Weather Station (Transmitter)

Operation Manual

FCC ID: WA5WS69CN

OVERVIEW

Introduction

Thank you for your purchasing this professional weather station. This device is working based on / network. It can be configured to send data to a specified server by so that users can run remote monitoring of weather condition.

This manual will guide you step-by-step through setting up your device. Use this manual to become familiar with your professional weather station, and save it for future reference.

The device can measure the below weather data and transmit them to web:www.wunderground.com by network.

1. **Wind direction**
2. **Wind speed**
3. **Solar radiation rate**
4. **UV index**
5. **Absolute pressure**
6. **Relative pressure**
7. **Gust**
8. **Indoor Temperature**
9. **Indoor Humidity**
10. **Outdoor Temperature**
11. **Outdoor Humidity**
12. **Dew point**
13. **Rain fall**

Package Content:

It includes a receiver built in WCDMA module, an Y shaped outdoor sensor, an indoor temperature & humidity sensor and a solar panel. Below please find the package content:

QTY	Item
1	Receiver unit
4	Screws 4.8*32 &Plastic insert 7.2*36.5 for mounting receiver
1	Outdoor sensor(Thermo-hygrometer / Rain Gauge / Wind Speed & direction Sensor /Transmitter)
1	Wind Vane
1	U-bolt with mounting clamps
1	Solar panel Unit
1	Metal holder(For solar panel)
3	Screw 2.9*10mm(For solar panel)
1	Round steel mounting loop(For solar panel)
1	Indoor temperature & humidity sensor
1	USB cable
1	Zip bag for 1pc 10mm single-head wrench
1	5 meter connection cable for solar panel to connect to Receiver
1	User manual

Outdoor sensor:

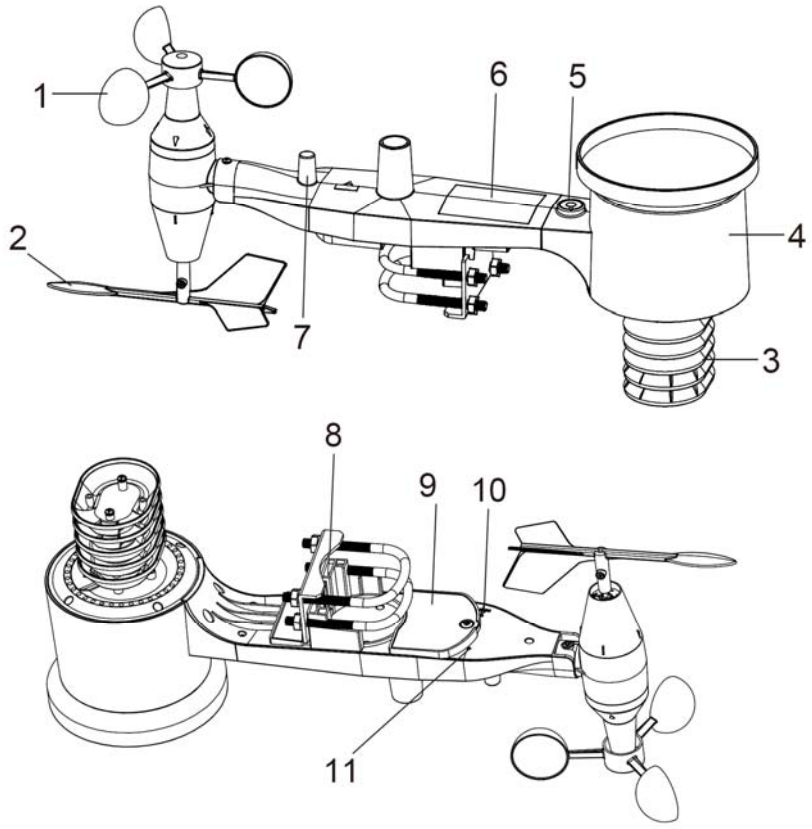
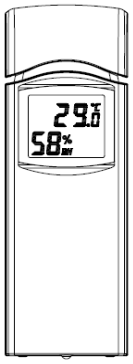


Figure 1

1. Wind Speed
2. Wind Vane
3. Thermo-hygro sensor
4. Rain collector
5. Bubble level
6. Solar panel
7. UV sensor/ Light sensor
8. U-Bolt
9. Battery compartment
10. Reset button
11. LED Indicator: light on for 4s if the unit power up. Then the LED will flash once every 16 seconds (the sensor transmission update period).

Indoor sensor:



Receiver unit

Outside

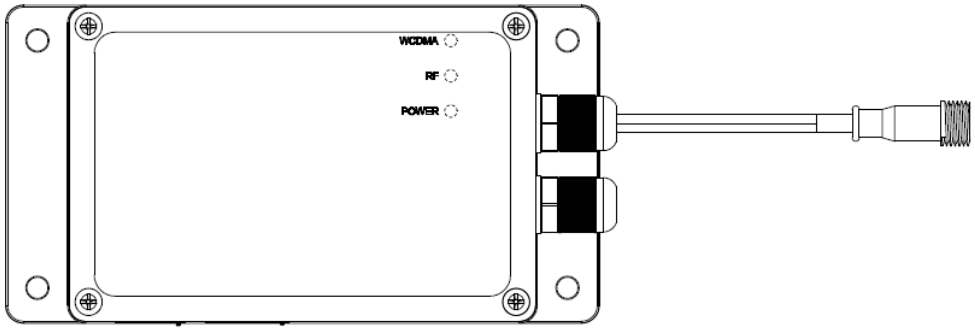


Figure 2

Inside

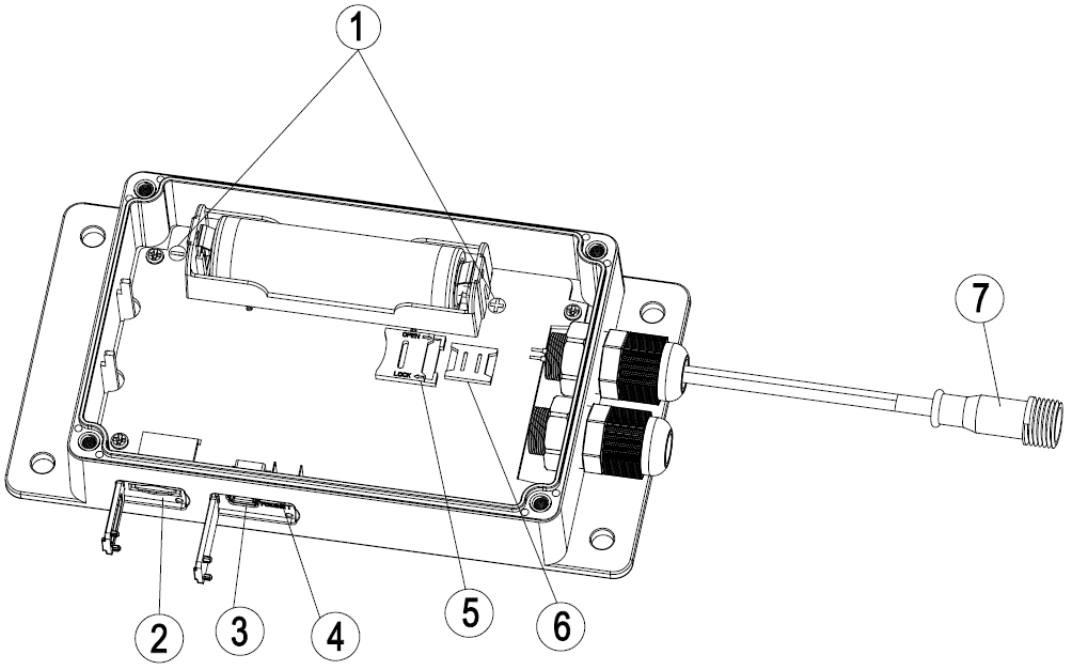


Figure 3

1. +/- electrode symbol of battery
2. TF card slot
3. USB interface
4. Reset button
5. Micro SIM card slot
6. Nano SIM card slot
7. Connector for solar power unit

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.

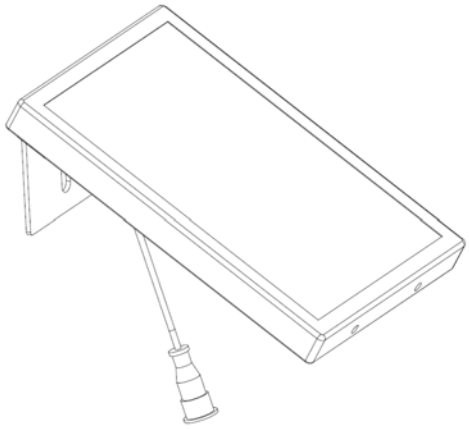
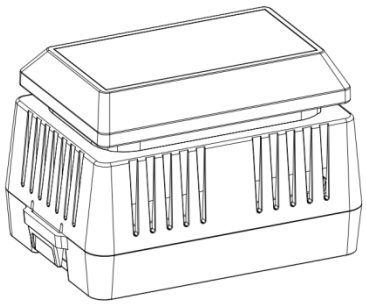


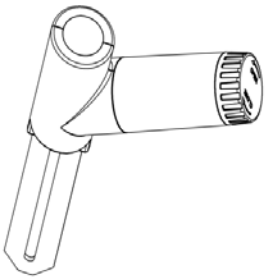
Figure 4

Optional Sensors（Purchased separately）

PM2.5/PM10 air quality sensor:



Soil Moisture Sensor:



Installation

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. (Refer to USB Configure Tool Operation part).

Outdoor unit

1. Install U-bolts and metal plate

Installation of the U-bolts, which are in turn used to mount the sensor package on a pole, requires installation of an included metal plate to receive the U-bolt ends. The metal plate, visible in Figure 5 has four holes through which the ends of the two U-Bolts will fit. The plate itself is inserted in a groove on the bottom of the unit . Note that one side of the plate has a straight edge (which goes into the groove), the other side is bent at a 90-degree angle and has a curved profile (which will end up “hugging” the mounting pole). Once the metal plate is inserted, insert both U-bolts through the respective holes of the metal plate as shown in Figure 3.

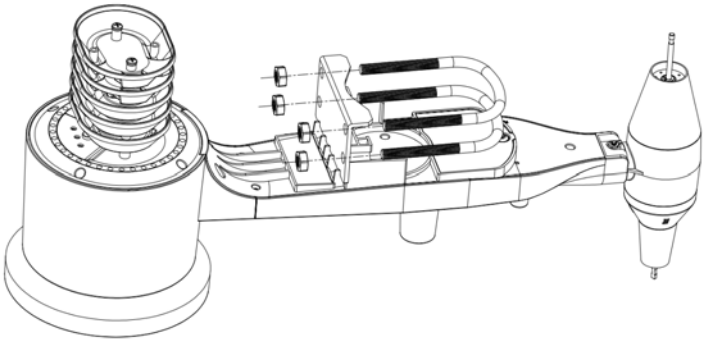


Figure 5: U-Bolt installation

Loosely screw on the nuts on the ends of the U-bolts. You will tighten these later during final mounting. Final assembly is shown in Figure 6.

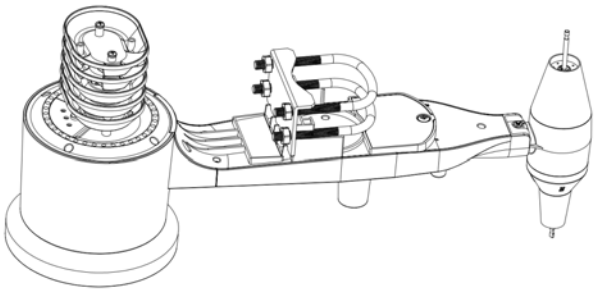


Figure 6: U-Bolts and nuts installed

The plate and U-Bolts are not yet needed at this stage but doing this now may help avoid damaging wind vane and wind speed cups later on. Handling of the sensor package with wind vane and speed cups installed to install these bolts is more difficult and more likely to lead to damage.

2. Install wind speed cups

Push the wind speed cup assembly onto the shaft on the top side of the sensor package, as shown in Figure 7 on the left side. Tighten the set screw, with a Philips screwdriver (size PH0), as shown on the right side. Make sure the cup assembly can rotate freely. There should be no noticeable friction when it is turning.

