

# AG-201

AG-201 stands as the basic Modbus RTU gateway for users seeking LTE connectivity for their custom applications. This gateway features both RS485 and LTE/GPRS communication capabilities, complete with SMS support. AG-201 ensures bidirectional connectivity, enabling Modbus RTU data exchange with the cloud with MQTT.

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

- [General information](#)
- [Configuration Manual](#)
- [Safety information](#)

# General information

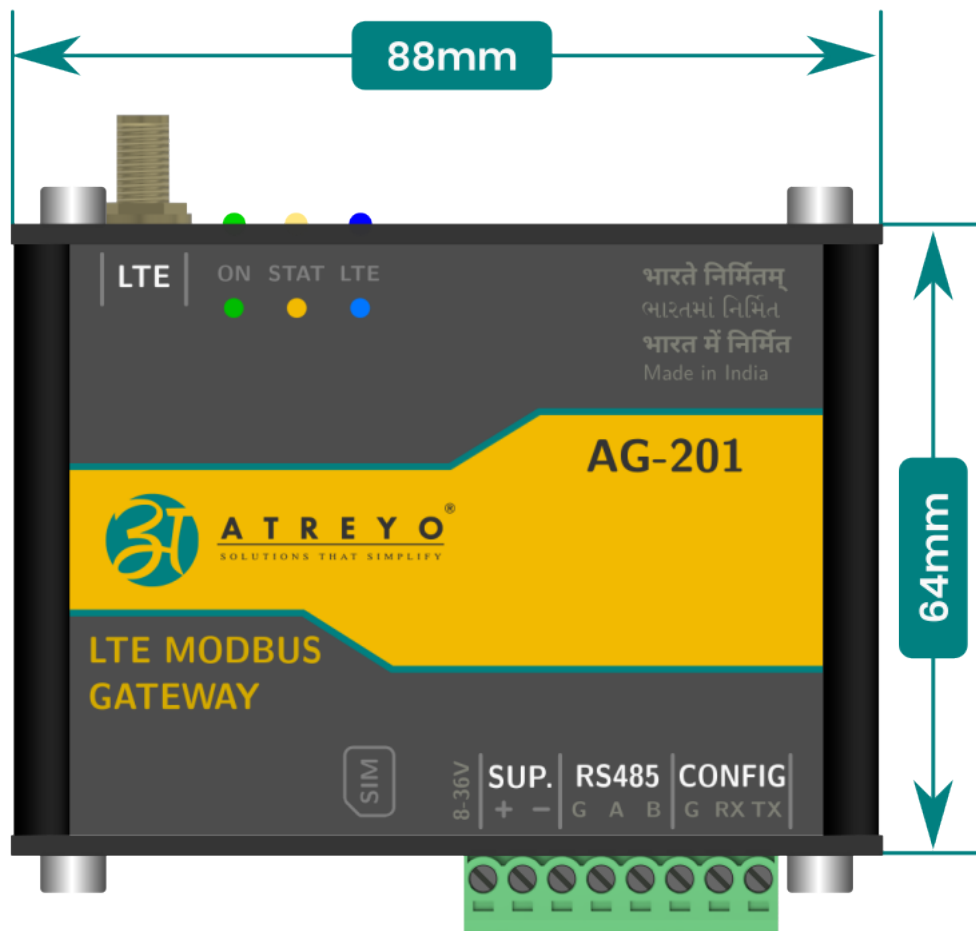
Download technical specification	<a href="#">Technical Specification</a>
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## Hardware

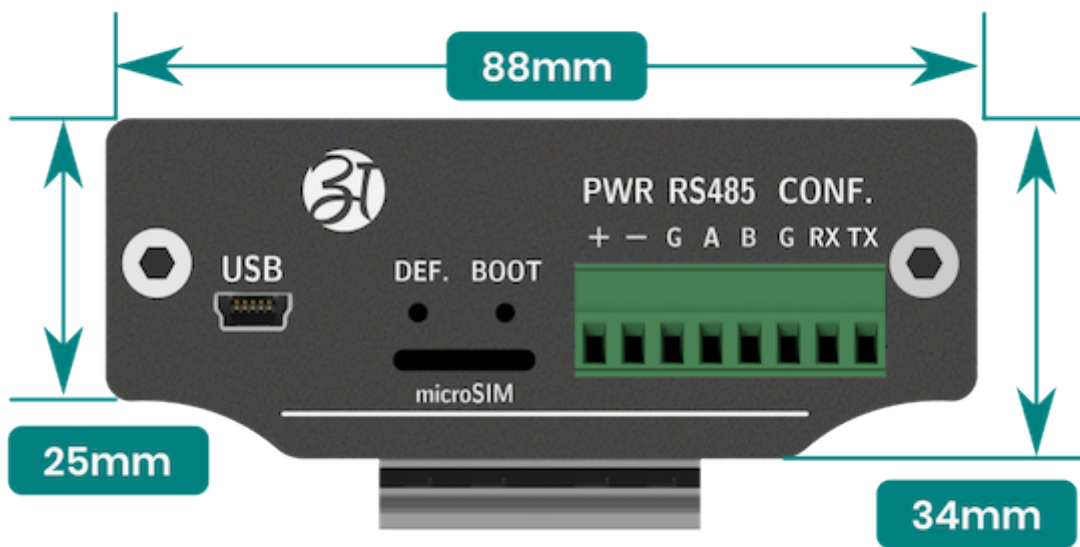
The Gateway is made on one PCB, which is fitted to the aluminum housing. The housing is made of a thick, strong aluminum profile with two end plates also made from aluminum. The surface of the housing is finished by anodizing.

