HARDWARE GUIDE

ATREYO
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AG-811

CCMS gateway with timer, 3 outputs and LTE

Table of content

1. Introduction

The AG-811 is a Gateway dedicated to work with central controlling and monitoring systems. It supports two-way communication with server through LTE/GSM or Ethernet[1]. It has inbuilt timer with 10 ON/OFF schedule within 24h, auto configurable sunrise/sunset timer based on geolocation and has 3 independent relays with NO/NC outputs. Every output can be controlled by separate time schedule. Gateway has isolated Modbus RTU interface to communicate with energy meters, PLCs and other Modbus devices. It can be configured by: internal website, SMS, string from server and configuration file loaded in predefined URL. For accurate time and location it has GPS and RTC.

Gateway is for use in street light control panels and other application where it is needed to control accurate on/off time with support of Modbus devices. It can be controlled remotely from server or via SMS or also work in stand alone mode.

The AG-811 has advance alert option with 10 mobile number list for SMS alerts. In superCap models there is power backup with power loss alert facility.

1.1. Features

- **LTE and GSM connectivity**
- **GNSS for accurate time and location**
- **3 independent NO/NC outputs**
- **Opto-isolated Modbus RTU**
- **2 opto-isolated digital inputs**
- **SMS alert and with mobile number filtering**
- **Timer with astronomical timer**
- **Internal website for configuration**
- **LAN with PoE**
- **Output status control by string from server and by SMS**
- **Modbus archive data in internal memory**
- **Aluminium compact size casing**
- **35mm DIN rail mounting**

1.2. Technical specification

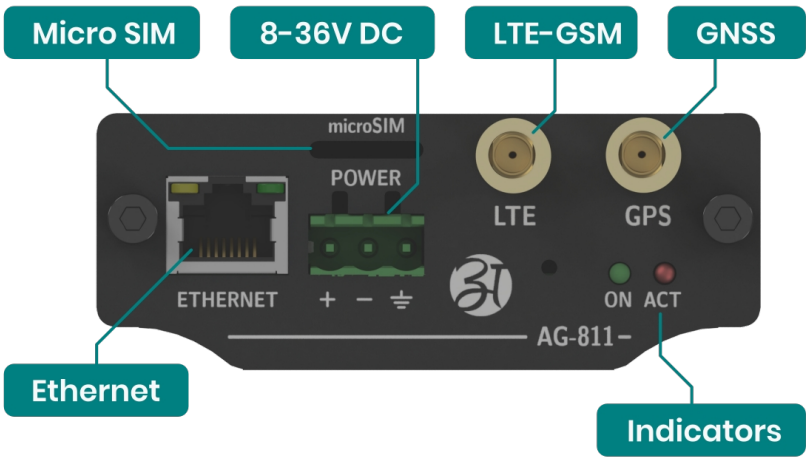
Technical specification is mentioned on separate document. Please visit product page

