AERCUS Instruments

WeatherMaster

MULTI-CHANNEL WIFI WEATHER STATION WITH INTERNET PUBLISHING

WeatherMaster MULTI-CHANNEL WIRELESS WEATHER STATION WITH INTERNET PUBLISHING

Operation Manual

About This Manual

Thank you and congratulations on selecting this professional weather station. We are positive you will enjoy the benefits of accurate weather readings and information that our weather stations offer. 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.

For optimal performance from your Aercus Instruments WeatherMaster we strongly recommend you read this manual thoroughly before beginning installation. Installation is simple if the steps below are followed and doing so will ensure that you avoid the most common pitfalls of weather station operation.

Important!

Warranty and Support

We warrant our products to be free of defects in components and workmanship, under normal use and service, for one year from the date of original purchase. For product support and warranty claims please contact the following:

- **Purchased in UK/EU:** As many issues can be a result of incorrect setup please contact our local distributor Greenfrog Scientific greenfrogscientific.co.uk and their team will be happy to help. Genuine faults can typically be diagnosed without requiring the unit to be returned and replacement parts sent quickly if needed.

- **Purchased in AUSTRALIA:** As many issues can be a result of incorrect setup please contact our local distributor Monax Test & Weather monaxtestandweather.com.au and their team will be happy to help. Genuine faults can typically be diagnosed without requiring the unit to be returned and replacement parts sent quickly if needed.

- **Purchased in NEW ZEALAND:** As many issues can be a result of incorrect setup please contact our local distributor Scientific Sales scientificsales.co.nz and their team will be happy to help. Genuine faults can typically be diagnosed without requiring the unit to be returned and replacement parts sent quickly if needed.

For all others, please contact the seller who sold you this item.

Contents

1. Pre-Installation Check and Site Survey

1.1 Pre-installation Check

Before installing your weather station in its permanent location, we recommend operating the weather station for one week in a temporary location with easy access. This will allow you to check out all the functions, ensure proper operation, and familiarise yourself with the weather station and calibration procedures. This will also allow you to test the wireless range of the weather station.

1.2 Site Survey

Perform a site survey before installing the weather station. Consider the following:

1. You must clean the rain gauge every few months and change the batteries every 12 months or so. Ensure you have easy access to the weather station.
2. Avoid radiant heat transfer from buildings and structures. In general, install the sensor array at least 1.5m from any building, structure, ground, or rooftop.
3. Avoid wind and rain obstructions. The rule of thumb is to install the sensor array at least four times the distance of the height of the tallest obstruction. For example, if the building is 6m tall, and the mounting pole is 2m tall, install 4 x (8m – 2m) = 24m away.
4. Wireless Range. The radio communication between receiver and transmitter in an open field can reach up to 100m, providing there are no interfering obstacles such as buildings, trees, vehicles, high voltage lines. Wireless signals will not penetrate metal buildings. Under most conditions, the maximum wireless range is 20-40m.
5. Radio interference such as PCs, radios or TV sets can, in the worst case, entirely cut off radio communication. Please take this into consideration when choosing console or mounting locations. Make sure your display console is at least 1.5m away from any electronic device to avoid interference.

2. Unpacking

Open your weather station box and inspect that the contents are intact (nothing broken) and complete (nothing missing). Inside you should find the following:

QTY	Item Description
1	Display console
1	AC adapter
1	Outdoor sensor array with the following sensors: temperature/humidity, rain gauge, wind speed, wind direction, light and UV and solar panel
1	Wind speed cups (to be attached to outdoor sensor body)
1	Wind vane (to be attached to outdoor sensor body)
1	Indoor sensor unit
2	U-bolts for mounting on a pole
4	Threaded nuts for U-bolts (M5 size)
1	Metal mounting plate to be used with U-bolts
1	Wrench for M5 bolts
1	User manual (this manual)

Table: Box contents

If components are missing from the package, or broken, please contact your local distributor to resolve the issue.

Note: Batteries for the outdoor sensor package are **not included**. You will need 2 AA-sized batteries, alkaline or Lithium batteries (Lithium is recommended for colder climates).

Note: The console operates using an AC adapter. The included adapter can generate a small amount of electrical interference with the RF reception in the console, when placed too close to the console. Please keep the console display 50cm/2ft from the power adapter to ensure best RF reception.

3. Display console

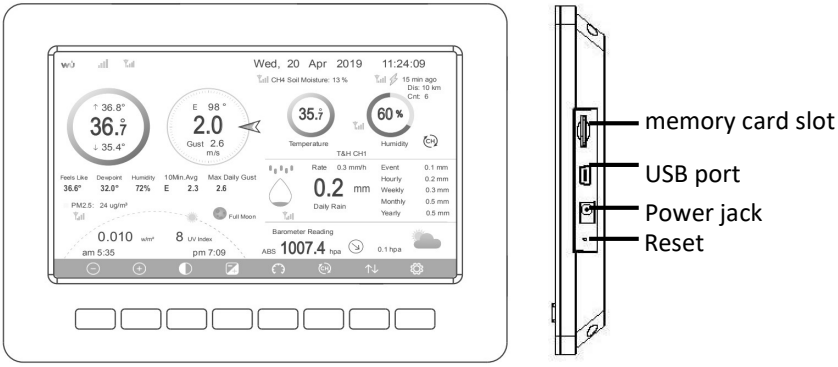


Figure 1: Display console

Note: The USB port in the console of weather station is only for firmware updates, not for data communication and a USB cable is not included. An SD card (not included) can also be used for the firmware update.

Outdoor sensor:

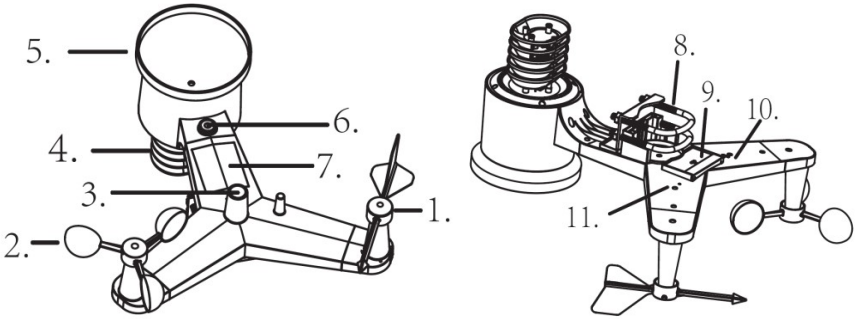


Figure 3: Sensor assembly components

1 Wind vane	7 Solar panel
2 Wind speed cups	8 U-Bolts
3 Light sensor and UV sensor	9 Battery compartment
4 Thermo/hygrometer sensor	10 Reset button
5 Rain collector	11 LED (red)
6 Bubble level	

Indoor sensor:

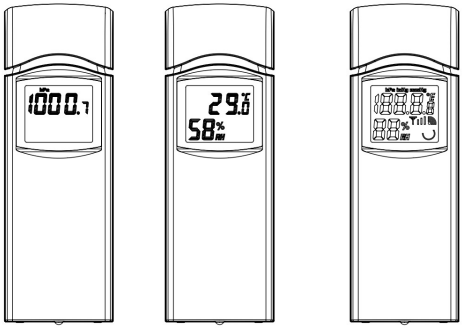


Figure 2: Indoor sensor 2 display variations

The indoor sensor will display indoor temperature, humidity, and barometric pressure alternately.

3.1 Optional sensors

The following optional sensors (purchased separately) can be used with the WeatherMaster.

If you have purchased extra sensors, just simple power up, the display console will receives the data automatically. If sensor not reporting in to console, the display console will re-search the data after one hour or restart the console to search the data. Please refer to the sensor manual (provided separately with sensor) for details.

This table shows the maximum number of each type of sensor that can be worked with console display

Sensor	Image	Maximum
WH31 Multi-channel temperature and humidity sensor		8
WH51 Soil moisture sensor		8
WH41 outdoor PM2.5 air quality sensor WH43 indoor PM2.5 air quality sensor WH41 and WH43 share the four channels		4
WH55 Water leak alarm		4

WH57 Lightning		1
WH45 Indoor PM2.5/PM10 CO_2 air quality sensor		1
WN34S stainless-steel probe thermometer for soil and water WN34L wire probe thermometer for water WN34S and WN34L share the 8 channels		8
WN35 leaf wetness sensor - data will not be displayed on the main screen, it will show its data on the Channel Data page.		8

Note： For optional sensors, the console will display current data, and historical data is saved on an SD card. If you are uploading to the internet, some websites do not support additional sensor data. We recommend Ecowitt.net.

4. Set up Guide

4.1 Pre-installation

To complete assembly you will need a Philips screwdriver (size PH0) and an M5 wrench (included).

For setup we recommend placing the weather station in a temporary location with easy access for one week. This will let you check all functions, ensure proper operation, and get familiar with the weather station and its calibration procedures.

Attention:

- Ensure batteries are installed with correct polarity (+/-)
- Do not mix old and new batteries
- Do not use rechargeable batteries
- If outdoor temperature go below 0°C for prolonged periods, Lithium based batteries are recommended for optimal performance

4.2 Outdoor Sensor Package Assembly

4.2.1 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, 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 (opposite the solar panel). 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 4.

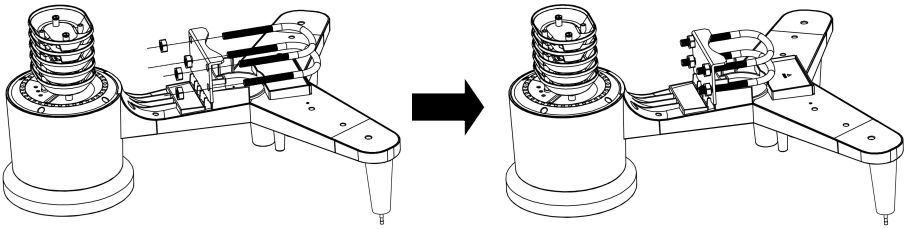


Figure 4: U-Bolt installation

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. Handling of the sensor package with wind vane and anemometer installed to install these bolts is more difficult and more likely to lead to damage.

4.2.2 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 6. 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

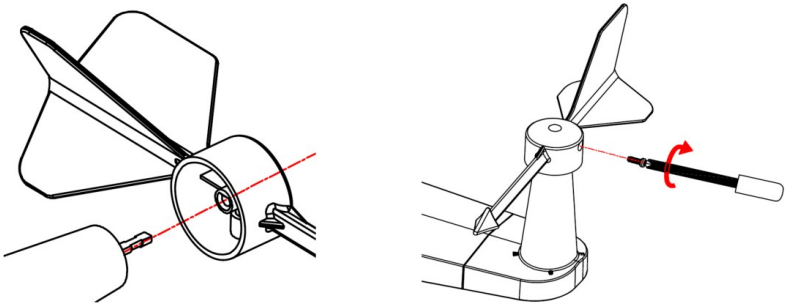


Figure 5: Wind vane installation diagram

The sensor array must be oriented so that the arrow marked “North” on the top of the wireless sensor is pointing north. If the sensor array is oriented incorrectly, wind direction measurement will be inaccurate.

4.2.3 Install anemometer

Push the anemometer assembly onto the shaft on the top side of the sensor package, as shown in Figure 6 (left). Tighten the set screw, with a Philips screwdriver (size PH0), as shown on the right. Make sure the cup assembly can rotate freely. There should be no noticeable friction when it is turning.

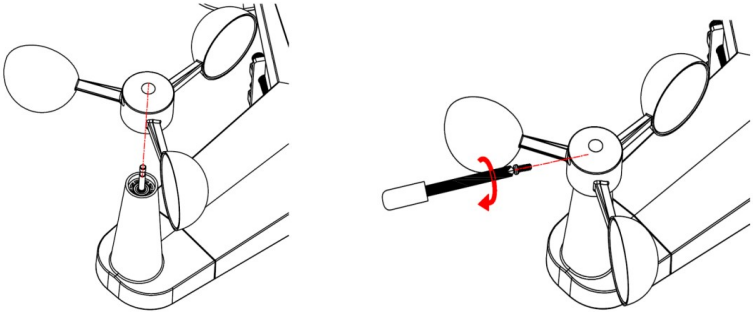


Figure 6: Wind speed cup installation diagram

4.2.4 Install rain gauge funnel

Turn clockwise to attach the funnel to the sensor array.

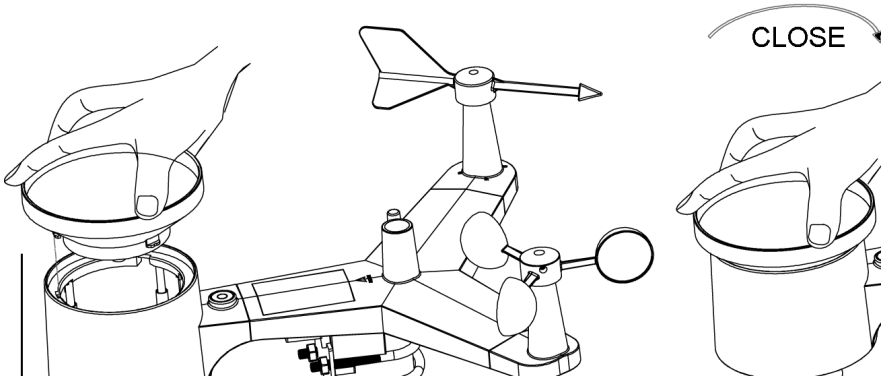


Figure 7: Rain Gauge Funnel installation diagram

4.2.5 Install Batteries in sensor package

Insert 2xAA batteries into the battery compartment and tighten the screw of battery cover. The LED indicator on the back of the transmitter will turn on for 4 seconds and flash once every 16 seconds.

