USER MANUAL **EN-US**

QUBINO MINI DIMMER

The Qubino Mini Dimmer is smaller than any other wireless dimmer in the world. Mini Dimmer is a MOSFET-switching light device that also supports control of low-voltage halogen lamps with electronic transformers, dimmable compact fluorescent lights, and dimmable LED bulbs. It can work with or without the neutral line (3 or 2-wire installation).

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1. About Qubino

Qubino is a family of innovative Z-Wave™ devices, many of them the smallest of their kind. Numerous breakthrough innovations, 100% quality control, and responsive customer service make Qubino the number one choice for making your life more comfortable.

Qubino enables you to transform – inexpensively and invisibly – any traditional electric device into a smart, connected one that you can control with your smart phone. Qubino devices are simple to install and use, but also extremely versatile - they offer a wealth of additional features and parameters for you to play with.

We love helping people who enjoy creating new ideas for their home and then using their hard work and skill to turn those ideas into reality. We admire their passion and resourcefulness. We do our best to supply you with products that will enable you to create a unique and special home for yourself. We innovate so that you can be free to make the smartest home possible. With just a touch of magic.

"Simple is smart." We believe it is smart to make complex things simple. But only when this means simple for our customers, not for ourselves. We think a lot so that you won't have to when it comes to installing or using our devices.

For more information visit: www.qubino.com

To find your nearest Qubino dealer visit: http://qubino.com/where-to-buy/

2. Support

Did you know that Qubino offers Z-Wave devices with 100% quality control guaranteed throughout the production process? Every single unit is tested and examined before being approved for sale – a truly unique pledge in the industry.

Why is this important?

Every device has a dedicated serial number and part number, which is assigned to the device only after it goes through a strict testing procedure.

Our support policy advises that every customer receives an answer within 24 hours during working days.

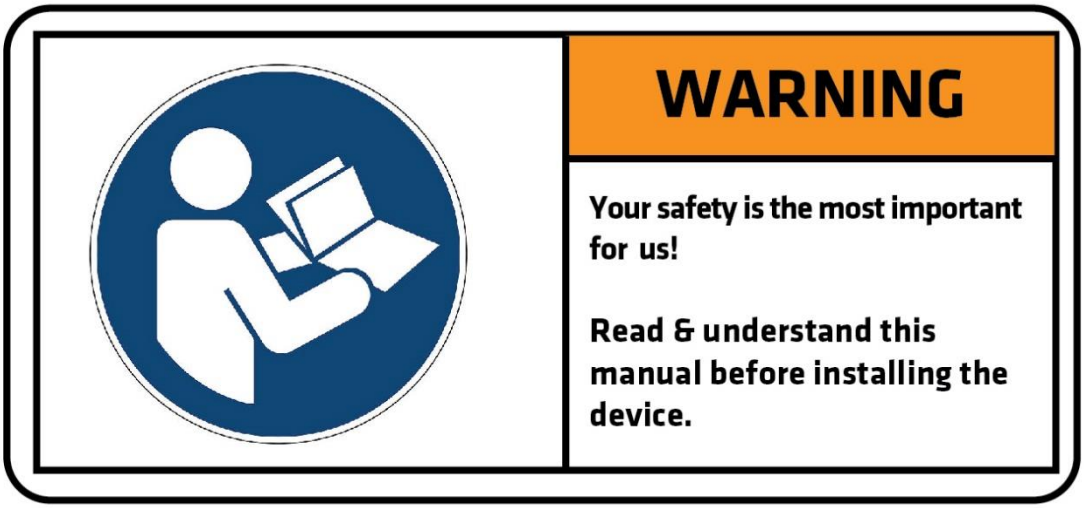
Go to our support website https://support.qubino.com/support/home and open a new support ticket. By telling us the product's unique serial number and part number, we will automatically review the production log file containing device parameters and information. This allows us to immediately identify and address issues, giving you the best customer support.

Based on customer and business partner feedback, we’re proud to boast Qubino’s support team as the best and fastest on the market. If you don't find the answers to your questions in this document, please contact us. We will try to help you as soon as possible.

3. Safety Information

For Qubino, safety is first, so we have prepared lots of safety tips and information that can be found throughout this manual.

To ensure your safety, please read this manual carefully before installing the device; follow the instructions exactly. The manufacturer (GOAP d.o.o. Nova Gorica) shall not be legally responsible for any equipment damage or personal injury caused by incorrect installation or operation other than that covered in this manual.



ⓘ Please check the Technical Specifications and Electrical Diagram chapters, as well as fuse requirements in the Installation chapter before installing the device.

4. Introduction

Mini Dimmer is a MOSFET-switching light device that supports the control of low-voltage halogen lamps with electronic transformers, dimmable compact fluorescent lights, and dimmable LED bulbs. It measures power consumption of the connected device. It supports momentary switches (by default) and toggle switches. It can work with or without the neutral line. As it is the smallest wireless dimmer on the market, Qubino Mini Dimmer allows the easiest and quickest installation in all types of flush mounting boxes.

The Qubino Mini Dimmer also acts as a Z-Wave repeater to improve the range and stability of the Z-Wave network.

Mini Dimmer supported functions:

Dim the Lights	Turn on/off	kWh Measurement	W Measurement	2 and 3-wire installation	Associations	Z-Wave Repeater	SmartStart	Automatically turn ON/OFF
✓	✓	✓	✓	✓	✓	✓	✓	✓

5. Functionality

5.1. Operation

The Mini Dimmer can dim or turn on/off the connected dimmable load. Non dimmable load can only be turned on/off. The load can be controlled by:

Toggle or momentary switch connected to terminal I. Check ⓘ NOTES.

- Toggle switch:
  - Turn the connected load:
    - OFF (0 %)
    - ON to last set value
- Momentary switch:
  - With short press turn the connected load:
    - OFF (0 %)
    - ON to last set value if above MIN
    - ON to MAX value if last set value was MIN
  - With double short press turn the connected load to MAX dimming value.
  - With long press set dimming level in between defined MIN and MAX dimming values.
- Remotely with gateway:
  - Set dimming value
  - Turn OFF (0 %) or ON

5.2. Power Consumption Reporting

Watt	Power – Active
kWh	Energy – Active power accumulated

Energy consumption in kWh is reported in 0.1 kWh resolution.

Active power in W is reported in 0.1 W resolution.

ⓘ NOTES: For more options check parameter no. 40.

5.3. Overload protection

Overload protection defined by user
The user has an option with parameter 70 to set an overload safety threshold. The threshold is set to 200W by default. If the power exceeds it for 5 seconds the Mini Dimmer will turn off, the red LED will turn ON and a “Overload detected” notification will be sent. To restore normal operation the user must press the toggle/momentary switch connected to terminal I or send a control frame.

Overload protection
Maximum Power Limit is automatically set by the device’s software which is 220 Watt. If the maximum power is exceeded for more than 5 seconds, the dimmer will turn off until the next power cycle and the red LED will turn ON. If this happens, check if the load matches the device specifications and if connections are according to the diagram. To restore the dimmer to its regular operation, please power cycle the device.
When overload occurs, an “Over-load detected” notification is sent to the gateway (hub). Maximum Power Limit is not same as Overload protection defined by user (parameter no. 70).

Overheating protection

Device integrates internal overheating protection solution. In case the overheating is detected the dimmer output goes automatically to OFF state. This state is recognizable by LED status. Wait the device to cool down and power cycle the device.

5.4. Calibration

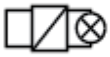
The Mini Dimmer has a calibration function to ensure correct operation. The calibration determines the maximum dimming value for the connected load to avoid that the load will take too much voltage from the module for its correct operation.

When the module is connected to the power supply for the first time (valid for 2 and 3-wire installation), the calibration will start automatically. If the module is not included in the gateway, the calibration is performed after each power cycle. When calibration is triggered, the device will slowly rise the dim value of the light bulb until it detects its maximum value. After it is detected it will turn off the output and set internal limits accordingly. The process lasts few seconds. During the calibration procedure the blue LED is ON. If the calibration will not perform correctly or any error will occur the blue LED will start blinking. Once the module is included and a power cycle is done the calibration will not start. To force the calibration (in case of load change) or trigger it after each power cycle even if the module is included you need to set the correct value in parameter 71 Calibration Trigger. With parameter 72 you can also check the calibration status in case the module is already mounted, and you can’t see the LED status. For more information about parameters please see chapter Configuration parameters.

ⓘ NOTE: When changing the connected load, it is recommended to force the calibration to ensure proper operation.

5.5. Supported dimmable bulb types

- Traditional incandescent bulbs
- Halogen bulbs operated by 240 Vac (High Voltage Halogen)
- Low voltage halogen bulbs with electronic or conventional transformers
- Compact fluorescent bulb (CFL)
- LED bulbs

Type of light source (load)		Max load consumption
	Resistive load: Conventional incandescent and halogen lights	200 W (240 Vac) 90 W (110 Vac)
	**LED bulb, compact fluorescent bulb (CFL), low voltage halogen bulbs with electronic transformer**	150 W (240 Vac) / 70 W (110 Vac)
	Low voltage halogen bulbs with conventional transformer	150 W (240 Vac) / 70 W (110 Vac)

Check the report of the dimmable bulbs we've tested with Mini Dimmer on the following link:

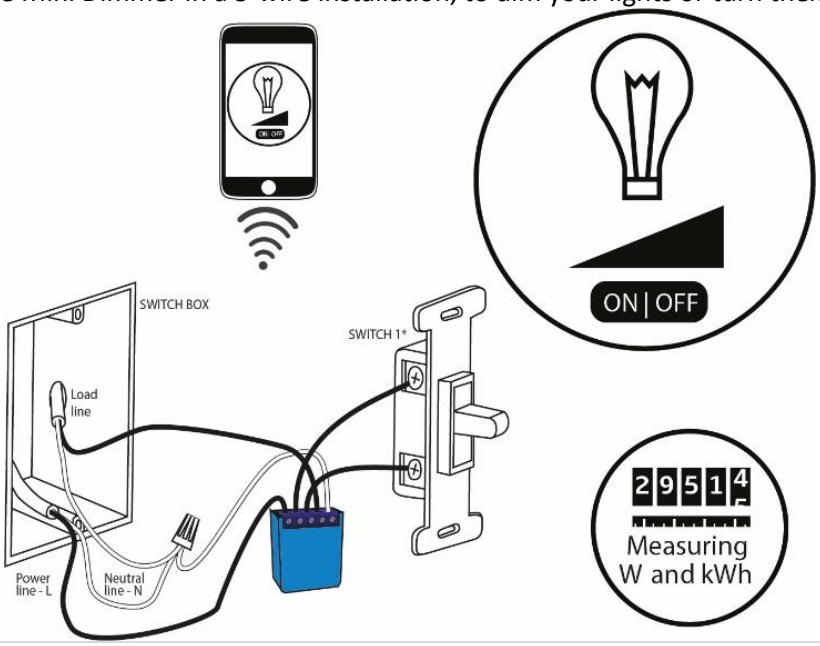
https://support.qubino.com/support/solutions/articles/44001877738-tested-lamps-with-mini-dimmer

6. Use Cases

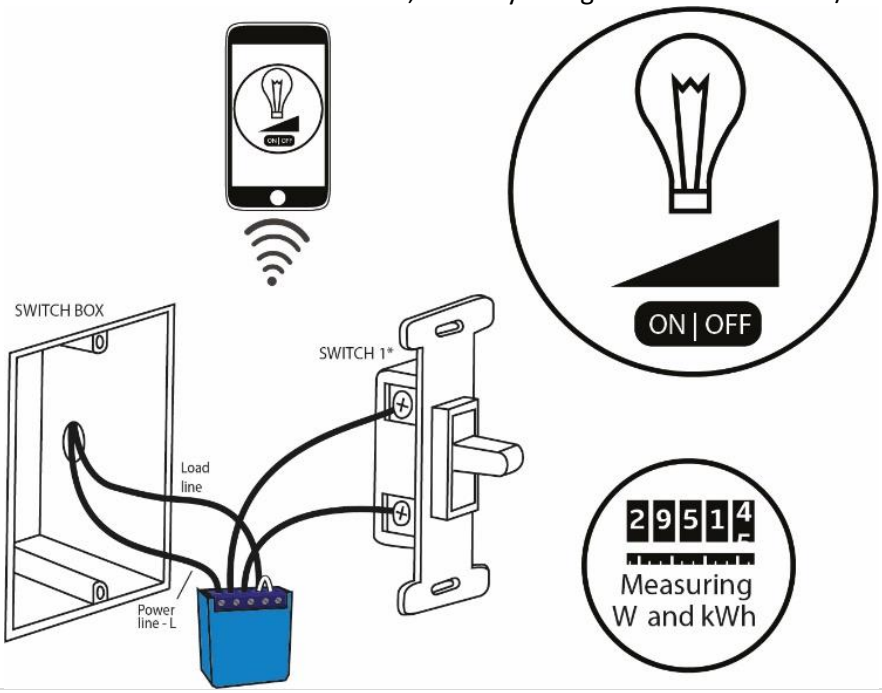
The Mini Dimmer can be used in many different scenes, which can help make your life more comfortable. We have prepared a few of them for you, so you can get an idea for your next smart home project.

