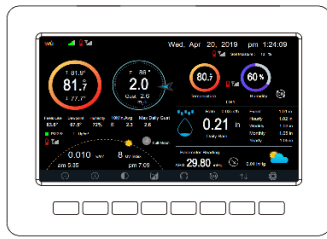**HP1000SE PRO**

Display

Manual (EN)

froggit.de

Support/updates/manuals/spare parts/compatible products:
www.froggit.de
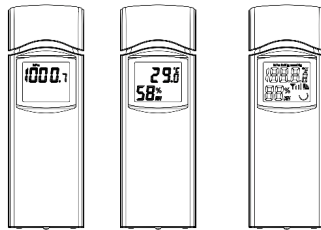
Display console

memory card slot

USB port

Power jack

Reset

Note: The USB port in the console of weather station is only for firmware update, not for data communication (USB cable not included).

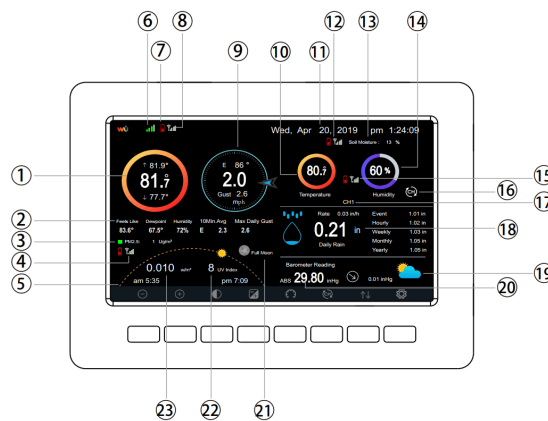You can use a SD card for the firmware update.(SD card not included).

Indoor sensor:

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

Console Display
See 6 to help you identify elements of the console's display screen.

Display Console Screen Layout

No	Description	No	Description
1	Outdoor temperature	13	Soil moisture(optional sensor)

| No	Description	No	Description
2	Outdoor Feels Like/Dew point/Humidity/10Min. Average Wind Direction/Max Daily Gust	14	Indoor humidity
3	PM2.5 concentration(optional sensor)	15	RF signal bar for multi-channel temperature and humidity sensor(optional sensor)
4	RF signal bar for PM2.5 sensor(optional sensor)	16	Multi-channel temperature and humidity sensor cycle display mode icon(optional sensor)
5	Sunrise / Sunset Time	17	Multi-channel temperature and humidity sensor channel number (optional sensor)
6	Wi-Fi signal bar	18	Rain fall Daily/Event/Hourly/Weekly/ Monthly/Yearly
7	Low battery power indicator for each sensor	19	Weather forecast
8	RF signal bar for outdoor sensor array	20	ABS/REL Barometer
9	Wind direction/Wind speed/Gust	21	Moon Phase
10	Indoor temperature	22	UV
11	Date and time	23	Solar Radiation
12	RF signal bar for soil moisture sensor(optional sensor)		

Table：Display console detailed items

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.
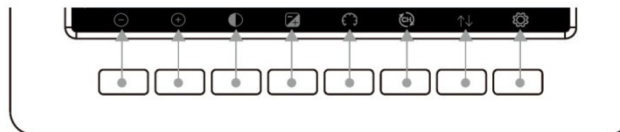

Dark Background Display
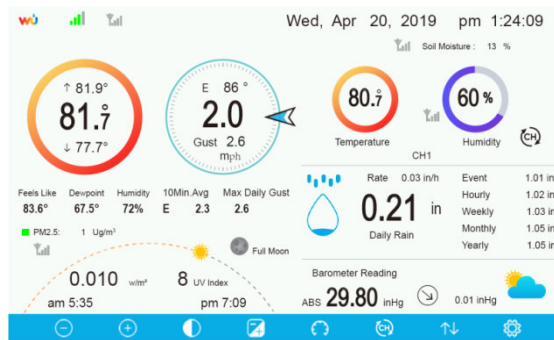
Light Background Display

Note: Sunrise/sunset time display will only work properly when GEO location has been set up correctly. GEO setup can be carried out under setup menu.

Key functions

Buttons around the display

There is a set of eight keys on the bottom of the display console. The following tables 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
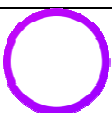
Icon	Description
◐	Backlight on/off key Press this key to on/off the backlight
⊿₊	Background key Press this key to choose between dark background display and light background display
◠	Pressure display key Press this key to choose the display between Absolute pressure and Relative pressure.
(CH)	Channel 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 Setting Mode

Table: Console buttons

Main interface icons explain

Temperature Icon

Temperature Range (degF)	Color Ring	Temperature Range (degF)	Color Ring
< -10	◯	50-60	◯
-10 to 0	◯	60-70	◯
0 to 10	◯	70-80	◯
10-20	◯	80-90	◯
20-30	◯	90-100	◯

30-40		100-110	
40-50		> 110	

Humidity Icon

Humidity Range (%)	Color Ring	Humidity Range (%)	Color Ring
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%	
50 to 60			

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

Hourly Rainfall Icon

Hourly Rain (in)	Icon	Hourly Rain (in)	Color Ring
0.0		0.6 to 0.8	
0 to 0.2		0.8 to 1	
0.2 to 0.4		1 to 1.2	
0.4 to 0.6		1.2 to 1.4	

Multiple Channel Selection and Scroll Mode

Multi-channel sensor is an optional sensor, not included in the package. 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 sensor, only the current data of each sensor can be viewed on the console, and no history data will be saved or uploaded to any weather servers.

History Mode

View and Reset MAX/MIN

While in normal display, press the key once to view and reset minimum and maximums.

