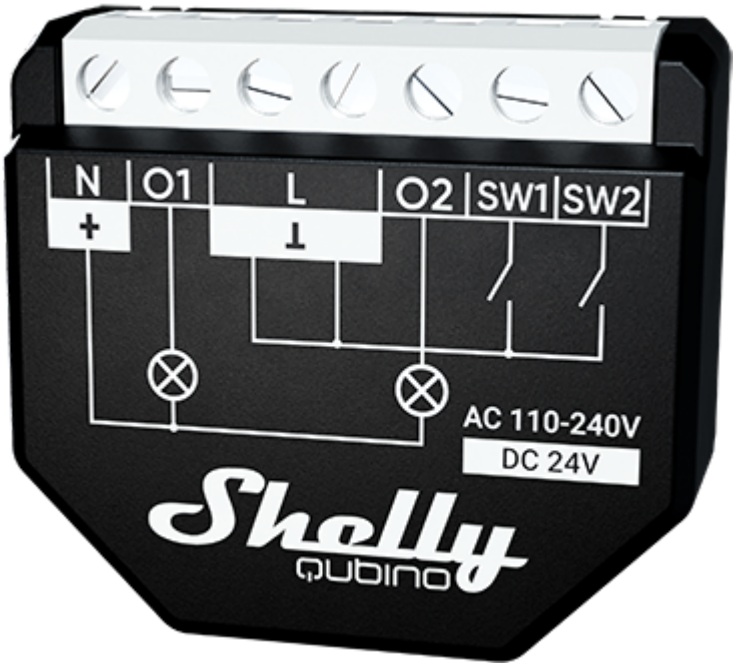
*Note: The product line known as "**Shelly Qubino Wave**" will now be referred to as "**Shelly Wave**". This name change will not impact the functionality of any devices. The only modification will be the use of the new name in all future documentation.*



Device identification

Device name: **Wave 2PM**
EU Part number/Ordering Code: QNSW-002P16EU
Z-Wave Product type ID: 0x0002
Z-Wave Product ID: 0x0081
Z-Wave Manufacturer: Shelly Europe Ltd.
Z-Wave Manufacturer ID: 0x0460

Terminology

- **Device -** In this document, the term "**Device**" is used to refer to the Wave 2PM device.
- **Gateway -** A Z-Wave® gateway, also referred to as a Z-Wave® controller, Z-Wave® main controller, Z-Wave® primary controller, or Z-Wave® hub, etc., is a device that serves as a central hub for a Z-Wave® smart home network. The term "**gateway**" is used in this document.
- **S button -** The Z-Wave® Service button, which is located on Z-Wave® devices and is used for various functions such as adding (inclusion), removing (exclusion), and resetting the device to its factory default settings. The term "**S button**" is used in this document.

Short description

The Wave 2PM (Device) is a single product that enables remote control of two electrical devices such as bulbs, ceiling fans, and IR heaters. It switches (on/off) two independent loads and measures their power consumption separately and in total. The Device is compatible with switches (default) and push-buttons.

Switch connected to input terminal SW (SW1)

If the SW (SW1) is configured as a switch (default), each toggle of the switch will change the output state O (O1) to the opposite state - ON, OFF, ON, etc.

- **Change switch position once:** Change the state of the output state O (O1) to the opposite one and send command to the associated devices in associated groups 2 and 3 (check chapter Z-Wave Association)

Switch connected to input terminal SW2

If the SW (SW1) is configured as a switch (default), each toggle of the switch will change the output state O2 to the opposite state - ON, OFF, ON, etc.

- **Change switch position once:** Change the state of the output state O2 to the opposite one and send command to the associated devices in associated groups 2 and 3 (check chapter Z-Wave Association)

Main applications

- Residential
- MDU (Multi Dwelling Units - apartments, condominiums, hotels, etc.)
- Light commercial (small office buildings, small retail/restaurant/gas station, etc.)
- Government/municipal
- University/college

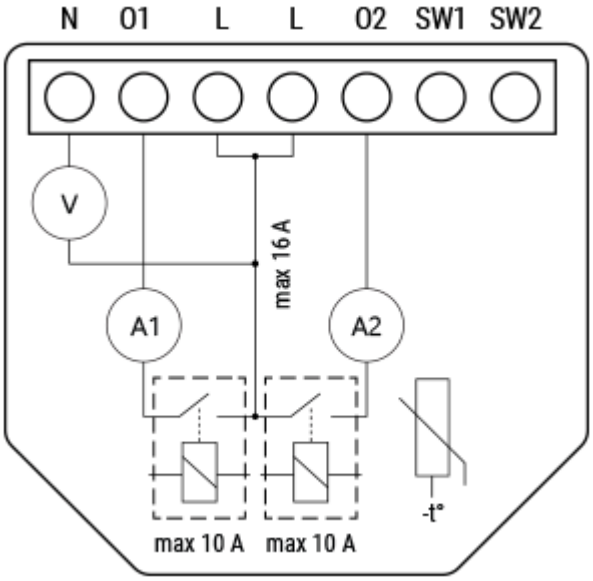
Integrations

Shelly Qubino Wave devices are developed on the **world's leading technology for smart homes – Z-Wave**.

This means Shelly Qubino Wave works with all **certified** gateways supporting Z-Wave communication protocol.

To make sure the functions of Shelly Qubino Wave products are supported on your gateway, we are regularly executing compatibility tests of our devices with different Z-Wave gateways.

Simplified internal schematics



Device electrical interfaces

Inputs

- 2 switch/button input on screw terminal
- 3 power supply inputs on screw terminals: N (+) and L (⏚)

Outputs

- 2 relay output with power measurement on screw terminal

Connectivity

Z-Wave - Unsecure, S0 Security, S2 Unauthenticated Security, S2 Authenticated Security

Safety features

Overheat protection

- switch off its own relay
- sends the Notification Report to the Gateway (Overheat detected)
- the led lights react as specified above (check blinking mode for Overheat detected)

Any of next activities reset this alarm: power cycle, short press on S button, press any switch-push button connected to any SW (SW, SW1, SW2, …) terminal.

