	14.4	24.3
202212E.CSV	0.50 KB	2025/06/30 ...	25.2	53	24.3	54	14.4	24.3
202212F.CSV	1.08 KB	2025/06/30 ...	25.2	53	24.3	53	14.1	24.3
202212G.CSV	0.62 KB	2025/06/30 ...	25.2	53	24.3	53	14.1	24.3
202212H.CSV	0.82 KB	2025/06/30 ...	25.2	53	24.3	53	14.1	24.3
202408O.CSV	0.92 KB	2025/06/30 ...	25.2	53	24.4	53	14.2	24.4
202408P.CSV	13.25 KB	2025/06/30 ...	25.2	53	24.4	53	14.2	24.4
202408Q.CSV	0.60 KB	2025/06/30 ...	25.3	53	24.4	53	14.2	24.4
202408R.CSV	536.74 KB	2025/06/30 ...	25.2	53	24.4	53	14.2	24.4
202408S.CSV	4.66 KB	2025/06/30 ...	25.2	53	24.4	53	14.2	24.4
202408T.CSV	2.80 MB	2025/06/30 ...	25.2	53	24.4	53	14.2	24.4
202409A.CSV	2.78 MB	2025/06/30 ...	25.2	53	24.4	53	14.2	24.4

➤ To graph the data:

1. Identify the data file start and end date and times.
2. Click the Graph button.
3. Enter the start and end date and times in the appropriate fields identified in Step 1.
4. Select the parameter you wish to graph, then click the Select button.



4.2.3 Upload

To upload weather data to the server, select Upload from the menu bar.

- ✧ We have dedicated a separate Section 6 to guide you on how to create an account and view the data for your reference.

User can upload data to the below public weather servers and customized servers(need to have the same protocol with wunderground.com).

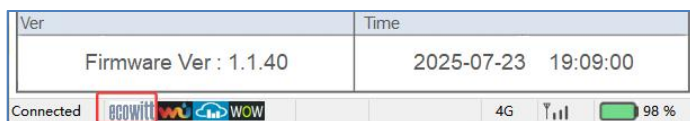
If user choose from the four public websites, you do not need to set the server type and port. If user choose to upload to customized website, you need to enter the Web server, and choose the Server type and Port.

Services	Description
Wunderground	Site: Wunderground.com Provides local & long-range weather forecasts, weather reports, maps & tropical weather conditions for locations worldwide.
WOW	Site: wow.metoffice.gov.uk A UK based weather observation website.
Weathercloud	Site: Weathercloud.net A large network of weather stations reporting data in real time from all over the world.
Ecowitt	Site: ecowitt.net Ecowitt's new weather server that can host a bunch of sensors that other services don't support at this time.

Note:

When using batteries together with a solar panel, it is recommended to set the upload interval to 10 minutes to ensure stable operation and sufficient power supply. Users may still choose to set the upload interval to 1 minute while using battery and solar power; however, this may result in higher power consumption, and there is a risk that the solar panel and batteries may not be able to keep up with the power demand.

- If uploaded successfully, ecowitt logo icon will appear on the PC software.
- The other three icons — WU, WeatherCloud, and WOW — represent weather services to which your data has been successfully uploaded.



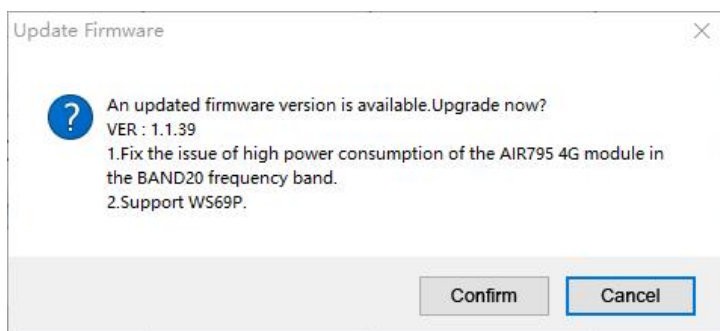
4.2.4 Reset

Click the Reset to choose a rest method.

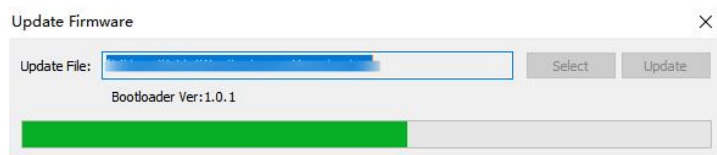


4.2.5 Update Firmware

After install the PC software and open on computer, if there is new version firmware available, a dialog box will pop up indicating to upgrade or not. Click "OK" will guide to upgrade the firmware.

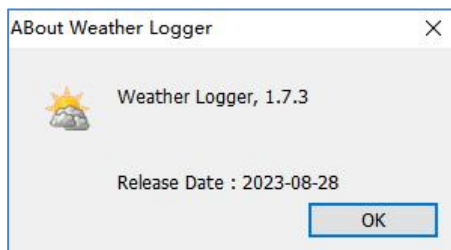


Upgrading the firmware:



4.2.6 About

Click About to get the below information.



- ❖ Here is the end of the PC software setup and instructions.
Please do not power off the gateway or close the waterproof box for now.

5. SMS Functions

Users can check current weather data by sending SMS to the receiver terminal via any of the 3 pre-programmed mobile numbers (only to be programmed with PC software, please refer to USB configure tool Operation).

SMS command list:

- 1) **Current:** send current weather data
- 2) **MAX:** send Maximum value recorded
- 3) **MIN:** send Minimum value recorded
- 4) **Interval:** send interval value setting
- 5) **Status:** send system status, like battery voltage, sensor status, network condition
- 6) **Alarm ON:** turn on sending alarm SMS function
- 7) **Alarm Off:** turn off sending alarm SMS function
- 8) **Reboot:** Reboot the device

1. View current weather Data: **Current.**

Sending a SMS of “Current” to the station will trigger a command to the weather station to send its latest weather data to your mobile phone via SMS. Answer from the weather station is as shown in below figure by 2 messages:

Current:
InTemp:28.9C
InHumi:92%
OutTemp:31.9C
OutHumi:77%
AbsBaro:8.86inHg
RelBaro:29.92inHg
DewPoint:27.4C
WindChill:31.9C
HeatIndex:42.7C
WindDir:267deg

Current:
Wind:2.5mph
Gust:3.4mph
Rain:
Rate:0inch/h
Day:0.73inch
Week:1.36inch
Month:1.36inch
Year:1.36inch
Light:390.37w/m2
UVI:3
Battery:3.8V

2. View Max/Min weather data record: **MAX/MIN**.

Sending SMS of “**Max**” or “**Min**” to weather station triggers sending recorded maximum value to your mobile phone.

The SMS from station looks like this:

Max:
InTemp=28.0C
InHumi=68%
OutTemp=28.8C
OutHumi=73%
Dewpoint:23.5C
AbsBaro:1006.6hpa
HeatIndex:32.8C

Max:
Wind:0m/s
Gust:0m/s
RainRate:0mm/h
RainHour:0mm
RainDay:0mm
Light:0lux
UVI:0

Min:
InTemp=27.5C
InHumi=70%
OutTemp=26.1C
OutHumi=67%
AbsBaro:997.5hpa
Dewpoint:19.5C
WindChill:26.1C

3. Check programmed interval time: **Interval**.

Send SMS “Interval” to station triggers sending its pre-programmed interval value stored on station, it is mainly for reminding the value programmed on station. The reply of SMS from station is like this:

Alarm=10min
Send=12h
Save=2min
Update=3min

Alarm: The interval of alarm repeating. A repeated alarm will only be sent after this interval.

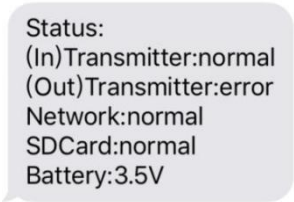
Send: The interval of sending current weather data by SMS.

Save: The logging history data interval that to be saved on Mirco SD Card.

Update: The interval of uploading data to internet.

4. Check weather station status: **Status**.

Send SMS “**Status**” to station will trigger station to send back current condition of the station system. The SMS from station looks like this:



(In)Transmitter=normal	The weather station indoor sensor is functioning without errors.
(In)Transmitter=error	An error has occurred, check the indoor sensor.
(Out)Transmitter=normal	The weather station outdoor sensor is functioning without errors.
(Out)Transmitter=error	An error has occurred, check the outdoor sensor.
Network=normal	The weather station network is functioning without errors.
Network=error	An error has occurred, check the weather station SIM card.
SD card=normal	The SD card is functioning without errors.
SD card=not exist	No Micro SD card is detected or available. Check the weather station and insert a suitable Micro SD card.
Battery=3.5V	The voltage of battery in console is 3.5V.

Table 8

5. Enable or disable alarm function: **Alarm On : Alarm Off**.

Send SMS “Alarm On” or “Alarm Off” will enable or disable the pre-programmed alarm function. Station will reply “Alarm disable” or “Alarm Enable” to confirm.

