Aeotec

Aeotec TriSensor 8

SKU: AEOEZWA045

Quickstart

This is a **secure Sensor** for **Europe**. To run this device please insert fresh **1 * CR123A** batteries. Please make sure the internal battery is fully charged. If your Z-Wave gateway supports SmartStart, you can scan the QR code on the TriSensor 8 to automatically pair the sensor if your Z-Wave hub supports this.

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 a reliable communication by reconfirming every message (**two-way communication**) and every mains 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.

Product Description

Aeotec TriSensor 8 was developed to detect ambient values and movement and to transmit them with Z-Wave Plus. It is powered by Aeotec's Gen8 technology. You can find out more about TriSensor 8 by following that link. To see whether TriSensor 8 is known to be compatible with your Z-Wave system or not, please reference our Z-Wave gateway comparison listing. The technical specifications of TriSensor 8 can be viewed at that link.

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 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 to be reset without any involvement of a Z-Wave controller. This procedure should only be used when the primary controller is inoperable.
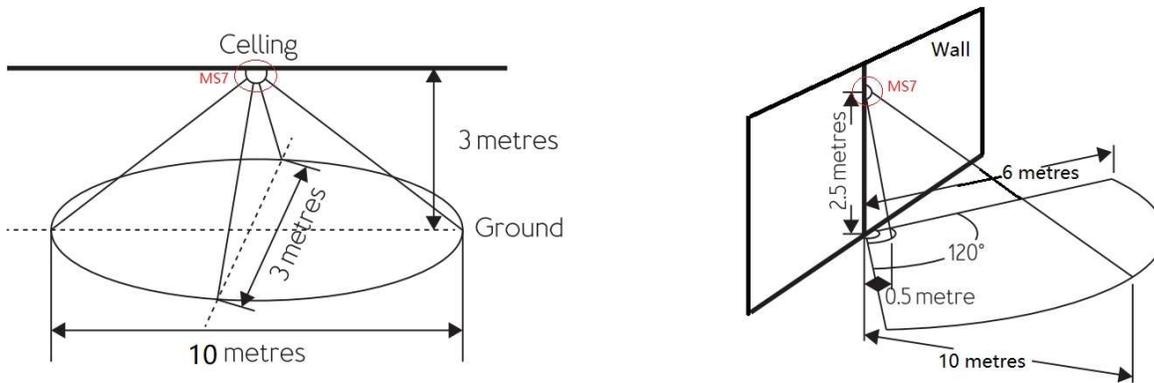
1. Make sure the device has been powered.
2. Press and hold the button for 12+ seconds, then release the action button.

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 level or different brands.
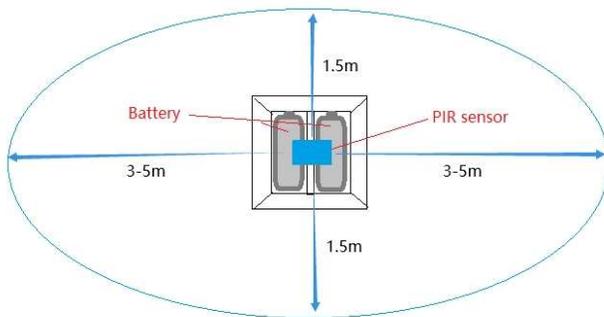
Installation

Placement Considerations.

There are some placement considerations when using the TriSensor 8 as a motion sensor. Above are some diagrams that show the distance at which the wall or ceiling installations can perform based on the height TriSensor 8 is installed, as well as the angle.

- Ceiling installation should have at least 3m height to the floor for the most optimal motion detection.
- Wall installation should have at least 2.5m height to the floor, angled downwards at 45 degrees.

The longer detection range of the motion sensor is in the direction of the side of the battery.

Installation positioning advice:

- Avoid installing TriSensor 8 in locations nearby environmental changes such as air conditioners, fans, or heaters. Instead, install the TriSensor 8 on the opposite side of the room against environmental changes as these will greatly impact the temperature sensor if you wish to get the most accurate temperature change for the overall room.
- Make sure to avoid installing TriSensor 8 nearby any metal, metal has a property that reflects wireless signals which can greatly impact the range of this sensor.
- Ensure that there are no objects or obstacles in front of the sensor lens which can impact the motion sensor tracking.
- Install TriSensor 8 pointed in the direction of the most foot traffic in the room.