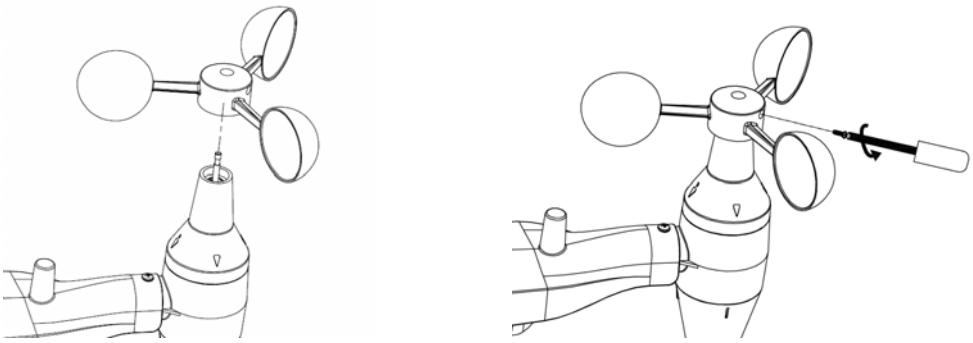


Figure 7: Wind speed cup installation diagram

3. Install wind vane

Push the wind vane onto the shaft on the opposite side of the wind cups, until it goes no further, as shown on the left side in Figure 8. Next, tighten the set screw, with a Philips screwdriver (size PH0), as shown on the right side, until the wind vane cannot be removed from the axle. Make sure the wind vane can rotate

freely. The wind vane's movement has a small amount of friction, which is helpful in providing steady wind direction measurements.

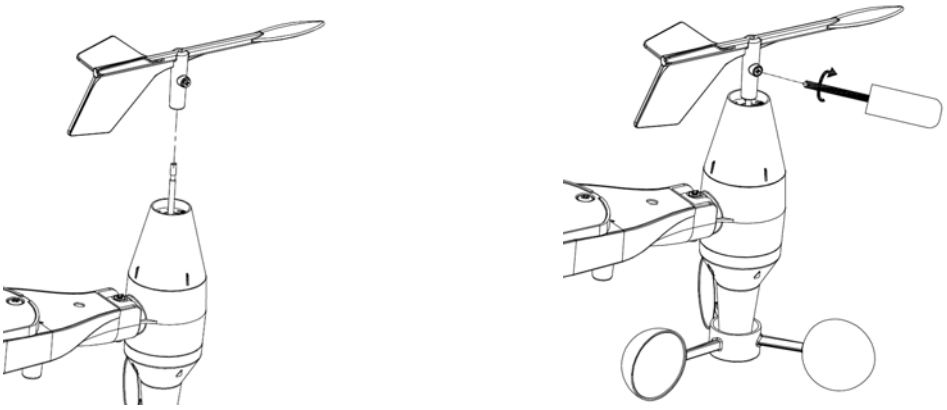


Figure 8: Wind vane installation diagram

4. Install Batteries

Open the battery compartment with a screwdriver and insert 2 AA batteries in the battery compartment. The LED indicator on the back of the sensor package will turn on for four seconds and then flash once every 48 seconds indicating sensor data transmission(the sensor transmission update period).

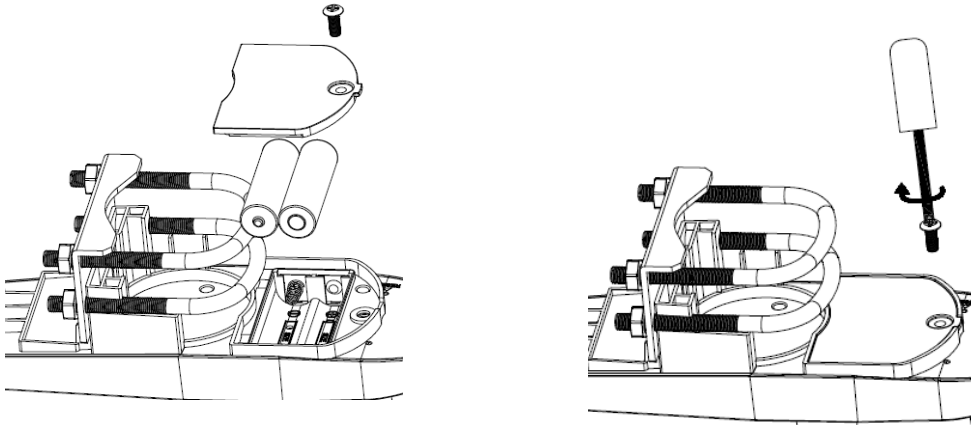


Figure 9: Battery installation diagram

Note: If LED does not light up or is on permanently, make sure the battery is inserted the correct way and inserted fully, starting over if necessary. Do not install the batteries backwards as it may permanently damage the outdoor sensor.

Note: We recommend Lithium batteries for cold weather climates, but alkaline batteries are sufficient for most climates. Rechargeable batteries have lower voltages and should never be used.

5. Mount outdoor sensor

Before you mount

Before proceeding with the outdoor mounting detailed in this section, you need to make sure the base station can receive the data from outdoor sensor, while you keep the assembled outdoor sensor package nearby (although preferably not closer than 1.5m from the console). This will make any troubleshooting and adjustments easier and avoids any distance or interference related issues from the setup.

After setup is complete and everything is working, return here for outdoor mounting. If issues show up after outdoor mounting they are almost certainly related to distance, obstacles etc.

Reference Figure 10, the mounting assembly includes two U-Bolts and a bracket that tightens around a 1 to 2" diameter pole (not included) using the four U-Bolt nuts.

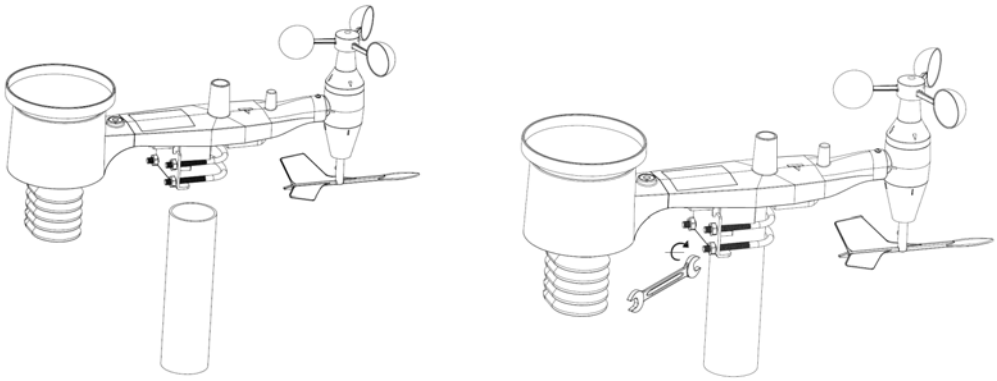


Figure 10: Sensor package mounting diagram

Note

Beside the antenna, there is an arrow icon with ”NORTH” words (Figure 11)representing the direction of north. The sensor body has to be adjusted so that the “NORTH” indication is facing to real north direction in your location. A compass device is recommended to help adjust direction. Permanent wind direction error will be introduced when the outdoor sensor is not installed in right direction.

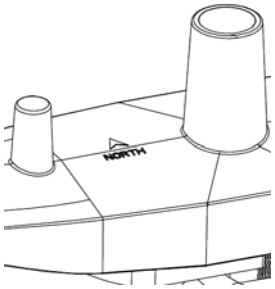


Figure 11

Now look at the bubble level. The bubble should be fully inside the red circle. If it is not, wind direction, speed, and rain readings may not operate correctly or accurately. Adjust the mounting pipe as necessary. If the bubble is close, but not quite inside the circle, and you cannot adjust the mounting pipe, you may have to experiment with small wooden or heavy cardboard shims between the sensor package and the top of the mounting pole to achieve the desired result (this will require loosening the bolts and some experimentation).

Make sure you check, and correct if necessary, the northly orientation as the final installation step, and now tighten the bolts with a wrench.

6. Reset Button and Transmitter LED

Using a bent-open paperclip, press and hold the RESET BUTTON (see Figure 12) to affect a reset: the LED turns on while the RESET button is depressed, and you can now let go. The LED should then resume as normal, flashing approximately once every 48 seconds.

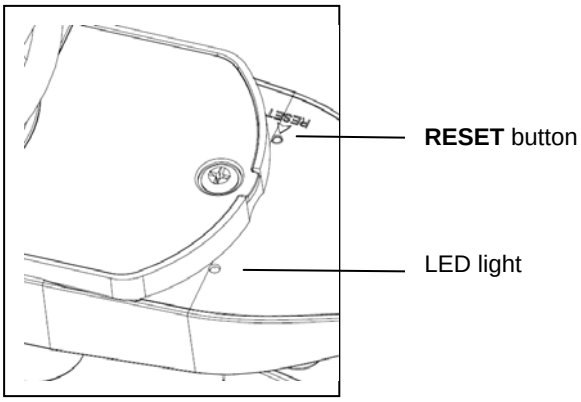


Figure 12

Indoor Sensor

Sensor Set up

Note: To avoid permanent damage, please take note of the battery polarity before inserting the batteries.

Remove the battery door on the back of the sensor. Insert two AA batteries.

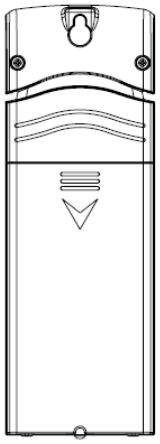


Figure 13

We recommend lithium batteries for cold weather climates, but alkaline batteries are sufficient for most climates. We do not recommend rechargeable batteries. They have lower voltages, do not operate well at wide temperature ranges, and do not last as long, resulting in poorer reception.

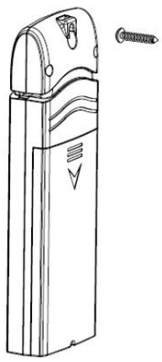
Replace the battery door. Note that the temperature and humidity will be displayed on the LCD display. Looking at the back of the unit from left to right, the polarity is (-) (+) for the top battery and (+) (-) for the bottom battery.

Sensor Placement

It is recommended you mount the remote sensor outside on a north facing wall, in a shaded area, at a height at or above the receiver. If a north facing wall is not possible, choose a shaded area, under an eve.

Direct sunlight and radiant heat sources will result in inaccurate temperature readings. Although the sensor is weatherproof, it is best to mount in a well-protected area, such as an eve.

1. Use a screw or nail to affix the remote sensor to the wall, as shown in Figure 6
2. Hang the remote sensor up on string, as shown in Figure 14.



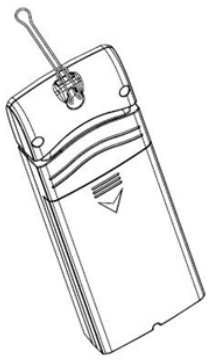


Figure 14

Note: Make sure the sensor is mounted vertically and not lying down on a flat surface. This will insure optimum reception. Wireless signals are impacted by distance, interference (other weather stations, wireless phones, wireless routers, TVs and computer monitors), and transmission barriers, such as walls. In general, wireless signals will not penetrate solid metal and earth (down a hill, for example).

Initial Receiver Unit Set Up

1. Before power on the device, please open the case (Figure 14) and use a 3G SIM card to install in one of the SIM card slots. (Figure 14).The Bigger slot is for micro SIM card and the other is for Nano SIM card.

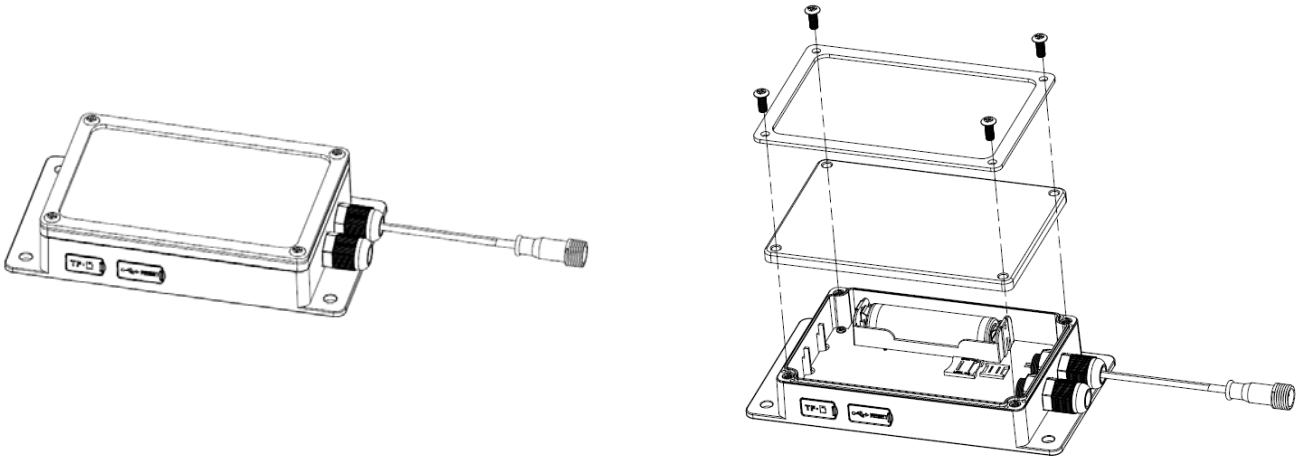


Figure 15

Micro SIM card slot: 1.Unfold the foil of Micro sim card slot 2.Put the SIM card into the compartment. 3. Cover the foil and lock the slot.

