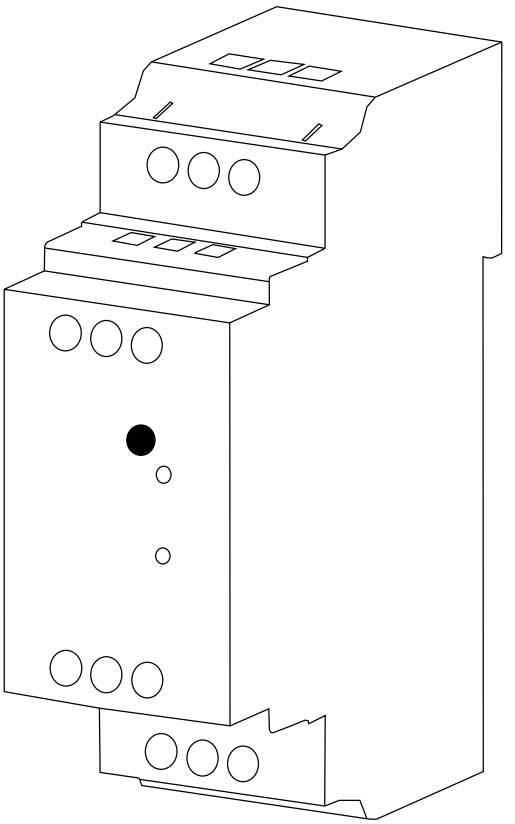
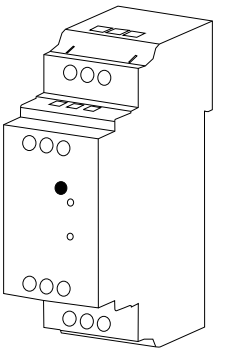


PC311 3-phase Power Clamp

Quick Start Guide

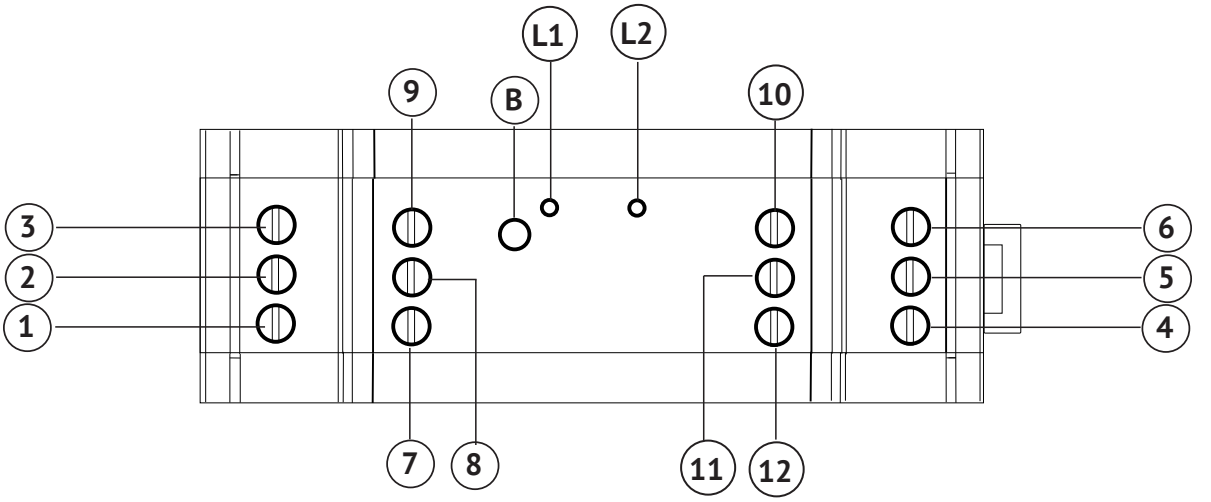
1 Introduction



The PC311 ZigBee 3-phase power clamp is used to monitor and report the energy consumption of a household or an industrial building. This allows you to remotely track the amount of electricity usage from your mobile phone.

This guide will provide you with an overview of the product and help you get through the initial setup and installation.

2 Get to know your device



L1, L2. LED indicator (L1-LED1, L2-LED2)

The LED status gives the following information of the power clamp:

LED Status	What it means
LED1 On	Relay Switch On
LED1 Off	Relay Switch Off
LED1 Slow Blinking and LED2 Off	Idle state, not associated with a network, waits for Man/Machine interaction
LED1 Fast Blinking and LED2 Off	Beacon state, not associated with a network, in "ready to join" mode
LED1 On/Off LED2 Fast Blinking	Normal operation, network associated, collecting measurements, Relay Switch On or Off
Both LEDS Off	Device is not operating
Both LEDS Blinking in different frequency	Identifying state, network associated, collecting measurements, Relay Switch On or Off
Both LEDS Blinking at the same time	Operating error, device needs restart

1~12. Electrical contacts

Connector	Id	Description
1	L1	Phase L1
2	L2	Phase L2
3	L3	Phase L3
4	N	Neutral
5	NT	Night Tariff
6	CTB	Current Transformers Black Wires
7	RN	Power Relay 100~240Vac Neutral
8	RL+	Latch Relay +
9	RL-	Latch Relay -
10	CTR1	Current Transformer 1 Red Wire

Connector	Id	Description
11	CTR2	Current Transformer 2 Red Wire
12	CTR3	Current Transformer 3 Red Wire
LED1	L1	Relay On/Off
LED2	L2	Network status
BUTTON	B	Man/Machine interface Button

