



FIB_FGRGB-101 RGB Module

Firmware Version : 22.22

Quick Start

A This device is a Z-Wave Actuator. Triple click the B-button or any switch connected to I1-I4 inputs confirms Inclusion or Exclusion. The device turns into autoinclusion mode when powered up the first time.

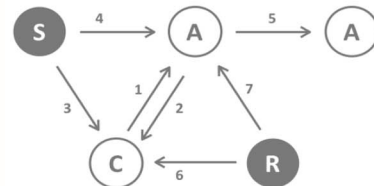
Please refer to the chapters below for detailed information about all aspects of the products usage.

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

The Fibar RGBW Module allows controlling 4-color LED strips via Z-Wave wirelessly and locally utilizing a traditional wall switch. Beside the traditional RGB channels it also supports an additional white light channel, which allows adding pastel to the colour scheme. 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 an input device for the Fibar insert that is controlling the load. The solution works with all switch designs or potentiometers with or without neutral position as long as there is enough space in the wall box behind the switch. The device is just 15 mm height. The available space depends on the size of the traditional switch, the dimensions of the wall box and the amount of additional cabling placed in this box. The device must be powered by a 12 V external power supply.

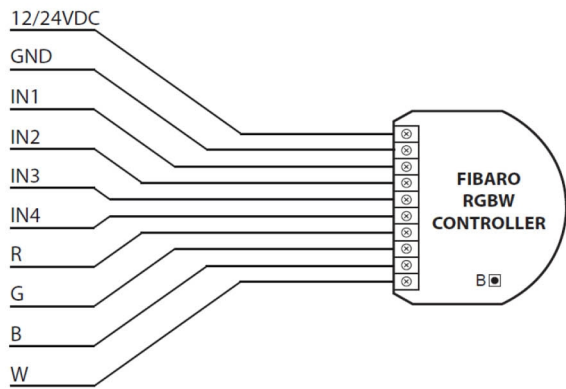
Before Device is installed

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

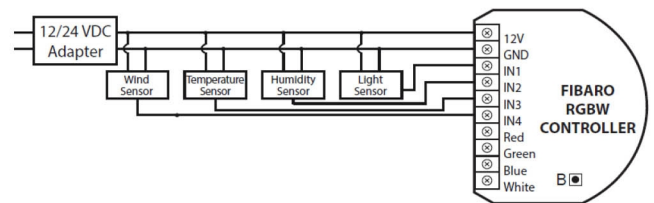
ATTENTION: only authorized technicians under consideration of the country-specific installation guidelines/norms may do works with 230 Volt mains power. Prior to the assembly of the product, the voltage network has to be switched off and ensured against re-switching.

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.

