ecowitt®

Weather Station Console Manual

Model: WS2320

https://s.ecowitt.com/YNNTU3

Table of Contents

1. Getting Started

1.1. Package List

QTY	Item
1	WS2320 Display Console
1	DC to USB Cable(adapter & batteries are not included)
1	User Manual
1	Quick Start Guide

Table 1

Note: When purchasing a single unit, the power adapter is not included. The power adapter is included when purchasing the WS2320 weather station kit.

1.2. Overview

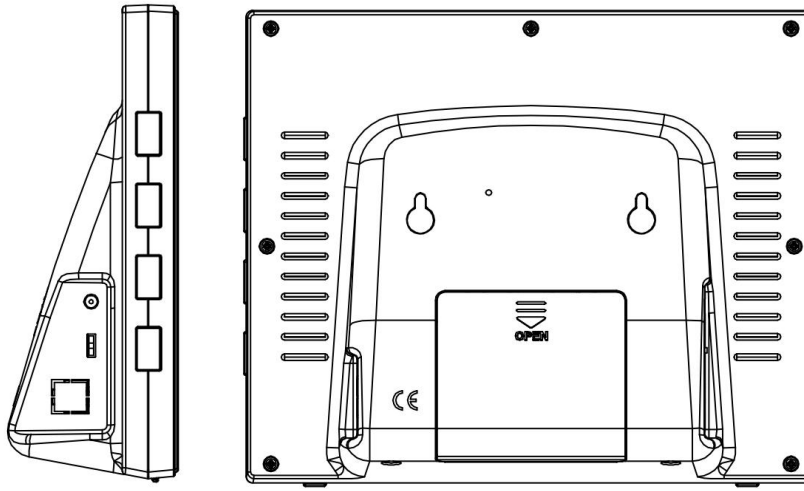


Figure 1: Overview

1.3. Multiple Views and Size (Unit:mm)

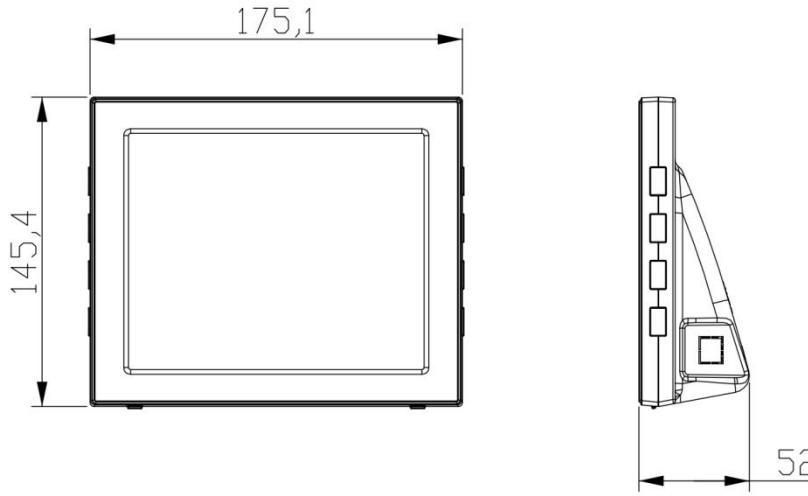


Figure 2: Size

1.4. Button Function

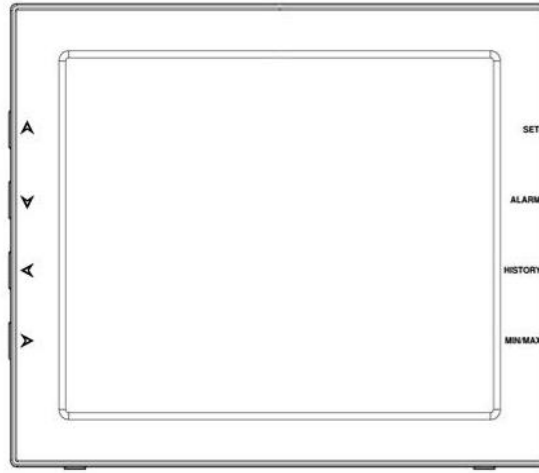


Figure 3: Touch Button Area

SET	Hold to enter settings mode
ALARM	Display high- or low-alarm (normal mode), or turn alarm on/off
HISTORY	Display historical sensor data records (normal mode), or return to normal mode (all other modes)
MIN/MAX	Display recorded minimum and maximum sensor values

Table 2: Right Side Buttons

⮝	Move to previous information message (normal mode), or increase (program mode). We will call this key “UP” in the remainder of this manual
⮟	Move to next information message (normal mode), or decrease (program mode). We will call this key “DOWN” in the remainder of this manual.
⮜	Move the previous display segment (normal mode), or back to main menu (settings mode). We will call this key “LEFT” in the remainder of this manual

➢	Move the next display segment (normal mode), or into sub menu (settings mode). We will call this key “RIGHT” in the remainder of this manual

Table 3: Left Side Buttons

1.5. Power on

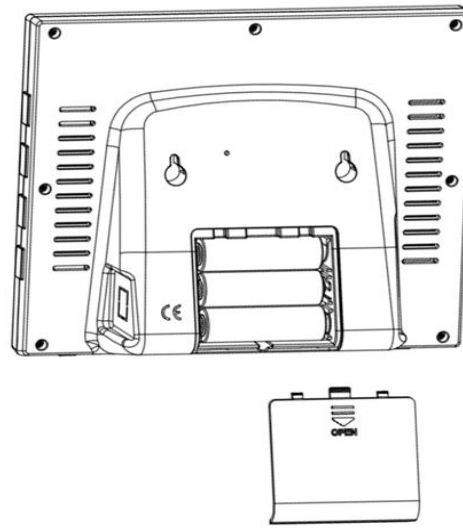
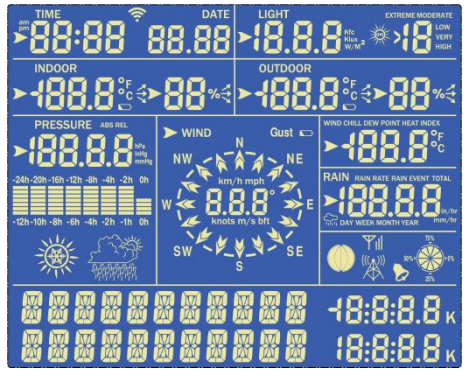


Figure 4

Power on the WS2320. It supports the DC power supply and the 5V 1A DC or 3 x AAA 1.5V Alkaline batteries(The batteries Not Included) power supply.

The black pull line in the battery compartment is designed to help remove the batteries.

Start-up Screen	Description
 Start information	After powering on, the host firmware version (not the Wi-Fi firmware version) and frequency will be displayed. Others information for factory use, but no for users.
 Full display	The full-screen display for 3 seconds, and you will hear a beep.
 Normal layout(without outdoor sensor array data)	The device enters normal layout. (Layout introduction refer to)

 Normal layout (with outdoor sensor array data)	Connected a sensor array.

Table 4

1.6. Connect the console with the sensor

- The WS2320 console could only connect with the WS69/WN67 outdoor sensor.
- Place the WS69/WN67 outdoor sensor next to the console, keep them about 5-10ft/1-2m away from the console.
- Install batteries on the sensor and wait for 1-2 minutes.
- Check whether the console will pick up the sensor data automatically and display it on the screen.

2. Ecowitt System Introduction

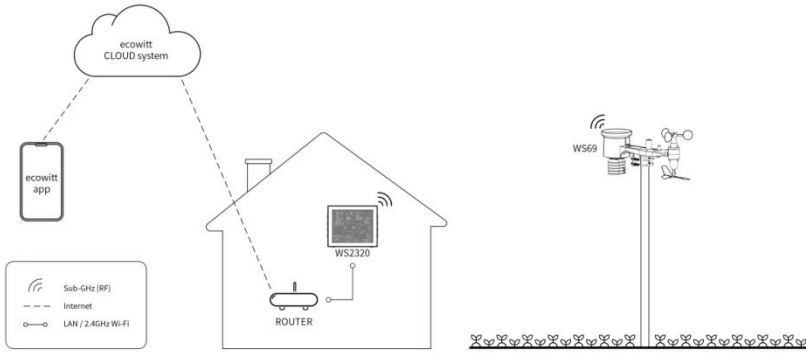


Figure 5: How the ecowitt system work

Thank you for purchasing the Ecowitt WS2320 weather station console.

The WS2320 features a 7" LCD display with adjustable brightness, supporting both DC and battery power. It has built-in sensors for indoor temperature, humidity, and pressure, along with time, clock alarm, and weather forecast functions. When paired with external sensors, it provides data on outdoor temperature, humidity, wind, UV, light, rainfall, and more.

The WS2320 console supports PC software, allowing you to monitor your weather station or set values on your computer or laptop.

WS2320 supports 2.4 GHz Wi-Fi, letting you view weather data remotely from anywhere on your phone, tablet, or computer via a browser, all for free.

Note: The WS2320 requires an outdoor sensor to collect outdoor data and is not a standalone product. It can only pair with a WN67/WS69 outdoor sensor array.

General Terms Used in the Manual:

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

Gateway: Also known as a hub, it is a Display less console. Here, refer to the GW3000 device.

Transmitter: Refers to the sensor.

Receiver: Refers to the console.

RF: Radio frequency. It refers to the ISM and SRD SUBG (Industrial, Scientific Medical, and Short Range Devices frequency bands below 1 GHz) for communicating between the gateway and its sensors. This frequency is different from the 4G modem or Wi-Fi working frequency. To avoid interferences, ISM/SRD bands are kept separate from 4G frequencies by national regulations. Typical ISM/SRD frequencies are 915 (Americas), 868 (Europe), 433 (worldwide), and 920 (Japan, Korea).

3. Ecowitt Network Provisioning

3.1. Check the power supply

Since the upcoming steps involve connecting to 2.4GHz Wi-Fi and uploading data, the DC power supply must be used.

3.2. Install the Ecowitt App

The following steps are for Wi-Fi network pairing and cloud data upload for mobile access. If online access isn't needed, skip setup and view data directly on the WS2320 console.

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

Open the Ecowitt App, follow the on-screen setup instructions to create an account, add a new device, and refer to section 3.4 below to pair your console to your Wi-Fi network.

Figure 6

Note: For Section 3.4 below (2 ways to complete Wi-Fi configuration), you'll need your Wi-Fi network name (SSID) and password.

3.3. Ecowitt APP Network Provisioning

There are two way to configure network：

1. WiFi Provisioning;
2. Manually Adding;

Please select one of them to complete the network configuration. After you completed if you want to change your router, please follow this section again. Open Ecowitt App →"Devices"→"Add New Devices", and then you will enter into the Gateway Provisioning page.

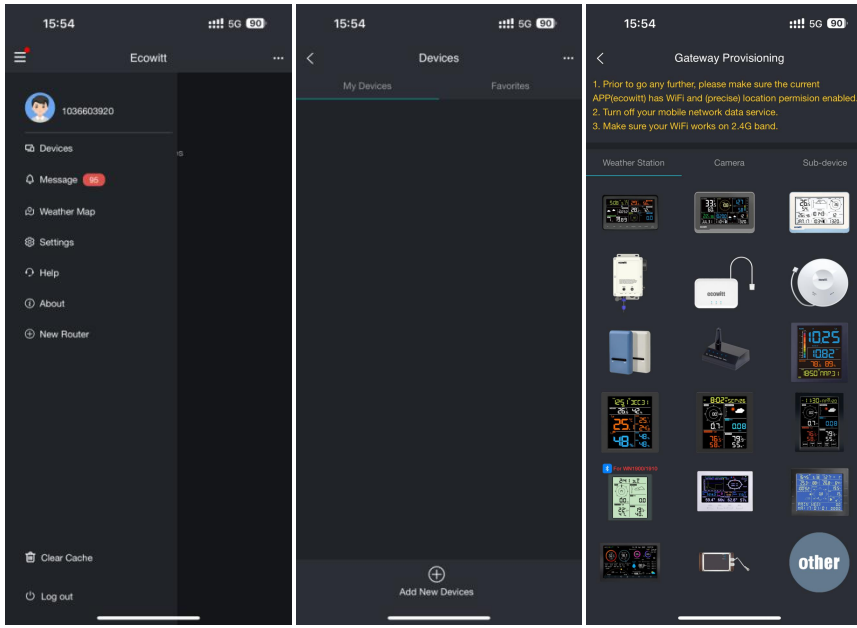


Figure 7

3.4. Wi-Fi provisioning on ecowitt app

(1) Click the WS2320 icone, and then choose WiFi Provisioning：

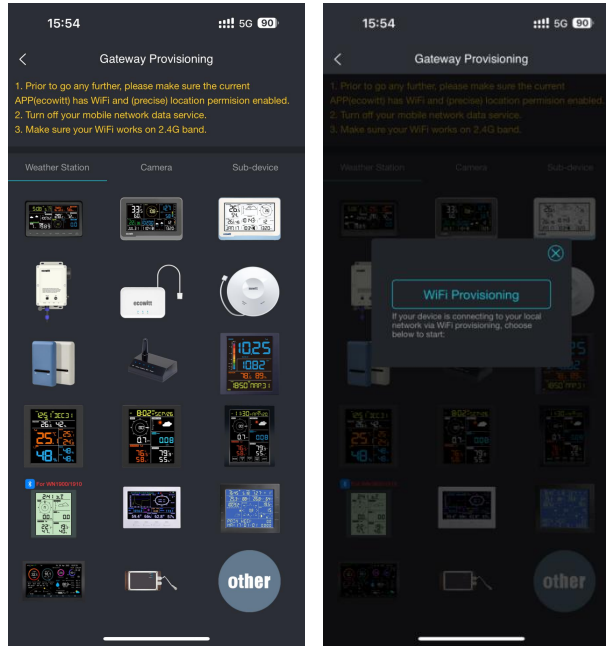


Figure 8

(2) Hold the WS2320 button and ALARM for 5s until the Wi-Fi icon and “MODE-B” start to flash rapidly; Use mobile phone or tablet to connect to the hotspot "**EasyWeatherPro-xxxxxx**" emitted by WS2320. Then tick "Operation Completed"→"Next".

