# Wave Pro 2PM

*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: Wave Pro 2PM**
EU Part number/Ordering Code: QPSW-0A2P16EU
Z-Wave Product type ID: 0x0002
Z-Wave Product ID: 0x008D
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 Shelly Qubino device that is a subject of this guide.
- **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, 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 Device is a DIN rail mountable 2-channel smart switch with power measurement. It controls the on/off function for two independent electrical devices with a load up to 16 A per channel (25 A in total). It is compatible with switches (default) and push-buttons.

## Switch/push-button connected to input terminal SW (SW1)

SW1: If the SW (SW1) is configured as a switch (default), each toggle of the switch will change the output O (O1) state to the opposite state - on, off, on, etc. If the SW (SW1) is configured as a push-button in the Device settings, each press of the push-button will change the output O (O1) state to the opposite state - on, off, on, etc.

### 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 O (O1) state to the opposite state - on, off, on, etc.

- **Change switch position once:** Change the state of the output O (O1) state to the opposite state and send the command to the associated devices in associated groups 2 and 3 (check chapter Z-Wave Association).
- **Change switch position twice:** If the delay between the first in the second click is less then 500ms, this is interpreted as “Change the switch position twice”. Send command to the associated devices (dimmers, shutters,….) in associated groups 2 and 3 (check chapter Z-Wave Association).

## Switch-memory connected to input terminal SW (SW1)

If the SW (SW1) is configured as a switch-memory, than:

- **Switching to Close switch-memory contact:** Change the state of the output state O (O1) to the On state and send command to the associated devices in associated groups 2 and 3 (check chapter Z-Wave Association)
- **Switching to Open switch-memory contact:** Change the state of the output state O (O1) to the Off state and send command to the associated devices in associated groups 2 and 3 (check chapter Z-Wave Association)

## Push-button connected to input terminal SW (SW1)

If the SW (SW1) is configured as a push-button in the Device settings, each press of the push-button changes the output state O (O1) to opposite - ON, OFF, ON, etc.

- **Short press**: 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)
- **Hold**: Send command to the associated devices in associated group 3 (check chapter Z-Wave Association)
- **Release**: Send command to the associated devices in associated group 3 (check chapter Z-Wave Association)

# Switch/push-button connected to input terminal SW2

If the SW2 is configured as a switch (default), each toggle of the switch will change the output O2 state to the opposite state - on, off, on, etc. If the SW2 is configured as a push-button in the Device settings, each press of the push-button will change the output O2 state to the opposite state - on, off, on, etc.

## Switch connected to input terminal SW2

If the SW2 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 4 and 5 (check chapter Z-Wave Association)
- **Change switch position twice:** If the delay between first in second click is less then 500ms, this is interpreted as Change switch possition twice. Send command to the associated devices (dimmers, shutters,….) in associated groups 4 and 4 (check chapter Z-Wave Association)

## Switch-memory connected to input terminal SW2

If the SW2 is configured as a switch-memory, than:

- **Switching to Close switch-memory contact:** Change the state of the output state O2 to the On state and send command to the associated devices in associated groups 4 and 5 (check chapter Z-Wave Association)
- **Switching to Open switch-memory contact:** Change the state of the output state O2 to the Off state and send command to the associated devices in associated groups 4 and 5 (check chapter Z-Wave Association)

### Push-button connected to input terminal SW2

If the SW2 is configured as a push-button in the Device settings, each press of the push-button changes the output state O2 to opposite - ON, OFF, ON, etc.

- **Short press**: Change the state of the output state O2 to the opposite one and send command to the associated devices in associated groups 4 and 5 (check chapter Z-Wave Association)
- **Hold**: Send command to the associated devices in associated group 4 (check chapter Z-Wave Association)
- **Release**: Send command to the associated devices in associated group 5 (check chapter Z-Wave Association)

## Switching On/Off load connected to O (O1

Load connected to O (O1) is possible to switch On/Off by:

- by Z-Wave command
- Automatically switching can be enabled by proper Parameters No. 19 and 20 settings.
- pressing the switch/push-button SW (SW1): Change the state of the connected load to the opposite one

## Switching On/Off load connected to O2

Load connected to O2 is possible to switch On/Off by:

- by Z-Wave command
- Automatically switching can be enabled by proper Parameters No. 21 and 22 settings.
- pressing the switch/push-button SW2: Change the state of the connected load to the opposite one