Nano SIM card slot: Insert the sim card into slot directly as shown in Figure 14.

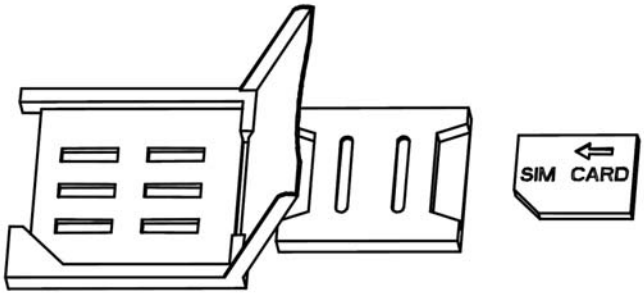


Figure 14

Note: The SIM card must support SMS and mobile data. SIM card lock must be disabled. Prepaid SIM cards are not recommended, as data will not be uploaded when you run out of credit.

Note: Please install only 1 SIM card to work.

2. Open the rubber seal on Micro SD card slot and install a Micro SD card. (Figure 15)

3. Install the supplied li-ion battery into the battery chamber. Do not install the batteries incorrect to the polarity markings. You can permanently damage the receiver. Until now the receiver is able to charge,

work and supply power to outdoor unit (Figure 15)

The battery must be full charged before you set up the receiver unit. To charge the battery, Open the rubber seal on USB interface and connect the receiver to PC or an USB charger via USB cable. Charge the battery for at least 1 hour.

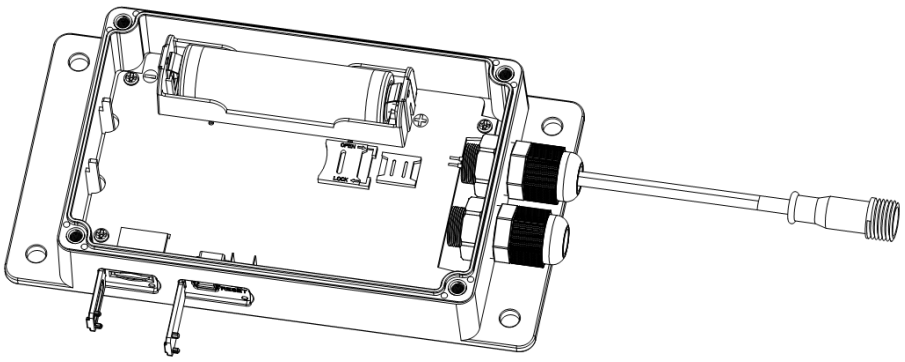


Figure 15

4. Re-assemble the receiver and fix it on wall or vertical surface with flat wooden board. Please keep the side with micro SD card slot and USB interface downward to make sure waterproof. If fix on wall directly, please use an electrical drill to bore sizeable holes and insert the plastic inserts before you mount screws.

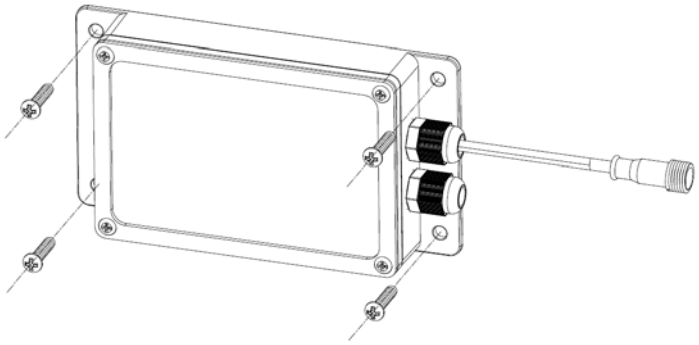


Figure 16

5. Mount the solar panel unit. Please mount it near the receiver for extending cable between solar unit and receiver is only 5 meters. There are a metal holder,3 screws and 1 steel mounting loop included for solar panel mount.

Mounting Steps:

a) Use a screw driver to assemble the metal holder on back of solar panel as shown in Figure 17.
b) There are 2 slots on the metal holder for steel loop. Attach the loop to the metal holder as shown in Figure 18.
c) Fix the loop on a mounting post and as shown in Figure 19. Make sure solar panel unit face sunlight.
d) Connecting the solar panel to receiver unit. A 5 meter extending cable is for option to extend the distance.

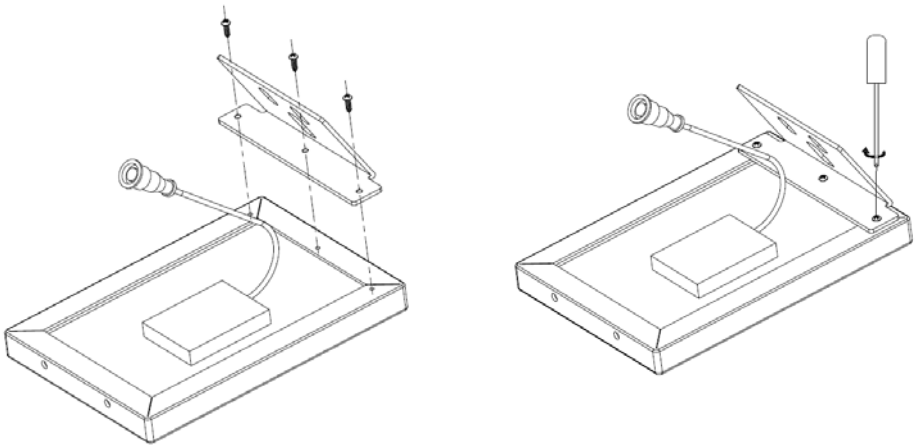


Figure 17

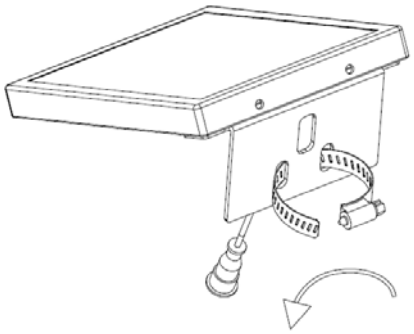


Figure 18

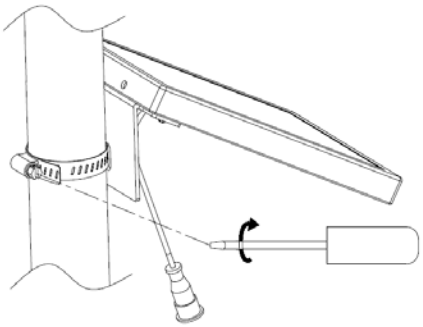


Figure 19

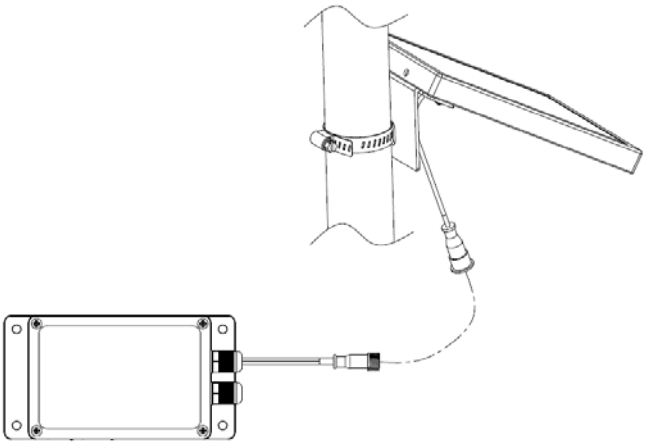
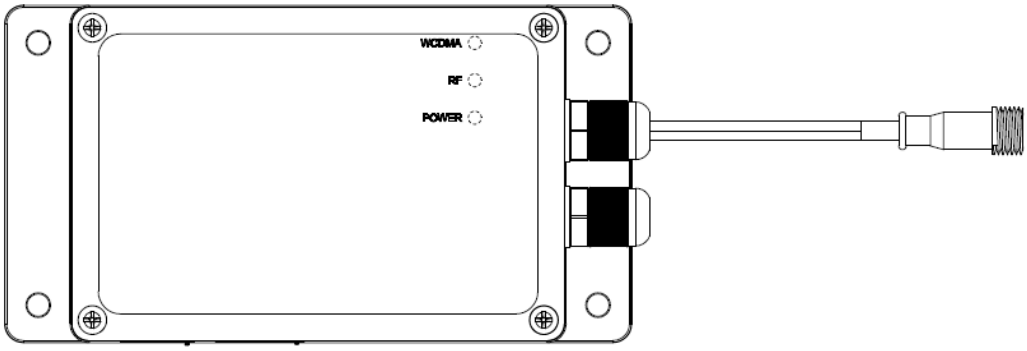


Figure 20

6. All LED lights will be light up after power on:



- 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). Receiver switches between automatically based on network availability.

  Quick flash in every 2 seconds means failure deliver. Please check the network availability or the battery.

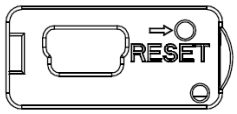
- RF Data collecting indicator: It will flash when receive data from outdoor sensor or indoor sensor.

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.

7. Time and date will be synchronized with internet after start up.
8. Open the rubber seal on there is a RESET button beside the USB interface. Use a pen to click it can reset the receiver unit.



USB Configure Tool Operation

Before using the weather station, you need to configure the settings on the PC via" **WEATHER LOGGER".** Receiver unit doesn't have to be powered on during configuring, unless you need to check current weather data and MIN/MAX records.

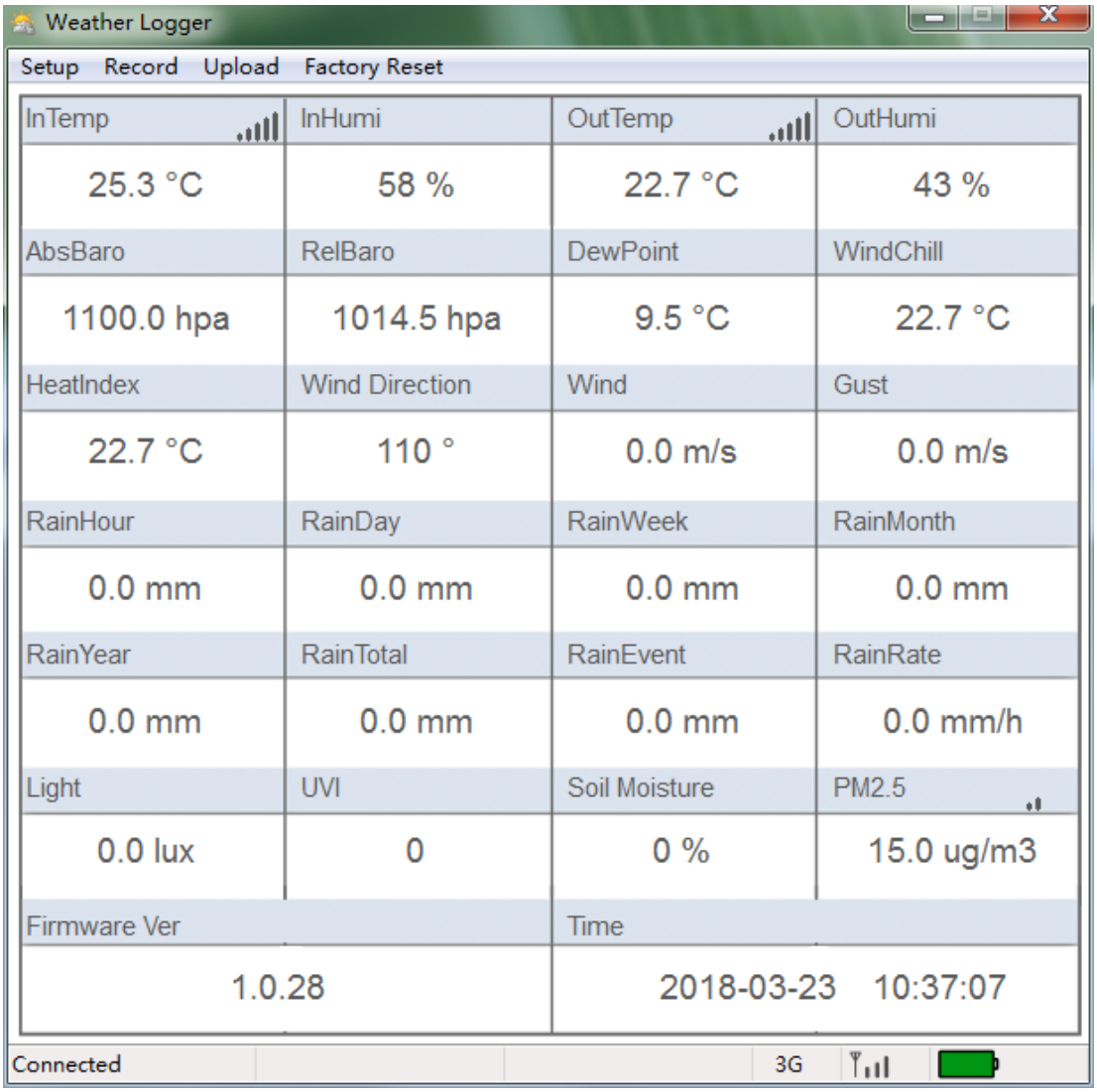
To download the latest "WEATHER LOGGER" PC software, please visit:
http://download.ecowitt.net/down/softwave?n=WeatherLogger

1. Decompress the Weather Logger file; open the Weather Logger Setup.exe to install the software.

2. Connect the receiver device to PC via an USB wire, and launch the software.

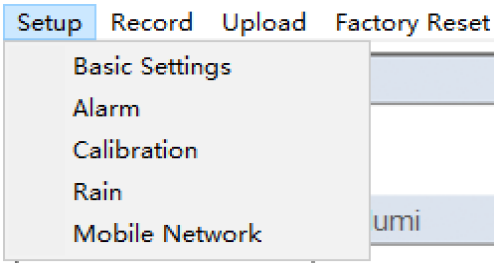
When base unit is connected to PC, it shows "USB Connected" at the bottom of screen. If no base station is connected, it shows"USB Unconnected".