Note: Wi-Fi will be disabled when the device is powered solely by batteries.

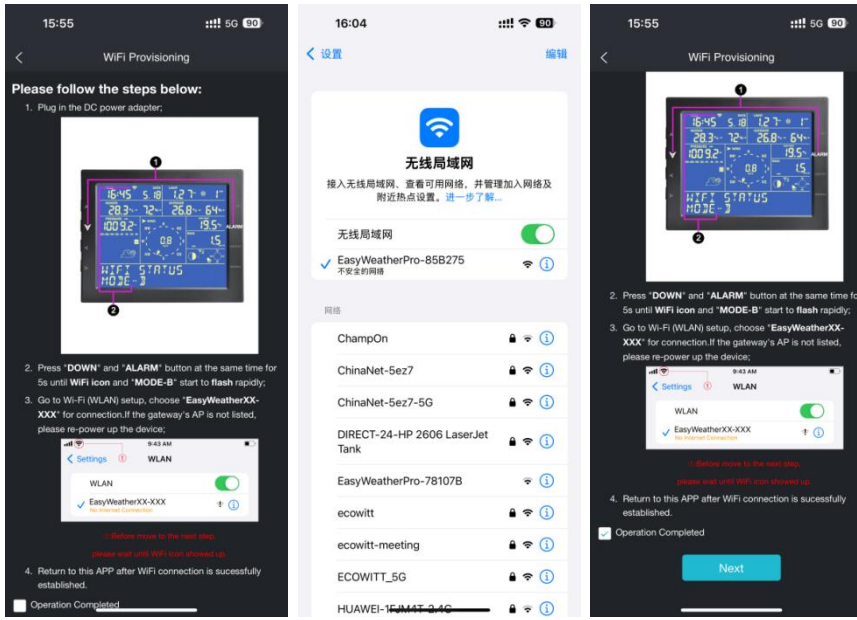


Figure 9

(3) Fill in the Wi-Fi SSID and password → click Submit" → click "Confirm"

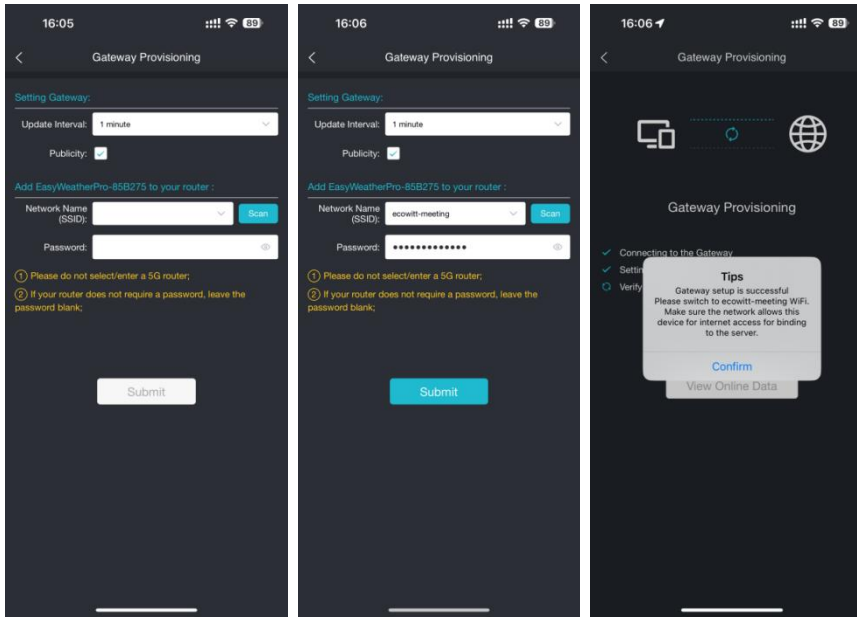


Figure 10

(4) Now the WS2320 console setup is successful. Switch the network of phone to the same Wi-Fi WS2320 is connected to. WS2320 has been successfully added to the App, then the data can be viewed on the App or ecowitt.net.

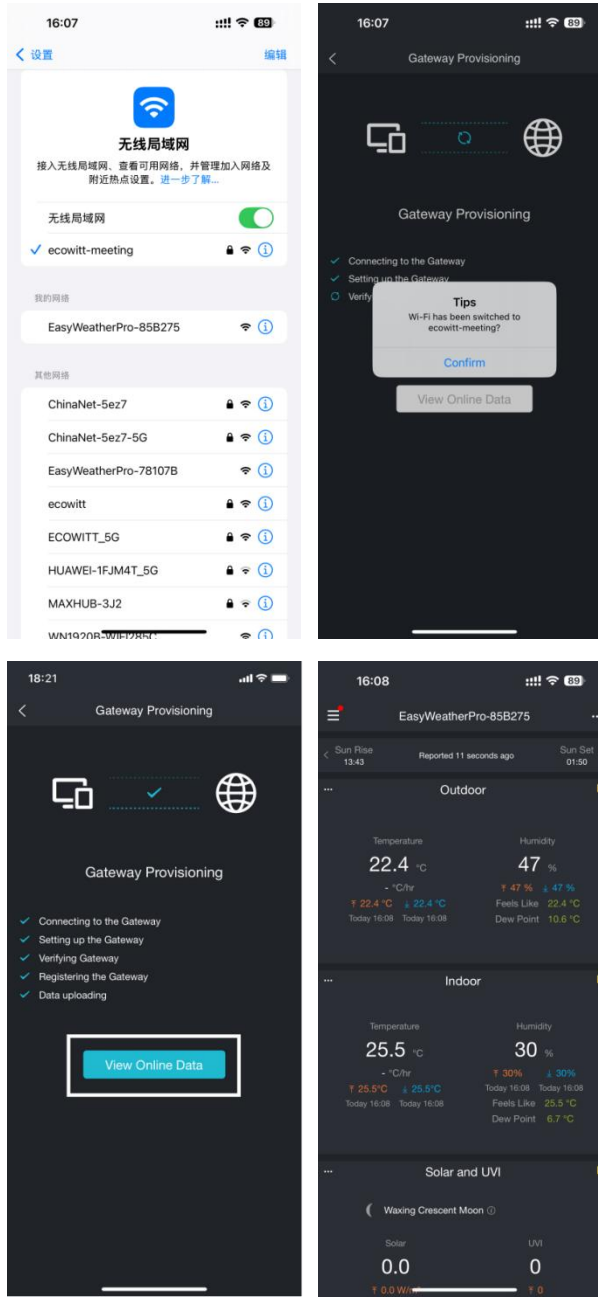

16:07
设置
编辑
无线局域网
接入无线局域网，查看可用网络，并管理加入网络及附近热点设置。进一步了解...
无线局域网
ecowitt-meeting
我的网络
EasyWeatherPro-85B275
其他网络
ChinaNet-5ez7
ChinaNet-5ez7-5G
EasyWeatherPro-78107B
ecowitt
ECOWITT_5G
HUAWEI-1FJM4T_5G
MAXHUB-3J2
16:07
Gateway Provisioning
Gateway Provisioning
Connecting to the Gateway
Setting up the Gateway
Tips
Wi-Fi has been switched to ecowitt-meeting?
Confirm
View Online Data
18:21
Gateway Provisioning
Gateway Provisioning
Connecting to the Gateway
Setting up the Gateway
Verifying Gateway
Registering the Gateway
Data uploading
View Online Data
16:08
EasyWeatherPro-85B275
Sun Rise 13:43
Reported 11 seconds ago
Sun Set 01:50
Outdoor
Temperature
22.4 °C
Humidity
47 %
Feels Like 22.4 °C
Dew Point 10.6 °C
Indoor
Temperature
25.5 °C
Humidity
30 %
Feels Like 25.5 °C
Dew Point 6.7 °C
Solar and UVI
Waxing Crescent Moon
Solar
0.0
UVI
0

Figure 11

Note: If you are unable to connect the WS2320 to Wi-Fi using the Ecowitt App, we recommend using the Manually Adding.

3.5. Manually adding on ecowitt app

(1) Refer to the section 3.3, you enter into the Gateway Provisioning page, and click the Other icon → choose “Manually Adding” → Enter the Manually Adding page.

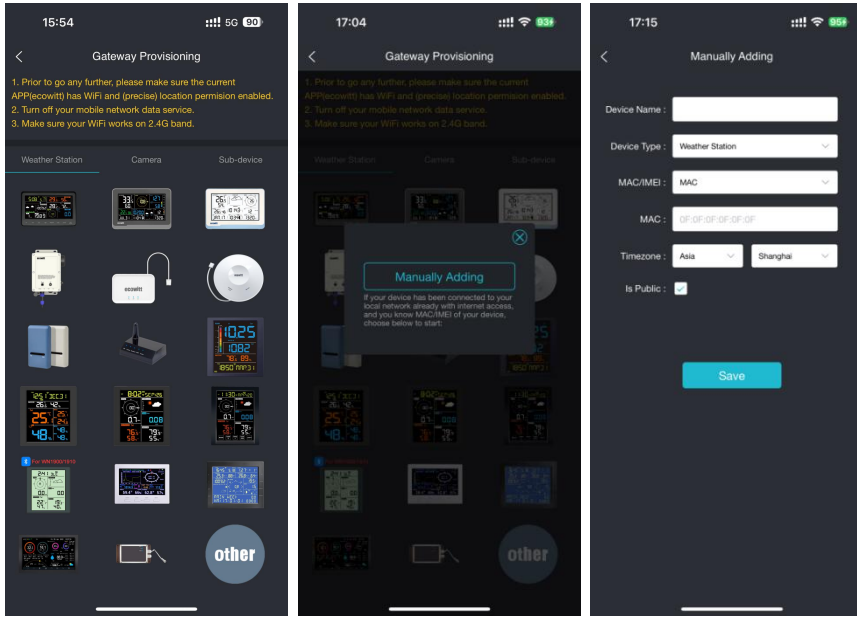


Figure 12

(2) Hold the WS2320 button ⮜ and ALARM for 5s until the Wi-Fi icon and “MODE-B” start to flash rapidly; Use mobile phone or tablet to connect to the hotspot "**EasyWeatherPro-xxxxxx**" emitted by WS2320. Use mobile browser to visit the URL: 192.168.4.1. No password is set by default. Click "login".

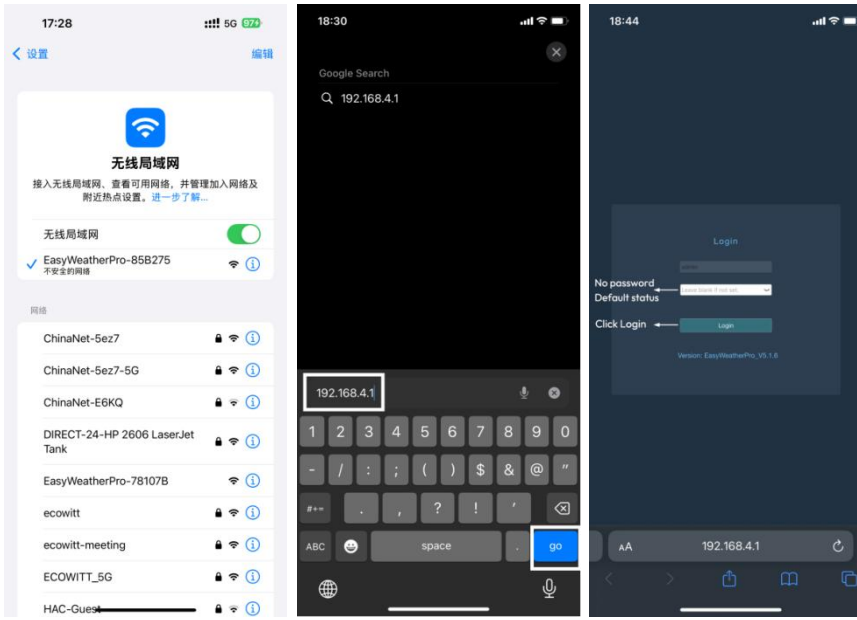


Figure 13

(3) Fill in the Router SSID and password. The WS2320 is now successfully connected to the 2.4GHz Wi-Fi router. Copy the MAC address for the next steps.