Alarm enable

Alarm disable

5.1 SMS data from station

Main base station will send weather, alarm or critical condition to system value regularly via SMS. Below are the SMS received looked like:

Current:
InTemp:28.9C
InHumi:92%
OutTemp:31.9C
OutHumi:77%
AbsBaro:8.86inHg
RelBaro:29.92inHg
DewPoint:27.4C
WindChill:31.9C
HeatIndex:42.7C
WindDir:267deg

Current:
Wind:2.5mph
Gust:3.4mph
Rain:
Rate:0inch/h
Day:0.73inch
Week:1.36inch
Month:1.36inch
Year:1.36inch
Light:390.37w/m2
UVI:3
Battery:3.8V

AlarmHigh:
InTemp:29.4C
RainRate:36.6mm
RainDay:6.1mm

AlarmLow:
OutTemp:22.5C
OutHumi:55%

5.2 Low Power alarm

The receiver unit constantly monitors the battery voltage. An SMS alert will be sent to pre-programmed phone when battery voltage drops below 3.5V:

Warning: Battery voltage low:
3.5V. Device will soon suspend
internet uploading

When battery voltage drops further and below 3.3V, system will suspend pushing data to weather server. SMS below will be sent.

Warning: Battery voltage low:
3.3V. Internet uploading is
suspended

All functions will be suspended when battery voltage drops below 3V.

When battery is charged to 3.9V or even higher, system will be activated by sending this SMS:

Battery levels sufficient.
Restart RF and data Upload

If system has restarted after reset, a startup SMS will be sent:

Device startup
Battery:99%

6. Optional Weather Servers

The gateway is capable of sending your sensor data to select internet-based weather services and your own website (need to have the same protocol with wunderground.com). The supported servers are shown in the table below:

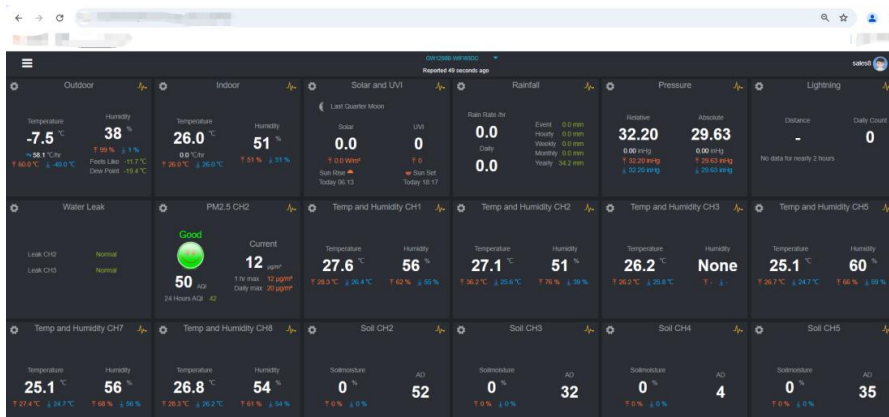
Service	Website	Description
Ecowitt Weather	<u>ecowitt.net</u>	Ecowitt is a new weather server that can host a bunch of sensors that other services don't support.
Weather Underground	<u>wunderground.com</u>	Weather Underground is a free weather hosting service that allows you to send and view your weather station data real-time, view graphs and gauges, import text data for more detailed analysis and use iPhone, iPad and Android applications available at Wunderground.com. Weather Underground is a subsidiary of The Weather Channel and IBM.
WOW	<u>wow.metoffice.gov.uk</u>	WOW is a UK based weather observation website.
Weather Cloud	<u>weathercloud.net</u>	Weathercloud is a real-time weather social network formed by observers from around the world.
Customized Website		Supports uploading to your customized website, if the website has the same protocol with Wunderground or Ecowitt.

Table 9: Supported Weather Servers

6.1 Viewing Data on www.ecowitt.net

You can observe your sensor's data by using the ecowitt.net web site. Just login the account.

Dashboard



✧ To enable this feature, please setup as follow described:

1. Register or log in your account on www.ecowitt.net.
2. Run the PC software and have your device connected to the PC.
3. Go to the Upload interface - set the Activity to Enable upload - click the button of "Add To Ecowitt".
4. Then it will jump to the webpage of ecowitt.net- click the  icon in the top left corner - choose "Devices" - add the device.
5. Complete all the information. When selecting MAC/IMEI, please select IMEI and input the numbers from the PC software. This number is also printed on the 4G modem.

Add Device

Device Name

Device Location

Device Type

Select

Timezone

Asia

Shanghai

MAC/IMEI

IMEI

Public Data

☒

Cancel

Save

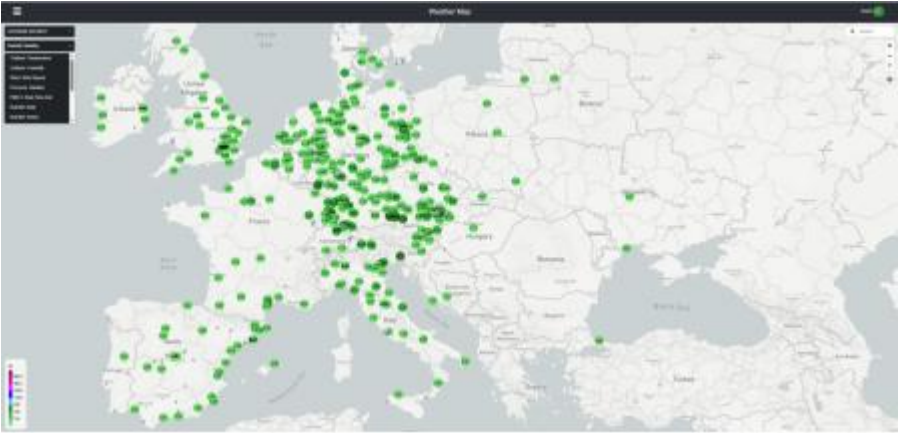
The screenshot shows the 'Weather' application interface. At the top, the location is 'Washington, DC' and the current weather is 'Partly Cloudy' with a temperature of 65°F. Below this, there are three charts:

- Rainfall:** A line chart showing rainfall over time. The y-axis ranges from 0.1 to 1.5. The x-axis shows dates from 10/10 to 10/26. A single data point is visible on 10/10, indicating a rainfall event.
- Indoor:** A line chart showing indoor temperature over time. The y-axis ranges from 65 to 75. The x-axis shows dates from 10/10 to 10/26. The temperature is relatively stable, fluctuating between 70 and 72 degrees.
- Outdoor:** A line chart showing outdoor temperature over time. The y-axis ranges from 60 to 80. The x-axis shows dates from 10/10 to 10/26. The temperature starts around 70, peaks at 75 on 10/10, and then generally decreases, ending around 65 on 10/26.

The screenshot displays a Home Assistant dashboard with the following components:

- Top Row:**
 - Rainfall:** Shows 0.00 with a forecast of 0.00-0.00.
 - Outdoor:** Temperature 75.0°F, Humidity 58%, Wind 1.5 mph.
 - Indoor:** Temperature 78.4°F, Humidity 48%, Wind 1.5 mph.
 - Solar and UV:** Shows 0.00 with a forecast of 0.00-0.00.
 - Wind:** Shows 32 mph with a forecast of 0.00-0.00.
- Bottom Row:**
 - PM2.5 CH1:** Shows 107 with a forecast of 107.
 - Soil CH1:** Shows 38 with a forecast of 38.
 - Temp CH1:** Shows 76.3°F with a forecast of 76.3°F.
 - Load CH1:** Shows 0 with a forecast of 0.
 - Battery:** Shows 97% with a forecast of 97%.
- Table:** A table at the bottom shows a log of data points for these sensors over time, with columns for Time, Rain, Rainfall, Humidity, Temperature, Wind, Solar, UV, Wind, and Battery.

Weather Map



6.2 Registering with and using wunderground.com

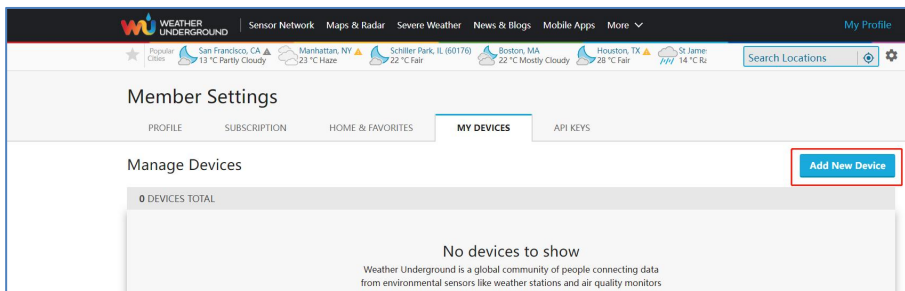
Perform the following steps to get the Station ID and Password on Wunderground.com:

- 1) Visit Wunderground.com and select the “Log in” at the upper right corner of the home page and sign up (if you don’t have an account, please register first.)

