

# DRAFT

## Wireless Weather station

## Owner's Manual

Thank you for purchasing the new generation of professional weather station. Designed and engineered with the state-of-art technology and components, this instrument will provide accurate and reliable measurement of wind speed & direction, wind chill, daily/weekly/monthly/accumulated rainfall, barometric pressure, weather forecast, indoor/outdoor humidity, temperature, heat index & dew point as well as radio-controlled alarm clock. Read this manual carefully to fully explore the features and functions of the new product.

### ***In this package you will find:***

One monitor (Receiver)  
One anemometer (Transmitter – transmit wind & outdoor Channel-1 temperature/humidity data)  
One rain gauge (Transmitter – transmit rainfall data)  
One 6.0V AC/DC adapter  
AA batteries x 7 pieces  
Mounting hardware for rain gauge (2 sets of screws & plastic screw plugs)  
Mounting hardware for anemometer (2 pieces of U-shape metal plate, 4 sets of Hex screws & nuts)  
One owner's' manual

### **Additional tools needed for installation**

- Small Phillips screwdriver
- Hexagonal Key
- Electric drill
- Pencil
- Level
- Mast, 1 – 1.25 inch (2.54 – 3.18 cm) in diameter (to mount the anemometer)

## Installation

The weather station operates at 433MHz and does not require wire installation among the component parts. To ensure successful installation and the best performance, we recommend you follow the installation instructions in the order they appear in this manual.

### **1. Battery & adapter installation for the monitor (receiver)**

Main Power source: Plug in the adapter jack into the side of the unit for basic operation and continuous backlight.

Backup Power: Open the battery door and insert 3 pieces of AA batteries according to the polarity indicated, close the battery cover.

### Sea level pressure setting

After battery/adapter installation, the monitor will enter sea level pressure setting mode directly and the pressure reading will flash. Press “▲” or “▼” to set the sea level pressure value. Press “PRESSURE” to confirm the setting and exit. This allows the unit to provide a more accurate weather forecast & pressure reading.

You can also set the sea level pressure any time after the installation is completed. For more information, see “WEATHER FORECAST & BAROMETRIC PRESSURE” section.

**Note:** you may obtain the current sea level pressure from the weather web site for your locate area.

## **2. Selecting a location for the anemometer**

Select a mounting location for the anemometer that is:

- Outdoors, not blocked on top or sides, so wind can freely reach the anemometer
- Within 100 meter (328 feet) open area from the monitor. Reduce distance if obstacles is between the anemometer & the monitor

The best location for the anemometer is usually mounted on a mast in an open area where wind is not blocked on top or sides, or above roof level on the building where the monitor is located.

### Testing the effective transmission range

Before mounting the anemometer, measure the distance between the monitor & anemometer and be sure it is within the effective transmission range. It is recommended to perform a simple RF transmission test before mounting.

- 1) Place the monitor in your selected indoor location and install adapter & batteries (see “Battery & adapter installation for the monitor” section above)
- 2) Place the anemometer horizontally in your selected outdoor location. Loosen the screws on the battery door with a small Phillips screwdriver and open the battery door. Insert 2 pieces of AA batteries according to the polarity indicated. Close the battery door and tighten the screws.
- 3) Hold “CHANNEL/SEARCH” button on the monitor for 3 seconds and the wind direction, temperature & humidity icons will flash on the display. The monitor is now searching for all remote sensors for 2 minutes.
- 4) If valid wind direction, wind speed and channel-1 temperature/humidity readings are shown on the monitor within 2 minutes, the RF transmission is successful and the anemometer & monitor are within the effective transmission.

If above readings are not shown after 2 minutes of searching, the transmission is failed.

Shorten the distance between the anemometer & monitor. Reset the anemometer by removing all batteries from the anemometer & wait for 10 seconds before re-installing the batteries again.

Repeat step 3 & 4 until the transmission is successful.