At the bottom of the housing there are slots through which DIN rail clamp or any other clamp can be mounted by t-nuts.

### Front view dimensions

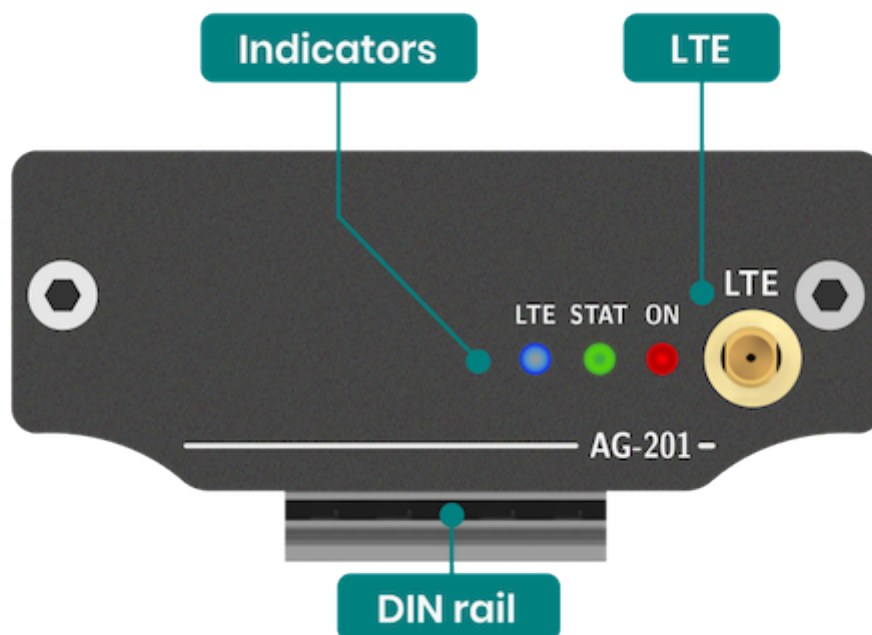


Side view dimensions

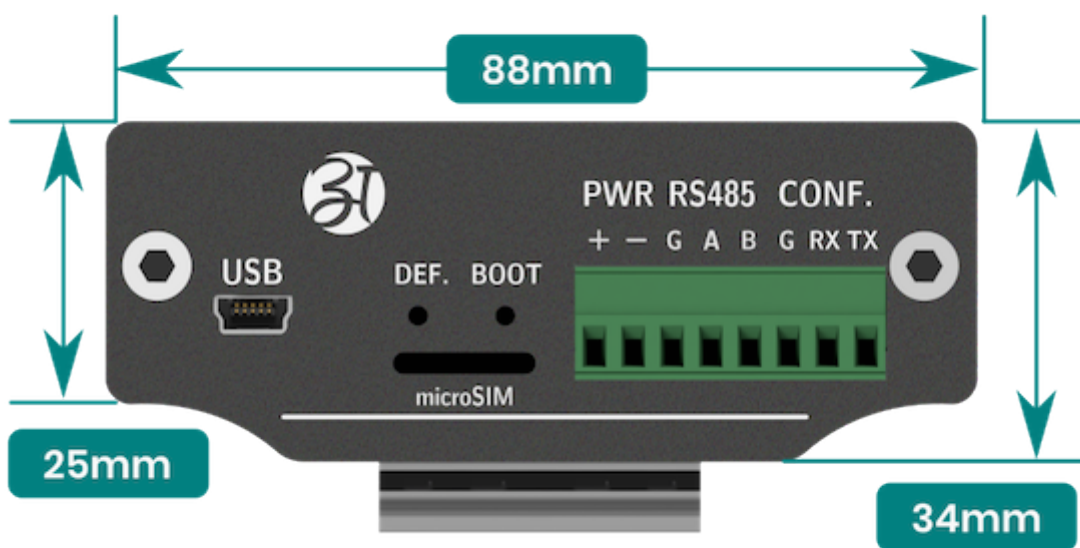


## Interfaces

Top view connectors



Bottom view connector



# Configuration Manual

After unpacking, the gateway is ready to use, but requires configuration to adapt to the required functions.

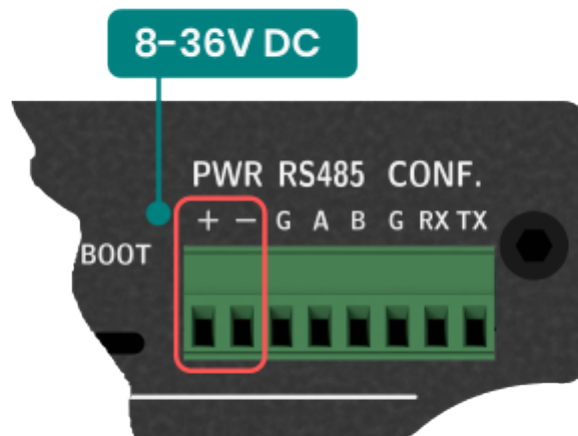
## Power supply

The device can be powered by connecting a power source to the terminal block:

1. Loosen or remove the screws on the terminal block.
2. Connect a 8–36 VDC power line to the terminal block.
3. Tighten the connections, using the screws on the terminal block.
4. Turn on the power source.

