AEO_DSB54
Recessed Door Sensor

Firmware Version : 1.5

Quick Start

S This device is a Z-Wave Sensor. Single click the Z-Wave button on the device with a small pin to include or exclude the device. Clicking the little button behind the battery cover will wake up the device and keep it awake.

Please refer to the chapters below for detailed information about all aspects of the products usage.

What is Z-Wave?

This device is equipped with wireless communication complying to the Z-Wave standard. Z-Wave is the **international standard for wireless communication** in smart homes and buildings. It is using the **frequency of 868.42 MHz** to realize a very stable and secure communication. Each message is reconfirmed (**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.

Z-Wave differentiates between Controllers and Slaves. Slaves are either sensors **(S)** transmitting metered or measured data or actuators **(A)** capable to execute an action. Controllers are either static mains powered controllers **(C)** also referred to as gateways or mobile battery operated remote controls **(R)**. This results in a number of possible communication patterns within a Z-Wave network that are partly or completely supported by a specific device.

1. Controllers control actuators
2. Actuators report change of status back to controller
3. Sensors report change of status of measured values to controller
4. Sensors directly control actuators
5. Actuators control other actuators
6. Remote controls send signals to static controllers to trigger scenes or other actions
7. Remote controls control other actuators.
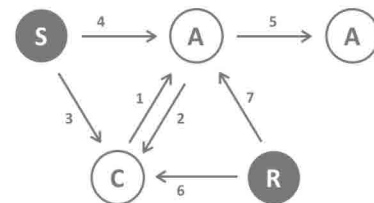
There are two different role a controller can have. There is always one single primary controller that is managing the network and including/excluding devices. The controller may have other functions - like control buttons - as well. All other controllers don't manage the network itself but can control other devices. They are called secondary controllers. The image also shows that its not possible to operate a sensor just from a remote control. Sensors only communicate with static controllers.

Product description

Recessed Door Sensor is a new small and compact Z-Wave sensor with the size of 2.5*7 cm (main body), that tells you and your Z-Wave network if a door is open or closed. It is nearly invisible, as the sensor is installed with the help of a slight drill hole hidden away on the top of your door. Installing Recessed Door Sensor is easy, as you only have to add it to your home's network activating its battery and associating it with your Z-Wave system.
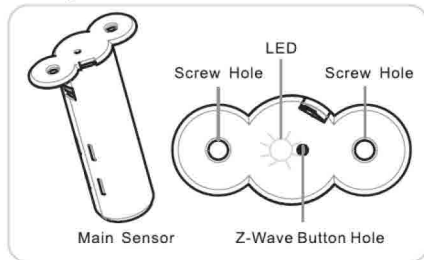
Batteries

The unit is operated by batteries. Use only batteries of correct type. Never mix old and new batteries in the same device. Used batteries contain hazardous substances and should not be disposed of with household waste!
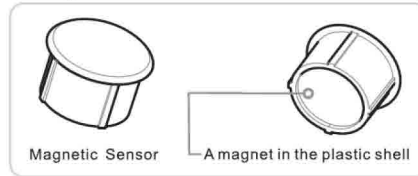
Battery Type: 1 * CR2

Installation Guidelines

The sensor is invisibly installed, so it sits within a door and its frame to provide all the information needed by a Z-Wave system for security, safety and ambiance.

• The larger Main Sensor

LED
Screw Hole   Screw Hole

Main Sensor   Z-Wave Button Hole

• The Magnetic Sensor

Magnetic Sensor   A magnet in the plastic shell

The Recessed Door Sensor is comprised of two parts: the larger Main Sensor and the smaller Magnetic Sensor. Both of them are to be installed for proper use.