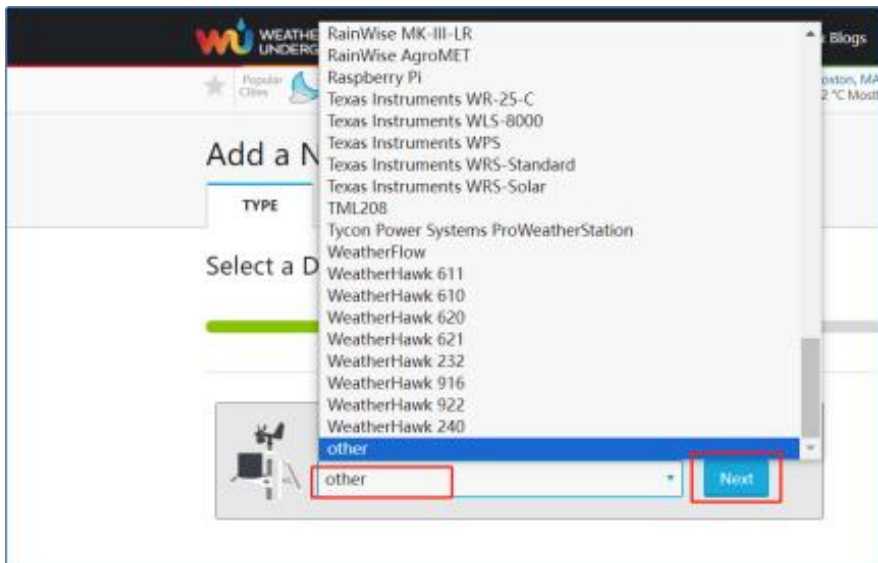
2) Click “My Profile” and select “My Devices” to register your station.



3) Select “Add New Device”.



4) Find the “TYPE”, select “other”, then click “Next”.



- 5) Select “Address” or “Manual” option, and find your local position. Press “Next”.

Add a New PWS

TYPE LOCATION DETAILS DONE

Set Device Name & Location

50%

Device Location:

☐ Address ☒ Manual

38.695,-76.740

Your Location has been verified and added!

Elevation: 12 m.
Lat, Lon: 38.695, -76.740
Neighborhood: Baden
Time Zone: America/New_York

Back Next



- 6) This time you will be asked the details about your weather station. Go ahead and fill out the form.

Add a New PWS

TYPE LOCATION DETAILS DONE

Tell Us More About Your Device

75%

Name:(Required)

Elevation:(Required)

Device Hardware:(Required)

Surface Type:

Height Above Ground:

You Make Our Forecasts More Accurate, We Respect Your Privacy

Contribute to the Weather Underground community by sharing some information about yourself and your sensor. We use this information to manage your account and to improve the experience from the Weather Underground community. We may also share certain data for commercial purposes, such as your sensor location.

Learn more about how we take your privacy seriously

(Required)
☒ I Accept ☐ I Deny

Email Preferences:
☒ I would like to receive PWS notifications.

Back Next

- 7) After completing the weather station, you will see Station ID and Station Key.

The screenshot shows a web interface titled "Add a New PWS" with tabs for TYPE, LOCATION, DETAILS, and DONE. The "DONE" tab is active, displaying "Registration Complete!" with a green progress bar at 100%. Below this, a message states: "Congratulations! Your personal weather station is now registered with Weather Underground. Enter the information below to your weather station software." Under the heading "Your PWS", the "Station ID:" and "Station Key:" fields are highlighted with a red box. A "Copy credentials" button is below these fields. To the right is an illustration of a computer monitor and keyboard with the text "Configure Your Software" below it. At the bottom left is a "View Devices" button. In the bottom right corner, there is a small watermark that reads "激活 Win10 转 Win7 设置".

- 8) Take note of the station ID and Key, then enter them and set the updated interval.

The screenshot shows an "Upload" dialog box with a close button (X) in the top right corner. It contains the following fields and controls: "Web server" (a dropdown menu showing "tupdate.wunderground.com"), "ID:" (a text input field), "Password:" (a text input field with a "Show Password" checkbox to its right), "Server type:" (a dropdown menu showing "php"), "Port:" (a text input field showing "80"), and "Web server updated interval:" (a text input field showing "5" next to a "Minute" dropdown menu). At the bottom are "Save" and "Cancel" buttons.

- 9) Refresh the page, you may have to wait about a few minutes until the status becomes 'Online'. Then you can click device name to view data.

Member Settings

PROFILE

SUBSCRIPTION

HOME & FAVORITES

MY DEVICES

API KEYS

Manage Devices

Add New Device

4 DEVICES TOTAL

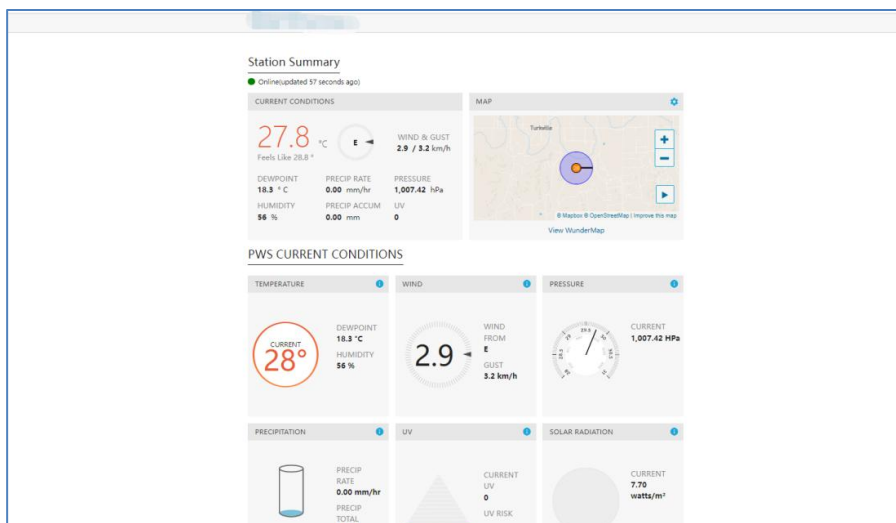
Name	Location	Status	ID	Key	Type	Manage
TEST2	Cunningham (Cunningham), KS	Online			PWS	Edit Delete Copy credentials

6.3 Viewing data on wunderground.com

The most basic way to observe your weather station's data is by using the wunderground.com web site. You will use a URL like this one, enter your Station ID in the section "STATIONID":

[http://www.wunderground.com/personal-weather-station / dashboard ? ID=STATIONID](http://www.wunderground.com/personal-weather-station/dashboard?ID=STATIONID)

It will show a page such this, where you can look at today's data and historical data as well:



6.4 Viewing data on weathercloud

- 1) Log in to the weathercloud.net.
- 2) Refer to the following numbers to locate and record the Link device – Weathercloud ID and Key.

The screenshot shows the 'Your devices' page on the weathercloud website. The page has a blue header with the weathercloud logo and navigation links: Home, Map, Database, Reports, Photos, and a user profile icon. Below the header, the 'Your devices' section contains a table with three columns: Status, Name, Model, Location, Gallery, and Interactions. There are three devices listed, each with a red 'X' status icon. To the right of the table, there is a '+ New' button (labeled 1) and a 'Settings' dropdown menu (labeled 2) for each device. The 'Link device' option in the dropdown menu is highlighted with a red box and labeled 3. Below the table, there is a message 'You follow no devices.' and an 'Explore map' button.

Status	Name	Model	Location	Gallery	Interactions
✖	Test_31f6d5c5d377f21 July 29, 2025, 12:33	Ecowitt GW Series	HongKong 22° 15' 4" N 114° 10' 35" E 0.0 m		0 followers 0 views
✖	EcoWR2551CHOW June 18, 2025, 17:04	La Crosse WS-2000 Series	深圳 22° 32' 56" N 114° 2' 14" E 0.0 m		0 followers 0 views
✖	test_aa8fa4c7fcd10d November 16, 2023, 10:08	Ecowitt GW Series	qweqwe 56° 41' 54" N 100° 20' 52" W 0.0 m		0 followers 0 views

The screenshot shows the 'Link device' dialog box overlaid on the 'Your devices' page. The dialog box has a title 'Link device' and a close button. It contains the text 'The link details for your device Test_31f6d5c5d377f21 are provided below:'. Below this text, there are two input fields: 'Weathercloud ID' and 'Key'. The 'Weathercloud ID' field contains the value '31f6d5c5d377f21'. Below the input fields, there is a link 'Follow the instructions here.'.

- 3) Enter the Weathercloud ID and Key in the PC software (Upload).

