

OPES® WEATHER STATION

INSTRUCTION MANUAL

MODEL: OP-WS01/WH1170

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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) DCF radio controlled time and date with manual setting
- 9) Automatically updates for daylight saving time based on Germany DST system
- 10) 12 or 24-hour time display
- 11) Perpetual calendar
- 12) Time alarm with snooze
- 13) Can receive information from one sensor
- 14) LED backlight
- 15) Wall hanging or free standing
- 16) Includes remote sensor
- 17) 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 can be caused by inserting the battery the wrong way). 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 Opes™ Weather Station.
- 3) Wait 3 minutes or until the outdoor temperature is displayed on the Opes™ Weather Station. ***Do not press any keys before outdoor sensor data is 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. **Therefore, if batteries are changed in the transmitter, the receiver must be powered up again to re-synchronise with the transmitter.**

After the remote sensor is powered up, the sensor will transmit weather data 6 times every 8s. After this learning period is over, 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 Radio Controlled Clock (RCC) time reception period (maximum 10 minutes), and no weather data will be received during this period of time. If RCC signal cannot be found within 1 minute, 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 is 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 Opes™ Weather Station receives the temperature signal, you will need to follow the battery installation

procedure again. **Please wait 10seconds before you re-insert the battery to make sure both transmitter and receiver reset properly.**

Note for Radio Controlled Time:

The time and date displayed 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:

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

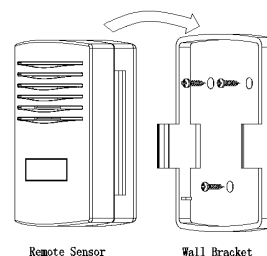
1) Base station

By using the foldable legs at the back of the unit, the base station can be placed onto any flat surface or can be wall mounted at the desired location by the hanging holes 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

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

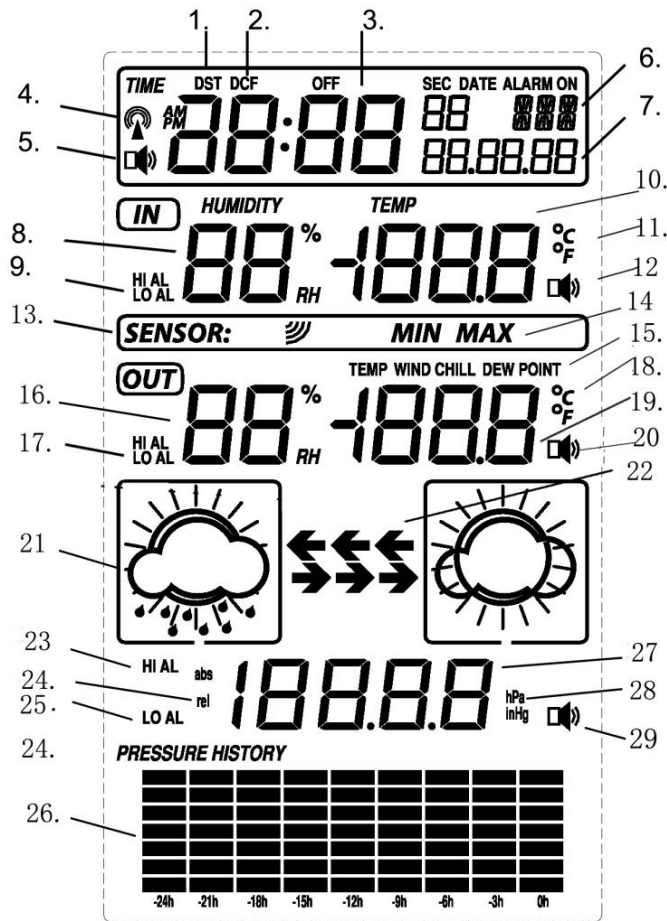
Note: To achieve a true temperature reading, avoid mounting remote sensor in direct sunlight. We recommend that you mount the remote sensor on an outside North-facing wall; obstacles such as walls, concrete, and large metal objects will reduce the range. The unit should be placed in a sheltered position where it will not be subjected to direct rain or snow.



4. LCD overview

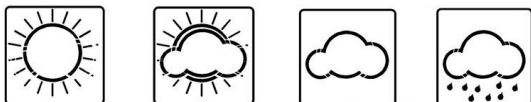
4.1 LCD overview

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

4.2 Weather forecasting



Sunny Partly Cloudy Cloudy Rainy

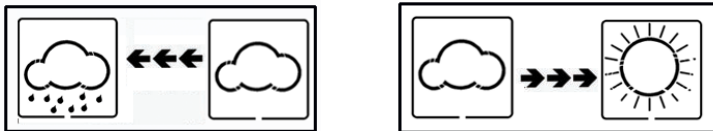
The four weather icons Sunny, Partly Cloudy, Cloudy and Rainy represent the weather forecasting. There are also two weather tendency indicators to show the air pressure tendency between the weather icons. The weather forecasting is based upon the change of air pressure.