Note that the device does not have an on/off switch. It automatically turns on when it receives power. It takes a couple of seconds for the system to boot up. Once the system is ready, the RED LED will light up.

Power terminal block pin assignments are shown below:

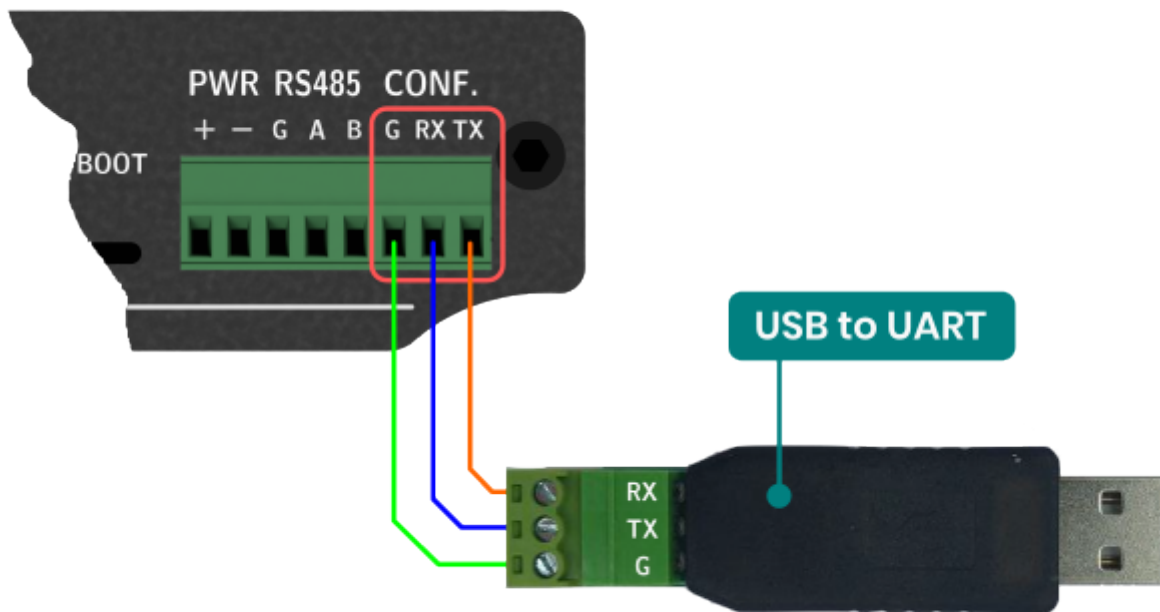


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## Connecting the configuration port

To configure the device, firstly connect RX, TX and GND of device to TX,RX and GND of Atreyo TTL converter or any other TTL converter with 9600, 8, N, 1 parameter.

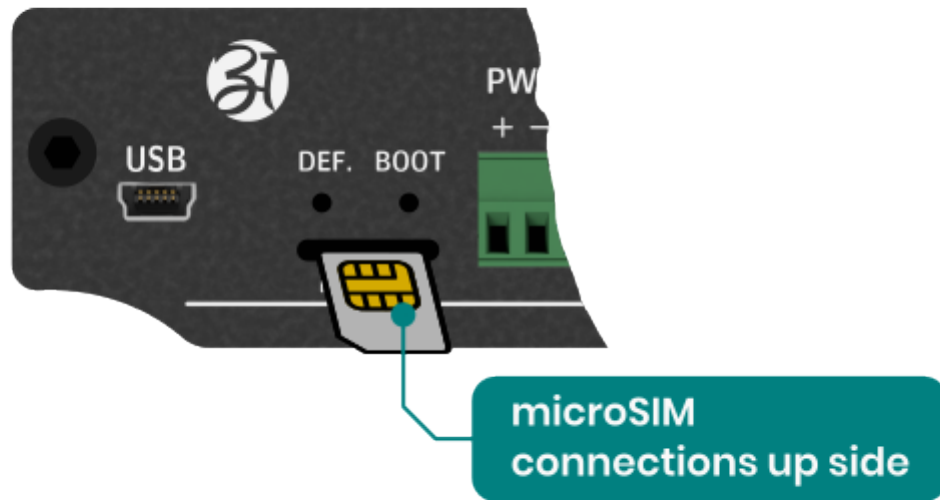
The pin assignment of the port is shown as above.



Note that RX of gateway should be connected to TX of USB-UART converter. And TX of gateway to RX of USB-UART converter

## Inserting SIM card

Please refer drawing for proper SIM placement.