All weather data will be displayed in table, if receiver grabs data from indoor sensor and outdoor sensor.



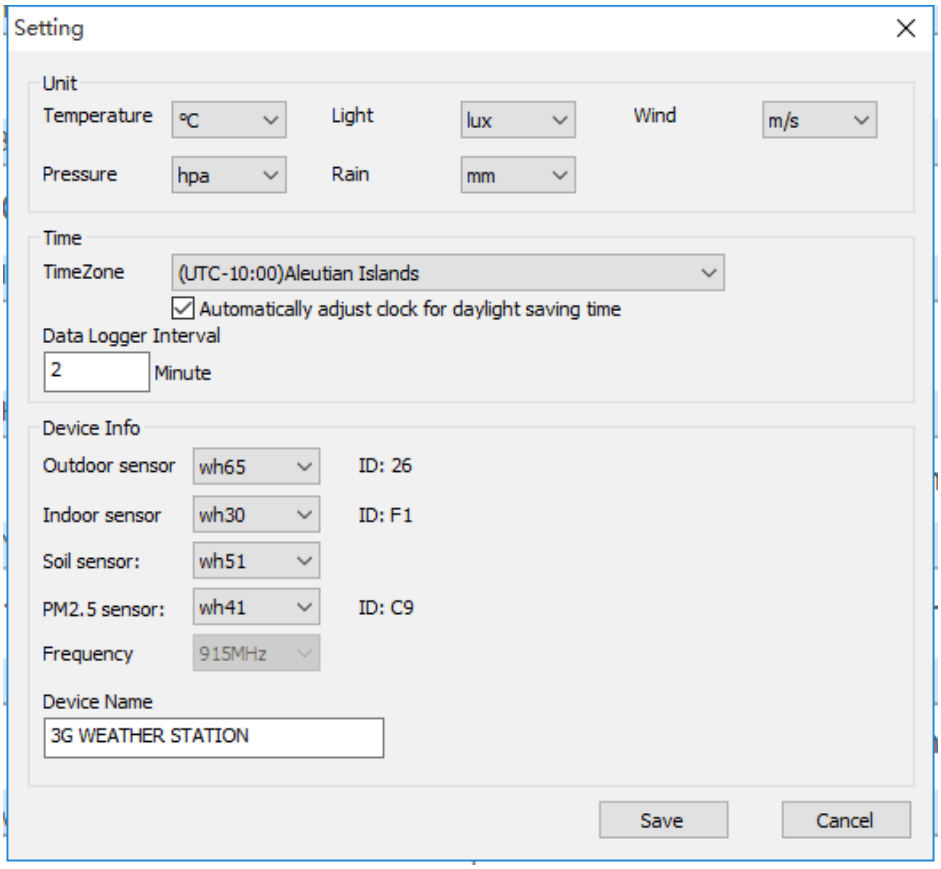
3.**Setup Menu.**

Click **Setup** menu, there are **Basic settings, Alarm, Calibration, Rain, Mobile Network** options.



3.1 Basic Settings

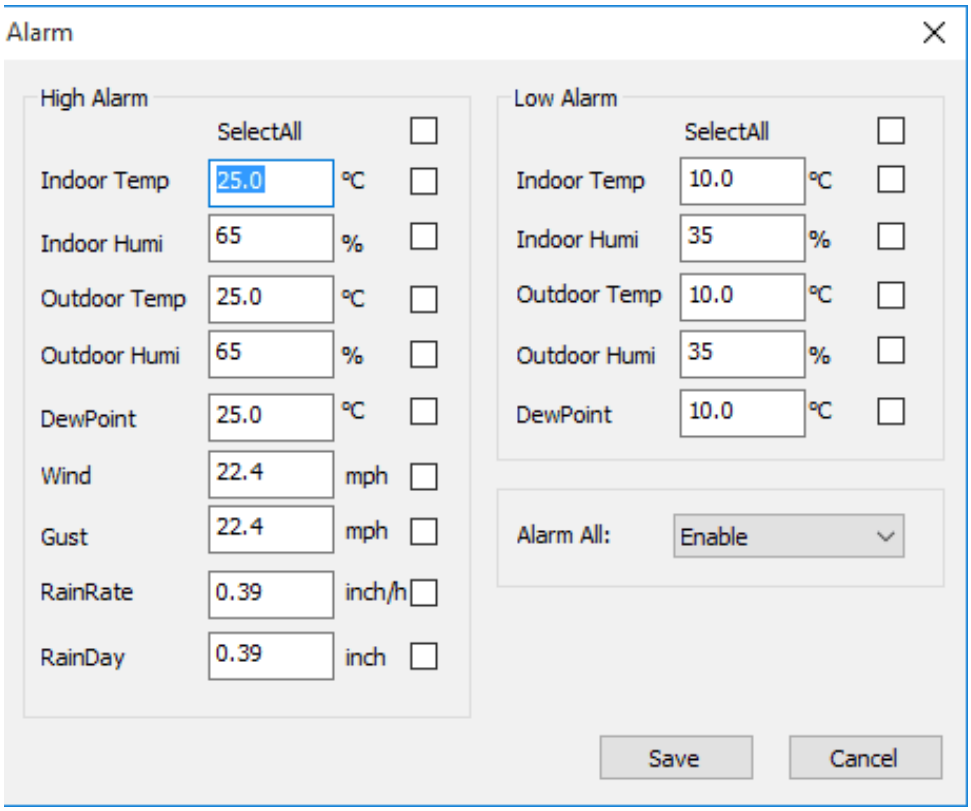
Click **Basic Settings** option to enter setting menu. Units of weather parameters, time zone, DST on/off, data logging interval can be configured here. Once you made your choice, press Save to make the setting effective.



Note: Do not configure the units from time to time. Every time some unit is changed, a new log file would be generated in the micro SD card.

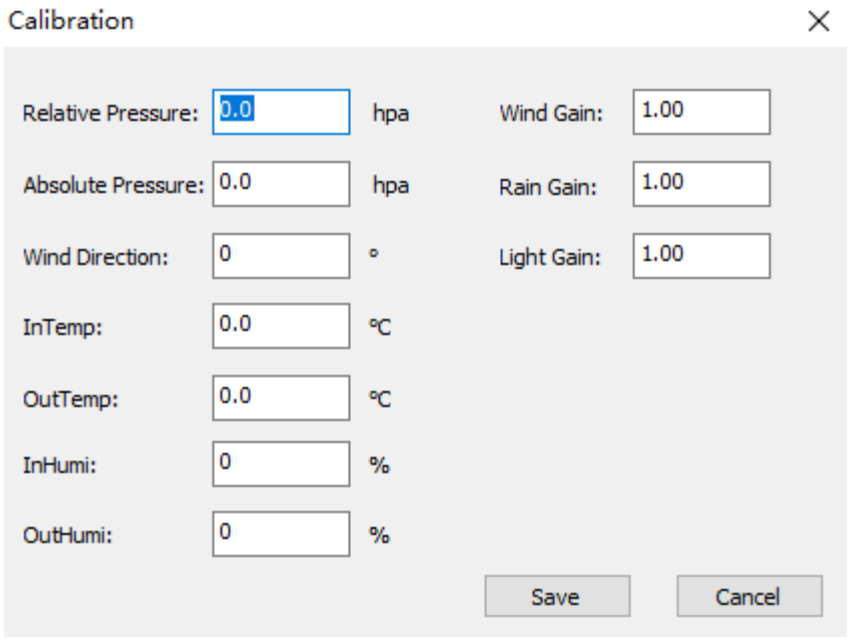
3.2 Alarm

Click **Alarm** option to enter setting menu. This section is used to set the desired time, high or low alarm value for the base unit, as well as able or disable the corresponding alarm function. Once you made your choice, choose Save to make the setting effective. If you don't want to make any change, just press Cancel and exit without change.



3.3 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.



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

(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 (969 mb) at an altitude of 1000 feet (305 m), but the relative pressure is 30.00 inHg (1016 mb).

The standard sea-level pressure is 29.92 in Hg (1013 mb). This is the average sea-level pressure around the world. Relative pressure measurements greater than 29.92 inHg (1013 mb) 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, the ground or trees).

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 ± 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 x the distance of the tallest obstruction. For example, if your house is 6m tall and you mount the sensor on a 1.5m pole:

Distance = 4 x (6 – 1.5)m = 18m.

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.

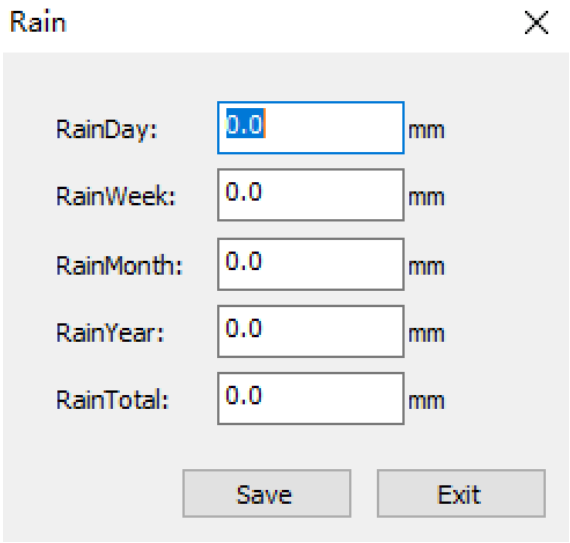
Without a calibrated source, wind speed can be difficult to measure. We recommend using a calibrated wind meter (available from Ambient Weather) and a constant speed, high speed fan.

(6) The rain collector is calibrated at the factory based on the funnel diameter. The bucket tips every 0.03 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/m^2 . 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 evapotransporation and solar panel efficiency.

3.4 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.



3.5 Mobile Network

Before you set up, please inquire SIM card carrier for APN, APN USER, APN PASSWORD information.

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

Telephone: You can set up at most 3 authorized numbers to send commands/receive alarm information.
And you need to define an ID No. for the device for identify. It can be consists of at most 20 digits or characters.

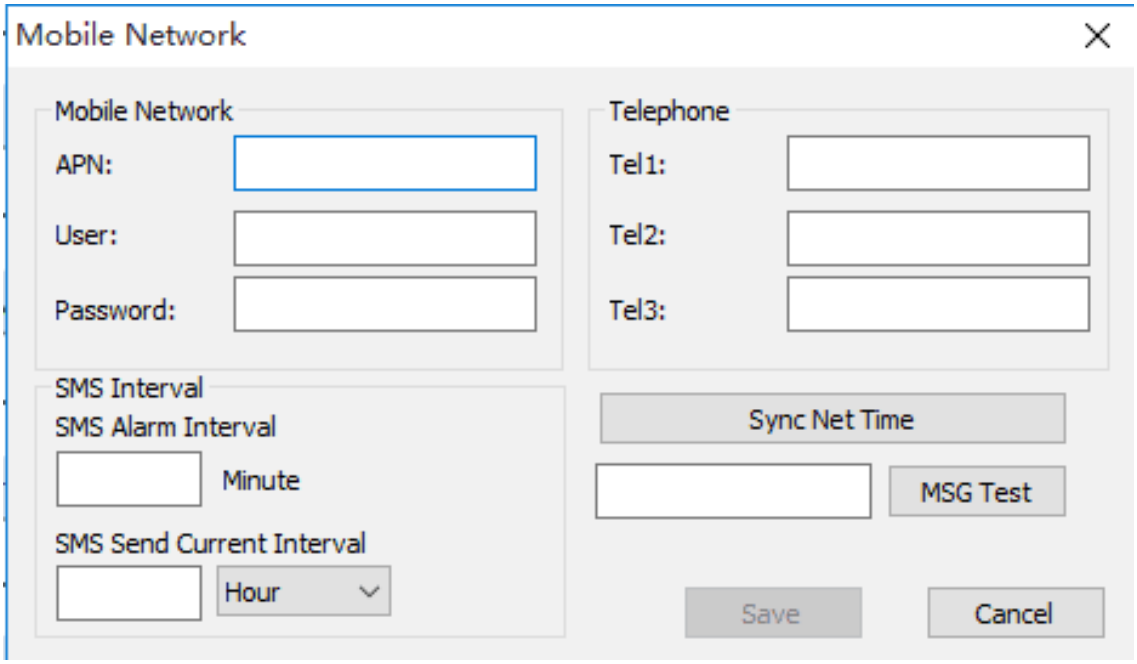
MSG Test: to send a message to test the network.