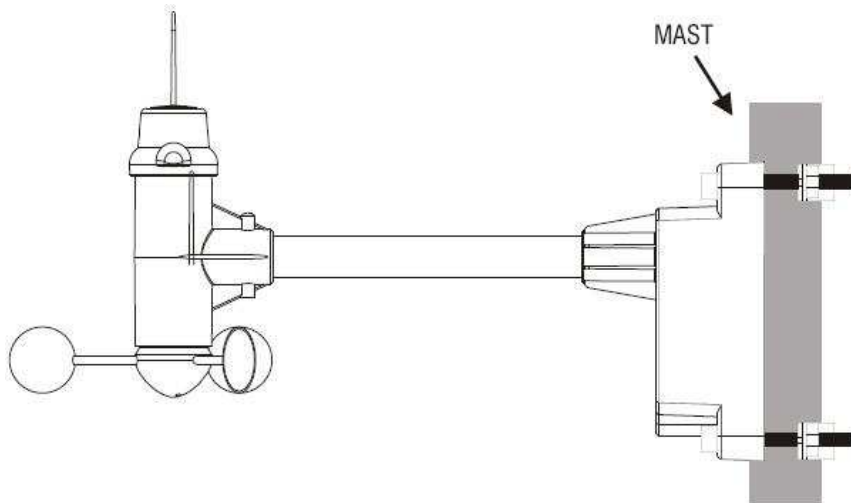
- 5) Remove all batteries from the anemometer before mounting and calibration.

### 3. Mounting the anemometer

**Important:** Before mounting, be sure the monitor & anemometer are within the effective transmission range.

**Note:** To mount the anemometer, you need a mast (not supplied) about 1 – 1.25 inches (2.54 – 3.1 cm) in diameter, and the hardware necessary to fasten it to the mounting location. If you previously installed such a mast (for mounting antenna, for example), you can mount the anemometer on that mast.

1. If necessary, mount and ground a mast as directed in the instructions provided by the mast.
2. Place the supplied U-shape metal plates around the mast. Insert 4 pieces of the supplied Hex screws through the holes of the U-shape plates and the holes on the anemometer's mounting bracket.  
(The wind vane is above the wind cup and the metal bar of the anemometer is in horizontal level)
3. Tighten the supplied Hex nut onto both ends of each screw

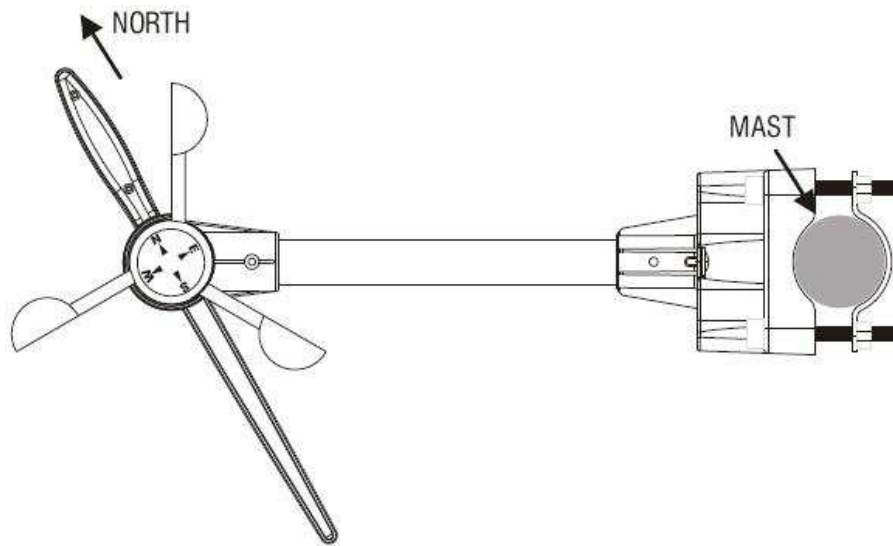


### 4. Calibrating the anemometer & installing batteries

After mounting the anemometer, follow these steps to calibrate the wind direction so that the anemometer properly measures the wind direction and transmit to the monitor. Be sure battery has been removed from the anemometer before the calibration.

**Important:** The same calibration (step 1 to 5) is needed for the first set up and every battery replacement.

1. After mounting the anemometer, loosen the screws on the battery door with a small screwdriver and open the battery door.
2. Use the compass on the anemometer and turn the wind vane so it is pointing due north.