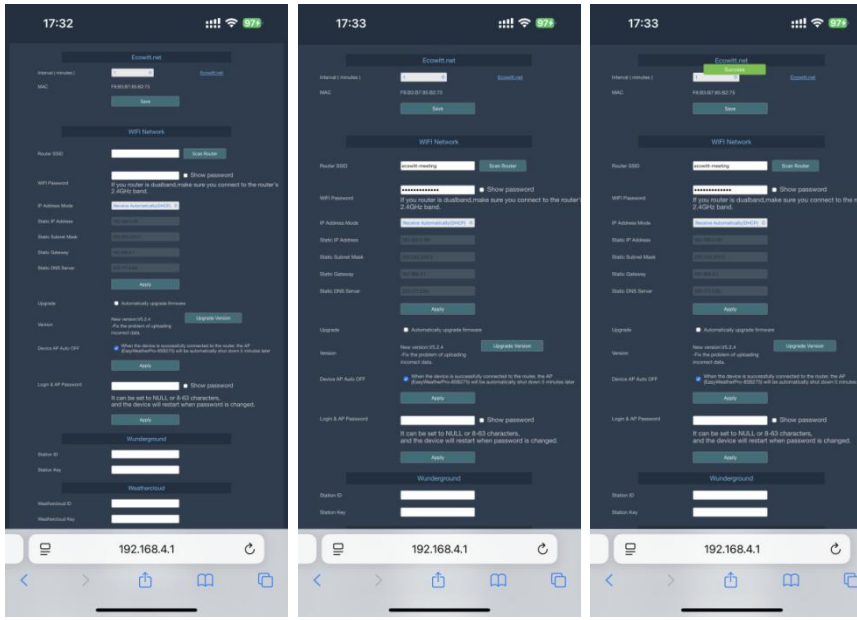


Figure 14

(4) Switch the phone's network to the same Wi-Fi that the WS2320 is connected to.

(5) Edit the Device Name, paste the MAC address copied in step (1) into the box, and click "Save". The data will then be available online.

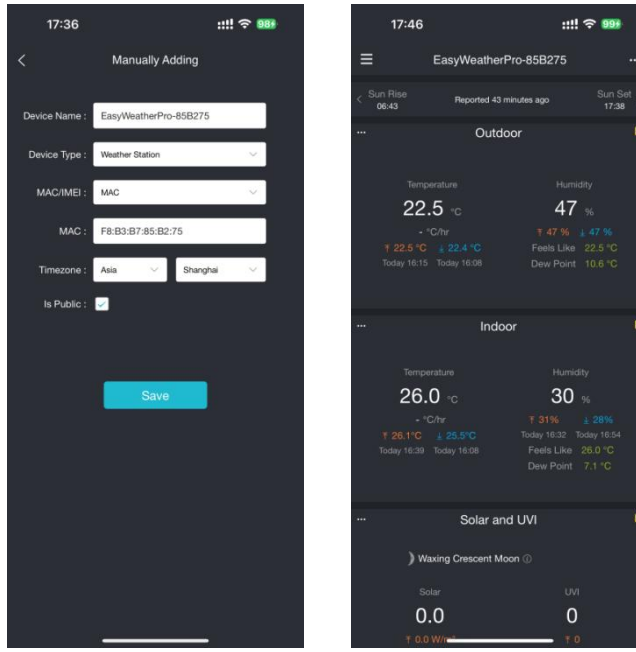


Figure 15

4. Setup your new device on Ecowitt APP

4.1. Firmware Upgrade, Device Location, Timezone, DST, and Data Public

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

1. Click on "Devices".
2. Click on the "…" icon in the upper right corner of the gateway.
3. You can edit your device name here if the default name needs to be changed.
3. Click version button to check latest firmware version and update.
4. Set the Device's precise location and Timezone on this interface. Tick "Is Public" when necessary.

5. Click "Save", then reboot the device, it will automatically synchronize time and DST.

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

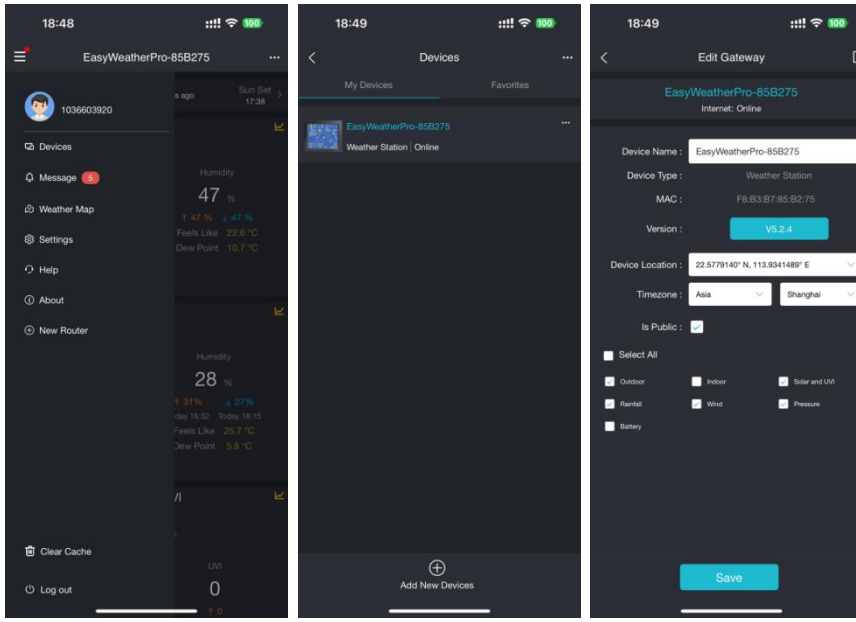


Figure 16

Note: After completing the above Wi-Fi configuration and related settings, the WS2320 screen will display a stable Wi-Fi signal tower, auto time zone, and DST (when necessary).

5. Devices management on Ecowitt APP

5.1. How to Delete My Devices

Hold the device card to show a red trash icon, and then touch it to delete.

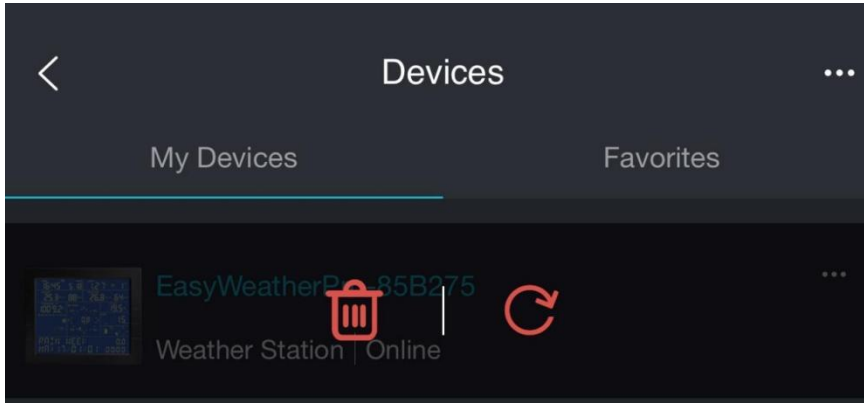


Figure 17

5.2. Manage Sensors

The WS2320 console could only pair with a WN67/WS69 outdoor sensor array. To pair with it, please do as follows:

1. Power the sensor on and place it next to the console.
2. Wait for 1~2 minutes and check if the console automatically picks up the sensor data and displays it on the screen or App.
3. If data is not received from a registered sensor, the RF icon will decrease its signal by one frame; if data is received, the RF icon will increase its signal by one frame.

6. Use on Web UI

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

6.1. Access the Web UI

Refer to the Section 3.5(1) and 3.5(2), enter the 192.168.4.1 in the browser. Log in with the default username and password, which is blank. If your gateway is connected to a local network, the WebUI can also be reached via the IP address the gateway has received or has been.

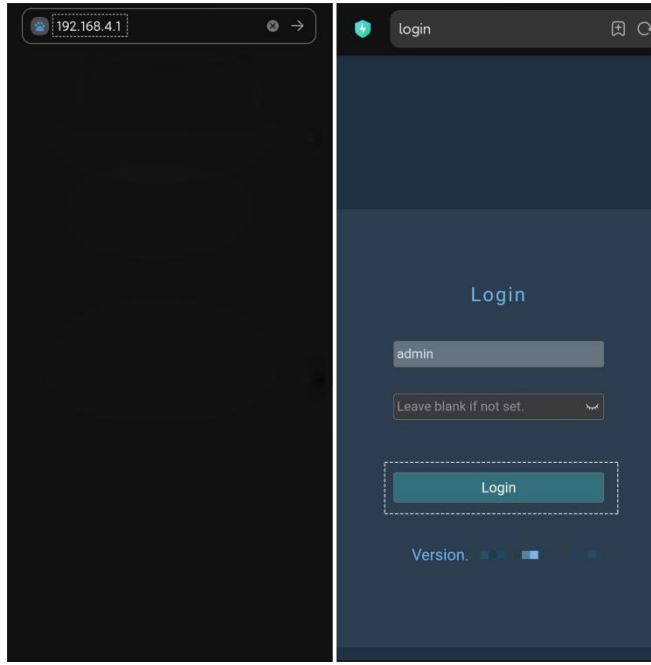


Figure 18

6.2. Upgrade Firmware Via WebUI 192.168.4.1

Choose "Automatically upgrade firmware" on the WebUI 192.168.4.1

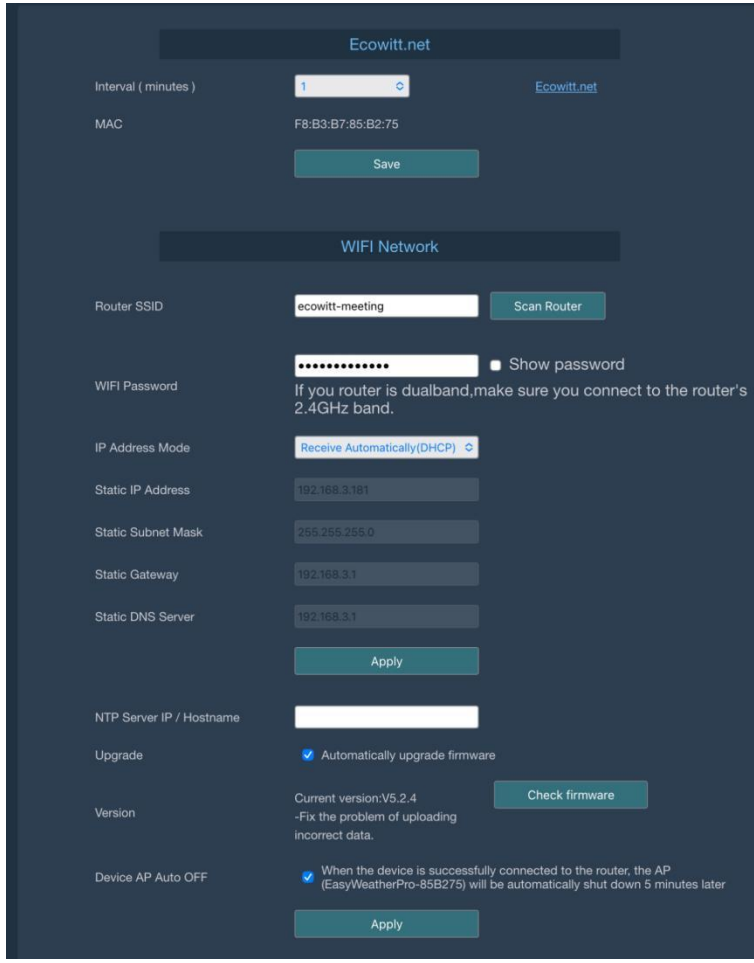


Figure 19

7. Optional Weather Server

7.1. Upload Data to Server

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

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

B. wunderground.com

C. weathercloud.net

D. wow.metoffice.gov.uk

E. Customized servers

7.2. Upload Weather Servers on ecowitt app

Upload servers management:

Ensure that the phone and WS2320 console are using the same Wi-Fi. Ecowitt App → "..." at the top right corner → "Others" → "DIY Upload Servers".

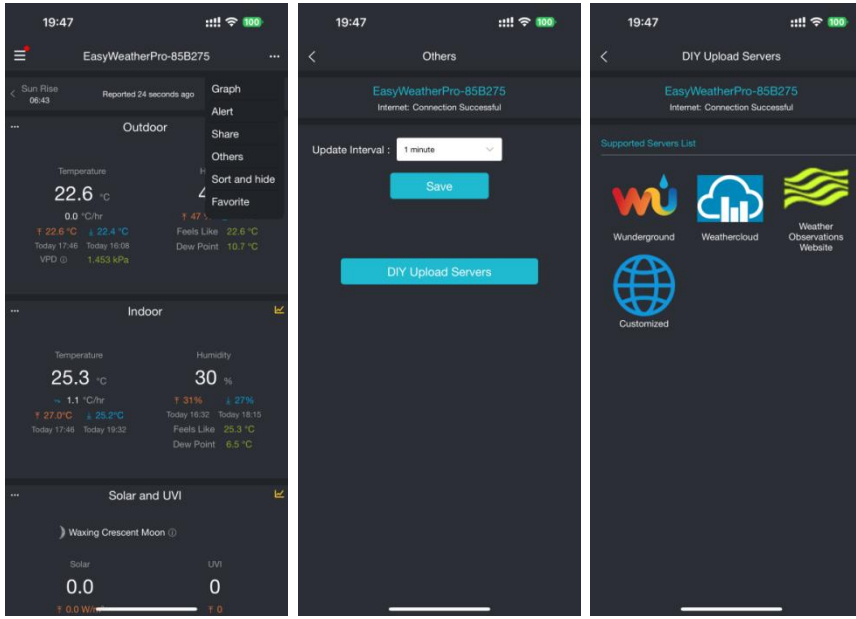


Figure 20

7.3. Add Weather Underground

If you need to upload data to a third-party website, you can follow the steps below, here we take **wunderground.com** as an example:

1. Visit wunderground.com and click **Log in** to create an account:

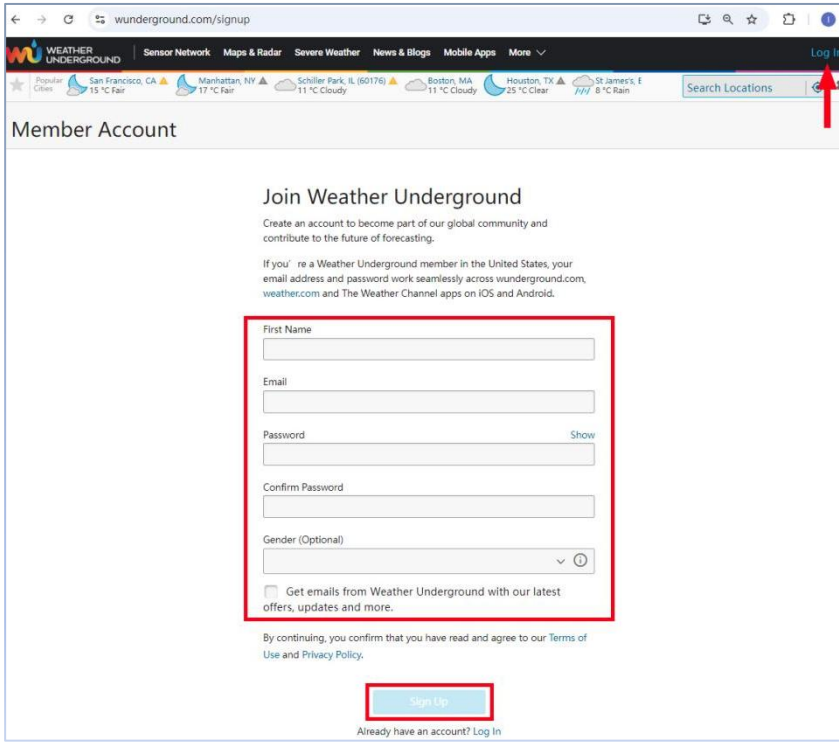


Figure 21

2. Click **My Profile→My Devices**.

Figure 22

3. Select **Add New Device**.

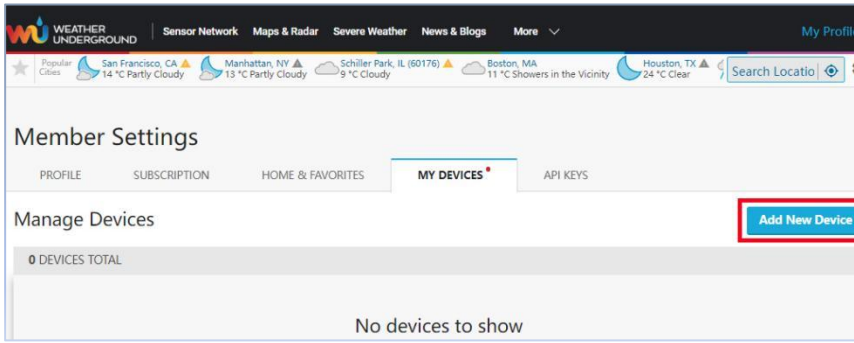


Figure 23

4. Find **Personal Weather Station**, select **other** and click **Next.**

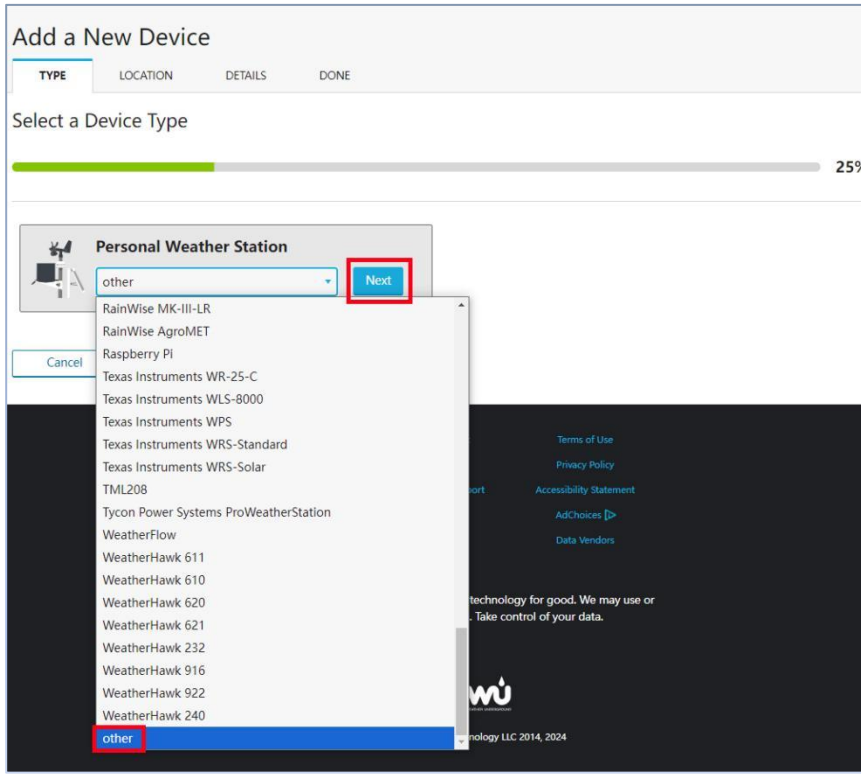


Figure 24

5. Select **Address** or **Manual**, and find your local position. Press **Next.**

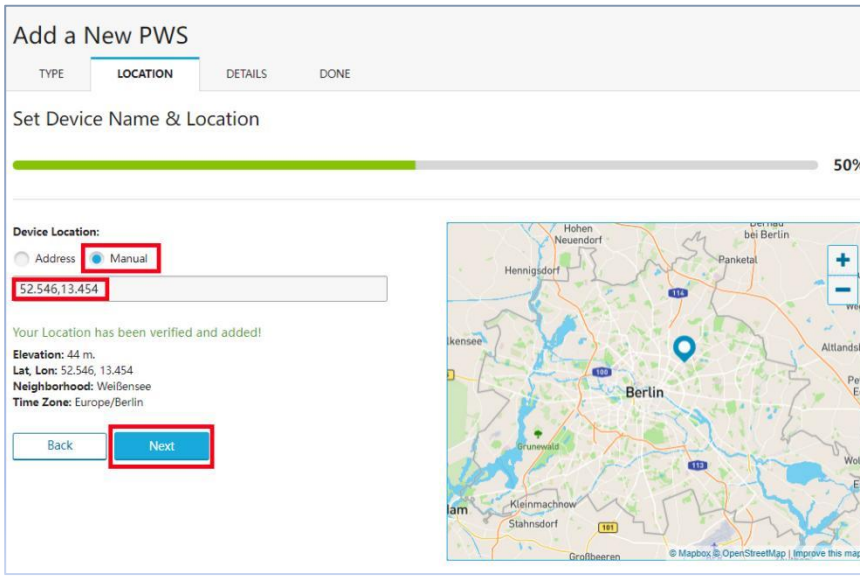


Figure 25

6. Fill out the details and go ahead.

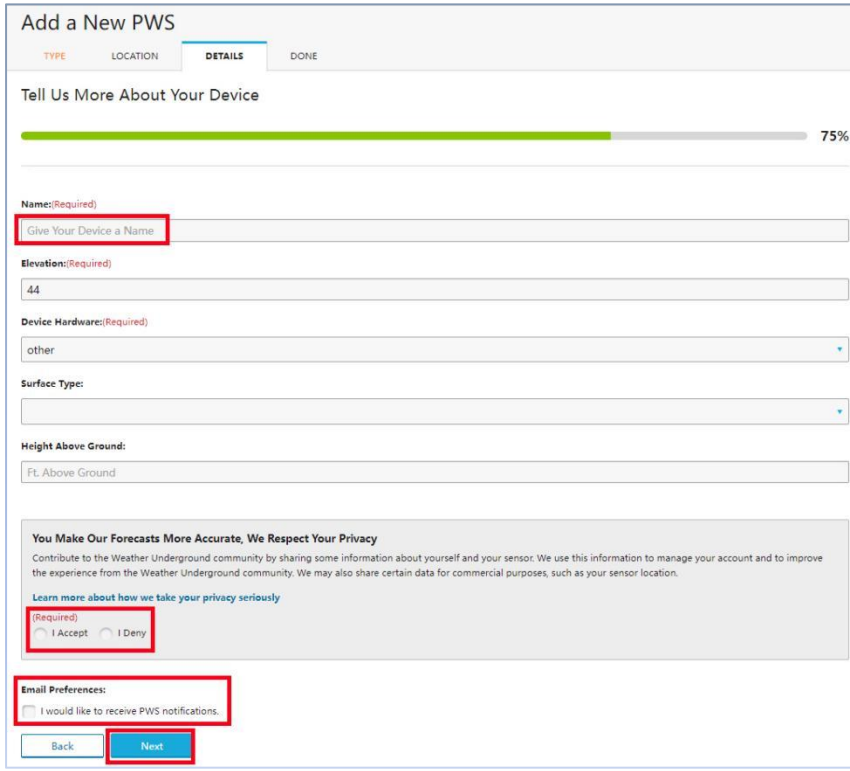


Figure 26

7. Then registration complete, you will see **Station ID** and **Station key.**

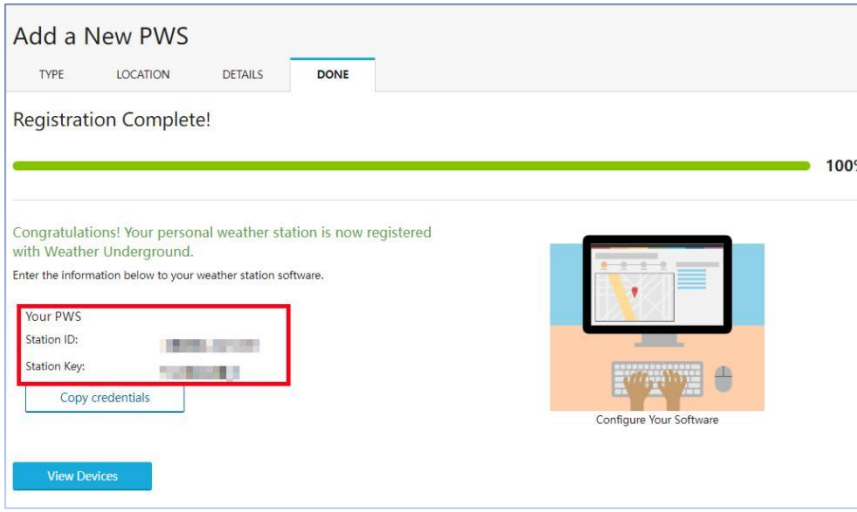


Figure 27

8. Enter the **Station ID** & **Station Key** and select **Save** on the ecowitt App. The data can then be viewed on wunderground.com.

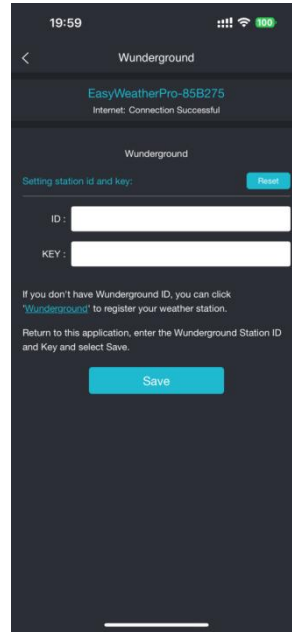


Figure 28

8. Display layout

8.1. Main screen

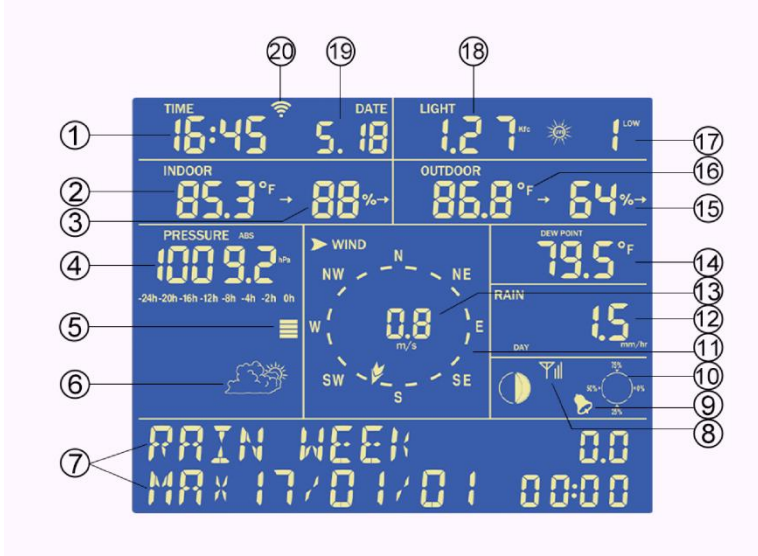


Figure 29

1 Time	11 Wind direction
2 Indoor Temperature	12 Rainfall
3 Indoor Humidity	13 Wind speed/Gust speed
4 Barometric Pressure	14 Wind chill/Dew point/Heat index
5 Barometric Pressure graph	15 Outdoor Humidity
6 Weather Forecast icon	16 Outdoor Temperature
7 Dynamic information display area	17 UV index
8 RF signal reception icon	18 Light
9 Alarm icon	19 Date
10 Memory status	20 Wi-Fi Signal icon

Table 5

8.2. TIME Segment

Figure 30

This segment (Figure 16) displays the current time and date. When connected to Wi-Fi, the time will be synchronized with a NIST atomic clock once a day, otherwise you must set (or correct) it manually using console functions. The time will be displayed in Universal Coordinated Time until you set the correct time zone offset on Ecowitt Weather server.

