



## Smart Relay

Document number: Rev.1.0

### Introduction

- The DinRail smart relay enables users to remotely control an electrical circuit (ON/OFF) and provides status reports to an Ethernet Gateway via radio frequencies.
- The user can schedule the device to turn on and off at predetermined intervals.
- Control logic can be driven by external or internal events.
- The DinRail smart relay offers the possibility to measure energy consumption of a preselected AC supply of up to 63A.
- The device is connected to the electrical panel of the installation and is fed by the same supply line.
- The unit communicates with the Gateway wirelessly via ZigBee network.

### Packaging content

- DinRail single-phase smart relay
- 63A open type voltage transformer

**RECOMMENDATION!** For the DinRail smart relay wiring use solid conductors with a cross section of 1mm<sup>2</sup>.

**CAUTION!** Make sure that the maximum voltage of the load that you want to monitor does not exceed the maximum electric voltage that your device can measure.

### Installation of voltage transformer

1. Connect the voltage transformer black connector to contact no 7 of the DinRail smart relay
2. Connect the voltage transformer red connector to contact no 8 of the DinRail smart relay
3. Find the supply line of the load that will be measured and pass it through the voltage transformer by opening its coil
4. Close the coil of the transformer and make sure that it is secured

### Specifications

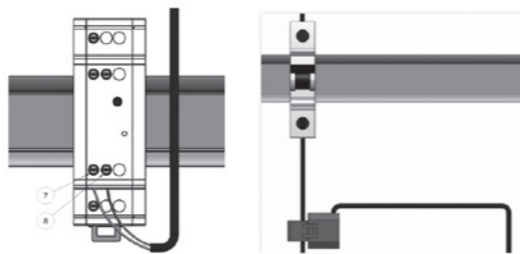
#### Electrical characteristics

- Operating voltage/frequency: 100 to 240Vac, 45 to 65Hz
- Power loss response: Automatic resumption of operation after power loss

#### Electrical measurements

- Parameters measured: Irms, Vrms, Frequency, active Power & Energy, reactive Power & Energy
  - Voltage measurement range: 100 to 240 Vac between phase and neutral
  - Frequency measurement range: 45 to 65 Hz
  - Current measurement range: up to 63 Amps
  - Tolerance: +10% of rated load (I<sub>on</sub>)
  - Measurement accuracy class\*: <1% error of measured value (metering device)
  - 0.1% error of measured value (current transformer)
  - Storage of measurement data in the device: 25 days
- \* Accuracy refers to Electric power measurements

**CAUTION!** Make sure that the direction of the arrow on the transformer is the same as the direction of the current to the load.



#### Provided current transformer (CT)

- DinRail 1-Phase 63A (I<sub>on</sub>): CT 63A, error allowance 0.1%
- Type: Open coil

#### Mechanical and environmental characteristics

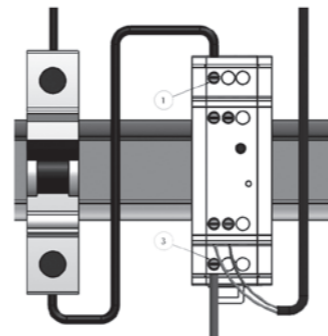
Operating environment: Temperature: -20°C to 50°C  
Relative humidity: 10% to 90%

#### Communication

- Communication protocol: ZigBee Mesh Network
- Frequency band: 2.4GHz
- Simultaneous operation of multiple metering devices: Yes
- Minimum data communication interval: 1 second (default 5 minutes)
- Possibility to maintain measurements history: Yes
- Response in case of communication loss: Yes (network reorganization via ZigBee)
- Communication Safety - Encryption: Yes (AES encryption, 128 bits)

#### Device power connection

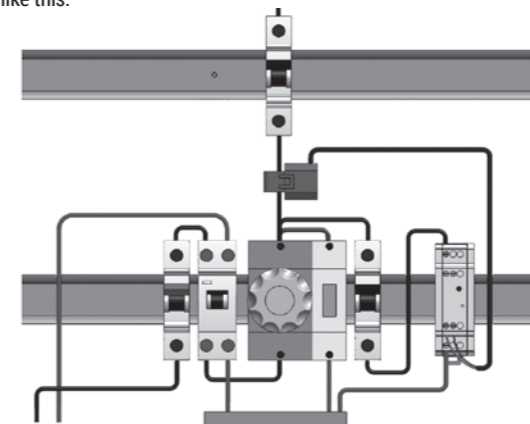
1. Power feed the protective fuse switch from the panel's main fuse
2. Connect the output of the protective fuse switch with contact no 1 of the DinRail smart relay
3. Connect one line from the neutral bar of the panel to contact no 3 of the DinRail smart relay



