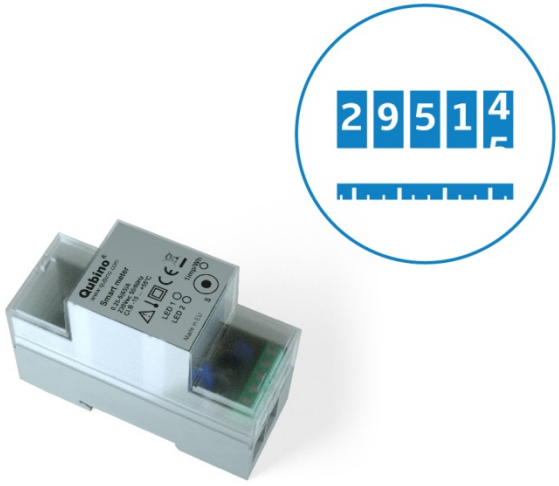
Your little magic for the smartest home.

USER MANUAL **EN**

QUBINO SMART METER



The Qubino Smart Meter is an extremely versatile and powerful Z-Wave device for measuring energy in a single-phase electrical power network of up to 65A.

EN

Table of contents

EN

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

About Z-Wave:

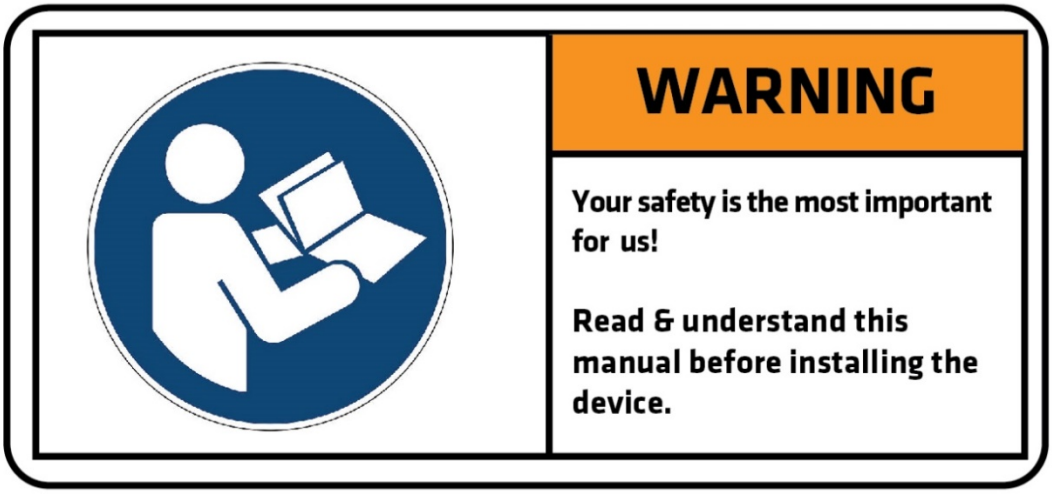
The Z-Wave protocol is an interoperable, wireless, RF-based communications technology designed specifically for control, monitoring, and status reading applications in residential and light commercial environments. Mature, proven, and broadly deployed (with over 50 million products sold worldwide), Z-Wave 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

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.

Smart Meter - Available Frequencies

ORDERING CODE (MODEL NUMBER)	POWER SUPPLY FREQUENCY	Z-WAVE FREQUENCY*
ZMNHTD1	50/60 Hz	868,4 MHz
ZMNHTD2	50/60 Hz	921,4 MHz
ZMNHTD3	50/60 Hz	908,4 MHz
ZMNHTD4	50/60 Hz	869,0 MHz
ZMNHTD5	50/60 Hz	916,0 MHz
ZMNHTD6	50/60 Hz	868,4 MHz
ZMNHTD7	50/60 Hz	919,8 MHz
ZMNHTD8	50/60 Hz	865,2 MHz
ZMNHTD9	50/60 Hz	922,5 MHz
ZMNHTDA	50/60 Hz	919,7 – 921,7 – 923,7 MHz
ZMNHTDB	50/60 Hz	868,1 MHz
ZMNHTDC	50/60 Hz	868,1 MHz
ZMNHTDD	50/60 Hz	919,8 MHz
ZMNHTDE	50/60 Hz	920,9 MHz

ⓘ PLEASE NOTE THAT SMART METER WORKS ONLY ON 230VAC +15/-20%.

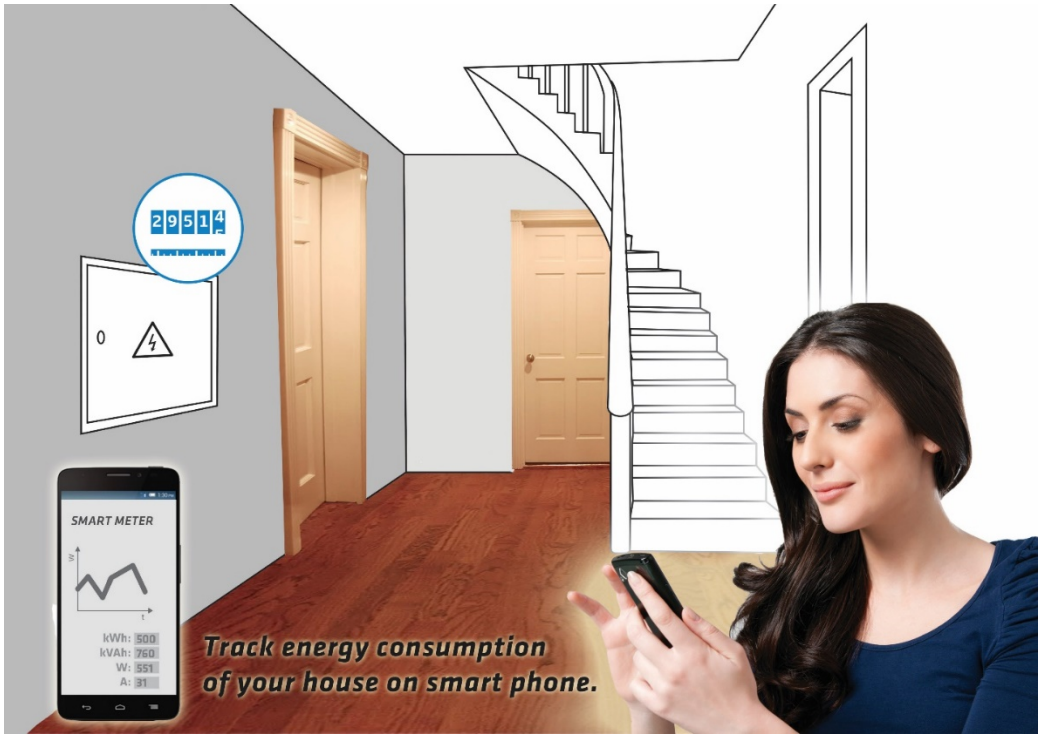
*You can check the Z-Wave frequency in your country here:
https://www.silabs.com/products/wireless/mesh-networking/z-wave/benefits/technology/global-regions?cid=nat-acq-zwv-041818

Where To Buy

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

1. Introduction

The Qubino Smart Meter is an extremely versatile and powerful Z-Wave device for measuring energy in a single-phase electrical power network of up to 65A. A built-in microprocessor calculates energy, power and power factor from the measured signals. It is designed to be mounted on a DIN rail.



The Qubino Smart Meter can be used in residential, industrial and utility applications. It measures energy directly in 2-wire networks by means of fast sampling of voltage and current signals. It calculates energy, power and power factor from the measured signals. You can control the device through the Z-Wave network.

The Qubino Smart Meter can operate across a wide temperature range, from a chilly -15˚C to a scorching 55˚C (5˚F–131˚F). Every device also acts as a repeater in order to improve the range and stability of the Z-Wave network.

Smart Meter measurements:

Voltage [V]	Current [A]	Power – Active [W]	Power – Reactive [kvar]	Power Factor – [PF]	Energy – Active power accumulated Import [kWh]	Energy – Active power accumulated Export[kWh]	Energy – Apparent power accumulated [kVAh]	Energy – Reactive power accumulated [kvarh]
✓	✓	✓	✓	✓	✓	✓	✓	✓

Smart Meter supported functions:

Associations	Z-Wave Repeater	Auto-inclusion
✓	✓	✓

Optional functions:

Turn ON/OFF device 1*	Turn ON/OFF device 2*	Automatically turn ON/OFF*
✓	✓	✓

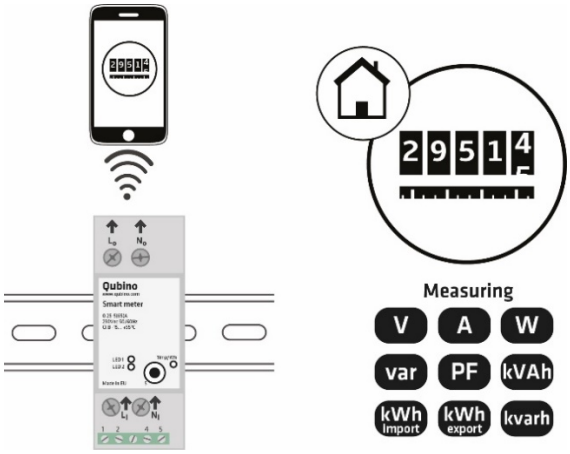
*with additional external contactors - IKA/BICOM. IKA and BICOM are sold separately - for more info, please see Qubino catalogue. Product ordering codes (model numbers): IKA232-20/230V: 030 046 833 000; BICOM432-40-WM1: 30.074.038

2. Use Cases

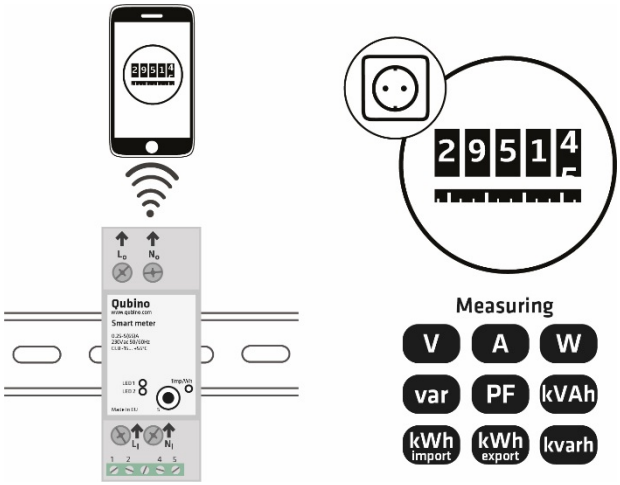
The Smart Meter can be used in many different scenes, which can help make your life more comfortable. We have prepared a few of them for you, so you can get an idea for your next smart home project. Of course, there are countless of other options for how to use Qubino Smart Meter to measuring energy in a single-phase electrical power network of up to 65A. and remotely control devices via your smartphone.

