# Instruction Manual
# Door Sensor

Thank you for your support

- Please read the instruction manual carefully before operating
- Please keep the instruction manual for future reference

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## Product Introduction

Door sensor is an intelligent security equipment that can transmit the Z-wave network which has particular frequency. In the Z-wave network communications, door sensor can be connected to any Z-wave main controller. The door sensor can send messages to the Z-wave main controller, and realize association with other devices through the Z-wave main controller. Different countries or areas, the radio frequency is different. In the communication with the Z-wave main controller, the door sensor can send messages to the Z-wave main controller, but it can not receive messages from the Z-wave main controller. When alarm is triggered, the door sensor sends messages to the Z-wave main controller, the Z-wave main controller will displays the current status of door sensor, so the door sensor can associate with other devices. Door sensor is battery powered, is small and can be installed on the window or door easily. When the door or window is open, the door sensor is triggered and linkage alarm realized.

## Specifications

| | |
|---|---|
| Power Supply | CR123 × 1 |
| Standby Current | |
| Work Current(RF Tx) | Up to 15mA |
| Operational Temperature | 0 - 70℃ |
| Communication frequency | 868.40MHz, 869.85MHz (EU)<br>908.40MHz, 916.00MHz(US) |
| Range | Up to 45m indoors (depending on the building structure), and 80m for outdoor open fields.<br>Up to 60m outdoors. |

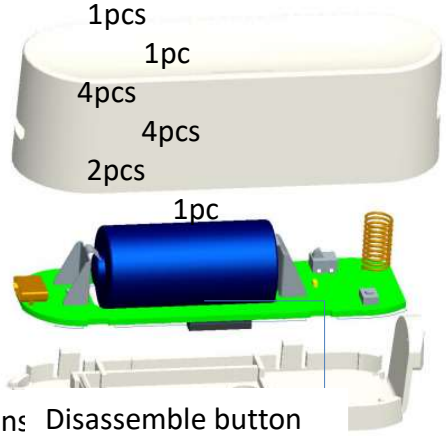
## Technical Information

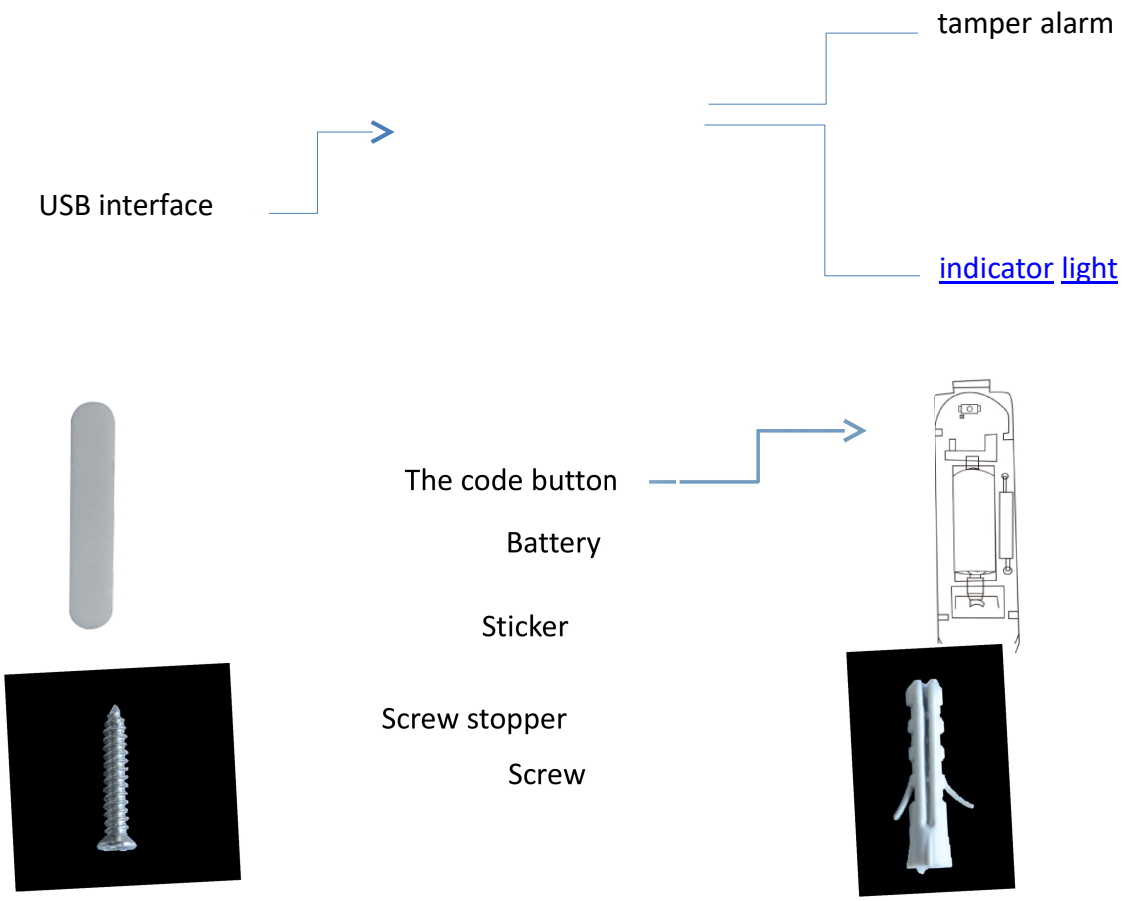
- Install on the door or window.
- Battery powered.
- Easily install with screws or sticker.
- Associate with other devices through the gateway.
- Compatible with any Z-wave network.
- It can be powered by USB