#### Device status according to LED indication

- LED on: Relay activated
- LED off: Relay deactivated
- LED flashes slowly: Device is offline (NOT searching network)
- LED flashes regularly: Device is offline (SEARCHING network)

**CAUTION!** Once the installation is complete, reinspect to make sure that the wiring is appropriately performed  
Upon completion of the electrical installation of the DinRail smart relay, the final image of the electrical panel must look like this:



#### SETUP 1 – (MEASUREMENT ONLY)

(2 DIN positions – 1.5 DinRail, 0.5 fuse 2A)

#### Electrical installation instructions

**CAUTION!** All the instructions provided in this brochure must be implemented exclusively by **qualified professional electricians**.  
Installation performed by non qualified persons presents the risk of accidental electric shocks, as well as causing irreversible damage to the device.

**RECOMMENDATION!** Every DinRail smart relay must be protected by a 2A fuse switch at its input.

1. Find the electrical panel of the load that will be monitored
2. Disconnect the power supply from the panel by switching off the main switch if this is possible, in order to eliminate the risk of electrocution

#### SETUP 2 – (LINE MEASUREMENT & INSPECTION)

(3 DIN positions – 1.5 DinRail, 0.5 fuse 2A, 1 relay)

Following the recommended wiring instructions, the user will be able to remotely or manually control the electrical load of up to 25A of any home appliance.

The user can monitor the load in one of the following ways:

- Via the smartwatt application (Auto position)
- Manually via a power relay (Position 1/ Position 0)

The wiring for load driving is presented in the diagrams of the following pages:

See overleaf

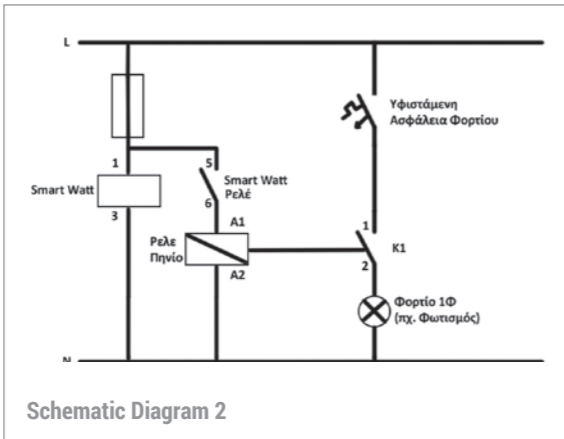
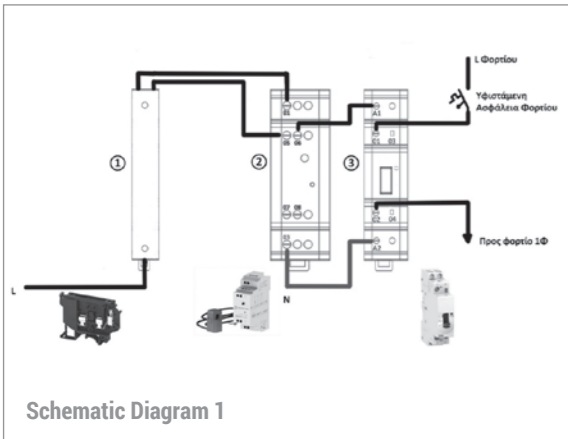
### Installation instructions

### Installation instructions

3. Find the supply line for the line you want to measure. This is the line in which the current transformer will be installed

**RECOMMENDATION!** The supply line must be between the main fuse and the load fuse (when measuring consumption of a specific load), or between the residual current device and the main fuse (when measuring total panel consumption).

