myTEM
SmartHome

myTEM Radio Switch Dimmer
MTSWD-100-WL

The myTEM Radio Switch Dimmer is a universal, Z-Wave compatible wall or ceiling switch and is used to control lighting (ON/OFF and 0-100%). The power and energy consumption of the connected device is measured. Three additional digital inputs and the programmable behavior to the wireless commands allow flexible use in the house.

The device is intended for installation in a flush-mounted box.

Further information can be found on our website:
https://www.mytem-smarthome.com/web/en/download

ATTENTION:

This device is not a toy. Please keep it away from children and animals!

Please read the manual before attempting to install the device!

These instructions are part of the product and must remain with the end user.

Warning and safety instructions

WARNING!

This word indicates a hazard with a risk that, if not avoided, can result in death or serious injury. Work on the device must only be carried out by persons with the necessary training or instruction.

CAUTION!

This word warns of possible damage to property.

SAFETY INSTRUCTIONS

- Operate this device only as described in the manual.
- Do not operate this device if it has obvious damage.
- This device shall not be altered, modified or opened.
- This device is intended for use in buildings in a dry, dust-free location.
- This device is intended for installation in a flush-mounted box. After installation, it must not be openly accessible.

DISCLAIMER

The manufacturer, TEM AG, is not liable for any loss or damage caused by failure to follow the instructions in the manual.

Typographical and printing errors cannot be excluded. However, the information contained in this manual is reviewed on a regular basis and any necessary corrections will be implemented in the next edition. We accept no liability for technical or typographical errors or the consequences thereof. Changes may be made without prior notice as a result of technical advances. TEM AG reserves the right to make changes to product design, layout and driver revisions without notice to its users. This version of the manual supersedes all previous versions.

Trademarks

What is Z-Wave?

Z-Wave is the international wireless protocol for communication in the smart home. Z-Wave ensures a reliable communication by reconfirming every message (**two-way communication**) and every mains powered node can act as a repeater for other nodes (**meshed network**) in case the receiver is not in direct wireless range of the transmitter.

Z-Wave **products from different manufacturers can be used together** in a wireless network. Thus, this product with any Z-Wave product from other manufacturers can be used in a common Z-Wave wireless network.

The myTEM Radio Switch Dimmer is a Z-Wave device with **secure communication (S2)** and uses the radio frequency of 868.4 MHz. If other devices also support the same secure communication, the data is exchanged in this secure mode. Otherwise, it will switch automatically to a lower level of security to maintain backward compatibility.

For more information about frequency regulations please refer to the homepage of Silicon Labs. For more information about Z-Wave technology, devices, tutorials, etc. please refer to www.z-wave.info.

Product description

The myTEM Radio Switch Dimmer is a universal, Z-Wave compatible wall or ceiling switch and is used to control lighting (e.g. dimmable LED bulbs, incandescent lamps, halogen lamps, etc.) (ON/OFF and 0-100%). The power and energy consumption of the connected device is measured.

Three additional digital inputs and the programmable behavior to the wireless commands allow flexible use in the house. At the same time, the device also serves as a Z-Wave repeater to improve range and stability of the Z-Wave network.

The device is intended for installation in a flush-mounted box, e.g. behind light switches.

Applications:

- Switching of lights
- Dimming of lights, selectable for leading or trailing edge control
- Measuring of power and energy consumption of connected device
- Operation via the central server

Preparation for the installation

In order to include ("Add") a Z-Wave device to a network it **must be in factory default state**. Please make sure to reset the device into factory default. After power-up, the status is displayed as below:

Status "Add" (included in a Z-Wave network):
The **LED** lights **green** for 1-2 seconds

Status "Remove" (not included):
The **LED** lights **red** for 1-2 seconds

WARNING! Depending on national safety standards, only authorized and/or trained technicians may be allowed to make electrical installations on the power supply. Please inform yourself about the legal situation before installation.

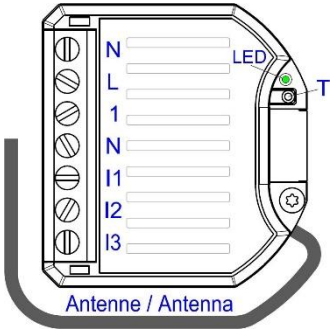
Device Reset Locally (Reset to factory default)

Please use this procedure only when the network primary controller is missing or otherwise inoperable.

