



## Smart Meter

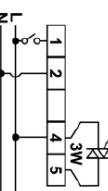
ORDERING CODE	Z-WAVE FREQUENCY
ZMHHTD1	868,4 MHz
ZMHHTD2	921,4 MHz
ZMHHTD3	908,4 MHz
ZMHHTD4	869,0 MHz
ZMHHTD5	916,0 MHz
ZMHHTD8	865,2 MHz

ZMHHTD8

This Z-Wave module is used for energy measurements in single-phase electrical power network and can be used in residential, industrial and utility applications. Meters measure energy directly in 2-wire networks according to the principle of fast sampling of voltage and current signals. A built-in microprocessor calculates energy, power and power factor from the measured signals.

The module can be controlled through Z-wave network and it acts as repeater in order to improve range and stability of Z-wave network.

It is designed to be mounted on DIN rail.



Installation

- To prevent electrical shock and/or equipment damage, disconnect electrical power remove main fuse or put on OFF position a main disconnection switch (or circuit breaker if it is compliant to standard IEC947-2), before installation or any servicing.

Make sure, that no voltage is present in the installation.

- Prevent the disconnecting device from being switched on accidentally.

- Connect the module according to electrical diagram.
- Locate the antenna far from metal elements (as far as possible).
- Do not shorten the antenna.

- Module installation requires a great degree of skill and may be performed only by a qualified and licensed electrician.
- Even when the module is turned off, voltage may be present on its terminals.

### Danger of electrocution!

- Module installation requires a great degree of skill and may be performed only by a qualified and licensed electrician.

- Even when the module is turned off, voltage may be present on its terminals.

- Do not connect the module to loads exceeding 1imp/Wh

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.

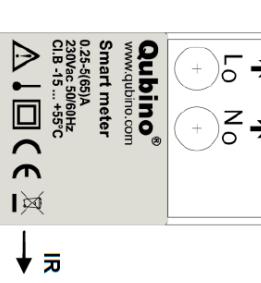
### Package contents

- Smart Meter

### Electrical diagram 230VAC

External relays

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



Module Inclusion (Adding to Z-wave network)

- Connect module to power supply
- enable add/remove mode on main controller
- auto-inclusion (works for about 5 seconds after connected to power supply) or press service button **S** for more than 2 second

NOTE: For auto-inclusion procedure, first set main controller into inclusion mode and then connect module to power supply.

### Module Exclusion/Reset (Removing from Z-Wave network)

- Connect module to power supply

- bring module within maximum 1 Meter (3 feet) of the main controller.

- enable add/remove mode on main controller
- press service button **S** for more than 6 seconds.

- By this function all parameters of the module are set to default values and own ID is deleted.

- Service button (used to add or remove module from the Z-Wave network).

- Green - Power on (solid) / no ID (blinking slow 1s) / Inc./Exc. mode (blinking fast 0.5s)

- Yellow on - output on (any) / Yellow off - outputs off (both)

- Output for IR external relay

- Red - Pulse rate (On - no load indication)

Group 1: Lifeline group (reserved for communication with the main controller), 1 node allowed.

### Configuration parameters

Parameter no. 7 – Input 1 switch function selection Available config. parameters (data type is 1 Byte DEC):

- default value 4

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

When External relay is OFF it goes automatically ON after time defined by this parameter. Timer is reset to zero each time the module receive ON command regardless from where it comes (push button, associated module, controller...). Available configuration parameters (data type is 2 Byte DEC):

- default value 0

Parameter no. 40 – Power reporting in Watts on power button

0 - ALL OFF disabled with define time, step is 1s.

1 - 32535 = 1second - 32535 seconds. Auto ON enabled with define time, step is 1s.