4. Inspect the inside of the panel to find the optimal spot for the installation of the DinRail smart relay
5. Install the protective fuse switch on the rail of the panel
6. Install the DinRail smart relay with the retaining and release clip flipped down and secure it on the rail of the panel



For the implementation of schematic diagram 1, follow the steps below:

1. Disconnect the power supply from the panel by switching off the main switch
2. Find a free area of 3DIN width, that is 54.8mm, on the electrical panel and install the equipment no (1), (2) & (3) using the retaining and release clip on the rail of the panel (it is recommended to install the items of the equipment in a way that no din rail of the panel interposes between them, in order to facilitate the electrical connections)
3. Connect a solid conductor with a cross section of 1mm<sup>2</sup> from the panel's main fuse to the lower terminal strip of the fuse switch (1)
4. Connect a solid conductor with a cross section of 1mm<sup>2</sup> from the upper terminal strip of the fuse switch to the terminal strip 01(Contact L) of the DinRail smart relay(2)
5. Connect a solid conductor with a cross section of 1mm<sup>2</sup> from the neutral bar of the panel to the terminal strip 03 (Contact N) of the DinRail smart relay(2)

6. To control activation and deactivation of the power relay coil (3) connect a solid conductor with a cross section of 1mm<sup>2</sup> from the upper terminal strip of the fuse switch to the terminal strip 05 (contact COM) of the smartwatt application and then proceed with the connection of the terminal strip 06 (contact NO) of the DinRail smart relay to the terminal strip A1 of the power relay (3)
7. Connect a solid conductor with a cross section of 1mm<sup>2</sup> from the terminal strip 03 (Contact N) of the DinRail smart relay to the terminal strip A2 of the power relay (3)
8. Disconnect the supply line of the load that will be monitored and connect it to the terminal strip 01 of the power relay (3)
9. Connect a conductor from the terminal strip 02 of the power relay (3) to the original position where the load that is being monitored is fed

The power relay has the following operating modes:

Operation position	Operation
1	Manual load activation
AUTO	DinRail smart relay monitoring. When the relay gives the relevant order, the load is activated.
0	Off position (deactivated)

When smartwatt gives the relevant order, then the NO contact (5,6) closes and the relay of component 3 is energised. Then contact 1-2 (K1) is closed and the load that will be monitored is activated. The position of the power relay must be set to AUTO.

The power relay allows manual activation of the load and the DinRail is not activated. When component (3) is in position 1, the load is activated isolating the DinRail smart relay. When component 3 is in position 0, then the circuit is deactivated.

### Coupling guide

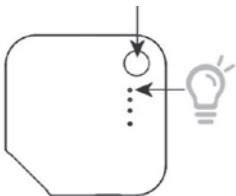
#### Connection to ZigBee network

During the activation of a device at the time of installation, the DinRail smart relay is in sleep mode (LED flashes slowly).

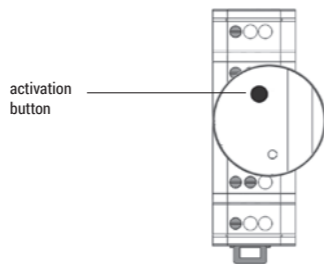
#### Connection to ZigBee network

During the activation of a device at the time of installation, the DinRail smart relay is in sleep mode (LED flashes slowly). To activate it follow the steps below.

1. Press the coupling button on the gateway device
2. The orange LED light will start flashing and the gateway device will be set to pending coupling mode (the orange LED light will keep flashing for the next 60 seconds)
3. Press the activation button on the DinRail smart relay once so that the device is set to coupling mode (LED light fast flashing)



4. The DinRail smart relay will search the network and access the activated gateway
5. Once the DinRail smart relay is connected to the network, the green LED light will remain ON (or OFF depending on the relay switch status)
6. The DinRail smart relay is ready to use, monitoring and measuring the preselected loads
7. The text on the new DinRail smart relay is available for the user via the smartwatt application



#### Coupling failure

The Gateway and the DinRail smart relay will try to perform coupling for 60". If coupling is not performed within 60", then the orange LED will turn off.

In case of coupling failure follow the instructions below:

1. Press the coupling button on the Gateway
2. Press the coupling button on the DinRail smart relay once
3. The devices will perform a new coupling attempt
4. The coupling recording will be completed (you must check the list at the smartwatt application that you have installed in your mobile phone/tablet)

#### Key functionality once the device has been connected to ZigBee network

- Press the button once > Relay change of status (ON/OFF)
- Press the button and keep pressed until LED light flashes once > Searching for 30", light flashes
- Press the button and keep pressed until LED light flashes twice > Searching for other ZigBee devices
- Press the button and keep pressed until LED light flashes three times> The device will disconnect from the connected ZigBee network. Automatic restart, reset to factory settings while the LED light flashes slowly.

#### Technical support

Technical support is provided by WATT+VOLT on 183 83 or online at support@smartwatt.gr.

#### Warranty

The warranty is valid for 24 months.

#### NOTES