Max/Min Screen

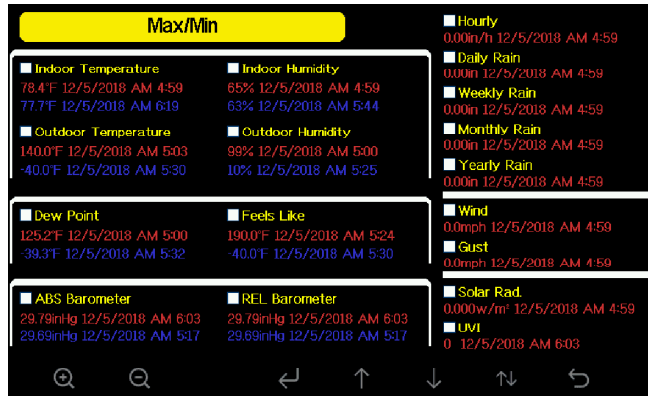| Icon	Description
⊕	Selection key Press this key to select the weather MAX/MIN record which need to clear
⊖	Selection key Press this key to select the weather MAX/MIN record which need to clear
↵	Enter key While the desired weather MAX/MIN record selected , press this key to popup Message Box "Clear 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

History Record Mode

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

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

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.

Clear History Record Screen

View a specific page of history

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

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.

View Graph

While in History Record Mode, press the ↑↓ key once to enter Graph Mode.
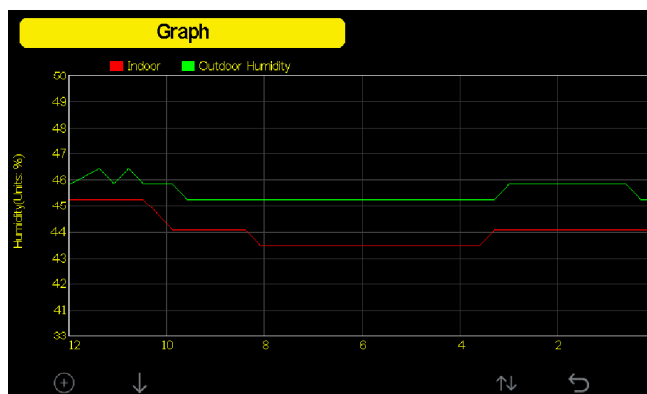
Graph Screen

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)

Setting Mode

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

Setup Menu Screen

Icon	Description
🔍⊕	**Select key** Press this key to select the unit or scrolls the value
🔍⊖	**Select key** Press this key to select the unit or scrolls the value.
←	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

Date and Time setting

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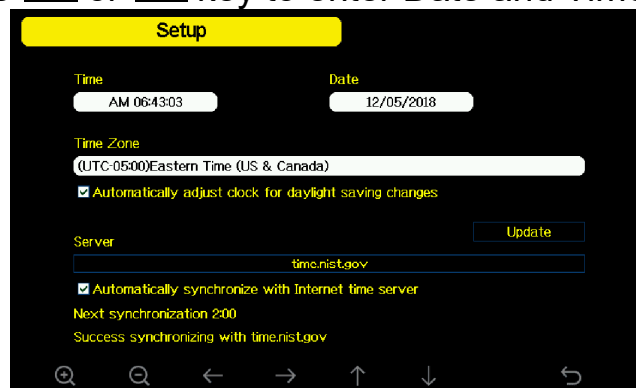
Time and date Setup Screen

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 possible.

Time Format setting

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).

Date Format setting

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

Temperature unit setting

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

Barometric unit

Press 🔍⊕ to change the temperature units of measure between

inHg, mmHg and hpa

Wind speed unit

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

Rainfall unit

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

Solar Rad. Unit

Press ⊕ to change the solar radiation units of measure between W/m^2,

lux and fc.

Multi Channel Sensor

In Multi channel sensor Setup Screen, you can rename the sensor or register the sensor again while the sensor lost connection to console display.
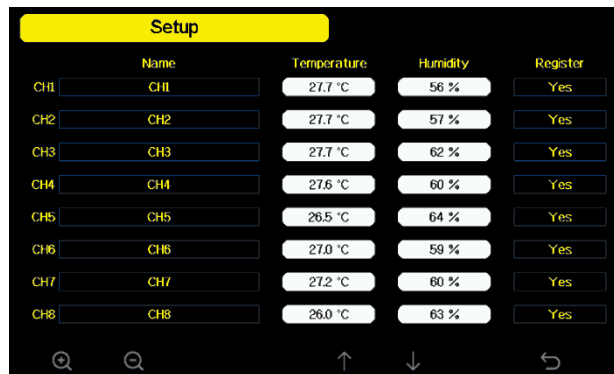
Multi channel sensor Setup Screen

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 setup page.
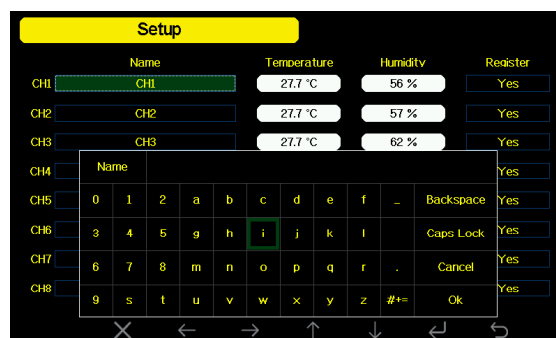
rename the sensor Screen

Press ↓ or ↑ key to select Register setting field, press the ⊕ or ⊖ key to register the selected sensor