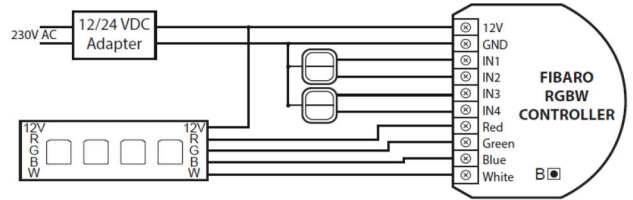
Installation Guidelines



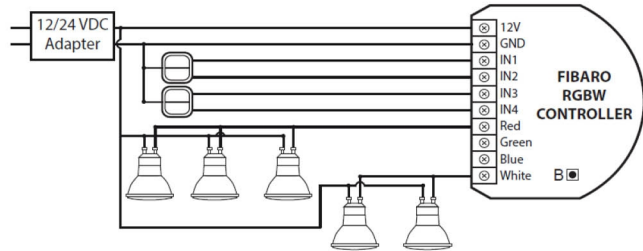
Terminals description



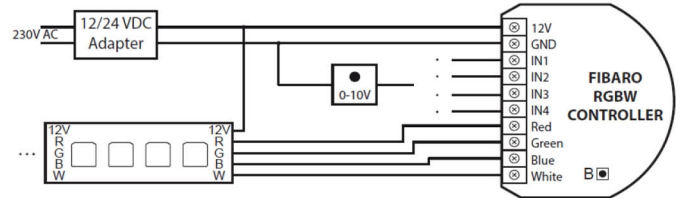
0-10V sensors wiring diagram



RGBW strip wiring diagram



Connecting halogen lighting



RGBW strip with 0-10V potentiometer wiring diagram

<p>DESCRIPTION</p> <p>12/24VDC - power supply signal GND - power supply ground signal IN1 - potential free / 0-10V input 1 IN2 - potential free / 0-10V input 2</p>	<p>IN3 - potential free / 0-10V input 3 IN4 - potential free / 0-10V input 4 R - output assigned to IN1 G - output assigned to IN2 B - output assigned to IN3 W - output assigned to IN4</p>
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1. Before installation ensure the voltage supply is disconnected.
2. Connect Fibaro RGBW Controller according to wiring diagram. First, connect outputs (R,G,B,W) RGB/RGBW/LED diodes or Halogen lights, or inputs (I1-I4). Second, connect voltage supply.
3. **The device must be powered by a dedicated stabilized power adapter (12V / 24V DC).**
4. Turn the voltage on.
5. Include the module into the Z-Wave network.

Note:

- Fibaro RGBW Controller is dedicated to operate in low voltage circuits of 12VDC or 24VDC. Connecting higher voltage load may result in Fibaro RGBW Controller damage.
- Fibaro RGBW Controller must be powered by the same voltage as the connected light source. I.e. if controlling 12V LED strip, the module must be connected to 12V power supply. Similarly, if controlling 24V RGBW strip, Fibaro RGBW Controller must be powered by 24V voltage supply.
- Fibaro RGBW Controller has 0-10V input. There is no 0-10V output. Output is controlled by PWM at 244Hz.
- Sensors using 0-10V interface use wire connection to inputs I1 - I4. Maximum length of 0-10V connection line is 10 m. Observe sensor's manufacturer recommendations towards 0-10V line diameter.
- 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 serial connection instead of one long strip connected parallel. Maximum recommended wire length, used to connect R/G/B/W outputs with a RGBW/RGB/LED strip is 10 m. Observe connected loads manufacturer recommendations towards connection wire diameter.

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.

For inclusion/exclusion of the device triple click the B-button or any switch connected to I1-I4 inputs. Further you can use the auto-inclusion mode by setting the Home Center controller into the inclusion mode and then connect voltage supply to auto-include Fibaro RGBW Controller.

Operating the device

The device may be controller by momentary or toggle switches. Fibaro RGBW Controller may serve as 0-10V input module and operate with any 0-10V sensor, e.g. temperature sensors, wind speed/direction sensors, air quality sensors, light sensors, etc.

Fibaro RGBW Controller offers fully configurable operating modes, user defined in parameter 14. Operating mode is set during first configuration in

Home Center 2 interface. Other main controllers require dedicated setting of parameter 14.

Fibaro RGBW Controller's operating modes:

RGB/RGBW MODE - controlling RGBW/RGB/LED strips or Halogen lights based on signals from switches connected to I1-I4 inputs. User may precisely set illumination colour.

Fibaro RGBW Controller has 4 controllable inputs I1-I4, configured by default to work with push buttons. Each input controls designated channel, i.e.:

- I1 controls R channel
- I2 controls G channel
- I3 controls B channel
- I4 controls W channel

Controlling I1-I4 inputs is achieved by connecting ground wire (GND) to specified channel (see scheme). Further, parameter's 14 settings allow for following type of manual control:

1. **NORMAL mode** - controlling output assigned to given input terminal. In this setting outputs will be controlled independently from one another, e.g. allowing for free adjusting each colours saturation. Double click will set a given channel's saturation to 100%. This operating mode works with momentary and toggle switches.
2. **BRIGHTNESS mode** - all outputs are controlled together, i.e. one switch controls brightness of all channels at the same time. This operating mode works with momentary and toggle switches.
3. **RAINBOW mode** - 3. mode - all outputs are controlled together giving a transition of full colours spectrum. RAINBOW mode works with momentary switches only.