1 The current firmware version does not support SSL over Ethernet

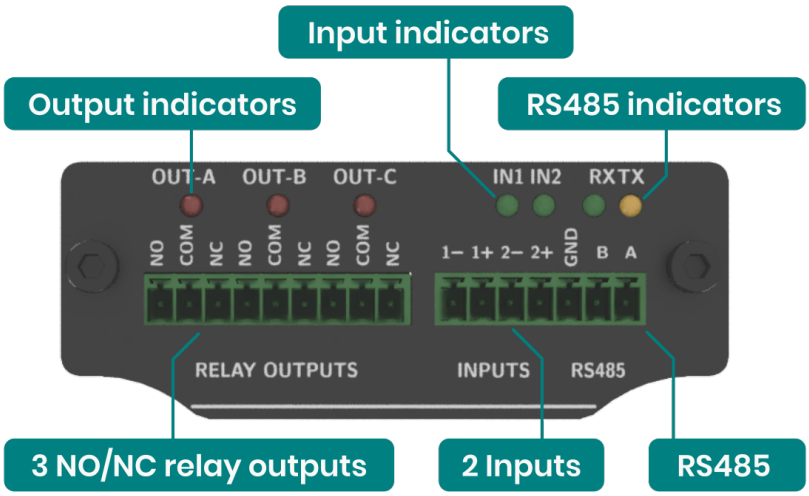
2. Layout

2.1. Layout and connector functions

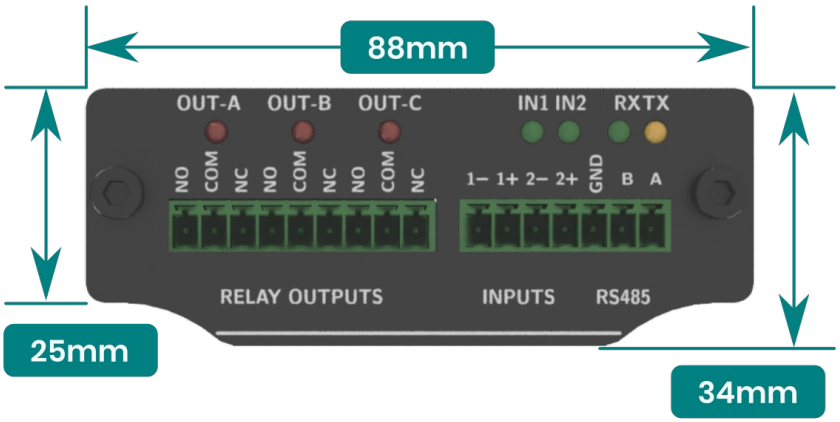
Top panel view

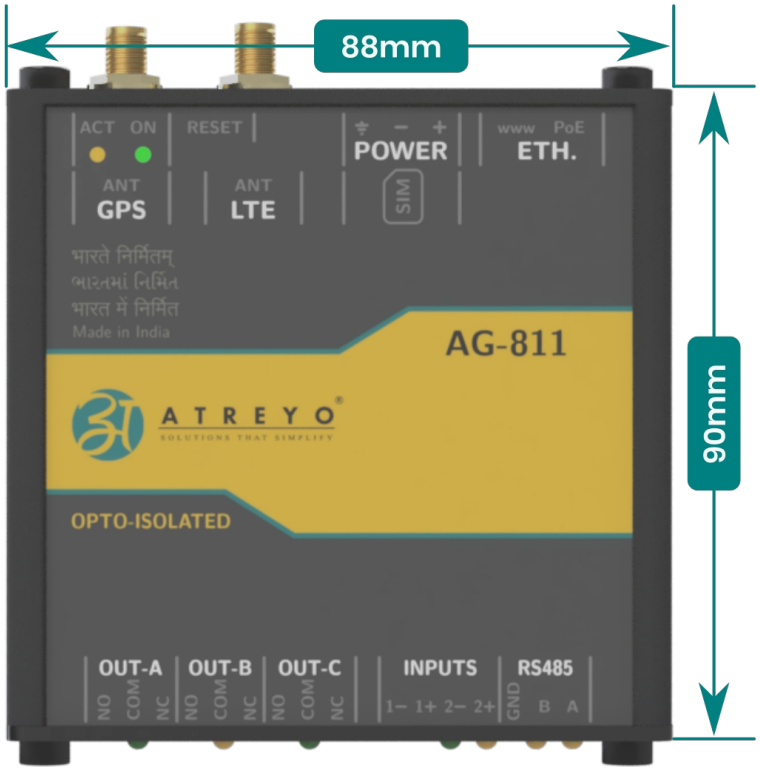


Connector panel view



2.2. Dimensions





2.3. Packaging list

AG-811 gateway

Antenna LTE and GNSS

All necessary pluggable connectors

DIN rail clamp with screws

2.4. Optional accessory

High gain LTE antenna / panel mount combo antenna

APS-10W24 – 3 phase power supply

24V/1A adapter power supply

3. Connectors, indicators and functions

3.1. Multi-function reset button

The AG-811 has multifunction reset button. This button is used to:

- reset device
- restart device
- make default configuration

Press and hold the reset button	Behaviour	Remark
1 to 10 seconds	power off	If device is using battery backup
10 to 20 seconds	restart device	
20 to 30 seconds	make default	
30 and more than 30	exit	

3.2. LED indicators

The device has 2 LED indicators on the antenna side and 8 on the connector side. On antenna side are power (green) and activity (yellow) indicator. The behaviour of activity LED is according to the table.

