

## Opening/Closing sensor iO Engineering Specification

Opening/Closing sensor iO is a wireless reed sensor powered by AAA battery. It is used for detecting the Opening and closing of doors, windows. It can communicate with another associated Z-Wave™ device, such as Siren, Smart Switch, etc.

Opening/Closing sensor iO can be included and operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers and/or other applications. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.

Opening/Closing sensor iO is also a security Z-Wave device and supports the Over The Air (OTA) feature for the product's firmware upgrade.

If you want your Opening/Closing sensor iO to be a security device that use secure/encrypted message to communicate in a Z-Wave network, then a security enabled Z-Wave controller is needed.

Features:

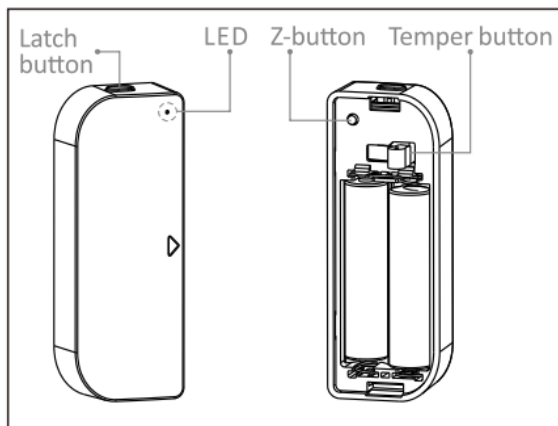
- 1) Opening/Closing sensor iO contains a sensor body and a magnet.
- 2) Door/Window opening detected through the separation of the main body and the magnet.
- 3) Door/Window closing detected through the combination of the main body and the magnet.
- 4) The longest effective distance between the sensor body and the magnet is 10MM.
- 5) The Sensor also possess the function of temper button, once the Sensor drops, it will notify

the gateway.

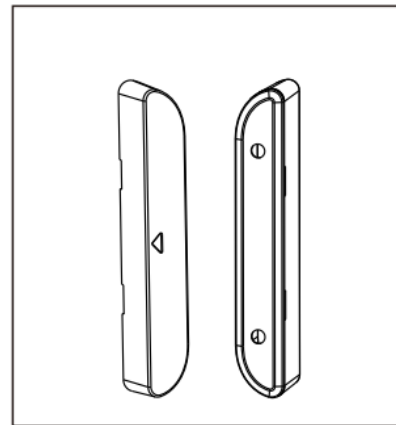
- 6) The battery life is up to 1 year.
- 7) Support low battery alarm function.
- 8) Support firmware OTA.

## 1. Familiarize yourself with your Door/Window Sensor

### 1.1 Opening/Closing sensor iO Layout



Sensor body



Sensor body

## 2. Technical specifications

Power supply:	Two AAA 1.5V Batteries
Storage environment:	-10 ℃ -50 ℃    0%-90%
Operational temperature:	0-40 ℃
Radio protocol:	Z-Wave
Radio frequency:	868.42MHz (EU)
Range:	More than 100m outdoors About 30m indoors (depending on building materials)
Dimensions:	Main body: 75*28*18mm Magnet: 75*12*18mm

Working current: About 60mA

Standby current: About 30uA

### 3. Functions of each trigger

#### Function of Action Button:

#### Opening/Closing sensor iO is not in the Z-Wave network:

Trigger	Description
Short press 1 time (within 1 second)	1. The LED will blink slowly three times.
Short press 3 time (within 1.5 seconds)	1. LED will keep on 30 seconds and then turn off. 2. <b>Add for inclusion(security):</b> 1. Insert the AAA battery. 2. Set the Z-Wave network main controller into learning mode. 3. Triggering this action button. If the add for inclusion is successful, the LED will blink fast until the received wake up no more information command will turn off. Otherwise, you need to repeat the process from step 2.
Press and hold for 1-3 seconds	Led keeps on when holding the Z-Button, turn off when Z-Button is released.
Press and hold for 3-20 seconds	Led will blink fast and then turn off
Press and hold more than 20 seconds	Led keep on 1 seconds and then turn off

