



Key Ring Controller KFOB2

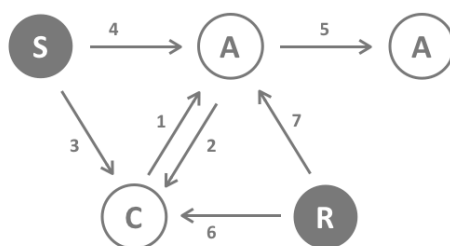
Quick Start

Please refer to the chapters below for detailed information about all aspects of the products usage. The device operates in normal control mode or in management mode. **Pushing all four buttons for 5 sec. will turn the device into management mode** (indicated by blinking green LED). The management mode will time out after 10 seconds if no further button is pushed. **Button 3 confirms standard inclusion or exclusion** started by a primary controller, button 2 issues a Node Information Frame or wakeup notification, button 4 is used to add devices into association groups and **button 1 confirms inclusion or exclusion in NWI (network wide inclusion) mode**.

What is Z-Wave?

This device is equipped with wireless communication complying with 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 (EU) or 908 MHz (US)** to realize a very stable and secure communication between devices of different origin, type and brand. 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.

Product description

The Z-Wave.Me Key Fob is a Z-Wave device that can both **control other Z-Wave devices** and **activate predefined scenes in an IP gateway**. Although it is controlling other devices, the **KFOB** can't act as Z-Wave network controller (primary or secondary) and will always need a Z-Wave network

controller to be included into a Z-Wave network. The device can be used in different modes that are selected by configuration parameters:

1. Control of groups of other Z-Wave devices using 'ON', 'OFF' and Dim commands.
2. Control of devices in proximity of the FOB using 'ALL ON' or 'ALL OFF' commands.
3. Control of a device in proximity of the FOB using 'ON' and 'OFF' commands.
4. Activation of predefined scenes in Gateways or other Z-Wave devices.

Installation Guidelines

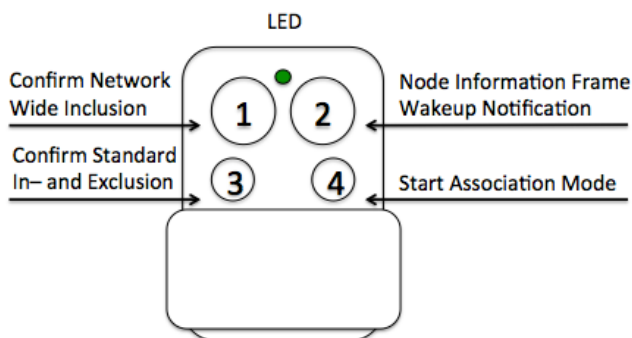
The device comes ready to use with a battery already installed. On factory default the device is not included in any network and any button push will result in a long red blink indicating an error. This behavior can be used to test the factory default or exclusion state.

For battery change, the device needs to be opened by removing the three little screws on the backside of the device. During reassembly, watch the position of the white rubber and make sure the silver buttons fit exactly into the nipples of the rubber.

The device can be operated in two different modes:

- Operation Mode: This is the mode where the device is controlling other Z-Wave devices or is activating scenes.
- Management Mode: The device is turned into the management mode by **pushing all four buttons for 5 sec**. A blinking green LED indicates the management mode. In the management mode the buttons of the device have different functions. If no further action is performed the device will turn back to the normal mode after 10 sec. Any management action terminates the management mode as well.

In management mode the following actions can be performed:



- Button 1 - Network Wide Inclusion: The device can be included into a Z-Wave Network from any physical location in the network. This requires a primary controller supporting Explorer Frames. This mode lasts for 20 seconds and stops automatically. Any button press stops the mode as well.
- Button 2 - Send Node Information Frame and Wake up Notification. (See explanation in the respective chapters below)
- Button 3 - Standard Inclusion/Exclusion Mode: The device is included or excluded from a controller in direct wireless range. Any button press stops the mode. Performing an exclusion of the device from a network resets the device into its factory default.
- Button 4 - Association Set: To assign target devices to one of the four association groups. Refer to the manuals section about association for more information how to set and unset association groups.

Behavior within the Z-Wave network

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**. The primary controller of the Z-Wave network initiates both processes. 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.

Z-Wave knows two types of inclusion processes: The standard inclusion requires that both controller and the device to be included are in physical proximity of few meters. The network wide inclusion allows including a device on every position in the network as long as there is at least one wireless connection to a device already included in the network. This function however requires that both controller and the device to be included support so-called explorer frames. Please refer to the technical data of the devices for more information about explorer frame support.

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.

