AeoTec AerQ Temperature and Humidity Sensor User Guide

AërQ Temperature & Humidity Sensor
SKU: AEOEZWA009

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Quickstart

This is a **secure Alarm Sensor** for **Europe.** To run this device please insert fresh **1 * CR2477** batteries. Please make sure the internal battery is fully charged. Triple clicking the central button includes (adds) and excludes (removes) the device. A click on the central button will wake up the device. The device supports the Security S2 framework with unauthenticated and authenticated network keys. The DSK for the S2 inclusion can be found inside the packaging of the sensor. Please follow the instructions on the central controller when including.
The device also supports Smart Start. Please scan the QR code on the outlet cover of the device and the controller will add the device automatically when powered up.

Important safety information

Please read this manual carefully. Failure to follow the recommendations in this manual may be dangerous or may violate the law. The manufacturer, importer, distributor, and seller shall not be liable for any loss or damage resulting from failure to comply with the instructions in this manual or any other material. Use this equipment only for its intended purpose. Follow the disposal instructions. Do not dispose of electronic equipment or batteries in a fire or near open heat sources.

What is Z-Wave?

Z-Wave is the international wireless protocol for communication in the Smart Home. This device is suited for use in the region mentioned in the Quickstart section.
Z-Wave ensures reliable communication by reconfirming every message (two-way communication) and every mains a powered node can act as a repeater for other nodes (meshed network) in case the receiver is not in direct wireless range of the transmitter.

This device and every other certified Z-Wave device can be **used together with any other certified Z-Wave device regardless of brand and origin** as long as both are suited for the same frequency range.

If a device supports secure communication it will communicate with other devices secure as long as this device provides the same or a higher level of security. Otherwise, it will automatically turn into a lower level of security to maintain backward compatibility.
For more information about Z-Wave technology, devices, white papers, etc. please refer to **www.z-wave.info**.

SmartStart. Available in selected Z-Wave Plus devices built upon 500 series technology and all devices built upon 700 series technology, SmartStart lets you set up Z-Wave devices in seconds. Using SmartStart enabled apps, simply scan the QR code on any compatible app to connect it to your Z- Wave gateway.

Product Description

This device measures the three air quality parameters temperature, humidity, and dew point, and reports them to a central controller. Besides this, the device can directly control groups of other Z-Wave devices on over- and undershooting a set temperature and/or humidity parameter. This can be used to establish control loops for temperature and humidity. The device wakes up every 15 minutes to measure the values and it will send unsolicited reports when values change. Additionally, the device will report all values on request. The AërQ Sensor is actively monitoring the danger of mold in a room based on the temperature and humidity and will issue alarm warnings when critical air conditions are met. Wireless Alarm and red and a green blinking LED will indicate a mold condition. This local LED warning function is also available when the device is not included in any Z-Wave network and works stand alone.

Prepare for Installation / Reset

Please read the user manual before installing the product.
In order to include (add) a Z-Wave device to a network, it must be in the factory default state. Please make sure to reset the device into factory default. You can do this by performing an Exclusion operation as described below in the manual. Every Z-Wave controller is able to perform this operation however it is recommended to use the primary controller of the previous network to make sure the very device is excluded properly from this network.

Reset to factory default
This device also allows being reset without any involvement of a Z-Wave controller. This procedure should only be used when the primary controller is inoperable.
Keep the button pressed for 10 seconds. Then the green LED will start blinking. Release the button, when the LED stops blinking. Your device is reset to factory default now.
Safety Warning for Batteries
The product contains batteries. Please remove the batteries when the device is not used. Do not mix batteries of different charging levels or different brands.

Installation

Just place the device on any flat surface. Please keep in mind that the temperature may be different in different locations inside the room. If placed too close to the heating both temperature, humidity, and dew point values may be wrong. The device is IP 20 rated. This means that is must not be exposed to direct water (rain). It is safe to use the device in a humid environment such as a bathroom or dedicated washing facility.

Inclusion/Exclusion

On factory default, the device does not belong to any Z-Wave network. The device needs to be added to an existing wireless network to communicate with the devices of this network. This process is called Inclusion. Devices can also be removed from a network. This process is called Exclusion. Both processes are initiated by the primary controller of the Z-Wave network. This controller is turned into exclusion respective inclusion mode. Inclusion and Exclusion is then performed doing a special manual action right on the device.

