PROFESSIONAL WEATHER STATION
Operation Manual

About this manual

Thank you and congratulations on selecting this professional weather station! We are positive you will enjoy the benefits of accurate weather readings and the precise radio controlled time information that our instruments offer.

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

Safety

- Do not expose the main unit to rain or moisture
- Use only recommended batteries
- Remove the batteries if the weather station is not to be used for a long time. Old batteries can begin to leak and damage the product.
- Remember to insert the batteries according to the markings in the battery compartment. The wrong polarity (+/-) can damage the weather station.
- Damage that has occurred by careless handling is not covered by the guarantee

Production Description

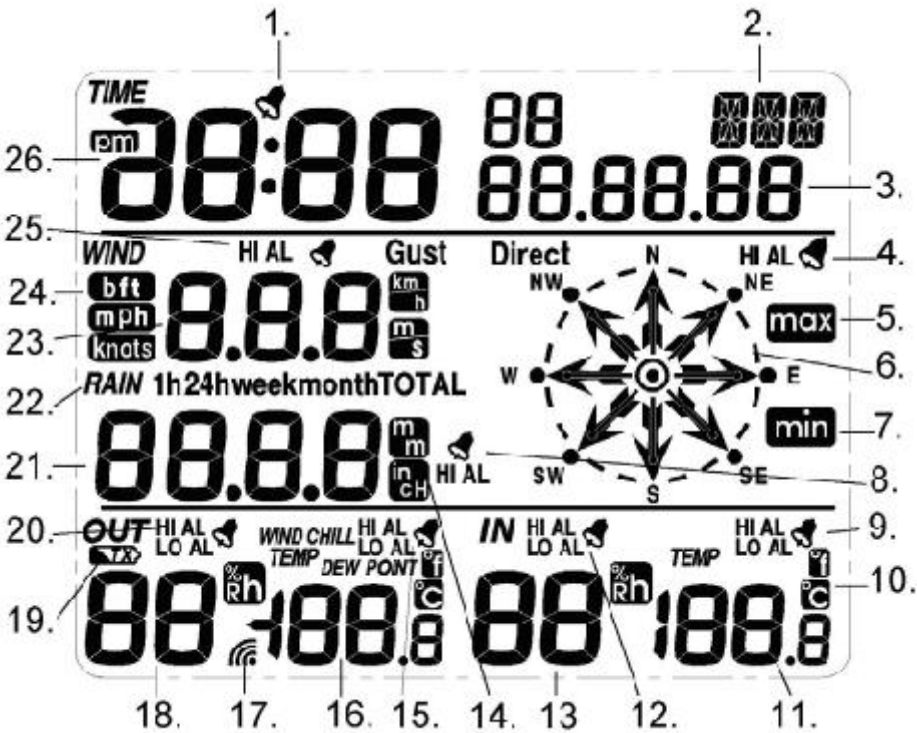
- Display of indoor and outdoor temperature, wind speed, wind direction, humidity, rainfall amounts, time and date
- Alarm function for certain weather conditions as well as records of all minimum and maximum values along with time and date of their recordings
- Time and date with manual setting
- Save the data when batteries is changed
- Operates on 5x LR6/AA alkaline batteries (not included)

Contents

- Main unit (Display unit)
- Outdoor unit

LCD Display

The following illustration shows the full segments of the LCD for description purpose only and will not appear like this during normal operation and use.



1. Time alarm on icon
2. Date of the week/time zone
3. Date
4. Wind direction alarm
5. General Max record
6. Wind direction
7. General Min. record
8. Rainfall high alarm
9. Indoor temperature high alarm and low alarm
10. Temperature unit
11. Indoor temperature
12. Indoor humidity high alarm and low alarm
13. Indoor humidity
14. Rainfall unit
15. Outdoor temperature high alarm and low alarm
16. Outdoor temperature
17. Outdoor reception signal
18. Outdoor Humidity
19. Outdoor transmitter low battery indicator
20. Outdoor humidity high alarm and low alarm
21. Rainfall
22. Rainfall 1h,24h, week, month or total display
23. Wind speed
24. Wind speed unit
25. Wind speed high alarm
26. Time

Note: The presence of the "Alarm-On icon" in the section means that the particular alarm has been enabled.