3. Hold the wind vane pointing due north and do not allow it to turn. Insert 2 pieces of AA batteries according to the polarity indicated. The red LED indicator above the battery cover of the anemometer will **flash few times right after battery installation**. Be sure the vane is pointing due north at the moment when red LED flashes and the calibration is now completed. Replace the battery cover and tighten the screws.
4. If the wind vane is not pointing due north when the red LED first flashes, remove batteries and repeat step 2 & 3.
5. Hold "CHANNEL/SEARCH" buttons on the monitor to search for remote transmitter. Wind direction, wind speed, wind chill & channel-1 temperature/humidity readings will appear if the RF transmission is successful.

## 5. Selecting a location for the rain gauge

Select a mounting location for the rain gauge that is:

- a flat, level surface
- within 30 meter (100 feet) open area from the monitor. Reduce distance if obstacles is between the rain gauge & the monitor
- in an area not blocked on the top or sides, so rain can freely reach the rain gauge (for example, not under an overhang or too close to a building or fence)

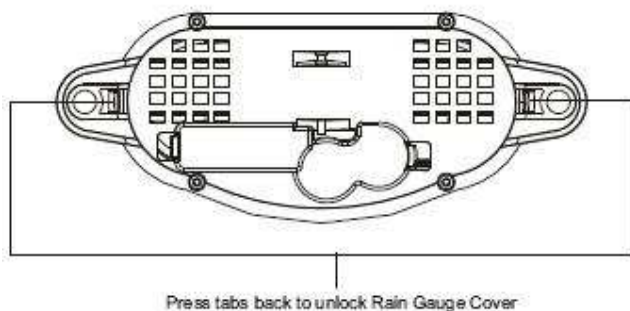
### **Cautions:**

- To prevent false rainfall readings caused by water splashes, do not choose a location that is not level or that is too close to the ground, a swimming pool, lawn sprinklers, or anywhere water might accumulate or run off
- The screen in the cylinder of the rain gauge filters most debris (such as leaves) that might fall into the rain gauge. To avoid frequent build-up of debris in the cylinder, do not mount the rain gauge

too close to the trees or plants

## **6. Battery Installation for the rain gauge**

1. Press the tabs back as indicated below to unlock the rain gauge cover



2. Lift the rain gauge cover off its base. Then carefully remove the packing tape from the bucket assembly
3. Open battery cover and insert 2 pieces of AA batteries according to the polarity indicated. Close the battery cover
4. Replace & lock the rain gauge cover on the base
5. Hold "CHANNEL/SEARCH" button on the monitor for 3 seconds and the total rainfall "- - -" will flash. The monitor is now searching for all remote sensors for 2 minutes. Total rainfall reading (in this case "0" mm or inch) will appear within 2 minutes if the RF transmission is successful and the monitor & rain gauge are now within the effective transmission range.
6. If total rainfall "- - -" stop flashing and stay on the display after 2 minutes of searching, the RF transmission is failed. Shorten the distance between the monitor & rain gauge. Reset the rain gauge by removing all batteries from the rain gauge and wait for 10 seconds before re-installing the batteries again. Then repeat step 5 (& 6) until the RF communication is completed.

## **7. Mounting the rain gauge**

Before mounting the rain gauge, be sure the rain gauge & monitor are within the transmission effective range and batteries are installed.

1. Hold the base of the rain gauge flat against the mounting surface then use a level to make sure the rain gauge (as it rest on the mounting surface) is horizontally level.
2. Use a pencil to trace the inside of the mounting holes on the base of the rain gauge to mark the screw locations.
3. Drill a hole in the center of each marked location and insert the supplied plastic screw plugs
4. Hold the rain gauge against the mounting surface so the holes on the base are aligned with the plugs, then thread the supplied washer head screws into each hole and use a screwdriver to tighten them.


## 8. Installing additional remote thermo-hygrometer sensor(s)



Additional remote thermo-hygrometer sensors can be purchased separately (not supplied in the package).