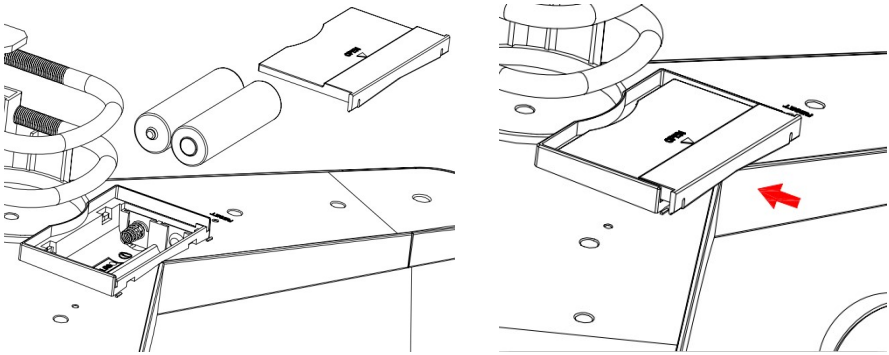


Figure 8: Battery installation diagram

Note: If no LED lights up or is illuminated permanently, make sure the battery is inserted the correct way and that a proper reset has been performed. Do not install the batteries backwards. You can permanently damage the outdoor sensor.

Note: The LED can be hard to see in bright light.

Note: 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.

4.2.6 Mount assembled outdoor sensor package

Install the sensor array in an open space, away from obstacles such as other buildings, trees, etc. that prevent free wind flow, to ensure undistorted measurements of individual weather elements. Point the part with the vane and propeller north for correct wind direction measurement. Place the sensor array onto the stand (not included) at a minimum height of 1.5 metres from the ground to prevent the measured values being affected by the ground surface and tighten the bolts. Use the spirit level on the top of the sensor array to ensure that it is level. Tighten the U-bolt nuts.

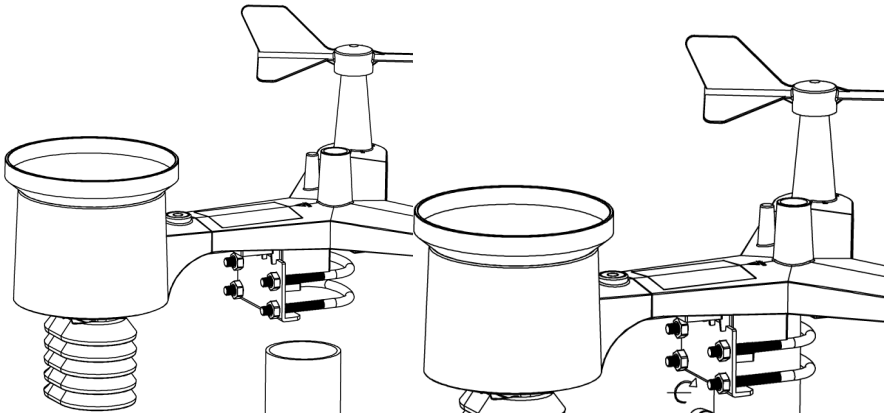


Figure 9: Sensor package mounting diagram

Note: If you handle the sensor array when it is powered up and transmitting, you can generate false wind reading as you move and rain readings if to tip the array. Please remember to reset your readings.

4.2.7 Reset Button and Transmitter LED

In the event the sensor array is not transmitting, reset the sensor array.

Using a skewer or open paperclip, press and hold the **Reset Button** (see Figure 0) to affect a reset. The LED turns on while the Reset button is depressed, and it can now be released. The LED should then return to flashing approximately once every 16 seconds.

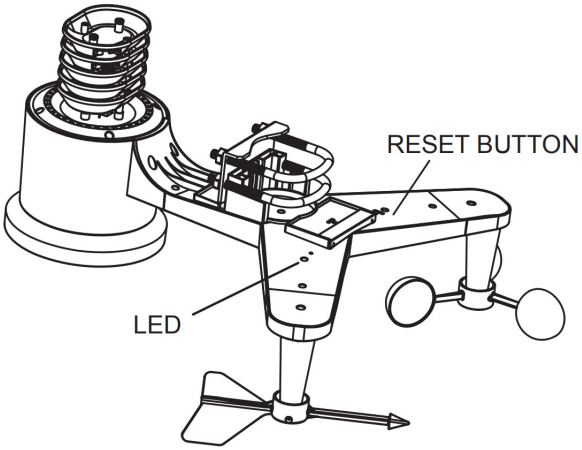


Figure 10: Reset button and Transmitter LED location

4.3 Indoor 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 (See Figure 11)

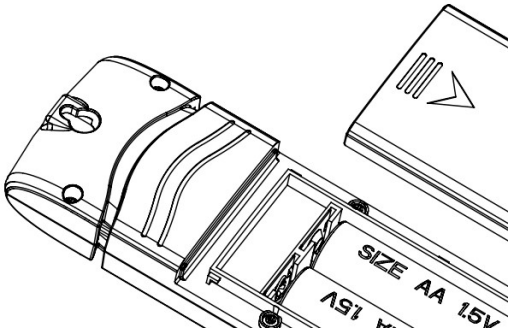


Figure 11: Indoor sensor battery installation

4.4 Multi-channel temperature and humidity sensor (Optional)

The WeatherMaster supports up to 8 additional thermo-hygrometer sensors (WH31), which can be viewed on the display tablet and Internet.

Note: Do not use rechargeable batteries. We recommend fresh alkaline batteries for outdoor temperature ranges between -10°C and 60°C and fresh lithium batteries for outdoor temperature ranges between -40°C and -10°C.

4.4.1 Install batteries

Remove the battery cover on the back of the transmitter by sliding downwards, as shown in Figure 2 .

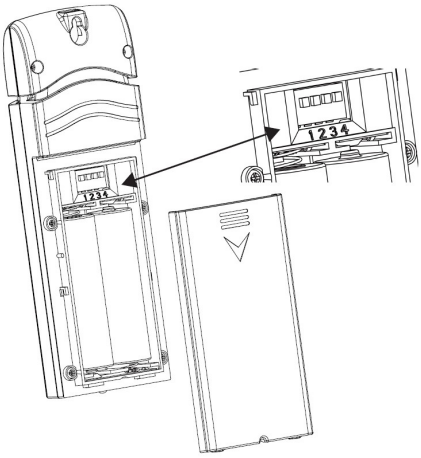


Figure 12: Battery installation

Before inserting the batteries, find the dip switches above the battery compartment and set the temperature units and channel number:

Temperature Units: To change the transmitter display units between °C and °F, change dip switch 4, as referenced in

Figure .

Channel Number: This device supports up to eight channels. To change the channel number, set dip switches 1, 2 and 3, as referenced in

Figure .

Switch in down position. Switch in up position.

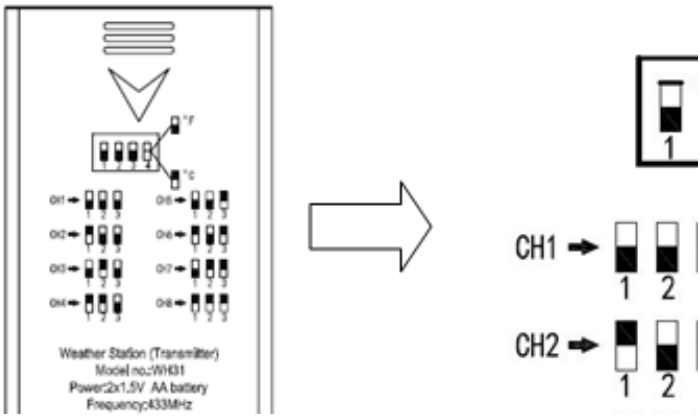


Figure 13: Dip Switch diagram

Figure 14: sensor LCD display

(1) Temperature
(2) Temperature units (°C or °F)
(3) Channel number
(4) Relative humidity

4.4.2 Sensor Placement

The sensor is ideally mounted in a location that never receives direct sunlight. Also, avoid locations with a nearby radiant heat source (radiator, heaters etc.) Direct sunlight and radiant heat sources will result in inaccurate temperature readings.

The unit is weather resistant. If you are placing it outside, please select a covered, sheltered location in the eves or under an awning.

To mount or hang the unit on a wall or wood beam either:

- Use a screw or nail to attach the remote sensor to the wall, as shown in Figure 1
  -or-
- Hang the remote sensor using a cord, as shown in Figure 1

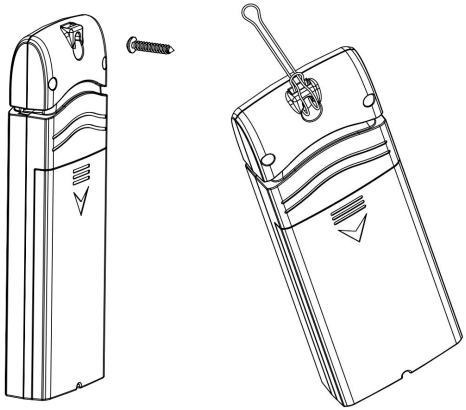


Figure 15: Indoor sensor mounting

Note: Make sure the sensor is mounted vertically and not lying down on a flat surface. This will insure optimum reception.

4.5 Best Practices for Wireless Communication

Wireless communication is susceptible to interference, distance, walls, and metal barriers. We recommend the following best practices for trouble free wireless communication:

1. Electro-Magnetic Interference (EMI). Keep the console at least 1.5m away from computer monitors and TVs.
2. Radio Frequency Interference (RFI). If you have other devices and communication is intermittent, try turning off these other devices for troubleshooting purposes. You may need to relocate the transmitters or receivers to avoid intermittent communication.
3. Line of Sight Rating. This device is rated at 100m line of sight (no interference, barriers, or walls) but typically you will get 20-40m maximum under most real-world installations, which include passing through barriers or walls.
4. Metal Barriers. Radio frequency will not pass through metal barriers such as aluminium siding. If you have metal siding, align the sensor array and console through a window to get a clear line of sight.

The following is a table of reception loss vs. the transmission medium. Each “wall” or obstruction decreases the transmission range by the factor shown below.

Medium	RF Signal Strength Reduction
Glass (untreated)	5-15%

Plastics	10-15%
Wood	10-40%
Brick	10-40%
Concrete	40-80%
Metal	90-100%

Table: RF Signal Strength reduction

4.6 Console Setup

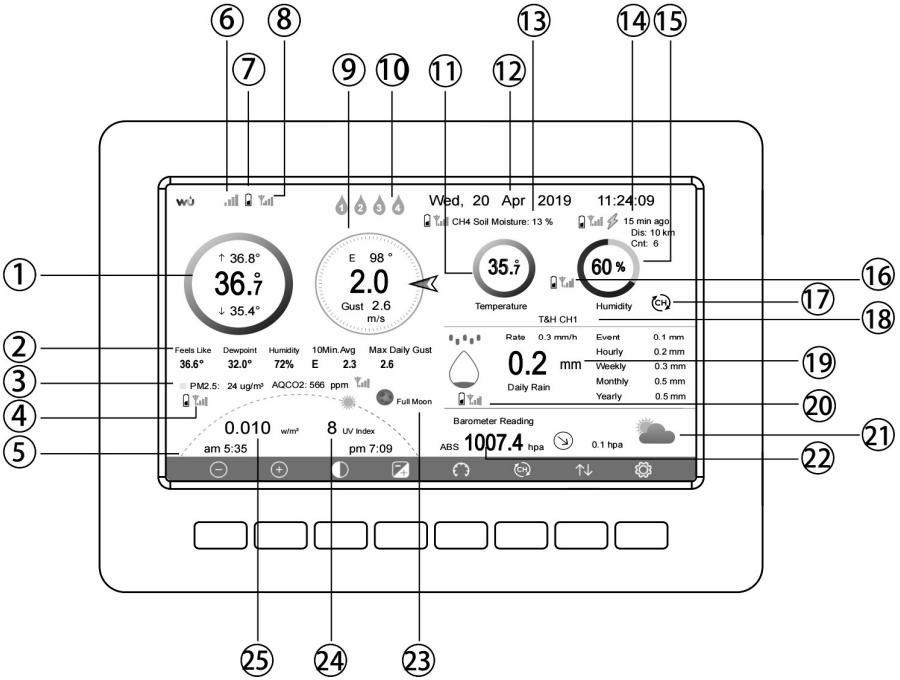


Figure 16: Display Console Screen Layout

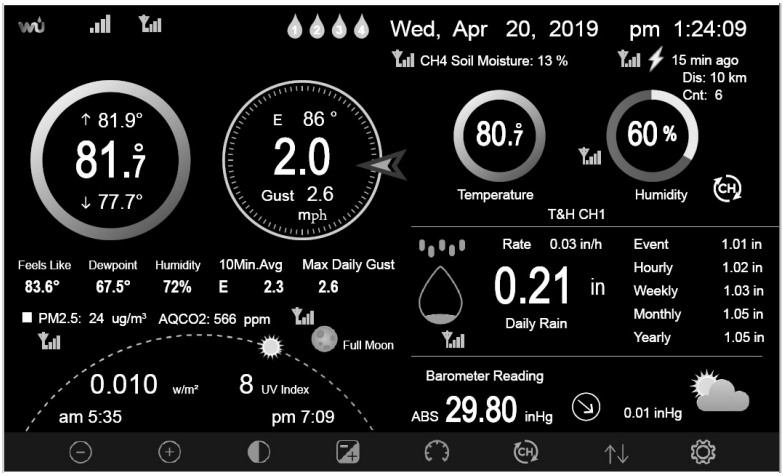
No	Description	No	Description
1	Outdoor temperature	14	Last lightning strikes detected time / distance; daily counts (optional sensor)
2	Outdoor Feels Like/Dew point/Humidity/10Min. Average Wind Direction/Max Daily Gust	15	Indoor humidity
3	PM2.5 concentration (optional sensor)	16	RF signal bar for multi-channel temperature and humidity sensor(optional sensor)

No	Description	No	Description
4	RF signal bar for PM2.5 sensor(optional sensor)	17	Multi-channel temperature and humidity sensor cycle display mode icon(optional sensor)
5	Sunrise / Sunset Time	18	Multi-channel temperature and humidity sensor channel number (optional sensor)
6	Wi-Fi signal bar	19	Rain fall Daily/Event/Hourly/Weekly/ Monthly/Yearly
7	Low battery power indicator for each sensor	20	RF signal bar for Rain fall sensor(optional sensor)
8	RF signal bar for outdoor sensor array	21	Weather forecast
9	Wind direction/Wind speed/Gust	22	ABS/REL Barometer
10	Water Leak Alarm (optional Senor)	23	Moon Phase
11	Indoor temperature	24	UV
12	Date and time	25	Solar Radiation
13	Soil moisture (optional sensor)		

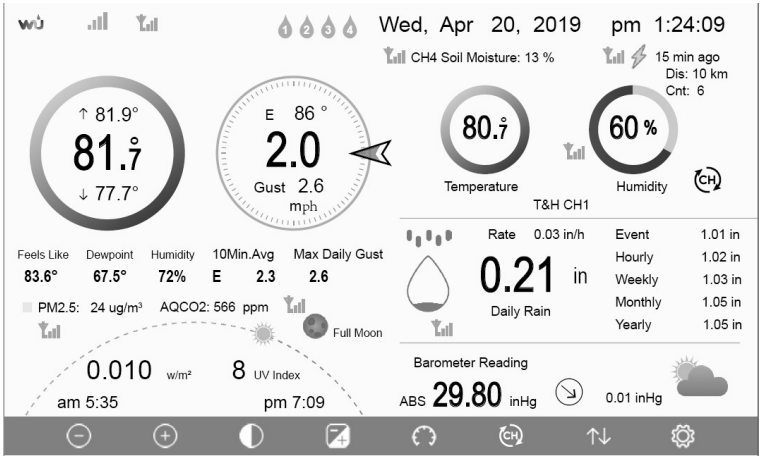
Table: Display console detailed items

4.6.1 Initial Display Console Set Up

Immediately after power up (inserting power adapter), the unit will turn on the display, and the unit will start to look for reception of the indoor and outdoor sensor data. This may take up to 3 minutes.



