

WIRELESS WEATHER STATION

INSTRUCTION MANUAL

WS-1400 DRAFT

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This Operation Manual is part of this product and should be kept in a safe place for future reference. It contains important notes on setup and operation.

1. Inventory of contents

- 1) Base station
- 2) One remote sensor with mounting bracket
- 3) Instruction manual

2. Feature

- 1) Wireless outdoor and indoor humidity (%RH)
- 2) Wireless outdoor and indoor temperature (°F or °C)
- 3) Records min. and max. humidity
- 4) Records min. and max. temperature
- 5) Barometric pressure 24-hour history graph (inHg or hPa)
- 6) Weather forecast tendency arrow
- 7) Forecast icons based on changing barometric pressure
- 8) Time and date by manual setting
- 9) DCF radio controlled time and date with manual setting (WH1170)
- 10) Automatically updates for daylight saving time based on Germany DST system (WH1170)
- 11) 12 or 24-hour time display
- 12) Perpetual calendar
- 13) Time alarm with snooze
- 14) Can receive one sensor
- 15) LED backlight
- 16) Wall hanging or free standing
- 17) Included transmitter
- 18) Low battery indicator
- 19) Synchronized instant reception

3. Set up Guide

3.1 Battery install

Note: To avoid operating problems, please take note of battery polarity before/when inserting any Alkaline Batteries (permanent damaged could be introduced by inserting the battery in wrong direction). Use good quality Alkaline Batteries and avoid rechargeable batteries.

- 1) Insert two AAA batteries into the remote sensor
- 2) Insert three AA batteries into the weather station.
- 3) Wait 3 minutes or until the outdoor temperature is displayed in the weather station. ***Do not press any keys before outdoor sensor data received .***
- 4) Mount the units, ensuring that the receiver can still pick up the signal from the transmitter. To measure outdoor temperature, place the transmitter outdoors. It will transmit the temperature from its location.

Every time the remote sensor is powered up (for example after a change of batteries), a random security code is transmitted and this code must be synchronized with the base station to receive weather data.

Thus if battery change happened on transmitter side, then the receiver must be power up again to re-learn the transmitter.

After the remote sensor is powered up, the sensor will transmit weather data every 8s for 16 times. After this learning period is over, then the transmitter will transmit every 48s.


When the base station is powered up, a short beep will sound and all LCD segments will light up for about 3 seconds before it enters into learning mode to learn the sensors security code. After the learning mode, the base station will start the DCF radio controlled time reception. The receiver will start RCC time reception period (maximum 10 minutes), and no weather data will be received during this period of time. If RCC signal can't be found within 1 minutes, the signal search will be cancelled and will automatically resume every two hours until the signal is successfully captured. Regular RF link will be established once RCC reception routine is finished.

Note: **DO NOT PRESS ANY KEY** during the first 3 minutes learning period. After both indoor and outdoor data are displayed you can place your remote sensor outdoors and set your time (if no RCC reception is possible). If there is no temperature reading in the indoor station, make sure the units are within range of each other or repeat the battery installation procedure. If a key is pressed before the weather station receives the temperature signal, you will need to follow the battery installation procedure again. **Please wait 10seconds before re-insert the battery again to make a proper reset for both transmitter and receiver.**

Note for Radio Controlled Time:

The time and date display is based on the signal provided by the highly accurate government operated atomic clock. The base station will continue to scan for the radio controlled time signal each day despite it being manually set. If reception has been unsuccessful, then the radio controlled time icon will not appear but reception will still be attempted continually. If reception has been successful, the received time and date will overwrite the manually set time and date.

Note:

When batteries require replacement for the base station, the low battery indicator will light up on the LCD.  **Please participate in the preservation of the environment by properly disposing of all used-up batteries and accumulators at designated disposal points. Never dispose of batteries in a fire as this may cause explosion, risk of fire or leakage of dangerous chemicals and fumes**

3.2 Mounting

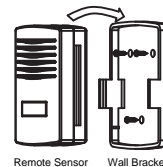
1) Base station

With one foldable legs at the back of the unit, the base station can be placed onto any flat surface or wall mounted at the desired location by the hanging holes also at the back of the unit. It is important to check that the radio signal can be received before permanently mounting any of the units

2) Remote sensor

Note: To achieve a true temperature reading, avoid mounting remote sensor in direct sunlight. We recommend that you mount the remote sensor on an outside North-facing wall; obstacles such as walls, concrete, and large metal objects will reduce the range.

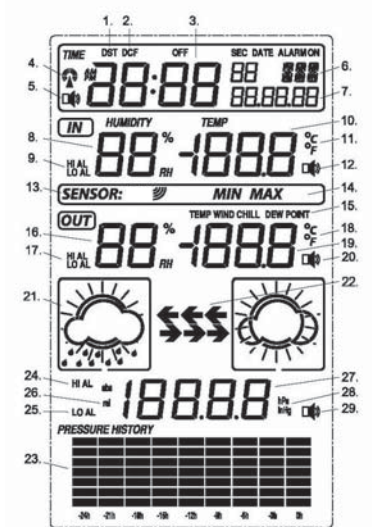
To wall mount, use 3 screws to affix the wall bracket to the desired wall, plug in the remote sensor to the bracket.