Power-up the device and then press the small lever (**T**) for 10 seconds with an **insulated** pen.

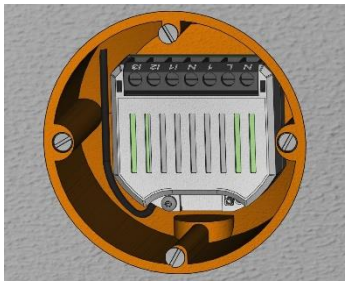
Reset: The **LED** lights up **briefly** in **red**

The device reset deletes the memory chip, including all Z-Wave network settings.

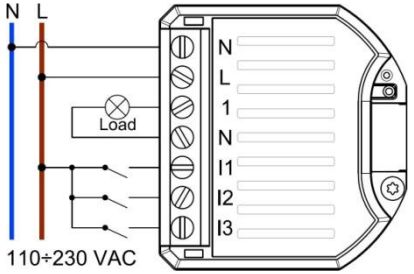


Installation

- **WARNING!** To avoid electrical shock and/or equipment damage, disconnect power to the main fuse or circuit breaker before installation or maintenance. Prevent the fuse from being accidentally switched on again and check that the system is de-energized.
- **WARNING!** The device shall be connected according to the wiring diagram only. Switches in the installation must comply with relevant safety standards.
- **WARNING!** The electrical installation must be protected with a fuse of max. 10 A.
- **WARNING!** The device should be installed in a flush-mounted box (wall, ceiling) in compliance with relevant national safety standards and with a depth of not less than 60 mm. The length of the cables between the device and a switch or the load should not exceed 10 m.
- **CAUTION!** Maximum loads shall not exceed **1 A, 250 VAC, (cos (φ) = 1.0)**.



1. For your safety, switch off the mains voltage (break fuse) during installation. Make sure that wires are not short-circuited during and after installation, as this may damage the device.
2. Connect the cables according to the wiring diagram below. Rigid wires or strands, stripped by about 6.5 mm, can be used for the installation.
3. Check the wiring and then push the device into the flush-mounted box.
4. For **maximum reach,** place the antenna upright and as far away from metal parts and the wiring as possible. **Attention: Do not shorten the antenna!**
5. Switch on the mains voltage and include ("Add") the device into a Z-Wave network as described below.
6. Switch off the mains voltage and fit a cover over the flush-mounted box. When you switch the mains voltage back on again is your device ready.



Inclusion/Exclusion ("Add/Remove") of the device

On factory default, the device does not belong to any Z-Wave network. In order to communicate with other Z-Wave devices, it must be included into an existing network or a new network has to be established. In Z-Wave, this process is called "Add".

Devices can also be removed from networks. In Z-Wave, this process is called "Remove". The primary controller of the Z-Wave network initiates both processes. This controller is put into the "Add", respectively the "Remove" mode. The manual of the controller will contain the information on how to switch it into these modes. Only when the primary controller of the Z-Wave network is in the "Add" mode can devices be added. Removing a device from the network will reset it to the delivery state.

SmartStart

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

The QR code is located on the side of the housing.

When the device is in the "Add" mode, the LED flashes **green**. When finished, the new status is:

Add: The **LED** lights up **briefly** in **green**
Remove: The **LED** lights up **briefly** in **red**

Manual inclusion/exclusion ("Add/Remove")

If the myTEM Radio Switch Dimmer shows status "Add", the "Remove" can be performed with any controller in the network or with the help of a new controller. However, it is recommended to use the primary controller of the previous network unless it is no longer available or damaged.

"Remove" deletes the memory chip, including all Z-Wave network settings.

1. Activate the "Add" or "Remove" mode on your controller.
2. Press a button connected to input I3 four times in quick succession to start include / exclude ("Add / Remove"). If a switch is used instead of the button, it must be changed accordingly eight times.

When the device is in the "Add" mode, the LED flashes **green**. When finished, the new status is:

Add: The **LED** lights up **briefly** in **green**
Remove: The **LED** lights up **briefly** in **red**

Quick trouble shooting

The following hints may help solving trouble during network installation.

1. Make sure that new devices are in factory reset state. The status is displayed at power up.
2. If a connection cannot be established, check that the controller and the device are working on the same radio frequency.
3. Remove devices that are no longer available in the Z-Wave network from all association groups. Otherwise, significant delays in the execution of commands are possible.
4. Make sure you have enough mains powered devices to benefit from the meshing network.
5. If the radio signal is insufficient, try reorienting or relocating the antenna.