NOTE: The Overheat protection is always active and cannot be disabled.
Additional description above under chapter **Notification for Overheat detected.**

Over-current Protection

Device has internal Over-current protection. If the current exceeds 16A+10% (Max switching current +10%) for more than 5s, the Device will:

- switch off its own relay
- sends the Notification Report to the Gateway (Over-current detected)
- the led lights react as specified above (check blinking mode for Over-current detected)

Any of next activities reset this alarm: power cycle, short press on S button, press any switch-push button connected to any SW (SW, SW1, SW2, …) terminal.

NOTE: The Over-current protection is always active and cannot be disabled.
Additional description above under chapter **Notification for Over-current detected.**

Supported load types

- Resistive (incandescent bulbs, heating devices)

- Capacitive (capacitor banks, electronic equipment, motor start capacitors)
- Inductive with RC Snubber (LED light drivers, transformers, fans, refrigerators, air-conditioners)

User interface

S button and operating modes

1. Normal mode
2. Setting in progress mode
3. Setting mode (with S button)
    - Settings mode is required to start desired procedure for example: adding (inclusion), removing (exclusion), factory reset etc. It has a limited time of operation. After the procedure in Setting mode is concluded, the Device goes automatically into Normal mode.
    - Entering to Setting mode:
        - Quickly press and hold the S button on the Device until the LED turns solid blue
        - An additional quick press on the S button means menu change in infinite loop
        - Menu LED status has a timeout of 10s before entering again into Normal state

S button's functions

- Manually adding the Device to a Z-Wave network
- Manually removing the Device from a Z-Wave network
- Factory Reset the Device

LED Signalisation

Click to see LED signalisation

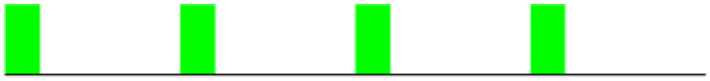
Normal mode

Removed/Excluded

The LED will be blinking **blue** in Mode 1 for 10 min after every power cycle and 10 min after S button pressed.

Added/Included

The LED will be blinking **green** in Mode 1 for 10 min after every power cycle and 10 min after S button pressed.



Settings in progress

Factory reset and reboot

During factory reset, the LED will turn solid **green** for approx. 1sec, then the **blue** and **red** LED will be blinking 0,1s On, 0,1s Off for about 2sec.

Adding / Removing

During adding or removing, the LED will be blinking **blue** in Mode 2.

Mode 2 LED 0,5s On 0,5s Off

Firmware updating OTA

During the OTA update, the LED will be blinking **blue** and **red** in Mode 2.

Mode 2 LED 0,5s On 0,5s Off

Checking power supply 230 V AC frequency or 24 V DC voltage

During checking the power supply, the LED will be blinking **blue** and **red** in Mode 5.

Mode 5 LED 0,2s blue 0,2s red

Settings mode with S button

Adding / Removing menu selected

When the menu is selected the LED will be on **blue**, for maximum of 10 seconds.

Adding / Removing menu - while pressing S- button - Add/Remove process selected

When the menu is executing the LED will be blinking **blue** in Mode 3.

Mode 3 LED 0,1s On 0,1s Off

Factory reset menu selected

When the menu is selected the LED will be on **red**, for maximum of 10 seconds.

Factory reset - while pressing S - button - Factory reset process selected

When the menu is executing the LED will be blinking **red** in Mode 3.

Mode 3 LED 0,1s On 0,1s Off

Alarm Mode

Over-current detected

The LED will be blinking **red** in Mode 4 1x - 0,2s On 0,2s Off 2s Off and repeating this sequence

Overheat detected

The LED will be blinking **red** in Mode 4 - 2x (LED 0,2s On / 0,2s Off) + 2s Off and repeating this sequence

Power supply fault (power supply 230 V AC frequency or 24 V DC voltage fault)

The LED will be blinking **red** in Mode 4 - 3x (LED 0,2s On / 0,2s Off) + 2s Off and repeating this sequence

LED blinking modes

Click to see the LED blinking modes

LED blinking modes	
Mode 1	0,5s On/2s Off
Mode 2	0,5s On/0,5s Off
Mode 3	0,1s On/0,1s Off
Mode 4	(1x to 6x - 0,2s On/0,2s Off) + 2s Off
Mode 5	0,2s On blue/0,2s On red

Specifications

Power supply	110-240 V AC / 24 V DC +/- 10%
Power consumption	< 0.3 W
Power measurement [W]	Yes
Max switching voltage AC	240 V
Max switching current AC	10 A per channel, 16 A total, 18 A total peak
Max switching voltage DC	30 V

Max switching current DC	10 A
Overheating protection	Yes
Over-current protection	Yes
Over-voltage protection	Yes
Distance	up to 40 m indoors (131 ft.) (depends on local condition)
Z-Wave® repeater:	Yes
CPU	Z-Wave® S800
Z-Wave® frequency band:	868,4 MHz
Maximum radio frequency power transmitted in frequency bend(s)	< 25 mW
Size (H x W x D)	37 x 42 x 16 ± 0.5 mm / 1.46 x 1.65 x 0.63 ± 0.02 in
Weight	29g
Mounting	Wall console
Screw terminals max torque	0.4 Nm / 3.5 lbin
Conductor cross section	0.5 to 1.5 mm² / 20 to 16 AWG
Conductor stripped length	5 to 6 mm / 0.20 to 0.24 in
Shell material	Plastic
Colour	Black
Ambient temperature	-20°C to 40°C / -5°F to 105°F
Humidity	30% to 70% RH
Max. altitude	2000 m / 6562 ft.