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. Set your Z-Wave hub to connect new Z-Wave devices.
2. Tap the TriSensor 8 **action button 3x times within 1.5 seconds**.
3. If prompted, scan the QR code or enter the 5-digit DSK code.

Exclusion

1. Set your Z-Wave gateway into Z-Wave unpair (exclusion) mode.
2. Tap the **action button 3x times within 1.5 seconds**; the red LED will light up.

Product Usage

Power up TriSensor 8.

TriSensor 8 can only be battery-powered, you must first power up your TriSensor before you can pair it and use it in your Z-Wave network.
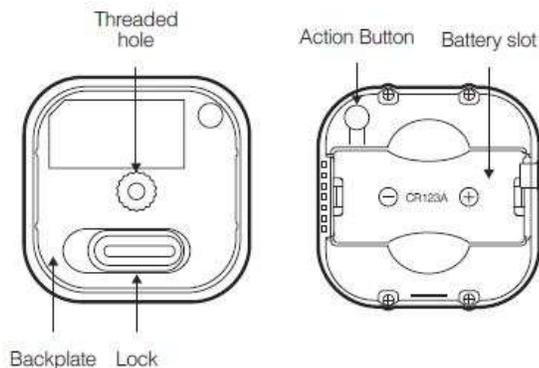
Steps.

1. Remove the battery cover by sliding the Unlock button LEFT, then pull the cover off.

2. Insert 1x CR123A lithium batteries orientated according to the diagram within your sensor.

Try inserting the batteries flat rather than at an angle.

WARNING: Not compatible with rechargeable CR123A batteries (3.6V).

3. You can close up the TriSensor 8 by placing the cover back on at an angle, but I would recommend doing this once you are done pairing the sensor to your Z-Wave network. So hold of on doing this so that you can reach the Action button on the TriSensor 8.

Node Information Frame

The Node Information Frame (NIF) is the business card of a Z-Wave device. It contains information about the device type and the technical capabilities. The inclusion and exclusion of the device is confirmed by sending out a Node Information Frame. Beside this it may be needed for certain network operations to send out a Node Information Frame. To issue a NIF execute the following action: Press button 3 times.

Communication to a Sleeping device (Wakeup)

This device is battery operated and turned into deep sleep state most of the time to save battery life time. Communication with the device is limited. In order to communicate with the device, a static controller **C** is needed in the network. This controller will maintain a mailbox for the battery operated devices and store commands that can not be received during deep sleep state. Without such a controller, communication may become impossible and/or the battery life time is significantly decreased.

This device will wakeup regularly and announce the wakeup state by sending out a so called Wakeup Notification. The controller can then empty the mailbox. Therefore, the device needs to be configured with the desired wakeup interval and the node ID of the controller. If the device was included by a static controller this controller will usually perform all necessary configurations. The wakeup interval is a tradeoff between maximal battery life time and the desired responses of the device. To wakeup the device please perform the following action: Press and hold the button for 3 seconds.

Quick trouble shooting

Here are a few hints for network installation if things dont work as expected.

1. Make sure a device is in factory reset state before including. 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. Dont poll FLIRS devices.
6. Make sure to have enough mains powered device 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: You can find OTA Update by Aeotec.

Association - one device controls an other 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 group will receive the same wireless command wireless command, typically a 'Basic Set' Command.

Association Groups:

Group Number	Maximum Nodes	Description
1	5	Lifeline
2	5	Motion (Basic Set)
3	5	Over Heat (Basic Set)
4	5	Under Heat (Basic Set)
5	5	Over light (Basic Set)
6	5	Under Light (Basic Set)
7	5	Temperature (Multisensor)

Configuration Parameters

Z-Wave products are supposed to work out of the box after inclusion, however certain configuration 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 case of a two byte value the same logic applies: Values greater than 32768 may needed to be given as negative values too.

