

AG-831

The AG-831 is a Gateway dedicated to work with central controlling and monitoring systems. It supports two-way communication with server through LTE/GSM or Ethernet. It has a built-in timer with 10 ON/OFF schedule within 24h, auto-configurable sunrise/sunset timer based on geolocation and has 3 independent relays. Every output can be controlled by a separate time schedule. Gateway has an isolated Modbus RTU interface to communicate with energy meters, PLCs and other Modbus devices. 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. This is an updated version of AG-811.

Please read carefully before starting. Also read the product [safety information](#).

- [General Information](#)
- [Configuration manual](#)
- [SMS functions](#)
- [Safety information](#)

General Information

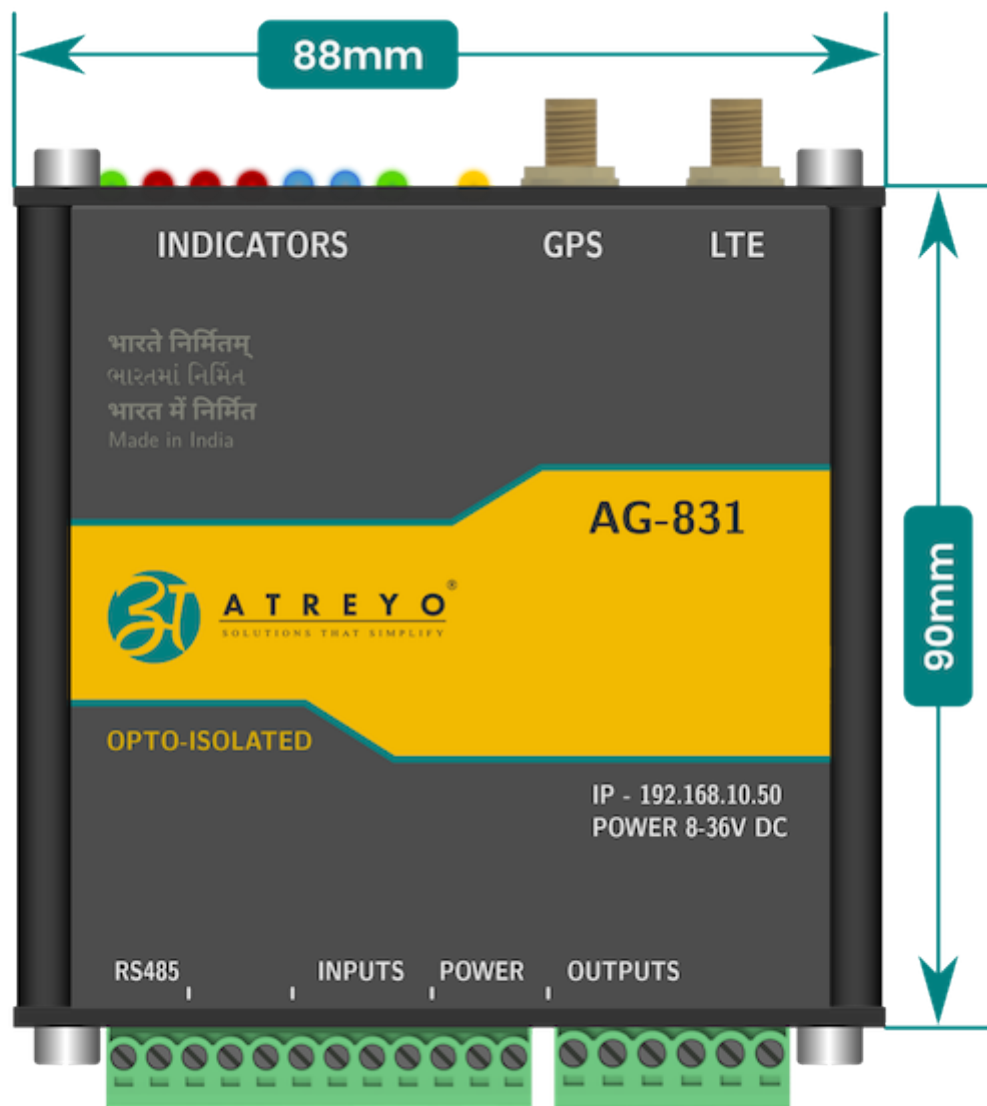
Download technical specification	Technical Specification
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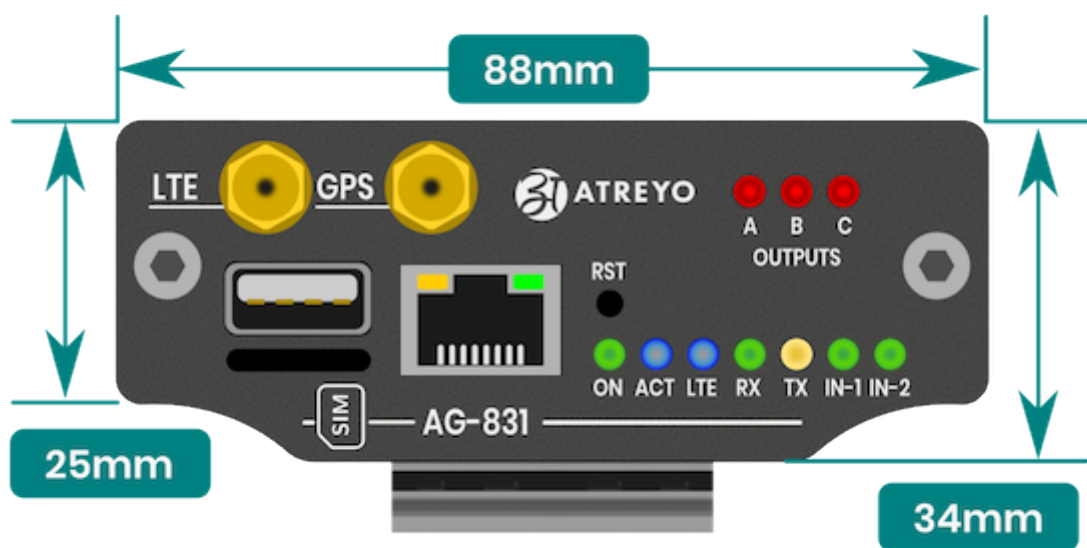
- LTE and GSM connectivity
- GNSS for accurate time and location
- 3 independent NO outputs
- Opto-isolated Modbus RTU
- 2 opto-isolated digital inputs
- SMS alert and with mobile number filtering
- Timer with astronomical timer
- Internal website for configuration
- LAN with PoE
- Output status control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