Basic wiring diagram

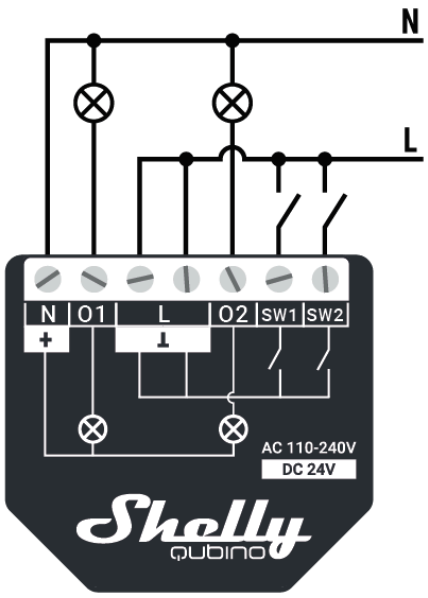


Fig.1

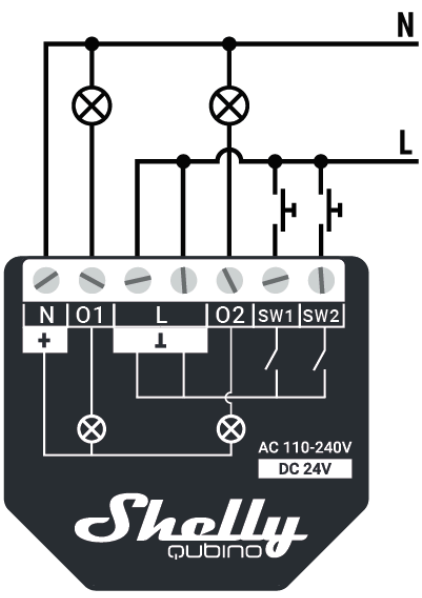


Fig. 2

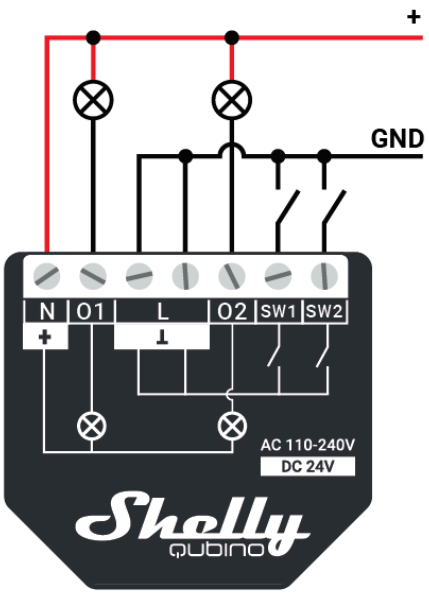


Fig. 3

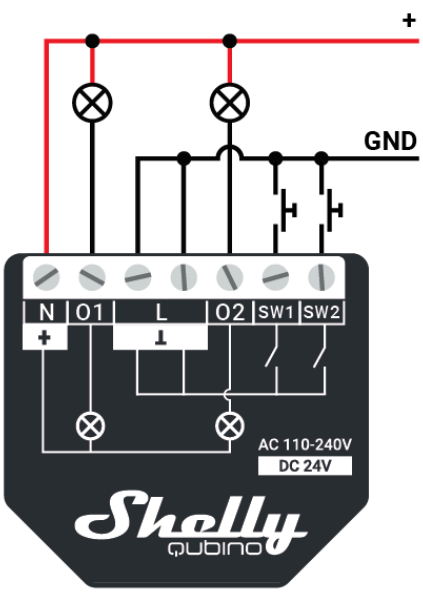


Fig. 4

Legend

Terminals		**Wires**	
N	Neutral terminal	**N**	Neutral wire

L	Live terminal (110–240 V AC)	**L**	Live (110 - 240 V AC) wire
SW 1	Switch/push-button input terminal (controlling O1)	+	24 V DC positive wire
SW 2	Switch/push-button input terminal (controlling O2)	**GND**	24 V DC ground wire
O1	Load circuit 1 output terminal		
O2	Load circuit 2 output terminal		
+	24 V DC positive terminal		
⊥	24 V DC ground terminal		

About Z-Wave®

Adding the Device to a Z-Wave® network (inclusion)

Click to see how to add, remove and reset the Device

Note! *All Device outputs (O, O1, O2, etc. - depending on the Device type) will turn the load 1s on/1s off /1s on/1s off if the Device is successfully added to/removed from a Z-Wave® network.*

Note! *In case of Security 2 (S2) adding (inclusion), a dialog will appear asking you to enter the corresponding PIN Code (5 underlined digits) that are written on the Z-Wave® DSK label on the side of the Device and on the Z-Wave® DSK label inserted in the packaging.*
IMPORTANT: The PIN Code must not be lost.

SmartStart adding (inclusion)

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

1. With the gateway application scan the QR code on the Device label and add the Security 2 (S2) Device Specific Key (DSK) to the provisioning list in the gateway.
2. Connect the Device to a power supply.
3. Check if the blue LED is blinking slowly. If so, the Device is not added to a Z-Wave® network.
4. Adding will be initiated automatically within a few seconds after connecting the Device to a power supply, and the Device will be added to a Z-Wave® network automatically.
5. The blue LED will be blinking faster during the adding process.
6. The green LED will be blinking in slowly if the Device is successfully added to a Z-Wave® network.

Adding (inclusion) with the S button

1. Connect the Device to a power supply.
2. Check if the blue LED is blinking slowly. If so, the Device is not added to a Z-Wave® network.
3. Enable add/remove mode on the gateway.
4. To enter the Setting mode, quickly press and hold the S button on the Device until the LED turns solid blue.
5. Quickly release and then press and hold (> 2s) the S button on the Device until the blue LED starts blinking slowly. Releasing the S button will start the Learn mode.
6. The blue LED will be blinking faster during the adding process.
7. The green LED will be blinking slowly if the Device is successfully added to a Z-Wave® network.

