AirLive
Powered by OvisLink Corp.

SD-103

RGBW Controller

User Manual

Copyright & Disclaimer

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

The SD-103 RGBW Controller is a universal, Z-Wave compatible RGB / RGBW controller. The RGBW Controller uses PWM output signal, which enables it to control LED, RGB, RGBW strips, and Halogen lights. Controlled devices may be powered by 12 or 24 VDC. All IN and OUT terminals can be configured for LED control. Control the brightness of your LED strip or change the Colour via the SmartLife Plus APP.

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^{TM} enabled network. Since SD-103 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 controller.

The table below lists an operation summary of basic Z-Wave functions. Please refer to the instructions for your any Z-Wave^TM 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-103 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-103 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-103 for more than 10 seconds.	Use this procedure only in the event that the primary controller is lost or otherwise inoperable.
	The device is Excluded and restores to factory default setting.	
	Then the device will be in auto-inclusion mode for 2 minutes.	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-103 send a 'node information frame' or NIF for associations, then pressing the On/Off button three times within 2 seconds will cause the SD-103 to send its NIF.	
	There is only one group for the controller.	

● 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.

Status	LED Indication
Red & Green Blinking by turns	The device is not included in a Z-Wave network.
Solid Green	The device is included in a Z-Wave network.
Green Blinking	The device is in auto inclusion mode.

1.4 Choosing a Suitable Location

1. Do not locate the controller 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 Device Installation

To install the SD-103 RGBW Controller please follow the following instructions.

1.   Prepare the following items:
-   RGBW strip (12V or 24V)   x1
-   Stranded wire   x5
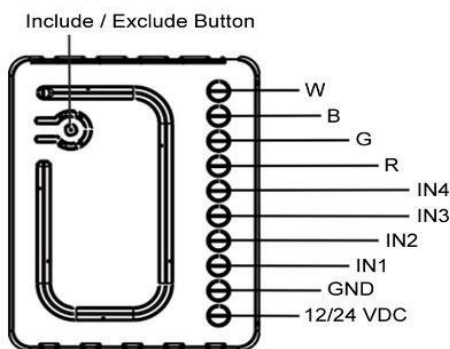-   Power adapter   x1

2.   Terminals Description.

Figure 1. Terminals Description

12/24VDC - Power supply signal	IN4 - Switch Input 4
GND - Power supply ground signal	R - Output assigned to IN1
IN1 - Switch Input 1	G - Output assigned to IN2
IN2 - Switch Input 2	B - Output assigned to IN3
IN3 - Switch Input 3	W - Output assigned to IN4

Glossary of terms
Include/Exclude Button - Inclusion/exclusion,
press 3 times in 2 seconds

3.   Connect to the R.G.B.W. Color LED Dimmer according to Figure 2, or Figure 3.
You can also only connect a RGBW strip and no switches. Then the control will be via the AirLive SmartLife Plus app only.
-   First, connect to RGBW strip with output channel(R, G, B, W)
-   Second, connect to the power supply.

If the device is properly connected, the RGBW strip will blink once. Note that the device must be powered by a dedicated stabilized power adapter.
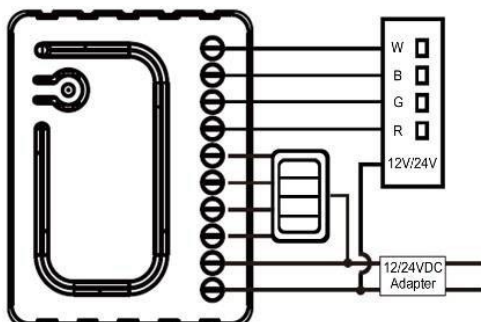