## Product Configuration

## Product List

- Door sensor main body 1pc
- Door sensor deputy body 1pc
- Battery 1pcs
- USB WIRE 1pc
- Screw 4pcs
- Screw stopper 4pcs
- Sticker 2pcs
- Instruction manual 1pc






# Z-Wave™ Network Inclusion/Exclusion/Reset

Remove the sensor casing, there is one button on the top side of PCB board, it can be executed inclusion, exclusion and reset from Z-Wave™ network.

| | | |
|---|---|---|
| **Add**[1] | 1、 Power up the device.<br>2、 Set Z-Wave™ Controller into inclusion mode<br>3、 Press and hold the button for 5s until white led lights is on, then release the button before led turn off. | Blue led will blink with 1s interval until inclusion successful. |
| **Remove** | 1、 Power up the device.<br>2、 Set Z-Wave™ Controller into exclusion mode<br>3、 Press and hold the button for 5s until white led lights is on, then release the button before led turn off. | Blue led will blink with 0.5s interval until exclusion successful. |
| **Factory Reset**[2] | 1、 Power up the device.<br>2、 Press and hold the button for 10s until pink led lights is on, then release the button before led turn off. | |

| | | |
|---|---|---|
| **Product Test Mode** | 1、 Press and hold the button.<br>2 、 Power on the device, device will enter into factory product test mode with white light blink one time. | |
| **Send NIF³** | Press and hold the button for 5s until white led lights is on, then release the button before led turn off. | |

**Notice 1:** When device enters into inclusion mode, the device all functionality will be useless. The inclusion mode will be timeout after 30s, user can implement step 3 to terminate inclusion mode.

**Notice 2:** Factory Reset will clear the device all Z-Wave™ Network data (include home id, node id, etc…) saved in memory, and restore all configuration parameters to factory default. Please use this procedure only when the network primary controller is missing or otherwise inoperable.