Dark Background Display



Light Background Display

Note: Sunrise/sunset time display will only work properly when latitude and longitude have been set up correctly. Location setup can be carried out under setup menu.

4.6.2 Key functions

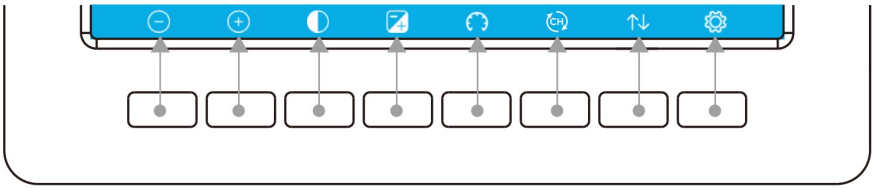


Figure 17: Console buttons

There is a set of eight keys on the bottom of the display console. The following table briefly explains the function of these keys.

Icon	Description
	Brightness control key Press this key to decrease the brightness
	Brightness control key Press this key to enhance the brightness
	Backlight on/off key Press this key to on/off the backlight
	Background key Press this key to choose between dark background display and light background display
	Pressure display key Press this key to choose the display between Absolute pressure and Relative pressure.
	Channel key Press this key to Shift the display between indoor temp & humidity, Multiple Channel temp& humidity and scroll automatically mode
	History key Press this key once to view Max/Min record and twice to enter History mode.
	Setting key Press this key to enter Setup Mode

Table: Console buttons

4.6.3 Main interface icons

4.6.3.1 Temperature icons

Temperature Range (°C)	Ring Colour	Temperature Range (°C)	Ring Colour
< -23		10 to 16	
-23 to -17		16 to 21	
-17 to -12		21 to 26	
-12 to -6		26 to 32	
-6 to 0		32 to 38	
0 to 4		38 to 43	
4 to 10		> 43	

4.6.3.2 Humidity icons

Humidity Range (%)	Ring Colour	Humidity Range (%)	Ring Colour
0%, no signal or dashes		50 to 60	
1 to 10		60 to 70	
10 to 20		70 to 80	
20 to 30		80 to 90	
30 to 40		90 to 99	
40 to 50		100%	

4.6.3.3 Wind direction

Current wind direction indication  , 10-minute average wind direction indication  .

4.6.3.4 Hourly rainfall icons

Hourly Rain (mm)	Icon	Hourly Rain (mm)	Icon
0.0		15 to 20	
0 to 5		20 to 20	
5 to 10		25 to 30	
10 to 15		> 30	

4.7 Multiple Channel Selection and Scroll Mode

Multi-channel sensors are optional sensor. If you have multiple wireless sensors, while in normal mode, press the  key to toggle display in sequence of indoor, CH1, CH2….CH8, scroll display. Please note if only CH2 is received, it will skip CH1, and toggle only between indoor and already learned sensors.

While in Scroll display mode, the scroll icon  will be displayed next to the indoor humidity and will scroll every 5 seconds.

Note: For multi-channel sensors, only the current data from each sensor can be viewed on the console, and no history data will be saved or uploaded to any internet servers.

4.8 History Mode

4.8.1 View and Reset MAX/MIN

While in normal display, press the  key once to view and reset minima and maxima.

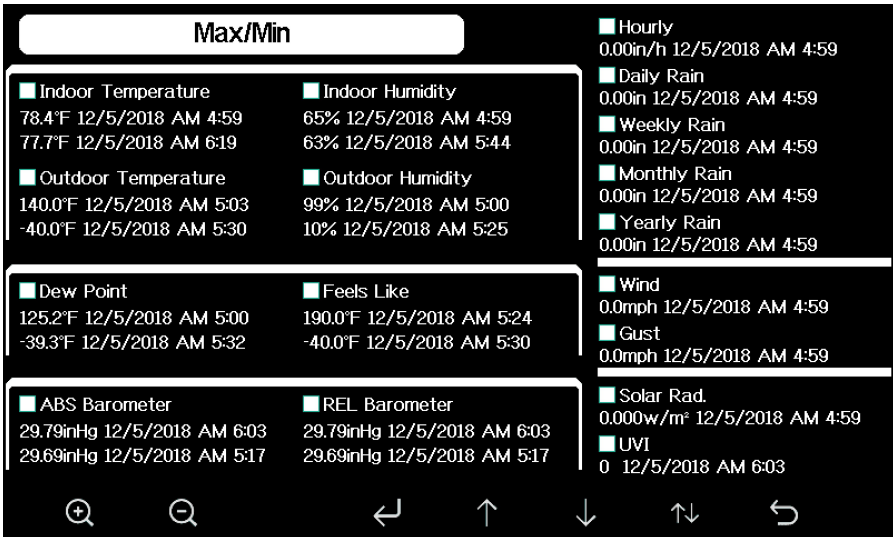


Figure 18: Max/Min screen

Icon	Description
	**Selection key** Press this key to select the weather MAX/MIN record which need to clear
	**Selection key** Press this key to select the weather MAX/MIN record which need to clear
	**Enter key** While the desired weather MAX/MIN record selected , press this key to popup Message Box ”Clear the Max/Min record?”. Press  key

	or ↓ key to select YES or NO. Press the ⊕ key or ⊖ key to confirm the selection.
↑	**Up arrow key** Press this key to change the activated option field
↓	**Down arrow key** Press this key to change the activated option field
↑↓	**History key** Press this key to select History data display
↩	**Return key** Press this key to return to normal display mode

4.8.2 History Record Mode

While in normal display, press the ↑↓ key twice to enter History Record Mode.

No	Time	Indoor Temperature (°F)	Indoor Humidity (%)	Outdoor Temperature (°F)	Outdoor Humidity (%)	Dew Point (°F)	Feels Like (°F)	Wind (mph)
2689	12/5/2018 AM 6:40	77.7	65	68.9	47	47.8	68.9	2.5
2690	12/5/2018 AM 6:45	77.7	65	68.9	47	47.8	68.9	2.5
2691	12/5/2018 AM 6:50	77.7	65	68.9	47	47.8	68.9	2.2
2692	12/5/2018 AM 2:40	77.9	65	68.9	47	47.8	68.9	2.5
2693	12/5/2018 AM 2:45	77.9	65	68.9	47	47.8	68.9	2.2
2694	12/5/2018 AM 2:50	77.9	65	68.9	47	47.8	68.9	2.2
2695	12/5/2018 AM 2:55	77.9	65	68.9	46	47.3	68.9	2.2
2696	12/5/2018 AM 3:00	77.9	65	68.9	46	47.3	68.9	2.2
2697	12/5/2018 AM 3:05	77.9	65	68.9	46	47.3	68.9	2.2
2698	12/5/2018 AM 3:10	77.9	65	68.9	46	47.3	68.9	2.2
2699	12/5/2018 AM 3:15	77.9	65	68.9	46	47.3	68.9	2.7
2700	12/5/2018 AM 3:20	77.9	64	68.9	46	47.3	68.9	2.5
2701	12/5/2018 AM 3:25	77.9	65	68.9	46	47.3	68.9	2.2
2702	12/5/2018 AM 3:30	78.1	65	68.9	46	47.3	68.9	2.2
2703	12/5/2018 AM 3:35	78.6	65	68.9	46	47.3	68.9	2.2
2704	12/5/2018 AM 3:40	78.6	65	68.9	46	47.3	68.9	2.2

Figure 19: History record screen

Icon	Description
	File Select key Press this key to clear all history record

	**Page Select key** Press this key to enter particular page of the history data. Each page contains 16sets data.
	**Scroll left key** Press this key to view the left of the scrollable area
	**Scroll right key** Press this key to view the right of the scrollable area
	**Page up key** Press this key to scroll up the page you are viewing
	Page down key Press this key to scroll down the page you are viewing
	**History key** Press this key to select the Max/Min record or History
	**Return key** Press this key to return to previous mode

4.8.2.1 Clear the history record

While in History Record Mode, press  key to popup the Message Box: "Clear the history record?" Press "Yes" to clear all history records saved on console. Press  or  key to return to History record Mode.

Figure 20: Clear history record screen

4.8.2.2 View a specific page of history

While in History Record Mode, press the  key to enter the page selection mode:

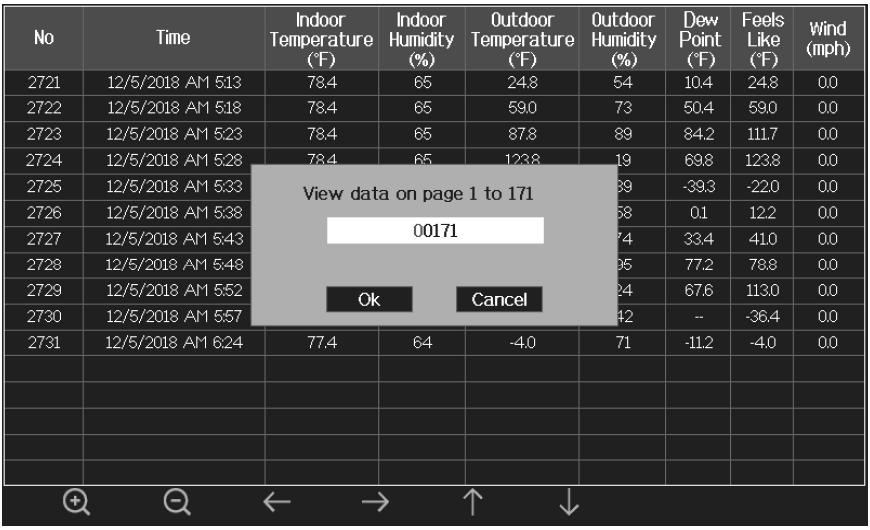


Figure 21: view a specific page of history screen

Press ← or → to select a digit in a number, press ⊕ or ⊖ key to change the number. Press ↑ or ↓ to change the activated option field, toggle OK or Cancel then press ⊕ or ⊖ key to confirm.

4.8.3 View Graph

While in History Record Mode, press the ↑↓ key three times to enter Graph Mode.

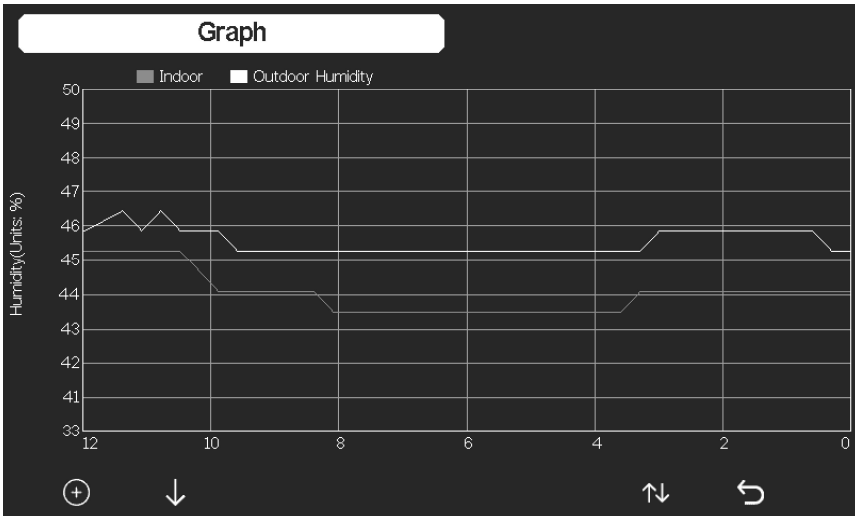


Figure 22: Graph Screen

Press ⊕ to shift the data display of 12/24/48/72H. Press ↓ to view the graph of the following data:

- Indoor outdoor temperature
- Dew Point and Feels like
- Indoor outdoor humidity

- Wind speed and Gust
- Wind Direction
- UVI
- Solar radiation
- Rainfall hourly and daily
- Barometer (REL & ABS)

4.8.4 View Channel Data

While in normal display, press the  key four times to enter Channel Data Mode.

If you purchase the optional sensor, soil moisture sensor or PM2.5 sensor or multi-channel temperature and humidity sensor, their data can be showed on Channel Data screen.

Press  or  key to select Name setting field, the name on focus turns green, press the  or  key to pop up the keyboard to enter the sensor name. Press  to scroll to the character and press  to select the character. Press  to return to the Channel Data page.

Press  key to page down.