Safety Information

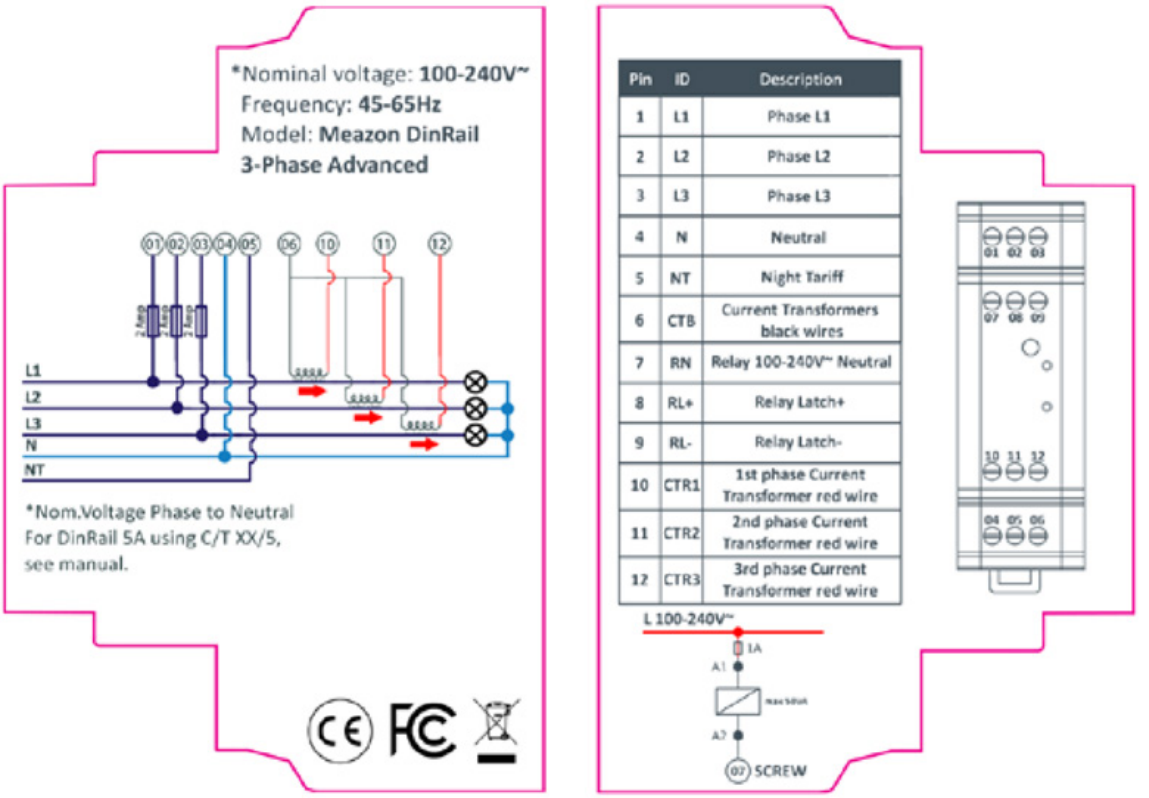
Use this product only in the manner described in this manual. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Product may be cleaned with a clean soft towel. Do not use liquids to clean.

Product is not water resistant. If the unit gets wet, do not touch it. Power off and allow it to dry thoroughly before further operation.

Do not disassemble the product. There are no spare parts for this, it is not repairable. If physical damage to the product occurs, do not use. Replace with a new one.

Diagram



3 Get Started

Installation requirements

The instructions provided below, should be performed only by licensed electricians. Installation from non- qualified individuals may lead to electrocution or heavy damage to the devices.

Wiring requirements: 16 or 18AWG Solid/ Stranded, torque 0.6Nm.

Make sure that the maximum amperage to be measured does not exceed the maximum value the provided 3-phase Power Clamp can measure.

The 3-phase Power Clamp must be protected with a 2A circuit breaker (3 pieces for 3-phase electrical panels, 1 piece for single-phase electrical

panels).

1) Locate the main electrical panel.

2) Turn the power off for safety reasons.

3) Locate the current conductors to be measured. Current transformers will be added at those conductors.

Warning!

Current conductors should be between the electrical fuse and the circuit breaker (in case of metering electrical loads separately), or between protection relay and electrical fuse (in case of measuring total consumption).

4) Check inside the electrical panel for the optimal location to place the The 3-phase Power Clamp as well as the 2A protective circuit breaker.

5) Place the protective circuit breaker at the rail.

6) Place the DinRail having the protection clip downwards and lock it at the rail of the electrical panel

In this installation guide the 3-phase Power Clamp will be called DinRail for brevity reasons.