LED	Function	Behaviour
POWER	Normal working condition	permanent ON
ACT	Normal working condition	blinking every 1 second
Serial	RX and TX data indication of RS485	blinking on data transfer
Inputs	Input 1 and 2 high level indication	ON if input high
Outputs	Out 1-3 ON	ON on output ON

3.3. LAN and PoE

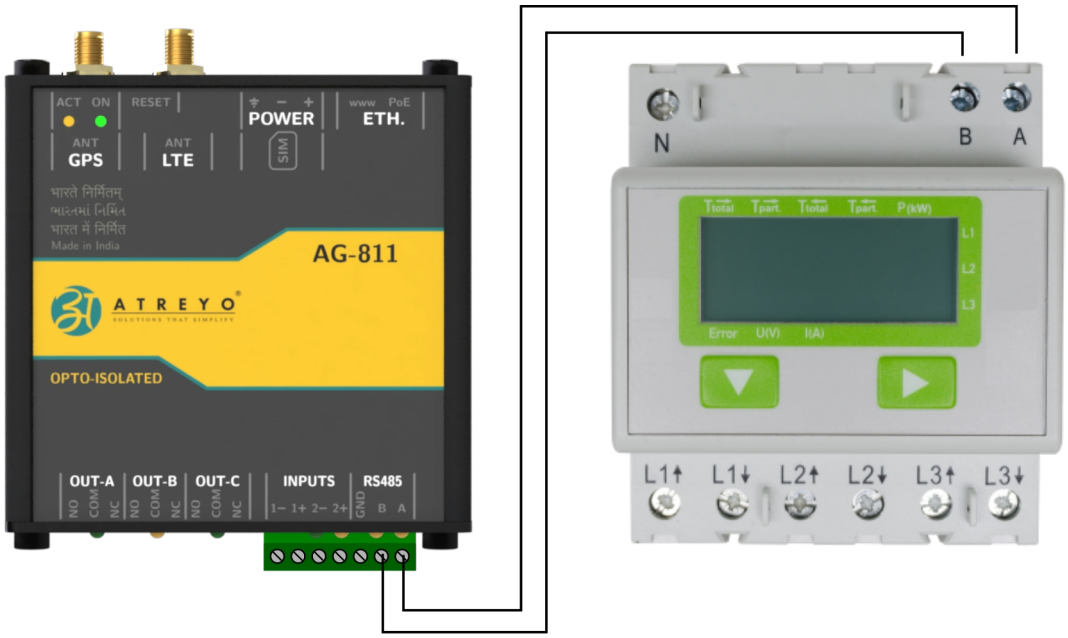
The LAN interface use standard RJ45 8 pin connector with LED indicators. The connector support PoE class A, with power supply range 10-36V DC. If we use screw terminal power connector to power the device the LAN line is protected against back voltage from device. The device is protected from reverse power polarity. If unknowingly it is reverse connected, the Gateway will not work, but will not be damaged. Follow the diagram of connection.

PIN number	Function	Remark
1	RX+	Data
2	RX-	Data
3	TX+	Data
4	DC +	Power supply positive

PIN number	Function	Remark
5	DC +	Power supply positive
6	TX-	Data
7	DC -	Power supply negative
8	DC -	Power supply negative

3.4. RS485 – Modbus

The device has opto-isolated RS485 interface with support of Modbus RTU. It is dedicated to energy meter, voltage meter and any Modbus device like PLC which support Modbus RTU protocol. The device supports multiple Modbus devices with separate address range. It is possible to directly send and receive any value of register from server. Please follow proper connection of A and B signals from device to A and B signals in power meter. If the polarity is reversed there will be no data transmission. All modbus configuration like baud-rate, parity, address available in internal website.



The device provide on-board 120Ω termination resistor for RS-485 port.

3.5. SIM card

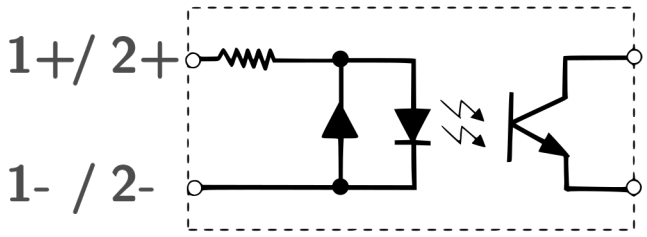
The device support microSIM with voltage 1.8 and 3V. The card holder is push-in/push-out type. Ensure inserting SIM card in proper direction according to the illustration.