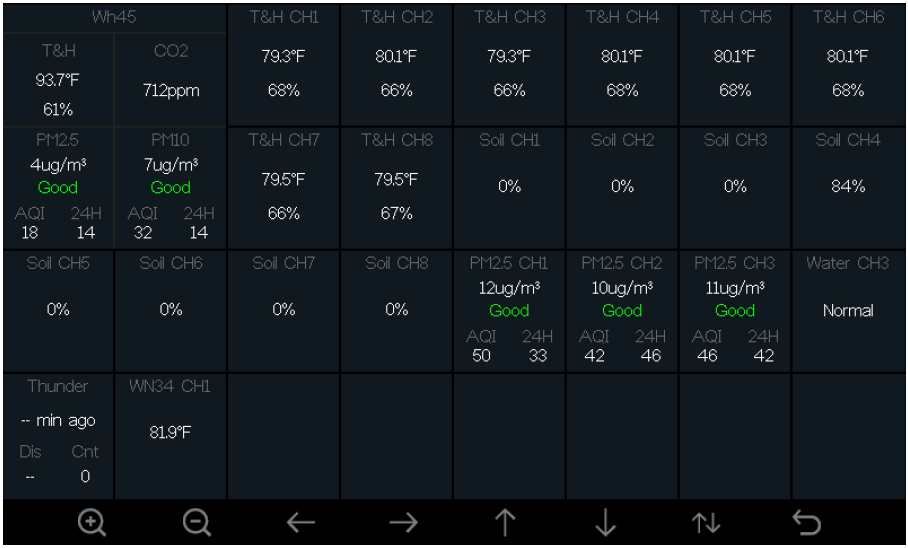


Figure 23: Channel Data Screen

4.9 Setup Mode

While in normal display, press the  key to enter Setup Mode. You can select the below sub-mode by pressing the  key

Figure 24: Setup Menu Screen

Icon	Description
	**Select key** Press this key to select the unit or scroll values
	**Select key** Press this key to select the unit or scroll values.
	**Left key** Press this key to select the set value.
	**Right key** Press this key to select the set value.
	**Up arrow key** Press this key to change the activated option field
	**Down arrow key** Press this key to change the activated option field
	**Set key** Press this key to select the Setting sub-Mode
	**Return key** Press this key to return to previous mode

4.9.1 Date and Time setup

While in Setup Mode, press ↓ key to select Date and Time Setup field, press ⊕ or ⊖ key to enter Date and Time Setup mode:

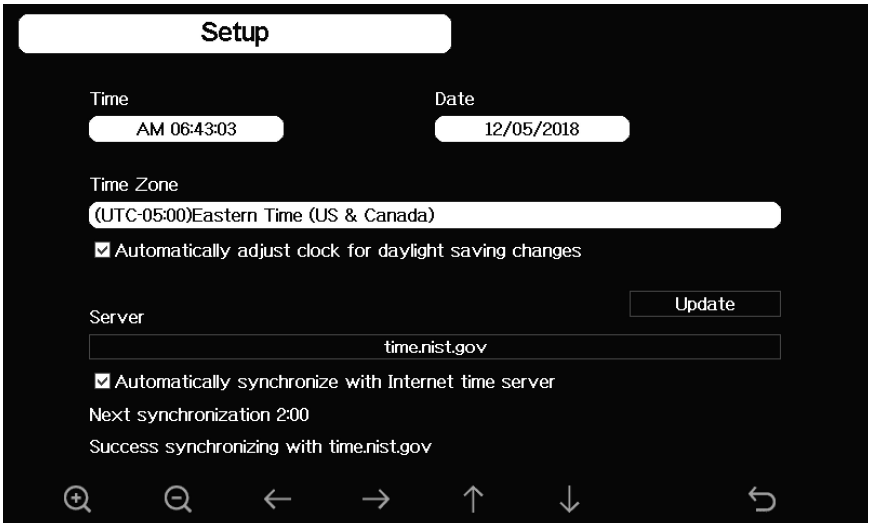


Figure 25: Time and date Setup Screen

1) Time setting (hour/minute/second)

Press ↓ key to select time setting field, and the hour digit will turn red, press the ⊕ or ⊖ key to change the hour setting. Press → to set the minute, the minute digit will turn red, press the ⊕ or ⊖ key to change the minute setting. Press → to set the second, and the second digit will turn red, press the ⊕ or ⊖ key to change the second setting

2) Date setting

Press  key to select Date setting field, the day digit on focus turns red, press the  or  key to change the day setting. Press  to set the month, then month digit focused will turn red, press the  or  key to change the month setting. Press  to set the year, the year digit on focus will turn red, press the  or  key to change the year setting

3) Time zone setting

Press  key to select Time zone setting field, press the  or  key to change the time zone setting. Press  key to select Update field, press the  or  key to update the time immediately.

4) Automatically synchronize with internet time server

The time server is time.nist.gov. Press the  or  key to tick" Automatically synchronize with internet time server" and press" update" to synchronize with time server immediately. Console time will be updated at 2:01am automatically when internet access is available.

4.9.2 Time format setup

Press  to change the time format between hour: minute: second (h:mm:ss), hour: minute: second AM (h:mm:ss AM) and AM hour: minute: second (AM h:mm:ss).

4.9.3 Date format setup

Press  to change the time format between DD-MM–YYYY, YYYY-MM-DD and MM-DD-YYYY

4.9.4 Temperature unit setup

Press  to change the temperature units of measure between °F and °C.

4.9.5 Barometric pressure unit setup

Press  to change the temperature units of measure between inHg, mmHg and hPa

4.9.6 Wind speed unit setup

Press  to change the wind speed units of measure between mph, bft (Beaufort scale), ft/s, m/s, km/h and knots.

4.9.7 Rainfall unit setup

Press  to change the rainfall units of measure between in and mm

4.9.8 Solar radiation unit setup

Press  to change the solar radiation units of measure between W/m^2,
lux and fc.

4.9.9 Multi-channel sensor setup

On the Multi-channel sensor setup screen, you can rename the each temperature/humidity sensor or register each temperature/humidity sensor again in the event of connection loss.

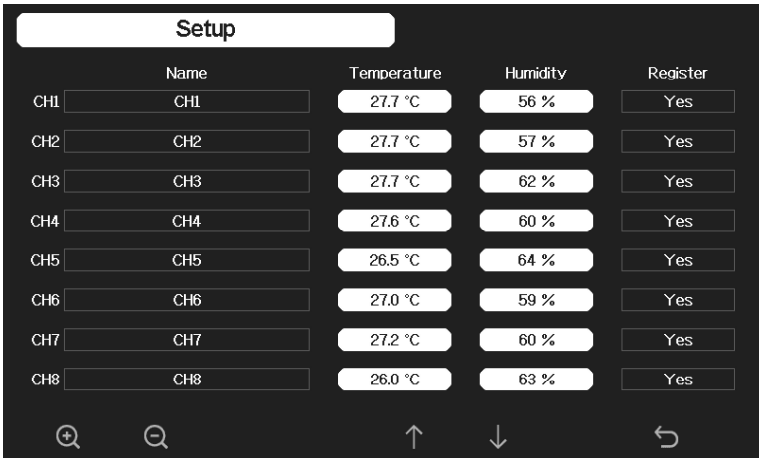


Figure 26: Multi channel sensor Setup Screen

Press  or  key to select the sensor name field to change. Once highlighted in green, press the  or  buttons to bring up the on-screen keyboard. Navigate using  to select each

letter and press  to select the character. Press  to return to the setup page.

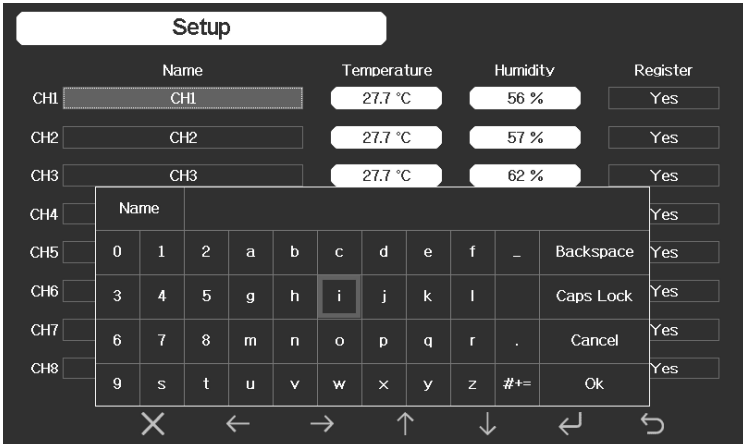


Figure 27: rename the sensor Screen

Press  or  key to select Register sensor field, press the  or  key to register the selected sensor

4.9.10 Backlight setting

While in Setup Mode, press  key to select Backlight Setup field, press  or  key to enter backlight setup mode:

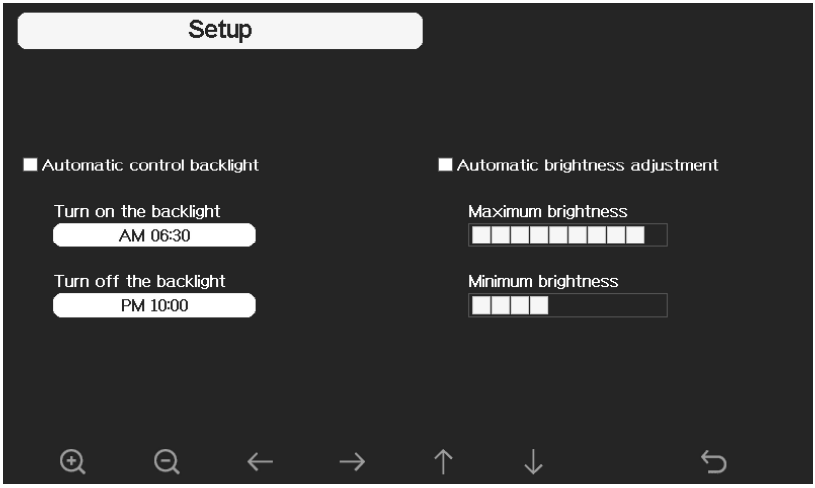


Figure 28: Backlight Setting Screen

Automatic control backlight: select this option to automatically turn the backlight on and off according to a set time (below)
Turn on the backlight: set the time to turn on the backlight
Turn off the backlight: set the time to turn off the backlight
Automatic brightness adjustment: select this option, the brightness will change according to the light intensity measured from outdoor sensor
Maximum brightness: set the maximum brightness in automatic brightness mode
Minimum brightness: set the minimum brightness in automatic brightness mode

Icon	Description
	Select key Press this key to select the unit or scroll values
	Select key Press this key to select the unit or scroll values.
	Left key Press this key to select the set value.

	**Right key** Press this key to select the set value.
	**Up arrow key** Press this key to change the activated option field
	**Down arrow key** Press this key to change the activated option field
	**Return key** Press this key to return to previous mode

If the auto backlight on time has been set, you can press  key to turn it off. Backlight will turn on again automatically next day. You can press any key to turn on the backlight for 60s if you are within the off period.

4.9.11 Longitude and Latitude setup

While in Setup Mode, press  key to select Longitude and Latitude Setup field followed by  or  :

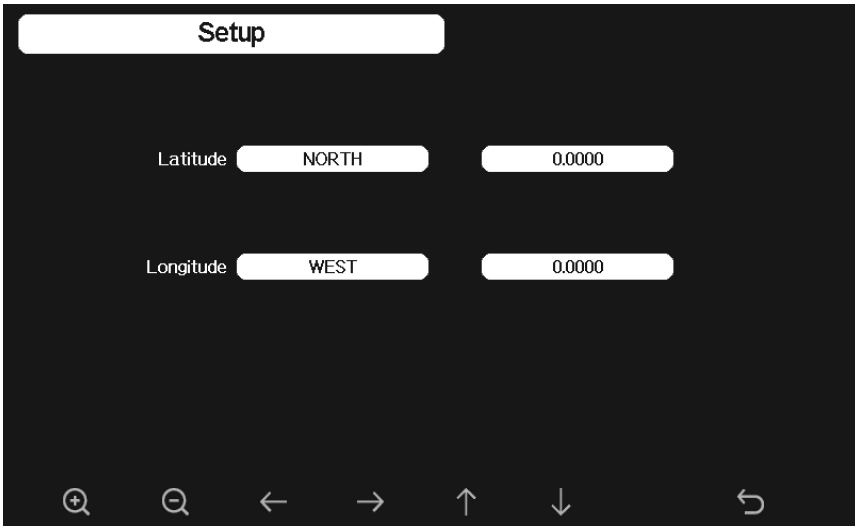


Figure 29: Longitude and Latitude Setting Screen

The sunrise/sunset times will be calculated automatically based on your longitude and latitude. Your co-ordinates can be found at a number of places. www.latlong.net is quick and easy. Make sure to set your hemispheres correctly. Two digits after decimal should be enough for this feature.

4.9.12 Barometric display setting

Press  to change the barometer display between REL (relative pressure) and ABS (absolute pressure). Unless you live at sea level, please use relative pressure.

4.9.13 Rainfall season (default: January)

Press  to change the beginning of the rainfall yearly season changeover month. The default is January. When selected, the annual rainfall and annual max/min rainfall are reset at 0:00 of the first day of the selected month.

4.9.14 Storing interval setup

Use your arrow keys to select a measurement interval of between 1 minute and 240 minutes.

4.9.15 Weather Server

Your console can send your sensor data to select internet-based weather services. The supported services are shown in the table below:

Service	Website	Description
Ecowitt Weather	ecowitt.net	Ecowitt is a new weather server that can host several sensors that other services

		don't support.
Weather Underground	wunderground.com	Weather Underground is a free weather hosting service that allows you to send and view your weather station data real-time, view graphs and gauges, import text data for more detailed analysis and use iPhone, iPad and Android applications available at Wunderground.com. Weather Underground is a subsidiary of The Weather Channel and IBM.
WOW	wow.metoffice.gov.uk	WOW is a UK-hosted based weather observation website, available for international users.
Weather Cloud	weathercloud.net	Weathercloud is a real-time weather social network.
Customised Website		Supports uploading to your customised website, using the same specification as either Wunderground or Ecowitt

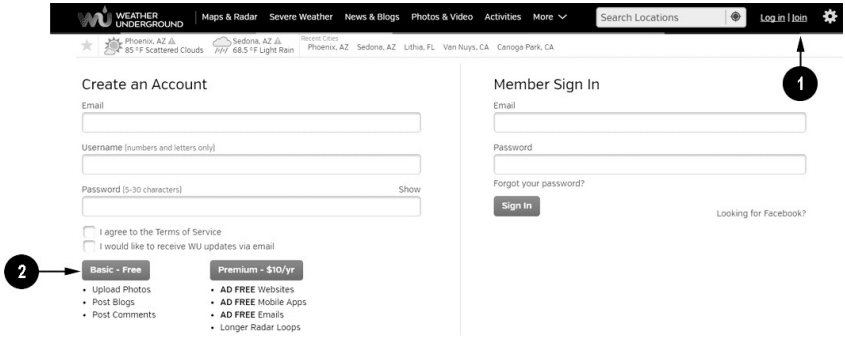
Table: Supported weather services

Note: If you are testing setup with the outdoor sensor array before mounting, you may want to consider connecting to Wi-Fi, but not yet configuring any of the weather services. The reason is that the data will not be correct the rain bucket may be tripped during handling, causing rain to be falsely registered.