Set up Guide

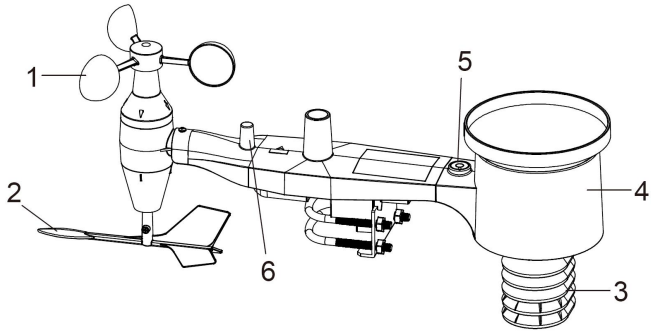


Figure 1

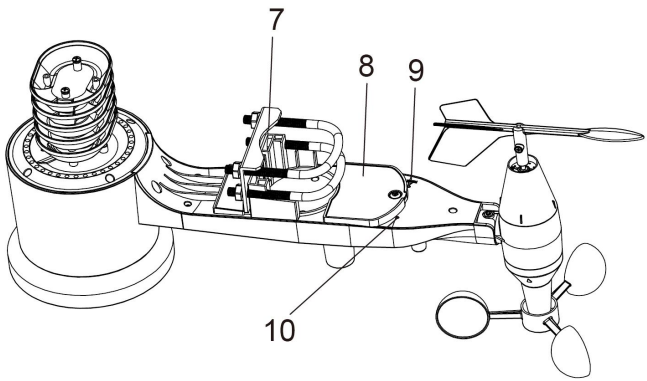


Figure 2

1. Wind Speed Sensor
2. Wind Vane
3. Thermo-hygro sensor
4. Rain collector
5. Bubble level
6. Antenna
7. U-Bolt
8. Battery compartment
9. Reset button
10. LED Indicator: light on for 4s if the unit power up. Then the LED will flash once every 48 seconds (the sensor transmission update period).

1. Install U-bolts and metal plate

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

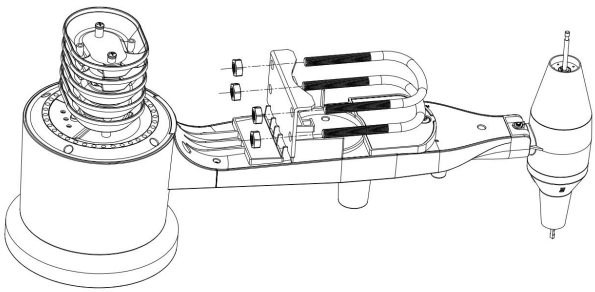


Figure 3: U-Bolt installation

Loosely screw on the nuts on the ends of the U-bolts. You will tighten these later during final mounting. Final assembly is shown in Figure 4.

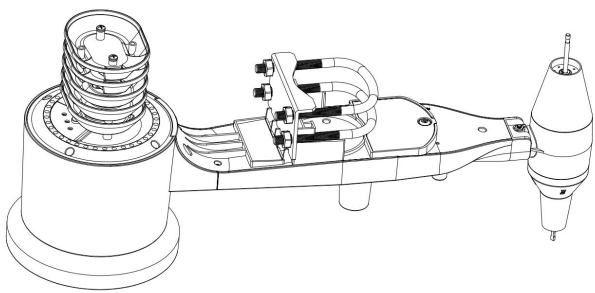


Figure 4: U-Bolts and nuts installed

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

2. Install wind speed cups

Push the wind speed cup assembly onto the shaft on the top side of the sensor package, as shown in Figure 5 on the left side. Tighten the set screw, with a Philips screwdriver (size PH0), as shown on the right side. Make sure the cup assembly can rotate freely. There should be no noticeable friction when it is turning.