2.1. Installation examples for the Smart Meter - used for measuring energy consumption

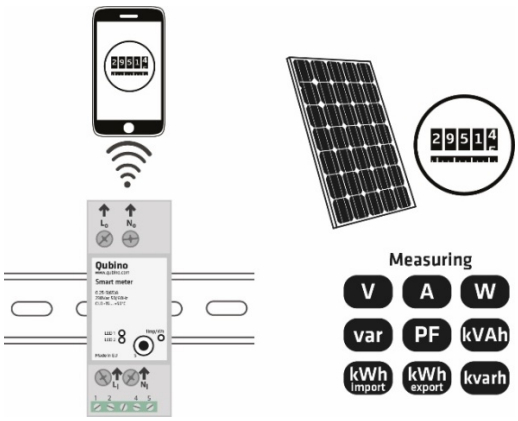
- Track the power consumption of the house



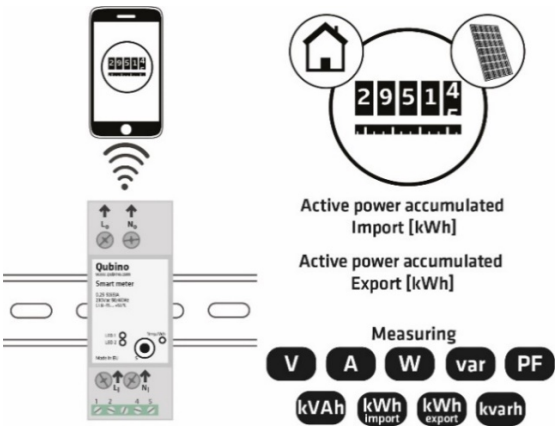
- Track the power consumption of one electrical device



- Track the power generated by the solar power plant



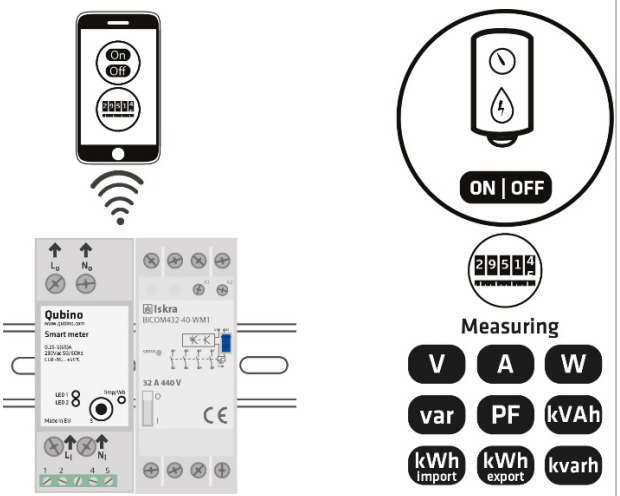
- Track the power consumed from the electrical power network and power exported in electrical power network



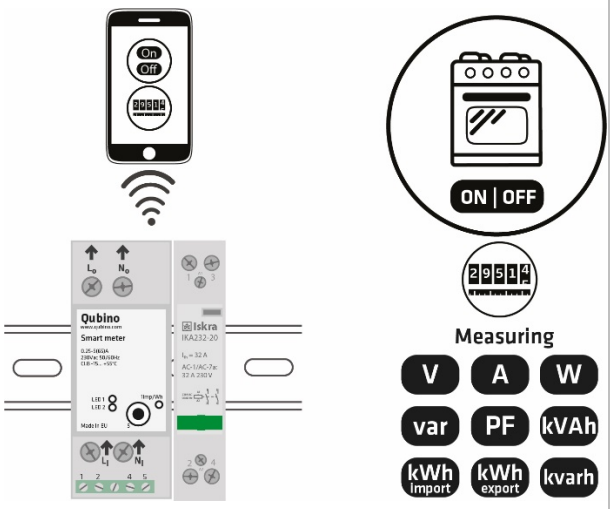
2.2. Installation examples for the Smart Meter - used for measuring energy consumption and for controlling* electrical devices

(*with additional external contactors - IKA/BICOM. IKA and BICOM are sold separately - for more info, please see Qubino catalogue. Product ordering codes (model numbers): IKA232-20/230V: 030 046 833 000; BICOM432-40-WM1: 30.074.038)

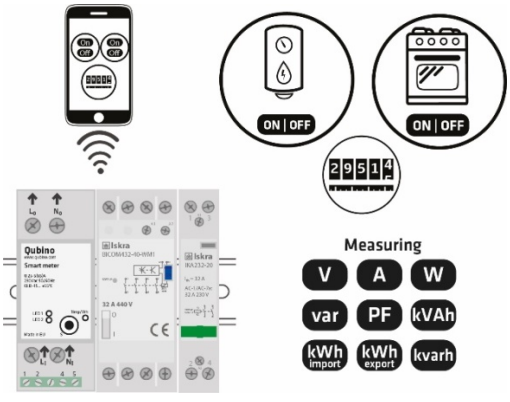
- Remotely control and measure the power consumption of one electrical device (for example: water heater) – with external relay BICOM432-40-WM1



- Remotely control and measure the power consumption of one electrical device (for example: oven) – with the external relay IKA232-20/230V



- Remotely measure the power consumption of the whole house and control two groups electrical devices – with BICOM432-40-WM1 and IKA232-20/230V

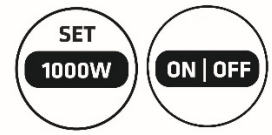


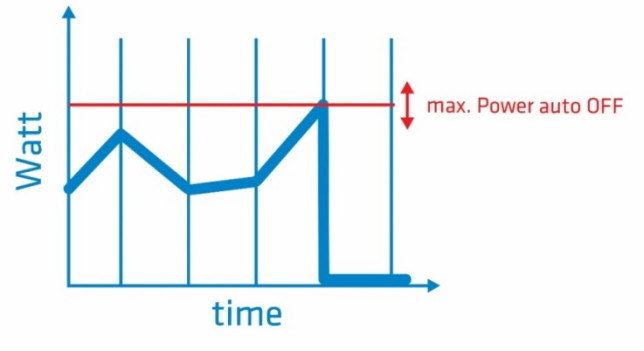
2.3. Additional features of Smart Meter which can make your life easier*

(*with additional external contactors - IKA/BICOM. IKA and BICOM are sold separately - for more info, please see Qubino catalogue. Product ordering codes (model numbers): IKA232-20/230V: 030 046 833 000; BICOM432-40-WM1: 30.074.038)

- **Do you often notice that some devices in your household consume too much energy?**

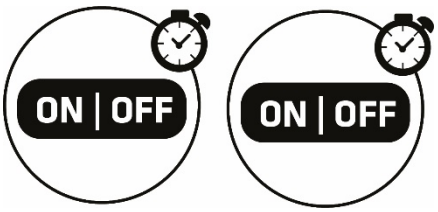
- The Smart Meter can automatically turn devices/lights off after they exceed the set power consumption. For example, the heating will automatically turn off after it reaches the set power consumption value. This function is independent of other scenes and gateway (hub) commands.





- **Do you often forget to turn off devices when you leave your home, like lights in the basement or attic?**

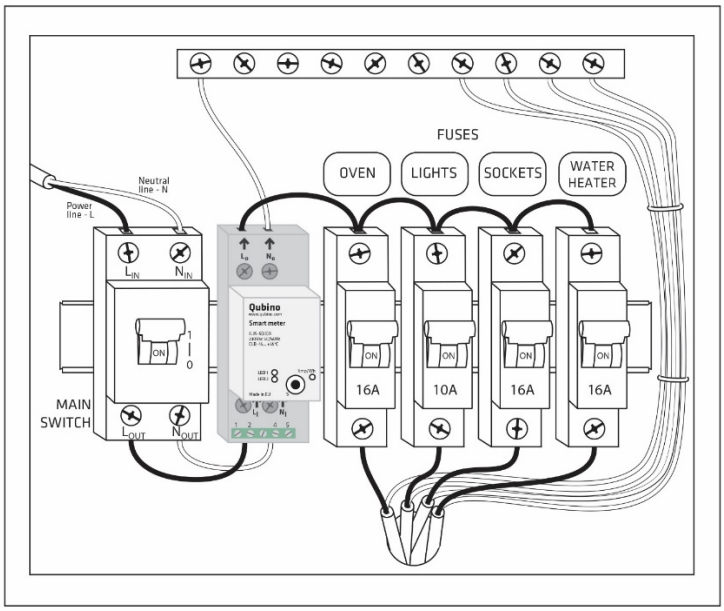
- The Smart Meter can automatically turn devices/lights on or off after a set period of time (when you're away from home). For example, the light will automatically turn off if it's been on for 8 hours, let's say. This function is independent of other scenes and gateway (hub) commands.



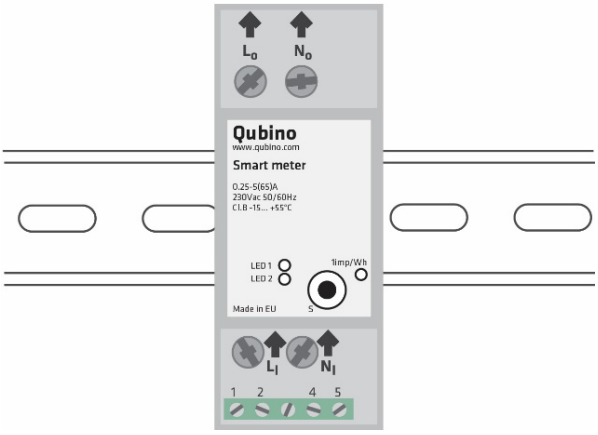
3. Qubino Smart Meter Advantages and Highlights

3.1. Advantages

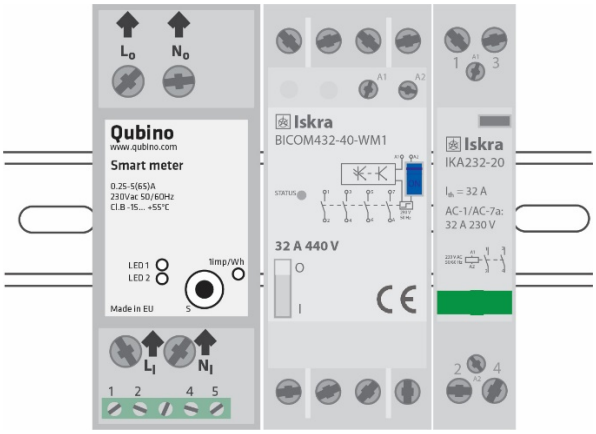
- The Qubino Smart Meter is **the most accurate Z-Wave Smart Meter in the world**. It is the only Z-Wave Smart Meter where the current passes through it – you do not need clamps. Measuring with a smart meter with clamps will never be as accurate as it is if the electricity passes through a device.



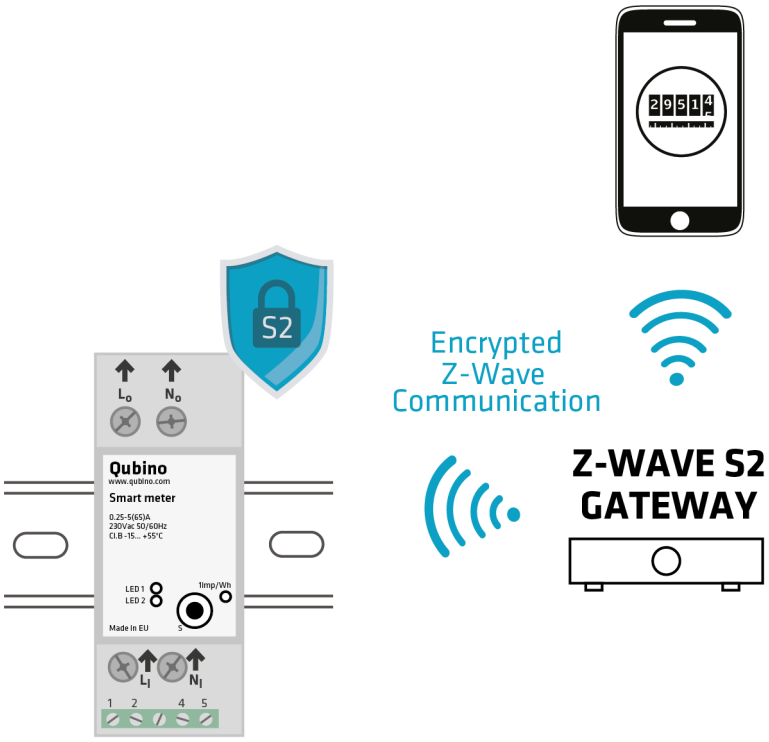
- The Qubino Smart Meter allows the **easiest and quickest installation possible** – no clamps. There is no simpler installation than **DIN rail installation** – and the Qubino Smart Meter is a DIN rail mounted device so the installation is simple.