Note! *In Setting mode, the Device has a timeout of 10s before entering again into Normal mode.*

Adding (inclusion) with a switch/push-button

1. Connect the Device to a power supply.
2. Check if the blue LED is blinking slowly. If so, the Device is not added to a Z-Wave® network.
3. Enable add/remove mode on the gateway.
4. Toggle the switch/push-button connected to any of the SW terminals (SW, SW1, SW2, etc.) 3 times within 3 seconds (this procedure puts the Device in Learn mode*). The Device must receive on/off signal 3 times, which means pressing the momentary switch 3 times, or toggling the switch on and off 3 times.
5. The blue LED will be blinking faster during the adding process.
6. The green LED will be blinking slowly if the Device is successfully added to a Z-Wave® network.

***Learn mode -** a state that allows the Device to receive network information from the gateway.

Removing the Device from a Z-Wave® network (exclusion)

Note! *The Device will be removed from your Z-Wave® network, but any custom configuration parameters will not be erased.*

Note! *All Device outputs (O, O1, O2, etc. - depending on the Device type) will turn the load 1s on/1s off /1s on/1s off if the Device is successfully added to/removed from a Z-Wave® network.*

Removing (exclusion) with the S button

1. Connect the Device to a power supply.
2. Check if the green LED will be blinking slowly. If so, the Device is added to a Z-Wave® network.
3. Enable add/remove mode on the gateway.
4. To enter the Setting mode, quickly press and hold the S button on the Device until the LED turns solid blue.
5. Quickly release and then press and hold (> 2s) the S button on the Device until the blue LED starts blinking slowly. Releasing the S button will start the LEARN MODE.

6. The blue LED will be blinking faster during the removing process.
7. The blue LED will be blinking slower if the Device is successfully removed from a Z-Wave® network.

Note! *In Setting mode, the Device has a timeout of 10s before entering again into Normal mode.*

Removing (exclusion) with a switch/push-button

1. Connect the Device to a power supply.
2. Check if the green LED will be blinking slowly. If so, the Device is added to a Z-Wave® network.
3. Enable add/remove mode on the gateway.
4. Toggle the switch/push-button connected to any of the SW terminals (SW, SW1, SW2,…) 3 times within 3 seconds (this procedure puts the Device in LEARN MODE). The Device must receive on/off signal 3 times, which means pressing the momentary switch 3 times, or toggling the switch on and off 3 times.
5. The blue LED will be blinking faster during the removing process.
6. The blue LED will be blinking slower if the Device is successfully removed from a Z-Wave® network.

Factory reset

Factory reset general

After Factory reset, all custom parameters and stored values (kWh, associations, routing, etc.) will return to their default state. HOME ID and NODE ID assigned to the Device will be deleted. Use this reset procedure only when the gateway is missing or otherwise inoperable.

Factory reset with the S button

Note! *Factory reset with the S button is possible anytime.*

1. To enter the Setting mode, quickly press and hold the S button on the Device until the LED turns solid blue.
2. Press the S button multiple times until the LED turns solid red.
3. Press and hold (> 2s) S button on the Device until the red LED starts blinking faster. Releasing the S button will start the factory reset.
4. During factory reset, the LED will turn solid green for about 1s, then the blue and red LED will start blinking faster for approx. 2s.
5. The blue LED will be blinking slower if the Factory reset is successful.

Factory reset with a switch/push-button

Note! *Factory reset with a switch/push-button is only possible within the first minute after the Device is connected to a power supply.*

1. Connect the Device to a power supply.
2. Toggle the switch/push-button connected to any of the SW terminals (SW, SW1, SW2,…) 5 times within 3 seconds. The Device must receive on/off signal 5 times, which means pressing the push-button 5 times, or toggling the switch on and off 5 times.
3. During factory reset, the LED will turn solid green for about 1s, then the blue and red LED will start blinking faster for approx. 2s.
4. The blue LED will be blinking slower if the Factory reset is successful.

Factory reset remotely with parameter with the gateway

Factory reset can be done remotely by settings in Parameter No. 120

Z-Wave® Security and Device Specific Key (DSK)

Click to see about the Security and the DSK

The Device supports the latest Security 2 (S2) feature. 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. To fully utilize the product and its Security 2 feature, a Security 2-enabled Z-Wave® gateway must be used.

Authenticated Control

· Out-Of-Band DSK for inclusion

· May be used by most implementations

The Device also supports Security 2 Authenticated, Unauthenticated, and Unsecure adding (inclusion).

> **Note**! When adding the Device to a Z-Wave network with a gateway supporting Security 2 (S2), the PIN Code of the Z-Wave Device Specific Key (DSK) is required. You can find it on the label on the side of the Device and a copy is inserted in the packaging, which must not be lost. Do not remove the Z-Wave DSK label from the Device. 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 part of the DSK text. The DSK is additionally represented with a QR Code as shown on the image.

DSK label and QR code (example)

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.

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

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

Z-Wave® Parameters

Click to see the Parameters

Parameter No. 1 - SW (SW1) Switch type

This parameter defines how the Device should treat the switch (which type) connected to the SW (SW1) terminal.

Value size: 1 Byte

Default value: 2

Values & descriptions:

- 0 - momentary switch (push button),
- 1 - toggle switch (contact closed - ON / contact opened - OFF),
- 2 - toggle switch (Device changes status when switch changes status)

Parameter No. 2 - SW2 Switch type

This parameter defines how the Device should treat the switch (which type) connected to the SW2 terminal.

Value size: 1 Byte

Default value: 2

Values & descriptions:

- 0 - momentary switch (push button),
- 1 - toggle switch (contact closed - ON / contact opened - OFF),
- 2 - toggle switch (device changes status when switch changes status)

Parameter No. 6 - Inputs SW1 & SW2 Swap

This parameter allows to swap the operation of switches connected to inputs SW1 and SW2 without changing the wiring.