#### Opening/Closing sensor iO is in the Z-Wave network:

Trigger	Description
Short press one time (within 1 second)	Led will keep on for 1 seconds
Short press 3 time (within 1.5 seconds)	1. Led will keep on for 30 seconds and then turn off; 2. <b>Remove for exclusion:</b> 1. Insert the AAA battery. 2. Set the Z-Wave network main controller into learning mode. 3. Triggering this action button. 4. If the remove for exclusion, the LED will blink slowly three times. Otherwise, the Led will keep on for 30 seconds and then turn off, in which case you need to repeat the process from step 2.
Press and hold for 1-3 seconds	Led keeps on when holding the Z-Button, turn off when Z-Button is released.
Press and hold for 3-20 seconds	1. LED will blink until the Z-Button is released. 2. Opening/Closing sensor iO will send " <b>Wake Up Notification Command</b> " to the nodes which is assigned by "Wake Up Command".

Press and hold more than 20 seconds	<b>Reset Opening/Closing sensor iO;</b> Triggering this action, led will keep on until the Z-Button is released; Opening/Closing sensor iO will send "Device_Reset_Locally" to the main controller and exclude from the Z-Wave network when the Z-Button is released, this procedure will reset the Sensor to factory default.

### SmartStart function

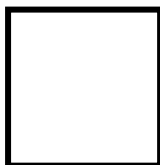
1. Support SmartStart inclusion MUST enter SmartStart Learn Mode by default when ready after powering up, regardless of network inclusion status.
2. The node being in SmartStart learn mode will issue Inclusion Requests at regular intervals if not included in a network.
3. Support the SmartStart node fallback on SmartStart learn mode after reset to factory default
4. A SmartStart node entering SmartStart Learn Mode will issue a single INIF if it already belongs to a Z-Wave network
5. Only the controller that supports the smartstart function saves the device's DSK could responds to this device. The product's DSK QR code is located next to the product's product information and the Z-Wave logo.

### 4. RESETTING

Reset procedure clears the Door/Window sensor's memory, including Z-Wave network controller information and advanced configuration.

To reset a Opening/Closing sensor iO:

Press and hold the Z-button for more than 20 seconds and then release.



#### NOTE

Use this procedure only in the event that the network primary controller is missing or otherwise inoperable.

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### 5. Security features of Opening/Closing sensor iO in Z-Wave network

Opening/Closing sensor iO can be included into a Z-Wave network as a security device. (S0 or S2)

#### 1. Add for inclusion (Classic Inclusion – for use if your controller does not support SmartStart):

- 1.1 Insert the AAA battery.
- 1.2 Set the Z-Wave network main controller into learning mode.
- 1.3 Press 3 times in 1.5 seconds.
- 1.4 If the add for inclusion is successful, the LED will blink fast until the received wake up no

more information command will turn off.

## 2. Remove for exclusion

2.1 Insert the AAA battery.

2.2 Set the Z-Wave network main controller into learning mode.

2.3 Triggering this action button.

If the remove for exclusion, the LED will blink slowly three times. Otherwise, the Led will keep on for 30 seconds and then turn off.