3.6. Antenna

The device has two female SMA connector for LTE/GSM antenna and for GPS antenna. For proper working it is necessary to connect LTE + GSM band antenna and proper GPS antenna. Antenna line is 50Ω type. Do not switch on device without antenna connected. For better connectivity in remote area it is necessary to use high gain antenna and place it outside of electrical panel box.

3.7. Digital inputs

The device has 2 opto-isolated up to 2500Vrms digital inputs with common minus signal. The signal maximum voltage is 30V DC. Inputs support only DC signal with proper polarisation. The input digital high is from 3.5V to V_{max}, and digital low from 0 to 2V. Inputs can be controlled also by open collector circuit with common positive. The input resistance is approx 2.7k. The input terminal diagram is as per below.



1+/2+ = digital input positive

1-/2- = digital input negative

If by mistake reverse polarity signal is connected to input the input will not work, but will not be damaged.

3.8. NO/NC outputs

The device has 3 outputs to drive load or external power relays or contractors. For every output 3 terminals are available: normal open, normal connected and common. The maximum load capacity is up to 3A and 230V for each output.

4. System functions

4.1. Schedule timers for control outputs

To control 3 outputs, device has 3 separate timetable with on/off schedule. Total timer schedule can implement up to 10 on/off sequence in 24h for each output.

4.2. Astronomical timer for control outputs

Device has 2 table position to switch on/off the outputs according to sunrise or sunset. The actual sunrise/sunset time is calculated from actual latitude and longitude and actual time. Latitude and longitude has to be entered manually in configuration web page or can be setted remotely.

4.3. SMS alerts

There is option to send SMS alert to the dedicated mobile number when any one of digital inputs is activated. For details see AG-811 Configuration Guide.

4.4. Configuration of device

Configuration of AG-811 can be done by:

Internal website

For configuration by internal website connect the laptop by LAN cable to the device and in browser type IP address of device 192.168.10.50. It is necessary to make proper configuration of LAN network in laptop.

SMS commands

Device allow to make configuration by SMS command. There is option to filter allowed mobile number to make configuration.

String from TCP/IP server

By the command from server it is possible to make all configuration. But initially it is necessary to set server configuration in device by SMS or internal website..

File remotely loaded from server URL

The device can upload configuration file from remote URL. The configuration of URL initially can be done by SMS or by internal website.

Configuration details are specified in separate document – AG-811 Configuration Guide.

4.5. Power supply

The device is powered by external DC power supply. Minimum supply voltage is 8V and maximum 36V. Preferred 24V. Select the power supply requirement according to the below table. The device had protection against high voltage and reverse polarity. High voltage will blow inbuilt fuse. Reverse voltage will not damage device – the device will simply not work on reverse voltage.

Supply Voltage	Minimum A requirement	Suggested power supply rating
12V	1A	1.5A
15V	1A	1.5A
24V	0.5A	0.7A
32V	0.5A	0.5A