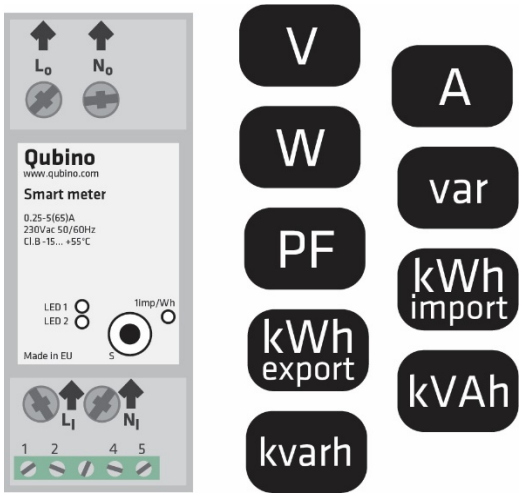
- Besides measuring, the Qubino Smart Meter is the only single-phase smart meter worldwide that allows you to **switch ON/OFF two independent electrical circuits**, with the connection of two additional contactors - IKA/BICOM. IKA and BICOM are sold separately - for more info, please see Qubino catalogue.
  Product ordering codes (model numbers): IKA232-20/230V: 030 046 833 000; BICOM432-40-WM1: 30.074.038



- The only Z-Wave Smart Meter in the world that supports Z-Wave **S2 Authenticated secure inclusion**.



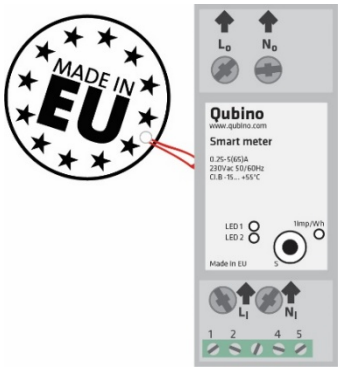
- The Qubino Smart Meter can measure 9 electrical values: Voltage [V], Current [A], Power – Active [W], Power – Reactive [kvar], Power Factor – [PF], Energy – Active power accumulated Import [kWh], Energy – Active power accumulated Export [kWh], Energy – Apparent power accumulated [kVAh], Energy – Reactive power accumulated [kvarh]



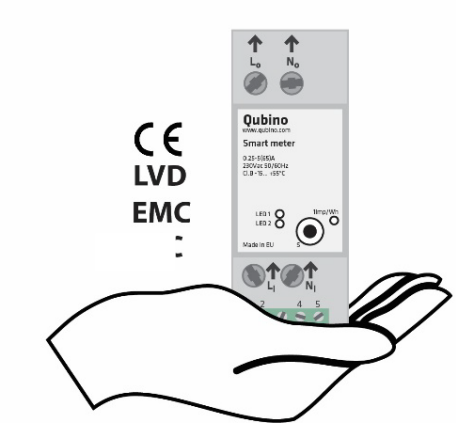
- Qubino guarantees **100% device quality**. Such high quality can be delivered because every Qubino goes through rigorous quality control standards throughout the production process. Every device has a unique serial number and part number, which are assigned to the device only after it goes through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

- By scanning the QR code on the side of your Qubino device, the serial and part numbers will be automatically copied on your mobile phone; they also provide **direct access to Qubino's technical support team**. The serial and part numbers of your device are given automatically every time you open an inquiry with our support team: this instantly shares the relevant device information we need to provide the best technical support possible. For details, please see the Device Information and Support chapter.

- The Qubino Smart Meter is **engineered and manufactured in the EU** and contains only the highest quality components.



- The Qubino Smart Meter is certified by an independent European Institute and has CE, LVD and EMC certificates to ensure the highest safety standards.



3.2. Highlights

- Remote (via smartphone or PC) and local measuring energy and optional* control 2 separate electrical circuitsUse the optional contactor or bi-stable switch with the Smart Meter to facilitate the switching of power circuits or appliances
  Ideal for fast switching of motors, electric heating and lights
- Works with toggle switches and push-button (momentary switches)
- Highly accurate monitoring and energy measurements
- Features one of the easiest and quickest installations of devices of this kind – DIN rail installation
- Saves and restores the last status after a power failure.
- Supports auto-inclusion mode for quick set up
- Can automatically turn devices on and off after a set period of time (helpful when you're away from home, for example)**
- Supports additional parameters for expert users, which allows for 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

*with additional external contactors - IKA/BICOM. IKA and BICOM are sold separately - for more info, please see Qubino catalogue. Product ordering codes (model numbers): IKA232-20/230V: 030 046 833 000; BICOM432-40-WM1: 30.074.038

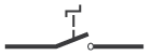
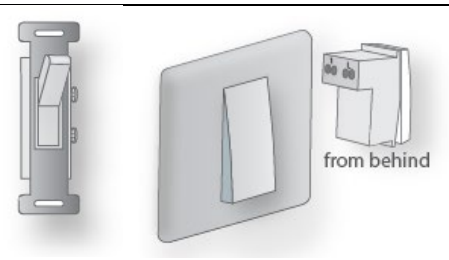
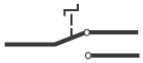
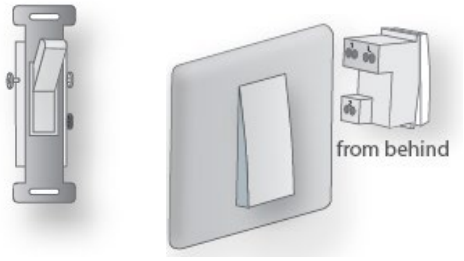
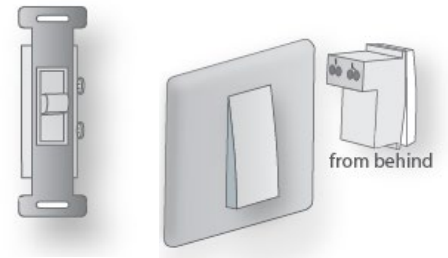
**Your gateway (hub) needs to support advanced configuration and parameter input if you wish to use this feature

4. Package Contents

- Smart Meter Device
- Installation Manual
- S2 packaging label

EN

5. 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	Intermedi-ate switch	Crossover switch; Cross connection
		After being released, it goes back to its original state	Momentary switch		Momentary switch	Monostable switch; Push button

6. 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/products/smart-meter/smart-meter-compatibility/

7. Installation

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

ⓘ **Danger of electrocution!**

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.

ⓘ **Note!**

Do not connect the module to loads exceeding recommended values. Connect the module only in accordance to the below diagrams. Improper connections may be dangerous.

Electrical installation must be protected by over current protection fuse with rated current up to 63A, it must be used according to wiring diagram to achieve appropriate overload protection of the module.

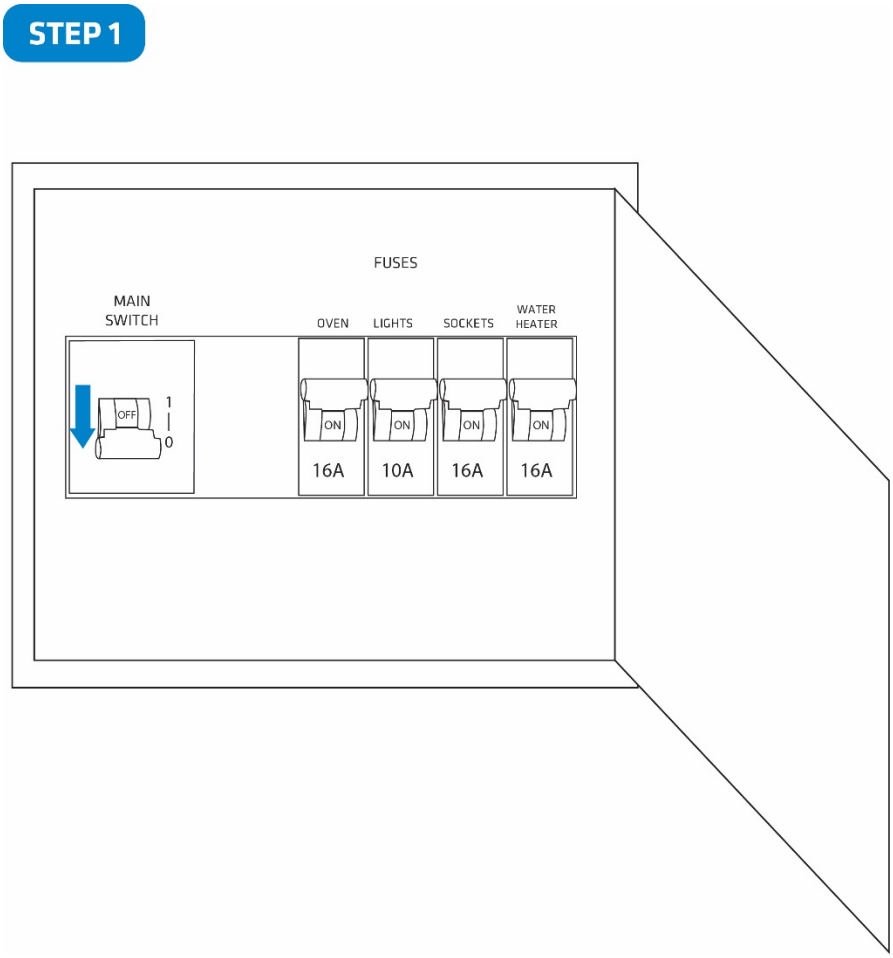
ⓘ **Note!**

The DSK code is used to include the device into the Z-Wave network. Once the device will be mounted, access to the DSK code label may be difficult, so we suggest rewriting the DSK code or scanning the QR code from the device label, before installing the device in electric box.

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.