4.LCD overview

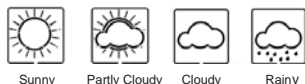
4.1 LCD overview

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



- | | |
|--|---|
| 1. DST | 15. Dew point temperature display |
| 2. DCF Radio Controlled Time | 16. Outdoor humidity display |
| 3. Time | 17. Outdoor temperature and humidity low/high alarm |
| 4. Radio Controlled Time icon | 18. Temperature display unit |
| 5. Alarm on indicator | 19. Outdoor temperature display |
| 6. Day of week/ time zone | 20. General outdoor alarm icon |
| 7. Date | 21. Weather forecast icon |
| 8. Indoor humidity display | 22. Weather tendency indicator |
| 9. Indoor temperature and humidity low / high alarm | 23. Pressure with 24 hour history graph |
| 10. Indoor temperature display | 24. Pressure high alarm |
| 11. Temperature display unit | 25. Pressure low alarm |
| 12. Indoor temperature and humidity alarm on indicator | 26. Absolute or relative air pressure selection |
| 13. Remote sensor transmit signal indicator | 27. Barometer air pressure |
| 14. MIN/MAX information | 28. Pressure display unit (inHg or hPa) |
| | 29. Pressure alarm on indicator |

4.2 Weather forecasting



The four weather icons Sunny, partly Cloudy, Cloudy and Rainy represent the weather forecasting. There are also two weather tendency indicators to show the air pressure tendency between the weather icons. The weather forecasting is based upon the change of air pressure.

4.3 Weather tendency indicator

The weather tendency indicators arrow is located between the weather icons to show the air pressure tendency and provide a forecast of the weather to be expected by the decreasing or increasing air pressure. The rightward arrow means that the air pressure is increasing and the weather is expected to become better. The leftward arrow means that the air pressure is decreasing and the weather is expected to become worse.

The change of weather forecast icon is in accord to the relationship between current relative pressure and the pressure change since last six hours. If the weather is changing, weather tendency indicator (animated arrows) will be flashing for three hours indicating a weather change is happening. After that, if weather conditions have become stable and no new weather change condition met, then the arrows will be fixed.

4.4 Examples of changing weather icons:



4.5 Storm warning indicator



The storm threshold can be set to suit the user's requirement for storm forecasting from 3-9hPa (default 4hPa). When there is a fall over pressure threshold within 3 hours, the storm forecasting will be activated, the clouds with rain icon and tendency arrows will flash for 3 hours indicating the storm warning feature has been activated.

Notes to pressure sensitivity setting for weather forecasting:

The pressure threshold can be set to suit the user's requirement for weather forecasting from 2-4hPa (default 2hPa). For areas that experience frequent changes in air pressure requires a higher setting compared to an area where the air pressure is stagnant. For example if 4hPa is selected, then there must be a fall or rise in air pressure of at least 4hPa before the weather station will register this as a change in weather.

5. Program Mode

The base station has five keys for easy operation: **SET** key, **ALARM** key, **MIN/MAX** key + key and **SNOOZE/LIGHT** key. And there are four program modes available: Quick Display Mode, Setting Mode, Alarm Mode and Min/Max Mode.

The program mode can be exited at any time by either pressing the **SNOOZE/LIGHT** key, or waiting for the 10-second time-out to take effect.

5.1 Quick Display Mode

- While in Normal Mode, press the **SET** key to enter the Quick Display Mode as follow:
 1. Outdoor Temperature / Dew point (press the **MIN/MAX** key or **+** key shifts the display between outdoor temperature and dew point)
 2. Absolute pressure / Relative pressure (press the **MIN/MAX** key or **+** key shifts the display between the absolute pressure and relative pressure)
- press the **SET** key to accept the change and advance to the next display mode. Continues to press the **SET** key to toggle through the display mode until return to the normal Mode

5.2 Setting Modes

- Press the **SET** key for 3 second while in normal mode to enter the normal Setting mode
- Press the **SET** key to select the following setting in sequence :
 1.
 - Time Zone Setting
 - 12/24 hour format
 - Manual time setting (hours/minutes)
 - Calendar setting (year /month /date)
 - Temperature display unit degree Celsius or Fahrenheit
 - Air pressure display units in hPa or inHg
 - Relative pressure setting from 919.0hPa – 1080.0hPa (default 1013.5hPa)
 - Pressure threshold setting (default 2hPa)
 - Storm threshold setting (default 4hPa)
- In the setting modes, press **+** key or **MIN/MAX** key change or scrolls the value. Hold the **+**key or **MIN/MAX** key for 3 second will increase/decrease digits in great steps.
- Press **SNOOZE/LIGHT** key or key idle 10 second, the setting mode will return to Normal Mode

Note: Please set the units firstly before change units' value. During change of units setting, units' value will change according to new units but it might cause resolution loss due to its internal calculation algorithm.