Prepare the Main Sensor

The first Step in installing your Recessed Door Sensor is to activate the Main Sensor.
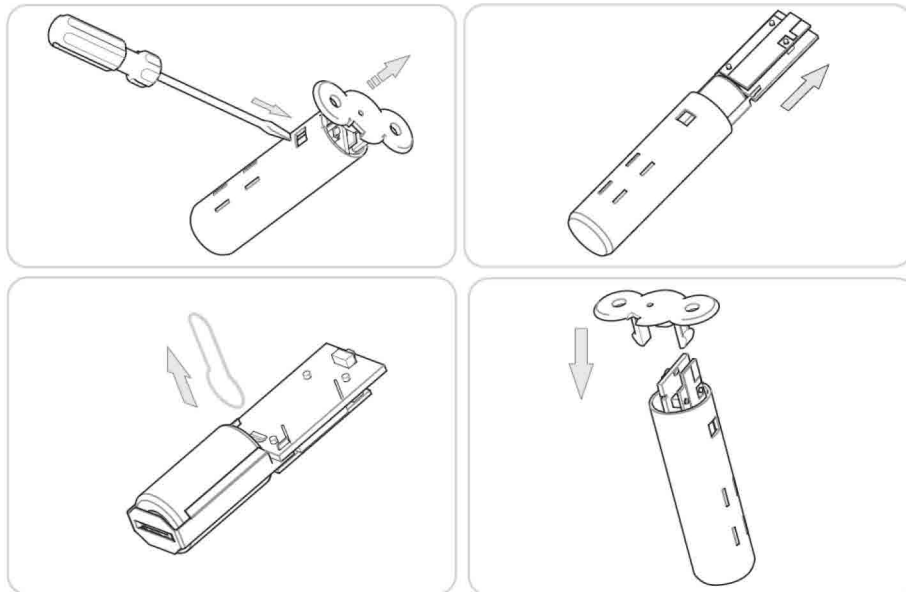
1. Using a slot-head scrwedriver, remove the Main Sensor's lid by pressing gently against its exposed connector.

2. Seperate the Main Sensors's two sections by first removing its lid and then removing its internal components.

3. Remove the clear battery insulator by pulling it away from the Main Sensor.

4. With the battery insulator removed, reinsert the internal components into the enclosure before reattaching its lid. Ensure that the Main Sensor's button aligns with the button hole of its lid.

Install the Main Sensor and Magnetic Sensor

Before beginning it is important to select a suitable position for your Recessed Door Sensor. Comply with the the following hints:

Top of the door

Side of the door
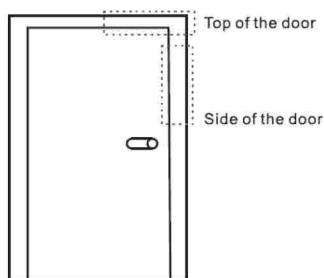
The rectangular areas highlighted above are the most appropriate installation positions.

• Install at the top or the side of a door.

• Position away from metal that could interfere with the sensor's magnetic funtionality. This includes your door blade, handle or lock mechanism.

• Install in a suitable location to ensure a clear (at least 1mm) seperation when the door is closed.

• Position exactly counterpart to the Magnetic Sensor.
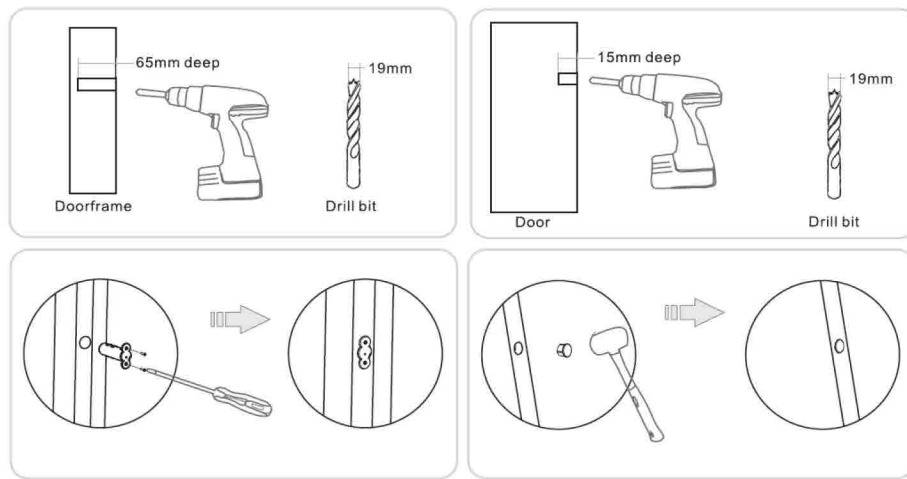
Step 1:

Prepare a space for the Main Sensor by drilling a hole into your doorframe using a 19mm wide drill bit. The hole should be 65mm deep.

Step 2:

Drill a corresponding hole in your door. The hole should be 15mm deep and 19mm wide. The position of the hole should allign exactly counterpart to hole in the door frame.

Step 3:

Insert the Main Sensor into the hole you created in the doorframe and fix it with two screws.