Parameter no. 40 – Power reporting in Watts on power change

Set value means percentage, set value from 0 - 100 = 0% - 100%. Available configuration parameters (data type is 1 Byte DEC):

- default value 10

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

When IR external relay is ON it goes automatically OFF after time defined by this Parameter. Timer is reset to zero each time the module receive ON command regardless from where it comes (push button, associated module, controller...). Available configuration parameters (data type is 2 Byte DEC):

- default value 0

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

When IR external relay is OFF it goes automatically ON after time defined by this Parameter. Timer is reset to zero each time the module receive OFF command regardless from where it comes (push button, associated module, controller...). Available configuration parameters (data type is 2 Byte DEC):

- default value 0

Parameter no. 42 – Power reporting in Watts by time interval

Set value means time interval (0 – 32535) in seconds, when power report is send. Available config. parameters (data type is 2 Byte DEC):

- default value 0

Parameter no. 45 – Reset Power counters

When External relay is ON it goes automatically OFF after time defined by this parameter. Timer is reset to zero each time the module receive ON command regardless from where it comes (push button, associated module, controller...). Available configuration parameters (data type is 1 Byte DEC):

- default value 0

Parameter no. 45 – Reset Power counters

Power factor, kVar (Reactive Power).

Available config. parameters (data type is 1 Byte DEC):

- default value 0

Parameter no. 45 – Reset Power counters

0 - no function

1 - reset counter 1 – KWh

2 - reset counter 2 – KVArh

4 - reset counter 3 – KVArh

### Associated Groups:

- 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. Available configuration parameters (data type 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

NOTE! After parameter change, first exclude module (without setting parameters to default value) and then re include the module.

NOTE! If you don't have IR BiComm relay module 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 LED 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. Available configuration parameters (data type is 2 Bytes 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 - 3235) in seconds (s). Available configuration parameters (data type is 2 Bytes DEC):

- default value 30
- 30 - 3235 = 30 s - 3235 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). Available config. parameters (data type 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)

**Parameter no. 130 – Serial Number**

Read only. Unsigned Value (32bit)

only. Unsigned Value (16bit). 2 decimal places.

**Parameter no. 132 - Meter Hardware reference**

Read only. Unsigned Value (16bit). 2 decimal places.

**Parameter no. 140 - Voltage U1**

Read only. Unit: V. Binary Unsigned Value (24bit), 1 decimal place.

**Parameter no. 141 - Current I1**

Read only. Unit: A. Binary Unsigned Value (24bit), 3 decimal places.

**Parameter no. 142 - Active Power Total (P1)**

Read only. Unit: W. Binary Signed Value (24bit), 1 decimal place.

**Parameter no. 143 - Reactive Power Total (Q1)**

Read only. Unit: kVAR. Binary Signed Value (24bit), 1 decimal place.

**Parameter no. 144 - Power Factor Total (PF1)**

Read only. Unsigned Value (16bit). 4 decimal places.

**Parameter no. 145 - Energy Counter 1 - Active power accumulated (import)**

Read only. Unit: kWh. Signed Long Value (32bit), 1 decimal place.

**Parameter no. 146 - Energy Counter 2 - Reactive power accumulated**

Read only. Unit: kVArh. Signed Long Value (32bit), 1 decimal place.

**Parameter no. 147 - Energy Counter 3 - Apparent power accumulated**

Read only. Unit: kVAh. Signed Long Value (32bit), 1 decimal place.

**Parameter no. 148 - Energy Counter 4 - Active power accumulated (export)**

Read only. Unit: kWh. Signed Long Value (32bit), 1 decimal place.

**Technical Specifications**

**Main terminals (L1, N1, LO, NO)**

Contacts capacity: 1.5 ... 16 (25) mm<sup>2</sup>

Connection screws: M5

Max torque: 3.5Nm (PZ2)

**Optional terminals (1,2,4,5)**

Contact capacity: 0.05 ... 1 (2.5) mm<sup>2</sup>

Screws: M3

Max torque: 0.6 Nm

**Measuring input:**

Type (connection): single phase (1b)