Installation in a three-phase panel

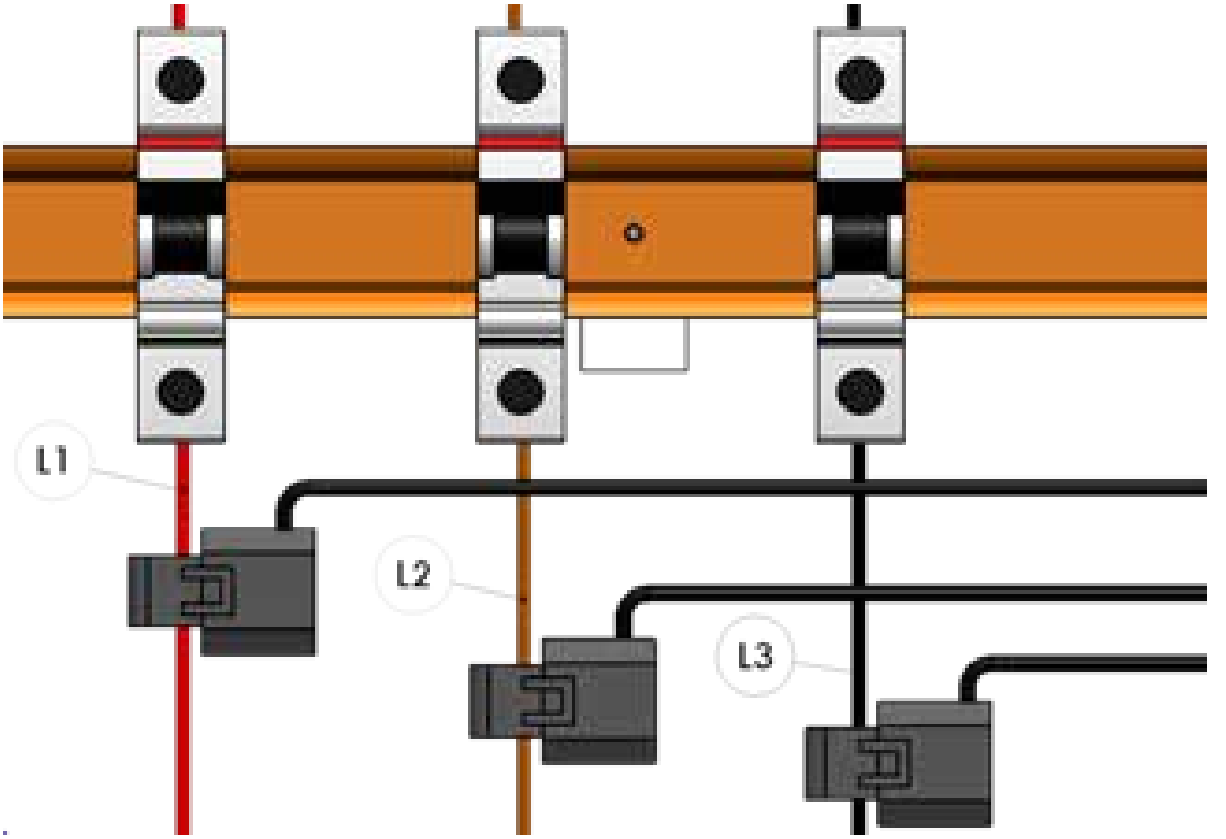
CTs installation

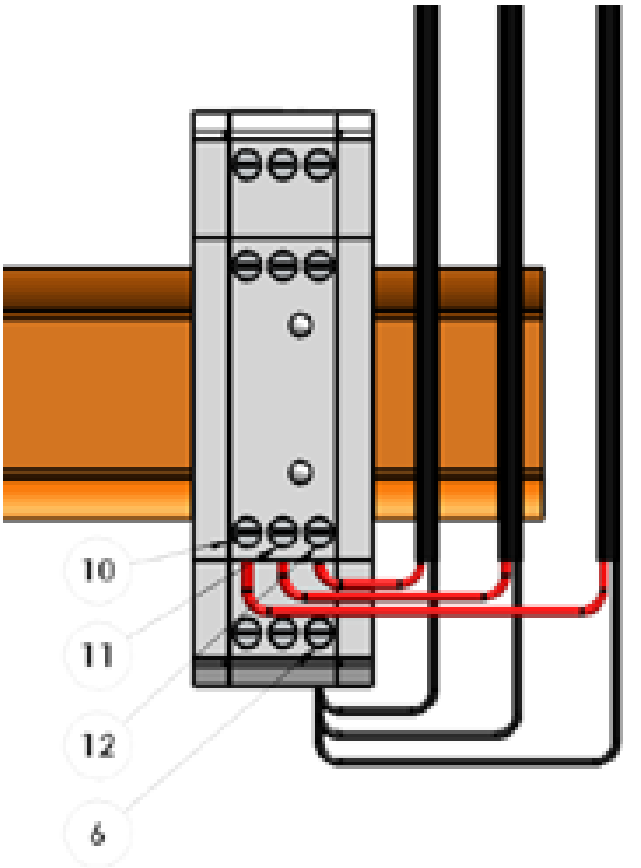
Connect each of the three Current Transformer's outputs (black wire) to contact 6 (CTB) of the DinRail.

• Connect each of the three Current Transformer's inputs (red wire) to contact 10 (CTR1), 11 (CRT2) and 12(CRT3) of the DinRail respectively.

• Locate the current conductors to be measured starting from phase L1 and pass it through the coil of the CT (current transformer) by opening the coil of CT.

• Close the CTs coil again. The red wire of this CT must be connected to contact 10 (CTR1) of the DinRail.





WARNING!

Make sure the direction of the arrow illustrated at the CT terminals to the load. Reconnect the current conductor.

• Repeat the process for the other two phases (L2, L3).

Power lines L1 L2 L3 installation

• Power the 2A protective circuit breakers from the main circuit breakers of the electrical panel

