



Philio Tech

Smart energy plug in switch

SKU: PHIEPAN16-1



Quickstart

This is a **secure On/Off Power Switch for Europe**. To run this device please connect it to your mains power supply. 1. Put your Z-Wave controller into inclusion mode by following the instructions provided by the controller manufacturer. 2. Pressing On/Off button three times within 2 seconds will enter inclusion mode.

Important safety information

Please read this manual carefully. Failure to follow the recommendations in this manual may be dangerous or may violate the law. The manufacturer, importer, distributor and seller shall not be liable for any loss or damage resulting from failure to comply with the instructions in this manual or any other material. Use this equipment only for its intended purpose. Follow the disposal instructions. Do not dispose of electronic equipment or batteries in a fire or near open heat sources.

What is Z-Wave?

Z-Wave is the international wireless protocol for communication in the Smart Home. This device is suited for use in the region mentioned in the Quickstart section.

Z-Wave ensures a reliable communication by reconfirming every message (**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.

This device and every other certified Z-Wave device can be **used together with any other certified Z-Wave device regardless of brand and origin** as long as both are suited for the same frequency range.

If a device supports **secure communication** it will communicate with other devices secure as long as this device provides the same or a higher level of security. Otherwise it will automatically turn into a lower level of security to maintain backward compatibility.

For more information about Z-Wave technology, devices, white papers etc. please refer to www.z-wave.info.



Product Description

This plug-in ON/OFF switch PAN16 is a security enabled Z-Wave Plus product, based on Z-Wave Plus technology. The device will enable security mode automatically if the controller supports security mode, too. Z-Wave Plus™ enabled devices displaying the Z-Wave Plus™ logo can also be used with it regardless of the manufacturer, and can also be used in other manufacturer's Z-Wave™ enabled networks. Remote On/Off control of the connected load is possible with other manufacturer's wireless Controller. Each switch is designed to act as a repeater. Repeaters will re-transmit the RF signal to ensure that the signal is received at its intended destination by routing the signal around obstacles and radio dead spots. Because PAN16 supports Security Command Class, it can learn with a Security enabled Z-Wave controller to fully utilize the device. Its functionality and supported command classes is identical when included as a secure and non-secure device. This plug-in ON/OFF switch is able to detect instance wattage (3000W/230VAC) (13Ampere) and overload current (14.5A with resistive load) of connected lights and appliances. When detecting overload state, the Switch will be disabled and its On/Off button will be locked out of which LED will flash quickly. However, unplugging and reconnecting the switch will reset its overload condition to normal status.

Adding to Z-Wave™ Network

In the front casing, there is an On/Off button with LED indicator which is used to toggle switch on and off or carry out inclusion, exclusion, reset or association. When first power is applied, its LED flashes on and off alternately and repeatedly at 0.5 second intervals. It implies that it has not been assigned a node ID and start auto inclusion.

Auto Inclusion

The function of auto inclusion will be executed as long as the switch does not have Node ID and just plug the switch into a wall outlet.

Note: Auto inclusion timeout is 2 minute during which the node information of explorer frame will be emitted once several seconds. Unlike "inclusion" function shown in the table below, the execution of auto inclusion is free from pressing the On/Off button on the Switch.

Prepare for Installation / Reset

Please read the user manual before installing the product.

In order to include (add) a Z-Wave device to a network it **must be in factory default state**. Please make sure to reset the device into factory default. You can do by performing an Exclusion operation as described below in the manual. Every Z-Wave controller is able to perform this operation however it is recommended to the primary controller of the previous network to make sure the very device is excluded properly from this network.

Reset to factory default

This device also allows to be reset without any involvement of a Z-Wave controller. This procedure should only be used when the primary controller is inoperable

1. Pressing On/Off button three times within 2 seconds will enter inclusion mode.
2. Within 1 second, press On/Off button again for 5 seconds.
3. IDs are excluded.

Safety Warning for Mains Powered Devices

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

Installation

1. Plug this On/Off Switch into a wall outlet near the load to be controlled.
2. Plug the load into the Switch. Make sure the load to be controlled cannot exceed 13A.
3. Press the button or switch on the load to the ON position.
4. To manually turn ON the Switch, press and release the On/Off button. The LED will turn ON, and the load plugged into the Switch will also turn ON.
5. To manually turn OFF the Switch, simply press and release the On/Off button. The LED will turn OFF and the load plugged into the Switch will also turn OFF.

Inclusion/Exclusion

On factory default the device does not belong to any Z-Wave network. The device needs to be **added to an existing wireless network** to communicate with the devices of this network. This process is called **Inclusion**.

Devices can also be removed from a network. This process is called **Exclusion**. Both processes are initiated by the primary controller of the Z-Wave network. The controller is turned into exclusion respective inclusion mode. Inclusion and Exclusion is then performed doing a special manual action right on the device.

Inclusion

Pressing On/Off button three times within 2 seconds will enter inclusion mode.

Exclusion

Pressing On/Off button three times within 2 seconds will enter exclusion mode.

Product Usage

1. Do not locate the Switch facing direct sunlight, humid or dusty place.
2. The suitable ambient temperature for the Switch is 0°C~40°C.
3. Do not locate the Switch where exists combustible substances or any source of heat, e.g. fires, radiators, boiler etc.
4. After putting it into use, the body of Switch will become a little bit hot of which phenomenon is normal.



Quick trouble shooting

Here are a few hints for network installation if things don't work as expected.

1. Make sure a device is in factory reset state before including. In doubt exclude before include.
2. If inclusion still fails, check if both devices use the same frequency.
3. Remove all dead devices from associations. Otherwise you will see severe delays.
4. Never use sleeping battery devices without a central controller.
5. Don't poll FLIRS devices.