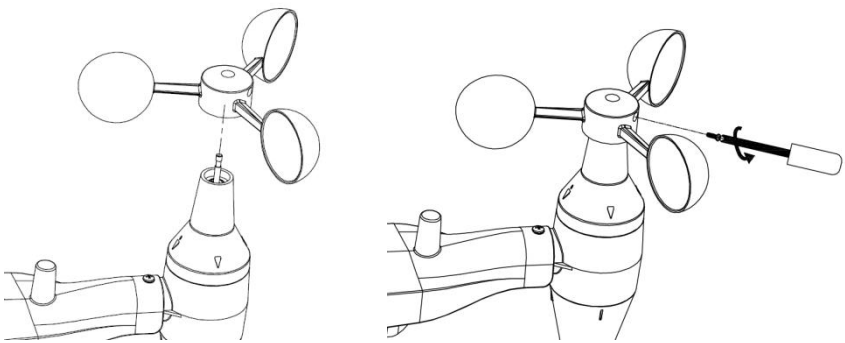


Figure 5: Wind speed cup installation diagram

3. Install wind vane

Push the wind vane onto the shaft on the opposite side of the wind cups, until it goes no further, as shown on the left side in Figure 6. Next, tighten the set screw, with a Philips screwdriver (size PH0), as shown on the right side, until the wind vane cannot be removed from the axle. Make sure the wind vane can rotate freely. The wind vane's movement has a small amount of friction, which is helpful in providing steady wind direction measurements.

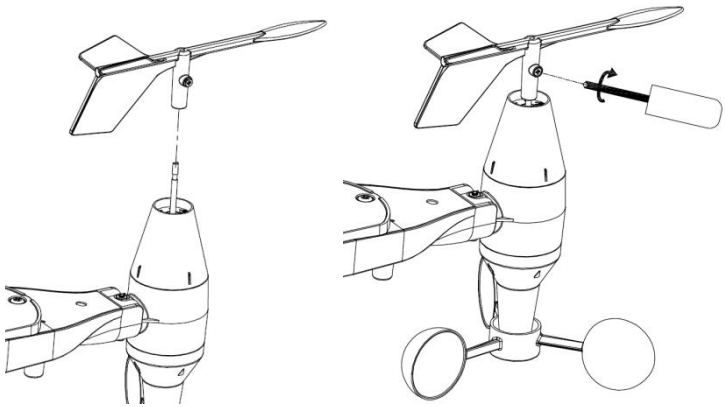


Figure 6: Wind vane installation diagram

4. Install Batteries

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

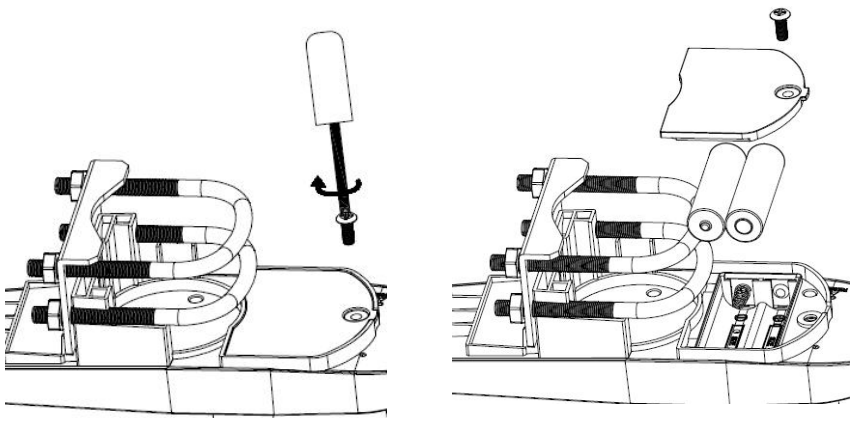


Figure 7: Battery installation diagram

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

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

5. Mount outdoor sensor

Before you mount

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

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

Reference Figure 8, the mounting assembly includes two U-Bolts and a bracket that tightens around a 1 to 2” diameter pole (not included) using the four U-Bolt nuts.

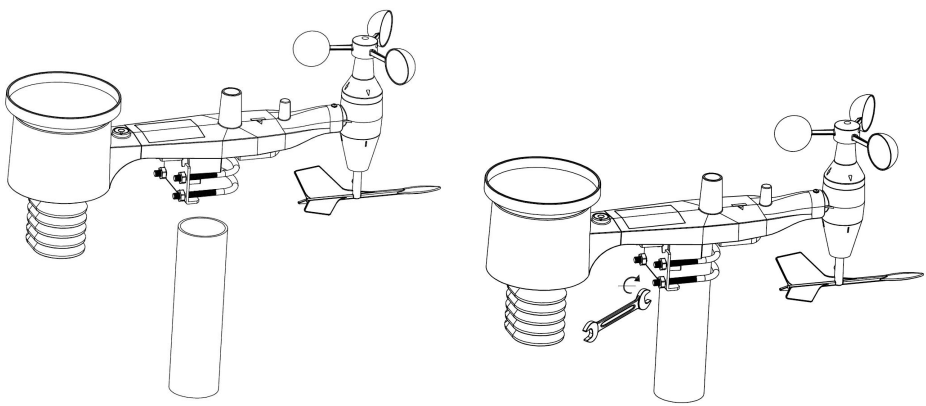


Figure 8: Sensor package mounting diagram

Note:

Beside the antenna, there is an arrow icon with ”WEST” words (Figure 9)representing the direction of west. The sensor body has to be adjusted so that the “WEST” indication is facing to real west direction in your location. A compass device is recommended to help adjust direction. Permanent wind direction error will be introduced when the outdoor sensor is not installed in right direction.

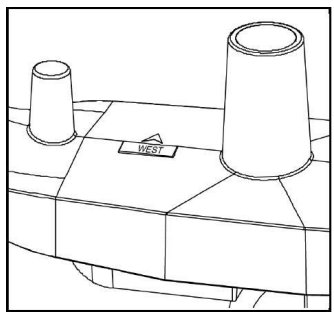


Figure 9

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

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

6. Reset Button and Transmitter LED

Using a bent-open paperclip, press and hold the RESET BUTTON (see Figure 10) to affect a reset: the LED turns on while the RESET button is depressed, and you can now let go. The LED should then resume as normal, flashing approximately once every 48 seconds.

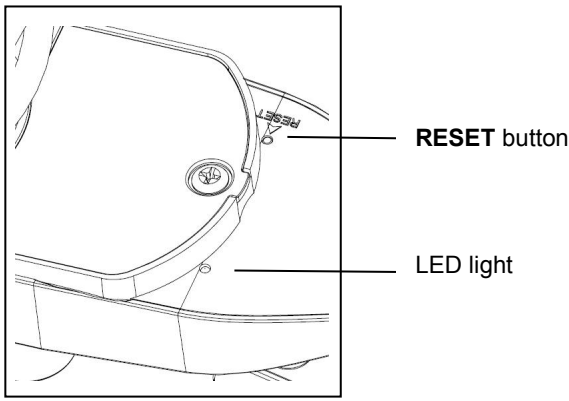


Figure 10

Best Practices for Wireless Communication

Note: To insure proper communication, mount the remote sensor(s) upright on a vertical surface, such as a wall. **Do not lay the sensor flat.**

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

1. **Electro-Magnetic Interference (EMI)**. Keep the console several feet away from computer monitors and TVs.
2. **Radio Frequency Interference (RFI).** If you have other 433/868/915 MHz devices and communication is intermittent, try turning off these other devices for troubleshooting purposes. You may need to relocate the transmitters or receivers to avoid intermittent communication.
3. **Line of Sight Rating.** This device is rated at 300 feet line of sight (no interference, barriers or walls) but typically you will get 100 feet maximum under most real-world installations, which

include passing through barriers or walls.

4. **Metal Barriers.** Radio frequency will not pass through metal barriers such as aluminum siding. If you have metal siding, align the remote and console through a window to get a clear line of sight.

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

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

Receiver /Indoor unit

After inserting the batteries into the Weather Station, all LCD segments will be turned on for a few seconds, all possible display segments are turned on for checking.

After this, the weather station will make initial measurement and start to register the transmitter (the radio reception icon will be turned on). Do not press any key before outdoor sensor data received, otherwise the outdoor sensor learning mode will be terminated. When outdoor transmitter has been registered, the base station will automatically switch to the normal display mode from which all further settings can be performed by the user.

Note:

If a battery change on the transmitter side happened, the receiver will be resynchronized to the transmitter again within the next 3 hours. If

you want to shorten the receiving data time, the base station has to re-install the battery so that it can have the new security code learnt right way, but the previous weather data and alarm value settings in receiver will be lost.

Note:
Commonly the radio communication between receiver and transmitter in the open field can reach a distance of up to 330 feet providing that there are no interfering obstacles such as buildings, trees, vehicles, high voltage lines, etc.
Radio interferences such as PC screens, radios or TV sets can, in bad cases, entirely cut off radio communication. Please take this into consideration when choosing standing or mounting locations.