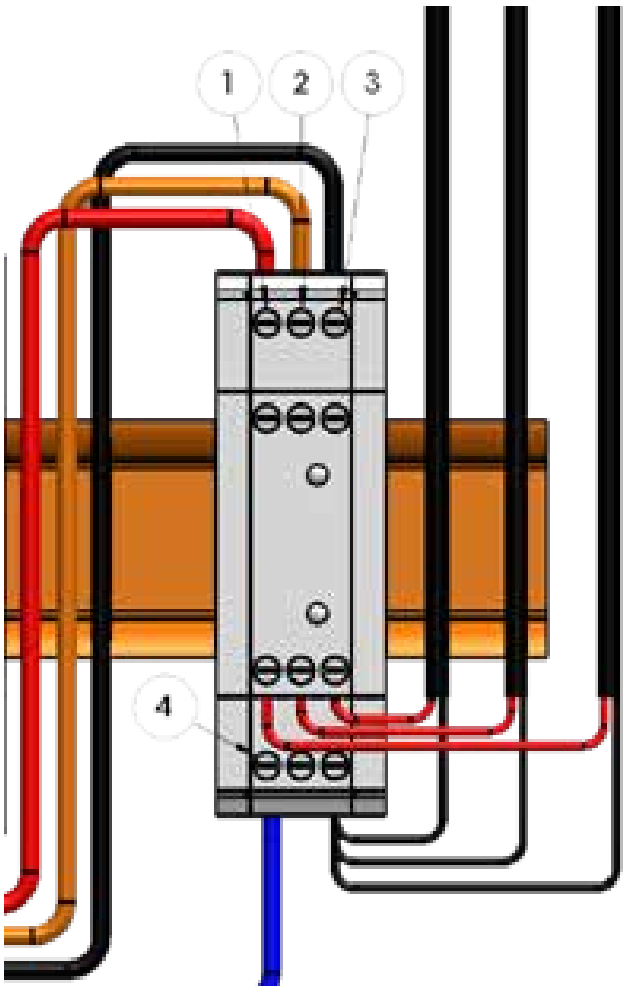
• Connect the output of each of the above circuit breakers with the terminal 1(L1), terminal 2(L2) and terminal 3(L3) respectively of the DinRail.

WARNING!

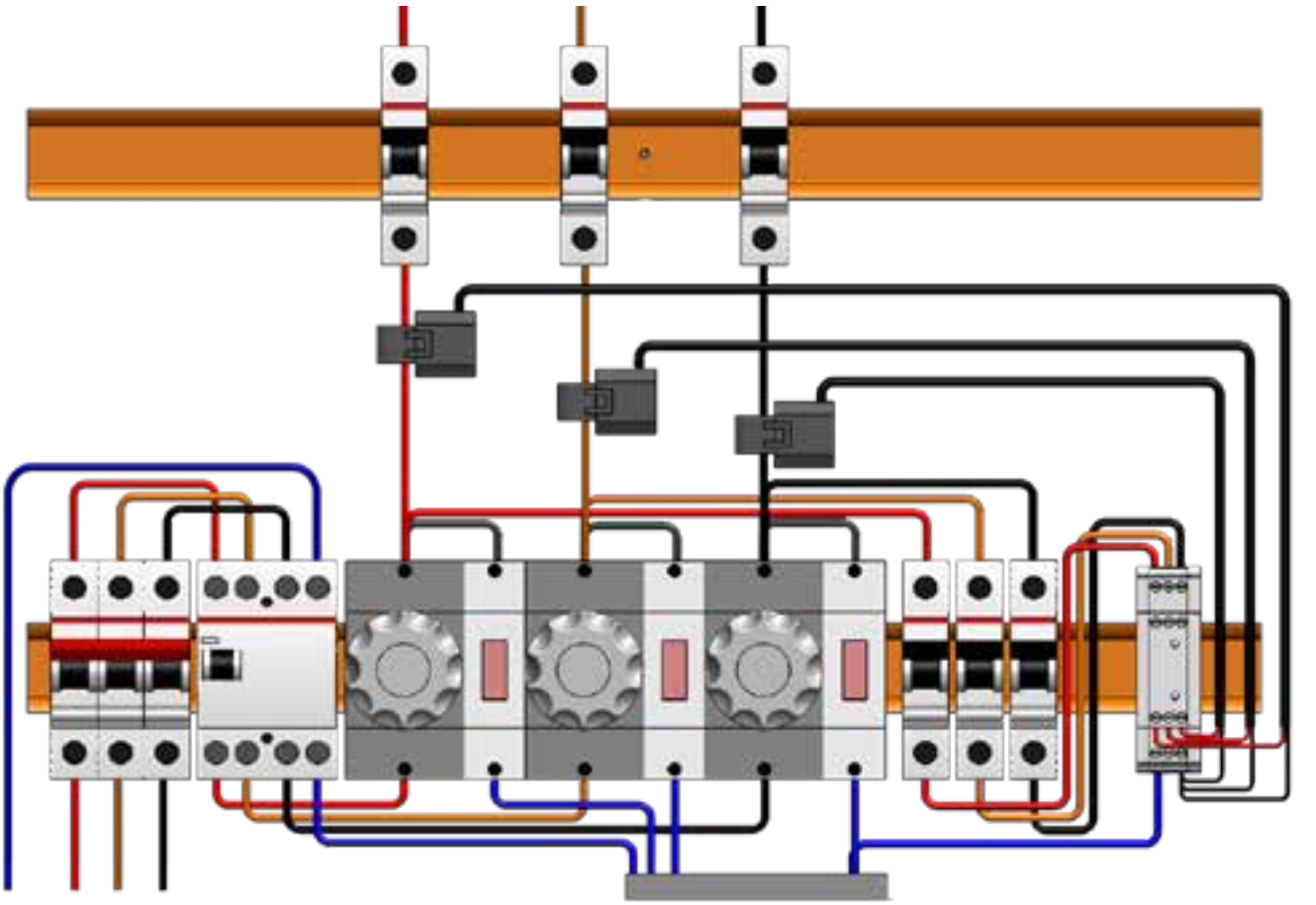
Make sure that the sequence of phases 1, 2 and 3 of the DinRail is strictly L1, L2 and L3, otherwise measurements will be incorrect.

• Connect the neutral conductor of the electrical panel to contact 4(N) of the DinRail.

• Check the entire procedure again before completing the installation (sequence of the phases of the inputs of the DinRail, sequence of the Current Transformers' connection, direction of the arrow of each CT).