Hardware informations

Top view

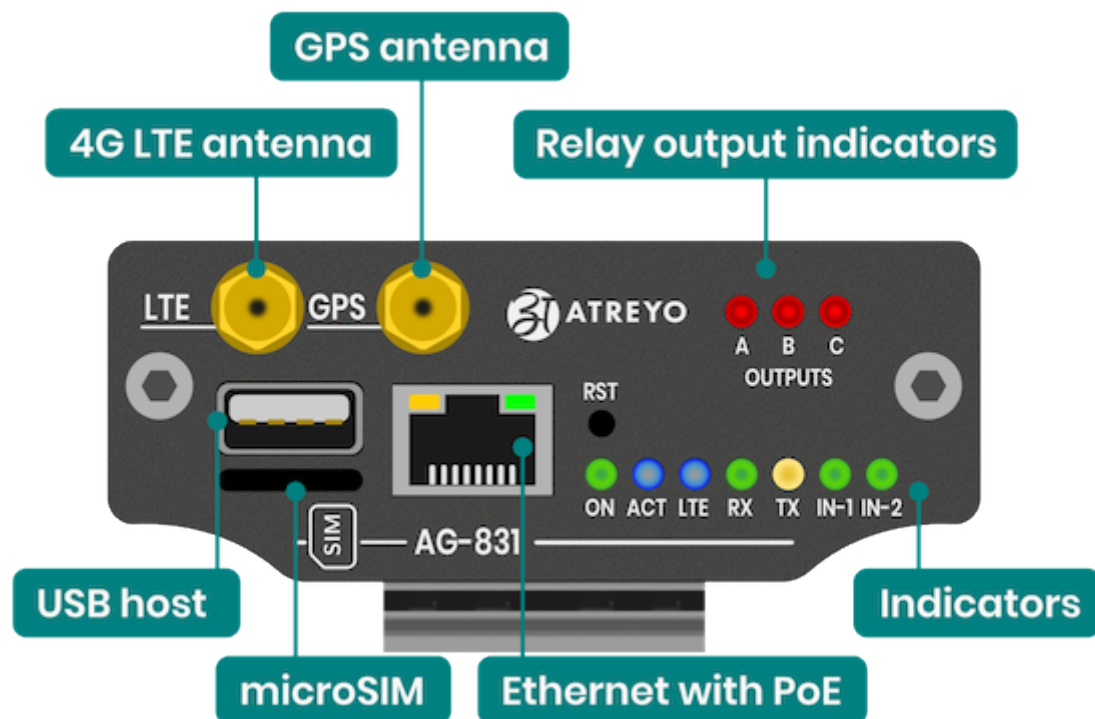


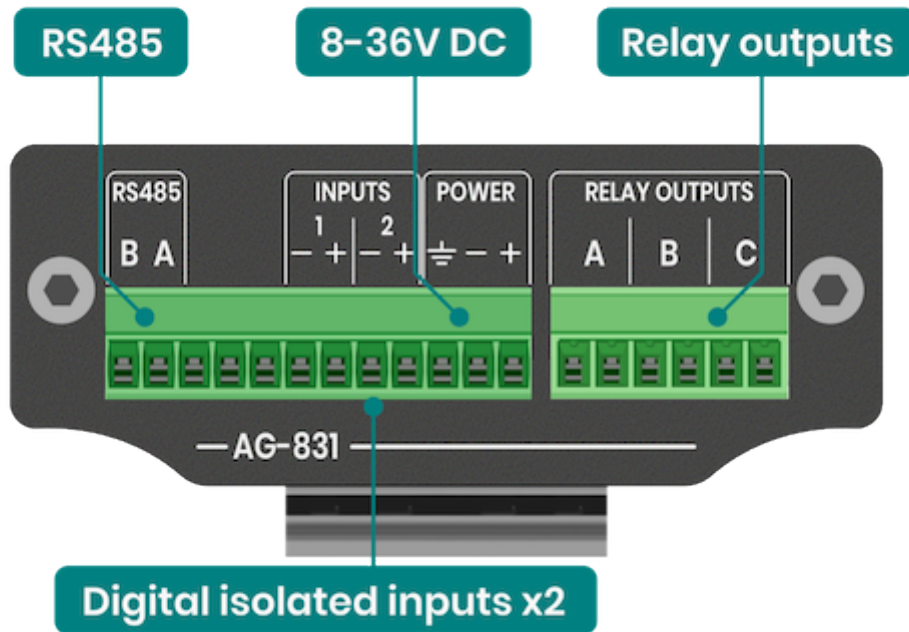
Side view



Connectors

The AG-831 has an RJ45 on the top with LED indicators and two SMA female sockets. There is also a two pluggable sockets on the bottom of the gateway.





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

PoE

The Gateway can also be powered via PoE in the range of 8-36V using unused pairs of wires in the LAN cable. Below is the pinout of the RJ45 socket.

Pin number	Function	Comment
------------	----------	---------

1	RX+	Data
2	RX-	Data
3	TX+	Data
4	DC+	Power supply positive
5	DC+	Power supply positive
6	TX-	Data
7	DC-	Power supply negative
8	DC-	Power supply negative

LED indicators

The device has 10 LED indicators on the antenna 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
LTE	LTE/GSM connection	blinking if LTE/GSM active
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

Configuration manual

Connect the correct power supply. You can choose the right power supply in the power supply section.