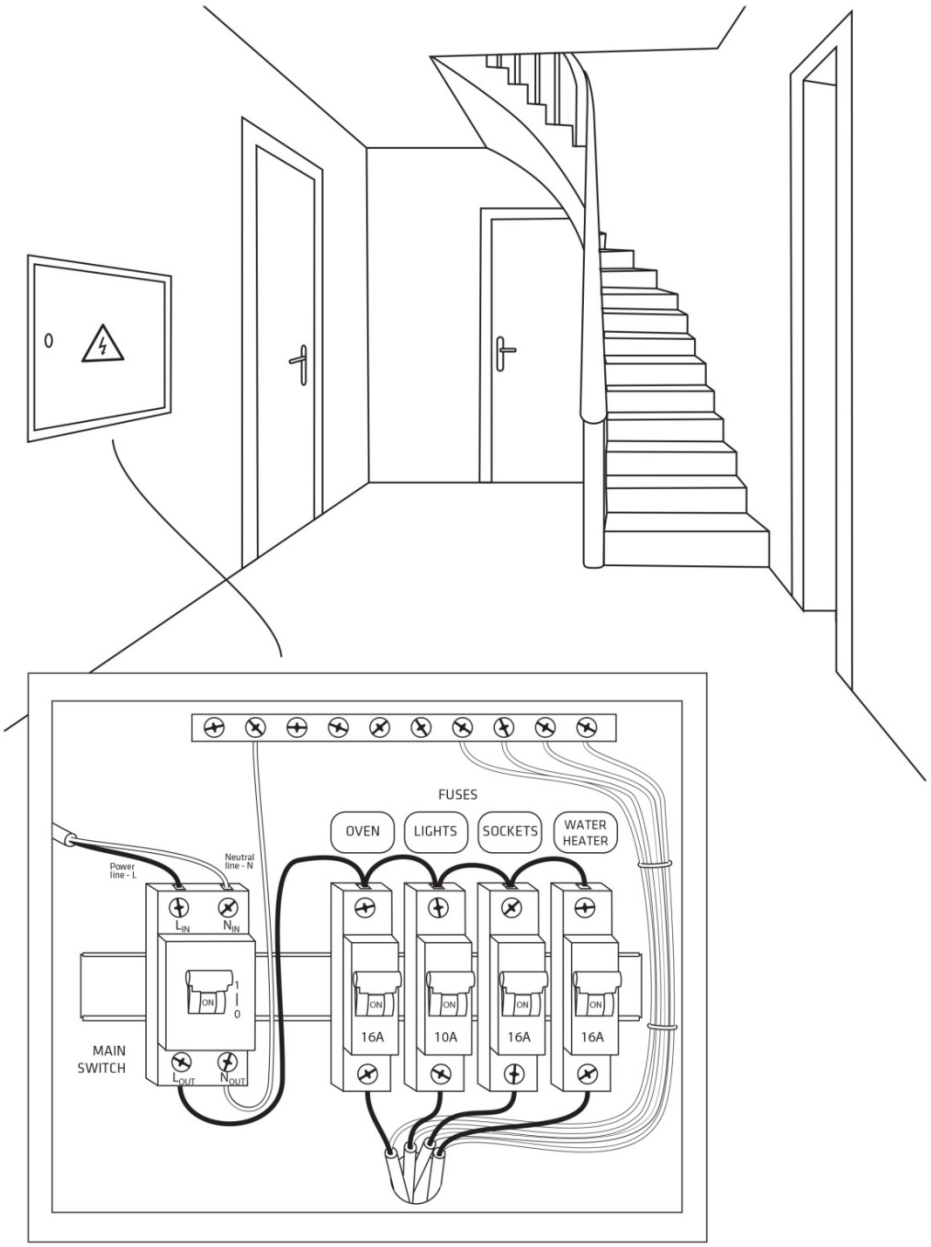


Step 2 – Installing the device:

- Connect the device exactly according to the diagrams shown below

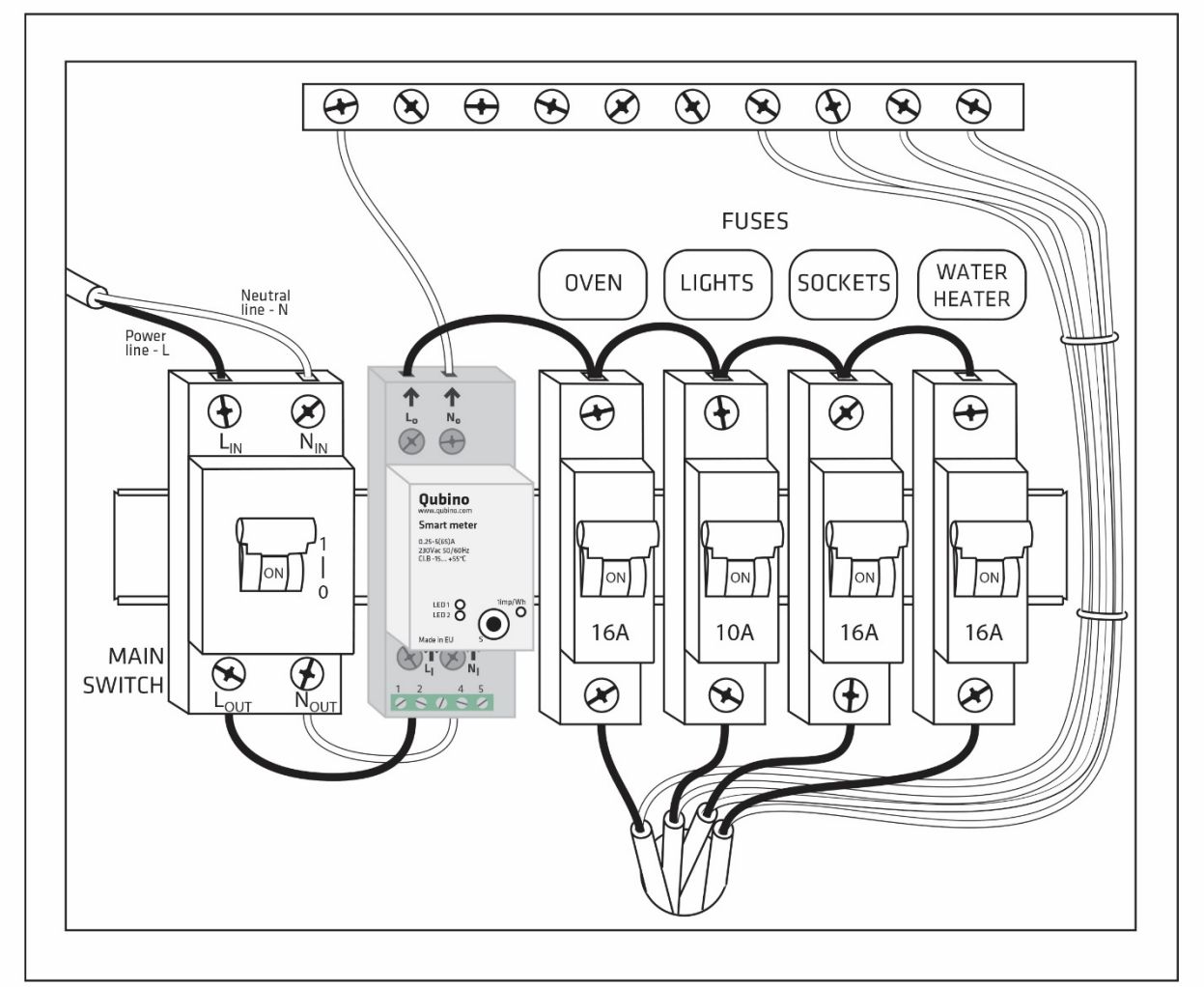
STEP 2

Before Qubino installation:



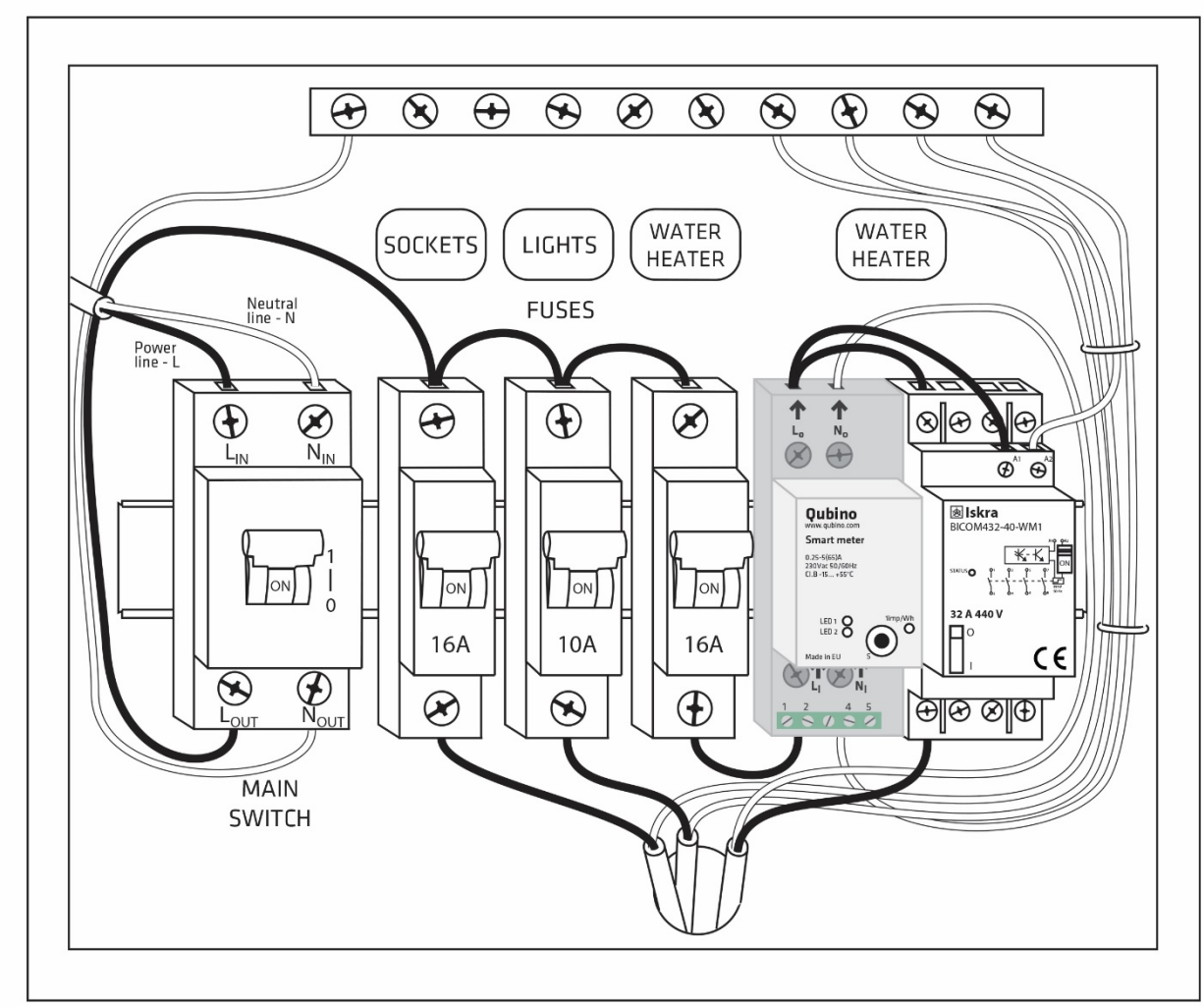
After Qubino installation:

For measuring energy of the house:



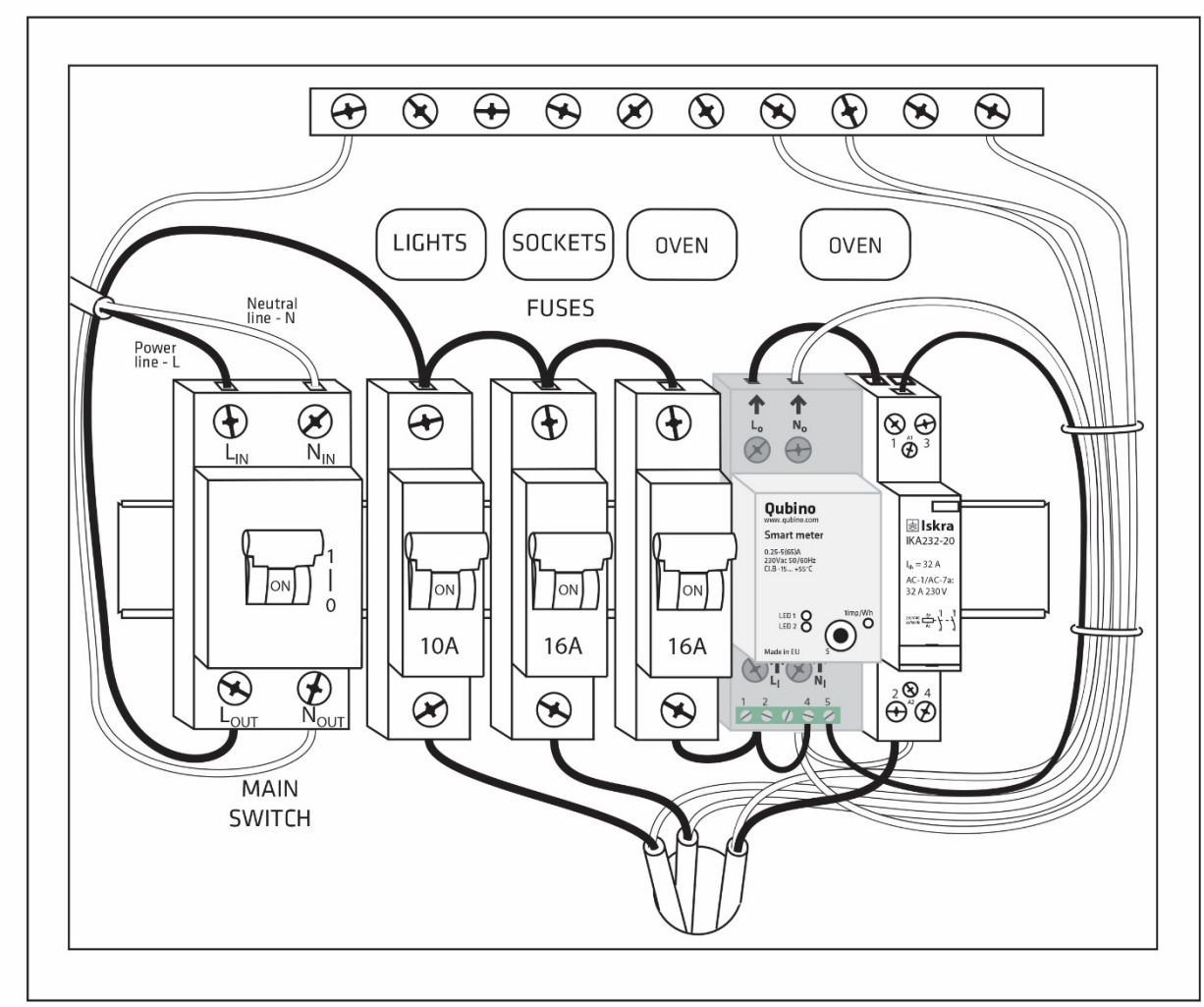
For controlling one electrical device with BICOM432-40-WM1*:

*BICOM is sold separately - for more info, please see Qubino catalogue. Product ordering code (model number): 30.074.038



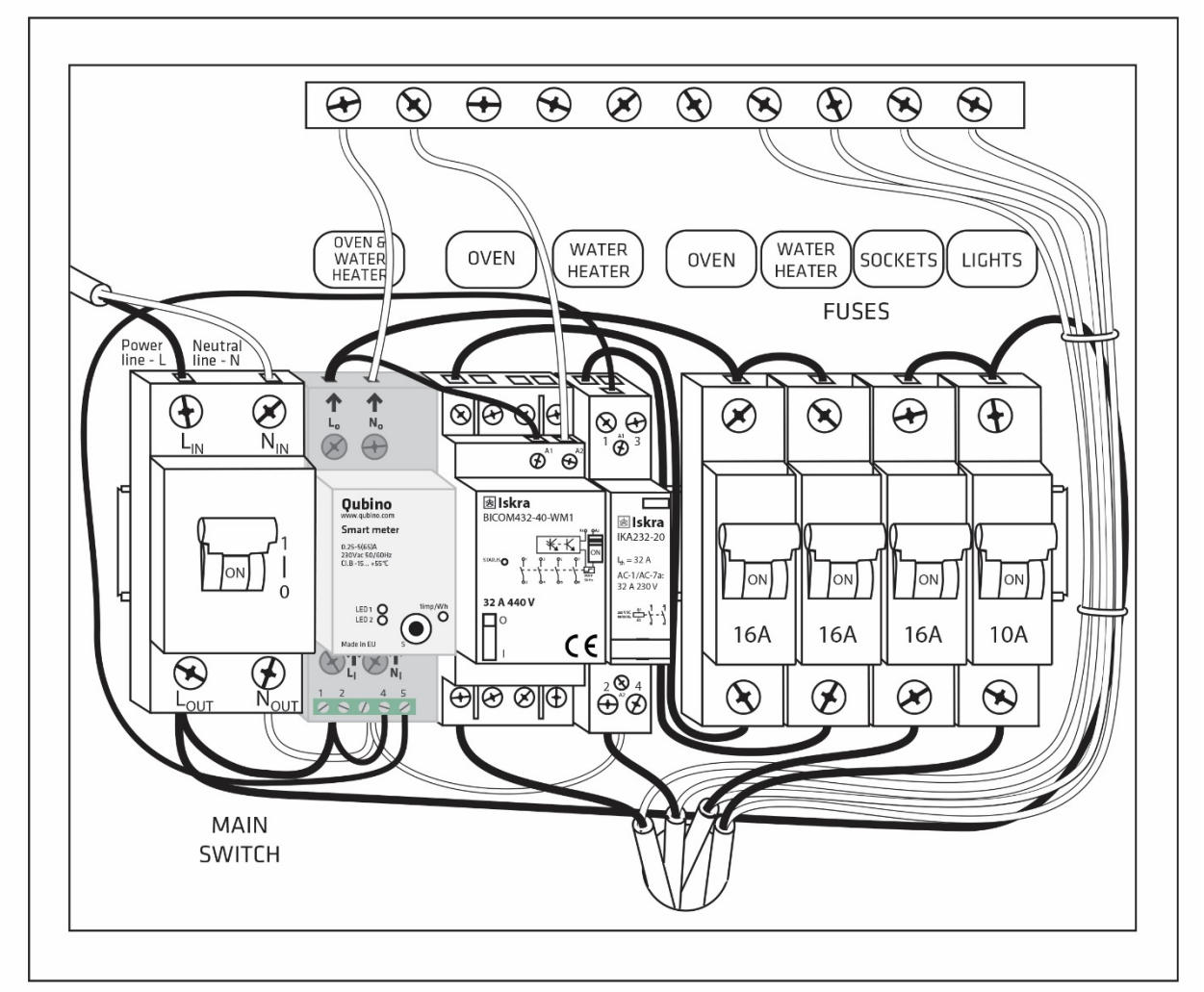
For controlling one electrical device with IKA232-20/230V

*IKA is sold separately - for more info, please see Qubino catalogue. Product ordering code (model number): 030 046 833 000

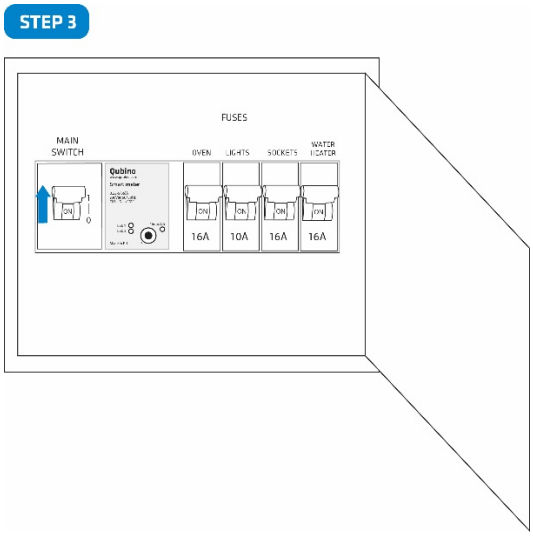


For controlling electrical devices with IKA232-20/230V* and one with BICOM432-40-WM1*:

*IKA and BICOM are sold separately - for more info, please see Qubino catalogue. Product ordering codes (model numbers): IKA232-20/230V: 030 046 833 000; BICOM432-40-WM1: 30.074.038



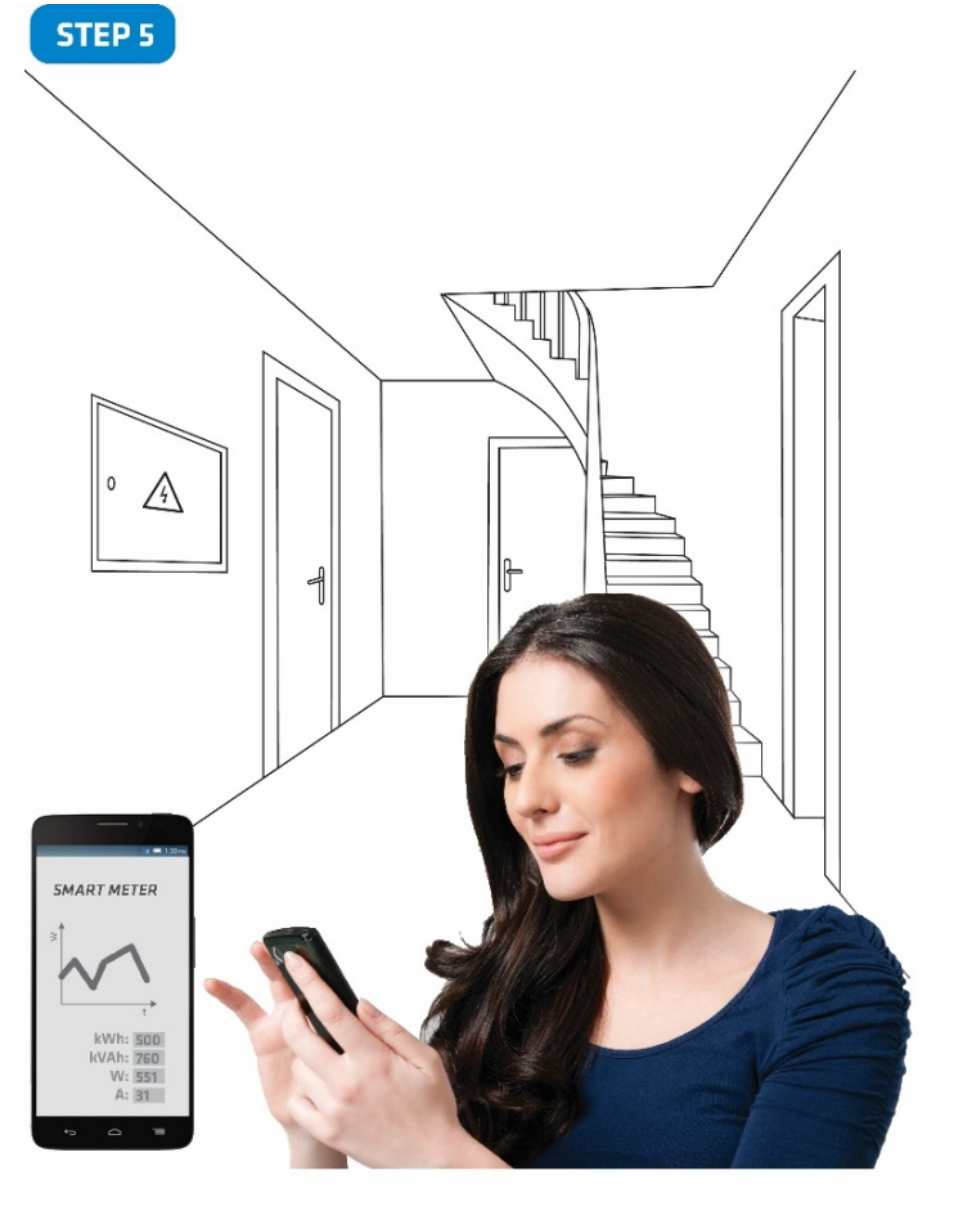
Step 3 – Turn ON the fuse:



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 Smart Meter



8. Device Information and 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.

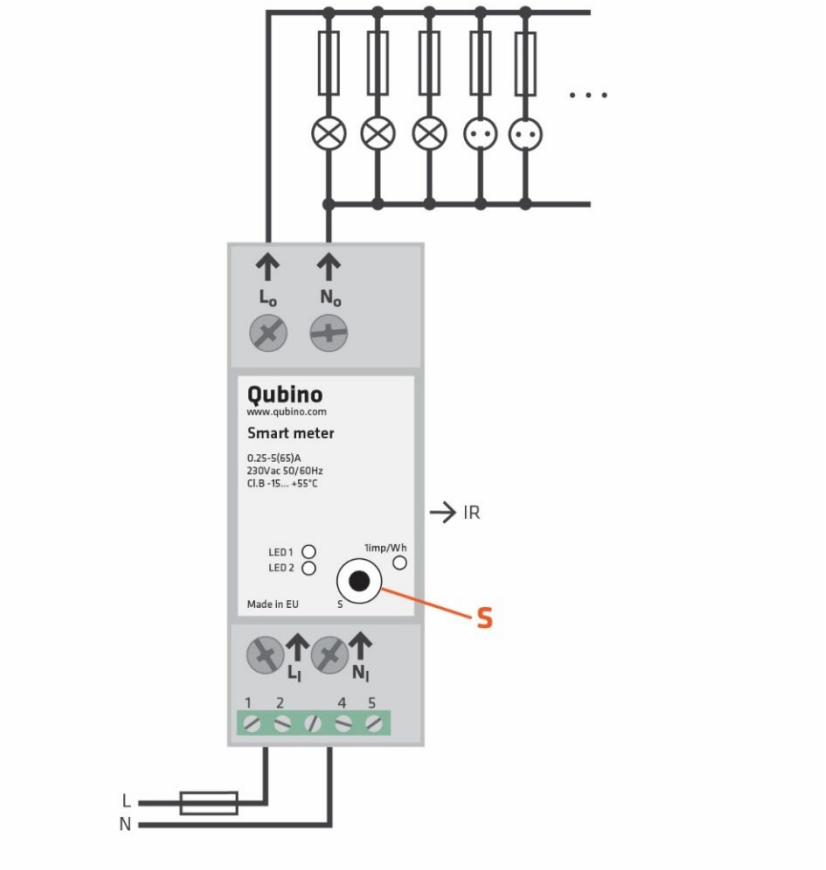
Why is this important?

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.

By scanning the QR code on the back of your Qubino, its device title, serial number, and part number are automatically copied to your mobile phone. You can also use the code for direct access to the device page for more information. If you still don't find what you're looking for, click on the link to Qubino technical support team. They will be able to automatically read the serial and part number from your device and quickly review the production log file containing the production date as well as any relevant device parameters and information. This process allows our team to immediately identify and address issues, giving you the best support possible.

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 our support team by scanning the QR code on your device or through our website: http://qubino.com/support/#email. We will try to help you as soon as possible.

9. Electrical Diagram 230VAC



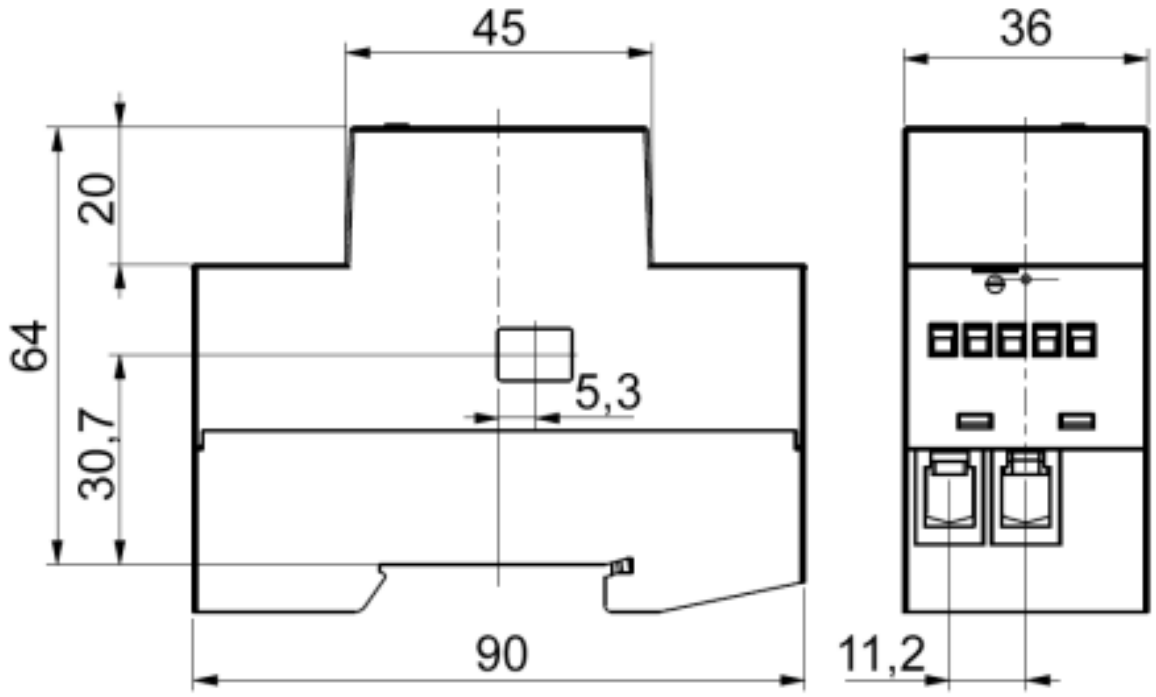
Notes for diagram:

LI	Live input
NI	Neutral input
Lo	Live output
No	Neutral output
1	Input for IR external relay/Ext. relay NC
2	Neutral lead for input NC
4	Live lead for External relay output NC
5	Output for External relay (max. 3W) NC
S	Service button (used to add or remove device from the Z-Wave network)
LED1	Device status. For detailed information please check the chapter "LED SIGNALIZATION FOR INCLUSION/EXCLUSION"
LED2	External relay and communication with meter chip status.For detailed information please check chapter LED SIGNALIZATION FOR INCLUSION/EXCLUSION
IR	Output for IR external relay
1imp/Wh	Red - Pulse rate (On – no load indication)

MEASUREMENTS:

V	Voltage
A	Current
W	Power – Active
var	Power – Reactive
PF	Power Factor
kWh	Energy – Active power accumulated Import
kWh	Energy – Active power accumulated Export
kVAh	Energy – Apparent power accumulated
kvarh	Energy – Reactive power accumulated

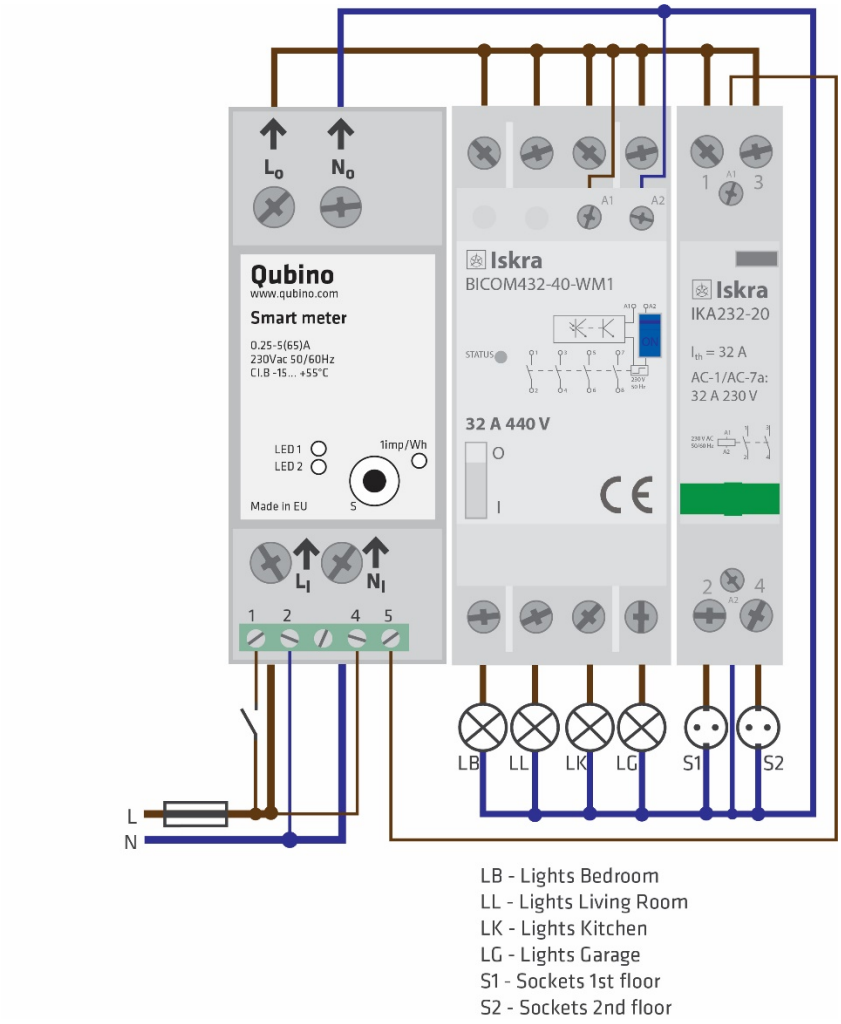
DIMENSIONAL DRAWING:



EXTERNAL RELAYS:

It is possible to connect two external relays to Smart Meter. One controlled by built-in optical (IR) communication port on the side, second controlled by output on terminal 5.

* IKA and BICOM are sold separately - for more info, please see Qubino catalogue. Product ordering codes (model numbers): IKA232-20/230V: 030 046 833 000; BICOM432-40-WM1: 30.074.038



LB - Lights Bedroom
LL - Lights Living Room
LK - Lights Kitchen
LG - Lights Garage
S1 - Sockets 1st floor
S2 - Sockets 2nd floor

BICOM432-40-WM1 (IR) RELAY

BICOM432-40-WM1 is a bistable switch with modbus communication over IR connection. Bistable switch is a switching device with two stable states for switching on and off all kinds of electrical loads. When the switch is not electrically, manually or over a IR communication path, remains stable in its operating position and will change its operating position on initiation or actuation. initiated Switch is controllable over a IR communication interface always in a slave communication position. BICOM432-40-WM1 has built-in electro-mechanical check of the position status. BICOM432-40-WM1 is available as standalone unit, being also powered from own power source over an internal power supply. By default, endpoint 3, which corresponds to this relay, is hidden and can be enabled by changing the value of the configuration parameter 100.

IKA232-20/230VIKA232-20 is a bistable switch, which can be controlled, in contrast to the IR relay, using a digital output (on the Smart meter). A bistable switch is a switching device with two stable states for switching on and off all kinds of electrical loads. It can be used for remote control of various AC devices (fast switching of motors, electric heating, lights and lightning, all kinds of electrical and electronic equipment, which can be found in residential, hospitals, hotels, and business premises). IKA232-20/230V is available as standalone unit, being also powered from own power source over an internal power supply. By default, endpoint 2, which corresponds to this relay, is hidden and can be enabled by changing the value of the configuration parameter 100.

Both relays can be controlled using the supported actuation commands: BASIC_SET, SWITCH_BINARY_SET.