Backlight setting

While in Menu Setting Mode, press ⬇ key to select Backlight Setup field, press 🔍⊕ or 🔍⊖ key to enter backlight Setup mode:
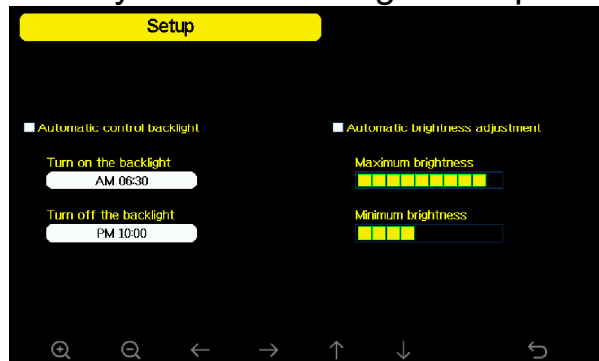
Backlight Setting Screen

Automatic control backlight: select this option, the backlight will auto turn on and off according the set time

Turn on the backlight: set the time of turning on backlight

Turn off the backlight: set the time of turning off 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 while it is the highest light intensity

Minimum brightness: set the minimum brightness while it is the weakest light intensity

Icon	Description
🔍⊕	**Select key** Press this key to select the unit or scrolls the value
🔍⊖	**Select key** Press this key to select the unit or scrolls the value.
←	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 turn-on time has been set, you can press ◑ key to turn off the backlight within the turn on time. Backlight will turn on again automatically at next turn on time. You can press any key to turn on the backlight for 60s within the turn off time

Longitude: Latitude setting

While in Menu Setting Mode, press ↓ key to select Longitude: Latitude Setup field, press ⊕ or ⊖ key to enter Longitude Latitude Setup mode:

Longitude and Latitude Setting Screen

The sunrise/sunset times will be calculating automatically base on the Longitude and Latitude. Your location GEO info can be found on mobile compass page. Two digits after decimal should be enough for this feature to be working correctly.

Barometric display

Press ⊕ to change the barometer display between REL (relative pressure) and ABS (absolute pressure)

Rainfall season (default: January)

Press ⊕ to change the beginning of the rainfall yearly season month. The default is January. Rainfall season influence the annual rainfall

maximum, minimum and total value. When one month was selected, the annual rainfall and annual max/min rainfall were zero clearing at 0:00 of the first day of the selected month.

Storing Interval (1-240minutes Selectable)

Weather Server

Your console is capable of sending your sensor data to select internet-based weather services. The supported services are shown in the table below:

Service	Website	Description
Ecowitt Weather	https://www.ecowitt.net	Ecowitt is a new weather server that can host a bunch of sensors that other services don't support.
Weather Underground	https://www.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	http://wow.metoffice.gov.uk/	WOW is a UK based weather observation website.
Weather Cloud	https://weathercloud.net	Weathercloud is a real-time weather social network formed by observers from around the world.
Customized		Supports uploading to your customized

Website		website, if the website has the same protocol with Wunderground or Ecowitt

Table: Supported weather services

Note: If you are testing the setup with the outdoor sensor package nearby and indoor, you may want to consider connecting to Wi-Fi, but not yet configuring any of the weather services. The reason is that while indoor the temperatures and humidity recorded by the outdoor sensor, and as reported to the weather service(s) will reflect indoor conditions, and not outdoor conditions. Therefore, they will be incorrect. Furthermore, the rainfall bucket may be tripped during handling, causing rain to register while it may not actually have been raining. One way to prevent this is to follow all instructions, except to use an incorrect password, on purpose! Then, after final outdoor installation, come back and change the password after clearing console history. That will start uploading to the services with a clean slate.

Wunderground server setup

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.
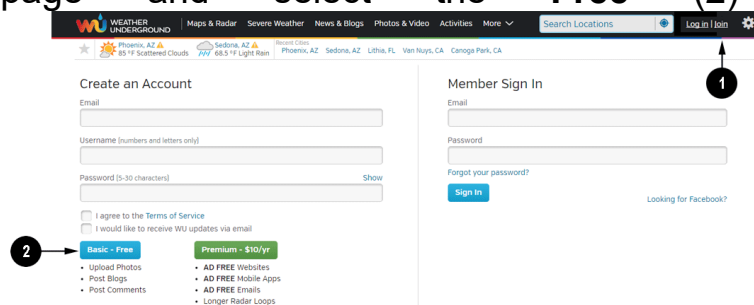
② Select **More | Register Your PWS** (3)
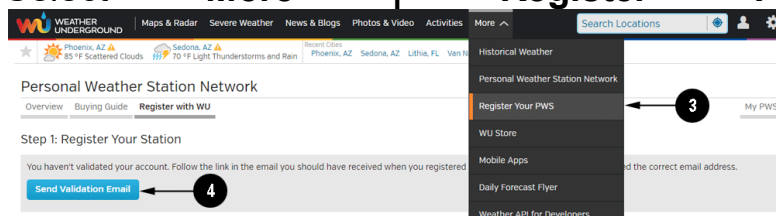
③ Click **Send Validation Email** (4). Respond to the validation email from Wunderground.com (it may take a few minutes).
④ Select **More | Register Your PWS** (5) again. This time you will be asked details about your weather station. Go ahead and fill out the form
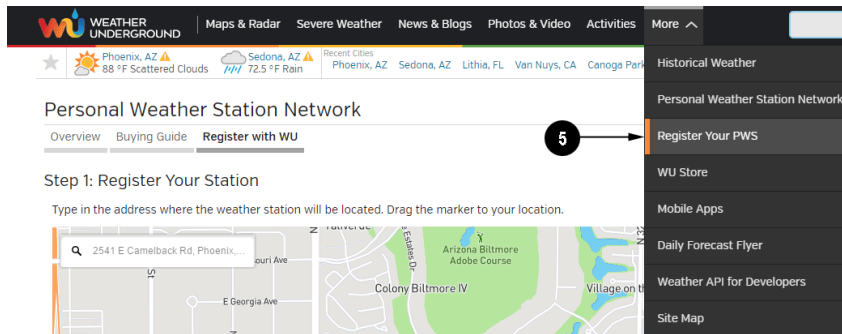
After completing the weather station, you will see something like this:

Congratulations. Your station is now registered with Wunderground!

