Qubino

The **INNOVATIVE** and **SMALLEST**

Flush Shutter

ORDERING CODE	Z-WAVE FREQUENCY
ZMNHCD1	868,4 MHz
ZMNHCD2	921,4 MHz
ZMNHCD3	908,4 MHz
ZMNHCD4	869,0 MHz
ZMNHCD5	916,0 MHz
ZMNHCD8	865,2 MHz

This Z-Wave module is used to control the motor of blinds, rollers, shades, venetian blinds, etc … The module can be controlled either through a Z-Wave network or through the wall switch.

Precise positioning is supported for motors equipped with mechanical or electronic end switches. The module is designed to be mounted inside a “flush mounting box”, hidden behind a traditional wall switch. Module measures power consumption of motor and support connection of digital temperature sensor. It is designed to act as repeater in order to improve range and stability of Z-wave network.

Supported switches

Module supports **mono-stable** switches (push button) and **bi-stable** switches.

Installation

- To prevent electrical shock and/or equipment damage, disconnect electrical power at the main fuse or circuit breaker 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.

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.

Note!

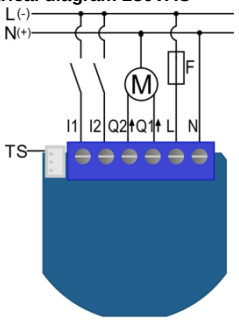
Do not connect the module to loads exceeding recommended values. Connect the module only in accordance to the below diagrams. Improper connections may be dangerous.

Electrical installation must be protected by directly associated over current protection fuse 4A, gG or Time lag T, rated breaking capacity 1500V (ESKA 522.723) must be used according to wiring diagram to achieve appropriate overload protection of the module. The fuse must be installed in fuse holder type: Adels contact 503 Si/ 1 DS.

Package contents

- Flush Shutter

Electrical diagram 230VAC



N	Neutral lead
L	Live lead
Q1	Output for motor UP (open)
Q2	Output for motor DOWN (close)
I2	Input for switch/push button DOWN (close)
I1	Input for switch/push button UP (open)
TS	Terminal for digital temperature sensor (only for Flush Shutter module compatible digital temperature sensor, which must be ordered separately).

Notes for the diagram:

S Service button (used to add or remove module from the Z-Wave network in case of 24 V SELV power supply).

WARNING: Service button S **must NOT be used** when module is connected to 110-230V power supply.

Durability of the device depends on applied load. For resistive load (light bulbs, etc.) and 4A current consumption of each individual electrical device, the durability exceeds 70.000 switches of each individual electrical device.

Module Inclusion (Adding to Z-wave network)

- Connect module to power supply (with temperature sensor connected - if purchased),
- auto-inclusion (works for about 5 seconds after connected to power supply) or
- press push button I1 three times within 3s (3 times change switch state within 3 seconds) or
- press service button **S** (only applicable for 24 V SELV supply voltage) for more than 2 second.

NOTE1: For auto-inclusion procedure, first set main controller into inclusion mode and then connect module to power supply.

NOTE2: When connecting temperature sensor to module that has already been included, you have to exclude module first. Switch off power supply, connect the sensor and re-include the module.

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 push button **I1** five times within 3s (5 times change switch state within 3 seconds) in the first 60 seconds after the module is connected to the power supply or
- press service button **S** (only applicable for 24 V SELV supply voltage) for more than 6 second.

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

If push button I1 is pressed three times within 3s (or service button S is pressed more than 2 and less than 6 seconds) module is excluded, but configuration parameters are not set to default values.

NOTE: If the module is included with parameters 71 with value different to default and module reset is done, wait at least 30s before next inclusion

Associations

Association enables Flush Shutter DC module to transfer commands inside Z-wave network directly (without main controller) to other Z-Wave modules.

Associated Groups:

Root device:

Group 1: default reporting group (reserved for the main controller).

Group 2: basic on/off (triggered at change of the input I1 state and reflecting its state) up to 16 nodes.

Group 3: basic on/off (triggered at change of the input I2 state and reflecting its state) up to 16 nodes.

Group 4: basic on/off (triggered at sensing moving direction of roller: up=FF, down=0) up to 16 nodes.