Value size: 1 Byte

Default value: 0

Values & descriptions:

- 0 - default (SW1 - O1, SW2 - O2),
- 1 - swapped (SW1 - O2, SW2 - O1)

Parameter No. 16 - Outputs O1 & O2 swap

This parameter allows to swap the operation of outputs O1 and O2 without changing the wiring (in case of an invalid motor connection) to ensure proper operation.

Values size: 1 Byte

Default value: 0

Values & descriptions:

- 0 - default
- 1 - reversed

Parameter No. 17 - Restore the O (O1) state after a power failure

This parameter determines if the on/off status is saved and restored for the load connected to O (O1) after a power failure.

Values size: 1 Byte

Default value: 0

Values & descriptions:

- 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. 18 - Restore the O2 state after a power failure

This parameter determines if the on/off status is saved and restored for the load connected to O2 after a power failure.

Values size: 1 Byte

Default value: 0

Values & descriptions:

- 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. 19 - O (O1) Auto OFF with timer

If the load O (O1) is ON, you can schedule it to turn OFF automatically after the period of time defined in this parameter. The timer resets to zero each time the Device receives an ON command, either remotely (from the gateway or associated device) or locally from the switch.

Values size: 2 Byte

Default value: 0

Values & their descriptions:

- 0 - Auto OFF Disabled
- 1 - 32535 = 1 - 32535 seconds or milliseconds – see Parameter no. 25. Set timer units to s or ms for O (O1) resolution 100ms

Parameter No. 20 - O (O1) Auto ON with timer

If the load O (O1) is ON, you can schedule it to turn OFF automatically after the period of time defined in this parameter. The timer resets to zero each time the Device receives an ON command, either remotely (from the gateway or associated device) or locally from the switch.

Values size: 2 Byte

Default value: 0

Values & their descriptions:

- 0 - Auto ON Disabled
- 1 - 32535 = 1 - 32535 seconds (or milliseconds – see Parameter No. 25. Set timer units to s or ms for O (O1) resolution 100ms

Parameter No. 21 - O2 Auto OFF with timer

If the load O2 is ON, you can schedule it to turn OFF automatically after the period of time defined in this parameter. The timer resets to zero each time the device receives an ON command, either remotely (from the gateway or associated device) or locally from the switch.

Values size: 2 Byte

Default value: 0

Values & their descriptions:

- 0 - Auto OFF Disabled
- 1 - 32535 = 1 - 32535 seconds (or milliseconds – see Parameter no. 26. Set timer units to s or ms for O2 resolution 100ms

Parameter No. 22 - O2 Auto ON with timer

If the load O2 is OFF, you can schedule it to turn ON automatically after the period of time defined in this parameter. The timer resets to zero each time the device receives an OFF command, either remotely (from the gateway or associated device) or locally from the switch.

Values size: 2 Byte

Default value: 0

Values & their descriptions:

- 0 - Auto ON Disabled
- 1 - 32535 = 1 - 32535 seconds (or milliseconds – see Parameter no. 26. Set timer units to s or ms for O2 resolution 100ms

Parameter No. 23 - O (O1) contact type - NO/NC

The set value determines the relay contact type for output O (O1). The relay contact type can be normally open (NO) or normally closed (NC).

Values size: 1 Byte

Default value: 0

Values & descriptions:

- 0 - NO
- 1 - NC

Relay logic:

Par-NO/NC	Command (switch, Z-Wave…)	Device output state
NO (0)	OFF	OFF (0 V)
NO (0)	ON	ON (230 V)
NC (1)	OFF	ON (230 V)
NC (1)	ON	OFF (0 V)

Parameter No. 24 - O2 contact type - NO/NC

The set value determines the type of Relay contact type for O2 output. The Relay contact type can be normally open (NO) or normally closed (NC).

Values size: 1 Byte

Default value: 0

Values & descriptions:

- 0 - NO
- 1 - NC

Relay logic:

par-NO/NC	command (switch, zwave,..)	Device output state
NO (0)	OFF	OFF (0V)
NO (0)	ON	ON (230V)
NC (1)	OFF	ON (230V)
NC (1)	ON	OFF (0V)

Parameter No. 25 - Set timer units to s or ms for O (O1)

Set the timer units to seconds or milliseconds. Choose if you want to set the timer in seconds or milliseconds in Parameters No. 19, 20.

Values size: 1 Byte

Default value: 0

Values & descriptions:

- 0 – timer set in seconds
- 1 – timer set in milliseconds

Parameter No. 26 - Set timer units to s or ms for O2

Set the timer units to seconds or milliseconds. Choose if you want to set the timer in seconds or milliseconds in Parameters No. 21, 22.

Values size: 1 Byte

Default value: 0

Values & descriptions:

- 0 – timer set in seconds
- 1 – timer set in milliseconds

Parameter No. 36 - O (O1) Power report on change - percentage

This parameter determines the minimum change in consumed power that will result in sending a new report to the gateway.

Values size: 1 Byte

Default value: 50

Values & descriptions:

- 0 - reports are disabled
- 1-100 (1-100%) - change in power

NOTE! *Regardless of the power consumption change in percentage, the report will not be sent more frequently than defined by Parameter No. 39.*

Parameter No. 37 - O2 Power report on change - percentage

This parameter determines the minimum change in consumed power that will result in sending new report to the gateway.

Values size: 1 Byte

Default value: 50

Values & descriptions:

- 0 - reports are disabled
- 1-100 (1-100%) - change in power

NOTE! *Regardless of the power consumption change in percentage, the report will not be sent more frequently than defined by Parameter No. 40.*

Parameter No. 39 - Minimum time between reports (O) O1

This parameter determines the minimum time that must elapse before a new power report on O (O1) is sent to the gateway.

Values size: 1 Byte

Default value: 30

Values & descriptions:

- 0 - reports are disabled
- 1-120 (1-120s) - report interval

NOTE! *This Parameter is in relation to Parameter No. 36.*
NOTE! *Setting the value to less than 30s can cause the Z-Wave network congestion state (slow Device response and decreased network stability).*

Parameter No. 40 - Minimum time between reports O2

This parameter determines the minimum time that must elapse before a new power report on O2 is sent to the gateway.