**Notice 3:** NIF – Node Information

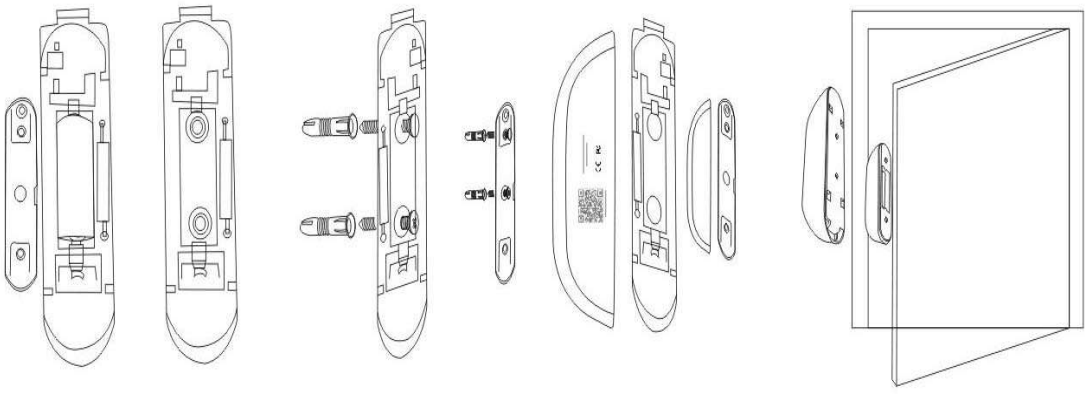
## Installation Steps

- Door sensor Installation
- Battery Installation

**Door Sensor Installation**

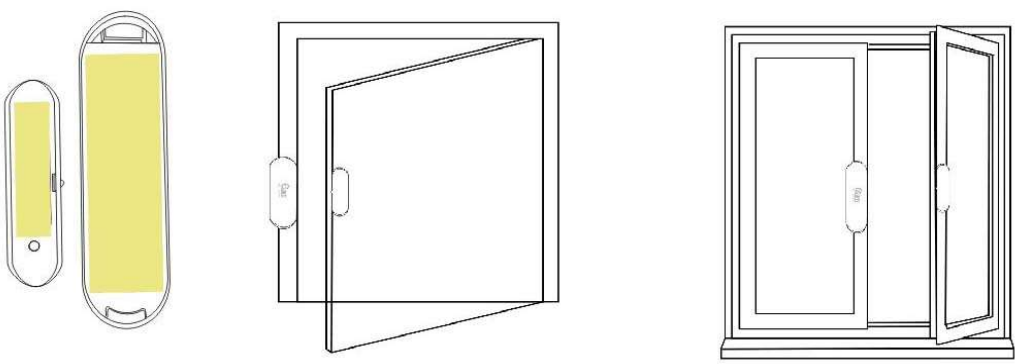
- **Option One**

Disassemble the door sensor main body and take out battery, fix it on the door with screws.
Disassemble the door sensor deputy body and fix it on the corresponding door frame position



- **Option Two**

Put the sticker on the bottom of door sensor to fix it on the wall



NOTE
When installing the door sensor, door sensor deputy body must be installed on the bulge side of the door sensor main body.

### Battery Installation


Disassemble the door sensor. Install battery Assemble the door main body sensor main body

### Tips

- When the door is closed, and the distance between the main body and the deputy is less than 2cm, the Z-wave main controller displays the door is closed perfectly.
- When the door is opened, the distance between the main body and the deputy body is more than 2cm, LED light flash and door sensor sends messages to the Z-wave main controller, the Z-wave main controller displays the door is open and alarms.
- Valid distance of door sensor is 2cm, so when install, please pay attention to the trigger surface, it is triggered by point to point.
- Make sure of that door sensor is in the Z-wave network.

# Association

The device supports 2 association groups, and each group supports max 5 associated nodes.
**Group 1** is lifeline group; all nodes which associated in this group will receive the messages sent by device through lifeline.
**Group 2** is controlling group, all nodes associated in this group will be controlled through BASIC_SET command by the device when device detects a door/window opened or closed event.

The Command Class supported by each association group is shown in the table below:

| Group | Command Class | Event |
|---|---|---|
| 1 (Lifeline) | COMMAND_CLASS_NOTIFICATION | NOTIFICATION_REPORT |
| | COMMAND_CLASS_SENSOR_MULTILEVEL | SENSOR_MULTILEVEL_REPORT |
| | COMMAND_CLASS_SENSOR_BINARY | SENSOR_BINARY_REPORT |
| | COMMAND_CLASS_BATTERY[1] | BATTERY_REPORT[1] |
| | COMMAND_CLASS_INDICATOR | INDICATOR_REPORT |
| | COMMAND_CLASS_DEVICE_RESET_LOCALLY | DEVICE_RESET_LOCALLY_NOTIFICATION |
| 2 (Control) | COMMAND_CLASS_BASIC | BASIC_SET |

**Notice 1:** {COMMAND_CLASS_BATTERY, BATTERY_REPORT} is valid only when included with LPM. Please see Page 9 for detail.

# Z-Wave™ Message Report

Once the device detects a door/window opened or closed event, it will report the event to the controller.
In default, device will use COMMAND_CLASS_NOTIFICATION to represent the door/window event. User can also enable COMMAND_CLASS_SENSOR_BINARY report by setting the "**Configuration No.8**" to '1'.