Group 5: basic on/off (triggered at reaching roller position: bottom=FF, top=0) up to 16 nodes.

Group 6: basic on/off (triggered at reaching roller position: bottom=FF, not bottom=0) up to 16 nodes.

Group 7: multilevel set (triggered at changes of value of the Flush Shutter DC position) up to 16 nodes.

Group 8: multilevel set (triggered at changes of value of slats tilting position) up to 16 nodes.

Group 9: multilevel sensor report (triggered at change of temperature sensor) up to 16 nodes.

End point 1:

Group 1: Lifeline group, 0 nodes allowed.

Group 2: basic on/off (triggered at change of the input I1 state and reflecting its state) up to 16 nodes.

Group 3: basic on/off (triggered at change of the input I2 state and reflecting its state) up to 16 nodes.

Group 4: basic on/off (triggered at sensing moving direction of roller: up=FF, down=0) up to 16 nodes.

Group 5: basic on/off (triggered at reaching roller position: bottom=FF, top=0) up to 16 nodes.

Group 6: basic on/off (triggered at reaching roller position: bottom=FF, not bottom=0) up to 16 nodes.

Group 7: multilevel set (triggered at changes of value of the Flush Shutter DC position) up to 16 nodes.

End point 2:

Group 1: Lifeline group, 0 nodes allowed.

Group 2: multilevel set (triggered at changes of value of slats tilting position) up to 16 nodes.

End point 3:

Group 1: Lifeline group, 0 nodes allowed.

Group 2: multilevel sensor report (triggered at change of temperature sensor) up to 16 nodes.

Automatic calibration

Automatic calibration is a process during which the Flush Shutter learns the position of the limit switches.

Shutter positioning calibration

(par. 71 set to 0)

There are two procedures of calibration.

Calibration through main controller UI

1) Include the module into the Z-wave network, according to module include instructions.
2) Set the parameter 78 (Forced Flush Shutter calibration) value to 1.
3) Flush Shutter performs the calibration process, completing full cycle - up, down and up again.
4) Set the parameter 78 (Forced Flush Shutter calibration) value to 0.

Calibration through the inputs I1 and I2

1) Include the module into the wireless network, according to module inclusion instructions.
2) Quick press the switch/push-button connected to I1 input and wait until the Shutter reach upper limit switch.
3) Quick press the switch/push-button connected to I2 input and wait until the Shutter reach lower limit switch.
4) Quick press the switch/push-button connected to I1 input and wait until the Shutter reach upper limit switch.

Slates tilting position calibration

(par. 71 set to 1)

When enabling venetian blind mode, position calibration for slats titling must be done. After doing this, position and angle of slates can be set. By default full turn time for slates is set to 1,5s. This value can be changed with parameter 72.

1) Include and make module calibration according to section ‘Shutter positioning calibration’.
2) Set parameter 71 to 1 ‘Venetian blinds’.
3) Exclude the module (without reset!).
4) Include the module.
5) After module inclusion beside main Shutter widget, another widget for slates control will appear on UI.
6) By default full turn movement is set to 1,5s. If this time is too long (if after slates full cycle Shutter starts moving up or down), decrease this time defined with parameter 72. If this time is to short (if slats will not turn for full cycle), increase this time defined with parameter 72.

Manual operation for Shutter

(par. 71 set to 0)

Module allows connecting of push-buttons (mono-stable) or switches (bi-stable) to I1 and I2 terminals.

Clicking push-button (<2s) connected to I1 (up), initiates up movement.

Clicking push-button (<2s) connected to I2 (down), initiates down movement.

If the Shutter is moving, each click, of any push-button, will stop the movement.

Keeping pressed push-button (>2s) connected to I1 (up), initiates up movement, until push-button is released.

Keeping pressed push-button (>2s) connected to I2 (down), initiates down movement, until push-button is released.

Manual operation for venetian blinds

(par. 71 set to 1)

Slates on start position - 0 degree

Clicking push-button (for time < full turn slates time-par.72) connected to I1 (up), initiates slates turning towards end - 180 degree position, until push-button is released.

Clicking push-button (for time < full turn slates time-par.72) connected to I2 (down), initiates Shutter down movement.

If the Shutter is moving, each click, of any push-button, will stop the movement.