**EC Directives conformity:**

EC Directive on Meas. Instruments 2004/22/EC

EC Directive on Low Voltage 2006/95/EC

EC Directive WEEE 2002/96/EC

Nominal frequency (fN):	50 and 60 Hz	GENERAL_TYPE_METER
<b>Accuracy:</b>	Active energy and power:	SPECIFIC_TYPE_WHOLE_HOME_METER_SIMPLE
<b>Z-Wave Supported Command Classes:</b>	COMMAND_CLASS_ZWAVEPLUS_INFO_V2	COMMAND_CLASS_BASIC
COMMAND_CLASS_SWITCH_ALL	COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V4	COMMAND_CLASS_SWITCH_BINARY_V2*
COMMAND_CLASS_NETER_V4	COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3	COMMAND_CLASS_CONFIGURATION

Read only. Unsigned Value (32bit)

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

COMMAND\_CLASS\_MULTI\_CHANNEL\_ASSOCIATION\_V4

COMMAND\_CLASS\_CONFIGURATION

COMMAND\_CLASS\_VERSION\_V2

COMMAND\_CLASS\_MANUFACTURER\_SPECIFIC\_V2

COMMAND\_CLASS\_DEVICE\_RESET\_LOCALLY

COMMAND\_CLASS\_POWERLEVEL

COMMAND\_CLASS\_ASSOCIATION\_V2

COMMAND\_CLASS\_SWICH\_BINARY\_V2\*

COMMAND\_CLASS\_RESET\_LOCALLY

COMMAND\_CLASS\_CRC\_16\_ENCAP

COMMAND\_CLASS\_FWUPDATE\_UPDATER\_ID\_V2

COMMAND\_CLASS\_MARK

COMMAND\_CLASS\_BASIC

COMMAND\_CLASS\_SWICH\_V2\*

\*valid if endpoints enabled

**Endpoint 1 (IR external relay):**

According standards for indoor active energy Meters.

Temperature and climatic condition according to EN 62052-11

Dust/water protection: IP20

Operating temperature: -10 ... 55°C

Storage temperature: -40 ... 70°C

Enclosure material: self extinguish

complying UL94 V

yes

COMMAND\_CLASS\_ASSOCIATION\_V2

COMMAND\_CLASS\_MULTI\_CHANNEL\_ASSOCIATION\_V3

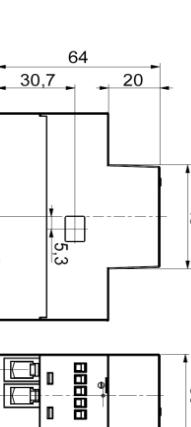
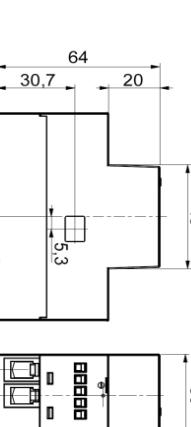
<b>Ambient conditions and Safety:</b>	According standards for indoor active energy Meters.	GENERAL_TYPE_SWITCH_BINARY
Temperature and climatic condition according to EN 62052-11	Dust/water protection: IP20	COMMAND_CLASS_SWITCH_BINARY
Read only. Unit: kVArh. Signed Long Value (32bit), 1 decimal place.	Operating temperature: -10 ... 55°C	COMMAND_CLASS_BASIC
Read only. Unit: kWh. Signed Long Value (32bit), 1 decimal place.	Storage temperature: -40 ... 70°C	COMMAND_CLASS_SWITCH_BINARY_V2
Read only. Unit: kWh. Signed Long Value (32bit), 1 decimal place.	Enclosure material: self extinguish	COMMAND_CLASS_ASSOCIATION_V2
Read only. Unit: kWh. Signed Long Value (32bit), 1 decimal place.	complying UL94 V	COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3

**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 once, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.

This user manual is subject to change and improvement without notice.

**NOTE:** User manual is valid for module with SW version 54,55&56 (SW version is part of P/N)! Example: P/N: ZMNHDX-HX-SGPX

**Important disclaimer** This 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.



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Date: 15.11.2016

Document Qubino\_Smart Meter

PLUS user manual\_V1.7\_eng

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- BASIC SET/GET on root device is mapped to