Upon completion of the electrical installation of DinRail, the electrical panel should appear as below:

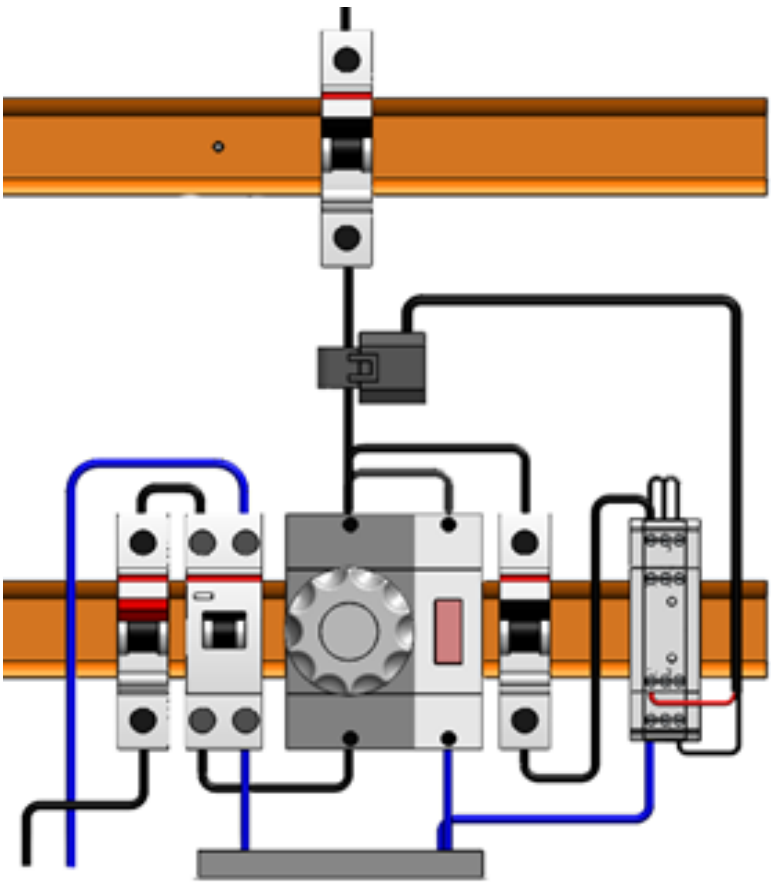


Electrical Panel with the 3-phase Power Clamp in a 3-Phase Panel

Installation in a single phase Panel

WARNING!

You can measure up to three (3) different loads. To do this, follow the instructions of 3-phase installation above. The only change in this procedure is that you have to bridge terminals 1(L1) – 2(L2) - 3(L3).



Electrical Panel with the 3-phase Power Clamp at Single- Phase Panel

External Power Relay installation examples

WARNING!

Use Power Relays with coil less than 50 VA. 3-phase Power Relay installation

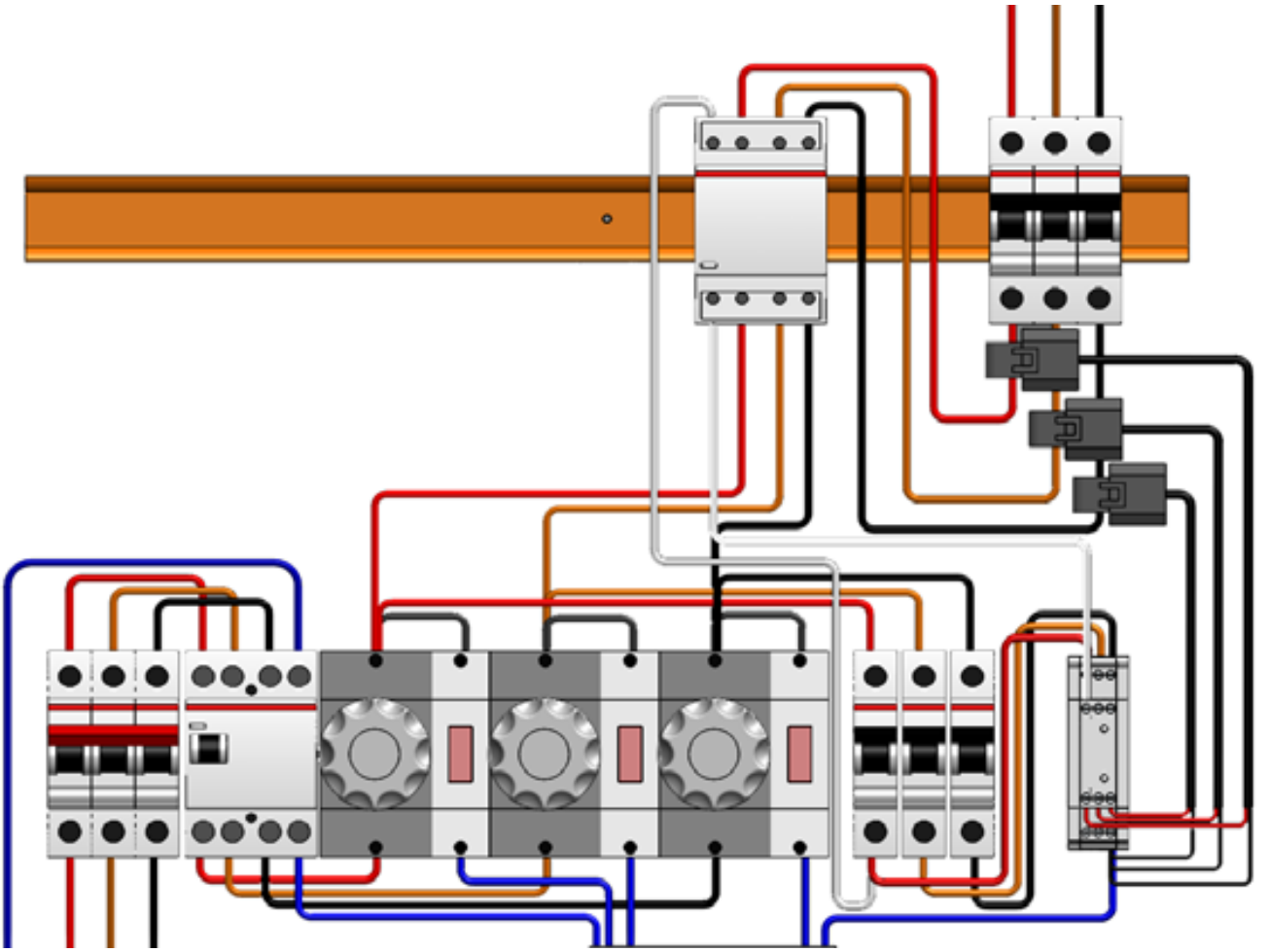
- Place Power Relay at the rail.
- Disconnect the conductors from the loads to be controlled and connect