## Door/Window Report

When device detects a door/window opened or closed event, it will automatically send the notification report to nodes associated in lifeline.

| | |
|---|---|
| **Command Class** | COMMAND_CLASS_NOTIFICATION |
| **Command** | NOTIFICATION_REPORT |
| **Type** | ACCESS_CONTROL (0x06) |
| **Event** | WINDOW_OR_DOOR_IS_OPENED (0x16)<br>WINDOW_OR_DOOR_IS_CLOSED(0x17) |
| | |
| **Command Class** | COMMAND_CLASS_SENSOR_BINARY |
| **Command** | SENSOR_BINARY_REPORT |
| **Type** | DOOR/WINDOW (0x0A) |
| **Event** | OPENED (0xFF) / CLOSED (0x00) |

## Tamper Report

When device detects the cover is removed event, it will automatically send the notification report to nodes associated in lifeline.

| | |
|---|---|
| **Command Class** | COMMAND_CLASS_NOTIFICATION |
| **Command** | NOTIFICATION_REPORT |
| **Type** | NOTIFICATION_TYPE_HOME_SECURITY (0x07) |

| | |
|---|---|
| **Event** | NOTIFICATION_EVENT_HOME_SECURITY_TAMPERING_COVERING_REMOVED (0x03)<br>NOTIFICATION_EVENT_HOME_SECURITY_NO_EVENT (0x00) |
| | |
| **Command Class** | COMMAND_CLASS_SENSOR_BINARY |
| **Command** | SENSOR_BINARY_REPORT |
| **Type** | TAMPER (0x08) |
| **Event** | COVER_REMOVED (0xFF) / COVER_CLOSED (0x00) |

## Command Class Sensor Multilevel

### Temperature Sensor

When the ambient temperature differential over 1.0℃ or 1.0 degree F(in default, and decides by "**Configuration No. 4**"), the device will unsolicited to send a "SENSOR_MULTILEVEL_REPORT" to nodes which associated in lifeline.

| | |
|---|---|
| **Command Class** | COMMAND_CLASS_SENSOR_MULTILEVEL |
| **Command** | SENSOR_MULTILEVEL_REPORT |
| **Type** | Air Temperature |
| **Scale** | 0.1 Degree Celsius / Fahrenheit(US) |

### Humidity Sensor

When the relative humidity differential over 1.0%RH (in default, and decides by "**Configuration No. 5**"), the device will unsolicited to send a "SENSOR_MULTILEVEL_REPORT" to nodes which associated in lifeline.

| | |
|---|---|
| **Command Class** | COMMAND_CLASS_SENSOR_MULTILEVEL |
| **Command** | SENSOR_MULTILEVEL_REPORT |
| **Type** | Humidity |
| **Scale** | 0.1% RH |

# Command Class Configuration

The device supports the controller to configure parameters of the device through Configuration Command Class, and the device has 9 parameters available for users to set according to their different needs:

**1) Led Indicated Disable**

This configuration sets to '0' will disable the Led indicating when device detects a door/window opened or closed event.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|---|---|---|---|
| 1 | 1 | 0, 1 | 1 |

**2) Binary Sensor Report Enable**

This configuration sets to '1' will enable SENSOR_BINARY_REPORT when device detects a door/window opened or closed event.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|---|---|---|---|
| 2 | 1 | 0 , 1 | 0 |

**3) Temperature Offset Value**

The current measuring temperature value can be add and minus a value by this setting. Temperature Offset Value = [Value] × 0.1 Degree Celsius / Fahrenheit (US).

| Parameter Number | Size (Byte) | Available Settings | Default value |
|---|---|---|---|
| 3 | 1 | -120 ~ 120 | 0 |

**4) Humidity Offset Value**

The current measuring humidity value can be add and minus a value by this setting. Humidity Offset Value = [Value] × 0.1 RH%.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|---|---|---|---|
| 4 | 1 | -120 ~ 120 | 0 |

**5) Temperature D-Value Setting**

This configuration sets the changed value of the temperature. When the difference from the last report exceeds this setting value, the device will report current temperature value to Z-Wave Hubs.

The D-Value = [Value] × 0.1 Degree Celsius / Fahrenheit (US).

| Parameter Number | Size (Byte) | Available Settings | Default value |
|---|---|---|---|
| 5 | 1 | 0 ~ 100 | 10 |

**6) Humidity D-Value Setting**

This configuration sets the changed value of the humidity. When the difference from the last report exceeds this setting value, the device will report current humidity value to Z-Wave Hubs. The D- Value = [Value] × 0.1 RH%.

| Parameter Number | Size (Byte) | Available Settings | Default value (min) |
|---|---|---|---|
| 6 | 1 | 0 ~ 100 | 20 |

**7) Basic Set Value**

This configuration sets the level for device sending BASIC_SET to nodes that associated in group 2 when device detects a door/window opened event.

[0] – Off, BASIC_SET = 0x00, all nodes associated in group 2 will be off. [1 … 99] – On. BASIC_SET = [Setting Value].