Keeping pressed push-button (for time > full turn slates time-par.72) connected to I1 (up), initiates full slates turn and up movement, until the push-button is released.

Keeping pressed push-button (for time > full turn slates time-par.72) connected to I2 (down), initiates Shutter down movement, until the push-button is released.

Keeping pressed push-button (for time > (full turn slates time +2s)) connected to I1 (up), initiates up movement, until push-button is released.

Slates on end position - 180 degree

Clicking push-button (for time < full turn slates time-par.72) connected to I1 (up), initiates Shutter up movement.

Clicking push-button (for time < full turn slates time-par.72) connected to I2 (down), initiates slates turning towards start - 0 degree position, until the push-button is released.

If the Shutter is moving, each click, of any push-button, will stop the movement.

Keeping pressed push-button (for time > full turn slates time-par.72) connected to I1 (up), initiates Shutter up movement, until the push-button is released.

Keeping pressed push-button (for time > full turn slates time-par.72) connected to I2 (down), initiates full slates turn and down movement, until the push-button is released.

Keeping pressed push-button (for time > (full turn slates time +2s)) connected to I2 (down), initiates down movement, until push-button is released.

Configuration parameters

Parameter no. 10 - Activate/deactivate functions ALL ON / ALL OFF

Available config. parameters (data type is 2 Byte DEC):

- default value 255
- 255 - ALL ON active, ALL OFF active.
- 0 - ALL ON is not active ALL OFF is not active
- 1 - ALL ON is not active ALL OFF active
- 2 - ALL ON active ALL OFF is not active

Flush Shutter responds to commands ALL ON / ALL OFF that may be sent by the main controller or by other controllers belonging to the system.

Parameter no. 40 - Power reporting in Watts on power change for Q1 or Q2

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

- default value 10 = 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: if power changed is less than 1W, the report is not send (pushed), independent of percentage set.

Parameter no. 42 – Power reporting in Watts by time interval for Q1 or Q2

Set value means time interval (0 – 32767) in seconds, when power report is send. Available configuration parameters (data type is 2 Byte DEC):

- default value 0 = reporting disabled
- 0 - reporting disabled
- 1 - 32767 = 1 second - 32767 seconds. Reporting enabled, power report is send with time interval set by entered value.

Parameter no. 71 – Operating modes

This parameter defines selection between two available operating modes. Available configuration parameters (data type is 1 Byte DEC):

- default value 0
- 0 - Shutter mode
- 1 - venetian mode (up/down and slate rotation)

NOTE1: After parameter change, first exclude module (without setting parameters to default value) then wait at least 30s and then re include the module!

Parameter no. 72 – Slats tilting full turn time

This parameter defines the time necessary for slats to make full turn (180 degrees). Available configuration parameters (data type is 2 Byte DEC):

- default value 150 = 1,5 seconds
- 0 - tilting time disabled
- 1 - 32767 = 0,01seconds - 327,67 seconds

NOTE: If time set is too high, this will result that after full turn, Shutter will start move up or down, for time remaining.

Parameter no. 73 – Slats position

This parameter defines slats position after up/down movement through Z-wave or push-buttons. Available configuration parameters (data type is 1 Byte DEC):

- default value 1
- 0 - Slats return to previously set position only in case of Z-wave control (not valid for limit switch positions).
- 1 - Slats return to previously set position in case of Z-wave control, push-button operation or when the lower limit switch is reached.

Parameter no. 74 – Motor moving up/down time

This parameter defines Shutter motor moving time of complete opening or complete closing. Available configuration parameters (data type is 2 Byte DEC):

- default value 0
- 0 – moving time disabled (working with limit switches)
- 1 - 32767 = 0,1seconds - 3276,7seconds
  After that time motor is stopped (relay goes to off state)

NOTE: Important is that the reference position to manually set moving time is always Shutter lower position!

Set parameter 74 to 0 and move the Shutter (using up/down push buttons or main controller UI) to the lowest desired position. On this Shutter position, set parameter 74 to time for complete opening or complete closing. At this point Shutter can be moved up (open) for set time, but can't be moved down because this position is already set as lower Shutter position.

To change Shutter lower position below already set (manual recalibration), parameter 74 must be set to 0 and repeat the procedure described above.