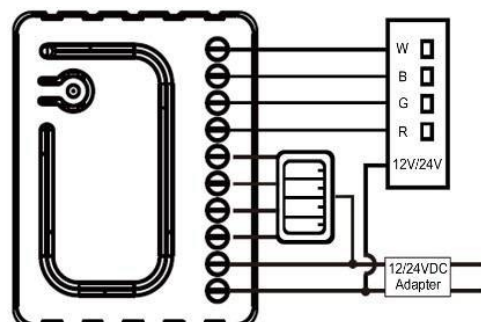Figure 2. Connecting toggle switch

Figure 3. Connecting momentary switch

4. According to the Figure 4, you can use the 18AWG copper wire and conductive connector to extend the connection of the power supply.
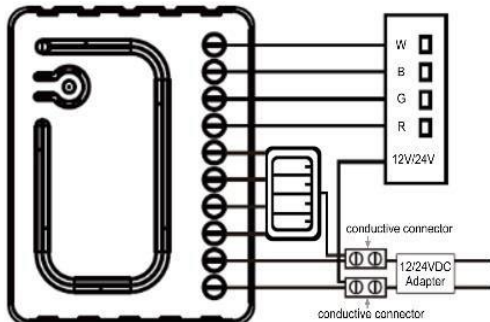

Figure 4. Connecting conductive connector

5. Please pull out the antenna and keep it at 90 degree to enhance the RF signals.

6. Support remote exclusion: Through configuration setting. Please refer to the following table.

Parameter	Size	Value
0XF0	1 byte	1

Warning!

1) The RGBW Controller is suggested to operate in low voltage circuits of 12VDC or 24VDC. Connecting to higher voltage load may result in the RGBW Controller damage.

Please refer to the following table.

Current of RGBW Strip	Stranded Wire
High Current	18 AWG
Low Current	22 AWG

2) The RGBW Controller must be powered by the same voltage as the connected light source. I.e. when controlling 12V LED strip, the module must be connected to 12V power supply. Similarly, when controlling 24V RGBW strip, the RGBW Controller must be powered by 24V voltage supply.

3)   The RGBW Controller must be powered by 12VDC or 24 VDC stabilized power supply with outputs load capacity matching to loads voltage.

4)   In case of connecting long RGBW/RGB LED strips voltage drops may occur, resulting in lower light brightness further from R/G/B/W outputs. To eliminate this effect it's recommended to connect few shorter strips in parallel connection instead of one long strip connected serially. Maximum recommended wire length, used to connect R/G/B/W outputs with a RGBW or RGB LED strip is 5 m. Observe connected loads manufacturer recommendations towards connection wire diameter.

5)   For connection of IN1~IN4, it is suggested to connect the 4 inputs individually to the same type of device. The devices can be as follows: the momentary switch, the toggle switch, or the toggle with memory switch.

Hardware Connection:

1.   Prepare the following items:
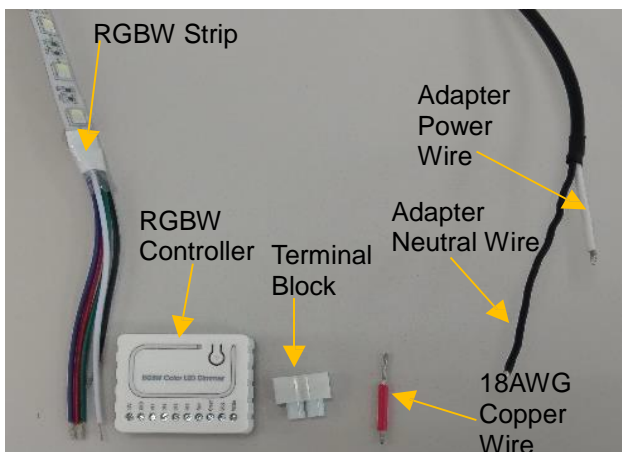
2.   Connect Adapter Power Wire and RGBW Strip Power Wire and 18 AWG Copper Wire with Terminal Block then connect to RGBW Controller (12V) and connect Adapter Neutral Wire to RGBW Controller.
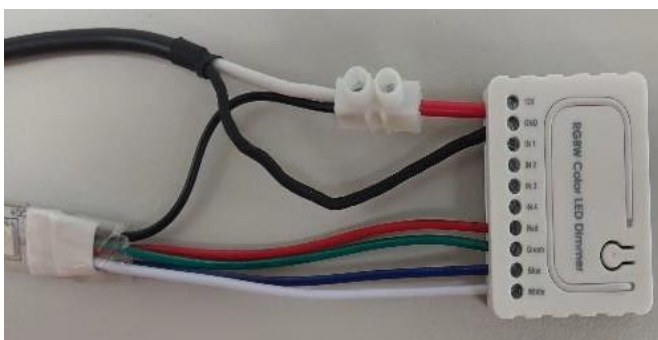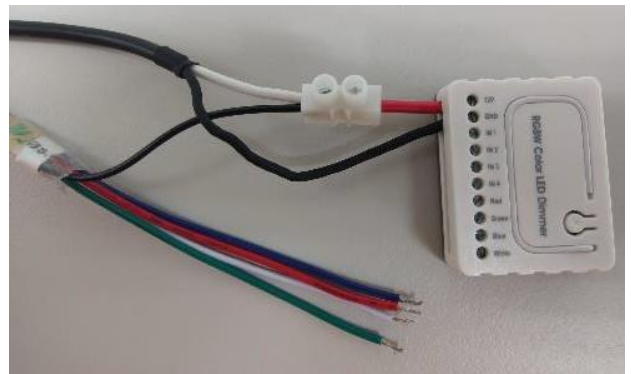
3.   Connect RGBW Strip color wire to RGBW Controller