## 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

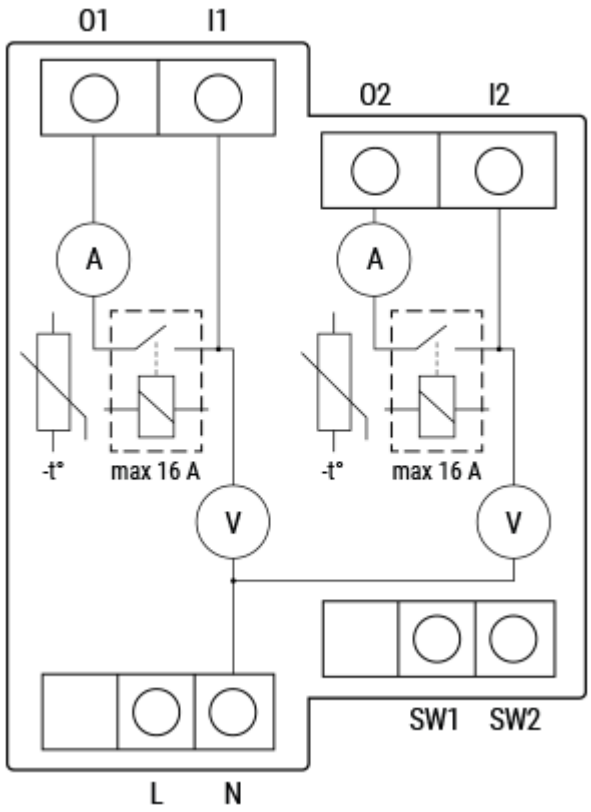
## Integrations

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 (+), 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

Device has internal Overheat protection. If the temperature exceeds predefined values 80°C for more than 5s, the Device will:

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

Any of the following activities reset this alarm: power cycle, short press on the S button, press on 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 LED blinking mode for Over-current detected)

Any of the following activities reset this alarm: power cycle, short press on the S button, press on 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.**

## Over-voltage Protection

Device has internal Over-voltage protection. This is valid for standard power supply voltage 230 V AC. If the voltage exceeds 240 V AC+15% (278 V AC) for more than 5s, the Device will:

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

Any of the following activities reset this alarm: power cycle, short press on the S button, press on 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-voltage 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

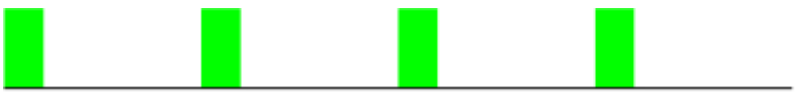
### Normal mode

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

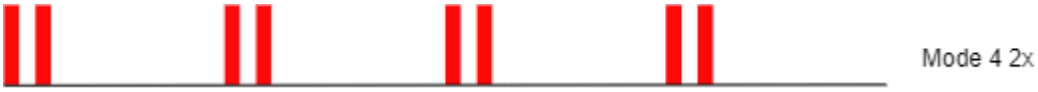
## Alarm Mode

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 - 0,2s On 0,2s Off 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 - 0,2s On 0,2s Off 0,2s On 0,2s Off 0,2s On 0,2s Off 2s Off and repeating this sequence


Overvoltage detected

The LED will be blinking **red** in Mode 4 7x - 0,2s On 0,2s Off 0,2s On 0,2s Off 0,2s On 0,2s Off 0,2s On 0,2s Off 0,2s On 0,2s Off 0,2s On 0,2s Off 0,2s On 0,2s Off 2s Off and repeating this sequence

## LED blinking modes

Click to see the LED blinking modes

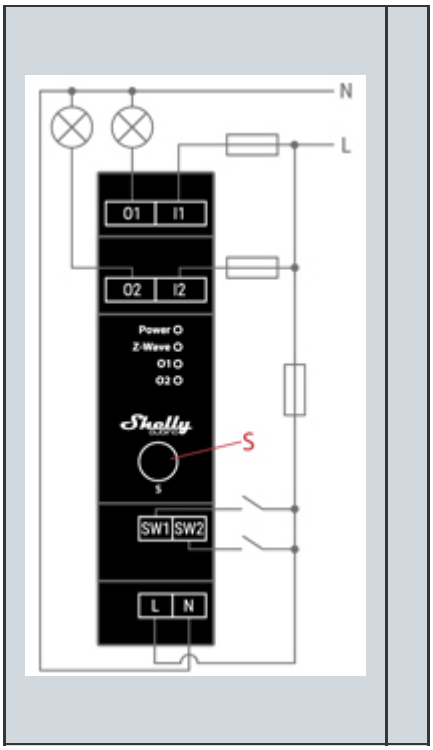
| **LED blinking modes** | |
|---|---|
| Mode 1 | 0,5s On/2s Off |
| Mode 2 | 0,5s On/0,5s Off |
| Mode 3 | 0,1s On/0,1s Off |
| Mode 4 | (1x to 6x - 0,2s On/0,2s Off) + 2s Off |
| Mode 5 | 0,2s On blue/0,2s On red |