Step 4:

Place a small amount of white glue (PVA) inside the hole you created and place the Magnetic Sensor inside. Insert it by tapping gently on it with a rubber hammer.

The gap between the two parts of your sensor must be at least 1 mm. Re-Affix the Sensors, if it doesn't fit.

Behavior within the Z-Wave network

I On factory default the device does not belong to any Z-Wave network. The device needs to join an existing wireless network to communicate with the devices of this network. This process is called **Inclusion**. Devices can also leave a network. This process is called **Exclusion**. Both processes are initiated by the primary controller of the Z-Wave network. This controller will be turned into exclusion respective inclusion mode. Please refer to your primary controllers manual on how to turn your controller into inclusion or exclusion mode. Only if the primary controller is in inclusion or exclusion mode, this device can join or leave the network. Leaving the network - i.e. being excluded - sets the device back to factory default.

If the device already belongs to a network, follow the exclusion process before including it in your network. Otherwise inclusion of this device will fail. If the controller being included was a primary controller, it has to be reset first.

Make sure that your Z-Wave Controller is in the Inclusion-/Exclusion-Mode. Single click the Z-Wave button on the device with a small pin to include or exclude the device.

A successful Inclusion/Exclusion lights up the sensor LED for a few seconds.

Operating the device

The Door Sensor reports the status of your door (open / closed) to a Z-Wave gateway or controller. The sensor will send radio signals up to 5 associated Z-Wave devices within 2 two association groups in its own Z-Wave network.

Wakeup Intervals - how to communicate with the device?

W 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.

A single click on the Z-Wave button will wakes up the device and keep it awake.

It is possible to set the node ID to 255 to send wakeup notifications as broadcast. In this mode device takes more time to go to sleep and drains battery faster, but can notify all it's direct neighbors about a wakeup.

Node Information Frame

| NI | The Node Information Frame 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.

A single click on the Z-Wave button sends a Node Information Frame.

Associations

| A | 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 a common wireless command.

Association Groups:

| 1 | receive Basic Set/ Sensor Binary Report, when the state of Recessed Door Sensor's magnet switch open or close (max. nodes in group: 5) |
| 2 | receive the Battery Low Warning Report and Battery Report (max. nodes in group: 5) |

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 to configure 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 two byte value the same logic applies: Values greater than 32768 may needed to be given as negative values too.

sensor binary report for magnet switch (Parameter Number 1, Parameter Size 1)
value, which is send when Magnet switch open/close

Value	Description
0	open = 00; close = 0xFF (Default)
1	open = 0xFF; close = 00

basic set for magnet switch (Parameter Number 3, Parameter Size 1)
value, which is send when Magnet switch open/close

Value	Description
0	open = 00; close = 0xFF (Default)
1	open = 0xFF; close = 00

low battery voltage check function (Parameter Number 101, Parameter Size 1)
parameter defines, if battery check function is possible, when battery is below warning voltage

Value	Description
0	Disable (Default)
1	Enable

battery low check Interval time (Parameter Number 111, Parameter Size 4)
minimum battery low check Interval time is 4 minutes (240 seconds)

Value	Description
0 — 65535	(Default 112)

Flag values for triggered magnet switch (Parameter Number 121, Parameter Size 4)
Flag values for which reports to send when the magnet switch is triggered

Value	Description

permit other configurations (Parameter Number 252, Parameter Size 1)
Lock or Unlock other configuration set function

Value	Description
0	unlock (Default)

1	lock

Reset to default (Parameter Number 255, Parameter Size 2)
Reset to the default configuration

Value	Description

Command Classes

Supported Command Classes

- Battery (version 1)
- Basic (version 1)
- Wake Up (version 2)
- Association (version 1)
- Version (version 1)
- Binary Sensor (version 1)
- Configuration (version 1)
- Manufacturer Specific (version 2)

Technical Data

Battery Type	1 * CR2
Wireless Range	up to 100 m outside, on average up to 20 m inside buildings
Explorer Frame Support	Yes
SDK	4.55.00
Device Type	Slave with routing capabilities
Generic Device Class	Binary Sensor
Specific Device Class	Routing Binary Sensor
Routing	No
FLiRS	No
Firmware Version	1.5

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 bringing 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 annonces that is is able to communicate.
- **Node Information Frame** — is a special wireless message issued by a Z_Wave device to announce its capabilities and functions.

Disposal Guidelines

The product contains batteries. Please remove the batteries when the device is not used.

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.