1. Select a location for the remote thermo-hygrometer that is within the effective transmission range of 100 meters (328 feet). Shorten the distance if obstacle is between the monitor & remote sensor.
2. Use a small screwdriver to loosen the screws on the battery door of the remote sensor. Insert 2 pieces of AAA batteries according to the polarity indicated.
3. Assign channel 2 or 3 to the remote sensor by setting the slide switch inside the battery compartment. (Channel 1 is used by the anemometer and should not be assigned to the new remote thermo-hygrometer)
4. Press "Tx" button inside the battery compartment of the remote sensor to transmit temperature & humidity data to the monitor. Then close the battery door and tighten the screws.
5. Hold "CHANNEL/SEARCH" button on the monitor to search for all remote sensors. The temperature & humidity readings of your selected channel number will be displayed on the monitor if RF transmission is successful.

## OPERATION

### Name and Functions of Buttons:

	<u>Press Functions</u>	<u>Hold 3 seconds</u>
RAIN/CLEAR	Read daily/monthly/weekly/total rainfall	Clear rainfall record
RAIN HISTORY	Read current & past 6 days, weeks or months rainfall data	
WIND	Read average & gust wind speed	
WIND ALARM	Read high gust wind alarm and low wind chill alarm	Enter high wind speed alarm & low wind chill alarm setting
PRESSURE	Toggle pressure unit hPa, inHg & mb	Sea level pressure setting
CHANNEL/ SEARCH	Select indoor, Channel 1, 2, 3 or auto scroll 	Search for all remote sensors

MEMORY	Read maximum/minimum records	Clear memory record
HEAT INDEX/ DEW POINT	Read Heat Index & Dew Point	
CLOCK	Read time, calendar and day-of-week	Set Clock & Calendar
ALARM	Read alarm time; enable/disable alarm	Alarm time setting
▲ UP	1 step forward in setting	Fast advance
▼ Down	1 step backward in setting	Fast backward
SNOOZE/LIGHT	Trigger snooze alarm & extend backlight	
WIND ALARM 	Enable/disable high gust wind alarm & low wind chill alarm	
WIND UNIT	Toggle wind speed unit between Beaufort, mph, m/s, km/h & knot	
RAIN UNIT	Toggle between mm & inch rainfall unit	
	Search for Radio-Controlled time	
ZONE	Toggle RC time & Zone time	Zone time setting
C/F	Toggle degree C & F unit	

## CONNECTING WITH REMOTE SENSORS

The weather station uses 433MHz radio signals to send and receive weather data between the monitors and remote sensors.

After battery/adaptor installation, the monitor will automatically search for remote sensors.

You can also enforce a searching mode by holding "CHANNEL/SEARCH" on the monitor.

Follow the instruction in the "INSTALLATION" section to set up the sensors and wireless connection. If the connection cannot be established, reset the remote sensor by removing the batteries from the sensor. Wait for 10 seconds and reinstall the batteries. Then hold "CHANNEL/SEARCH" on the monitor

to search for the sensors. If that continues to fail, shorten the distance between the sensor & monitor and reinstall the sensors if necessary (Details refer "INSTALLATION" section)

**Anemometer (with built-in temperature & humidity sensor):**

**Important:** Wind direction calibration is needed whenever the anemometer is reset (or during battery replacement)

**Searching mode display:**

Wind direction, temperature & humidity information will flash

**RF Connection completed:**

Valid wind speed/direction & Ch-1 temperature/humidity readings appear

**RF Connection failed:**

"- - -" wind speed appears; no wind direction. Unable to display Ch-1 temperature & humidity

**Rain Gauge:**

**Searching mode display:**

Total rainfall information will flash

**RF connection completed:**

Valid total rainfall reading appears

**RF connection failed:**

"- - -" stops flashing & stays on the total rainfall display (previous daily/weekly/monthly rainfall readings remain in record)

**Additional remote thermo-hygrometer sensor:**

Additional remote thermo-hygrometer sensors can be purchased separately (not supplied in the package).

**Important:** Select Ch-2 or 3 for additional remote thermo-hygrometer sensor since Ch-1 has been assigned to the anemometer.

**Searching mode display:**

Temperature & humidity information will flash

**RF Connection completed:**

Valid temperature/humidity readings of your selected channel appear

**RF Connection failed:**

Unable to display the temperature & humidity readings of your selected channel

**WEATHER FORECAST & BAROMETRIC PRESSURE**

The unit predicts weather condition of the next 12 – 24 hours based on the change of atmospheric pressure. The coverage area is around 30 – 50 km. The weather forecast is based on atmospheric



pressure change and is about 70-75% correct. As weather conditions cannot be 100% correctly forecasted, we cannot be responsible for any loss caused by an incorrect forecast.