Program Mode

The base station has five keys for easy operation: **SET** key, **+** key, **HISTORY** key, **ALARM** key, **MIN/MAX** key
Note:
When setting certain units in the manual setting mode, hold the **+** or **MIN/MAX** key for 2s will increase/decrease digits in greater steps.

The setting procedure can be exited at any time by either pressing the **HISTORY** key or waiting for the 30-second time-out to take effect.

Quick Display Mode
- While in normal display, Press the **SET** key to enter the Quick Display Mode as follow:

- Wind speed / Gust speed (press the **+** key or **MIN/MAX** key shifts the display between the wind speed and gust speed)
- 1 hour / 24 hour / week / month / total rainfall quantity (press the **+** key or **MIN/MAX** key shifts the display between the selectable rainfall quantities), while display the rainfall total quantity, pressing the **SET** key for 2 seconds will reset the rainfall total value to zero.
- Outdoor Temperature / Wind chill / Dew point (press the **+** key or **MIN/MAX** key shifts the display between outdoor temperature, wind chill and dew point)

Press the **SET** key to accept the change and advance to the next display mode. Continue to press the **SET** key to toggle through the display mode until return to the normal Mode

Setting Mode

- Press the **SET** key for 2 second while in normal mode to enter the Setting mode, LCD contrast digits will start flashing. You can skip over any setting by press the **SET** key. Press **+** key or **MIN/MAX** key to select the units or scrolls the value. Holding the **+** key or **MIN/MAX** key for 2 second will increase/decrease digits in great steps. To exit the Setting mode at any time, press the **HISTORY** key.

- Time Zone Setting (-12→12)
  Note: At Europe, 0 for GMT+1 time zone, 1 for GMT+2 time zone, -1 for GMT time zone. At America, -4 for Atlantic Time zone, -5 for Eastern Time zone, -6 for Central Time zone, -7 for Mountain Time zone, -8 for Pacific time zone, -9 for Alaska time zone, -10 for Hawaii time zone.

- 12/24h time display select.
- Manual time setting (hours/minutes)
- Select DD-MM or MM-DD format.
- Calendar setting(year /month/ date)
- Wind speed and gust display units in km/h, m/s, bft, mph, knots
- Wind direction
- Rainfall display units in mm or inch
- Temperature display unit degree Celsius or Fahrenheit

Calibration Mode

- Press the **HISTORY** key for 8 second while in normal mode to enter the Calibration Mode, and the wind factor digits will start flashing. You can skip over any setting by press the **SET** key. Press **+** key or **MIN/MAX** key to select the units or scrolls the value. Holding the **+** key or **MIN/MAX** key for 2 second will increase/decrease digits in great steps. To exit the Calibration mode at any time, press the **HISTORY** key.
- Wind Speed Calibration (default is 1.0, adjustment rang 0.75 to 1.25)

- Rainfall data Calibration (default is 1.0, adjustment rang 0.75 to 1.25)
- History rainfall Calibration
- Outdoor humidity Calibration
- Outdoor temperature Calibration
- Indoor humidity Calibration
- Indoor temperature Calibration

Wind Speed Calibration

Wind speed is the most sensitive to installation constraints. The weather station should not be located close to buildings, trees or other obstructions.

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

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

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

Temperature Calibration

Temperature errors can occur when a sensor is placed too close to a heat source (such as a building structure, the ground and when placed in direct sunlight without proper shielding in hot weather environments).

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

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

Humidity Calibration

Humidity is a difficult parameter to measure accurately and drifts over time. Humidity errors can occur when placed too close to the ground, near grass or other sources of humidity.

The hygrometer sensor utilizes a capacitor, which varies as a function of humidity. Due to manufacturing tolerances, the accuracy of the sensor is ± 5%. To improve on this accuracy, the indoor and outdoor humidity readings can be adjusted or calibrated from the display console.

To calibrate humidity, you will need an accurate source, such as a sling psychrometer or Humidipaks One Step Calibration kit.

Rainfall calibration

The Rain Collector is calibrated at the factory so the bucket tips (and records rainfall) for each 0.01" (or 0.3 mm) of rain. To calibrate rainfall, we recommend a tube type rain gauge. Use a rain gauge with an aperture of at least 4 inches. Any smaller and the readings obtained may not be accurate. Place the tube type rain gauge directly next to the rain collector. Compare the totals on three storms. Based on this, develop an average for how far off the readings are.