Then connect the LAN cable to the gateway to the router. It is important that the IP address is in the range of 192.168.10.xxx.

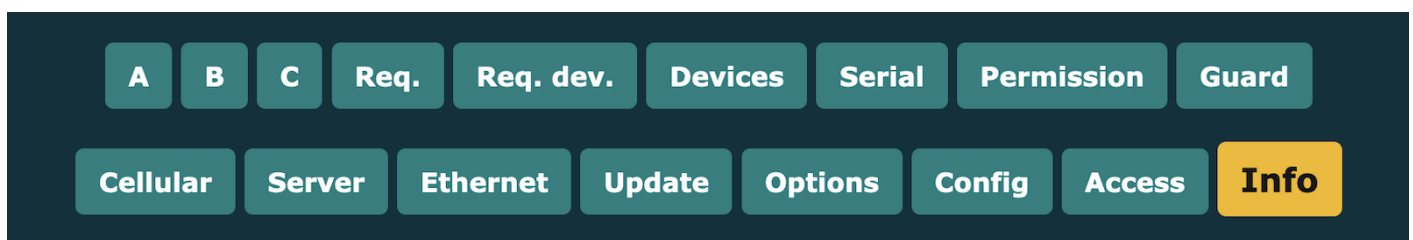
To enter internal website of Gateway make proper LAN connection and in browser address tab enter Gateway IP. The default IP is:

192.168.10.50.

User name: **atreyo**

password: **atreyo.**

In the main menu there are tabs with settings sections.



- A, B, C – for digital outputs
- Req – request modbus device
- Req. dev. – request modbus device
- Devices – RTU configurations devices
- Serial – configuration serial communication
- Permission – permission configuration for mobile numbers
- Guard – for monitoring communication and activity
- GSM – GSM, LTE, GPRS configuration like APN, password etc.
- Server – server configuration
- Ethernet – Ethernet configuration
- Update – upload firmware and remote update configuration
- Options – for date, time, location, default etc.
- Config – backup, restore and remote configuration.
- Access – access configurations for internal website
- Info – main page with information about model, firmware version etc.

