PAD02   Z-Wave Smart Dimmer Socket

Introduction

PAD02 is an E27(EU)/ E26(US) Edison screw based lamp socket, which provides electrical connection to the E14(EU)/ E12(US) Edison screw based lamps and support it in the lighting fixture. The use of socket allows lamps to be safely and conveniently replaced. You can On/Off the light by pressing the button briefly, or a long pressing to control the brightness of dimmable lighbulb.

This dimmer is a transceiver which is a security enabled device which based on Z-Wave Plus technology. 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 dim level control of the connected light is possible with other manufacturer's wireless Controller.

Since PAD02 supports Security Command Class, it can learn with a Secured enabled controller to fully utilize the device. Its functionality and supported command classes is identical when included as a secure and non-secure device.

Warning:

1. Plug out to disconnect from power supply; Do not plug in line.

2. For continued protection against risk of electric, replace only with same type and rating of fuse.

3. Do not connect any appliances other than luminary products.

4. Do not connect any appliances to this remote controlled lampholder which are radiating heat and may cause ignition or burning of surrounding materials (for example radiation heaters, portable heaters, portable floodlights, desk lamps, etc).

5. Take into consideration that connected appliances might be moved by pets, cleaning staff or other persons who are not aware of the remote control functions.

6. The connection/installation of this product should be in a suitable area with the remote controlled lampholder easily readable and accessible for disconnection actions.

Specification

Operating Voltage	220/ 230/ 240VAC 50/60Hz for EU 120VAC 60Hz for US
Maximum Load (Wattage)	Max. 15 W Type B (for incandescent lamps)
	Max.9W Type Dimmable SBLED
Fuse information	Built-in High Breaking Capacity Current Fuse Protection. Rated: 1.25A; 250V Built-in Thermal Cut-off Fuses Protection. Rated Temperature: 125℃; Rated: 2A 250V
Screw lampholder Type:	EU type: E27 to E14; **PAD02-1**
	US type: E26 to E12; **PAD02-2**
Range	Minimum 40m indoor 100m outdoor line of sight
Location	Indoor used
Operating Temperature	0℃ to 40℃
Frequency Range	868.40MHz & 869.85MHz/ EU (PAD02-1); 908.4MHz & 916.0MHz/ USA (PAD02-2);
RF Maximum Power	+5dBm
FCCID	RHHPAD02

** Specifications are subject to change and improvement without notice.

Troubleshooting

Symptom	Cause of Failure	Recommendation
The dimmer does not work and LED off	1.The dimmer is not plugged into the electrical outlet properly 2.The dimmer break down	1. Check power connections 2. Don't open up the dimmer and send it for repair.
The dimmer LED illuminating, but cannot control the ON/OFF dimmer of the attached load	Check if the load plugged into the dimmer has its own ON/OFF switch	Set the ON/OFF switch of the attached load to ON.
The dimmer LED illuminating, but the detector cannot control the dimmer	1. Not carry out association 2. Same frequency interference	1. Carry out association 2. Wait for a while to re-try

Screw lampholder Type:

Since the socket type for each country in Europe varies, refer to the outline for each socket suited for each country as follows:

EU TYPE: PAD02-1

US TYPE: PAD02-2

Note: Please make sure that the intensity of the screw lampholder of the electrical device must be Maximum Load (Watt) and have same head as the enclosed screw lampholder before inserting to the socket.

Product Overview

On/off Button, Learn key and
Dimmer key (dimmer on status)

For Instruction to http:// www.philio-tech.com

Adding to Z- Wave™ Network

In the front casing, there is an on/off button with LED indicator below which is used to switch on and off, dim level, or carries out add, remove, 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 dimmer does not have Node ID and just connect the dimmer to main power.

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

The table below lists an operation summary of basic Z-Wave functions. Please refer to the instructions for your Z- Wave™ certificated primary controller to access the setup function, and to Add/Remove/Associate devices

Function	Description	Annotation
No node ID	The Z-Wave Controller does not allocate a node ID to the Switch.	LED 2-second on, 2-second off
Add (Inclusion)	1. Put your Z-Wave controller into inclusion mode by following the instructions provided by the controller manufacturer.	
	2. Pressing Include button of PAD02 three times within 2 seconds will enter inclusion mode.	
Remove (Exclusion)	1. Put your Z-Wave controller into exclusion mode by following the instructions provided by the controller manufacturer.	