Inclusion

1. Insert the battery.
2. Press the button quickly three times in a row.

Exclusion

1. Press the button quickly three times in a row.

Product Usage

Once the device is powered up it will start monitoring the air parameters and warn of mold using the local red and green LED. All air parameters are measured every 15 minutes. Pushing the button will force an immediate measurement and the LEDs will indicate the danger of mold

- green: no danger of mold in the room
- red: danger of mold, open the windows to lower the humidity

  The device contains two sensors with the following accuracy measures:
- Relative Humidity: precision ± 3% RH (max), range 0 to 80% RH
- Temperature: precision ±0.4 °C (max), range 0 to 65 °C
- Dew Point: precision ±0.4 °C (max), range 0 to 65 °C (calculated from other sensor values)

  The device sends the following notifications to the central controller:
- Weather Alarm – Moisture Alarm(0x10 – 0x02)
- Power management – Replace battery now(0x08 – 0x0b)
- Heat Alarm – Overheat Unknown Location(0x04 – 0x02)
- Heat Alarm – Underheat Unknown Location(0x04 – 0x05)

Forget the status of the device on the network you need to insert a battery into the device. And you see the result: – “The GREEN LED will blink one time in case of success or RED LED will blink five times in case of failure”.

Quick troubleshooting

Here are a few hints for network installation if things don’t work as expected.

1. Make sure a device is in a factory reset state before including it. In doubt exclude before include.
2. If inclusion still fails, check if both devices use the same frequency.
3. Remove all dead devices from associations. Otherwise, you will see severe delays.
4. Never use sleeping battery devices without a central controller.
5. Don’t poll FLIRS devices.
6. Make sure to have enough mains powered devices to benefit from the meshing

Firmware-Update over the Air

This device is capable of receiving a new firmware ‘over the air. The update function needs to be supported by the central controller. Once the controller starts the update process, perform the following action to confirm the firmware update: Wake Up the device by pressing the central button once.

Association – one device controls another device

Z-Wave devices control other Z-Wave devices. The relationship between one device controlling another device is called association. In order to control a different device, the controlling device needs to maintain a list of devices that will receive controlling commands. These lists are called association groups and they are always related to certain events (e.g. button pressed, sensor triggers, …). In case the event happens all devices stored in the respective association, the group will receive the same wireless command, typically a 'Basic Set' Command.

Association Groups:

Group Number	Maximum Nodes	Description
1		Lifeline
2	5	High-Temperature Notification
3	5	Low-Temperature Notification
4	5	High Humidity Notification
5	5	Low Humidity Notification
6	5	Air Temperature (A multilevel sensor report i s sent to the nodes in this group)

Configuration Parameters

Z-Wave products are supposed to work out of the box after inclusion, however, certain configurations can adapt the function better to user needs or unlock further enhanced features.
IMPORTANT: Controllers may only allow configuring signed values. In order to set values in the range, 128 255 the value sent in the application shall be the desired value minus 256. For example: To set a parameter to 200 it may be needed to set a value of 200 minus 256 = minus 56. In the case of a two-byte value, the same logic applies: Values greater than 32768 may be needed to be given as negative values too.
Parameter 1: Minimum Temperature change to report
This value defines the minimum change of temperature to cause an unsolicited report of humidity to the central controller using Lifeline. If the value is set to 0, there will be no reports sent to the controller, when the temperature changes. However, periodic reports, managed by configuration parameter 4, may still be active.
Size: 1 Byte, Default Value: 20

Setting	**Description**
0	disabled
1 – 100	1/10 degree

Parameter 2: Minimum humidity change to report
This value defines the minimum change of humidity to cause an unsolicited report of humidity to the central controller using Lifeline. If the value is set to 0, there will be no reports sent to the controller, when the humidity changes. However, periodic reports, managed by configuration parameter 4, may still be active.
Size: 1 Byte, Default Value: 5

Setting	**Description**
0	disabled
1 – 20	%

Parameter 4: Periodic Reports
This parameter defines the time interval to send an unsolicited report. If the value is set to 0, there will be no periodic reports sent to the controller. However, reports on temperature/humidity changes, managed by configuration parameters 1 and 2, may still be active.
Size: 2 Byte, Default Value: 43200

Setting	Description
0	disabled
900 – 65535	Seconds

Parameter 5: Temperature Upper Watermark value
This parameter defines a temperature. If the measured temperature surpasses this watermark a BASIC the command is sent into Association Group 2
Size: 2 Byte, Default Value: 0

Setting	Description
0	disabled
1 – 1000	1/10 degree

Parameter 6: Temperature Lower Watermark value
This parameter defines a temperature. If the measured temperature drops below this watermark an ASICcommand is sent into Association Group 3
Size: 2 Byte, Default Value: 0

Setting	Description
0	disabled
200 – 1000	1/10 degree

Parameter 7: Humidity Upper Watermark value
This parameter defines relative humidity. If the measured relative humidity surpasses this watermark a The BASIC command is sent into Association Group 4
Size: 1 Byte, Default Value: 0