Do not compare rainfall readings to reading obtained from television, radio, newspapers, or neighbors' readings. Such readings are not located in your specific environment and therefore are not an accurate measurement of the weather readings taking place in your surroundings. The rain collector is carefully tested at the factory to conform to the specifications listed in the back of this manual.

The history rainfall calibration factor is applied to the running total, not individual tips. All of the rainfall figures are calculated from the total

number of tips recorded by the station since it was reset. The total is multiplied by 0.3 to get a total in mm. This is then converted to inches if necessary by multiplying by 0.0393700787. The calibration multiplier is then applied to this, and this is the figure that remembers and compares each time a new total is read from the station.

History Modes

- While in Normal Mode, press the **HISTORY** key to enter the History Mode.
- In the history mode, press **SET** key will trigger the history clear procedure: the word of “CLEAR” will be flashing, hold the **SET** key for 2 seconds will clear all the history records.
- In the history mode, press the **MIN/MAX** key to select the record over the past 24hours at increments of -3 hours, -6 hours, -9 hours, -12 hours, -15 hours, -18 hours, -21 hours, -24 hours.

Press the **HISTORY** key or key idle 30 second to return to Normal Mode

Alarm Modes

- While in Normal Mode press the **ALARM** key to enter the High Alarm Mode, Press the **ALARM** key again to enter Low Alarm mode, press the **ALARM** key the third time to return the Normal Mode.

Remark: after the initial pressing of **ALARM** key, the display will be refreshed to show current high, low alarm values. Normal alarm value will be displayed only for those already activated, all other not activated values will be displayed with “- - -“or “- -“instead.

-In the High Alarm Mode press the **SET** key to select the following alarm modes:

1. Time alarm
2. Wind speed high alarm (0-50m/s)
3. Gust speed high alarm (0-50m/s)
4. Wind direction alarm
5. 1Hour rain high alarm (0-999.9mm)

6. 24 hour rain high alarm (0-999.9mm)
7. Outdoor humidity high alarm (10%-99%)
8. Outdoor temperature high alarm (-40˚C--60˚C)
9. Wind chill high alarm (-40˚C--60˚C)
10. Dew point high alarm (-40˚C--60˚C)
11. Indoor humidity high alarm (10%-99%)
12. Indoor temperature high alarm (0˚C--50˚C)

-In the Low Alarm Mode press the **SET** key to select the following alarm modes:

1. Time alarm
2. Outdoor humidity low alarm (10%-99%)
3. Outdoor temperature low alarm (-40˚C--60˚C)
4. Wind chill low alarm (-40˚C--60˚C)
5. Dew point low alarm (-40˚C--60˚C)
6. Indoor humidity low alarm (10%-99%)
7. Indoor temperature low alarm (0˚C--50˚C)

- In the alarm modes, press **+** key or **MIN/MAX** key to change or scroll the alarm value.

Hold the **+** key or **MIN/MAX** key for 2 second will increase/decrease digits in great steps. Press the **ALARM** key to select the alarm on or off (if alarm is enabled, the speaker icon on the LCD will be turned on indicating the alarm function has been enabled).

- Press the **SET** key to toggle through each alarm mode until it returns to the normal display mode.

-Press **HISTORY** key or key idle 30 second at any time, the alarm mode will return to Normal Mode

Canceling the Temperature Alarm While Sounding

a. When a set weather alarm condition has been triggered, that particular alarm will sound for 120 second and flash until the weather condition doesn’t meet the user set level. Press any key to mute the

alarm. When weather alarm condition was activated again within 3 hours, alarm will not sound but will continue to flash until weather conditions have become more steady. This feature is useful to avoid repeated triggering for the same alarm value.

b. The alarm will reactivate automatically once the value has fallen below the set value.

Min/Max Mode

- While in Normal Mode, press the **MIN/MAX** key to enter the maximum mode

- Press **MIN/MAX** key again to enter the minimum mode

- Press **MIN/MAX** key again to return the Normal Mode.

- In the maximum reading Mode, press the **+** key to display the following maximum values together with the time and date stamp when these values were recorded, if hold the **SET** key for 3s in the following individual maximum value will be reset to current reading together with the current time and date.