When the arrow indicator is in this segment the following messages will appear in the message panel:

1. Current year, and day of the week
2. Time of alarm and status of alarm (on/off)
3. Current moon phase (see “Other Console Functions” for detail)

8.3. LIGHT Segment

Figure 31

This segment displays the current solar radiation (light) and ultra-violet index (UV-index). The light is the overall intensity of sunlight and its theoretical maximum varies with location and time of year. The actual value also depends on atmospheric conditions (clouds, vapor, etc.) and varies throughout the day. The UV-index is a value that gives an indication of the strength of harmful UV radiation and can be helpful to know when protection from the sun is advised. A qualitative indication of the strength of UV radiation is also included (LOW etc.)

When the arrow indicator is in this segment the following messages will appear in the message panel, each with a corresponding time stamp:

1. Maximum light strength for the current day
2. Maximum light strength since last reset
3. Maximum UV-index for the current day
4. Maximum UV-index since the last reset

8.4. INDOOR Segment

Figure 32

This segment displays the current indoor temperature and humidity, as measured at the location of console. When the arrow indicator is in this segment the following messages will appear in the message panel, each with a corresponding time stamp:

1. Maximum (indoor) temperature for the current day
2. Minimum (indoor) temperature for the current day
5. Maximum (indoor) temperature since last reset
6. Minimum (indoor) temperature since the last reset
3. Maximum (indoor) humidity for the current day
4. Minimum (indoor) humidity for the current day
7. Maximum (indoor) humidity since last reset
8. Minimum (indoor) humidity since the last reset

8.5. OUTDOOR Segment

Figure 33

This segment displays the current outdoor temperature and humidity, as measured at the location of the outdoor sensor package. When the arrow indicator is in this segment, the messages that appear on the message board are the same as for the indoor conditions, except they reflect outdoor conditions.

8.6. PRESSURE Segment

Figure 34

This segment displays the current barometric pressure, a historical graph of pressures, and a pictorial weather forecast. Pressure is measured at the location of the console, but of course reflects both indoor and outdoor pressure as these are identical.

The pressure indicated may be absolute (ABS) or relative (REL), depending on the variation you have selected using the SET key. The absolute pressure is the pressure measured at your console's location (altitude). Relative pressure refers to the pressure measured by your console (absolute), corrected to the value that would exist if your station was located at sea level. The relative pressure is what is normally published by official weather stations.

Below the pressure values there is a historical graph. This graph can be configured to display 12 or 24 hours of history and will give you some insight into how pressure has been changing. Falling pressures typically

indicate worsening weather (to come), and rising pressures indicate good/better weather is to come. Rapid rise or fall indicates the passage of a "front."

Below the graph you will see a pictorial forecast for the next 12 hours.

When the arrow indicator is in this segment the following messages will appear in the message panel, each with a corresponding time stamp:

1. Maximum relative barometric pressure of the current day
2. Minimum relative barometric pressure of the current day
3. Maximum relative barometric pressure since the last reset
4. Minimum relative barometric pressure since the last reset
5. Maximum absolute barometric pressure of the current day
6. Minimum absolute barometric pressure of the current day
7. Maximum absolute barometric pressure since the last reset
8. Minimum absolute barometric pressure since the last reset

8.7. WIND Segment

Figure 35

This segment displays wind related information. Inside the circular “compass rose” you will find two arrows (if they overlap only one will be visible). The “thicker” arrow indicates the most recently measured wind direction 16 seconds or less ago). The “thinner” arrow represents the average wind direction in the prior interval of 16 seconds. This allows insight into the change of direction of the wind.

Both arrows can take 16 specific values: N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW, and NNW. Therefore, these indications are only accurate within 22.5 degrees.

When the arrow indicator is in this segment you can use the “SET” button to show variations. The variation shown above displays last measured wind speed in the center of the compass rose. The other variations display “wind gust” speed, or wind direction in degrees (thus allowing more precision than just the arrows).

When the arrow indicator is in this segment the following messages will appear in the message panel, each with a corresponding time stamp:

1. Maximum wind speed of the current day
2. Maximum wind speed since the last reset
3. Maximum wind gust speed of the current day
4. Maximum wind gust speed since the last reset

8.8. FEELS LIKE Segment

Figure 36

This segment displays calculated values related to temperature and pressure. The values that can be displayed are “wind chill”, “heat index”, and “dew point.”

Wind chill and heat index are perceptual values that indicate the air temperature as experienced by humans, as opposed to the measured ambient

air temperature. The passing flow of lower temperature air makes it feel "colder" and this is reflected in the wind chill temperature. Conversely, if it feels warmer than the measured air temperature due to the effects of humidity, we use a heat-index temperature to indicate how warm it feels.

The "dew point" is not a perceptual value, but it is calculated from the sensor values (temperature and humidity). The dew point is the temperature to which air has to be cooled to become saturated, and beyond which airborne water vapor would become liquid (dew).

When the arrow indicator is in this segment the following messages will appear in the message panel, each with a corresponding time stamp:

1. Minimum wind chill temperature of the current day
2. Minimum wind chill temperature since the last reset
3. Maximum dew point temperature of the current day
4. Minimum dew point temperature of the current day
5. Maximum dew point temperature since the last reset
6. Minimum dew point temperature since the last reset
7. Maximum heat index of the current day.
8. Maximum heat index since the last reset

8.9. RAIN Segment

Figure 37

This segment displays rainfall related values. The values that can be displayed (use the “SET” button when the arrow is in the segment) are: RAIN RATE (amount of rain accumulated in past 60 minutes), RAIN EVENT, RAIN TODAY, RAIN THIS WEEK, RAIN THIS MONTH, RAIN THIS YEAR or TOTAL RAIN. “RAIN EVENT” means a single period of rainfall not interrupted by a rain rate of 0. Thus, if it rains for 10 minutes, RAIN EVENT will display values for that 10-minute period. Likewise, if it rains continuously for 4.5 hours, the values will pertain to the whole 4.5-hour period.

When the arrow indicator is in this segment the following messages will appear in the message panel, each with a corresponding time stamp:

1. Maximum rain rate of the current day
2. Maximum rain rate since the last reset

3. Total rainfall of current day
4. Total rainfall of the current week. The week starts at midnight when Sunday begins and ends exactly 7 days later
5. Total rainfall of the current month
6. Total rainfall of the current year

8.10. Message Panel Segment

Figure 38

There are information segments for each separate sensor (10 totals), such as temperature, pressure etc. Press LEFT, or RIGHT keys to switch among different segments. The currently selected segment will be marked with the arrow symbol ➢.

The selected segment also determines the message(s) shown in the message panel on the bottom left. These messages rotate every 5 seconds.

There are two rows of 11-character segments on the left where message text will be displayed, and there are two rows of number displays on the right. If there are multiple messages, they will change every 5 seconds, or you can push the UP or DOWN buttons to force a change to another message at any time. When alarm conditions are active, corresponding messages will display here.

Some of the segments can display different variations. For example, you can display RAIN, RAIN RATE, RAIN EVENT, DAY TOTAL, WEEK TOTAL, MONTH TOTAL, YEAR TOTAL, and TOTAL. After such a segment has been selected with the LEFT/RIGHT keys, you can select between these variations by pressing the SET key (repeatedly as necessary).

Now we discuss the various information segments in the display while in normal mode.

8.11. Moon Phases, RF Reception Strength and Recording Storage Capacity Segment

Figure 39

8.11.1 Moon Phases

The phase of the moon for the current day (night) are displayed as an icon in the segment that displays moon phase, RF signal strength, and storage utilization. If the “arrow” is in this segment, the message panel will also describe the moon phase in words. The table below shows the possible icons and their descriptions. Note that icons mimic the actual appearance of the moon and therefore are different for installations in the northern hemisphere vs. southern hemisphere.

Northern Hemisphere	Description	Southern Hemisphere
	NEW MOON	
	WAXING CRESCENT MOON	
	FIRST QUARTER MOON	
	WAXING GIBBOUS MOON	
	FULL MOON	
	WANING GIBBOUS MOON	
	LAST QUARTER MOON	
	WANING CRESCENT MOON	

Table 6

8.11.2 RF Reception strength

The strength of RF signal reception from the outdoor sensor package can be checked by looking at the item 8. The strongest signal is indicated by three bars of increasing length. Less signal quality may show 2, 1 or no bars. This may be helpful when you seem to have reception problems.

8.11.3 Recording storage capacity used

The console can store historical sensor data on internal storage. The storage is permanent and will not be lost if there is a power outage. There is room for 3,552 records and you can see how much of this storage is used by inspecting

the “storage capacity used” indicator. This is found in the same segment as the moon phases and RF signal strength indicator and is depicted as a circle with marks at 0%, 25%, 50%, 75% (100% is when the circle is full). Once the full capacity is used new data will replace the oldest stored data (the circle will remain full).

9. Mode

9.1. Setting Mode

Settings mode can be activated by pressing the SET button and holding it for 2 seconds. Once activated you can use the button ≺ to select a particular settings category, or cycle through available categories. The settings categories available are:

- TIME SETTING
- UNIT SETTING
- RECORD SAVE INTERVAL
- RAIN SEASON SETTING
- BAROMETRIC SETTING
- KEY BEEP SETTING
- CALIBRATION SETTING
- TRANSMITTER ID
- MAC ADDRESS

Once you have selected the desired category, you can change modes to where you can actually see and modify the related settings for the category by pressing the button≻ . For each setting displayed you can change the value or choices by using the button ≻/∀, repeatedly if necessary. Holding these button down for two seconds or more will cause rapid increase or decrease of the selected value. Continue with the button ≻ to move on to other settings within the category or leave settings mode and return to normal mode by pressing the HISTORY key, or simply waiting 30 seconds or more without pressing any button.

9.1.1 TIME SETTING

The following sub-settings are available in the “TIME SETTING” category:

1. TIME FORMAT: A choice between 12H or 24H time display is available
2. DATE FORMAT: The following date format choices are available: MM-DD-YYYY, DD-MM-YYYY, or YYYY-MM-DD
3. TIME: Use this to manually set the current time and date. Use ∧/∨ buttons to change the blinking digits, use the button > to advance from hours to minutes, to month, to day, to year.
4. NORTH/SOUTH: Set which hemisphere you are located in so that moon phases can be displayed correctly.

9.1.2 UNIT SETTING

The following sub-settings are available in the “UNIT SETTING” category:

1. LIGHT UNIT: A choice of lux, fc, or w/m^2
9. TEMPERATE UNIT: A choice of Celsius (C) or Fahrenheit (F)
10. BAROMETRIC UNIT: A choice of hectopascal (hPa), inches mercury (inHg), or millimeters mercury (mmHg)
11. WIND SPEED UNIT: A choice of km/h, mph, knots, m/s, or Beaufort (bft)
12. RAINFALL UNIT: A choice of mm, or inch

9.1.3 RECORD SAVE INTERVAL

This category has only one setting and it affects the interval (in minutes) after which sensor data is recorded. If set to “5 minutes” for example, the current settings are recorded to permanent storage every 5 minutes. Use the button > to activate the setting and then ∧/∨ buttons to change the interval as desired.

9.1.4 RAIN SEASON SETTING

For official recording of weather results, rain is often tracked over a 12-month period that does not start on January 1. Using this category's only setting you can choose the month whose first day is the official start of the statistical rainfall season. Use the button ➤ to activate the setting and then ▲/▼ buttons to choose the desired month.

If you chose OCT, for example, annual rain totals, maximum and minimum will reset to 0 on October 1 each year. Which month to use depends on your location's official definition of the rain season. Consult online sources to find this information.

9.1.5 BAROMETRIC SETTING

This category offers only one setting, called BAROMETRIC HISTORY. It allows you to choose between a 12 hr. or 24 hr. historical interval for graphing past barometric pressure information. Use the ▲/▼ buttons to select as desired. The graph will display a 12 hr. or 24 hr. scale above or below the graphing area.

9.1.6 KEY BEEP SETTING

This category offers one setting to have keys beep, or not, when pressed. Use the ▲/▼ buttons to select as desired.

9.1.7 CALIBRATION SETTING

This category offers settings through which you can alter values obtained from the sensors before display or recording. This functionality is generally used to make sure that the displayed and recorded values match those of a reference measurement or instrument. The most often used example of this concerns absolute and relative pressure measurements. More on that in a moment.

There are also a few sub-settings that are not true settings, but rather total values. These relate to rainfall totals an can be set to desired starting values. This may be useful when installing the weather station in the middle of a rainfall season. Totals can be set (from the initial value of 0) to known values for the current year, month etc. so that, going forward the console will display correct values (as if you had the weather station all along).

All calibration settings generally offer an OFFSET, or FACTOR (COEFFICIENT). A recorded and displayed value is computed from the sensor value by multiplying the sensor value by the FACTOR and then adding the OFFSET. Where factors are not offered as a setting, the factor will be 1. This will also be the default factor. The default offset will be 0. Frequently only barometric settings will need adjustment!

While changing a setting, the console displays what the current sensor value is with this offset or factor applied so you can either determine desired offset beforehand, know what you reference value is and manipulate offset until the reference value is matched. Offset values should be specified in the selected units for that sensor!