# Specifications

| | |
|---|---|
| Power supply | 110 - 240 V AC, 50/60 Hz |
| Power consumption | < 0.3 W |
| Power measurement [W] | Yes |
| Max. switching voltage AC | 240 V |
| Max. switching current AC | 16 A per channel, 25 A total |

| | |
|---|---|
| Max. switching voltage DC | N/A |
| Max. switching current DC | N/A |
| Overheating protection | Yes |
| Overload protection | Yes |
| Overvoltage 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 band(s) | < 25 mW |
| Size (H x W x D) | 94x19x69 ±0.5 mm / 3.70x0.75x2.71 ±0.02 in |
| Weight | 75 g / 2.65 oz. |
| Mounting | DIN rail |
| Screw terminals max. torque | 0.4 Nm / 3.54 lbin |
| Conductor cross section | 0.5 to 2.5 mm² / 20 to 14 AWG (green connector)<br>0.5 to 1.5 mm² / 20 to 16 AWG (white connectors) |
| Conductor stripped length | 6 to 7 mm / 0.24 to 0.28 in (green connector)<br>5 to 6 mm / 0.20 to 0.24 in (white connectors) |
| Shell material | Plastic |
| Color | 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




## Legend

| Terminals | | Wires | |
|---|---|---|---|
| **N** | Neutral terminal | **N** | Neutral wire |
| **L** | Live terminal (110–240 V AC) | **L** | Live (110 - 240 VAC) wire |
| **SW 1** | Switch/push-button input terminal (controlling O1) | | |
| **SW 2** | Switch/push-button input terminal (controlling O2) | | |
| **I1** | Input terminal for Load circuit 1 | | |
| **I2** | Input terminal for Load circuit 2 | | |
| **O1** | Load circuit output terminal 1 | | |
| **O2** | Load circuit output terminal 2 | | |

# 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 in Mode 1. 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 in Mode 2 during the adding process.
6. The green LED will be blinking in Mode 1 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 in Mode 1. 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 in Mode 3. Releasing the S button will start the Learn mode.
6. The blue LED will be blinking in Mode 2 during the adding process.
7. The green LED will be blinking in Mode 1 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 in Mode 1. 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 in Mode 2 during the adding process.
6. The green LED will be blinking in Mode 1 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 is blinking in Mode 1. 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 in Mode 3. Releasing the S button will start the LEARN MODE.
6. The blue LED will be blinking in Mode 2 during the removing process.
7. The blue LED will be blinking in Mode 1 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 is blinking in Mode 1. 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 in Mode 2 during the removing process.
6. The blue LED will be blinking in Mode 1 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, routings, 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 in Mode 3. 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 in Mode 3 for approx. 2s.
5. The blue LED will be blinking in Mode 1 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 in Mode 3 for approx. 2s.
4. The blue LED will be blinking in Mode 1 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 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. The unique DSK code is printed on the DSK label on the side of the Device and a copy is inserted in the packaging, which must not be lost. Do not remove the DSK label from the product. As a backup measure, use the label in the packaging.


The first five digits of the key are highlighted or underlined to help the user identify the PIN Code 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)

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.

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,
- 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 (O1 - OPEN, O2 - CLOSE),
- 1 - reversed (O1 - CLOSE, O2 - OPEN)

## Parameter No. 17 - Restore state of O (O1) after power failure

This parameter determines if on/off status is saved and restored for load connected to O (O1) after 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. Auto OFF timer enabled for a given amount of seconds (or milliseconds) resolution 100ms

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

If the load O (O1) 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. 25. Auto ON timer enabled for a given amount of seconds (or milliseconds) 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:

| parameter - 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 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 - Minimal 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 with 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 with 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
- 2 close relay

## 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
- 2 close relay

## 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
- 2 close relay

## 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
- 2 close relay

## Parameter No. 120 - Factory Reset

Reset to factory default settings and removed from the z-wave network

Values size: 4 Byte

Default value: 0

Values & descriptions:

- 0 - Don’t do Factory reset
- 1431655765 - Do the Factory reset (hex 0x55555555)

Note: After reset is performed, the parameter value is automatically set to 0.