1.6 Command Class Information.

Multilevel Switch Device Information
GENERIC_TYPE_SWITCH_MULTILEVEL
SPECIFIC_TYPE_POWER_SWITCH_MULTILEVEL

Multilevel Switch Command Class
COMMAND_CLASS_ZWAVEPLUS_INFO_V2
COMMAND_CLASS_VERSION_V2
COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2
COMMAND_CLASS_DEVICE_RESET_LOCALLY_V1
COMMAND_CLASS_POWERLEVEL_V1
COMMAND_CLASS_BASIC_V1
COMMAND_CLASS_SWITCH_MULTILEVEL_V2
COMMAND_CLASS_COLOR_CONTROL_V2
COMMAND_CLASS_CONFIGURATION_V1
COMMAND_CLASS_ASSOCIATION_V2
COMMAND_CLASS_ASSOCIATION_GRP_INFO_V1
COMMAND_CLASS_SWITCH_BINARY_V2
COMMAND_CLASS_FIRMWARE_UPDATE_MD_V2

Detailed description of each command class
- ZWAVEPLUS INFO command class
The Z-Wave Plus Info Get Command is used to get additional information of the Z-Wave Plus device in question.

- VERSION command class
The user can enquire the version of the unit using VERSION_GET command. It will return VERSION_REPORT Command. Version Report Command:
[Command Class Version, Version Report, Z-Wave Library Type, Z-Wave Protocol Version, Z-Wave Protocol Sub Version, Application Version, Application Sub Version]

- MANUFACTURER SPECIFIC command class
The user can use the Manufacturer Specific Get Command to request manufacturer specific information from another node. Manufacturer Specific Report Command:
[Command Class Manufacturer Specific, Manufacturer ID 1, Manufacturer ID 2, Product Type ID 1, Product Type ID 2, Product ID 1, Product ID 2]

● DEVICE RESET LOCALLY command class

The Device Reset Locally Command Class is used to notify central controllers that a Z-Wave device is resetting its network specific parameters.

● BASIC command class

The device will be turned ON or OFF after receiving the BASIC_SET command.

To be turned on:

[Command Class Basic, Basic Set, Basic Value = 0x01~0x63 in percentage; FF set to last value]

To be closed:

[Command Class Basic, Basic Set, Basic Value = 0x00]

● SWITCH MULTILEVEL command class

The device will be turned ON or OFF after receiving the SWITCH_ MULTILEVEL_SET command.