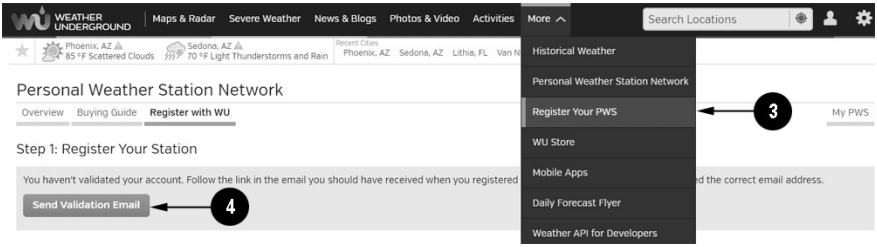
4.9.16 Wunderground server setup

4.9.16.1 Get the station ID and key/password

① Visit Wunderground.com and select the **Join** link (1) at the top of the page and select the **Free** (2) sign up option.



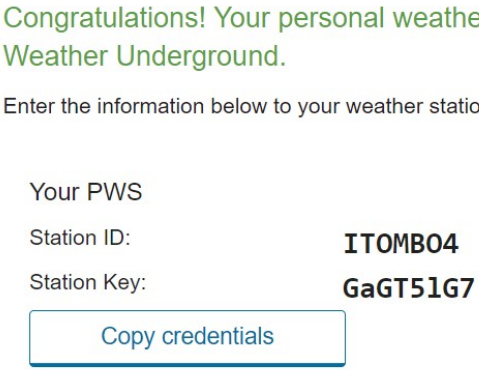
② Select **More | Register Your PWS** (3)



③ Click **Send Validation Email** (4). Respond to the validation email from Wunderground.com (it may take a few minutes).

④ Select **More | Register Your PWS** (5) again. This time you will be asked details about your weather station. Go ahead and fill out the form. Select Other as your hardware type

After completing the weather station, you will see something like this:



Your station ID will have the form: ICCCCC###, I for international, CCCCC is an abbreviation for your city and ### is the station number in that city. In the example above, you see station 4 in the city starting TOMBO, outside the USA.

⑤ Take note of the station ID and station key and enter it in the Weather Server:

4.9.16.2 Registration on console display

Press  or  key to enter Weather Server set up mode. Enter the Station ID and Password obtained from Wunderground.com.

Figure 30: WU Server setup screen

scroll value up	scroll value down	Scroll field up	Scroll field down	return to Setup

Set Station ID: Press  to highlight the Station ID. Enter your station ID. Press  to bring up the on-screen keyboard. Navigate using     to select each letter and press  to select the character. Press  to return to the setup page.

Set Station Key: Press  to highlight the station key. Enter your station key from your setup process. Press  buttons to bring up the on-screen keyboard. Navigate using     to select each letter and press  to select the character. Press  to return to the setup page.

3)Viewing data on wunderground.com

The way to you're your data is to navigate to wunderground.com/dashboard/pws/ICCCCxxx where ICCCCxxx is your station ID. Here you can see your current and past data.

The Weather Underground App on iPhone or Android will give you limited data - you can find your station by using the App and searching for your Station ID. There are also several third-party options on both iOS and Android.

In the meantime,

1) Navigate to wunderground.com/dashboard/pws/ICCCCxxx where ICCCCxxx is your station ID in your phone browser
2) Tap the three dots menu on Android, or the Square icon in iOS.

3) Select Add to Home screen

4) The mobile version of the website is nice and will give you full access to your readings. Now when you select the icon on your home screen, you'll go direct to your station.

As far as third-party Apps go, we suggest Meteo PWS on Android and myPWS on Apple.

4.9.17 Weathercloud server setup

To register with Weathercloud follow these steps:

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

2) Respond to the validation email from Weathercloud (it may take a few minutes).
3) You will then be prompted to add a device/ Select "Create device" and enter your station's information:

4) After registering your station, take note of the "Weathercloud ID" and "Key" presented to you.
5) Enter these values in the **Weather Server**:

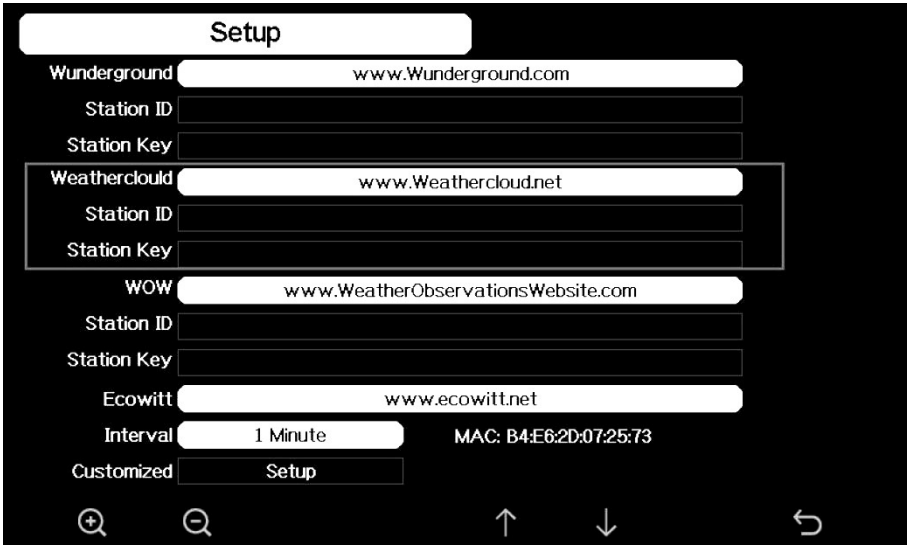


Figure 31: Weathercloud Server setup screen

scroll value up	scroll value down	Scroll field up	Scroll field down	return to Setup

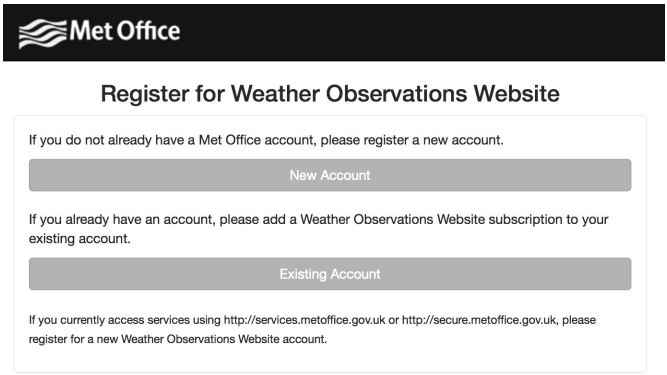
4.9.17.1 Weather Observations Website (WOW) server setup

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

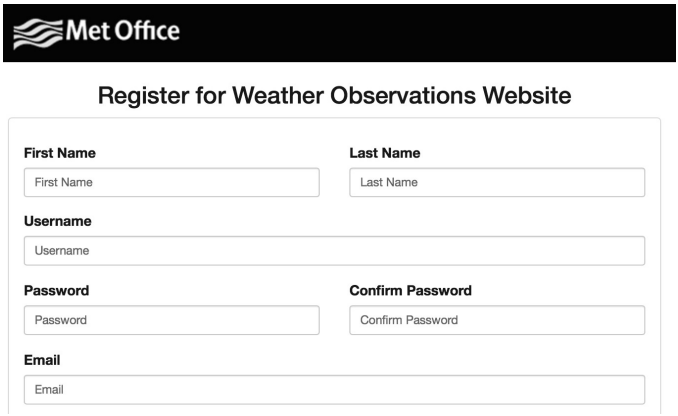
1) Sign Up with WOW

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

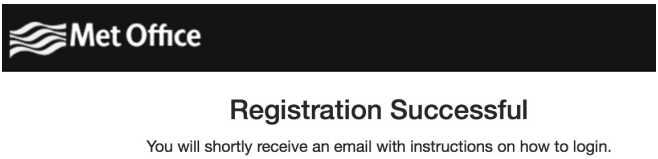
You will be presented with the screen below where you will choose to either create a new account or use an already existing account. Click the desired option.



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:



2) Confirm your email with WOW

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

3) Login to WOW

Follow instructions on the screen and login to the site.

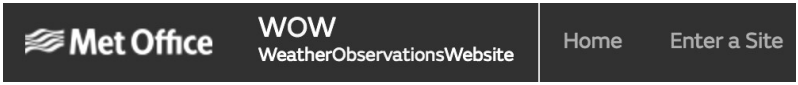
4) Create/Set up a new WOW site

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

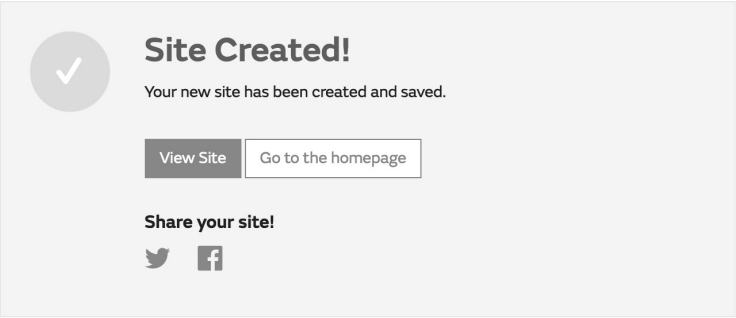
Site ID: This is an arbitrary number that is used to distinguish your site from another. This number appears (in brackets) next to or underneath the name of your site on the site information page, for example: 6a571450-df53-e611-9401-0003ff5987fd

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 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

123456

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

Figure 32: WOW Server setup screen

scroll value up	scroll value down	Scroll field up	Scroll field down	return to Setup

4.9.17.2 Ecowitt.net server setup

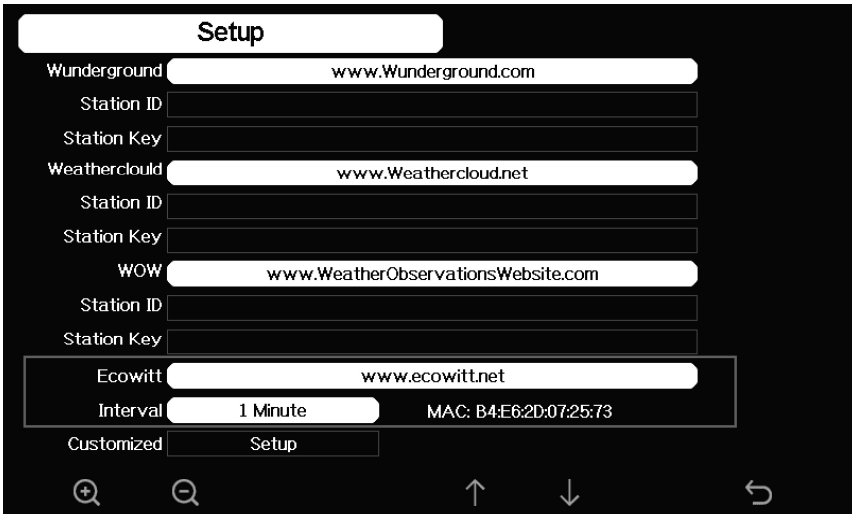
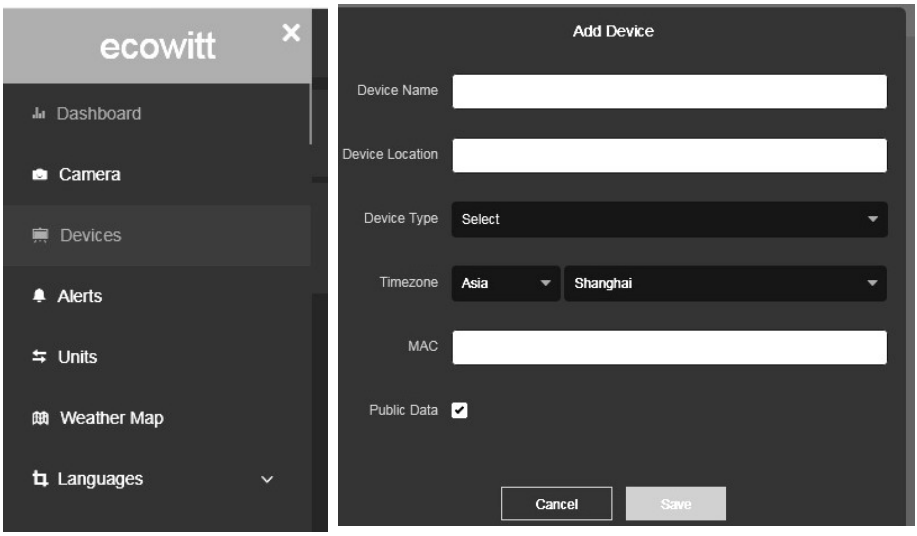


Figure 33: Ecowitt Server setup screen

				
scroll value up	scroll value down	Scroll field up	Scroll field down	return to Setup

To register with Ecowitt follow these steps:

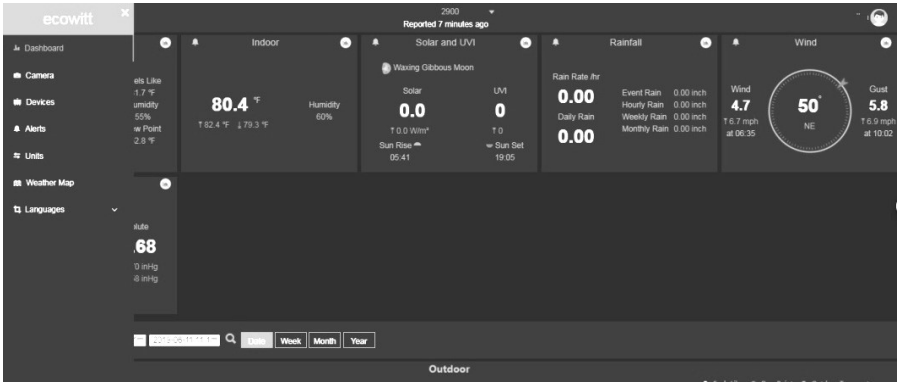
Visit ecowitt.net and enter Email and Password to sign up.
Press the upper left menu button and select Devices. Press Add Device and input all the information needed, press save. MAC address found on Ecowitt Server setup screen (Figure 33), Note that this is an example only and your MAC address will be different.