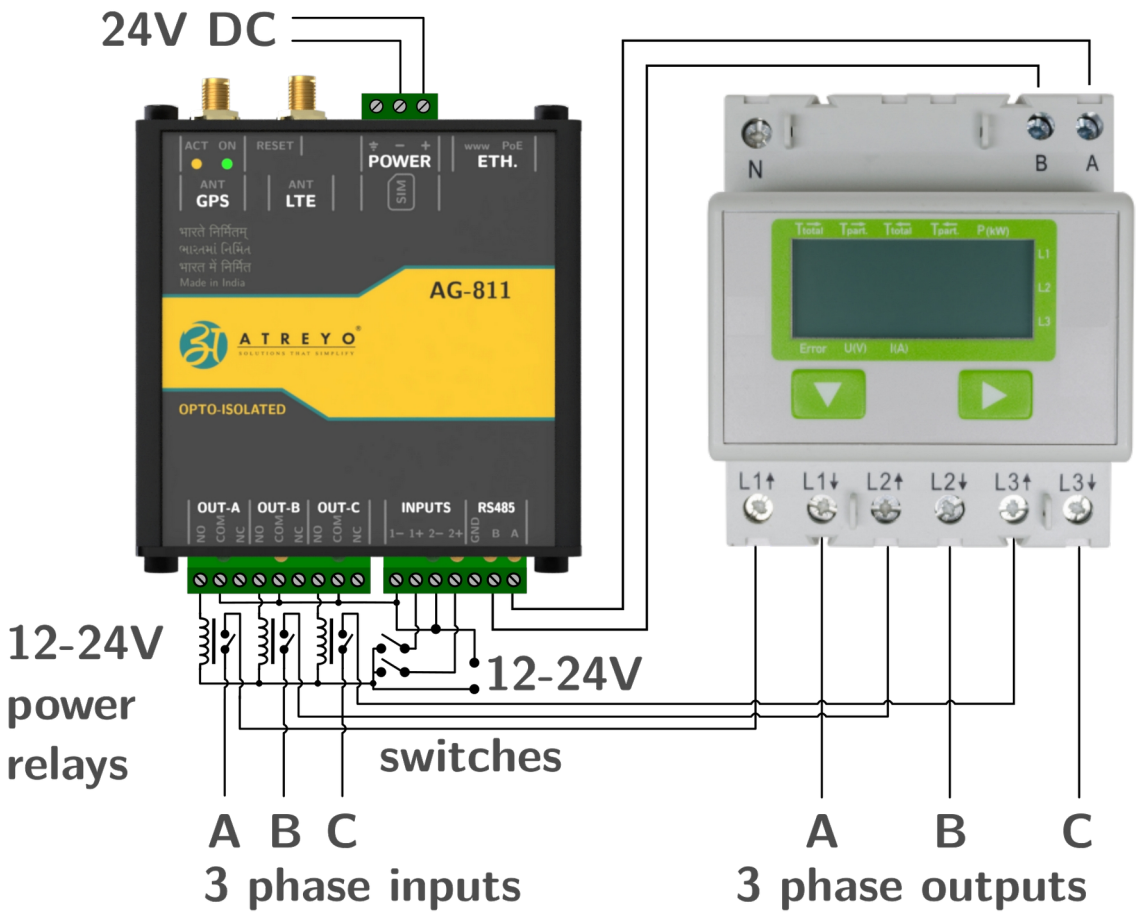
4.6. Mounting place and condition

The device is dedicated to use in environment that is clean and protected from water and dust. It can be used inside electrical panel boxes outdoor and without box in indoor application. Mounting on standard 35mm DIN rail. Device can be placed in any direction. Protect device from direct sunlight and any other heat source.

5. Wiring example

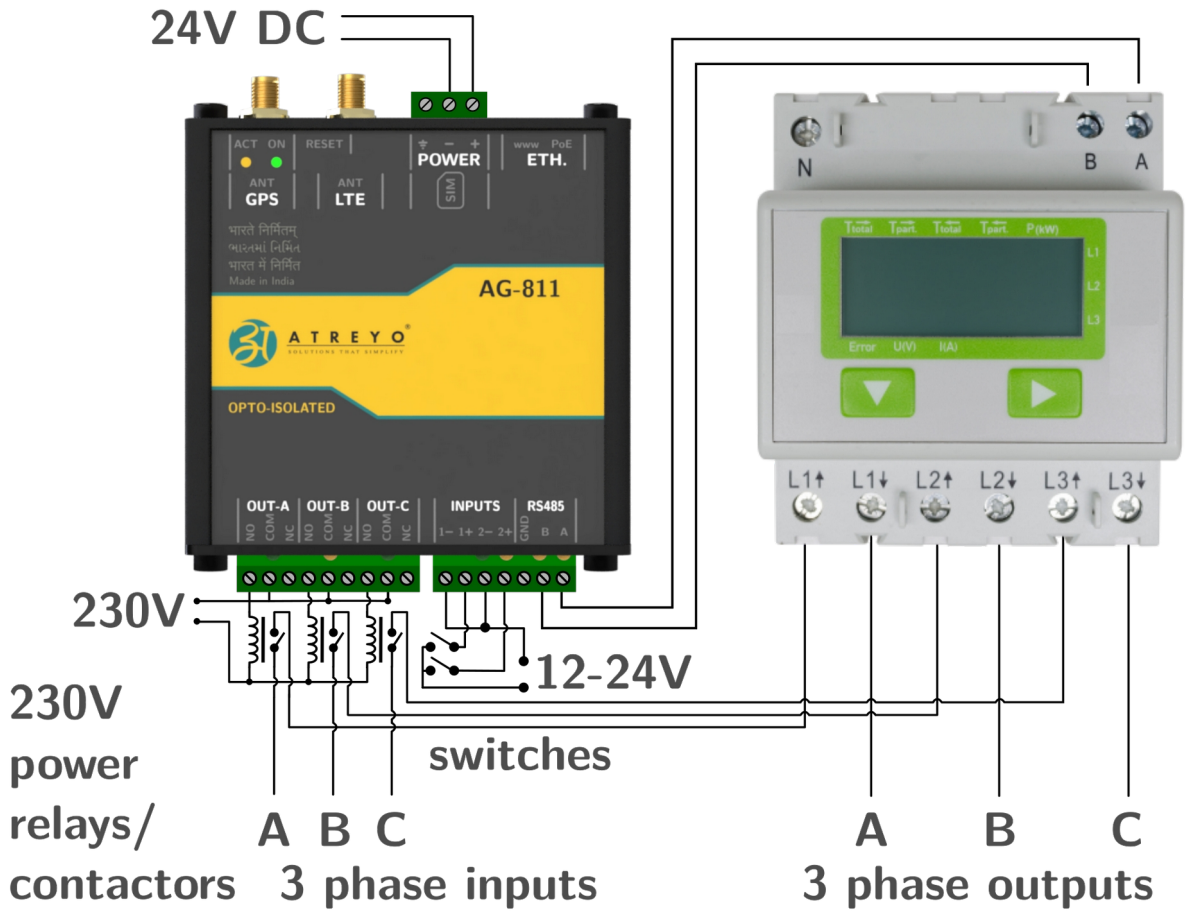
5.1. Example 1 – with 24V external power relays/contractors