## 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

[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 O

| **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 |

### 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 |

## Over-voltage detected

| **Comment** | **Over-voltage detected** |
|---|---|
| Z-Wave Notification Type Name | Power management |
| Z-Wave Notification type - Value | 0x08 |
| Z-Wave Notification type - Event | State |

| | |
|---|---|
| Z-Wave Notification Name | Over-voltage detected |
| Z-Wave Notification Name - Value | 0x07 |
| Z-Wave Notification Name - Version | V3 |
| 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

## Root Device
## Association group 1 – Lifeline Group reports the Device status and allows for assigning single Device only (Gateway by default), 1 node allowed only. Supports the following command classes:

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 Overcurrent detected sum of all outputs O (O1+O2+…)
6. NOTIFICATION_REPORT : triggered on Overvoltage 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 multilevel start / stop command class).
Triggered by SW (SW1). The device sends according to the state of SW (SW1) (switch or push-button) the command SWITCH_MULTILEVEL_START_LEVEL_CHANGE or SWITCH_MULTILEVEL_STOP_LEVEL_CHANGE to the associated device. Supports the following command classes:

- SWITCH_MULTILEVEL_START_LEVEL_CHANGE : initiate a transition to a new level
- SWITCH_MULTILEVEL_STOP_LEVEL_CHANGE : stop an ongoing transition

**Association Group 4**
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 5**
Allowed nodes: 9
It is assigned to switch connected to the SW (SW1) terminal (uses multilevel start / stop command class).
Triggered by SW (SW1). The device sends according to the state of SW (SW1) (switch or push-button) the command SWITCH_MULTILEVEL_START_LEVEL_CHANGE or SWITCH_MULTILEVEL_STOP_LEVEL_CHANGE to the associated device. Supports the following command classes:

- SWITCH_MULTILEVEL_START_LEVEL_CHANGE : initiate a transition to a new level
- SWITCH_MULTILEVEL_STOP_LEVEL_CHANGE : stop an ongoing transition

# Endpoint 1

## Endpoint 1 - Association Group 1 - Lifeline

SWITCH_BINARY_REPORT : status change report for output O (O1)

NOTIFICATION_REPORT : triggered on Overcurrent detected O (O1)

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).

It is recommended to use push buttons for this association. 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, …)

# Endpoint 2

## Endpoint 2 - Association Group 1 - Lifeline

SWITCH_BINARY_REPORT : status change report for output O2

NOTIFICATION_REPORT : triggered on Overcurrent detected O2

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.

It is recommended to use push buttons for this association. 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, …)

# 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 recognized 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: Support

# Compatibility with gateways

| **Wave Pro 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 | ✅ | ✅ | ✅ | ✅ | ✅ | ✅ | ✅ | *H |
| Homee Cube Gen 7 | ✅ | ✅ | ✅ | ✅ | ✅ | ✅ | ✅ | |
| Homee Cube Gen 5 | ✅ | ✅ | **P** *1 | **P** *1 | ❌ *2 | ❌ *2 | ❌ *2 | *1, *2 |
| Smart Things | ✅ | ✅ | ✅ | ✅ | ✅ | ✅ | ✅ | with the Shelly Wave edge driver |
| Vera Ezlo | ✅ | ✅ | ✅ | ✅ | ✅ | ✅ | ✅ | |
| Cozify | ✅ | ✅ | ✅ | ✅ | ✅ | ✅ | ✅ | |
| Notes | *1 The output change state however, the corresponding user interface state fails to reflect the updates.<br>*2 The W and kWh are not reported to the user interface.<br>*H Troubles with reports can be solved with this solution. | | | | | | | |

| **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. |

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

# Gateway guides

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

# Compliance

- Shelly Wave Pro 2PM multilingual EU declaration of conformity 2025-08-21.pdf
- Wave Pro 2PM UK PSTI ACT Statement of compliance.pdf

Compliance archive

Wave Pro 2PM multilingual EU declaration of conformity 43 2024-02-28.pdf

# Printed User Guide

Wave Pro 2 PM Ръководство за употреба и безопасност.pdf.pdf Wave_Pro2PM_multilang_2023_print_V1.pdf