Examples where Mini Dimmer is installed behind a wall switch in a 2-wire or 3-wire installation

- Use the Mini Dimmer in a 3-wire installation, to dim your lights or turn them ON/OFF.

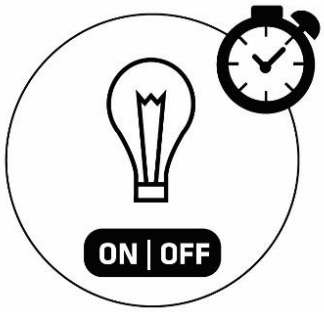


- Use the Mini Dimmer in a 2-wire installation, to dim your lights or turn them ON/OFF.

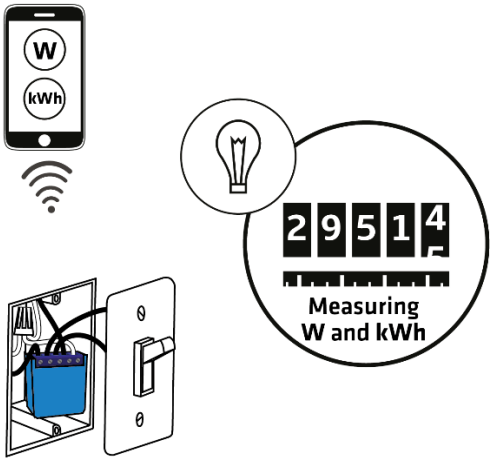


Additional features of Mini Dimmer which can make your life easier

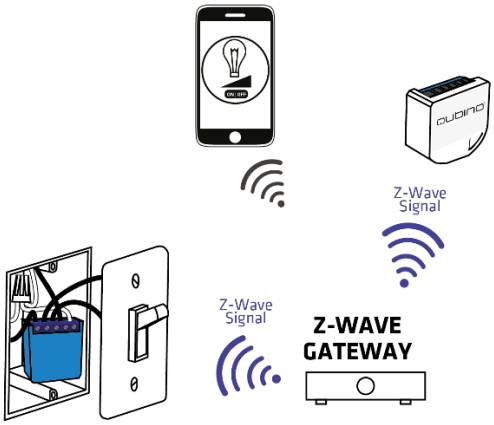
- **Do you often forget to turn off devices when you leave your home, like lights in the basement or attic?**
- The Mini Dimmer can automatically turn lights on or off after a set period (when you're away from home). For example, the light will automatically turn off if it's been on for 8 hours, let's say. This function is independent of other scenes and gateway (hub) commands.



- **Do you know how much energy you consume?**
- The Mini Dimmer monitors and reports energy consumption of connected devices in real time to your smart home app (your gateway (hub) needs to support this feature). Know how much power your lights are using.



- **Want to control other devices in your Z-Wave network with the Mini Dimmer?**
- Connect the Mini Dimmer with other devices in your network to remotely and automatically trigger another Z-Wave device. And have other Z-Wave devices trigger your Qubino Mini Dimmer.



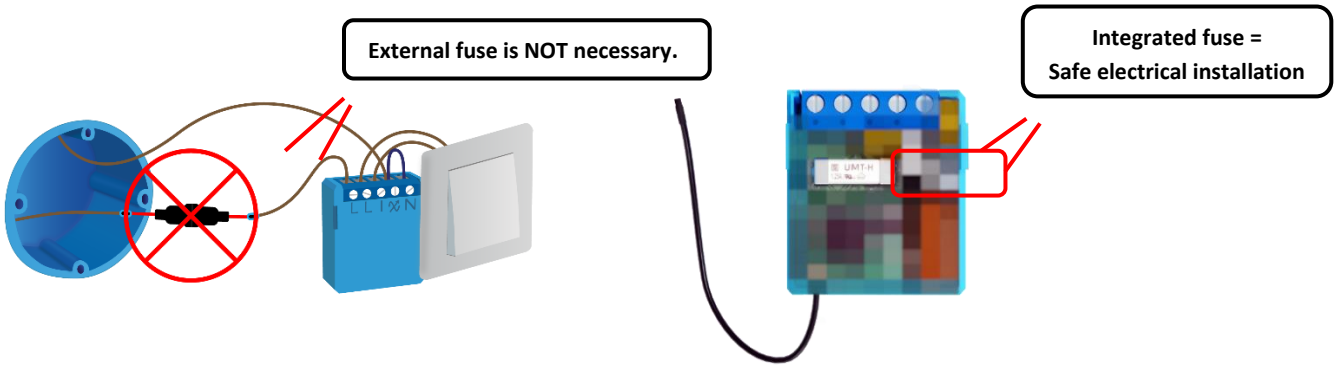
7. Advantages and Highlights

7.1. Advantages

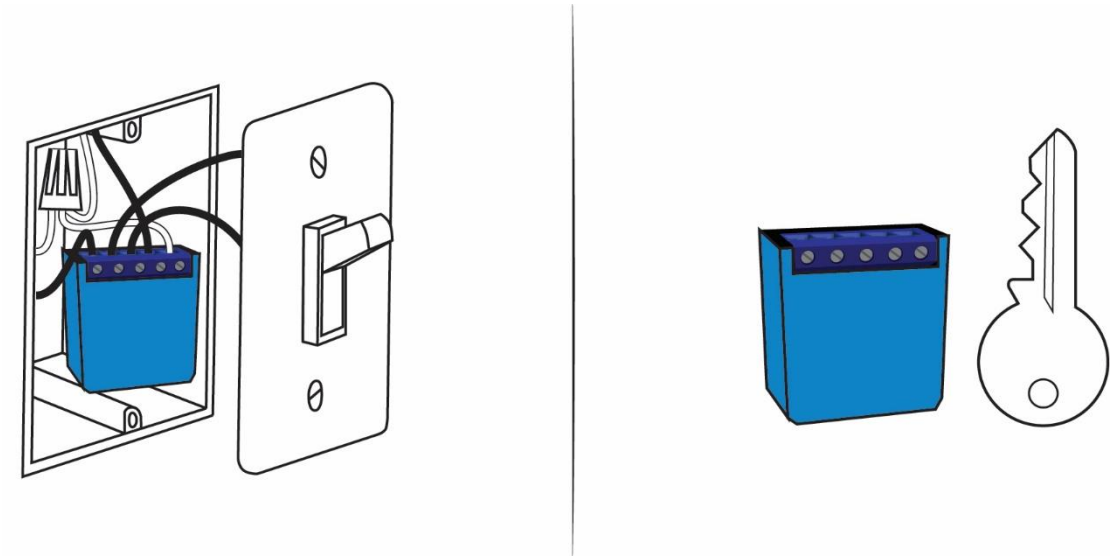
- **SAFETY**: Qubino Mini dimmer has **a CE mark** what grants that it passed all the tests required to comply with the EU Directives, including the LVD Directive which concerns safety. In order to be safe and eligible for selling on the market, all dimmers and similar devices must pass overcurrent tests, set by the international standard EN 60669-2-1. One of the ways to pass these tests and become a certified, “safe-to-use” device is, to have a built-in or external protection fuse, that is certified and compliant with the standard. This external/internal fuse has to support the same current as the dimmer does, this way it protects the dimmer and the light connected to the dimmer from damaging.

  The standard also requires that the manufacturers should specify in their instruction sheets the information of the protective device which is intended to protect the electronic switch. If your dimmer does not have a built-in fuse, make sure you buy an appropriate external fuse. Only by doing this your electrical installation will be 100% safe.

  Qubino Mini Dimmer **has an integrated fuse**, this means it complies to safety standards, is safe-to-use and you do not have to buy additional fuse to protect the electrical installation.

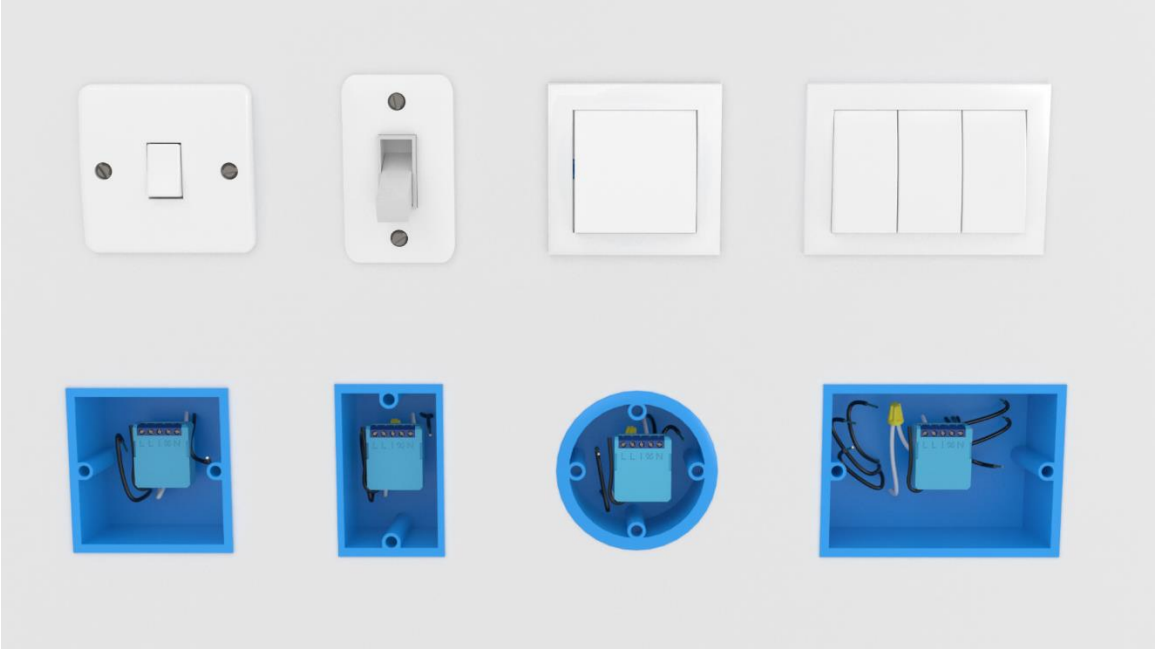


- **SIZE: The Qubino Mini Dimmer is smaller** than any other wireless dimmer in the world. Because of its small size, it fits in even the smallest, most shallow and most crowded electrical boxes

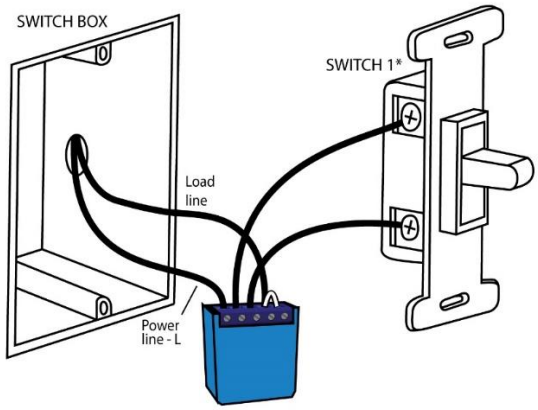


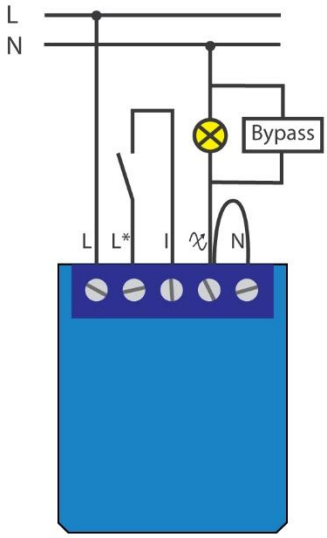
overflowing with wires.

- **FITTING:** Mini Dimmer fits **all types of flush mounting boxes worldwide**. Reduce assembly time and installation expenses. Install it fast and easy behind a classic switch.