IN/OUT MODE - all inputs and outputs may be freely configured by the user. All inputs I1 - I4 and outputs R, G, B, W may be independently configured by the user. Depending on configuration the device will be presented in Home Center 2 interface as sensors or dimmers. User defines sensor type and its operating range. If a given channel operates in OUT mode, user may control e.g. LED or Halogen lamp brightness.

Fibaro RGBW Controller has 4 controllable, analog inputs I1 - I4, allowing for 0-10V analog signal interpretation. This functionality may be used in operation with analog sensors and potentiometers. What's more, in IN/OUT mode all inputs and outputs may be configured independently, e.g. I1 may be configured as 0-10V sensor input and I2-I4 may control LED strip or Halogen lamps.

Another option is to configure I1 as 0-10V input and connect 0-10V potentiometer to it, and connecting Halogen lamps to R output. At the same time, other inputs may work with 0-10V sensors.

Current load and energy consumption:

Fibaro RGBW Controller allows for the current load and power consumption monitoring. Data is sent to the main controller.

Electric power - power consumed by an electric device in an instant, in Watts (W).

Electric energy - energy consumed by a device through a time period. Most commonly measured in kilowatt-hours (kWh). One kilowatt-hour is equal to one kilowatt of power consumed over a period of one hour, 1kWh = 1000 Wh.

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 **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	assigned to IN1 input - sends control frame to associated devices each time the device state changes (ON/OFF) (max. nodes in group: 5)
2	assigned to IN2 input - sends control frame to associated devices each time the device state changes (ON/OFF) (max. nodes in group: 5)
3	assigned to IN3 input - sends control frame to associated devices each time the device state changes (ON/OFF) (max. nodes in group: 5)
4	assigned to IN4 input - sends control frame to associated devices each time the device state changes (ON/OFF) (max. nodes in group: 5)
5	reports device status. Only one device may be assigned to this group, main controller by default (max. nodes in group: 1)

Set and unset associations to actuators

Associations can be assigned and remove either via Z-Wave commands or using the device itself.

SA

For association bring your controller in the association mode and triple click the B-button or any switch connected to I1-I4 inputs.

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.

ALL ON / ALL OFF function activation (Parameter Number 1, Parameter Size 1)

Activation/deactivation of ALL ON/ALL OFF functions

Value	Description
0	ALL ON inactive ALL OFF inactive
1	ALL ON inactive ALL OFF active
2	ALL ON active ALL OFF inactive
255	ALL ON active ALL OFF active (Default)

Associations command class choice (Parameter Number 6, Parameter Size 1)

Value	Description
0	Normal (Dimmer) - BASIC_SET/SWITCH_MULTILEVEL_START/STOP (Default)
1	Normal (RGBW) - COLOR_CONTROL_SET/START/STOP_STATE_CHANGE
2	Normal (RGBW) - COLOR_CONTROL_SET
3	Brightness - BASIC_SET/SWITCH_MULTILEVEL_START/STOP
4	Rainbow (RGBW) - COLOR_CONTROL_SET

Outputs state change mode (Parameter Number 8, Parameter Size 1)

MODE1, Example: change saturation level from 0% to 99%, Parameter 9: Step = 5, Parameter 10: Time between steps: 10ms.

Value	Description
0	MODE1 (related parameters: 9-step value, 10-time between steps) (Default)
1	MODE2 (related parameters: 11-time to change value, relevant for RGB/RGBW)

Step value (relevant for MODE1) (Parameter Number 9, Parameter Size 1)

Value	Description
1 — 255	step value (Default 1)

Time between steps (relevant for MODE1) (Parameter Number 10, Parameter Size 2)

MODE2, Example: change saturation level from 0% to 99%, Parameter 11: time for changing from start to end value = 500sec.

Value	Description
1 — 60000	1 ms (Default 10)

Time for changing from start to end value (Parameter Number 11, Parameter Size 1)

Default setting: 67 (3s)

Value	Description
0	immediate change
1 — 63	20-126 [ms] value*20ms
65 — 127	1-63 [s] (value-64)*1s (Default 67)
129 — 191	10-630 [s] (value-128)*10s
193 — 255	1-63 [min] (value-192)*1min

Maximum lighting level (Parameter Number 12, Parameter Size 1)

Value	Description
3 — 255	(Default 255)

Minimum lighting level (Parameter Number 13, Parameter Size 1)

The minimum level cannot be upper than maximum level.