Once the controller is turned into standard inclusion mode, **turn the Key Fob into management mode and hit Button 3**. Entering management mode and hitting button 3 when the controller is in exclusion mode



exclude the device. To include/exclude the device in the Network Wide Inclusion Mode **turn the KFOB into management mode and hit Button 1.**

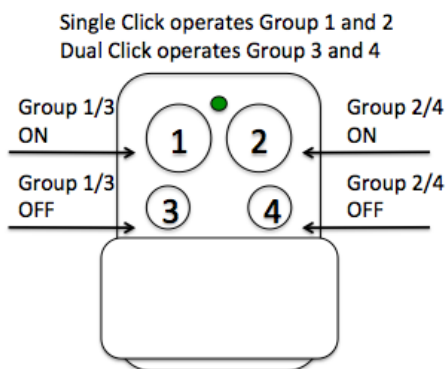
Operating the device

Depending on the button mode and command set configured the key fob can be used in different ways.

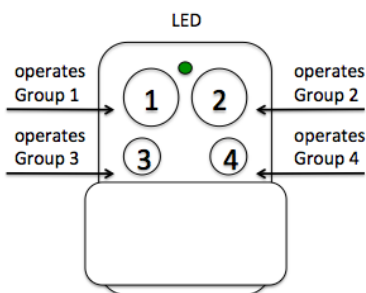
Button modes:

Control with two groups of two buttons (This is the default mode) One group (No. 1) of devices is controlled by button 1 and 3, the other group (No. 2) is controlled by button 2 and 4. Clicking the larger button turns the loads 'ON', clicking the smaller button turns the loads 'OFF'. If double clicks are enabled in configuration parameters #1 or #2, groups No 3 and No 4 are controlled by short double click of the buttons.

Dimming commands are sent by holding down the buttons (Dim UP using Buttons 1 and 2, Dim Down using Buttons 3 and 4) respective Click + Hold in case the double click option is enabled.



Control with single buttons In this mode a group of devices is controlled by a single button: single click turns 'ON'; double click turns 'OFF' devices in the group. In case dimmers are controlled, holding down the button will dim up, click and hold down will dim down the load. The group number corresponds to the button label.



Control Commands:

The configuration parameter #11...#14 specifies what commands are sent when the buttons are operated.

Direct Control of associated devices using 'ON', 'OFF', 'DIM UP' and 'DIM DOWN'

(This is the default mode No. 1). Devices in association groups are controlled using Basic 'ON' and 'OFF' commands and Dim Start/Stop commands. This mode implements the communication pattern 7. The parameter value No. 2 disables the use of Dim commands.

Control of Devices in proximity

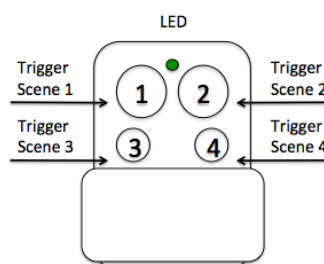
Basic 'ON', 'OFF' and Dim Start/Stop commands are sent to the device nearest to the Fob. (50...100 cm) Attention: In case there is more than one Z-Wave device nearby all these devices may be switched. For this reason the proximity function should be handled with care. This mode implements the communication pattern 7.

Control of neighboring devices using the 'ALL ON' and 'ALL OFF' commands.

The special commands 'ALL ON' resp. 'ALL OFF' are sent as broadcast to all devices in direct wireless range. The devices act according to their individual settings for 'Switch ALL' commands. This mode implements the communication pattern 7.

Simple Scene Activation using configurable scene control commands

Associated devices in an association group are controlled by individual commands defined by Z-Wave command class 'Scene Controller Configuration'. One scene number can be configured per association group. On default, the scene number equals the association group number as shown in the figure below. This mode implements communication patterns 6 and 7. This mode is typically used to activate scenes in IP gateways but can also be used to activate predefined scenes in other scene-capable devices.



Enhanced Scene Activation

In this mode every button action can issue a scene activation command with a dedicated number. The scene number is a combination of the group number and the action performed on the button and has always two digits. The group number defines the upper digit of the scene number, the action the lower digit. The following actions are possible:

- 1 = On
- 2 = Off
- 3 = Dim Up Start
- 4 = Dim Down Start
- 5 = Dim Up Stop
- 6 = Dim Down Stop

Example: Clicking/double clicking the button 1 will issue a scene activation command for scene 11 (button 1 click, event on) and scene 12 (button double click 1, event off, single button control is used in this example). This mode implements the communication pattern 6.

Child Protection

The device can be turned into a child protection mode. In this mode all local operation is disabled. The child protection mode **MUST** be turned on wirelessly. However, in protected by sequence mode it is possible to unlock the device for local operation by pressing any button for 5 seconds. The unlock state will last for 5 seconds.

Wakeup Intervals - how to communicate with the device?

This device is battery operated and turned into deep sleep state most of the time to save battery power. 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 cannot be received during deep sleep state. Without such a controller, communication may become impossible and/or the battery lifetime is significantly decreased.

The device will stay awake right after inclusion for 2.5 seconds allowing the controller to perform certain configuration actions. It is possible to manually wake up the device by pushing button 2 in management mode.



The minimum allowed wakeup time is 240s but it's strongly recommended to define a much longer interval since the only purpose of a wakeup should be the reporting of the battery status or an update of the child protection settings. Defining Node id of 0 as a destination of the Wakeup Notification will disable the periodical wakeup function entirely.

