PHIEPAN04-1B

Relay Insert 2 * 1.5 KW with Power Meter

Firmware Version : 1.4

Quick Start

A This device is a Z-Wave Actor. Tripple Click the Button on the device confirms the inclusion, exclusion and association. After power up it will stay in auto inclusion mode for 4 minutes. To support handling of the device when already installed the external switch can be used for inclusion or exclusion for 3 minutes after power up.

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.
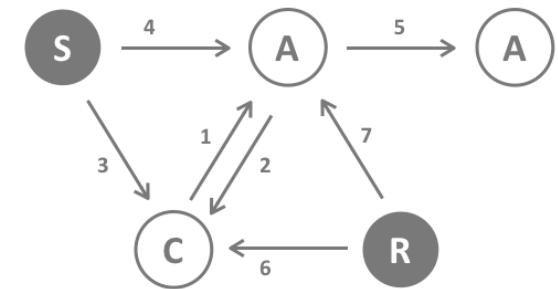
There are two different role a controller can have. There is always one single primary controller that is managing the network and including/excluding devices. The controller may have other functions - like control buttons - as well. All other controllers don't manage the network itself but can control 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

This Insert Switch allows controlling two independent loads both wirelessly via Z-Wave and locally utilizing a traditional wall switch. Thanks to its calibration technology the device cannot only be used to switch resistive devices but also works perfectly with many kind of reactive or resistive loads such as fluorescent lights or LEDs. This insert switch module has a power meter function and is able to measure instant power, voltage, current, power factor and accumulated power consumption. In addition to this, the device has an overload protection. The device is placed in a wall box right behind the normal switch. The switch is not longer directly connected to the load but acts as input device for the insert that is controlling the load. This device is designed for a 3 wire system and needs a neutral wire in the wall box.

Before Device is installed

Please read carefully the enclosed user manual before installation of the radio-actuator, in order to ensure an error-free functioning.

ATTENTION: only authorized technicians under consideration of the country-specific installation guidelines/norms may do works with 230 Volt mains power. Prior to the assembly of the product, the voltage network has to be switched off and ensured against re-switching.

The product is permitted only for proper use as specified in the user manual. Any kind of guarantee claim has to be forfeited if changes, modifications or painting are undertaken. The product must be checked for damages immediately after unpacking. In the case of damages, the product must not be

operated in any case. If a danger-free operation of the equipment cannot be assured, the voltage supply has to be interrupted immediately and the equipment has to be protected from unintended operation.