them to the power input
connectors of the Power Relay.

• Connect the power outputs of the Power Relay to the loads with the same order.

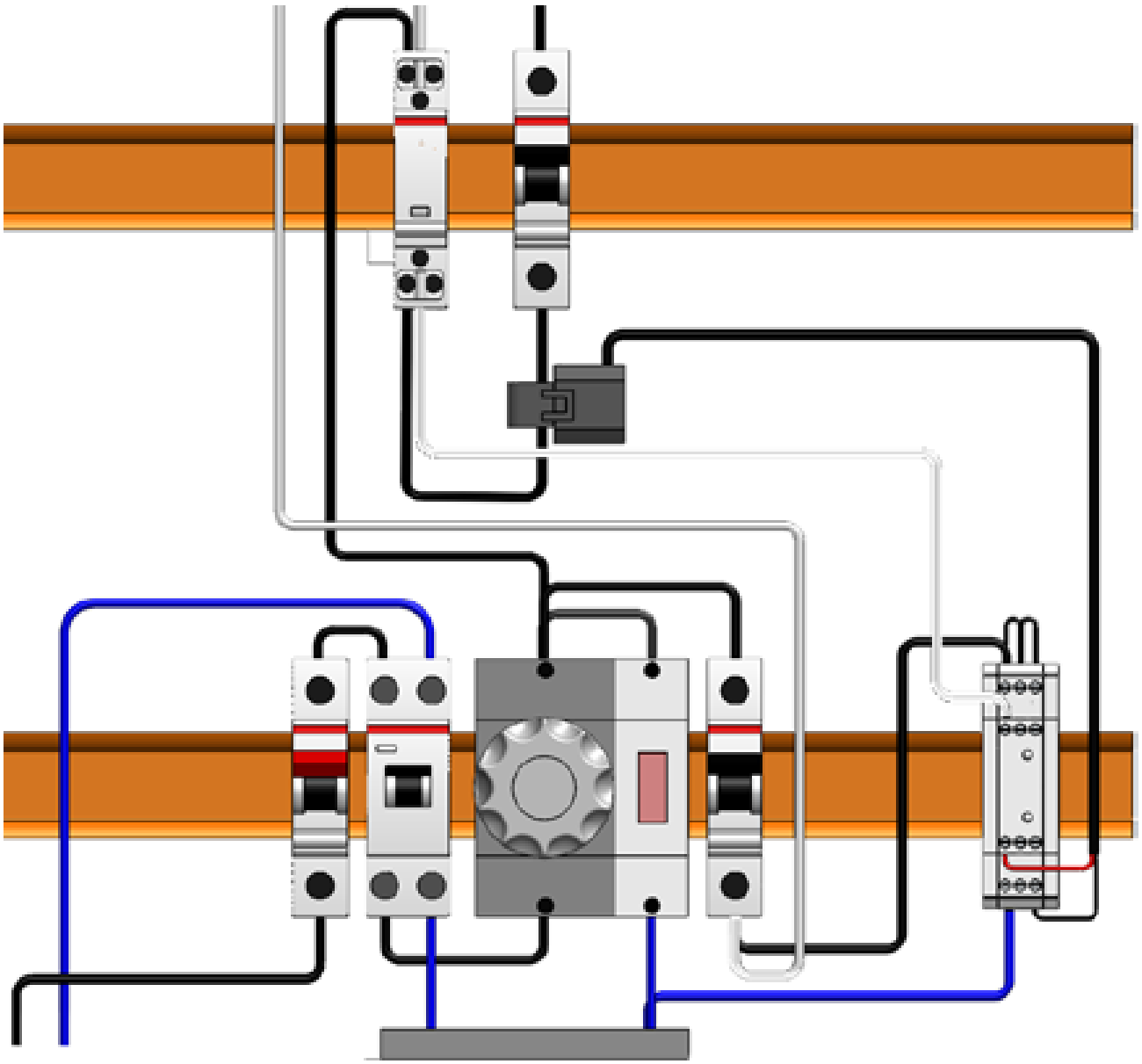
• Connect a conductor from any phase to the Power Relays Coil input connector.

• Connect a conductor from the Power Relays Coil output connector to the DinRail terminal 7 (RN).



Electrical Panel with the 3-phase Power Clamp at a 3-Phase Panel and external 3-phase power relay

1-phase Power Relay installation



Electrical Panel with the 3-phase Power Clamp at a single-Phase Panel and external single-phase power relay

External Latch Relay installation examples

WARNING!