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

Your Station ID:

KAZPHOEN424

Your Station Key/Password:

mdreeley

Your station ID will have the form: KSSCCCC###, where K is for USA station (I for international), SS is your state, CCCC is an abbreviation for your city and ### is the station number in that city. In the example above, you see station 424 in the state of Arizona (AZ) in the United States (K).

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

Registration on console display

Press 🔍 or 🔍 key to enter Weather Server set up mode. The device can be configured to send real-time data to wunderground.com®. Enter the Station ID and Password obtained from Wunderground.com.

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 display the keyboard. Press ⬆ ⬇ ⬅ ➡ to scroll to the character and press ↵ to select the character. Press ↩ to return to the setup page.

Set Station Key: Press ⬇ to highlight the station key. Enter your password obtained from according weather server. Press 🔍 to display the keyboard. Press ⬆ ⬇ ⬅ ➡ to scroll to the character and press ↵ to select the character. Press ↩ to return to the setup page.

3)Viewing data on wunderground.com

The most basic way to observe your weather station's data is by using the wunderground.com web site. You will use a URL like this one, where your station ID replaces the text "STATIONID": http://www.wunderground.com/personal-weather-station/dashboard?ID=STATIONID

It will show a page such as this, where you can look at today's data and historical data as well:
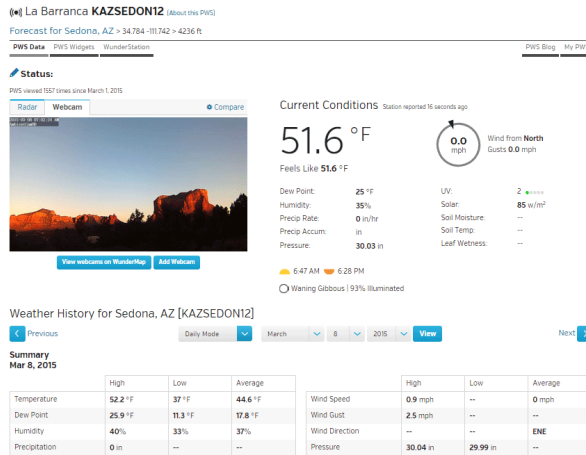
There are also some very useful mobile apps. The URLs provided here go to the Web version of the application pages. You can also find them directly from the iOS or Google Play stores:

- **WunderStation**: iPad application for viewing your station's data and graphs
  https://itunes.apple.com/us/app/wunderstation-weather-from-your-neigh
  borhood/id906099986
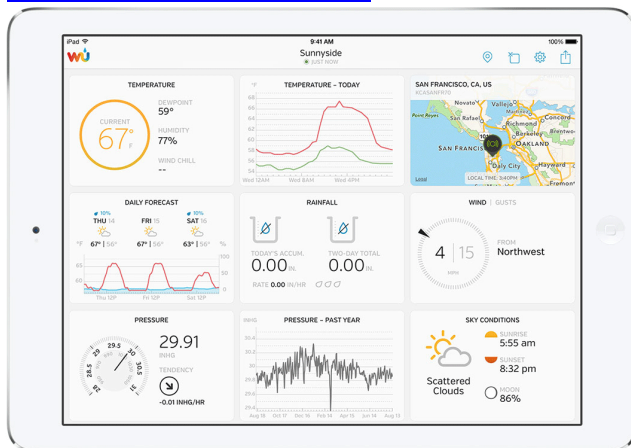
- **WU Storm**: iPad and iPhone application for viewing radar images, animated wind, cloud coverage and detailed forecast, and PWS station data