	2. Pressing Include button of PAD02 three times within 2 seconds will enter exclusion mode.	
	3. Node ID has been excluded.	0.5s On, 0.5s Off (Enter auto inclusion)
Reset	1. Pressing Include button of PAD02 three times within 2 seconds will enter inclusion mode.	Use this procedure only in the event that the primary controller is lost or otherwise inoperable.
	2. Within 1 second, press Include button of PAD02 again for 5 seconds.	
	3. Node IDs are excluded.	0.5s On, 0.5s Off (Enter auto inclusion)
Association	1. The PAD02 is an always listening Z-Wave device, so associations may be added or removed by a controller at any time. Or If your controller requires to have the PAD02 send a 'node information frame' or NIF for associations, then pressing the On/Off button three times within 2 seconds will cause the PAD02 to send its NIF.	
	2. There are only two groups for the switch.	

※Adding a node ID allocated by Z-Wave Controller means inclusion. Removing a node
  ID allocated by Z-Wave Controller means exclusion.

※Failed or success in including/excluding the node ID can be viewed from the Z-Wave
  Controller.

LED Indication
To distinguish what mode the switch is in, view from the LED for identification.

State Type	LED Indication
Normal	Whenever we switch On and off of the PAD02 by On/Off button or RF command, the LED will lights up when switch on; whereas LED off when switch off.
No node ID	Under normal operation, when the dimmer has not been allocated a node ID, the LED flashes on and off alternately at 2-second intervals. By pressing On/Off button, it will stop flashing temporarily.
Learning	When PAD02 is in learning mode, LED flashes on and off alternately

and repeatedly at 0.5 second intervals.

Manual dim level control:
To manually switch on the light, press and release the On/Off button shortly when the light is off. The light will dim from off to the level which was set before switch off. To manually switch off the light, press and release the On/Off button shortly when the light is on. To adjust the dim level, press and hold the On/Off button until the desired dim level is achieved, then release.

Programming :
1. Basic Command Class / Multilevel Switch Command Class
   The dim level can be set by BASIC and MULTILEVEL SWITCH commands.
   1-1 BASIC_GET
      Upon receipt of the following commands from a Z-Wave Controller, the dimmer
      will report its dim level to the node inquired.

Basic Get Command: **[Command Class Basic, Basic Get]**
Basic Report Command: Report OFF: **[Command Class Basic, Basic Report, Value = 0]** Report ON:**[Command Class Basic, Basic Report, Value = 1~99]**

   1-2 BASIC_SET
      Upon receipt of the following commands from a Z-Wave Controller, the dimmer
      will be set to the dim level.

Basic Set Command:**[Command Class Basic, Basic Set, Value = 1~99]**: the light attached to the dimmer turns on.
Basic Set Command:**[Command Class Basic, Basic Set, Value = 0]**: the light attached to the dimmer turns off.

   1-3 MULTILEVEL SWITCH GET
      Upon receipt of the following commands from a Z-Wave Controller, the dimmer will
      report its dim level to the node inquired.

Multilevel Switch Get Command: **[Command Class Multilevel Switch, Multilevel**

Switch Get]

Multilevel Switch Report Command:

Report OFF: **[Command Class Multilevel Switch, Multilevel Switch Report, Value = 0]**

Report ON:**[Command Class Multilevel Switch, Multilevel Switch Report, Value = 1~99]**

1-2 **Multilevel Switch SET**

Upon receipt of the following commands from a Z-Wave Controller, the dimmer

will be set to the dim level.

Multilevel Switch Set Command: **[Command Class Multilevel Switch, Multilevel Switch Set, Value = 1~99, Duration = 0~255]**: the light attached to the dimmer turns on.

Multilevel Switch Set Command: **[Command Class Multilevel Switch, Multilevel Switch Set, Value = 0, Duration = 0~255]**: the light attached to the dimmer turns off.

2. **Z-Wave's Group**

2-1 Group1 Lifeline: (Maximum 5 nodes)

The dimmer can be set to send reports to associated Z-Wave devices. It supports

one association group with one node support for Grouping 1. For group 1, the dimmer

will report ALARM_REPORT 、DEVICE_RESET_LOCALLY_NOTIFICATION and

MULTILEVEL_SWITCH_REPORT.

2-1-1 Overload alarm report

When PAD02 detects overload, it will send Alarm Report to group 1 node. After

detecting overload state and sending this alarm report, PAD02 will turn off the light

automatically and lockout the On/Off button. The only thing to do is unplug PAD02

and reduce the load. Then re-plug PAD02 and it will work again.

The content of Alarm Report

Alarm report command: [Command_Class_Alarm, Alarm_Report, Alarm Type = 0x08, Alarm Level = 0xFF]

2-1-2 Device reset locally notification:

When PAD02 is reset manually, it will send a DEVICE_RESET_LOCALLY_

NOTIFICATION to the nodes of group 1.

