

ZB-CONNECTION WIRELESS FAMILY DEVICES

PLUG sensor

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|----------------|--------------|-------------------------|
| products code: | ZR-PLUG-EU-M | (Schuko plug) |
| | ZR-PLUG-IT-M | (Italian 10/16Amp plug) |
| | ZR-PLUG-UK-M | (UK plug) |
| | ZR-PLUG-FR-M | (French plug) |

GENERAL DEVICE CHARACTERISTICS

ZR-PLUG belongs to ZB-Connection devices family.

It is put between the wall mains socket and an electric load, typically a home appliance. It can measure active power and energy consumptions and can switch on/off an electric load with radio messages. It is also possible to set a Power threshold below which the device considers its electric load as working in stand-by mode and therefore it is switched off (Stand-by Killer).

This device has to be directly and continuously main powered.

For network purposes, it is a Router (Repeater) i.e. it has function of maintaining radio traffic from and to other similar devices and it can also act as a parent device for battery-powered sensors of the same family.

ELECTRICAL DEVICE CHARACTERISTICS

| | |
|---------------------------|--|
| POWER SUPPLY: | 85-250 Vac; 50/60 Hz |
| WIRELESS CHARACTERISTICS: | 2405 MHz ÷ 2480 MHz DSSS Modulation Nominal transmission Power +3dBm IEEE 802.15.4 compliant Stack EmberZNet3.5.x Stack version 0 Proprietary profile ID Proprietary encryption key |
| MEASURES: | Energy consumed [Wh] Active Power [W] Time of measurement [sec] |
| RELAY CHARACTERISTICS: | Contacts 10A 250V (resistive load) |
| CONNECTIONS: | Plug (Schuko/Italian/UK/French depending on the product code) |
| OPERATING CONDITIONS: | -10 + 55 °C |
| PROTECTION CLASS: | IP30 |

ASSOCIATING THE DEVICE TO A COMPATIBLE NETWORK

The process to be followed when annexing the ZR-PLUG node to a network is the same as that for all ZB-Connection routers.

The annexing process is activated automatically by the device if the node does not have network parameters, this happens if the device is new or if it has been voluntarily disassociated.

The annexing process consists in scanning all 16 radio channels, in search of an "open" and compatible network (i.e. a ZB-Connection network).

Scanning lasts about 20 seconds. If the annexing process terminates unsuccessfully, the device resets and the annexing process is re-started.

Network opening is performed by stimulating the Gateway, by pressing the Gateway's push button or sending the appropriate command password (for further information, refer to the document relating to the Gateway).

DISASSOCIATING THE DEVICE FROM THE NETWORK

Device disassociation causes the loss of network parameters, with the consequent exiting of the device from the network it belongs to.

In addition to the loss of network parameters, the device loads the default value for each of its operation parameters (HoldingRegister).

Disassociation can be commanded in two ways:

- Receipt of the appropriate command password.
- Holding the button pressed for at least 6 seconds, until led becomes green colored. Disassociation using the push button is only possible within 60 seconds from when the device is switched on.

Attention: The procedure just described lets keep the device address previously set. To restore also this parameter to its default value (127) it is necessary to hold the button pressed for a time longer than 12 seconds, until led color passes from green to red.

LEDS INTERFACE

The ZR-PLUG device has a bi-color led (red/green) that provides information about device operation status. The device also has a push button used for stimulating it and for the disassociation process.

Behaviour of leds at the start-up:

At the reset of device led lighted for 2 seconds, then it flash fast for another 2 seconds with orange colour. At the end of flashing device starts the normal functioning.