This category offers the following sub-settings to change:

1. IN TEMP OFFSET: The value you select will be added to the indoor temperature sensor value before display and recording.
2. IN HUMI OFFSET: The value you select will be added to the indoor humidity sensor value before display and recording. When using a value other than 0 is it possible to compute humidity values below 0% or above 100%. Such values will be “clipped” to 0%, respectively 100% if that is the case.
3. OUT TEMP OFFSET: Similar to IN TEMP OFFSET, but for outdoor temperature sensor.
4. OUT HUMI OFFSET: Similar to IN HUMI OFFSET, but for outdoor humidity sensor.
5. ABS PRESS OFFSET: The value you select will be added to the absolute barometric pressure reading (actual sensor value). See note below.

6. REL PRESS OFFSET: The value you select will be added to the calibrated absolute barometric pressure reading (sensor value plus ABS PRESS OFFSET). See note below.
7. WIND DIR OFFSET: The value you select (in degrees) will be added to the wind direction sensor value. If resulting values exceed 359, 360 will first be subtracted (so that 370 becomes 10), and if values less than 0 would result, 360 is first added. This setting is useful if, after permanent installation your reference indicates that your wind direction is systematically different from the reference and can be used to prevent having to re-orientate the outdoor sensor package. IMPORTANT: If you are installing in the southern hemisphere and followed earlier directions, you must use an initial offset of 180 here and subsequently adjust for small differences relative to a reference.
8. WIND SPEED FACTOR: The value you select will be multiplied with the sensor value. If your wind speed consistently differs from a known good reference (these are very hard to obtain), by a constant factor, you can make an adjustment here. The allowable range is 0.1 minimum to 2.5 maximum in 0.1 increments.
9. RAINFALL FACTOR: The value you enter here is multiplied with the rain rate sensor value. If your rain rate consistently differs from a known good reference (these are very hard to obtain), by a constant factor, you can make an adjustment here. The allowable range is 0.1 minimum to 2.5 maximum in 0.1 increments.
10. RAIN DAY TOTAL: The value you enter here is not an offset or a factor, but rather represents the total amount of rain seen so far for the current day. It should rarely need an adjustment after initial installation and setting. Allowable values are 0 – 9,999 mm or equivalent in other units.
11. RAIN WEEK TOTAL: The value you enter here is not an offset or a factor, but rather represents the total amount of rain seen so far for the current week (remember the week starts with Sunday). It should rarely need an adjustment after initial installation and setting. Allowable values are 0 – 9,999 mm or equivalent in other units.

12. RAIN MONTH TOTAL: The value you enter here is not an offset or a factor, but rather represents the total amount of rain seen so far for the current month. It should rarely need an adjustment after initial installation and setting. Allowable values are 0 – 9,999 mm or equivalents in other units.
13. RAIN YEAR TOTAL: The value you enter here is not an offset or a factor, but rather represents the total amount of rain seen so far for the current statistical rain year (may not start in January, see section 5.2.4). It should rarely need an adjustment after initial installation and setting. Allowable values are 0 – 9,999 mm or equivalents in other units.
14. RAIN TOTAL: The value you enter here is not an offset or a factor, but rather represents the total amount of rain seen since the last reset of the unit or since this value was last changed. It should rarely need an adjustment after initial installation and setting. Allowable values are 0 – 9,999 mm or equivalents in other units.
15. TRANSMITTER ID: This is not a setting you can change. Rather it tells you a number that identifies the type of outdoor sensor from which sensor data was received. This is mostly useful for troubleshooting scenarios.

Note: Before making adjustments to WIND SPEED FACTOR or RAINFALL FACTOR please make sure your outdoor sensor package is mounted level and that the wind vane can move unobstructed and that there is no “slippage” on the axis (make sure set-screw is tight).

9.1.7.1 Calibration of barometric pressure settings.

Unlike all other calibration settings where factory installation ensures that, within the specified instrument precision, factors of 1.0 and offsets of 0 are appropriate and correct, this generally cannot be done for relative barometric pressure readings. To understand consider the following.

Absolute barometric pressure, can be calibrated at manufacturing time by comparing with a precise instrument that measures pressure at the same location. In practice, sometimes small adjustments of a few hPa may be needed. The relative pressure represents what the air pressure would indicate if your station was at sea level and depends on the altitude of your console and cannot be known in advance. This is why it needs an offset adjustment.

There are different manners in which to handle this adjustment. We will outline a reliable procedure below, which requires adjusting both pressure offsets. The method assumes that you have an official airport sufficiently nearby to act as a reliable reference. Usually distances of up to 25 miles work reliably, but this is not always true and depends on geography. We start by assuming that your station's absolute pressure reading is correct and needs no offset correction.

1. For this procedure we will get the most precise results if our display for pressure is in hPa units. Even if you do not want to use those units eventually, set the console to use them for now.
2. Determine the altitude, or elevation above sea level, of your station's console. This measurement is necessary to account for the difference in air pressure caused by the elevation of your console. Elevation above sea level reduces the absolute pressure measured by your sensor. Determine this altitude using a GPS, or look it up using a tool such as this web site: https://www.freemaptools.com/elevation-finder.htm. You can input your location's GPS coordinates, or manipulate the map to your location. Click on "Estimate Elevation" and observe the result. For an example we will use a console location at 42 ft. above sea level.
3. This tool will provide the ground level elevation at your location, so you will need to add the right amount for how high above ground level your console is. If you are on a ground floor and have the console on a desk, you'll have to add something like 3-4 ft. If you are using a GPS system that tells you elevation, make sure it is right next to the console and you'll be able to read the correct elevation right from the GPS results without further adjustment.

4. With the correct altitude/elevation in hand you will need to determine the correct offset. To be added to the absolute pressure reading in order to compute relative pressure (sea level equivalent). Correction tables can be found on-line in many places. One example is the table found at the web site at https://novalynx.com/manuals/bp-elevation-correction-tables.pdf. Locate your elevation in the first column and read the correction in the third column. This table, however is rather coarse, making it hard to be precise. An alternative is an on-line calculator such as the one found here: http://www.csgnetwork.com/barcorrecthcalc.html
   For our example of 42 ft. above sea level we input 42 ft. of elevation and a standard pressure of 1013.25 hPa/mb and press calculate. We find an "absolute barometer value" that should be -1.5626061222588443 hPa lower than at sea level. The inverse (because relative pressure is higher than absolute pressure) of this number will be our "REL PRESS OFFSET" value. Use the settings procedure to input +1.6 (nearest rounded value we can input). Remember we assume "ABS PRESS OFFSET" to be 0, so check and change that as well if necessary.
5. Now we need a reliable reference for pressure at sea level. Locate the official identifier for the nearest airport. Refer to "World Airport Codes" at https://www.world-airport-codes.com or a similar reference. Enter your location or nearby airport name, and press "Search." Select the correct airport from your search results and click on it. For example, search for "Mountain View" and click on "Moffet Field."
6. From the resulting page find the ICAO code, if listed. Otherwise use the IATA code. For the example above, you would find IATA code "NUQ."
7. Now go to a web site like AVIATION WEATHER CENTER (for US locations) at https://www.aviationweather.gov/metar?gis=off and enter the code you found in step 2, and click "Decoded" (to make the next step easier) before requesting the METAR information. For the example we would enter "KNUQ" and find a result output like: "30.09 inches Hg (1019.0 mb) [Sea level pressure: 1019.1 mb]"
8. Make sure your console is displaying REL barometric pressure and compare its value with the value from the airport. In our example, the

REL display was 1022.9 where we expected 1019.1. This then tells us that our displayed REL pressure is 1022.9 – 1019.1 = 3.8 hPa different from the reference source.

9. Since we assumed the absolute pressure measured was correct, and we presumably calculated the elevation related offset correctly, we must conclude that the absolute pressure was not correct after all. It appears to be 3.8 too high, so we'll now enter an offset of -3.8 in the settings for ABS PRESS OFFSET.
10. For a more precise procedure, locate a very precise barometer that you can place right next to the console, you would adjust "ABS PRESS OFFSET" until the ABS pressure reads identical. You would then still apply the calculated "REL PRESS OFFSET" as above, and then, as a final step, further adjust "REL PRESS OFFSET" until it displays the reference value from the airport. This procedure would also produce the correct relative pressure, but due to a precise calibration of the absolute pressure, it too is correct.

The first procedure above generally works quite well, but for stations at fairly high altitudes (e.g. 5,000 ft. or higher) it may be more incorrect than at lower altitudes. In such cases comparisons with other known correct, and nearby at similar altitude, stations may help.

Now that calibration is complete, feel free to change the pressure units to whatever you like.

Note: Airport METAR data is often only updated every 10, 15 or even 30 minutes. If you use the information in the procedure above, you may be looking at pressure data that is out of date by as much as the update interval. To get best results observe several times and figure out the update interval and then use two values for the procedure: one taken immediately after an update, another taken about halfway through the interval.

Note: It is also a good idea to observe some more after the calibration procedure is complete to make sure the numbers are correct.

9.2. Alarm Mode

In ALARM mode you can activate alarms that will alert you to the presence of alarmingly high or low sensor values. From normal mode, you can enter alarm mode by pressing the button ALARM. By pressing the button ALARM once you will enter "high" alarm mode where you can set or change alarm conditions for alarmingly high sensor values. Pressing button ALARM again will activate "low" alarm mode, for alarmingly low values. High alarm mode also includes a conventional time-based alarm (alarm clock).

When an alarm condition is met, the alarm will sound a loud beep, and the alarm icon ( ) will flash. The message panel will display a message appropriate for the alarm condition. Press any button to silence the alarm beep. The flashing alarm icon will stay until the alarm condition itself is no longer satisfied (e.g. temperature drops below alarm value, etc.)

Once in alarm mode use the / buttons to witch between the various possible alarms and use the / buttons to change the value setting for a particular alarm. The button SET

is used to switch a particular alarm from enabled (ON) to disabled (OFF). To leave alarm mode, press the HISTORY button or it will happen after 30 seconds of inactivity.

9.2.1 HIGH ALARM SETTING

In the "high" alarm mode, the following alarms are available by cycling through them using the / buttons.

1. TIME ALARM: Set alarm to activate at a specified time

16. IN TEMP HIGH ALARM: Set value at which an "indoor temperature high" alarm will activate
17. IN HUMI HIGH ALARM: Set value at which an "indoor humidity high" alarm will activate

18. OUT TEMP HIGH ALARM: Set value at which an “outdoor temperature high” alarm will activate
19. OUT HUMI HIGH ALARM: Set value at which an “outdoor humidity high” alarm will activate
20. ABS BARO HIGH ALARM: Set value at which an “absolute barometric pressure high” alarm will activate
21. REL BARO HIGH ALARM: Set value at which an “relative barometric pressure high” alarm will activate
22. WIND HIGH ALARM: Set value at which an “wind speed high” alarm will activate
23. GUST HIGH ALARM: Set value at which an “wind gust speed high” alarm will activate
24. DEW POINT HIGH ALARM: Set value at which an “dew point high” alarm will activate
25. HEAT INDEX HIGH ALARM: Set value at which an “heat index high” alarm will activate
26. RAIN RATE HIGH ALARM: Set value at which an “rain rate high” alarm will activate
27. RAIN DAY HIGH ALARM: Set value at which an “rain total for day high” alarm will activate

9.2.2 LOW ALARM SETTING

The “low” alarm mode is quite similar to the “high” alarm mode but does not have the “time alarm” setting and omits setting for which a low alarm does not make sense and adds settings for which only a low alarm makes sense.

1. IN TEMP LOW ALARM: Set value at which an “indoor temperature low” alarm will activate
28. IN HUMI LOW ALARM: Set value at which an “indoor humidity low” alarm will activate

29. OUT TEMP LOW ALARM: Set value at which an “outdoor temperature low” alarm will activate
30. OUT HUMI LOW ALARM: Set value at which an “outdoor humidity low” alarm will activate
31. ABS BARO LOW ALARM: Set value at which an “absolute barometric pressure low” alarm will activate
32. REL BARO LOW ALARM: Set value at which an “relative barometric pressure low” alarm will activate
33. WIND CHILL LOW ALARM: Set value at which an “wind chill low” alarm will activate
34. DEW POINT LOW ALARM: Set value at which an “dew point low” alarm will activate

9.3. History Mode

History mode allows you to inspect the historical records of all available weather values. The console stores up to 3,552 records, where each record contains a complete set of weather values at a particular point in time, along with a time stamp. The recordings are made at a fixed interval that can be set through settings (see section 9.1.3). At the standard 5-minute interval that means 296 hours, or a little over 12 days. Once the recording storage is full, the oldest recording will be overwritten by a newer one, thus always keeping the 3,552 newest ones.

Enter history mode from normal mode by pressing the HISTORY button. The message panel will then show either “HISTORY NONE RECORD” if no records are stored, or it will display a message like “HISTORY P/R 1.07” and “YEAR 2018”.

History records are kept in “pages” of 32 records each. The “P/R” number in the message indicates the current page and record number: in the example above page 1 record number 7. The values themselves are displayed in their respective display segments. You can cycle through record numbers using the ▲/▼ buttons, and through pages using the ◀/▶ buttons.

When in history mode it is also possible to clear all historical records. Do this by holding down the SET button for 2 seconds.

9.4. MIN/MAX Mode

The Min/Max mode is used to inspect maximum or minimum recorded values for sensors. The mode is activated by pressing the MIN/MAX button. Once in Max/Min mode, continued pressed will cycle through the following categories:

1. TODAY MAX: Maximum recorded values for the current day
35. HISTORY MAX: Maximum recorded values since last reset
36. TODAY MIN: Minimum recorded values for the current day
37. HISTORY MIN: Minimum recorded values since last reset

Within each category you can use the ≺ / ≻ buttons to switch among max/min records of the various weather values. Each minimum or maximum will be displayed in its respective display segment, while a message in the message panel will indicate what kind of minimum or maximum is currently selected.