Note: When select device address on map, please wait till the map display before select your address.

Note: Please put in the correct time zone to get the correct time. Because the time will be updated to internet time automatically while WIFI connection.

Once registered, select the dashboard to view your data, as shown below:



Ecowitt.net is a responsively designed, mobile friendly. To view on your mobile, open your mobile devices web browser, browse to ecowitt.net, and bookmark your dashboard for quick access.

4.9.17.3 Customised server setup

For highly experienced users, it offers the option to send data to the user's own server. Press the "setup" button to enter Customized setup screen,

Figure 34: Server setup screen

Select Enable button and select the protocol type. The website should use either the Wunderground or Ecowitt format for data transfer.

4.9.18 Wi-Fi scan

Note: Your WeatherMaster can only connect on 2.4GHz WiFi. Ensure that your WiFi is available on 2.4GHz and configure mesh systems to keep a stable 2.4GHz signal for your WeatherMaster

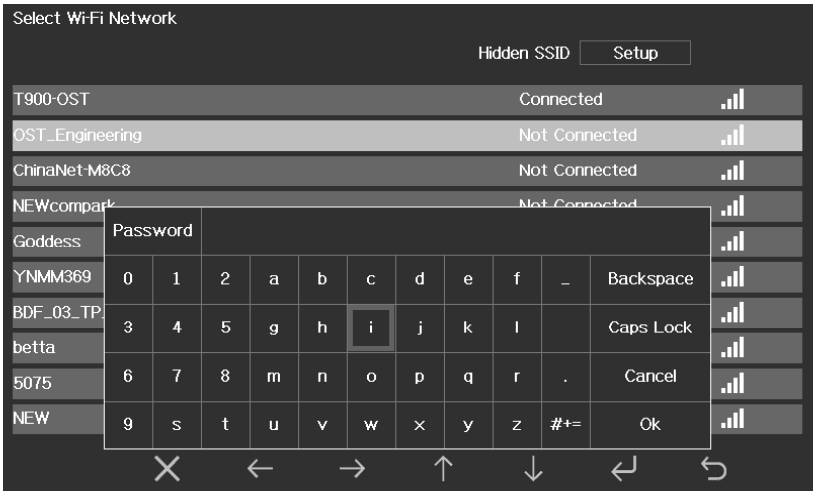


Figure 35: Select Wi-Fi Network Screen

Press ↑ or ↓ key to select the Wi-Fi network. Press ↵ key to confirm and enter the password. Press ⮌ to return to normal display mode. If that your network is not listed when Wi-Fi Scan is performed, press ⮌, restart Wi-Fi Scan and this will usually solve the problem.

Note: Connection to a weather network requires successful connection to WiFi. If the Wi-Fi network connects successfully, ▂▄▆ will show on the

left top of the console display. If data is upload to Wunderground.com successfully,  will show on the left top of the console display.

If you use a hidden SSID, please follow below steps to connect:

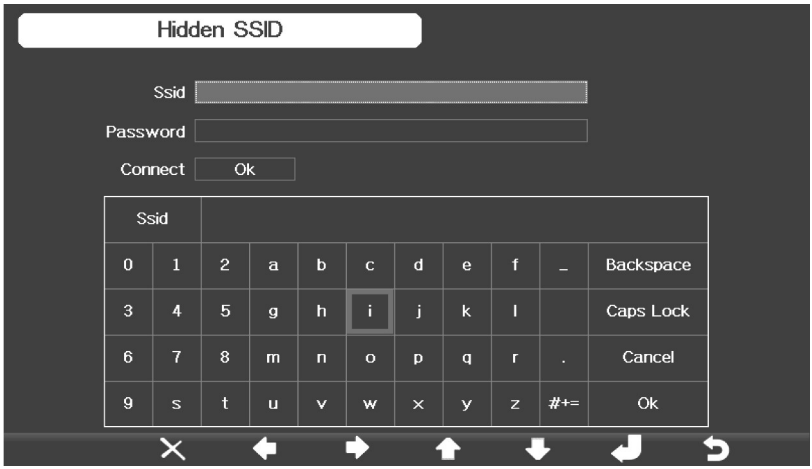
1) Press   to select Hidden SSID setup, and press  .

2) Press  to highlight the SSID and enter the details using the on-screen keyboard. Press  to return to the setup page.

3) Repeat for the password.

4) Press  to highlight the "OK" button beside "Connect" to start connecting.

After connected successfully, the status will display" Connected".



4.9.19 Background

While in Setup Mode, press ↓ key to select Background Setup field, press ⊕ or ⊖ key to choose between dark background display and light background display

4.9.20 More

This screen is for optional sensors calibration and all sensor ID setup. Press ⊕ or ⊖ key to enter More mode.

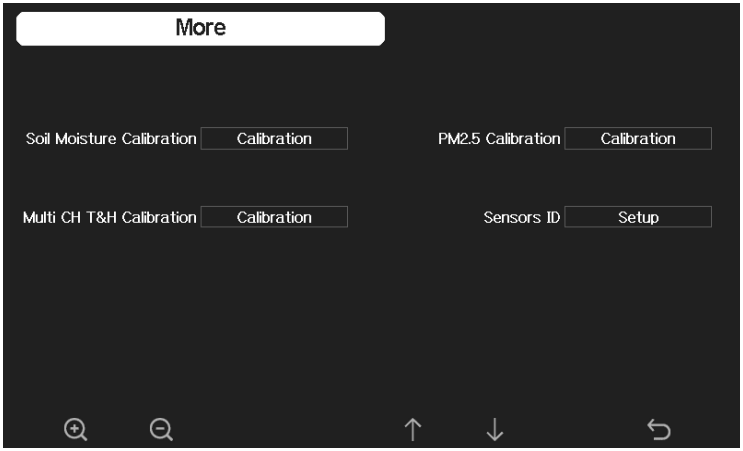


Figure 36: optional sensors calibration and sensor ID setup

Press ↓ or ↑ key to select setting field, press the ⊕ or ⊖ key to enter option sensors calibration mode or Sensor ID setup mode.

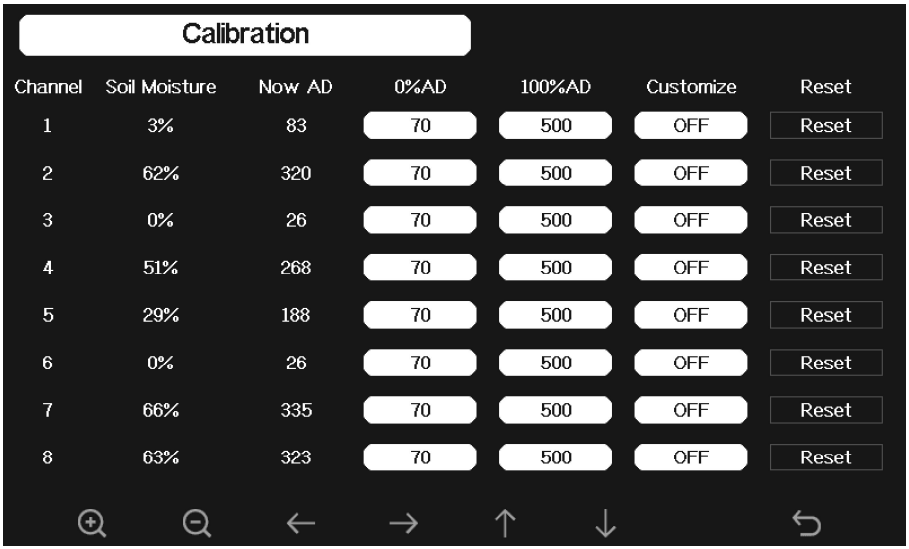


Figure 37: Soil Moisture Calibration Screen

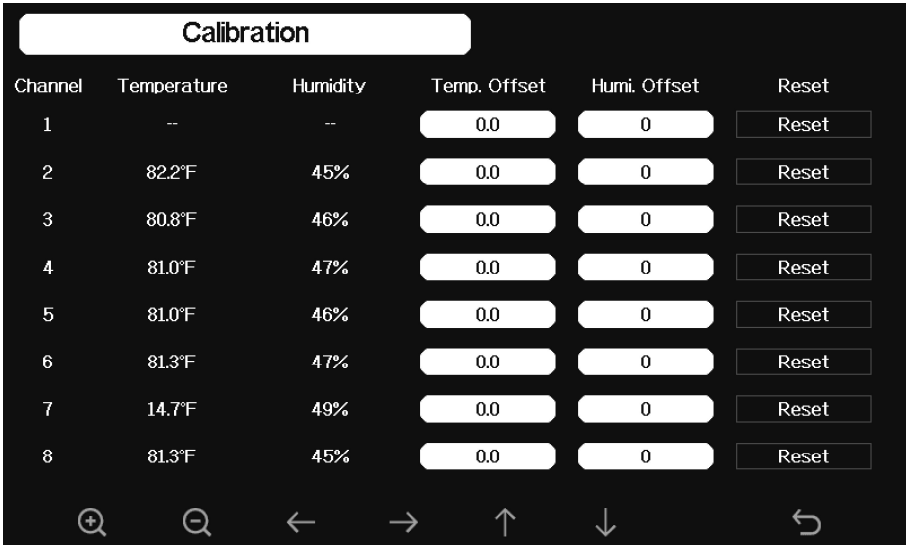
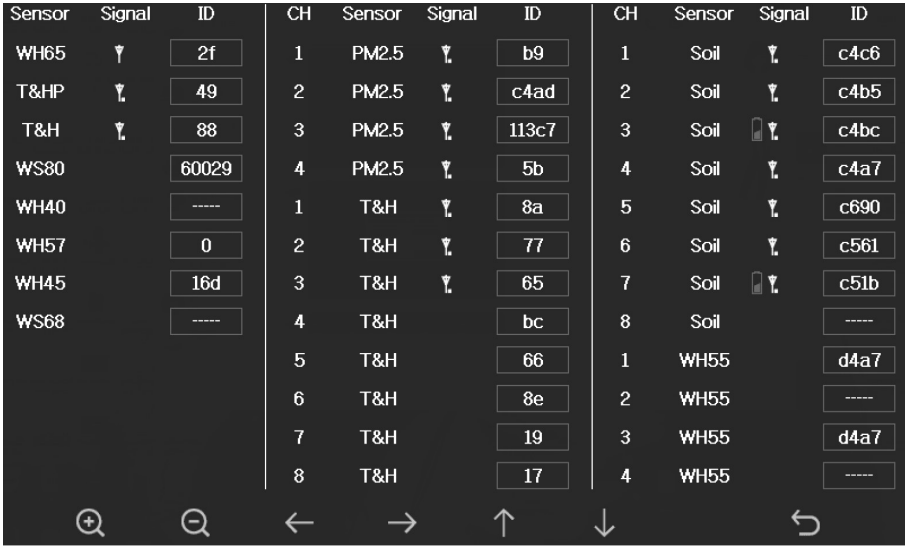


Figure 38: Multi-channel Temperature and Humidity Sensor calibration Screen

Icon	Description
	Select key Press this key to select the unit or scroll values
	Select key Press this key to select the unit or scroll values
	Left key Press this key to select the set value
	Right key Press this key to select the set value
	Up arrow key Press this key to change the activated option field
	Down arrow key Press this key to change the activated option field

	Return key Press this key to return to previous mode



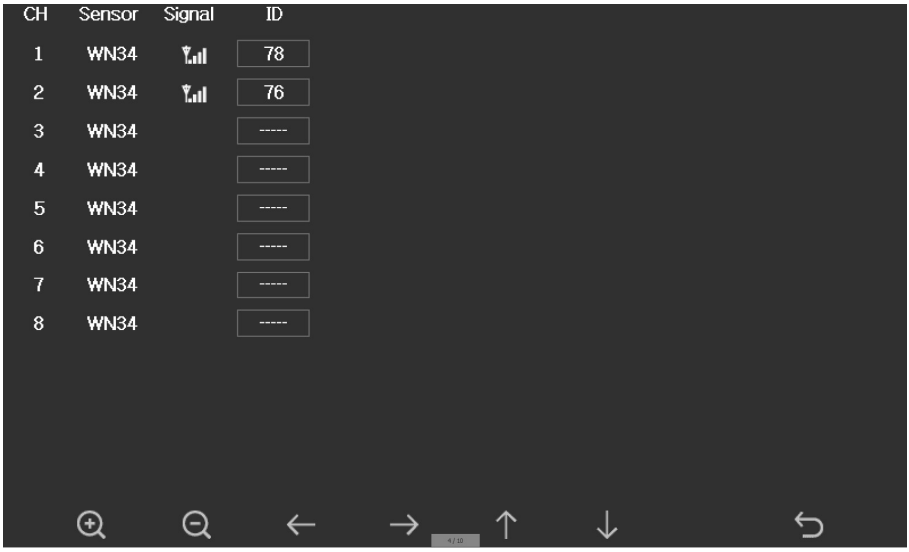
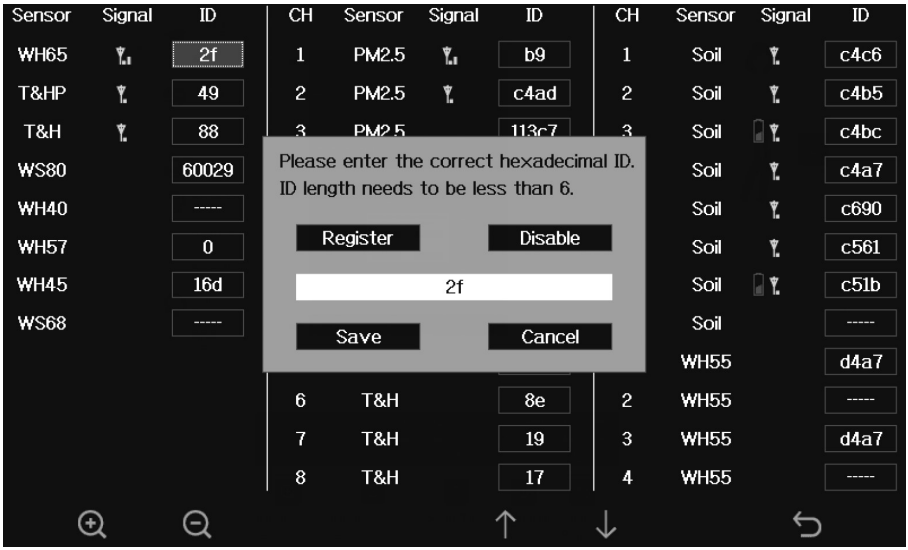
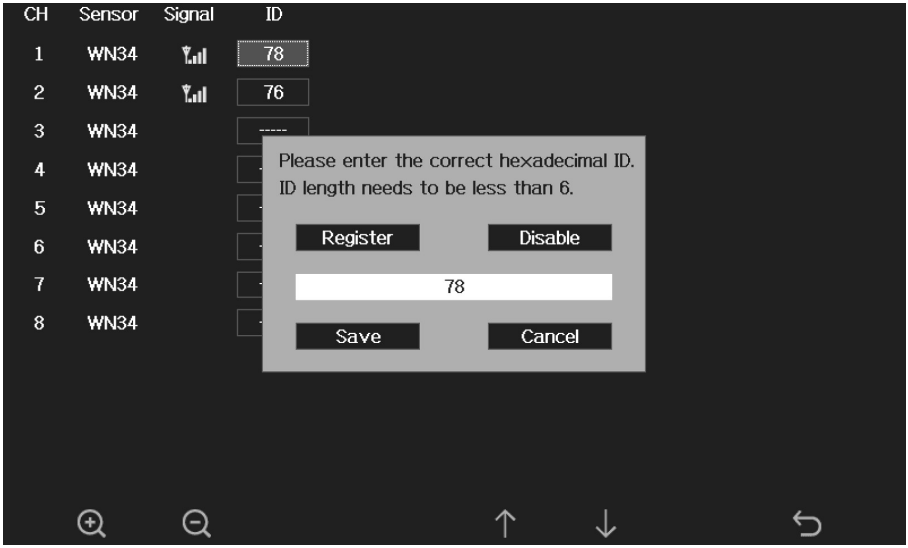