https://itunes.apple.com/us/app/wu-storm/id955957721
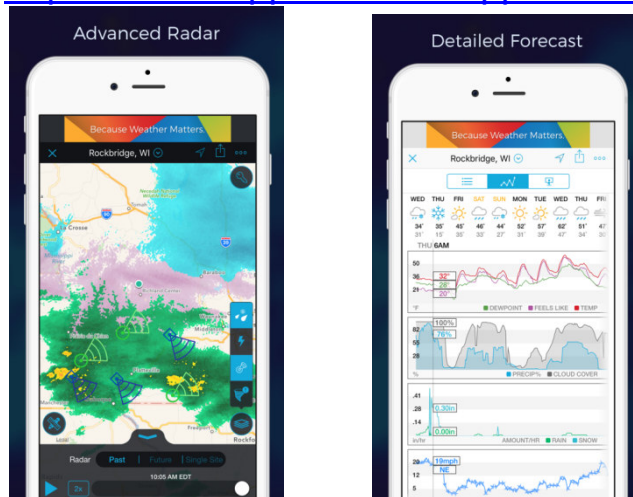
- **Weather Underground: Forecast**: iOS and Android application for forecasts
https://itunes.apple.com/us/app/weather-underground-forecast/id486154808
https://play.google.com/store/apps/details?id=com.wunderground.android.weather&hl=en
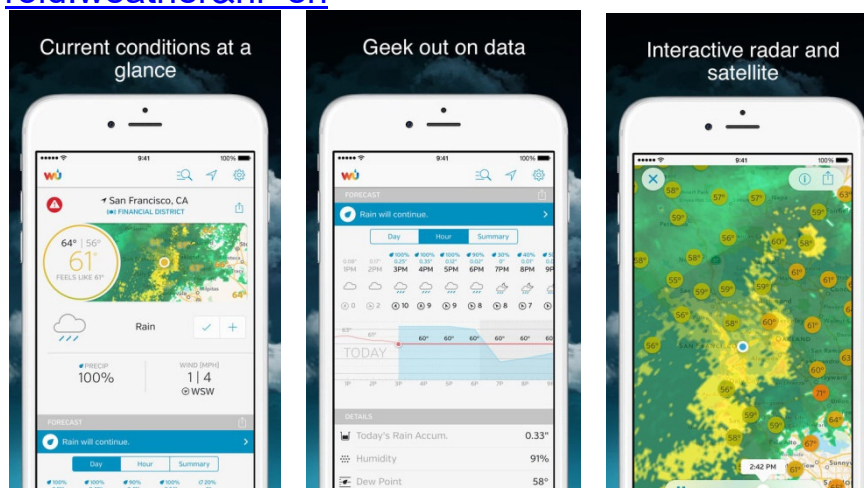
- **PWS Weather Station Monitor**: View weather conditions in your neighborhood, or even right in your own backyard. Connects to wunderground.com
https://itunes.apple.com/us/app/pws-weather-station-monitor/id713705929
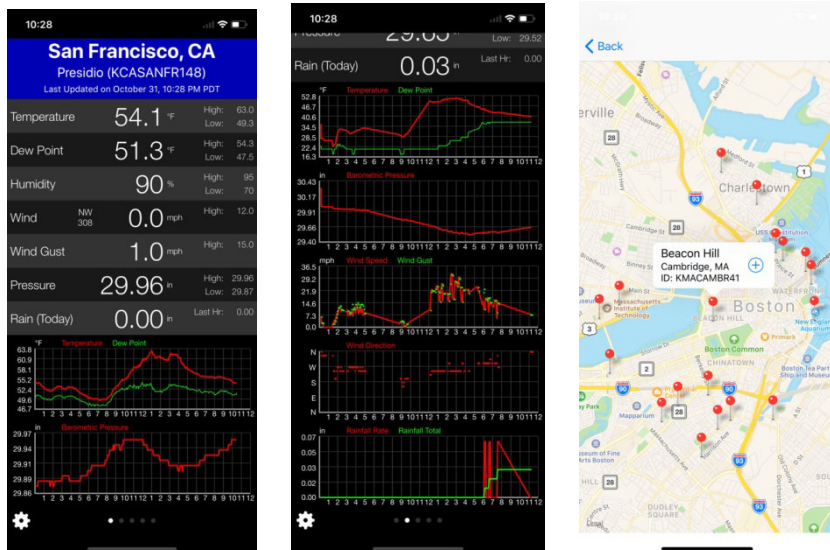
Weathercloud server setup

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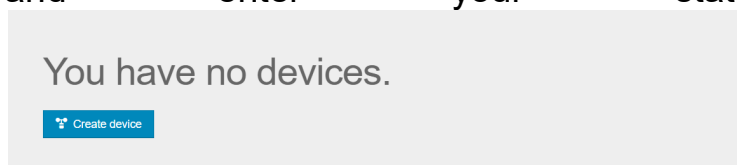
4) After registering your station, take note of the "Weathercloud ID" and "Key" presented to you.
5) Enter these values in the **Weather Server**:

Figure 31: Weathercloud Server setup screen

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

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 http://wow.metoffice.gov.uk. On the top-right side of the resulting page you will see menu options. Click "Sign Up"

You will be presented with the screen below where you will choose to either create a new account or use an already existing account. Click the desired option.
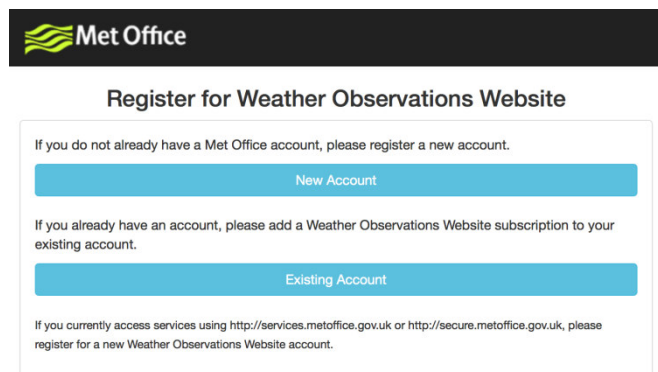
If you chose "New Account" you will be presented with a form to fill out:

The actual form is longer, but all questions should be self-explanatory. Complete and submit the form. You will receive the following notice on completion:
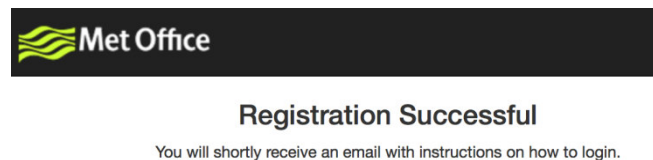
2) Confirm your email with WOW

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 the you contribute. Basically, WOW builds a personal web site for your weather station. Associated with the web site is two items you will need to allow uploading of data:

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

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

Begin setting up a new site by clicking "Enter a Site":
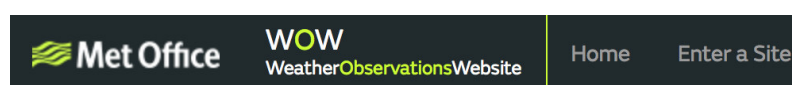
You will be presented with a form where you detail your station's location and a bunch of other settings related to how you wish the site to operate. After you complete the setup, you should see:
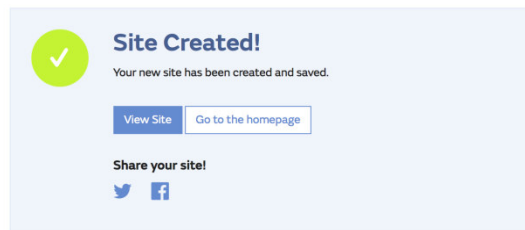
Make sure you are (still) logged in to the WOW site. Login as necessary. Now click on "My Sites" in the navigation bar at the top. If you have only 1 site, you will now be shown its page. If you have multiple, you will have to choose the correct one first. On this page, on the right side you will find the site id just below the map:
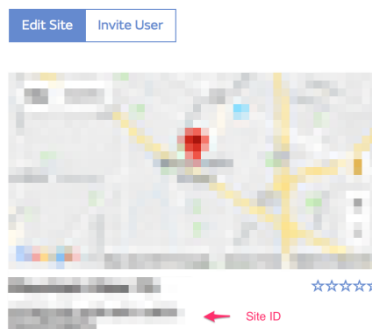
You will also need to establish a unique 6 digits PIN code that you should keep secret. It is the "Authentication Key." Setup this number by clicking on "Edit Site") and filling out the with a 6-digit number of your choice:

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

Figure 32: WOW Server setup screen

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

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:

1) Visit ecowitt.net and enter Email and Password to sign up.
2) 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 (**Fehler! Verweisquelle konnte nicht gefunden werden.**), Note that this is an example only and your MAC address will be different.
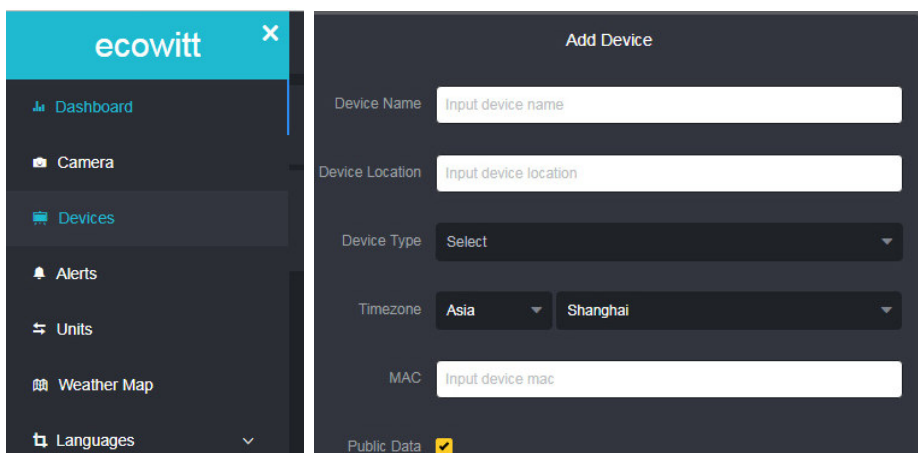
Note: When select device address on map, please wait till the map display before select your address.

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:
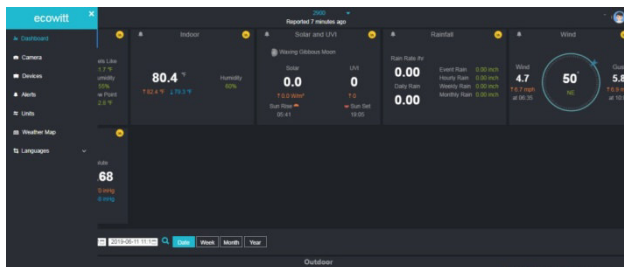
Ecowitt.net is a responsive design and mobile friendly. Simply open your mobile devices web browser, browse to ecowitt.net, and bookmark your dashboard for quick access.

Customized 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,

Server setup screen

Select Enable button and select the protocol type. The website should has the same protocol with Wunderground or Ecowitt. Input all the information needed.
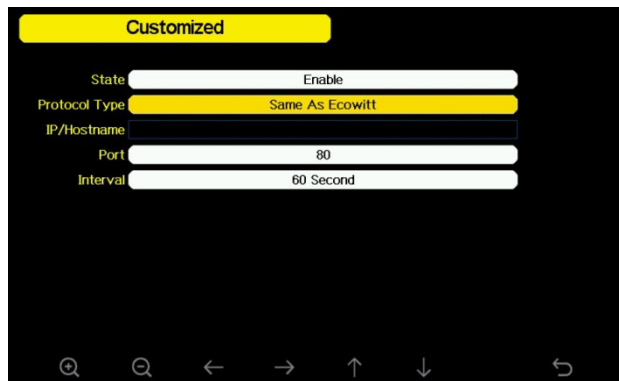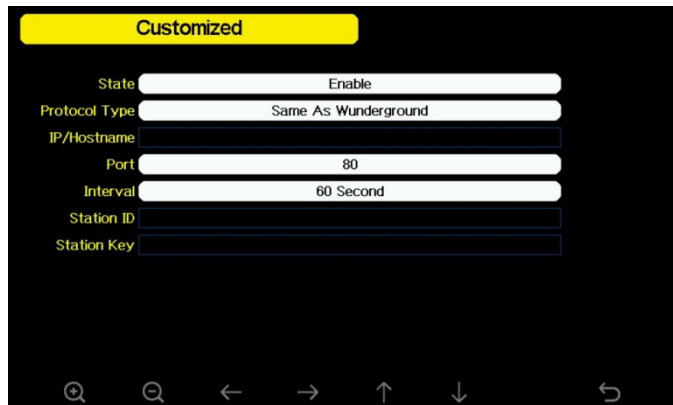
Wi-Fi scan
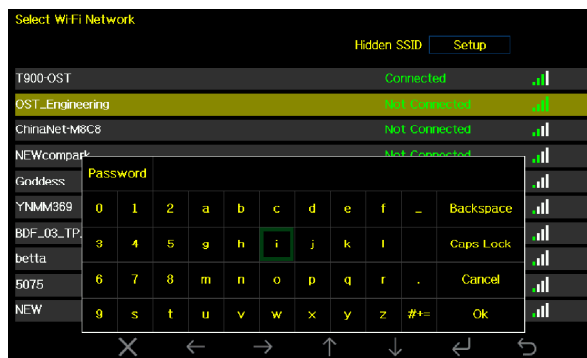
Select Wi-Fi Network Screen