6.5 Viewing data on Weather Observations Website (WOW)

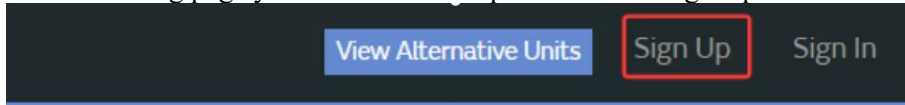
To have your weather station upload data to the Met Office's WOW site you will need to complete the following steps:

1. Sign Up with WOW

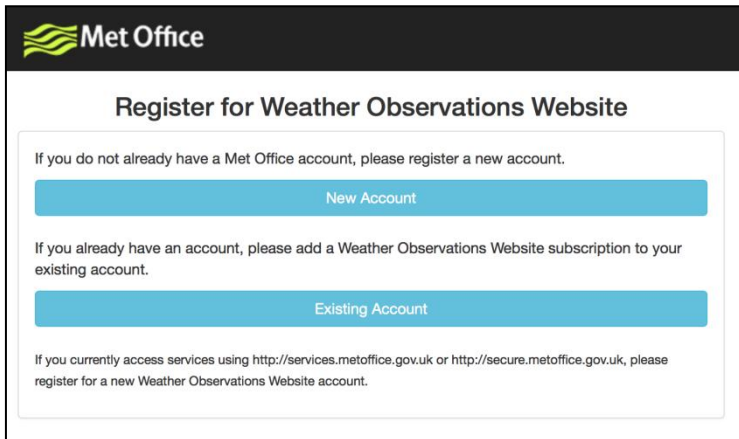
2. Confirm your email with WOW
3. Login to WOW
4. Create/Set up a new WOW site

1) Sign up with WOW

Navigate your browser to <http://wow.metoffice.gov.uk>. On the top-right side of the resulting page you will see menu options. Click “Sign Up”.



You will be presented with the screen below where you will choose to either create a new account or use an already existing account. Click the desired option.

A registration form titled 'Register for Weather Observations Website' under the Met Office logo. The form has two main sections. The first section says 'If you do not already have a Met Office account, please register a new account.' and has a blue button labeled 'New Account'. The second section says 'If you already have an account, please add a Weather Observations Website subscription to your existing account.' and has a blue button labeled 'Existing Account'. At the bottom, there is a note: 'If you currently access services using <http://services.metoffice.gov.uk> or <http://secure.metoffice.gov.uk>, please register for a new Weather Observations Website account.'

If you chose “New Account” you will be presented with a form to fill out:



Register for Weather Observations Website

First Name First Name	Last Name Last Name
Username Username	
Password Password	Confirm Password Confirm Password
Email Email	

The actual form is longer, but all questions should be self-explanatory. Complete and submit the form. You will receive the following notice on completion:



Registration Successful

You will shortly receive an email with instructions on how to login.

2) **Confirm email with WOW**

Now wait for the email to arrive and click the link in that email to confirm your email address.

3) **Login with WOW**

Follow instructions on the screen and login to the site.

Create/Set up a new WOW site

Once you are logged in you will need to create a new WOW site. “Sites” are the means by which WOW organizes weather data the you contribute. Basically, WOW builds a personal web site for your weather station. Associated with the web site is two items you will need to allow uploading of data:

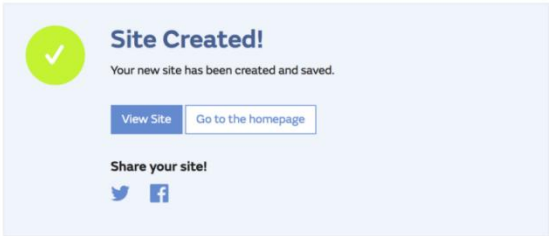
Site ID: This is an arbitrary number that is used to distinguish your site from another. This number appears (in brackets) next to or underneath the name of your site on the site information page, for example: 6a571450-df53-e611-9401-0003ff5987fd.

Authentication Key: This is a 6-digit number that is used to ensure data is coming from you and not another user.

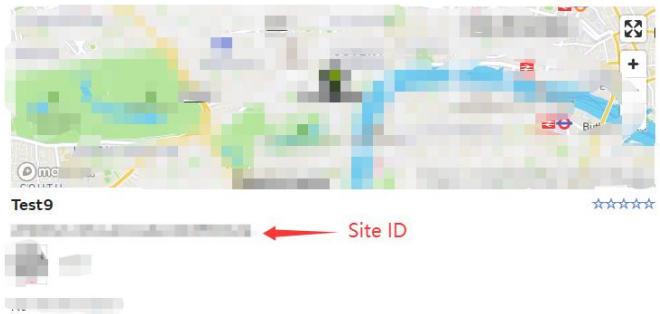
Begin setting up a new site by clicking “Enter a Site”:



You will be presented with a form where you detail your station’s location and a bunch of other settings related to how you wish the site to operate. After you complete the setup, you should see:



Make sure you are (still) logged in to the WOW site. Login as necessary. Now click on “My Sites” in the navigation bar at the top. If you have only 1 site, you will now be shown its page. If you have multiple, you will have to choose the correct one first. On this page, on the right side you will find the site id just below the map:



You will also need to establish a unique 6 digits PIN code that you should keep secret. It is the “Authentication Key.” Setup this number by clicking on “Edit Site”) and filling out the with a 6-digit number of your choice:

Authentication Key

7. Installation

We suggest you assemble all components of the weather station, including console in one location so you can easily test functionality. After testing, place the outdoor sensor package in the desired location. Note, however, that movement during assembly, and movement after assembly can cause the rain sensor to “falsely” register rain. It is therefore best if you do not connect the console to any Internet services until you have reset these false readings using the console. The errant values may be hard to remove from Internet services if you do not reset first.

Important:

Also please note configuring parameters on PC software is necessary before permanent installation. (Refer to Section 4.2 USB Configure Tool Operation).

Attention:

Follow suggested order for battery installation (outdoor sensor first, console second)

Required Tools:

- Phillips screwdriver PH1(not included)
- Phillips screwdriver PH2(not included)
- Flathead screwdriver SL2(not included)
- Wrench(included).

7.1 Assembling the WS69 Sensor Array

7.1.1 Installing U-bolts and Metal Plate

Installing the U-Bolts (for Mounting the Sensor Package onto a Pole)

- Although this installation can be done later, it is recommended to complete it before installing the wind speed and wind direction components, in order to avoid damage to the wind cups or wind vane.

- Required Parts:
U-Bolts × 2
Metal Mounting Plate × 1
Nuts × 4 (pre-installed on the U-Bolts)

- Installation Steps:

- ① Insert the Metal Mounting Plate

Insert the metal plate into the groove located at the bottom of the unit (on the opposite side of the solar panel).

Note:

One side of the metal plate is flat and should slide into the groove. The other side is bent at a 90-degree angle with a curved profile designed to “hug” the mounting pole.

- ② Prepare the U-Bolts

Remove the nuts from both U-bolts.

- ③ Insert the U-Bolts

Insert both U-bolts through the four holes on the metal plate, as shown in Figure 13.

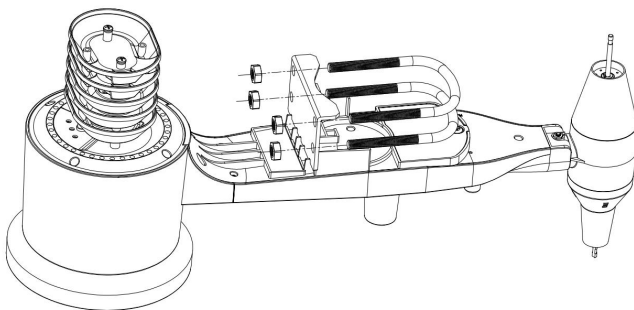


Figure 13: U-Bolt installation

- ④ Attach the Nuts

- ⑤ For final assembly, refer to Figure 14.

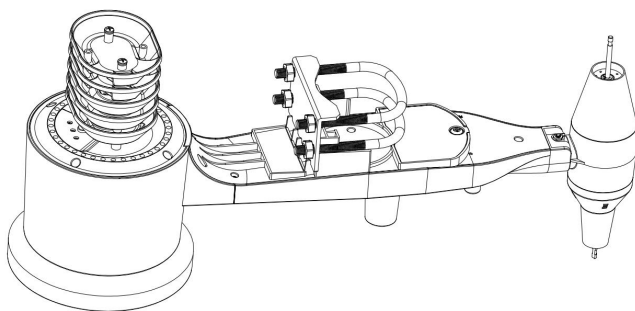


Figure 14: U-Bolts and nuts installed

7.1.2 Installing the Wind Vane

① Insert the Wind Vane

Push the wind vane onto the shaft located at the top of the sensor package, as shown in Figure 15 (left). Ensure it is fully seated.

② Secure with Set Screw

Tighten the set screw, as shown in Figure 15 (right). Tighten until the wind vane is securely fixed and cannot be pulled off the shaft.

③ Check for Smooth Rotation

Make sure the wind vane can rotate freely. A small amount of friction is normal and helps stabilize wind direction readings.