Use 12V (coil voltage) Latch Relays. The 3-phase Power Clamp supports both Single-coil and Double- coil Latch Relays. Use:

• Latch Relays “Relay+” and “Relay-“connectors if you use Single-coil Latch Relay

• Latch Relays “Relay+” and “Relay-com” connectors if you use Double-coil Latch Relay

WARNING!

Be very careful when using Latch Relays. Make sure there would be no naked contacts after the installation.

WARNING!

When using Double-coil Latch Relays it is strictly recommended to shield the remaining Latch Relays connector. If this remaining connector touches any other high voltage conductor it could cause:

* Electrical current leakage and electrical disconnection through residual-current circuit breaker (RCCB).

* Irreparable damage on The 3-phase Power Clamp.

3-phase Latch Relay installation

• Place Latch Relay at the electrical panel.

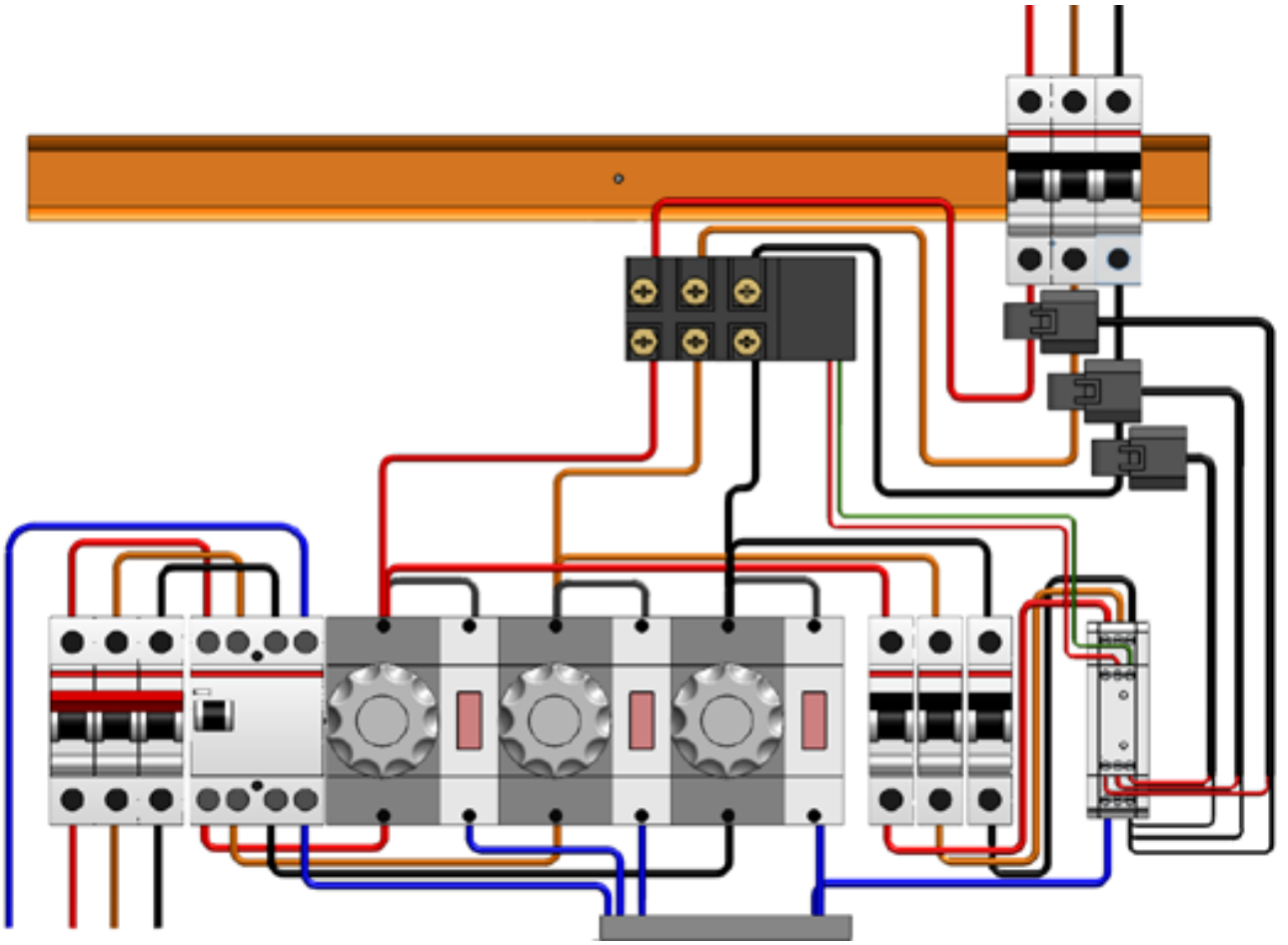
• Disconnect the conductors from the loads to be controlled and connect them to the power input

connectors of the Latch Relay.

• Connect the power outputs of the Latch Relay to the loads with the same order.