Press ⬆ or ⬇ key to select the Wi-Fi network. Press ⏎ key to confirm and enter the password. Press ↩ key to return to normal display mode. It is possible that your network is not listed when Wi-Fi Scan is performed. Press ↩ button and restart Wi-Fi Scan, this will usually solve the problem.

Only after connect to WLAN you can upload the data to weather website. If the Wi-Fi network connects successfully, the icon ▮▮▮ **will show on the left top of the console display.** If the data upload to Wunderground.com successfully, the icon 🌤 will show on **the left top of the console display**.

If the Wi-Fi network you would like to connect is with a hidden SSID, please follow below steps to connect:

1) Press ↑ ↓ to select Hidden SSID setup, and press ⏎ key directly to enter.

2).Press ↓ to highlight the SSID. Press ⏎ to display the keyboard and enter your SSID. Press ↑ ↓ ← → to scroll to the character and press ⏎ to enter the character. Press ↩ to return to the setup page.

3). Press ↓ to highlight the Password. Press ⏎ to display the keyboard and start to enter your password.. Press ↑ ↓ ← → to scroll to the character and press ⏎ to enter the character. Press ↩ to return to the setup page.

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

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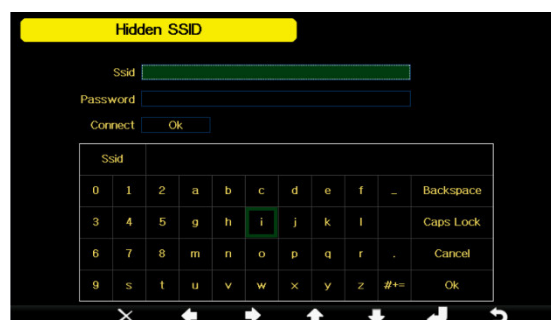
Background

While in Menu Setting Mode, press ![down arrow] key to select Background Setup field, press ![zoom in] or ![zoom out] key to choose between dark background display and light background display

3.11 Alarm Setting Mode
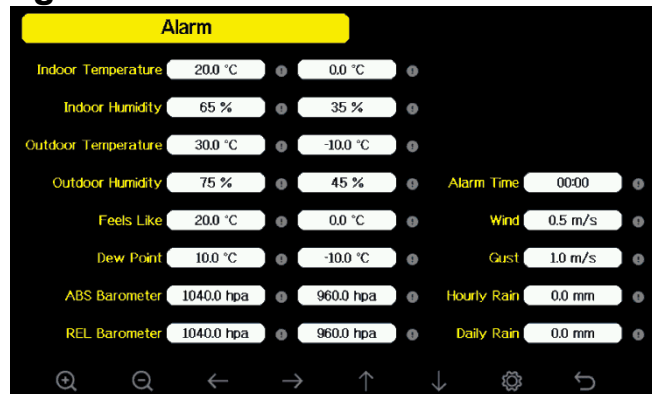
Figure 36: Alarm Setting Screen

Icon	Description
![zoom in]	**Select key** Press this key to select the unit or scrolls the value
![zoom out]	**Select key** Press this key to select the unit or scrolls the value.
![left]	Left key Press this key to select the set value.
![right]	Right key Press this key to select the set value.
![up]	Up arrow key Press this key to change the activated option field
![down]	Down arrow key Press this key to change the activated

Icon	Description
⚙	Set key Press this key to select the Setting sub-Mode
↩	Return key Press this key to return to previous mode

The first row is high alarm value and the second row is low alarm value. When weather alarm condition has been triggered, that particular alarm will sound for 120 second and the corresponding icon will flash until the weather condition doesn't meet the user set level. Press any key to mute the alarm.

Calibration Mode
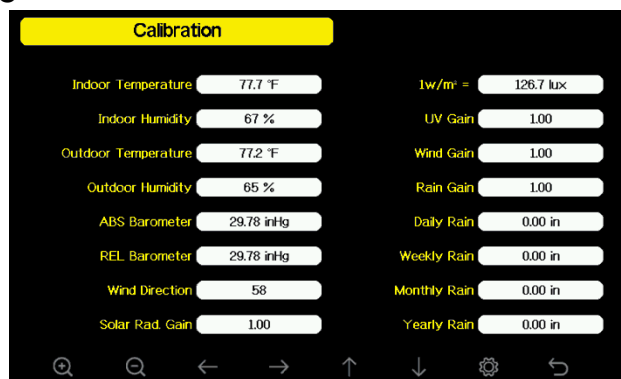
Figure 37: Calibraton Setting Screen