1. Wind speed maximum
2. Gust speed maximum
3. 1Hour rain maximum
4. 24 hour rain maximum
5. Week rainfall maximum
6. Month rainfall maximum
7. Outdoor humidity maximum
8. Outdoor temperature maximum
9. Wind chill temperature maximum
10. Dew point temperature maximum
11. Indoor humidity maximum
12. Indoor temperature maximum

- In the minimum reading Mode, press the **+** key to display the following minimum values together with the time and date at which these values

were recorded, if hold the **SET** key for 3s in the following individual minimum value will be reset to current reading together with the current time and date.

1. Outdoor humidity minimum
2. Outdoor temperature minimum
3. Wind chill temperature minimum
4. Dew point temperature minimum
5. Indoor humidity minimum
6. Indoor temperature minimum

- Press the **HISTORY** key or key idle 30 second, the **MIN/MAX** mode will return to Normal Mode

Reset To Factory Default Settings
While in normal display, press and hold the **+** key for 20s to reset all settings to the manufacturer default setting

Specifications

Outdoor data

Transmission distance in open field : 100m(300 feet)
Frequency : 433/868 MHz

Temperature range : -40˚C--60˚C (-40˚F to +140˚F)
Accuracy : + / - 1 ˚C
Resolution : 0.1˚C

Measuring range rel. humidity : 10%～99%
Accuracy : +/- 5%

Rain volume display : 0 – 9999mm (show --- if outside range)
Accuracy : + / - 10%
Resolution : 0.3mm (if rain volume < 1000mm)
1mm (if rain volume > 1000mm)

Wind speed : 0-180km/h (0~110mph) (show --- if outside range)
Accuracy: : +/- 1m/s (wind speed< 10m/s)
+/-10% (wind speed > 10m/s)

Measuring interval thermo-hygro sensor : 48 sec
Water proof level : IPX3

Indoor data

Measuring interval temperature/humidity : 30 sec
Indoor temperature range : 0˚C--50˚C (32˚F to + 122˚F) (show --- if outside range)
Resolution : 0.1˚C

Measuring range rel. humidity : 10%～99%
Resolution : 1%

Alarm duration : 120 sec

Power consumption

Base station : 3XAA 1.5V LR6 Alkaline batteries (not included)
Remote sensor : 2xAA 1.5V LR6 Alkaline batteries(not included)

Remark:

Where outdoor temperature is lower than -20˚C, make sure proper type of batteries to be used to assure that the device can get enough power to maintain its function properly. Normal alkaline batteries is not allow to be used since when outdoor temperature is lower than -20 ˚C, the battery's discharging capability is greatly reduced.

When out of the temperature range of 10~35℃, transmitter low battery indicator maybe show up abnormally even you change new batteries because the low voltage test point will rise along with the temperature drop under 10℃. In this case, you don't need to change the transmitter batteries. The low battery indicator will work normal when the outdoor temperature rise to 10~35°C

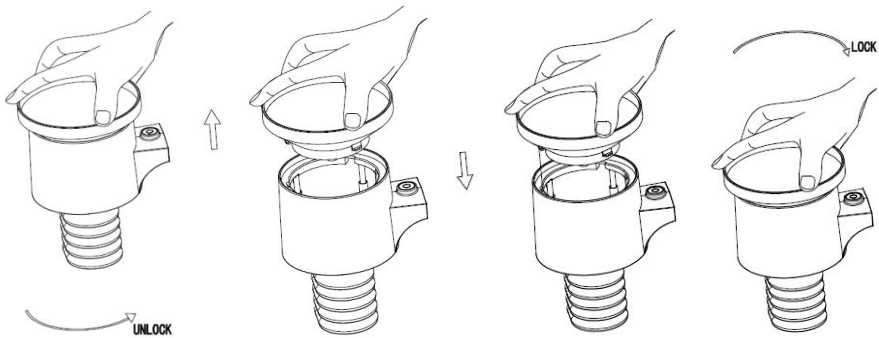
Please help in the preservation of the environment and return used batteries to an authorized depot.

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

Appendix

Maintance

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



2. Replace batteries every 1-2 years. If left in too long, the batteries may leak due to environmental challenges. In harsh environments, inspect the batteries every 3 months
3. When replacing the batteries, apply a corrosion preventive compound on the battery terminals.
4. In snowy environments, spray the top of the weather station with anti-icing silicon spray to prevent snow build up.

Battery regulation / imprint

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.