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 its direct neighbors about a wakeup.

Node Information Frame

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.

Pressing Button 2 in management mode will issue a Node Information Frame.

LED Control

- Confirmation - green 2 sec
- Failure - red 2 sec
- Button press confirmation - green 1/4 sec
- Waiting for Network Management mode selection - green blinks
- Waiting for group selection in Association Set Mode - green fast blink
- Waiting for NIF in Association Set Mode - green-red-off blink

Associations

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	By button 1 or single clicks of buttons 1 and 2 (max 8 nodes)
2	By button 2 or double clicks of buttons 3 and 4 (max 8 nodes)
3	By button 3 or single clicks of buttons 1 and 2 (max 8 nodes)

4	By button 4 or double clicks of buttons 3 and 4 (max 8 nodes)
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The IP gateway that will receive the scene activation commands must be placed on all association groups.

Set and unset associations to actuators

Associations can be assigned and removed either via Z-Wave commands or using the device itself.

To control a Z-Wave device from the Key Fob, the Node id of this device needs to be assigned to one of the four association groups. This is a three-step process:

1. Turn the Key Fob into management mode and hit button 4 within 10 sec. (LED is blinking green when management mode is reached).
2. Within 10 sec. push the button of the Key Fob you like the Z-Wave actuator to be controlled with. After 10 sec. the devices goes back to sleep. **Single click means adding to this association group, double click means removing the node selected** in step (3) from this association group.
3. Find the Z-Wave actuator you like to control by the device. Hit the button on the device to issue a Node Information Frame within 20 sec. A common way is hitting a control button one or three times. Please consult the manual of the device to be controlled for more information how to issue a Node Information Frame. Any button press on Key Fob at this stage will terminate the process.

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.

Pair Mode for Button 1 and 3 (Parameter Number 1)

Pair Mode for Button 2 and 4 (Parameter Number 2)

Value	Description
0	Separately
1	In pair without double clicks (Default)
2	In pair with double clicks

Control Commands on Group 1 (Parameter Number 11)

Control Commands on Group 2 (Parameter Number 12)

Control Commands on Group 3 (Parameter Number 13)

Control Commands on Group 4 (Parameter Number 14)

Value	Description
0	Disabled
1	Switch On/Off and Dim (send Basic Set and Multilevel) (Default)
2	Switch On/Off only (send Basic Set)
3	Switch All
4	Send Scenes
5	Send Preconfigured Scenes
6	Control devices in proximity

Typical click timeout (Parameter Number 20)

Typical time used to differentiate click, hold and double click

Value	Description
1 — 100	in 10ms units (Default 50)

Send the following Switch All commands (Parameter Number 21)

Value	Description
1	Switch off only (Default)
2	Switch on only
255	Switch all on and off

Invert buttons (Parameter Number 22)

Value	Description
0	No (Default)
1	Yes

LED confirmation mode (Parameter Number 24)

This allows saving battery power

Value	Description
0	No confirmations
1	Confirm button press
2	Confirm button press and delivery (Default)

Send unsolicited Battery Report on Wake Up (Parameter Number 30)

Value	Description
0	No (Default)
1	To same node as wake up notification
2	Broadcast to neighbors

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!

Technical Data

IP Rating	IP 20
Battery Type	1 * CR2032
Frequency	EU: 868.4 MHz (EN 300 220) or RU: 869.0 MHz (GKRCh/EN 300 200) or US: 908.4 MHz (FCC CFR47 P 15.249)
Wireless Range	Up to 100 m outside, on average up to 20 m
Explorer Frame	Yes
SDK	4.54 pl1
Device Type	Slave with routing capabilities
Specific Device Class	Multilevel Remote Switch
Routing	No
FLIRS	No
Firmware Version	1.3
Dimensions	50 x 30 x 10 mm
Weight	30 gr.

Z-Wave.Me guarantees that every device is free from physical defects in material and workmanship under normal use for one year from the date of purchase. If the product proves defective during this one-year warranty period, Z-Wave.Me will replace it free of charge. Z-Wave.Me does not issue any refunds. This warranty is extended to the original end user purchase only and is not transferable. This warranty does not apply to: (1) damage to units caused by accident, dropping or abuse in handling, or any negligent use; (2) units which have been subject to unauthorized repair, taken apart, or otherwise modified; (3) units not used in accordance with instruction; (4) damages exceeding the cost of the product; (5) transit damage, initial installation costs, removal cost, or reinstallation cost. For information on additional devices, please visit us online.



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- (1) Reorient or relocate the receiving antenna.
 - (2) Increase the separation between the equipment and receiver.
 - (3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
 - (4) Consult the dealer or an experienced radio/TV technician for help.
- Any changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the device.

Where shielded interface cables have been provided with the product or specified additional components or accessories elsewhere defined to be used with the installation of the product, they must be used in order to ensure compliance with FCC regulations.

CE for Class B ITE (Following European standard EN55022/1998; EN61000-3-2/1995; EN61000-3-3/1995, EN55024/1998, EN60950-1/2001)