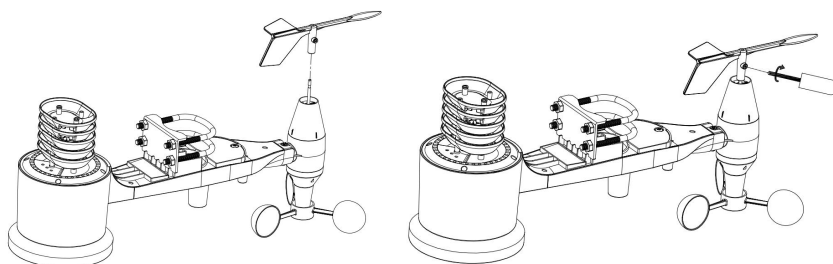


Figure 15: Wind vane installation diagram

7.1.3 Installing the Wind Speed Cup

① Push the wind speed cup assembly onto the shaft located on the opposite side of the wind vane, as shown in Figure 16 (left). Ensure it

is fully seated.

② Tighten the set screw, as shown in Figure 16 (right). Tighten until the cup assembly is securely fixed and cannot be pulled off the shaft.

③ Make sure the cup assembly can rotate freely. There should be no noticeable friction when spinning.

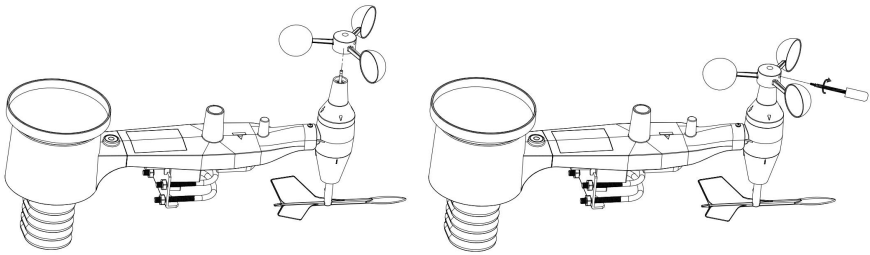


Figure 16: Wind speed cup installation diagram

7.1.4 Install Batteries in WS69 Sensor

Battery Usage Warnings	
Correct Installation	Insert the battery with the correct polarity. The system requires initial power from the backup battery before the solar panel takes over. If the LED does not light up or stays on permanently, check battery orientation and reinsert if needed. Incorrect installation may cause permanent damage.
Cold Weather Considerations	In winter or high-altitude areas with limited sunlight, the system depends more on the backup battery. Lithium batteries are recommended for better performance in cold conditions.
Battery Type Recommendations	Do not use rechargeable NiMH or NiCd batteries, as they are unsuitable. Lithium batteries are ideal for cold climates, while alkaline batteries work for most environments. Rechargeable batteries should never be used due to their lower voltage.

Table 10: Battery requirements

- ① Use a screwdriver to open the battery compartment.
- ② Install 2 × AA batteries into the compartment, ensuring correct polarity.
- ③ The Sensor ID of this WS69 is attached on its body. Under normal conditions, the sensor will be automatically recognized by the gateway once it is powered on.
If the gateway does not receive the signal, try moving the sensor closer to the gateway or manually enter the Sensor ID (see Section 4.2.1.6).
- ④ The LED indicator on the back of the sensor package will:
 - Light up for 4 seconds.
 - Then blink once every 16 seconds, indicating normal data transmission.
- ⑤ If you missed the initial LED activity, simply check for the 16-second blink to confirm normal operation. If needed, remove and reinsert the batteries to restart the process.

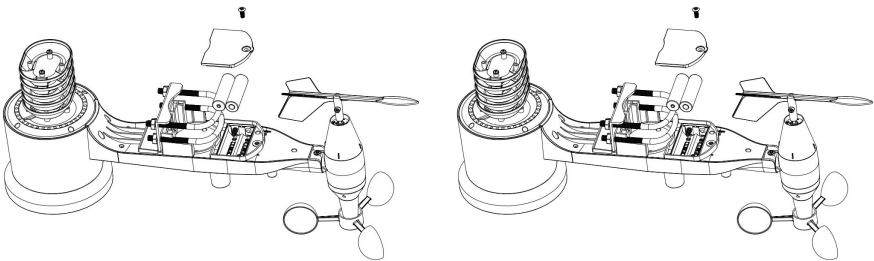


Figure 17: Battery installation diagram

Note:

The sensor will start recording data after install batteries. Moving the sensor from indoors to outdoors may accidentally trigger the rainfall sensing bucket, causing the console to register false rainfall data. To prevent this, you can temporarily turn off the gateway after pairing.

Additionally, use the console functions or ecowitt.net to clear any incorrect rainfall records if necessary.

7.1.5 Mounting On a Pole

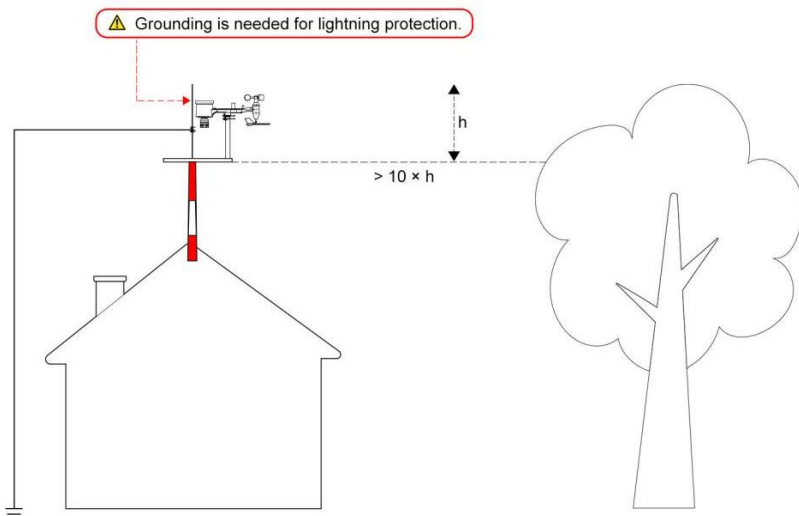
7.1.5.1 Before you mount

Before proceeding with the outdoor mounting detailed in this section, you may want to first follow the setup instructions starting from Section 7.2 Indoor Sensor Set Up. Keep the assembled outdoor sensor package nearby during this process—preferably at least 5 feet away from the receiver unit. This approach simplifies troubleshooting and adjustments by minimizing distance or interference issues.

Once the setup is complete and all functions are verified, return to this section for outdoor mounting. If any issues arise after mounting outdoors, they are most likely caused by distance, obstacles, or environmental interference.

7.1.5.2 Warnings and Cautions

- Any metal object may attract a lightning strike, including your weather station mounting pole. Never install the weather station in a storm.
- If you are mounting the weather station to a house or structure, consult a licensed electrician for proper grounding. A direct lightning strike to a metal pole can damage or destroy your home.
- Installing your weather station in a high location may result in injury or death. Perform as much of the initial check out and operation on the ground and inside a building or home. Only install the weather station on a clear, dry day.



Note: Due to no grounding protection against Lightning (related ESD discharge damage).

Sensor/System damage is not covered under warranty.

7.1.5.3 Mounting

You can attach a pipe to a permanent structure and then attach the sensor package to it (Figure 18).

The U-Bolts will accommodate a pipe diameter of 1-2 inches (pipe is not included).

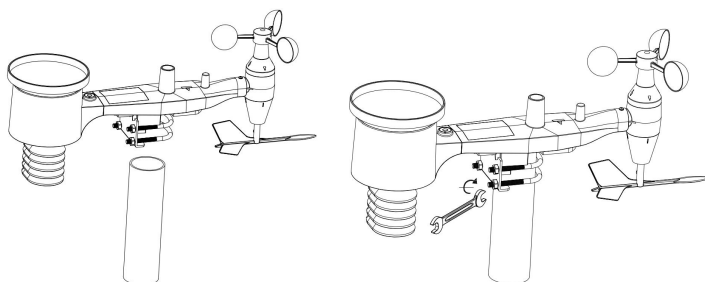


Figure 18: WS69 mounting diagram

① Ensure the mounting pipe is vertical or nearly vertical

Use a level if necessary.

② Place the sensor package on the mounting pipe

The U-bolts should be loose enough to allow this; loosen the nuts if needed. Once positioned, hand-tighten all four nuts evenly. Do not use a wrench yet!

③ Align the entire sensor package

Now you will need to align the whole package in the proper direction by rotating it on top of the mounting pipe as needed. Locate the “WEST” arrow on top of the sensor package near the light sensor, opposite the solar panel. Rotate the sensor until this arrow points due west. Using a compass (most smartphones have one) is helpful for accuracy. Once correctly oriented, lightly tighten the bolts with a wrench to prevent further rotation.