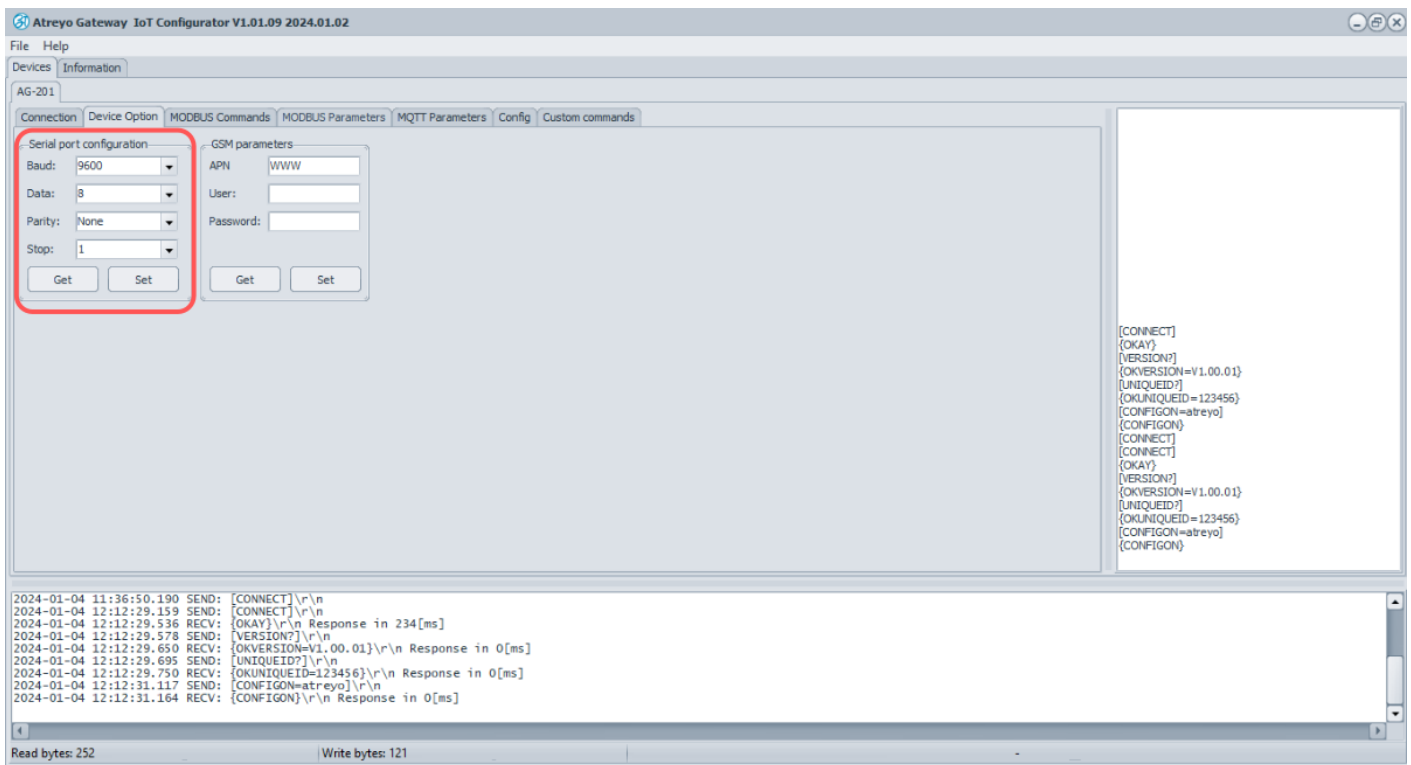


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## Connecting configuration application

1. Connect one end of the TTL converter to the window computer.
2. Open AG IoT Configuration application on window PC.
3. Select AG-201, Select COM port and configure port with 9600,N,1,8 and click open port  
After port connection, click connect.
4. Once the connection is established successfully, enter the password "atreyo" to access the configuration mode. This is the default password.
5. Click CONFIGON and configure device parameter, as shown below:





## Benereal configuration

1. Reset the device parameters by selecting **Make default**.
2. Initiate a device restart by clicking on **Restart**.
3. Modify the password in the Device Password section; after entering the new password, click **Set Password**.
4. To apply and save these changes in the device, click **Config OFF**.
5. After configuring all parameters, remember to click **Config OFF**.
6. The device will automatically restart and operate based on the new configured parameters.

## Serial interface

Go to Device option to view and configure serial parameter.

To configure serial parameter:

1. Configure the **baudrate**, **parity**, **data bits** and **stop bits**.
2. Click "**Set**" to apply the chosen settings.
3. Click "**Get**", to access the stored serial parameters from the device.

Fiels	Value	Comment
Baudrate	2400   4800  9600  14400   19200   28800   33600   38400   57600   115200   230400   460800  921600	default: 9600
Data	8   9	default: 8

Fiels	Value	Comment
Parity	None   Odd   Even	default: None
Stop	1   2	default: 1

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Connection Device Option MODBUS Commands MODBUS Parameters MQTT Parameters Config Custom commands

Serial port configuration

Baud: 9600

Data: 8

Parity: None

Stop: 1

Get Set

GSM parameters

APN: WWW

User:

Password:

Get Set

```
[CONNECT]
{OKAY}
[VERSION?]
{OKVERSION=V1.00.01}
[UNIQUEID?]
{OKUNIQUEID=123456}
[CONFIGON=atreyo]
{CONFIGON}
[CONNECT]
[CONNECT]
{OKAY}
[VERSION?]
{OKVERSION=V1.00.01}
[UNIQUEID?]
{OKUNIQUEID=123456}
[CONFIGON=atreyo]
{CONFIGON}
```

2024-01-04 11:36:50.190 SEND: [CONNECT]\r\n

2024-01-04 12:12:29.159 SEND: [CONNECT]\r\n

2024-01-04 12:12:29.536 RECV: {OKAY}\r\n Response in 234[ms]