Icon	Description
🔍+	**Select key** Press this key to select the unit or scrolls the value
🔍-	**Select key** Press this key to select the unit or scrolls the value.
←	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

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	Defa	Typical Calibration Source
Temperature	Offset	Curr Valu	Red Spirit or Mercury Thermometer (1)
Humidity	Offset	Curr Valu	Sling Psychrometer (2)
ABS Barometer	Offset	Curr Valu	Calibrated laboratory grade barometer
REL Barometer	Offset	Curr Valu	Local airport (3)
Wind Direction	Offset	Curr Valu	GPS, Compass (4)

Solar Radiation	Gain	1.00	Calibrated laboratory grade solar radiation sensor
1 w/m^2	Gain	126. 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 4" (7)
Daily Rain	Offset	Curr Valu	Apply an offset if the weather station was not operating for the entire day.
Weekly Rain	Offset	Curr Valu	Apply an offset if the weather station was not operating for the entire week.
Monthly Rain	Offset	Curr Valu	Apply an offset if the weather station was not operating for the entire month.
Yearly Rain	Offset	Curr Valu	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 (many official weather stations are not properly installed and calibrated).

Place the sensor in a shaded, controlled environment next to the fluid thermometer, and allow the sensor to stabilize for 3 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 affect on humidity readings (installation over dirt vs. lawn for   example).

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

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

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

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

(4) Only use this if you improperly installed the weather station sensor array, and did not point the direction reference to true north.

(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 evapotransporation 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 20' tall and you mount the sensor on a 5' pole:
Distance = 4 x (20 – 5)' = 60' or =4 x (6.10-1.52)=18.32m.

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 (not included) 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 0.01" or 0.1m of rain (referred to as resolution). The accumulated rainfall can be compared to a sight glass rain gauge with an aperture of at least 4" or 0.1m. 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 <u>MUST</u> 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.

Factory reset
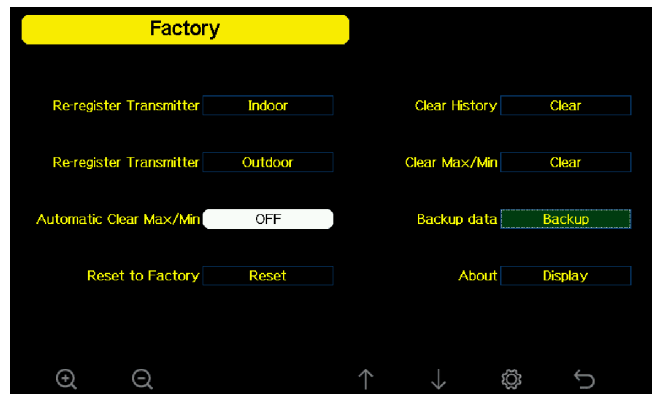
Factory Reset Screen

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.

Re-register outdoor transmitter

Please reference section 5.13.1. Procedures and settings are similar to re-register indoor transmitter

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 history min/max record.

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.

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.

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.

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.

Other Console Functions

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	1	Light air

km/h		
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 - 86.9 km/h	9	Strong gale
55 - 63 mph, or 88.5 - 101.4 km/h	10	Storm
64 - 73 mph, or 103 - 117.5 km/h	11	Violent storm
74 mph and above, or 119.1 km/h and above	12	Hurricane

Table 1: Beaufort wind force scale

Weather Forecasting

The five weather icons are Sunny, Partly Cloudy, Cloudy, Rainy and Stormy.

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 increases for a sustained period of time	Pressure increases slightly or initial power up	Pressure decreases slightly

Rainy	Stormy
🌧️	⛈️
Pressure decreases for a sustained period of time	Pressure rapidly decreases

Lightning Alert

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

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 the 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.

The National Weather Service (and other weather services such as Accuweather and The Weather Channel) have many tools at their

disposal to predict weather conditions, including weather radar, weather models, and detailed mapping of ground conditions.

Moon Phase

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

Gerneral safety insructions

Danger of asphyxiation:

Keep all packaging materials (plastic bags, rubber bands, etc.) away from children. There is a danger of suffocation!

Danger of burns:

Caution! Leaking / leaking battery acid can lead to burns! Avoid contact of battery acid with eyes, mucous membranes and skin. In case of contact, rinse the affected areas immediately with clear water and consult a doctor.

Risk of electric shock:

Children must not be unattended with the device, because the device contains electronic parts which are operated by means of a power source. The device may only be used as described in the instructions. If not, there is a risk of electric shock.

Danger of fire & explosion:

Use only recommended batteries. Never short-circuit the unit or batteries. Never throw the device or batteries into a fire! Overheating and improper handling may result in short circuits which can cause fires and explosions.

Important:

If there is a defect, contact your dealer immediately. Never disassemble the device! The dealer will contact the service department. Never expose the device to water! Protect the device from vibrations. Only use recommended batteries. Never mix batteries - Always replace empty

batteries with a complete set of full power batteries. If the unit is not powered for a longer period of time or is not in use, remove the batteries from the unit. The manufacturer accepts no liability for incorrectly inserted batteries!

CE ♻

Notes on the return of batteries according to §12 BatterieVO: Batteries do not belong in the household waste. Please dispose of all batteries as required by law, disposal in domestic waste is expressly prohibited. Batteries and rechargeable batteries can be dispensed free of charge at municipal collection points or in the shops on the spot.

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           WEEE Reg. Nr. 66110125

declaration of conformity

Hereby we declare, HS-Group GmbH & Co.KG, Escherstr. 31, 50733 D-Cologne, that this product is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. The declaration of conformity for this product can be found at: www.froggit.de or on request.