Note: Pointing the sensor west serves two purposes:

- A. It positions the solar panel and light sensor optimally for solar radiation measurement and capacitor charging. It aligns the zero reading of wind direction to due north, as customary in the Northern Hemisphere.
- B. If installing in the Southern Hemisphere, the “WEST” arrow should point due east instead. This will cause the wind direction zero reading to point south, which must be corrected by applying a 180-degree offset in calibration settings (see the Calibration section).

④ Check the bubble level

The bubble should be fully inside the red circle. If not, wind direction, speed, and rain measurements may be inaccurate. Adjust the mounting pipe as necessary. If adjustment is limited

and the bubble is close but not inside the circle, consider using small wooden or cardboard shims between the sensor package and the mounting pipe top. This may require loosening bolts and some trial and error.

⑤ Final step

Re-check the westward orientation, then tighten the bolts with a wrench. Do not overtighten, but ensure the sensor package is secure enough to withstand strong wind and rain.

Note:

If you tested the full assembly indoors before mounting outdoors, transport and handling may have triggered the rain sensing bucket, causing the receiver to register false rainfall. Use PC software to clear the history to avoid false weather data reporting.

7.1.6 Reset Button and Transmitter LED

If the sensor array is not transmitting, reset the sensor array.

- Using a bent-open paperclip, press and hold the RESET BUTTON (see Figure 19) to perform a reset: the LED will turn on while the RESET button is pressed, then you can release it. The LED should then return to normal, flashing approximately once every 16 seconds.

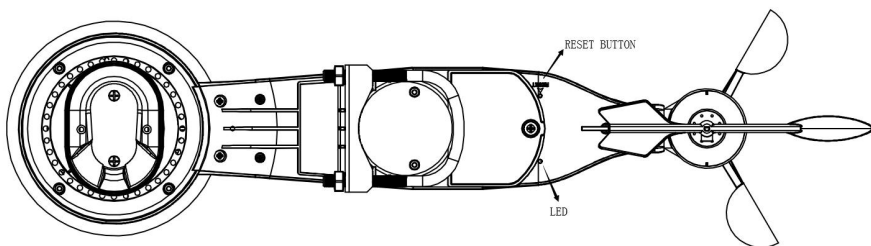


Figure 19: Reset button and Transmitter LED location

- ❖ The WS69 sensor array has a separate user manual. Please refer to the specific manual if needed.

7.2 Indoor Sensor Set Up

7.2.1 Power On the Sensor

- To avoid permanent damage, make sure to observe the correct battery polarity before inserting the batteries. Refer to Figure 20: from left to right, the left-most (or bottom) battery should be inserted with the positive (+) terminal facing down, and the other battery with the positive (+) terminal facing up.

Steps:

- ① Remove the battery cover on the back of the sensor by sliding it in the direction of the arrow.
- ② Insert two AA batteries(not included) as described above.
- ③ Reattach the battery cover by sliding it back into place in the opposite direction until it clicks and locks securely.
- ④ After powering on, the LCD screen will immediately display the Sensor ID of this device. Under normal conditions, the sensor will be automatically recognized by the gateway once it is powered on. If the gateway does not receive the signal, try moving the sensor closer to the gateway or manually enter the Sensor ID (see Section 4.2.1.6) .

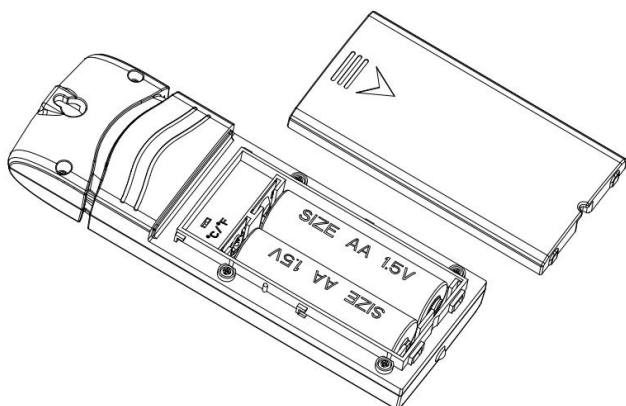


Figure 20: Indoor sensor battery installation

- ✧ **Temperature Units:** To change the transmitter display units of temperature measure (°F vs. °C), change Dip Switch °C/°F, as referenced in Figure 20.

7.2.2 Sensor Placement

The ideal location for mounting the indoor sensor is one that never receives direct sunlight, not even through windows. Avoid installing the sensor near radiant heat sources such as radiators, heaters, or appliances, as both sunlight and heat can lead to inaccurate temperature readings.

While the sensor is designed to monitor indoor conditions for display on the console, it can also be used as a secondary outdoor sensor if desired. The unit is weatherproof, but for best performance, follow the placement guidelines above and install it under cover (such as under an eave, awning, or other shelter) to protect it from direct exposure to rain and sun.

➤ Mounting Instructions:

To mount or hang the unit on a wall or wooden beam:

- Use a screw or nail to mount the sensor directly (see left side of Figure 21), or hang the sensor using a string or wire (see right side of Figure 21).

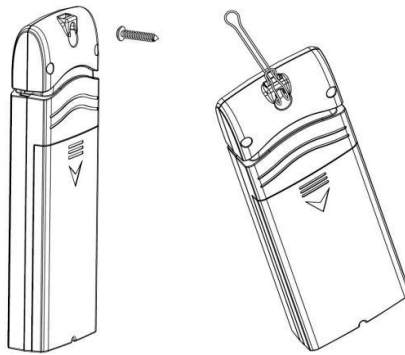


Figure 21: Indoor sensor mounting

Note:

Always mount the sensor **vertically**, not flat on a surface. Proper orientation ensures optimal wireless signal reception.

- Wireless performance may be affected by:
 - Distance
 - Interference from other devices (e.g., wireless routers, phones, TVs, monitors, or other weather stations)
 - Obstacles, such as walls, metal siding, or large appliances
Radio signals typically cannot penetrate solid metal or earth, such as through metal walls or down a hillside. Adjust placement if needed to ensure reliable transmission.

7.2.2 Practices for Wireless Communication

Wireless (RF) communication is susceptible to interference, distance, walls and metal barriers. We recommend the following best practices for trouble free wireless communication between both sensor packages and the gateway:

① **Indoor Sensor Placement.** For optimal signal strength, mount or hang the indoor sensor vertically. Do not place it flat on a surface, as this will reduce transmission range.

② **Electromagnetic Interference (EMI).**Keep the gateway at least several feet away from sources of electromagnetic interference, such as computer monitors and televisions.

③ **Radio Frequency Interference (RFI).**If other devices operating on the same frequency band (433.92 MHz) cause intermittent communication between the sensor package and console, try temporarily turning off those devices to troubleshoot.

To resolve persistent interference, consider relocating the transmitters or receivers to restore stable communication.

④ **Line-of-Sight Range.**This device has a line-of-sight communication range of up to 300 feet under ideal conditions (no walls or interference). In typical indoor environments (e.g., one or two walls), expect a range of about 100 feet.

⑤ **Metal Barriers.**Radio signals cannot pass through metal surfaces such as aluminum siding or metal-framed walls. If you experience signal issues near such barriers, reposition the sensor package or console to bypass the obstruction.

The following table shows different transmission media and expected signal strength reductions. Each “wall” or obstruction decreases the transmission range by the factor shown below.

Medium	RF Signal Strength Reductio
Glass (untreated)	5-15%
Plastics	10-15%
Wood	10-40%
Brick	10-40%
Concrete	40-80%
Metal	90-100%

Table 11: RF Signal Strength reduction

7.3 Mounting the Solar Panel

Mounting steps:

- ① Use a screwdriver to assemble the metal holder on back of solar panel as shown in Figure 22.

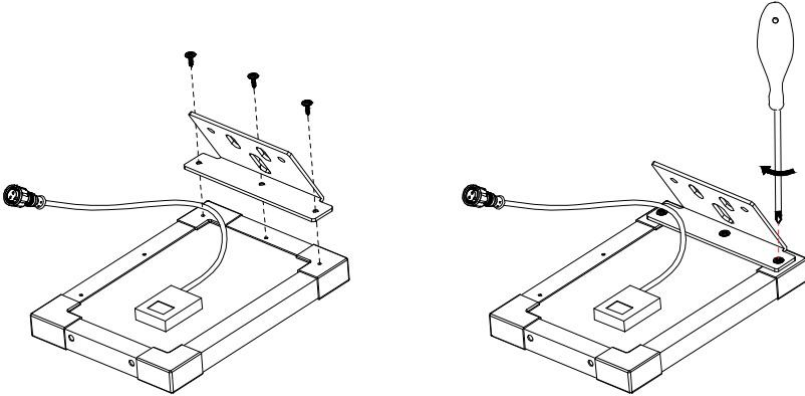
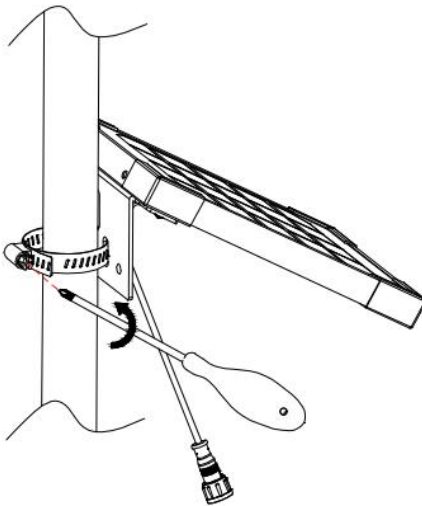


Figure 22

- ② There are 2 slots on the metal holder for steel loop. Attach the loop to the metal holder and make sure solar panel unit face sunlight as shown in Figure 23.