In case Shutter has limit switches, but anyhow you would like to limit opening/closing position by time, you can still do it. In case you put time that is longer that opening/closing real time limited by limit switches, Shutter will stop at limit switch, but the module relay will switch off after define time, not by Shutter limit switch. Take in consideration that in this condition, the positioning with slider through UI will not show correct Shutter position.

Parameter no. 76 - Motor operation detection

Power threshold to be interpreted when motor reach the limit switch. Available configuration parameters (data type is 1 Byte DEC):

- default value 30 = 30W
- 0 - 127 = 1-127 W. The value 0 means reaching a limit switch will not be detected.

Parameter no. 78 - Forced Shutter calibration

By modifying the parameters setting from 0 to 1 a Shutter enters the calibration mode. Available configuration parameters (data type is 1 Byte DEC):

- default value 0
- 1 - Start calibration process (when calibration process is finished, completing full cycle - up, down and up, set the parameter 78 (Forced Shutter calibration) value back to 0.

Parameter no. 85 – Power consumption max delay time

This parameter defines the max time before motor power consumption is read after one of the relays is switched ON. If there is no power consumption during this max time (motor not connected, damaged or requires higher time to start, motor in end position) the relay will switch OFF. Time is defined by entering it manually. Available configuration parameters (data type is 1 Byte DEC):

- default value 30 = 3s
- 0 = time is set automatically
- 3 - 50 = 0,3seconds - 5seconds (100ms resolution)

Parameter no. 90 – Time delay for next motor movement

This parameter defines the minimum time delay between next motor movement (minimum time between switching motor off and on again). Available configuration parameters (data type is 1 Byte DEC):

- default value 5 = 500ms
- 1 - 30 = 0,1seconds - 3seconds (100ms resolution)

Parameter no. 110 – Temperature sensor offset settings

Set value is added or subtracted to actual measured value by sensor. Available configuration parameters (data type is 2 Byte DEC):

- default value 32536
- 32536 - offset is 0.0C
- From 1 to 100 - value from 0.1 °C to 10.0 °C is added to actual measured temperature.
- From 1001 to 1100 - value from -0.1 °C to -10.0 °C is subtracted to actual measured temperature.

Parameter no. 120 - Temperature sensor reporting

If digital temperature sensor is connected, module reports measured temperature on temperature change defined by this parameter. Available configuration parameters (data type is 1 Byte DEC):

- default value 5 = 0,5°C
- 0 - Reporting disabled
- 1-127 = 0,1°C - 12,7°C, step is 0,1°C

Parameter No. 250 – Unsecure / Secure Inclusion

Available configuration parameter (data type is 1 Byte Dec):

- default Value 0
- 0 – Unsecure Inclusion
- 1 – Secure Inclusion

A Flush dimmer supports secure and unsecure inclusion. Even if the controller does not support security command classes, a dimmer could be included as unsecure and keep all the functionality.

Technical Specifications

Power supply	110 - 230 VAC ±10% 50/60Hz, (24-30 VDC)
Rated load current of AC output (resistive load)*	2 X 4A / 230VAC
Output circuit power of AC output (resistive load)	2 X 920W (230VAC)
Power measurement accuracy	P=0-200W, +/-2W P>200W, +/-3%
Digital temperature sensor range (sensor must be ordered separately)	-50 ~ +125°C
Operation temperature	-10 ~ +40°C
Distance	up to 30 m indoors (depending on building materials)
Dimensions (WxHxD) (package)	41,8x36,8x16,9mm (79x52x22)
Weight (Brutto with package)	28g (34g)
Electricity consumption	0,4W
For installation in boxes	Ø ≥ 60mm or 2M, depth≥ 60mm
Switching	Relay (2x)

*In case of load other than resistive, pay attention to the value of cos φ and if necessary apply load lower than the rated load. Max current for cos φ=0,4 is 2A at 250VAC.

