009204

KFOB-C Remote-Control

Manual

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Quick Start

This wireless Z–Wave remote controller can act in two different modes that are activated with the first configuration action after factory default:

1. Pushing **Button 1 for one sec.** (red/green blink) adds the KFOB to an existing network as **secondary controller**.
    - The four buttons will send **activate 4 different scenes** (Central Scene Command) in the central gateway (For this a Z-Wave control center is required. In an existing Z-Wave network the KFOB is able to control up to 4 different scenes with its four buttons.)
2. Pushing **Button 3 for one sec.** (green blink) adds a new Z-Wave actuator device to the KFOB who becomes the **primary controller** of this new network.
    - The KFOB can even control devices without a central controller and will become primary controller of an own Z-Wave network. The connected new device (actuator) can be controlled using the two buttons left (Button 1 = up/on/open, Button 3 = down/off/closed).

After the first action you can further manage (add/remove more devices when primary; wakeup; reset to default) and configure the KFOB using the management mode. To activate this **management mode push all four buttons for one second simultaneously** (green blinks slowly). The buttons will have different functions then.

The device is battery-operated and can be mounted on every flat and dry surface.

Product Description

The KFOB remote controller is a 4 button Z-Wave device capable to act both as primary or secondary controller. The four buttons **can control other Z-Wave devices such as switches, dimmer and even door locks directly**. Various options – configurable by Z-Wave configuration commands – define the actions and the commands used for this control. It is possible to use two sets of buttons (one for on/open/up and one for off/closed/down) or four single buttons to control four different groups of devices.

The KFOB controller also allows **triggering scenes in a central controller**. Again different modes can be configured to adapt to the various implementations of scenes in different central controllers in the market. Control options also include special modes like „all on/off“ or always controlling the Z-Wave device in proximity to the controller.

The **device supports secure communication** when included with enhanced security option and when communicating to a device also supporting enhanced security option. Otherwise the device will automatically turn into normal communication to maintain backward compatibility.

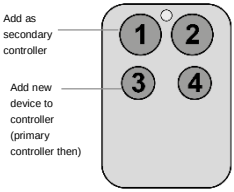
Installation Guidelines

The device comes ready to use with a battery already installed.

For battery change the device needs to be opened by removing the three little screws on the backside of the device. Use a screwdriver or any other usable device to gently push out the battery as shown on the picture. During reassembly watch the position of the white rubber and make sure the silver buttons fi t exactly into the nipples of the rubber.

The device can be operated in two different modes. These modes are activated with the first configuration action after factory default:

1. Pushing **Button 1 for one sec.** (red/green blink) adds the KFOB to an existing network as **secondary controller**.
    - The four buttons will send **activate 4 different scenes** (Central Scene Command) in the central gateway (For this a Z-Wave control center is required. In an existing Z-Wave network the KFOB is able to control up to 4 different scenes with its four buttons.)
2. Pushing **Button 3 for one sec.** (green blink) turns the KFOB into inclusion status and a Z-Wave actuator can be added to the wireless network. Consult the manual of the new device how to start the inclusion process (e.g. pushing local inclusion button three times).
    - The KFOB can even control devices without a central controller and will become **primary controller** of an own Z-Wave network. The connected new device (actuator) can be controlled using the two buttons left (Button 1 = up/on/open, Button 3 = down/off/closed).



When the KFOB is primary controller the very first device included will be automatically put into button group A (left buttons 1 and 3) and the command set will change according to the rules just mentioned. All other devices need to be put in button groups manually.

Management Mode

After the first action you can further manage (add/remove more devices when primary; wakeup; reset to default) and configure the KFOB using the management mode. To activate this **management mode push all four buttons for one second simultaneously** (green blinks slowly). The buttons will have different functions:

When in **Secondary Controller Mode:**

- Push **Button 1**: Start Learn Mode. This allows to be removed or re-added from/to a network
- Push **Button 2**: Manually wakeup the device and issue a ‘Node Information Frame’
- Push **Button 3 followed by Button 4 for 5 Seconds**: Reset to Factory Defaults

When in **Primary Controller Mode:**

- Push **Button 2**: Manually wakeup the device and issue a ‘Node Information Frame’
- Push **Button 3**: Activate Primary controller mode. After this you must select the action as primary controller with another short click on one of the buttons:
    - **Button 1**: Start inclusion of a Z-Wave device
    - **Button 2**: Start forced-unsecure inclusion

- **Button 3**: Start exclusion of a Z-Wave device (Consult the manual of the new device how to start the exclusion process.)*
- **Button 4**: Start handover of primary controller role to different controller
- **Button 4 for 5 seconds**: Reset to factory defaults

- Pushing **Button 4**: Here you can assign wireless actuators to the button control group A (left pair) or group B (right pair):
  - Once you clicked button 4 select the button pair you wish the new device being controlled (group A: either button 1 or button 3; group B: either button 2 or button 4). Then issue a Node Information Frame of the device you have already included and you want to control with the selected button group.