A currently displayed minimum or maximum value can be cleared from the historical record by holding down the SET button for two seconds.

Return to normal mode by pressing the HISTORY button or it will happen after 30 seconds of inactivity.

10. PC Software Operation

Software to monitor your weather station or set values is available for your computer or laptop. The following operating systems are supported: Windows version XP, Vista, 7, 8 or 10. You may download the software from: http://download.ecowitt.net/down/softwave?n=WeatherSmartIP

10.1. Installation and configuration

After downloading, install the software by decompressing the archive named "**WeatherSmartIP**." You will then have a file called "**WeatherSmartIP Setup.exe**". Double click it to start installation.

After making sure your PC is on the same network segment as your console (using Wi-Fi or Ethernet cable), start the **WeatherSmartIP** application that is now installed and select the IP address on that network segment that your computer is using(this window will pop out when your PC has more than one IP addresses):

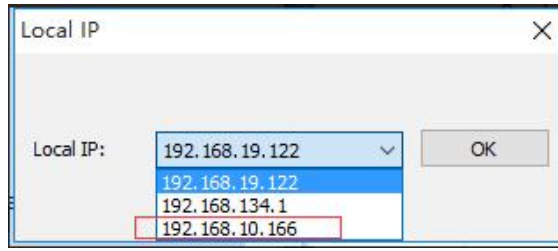


Figure 40: PC Software – IP selection

Most computers have only one IP address, but if yours has more than one and if you don't know which IP address is the correct one, go to your control panel and inspect the properties of the Wi-Fi network that the console is connected to:

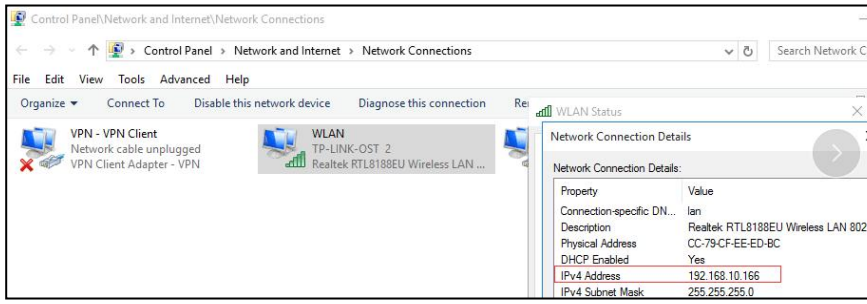


Figure 41: Determining Wi-Fi network addresses

Now, choose "Select Device" from the System menu and select the IP address that your console is using (you can find this information in the

mobile application's "Device List"). If you only have one weather station you should only be offered one choice.

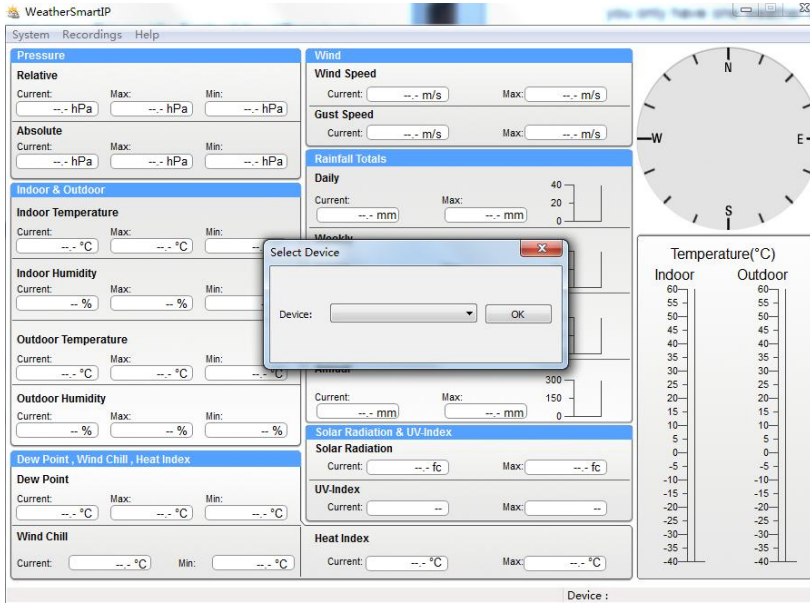


Figure 42: PC Software – weather station selection

Once connected, the software will display the current weather data from the console:

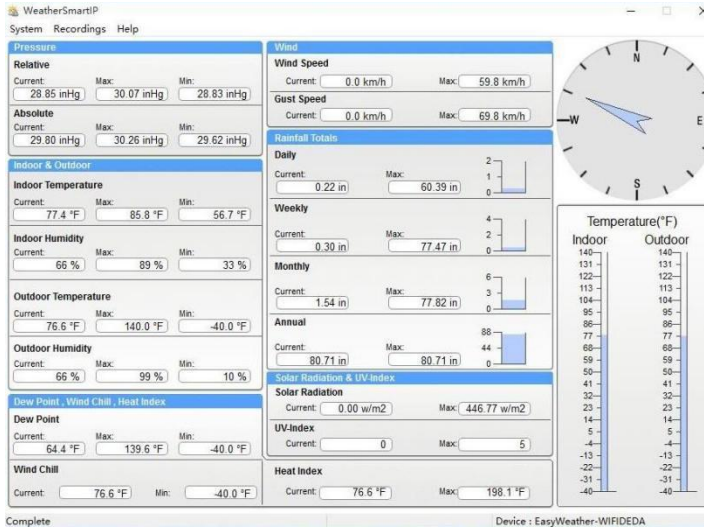


Figure 43: PC Software – Current weather data

10.2. Basic Functions

Basic functions are located under the “System” menu:

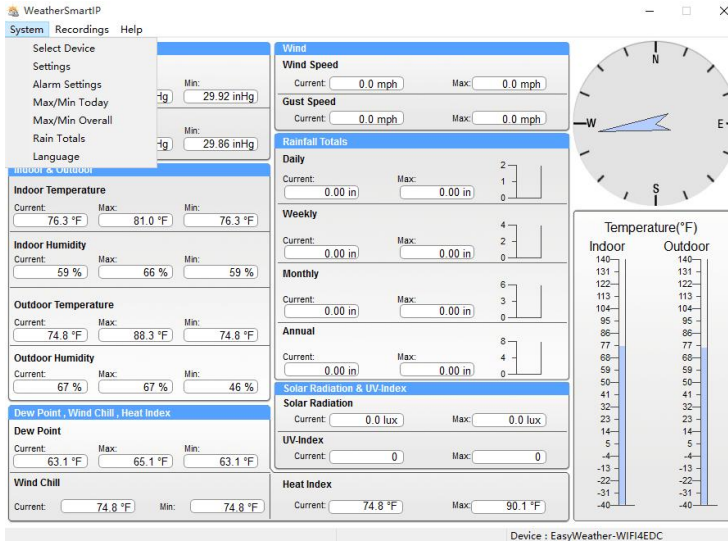


Figure 44: PC Software － System Menu

10.2.1 Setting

The “Setting” option gives you access to a screen where you can control time settings, display units, and what sensor values will be displayed. You can also switch keypad beeps on or off:

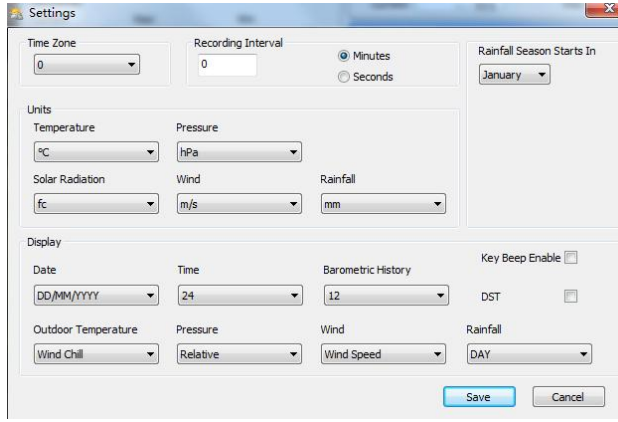


Figure 45: PC Software – Setting screen

10.2.2 Alarm

The "Alarm" option gives you access to inspect or change the various alarm settings that can also be controlled directly on the console (see section 5.2.8).

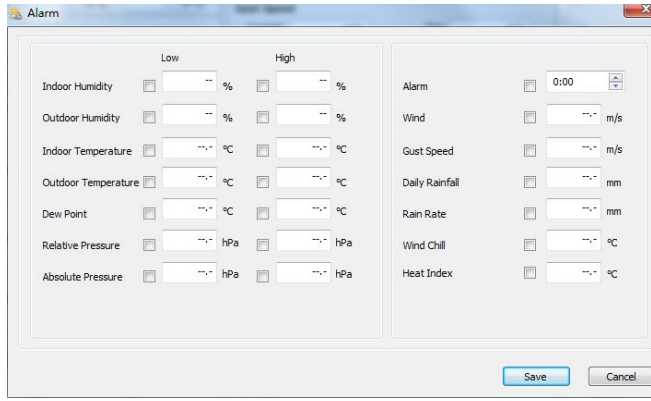


Figure 46

10.2.3 Max/Min Today

The "Max/Min Today" option presents a screen where you can see all

maxima and minima of weather values for the current day. There is also a "Clear" button which allows you to clear these values (causing new extremes to be recorded for the remainder of the day).

Figure 47: PC Software – Current day Max/Min data

10.2.4 Max/Min Overall

The "Max/Min Overall" option is similar to the "Max/Min Today" option, but rather than showing extreme values for the current day, it shows extreme values across the recorded history (up to 3,552 records). Each extreme value will be presented along with date and time when it occurred. Here too there is a "Clear" button that will erase all these extremes (not the historical data itself).

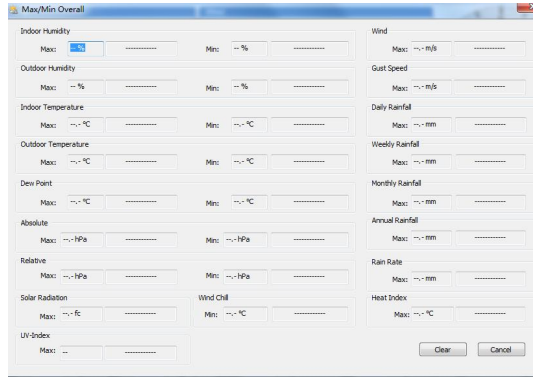


Figure 48: PC Software – Historical Max/Min data

10.2.5 Rain Totals

The currently accumulated rain totals for different periods can be seen, and changed, on this screen:

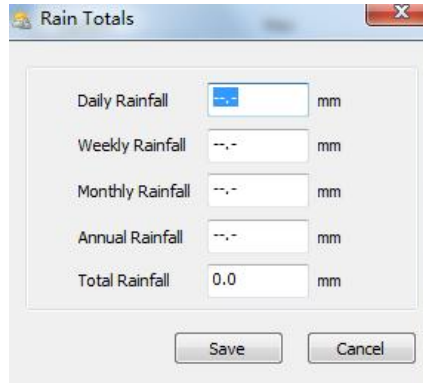


Figure 49: PC Software – Rain Totals settings

Any changes you make here will be immediately reflected in the console.

10.3. Record Functions

Access to the full historical data record is available through the “Record” menu:

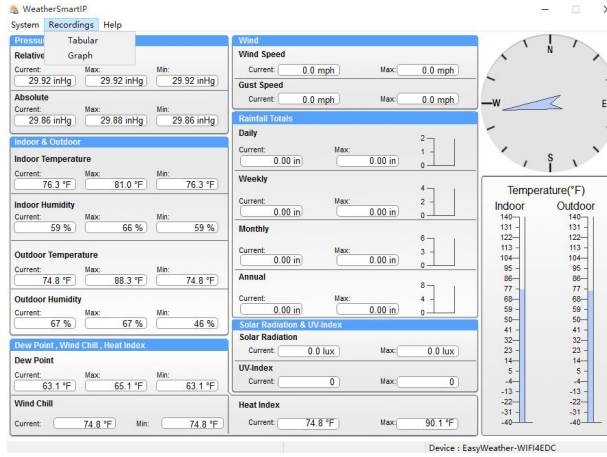


Figure 50: PC Software – Record Menu

10.3.1 Tabular

The “Tabular” option presents a screen listing all historical data in text format. Data is presented in tabular format. The data range can be controlled and a “Search” function is available for the data in the date range. Other buttons allow for clearing the data stored in the PC software (“Clear Data”) and data in the historical record storage on the console (“Clear Memory”). Finally, the “Export” button allows export of the data in the table in CSV format.