Figure 39: Sensors ID setup Screen

This screen list all the sensors can work with WeatherMaster console. This package just included WH65 outdoor sensor array and T&HP (temperature, humidity and pressure) indoor sensor. These two sensors signal reception status and ID number will automatically display on the screen if console receives the sensors signal. The sensor ID is unique and fixed. You can choose **Disable** to disconnect from the console or Register to reconnect with the console.





4.10 Alarm Setup Mode

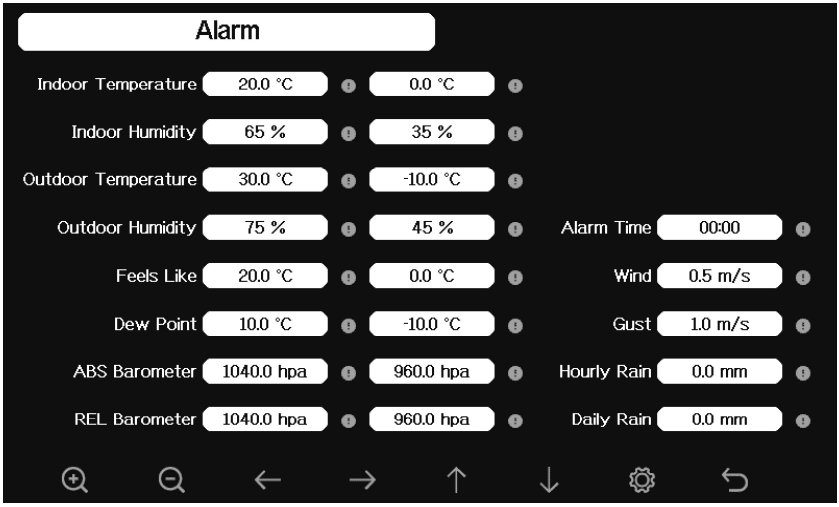


Figure 40: Alarm Setting Screen

Icon	Description

	**Select key** Press this key to select the unit or scroll values
	**Select key** Press this key to select the unit or scroll values
	**Left key** Press this key to select the set value
	**Right key** Press this key to select the set value
	**Up arrow key** Press this key to change the activated option field
	**Down arrow key** Press this key to change the activated option field
	**Set key** Press this key to select the setup sub-mode
	**Return key** Press this key to return to previous mode

The first column is the high alarm value, and the second column is the low alarm value.

When weather alarm condition has been triggered, that alarm will sound for 120 second and the corresponding icon will flash until the weather condition does not meet the user set level. Press any key to mute the alarm.

4.11 Calibration Mode

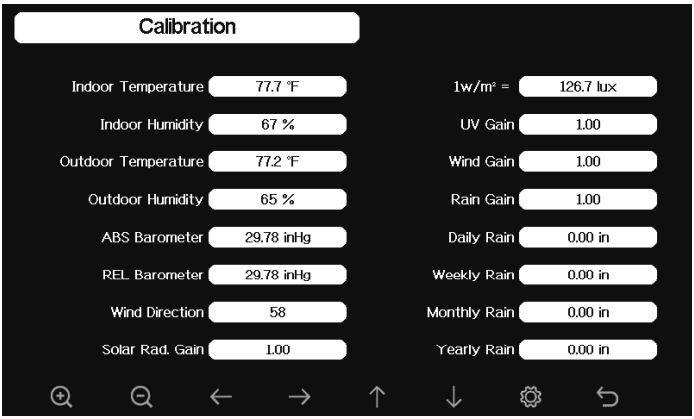


Figure 41: Calibration Setting Screen

Icon	Description
	**Select key** Press this key to select the unit or scroll values
	**Select key** Press this key to select the unit or scroll values
	**Left key** Press this key to select the set value
	**Right key** Press this key to select the set value
	**Up arrow key** Press this key to change the activated option field
	**Down arrow key** Press this key to change the activated option field
	**Set key** Press this key to select the setup sub-mode
	**Return key** Press this key to return to previous mode

To adjust the parameter, press  to scroll to the parameter you wish to change. Press  to highlight the sign (positive vs. negative, if applicable) and significant digit. Press  or  to change the calibrated value.

Parameter	**Type of Calibration**	**Default**	**Typical Calibration Source**
Temperature	Offset	Current Value	Red Spirit or Mercury Thermometer (1)
Humidity	Offset	Current Value	Sling Psychrometer (2)
ABS Barometer	Offset	Current Value	Calibrated laboratory grade barometer
REL Barometer	Offset	Current Value	Local airport (3)
Wind Direction	Offset	Current Value	GPS, Compass (4)
Solar Radiation	Gain	1.00	Calibrated laboratory grade solar radiation sensor
1 w/m^2	Gain	126.7 lux	Solar radiation conversion from lux to w/m^2 for wavelength correction (5)
Wind	Gain	1.00	Calibrated laboratory grade wind meter (6)
Rain	Gain	1.00	Sight glass rain gauge with an aperture of at least 10cm (7)
Daily Rain	Offset	Current Value	Apply an offset if the weather station was not operating for the entire day.
Weekly Rain	Offset	Current Value	Apply an offset if the weather station was not operating for the entire week.
Monthly Rain	Offset	Current Value	Apply an offset if the weather station was not operating for the entire month.
Yearly Rain	Offset	Current Value	Apply an offset if the weather station was not operating for the entire year.

(1) 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.

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

(2) Humidity is a difficult parameter to measure electronically and drifts over time due to contamination. In addition, location has an adverse effect on humidity readings (installation over dirt or 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.

(3) The display console 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 1030hPa at an altitude of 200m, but the relative pressure is 1006hPa.

The standard sea-level pressure is 1013hPa. This is the average sea-level pressure around the world. Relative pressure measurements greater than 1013hPa are considered high pressure and relative pressure measurements less than 1013hPa are considered low pressure.

To determine the relative pressure for your location, locate an official reporting station near you from an official source and set your weather station to match the official reporting station.

(4) Only use this if you have orientated the weather station sensor array such that the guide arrow and does not point to true North. Apply some tape to the windvane to stop it moving and apply a calibration of the direction it is pointed in degrees.

(5) 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 evapotranspiration and solar panel efficiency.

(6) 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 8m tall and you mount the sensor on a 2m pole:

Here, the distance to mount away from house = 4 x (8 – 2) = 24m.

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 speed, high speed fan.

(7) The rain collector is calibrated at the factory based on the funnel diameter. The bucket tips every 0.3mm of rain (referred to as resolution). The accumulated rainfall can be compared to a sight glass rain gauge with an aperture of at least 10cm. Make sure you periodically clean the rain gauge funnel.

Note: The purpose of calibration is to fine tune or correct for any sensor error associated with the devices margin of error. Errors can occur due to electronic variation (example, the temperature sensor is a resistive thermal device or RTD, the humidity sensor is a capacitance device), mechanical variation, or degradation (wearing of moving parts, contamination of sensors).

Calibration is only useful if you have a known calibrated source, you can compare it against, and is optional. This section discusses practices, procedures, and sources for sensor calibration to reduce manufacturing and degradation errors. Do not compare your readings obtained from sources such as the internet, radio, television or newspapers. The purpose of your weather station is to measure conditions of your surroundings, which vary significantly from location to location.

Note: UV Calibration MUST be performed every 2 to 3 months to improve results. Over time, UV Index may alter results based on bright and strong sunlight conditions. This is why diligent UV Calibration is recommended.

4.12 Factory reset

Figure 42: Factory Reset Screen

4.12.1 Re-register indoor transmitter

Press  or  key to select re-register indoor transmitter. Press  or  key to popup the Message Box ”Register a new indoor transmitter?” Press  or  to select Yes or No. Press the  or  key to confirm the selection.

4.12.2 Re-register outdoor transmitter

Please reference section 6.7.1. Procedures and settings are similar to re-register indoor transmitter

4.12.3 Automatic Clear Max/Min

To turn on/off automatically clear Max/Min record at 0:00hr every day.

Press  or  key to select Automatic clear Max/Min. Press  or  key to switch on/off.

When it is selected with ON option, min/max will be presented as daily min/max, and with OFF option selected, it is for historical min/max record.

4.12.4 Reset to Factory

Press  or  key to select Reset to Factory. Press  or  key to popup the Message Box ”Reset to factory default?” Press  or  to select Yes or No. Press the  or  key to confirm the selection.

4.12.5 Clear History

Press  or  key to select Clear History. Press  or  key to popup the Message Box ”Clear the history record?” Press  or  to select Yes or No. Press the  or  key to confirm the selection.

4.12.6 Clear Max/Min

Press  or  key to select Clear Max/Min. Press  or  key to popup the Message Box ”Clear the max/min record?” Press  or

to select Yes or No. Press the or key to confirm the selection.

4.12.7 Backup data

Press or key to select Backup data. Press or key to popup the Message Box ”Copy history data to SD card?” Press or to select OK or Cancel. Press the or key to confirm the selection.

Note: You need to insert a SD card(not included) into the console before using this function.

4.12.8 About information

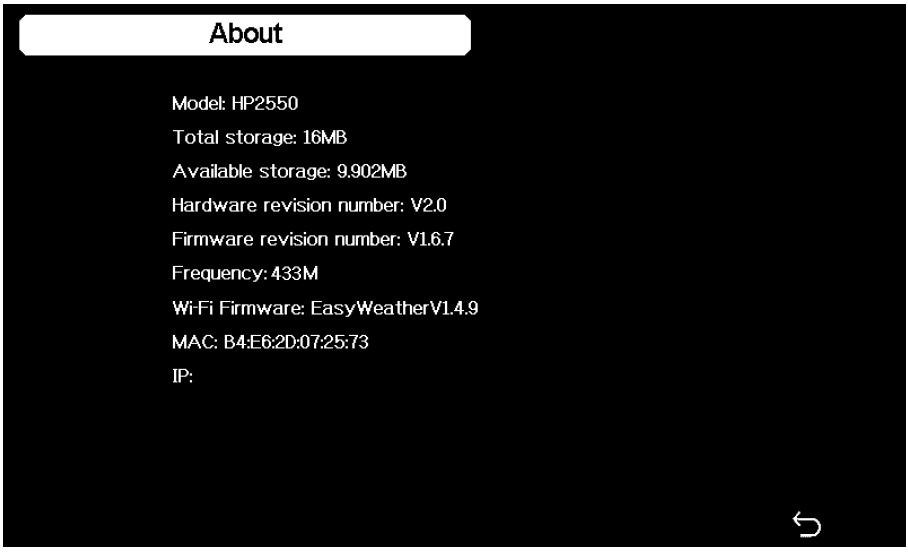


Figure 43: About information Screen

Note: This figure is just for reference(model and frequency will change according to different market). The actual display console may be with higher firmware version than this manual described because we will update the firmware occasionally.

4.12.9 Language

Press  or  key to select Language. Press  or  key to switch different language display.

5. Other Console Functions

5.1 Beaufort Wind Force Scale

If you have selected the use of Beaufort wind speed units, you can use the table below for reference. The Beaufort scale is based on qualitative wind conditions and how they would affect a ship's (frigate) sails (so yes, it is an "old" standard). It is therefore less precise than the other scales but is still in use in various locales.

Wind speed	Beaufort number	Description
0 - 1 mph, or 0 - 1.6 km/h	0	Calm
1 - 3 mph, or 1.6 - 4.8 km/h	1	Light air
3 - 7 mph, or 4.8 - 11.3 km/h	2	Light breeze
7 - 12 mph, or 11.3 -1 9.3 km/h	3	Gentile breeze
12 - 18 mph, or 19.3 - 29.0 km/h	4	Moderate breeze
18 - 24 mph, or 29.0 - 38.6 km/h	5	Fresh breeze
24 - 31 mph, or 38.6 - 49.9 km/h	6	String breeze
31 - 38 mph, or 49.9 - 61.2 km/h	7	Near gale
38 - 46 mph, or 61.2 - 74.1 km/h	8	Gale
46 - 54 mph, or 74.1 - 88 km/h	9	Strong gale
55 - 63 mph, or 88 - 102 km/h	10	Storm
64 - 73 mph, or 102 - 117 km/h	11	Violent storm
74 mph and above, or 117 km/h and above	12	Hurricane

Table: Beaufort wind force scale

5.2 Weather Forecasting

The seven weather icons are Sunny, Partly Cloudy, Cloudy, Rainy, Stormy, Snowy and Snow Storms.