Values size: 1 Byte

Default value: 30

Values & descriptions:

- 0 - reports are disabled
- 1-120 (1-120s) - report interval
- 10-120 (10-120s) - report interval, remark

NOTE! *This Parameter is in relation to Parameter No. 37*
NOTE! *Setting the value to less than 30s can cause the Z-Wave network congestion state (slow Device response and decreased network stability).*

Parameter No. 91 - Water Alarm

This parameter determines which alarm frames the Device should respond to and how. The parameters consist of 4 bytes, the three most significant bytes are set according to the official Z-Wave protocol specification.

Values size: 4 Byte

Default value: 0

Values & descriptions:

- 0 no action
- 1 open relay / Open blinds (Up position)
- 2 close relay / Close blinds (Down position)

Parameter No. 92 - Smoke Alarm

This parameter determines which alarm frames the Device should respond to and how. The parameters consist of 4 bytes, the three most significant bytes are set according to the official Z-Wave protocol specification.

Values size: 4 Byte

Default value: 0

Values & descriptions:

- 0 no action
- 1 open relay / Open blinds (Up position)
- 2 close relay / Close blinds (Down position)

Parameter No. 93 - CO Alarm

This parameter determines which alarm frames the Device should respond to and how. The parameters consist of 4 bytes, the three most significant bytes are set according to the official Z-Wave protocol specification.

Values size: 4 Byte

Default value: 0

Values & descriptions:

- 0 no action
- 1 open relay / Open blinds (Up position)
- 2 close relay / Close blinds (Down position)

Parameter No. 94 - Heat Alarm

This parameter determines which alarm frames the Device should respond to and how. The parameters consist of 4 bytes, the three most significant bytes are set according to the official Z-Wave protocol specification.

Values size: 4 Byte

Default value: 0

Values & descriptions:

- 0 no action
- 1 open relay / Open blinds (Up position)
- 2 close relay / Close blinds (Down position)

Parameter No. 120 - Factory Reset

Reset to factory default settings and removed from the Z-Wave network.

The parameter is Advanced and may be hidden under the Advanced tag.

Values size: 1 Byte

Default value: 0

Values & descriptions:

- 0 - Don’t do Factory reset

- 1 - Do the Factory reset

Parameter No. 201 - Serial Number 1

This parameter contains a part of device’s serial number.

The parameter is Read-Only and cannot be changed.
The parameter is Advanced and may be hidden under the Advanced tag.

Values size: 4 Byte

Default value: Device specific

Values & descriptions:

- 0x00000000 - 0x7FFFFFFF

Parameter No. 202 - Serial Number 2

This parameter contains a part of device’s serial number.

The parameter is Read-Only and cannot be changed.
The parameter is Advanced and may be hidden under the Advanced tag.

Values size: 4 Byte

Default value: Device specific

Values & descriptions:

- 0x00000000 - 0x7FFFFFFF

Parameter No. 203 - Serial Number 3

This parameter contains a part of device’s serial number.

The parameter is Read-Only and cannot be changed.
The parameter is Advanced and may be hidden under the Advanced tag.

Values size: 4 Byte

Default value: Device specific

Values & descriptions:

- 0x00000000 - 0x7FFFFFFF

Z-Wave® Command Class

Click to see the Command Classes

1. ASSOCIATION_V2 [S0, S2]*
2. ASSOCIATION_GRP_INFO_V3 [S0, S2]*
3. BASIC_V2 [S0, S2]*
4. SWITCH_BINARY_V2 [S0, S2]*

5. CONFIGURATION_V4 [S0, S2]*
6. DEVICE_RESET_LOCALLY_V1 [S0, S2]*
7. FIRMWARE_UPDATE_MD_V5 [S0, S2]*
8. INDICATOR_V3 [S0, S2]*
9. MANUFACTURER_SPECIFIC_V2 [S0, S2]*
10. METER_V6 [S0, S2]*
11. MULTI_CHANNEL_V4 [S0, S2]*
12. MULTI_CHANNEL_ASSOCIATION_V3 [S0, S2]*
13. NOTIFICATION_V8 [S0, S2]*
14. POWERLEVEL_V1 [S0, S2]*
15. SECURITY_V1
16. SECURITY_2_V1
17. SUPERVISION_V1
18. TRANSPORT_SERVICE_V2
19. VERSION_V3 [S0, S2]*
20. ZWAVEPLUS_INFO_V2

EndPoint 1

1. ASSOCIATION_V2 [S0, S2]*
2. ASSOCIATION_GRP_INFO_V3 [S0, S2]*
3. BASIC_V2 [S0, S2]*
4. SWITCH_BINARY_V2 [S0, S2]*
5. METER_V6 [S0, S2]*
6. MULTI_CHANNEL_V4 [S0, S2]*
7. NOTIFICATION_V8 [S0, S2]*
8. SECURITY_V1
9. SECURITY_2_V1
10. SUPERVISION_V1
11. ZWAVEPLUS_INFO_V2

EndPoint 2

1. ASSOCIATION_V2 [S0, S2]*
2. ASSOCIATION_GRP_INFO_V3 [S0, S2]*
3. BASIC_V2 [S0, S2]*
4. SWITCH_BINARY_V2 [S0, S2]*

5. METER_V6 [S0, S2]*
6. MULTI_CHANNEL_V4 [S0, S2]*
7. NOTIFICATION_V8 [S0, S2]*
8. SECURITY_V1
9. SECURITY_2_V1
10. SUPERVISION_V1
11. ZWAVEPLUS_INFO_V2