To be turned on:

[Command Class Multilevel, Multilevel Set, Basic Value = 0x01~0x63 in percentage; FF set to last value]

To be closed:

[Command Class Multilevel, Multilevel Set, Basic Value = 0x00]

● COLOR CONTROL command class

This class is used for Color setting.

See the following table for configuration variables:

Capability ID	Color	State Level
0 (0x00)	Warm White	0x00-0xFF
2 (0x02)	Red	0x00-0xFF
3 (0x03)	Green	0x00-0xFF
4 (0x04)	Blue	0x00-0xFF

● CONFIGURATION command class

This class is used for setting certain vendor specific configuration variables. See the following table for configuration variables:

Configuration Parameter	Function	Size (Byte)	Value	Default	Description
1 (0X01)	Input IN1	1	1-9	1	1: NORMAL mode - momentary switch type 2: NORMAL mode - toggle switch type 3: NORMAL mode - toggle with memory switch type 4: BRIGHTNESS mode - momentary switch type 5: BRIGHTNESS mode - toggle switch type 6: BRIGHTNESS mode - toggle with memory switch type 7: SCENE mode - momentary switch type 8: SCENE mode - toggle switch type 9: SCENE mode - toggle with memory switch type
2 (0X02)	Input IN2	1	1-9	1	Same as Parameter 1
3 (0X03)	Input IN3	1	1-9	1	Same as Parameter 1
4 (0X04)	Input IN4	1	1-9	1	Same as Parameter 1
5 (0X05)	Auto Scene Mode Set	1	0-6	1	0: Scene OFF 1: Ocean 2: Lightning 3: Rainbow 4: Snow 5: Sun 6: Dancing

6 (0X06)	Auto Scene Mode Duration	2	1-127 1001-1127	3	Adjust Scene delay time: 1: When value is 1-127, the delay duration is 1 sec to 127 sec. 2: When value is 1001-1127, the delay duration is from 1 min to 127 min. Note: This parameter has no effect on Lighting and Dancing Scene.
7 (0X07)	Memorize Device Status at Power Cut	1	0-1	1	0: Device does not memorize its status at power cut. Load is disconnected 1: Device memorizes its status at the power cut. Load will be set to the status before power cut.
10 (0X0A)	MAX Dimming Value	1	2-99	99	2-99 = 2 % – 99 %
11 (0X0B)	MIN Dimming Value	1	1-98	1	1-98 = 1 % – 98 %
12 (0X0C)	Dimming Time (Soft ON/ OFF)	1	5-25	10	Default value 10 = 1 s, 5 – 25 = from 0.5 to 2.5 seconds
13 (0X0D)	Dimming Time When Key Pressed	1	1-127	3	Default value 3 = 3 s, 1 – 127 =from 1 to 127 seconds
14 (0X0E)	4 Dimmers Mode	1	0-3	0	0: 4 Dimmers mode disabled 1: 4 Dimmers mode enabled – momentary switch type 2: 4 Dimmers mode enabled – toggle switch type 3: 4 Dimmers mode

					enabled – toggle with memory switch type Note 1: If the parameter no.14 is enabled, parameter no.1,2,3,4 has no effect. Note 2: If the device is not used with the Gateway, you will need to exclude the device from the other controller and then include the device again when switching 4 Dimmer mode is enabled or disabled.

- **ASSOCIATION command class**

The device can be set 1 auto-report ID in Group 1.

The device will send BASIC_REPORT to device associated in Group 1 when correspond Device is activated.

- **ASSOCIATION GRP INFO command class**

The device will report the Lifeline group information.

- **SWITCH_BINARY command class**

The device will be turned ON or OFF after receiving the SWITCH_BINARY command.

To be turned on:

[Command Class SWITCH_BINARY, Set, Value = 0x01~0x63 in percentage; FF set to last value]

To be closed:

[Command Class SWITCH_BINARY, Set, Basic Value = 0x00]

- **FIRMWARE UPDATE META DATA command class**

Support OTA (On-The-Air) firmware update function.