SMS Alarm Interval: the interval of sending alarm indications by SMS to authorized smart phone, ranges from 10 minutes to 120 minutes. Set up as”0” means alarm indication will not repeat.

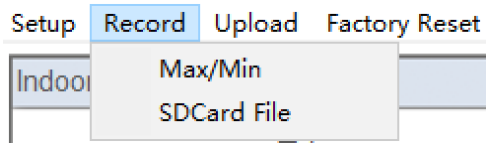
SMS send Current interval: the interval of sending real weather data to authorized smart phone, ranges from 1 minute to 24hours. Set up as"0" means real time weather data will not be sent.

Sync Net Time: Synchronize internet time on Weather Logger.

MSG Test: to send a message to test the network.



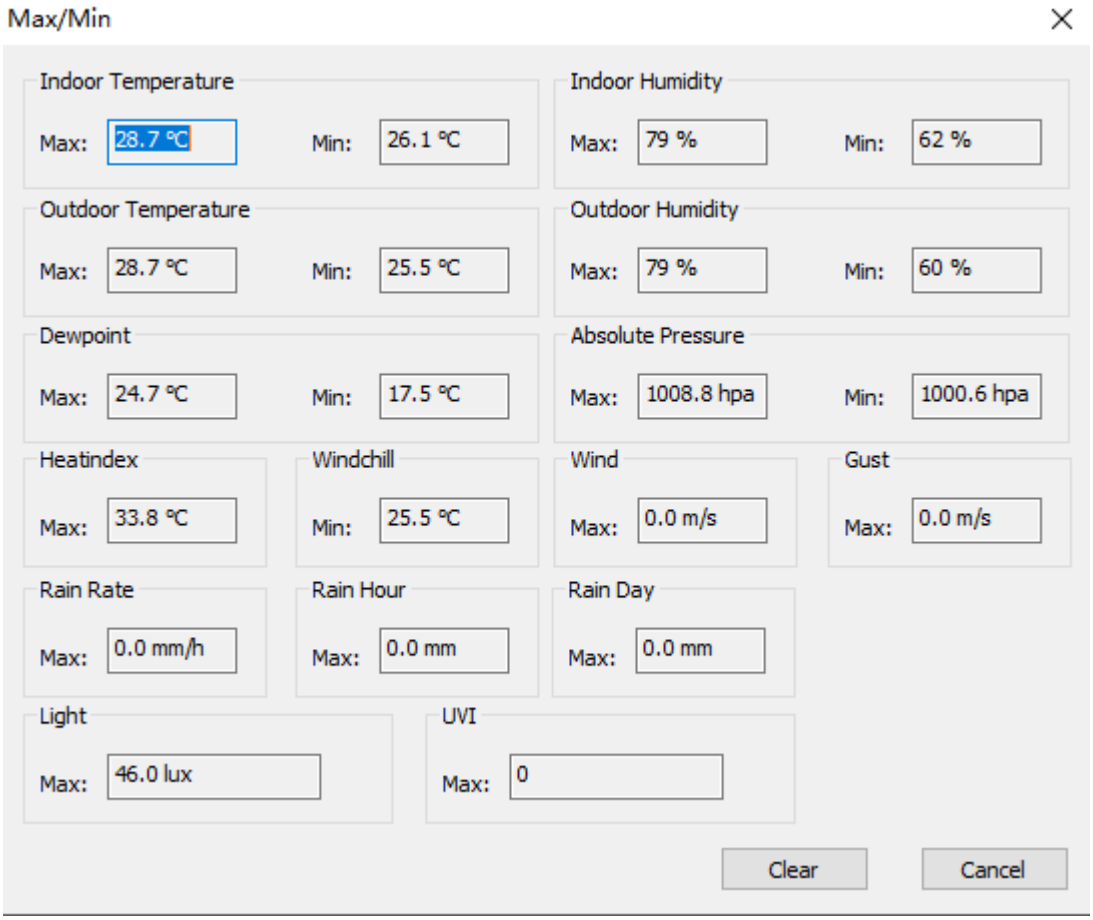
4.Record Menu



Click **Record** menu,there are **Max/Min** and **SDCard File** options.

4.1 Max/Min

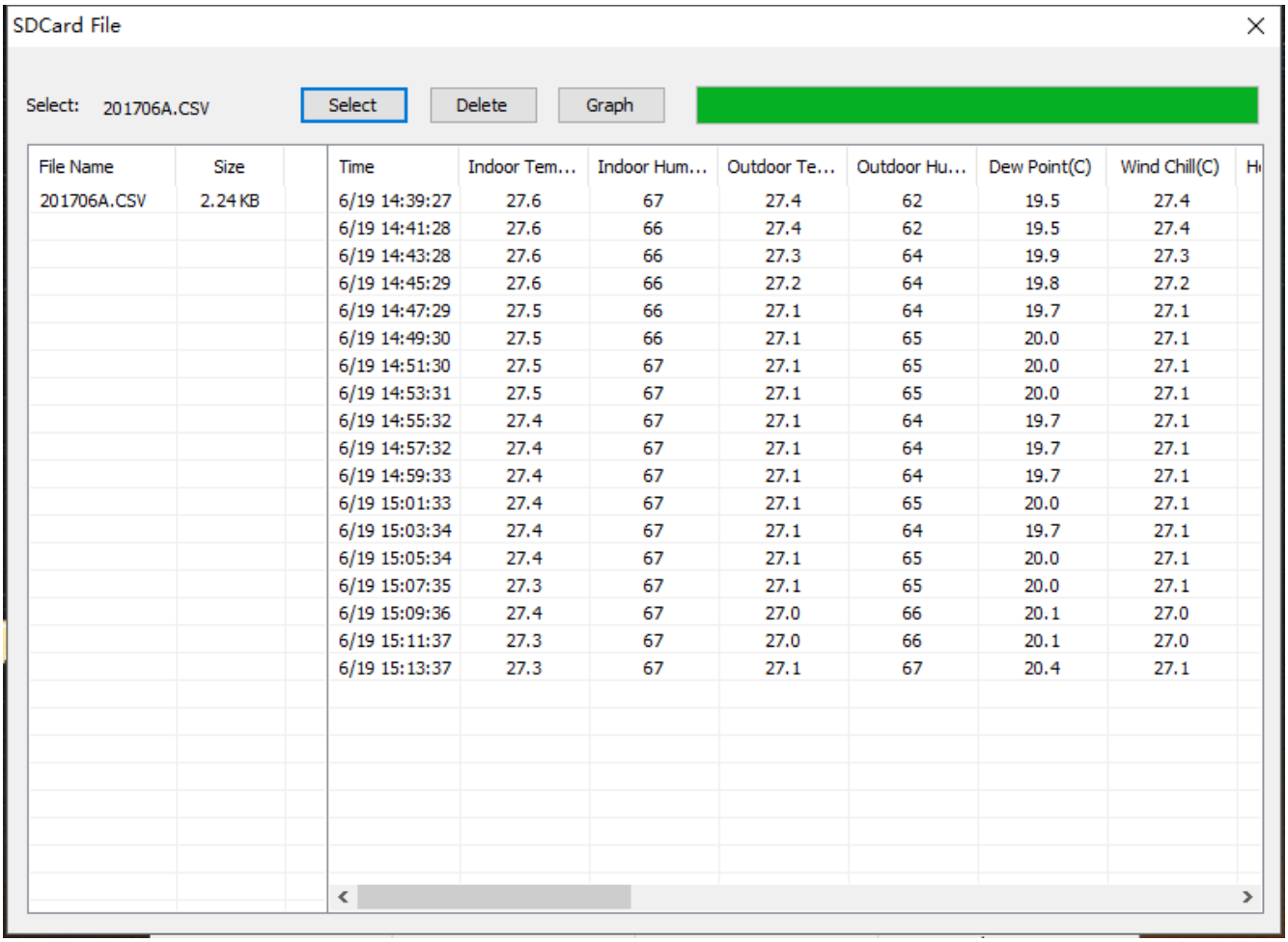
This section is used to display the recorded min and max value.



4.2 SDCard File

Click **SDCard File** to download and analyze data stored on the SD Card.

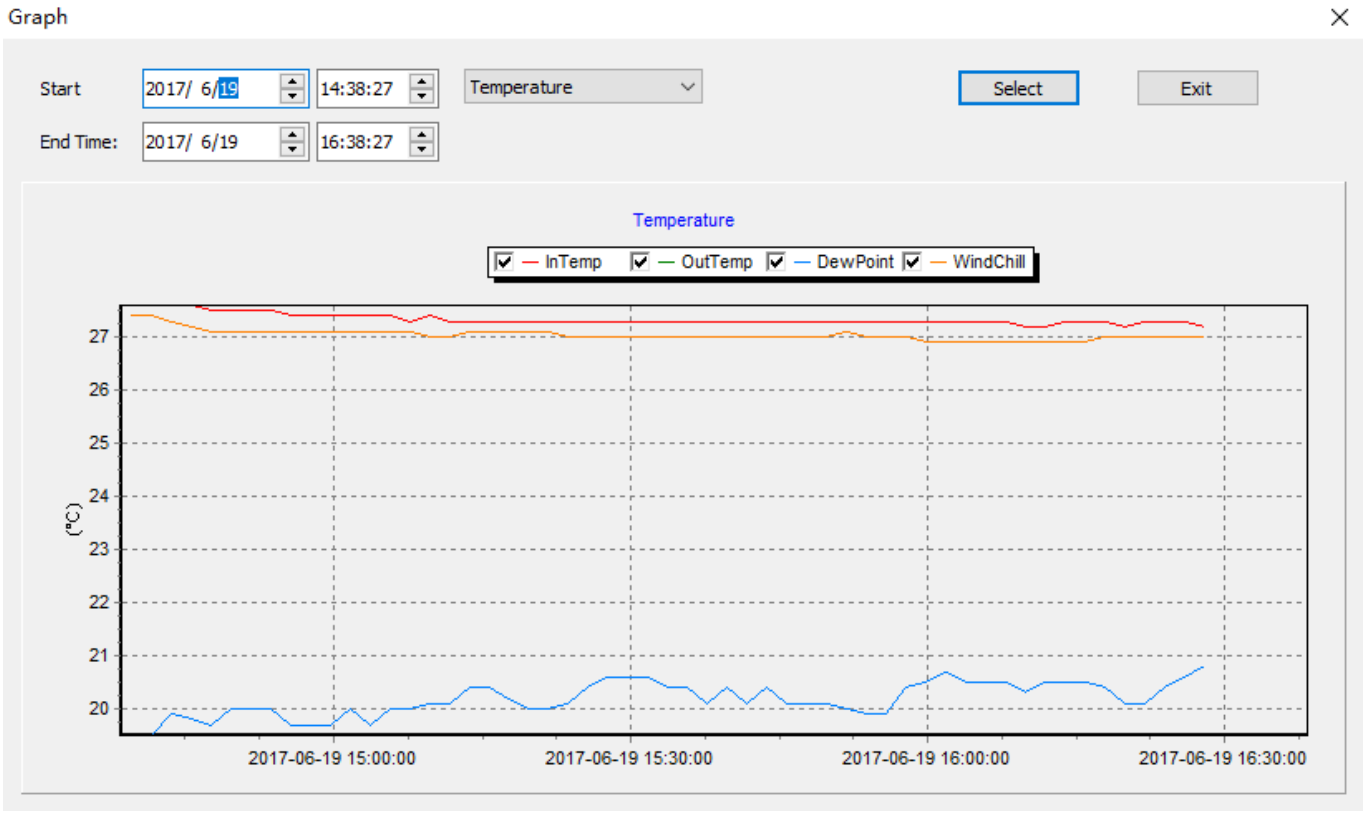
Select the file you wish to view from the list and press **Select** to view the data.