The forecast icon is based on the rate of change of barometric pressure. Please allow at least **one month** for the weather station to learn the barometric pressure over time.

Sunny	**Partly Cloudy**	**Cloudy**
		
Pressure increasing for a sustained period	Pressure increasing slightly (or default)	Pressure decreasing slightly
Rainy	**Stormy**	**Snowy**
		
Pressure decreasing for a sustained period	Pressure rapidly decreases	Pressure decreases for a sustained period, freezing
Snow Storms		
		
Pressure rapidly decreases, freezing		

Note: When outdoor temperature is below 0°C and the forecast is Rainy or Stormy, the LCD will display Snowy and Snow Storms.

5.3 Lightning Alert

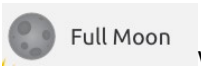
The lightning icon will appear if the Dew Point exceeds 21°C/70°F. This means there is a chance of lightning storms forming.

5.4 Weather Forecasting Description and Limitations

In general, if the rate of change of pressure increases, the weather is generally improving (sunny to partly cloudy). If the rate of change of pressure decreases, the weather is generally degrading (cloudy, rainy or stormy). If the rate of change is relatively steady, it will read partly cloudy.

The reason the current conditions do not match the forecast icon is because the forecast is a prediction 24-48 hours in advance. In most locations, this prediction is only 70% accurate and it is a good idea to consult you national weather service for more accurate weather forecasts. In some locations, this prediction may be less or more accurate. However, it is still an interesting educational tool for learning why the weather changes.

5.5 Moon Phase

In the event the moon phase is 100%, the icon 

will appear in its place. In the event of 0%, the word “New Moon” will appear in its place.

Moon Phase	Image	Moon Phase	Image
Day 1		Day 14	
Day 2		Day 15	

Day 3		Day 16	
Day 4		Day 17	
Day 5		Day 18	
Day 6		Day 19	
Day 7		Day 20	
Day 8		Day 21	
Day 9		Day 22	
Day 10		Day 23	
Day 11		Day 24	
Day 12		Day 25	
Day 13 Full Moon		Day 26 New Moon	

6. Maintenance

The following steps should be taken for proper maintenance of your station

1) Clean the rain gauge once every 3 months. Rotate the funnel anti-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.

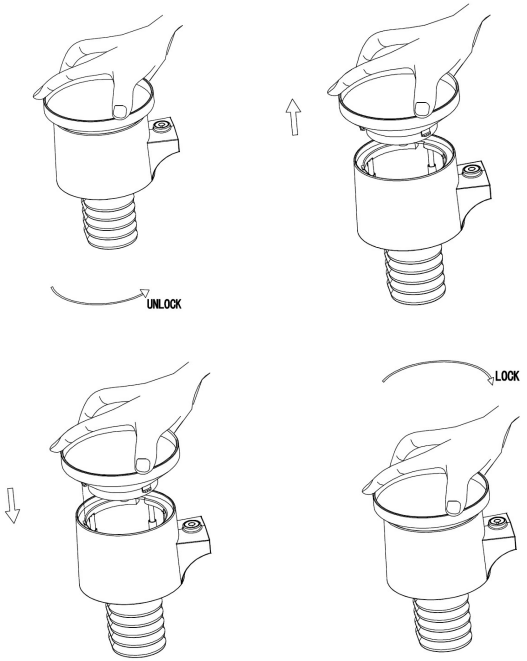


Figure 44: Rain gauge maintenance

2) Clean the solar radiation sensor and solar panel every 3 months with a non-abrasive slightly damp cloth.
3) Replace batteries every 1 year of as needed. 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).

4) When replacing the batteries, apply a corrosion preventing compound on the battery terminals, available at most hardware stores.
5) In snowy environments, spray the top of the weather station with anti-icing silicon spray to prevent snow build up.

7. Troubleshooting Guide

Look through the following table and locate an issue or problem you are experiencing in the left column and read possible solutions in the right column.

Problem	Solution
Wireless sensor not reporting data to console. There are dashes on the display console.	The maximum line of sight communication range is about 100m. Move the sensor assembly closer to the display console. Resynchronize the remote sensor(s). Reference Section 4.10.1 and 4.10.2. 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 barriers (down a hill). Radio Frequency (RF) sensors cannot transmit through metal barriers (example, aluminum siding) or multiple, thick walls. Move the display console around electrical noise-generating devices, such as computers, TVs and other wireless transmitters or receivers.

Problem	Solution
Outdoor sensor array does not communicate to the display console.	The 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 Installation. With an open-ended paperclip, press the reset button for 20 seconds to completely discharge the voltage. Take out the batteries and wait one minute, while covering the solar panel to drain the voltage. Put batteries back in and resync with console by powering down and up the console with the sensor array about 10 feet away. Bring the sensor array inside the house (you can disconnect it from the rest of the sensors). 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 outdoor sensor array. If the batteries were recently replaced, check the polarity. If the sensor is flashing every 16/48 (depending on model) seconds, proceed to the next step. There may be a temporary loss of

Problem	Solution
	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. Replace the batteries in the outside sensor array. With the sensor array and console three metres away from each other, remove AC power from the display console and wait 10 seconds. Re-connect power.
Temperature sensor reads too high in the daytime.	Make certain that the sensor array is not too close to heat generating sources or structures, such as buildings, pavement, walls or air conditioning units. Use the calibration feature to offset installation issues related to radiant heat sources. Reference 5.12. If directly in direct sunshine for extended periods, the body of the sensors will heat enough to cause overreading.

Problem	Solution
Absolute pressure does not agree with official reporting station	You may be viewing the relative pressure, not the absolute pressure. Select the absolute pressure. Make sure you properly calibrate the sensor to an official local weather station. Reference Section 5.12 for details.
Rain gauge reports rain when it is not raining	An unstable mounting solution (swaying on the mounting pole) may result in the tipping bucket incorrectly registering rainfall. Make sure you have a stable, level mounting solution.
Data not reporting to Wunderground.com	Confirm that you are using your station key, not your Weather Underground Confirm your station ID is correct. The station ID is all capitals, and the most common issue is substituting an O for a 0 (or visa versa). Example, KAZPHOEN11, not KAZPH0EN11 Make sure the date and time are correct on the console. If incorrect, you may be reporting old data, not real time data. Make sure your time zone is set properly. If incorrect, you may be reporting old data, not real time data. Check your router firewall settings. The console sends data via port 80.
No WiFi connection	Check for WiFi signal strength symbol on the

Problem	Solution
	display  . If wireless connectivity is successful and reporting to Wunderground.com, the WiFi icon  will be displayed the home page. Make sure your router WiFi settings are correct (network name, password and security settings). Make sure you are connected to a stable 2.4GHz WiFi Network

8. Glossary of Common Terms

TERM	DESCRIPTION
ABSOLUTE AIR PRESSURE/ABSOLUTE BAROMETRIC PRESSURE	Absolute air pressure is the air pressure registered on a barometer without regard to altitude.
BAROMETER	A barometer is a device that measures the pressure of the air pushing on it—this measurement is called the barometric pressure. We don't actually feel the barometric pressure because the air pressure is pushing equally in every direction.
BEAUFORT (Bft)	An indicator of wind force strength (not speed) as it would act on a ship's sails. Still commonly in used in some locales to indicate wind force.
DEW POINT	The temperature to which air must be cooled to become saturated with water vapor. When

TERM	DESCRIPTION
	further cooled, the airborne water vapor will condense to form liquid water (dew), or frost if below freezing.
HEAT INDEX	The heat index (HI) or humiture is an index that combines air temperature and relative humidity, in shaded areas, as an attempt to determine the human-perceived equivalent temperature, as how hot it would feel if the humidity were some other value in the shade. Heat index only applies when the temperature is above 27 degrees Celsius and the humidity is above 40%.
HECTOPASCALS (hPa)	This is an international standard (SI system) for measuring air pressure. It used to be referred to as milli-bars (mb) and sometimes still is. They are equivalent.
HYGROMETER	An instrument that measures relative humidity of the air. This is expressed as a percentage between 0% and 100%.
INCHES OF MERCURY (inHg)	This imperial unit of measurement for air pressure in the United States. It refers to the length of a standard column of mercury (a liquid metal) that can be pushed up by the ambient air pressure. Standard pressure is approximately 29.92 inHg
KNOTS (kn)	One knot is equivalent to one nautical mile and is sometimes used to indicate wind speed.
LUX (lx)	The unit of illuminance (a measure of the intensity of illumination on a surface) as used

TERM	DESCRIPTION
	in the SI system.
MILLIBAR (mb)	See HECTOPASCALS.
MM OF MERCURY (mmHg)	This is like inches of mercury, except expressed in millimeters. Standard pressure is approximately 760 mmHg.
NIST	National Institute of Standards and Technology. A United States institute that keeps very accurate time using atomic clocks and provides and internet-based service to accurately set device clocks.
RELATIVE AIR PRESSURE/ RELATIVE BAROMETRIC PRESSURE	Relative air pressure is the absolute air pressure compensated for the altitude of the barometer. The result is what the air pressure would be at sea level.
ULTRA VIOLET INDEX	The ultraviolet index or UV-Index (UVI) is an international standard measurement of the strength of sunburn-producing ultraviolet (UV) radiation at a particular place and time. The purpose of the UV Index is to help people effectively protect themselves from UV radiation. The UV Index is a linear scale, with higher values representing a greater risk of sunburn (which is correlated with other health risks) due to UV exposure. An index of 0 corresponds to zero UV radiation, as is essentially the case at night. An index of 10 corresponds roughly to midday summer sunlight with a clear sky when the UV Index was originally designed, but values above 10 are sometimes possible. Levels above 8 are

TERM	DESCRIPTION
	considered “very high” and above 11 are considered “extreme.”
WIND CHILL	Wind chill (popularly wind chill factor) is the lowering of body temperature due to the passing-flow of lower-temperature air. In other words, the air “feels” colder than it is because of the chilling effect of the wind on the skin. Wind chill only applies when the average wind speed is above 4.8 kph and the temperature is below 10° Celsius.

Table: Glossary of terms

9. Specifications

Frequency: 915MHz (AU/NZ), 868MHz (EU/UK)

Indoor Sensors:
Temperature range: -10°C – 60°C
Temperature resolution: 0.1°C
Temperature accuracy: ± 1°C

Humidity range: 10% - 99%
Humidity resolution: 1%
Humidity accuracy: ± 5% (between 20% and 90%)

Pressure range: 300hpa to 1100hpa
Pressure resolution: 0.1hPa
Pressure accuracy: ±3 hPa (between 700 and 1100hPa)
Sensor reporting interval: 60 seconds

Outdoor Sensors:
Temperature range: -40°C – 60°C
Temperature resolution: 0.1°C
Temperature accuracy: ± 1°C

Humidity range: 10% - 99%
Humidity resolution: 1%
Humidity accuracy: ± 5% (between 20% and 90%)

Rain range: 0 – 9999 mm
Rain accuracy: ± 10%
Rain resolution: 0.3 mm (for volume < 1,000 mm)
1 mm (for volume ≥ 1,000 mm)

Wind Range: 0 – 50 m/s (0 ~ 100 mph)
Wind Accuracy: ± 1 m/s (speed < 5 m/s), ± 10% (speed ≥ 5 m/s)

UV-Index range: 0 - 15
Light range: 0 – 120 kLux
Light accuracy: ± 15%
Sensor reporting interval: 16 seconds
Note: Out of range values will be displayed using "---":

Power Consumption:

Console: 5V DC adaptor (included)
Indoor sensors: 2 x AA 1.5V Alkaline batteries (not included)
Outdoor sensors: 2 x AA 1.5V Alkaline batteries (not included), solar power is used when available
Battery life: 12 months for console and 24 months for indoor sensor (use Lithium batteries in cold weather climates)
Transmission Range: Up to 100m (line of sight)

10. Contact Information

Purchased in UK/EU: Please contact our local distributor Greenfrog Scientific greenfrogscientific.co.uk and their team will be happy to help. Genuine faults can typically be diagnosed without requiring the unit to be returned and replacement parts sent quickly if needed.

Purchased in AUSTRALIA: Please contact our local distributor Monax Test & Weather monaxtestandweather.com.au and their team will be happy to help. Genuine faults can typically be diagnosed without requiring the unit to be returned and replacement parts sent quickly if needed.

Purchased in NEW ZEALAND: Please contact our local distributor Scientific Sales scientificsales.co.nz and their team will be happy to help. Genuine faults can typically be diagnosed without requiring the unit to be returned and replacement parts sent quickly if needed.

For all others, please contact the retailer who sold you this item.

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Manual version: 2022/1.2

EU DECLARATION OF CONFORMITY

Hereby, Aercus Instruments, declares that this Wireless Weather Station (Model: WeatherMaster) is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. A copy of the signed and dated Declaration of Conformity is available on request from contact@aercusinstruments.com.

UNTRIES RTTE APPROVAL COMPLIED

All EU countries

DECLARATION DE CONFORMITE UE

Par la présente, Aercus Instruments, déclare que cette station météo sans fil (Modèle : WeatherMaster) est conforme aux exigences essentielles et autres dispositions pertinentes de la Directive 1999/5/CE. Une copie de la Déclaration de conformité datée et signée est disponible sur simple demande auprès de contact@aercusinstruments.com.

CONFORMITE AUX EXIGENCES NATIONALES RTTE

Tous les pays de l'Union européenne

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DICHIARAZIONE DI CONFORMITÀ UE

Con la presente, Aercus Instruments dichiara che questa Stazione Meteorologica Wireless (modello: WeatherMaster) è conforme ai requisiti essenziali e alle altre disposizioni pertinenti della Direttiva 1999/5 / CE. Una copia della Dichiarazione di Conformità, firmata e datata, è disponibile su richiesta all'indirizzo contact@aercusinstruments.com.

PAESI RTTE DI COMPLETATA OMOLOGAZIONE

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UK DECLARATION OF CONFORMITY

Hereby, Aercus Instruments, declares that this Wireless Weather Station (Model: WS3085) is in compliance with the essential requirements and other relevant provisions of the Electromagnetic Compatibility Regulations 2016. A copy of the signed and dated Declaration of Conformity is available on request from contact@aercusinstruments.com.

COUNTRIES RTTE APPROVAL COMPLIED

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