6. Make sure to have enough mains powered device to benefit from the meshing

Association - one device controls another device

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 all 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 the same wireless command, typically a 'Basic Set' Command.

Association Groups:

Group Number	Maximum Nodes	Description
1	1	Z-Wave Plus Lifeline

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 configuring 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 a two byte value the same logic applies: Values greater than 32768 may be needed to be given as negative values too.

Parameter 1: Watt Meter Report Period

If the setting is configured for 1 hour (set value =720), the PAN16 will report its instant power consumption every 1 hour to Group1 node. The maximum interval to report its instant power consumption is 45 hours (5s*32767/3600=45hr).

Size: 2 Byte, Default Value: 720

Setting	Description
1 - 32767	720*5s=3600s=1 hour

Parameter 2: KWH Meter Report Period

If the setting is configured for 1 hour (set value =6), the PAN16 will report its Accumulated Power Consumption (KW/h) every 1 hour to Group1 node. The maximum interval to report its Accumulated Power Consumption (KW/h) is 227.55 days (10min*32767/1440=227.55 days).

Size: 2 Byte, Default Value: 6

Setting	Description
1 - 32767	6*10min=1 hour

Parameter 3: Threshold of current for Load Caution

This is a warning when the current of load over the preset threshold value, if the setting value is 1300, when the load current of Relay1 over this value, PAN16 will current meter report to warn the Group1 node, the Range of the setting value is from 10 to 1300, and the default value is 1300.

Size: 2 Byte, Default Value: 1300

Setting	Description
10 - 1300	1300*0.01A = 13A

Parameter 4: Threshold of KWh for Load Caution

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 over value, PAN16 will send KWH meter report to warn the Group1 node, minimum value is 1KWh and default value is 10000 kWh.

Size: 2 Byte, Default Value: 10000

Setting	Description
1 - 10000	10000*1KWH=10000KWH

Parameter 5: Restore switch state mode

Whenever the AC power return from lost, PAN16 will restore the switch state which could be SWITCH OFF (LAST SWITCH STATE) SWITCH ON. The default setting is LAST SWITCH STATE.

Size: 1 Byte, Default Value: 1

Setting	Description
0	Switch off
1	Last switch state
2	Switch on

Parameter 6: Mode of switch off function

When the mode of switch On/Off is set to 0, any command of switch off will be disabled and the On/Off function of include button will be disabled. The default set enable mode. When manual On/Off function is disabled, the RF command can only switch On but not Off. This is useful function for keeping the device in switch state.

Size: 1 Byte, Default Value: 1

Setting	Description
0	0 : Disable
1	1 : Enable

Parameter 7: LED indication mode

1. Show Switch State When switch is on, LED is on. When switch is off, LED is off. The default setting is Show Switch State. 2. Show Night mode - When switch is on, LED is off. When switch is off, LED is on. 3. One Flash mode When the state of switch changes, LED will be on only one second, then LED keeps off.

Size: 1 Byte, Default Value: 1

Setting	Description
1	Show switch state
2	Show night mode
3	One flash mode

Parameter 8: Auto off timer

Whenever PAN16 switches to on, the auto off timer begin to count down. After the timer decrease to zero, it will switch to off automatically. However if Auto off timer set as 0, the auto off function will be disabled. The default setting is 0.

Size: 2 Byte, Default Value: 0

Setting	Description
0	Disable auto off function
1 - 32767	1s ~ 32767s

Parameter 9: RF off command mode

Whenever a switch off command, BASIC_SET, BINARY_SWITCH_SET, SWITCH_ALL_OFF, is received, it could be interpreted as 4 variety of commands. 1. Switch Off switches to OFF state. The default setting is Switch Off. 2. Ignore The switch off command will be ignored. 3. Switch Toggle switches to the i of current state. 4. Switch On switches to ON state.

Size: 1 Byte, Default Value: 0

Setting	Description
0	Switch off
1	Ignore
2	Switch toggle
3	Switch on

Parameter 11: Manual Switch Report mode

Whenever PAN16 manually switch on or off, it will send BINARY_SWITCH_REPORT to the node of group1. The default setting is Enable the function.

Size: 1 Byte, Default Value: 1

Setting	Description
0	Disable
1	Enable

Parameter 12: Auto Report after Reset

Size: 1 Byte, Default Value: 1

Setting	Description
0	Disable
1	Enable

Parameter 13: Adjustable Overload

$1450 * 0,01A = 14,5A$

Size: 2 Byte, Default Value: 1450

Setting	Description
450 - 1450	steps 0,01A

Technical Data

Dimensions	0.0510000x0.0750000x0.0790000 mm
Weight	105 gr
Hardware Platform	ZM5202
EAN	4713698572471
IP Class	IP 20
Voltage	230
Load	3000 W
Device Type	On/Off Power Switch
Network Operation	Always On Slave
Z-Wave Version	6.51.09
Certification ID	ZC10-16105251
Z-Wave Product Id	0x013C.0x0001.0x0029
Color	White
Electric Load Type	Electronic with/without DimmingIncandescentFluorescent (Non-Dimming)LED
Supported Meter Type	Electric Energy
Switch Type	Push Button
Firmware Updatable	Updatable by Consumer by RF
Frequency	Europe - 868,4 Mhz
Maximum transmission power	5 mW

Supported Command Classes

- Alarm
- Switch All
- Association Grp Info
- Association V2
- Basic
- Configuration
- Device Reset Locally
- Firmware Update Md V2
- Manufacturer Specific V2
- Meter V3
- Powerlevel
- Protection V2
- Security
- Switch Binary
- Version V2

- Zwaveplus Info V2

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 adding 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 announce that it is able to communicate.
- **Node Information Frame** — is a special wireless message issued by a Z-Wave device to announce its capabilities and functions.

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