To obtain an accurate weather forecast & barometric pressure reading, you need to input your current local sea level pressure. After battery/adaptor installation, it will enter sea level pressure setting directly and the pressure reading will flash. Press “▲” or “▼” to set the value and press “PRESSURE” to confirm and exit.

You can also hold “PRESSURE” button to enter sea level pressure setting in normal display mode. Press “▲” or “▼” to set the value and press “PRESSURE” to confirm and exit.

Press PRESSURE button to select pressure unit between hPa, inHg & mb.

**Note:** you may obtain your current local sea level pressure information from the weather web site.

### IN/OUT TEMPERATURE & HUMIDITY

Temperature & humidity readings are shown on the upper right of the display.

Press “C/F” button to select temperature unit C/ F.

Press “CHANNEL/SEARCH” repeatedly to select indoor, Ch1, Ch2, Ch3 or auto-channel scrolling ↻ display modes.

Note: The outdoor temperature & humidity sensor is built inside the anemometer and is assigned to channel 1. Additional remote thermo-hygrometer sensor(s) can be purchased separately and they should be assigned to Ch-2 or 3 only.

### ICE ALERT

Ice alert indicator ❄ appears on the display next to the wind chill reading when outdoor channel-1 temperature falls to or below 4C (or 39.2F). It provides an early alert for possible icy road condition to driver.

### IN/OUT HEAT INDEX

Heat Index combines the effects of heat and humidity. It is the apparent temperature of how hot the heat-humidity combination makes it feels.

Press “Heat Index/Dew Point” button once to show the respective indoor or outdoor heat index on the display. “HEAT INDEX” icon will appear.

### **IN/OUT DEW POINT**

Dew point is the saturation point of the air, or the temperature to which the air has to be cooled in order to get condensation.

Press HEAT INDEX / DEW POINT button twice to show the respective indoor or outdoor dew point reading on the display. "DEW POINT" icon will appear.

### **DAILY, WEEKLY, MONTHLY & ACCUMULATED RAINFALL**

The wireless rain gauge provides daily, weekly, monthly and accumulated rainfall measurements.

Press "RAIN/CLEAR" repeatedly to switch between the different modes and the corresponding "DAILY", "WEEKLY", "MONTHLY" or "TOTAL" icon will appear indicating your current display mode.

In daily, weekly or monthly rainfall display, hold "RAIN/CLEAR" to clear all daily, weekly & monthly rainfall reading to zero. In total rainfall display, hold "RAIN/CLEAR" to clear total rainfall reading.

Press "RAIN UNIT" on the back casing to change the unit between mm and inch.

### **RAINFALL HISTORY**

This unit has a large capacity memory that can store and display:

- Daily rainfall (up to last six days as well as current day)
- Weekly rainfall (up to last six weeks as well as current week)
- Monthly rainfall (up to last six months as well as current month)

Press "RAIN" to select daily, weekly or monthly rainfall display mode. Press "RAIN HISTORY" repeatedly to scroll through the current & last 6 days/weeks/months data corresponding to your selected rainfall mode. On the bar chart display, the "0" represents the current period. -1, -2, etc indicate the prior periods. The precise rainfall reading of the selected period will be shown on the display.

Example 1:

In April, press "RAIN HISTORY" repeatedly in the monthly rainfall mode until "-3" bar chart is shown. The bar chart and reading indicate the monthly rainfall record in January (from 1st Jan to 31st Jan)

Example 2:

On Wednesday, press "RAIN HISTORY" repeatedly in the weekly rainfall mode until "-1" bar chart is shown. The bar chart and reading indicate the weekly rainfall recorded last week (from last Sunday to last Saturday).

Example 3:

On Friday, press "RAIN HISTORY" repeatedly in the daily rainfall mode until "-2" bar chart is shown. The bar chart and reading indicate the daily rainfall record on this Wednesday.