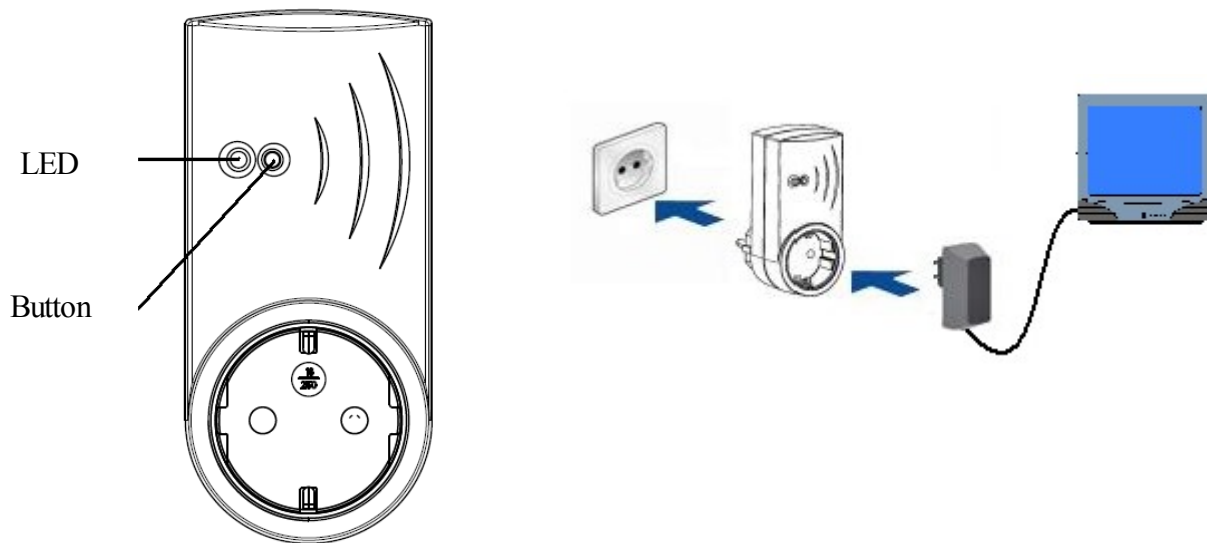
Led functioning when device is NOT joined with a network:

Led lighted steady with orange colour (2 seconds of blink each 20 seconds).

Led functioning when device is joined with a network:

- Orange flash: Device joined, default address (127)
- Green flash: Device joined, address assigned, relay off
- Red flash: Device joined, address assigned, relay on

PRODUCT VIEW



DEVICE ADDRESSING

The default value for address is fixed to 127.

Until device is not associated with a valid address (between 16 and 126) its operation is disabled.

The address assignment procedure is the following:

- 1) enter value 6521 into HoldingRegister[0];
- 2) specify a valid address value (between 16 and 126) into HoldingRegister[2];
- 3) confirm it by activating CoilStatus[0].

An alternative simpler approach consists setting the new address value directly using Z-HANDZER which is a portable hand held tool (refer to the Z-HANDZER manual).

Attention: Be careful when assigning the addresses. Two devices with the same address put their data into the same container of Gateway and this would generate ambiguity, which would be difficult to identify.

PERFORMING MEASUREMENTS

The device is able to evaluate active power (Watt), total energy consumed (Watt hour) and the time from start of measurements (seconds).

These measurements are performed on the current flow through relay and are performed only when the relay is on. Therefore, when the electric load is disconnected also the elapsed time counting is stopped.

Active power is measured each 2 seconds; its value is measured in a period of 2 seconds.

It is possible to store into a non volatile memory the data acquired (however an automatic and periodic saving occurs every six hours). It is also possible to reset data collected using the proper single coils. For further information, refer to the next table that depicts how data is mapped into the device (agent).

From firmware version 2053 and higher it is possible to set the energy consumed counter.

MANAGE RELAY OUTPUT

To activate the relay output set Coil Status CS[1]; to deactivate it set Coil Status CS[2]. The logic state of this output is shown in Input Status IS[0].

The state of this output is saved in non-volatile memory.

When relay output is off, a pressing on button causes the relay turning on.

STAND-BY-KILLER MODE

Stand-By-Killer mode is enabled by operating on CS[3].

When it is enabled the device automatically turn off the relay output when the power flow through relay is below a preset threshold (parameter HR[4] Stand-by-killer Power Threshold) for a time higher than a preset value (parameter HR[3] Stand-by-killer Time Window).

When Stand-By-Killer mode is enabled and relay output is off, a pressing on button causes the relay turning on; in this case the Time Window value is fixed to 15 minutes.