File Name	Size	Time	Indoor Tem...	Indoor Hum...	Outdoor Te...	Outdoor Hu...	Dew Point(C)	Wind Chill(C)	H
201706A.CSV	2.24 KB	6/19 14:39:27	27.6	67	27.4	62	19.5	27.4	
		6/19 14:41:28	27.6	66	27.4	62	19.5	27.4	
		6/19 14:43:28	27.6	66	27.3	64	19.9	27.3	
		6/19 14:45:29	27.6	66	27.2	64	19.8	27.2	
		6/19 14:47:29	27.5	66	27.1	64	19.7	27.1	
		6/19 14:49:30	27.5	66	27.1	65	20.0	27.1	
		6/19 14:51:30	27.5	67	27.1	65	20.0	27.1	
		6/19 14:53:31	27.5	67	27.1	65	20.0	27.1	
		6/19 14:55:32	27.4	67	27.1	64	19.7	27.1	
		6/19 14:57:32	27.4	67	27.1	64	19.7	27.1	
		6/19 14:59:33	27.4	67	27.1	64	19.7	27.1	
		6/19 15:01:33	27.4	67	27.1	65	20.0	27.1	
		6/19 15:03:34	27.4	67	27.1	64	19.7	27.1	
		6/19 15:05:34	27.4	67	27.1	65	20.0	27.1	
		6/19 15:07:35	27.3	67	27.1	65	20.0	27.1	
		6/19 15:09:36	27.4	67	27.0	66	20.1	27.0	
		6/19 15:11:37	27.3	67	27.0	66	20.1	27.0	
		6/19 15:13:37	27.3	67	27.1	67	20.4	27.1	

To graph the data:

1. Identify the data file start and end date and times.
2. Press 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, and press the **Select** button.

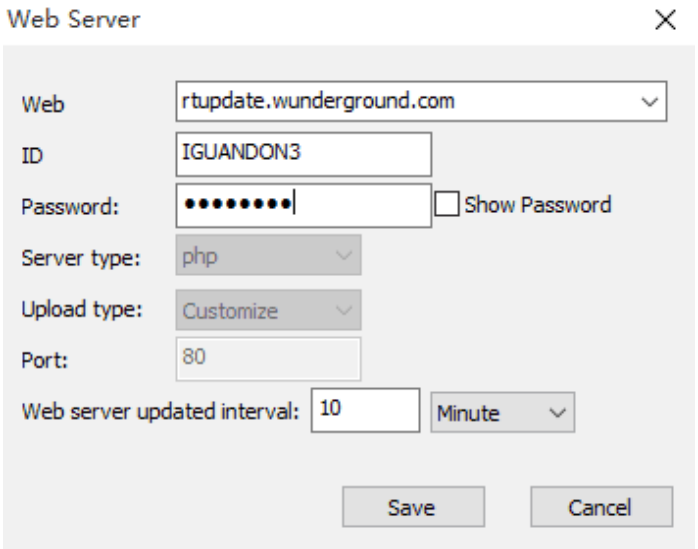


5. Upload

To upload weather data to the internet, from EasyWeather, select **Upload** from the menu bar.

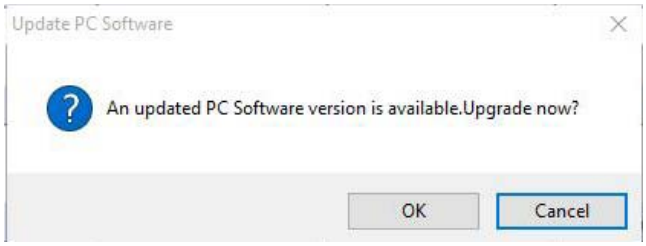
User can upload data to website. www.wundergound.com or their own website. If user choose www.wundergound.com, he do not need to set the server, server type and port. If user choose custom, he need to set the server, server type and port. And web server update interval can be set up.

Note: Minimum uploading interval is 10 minutes using battery and solar panel in the package. If you use USB charger minimum uploading can be 3 minutes. It won't upload data to internet if you set up as"0".



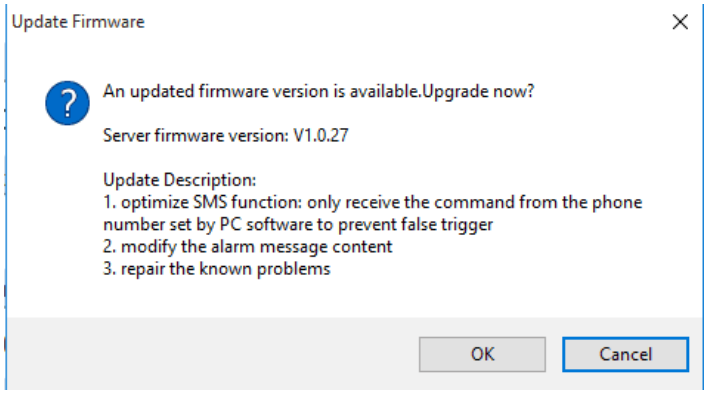
6. Update Weather Logger

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

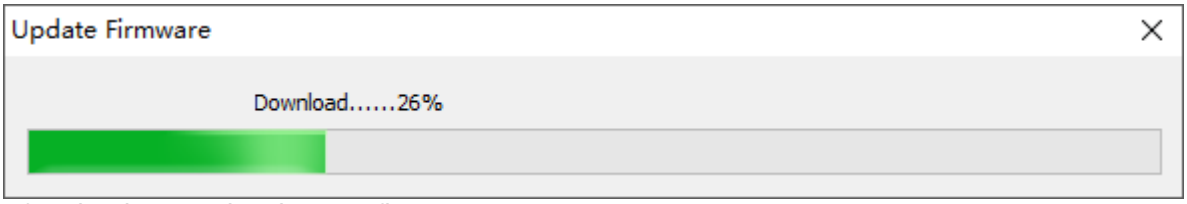


7. Update Firmware

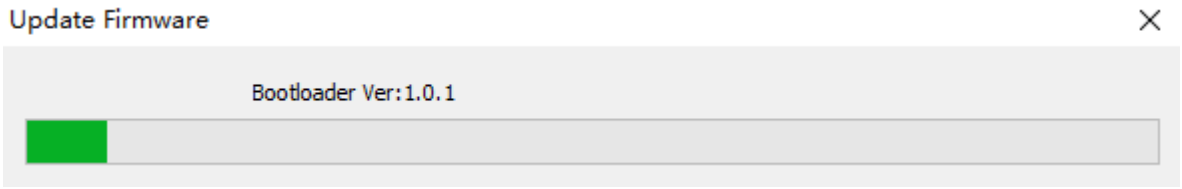
After you finish or ignore the upgrade of **Weather Logger**, if there is new version firmware of weather station available, another dialog box will pop up indicating to upgrade or not. Click "**OK"** will guide to upgrade the firmware.



System will download firmware first.



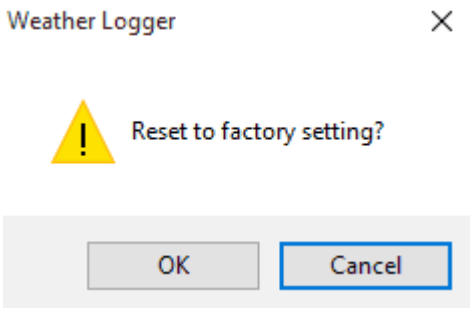
After that it upgrades the new firmware.



Note: Before V1.0.13, you need to manually press the reset button on the device when upgrading the firmware, V1.0.13 and later versions do not need this operation

8. Factory Reset

Press **Factory Reset** button, below indication will be displayed:



Click"**OK"** to return to factory default settings or click "cancel" to cancel the factory reset.

SMS configuring and alarm indication

Configure by SMS

Users can check current weather data by sending SMS to the receiver terminal via at most 3 authorized mobile numbers pre-determined on the PC software(Refer to USB configure tool Operation).

SMS command keywords are as follows (support for fuzzy matching)

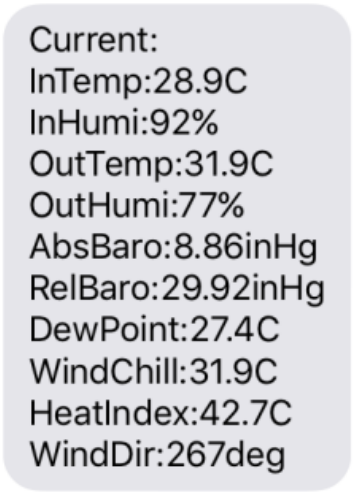
keyword	return
Current	Current real time weather data
Max	History Maximum values
Min	History Minimum value
Telephone	Telephone number
Interval	Interval time
Status	Device operation status
Alarm	High and low alarm
Alarm On	Alarm enabled
Alarm Off	Alarm disabled
Reboot	Reboot the device

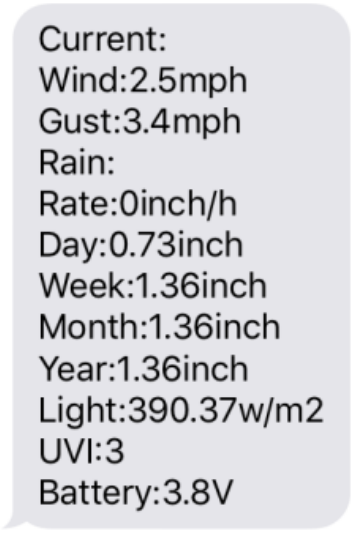
1. View current weather Data

Current real time weather data can be achieved by sending a SMS from your Smartphone with the command:

Current

Answer from the weather station is as shown in below figure by 2 messages:





2. View Max/Min weather data record:

History Maximum values of weather data can be achieved by sending commands.

Max

Answer from the weather station is as shown in below figure:

History Minimum values of weather data can be achieved by sending commands.

Min

Answer from the weather station is as shown in below figure:

3. Check authorized mobile phone numbers:

Send a SMS with below command

Telephone

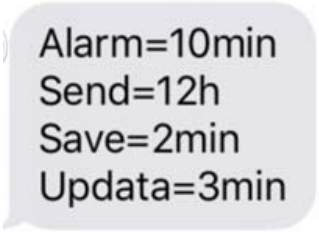
The weather station will answer with a SMS displaying all pre-determined mobile phone numbers set up on Weather Logger:

4. Check interval

Send a SMS with below command

Interval

Answer from the weather station is as shown in below figure:



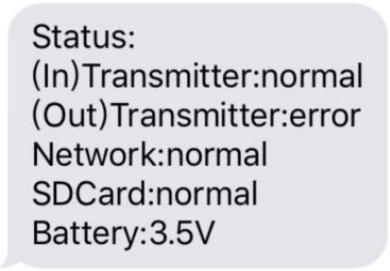
Alarm: The interval of alarm indication repeating.
Send: The interval of polling real time weather data by SMS.
Save: The logging interval to Mirco SD Card.
Updata: The interval of uploading data to internet.
Min*: minute*
H: *hour*

5. Check weather station performance status

Send a SMS with the command:

Status

Reply from the weather station



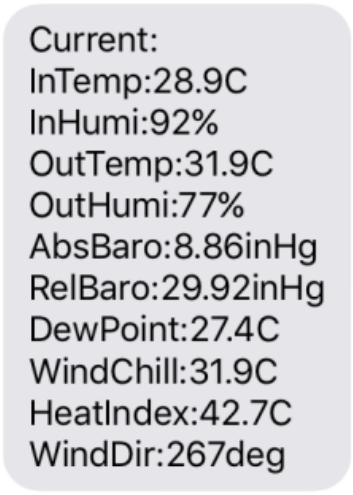
(In)Transmitter=normal The weather station indoor sensor is functioning without errors
(In)Transmitter =error A error has occurred, check the indoor sensor
(Out) Transmitter=normal The weather station outdoor sensor is functioning without errors
(Out) Transmitter =error A error has occurred, check the outdoor sensor
Network=normal The weather station network is functioning without errors
Network= error A 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

6. Real Time Weather data polling by SMS:

The real time weather data can be configured to send by SMS, if you set the time interval on the USB configure tool Weather Logger.

Sending by SMS in a certain time interval ranges from 1 minute to 24 hours. If you set it as “none”, real time weather data will not be sent.

Please note each polling record would be send in 2 messages:



7. Alarm indication

7.1 Enable or disable the alarm indication

Please make sure alarm indications are enabled when set up on PC software Weather Logger or by SMS. Send a SMS with the command to check:

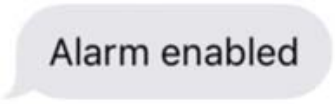
Alarm

If alarm indication is not enabled, the weather station will advise with command:

Please enable the switch of alarm indications on PC software Weather Logger or send SMS with command

Alarm on

Answer from weather station will be:



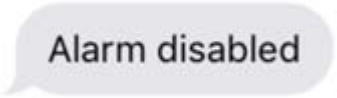
When the threshold of Alarms are exceeding, alarm will be triggered and alarm indication will be delivered by SMS to authorized cell phone numbers. The alarm sending interval is configurable, ranges from 5 to 240 minutes.