Z-Wave Association - Devices control each other

The Association Command Class is used to manage associations to Node-ID destinations. An association group sends commands to the configured destinations when triggered by an event.

Association group of the myTEM Radio Switch Dimmer:

Root Device:

Group ID	Profile / Name	Max. no of units	Command Class	Type / Event	Description
1	General: Lifeline / Lifeline	5	Notification Report	T: System (0x09) E: Heartbeat (0x05)	Reports to be alive (interval according to configuration)
				T: Power Management (0x08) E: Power has been applied (0x01)	Reports the device had a start-up (sent after each power-up only)
			Meter Report	T: Single electric meter (0x01) S: Kilowatt (0x07)	Actual power of output 1 (interval according to configuration)
				T: Single electric meter (0x01) S: Kilowatt hours (0x00)	Cumulated energy of output 1 (interval according to configuration)
			Device Reset Locally		Reports resetting network and configuration parameter

The reports "Heartbeat" and "Power Management" can be activated / deactivated separately via the command class **Notification**.

Endpoint 1: Power Switch (dimming output 1)

The endpoint reflects the dimming output with measurement of the actual power and energy.

Group ID	Profile / Name	Max. no of units	Command Class	Description
1	General: Lifeline / Lifeline	5	Meter Report	Actual power and the cumulated energy of the output 1

Endpoint 2 – 4: Sensor - Notification (digital inputs 1 – 3)

Each endpoint reflects a digital input.

Group ID	Profile / Name	Max. no of units	Command Class	Type / State	Description
1	General: Lifeline / Lifeline	5	Notification Report	T: System (0x09) S: Low (0x0A) / Open (0x0B)	Report “Low” (input DI<n> closed), Report “Open” (input DI<n> open)

Z-Wave configuration parameters

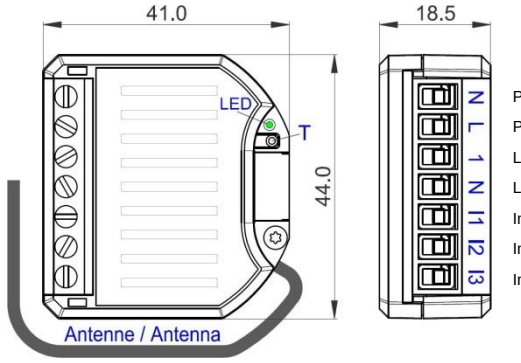
Z-Wave products can be used out of the box after inclusion (“Add”) into the network. With the configuration, however, the behavior can be better adapted to the application. **CAUTION! Depending on the function the server may change some default settings.**

Par#	Description	Unit	Min	Max	Default	Precision	R/W	Size
1	Heartbeat rate	min	1	1440	60	0	r/w	2 bytes
2	Main voltage	V	80	280	230	0	r/w	2 bytes
3	Phase shift - cosines (φ)	–	0.00	1.00	1.00	2	r/w	2 bytes
4	Leading- / trailing-edge (0 = leading-edge)	–	0	1	0	0	r/w	2 bytes
5	Send interval energy, output 1	min	1	120	5	0	r/w	2 bytes
6	Minimum delta energy send, output 1 x)	kWh	0.001	50.000	2.000	3	r/w	2 bytes
7	Send interval power, output 1	min	1	120	5	0	r/w	2 bytes
8	Minimum delta power send, output 1 x)	%	1	100	5	0	r/w	2 bytes