Supported loads:

Ⓜ Electric motor

Z-Wave Supported Command Classes:

COMMAND_CLASS_ZWAVEPLUS_INFO_V2,
COMMAND_CLASS_VERSION_V2
COMMAND_CLASS_DEVICE_RESET_LOCALLY_V1
COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2
COMMAND_CLASS_POWERLEVEL_V1
COMMAND_CLASS_SECURITY

Securely Supported Command Classes:

COMMAND_CLASS_SWITCH_ALL_V1
COMMAND_CLASS_SWITCH_BINARY_V1
COMMAND_CLASS_SENSOR_BINARY_V1
COMMAND_CLASS_SWITCH_MULTILEVEL_V3
COMMAND_CLASS_METER_V4
COMMAND_CLASS_SENSOR_MULTILEVEL_V7
COMMAND_CLASS_NOTIFICATION_V5
COMMAND_CLASS_MULTI_CHANNEL_V4
COMMAND_CLASS_ASSOCIATION_2
COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3
COMMAND_CLASS_ASSOCIATION_GRP_INFO_V2
COMMAND_CLASS_CONFIGURATION_V1
COMMAND_CLASS_MARK
COMMAND_CLASS_BASIC_V1
COMMAND_CLASS_SWITCH_MULTILEVEL_V3

Endpoint1:
Device Class:
BASIC_TYPE_ROUTING_SLAVE
GENERIC_TYPE_SWITCH_MULTILEVEL
SPECIFIC_TYPE_CLASS_C_MOTOR_CONTROL
Command Classes:
COMMAND_CLASS_ZWAVEPLUS_INFO_V2
COMMAND_CLASS_SECURITY
COMMAND_CLASS_SWITCH_ALL_V1
COMMAND_CLASS_SWITCH_BINARY_V1
COMMAND_CLASS_SWITCH_MULTILEVEL_V3
COMMAND_CLASS_METER_V4
COMMAND_CLASS_ASSOCIATION_V2
COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3
COMMAND_CLASS_ASSOCIATION_GRP_INFO_V2
COMMAND_CLASS_MARK
COMMAND_CLASS_BASIC_V1
COMMAND_CLASS_SWITCH_MULTILEVEL_V3

Endpoint2:
Device Class:
BASIC_TYPE_ROUTING_SLAVE
GENERIC_TYPE_SWITCH_MULTILEVEL
SPECIFIC_TYPE_CLASS_C_MOTOR_CONTROL
Command Classes:
COMMAND_CLASS_ZWAVEPLUS_INFO_V2
COMMAND_CLASS_SECURITY
COMMAND_CLASS_SWITCH_ALL
COMMAND_CLASS_SWITCH_BINARY_V1
COMMAND_CLASS_SWITCH_MULTILEVEL_V3
COMMAND_CLASS_ASSOCIATION_V2
COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3
COMMAND_CLASS_ASSOCIATION_GRP_INFO_V2
COMMAND_CLASS_MARK
COMMAND_CLASS_BASIC_V1
COMMAND_CLASS_SWITCH_MULTILEVEL_V3

Endpoint 3:
Device Class:
GENERIC_TYPE_SENSOR_MULTILEVEL
SPECIFIC_TYPE_ROUTING_SENSOR_MULTILEVEL
Command Classes:
COMMAND_CLASS_ZWAVEPLUS_INFO_V2
COMMAND_CLASS_SECURITY
COMMAND_CLASS_SENSOR_MULTILEVEL_V7
COMMAND_CLASS_ASSOCIATION_V2
COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3
COMMAND_CLASS_ASSOCIATION_GRP_INFO_V2

NOTE**:** The above list is valid for the product with a temperature sensor connected to TS terminal at the time of inclusion. In case the sensor is not connected then the following command class and endpoint 3 are not supported:

COMMAND_CLASS_SENSOR_MULTILEVEL_V7

Endpoint 2 is supported by the module only when the parameter no. 71 is set to the value 1 and the module is excluded and re-included into the network.

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.

COMMAND_CLASS_BASIC:

- The module will be turned ON or OFF after receiving the BASIC_SET command. To be turned ON: [Command Class Basic , Basic Set, Basic Value = 0x01~0x63 in percentage; FF set to last value]
- To be turned OFF:[Command Class Basic , Basic Set, Basic Value = 0x00]

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.

Important disclaimer

Z-wave wireless communication is inherently not always 100% reliable, and as such, this product should not be used in situations in which life and/or valuables are solely dependent on its function.

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 S5 (SW version is part of P/N)!

Example: P/N: ZMNHCD x Hx**S6**Px

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