Ethernet

The LAN interface use standard RJ45 8 pin connector with LED indicators. The connector support PoE class A, with power supply range 8-36V 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.

Configuration of Ethernet

Ethernet configuration for LAN. Default value is:

IP = **192.168.10.50**

Mask = **255.255.255.0**

Gateway = **192.168.10.1**

DNS1 = **8.8.8.8**

DNS2 = **8.8.4.4**

A

B

C

Req.

Req. dev.

Devices

Serial

Permission

Guard

Cellular

Server

Ethernet

Update

Options

Config

Access

Info

Ethernet



Ethernet configuration

IP:

192.169.10.50

Mask:

255.255.255.0

Gateway:

192.158.10.1

DNS1:

8.8.8.8

DNS2:

8.8.4.4

Save ethernet

LTE modem

Gateway has inbuilt LTE modem with support of LTE and GPRS.

SIM card

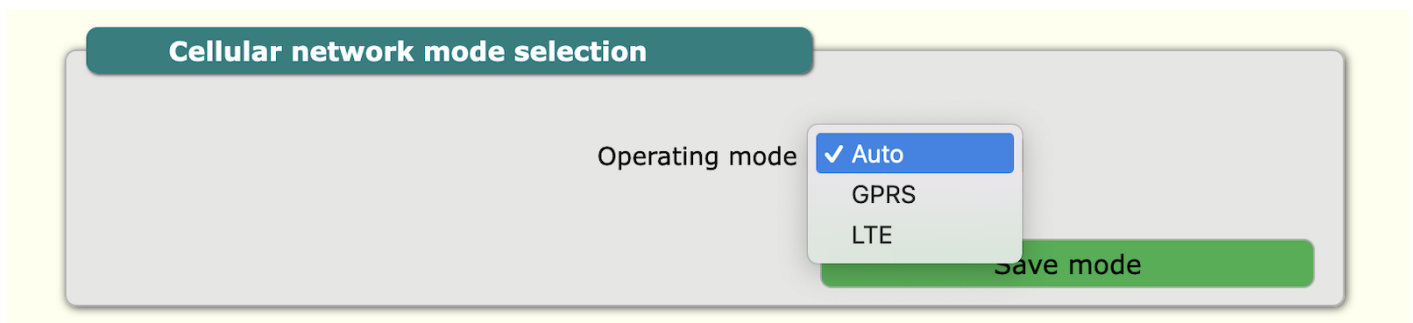
The device support microSIM with voltage 1.8 and 3V. The card holder is push-in/push-out type. Ensure inserting SIM card in proper direction according to the illustration.

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.

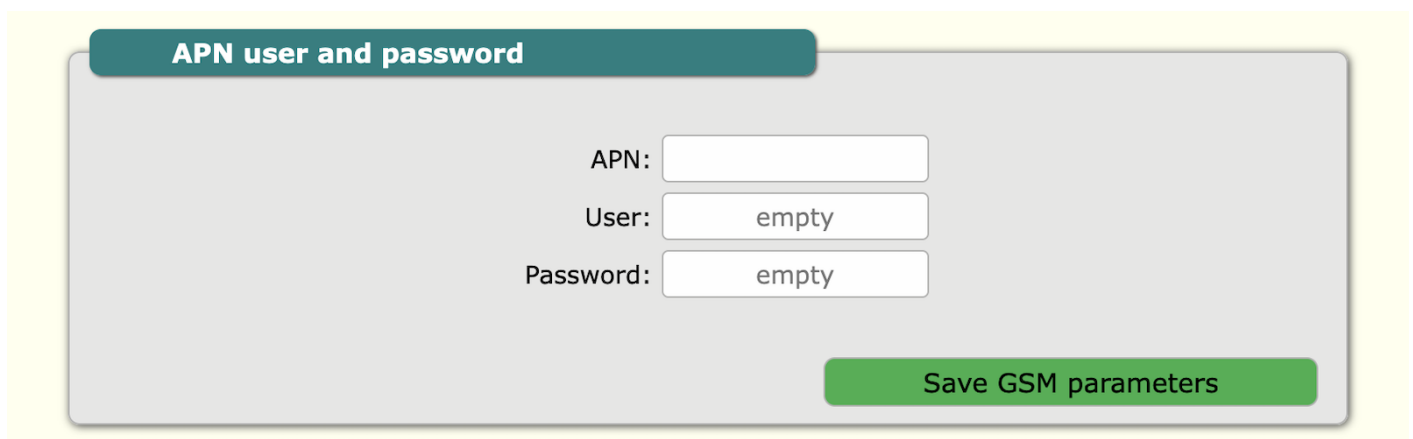
Cellular network configuration

Configuration for mode of connection. Default is auto. But if you are using a SIM card that has only GPRS available, set the connection type to GPRS. If it has only LTE then select LTE and if it has both then you can leave it at auto.