[100] – On, BASIC_SET = 0xFF.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|---|---|---|---|
| 7 | 1 | 0 ~ 100 | 100 |

**8) Basic Set Off Delay Time**

This configuration sets the time delay for device sending BASIC_SET = 0x00 to nodes that associated in group 2 when device detects a door/window closed event.

**[0]** – No time delay.

**[1 … 30000]** – Time delay count. Unit: Second.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|---|---|---|---|
| 8 | 2 | 0 ~ 30000 | 0 |

**9) Sensor Measuring Interval**

This parameter is configured the time interval for sensor measuring interval time. This value is larger, the sensor values updates slowly. '0' – Sensor Measuring Disable. Unit: Second.

| Parameter Number | Size (Byte) | Available Settings | Default value |
|---|---|---|---|
| 9 | 2 | 0 ~ 30000 | 180 |

# Wakeup Command Class

The device stays in sleep status for the majority of time in order to conserve battery life. The minimum wakeup interval is 20s
The maximum wakeup interval is 86400s (24 Hours)
Allowable min step among each wakeup interval is 10 seconds, such as 1860s, 1870s,1880s…
**Note:** The default value is 8 hours with factory default. This value is greater, the battery life is longer.

# Battery Command Class

The users can also enquire the battery status of the device by sending BATTERY_GET command. Once the device receivers the command, it will return BATTERY_REPORT command.
The device will send BATTERY_LEVEL = 0xFF command to the Z-Wave™ Controller to inform that the device is in dead battery status, otherwise BATTERY_LEVEL value range is 0% to 100%.

# Command Class Basic

The COMMAND_CLASS_BASIC is realized to control the devices associated in group 2 in this device. When device detects a Door/Window opened event occurred, it will send a "BASIC_SET = [Value]" command to control the devices in group 2. And it will send a "BASIC_SET = 0x00" command to control the devices in group 2 after the Door/Window is closed. The [Value] is set by **configuration No.7**.

# SmartStart

SmartStart enabled products can be added into a Z-Wave network by scanning the Z-Wave QR Code present on the product with a controller providing SmartStart inclusion. No further action is required and the SmartStart product will be added automatically within 10 minutes of being switched on in the network vicinity.

This device supports SmartStart function. QR code printed by laser can be found on surface of product and the outside of packing box. And the full DSK code is printed can be found on the packing box.

The device will enter SmartStart if the device is not included in network after power up. And if device is not included successfully during 10 second, it will enter sleep mode. And then
2nd SmartStart time delay approximately 16s
3rd SmartStart time delay approximately 32s
4th SmartStart time delay approximately 64s
5th SmartStart time delay approximately 128s

6th SmartStart time delay approximately 256s
7th SmartStart time delay approximately 512s
Afterwards, the Smartstart mode will be auto running with 512 second interval until device is included successfully or battery run down.

# Led Action Indicator

| Led Color | Action | Description |
|---|---|---|
| Red | Light On 1s When Power On | Not Add in Z-Wave Network |
| | Blink One Time | Door/Window is Opened |
| | Fast Blinks | Cover is Removed |
| Pink | Light On 2s | Press And Hold Button 10s, Off at 12th Second |
| Green | Light On 1s When Power On | Add in Z-Wave in Network Already |
| | Blink One Time | Door/Window is Closed |
| White | Light On 2s | Press And Hold Button 5s, Off at 7th Second |
| Cyan | Blink One Time | Cover is Closed |
| Blue | Blink with 1s Interval | Add to Z-Wave Network |
| | Blink with 500ms Interval | Remove from Z-Wave Network |
| Yellow | Blink with 500ms Interval | OTA is Running |
| | Light On Always | Button Pressed and Held Time Large Than 12s. |

# Security Network

The device supports the security function with S2 encrypted communication. The device will auto switch to the security mode when the device included with a security controller. In the security mode, the follow commands must use security and security_2 command class wrapped to communicate, otherwise the device will not response any commands.

## Security Keys

This device supports security levels are listed in below table:

| Security Levels | Support (Yes/No) |
|---|---|
| SECURITY_KEY_S0 | Yes |
| SECURITY_KEY_S2_UNAUTHENTICATED | Yes |
| SECURITY_KEY_S2_AUTHENTICATED | Yes |
| SECURITY_KEY_S2_ACCESS | No |

# All Supports Command Class

This device supports 2 role type: AOS(Always On Slave) and LPM(Low Power Mode). Which role type is valid decided by which power (Battery or DC Power) is supplied when include.