## 3. Security device

### 2.1 The node info frame supports:

COMMAND\_CLASS\_ZWAVEPLUS\_INFO V2

COMMAND\_CLASS\_SECURITY V1

COMMAND\_CLASS\_SECURITY\_2 V1

COMMAND\_CLASS\_TRANSPORT\_SERVICE V2

### 2.2 Security Command Supported Report Frame:

COMMAND\_CLASS\_VERSION V2

COMMAND\_CLASS\_MANUFACTURER\_SPECIFIC V2

COMMAND\_CLASS\_NOTIFICATION V5

COMMAND\_CLASS\_ASSOCIATION\_GRP\_INFO V1

COMMAND\_CLASS\_ASSOCIATION V2

COMMAND\_CLASS\_BATTERY V1

COMMAND\_CLASS\_WAKE\_UP V2

COMMAND\_CLASS\_POWERLEVEL V1

COMMAND\_CLASS\_CONFIGURATION V1

COMMAND\_CLASS\_FIRMWARE\_UPDATE\_MD V4

COMMAND\_CLASS\_SUPERVISION V1

## 6. Battery Command

1. When sending Battery get command to the product, the product will report the current battery power when it wakes up.

2. The battery report value 0xff will be reported to the associated node of group 1 when the product is at a low voltage (the threshold value can be configured in Configuration, the default value is less than 20% of the power).

## 7. Wake up command

7.1. When the product has been online, long press the Z-Wave button for more than 3 seconds to report the product has been awakened.

7.2 Wake up Interval Capabilities Report CC

Minimum Wake up Interval Seconds = 0 seconds

Maximum Wake up Interval Seconds = 86400 seconds, that is 1 day

Default Wake up Interval Seconds = 0 seconds

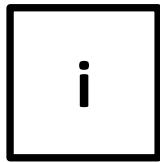
Wake up Interval Step Seconds = 86400 seconds

## 8. Note for special command

### 8.1 Association Command

Opening/Closing sensor iO supports two association groups.

Grouping Identifier	Max Nodes	Send Commands
Group 1	0x05	1. Notification Report. Sensor will send Notification Report when the sensor body and magnet removed or combined. 2. Battery Report. Sensor will send Battery Report when the battery level is low and the battery report's value is 0xFF. This Group 1 is the Lifeline group.
Group 2	0x05	1. Basic Set Sensor will send Basic Set when the sensor body and magnet removed or combined.



**TIP:**

1. The max number of associated nodes of all these 2 groups is 5.
2. Association allows for direct transmission of control command between devices and takes place without the participation of the main controller.

### 8.2 Basic Command

There is no relevant commands are available for mapping.

### 8.3 Notification Command

Supported Notification Type	Supported Event
Access Control (0x06)	Window/Door is open (0x16)
	Window/Door is closed (0x17)
Home Security (0x07)	Tampering, Product covering removed (0x03)

1. Notification Supported Report;  
There are two types notification are supported, Access Control (0x06) and Home Security (0x07).
2. Event Supported Report;  
Access Control: Window/Door is open (0x16), Window/Door is closed (0x17).  
Home Security: Tampering, Product covering removed (0x03), Previous Events cleared (0x00).
3. How to trigger the different notifications;

Access Control:

Window/Door is open (0x16): the separation of the main body and the magnet.

Window/Door is closed (0x17): the combination of the main body and the magnet.

Home Security:

Tampering, Product covering removed (0x03): the temper button is released.

Previous Events cleared (0x00): the temper button is pressed.

## 8.5 Configuration Command

Opening/Closing sensor iO offers a wide variety of advanced configuration settings. Below parameters can be accessed from main controllers configuration interface.

**NOTE: ALL NUMBERS BELOW ARE DECIMAL.**

### Parameter No.15 Value of the BASIC SET

Opening/Closing sensor iO can reverse its value of BASIC SET when the magnet is triggered.

**0** – Send BASIC SET VALUE = 255 to nodes associated with group 2 when door/window is opened.

Send BASIC SET VALUE = 0 to nodes associated with group 2 when door/window is closed.

**1** – Send BASIC SET VALUE = 0 to nodes associated with group 2 when door/window is opened.

Send BASIC SET VALUE = 255 to nodes associated with group 2 when door/window is closed.

Default setting: **0**

Parameter size: **1[byte]**

### Parameter No.32 Level of low battery

This parameter defines a battery level as the “low battery”.

Available settings: **10-50 (10% - 50%)**

Default setting: **20 (20%)**

Parameter size: **1[byte]**

### Parameter No.254 Enable/disable the configuration command

Lock/unlock all configuration parameters.

**0** – Unlock.

**1** – Lock.

Default setting: **0**

Parameter size: **1[byte]**