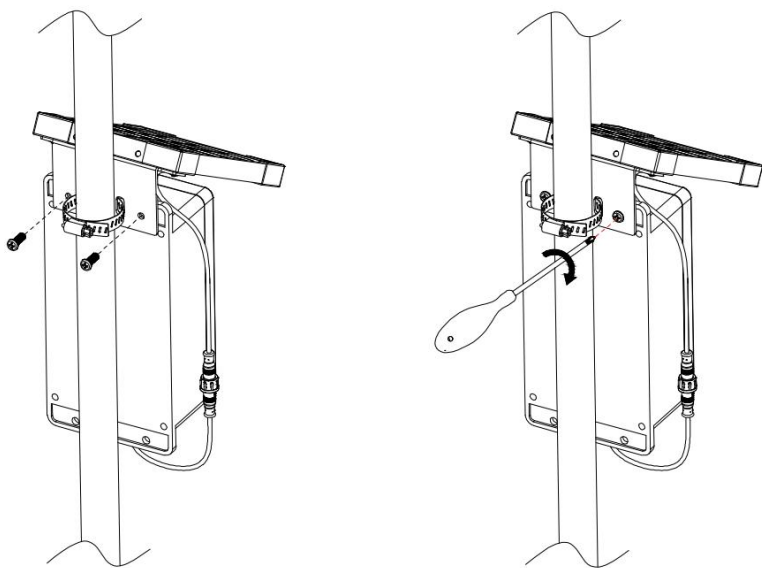


Figure 23

- ③ Connecting the solar panel to the gateway. The 5 meter extending cable is for option to extend the distance.

When it happened that one solar panel is not supplying enough energy to charge up the battery, an extension power cord and extra solar panel can be mounted so that two or even more solar panels to be sued to charge up the system. The splitter cable and extra solar panel can be purchased on shop.ecowitt.com.

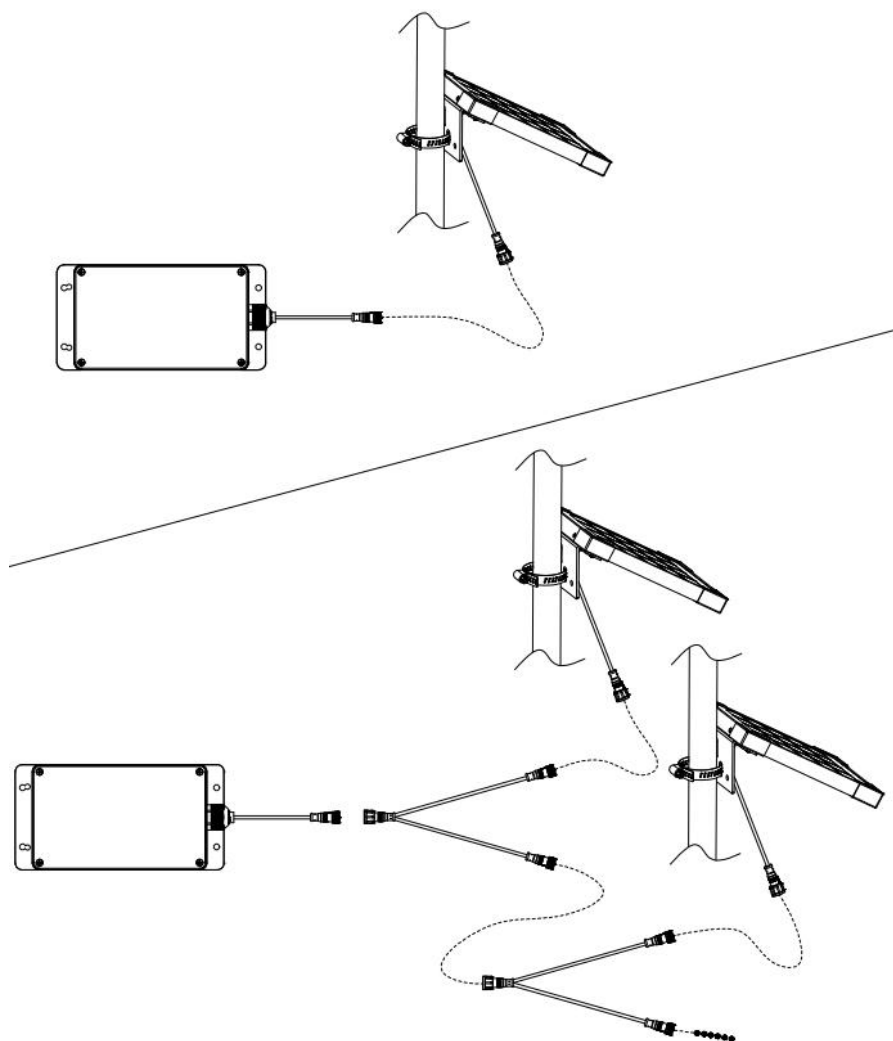


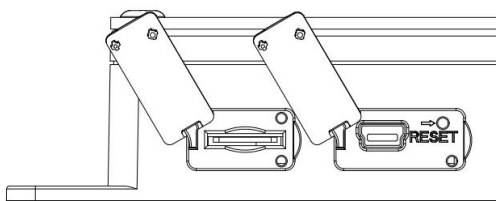
Figure 24

7.4 Check Device Operating Status

(1) All LED lights will be light up after power on.

- Cellular network indicator: Once the device is establishing the connection to internet, it will turn on and flash. The flash indicating data is uploading to website in a certain interval. (Set up on PC software).

- Quick flash in every 2 seconds means failure deliver. Please check the network availability or the battery.
 - RF Data collecting indicator: It will flash when receive data from outdoor sensor or indoor sensor.
 - Quick flash in every 2 seconds means failure communication between indoor/outdoor sensor and receiver unit. Please check weather station and re-establish the RF communication.
 - Power indicator: It flashes every 3 seconds during working. Stop flashing means power failure. Please check battery.
- (2) Time and date will be synchronized with internet after start up.
- (3) Open the rubber seal on there is a RESET button beside the USB interface. Use a clipper pin to push and trigger a complete reset.



8 Features

Receive the following weather data from outdoor integrated sensor:

- Indoor/Outdoor temperature and humidity
- Wind speed, gust speed, and wind direction
- Absolute and Relative barometric pressure
- Rainfall rate and totals for day, week, month, year and life-time total
- Calculated wind chill, dew point and heat index
- Solar light intensity and UV index
- Selectable display units for each sensor: °C or °F (temperature); mph, km/h, m/s, knots or Beaufort (wind speed); inHg, hPa or mmHg (pressure); in or mm (rainfall); lux, fc or w/m² (solar lighting)
- Maximum and minimum values for sensors
- High/low alarm options for sensors
- Can be configured with WH41 PM 2.5 air quality sensor and WH51 soil

moisture sensor (all sold separately)

- Data preserved during battery change
- Setup PC software (USB connection)
- Send alarm message to mobile by SMS
- The data saved as CSV file on the SD card
- Transmission span time is programmable by user from 0 or 10minute to 24hour (0 is not send the data via cellular network)
- Pushes sensor data to cloud weather services:
 - ecowitt.net
 - wunderground.com
 - weathercloud.net
 - www.metoffice.gov.uk
- Custom sites using Wunderground protocol
- Data storage service on Ecowitt server: ecowitt.net
- Stores data for past six months at 5-minute intervals
- Stores data for past year at 30-minute intervals

9. 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 any time.

9.1 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/Sensor:
Outdoor temperature priority: WS80>WS69(WN67)
Traditional rainfall Priority: WH40>WS69(WN67)
Solar: WS80>WS69

9.2 Supported 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 (the frequency is different for various countries because of regulations)

Note:

1. Max QTY of the following table 12 means the maximum number of different sensors that can be connected to the WS6006 gateway.
2. Only one sensor (WN31/WN31_EP/WN30/WN36) among these four types is supported by the gateway at a time.
3. Only one sensor array (WS69 or WN67) between the two types is supported by the gateway at a time.