1.7 Firmware Update Over the Air (OTA)

SD-103 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_V2
COMMAND_CLASS_VERSION_V2
COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2
COMMAND_CLASS_DEVICE_RESET_LOCALLY_V1
COMMAND_CLASS_POWERLEVEL_V1
COMMAND_CLASS_BASIC_V1
COMMAND_CLASS_SWITCH_MULTILEVEL_V2
COMMAND_CLASS_COLOR_CONTROL_V2
COMMAND_CLASS_CONFIGURATION_V1
COMMAND_CLASS_ASSOCIATION_V2
COMMAND_CLASS_ASSOCIATION_GRP_INFO_V1
COMMAND_CLASS_SWITCH_BINARY_V2
COMMAND_CLASS_FIRMWARE_UPDATE_MD_V2

1.9 External Switch Operation.

Input Operating Mode	Switch Type	Key Operation	Action
Normal	Momentary	Fast Press	Single output Turn ON (last dimming value) / Turn OFF
		Fast Double Click	Single output Turn ON (MAX dimming value)
		Press and Hold (more than 1 second)	Single output increase or decrease brightness
	Toggle	Switch Position	Single output Turn ON (MAX dimming value) / Turn OFF
	Toggle with Memory	Position1=>Position2	Single output Turn ON (MAX dimming value)
		Position2=>Position1	Single output Turn OFF

Brightness	Momentary	Fast Press	4 outputs simultaneously Turn ON (last dimming value) / Turn OFF
		Fast Double Click	4 outputs simultaneously Turn ON (MAX dimming value)
		Press and Hold (more than 1 second)	4 outputs simultaneously increase or decrease brightness
	Toggle	Switch Position	4 outputs simultaneously Turn ON (MAX dimming value) / Turn OFF
	Toggle with Memory	Position1=>Position2	4 outputs simultaneously Turn ON (MAX dimming value)
		Position2=>Position1	4 outputs simultaneously Turn OFF
Scene	Momentary	Fast Press	Turn ON the last scene or default scene / Turn OFF
		Press and Hold (more than 1 second)	Changing the scene
	Toggle	Switch Position	Turn ON the last scene or default scene / Turn OFF
	Toggle with Memory	Position1=>Position2	Turn ON the last scene or default scene
		Position2=>Position1	Turn OFF
4 Dimmers	Momentary	Fast Press	Single output Turn ON (last dimming value) / Turn OFF
		Fast Double Click	Single output Turn ON (MAX dimming value)
		Press and Hold (more than 1 second)	Single output increase or decrease brightness
	Toggle	Switch Position	Single output Turn ON (MAX dimming value) / Turn OFF
	Toggle with Memory	Position1=>Position2	Single output Turn ON (MAX dimming value)
		Position2=>Position1	Single output Turn OFF

1.10 Troubleshooting

Symptom	Cause of Failure	Recommendation
The dimmer does not work and LED off	1.The dimmer is not using the correct voltage. 2.The dimmer break down	1. Check power connections 2. Don't open up the dimmer and send it for repair.
Cannot control the RGBW colours	1. Not carry out association 2. Same frequency interference	1. Carry out association 2. Wait for a while to re-try

1.11 Specification

Specification	
Model	SD-103 Smart Home RGBW Controller SD-103
Z-Wave Standard	Z-wave Plus
Z-Wave Frequency	CE: 868.40MHz,869.85MHz FCC: 908.40MHz,916.00MHz
Maximum transmission distance	30M indoor use
Rated output power	1. Combined 13A (sum of all connected output channels)
	2. 7A for single output channel *When four output channels are all connected, it is suggested to use 3.25A for each output channel.
Supply Voltage	12V / 24V DC
Max load (e.g.halogen bulbs)	At 12V - 156W combined
	At 24V - 312W combined
Electricity consumption	12V / 0.48W ; 24V / 0.72W
LED Indicator	1 Red/Green LED
Button	Inclusion /Exclusion
Dimension and Environment	
Dimensions	40.5 x 32 x 14.5mm
Operation Temperature	0~40℃
Storage Temperature	-20~70℃

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

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