- **WITHOUT NEUTRAL**: Mini Dimmer **does not require neutral wire (N)** and therefore it also works in a 2-wire installation

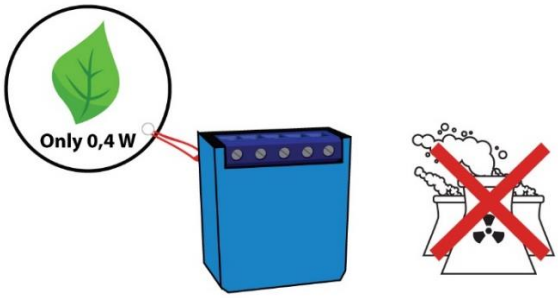




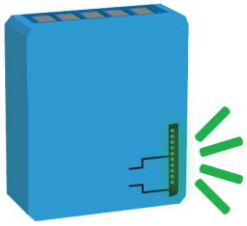
ⓘ NOTE: When installing the Mini Dimmer in a 2-wire installation we recommend using a Bypass.

- **MINIMUM LOAD POWER:** Qubino Dimmer allows a direct connection of even the smallest bulbs. It's the only Z-Wave dimmer on the market that **does not require any minimum load power**, which means that the user can connect bulbs with minimum power loads that are bigger than 0 W (valid only in case of 3-wire installation).

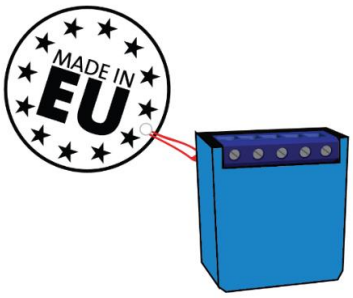
- **LOW POWER CONSUMPTION**: Compared to other IoT devices on the market, that for its own functioning, consume between 0,6-1,5 W, Mini Dimmer **consumes the least power – only 0.4 W**. Why is this important? - According to statistics, we will have 20 billion IoT devices installed in 2020. If all these devices had a power consumption as low as Mini Dimmer - 0,4 W, we would need 4 GW less energy. As a comparison, a nuclear power plant produces approx. 700 MW/year, so this means a few nuclear stations worldwide, could be shut down.
  (source: Statista: https://www.statista.com/statistics/764026/number-of-iot-devices-in-use-worldwide/; NEK https://www.nek.si/en/about-nek/production)



- **LED signalization** - Easily recognize, if the Mini Dimmer is included or excluded from the network, be aware in case of overload or overheating and when the calibration is in progress.



- **MADE IN EU**: The Qubino Mini Dimmer is **engineered and manufactured in the EU** and contains only the highest quality components.
  3 Main Reasons why it is important that Qubino is MADE IN EUROPE:
  - **QUALITY ASSURANCE** - Each Qubino product goes through rigorous quality assurance inspections at every stage of the product development - production, programming, testing, packaging and delivery. It doesn't end here, quality assurance continues with the fast and reliable, customer support.
  - **WORKERS RIGHTS** - Every EU worker has certain minimum rights relating to: health and safety at work, equal opportunities for women and men, protection against discrimination based on sex, race, religion, age, labour law.
  - **ENVIRONMENTAL PROTECTION EU** - Environmental policies and legislation protect natural habitats, keep air and water clean, ensure proper waste disposal, improve knowledge about toxic chemicals and help businesses move toward a sustainable economy.



7.2. Highlights

- Qubino guarantees **100 % device quality**. Such high quality can be delivered because every Qubino goes through rigorous quality control standards throughout the production process. Every device has a unique serial number and part number, which are assigned to the device only after it goes through a strict testing procedure.

- LED signalization - Easily recognize, if the Mini Dimmer is included or excluded from the network, be aware in case of overload or overheating and when the calibration is in progress.
- Remotely (via smartphone or PC) or locally (by light switch) controls dimmable bulbs
- Does not require a neutral line
- In a 3-wire installation, it doesn't require a minimum load power – connect bulbs from 1W on
- Works with momentary or toggle switch
- Measures active power (W) and energy (kWh) of the connected device in real time via smartphone, in a 3- or 2-wire installation
- Features one of the easiest and quickest installations of this kind of devices; it fits in even the smallest flush mounting boxes
- Saves and restores the last status after a power failure
- Supports SmartStart mode for quick set up
- Automatically turns devices on and off after a set period (suitable when you're away from home)
- Supports additional parameters for expert users, which allows advanced configuration*
- Acts as a signal repeater which improves the range and stability of your Z-Wave network
- Can be used to remotely control and trigger other devices in your Z-Wave network
- Is a trailing-edge dimmer, which means that is suitable for different types of the connected loads

*Your gateway (hub) needs to support advanced configuration and parameter input if you wish to use this feature

8. Package Contents

- Mini Dimmer Device
- Installation Manual
- SmartStart & S2 packaging label

9. Installation

Before installing the device, please read the following carefully and follow the instructions exactly:

ⓘ NOTES:

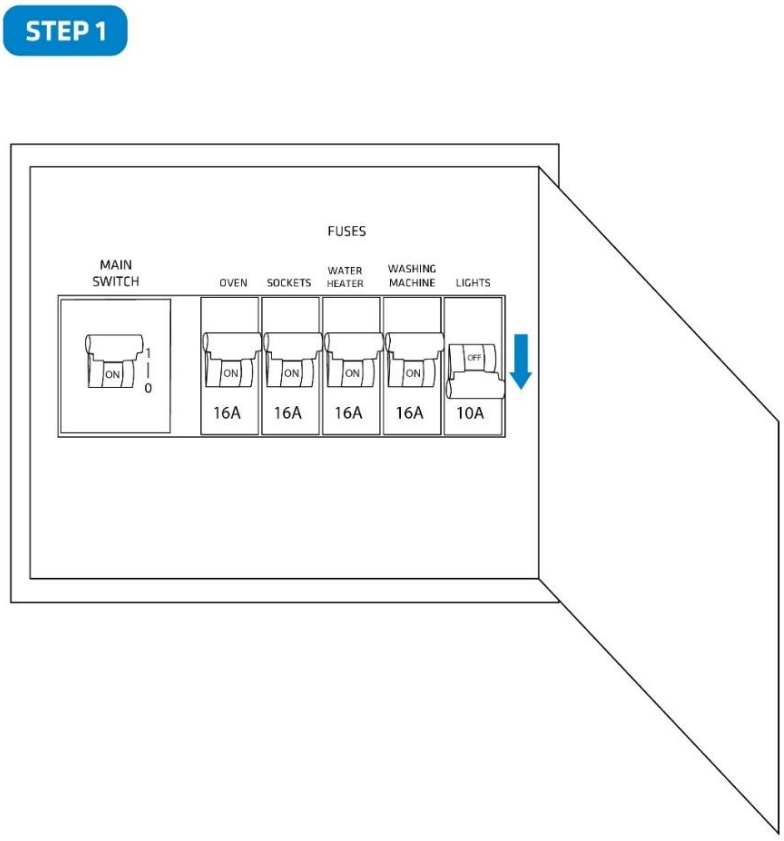
- Installation of this device requires a great degree of skill and may be performed only by a licensed and qualified electrician. Please keep in mind that even when the device is turned off, voltage may still be present in the device's terminals.
- Do not connect the device to loads outside recommended power 30. Connect the device exactly as shown in the provided diagrams. Improper wiring may be dangerous and result in equipment damage.
- Do not simultaneously connect different types of light sources.
- When changing the connected load, it is recommended to force the calibration to ensure proper operation.
- We can guarantee dimming compatibility only with Conventional incandescent and halogen bulbs. For dimming LED bulbs please refer to the manufacturer`s specifications and make sure to read their recommendations, as dimming behaviour can vary. To ensure acceptable dimming performance we advise independent test, before starting a large-scale installation.

9.1. Installing the device behind a light switch

The installation process, tested and approved by professional electricians, consists of the following simple steps:

Step 1 – Turn OFF the fuse:

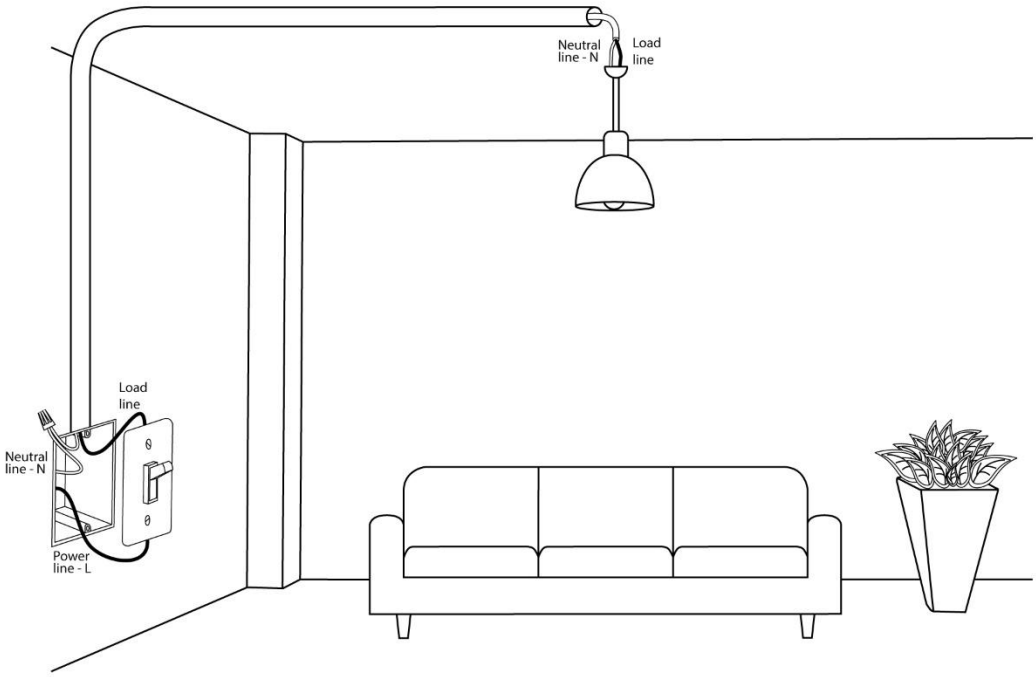
- To prevent electrical shock and/or equipment damage, disconnect electrical power at the main fuse or circuit breaker before installation and maintenance.
- Be aware that even if the circuit breaker is off, some voltage may remain in the wires — before proceeding with the installation, be sure no voltage is present in the wiring.
- Take extra precautions to avoid accidentally turning the device on during installation.



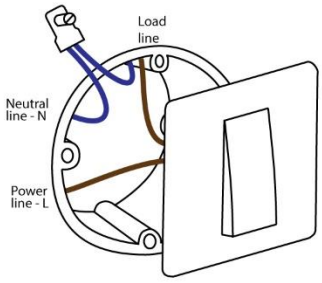
Step 2 – Installing the device:

- Connect the device exactly according to the diagrams shown below

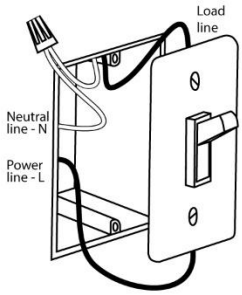
Before Qubino installation:



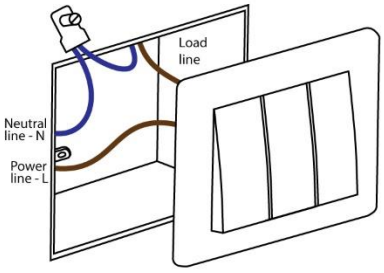
EU example:



USA example:



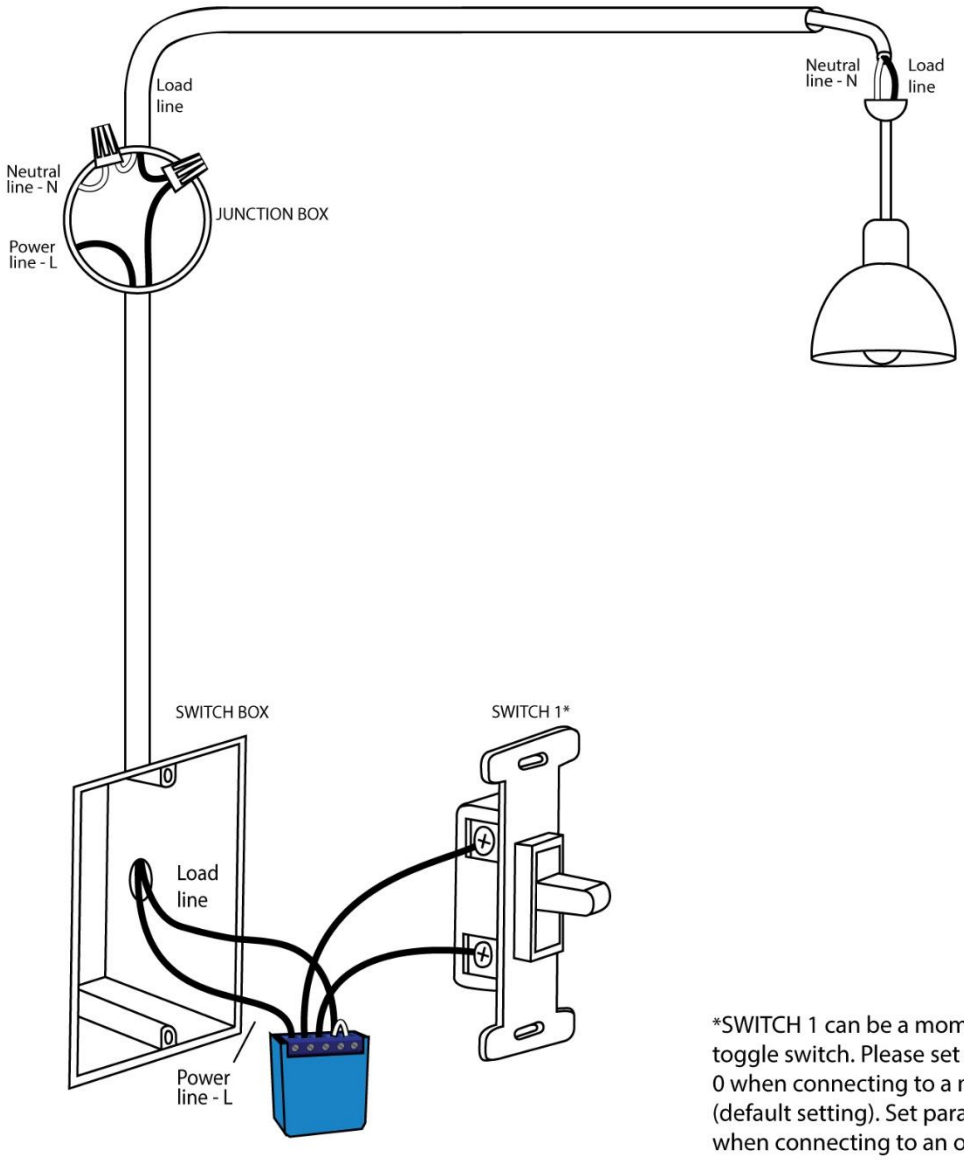
ITA/Brasil example:



Installation and wire connections are the same in USA, EU and ITA/Brasil.

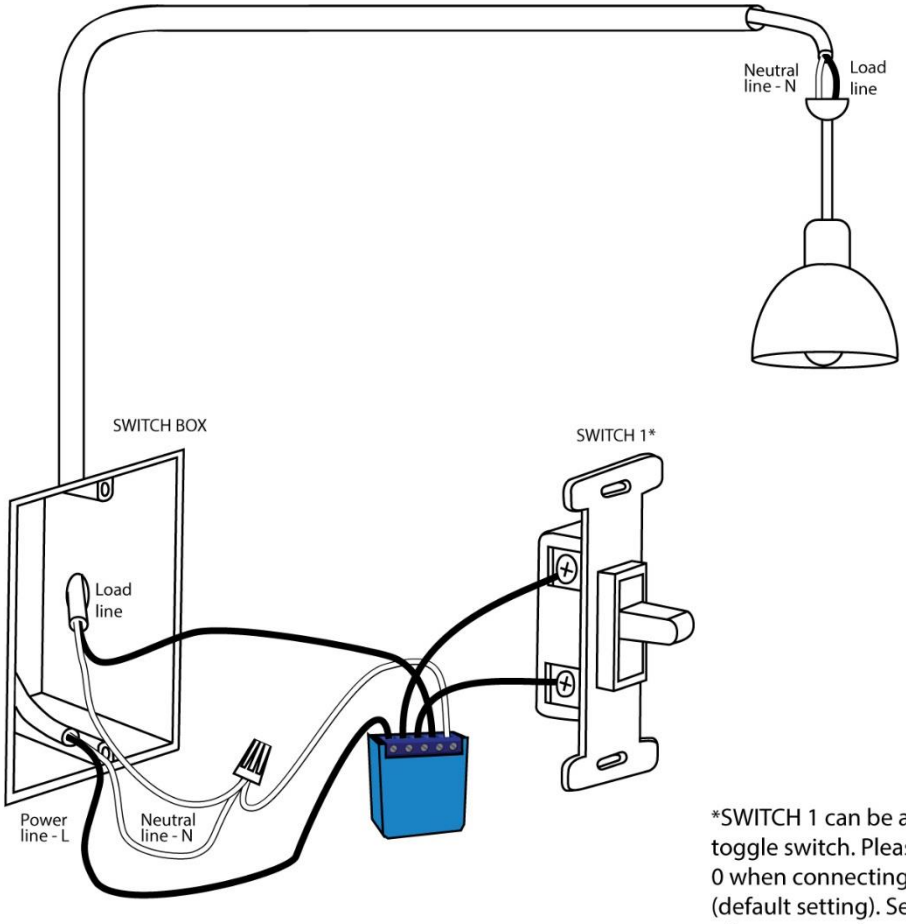
After Qubino installation:

Connection without a neutral line, 2-wire installation



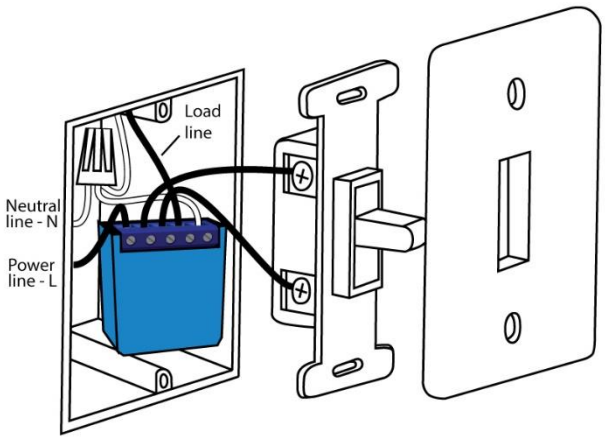
*SWITCH 1 can be a momentary switch or a toggle switch. Please set parameter 1 to value 0 when connecting to a momentary switch (default setting). Set parameter 1 to value 1 when connecting to an on/off toggle switch. Please see the Configuration Parameters chapter for more information about advanced parameter settings

Connection with a neutral line, 3-wire installation

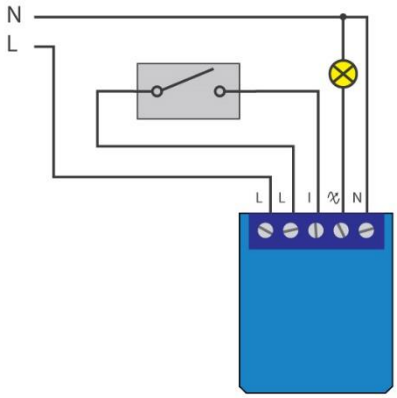


*SWITCH 1 can be a momentary switch or a toggle switch. Please set parameter 1 to value 0 when connecting to a momentary switch (default setting). Set parameter 1 to value 1 when connecting to an on/off toggle switch. Please see the Configuration Parameters chapter for more information about advanced parameter settings

Installation in the switch box:

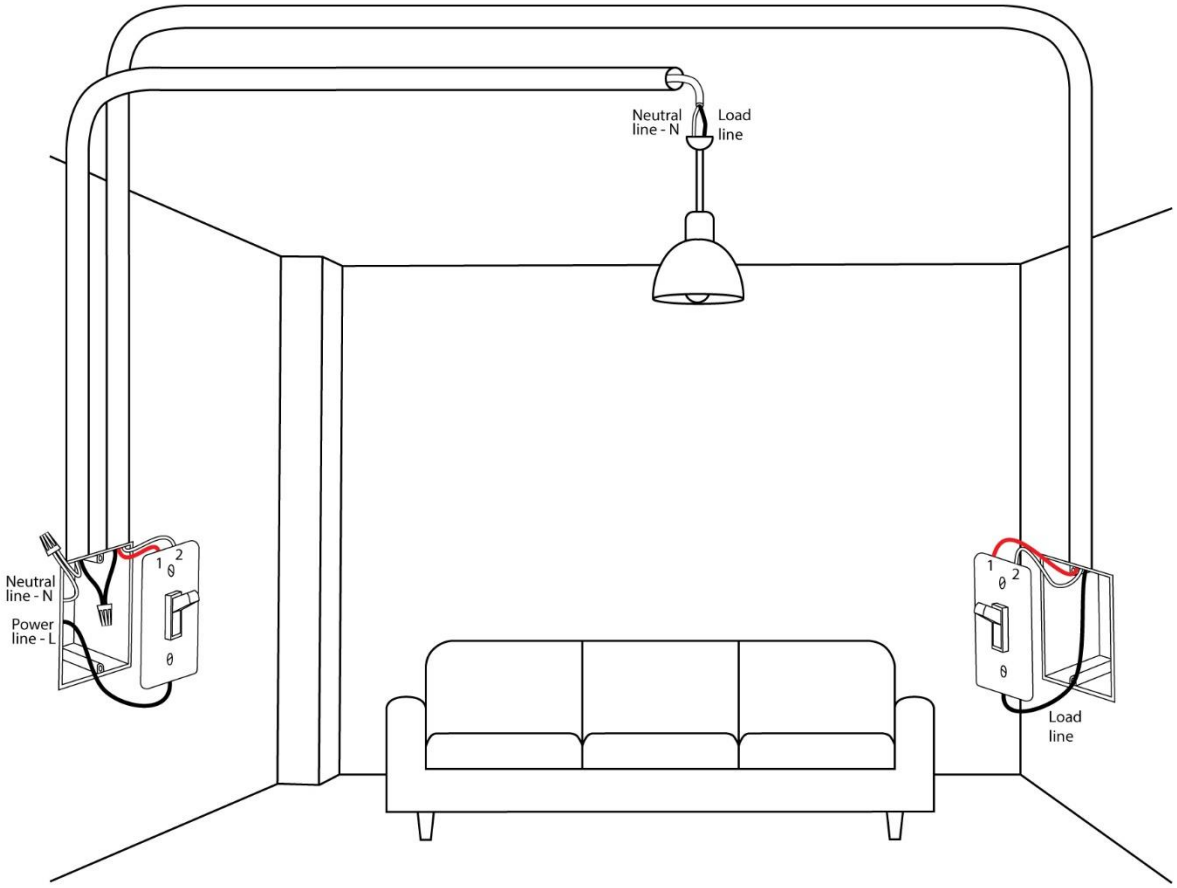


Electrical diagram:

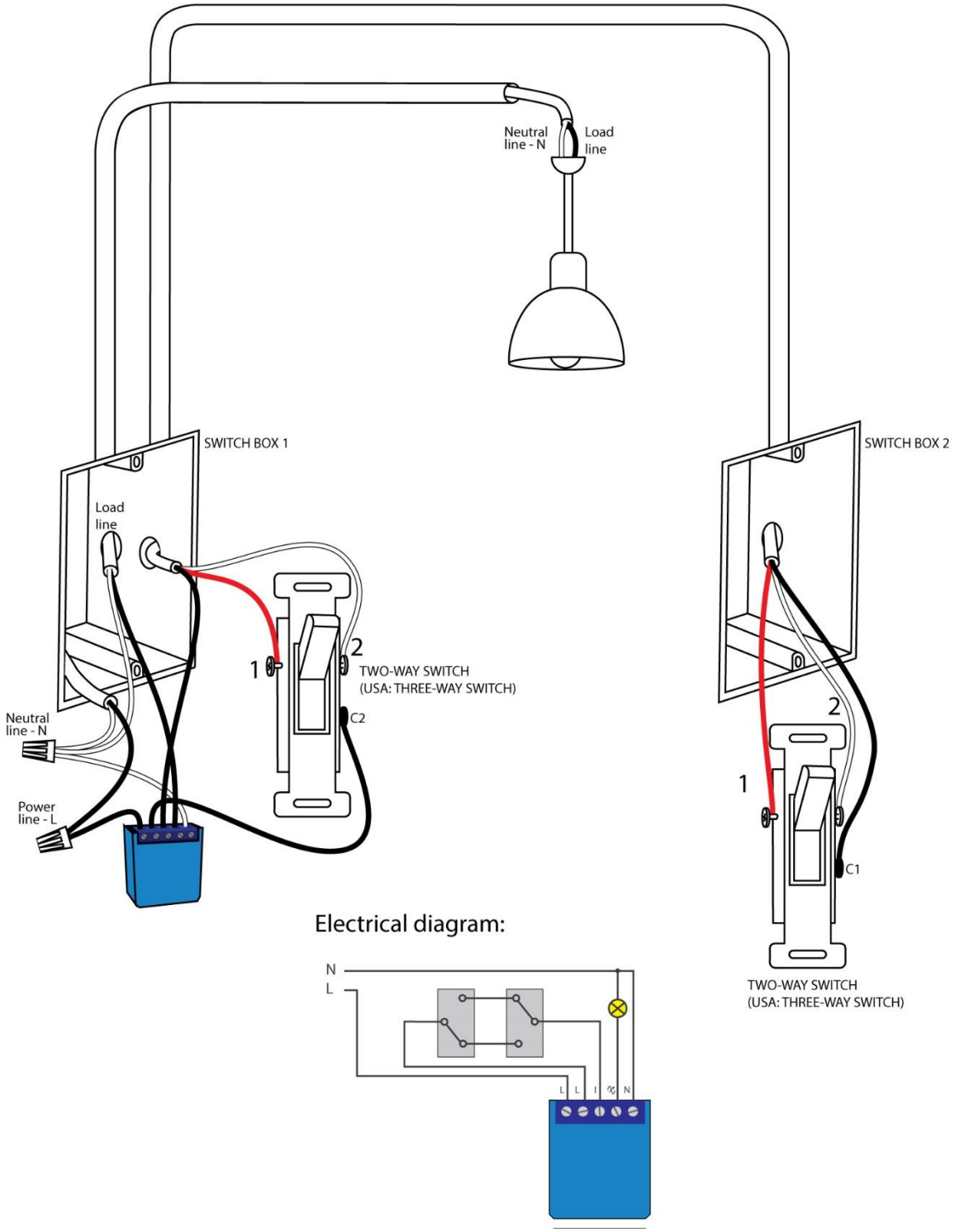


INSTALLATION WITH 2 OR MORE SWITCHES CONTROLLING THE SAME LIGHT:

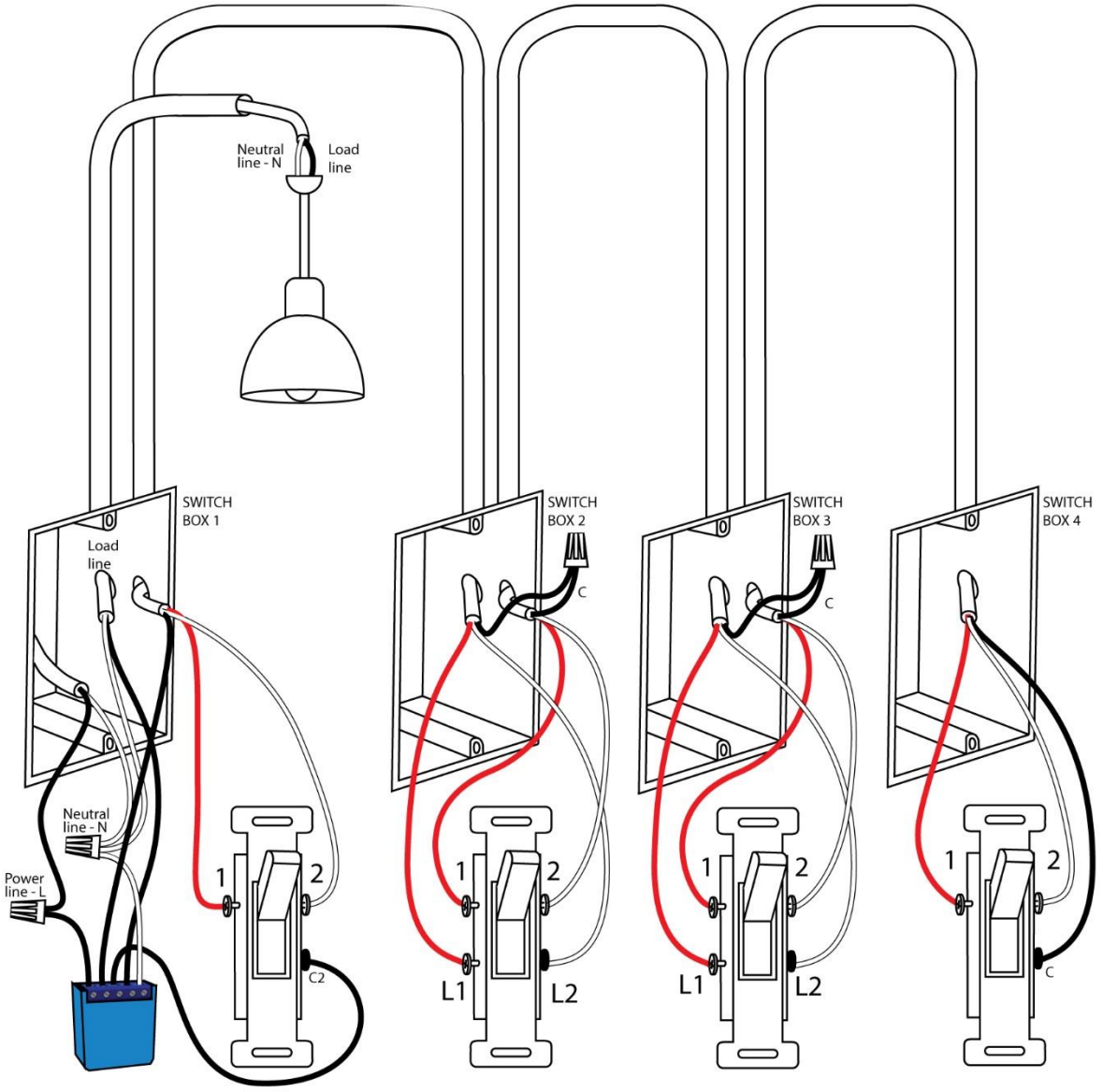
<u>Before Qubino installation:</u>



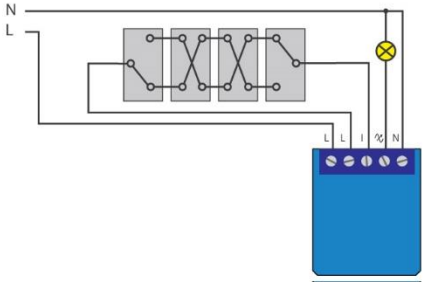
2 WAY SWITCH:


Neutral line - N
Load line
SWITCH BOX 1
SWITCH BOX 2
Load line
1
2
TWO-WAY SWITCH
(USA: THREE-WAY SWITCH)
C2
Neutral line - N
Power line - L
2
1
C1
TWO-WAY SWITCH
(USA: THREE-WAY SWITCH)
Electrical diagram:
N
L
L
L
N

MULTI-WAY SWITCHES:



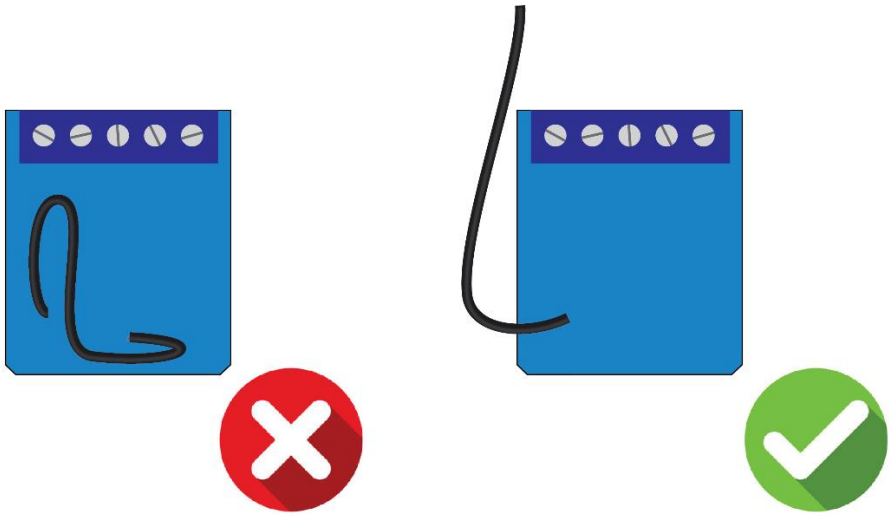
Electrical diagram:



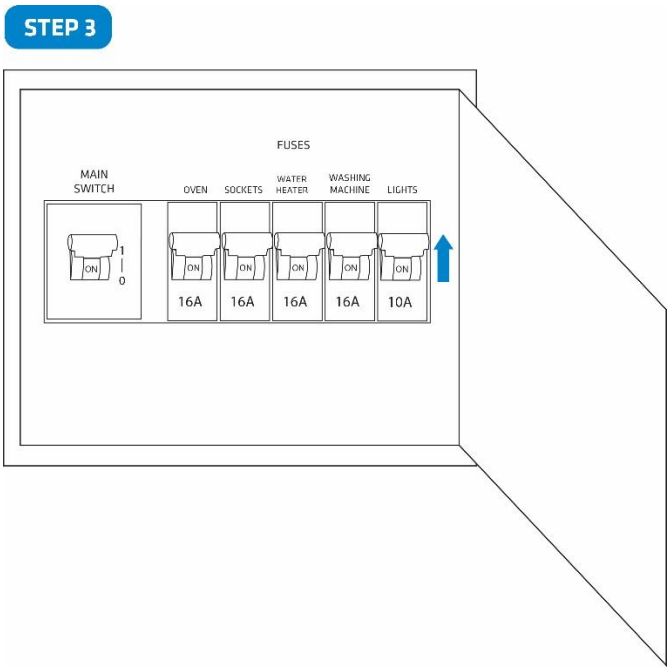
ⓘ NOTE: Antenna positioning

- Place the antenna as far as possible from metal elements as they may cause signal interference.
- Do not shorten the antenna.

The device's antenna should be as upright as possible. This ensures the device's operational range is maximized (up to 131 feet (40 m) line of sight).



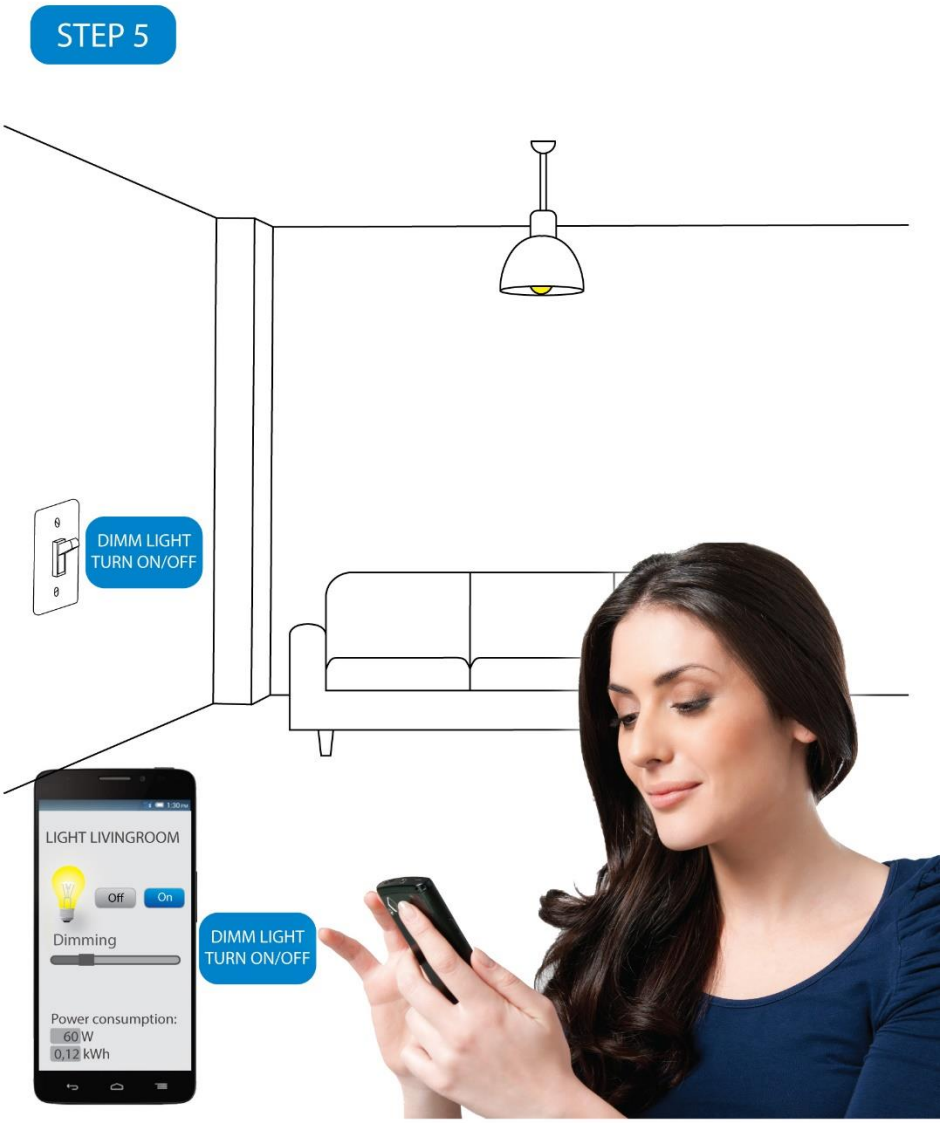
<u>Step 3 – Turn ON the fuse:</u>



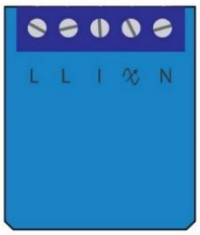
Step 4 – Add the device to your Z-Wave network:

- For more details on how to include the device, please refer to the Z-Wave Inclusion chapter.