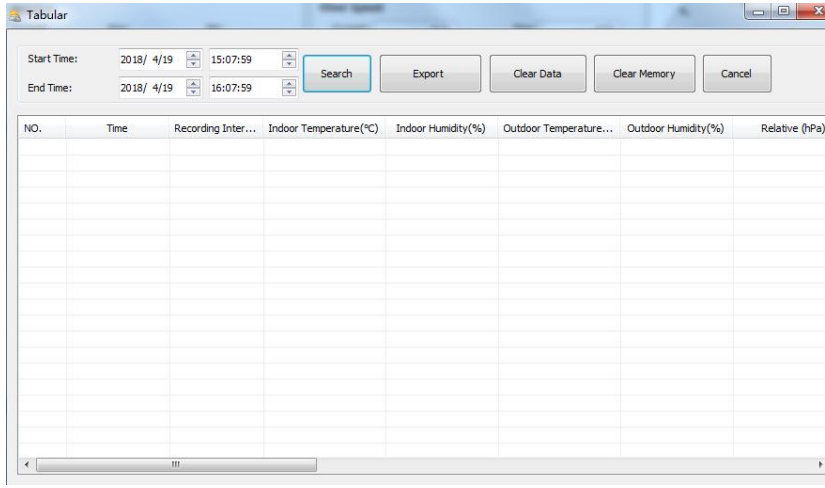


Figure 51: PC Software – Tabular historical data

10.3.2 Graph

The “Graph” option gives access to the same data as does the “Historical” option, but instead of a tabular presentation, you are given a graphical representation. Data range and search are also available here. You will use a popup menu to select the type of data you wish to see graphed (temperature, humidity, wind, etc.). You can export any graph as an image:

Figure 52: PC Software – Graphical historical data

11. Historical Data Export and Clear

11.1. Export History Data

The WS2320 doesn't support a memory card to store data. When the Wi-Fi configuration (refer to Section 3.3) is completed, you can log in to Ecowitt.net to export the data in **xlsx** file format.

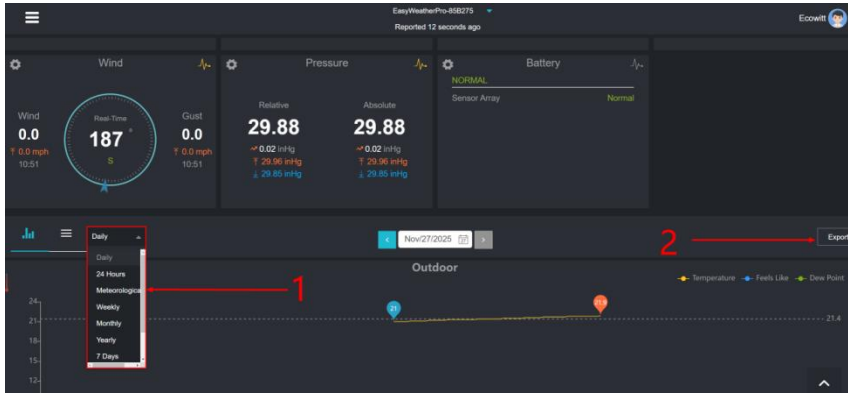


Figure 53

Note:

Data with a query interval of days/24 hours is retained for 3 months.

Data with a weekly query interval is retained for 1 year.

Data with a monthly query interval is retained for 2 years.

Data with a yearly query interval is retained for 4 years.

11.2. Clear History Data

Choose "menu" → "Devices" → " " →"Sure".

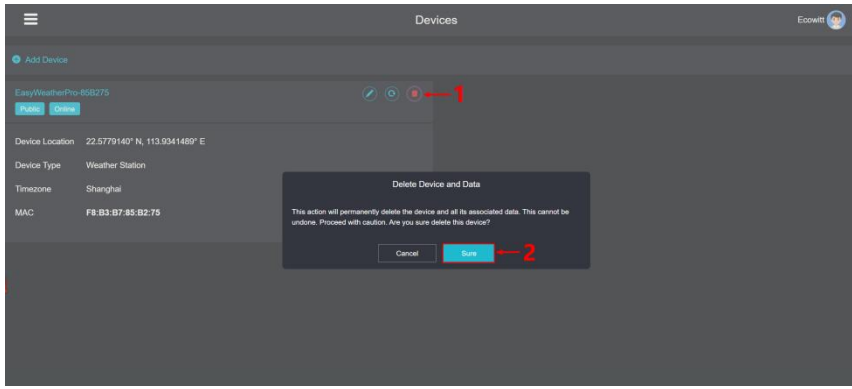


Figure 54

12. Features

- Time and date, Moon phase
- Indoor/Outdoor temperature and humidity
- Wind speed, gust speed, and wind direction (compass)
- Absolute and Relative barometric pressure
- Rainfall rate and totals for day, week, month, year and life-time total
- Calculated wind chill, dew point and heat index display

- Solar light intensity and UV index
- Selectable display units for each sensor: C or F (temperature); mph, km/h, m/s, knots or Beaufort (wind speed); inHg, hPa or mmHg (pressure); in or mm (rainfall); lux, fc or w/m^2 (solar lighting)
- Weather forecast based on barometer reading
- Barometric history chart (12, or 24 hr.)
- Maximum and minimum values for sensor with time stamp
- High/low alarm options for sensors
- Message panel showing alarm conditions, min and max data, etc.
- Data preserved during battery change
- PC software (requires Wi-Fi connection; downloaded)
- Backlight high/low adjustable when connected to power adapter
- Pushes sensor data to cloud weather services:
  - https://www.ecowitt.net
  - https://www.wunderground.com
  - https://www.weathercloud.com/
  - https://www.wow.com
  - Custom sites using either Wunderground or Ecowitt protocol. Contact the Customer Support department for assistance.
- Data storage service on Ecowitt server: https://ecowitt.net
  - Stores data for past six months at 5-minute intervals
  - Stores data for past year at 30-minute intervals

13. Specifications

Model	WS2320
Name	Weather Station Display Console
Dimensions	173 x 143 x 52mm
Screen Size	139 x 111mm
Material of Plastic Casing	ABS
Material of Screen	HTN-LCD
Temperature Metering Range	0°C – 50°C (32°F - 122°F)
Temperature Metering Accuracy	±1°C(±1.8°F)
Temperature Metering Resolution	0.1°C, or 0.1°F
Humidity Metering Range	10% ~ 99% RH
Humidity Metering Accuracy	±5%RH
Humidity Metering Resolution	1%RH
Barometric pressure range	300 – 1,100 hPa (8.85 – 32.5 inHg)
Barometric pressure accuracy	± 3 hPa in 700 – 1,100 hPa range
Barometric pressure resolution	0.1 hPa (0.01 inHg)
Alarm duration	120s
Sensor reporting interval	48 seconds
RF Connection Frequency	920/915/868/433MHz (depending on local regulations)
RF Wireless Range	Over 100 meters (in open areas)
WLAN	802.11 b/g/n 2.4 GHz (802.11n, Max 150 Mbps)
WLAN Range	Over 30 meters (in open areas)
Power Supply	5V DC adaptor (not included) or 3 x AA 1.5V LR6 Alkaline batteries (not included)
Battery Life	6 Months

Table 7

14. Optional Sensors

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

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

The following sensors can be purchased separately. Make sure to select the model of the units with the same RF frequency as your gateway or display (the frequency is different for various countries because of regulations).

Sensor Model	**Max QTY**	**Picture**	**Functions**
WS69	1		Outdoor temperature & humidity, light, UV, wind speed/direction, rainfall
WN67	1		Outdoor temperature & humidity, wind speed/direction, rainfall

Table 8

15. 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
Outdoor sensor not reporting to console Dashes (--) on the display console	Check that the outdoor transmission LED on the bottom is flashing approximately every 16 seconds. See Figure 2 item 9. If the batteries were recently (re)placed, check correct polarity was used and/or reseat the batteries. If the batteries are old, replace them. If the LED is now flashing every 16 seconds, proceed to the next step. If it is not flashing and you have repeated battery checks and placement, you may have a defective unit. Make sure you have fresh batteries in the display console. If the batteries may have been changed in the remote and/or the console, and the console has not been reset, the solution may be as simple as **powering cycling** the console: remove both batteries and external adapter for about 10 seconds and reconnect. If you still have problems, bring the outdoor sensor to a location about 10 ft. away from the console for testing. Power cycle the console as described above. Do not touch any buttons for several minutes to allow the console to “discover” the outdoor sensor.
Intermittent problems with outdoor sensor reception on console	There may be a temporary loss of communication due to signal quality issues caused by electrical interference or other location related factors (obstacles along line of sight). To troubleshoot, install a fresh set of batteries in the remote sensor array and console. For cold weather environments, install lithium batteries. If problems remain with fresh batteries, ensure power adapter is not too close to the console, and the console is

Problem	Solution
	not close to other electrical noise generating devices such as TVs, monitors, computers and transmitting devices. If you still have intermittent problems move sensor and console closer together, but not closer than 5 ft. Also check that there are no metal barriers like aluminum siding, or metal wall framing, along the line of sight between sensor and console. Relocate sensor and console as necessary to avoid obstacles. Depending on natural barriers you may also have to move the outdoor sensor higher and/or closer.
Indoor and Outdoor Temperature do not agree during indoor testing	During installation testing it is useful to test with both console and outdoor unit in the same room. Allow up to one hour for the sensors to stabilize and adjust to room temperature. The indoor and outdoor temperature sensors should agree within 4 °F (the sensor accuracy is ± 2 °F). If these values still disagree, use calibration offsets for one or both sensors (see section 5.2.7) to adjust to a known good reference temperature.
Indoor and Outdoor Humidity do not agree during indoor testing	The procedure here is that same as for outdoor/indoor temperature. The sensors should agree within 10 % (the sensor accuracy is ± 5 %) If these values still disagree, use calibration offsets for one or both sensors (see section 5.2.7) to adjust to a known good reference humidity.
Relative pressure does not agree with official reporting station	Relative pressure refers to sea-level equivalent temperature and should generally agree closely with the official station. If there is a disagreement, make sure you are not looking at absolute pressure, in particular if your station is not near sea level. Also check at different times due to occasional delays in updates to the official station. Redo the pressure calibration procedure described in section 5.2.7.1. The barometer is only accurate to ± 0.09 inHg (3 hPa) within the following relative pressure range: 20.67 to 32.50 inHg (700 – 1,100 hPa), which corresponds to an altitude of 9,000 ft. (2,750 m) down to 2,500 ft. (750 m) below sea level. At higher altitudes, you should expect a

Problem	Solution
	possible lesser accuracy and non-linearity effects in the error (the calibration offset only allows for a partially linear correction).
Time is incorrect	Make sure your time zone and daylight savings time setting is correct at Ecowitt Weather server. If not connected to the Internet via Wi-Fi, you may also have to manually set the correct time.
The forecast icon is not accurate	The weather station console must run for several days to trend barometric pressure properly and start producing reasonable forecasts. The weather forecast is an estimation or generalization of weather changes in the next 24 to 48 hours and varies from location to location. The pressure trend is a simplified tool for projecting weather conditions and is never to be relied upon as an accurate method to predict the weather.
Moon phase is not correct	Check your calendar date and make sure it is correct.
Display console contrast is weak	Replace console batteries with a fresh set of batteries and/or make sure external power adapter is connected and functioning.
Data not reporting to Wunderground .com	Confirm your station ID is correct. The station ID is all caps, and the most common issue is substituting a capital letter O for a 0 (zero) or vice versa. Please note the digit 0 can only occur in the last part of the station ID (which is a station number in a city). Example, KAZPHOEN11, not KAZPH0EN11 If there's a number "1" on the station key, try to input the lower case of letter "L" to replace it on the app. Confirm that your password (also called: key) is correct. It is the password wunderground.com generated for your station ID. You can also verify it by logging in to wunderground.com and looking it up under “My PWS.” Make sure the date, time and time zone is correct on the Ecowitt Weather server. If it is not incorrect, you may be reporting data for a point in the past or future and you

Problem	Solution
	may not see it where you expect it. Check your router firewall settings. The console sends data via port 80. If you can access other web sites using "http" (not to be confused with "https") this setting will be OK.
No Wi-Fi connection	Check for Wi-Fi symbol on the display. If wireless connectivity is operational, the Wi-Fi icon  will be displayed in the time segment on the console. If the symbol is not displayed, but you do remember configuring it successfully before, check that the console external power adapter is plugged in and functional. Wi-Fi use demand more energy than batteries alone can provide. If you have never been able to configure Wi-Fi to a working state, make sure your Wi-Fi supports 2.4 GHz signals (801 type B or G, or N). The console does **not support** Wi-Fi that uses the 5 GHz spectrum. Make sure you configured the correct SSID and password. Repeat the procedure if necessary to verify. The console does not support so-called "captive Wi-Fi" networks. These are typically "guest" type networks where users have to agree to terms and conditions before being connected.

Table 9

16. Warranty

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

All trademarks and patents are recognized.

We provide a 2-year limited warranty on this product against manufacturing defects or defects in materials and workmanship.

This limited warranty begins on the original date of purchase, is valid only on products purchased, and only to the original purchaser of this product. To receive warranty service, the purchaser must contact us for problem determination and service procedures.

This limited warranty covers only actual defects within the product itself and does not cover the cost of installation or removal from a fixed installation, normal set-up or adjustments, or claims based on misrepresentation by the seller, or performance variations resulting from installation-related circumstances.

17. FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not

occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception,
which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.
To maintain compliance with RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.
IC Caution:
English:
This device contains licence-exempt transmitter(s) /receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
1.This device may not cause interference.
2.This device must accept any interference, including interference that may cause undesired operation of the device.

18. Battery Care and Maintenance

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

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

- Always purchase the correct size and grade of battery most suitable for the intended use.
- Always replace the whole set of batteries at one time, taking care not to mix old and new ones, or batteries of different types.
- Clean the battery contacts and also those of the device prior to battery installation.
- Ensure the batteries are installed correctly with regard to polarity (+ and -).
- Remove batteries from product during periods of non-use. Battery leakage can cause corrosion and damage to this product.
- Remove used batteries promptly.
- For recycling and disposal of batteries, and to protect the environment, please check the internet or your local phone directory for local recycling centers and/or follow local government regulations

19. Contact Us

19.1. After-sales Service

Order Issues:

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

Usage Inquiries:

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

19.2. Stay in Touch

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