2024-01-04 12:12:29.578 SEND: [VERSION?]\r\n

2024-01-04 12:12:29.650 RECV: {OKVERSION=V1.00.01}\r\n Response in 0[ms]

2024-01-04 12:12:29.695 SEND: [UNIQUEID?]\r\n

2024-01-04 12:12:29.750 RECV: {OKUNIQUEID=123456}\r\n Response in 0[ms]

2024-01-04 12:12:31.117 SEND: [CONFIGON=atreyo]\r\n

2024-01-04 12:12:31.164 RECV: {CONFIGON}\r\n Response in 0[ms]

Read bytes: 252 Write bytes: 121

## GSM parameter

1. Configure the **APN**, **user**, **password**.
2. Click "**Set**" to apply the chosen settings.
3. Click "**Get**", to access the stored GSM parameters from the device.

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Serial port configuration

Baud: 9600
Data: 8
Parity: None
Stop: 1

Get
Set

GSM parameters

APN: WWW
User:
Password:

Get
Set

[CONNECT]  
{OKAY}  
[VERSION?]  
{OKVERSION=V1.00.01}  
[UNIQUEID?]  
{OKUNIQUEID=123456}  
[CONFIGON=atreyo]  
[CONFIGON]  
[CONNECT]  
[CONNECT]  
{OKAY}  
[VERSION?]  
{OKVERSION=V1.00.01}  
[UNIQUEID?]  
{OKUNIQUEID=123456}  
[CONFIGON=atreyo]  
[CONFIGON]

2024-01-04 11:36:50.190 SEND: [CONNECT]\r\n  
2024-01-04 12:12:29.159 SEND: [CONNECT]\r\n  
2024-01-04 12:12:29.536 RECV: {OKAY}\r\n Response in 234[ms]  
2024-01-04 12:12:29.578 SEND: [VERSION?]\r\n  
2024-01-04 12:12:29.650 RECV: {OKVERSION=V1.00.01}\r\n Response in 0[ms]  
2024-01-04 12:12:29.695 SEND: [UNIQUEID?]\r\n  
2024-01-04 12:12:29.750 RECV: {OKUNIQUEID=123456}\r\n Response in 0[ms]  
2024-01-04 12:12:31.117 SEND: [CONFIGON=atreyo]\r\n  
2024-01-04 12:12:31.164 RECV: [CONFIGON]\r\n Response in 0[ms]

Read bytes: 252
Write bytes: 121

## Modbus

For Modbus command frame configuration, refer the table. You can add new modbus request string via the edit section.

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#	Slave ID	Function code	Data type	Endian struct	Start address	Data length	Offset address
1	1	03	8Bit INT	ABCD	40000	1	1

Edit section

Fields

Slave ID: 1
Function code: 03 Read Holding Registers (4x)
Data type: 8Bit INT

Start address: 40000
Data length: 1

Endian struct: ABCD
Offset address: 1

1,([1]03|8Bit INT|ABCD|40000|1|1)

Navigate

Selected item: 1

Add
Insert
Delete

Copy item
Paste item

Device

Get item
Get all
Set item
Set all

[CONNECT]  
{OKAY}  
[VERSION?]  
{OKVERSION=V1.00.01}  
[UNIQUEID?]  
{OKUNIQUEID=123456}  
[CONFIGON=atreyo]  
[CONFIGON]  
[CONNECT]  
[CONNECT]  
{OKAY}  
[VERSION?]  
{OKVERSION=V1.00.01}  
[UNIQUEID?]  
{OKUNIQUEID=123456}  
[CONFIGON=atreyo]  
[CONFIGON]