- **Disable alarm indication**

Alarm indication will be polling in a certain interval. If you wish not be annoyed by repeat SMS, you can set up on PC software Weather Logger to disable the alarm indication or send a SMS with command

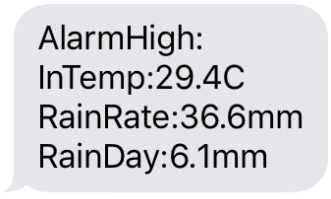
Alarm off

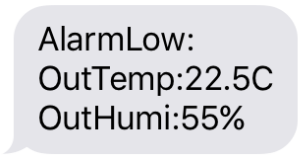
Answer from weather station will be:



7.2 High & Low alarm indication.

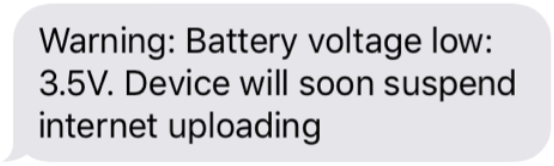
When there are high/low alarms triggered, below alarm indication will be send by SMS:



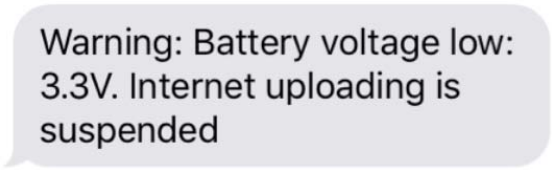


7.3 Low Power alarm

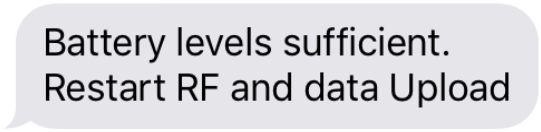
The receiver unit constantly monitors the battery voltage. Battery voltage is 4.2V when it is full charged. An SMS alert will be sent to authorized smart phone when battery voltage drops below 3.5V:



We suggest the battery be charged or replaced once battery drops below 3.3V, or the 3G module will be suspended when battery voltage drops below 3.3V.Then below SMS will be sent to smart phone. After that No SMS will be sent or no data will be uploading to internet.



And all functions will be suspended if battery voltage drops below 3V. After that if the device is charged by USB charger directly without disconnecting battery, or charged by the solar panel automatically, below SMS will be send once battery voltage resume to above 3.9V:

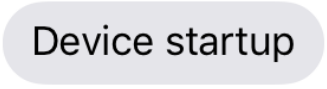


8. Restart the device

Send a SMS with command

Reboot

After the device is restarted, it replies below message from the weather station:



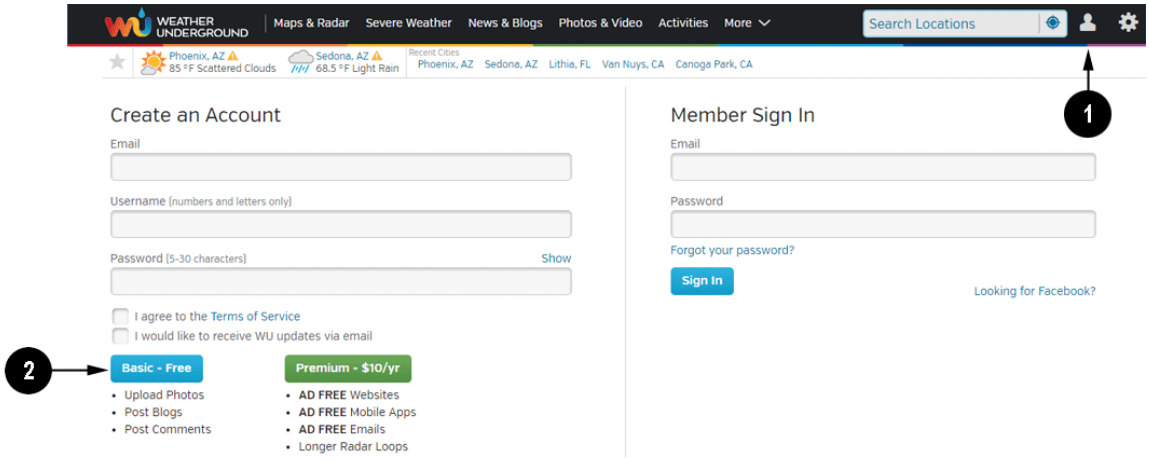
Weather Server

The receiver is configured to send real-time data to wunderground.com® Enter the Station ID and Password from wunderground.com®. The weather data will be displayed on the user interface.

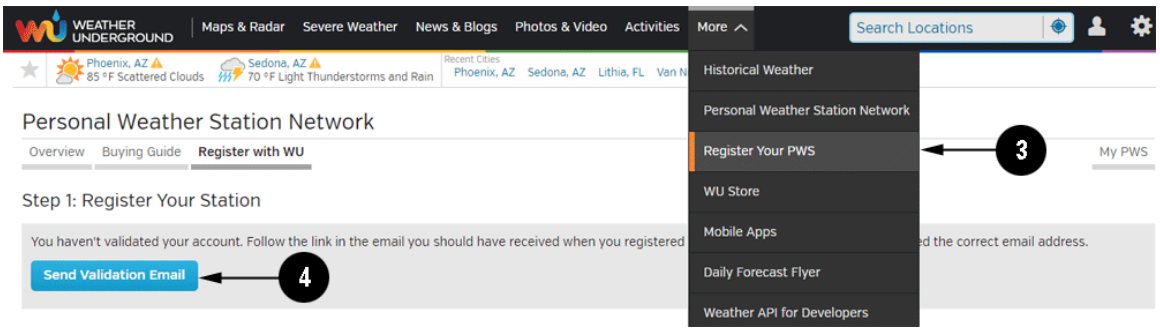
1.Registering with wunderground.com

1.1: How to create a Wunderground.com account and station ID.

1. Visit Wunderground.com, click on the person icon  and create a free account.
2. Select the Basic – Free account. A paid account is not required.



3. Select **More | Register Your PWS**.
4. Click **Send Validation Email**. Respond to the validation email from Wunderground (it may take a few minutes).



5. Select More | Register Your PWS again and enter all of the information requested.

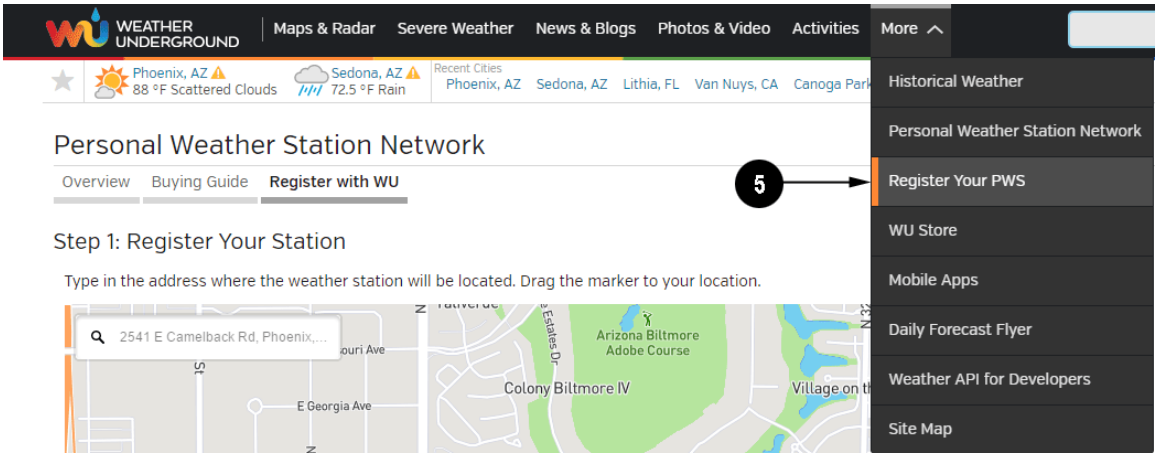


Figure 1

6. Once registered, you receive a station ID and password. Make a note of this. You will need to enter it into PC software。

Congratulations. Your station is now registered with Wunderground!

You are almost done. Now go to your weather station software and add the following:

Your Station ID:

KAZPHOEN424

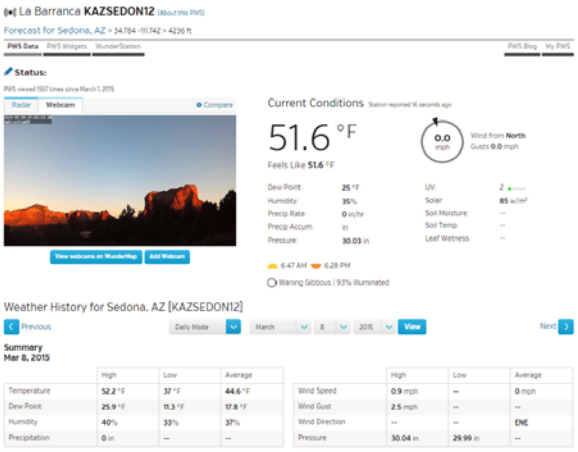
Your Station Key/Password:

mdreeley

1.2 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, where your station ID replaces the text "STATIONID": http://www.wunderground.com/personal-weather-station/dashboard?ID=STATIONID

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



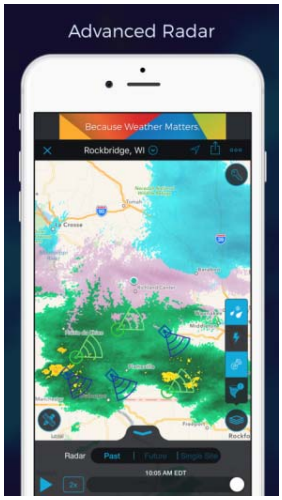
There are also some very useful mobile apps. The URLs provided here go to the Web version of the application pages. You can also find them directly from the iOS or Google Play stores:

WunderStation: iPad application for viewing your station's data and graphs

https://itunes.apple.com/us/app/wunderstation-weather-from-your-neighborhood/id906099986

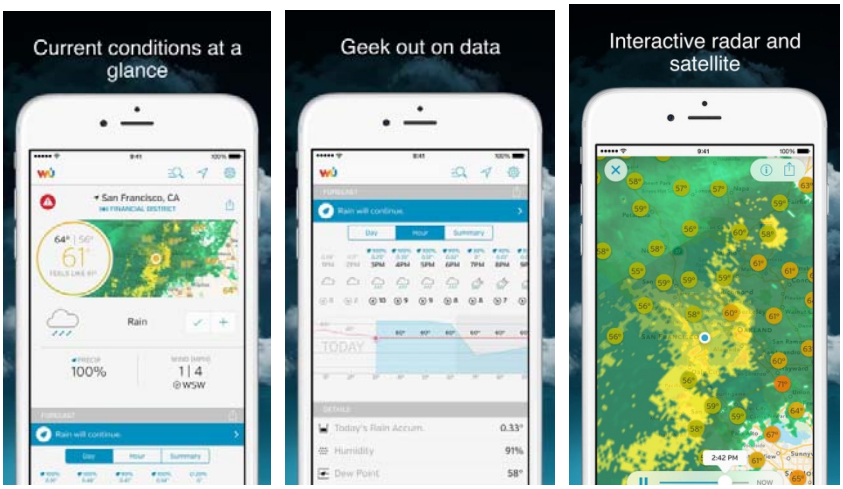
WU Storm: iPad and iPhone application for viewing radar images, animated wind, cloud coverage and detailed forecast, and PWS station data

https://itunes.apple.com/us/app/wu-storm/id955957721



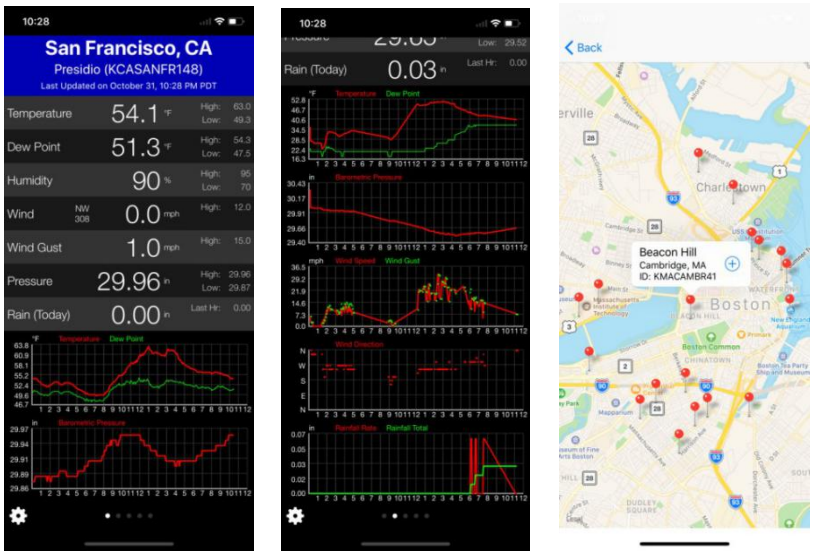
Weather Underground: Forecast: iOS and Android application for forecasts

https://itunes.apple.com/us/app/weather-underground-forecast/id486154808
https://play.google.com/store/apps/details?id=com.wunderground.android.weather&hl=en



PWS Weather Station Monitor: View weather conditions in your neighborhood, or even right in your own backyard. Connects to wunderground.com

https://itunes.apple.com/us/app/pws-weather-station-monitor/id713705929



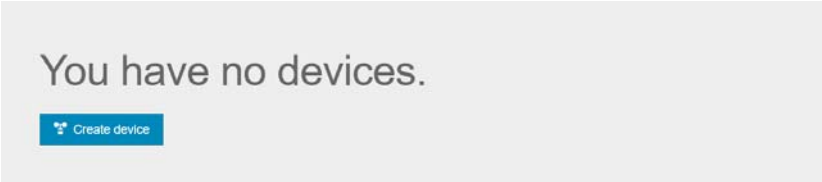
2. Registering with Weathercloud

To register with Weathercloud follow these steps:

Visit weathercloud.net and enter a Username, Email and Password to sign up.