## WIND SPEED & DIRECTION

The weather station uses the anemometer to sample the wind speed and direction. You can set the monitor to display the wind speed in miles per hour (mph), kilometers per hour (km/h), meters per second (m/s), knots and Beaufort. Press “WIND UNIT” on the back casing until the desired unit appears.

The monitor displays 16 wind directions (N for north, S for south, SW for south-west and so on).

Press “WIND” to select gust & average wind speed display.

Beaufort	Knots	Wave height (meter)	Wave height (feet)	WMO description	Effects observed on the sea
0	Under 1	-	-	Clam	Sea is like a mirror
1	1 – 3	0.07	0.25	Light air	Ripples with appearance of scales; no foam crests
2	4 – 6	0.15 – 0.3	0.5 – 1	Light breeze	Small wavelets; crests of glassy appearance, not breaking
3	7 – 10	0.6 – 0.9	2 – 3	Gentle breeze	Large wavelets; crests begin to break; scattered whitecaps
4	11 – 16	1 – 1.5	3.5 – 5	Moderate breeze	Small waves, becoming longer; numerous whitecaps
5	17 – 21	1.8 – 2.4	6 – 8	Fresh breeze	Moderate waves, taking longer form; many whitecaps; some spray
6	22 – 27	2.9 – 4	9.5 – 13	Strong breeze	Larger waves forming; whitecaps everywhere; more spray
7	28 – 33	4.1 – 5.8	13.5 – 19	Near gale	Sea heaps up; white foam from breaking waves begins to be blown in streaks
8	34 – 40	5.5 – 7.6	18 – 25	Gale	Moderately high waves of greater length; edges of crests begin to break into spindrift; foam is blown in well-marked streaks
9	41 – 47	7 – 9.7	23 – 32	Strong Gale	High waves; sea begins to roll; dense streaks of foam; spray may begin to reduce visibility
10	48 – 55	8.8 – 12.5	29 – 41	Storm	Very high waves with overhanging crests; sea takes white appearance as foam is blown in very dense streaks; rolling is heavy and visibility is reduced
11	56 – 63	11.2 – 15.8	37 – 52	Violent	Exceptionally high waves; sea covered with white foam patches; visibility further reduced
12	64 & over	13.7 & over	45 & over	Hurricane	Air filled with foam; sea completely white with driving spray; visibility greatly reduced

*(Reference table based on observations of the effects of the wind)*

## WIND CHILL

Wind chill is the apparent temperature felt on exposed skin due to the combination of air temperature and wind speed. The wind chill reading on the monitor is calculated based on the temperature measured from the anemometer (channel-1) and the average wind speed.

To change wind chill temperature unit, press “C/F” button on the back casing.

## GUST WIND & WIND CHILL ALARM

### High Gust Wind Alarm

You can set the monitor to sound an alarm for about 1 minute when gust wind reaches or exceeds a set limit. Press “WIND ALARM” to silence the alarm sound. The related high alarm icons will continue to flash until the alarm condition is no longer met.

### High Gust Wind Alarm Setting:

- Press “WIND ALARM” to show high gust wind alarm display. “ALARM” icons appear in the gust wind display area
- Hold “WIND ALARM” button to enter its setting mode and gust wind digits will flash
- Press “▲” or “▼” to set the value
- Press “WIND ALARM” to confirm setting and exit



Press “WIND AL  repeatedly to enable or disable the gust alarm. “ H” appears when it is enabled.

### Low Wind Chill Alarm

You can also set the monitor to sound an alarm for about 1 minute when the wind chill reaches or falls below the set limit. Press “WIND ALARM” to silence the alarm sound. The related low alarm icon will continue to flash until the alarm condition is no longer met.

### Low Wind Chill Alarm Setting:

- Press “WIND ALARM” repeatedly so “ALARM” icons appear in the wind chill display area
- Hold “WIND ALARM” button to enter its setting mode and the wind chill digits will flash
- Press “▲” or “▼” to set the value
- Press “WIND ALARM” to confirm setting and exit


Press “WIND AL  repeatedly to enable or disable the wind chill alarm. “ Lo” appears when it is enabled.