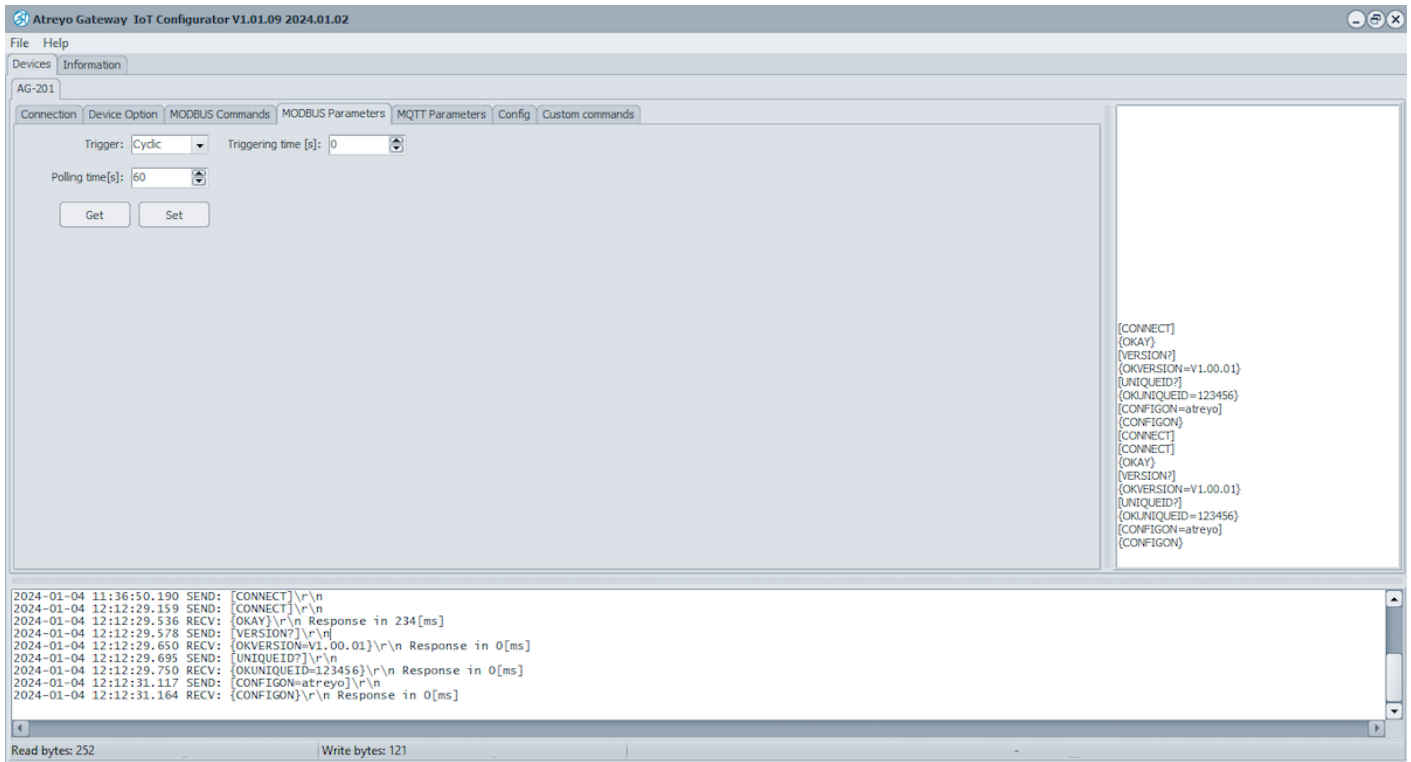
2024-01-04 11:36:50.190 SEND: [CONNECT]\r\n  
2024-01-04 12:12:29.159 SEND: [CONNECT]\r\n  
2024-01-04 12:12:29.536 RECV: {OKAY}\r\n Response in 234[ms]  
2024-01-04 12:12:29.578 SEND: [VERSION?]\r\n  
2024-01-04 12:12:29.650 RECV: {OKVERSION=V1.00.01}\r\n Response in 0[ms]  
2024-01-04 12:12:29.695 SEND: [UNIQUEID?]\r\n  
2024-01-04 12:12:29.750 RECV: {OKUNIQUEID=123456}\r\n Response in 0[ms]  
2024-01-04 12:12:31.117 SEND: [CONFIGON=atreyo]\r\n  
2024-01-04 12:12:31.164 RECV: [CONFIGON]\r\n Response in 0[ms]

Read bytes: 252
Write bytes: 121

Field	Value	Description
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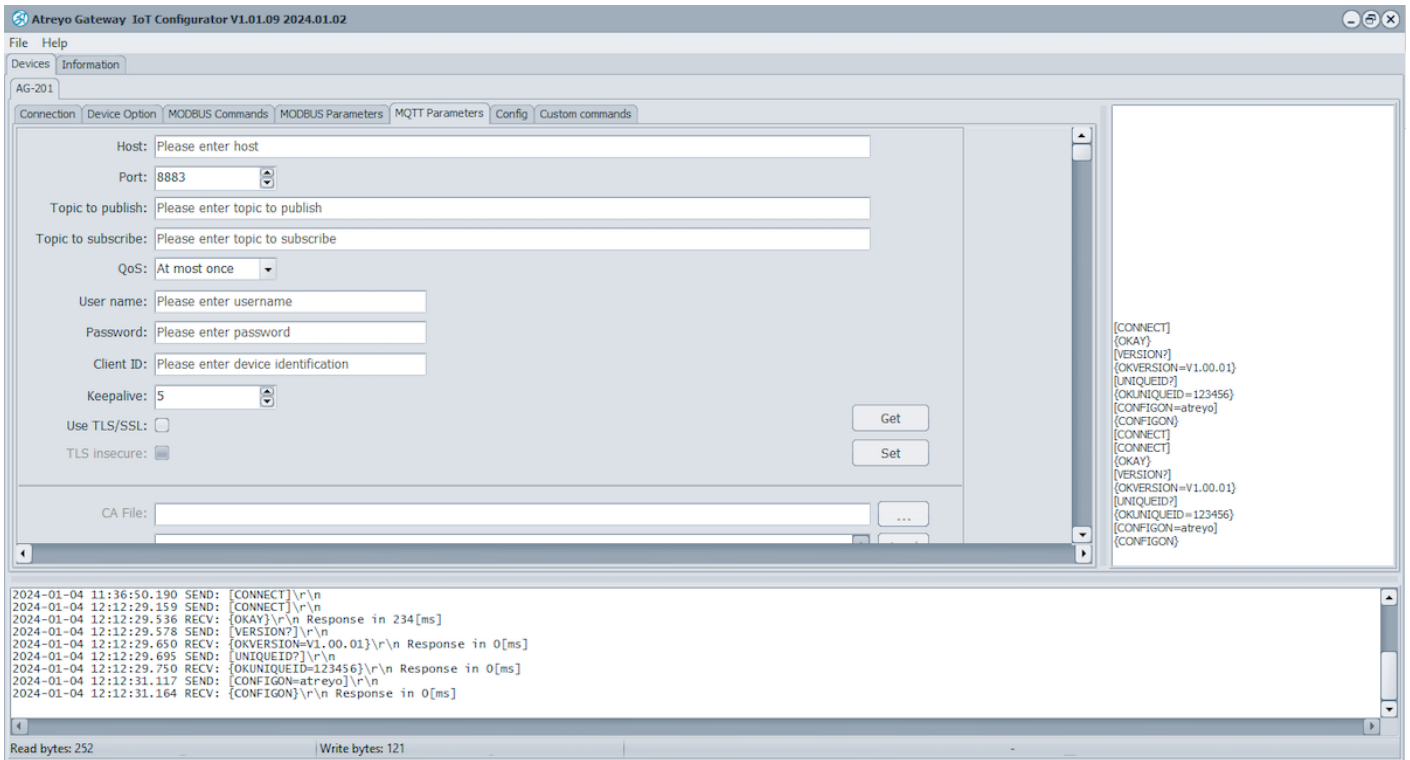
Slave ID	Integer[1...255]	Slave ID
Function code	Read Coils(1)   Read Discrete Input(2)   Read Holding Register(3)   Read Input Register(4)	Specifies the type of register being addressed by a Modbus request
Data structure	8bit INT   8bit UINT   8bit HEX  16bit INT  16bit UINT   32bit float   16bit HEX   32bit HEX   Bool	Defines how read data will be stored
Start address	Integer [0 – 65535]	First Modbus register from which data will be read
Offset address	Integer	The starting address or position of a data element within a register or data block
Data length	Integer [1 – 30]	Number of Modbus registers that will be read during the request
Data length	Integer [1 – 30]	Number of Modbus registers that will be read during the request
Endian structure	2bit data – ABCD   BADC   CDAB   DCBA 16bit data – AB   BA	Select endian structure of data type
Trigger	-	Not available now
riggering time	-	Not available now
Polling time	integer [1..]in sec; default: 60Sec	Interval at which requests are sent to the server device.