Installation Guidelines
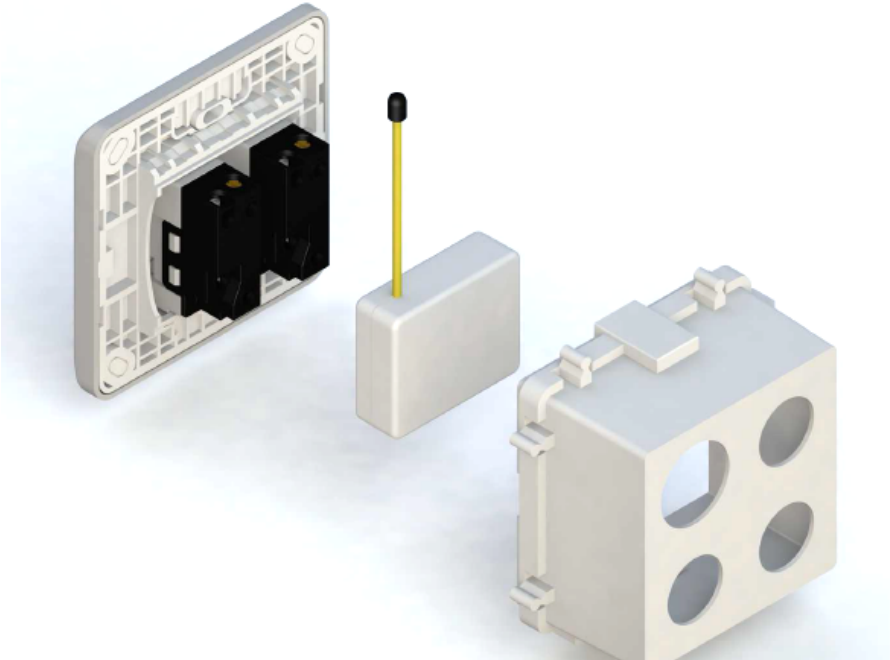
Put the in wall switch into a wall box and connect the pins as shown in the figure.
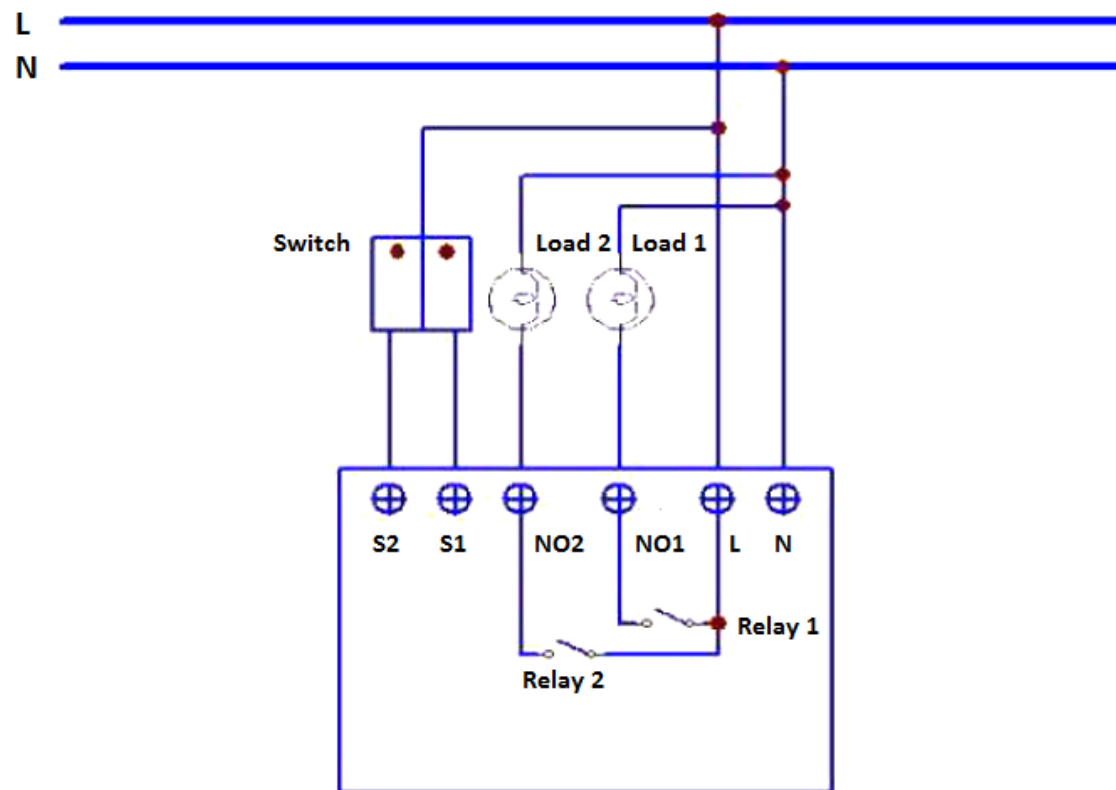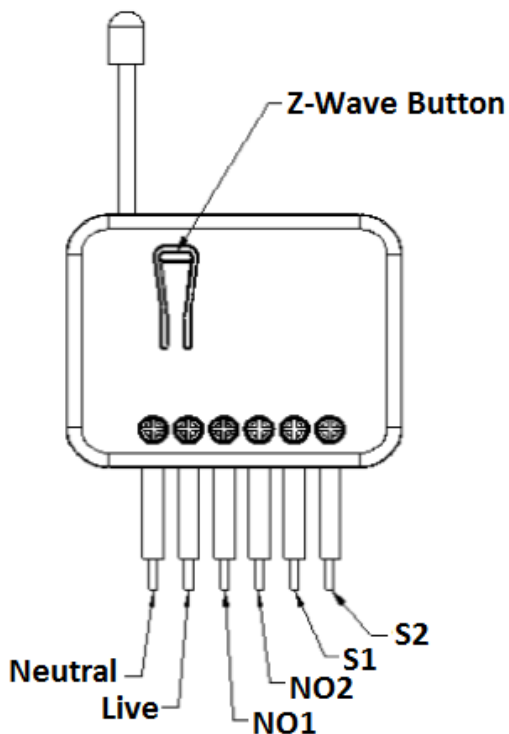
Behavior within the Z-Wave network

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.

Tripple Click the button on the device confirms inclusion and exclusion. After power up it will stay in auto inclusion mode for 4 minutes. To support

handling of the device when already installed the external switch can be used for inclusion or exclusion for 3 minutes after power up.

Operating the device

Manual Operation

The device can be operated suing the externally connected switch. Three different modes are supported:

*   **Edge Mode:** Die Position of the external switch determines the switching state of the relay. After a wireless switching command it may be needed to operate the switch twice to return to the direct relation of switch position and relay state. This mode is the factory default mode.
*   **Toogle Mode:** Each "ON"-Position of the external switch will toggle the state of the relays. This mode is particularly suited for mono-stable switches.
*   **Edge/Toggle-Mode:** Every change of the state of the external switch results in a change of the relay state.

Remote Operation

Remote On/Off control of the switch is possible with any Z-Wave controller. Further you can set associations to let your device controlled by other Z-Wave devices like sensors.