2-1-3 Multilevel switch report:

Whenever the level of PAD02 is changed, it will send a

MULTILEVEL_SWITCH_ REPORT to the nodes of group 1.

Multilevel Switch Report Command:

Report OFF: [Command Class Multilevel Switch, Multilevel Switch Report, Value = 0]

Report ON:[Command Class Multilevel Switch, Multilevel Switch Report, Value = 1~99]

2-2 Group 2 Control_key1: (Maximum 5 nodes)

When the On/Off status changes or the dim level is achieved manually, it will send

BASIC_SET command to group 2 nodes to make them unanimous.

Basic Set Command:

Dimmer Off:[Command Class Basic, Basic Set, Value = 0]

Dimmer On:[Command Class Basic, Basic Set, Value = 1~99]

3. **Z-Wave's Configuration**

Configuration Parameter	Function	Size (Byte)	Value	Unit	Default	Description
1	Dimmer Level Report mode	1	0-1		1	0 : Disable 1 : Enable
2	LED indication mode	1	1-3		1	1 : Show dimmer state 2 : Show night mode 3 : One flash mode
4	Restore dimmer state	1	0-2		1	0 : Dimmer off 1 : Last dimmer state 2 : Dimmer on

3-1 Dimmer level report mode:

Whenever dimmer on/off state changes, it will send MULTILEVEL_SWITCH_

REPORT to the nodes of group1. The default setting is Enable the function.

3-2 LED indication mode:

    3-2-1 Show dimmer State：When dimmer is on, LED is on. When dimmer is off, LED is off. The default setting is Show dimmer State.

    3-2-2 Show Night mode：When dimmer is on, LED is off. When dimmer is off, LED is on.

    3-2-3 One flash mode:　When dimmer on/off state changes, LED will light on one second and then off.

3-3 Restore dimmer state:

 Whenever the AC power return from lost, PAD02 will restore the switch state which could be Dimmer off、Last dimmer state、Dimmer on. The default setting is Last dimmer state.

4. **Firmware update over the air (OTA)**

    PAD02 is based on 500 series SoC and supports Firmware Update Command Class, it can receives the updated firmware image sent by controller via the Z-wave RF media. It is a helpful and convenient way to improve some function if needed.

5. **Command Classes**

The Switch supports Command Classes including…
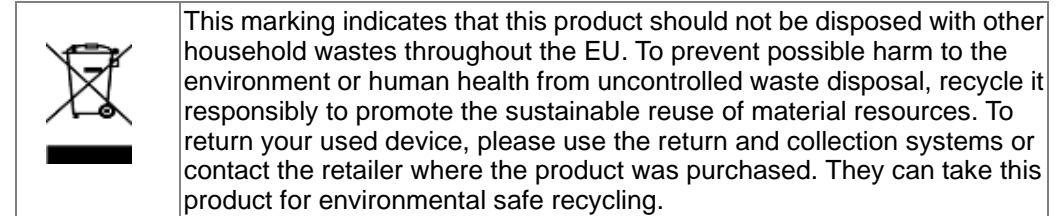* COMMAND_CLASS_ZWAVEPLUS_INFO
* COMMAND_CLASS_VERSION_V2
* COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2
* COMMAND_CLASS_SECURITY
* COMMAND_CLASS_DEVICE_RESET_LOCALLY
* COMMAND_CLASS_ASSOCIATION_V2
* COMMAND_CLASS_ASSOCIATION_GRP_INFO
* COMMAND_CLASS_POWERLEVEL
* COMMAND_CLASS_BASIC
* COMMAND_CLASS_SWITCH_MULTILEVEL_V2
* COMMAND_CLASS_CONFIGURATION
* COMMAND_CLASS_ALARM
* COMMAND_CLASS_FIRMWARE_UPDATE_MD_V2
* COMMAND_CLASS_SCENE_ACTIVATION
* COMMAND_CLASS_SCENE_ACTUATOR_CONF

Choosing a Suitable Location

1. Do not locate the dimmer facing direct sunlight, humid or dusty place.

2. The suitable ambient temperature for the dimmer is 0℃~40℃.

3. Do not locate the dimmer where exists combustible substances or any source of heat, e.g. fires, radiators, boiler etc.

4. After putting it into use, the body of dimmer will become a little bit hot of which phenomenon is normal.

Disposal

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

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FCC Interference Statement

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 of the following measures:

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and receiver.

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

警語:

「取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。」