The interface shows a title bar 'Cellular network mode selection'. Below it, the text 'Operating mode' is followed by a dropdown menu. The dropdown menu is open, showing three options: 'Auto' (selected with a checkmark), 'GPRS', and 'LTE'. To the right of the dropdown is a green button labeled 'Save mode'.

GSM configuration include: APN, user and password.



The interface shows a title bar 'APN user and password'. Below it, there are three input fields: 'APN:', 'User:', and 'Password:'. The 'User:' and 'Password:' fields contain the text 'empty'. To the right of the input fields is a green button labeled 'Save GSM parameters'.

Gateway phone number is Gateway SIM card phone number. It is not necessary to provide this, but in future this information is accessible by TCP/IP and for maintenance is good practice to add this number.

Gateway phone number

Device phone number:

Save device phone number

Cellular network testing is for testing of SIM card and network. You can add your number and Gateway will call or send SMS to this number. For this purpose, call and SMS support must be enabled with the mobile operator.

Testing call and SMS service

Enter the phone number:

Send SMS status

Make a call

Modem data log

...

GNSS

The gateway has a built-in GNSS module which is used as a source of accurate time and location. GNSS settings are known in the LTE modem settings tab

Manual GPS

The location is needed for the solar timer system. In some situations, the gateway is placed in such a location that it does not catch the GNSS signal, and for this purpose there is a manual GPS option. To use this option, you need to enter the longitude and latitude manually.

Powering the active GNSS antenna

The gateway has the ability to accommodate both passive and active GNSS antennas. The supply voltage of the active antenna is 3.3V. To enable the power supply, select Antenna power supply ON.

GPS localization of gateway

Manual GPS

OFF

▼

Latitude:

23.033537

Longitude:

72.524789

[Find out how to enter coordinates](#)

[Atreyo headquarter Latitude:23.033537, Longitude:72.524789](#)

Save GPS options

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.

Serial Configuration

In this section are RS485 parameter configuration: baud rate, data bit, parity and stop bit.

Parameter	Option/range
Baud-rate	2400 to 460800
Data bit	8, 9
Parity	None, Even, Odd
Stop bit	1, 1.5, 2

Serial interface configuration

Baud2400

Data Bit8

ParityNone

Stop Bit0,5

Save serial

Req. dev. – Request device log

In this section is visible log of modbus devices. In this tab is optional feature to make support for Selec® company meter without necessity to set modbus device details. In window the reply from Selec® device will be visible. Now 2 models of meters are supported MFM383 and EM2M.

Request selected Modbus device

Select device type:SELEC MFM383

Device modbus address:

...

Devices – Modbus devices

Modbus devices configuration of modbus devices connected to Gateway. Configuration of: device ID, register, endian, start address, offset address, registers, timeout. It can add multiple devices up to maximum 16.

Sn	Parameter	Details information
1	Use	To activate device configuration
2	Modbus Device ID	The ID of modbus device. 01 up to FF
3	Register structure	8 bit UINT, 16 bit UINT, 32 bit UINT, 8 bit INT, 16 bit INT, 32 bit INT, 32 bit float, 16 bit HEX, 32 bit HEX, Array HEX
4	Endian Structure	ABCD, BADC, CDAB, DCBA
5	Start address	First Modbus register address

Sn	Parameter	Details information
6	Offset address	Offset address for add or subtract of actual query address, according to slave device data storage system
7	Number of registers	How many registers needed to query
8	Timeout [ms]	Response time-out for query

Modbus RTU devices configuration

Use	MODBUS Device ID	Register structure	Endian structure	Start address	Offset address	Number of registers	Timeout [ms]
☒	12	8 bit UINT	ABCD				
☒	15	8 bit INT	ABCD				
☒	17	8 bit UINT	ABCD				
☒	323	8 bit UINT	ABCD				
☐		16 bit UINT					
☐		32 bit UINT					
☐		8 bit INT					
☐		16 bit INT					
☐		32 bit INT					
☐		32 bit float					
☐		16 bit HEX					
☐		32 bit HEX					
☐		Array HEX					