This is simplified wiring diagram for control lighting with external high power DC24 coil relays. The inbuilt relays in the device drive with 12-24V DC external relays. The switches can be used for sending information to server about such cases like: open the door of panel, switching to manual option or any other.



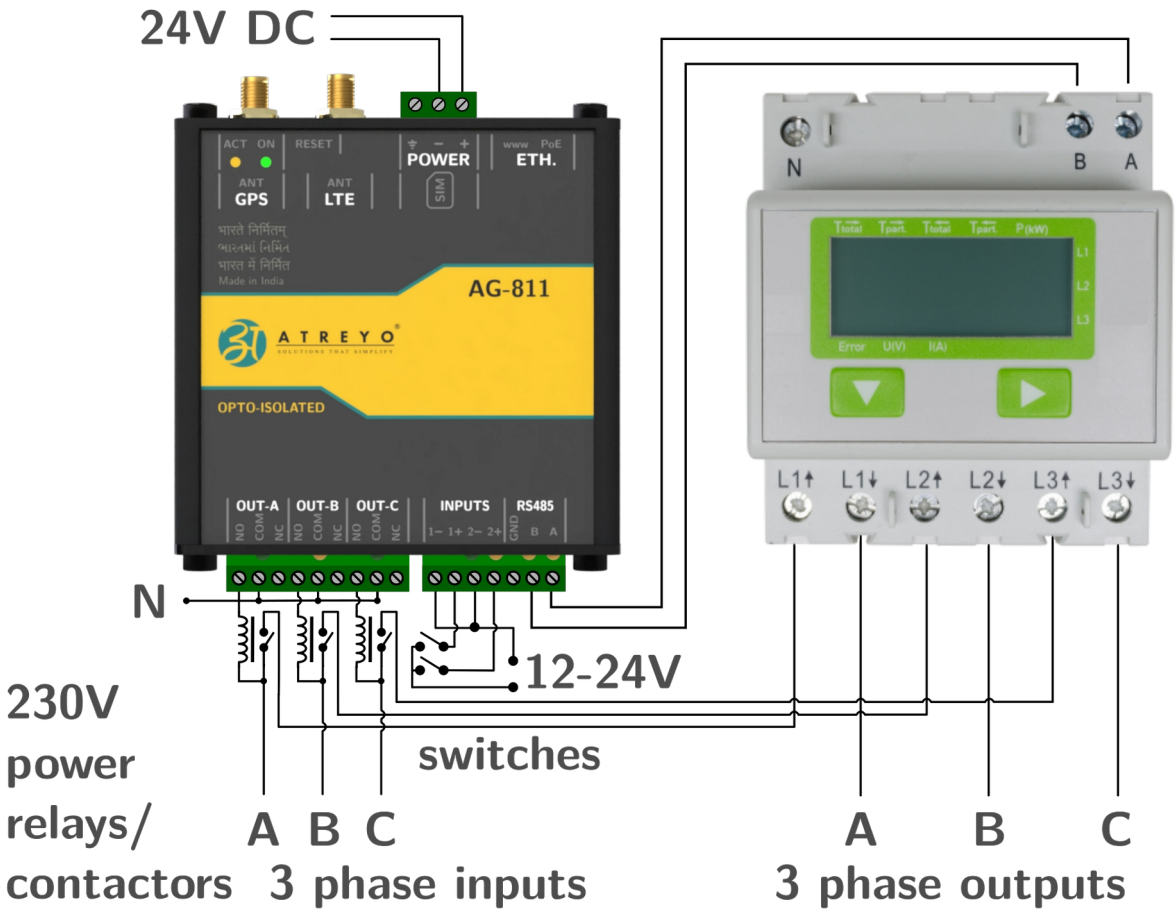
5.2. Example 2 – with common 230V supply for power relays/contractors