***** Removing a device from the network means that it is turned back into factory default status. This process can also exclude devices from its previous network.

Attention: For convenience reasons some special short cut apply IF and **only IF the KFOB is the primary controller of the network: The first device included into a button group will define the commands sent** out by this group regardless of the default value of the configuration parameters 11-14. If the device is a door lock the button group will turn into door lock control (value=7). For dimmers and motor controls the value changes into Multilevel Switch Control (value=1). All other devices will turn the button group into Basic Control (value=2). All configuration values can be changed if needed.

Shift primary role to a different controller

The device can hand over its primary role to another controller and become secondary controller. Turn into management mode by pressing all four buttons for 1 second. The green LED will start blinking slowly. Now hit button 3 to activate the primary controller functions. The green LED will blink faster. Now hit button 4 to turn the controller into primary shift mode. Consult the manual of the new device how to start the primary shift process for the new primary controller.

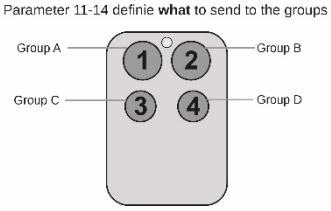
Advanced Configuration for Advanced Users

The function of the KFOB can be further enhanced by changing configuration options: Using the configuration parameters 1 and 2 you can change the number of control groups for direct control of actuators (e.g. adapter plug or lamp). Please refer to the description of the configuration parameters for details.

The configuration parameters 11…14 allow changing commands the controller will send out on button press. With this it's possible e.g. to issue scene trigger when in primary mode or direct control of device when in secondary mode. Furthermore the value 5 on the parameters allows changing the device into a configuration where it supports old legacy gateway not able to handle the Central Scene Triggering Commands yet.

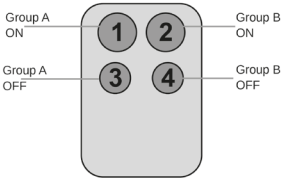
Note: If you fear you got lost in changing configuration parameters just perform a reset to factory default.

Button Modes



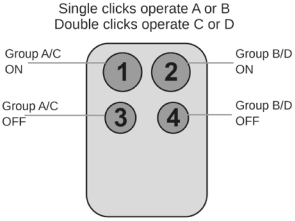
4 Groups are controlled with single button (parameter 1/2 = 0)

The four buttons 1-4 control one single control group each: 1→A, 2→B, 3→C, 4→D. Single click turns devices in the control group on, double click turns them off. Click and hold can be used for dimming.



2 Groups are controlled with two buttons (parameter 1/2 = 1)

The buttons 1 and 3 control the control group A (button 1 turns on, button 3 turns off), the buttons 2 and 4 control the control group B (button 2 turns on, button 4 turns off). In case dimmers are controlled, holding down the larger button will dim up, holding down the smaller button will dim down the load. Releasing the button will stop the dimming function.



4 Groups are controlled with two buttons and double click (parameter 1/2 = 2)

This mode enhances the previous mode and allows to control two further control groups C and D using double clicks. The devices supports 8 different operating modes – this means the kind of commands sent out when pushing a button. Operating modes either directly control other devices or they issue various scene activation commands to a central controller.

The device supports 8 different operating modes – this means the kind of commands sent out when pushing a button. Operating modes either directly control other devices or they issue various scene activation commands to a central controller.