Example

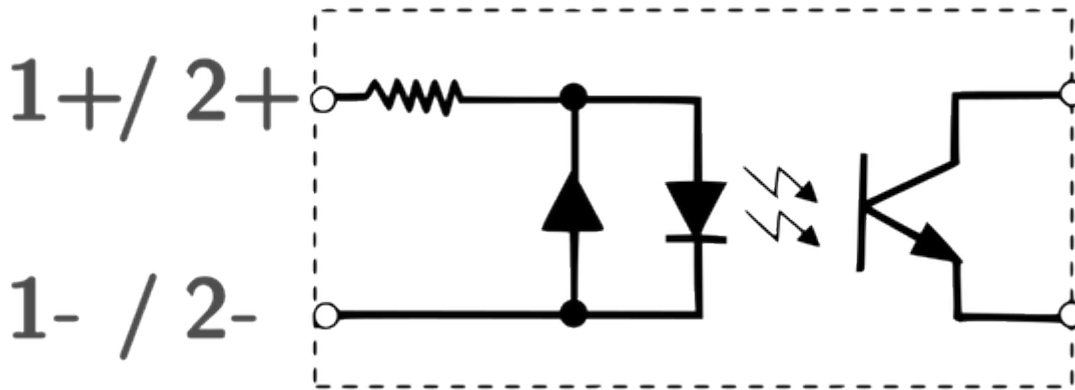
Example for query: 01 04 00 00 00 28 F0 14
In this example F0 14 is checksum CRC-16 big endian.

Modbus RTU devices configuration

Use	MODBUS Device ID	Register structure	Endian structure	Start address	Offset address	Number of registers	Timeout [ms]
☒	01	32 bit float	CDAB	30001	30001	40	900-
☐							
☐							
☐							

Digital inputs

The device has 2 opto-isolated up to 2500Vrms digital inputs with separate 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 Vmax, 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.



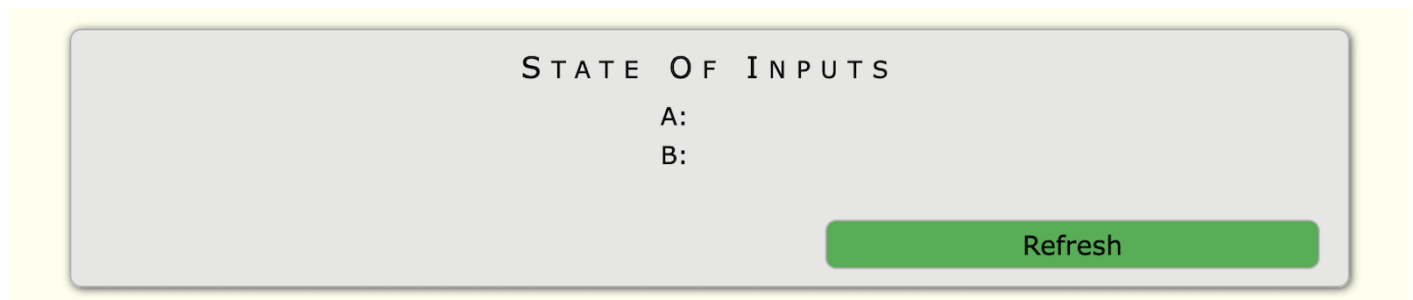
1+/2+ = digital input positive

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.

Digital input status

The status of the inputs can be checked in the tab **info>state** of input.



Digital output and timer

The device has 3 outputs to drive load or external power relays or contractors. For every output 2 terminals are available: normal open and common. The maximum load capacity is up to 3A and 230V for each output.

Channel functionality configuration

There are 2 options of channel functionality:

- Instant action
- Once action

If there is selected instant action the system is checking the schedule time table for this output every few second and correct the output status accordingly. We choose this configuration when we want to control the Gateway from internal schedule. In this mode of configuration the SMS and server commands on/off command are not working.

Once action allow to control by SMS, but in case of power failure the device will not return to previous status of outputs.

Channel functionality selection

Set **Instant Action** if you want to use this channel on live refresh.
Set **Once Action** if you want to control channel via SMS.

Event status checking Instant Action ▾

Set functionality

Manual ABC outputs control by website

There is individual tab for each output channel A, B, C. User can change status of output using internal website. This facility is for testing of outputs.

Gateway Channel 'A' Timer

Select and set output status

Status output OFF ▾

Set output

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.

In order to set the time of switching ON/OFF the Gateway A, B C outputs, all parameters for each output must be set separately. User also needs to select whether to use a given configuration. Maximum 10 schedulers can be added for every output.

Channel 'A' timer settings

Use	On		---	Off	
	Hour	Minute		Hour	Minute
☐	18	26	----	05	35
☐			----		
☐			----		
☐			----		
☐			----		
☐			----		
☐			----		
☐			----		
☐			----		
☐			----		
☐			----		

Save channel

Astronomical timer

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.

The astronomical schedule is 2 ON and 2 OFF option for each output.