Step 5 – The Installation is now complete. It's time to make your life more comfortable with the help of the Qubino Mini Dimmer

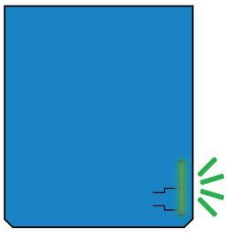


10. Technical Specifications



L	Live (line) wire (-Vdc)
L *	Live for momentary/toggle switch
I	Terminal for momentary/toggle switch
	Output for electrical device
N	Neutral wire (+Vdc)

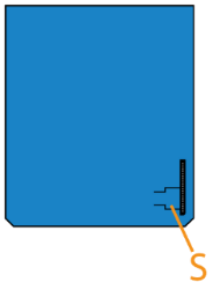
LED signalization



LED	**When the Mini Dimmer is excluded:** • green LED is blinking (1 sec ON, 1 sec OFF) • red LED is ON if overload occurs • red LED is blinking (1 sec ON, 1 sec OFF) if overheating occurs • blue LED is blinking (1 sec ON, 1 sec OFF) if calibration fails • blue LED is ON when calibration is in progress **When the Mini Dimmer is included:** • green LED is ON first 5 minutes after inclusion • green LED is OFF after 5 minutes from inclusion • red LED is ON if overload occurs • red LED is blinking (1 sec ON, 1 sec OFF) if overheating occurs • blue LED is blinking (1 sec ON, 1 sec OFF) if calibration fails • blue LED is ON when calibration is in progress

ⓘ NOTE: after each power cycle all 3 integrated RGB LEDs will blink (G, B and R one after the other) once before resuming normal operation.

S-button



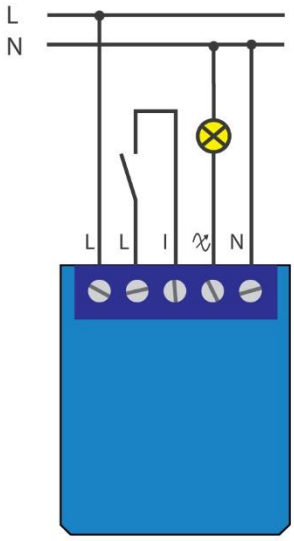
ⓘ NOTE: Check inclusion, exclusion and reset chapters to see the functionality of the S button.

Power supply	110 - 240 Vac ±10 % 50/60 Hz (24-30 Vdc*)
Rated load current of AC output	0,85 A
Output circuit power of AC output (resistive load)	200 W (240 Vac) 90 W (110 Vac)
Power measurement accuracy (2-wire)	± 10 %
Power measurement accuracy (3-wire)	± 2 %
Operation temperature	-10 ~ +40 °C (14 ~ 104 °F)
Z-Wave operation range	up to 40 m indoors (131 ft)
Dimensions (WxHxD) (package)	38x33,5x15,5mm (86x74x43 mm)
Weight (with package)	24 g (50 g)
Electricity consumption	≈ 0,4 W
Mounting	Ø ≥ 60 mm (2,36 in) or 2M, Depth ≥ 60 mm (2,36 in)
Switching	MOSFET (Trailing edge)
Z-Wave Repeater	Yes

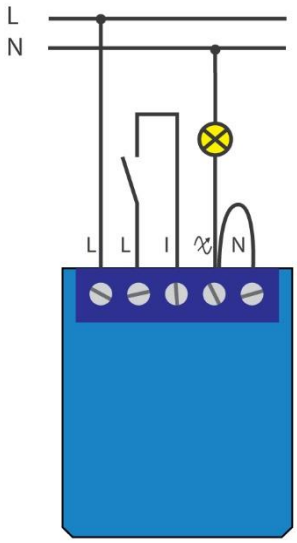
* 24-30 Vdc connection is only used when adding, removing or resetting the device with S button.

11. Electrical diagram

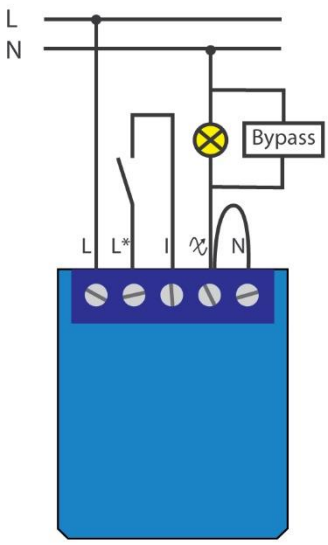
3-wire installation (110 – 240 Vac)



2-wire installation (110 – 240 Vac)

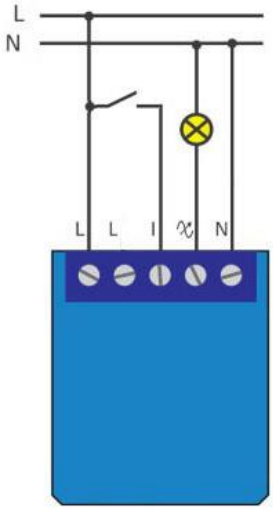


2-wire installation (110 – 240 Vac) With Bypass

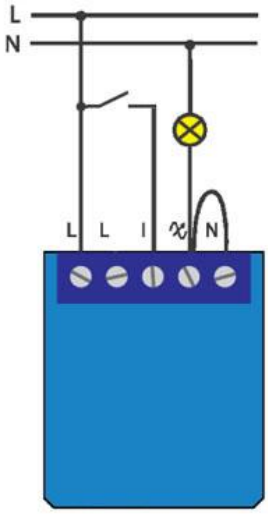


Alternative wiring:

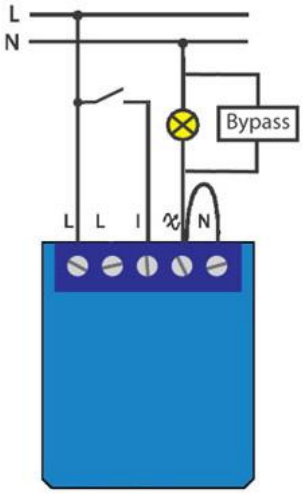
3-wire installation (110 – 240 Vac)



2-wire installation (110 – 240 Vac)

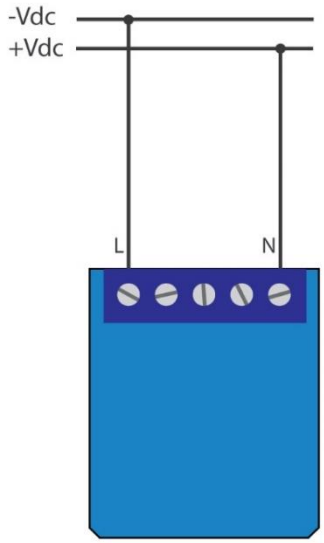


2-wire installation (110 – 240 Vac) With Bypass



More examples of different kind of wiring, can be found on the Qubino support portal here.

This connection can only be used when adding, removing or resetting the device with S button. (24 – 30 Vdc)



Notes for the diagram:

L	Live (line) wire (-Vdc)
L *	Live for momentary/toggle switch
I	Terminal for momentary/toggle switch
∿	Output for electrical device
N	Neutral wire (+Vdc)

12. Z-Wave™

The Z-Wave protocol is an interoperable, wireless, RF-based communications technology designed specifically for control, monitoring, and status reading applications in residential and light commercial environments. Mature, proven, and broadly deployed (with over 50 million products sold worldwide), Z-Wave is by far the world market leader in wireless control, bringing affordable, reliable, and easy-to-use 'smart' products to millions of people in every aspect of daily life.

Source: www.z-wavealliance.org

12.1. Compatibility with Z-Wave Gateways (hubs)

Please check compatibility with your Z-Wave gateway (hub) before you purchase this device. The compatibility table is available online.

https://qubino.com/manuals/Compatibility_with_gateways/Compatibility_manual_Mini_Dimmer_11092019.pdf

12.2. Adding the device to a Z-Wave network (Inclusion)

AUTOMATICALLY ADDING THE DEVICE TO A Z-WAVE NETWORK (SMARTSTART INCLUSION)

1. Scan QR code on device label and add S2 DSK to Provisioning List in gateway (hub)
2. Connect the device to the power supply
3. Inclusion will be initiated automatically within few seconds of connection to the power supply and the device will automatically enrol in your network (when the device is excluded and connected to the power supply it automatically enters the LEARN MODE state).

NOTE: LEARN MODE state allows the device to receive network information from the controller.

ⓘ SmartStart inclusion is a part of S2 security level, so if you want to use SmartStart, you need to include it as S2 Authenticated.

MANUALLY ADDING THE DEVICE TO A Z-WAVE NETWORK (MANUAL INCLUSION)

1. Connect the device to the power supply

2. Enable add/remove mode on your Z-Wave gateway (hub)

3. Toggle the switch connected to the terminal I 3 times within 3 seconds (this procedure puts the device in LEARN MODE). The device has to get On/Off signal 3 times, meaning 3 times push of the momentary switch or with toggle switch 3 times On and 3 times Off.

OR

Press and hold the S (Service) button between 2 and 6 seconds if connected to power supply. For your safety use only 24-30 Vdc power supply when accessing to S (Service) button. This procedure puts the device in LEARN MODE.

4. A new device will appear on your dashboard.

5. Inclusion with the switch connected to terminal I is not limited by time.

ⓘ NOTE: LEARN MODE state allows the device to receive network information from the controller.

12.3. Z-Wave Security and DSK

Qubino`s Mini Dimmer supports the latest Security 2 feature. Security S2 is handled by the Strong AES 128 Encryption protocol, which means that the S2 makes Z-Wave the most secure IoT (Internet of Things) security platform out there. In order to fully utilize the product and its SECURITY 2 feature, a Security Enabled Z-Wave gateway (hub) must be used.

Authenticated Control

- Out-Of-Band Device Specific Key for inclusion
- May be used by most implementations

Also supports: Security S2 Authenticated, Unauthenticated, and Unsecure inclusion

IMPORTANT: When adding the Mini Dimmer to a Z-Wave network with a controller supporting Security 2 (S2), the PIN code of the Z-Wave Device Specific Key (DSK) is required. The unique DSK code is printed on the product label and a copy is inserted in the packaging, which must not be lost. Do not remove the DSK from the product. As a backup measure, use the label in the packaging.

The first five digits of the key are highlighted or underlined to help the user identify the PIN code portion of the DSK text.

The DSK is additionally represented with a QR Code as shown here.

DSK label and QR code (example)

A joining node requesting to join the S2 Access Control Class or the S2 Authenticated Class will obfuscate its Public Key by setting the bytes 1..2 to zeros (0x00) before transferring its key via RF.

A joining node requesting to join only the S2 Unauthenticated Class will send the its full Public Key when transferring the key via RF as the including node has no access to the DSK.

The DSK may be used for out-of-band (OOB) authentication.

- The including gateway (hub) may use QR code scanning device to read the entire DSK off the joining device and match it with the obfuscated public key received via RF from the joining device.

SmartStart enabled products can be added into a Z-Wave network by scanning the Z-Wave QR Code present on the product with a controller providing SmartStart inclusion. No further action is required and the SmartStart product will be added automatically within 10 minutes of being switched on in the network vicinity.

12.4. Removing the device from a Z-Wave network (Exclusion)

REMOVAL FROM A Z-WAVE NETWORK (Z-WAVE EXCLUSION)

1. Connect the device to the power supply.

2. Make sure the device is within direct range of your Z-Wave gateway (hub) or use a hand-held Z-Wave remote to perform exclusion.