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

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

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

2. Automatic selection of secure/unsecure inclusion

3. The device can be automatically added to a Z-Wave network during the first 2 minutes

4. Connect the device to the power supply

5. Auto-inclusion will be initiated within 5 seconds of connection to the power supply and the device will automatically enrol in your network

ⓘ NOTE: For S2 inclusion please check chapter – »16. Z-Wave Security«.

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)

2. Toggle the Service button S between 0.2 and 3 seconds

3. A new multi-channel device will appear on your dashboard

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

REMOVAL FROM A ZWAVE 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. Press and hold the S service button between 0.2 and 3 seconds

5. The device will be removed from your network but custom configuration parameters will not be erased

FACTORY RESET

1. Connect the device to the power supply

2. Press and hold the S service button between 6 seconds and 20 seconds

3. Device will be removed from you network

ⓘ By resetting the device, all custom parameters previously set on the device will return to their default values, and the owner ID will be deleted. Use this reset procedure only when the main gateway (hub) is missing or otherwise inoperable.

LED SIGNALIZATION FOR INCLUSION/EXCLUSION

LED1 (Green)

- LED is ON = Power ON, module is included
- LED is 1s OFF, 1s ON = Power ON, module is excluded

LED2 (Orange)

a. Communication indicator
   - LED is indicating communication with the measuring processor

ⓘ NOTE: Signalization described below is valid only in case, that par.100 is set to the value different than zero.

a. External IR relay enabled only
   - LED is ON = External IR relay is turned ON
   - LED is OFF = External IR relay is turned OFF
   - LED is 0.5s OFF, 0.5s ON = IR communication error

b. External TRIAC relay enabled only
   - LED is ON = External IR relay is turned ON
   - LED is OFF = External IR relay is turned OFF

c. Both TRIAC and IR enabled
   - LED is ON = External IR relay is turned ON
   - LED is OFF = External IR relay is turned OFF
   - LED is 0.5s OFF, 0.5s ON = IR communication error

d. External IR relay disabled
   - LED is ON = modbus packet is sent
   - LED is OFF = modbus packet is received

12. Associations

Association Groups:

- Group 1: Lifeline group (reserved for communication with the primary gateway (hub)), 1 node allowed.

13. Configuration Parameters

Parameter no. 7 – Input 1 switch function selection

Values (size is 1 byte dec):

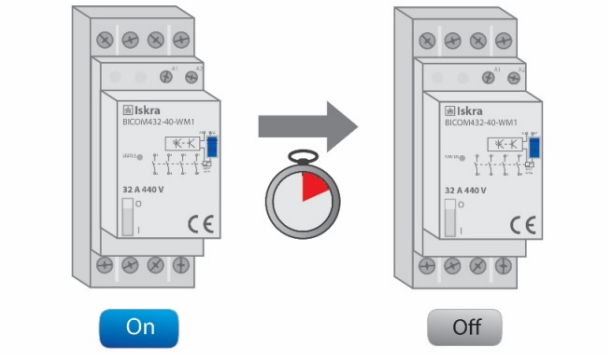
- Default value 4
- 0 – disabled
- 2 – IR external relay control – mono stable push button
- 3 – IR external relay control – bi-stable switch
- 4 – External relay control – mono stable push button
- 5 – External relay control – bi-stable switch

Parameter no. 11 – Automatic turning off External IR relay output after set time

When External IR relay is ON it goes automatically OFF after time defined in this parameter. Timer is reset to zero each time the device receives ON command.

Values (size is 2 byte dec):

- Default value 0
- 0-59 = Auto OFF disabled
- 60-32535 = 60 seconds – 32535 seconds

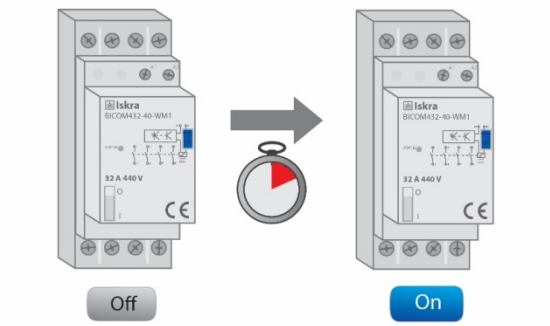


Parameter no. 12 – Automatic turning on External IR relay output after set time

When External IR relay is OFF it goes automatically ON after time defined in this parameter. Timer is reset to zero each time the device receives OFF command.

Values (size is 2 byte dec):

- Default value 0
- 0-59 = Auto ON disabled
- 60-32535 = 60 seconds – 32535 seconds

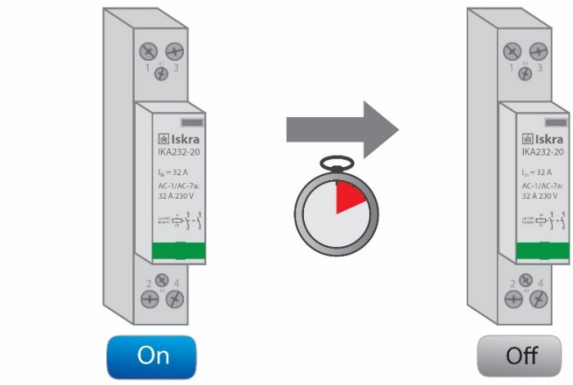


Parameter no. 13 – Automatic turning off External relay output after set time

When External IR relay is ON it goes automatically OFF after time defined in this parameter. Timer is reset to zero each time the device receives ON command.

Values (size is 2 byte dec):

- Default value 0
- 0-59 = Auto OFF disabled
- 60-32535 = 60 seconds – 32535 seconds

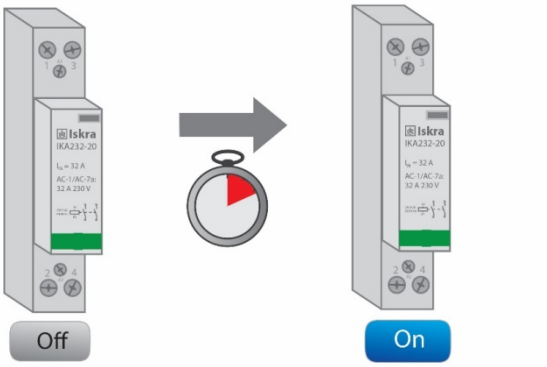


Parameter no. 14 – Automatic turning on External relay output after set time

When External IR relay is OFF it goes automatically ON after time defined in this parameter. Timer is reset to zero each time the device receives OFF command.

Values (size is 2 byte dec):

- Default value 0
- 0-59 = Auto ON disabled
- 60-32535 = 60 seconds – 32535 seconds



Parameter no. 40 –Reporting Watts on power change

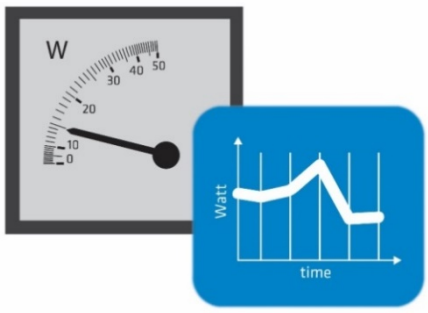
Set value means percentage from 0-100 = 0% - 100%

Values (size is 1 byte dec):

- Default value 10
- 0 – reporting disabled
- 1-100 = 1% - 100% reporting enabled. Power report is send (push) only when actual power in Watts (in real time changes for more than set percentage comparing to previous actual power in Watts, step is 1%.

NOTE: when power is changed for more than percent value in this parameter -> the device is reporting also:

- A (Current) (if the value has changed)
- V (Voltage) (if the value has changed)
- Power Factor (if the value has changed)
- kvar (Reactive power) (if the value has changed)
- kWh (Energy – Active power accumulated Import) (if the value has changed)
- kWh (Energy – Active power accumulated Export) (if the value has changed)
- kVAh (Energy – Apparent power accumulated) (if the value has changed)
- kvarh (Energy – Reactive power accumulated) (if the value has changed)



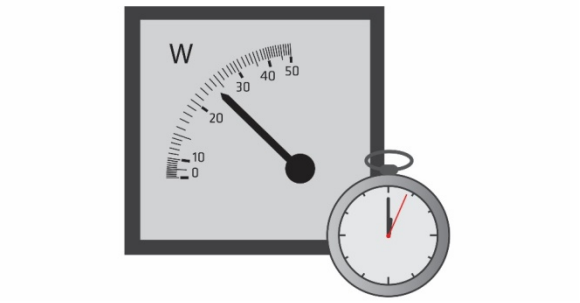
To avoid unintended reporting (electric disturbances, noise, etc..) the measured power less than 5W is not reported.

Parameter no. 42 – Reporting on time interval

Values (size is 2 byte dec):

- Default value 600 (10 minutes)
- 0-59 = reporting disabled
- 60-32535 = 60 seconds - 32535 seconds. Reporting enabled. Report is send with the time interval set by entered value.

NOTE: The device is reporting following values:

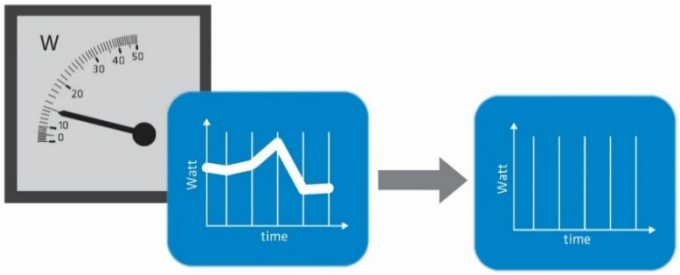


- W (Active Power) (if the value has changed)
- A (Current) (if the value has changed)
- V (Voltage) (if the value has changed)
- Power Factor (if the value has changed)
- kvar (Reactive power) (if the value has changed)
- kWh (Energy – Active power accumulated Import) (if the value has changed)
- kWh (Energy – Active power accumulated Export) (if the value has changed)
- kVAh (Energy – Apparent power accumulated) (if the value has changed)
- kvarh (Energy – Reactive power accumulated) (if the value has changed)

Parameter no. 45 – Reset Power counters

Values (size is 1 byte dec):

- Default value 0
- 0 – no function
- 1 – reset counter 1 –kWh import
- 2 – reset counter 2 – kvarh
- 4 – reset counter 3 – kVAh
- 8 – reset counter 4 – kWh export
- 15 – reset ALL counters



Parameter no. 100 – Enable / Disable endpoints IR external relay and External relay

Enabling IR external relay and External relay or both of them, means that endpoint (IR external relay) and endpoint (External relay) or both will be present on UI. Disabling them will result in hiding endpoints according to Parameter set value. Note that hiding endpoint has no impact on its functionality.

Values (size is 1 byte dec):

- default value 0
- 0 - Endpoints IR external relay and External relay disabled
- 1 - Endpoints IR external relay disabled, External relay enabled
- 2- Endpoints IR external relay enabled, External relay disabled
- 3- Endpoints IR external relay and External relay enabled

NOTE1: After parameter change, first exclude device (without setting parameters to default value) and then re include the device.