Sensor Model	Max QTY	Picture	Functions
WS69	1		Outdoor,temperature&humidity, light, UV, wind speed/direction, rainfall
WN67			Outdoor,temperature&humidity, wind speed/direction, rainfall
WS80	1		Outdoor,temperature&humidity, light, UV, wind speed/direction
WH40/WH40H	1		Rainfall
WH51	1		Soil moisture
WH51L			Soil moisture
WH41	1		PM2.5
WN34L/S/D	1		Temperature
WN35	1		Leaf wetness

WN31	1		Temperature and humidity
WN31_EP			Temperature and Humidity
WN30			Temperature
WN36			Pool temperature

Table 12: Supported Sensors

10. Specification

10.1 Outdoor Sensor Array

Item		Specification
Model		WS69 Outdoor Sensor Array
Dimensions		475×118×207(mm)
Weight		634g
Material of Plastic Casing		PC+ABS
Temperature Range	Metering	-40° C to 60° C (-40°F to 140°F)
Temperature Accuracy	Metering	±1° C (± 1.8° F)

Temperature Resolution	Metering	0.1° C (0.2° F)
Humidity Metering Range		1%RH to 99%RH
Humidity Accuracy	Metering	± 5%RH
Humidity Resolution	Metering	1%RH
Rainfall Metering Range		0mm to 9999mm
Rainfall Metering Accuracy		± 10%
Rainfall Resolution	Metering	0.3 mm (for volume < 1,000 mm); 1 mm (for volume ≥ 1,000 mm)
Wind speed Metering Range		0 to 80 m/s
Wind speed Accuracy	Metering	± 1 m/s (speed < 10 m/s) ± 10% (speed ≥ 10 m/s)
Wind speed Resolution	Metering	0.1m/s
Wind Metering Interval		2s
Gust wind speed		Maximum wind speed recorded in the past 16 seconds
Wind direction Metering Range		0° to 359°
Wind direction Accuracy	Metering	± 15°
Wind direction Resolution	Metering	1°
Light Metering Range		0Klux to 200Klux
Light Metering Accuracy		± 25%
Light Metering Resolution		0.1Klux
UV Metering Range		1 to 15
UV Metering Accuracy		± 2

UV Metering Resolution	1
Data reporting Interval	About 16 seconds
Air pressure range	300 – 1100 hPa (8.85 – 32.5 inHg)
Air pressure accuracy	±3 hPa (within the range of 700 – 1100 hPa)
Air pressure resolution	0.1 hPa (0.01 inHg)
RF Connection Frequency	920/915/868/433MHz (depending on local regulations)
RF Wireless Range (in open areas)	Over 100 meters (328 ft.)
Temperature Range	-40°C - 60°C (-40°F - 140°F)
Protection Rating	IP44
Built-in Solar panel	6.5V/60mA
Power Supply	2*AA batteries(not included)
Battery Life	2 years

Table 13: Outdoor Sensor Array Specification

10.2 Indoor Sensor

Item	Specification
Model	WN31C1 Indoor Sensor
Dimensions	122×42×18 (mm)
Screen Size	22×26 (mm)
Weight	45g
Material of Plastic Casing	ABS
Measuring interval	61 seconds

Temperature range	-40°C - 60°C (-40°F - 140°F)
Temperature resolution	0.1°C (0.2°F)
Relative humidity range	1% ~ 99%
Humidity resolution	1%
Power Supply	2*AA batteries(not included)

Table 14: Indoor Sensor Specification

10.3 Gateway

Item	Specification
Model	WS6006_C gateway
Dimensions	240×121×76(mm)
Material of Plastic Casing	PC+ABS
Weight	747.8g
Protection Rating	IP65

Table 15: Gateway Specification

10.4 Solar Panel

Item	Specification
Name	Solar Panel
Dimensions	195 × 140 ×19(mm)
Weight	343.0g
Electrical Characteristics	Voc: 6.2V Isc: 500mA

11.Troubleshooting Guide

Problem	Solution
Outdoor data not transmitted.	The outdoor sensor array may have initiated properly and the data is registered by the console as invalid, and the console must be reset. Press the reset button as described in Section 7.1.6. Take out the batteries and wait one minute, while covering the solar panel to drain the voltage. Put batteries back in and resync the console with the sensor array about 10 feet away. The LED next to the battery compartment will flash every 16 seconds. If the LED is not flashing every 16 seconds... Replace the batteries in the outside sensor array. If the batteries were recently replaced, check the polarity. If the sensor is flashing every 16 seconds, proceed to the next step. There may be a temporary loss of communication due to reception loss related to interference or other location factors, or the batteries may have been changed in the sensor array and the console has not been reset. The solution may be as simple as powering down and up the console (remove AC power and batteries, wait 10 seconds, and reinsert AC power and batteries).
Temperature sensor reads too high in the day time.	Make certain that the sensor array is not too close to heat generating sources or strictures, such as buildings, pavement, walls or air conditioning units. Use the calibration feature to offset installation issues related to radiant heat sources.
Relative pressure does not agree with official reporting station	You may be viewing the absolute pressure, not the relative pressure. Select the relative pressure. Make sure you properly calibrate the sensor to an official local weather station.
Rain gauge reports rain when it is not raining	An unstable mounting solution (sway in the mounting pole) may result in the tipping bucket incorrectly incrementing rainfall. Make sure you have a stable, level mounting solution.

Data not reporting to Wunderground.com	1. Confirm your password or key is correct. It is the password you registered on Wunderground.com. Your Wunderground.com password cannot begin with a non-alphanumeric character (a limitation of Wunderground.com, not the station). Example, \$oewkrf is not a valid password, but oewkrf\$ is valid. 2. Confirm your station ID is correct. The station ID is all caps, and the most common issue is substituting an O for a 0 (or visa versa). Example, KAZPHOEN11, not KAZPH0EN11 3. Make sure the date and time is correct on the PC software. If incorrect, you may be reporting old data, not real time data. 4. Check your router firewall settings. The console sends data via Port 80.
---	--

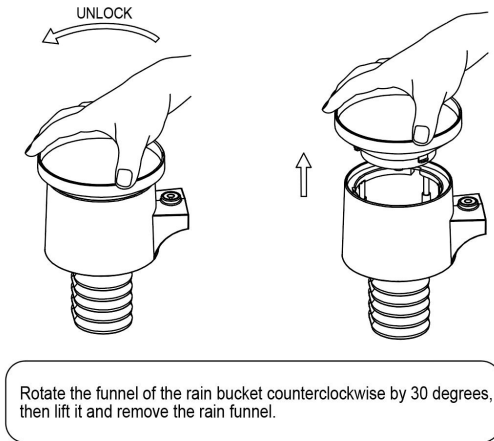
Table 16

12. Maintenance

12.1 Clean Rain Gauge

- ✓ Check the rain gauge every 3 months. Please refer to the Figure 25 to disassemble and install the rain gauge. Clean the funnel and bucket with a damp cloth to remove any dirt, debris and insects. Spray the array lightly with insecticide, if there's a bug infestation.

1) Rain Funnel Disassembly Diagram:



2) Rain Funnel Installation Diagram:



1. Align the hook of the rain funnel with the groove of the rain bucket and place it downwards into the rain bucket.



2. Rotate the rain funnel clockwise until it stops (approximately 30 degrees), accompanied by a clicking sound.

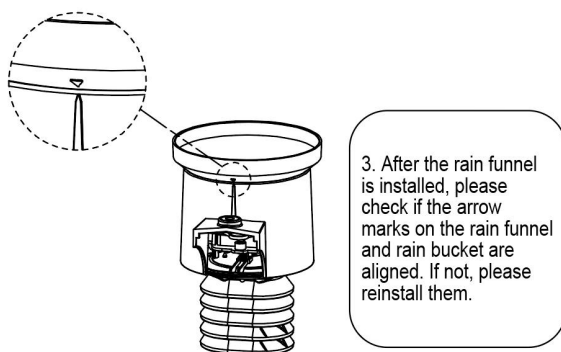


Figure 25

- ✓ Clean the solar radiation sensor and solar panel every 3 months with a non-abrasive slightly damp cloth.
 - ✓ Replace batteries every 1-2 years.
- If left in too long, the batteries may leak due to environmental challenges. In harsh environments, inspect the batteries every 3 months (while cleaning the solar panel).
- ✓ When replacing the batteries, apply a corrosion preventing compound on the battery terminals, available at Amazon and most hardware stores.
 - ✓ In snowy environments, spray the top of the weather station with anti-icing silicon spray to prevent snow build up.

12.2 Clean Solar Radiation Sensor and Solar Panel

The solar radiation sensor and solar panel of the outdoor sensor array need to be cleaned with a non-abrasive slightly damp cloth every 3 months.

12.3 To Prevent Snow build up

In snowy days, use anti-icing silicon spray on the top of the weather station to prevent snow build up.

13. Warranty Information

We disclaim 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.

Manufacture: 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. Contact Us

15.1 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.

15.2 Stay in Touch

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



Copyright © 2025 ecowitt All Rights Reserved. DC101325