Note: [S2] Security S2 Command Class*

Z-Wave® Notifications Command Class

Click to see the Notification Command Class

Overheat detected

Comment	**Overheat detected**
Z-Wave Notification Type Name	Heat Alarm
Z-Wave Notification type - Value	0x04
Z-Wave Notification type - Event	State
Z-Wave Notification Name	Overheat detected
Z-wave Notification Name - Value	0x02
Z-Wave Notification Name - Version	V2
Z-Wave Device specific	Yes
LED signalisation	Check LED signalisation table
Device reaction - Switch OFF all outputs and send notification	Yes
Action to restore - power cycle	Yes
Action to restore - short press on S button	Yes
Action to restore - press any switch-push button connected to any SW (SW, SW1, SW2, …) terminal	Yes

Over-current detected

Comment	Over-current detected O (O1)
Z-Wave Notification Type Name	Power management
Z-Wave Notification type - Value	0x08
Z-Wave Notification type - Event	State
Z-Wave Notification Name	Over-current detected
Z-wave Notification Name - Value	0x06
Z-Wave Notification Name - Version	V3
Z-Wave Device specific	Yes
LED signalisation	Check LED signalisation table
Device reaction - Switch OFF the output O (O1) and send a notification	Yes
Action to restore - power cycle	Yes
Action to restore - short press on S button	Yes
Action to restore - press any switch-push button connected to any SW (SW, SW1, SW2, …) terminal	Yes

Comment	Over-current detected O2
Z-Wave Notification Type Name	Power management
Z-Wave Notification type - Value	0x08
Z-Wave Notification type - Event	State
Z-Wave Notification Name	Over-current detected
Z-wave Notification Name - Value	0x06
Z-Wave Notification Name - Version	V3
Z-Wave Device specific	Yes
LED signalisation	Check LED signalisation table
Device reaction - Switch OFF the output O2 and send a notification	Yes
Action to restore - power cycle	Yes
Action to restore - short press on S button	Yes

Action to restore - press any switch-push button connected to any SW (SW, SW1, SW2, …) terminal	Yes

Comment	**Over-current detected O1+O2**
Z-Wave Notification Type Name	Power management
Z-Wave Notification type - Value	0x08
Z-Wave Notification type - Event	State
Z-Wave Notification Name	Over-current detected
Z-wave Notification Name - Value	0x06
Z-Wave Notification Name - Version	V3
Z-Wave Device specific	Yes
LED signalisation	Check LED signalisation table
Device reaction - Switch OFF the output O1 and O2 and send a notification	Yes
Action to restore - power cycle	Yes
Action to restore - short press on S button	Yes
Action to restore - press any switch-push button connected to any SW (SW, SW1, SW2, …) terminal	Yes

AC mains disconnected

Comment	**AC mains disconnected (valid for AC and DC power supply)**
Z-Wave Notification Type Name	Power management
Z-Wave Notification type - Value	0x08
Z-Wave Notification type - Event	State
Z-Wave Notification Name	AC mains disconnected
Z-wave Notification Name - Value	0x02
Z-Wave Notification Name - Version	V2
Z-Wave Device specific	Yes

LED signalisation	Check LED signalisation table
Device reaction - Switch OFF all outputs and send notification	Yes
Action to restore - power cycle	Yes
Action to restore - short press on S button	Yes
Action to restore - press any switch-push button connected to any SW (SW, SW1, SW2, …) terminal	Yes

Z-Wave® Associations

Click to see the Assiciations

Associations are used for direct communication between the Device and other devices within your Z-Wave network without the need of the Z-Wave gateway.

Max. number of associated devices per group is 9. This value is fixed and can not be configured.
Each association group supports the association of up to 9 devices (nodes). To avoid network delays, we recommend limiting the amount of associated devices to no more than 5 per group. “Lifeline Group” is reserved solely for a gateway and hence only 1 node can be assigned.

Association group 1 – “Lifeline Group” reports the status of the Device status and allows to assign only one device (gateway by default); only 1 node is allowed. The following command classes are supported:

Root device

Association Group 1 - Lifeline

1. INDICATOR_REPORT : LED status
2. DEVICE_RESET_LOCALLY_NOTIFICATION : triggered upon request
3. SWITCH_BINARY_REPORT : status change report for all outputs O (O, O1, O2, …) - common
4. NOTIFICATION_REPORT : triggered on Overheat
5. NOTIFICATION_REPORT : triggered on Over-current detected sum of all outputs O (O1+O2+…)
6. NOTIFICATION_REPORT : triggered on Over-voltage detected
7. NOTIFICATION_REPORT : triggered on AC mains disconnected
8. METER_REPORT : triggered by the load power consumption of all connected loads to all outputs O (O1+O2+…) (according to the settings of Parameters from No. 36 to 43)

Association Group 2

Allowed nodes: 9
It is assigned to switch connected to the SW (SW1) terminal (uses Basic command class).
Triggered by SW (SW1). The device sends according to the state of SW (SW1) (switch or push-button) the

command BASIC_SET ON or BASIC_SET OFF to the associated device. This command is reflected to the output of associated device. Supports the following command classes:

- BASIC_SET : set On / Off state at the associated device

Association Group 3

Allowed nodes: 9
It is assigned to switch connected to the SW (SW1) terminal (uses Switch Multilevel command class). Triggered by SW (SW1).
Supports the following command classes:

- SWITCH_MULTILEVEL_START_LEVEL_CHANGE : initiate a transition to a new level (increase or decrease light intensity in case of dimmer, or move shutter up or down, …)
- SWITCH_MULTILEVEL_STOP_LEVEL_CHANGE : stop an ongoing transition (stop increase or decrease light intensity in case of dimmer, or stop moving shutter up or down, …)

It is recommended to use push buttons for this association.

