Air Live®
Powered by OvisLink Corp.

SD-102

Smart Dimmer Socket

User Manual

www.airlive.com

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This product contains some codes from GPL. In compliance with GPL agreement, AirLive will publish the GPL codes on our website. Please go to www.airlive.com and go to the "Support->GPL" menu to download source code.

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.

Warning

1. Plug out to disconnect from power supply; Do not plug in line.
2. Do not exceed the max rating.

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.

Table of Contents

1 Overview

SD-102 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 lightbulb.
This dimmer is a transceiver which is a security enabled device which based on Z-Wave Plus technology, and it is fully compatible with any Z-Wave™ enabled network. Since SD-102 supports Security Command Class, it can learn with Secured controller. Its functionality and supported command classes is identical when included as a secure and non-secure device.

1.1 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 or carries out inclusion, exclusion, reset or association.
When first power 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.

1.2 Auto Inclusion

The function of auto inclusion will be executed as long as the dimmer does not have Node ID and just connect the switch 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 any Z-Wave™ Certificated Primary Controller to access the Setup function, and to include/exclude/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)	Put your Z-Wave controller into inclusion mode by following the instructions provided by the controller manufacturer.	One press one flash LED
	Pressing Include button of SD-102 three times within 2 seconds will enter inclusion mode.	
Remove (Exclusion)	Put your Z-Wave controller into exclusion mode by following the instructions provided by the controller manufacturer.	One press one flash LED
	Pressing Include button of SD-102 three times within 2 seconds will enter exclusion mode.	
	Node ID has been excluded.	0.5s On, 0.5s Off (Enter auto inclusion)
Reset	Pressing Include button of SD-102 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.
	Within 1 second, press Include button of SD-102 again for 5 seconds.	
	IDs are excluded.	0.5s On, 0.5s Off (Enter auto inclusion)

Association	The SD-102 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 SD-102 send a 'node information frame' or NIF for associations, then pressing the On/Off button three times within 2 seconds will cause the SD-102 to send its NIF.	
	There is only one group for the dimmer.	
● 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.		

1.3 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 SD-102 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 Switch 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 SD-102 is in learning mode, LED flashes on and off alternately and repeatedly at 0.5 second intervals.

1.4 Choosing a Suitable Location

1. Do not locate the dimmer 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 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.

1.5 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.

1.6 Programming

1.6.1. Basic Command Class / Multilevel Switch Command Class

The dim level can be set by BASIC and MULTILEVEL SWITCH commands.

1.6.1.1. 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]**

1.6.1.2. 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.

1.6.1.3. 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]**

1.6.1.4. MULTILEVEL SWITCH GET

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.

1.6.2. Z-Wave's Group (Maximum 1 node)

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 and DEVICE_RESET_LOCALLY_NOTIFICATION.

1.6.2.1. Overload alarm report

When SD-102 detects overload, it will send Alarm Report to group 1 node. After de- tecting overload state and sending this alarm report, SD-102 will turn off the light automatically and lockout the On/Off button. The only thing to do is unplug SD-102 and reduce the load. Then replug SD-102 and it will work again.

The content of Alarm Report

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

1.6.3. Z-Wave's Configuration

Configuration Parameter	Function	Size (Byte)	Value	Unit	Default	Description

1	Mode of Switch Off function	1	0-1		1	0: Disable 1: Enable
2	LED indication mode	1	1-2		1	1: Show switch state 2: Show night mode
3	Auto off timer	2	0-0x7FFF	1s	0	0: Disable auto off function 1-0x7FFF: 1s~32767s
4	RF off command mode	1	0-3		0	0: Switch off 1: Ignore 2: Switch toggle 3: Switch on

1.6.3.1. 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 setting is enable mode.

1.6.3.2. 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.

1.6.3.3. Auto off timer

Whenever PAN15 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 is set as 0, the auto off function will be disabled. The default setting is 0.

1.6.3.4. 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：It switches to OFF state. The default setting is Switch Off.
2. Ignore：The switch off command will be ignored.
3. Switch Toggle：It switches to the inverse of current state.

4. Switch On：It switches to ON state.

1.7 Firmware Update Over the Air (OTA)

SD-102 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.

1.8 Command Class

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

1.9 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: SD-102-1

US Type: SD-102-2

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

1.10 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 state of the load attached	1. Check if the load plugged into the dimmer has its own ON/OFF switch. 2. The dimmer is protected.	1. Set the ON/OFF switch of the load attached to ON 2. Unprotected the switch or follow the instruction of protection.
The dimmer LED illuminating, but the Detector cannot control the Switch	1. Not carry out association 2. Same frequency interference	1. Carry out association 2. Wait for a while to re-try

1.11 Specification

Operating Voltage	100-240Vac / 50Hz-60Hz
Maximum Load (Ampere)	1A (Resistive load)
Maximum Load (Ampere)	0.1A (Dimmable LED bulbs)
Screw lampholder type	EU type: E27 to E14
	US type: E26 to E12
Range	Minimum 40 m in door 100m outdoor line of sight
Frequency Range	868.40MHz & 869.85MHz/ EU (SD-102-EU); 908.4MHz & 916.0MHz/ USA (SD-102-US);
Operating Temperature	0°C ~ 40°C

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

OvisLink Corp.,
http://www.airlive.com/
TEL: +886 2 2218 6888
FAX: +886 2 2918 6988