3. Enable add/remove mode on your Z-Wave gateway (hub).

4. Toggle the switch connected to the terminal I 3 times within 3 seconds (this procedure put the device in LEARN MODE). The device has to get On/Off signal 3 times, meaning 3 times push of the momentary switch or with toggle switch 3 times On and 3 times Off.

OR

Press and hold the S (Service) button between 2 and 6 seconds if connected power supply. For your safety use only 24-30 Vdc power supply when accessing to S (Service) button. This procedure put the device in LEARN MODE.

5. Exclusion with the switch connected to terminal I is not limited by time.

6. The device will be removed from your network, but any custom configuration parameters will not be erased.

ⓘ NOTE: LEARN MODE state allows the device to receive network information from the controller.

12.5. Device factory reset

1. Connect the device to the power supply.

2. Within the first minute (60 seconds) the device is connected to the power supply, toggle the switch connected to the terminal I 5 times within 3 seconds. The device has to get On/Off signal 5 times, meaning 5 times push of the momentary switch or with toggle switch 5 times On and 5 times Off.

OR

Press and hold the S (Service) button for at least 6 seconds if connected to power supply. For your safety use only 24-30 Vdc power supply when accessing to S (Service) button. This procedure put the device in LEARN MODE.

ⓘ NOTE: By resetting the device, all custom parameters previously set on the device will return to their default values, and the node ID will be deleted. Use this reset procedure only when the main gateway (hub) is missing or otherwise inoperable. If an end device is factory reset, it is reverted to the Z-Wave SmartStart inclusion state.

ⓘ NOTE: the reset with switch connected to terminal I is possible only in the first minute after the device is connected to the power.

ⓘ NOTE: after the reset is successfully done the autocalibration will trigger and the green LED will start blinking.

12.6. Associations

Use associations for direct communication between the Mini Dimmer and other devices within your Z-Wave network without the need of your primary gateway (hub).

Association groups:

ID	Name	Allowed nodes	Description
1	Lifeline	1	Supports the following command classes: • Device Reset Locally: triggered upon request • Meter Report: triggered according to Configuration parameters 40 and 42 • Notification Report: triggered on overload/over heating • Switch Multilevel Report: triggered upon request or according to Configuration parameters 11 and 12. • Switch Binary Report: triggered upon request or according to Configuration parameters 11 and 12.
2	Basic OnOff	16	Supports the following command classes: • Basic set: triggered at the change of the output and reflecting its state
3	StartStop level change	16	Supports the following command classes: • Start/Stop Level Change: triggered upon holding and releasing the switch connected to terminal I
4	Multilevel set	16	Supports the following command classes: • Switch Multilevel Set: triggered at change of output and reflecting its state

12.7. Notification Command Class

The Mini Dimmer supports the following notifications:

- In case of exceeding the power value set in parameter 70 (default 200 W) for more than 5 seconds the Mini Dimmer automatically turns off the output and the overload notification is sent.
- In case the parameter 70 is disabled the Mini Dimmer has a fixed overload safety value of 220 W to prevent any damage to the module. In this case if the active power is greater than 220 W for 5 second or more the output is turned off automatically and an overload notification is sent.

Notification Type	Notification Event
Power Management (0x08)	Over-load detected (0x08)

12.8. Configuration Parameters

Parameter no. 1 – In-wall Switch Type for Load (∿) to control terminal I

With this parameter, you can select between momentary and on/off toggle switch types.

Values (size is 1-byte dec):

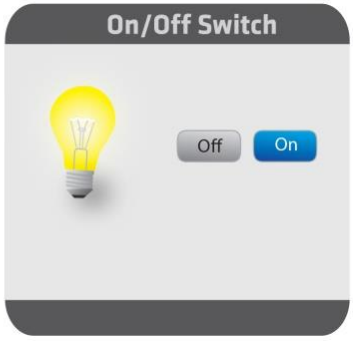
- default value 0
- 0 - momentary switch
- 1 - on/off toggle switch

Parameter no. 6 – Load type

With this parameter, you select the load type, dimmable or non dimmable. Device operating in dimmable mode on non dimmable load can lead to device or load malfunction. For non dimmable loads par. 6 must be set to 1.

Values (size is 1-byte dec):

- default value 0
- 0 – Dimmable load
- 1 - Non dimmable load



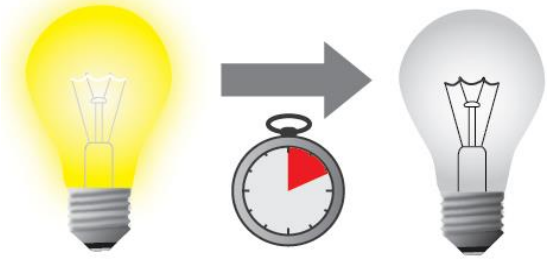
ⓘ NOTE: When par.6 set to 1 (non dimmable load) values of listed parameters will be ingnored (par.60 min. dimming value, par.61 max. dimming value, par.65 Dimm. Time when key presed par.66 dimm. Time when key hold, par.21 Double click function

ⓘ NOTE: If the bulb is dimmable or non dimmable (generally valid for LED) is shown on the bulb itself or on packaging.

ⓘ NOTE: Parameter 6 is replacing parameter 5. Present in previous version.

Parameter no. 11 - Turn Load (⌁) Off Automatically with Timer

If Load (⌁) is ON, you can schedule it to turn OFF automatically after a period of time defined in this parameter. The timer is reset to zero each time the device receives an ON or OFF command, either remotely (from the gateway (hub) or associated device) or locally from the switch.

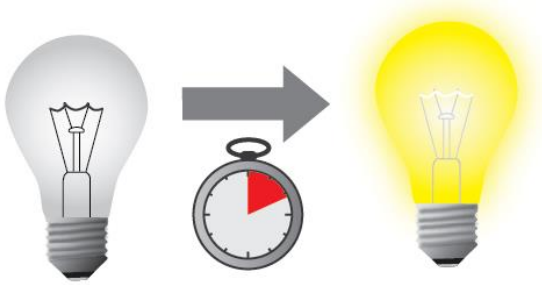


Values (size is 2-byte dec):

- default value 0
- 0 - Auto OFF Disabled
- 1 - 32536 = 1 - 32536 seconds - Auto OFF timer enabled for a given amount of seconds

Parameter no. 12 - Turn Load (⌁) On Automatically with Timer

If Load (⌁) is OFF, you can schedule it to turn ON automatically after a period defined in this parameter. The timer is reset to zero each time the device receives an OFF or ON command, either remotely (from the gateway (hub) or associated device) or locally from the switch.



Values (size is 2-byte dec):

- default value 0
- 0 - Auto ON Disabled
- 1 - 32536 = 1 - 32536 seconds - Auto ON timer enabled for a given amount of seconds

Parameter no. 21 - Enable/Disable the Double click function

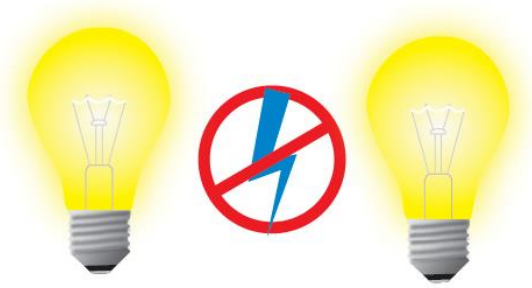
If the Double click function is enabled, a fast double click on the momentary switch sets the dimming level to the maximum dimming value.

Values (size is 1-byte dec):

- default value 0
- 0 - double click disabled
- 1 - double click enabled

Parameter no. 30 - Restore on/off status for load after power failure

This parameter determines if on/off status is saved and restored for the load after power failure.



Values (size is 1-byte dec):

- default value 0
- 0 - Device saves last on/off status and restores it after a power failure.
- 1 - Device does not save on/off status and does not restore it after a power failure, it remains off.

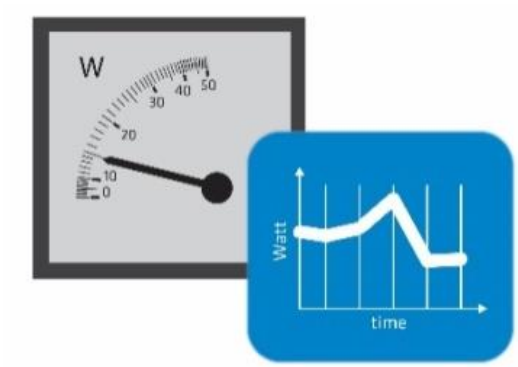
Parameter no. 40 – Watt Power Consumption Reporting Threshold for Load

Choose by how much the power consumption needs to increase or decrease to be reported. Values correspond to percentages so if 10 is set (by default), the device will report any power consumption changes of 10 % or more compared to the last reading.

Values (size is 1-byte dec):

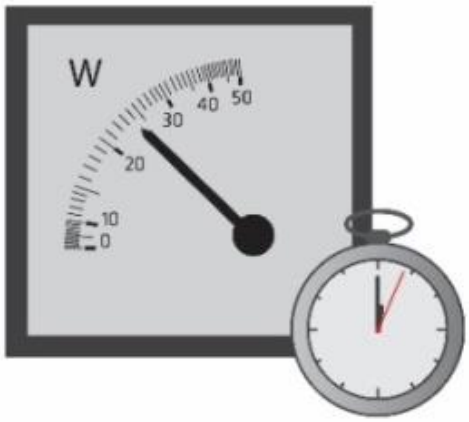
- default value 10
- 0 - Power consumption reporting disabled
- 1 - 100 = 1 % - 100 % Power consumption reporting enabled. New value is reported only when Wattage in real time changes by more than the percentage value set in this parameter compared to the previous Wattage reading, starting at 1 % (the lowest value possible).

ⓘ NOTE: The power consumption needs to increase or decrease by at least 2 Watts to be reported, regardless of percentage set in this parameter.



Parameter no. 42 – Watt Power Consumption Reporting Time Threshold for Load

Set value refers to the time interval with which power consumption in Watts is reported (0 - 32767 seconds). If 300 is entered, energy consumption reports will be sent to the gateway (hub) every 300 seconds (5 minutes) if there was a change compared from the last report.



Values (size is 2-byte dec):

- default value 0
- 0 - Power consumption reporting on time interval disabled
- 30 - 32767= 30 - 32767seconds. Power consumption reporting enabled. Report is sent according to time interval (value) set here.

ⓘNOTE: Values from 1 to 29 are ignored by device due to standard recommendation.
ⓘNOTE: The report will be send only if there was a change compared to the last report.

Parameter no. 60 – Minimum dimming value

The value set in this parameter determines the minimum dimming value (the lowest value which can be set on the device, when, for example, dimming lights with wall switch or slider in the GUI (Gateway - hub)).

Values (size is 1-byte dec):

- default value 15 = 15 % (minimum dimming value)
- 0 - 98 = 1 % - 98 %, step is 1 %. Minimum dimming value is set by entering a value.

ⓘ NOTE: The minimum level may not be higher than the maximum level!

ⓘ NOTE: The outpup level is automatically adjusted according to changed value

ⓘ NOTE: Value was increased to 15 from 1 present on previous SW version

Parameter no. 61 – Maximum dimming value

The value set in this parameter determines the maximum dimming value (the highest value which can be set on the device, when, for example, dimming lights with wall switch or slider in the GUI (Gateway - hub)).

Values (size is 1-byte dec):

- default value 99 = 99 % (Maximum dimming value)
- 1 - 99 = 2 % - 99 %, step is 1 %. Maximum dimming value is set by entering a value.

ⓘNOTE: The maximum level may not be lower than the minimum level!

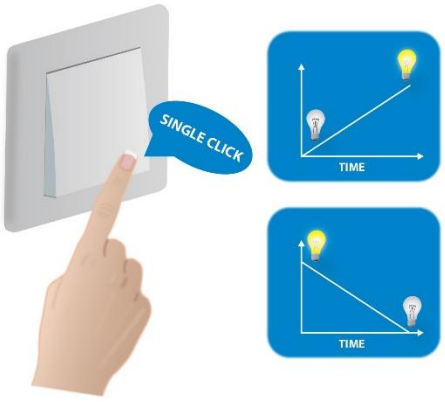
ⓘNOTE: The output level is automatically adjusted according to changed value

Parameter no. 65 – Dimming time when key pressed (soft on/off)

Choose the time during which the device will move between the min. and max. dimming values by a short press of the momentary switch connected to terminal I.