Association Group 4

Allowed nodes: 9
It is assigned to switch connected to the SW2 terminal (uses Basic command class).
Triggered by SW2. Supports the following command classes:

- BASIC_SET : set On / Off state at the associated device

Association Group 5

Allowed nodes: 9
It is assigned to switch connected to the SW2 terminal (uses Switch Multilevel command class). Triggered by SW2.
Supports the following command classes:

- SWITCH_MULTILEVEL_START_LEVEL_CHANGE : initiate a transition to a new level (increase or decrease light intensity in case of dimmer, or move shutter up or down, …)
- SWITCH_MULTILEVEL_STOP_LEVEL_CHANGE : stop an ongoing transition (stop increase or decrease light intensity in case of dimmer, or stop moving shutter up or down, …)

It is recommended to use push buttons for this association.

Endpoint 1

Association Group 1 - Lifeline

1. SWITCH_BINARY_REPORT : status change report for output O (O1)
2. NOTIFICATION_REPORT : triggered on Over-current detected O (O1)
3. METER_REPORT : triggered by load power consumption connected to output O(O1) (according to the settings of Parameters No. 36 and 39)

Association Group 2

Allowed nodes: 9
It is assigned to switch connected to the SW (SW1) terminal (uses Basic command class).
Triggered by SW (SW1). The device sends according to the state of SW (SW1) (switch or push-button) the command BASIC_SET ON or BASIC_SET OFF to the associated device. This command is reflected to the output of associated device. Supports the following command classes:

- BASIC_SET : set On / Off state at the associated device

Association Group 3

Allowed nodes: 9
It is assigned to switch connected to the SW (SW1) terminal (uses Switch Multilevel command class). Triggered by SW (SW1).
Supports the following command classes:

- SWITCH_MULTILEVEL_START_LEVEL_CHANGE : initiate a transition to a new level (increase or decrease light intensity in case of dimmer, or move shutter up or down, …)
- SWITCH_MULTILEVEL_STOP_LEVEL_CHANGE : stop an ongoing transition (stop increase or decrease light intensity in case of dimmer, or stop moving shutter up or down, …)

It is recommended to use push buttons for this association.

Endpoint 2

Association Group 1 - Lifeline

1. SWITCH_BINARY_REPORT : status change report for output O2
2. NOTIFICATION_REPORT : triggered on Over-current detected O2
3. METER_REPORT : triggered by load power consumption connected to output O2 (according to the settings of Parameters No. 37 and 40)

Association Group 2

Allowed nodes: 9
It is assigned to switch connected to the SW2 terminal (uses Basic command class).
Triggered by SW2. The device sends according to the state of SW2 (switch or push-button) the command BASIC_SET ON or BASIC_SET OFF to the associated device. Supports the following command classes:

- BASIC_SET : set On / Off state at the associated device

Association Group 3

Allowed nodes: 9
It is assigned to switch connected to the SW2 terminal (uses Switch Multilevel command class). Triggered by SW2.
Supports the following command classes:

- SWITCH_MULTILEVEL_START_LEVEL_CHANGE : initiate a transition to a new level (increase or decrease light intensity in case of dimmer, or move shutter up or down, …)

- SWITCH_MULTILEVEL_STOP_LEVEL_CHANGE : stop an ongoing transition (stop increase or decrease light intensity in case of dimmer, or stop moving shutter up or down, …)

It is recommended to use push buttons for this association.

Z-Wave® Important disclaimer

Z-Wave® wireless communication may not always be 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 recognised by your gateway or appears incorrectly, you may need to change the Device type manually and ensure that your gateway supports Z-Wave Plus™ multi-level devices.

Troubleshooting

For troubleshooting please visit our support portal: https://support.shelly.cloud/

Compatibility with gateways

Wave 2PM	**functions - reports**							
Gateway	On/Off 1	On/Off 2	SW 1 On/Off	SW 2 On/Off	W 1	W 2	kWh	Notes
Home Assistant	✓	✓	✓	✓	✓	✓	✓	
Fibaro HC 3 / Z-Wave engine 3	✓	✓	✓	✓	✓	✓	✓	
Homey	✓	✓	✓	✓	✓	✓	✓	Troubles with reports can be solved with this solution.
Homee Cube Gen 7	✓	✓	✓	✓	✓	✓	✓	
Homee Cube Gen 5	**P**	**P**	**P**	**P**	**P**	**P**	**P**	*1
SmartThings	✓	✓	✓	✓	✓	✓	✓	with the Shelly Wave edge driver
Vera Ezlo	✓	✓	✓	✓	✓	✓	✓	
Cozify	✓	✓	✓	✓	✓	✓	✓	
Hubitat	✗	✗	✗	✗	✗	✗	✗	
Notes	*1 - The device is configured as a single-channel device, featuring a singular switch within the application interface that enables control over both outputs							

	simultaneously.

Legend	
Symbol	State
✅	Working / Possible
❌	Not Working / Not Possible
P	Partially
N/T	Not Tested
TBD	To be done

Function	**Meaning / tested**
On/Off	if device respond to the app UI On/Off command
SW On/Off	if device reports On/Off changes by SW input
Dimming	if device respond to app UI dimming command
SW Dimming	if device report dimming state change by SW input
Watts	if Watts are reported (unsolicited)
kWh	if kWh are reported (unsolicited)
Up/Down	if device respond to the app UI Up/Down command
SW Up/Down	if device reports Up/Down changes by SW input
Slats	if the slats respond to the app UI command
SW Slats	if the slats report the changes done by SW

D control	*detached mode* if device reports scene commands single press, double press,…
D Binary	*detached mode* if the device reports binary On/Off by SW input
Sensor #	Is the sensor report visualized in the gateway, type of sensor in the notes.

Gateway guides

You may find useful guides on gateways in the Z-Wave Shelly Knowledge base.

Compliance

Wave 2PM multilingual EU declaration of conformity 2025-07-22.pdf

Wave 2PM UK PSTI ACT Statement of compliance.pdf

Compliance archive

Wave 2PM multilingual EU declaration of conformity 11 2023-08-31.pdf

Printed User Guide

Wave 2PM Ръководство за употреба и безопасност.pdf.pdf Wave_2PM_multilang_2023_print_V4.pdf