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 based on the relationship between current relative pressure and the pressure change in the previous 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 require 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 Opes™ 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 changes and advance to the next display mode. Continue to press the **SET** key to toggle through the display mode until you 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 (should be set at "-1" for UK and "0" For Germany)
 - 2) 12/24 hour format
 - 3) Manual time setting (hours/minutes)
 - 4) Calendar setting (year /month /date)
 - 5) Temperature display unit degree Celsius or Fahrenheit
 - 6) Indoor humidity calibration
 - 7) Outdoor humidity calibration
 - 8) Air pressure display units in hPa or inHg
 - 9) Relative pressure setting from 919.0hPa – 1080.0hPa (default 1013.5hPa)
 - 10) Pressure threshold setting (default 2hPa)
 - 11) Storm threshold setting (default 4hPa)
- In the setting modes, press **+** key or **MIN/MAX** key to change or scroll the value. Hold the **+**key or **MIN/MAX** key for 3 second will increase/decrease digits in greater steps.
- Press **SNOOZE/LIGHT** key or no key for 10 seconds and the setting mode will revert to Normal Mode

Note: Please first set the units of measurement before attempting to change unit values. 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.

5.2.1 Setting Calibrated Humidity

The display console allows you to calibrate both the indoor and outdoor humidity. Humidity is a difficult parameter to measure accurately and drifts over time. The calibration feature allows you to zero out this error. To calibrate humidity, you will need an accurate source, such as a hygrometer.

To calibrate indoor humidity, in the Set Mode with indoor humidity flashing, press the **+** key or **MIN/MAX** key to increase or decrease the humidity setting (in increments of 1%) to match the calibrated or known humidity source. To return the indoor humidity to the measured value, press and hold the SET key for 3 seconds and the humidity will return to the uncalibrated value.

To calibrate outdoor humidity, in the Set Mode with outdoor humidity flashing, press the **+** key or **MIN/MAX** key to increase or decrease the humidity setting (in increments of 1%) to match the calibrated or known humidity source. To return the outdoor humidity to the measured value, press and hold the SET key for 3 seconds and the humidity will return to the uncalibrated value.

Note: The remote (outdoor) thermo-hygrometer will always display the measured humidity level and not the calibrated humidity level. Only the console will show the calibrated value.

Note: The dew point calculation is based on the calibrated humidity level.

5.2.2 Setting Barometric Pressure


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 Opes™ Weather Station to match the official reporting station.

To change the relative pressure when flashing, press the  key or **MIN/MAX** key to increase or decrease the relative pressure setting to match the official reporting station.

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:
 6. Time alarm (hour/minute)
 6. Indoor humidity high alarm
 6. Indoor temperature high alarm
 6. Outdoor humidity high alarm
 6. 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 to change or scroll the alarm value. Hold the **+** key or **MIN/MAX** key for 3 second to change the number in greater steps. 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 no key for 10 seconds and the alarm mode will return to Normal Mode

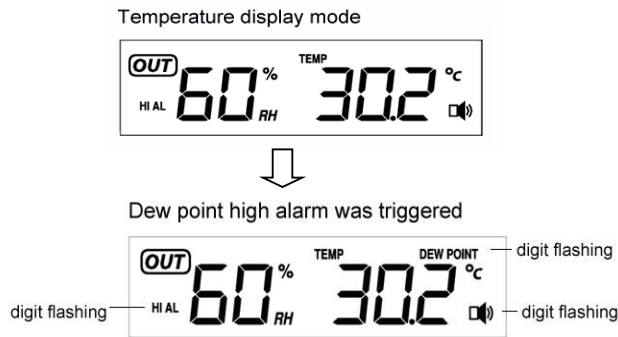
Canceling the Temperature Alarm While Sounding

a. When a set weather alarm condition has been activated, that particular alarm will sound and flash for 120 seconds. Press any key to mute the alarm. When weather alarm condition is 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.

b. 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 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

- Maximum Reading Reset: In the maximum reading Mode, press the **+** key to display the maximum values for the readings below together with the time and date time stamp at which these values were recorded. Press **SET** key for 2 seconds for each reading to reset the Maximum value to the current reading:
 1. Indoor humidity maximum
 2. Indoor temperature maximum
 3. Outdoor humidity maximum
 4. Outdoor temperature maximum
 5. Outdoor dew point maximum
 6. Pressure maximum

- Minimum Reading Reset: In the minimum reading Mode, press the **+** key to display the minimum values for the readings below together with the time and date at which these values were recorded. Press **SET** key for 2 seconds for each reading to reset the Minimum value to the current reading:
 1. Indoor humidity minimum
 2. Indoor temperature minimum
 3. Outdoor humidity minimum
 4. Outdoor temperature minimum
 5. Outdoor dew point minimum
 6. Pressure minimum

- Press the **SNOOZE/LIGHT** key or no key for 10 seconds, the Min/Max mode will return to Normal Mode

6. Problems and interference with operation

| Problem & cause | Remedy |
|---|---|
| Poor response inaccurate readings | 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. Neighbours using electrical devices operating at the same signal frequency can also cause interference with reception |
| Poor contrast LCD or no reception or low batteries in sensors or receiver | Change batteries |
| 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°C to +65°C (show OFL if outside range) |
| Resolution | : | 0.1°C |
| Measuring range rel. humidity | : | 1%~99% |
| Humidity accuracy | : | +/-5% under 0-45°C |
| Measuring interval thermo-hygro sensor | : | 48 sec |
| Water proof level | : | IPX3 |

Indoor data

| | | |
|-------------------------------|---|------------------|
| Pressure / temperature | : | 48 sec |
| Indoor temperature range | : | 0°C to +60°C |
| Resolution | : | 0.1°C |
| 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 |