Values (size is 1-byte dec):

- default value 1 = 1 s
- 1 - 127 = 1 seconds- 127 seconds, step is 1 second

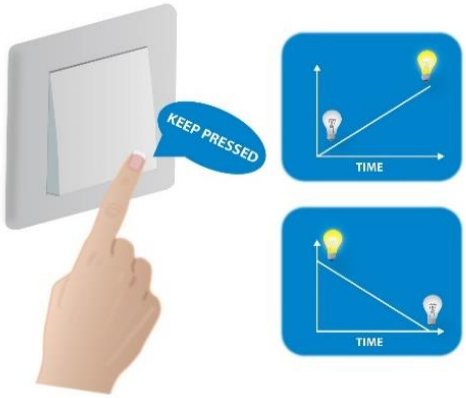


Parameter no. 66 – Dimming time when key hold

Choose the time during which the Dimmer will move between the min. and max. dimming values during a continuous press of the momentary switch connected to terminal I, by an associated device or through the UI controls (BasicSet, SwitchMultilevelSet).

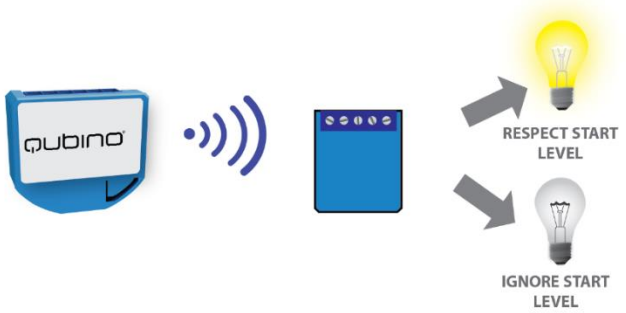
Values (size is 2-byte dec):

- default value 3 = 3 seconds
- 1-127 = 1 second – 127 seconds
- 128 – 253 = 1 minute – 126 minutes



Parameter no. 67 – Ignore start level

Choose whether the device should use (or disregard) the start dimming level value. If the device is configured to use the start level, it should start the dimming process from the currently set dimming level. This parameter is used with association group 3.

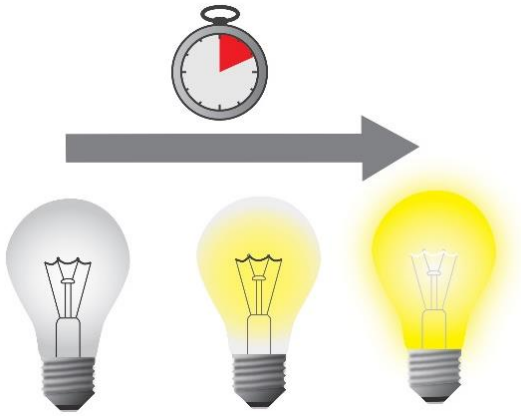


Values (size is 1-byte dec):

- default value 0
- 0 – use the start level value
- 1 - ignore the start level value

Parameter no. 68 – Dimming duration for associations

Choose the time during which the device will transition from the current value to the new target value. This parameter applies to the association group 3.



Values (size is 1-byte dec):

- default value 0 (dimming duration according to parameter 66)
- 1 - 127 (from 1 to 127 seconds)

Parameter no. 70 - Overload safety switch

The function allows for turning off the controlled device in case of exceeding the defined power for more than 5 s. Controlled device can be turned back on by terminal I or sending a control frame.

Values (size is 2-byte dec):

- default value 200
- 1 – 200 = 1 W – 200 W
- 0 = function not active

ⓘ NOTE: This functionality is not an overload safety protection, please check the technical specifications chapter for more details.

In case of overload the following message will be send towards the controller:

- COMMAND_CLASS_NOTIFICATION_V8
- The Alarm V1 type field set to 0x00
- Notification Type 0x08 and 0x08 (Overload detected)

Parameter no. 71 – Calibration trigger

Choose when will be the calibration procedure triggered.

Values (size is 1-byte dec):

- default value 0 - calibration done after power cycle if module is excluded
- 1 – calibration done after power cycle regardless of inclusion status
- 2 – force calibration. Calibration will start immediately

NOTE: For additional information check 'MINI DIMMER CALIBRATION' under chapter 2.

Parameter no. 72 – Calibration status (read only)

Whit this parameter you can check the calibration status.

Values (size is 1-byte dec):

- default value 2 – calibration failed
- 1 – calibration was successful
- 2 – calibration failed

Parameter no. 73 – Alarm/Notification events

This parameter defines the module behaviour in case it receives any Alarm/Notification events.

Values (size is 1-byte dec):

- default value 0 – function not active
- 1 – turn ON
- 2 – turn OFF
- 3 – start blinking (output turns 1 s ON, and 1 s OFF)

ⓘ NOTE: When value 3 is selected the default time interval of the blinking is 10 minutes. It can be stopped with a button press or sending a control frame. To adjust the time interval please refer to parameter 74 – Alarm/Notification time interval.

Parameter no. 74 – Alarm/Notification time interval (dependant on parameter 73)

This parameter defines the time interval of the blinking state, once the module receives an alarm/notification event. Minimum step increase is 1 minute.

Values (size is 1-byte dec):

- default value 10 = 10 minutes
- 1 – 125 = 1 -125 minutes

ⓘ NOTE: This parameter does not have any effect if parameter 73 is not set to value 3.

12.9. Available Frequencies

ORDERING CODE (MODEL NUMBER)	POWER SUPPLY FREQUENCY	Z-WAVE FREQUENCY*
ZMNHHD1	50 Hz	868,4 MHz
ZMNHHD2	50 Hz	921,4 MHz
ZMNHHD3	60 Hz	908,4 MHz
ZMNHHD4	50 Hz	869,0 MHz
ZMNHHD5	50 Hz	916,0 MHz
ZMNHHD6	50 Hz	922,5 MHz
ZMNHHD7	50 Hz	919,8 MHz
ZMNHHD8	50 Hz	865,2 MHz
ZMNHHD9	60 Hz	922,5 MHz
ZMNHHDA	60 Hz	920,9MHz
ZMNHHDC	60 Hz	868,4 MHz
ZMNHHDD	60 Hz	921,4 MHz
ZMNHHDE	50 Hz	868,4 MHz
ZMNHHDF	50 Hz	908,4 MHz

You can check the Z-Wave frequency in your country here:
https://www.silabs.com/products/wireless/mesh-networking/z-wave/benefits/technology/global-regions

12.10 Z-Wave Command Classes

Root device:

GENERIC_TYPE_SWITCH_MULTILEVEL

SPECIFIC_TYPE_POWER_SWITCH_MULTILEVEL

Supported Z-Wave Command Classes:

COMMAND_CLASS_ZWAVEPLUS_INFO_V2

COMMAND_CLASS_SUPERVISION_V1

COMMAND_CLASS_TRANSPORT_SERVICE_V2

COMMAND_CLASS_SECURITY_2_V1

COMMAND_CLASS_VERSION_V2 [S2]*

COMMAND_CLASS_DEVICE_RESET_LOCALLY_V1 [S2]*

COMMAND_CLASS_POWERLEVEL_V1 [S2]*

COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2 [S2]*

COMMAND_CLASS_SWITCH_BINARY_V1 [S2]*

COMMAND_CLASS_SWITCH_MULTILEVEL_V3 [S2]*

COMMAND_CLASS_METER_V4 [S2]*

COMMAND_CLASS_NOTIFICATION_V8 [S2]*

COMMAND_CLASS_ASSOCIATION_V2 [S2]*

COMMAND_CLASS_ASSOCIATION_GRP_INFO_V2 [S2]*

COMMAND_CLASS_CONFIGURATION_V1 [S2]*

COMMAND_CLASS_BASIC_V1 [S2]*

*[S2] Security S2 Command Class

COMMAND_CLASS_METER

- Default values:
  - Rate Type = 1 (Import)
  - Scale = 0 (kWh)

This Security Enabled Z-Wave Plus™ Product can be included and operated in any Z-Wave network with other Z-Wave certified devices from any other manufacturers. All constantly powered nodes in the same network will act as repeaters regardless of the vendor in order to increase reliability of the network.

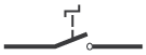
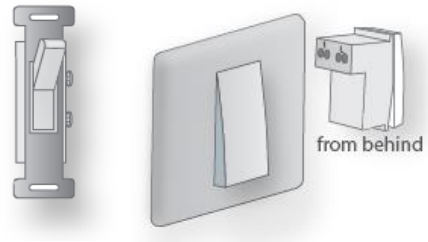
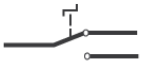
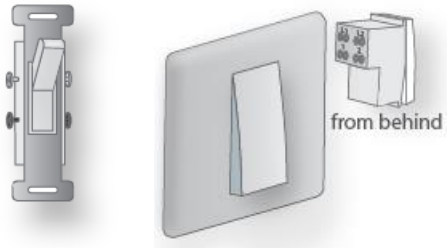
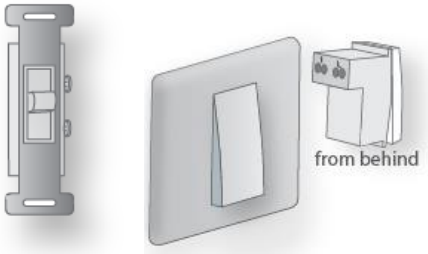
DSK access via UI
Gateways, which implement the S2 and SmartStart security feature, display an input dialog box, with a full or partial DSK key. The majority of them display a partial DSK (they don't show the PIN code), when the device is included with the S2-Authenticated security scheme. When included with the S2-Unauthenticated, some gateways show the complete DSK while others perform the complete inclusion process without prompting the user with the dialogue.

Mapping of the command BASIC_SET:

If parameter 6 is set to 0 (dimmable load), the device, receiving the BASIC_SET(value) command, will behave as follows:
- BASIC_SET(0x00): the command is mapped to SWITCH_MULTILEVEL_SET(0x00)
- BASIC_SET(0x01-0x63): the command is mapped to SWITCH_MULTILEVEL_SET(0x01-0x63)

If parameter 6 is set to 1 (non-dimmable load), the device, receiving the BASIC_SET(value) command, will behave as follows:
- BASIC_SET(0x00): the command is mapped to SWITCH_MULTILEVEL_SET(0x00)
- BASIC_SET(0x01-0x63): the command is mapped to SWITCH_MULTILEVEL_SET(0x63)

13. Technical Terms for Switches

Symbol	Switch example images	Definition	EU	USA	Qubino	Other names
		Single pole, single throw (SPST) - One switch controlling one light / circuit of lights	One-way switch	Two-way switch (regular switch)	Toggle switch	Switch; Bi-stable switch
		Single pole, double throw (SPDT) - Two switches controlling the same light / circuit of lights	Two-way switch	Three-way switch	Two-way switch	
		Used when you have three or more switches controlling the same light	Intermedi-ate switch	Four-way switch	Intermediat e switch	Crossover switch; Cross connection
		After being released, it goes back to its original state	Momentary switch		Momentary switch	Monostable switch; Push button

14. Troubleshooting

The bulb or light connected to the Mini Dimmer starts flickering.

Possible causes:

- Higher possibility in 2-wire installation, compared to 3-wire
- Higher possibility when using low power LED lights
- Higher possibility at/around minimum dimming range
- Might be caused by ripple-control signals emitted by electricity grid supplier
- Might be caused by higher voltage drops and or interferences on power lines

Possible solutions:

- We suggest increasing the value of Parameter no. 60 – Minimum dimming value
- We suggest adding a bypass in parallel with the light
- We suggest (if possible) wiring the neutral wire to the flush box in case there is currently only 2-wire

15. Important Disclaimer

Z-Wave wireless communication is not always 100% reliable. This device should not be used in situations in which life and/or valuables are solely dependent on its functioning. If the device is not recognized by your gateway (hub) or shows up incorrectly, you may need to change the device type manually and make sure your gateway (hub) supports multi-channel devices. Contact us for help before returning the device: http://qubino.com/support/#email

16. Warning

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. When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposal free of charge.

17. Regulations

Legal Notice

This user manual is subject to change and improvement without notice. GOAP d.o.o. Nova Gorica reserves all rights to revise and update all documentation without any obligation to notify any individual or entity.

WEEE

According to the WEEE (Waste electrical and electronic equipment) Directive, do not dispose of this product as household waste or commercial waste. Waste electrical and electronic equipment should be appropriately collected and recycled as required by practices established for your country. For information on recycling of this product, please contact your local authorities, your household waste disposal service or the shop where you purchased the product.

NOTE: User manual is valid for devices with SW version V31.00 (PN: last part of ordering code HXS3P1)

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