The example with power relay/contactor powered by single 230V AC. In this example the separate power is provided for relays but common for all relays.



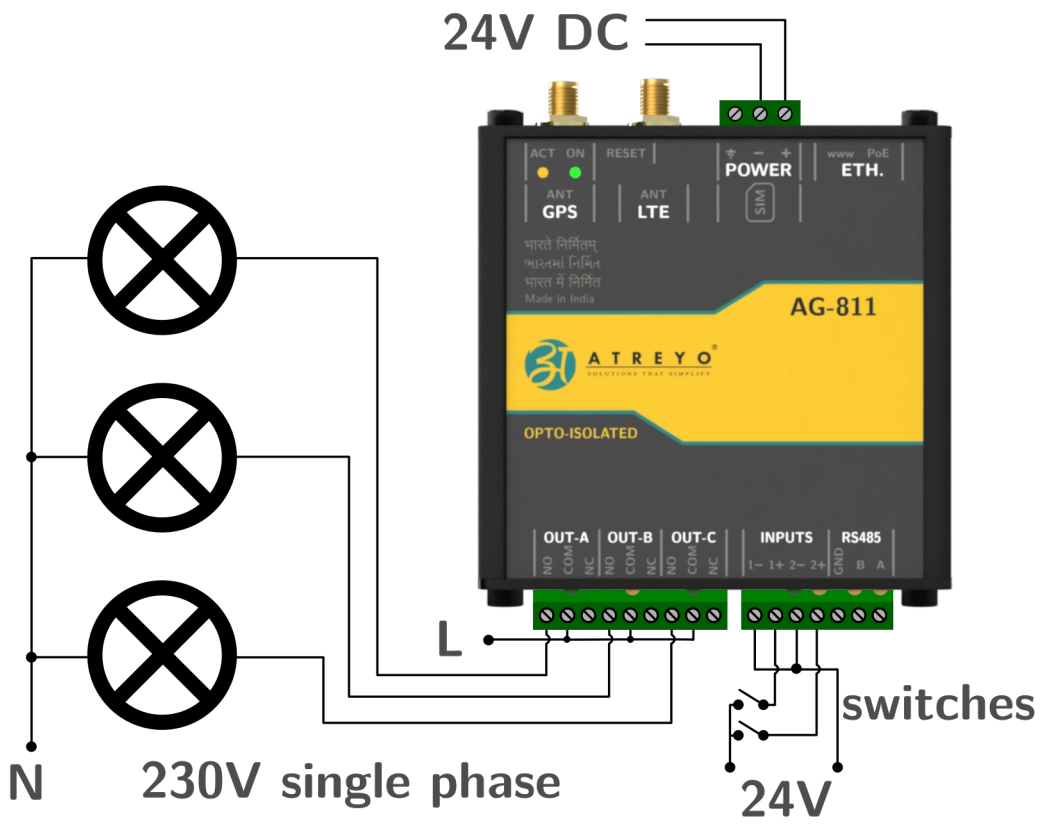
5.3. Example 3 – with separate power for relay/contractor

This example is with separate relay power. Each relay from different phase.



5.4. Example 4 – single phase direct drive

This is example for direct driving the load. Ensure maximum load not exceed 300W on every output.



Atreyo Research & Development LLP	**+91 9727741417** **info@atreyo.in**	414, Sunrise Mall, Mansi Circle, Vastrapur Ahmedabad 380015, India

6. Legal

6.1. Copyright

6.2. Trademarks

6.3. Disclaimer

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