The role type is AOS if both battery and DC power supply. The role type is LPM only if battery supply.
When device is included with AOS, it also can make a repeater role.

## Command List When LPM Included

| Command Class | Version | Not Included | Non-secure Included | S0 Included | | S2 Included | |
|---|---|---|---|---|---|---|---|
| | | | | Non-Secure | Secure | Non-Secure | Secure |
| COMMAND_CLASS_ZWAVEPLUS_INFO | 2 | ● | ● | ● | | ● | |
| COMMAND_CLASS_SECURITY | 1 | ● | ● | ● | | ● | |
| COMMAND_CLASS_SECURITY_2 | 1 | ● | ● | ● | | ● | |
| COMMAND_CLASS_TRANSPORT_SERVICE | 2 | ● | ● | ● | | ● | |
| COMMAND_CLASS_VERSION | 3 | ● | ● | | ● | | ● |
| COMMAND_CLASS_POWERLEVEL | 1 | ● | ● | | ● | | ● |
| COMMAND_CLASS_ASSOCIATION | 2 | ● | ● | | ● | | ● |
| COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION | 3 | ● | ● | | ● | | ● |
| COMMAND_CLASS_ASSOCIATION_GRP_INFO | 1 | ● | ● | | ● | | ● |
| COMMAND_CLASS_MANUFACTURER_SPECIFIC | 2 | ● | ● | ● | | | ● |
| COMMAND_CLASS_DEVICE_RESET_LOCALLY | 1 | ● | ● | | ● | | ● |
| COMMAND_CLASS_BATTERY | 1 | ● | ● | | ● | | ● |
| COMMAND_CLASS_WAKEUP | 2 | ● | ● | | ● | | ● |
| COMMAND_CLASS_NOTIFICATION | 8 | ● | ● | | ● | | ● |
| COMMAND_CLASS_SENSOR_MULTILEVEL | 11 | ● | ● | | ● | | ● |
| COMMAND_CLASS_SENSOR_BINARY | 2 | ● | ● | | ● | | ● |
| COMMAND_CLASS_INDICATOR | 3 | ● | ● | | ● | | ● |
| COMMAND_CLASS_CONFIGURATION | 4 | ● | ● | | ● | | ● |
| COMMAND_CLASS_SUPERVISION | 1 | ● | ● | ● | | ● | |
| COMMAND_CLASS_FIRMWARE_UPDATE_MD | 5 | ● | ● | | ● | | ● |

## Command List When AOS Included

| Command Class | Version | Not Included | Non-secure Included | S0 Included | | S2 Included | |
|---|---|---|---|---|---|---|---|
| | | | | Non-Secure | Secure | Non-Secure | Secure |
| COMMAND_CLASS_ZWAVEPLUS_INFO | 2 | ● | ● | ● | | ● | |
| COMMAND_CLASS_SECURITY | 1 | ● | ● | ● | | ● | |
| COMMAND_CLASS_SECURITY_2 | 1 | ● | ● | ● | | ● | |
| COMMAND_CLASS_TRANSPORT_SERVICE | 2 | ● | ● | ● | | ● | |
| COMMAND_CLASS_VERSION | 3 | ● | ● | | ● | | ● |
| COMMAND_CLASS_POWERLEVEL | 1 | ● | ● | | ● | | ● |
| COMMAND_CLASS_ASSOCIATION | 2 | ● | ● | | ● | | ● |
| COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION | 3 | ● | ● | | ● | | ● |
| COMMAND_CLASS_ASSOCIATION_GRP_INFO | 1 | ● | ● | | ● | | ● |
| COMMAND_CLASS_MANUFACTURER_SPECIFIC | 2 | ● | ● | ● | | | ● |
| COMMAND_CLASS_DEVICE_RESET_LOCALLY | 1 | ● | ● | | ● | | ● |
| COMMAND_CLASS_NOTIFICATION | 8 | ● | ● | | ● | | ● |
| COMMAND_CLASS_SENSOR_MULTILEVEL | 11 | ● | ● | | ● | | ● |
| COMMAND_CLASS_SENSOR_BINARY | 2 | ● | ● | | ● | | ● |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COMMAND_CLASS_INDICATOR | 3 | ● | ● | | ● | | ● |
| COMMAND_CLASS_CONFIGURATION | 4 | ● | ● | | ● | | ● |
| COMMAND_CLASS_SUPERVISION | 1 | ● | ● | ● | | ● | |
| COMMAND_CLASS_FIRMWARE_UPDATE_MD | 5 | ● | ● | | ● | | ● |