Parameter 3: Motion Untrigger Time
Timeout configuration set in second for TriSensor to send no trigger status.
Size: 2 Byte, Default Value: 60

Setting	Description
30 - 3600	seconds

Parameter 4: Motion Sensitivity
Set the sensitivity of TriSensor.
Size: 1 Byte, Default Value: 2

Setting	Description
0	disable
1 - 3	Sensitivity

Parameter 5: Motion Report Type (V1.08 or higher)
Sends Notification or Sensor Binary Report
Size: 1 Byte, Default Value: 2

Setting	Description
0	Send Notification Report
1	Send Sensor Binary Report
2	Send Notification and Sensor Binary Report

Parameter 7: Motion Group Control (Group2)

Set control of other devices on group2 based on motion trigger
Size: 1 Byte, Default Value: 0

Setting	Description
0	Send BASIC_SET (0xFF) when motion is triggered to associated device Send BASIC_SET (0x00) when motion is untriggered to associated device
1	Send BASIC_SET (0x00) when motion is triggered Send BASIC_SET (0xFF) when motion is untriggered
2	Send BASIC_SET (0xFF) when motion is triggered, Nothing when motion untriggered
3	Send BASIC_SET (0x00) when motion is triggered, Nothing when motion untriggered.
4	Send BASIC_SET (0x00) when motion is untriggered, Nothing when motion triggered.
5	Send BASIC_SET (0xFF) when motion is untriggered, Nothing when motion triggered.
6	Send BASIC_SET (value is configured by parameter 8) when motion is triggered to associated devices. Send BASIC_SET (value is configured by parameter 8) when motion is untriggered.

Parameter 8: Motion Group Value Setting

Set Basic Set value for Group2. The MSB will act as the basic set value when motion trigger. The LSB will act as the basic set value when motion untrigger. E.g. value=0x0A00, then BASIC_SET(0x0A) will be sent when motion trigger, BASIC_SET(0x00) will be sent when motion untrigger.
Size: 2 Byte, Default Value: 65280

Setting	Description
0 - 30000	Value

Parameter 9: Motion Group Control Requirement

Set threshold of Light/Lux when devices associated in group2 should be triggered by motion. Associated device only receive BASIC_SET command when light <= (this value).
Size: 2 Byte, Default Value: 30000

Setting	Description
0 - 30000	Value

Parameter 10: Over Heat Group Threshold (Group3)

Set threshold of temperature. Designed to control Air Conditioners or temperature controllers ON or OFF. If measured temperature >= (this value, Scale is determined by Param24) send BASIC_SET (0xFF) to associated devices. If measured temperature < (this value) send BASIC_SET (0x00) to associated devices. E.g. Value 239 means 23.9 C. Value 750 means 75.0 F.
Size: 2 Byte, Default Value: 270

Setting	Description
270 - 850	°C
806 - 1850	°F

Parameter 11: Under Heat Group Threshold (Group4)

Set threshold of temperature. Designed to control Air Conditioners or temperature controllers ON or OFF. If measured temperature <= (this value, Scale is determined by Param24) send BASIC_SET (0xFF) to associated devices. If measured temperature > (this value) send BASIC_SET (0x00) to associated devices. E.g. Value 155 means 15.5 C. Value 600 means 60.0 F
Size: 2 Byte, Default Value: 155

Setting	Description
-100 - 155	°C
140 - 600	°F
0	disable

Parameter 12: Over Light Group Threshold (Group5)

Set threshold of Light/Lux. If measured light/lux >= (this value) send BASIC_SET (0xFF) to associated devices. If measured light < (this value) send BASIC_SET (0x00) to associated devices.
Size: 2 Byte, Default Value: 2000

Setting	Description
0	disable
1 - 30000	Lux

Parameter 13: Under Light Group Threshold (Group6)

Set threshold of Light/Lux. If measured light/lux <= (this value) send BASIC_SET (0xFF) to associated devices. If measured light/lux > (this value) send BASIC_SET (0x00) to associated devices.
Size: 2 Byte, Default Value: 100

Setting	Description
0	disable
1 - 30000	Lux

Parameter 14: Low Battery Threshold

Configure low battery report threshold, sends low battery report via notification and battery report when battery level drops under setting. Unit %.
Size: 1 Byte, Default Value: 20