1. By clicking ADD, you can add multiple Modbus request strings.
2. Click "Set" to save a single frame or "Set All" to save all the Modbus request strings in the device.
3. clicking "Get" or "Get All", to access the saved Modbus strings in the device.
4. Additionally, you can delete, copy, and paste strings from the Navigate section.
5. Go to Modbus parameter section and set polling time of modbus data to the server by click on "Set". Also check polling time from device by click on "Get"



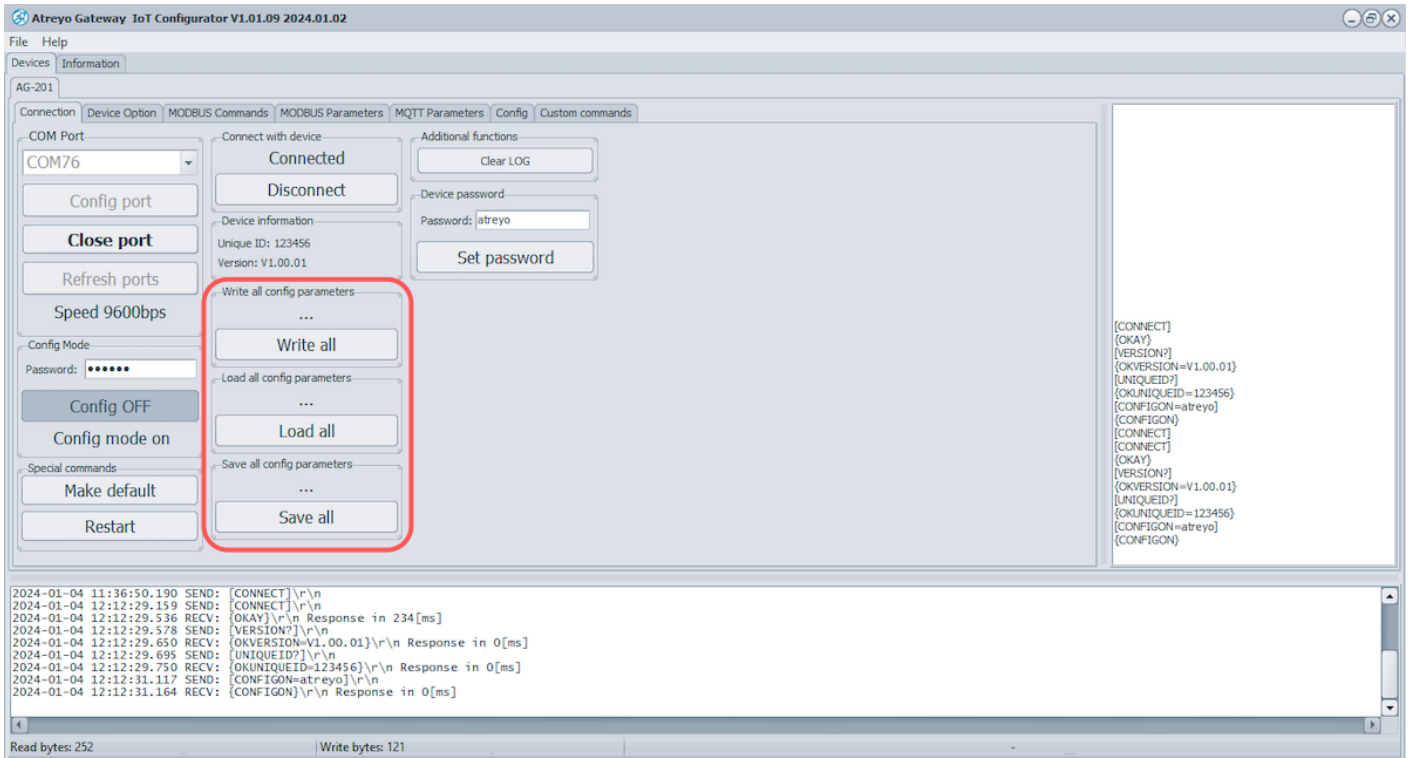
## MQTT

1. Go to MQTT Parameter section, to add MQTT parameter.
2. Specify a server details, host and port.
3. If the broker requires, enter Client ID, Username, and Password. (optional). If not, enter NULL.
4. Specify the publish and subscribe topics.
5. Once you've specified all parameters, click "Set."
6. Click "Get", to access details of the MQTT parameters.



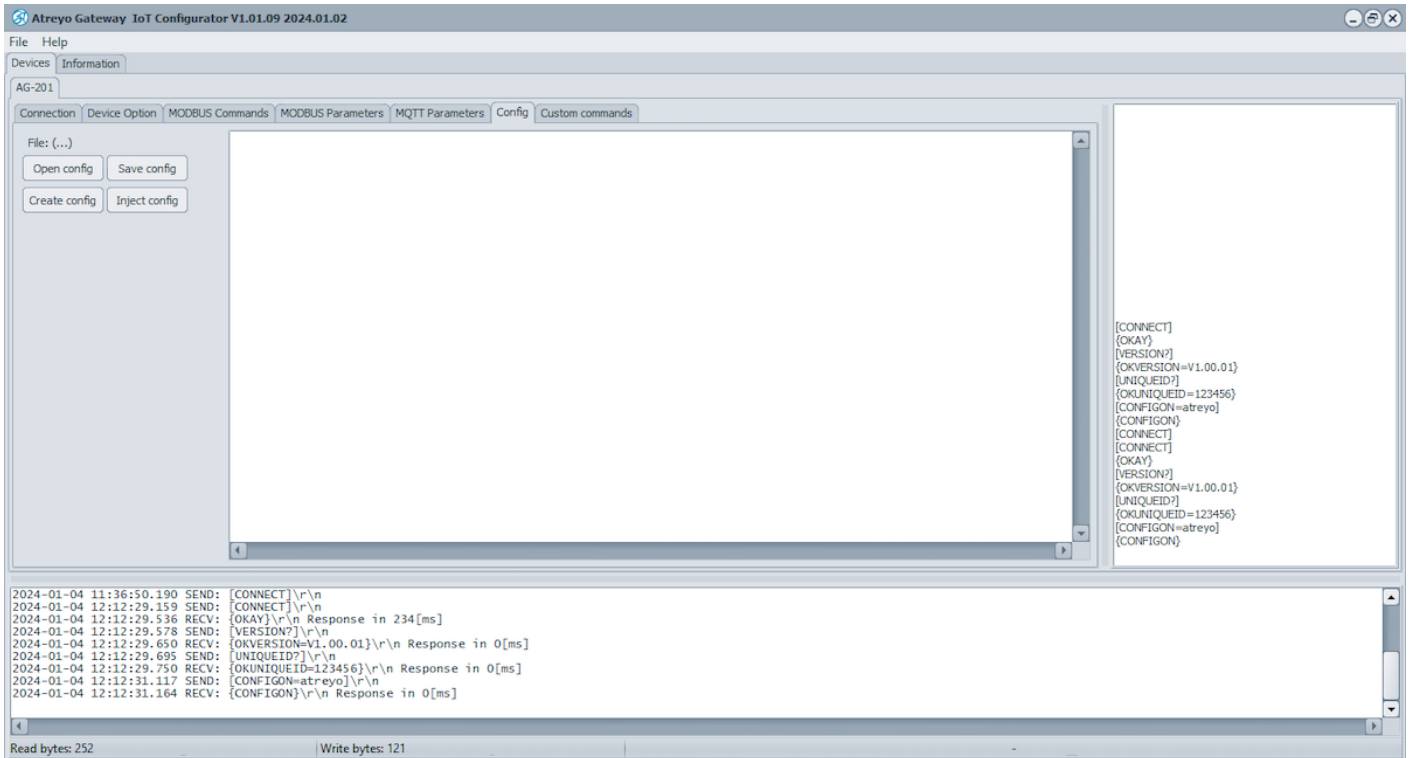
## Save and restore

Easily configure the number of devices by loading a configuration file. Navigate to the Connection section, load the file by clicking **Load All**, and load all configuration parameters by clicking **Write All**.



The application allows saving the configuration for later uploading to other gateways.

1. Save all configured parameters in a file by navigating to the Connection section and clicking **Save all**.
2. After clicking "Save all", navigate to the Config section. From there, first you have to create config file by click on "Create config", once you create file, you can save it by clicking **Save config**.
3. And this file you can use for configuration of other AG-201 gateway anytime by click on **Open config**.



# 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.