Setting	Description
0	disabled
1 – 90	%

Parameter 8: Humidity Lower Watermark value
This parameter defines relative humidity. If the measured temperature drops below this relative humidity a The BASIC command is sent into Association Group 5
Size: 1 Byte, Default Value: 0

Setting	Description
0	disabled
1 – 90	%

Parameter 9: Low-Temperature Trigger BASIC Set Command Value
This defines what BASIC command shall be sent out into association group 3
Size: 1 Byte, Default Value: 255

Setting	Description
0 – 255	Value

Parameter 10: High-Temperature Trigger BASIC Set Command Value
This defines what BASIC command shall be sent out into association group 2
Size: 1 Byte, Default Value: 0

Setting	Description
0 – 255	Value

Parameter 11: Low Humidity Trigger BASIC Set Command Value
This defines what BASIC command shall be sent out into association group 5
Size: 1 Byte, Default Value: 255

Setting	Description
0 – 255	Value

Parameter 12: High Humidity Trigger BASIC Set Command Value
This defines what BASIC command shall be sent out into association group 4
Size: 1 Byte, Default Value: 0

Setting	Description
0 – 255	Value

Parameter 13: Offset value for Mould danger notification
This value allows increasing the humidity threshold for mould danger notification by a max of 10%
Size: 1 Byte, Default Value: 0

Setting	Description
0 – 10	%

Parameter 255: Reset Parameter
This parameter helps reset configuration parameters and the device to factory defaults
Size: 4 Byte, Default Value: 0

Setting	Description
1 – 4294967294	Reset all Parameter settings to their default settings.
4294967295	Completely factory reset sensor and send device reset lo cally notification.

Technical Data

Dimensions	34x34x16 mm
Hardware Platform	ZGM130S
IP Class	IP 20
Battery Type	1 * CR2477
Device Type	Notification Sensor
Generic Device Class	GENERIC TYPE SENSOR NOTIFICATION (0x07)
Specific Device Class	SPECIFIC TYPE NOTIFICATION SENSOR (0x01)
Network Operation	Reporting Sleeping Slave
Firmware Version	01.00
Z-Wave Version	07.12
Z-Wave Product Id	0371.0002.0009
Frequency	Europe – 868,4 Mhz
Maximum transmission	5 mW

Supported Command Classes

- Binary Sensor Command Class, Version 2 (highest granted security level)
- Configuration Command Class, Version 4 (highest granted security level)
- Multilevel Sensor Command Class, Version 11 (highest granted security level)
- Multi-Channel Association Command Class, Version 3 (highest granted security level)
- Association Group Information Command Class, Version 3 (highest granted security level)
- Device Reset Locally Command Class, Version 1 (highest granted security level)
- Z-Wave Plus Info Command Class, Version 2 (non-Secure)
- Notification Command Class, Version 8 (highest granted security level)
- Manufacturer Specific Command Class, Version 2 (highest granted security level)
- Powerlevel Command Class, Version 1 (highest granted security level)
- Firmware Update Meta Data Command Class, Version 5 (highest granted security level)
- Battery Command Class, Version 1 (highest granted security level)
- Wake Up Command Class, Version 2 (highest granted security level)
- Indicator Command Class, Version 3 (highest granted security level)
- Association Command Class, Version 2 (highest granted security level)
- Version Command Class, Version 3 (highest granted security level)

- Security 2 Command Class, Version 1 (highest granted security level)
- Supervision Command Class, Version 1 (non-Secure)
- Transport Service Command Class, Version 2 (non-Secure)

Explanation of Z-Wave specific terms

- **Controller** — is a Z-Wave device with capabilities to manage the network. Controllers are typically Gateways, Remote Controls or battery-operated wall controllers.
- **Slave** — is a Z-Wave device without capabilities to manage the network. Slaves can be sensors, actuators, and even remote controls.
- **Primary Controller** — is the central organizer of the network. It must be a controller. There can be only one primary controller in a Z-Wave network.
- **Inclusion** — is the process of adding new Z-Wave devices into a network.
- **Exclusion** — is the process of removing Z-Wave devices from the network.
- **Association** — is a control relationship between a controlling device and a controlled device.
- **Wakeup Notification** — is a special wireless message issued by a Z-Wave device to announces that is able to communicate.
- **Node Information Frame** — is a special wireless message issued by a Z-Wave device to announce its capabilities and functions.

Documents / Resources

	AeoTec AerQ Temperature and Humidity Sensor [pdf] User Guide AerQ Temperature and Humidity Sensor, AEOEZWA009

References

- Z-Wave Europe - The leading european distributor for Smart Home products.
- Z-Wave Smart Home - Z-Wave Smart Home Community and Service Portal