Setting	Description
10 - 50	%

Parameter 15: Threshold Check Enable/Disable

Size: 1 Byte, Default Value: 0

Setting	Description
0	disable
1	enable

Parameter 16: Temperature Threshold

Size: 1 Byte, Default Value: 30

Setting	Description
0	disable
1 - 255	Value x 0,1

Parameter 17: Lux Threshold

Size: 2 Byte, Default Value: 250

Setting	Description
0	disable
0 - 10000	Lux

Parameter 18: Threshold Check Time

Set threshold check time in seconds.
Size: 2 Byte, Default Value: 900

Setting	Description
60 - 65535	Time in seconds

Parameter 19: Sensor Limit Control

This value is bit mask. Used to enable/disable measurement reports for various sensors that is more than the upper limit value or less than the lower limit value. (1+2=3)
Size: 1 Byte, Default Value: 0

Setting	Description
0	Disable
1	Temperature upper level
2	Lux upper level
4	Temperature lower level
8	Lux lower level

Parameter 20: Temperature Upper Limit

Set upper limit level for temperature set in scale of 0.1. Scale is determined by Param23. If (Current measurement) > (Upper Limit), then report sensor.
Size: 2 Byte, Default Value: 280

Setting	Description
280 - 1000	°C
824 - 2120	°F

Parameter 21: Temperature Lower Limit

Set lux upper limit level. If (Current measurement) > (Upper Limit), then report sensor.
Size: 2 Byte, Default Value: 0

Setting	Description
-400 - 0	°C
-400 - 320	°F

Parameter 22: Lux Upper Limit

Set Lux upper limit level. If (Current measurement) > (Upper Limit), then report sensor.
Size: 2 Byte, Default Value: 1000

Setting	Description
0 - 30000	Lux

Parameter 23: Lux lower limit level.

Set Lux lower limit level. If (Current Measurement) < (Lower limit), then report sensor.
Size: 2 Byte, Default Value: 100

Setting	Description
0 - 30000	Lux

Parameter 24: Temperature Scale

Set the scale for temperature when reports.
Size: 1 Byte, Default Value: 0

Setting	Description
0	°C
1	°F

Parameter 25: Automatic Interval Time

Interval time set in seconds to check the sensor report. Multilevel Sensor Report will be sent when timeout
Size: 2 Byte, Default Value: 3600

Setting	Description
30 - 65535	Time in seconds

Parameter 26: Motion Sensor Report Indicator (V2.08 or higher)

Allow user to enable/disable LED activity of specific reports sent by sensor. Button press indicator is not affected by this.
Size: 1 Byte, Default Value: 1

Setting	Description
0	disable
1	enable

Parameter 27: Motion Sensor Report Indicator (V2.08 or higher)

If LED is enabled by Param26, allow user to change the report color of motion sensor.
Size: 1 Byte, Default Value: 1

Setting	Description
0	disabled
1	Red
2	Blue
3	Green
4	Pink
5	Cyan
6	Purple
7	Orange
8	Yellow
9	White

Parameter 28: Temperature Offset Value (V2.08 or higher)

Can add or minus this setting value to calibrate temperature when checked. Scale is defined by Param24. e.g. Value 15 means 1.5C
Size: 2 Byte, Default Value: 0

Setting	Description
-200 - 200	-20°C - 20°C

Parameter 29: Lux Offset Value (V2.08 or higher)

Can add or minus this setting value to calibrate Lux when checked.
Size: 2 Byte, Default Value: 0

Setting	Description
-10000 - 10000	LUX

Technical Data

Dimensions	45 x 45 x 40 mm
Weight	22 gr
Hardware Platform	EFR32ZG23
EAN	1220000017276
IP Class	IP 20
Voltage	3V
Battery Type	1 * CR123A
Device Type	Sensor
Firmware Version	02.07
Z-Wave Version	07.12
Certification ID	ZC14-24010390
Z-Wave Product Id	0x0371,0x0002,0x002d
Frequency	Europe - 868,4 Mhz
Maximum transmission power	5 mW

Supported Command Classes

- Ss Basic
- Application Status
- Sensor Multilevel
- Transport Service
- Association Grp Info
- Device Reset Locally
- Zwaveplus Info
- Supervision
- Configuration
- Alarm
- Manufacturer Specific
- Powerlevel
- Firmware Update Md
- Battery
- Wake Up
- Association
- Version
- Indicator
- Multi Channel Association
- Security
- Security 2

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.