Operating modes for direct device control are:

- **Direct control of associated devices with On/Off/Dim commands (parameter 11...14 = 1).** Devices are controlled using Basic Set On/Off commands and Switch-Multilevel Dim Start/Stop. This mode implements communication pattern 7**.
- **Direct control of associated devices with only On/Off commands (parameter 11...14 = 2).** Devices are controlled using only Basic Set On/Off commands. On dimming Up event On is sent, on dimming Down Off is sent. This mode also implements communication pattern 7**.
- **Switch-All commands (parameter 11...14 = 3).** In this mode all neighboring devices will receive Switch-All set On/Off command and interpret it according to their membership in Switch-All groups. This mode implements communication pattern 7**.
- **Direct control of devices in proximity (parameter 11...14 = 6).** Basic Set and Switch-Multilevel Dim commands are sent to a device in proximity (50...100 cm) from the controller. Attention: In case there are more than one Z-Wave devices nearby all these devices may be switched. For this reason the proximity function should be handled with care. This mode implements communication pattern 7**.
- **Door lock control (parameter 11...14 = 7).** This mode allows direct control (open/close) of electronic door locks using secure communication. The mode implements communication pattern 7**.

Operating modes for scene activation are:

- **Direct activation of preconfigured scenes (parameter 11...14 = 5).** Associated devices in an association group are controlled by individual commands defined by Z-Wave command class „Scene Controller Configuration“. This mode enhances mode direct control of associated devices with On/Off/Dim commands and implements communication patterns 6 and 7**. Please turn the button mode to „separate“ to allow different a scene ID on every button.
- **Scene activation in IP gateway (parameter 11...14 = 4).** If configured correctly the buttons can trigger a scene in a gateway. The scene number triggered 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 will issue scene triggers, scene 11 (button 1 click, event on), scene 12 (button double click 1, event off, single button control is used in this example)

- **Activation of central scenes (parameter 11...14 = 8, default).** Z-Wave Plus introduces a new process for scene activation – the central scene control. Pushing a button and releasing a button send a certain command to the central controller using the lifeline association group. This allows reacting both on button push and button release. This mode implements communication patterns 6 but requires a central gateway supporting Z-Wave Plus.

**Communication pattern 7: Remote controls control actuators; Communication pattern 6: Remote controls cause events in a static controller, which can be uses for scene control for example

Attention: The KFOB is designed for the modern Z-Wave Plus style scene activation using "Central Scene Command". If you want to support the legacy controllers such as VERA you need to reconfigure it for this. Please go to www.z-wave.info/service **to find the appropriate tutorials.**

Factory Reset

The device can be set back to factory defaults without performing an exclusion process. Please execute the following steps:

1. Turn the device into management mode
2. Click on button 3
3. Keep button 4 pushed for 5 seconds. For first 5 seconds the green LED will blink, then it turns into long-red/short-green blinking until reset is complete.

Please use this procedure only if the device is secondary controller and the primary controller is missing or otherwise inoperable.

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**. 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 controller's 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.

Please check the instructions in the quick start section how to include and exclude the device from a network.

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 within 5 seconds. The unlock-state will last for 5 seconds.

Wake Up 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 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't 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 wake up regularly and announce the wake up state by sending out a so-called **Wake Up Notification.** The controller can then empty the mailbox. Therefore, the device needs to be configured with the desired wake up

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 wake up interval is a tradeoff between maximal battery life time and the desired responses of the device.

The device will stay awake right after inclusion for 10 seconds allowing the controller to perform certain configuration. It is possible to manually wake up the device by pushing button 2 in management mode. The minimum allowed wake up time is 240s but it is strongly recommended to define a much longer interval since the only purpose of a wake up should be the reporting of the battery status or an update of the child protection settings. The device has a periodic wake up function however this function is disabled by the configuration parameter #25. This will protect the battery in case the controller is accidently configuring a wake up interval. A wake up of the KFOB outside the range of the controller will lead to lots of unsuccessful communication attempts draining the battery. Defining node ID of 0 as a destination of the Wake Up Notification will disable the periodical wake up function as well.

It is possible to set the node ID to 255 to send Wake Up 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 wake up.

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 are 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

1. Confirmation – Green, 1 second
2. Failure – Red, 1 second
3. Button press confirmation – Green, 1/4 second
4. Waiting for Network Management Mode selection – Slow green blinks
5. Waiting for group selection in Association Set Mode – Green fast blink
6. Waiting for primary controller function selection – Green fast blink
7. 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	Lifeline (max. nodes in group: 10)
2	Control Group A, controlled by button 1 or single clicks of buttons 1 and 3 (max. nodes in group: 10)
3	Control Group B, controlled by button 2 or single clicks of buttons 2 and 4 (max. nodes in group: 10)
4	Control Group C, controlled by button 3 or double clicks of buttons 1 and 3 (max. nodes in group: 10)
5	Control Group D, controlled by button 4 or double clicks of buttons 2 and 4 (max. nodes in group: 10)

Set and Unset Associations to Actuators

Associations can be assigned and remove either via Z-Wave commands or using the device itself. To control a Z-Wave device from the KFOB 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 KFOB 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 you like the Z-Wave actuator to be assigned with. After 10 sec. the device 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 KFOB. 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 KFOB 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.