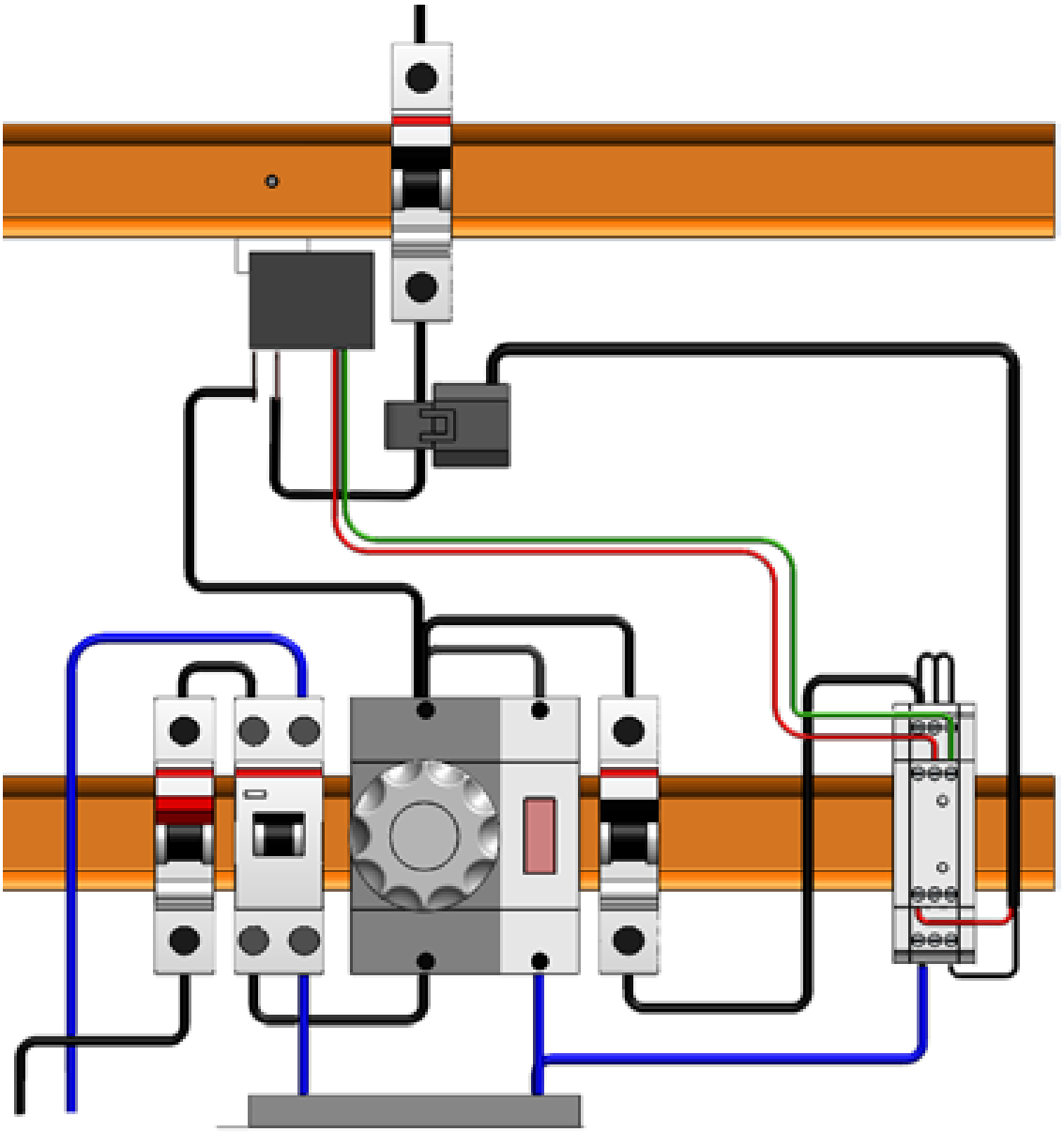
• Connect Latch Relays “Relay+” to the to the DinRails terminal 8 (RL+).

• Connect Latch Relays “Relay-” or “Relay-com” to the DinRails terminal 9 (RL-).



Electrical Panel with the 3-phase Power Clamp at 3-Phase Panel and external 3-Phase Latch Relay

1-phase Latch Relay installation



Electrical Panel with the 3-phase Power Clamp at 1-Phase Panel and external 1-Phase Latch Relay

Network setup

To get started, you will need:
A Gateway
The mobile app

Follow the steps below to join the power clamp to the gateway's network:
1. Power on the Power Clamp.
2. Set your gateway to permit joining.
3. Press the B button once, the LED 1 will blink fastly indicating the power clamp is ready to join the gateway's network.
4. The power clamp will join the gateway's network automatically and the LED1 indicator will become solid, the LED2 will start flashing when successfully joined.
5. Now you can use your mobile app to remotely monitor the home energy usage.

Pair with other device

Note: If the power clamp is connected to a external device then you can pair the power clamp to a smart device to control the external device ON/OFF. Make sure the smart device you want to pair is in the same network before pairing.

1. Press and hold the B button until the LED1 flashes once to enter identify mode, the LED1 will be flashing when it is in pairing mode.
2. Follow the instructions of the other device to enter the device to pairing mode. The devices will pair with each other automatically, the LED1 will become solid when sucessfully paired.

Reset:

Press and hold the B button until the LED1 flashes three times to restore the device to default factory setting (cumulative power consumption will not be cleared).

4 Technical Specifications

Wireless Connectivity	• ZigBee 2.4GHz IEEE 802.15.4
RF Characteristics	• Operating frequency: 2.4GHz • Outdoor/Indoor range: 100m/30m
ZigBee Profile	• Home Automation Profile
Operating Voltage	• 100~240Vac / 45-65 Hz
Ranges of measured parameters	• Voltage: 0 to 240 Vac between phase and Neutral • Current: 125 Amps
Calibrated Metering Accuracy	• <1% of reading measurement error
Dimension	• 80(L) x 27.8(W) x 58.3(H) mm
Weight	• 85g

5 Safety Notice

WARNING: Failure to follow these safety notices could result in fire, electric shock, other injuries, or damage to the Power Clamp and other property. Read all the safety notices below before using the Power Clamp.

- Avoid high humidity or extreme temperatures.
- Avoid long exposure to direct sunlight or strong ultraviolet light.
- Do not drop or expose the unit to intense vibration.
- Do not disassemble or try to repair the unit on yourself.
- Do not expose the unit or its accessories to flammable liquids, gases or other explosives.