Channel 'A' sunrise / sunset timer settings

Use	Timer	On	---	Timer	Off				
	Time of day	Action		Time of day	Action				
OFF	Sunset	Add	0	15	-----	Sunrise	Sub	0	30
OFF	Time	None			-----	Time	None		

Save daylight

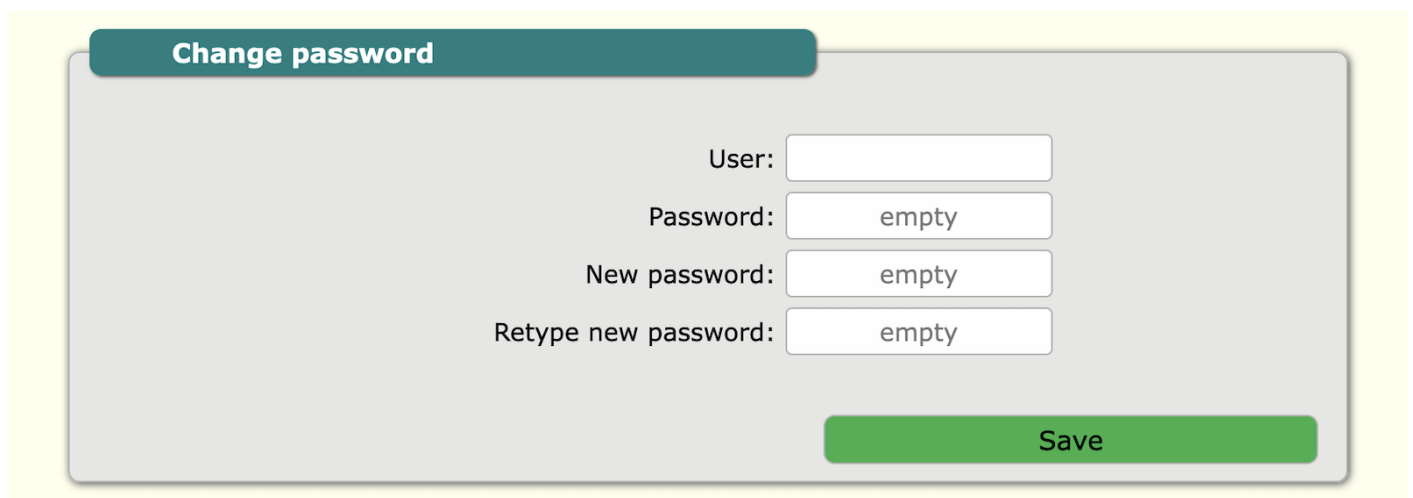
Output direct control by SMS

If you like to control Gateway's outputs direct by SMS only you have to set "once action". This configuration has to be apply for ABC outputs separately. For working with server user needs to set "INSTANT". More information in the SMS section.

Users - passwords

Password configuration

This section is for internal website access. Default password is **atreyo**.



A screenshot of a web form titled "Change password". The form has a light gray background and is set against a pale yellow background. It contains four input fields: "User:", "Password:", "New password:", and "Retype new password:". The "Password:", "New password:", and "Retype new password:" fields contain the text "empty". A green "Save" button is located at the bottom right of the form.

Change password

User:

Password:

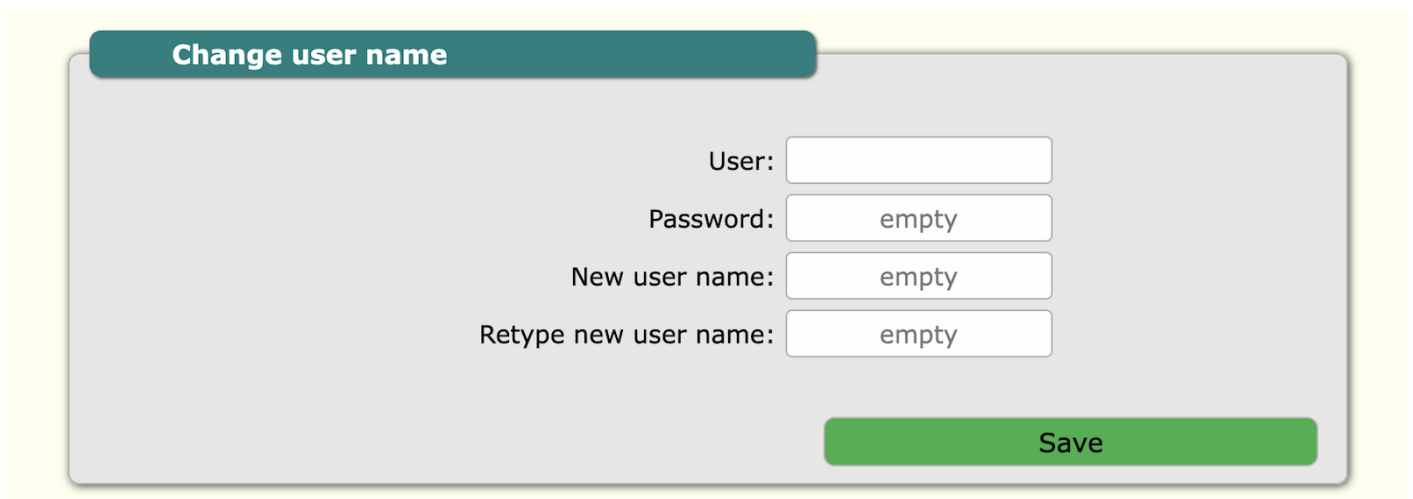
New password:

Retype new password:

Save

User configuration

For user change. Default user is **atreyo**.



A screenshot of a web form titled "Change user name". The form has a light gray background and is set against a pale yellow background. It contains four input fields: "User:", "Password:", "New user name:", and "Retype new user name:". The "Password:", "New user name:", and "Retype new user name:" fields contain the text "empty". A green "Save" button is located at the bottom right of the form.

Change user name

User:

Password:

New user name:

Retype new user name:

Save

Permissions and role

This tab is for permissions of mobile numbers to protect from unauthorised access via SMS commands. By default any number can access Gateway but after input of any number only number

from list is able to control Gateway. Mobile number has roles of "normal" and "emergency". Normal role allow to make control of Gateway, and emergency in addition is the emergency number for alerts. In AG-831 digital inputs high status is event for emergency SMS. It is possible to add maximum 13 telephone numbers. Number format with + before country prefix.

Mobile number role configuration

Phone number	Status
+91997636283445	✓ Normal Emergency Normal
	Normal

System

Multi-function reset button

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

- reset device
- restart device
- make default configuration

Multi-function reset button

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- 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	

Firmware update

The Gateway can update firmware from remote URL and locally direct by uploading BIN file with proper firmware. To load firmware click load firmware file and select firmware. After loading Gateway will automaticity restart. Firmware update in normal condition will not reset configuration.

Local update

Upload firmware locally

...

Click to load firmware file

Update from server

Update remotely from the server

Update file URL:

Update

Save parameter

Backup / restore config

The gateway allows you to backup your configuration and also upload the configuration to the gateway. To do this, you need to enter the config section.

Local backup/restore

Backup configuration

[Download configuration file](#)

Restore configuration

...

Click to select configuration file

Configuration from server

Also, it is possible to download the configuration from the server. To do this, enter the correct address of the server and the configuration file.

Configuration file url in server

Config file URL:

Get configuration from URL

Save config URL

SMS functions

Safety information

Operating environment

- The device is designed to be installed in clean, dust-free and insect-free places
- Operating temperature: -25 ~ 65°C (-13 ~ 149°F).
- Humidity range is 10% to 95% (non-condensing). Use the device in a dry environment.
- Away from heat sources and direct sunlight.
- It must not be exposed to acid fumes, salts and other chemicals.
- The device must not be used in places where there is a risk of gas explosion.

Use in inappropriate conditions may damage the device or shorten its life.

Electrical and power supply safety

- The device is powered with a voltage in the range of 8-36V. Voltage up to 24V is considered safe. Be especially careful when supplying them with higher voltages.
- Use only approved accessories
- Use the supplied power adapter or a good quality certified power adapter with the correct supply voltage range and sufficient power.
- Only use approved accessories like antenna etc.

Only a person with qualification and appropriate knowledge should install the device.

Malfunctioning and damaged device

- Do not disassemble the device.
- Only qualified personnel must service or repair the device or its accessories.
- If water or other liquid has got into the device, or if it looks mechanically damaged, do not connect the device, but take it to an authorized service center.

Radio frequency exposure

This device has been designed and manufactured not to exceed radio frequency energy emission limits set by regulatory agencies. To comply with RF exposure guidelines, the device must be used at least 20 cm away from a person's body. Failure to follow these instructions may result in exceeding the applicable RF exposure limits. This only applies to models with a built-in LTE modem.

What to do and what not to do

- You are solely responsible for the use of the device and any consequences of its use.
- Do not store or use the device in harsh environments such as dust, gases, oils, chemical vapors and damp places.
- Do not throw the device and its accessories. Handle with care.
- The device heats up during operation. Ensure proper ventilation.
- If you need to dispose of your device, check your local regulations for recycling and disposal of electronics.
- Route power, Ethernet, and antenna cables properly so that they cannot be accidentally pulled out.
- The device should be used and kept away from small children.