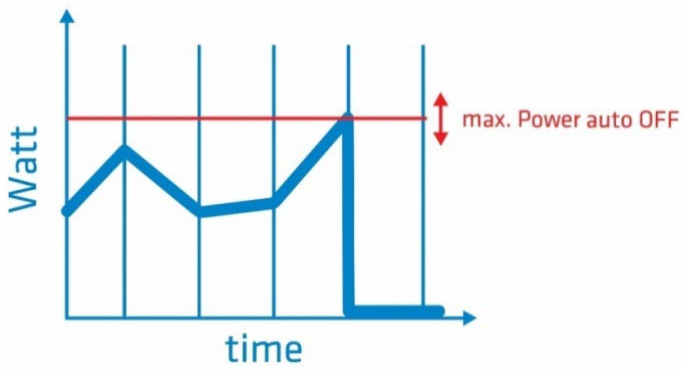
NOTE 2: If you don't have IR BICOM relay device mounted and you enable IR communication (parameter 100 is 2 or 3) there will be no valid IR relay state reported. It will be reported IR COMMUNICATION ERROR and LED2 will BLINK.

Parameter no. 110 - Maximum Power auto off

Set value means Maximum Power Consumption (0 - 15000) in watts (W), when relays are turned off according to parameters no. 111 and 112.

Values (size is 2 byte dec):

- default value 0
- 0 - no function
- 1 - 15000 = 1 W - 15000 W Maximum Power Consumption

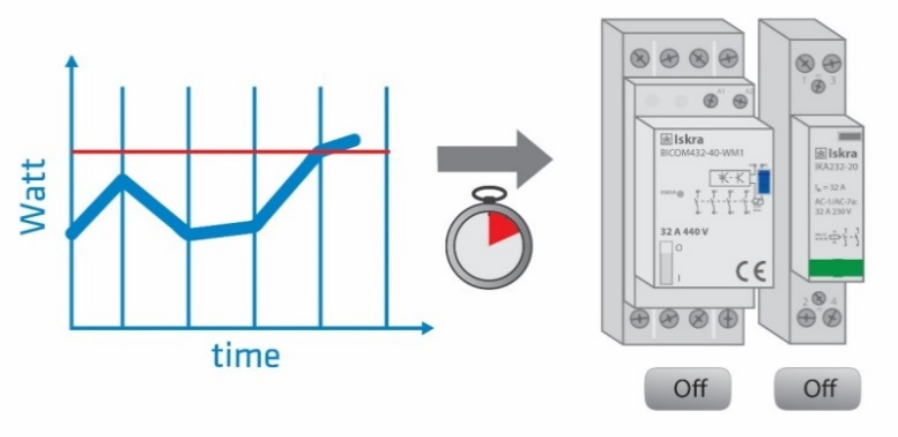


Parameter no. 111 - Delay overpower off

Set value means number of second to power off relay (defined by parameters no. 110 and 112) before restart (30 - 32535) in seconds (s).

Values (size is 2 byte dec):

- default value 30
- 30 – 32535 = 30 s – 32535 s delay

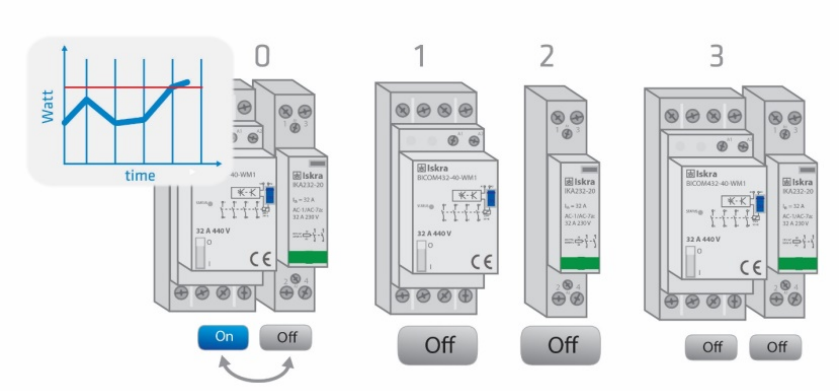


Parameter no. 112 - Relay to power off

Set value selects relay to be powered off when threshold is reached (defined by parameters no. 110 and 111).

Values (size is 1 byte dec):

- default value 0
- 0 - switch between the 2 relays (power off relay 1 first, after power on, if power consumption is still over, power off relay 2, ...)
- 1 - always power off relay 1 (IR external relay)
- 2 - always power off relay 2 (External relay)
- 3 - always power off both relays (relay 1 and relay 2)



14. Technical Specifications

Main terminals (LI, NI, Lo, No)	
Contacts capacity:	1.5 ... 16 (25) mm2
Connection screws:	M5
Max torque:	3.5 Nm (PZ2)
Optional terminals (1,2,4,5)	
Contact capacity:	0.05 ... 1 (2.5) mm2
Screws:	M3
Max torque:	0.6 Nm
Measuring input:	
Type (connection):	single phase (1b)
Reference current (Iref):	5 A
Maximum current (Imax):	65 A
Minimum current (Imin):	0.25 A
Starting current:	20 mA
Voltage (Un):	230 V (±20 %)
Power consumption at Un:	< 2W
Nominal frequency (fn):	50 and 60 Hz
Accuracy:	
Active energy and power:	
Standard EN 62053-21:	class 1
Standard EN 50470-3:	class B
Reactive energy:	
Standard EN 62053-23:	class 2
Optical communication:	
Type:	IR - used to control BICOM432-40-WM1
Input (1):	
Rated voltage:	230 V (± 20%)

Input resistance:	450 kOhm
Safety:	
Indoor Meter:	yes
Degree of pollution:	2
Protection class:	II
AC voltage test:	4 kV
Installation Category:	300 Vrms cat. III
Standard:	EN 50470
Ambient conditions and EMC:	
According standards for indoor active energy Meters.	
Temperature and climatic condition according to EN 62052 11	
Ambient conditions and Safety:	
According standards for indoor active energy Meters.	
Temperature and climatic condition according to EN 62052 11	
Dust/water protection:	IP20
Operating temperature:	-15 ... 55°C
Storage temperature:	-40 ... 70°C
Enclosure material:	Self-extinguish complying UL94 V
Indoor Meter:	yes
Degree of pollution:	2
AC voltage test:	4 kV
Distance:	up to 30 m indoors (depending on building materials)
Weight (with packaging):	150g (170g)
Frequency range:	868.4 MHz, Z-Wave
Installation	Din rail 35mm
Dimensions (W x H x D):	36 x 90 x 64mm
Package dimensions (W x H x D):	40 x 95 x 80mm
Colour	RAL 7035

15. Z-Wave Command Classes

ROOT DEVICE:

GENERIC TYPE: GENERIC_TYPE_METER

SPECIFIC TYPE: SPECIFIC_TYPE_WHOLE_HOME_METER_SIMPLE

SUPPORTED Z-Wave COMMAND CLASSES:

COMMAND_CLASS_ZWAVEPLUS_INFO_V2

COMMAND_CLASS_TRANSPORT_SERVICE_V2

COMMAND_CLASS_SECURITY_V1

COMMAND_CLASS_SECURITY_2_V1

COMMAND_CLASS_SUPERVISION

COMMAND_CLASS_CRC_16_ENCAP

COMMAND_CLASS_DEVICE_RESET_LOCALLY [S0]* [S2]*

COMMAND_CLASS_POWERLEVEL [S0]* [S2]*

COMMAND_CLASS_VERSION_V2 [S0]* [S2]*

COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2 [S0]* [S2]*

COMMAND_CLASS_CONFIGURATION_V1 [S0]* [S2]*

COMMAND_CLASS_ASSOCIATION_V2 [S0]* [S2]*

COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3 [S0]* [S2]*

COMMAND_CLASS_ASSOCIATION_GRP_INFO_V2 [S0]* [S2]*

COMMAND_CLASS_METER_V4 [S0]* [S2]*

COMMAND_CLASS_FIRMWARE_UPDATE_MD_V4 [S0]* [S2]*

*[S0] Security Command Class

*[S2] Security S2 Command Class

END POINT 1:

GENERIC TYPE: GENERIC_TYPE_METER

SPECIFIC TYPE: SPECIFIC_TYPE_WHOLE_HOME_METER_SIMPLE

SECURELY SUPPORTED COMMAND CLASSES *:

COMMAND_CLASS_ZWAVEPLUS_INFO_V2

COMMAND_CLASS_SECURITY_V1

COMMAND_CLASS_SECURITY_2_V1

COMMAND_CLASS_SWITCH_BINARY_V1

COMMAND_CLASS_SWITCH_ALL_V1

COMMAND_CLASS_ASSOCIATION_V2

COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3

COMMAND_CLASS_ASSOCIATION_GRP_INFO_V2

COMMAND_CLASS_METER_V4

END POINT 2:

GENERIC TYPE: GENERIC_TYPE_SWITCH_BINARY

SPECIFIC TYPE: SPECIFIC_TYPE_POWER_SWITCH_BINARY

SECURELY SUPPORTED COMMAND CLASSES *:

COMMAND_CLASS_ZWAVEPLUS_INFO_V2

COMMAND_CLASS_SECURITY_V1

COMMAND_CLASS_SECURITY_2_V1

COMMAND_CLASS_SWITCH_BINARY_V1

COMMAND_CLASS_SWITCH_ALL_V1

COMMAND_CLASS_ASSOCIATION_V2

COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3

COMMAND_CLASS_ASSOCIATION_GRP_INFO_V2

END POINT 3:

GENERIC TYPE: GENERIC_TYPE_SWITCH_BINARY

SPECIFIC TYPE: SPECIFIC_TYPE_POWER_SWITCH_BINARY

SECURELY SUPPORTED COMMAND CLASSES *:

COMMAND_CLASS_ZWAVEPLUS_INFO_V2

COMMAND_CLASS_SECURITY_V1

COMMAND_CLASS_SECURITY_2_V1

COMMAND_CLASS_SWITCH_BINARY_V1

COMMAND_CLASS_SWITCH_ALL_V1

COMMAND_CLASS_ASSOCIATION_V2

COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3

COMMAND_CLASS_ASSOCIATION_GRP_INFO_V2

* Command classes on endpoints are supported securely only if the device is added to a Z-Wave network as secure.

NOTE:

- Endpoints are shown/hidden by Parameter No. 100
- 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; FF]
- To be turned OFF: [Command Class Basic, Basic Set, Basic Value = 0x00]
- BASIC SET/GET on root device is mapped to basic set/get of both endpoints.

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 and product categories. All constantly powered nodes in the same network will act as repeaters regardless of the vendor in order to increase reliability of the network.

16. Z-Wave Security

Qubino Smart Meter 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 Unauthenticated, Security S0 and Unsecure inclusion

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

The first five digits of key is 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 in two ways.

- The including gateway (hub) may use QR code scanning to read the entire DSK off the joining device and match it with the obfuscated public key received via RF from the joining device.
- Else the including gateway (hub) will ask the user to enter a 5 digits PIN code (the 5 first digits of the DSK label) in order to substitute the obfuscated bytes of the joining node's Public Key. The including gateway (hub) may additionally ask the user to visually validate that the rest of the DSK with the Public Key received via RF.

17. 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

18. 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.

19. 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.

Declaration of Conformity

Qubino Smart Meter device is in compliance with the essential requirements and other relevant provisions of the Low voltage (LVD) Directive (2014/35/EU), Electromagnetic Compatibility (EMC) Directive (2014/30/EU), Radio Equipment Directive (2014/53/EU), Directive RoHS 2 (2011/65/EU) and Directive ErP (2009/125/EC).

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: Extended manual is valid for device with S7 software version (SW version is part of P/N)! Example:P/N: ZMNHTDxHxS7Px

GOAP d.o.o. Nova Gorica
Ulica Klementa Juga 007, 5250 Solkan, Slovenia

E-mail: info@qubino.com
Tel: +386 5 335 95 00
Web: www.qubino.com
Date: 11.04.2019; V 3.4