Button 1 and 3 pair mode (Parameter Number 1, Size 1)

In separate mode button 1 works with Group A, button 3 with Group C. Click is ON, Hold is dimming UP, Double click is OFF, Click-Hold is dimming DOWN. In pair button 1/3 are UP/DOWN correspondingly. Click is ON/OFF, Hold is dimming UP/DOWN. Single clicks works with Group A, double click with Group C.

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

Button 2 and 4 pair mode (Parameter Number 2, Size 1)

In separate mode button 2 works with control group B, button 4 with control group D. Click is ON, Hold is dimming UP, Double click is OFF, Click-Hold is dimming DOWN. In pair button B/D are UP/DOWN correspondingly. Click is ON/OFF, Hold is dimming UP/DOWN. Single clicks works with Group B, double click with Group D.

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

Command to control Group A (Parameter Number 11, Size 1)

This parameter defines the command to be sent to devices of control group A when the related button is pressed.

Value	Description
0	Disable
1	Switch on/off and Dim (send Basic Set and Switch Multilevel)
2	Switch on/off only (send Basic Set)
3	Switch all
4	Send scenes
5	Send preconfigured scenes
6	Control devices in proximity
7	Control door lock
8	Central scene to gateway (default)

Command to control Group B (Parameter Number 12, Size 1)

This parameter defines the command to be sent to devices of control group B when the related button is pressed.

Value	Description
0	Disable
1	Switch on/off and Dim (send Basic Set and Switch Multilevel)
2	Switch on/off only (send Basic Set)
3	Switch all
4	Send scenes
5	Send preconfigured scenes
6	Control devices in proximity
7	Control door lock
8	Central scene to gateway (default)

Command to control Group C (Parameter Number 13, Size 1)
This parameter defines the command to be sent to devices of control group C when the related button is pressed.

Value	Description
0	Disable
1	Switch on/off and Dim (send Basic Set and Switch Multilevel)
2	Switch on/off only (send Basic Set)
3	Switch all
4	Send scenes
5	Send preconfigured scenes
6	Control devices in proximity
7	Control door lock
8	Central scene to gateway (default)

Command to control Group D (Parameter Number 14, Size 1)
This parameter defines the command to be sent to devices of control group D when the related button is pressed.

Value	Description
0	Disable
1	Switch on/off and Dim (send Basic Set and Switch Multilevel)
2	Switch on/off only (send Basic Set)
3	Switch all
4	Send scenes
5	Send preconfigured scenes
6	Control devices in proximity
7	Control door lock
8	Central scene to gateway (default)

Send the following switch all commands (Parameter Number 21, Size 1)

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

Invert buttons (Parameter Number 22, Size 1)

Value	Description
0	No (default)
1	Yes

Blocks wake up even when Wake Up Interval is set (Parameter Number 25, Size 1)
If the KFOB wakes up and there is no controller nearby, several unsuccessful communication attempts will drain battery.

Value	Description
0	Wake up is blocked (default)
1	Wake up is possible if configured accordingly

Send unsolicited battery report on Wake Up (Parameter Number 30, Size 1)
If the KFOB wakes up and there is no controller nearby, several unsuccessful communication attempts will drain battery.

Value	Description
0	No
1	To same node as Wake Up Notification (default)
2	Broadcast to neighbors

Technical Data

IP Rating	IP 20
Battery Type	1 * CR2032
Frequency	868.42 MHz
Wireless Range	Up to 100 m outside, on average up to 20 m inside buildings
Explorer Frame Support	Yes
Device Type	Portable Controller
Routing	No
FLiRS	No
Firmware Version	1.3
Battery Life	> 2 years

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.
- **Wake up Notification** is a special wireless message issued by a Z-Wave device to announce 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.

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 health and well-being.

Support

Should you encounter any problem, please give us an opportunity to address it before returning this product. Most questions regarding Z-Wave wireless communication standard can be answered through the international community at www.z-wave.info.

If your question can‘t be answered there, please use www.popp.eu/support or contact us by email: info@popp.eu

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