Respond to the validation email from Weathercloud (it may take a few minutes).

You will then be prompted to add a device/ Select “Create device” and enter your station’s information:



After registering your station, take note of the “Weathercloud ID” and “Key” presented to you.

Enter these values in the PC software:

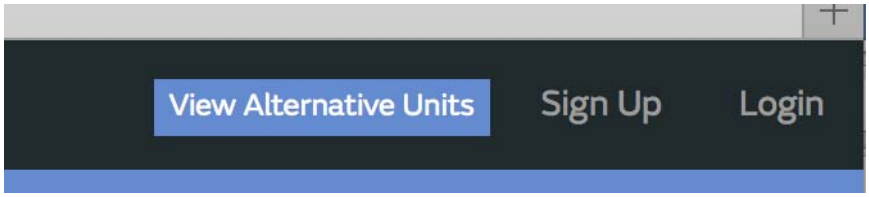
3. Registering with Weather Observations Website (WOW)

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

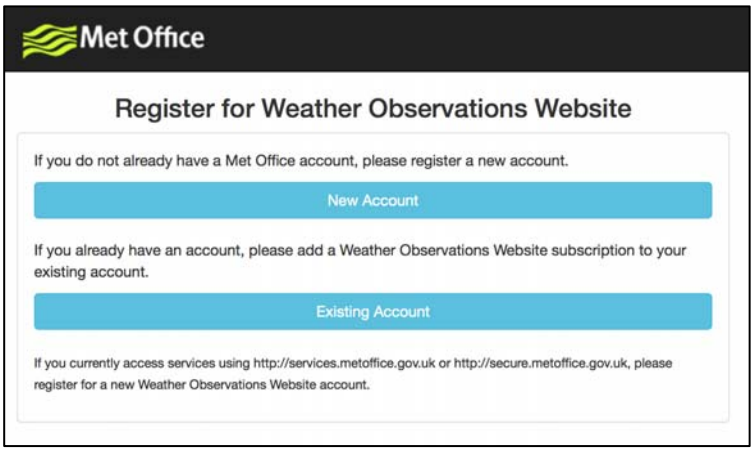
1. Sign Up with WOW
2. Confirm your email with WOW
3. Login to WOW
4. Create/Set up a new WOW site

3.1 Sign up with WOW

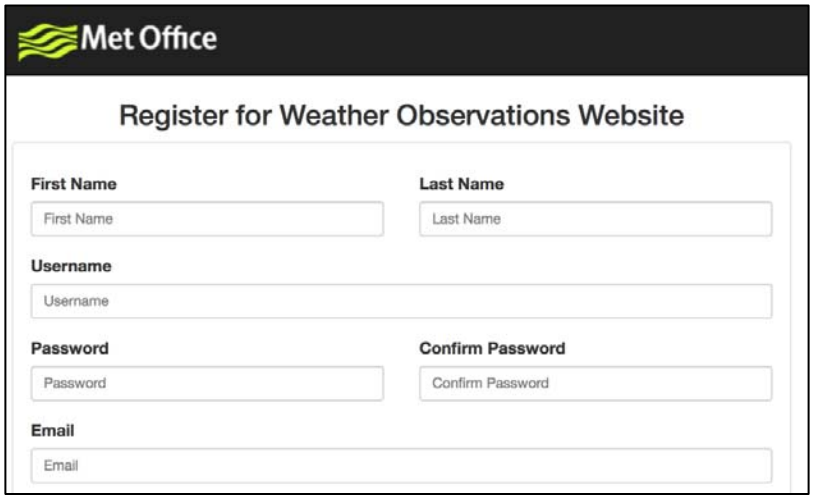
Navigate your browser to http://wow.metoffice.gov.uk. On the top-right side of the resulting page you will see menu options. Click “Sign Up”.



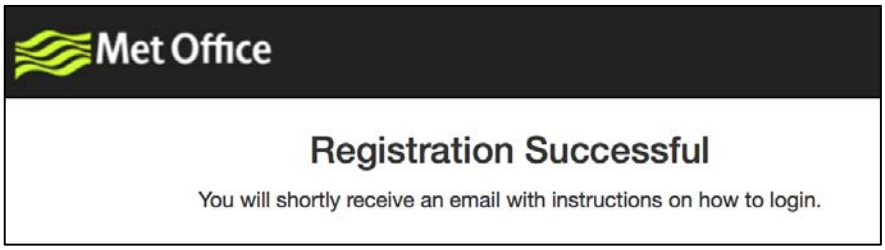
You will be presented with the screen below where you will choose to either create a new account or use an already existing account. Click the desired option.



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



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:



3.2. Confirm email with WOW

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

3.3. Login with WOW

Follow instructions on the screen and login to the site.

Create/Set up a new WOW site

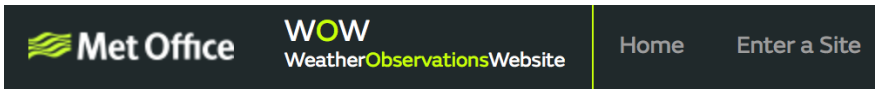
Once you are logged in you will need to create a new WOW site. “Sites” are the means by which WOW

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:

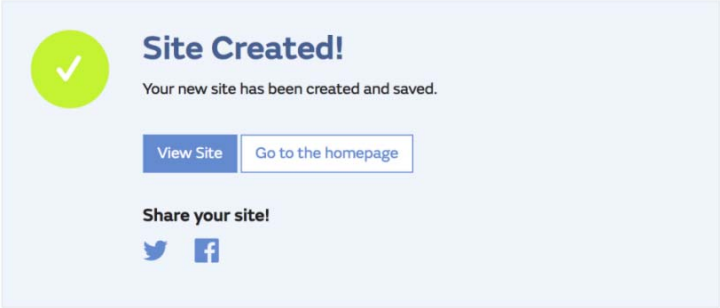
Site ID: This is an arbitrary number that is used to distinguish your site from another. This number appears (in brackets) next to or underneath the name of your site on the site information page, for example: 6a571450-df53-e611-9401-0003ff5987fd

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

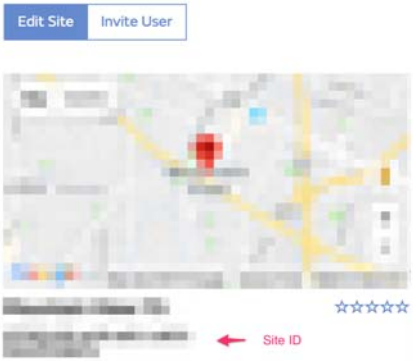
Begin setting up a new site by clicking “Enter a Site”:



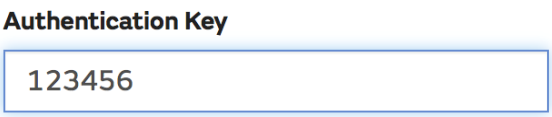
You will be presented with a form where you detail your station’s location and a bunch of other settings related to how you wish the site to operate. After you complete the setup, you should see:



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:



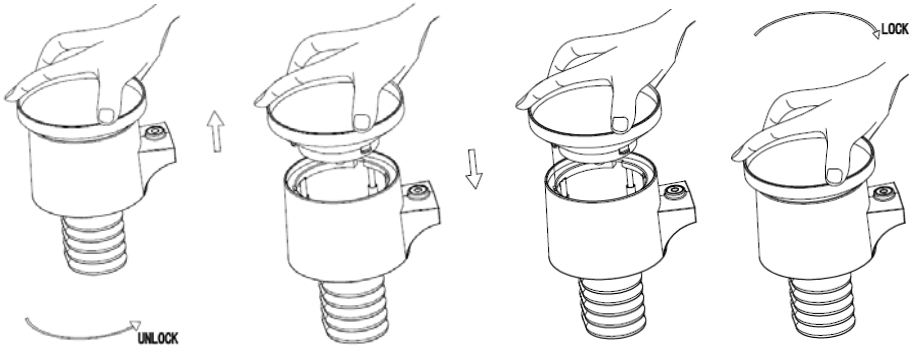
You will also need to establish a unique 6 digits PIN code that you should keep secret. It is the “Authentication Key.” Setup this number by clicking on “Edit Site”) and filling out the with a 6-digit number of your choice:



You will need both “Site ID” and “Authentication Key” to setup the upload configuration for WOW in the PC software.

Maintenance

1. Clean the rain gauge once every 3 months. Rotate the funnel counter-clockwise and lift to expose the rain gauge mechanism, and clean with a damp cloth. Remove any dirt, debris and insects. If bug infestation is an issue, spray the array lightly with insecticide



.

2. Clean the solar radiation sensor and solar panel every 3 months with damp cloth.
3. 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 (when cleaning the solar panel).
4. When replacing the batteries, apply a corrosion preventive compound on the battery terminals, available at Amazon and most hardware stores.
5. In snowy environments, spray the top of the weather station with anti-icing silicon spray to prevent snow build up.

Troubleshooting Guide

Problem	Solution
Indoor temperature and humidity not reported	The maximum line of sight communication range is about 100m. Move the sensor assembly closer to the receiver. Install a fresh set of batteries in the remote sensor(s). Make sure the remote sensors are not transmitting through solid metal (acts as an RF shield), or earth barrier (down a hill). Radio Frequency (RF) Sensors cannot transmit through metal barriers (example, aluminum siding) or multiple, thick walls. Move the receiver around electrical noise generating devices, such as computers, TVs and other wireless transmitters or receivers.
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 **Initial Receiver Unit Set Up** Take out the batteries and wait one minute, while covering the solar

Problem	Solution
	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 Wundeground.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 console. 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.

Specifications

Outdoor data

Transmission distance in open field : 100m(300 feet)
Frequency : 433.92MHz

Temperature range -40˚C--60˚C(-40℉ to +140℉)
Resolution : 0.1˚C (0.2℉)
Measuring range rel. humidity : 1%～99%
Rain volume display : 0 – 9999mm (show --- if outside range)
Resolution : 0.3mm (if rain volume < 1000mm)
1mm (if rain volume > 1000mm)
Wind speed : 0-160km/h (0~100mph) (show --- if outside range)

Measuring interval thermo-hygro sensor: 16 sec
Water proof level : IPX3

Indoor data
Measuring interval : 61 sec
Indoor temperature range : 0˚C--60˚C (32℉ to + 140℉) (show --- if outside range)
Resolution : 0.1˚C (0.2℉)
Measuring range rel. humidity : 1%～99%
Resolution : 1%
Measuring range air pressure : 300-1100hPa (8.85-32.5inHg)
Accuracy : +/-3hpa under 700-1100hPa
Resolution : 0.1hPa (0.01inHg)

Power consumption
Base station : 1x 18650 battery (included) or USB charger (Not included)
Solar panel as backup power: 3W(6.2V 500mA)195mm*138mm

Indoor sensor : 2xAA Alkaline batteries (not included)
Outdoor sensor : 2xAA Alkaline batteries (not included)
Battery life : Minimum 12 months for base station
Minimum 12 months for indoor & outdoor sensor

Please help in the preservation of the environment and return used batteries to an authorized depot.

This handbook may contain mistakes and printing errors. The information in this handbook is regularly checked and corrections made in the next issue. We accept no liability for technical mistakes or printing errors, or their consequences.
All trademarks and patents are acknowledged.

FCC STATEMENT

1. **This device complies with Part 15 of the FCC Rules.**
   Operation is subject to the following two conditions:
   (1) This device may not cause harmful interference, and
   (2) This device must accept any interference received, including interference that may cause undesired operation.
2. **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, pursuant to Part 15 or 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 casue harmful interference to radio communications, However, there is no guarantee that interference will not occur in a particular installation. If the 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.