The switch is able to detect the current wattage (5 - 1500W) and overload wattage (1600 - 1700W) of connected loads. When detecting overload state, the switch will be disabled and the LED will flash quickly. Turning off and on of the power supply will reset from this state.

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.

Tripple Click the button on the device sends out 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

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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	Status-Update für Relais 1 and 2 and all Metering reports (max. nodes in group: 1)
2	Status-Update für Relais 1 and Metering reports (max. nodes in group: 1)
3	Status-Update für Relais 2 and Metering reports (max. nodes in group: 1)

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.

Watt Meter Report Period (Parameter Number 1, Parameter Size 2)
If the setting is configured for 1hour (set value =720), the PAN04 will report its instant power consumption every 1 hour to the node of correspond Group.

Value	Description
1 — 32767	Set time interval for device to send power consumption report, e.g. 720*5s=3600s=1 (Default 720)

KWH Meter Report Period (Parameter Number 2, Parameter Size 2)
If the setting is configured for 1hour (set value =6), the PAN04 will report its

Value	Description
1 — 32767	Set time interval for device to send accumulated power consumtion report, e.g. 6*10min= 1 hour. (Default 6)

Selected Relay (Parameter Number 3, Parameter Size 1)

If Controller not using Multi_Channel command class to access the relay of PAN04, you may configure the select value to react the Basic Command Class, Binary Switch Command Class or Meter Command Class V3.

Value	Description
1	1：Relay1
2	2：Relay2
3	3：Relay1 & Relay2 (Default)

Edge or Pulse mode or Edge-Toggle mode (Parameter Number 4, Parameter Size 1)

Manual switch S1 and S2 can set to Edge mode or Pulse mode or Edge-Toggle

Value	Description
1	1：Edge mode (Default)
2	2：Pulse mode
3	3：Edge-Toggle mode

Threshold of current for Load Caution (Parameter Number 5, Parameter Size 2)

This is a warning when the current of load over the preset threshold value, if the setting value is 750, when the load current of Relay1 or Relay2 over this value, PAN04 will send current meter report to the node of correspond Group, the Range of the setting value is from 10 to 750, and the default value is 750.

Value	Description
10 — 750	Define treshold, e.g. 750*0.01A = 7.5A. (Default 750)

Threshold of KWH for Load Caution (Parameter Number 6, Parameter Size 2)

This is a warning when the KWh of load over the preset threshold value, If the setting value is 10000, when the Accumulated Power Consumption of Relay1 or Relay2 over this value, PAN04 will send KWh Meter Report command to the node of correspond Group, minimum value is 1KWh and default value is 10000

Value	Description

1 — 1000	Define treshold.

Restore switch state mode (Parameter Number 7, Parameter Size 1)
Restores the switch state setting in case the device was disconnected from the power source.

Value	Description
0	0 : Switch off
1	1 : Last switch state (Default)
2	2 : Switch on

Auto off timer (Parameter Number 8, Parameter Size 2)
Whenever the device switches to on, the auto off timer begin to count down. After the timer decrease to zero, it will switch off automatically.

Value	Description
0	0 : Disable auto off function (Default)
1 — 32767	Define time interval for auto off function.

RF off command mode (Parameter Number 9, Parameter Size 1)
Whenever a switch off command, BASIC_SET 、BINARY_SWITCH_SET 、 SWITCH_ALL_OFF, is received, it could be interpreted as 4 kinds of commands.

Value	Description
0	0 : Switch off (Default)
1	1 : Ignore
2	2 : Switch toggle
3	3 : Switch on

Existence of Endpoint 3 (Parameter Number 10, Parameter Size 1)

Multi-Channel Command is a good way to control relay1 and relay2 of PAN04 individually. The endpoint3 of PAN04 is related to both relay1 and relay2. In some condition it becomes redundant in Multi-Channel Command Class.

Value	Description
1	1 : Endpoint3 exist (Default)
2	2 : No Endpoint3

Command Classes

Supported Command Classes

- Basic (version 1)

- Binary Switch (version 1)

- All Switch (version 1)

- Scene Activation (version 1)

- Scene Actuator Configuration (version 1)

- Meter (version 3)

- Association Group Information (version 1)

- Device Reset Locally (version 1)

- Z-Wave Plus Information (version 2)

- Multi Channel (version 3)

- Configuration (version 1)

- Alarm (version 1)

- Manufacturer Specific (version 2)

- Powerlevel (version 1)

- Protection (version 2)

- Firmware Update Meta Data (version 2)

- Association (version 2)

- Version (version 2)

Technical Data

IP Rating	IP20
Explorer Frame Support	No
SDK	
Device Type	Slave with routing capabilities
Generic Device Class	Binary Switch
Specific Device Class	Binary Power Switch
Routing	Yes
FLiRS	No
Firmware Version	1.4

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 does not contain hazardous chemicals.

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.

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