## MAXIMUM & MINIMUM RECORDS




Press “MEMORY” repeatedly to view the maximum & minimum values of temperature, humidity, heat index, dew point, wind speed & wind chill readings. The corresponding “MAX” and “MIN” icons will appear. To clear the memory record, hold “MEMORY” in the max/min display mode


## RADIO-CONTROLLED CLOCK


The unit will start synchronizing the radio-controlled clock after battery/adaptor installation. The antenna icon will flash during synchronization. If the reception of radio-controlled time is successful, antenna

icon with full signal strength  will appear on screen. The radio-controlled clock will have a daily

synchronization at 02:03 & 03:03 everyday. Each reception cycle is around 2.5 to 10 minutes.

			Antenna icon disappear
Searching for Radio-Controlled Clock Signal	Reception is successful	Reception is fail	Reception is disabled

Antenna icon without signal strength indicates the past reception is not successful (Daily synchronization is still enabled). To enforce searching of radio-controlled time signal immediately, press “” repeatedly until the antenna icon flashes. If reception continues to fail, try other locations later. Place the unit away from source of interference such as mobile phones, appliances, TV etc.

To disable the radio-controlled time reception and stop the daily synchronization, continue pressing “” until the antenna icon disappears.

## CLOCK & CALENDAR

Press “CLOCK” to toggle display between time, calendar and day of the week.

### Clock & calendar setting:

Note: You need to set clock & calendar when your weather station cannot receive radio-controlled time signal in your location.


- Hold “CLOCK “ button to enter clock setting mode.
- Using “▲” or “▼” to adjust and “CLOCK” to confirm, the following values can be set in sequence:  
12/24hr format > Hr > Min > Yr > D/M or M/D format > Month > Date > EXIT

## HOME TIME, WORLD (ZONE) TIME

Hold “ZONE” to enter world (zone) time setting mode. Press “▲” or “▼” to enter the desired hour offset value from -12 to +12 hours. Press “ZONE” to confirm each setting.

Press “ZONE” button to toggle between home (radio-controlled) time and world (zone) time. “ZONE” icon appears when world (zone) time is selected. When zone time is not used, set zone time to “0”.

## ALARM SETTING

Press “ALARM” button to show alarm time and the “ALARM” icon will appear. Press again to enable or disable the alarm. Bell icon “” appears when alarm is enabled.

Hold “ALARM” to enter alarm time setting mode. Press “▲” or “▼” to enter the desired Hour/ Min values and press “ALARM” to confirm setting.

## SNOOZE & BACKLIGHT

When alarm is going off, press SNOOZE/ LIGHT to trigger snooze function and “Zz” icon will appear. To stop alarm for one day, press “ALARM” key.

In normal display, press SNOOZE/LIGHT for an extended backlight if adapter is not connected.

## LOW BATTERY INDICATION

Low battery indication is available for the monitor itself and all of the remote sensors. Replace the batteries and follow the setup procedure in this instruction manual.

**Important:** Wind direction calibration is required for the anemometer during battery replacement (Details refer “Calibrating the anemometer & installing batteries” section)

## BATTERY DISPOSAL

Replace only with the same or equivalent type recommended by the manufacturer.

Please disposal of old, defective batteries in an environmentally friendly manner in accordance with the relevant legislation.

## SPECIFICATIONS

Indoor Temperature	: 0 C to + 50 C (+32 F to +122 F)
Outdoor Temperature	: -20 C to +60 C (-4 F to +140 F)
Temperature Resolution	: 0.1 degree C
Indoor & Outdoor Humidity	: 20% - 99% RH
Humidity Resolution	: 1% RH
Channel for Temp & Humidity	: maximum 3
Wind speed range	: 0 – 30m/s : 0 – 108 km/h : 0 – 67 mph : 0 – 58.3 knot : 0 - 11 Beaufort
Rain Gauge reading	: 0 – 9999 mm : 0 – 393.66 inch
Transmission (Anemometer)	: up to 100M (228 feet) in open area, RF434 MHz
Transmission (Rain Gauge)	: up to 30M (98 feet) in open area, RF434 MHz
Clock	: DCF77 Radio-Controlled, Quartz back-up
Power	: 6.0V adapter & AA x 3 pieces for the monitor : AA x 2 pieces for anemometer : AA x 2 pieces for rain gauge