Value	Description
1 — 255	(Default 2)

Inputs/Outputs configuration (Parameter Number 14, Parameter Size 2)

Default setting: 4369 Controlled device: RGBW, toggle switch inputs (NORMAL MODE). Each 4bit refer to given IN/OUT (channel) settings.

Value	Description
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Restore switch state after power cycle (Parameter Number 16, Parameter Size 1)

Defines if the switch should restore switch state to the last state prior to device power off (power cycle).

Value	Description
0	No, turn off
1	Yes (Default)

Alarm of any type (Parameter Number 30, Parameter Size 1)

General alarm, flood alarm, smoke alarm: CO, CO2, temperature alarm.

Value	Description
0	INACTIVE - the device doesn't respond to alarm frames (Default)
1	ALARM ON - the device turns on once alarm is detected (all channels set to 99%)
2	ALARM OFF - the device turns off once alarm is detected (all channels set to 0%)
3	ALARM PROGRAM - alarm sequence turns on (program selected in parameter 38)

Alarm sequence program (Parameter Number 38, Parameter Size 1)

1-10 specifies alarm program number

Value	Description
1 — 10	(Default 10)

Active PROGRAM alarm time (Parameter Number 39, Parameter Size 2)

Value	Description
1 — 65534	sec (Default 600)

Command class reporting Outputs status change (Parameter Number 42, Parameter Size 1)

Value	Description
0	Reporting as a result of inputs and controllers actions (SWITCH MULTILEVEL) (Default)
1	Reporting as a result of inputs actions (SWITCH MULTILEVEL)
2	Reporting as a result of inputs actions (COLOR CONTROL)

Reporting 0-10v analog inputs change threshold (Parameter Number 43, Parameter Size 1)

Parameter defines a value by which input voltage must change in order to be reported to the main controller. New value is calculated based on last reported value. 1-100 - (0.1-10V).

Value	Description
1 — 100	0.1V (Default 5)

Power load reporting frequency (Parameter Number 44, Parameter Size 2)

Time between reports. The report will be sent if last reported value differs from the current value, else reports will also be sent in case of polling.

Value	Description
0	Reports are not sent. Reports will only be sent in case of polling or at turning OFF the device.
1 — 65534	sec (Default 30)

Reporting changes in energy consumed by controlled devices. (Parameter Number 45, Parameter Size 1)

New reported energy value is calculated based on last reported value. 1 - 254 (0,01kWh - 2,54kWh), 10 = 0.1kWh.

Value	Description
0	changes in consumed energy will not be reported. Reports will be sent only in case of polling.
1 — 254	0.01kWh (Default 10)

Response to BRIGHTNESS set to 0% (Parameter Number 71, Parameter Size 1)

Value	Description
0	illumination colour set to white (all channels controlled together)

Starting animation programm (Parameter Number 72, Parameter Size 1)

Starting predefined program when device set to work in RGB/RGBW mode (parameter 14) - relevant for main controllers other than Home Center 2 only.

Value	Description
1 — 10	animation program number (Default 1)

Triple click action (Parameter Number 73, Parameter Size 1)

Value	Description
0	NODE INFO control frame is sent (Default)
1	starting favourite program

Command Classes

Supported Command Classes

- Multi Channel (version 3)
- Basic (version 1)
- Version (version 1)
- Multilevel Switch (version 1)
- All Switch (version 1)
- Manufacturer Specific (version 1)
- Configuration (version 1)
- Multilevel Sensor (version 2)
- Meter (version 2)
- Powerlevel (version 1)
- Firmware Update Meta Data (version 1)
- Association (version 2)

Technical Data

Power Supply	12V
Explorer Frame Support	Yes
SDK	4.54.02
Device Type	Slave with routing capabilities
Generic Device Class	Multilevel Switch
Specific Device Class	Multilevel Power Switch
Routing	Yes
FLiRS	No
Firmware Version	22.22

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 announces 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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