x) Delta value in relation to the last sent value

Technical specifications

Dimensions (W × H × D)	44 × 41 × 18.5 mm
Installation / mounting	In flush-mounted box (wall, ceiling) ≥ Ø 60 mm, depth ≥ 60 mm
Operating voltage	230 VAC ± 10%, 50 Hz
Power consumption in standby	Continuous operation for wireless network, therefore no standby operation
Power consumption in operation	1.3 W (without consumption of external devices)
Switchable load	0 – 250 W, 230 VAC, cos (φ) =1.0
Power (current) measurement accuracy	P = 0 W ... 100 W, ± 2 W; P > 100 W, ± 3%
Ambient temperature for operation	0 °C – 40 °C
Ambient temperature for storage	-20 °C – 60 °C
Ambient humidity	5 %RH – 85 %RH (non condensing)
Wire cross-section terminals	0.34 mm² – 6.0 mm² solid; 0.34 mm² – 4.0 mm² flexible; 2 × 1.5 mm² two wires
Stripping length for terminals	6.5 mm ± 0.5 mm
Tightening torque for terminals	0.5 Nm
Degree of protection provided by enclosure	IP 20 (after installation) (according to EN 60529)
Protection class	II (according to EN 60730-1)
Overvoltage category	II (according to EN 60730-1, resp. EN 60664-1)
Pollution degree	2 (according to EN 60730-1)
Safety main unit	EN 60730-1:2016 + A1:2019
EMC main unit	EN 60730-1:2016 + A1:2019 EN IEC 61000-6-2:2019 EN 61000-6-3:2007 + A1:2011 / AC:2012
Safety radio part	EN 62368-1:2014 / AC:2017 EN 62479:2010
EMC radio part	EN 301 489-1 V2.2.3 EN 301 489-3 V2.1.1
Radio spectrum	EN 300 220-2 V3.2.1
RoHS	EN IEC 63000:2018
CE conformity CE	2014/35/EU (LVD) 2014/53/EU (RED) 2014/30/EU (EMC) 2011/65/EU (RoHS)
Z-Wave hardware platform	ZM5101
Device Type	Light Dimmer Switch
Role Type	Always On Slave (AOS)



Power supply (**Neutral**)
Power supply (**Live**)
Load output 1 (**Live**)
Load output 1 (**Neutral**)
Input from switch 1 (**must have same potential as terminal L**)
Input from switch 2 (**must have same potential as terminal L**)
Input from switch 3 (**must have same potential as terminal L**)

Explanation of some Z-Wave specific terms

Controller... is a Z-Wave device with the capability to manage a network. They are typically gateways, remote controls or wall controllers.

Primary controller... is the central administrator of the Z-Wave network. In a Z-Wave network, only one primary controller is allowed.

Slave... is a Z-Wave device without the ability to manage a network. Slaves can be sensors, actuators and even remote controls.

Add (Inclusion)... is the process of adding new Z-Wave devices into a network.

Remove (Exclusion)... is the process of removing Z-Wave devices from the network.

Wakeup Notification... is a special wireless message issued by battery powered Z-Wave devices to announce that they are awake and able to communicate.

Node Information Frame (NIF)... is a special wireless message issued by a Z-Wave device to announce its capabilities and functions.

Supported Command Classes

Root Device:

Command Class (CC)	Not added	Non-secure added	Securely added, non-secure CC	Securely added, secure CC
Application Status CC	Support	Support	Support	
Association CC	Support	Support		Support
Association Group Information CC	Support	Support		Support
Configuration CC	Support	Support		Support
Device Reset Locally CC	Support	Support		Support
Firmware Update Meta Data CC	Support	Support		Support
Manufacturer Specific CC	Support	Support		Support
Meter CC	Support	Support		Support
Multi Channel Association CC	Support	Support		Support
Multi Channel CC	Support	Support		Support
Notification CC	Support	Support		Support
Powerlevel CC	Support	Support		Support
Security_2 CC	Support	Support	Support	
Supervision CC	Support	Support	Support	
Switch Multilevel CC	Support	Support		Support
Transport Service CC	Support	Support	Support	
Version CC	Support	Support		Support
Z-Wave Plus Info CC	Support	Support	Support	

Endpoint 1: Power Switch (dimming output 1)

Command Class (CC)	—	Non-secure added	Securely added, non-secure CC	Securely added, secure CC
Association CC		Support		Support
Association Group Information CC		Support		Support
Meter CC		Support		Support
Multi Channel Association CC		Support		Support
Security_2 CC			Support	
Supervision CC		Support	Support	
Switch Multilevel CC		Support		Support
Z-Wave Plus Info CC		Support	Support	

Endpoint 2 – 4: Sensor - Notification (digital inputs 1 – 3)

Command Class (CC)	—	Non-secure added	Securely added, non-secure CC	Securely added, secure CC
Association CC		Support		Support
Association Group Information CC		Support		Support
Multi Channel Association CC		Support		Support
Notification Sensor CC		Support		Support
Security_2 CC			Support	
Supervision CC		Support	Support	
Z-Wave Plus Info CC		Support	Support	