5.3 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
 - Remark: after the initial pressing of **ALARM** key, the display will be refreshed to show current high, low alarm value. Normal alarm value will be displayed only for those already activated, all other not activated values will be displayed with "---"or"--"instead.
- Press the **ALARM** key again to return the Normal Mode
- In the High Alarm Mode press the **SET** key to select the following alarm modes:
 1. Time alarm (hour/minute)
 2. Indoor humidity high alarm
 3. Indoor temperature high alarm
 4. Outdoor humidity high alarm
 5. Outdoor temperature and dew point high alarm
 6. Pressure high alarm
- In the Low Alarm Mode press the **SET** key to select the following alarm modes:
 1. Time alarm (hour/minute)
 2. Indoor humidity low alarm
 3. Indoor temperature low alarm
 4. Outdoor humidity low alarm
 5. Outdoor temperature and dew point low alarm
 6. Pressure low alarm

- In the alarm modes, Press **+** key or **MIN/MAX** key change or scrolls the alarm value. Hold the **+** key or **MIN/MAX** key for 3 second to change the number in great step. Press the **ALARM** key to choose 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 confirm the setting and continue pressing the **SET** key to toggle through each alarm mode until it returns to the normal display mode.
- Press **SNOOZE/LIGHT** key or key idle 10 second at any time, the alarm mode will return to Normal Mode

Canceling the Temperature Alarm While Sounding

- When a set weather alarm condition has been activated, that particular alarm will sound and flash for 120 second. Press any key to mute the alarm. When weather alarm condition was activated again within 10 minutes, 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.
- The alarm will reactivate automatically once the value has fallen below the set value, or if a new value is entered.

The outdoor weather alarm

When a set outdoor weather alarm has been triggered, it will flash on the LCD display and the general outdoor alarm icon and high/low alarm icon will flash accordingly. For example in outdoor temperature display mode, when dew point high alarm is triggered, **DEW POINT** icon will flash along with general outdoor alarm icon and high alarm icon flashing, telling that the current alarm source is from dew point.



5.4 Min/Max Mode

- While in Normal Mode, press the **MIN/MAX** key to enter the maximum mode, **MAX** logo and the general Max record will be displayed.
- Press **MIN/MAX** key again to enter the minimum mode, **MIN** icon and minimum record will be displayed
- 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 time stamp at which these values were recorded:
 1. Indoor humidity maximum
 2. Indoor temperature maximum
 3. Outdoor humidity maximum
 4. Outdoor temperature maximum
 5. Pressure 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:
 1. Indoor humidity minimum
 2. Indoor temperature minimum

3. Outdoor humidity minimum
 4. Outdoor temperature minimum
 5. Pressure minimum
- While in the minimum or maximum mode, press **SET** key for 2 seconds individual minimum or maximum record will be reset to current reading together with the current time and date.
 - Press the **SNOOZE/LIGHT** key or key idle 10 second, the Min/Max mode will return to Normal Mode

6. Problems and interference with operation

Problem & cause	Remedy
Distance between transmitters and receiver too long	Reduce distance between transmitters and receiver to receive signal
High shielding materials between the units (thick walls, steel, concrete, isolating aluminum foil and etc.)	Find a different location for sensors and/or receiver. See also item 'transmission range' below
Interference from other sources (e.g. wireless radio, headset, speaker, etc. operating on the same frequency)	Find a different location for the sensors and/or base station. Neighbors using electrical devices operation on the same signal frequency can also cause interference with reception
No reception after adding extension cables	Find a new location for the sensors and/or base station.
Poor contrast LCD or no reception or low batteries in sensors or receiver	Change batteries (check low battery indicator on the LCD)
Temperature, humidity, or air pressure is incorrect.	Check/replace batteries. If multiple remote sensors are in use, check location with corresponding "boxed numbers". Or move away from sources of heat/cold. Adjust relative air pressure to a value from a reliable source (TV radio, etc.).

7. Specifications

Outdoor data

Transmission distance in open field :	100meter max.
Frequency :	433MHz
Temperature range :	-40℃ to +65℃ (show OFL if outside range)
Resolution :	0.1℃
Measuring range rel. humidity :	20%~95%
Humidity accuracy :	+/-5% under 0-45℃
Measuring interval thermo-hygro sensor :	48 sec
Water proof level :	IPX3

Indoor data

Pressure / temperature :	48 sec
Indoor temperature range :	0℃ to +60℃
Resolution :	0.1℃
Measuring range rel. humidity :	1%~99%
Resolution :	1%
Measuring range air pressure :	919hPa ~ 1080hPa
Resolution/Accuracy :	0.1hPa/1.5hPa
Alarm duration :	120 sec

Power consumption

Base station :	3XAA 1.5V LR6 Alkaline batteries
Remote sensor :	2xAAA 1.5V LR03 Alkaline batteries
Battery life :	Minimum 12 months for base station Minimum 24months for remote sensor