

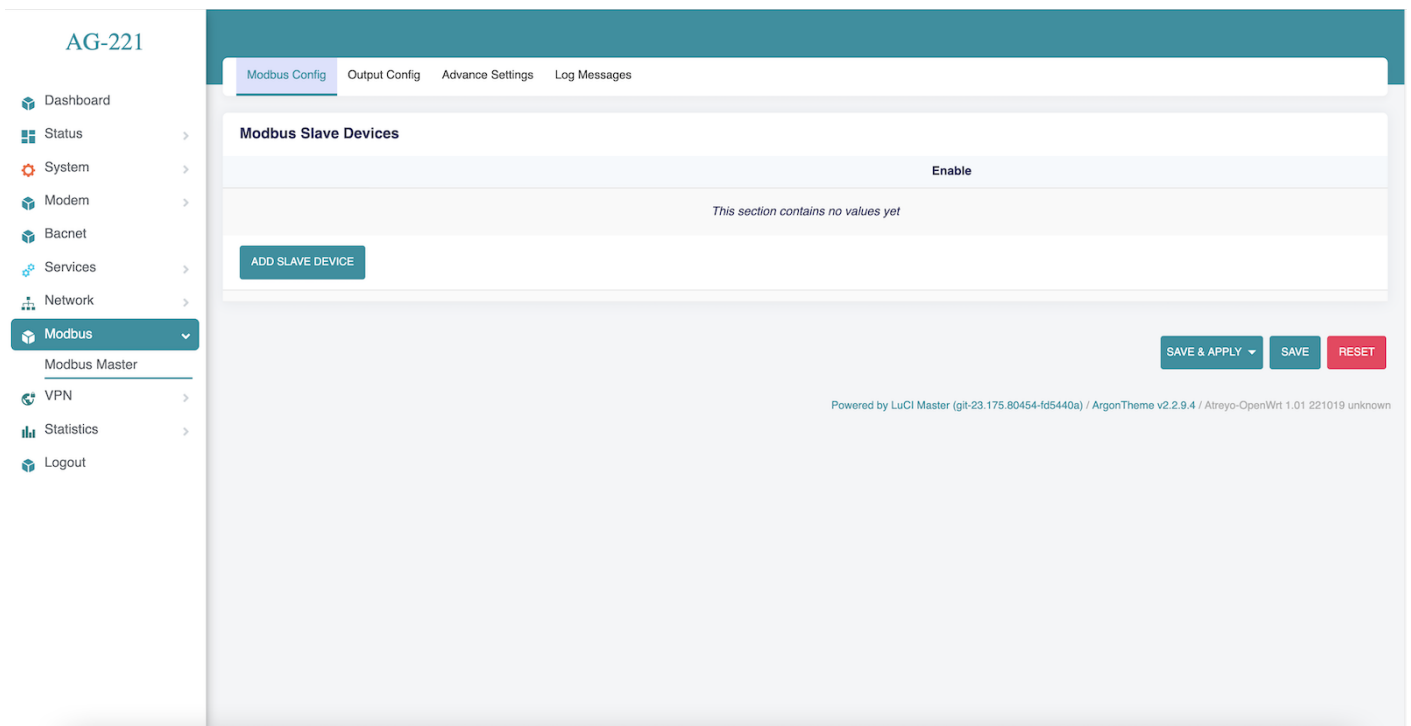
Modbus Master

Modbus Master is an application that allows full operation of devices connected to the gateway over Modbus RTU and Modbus TCP/IP. Also, the application allows sending data to the server via MQTT, TCP/IP JSON and saving to storage.

Configuration of Modbus Master

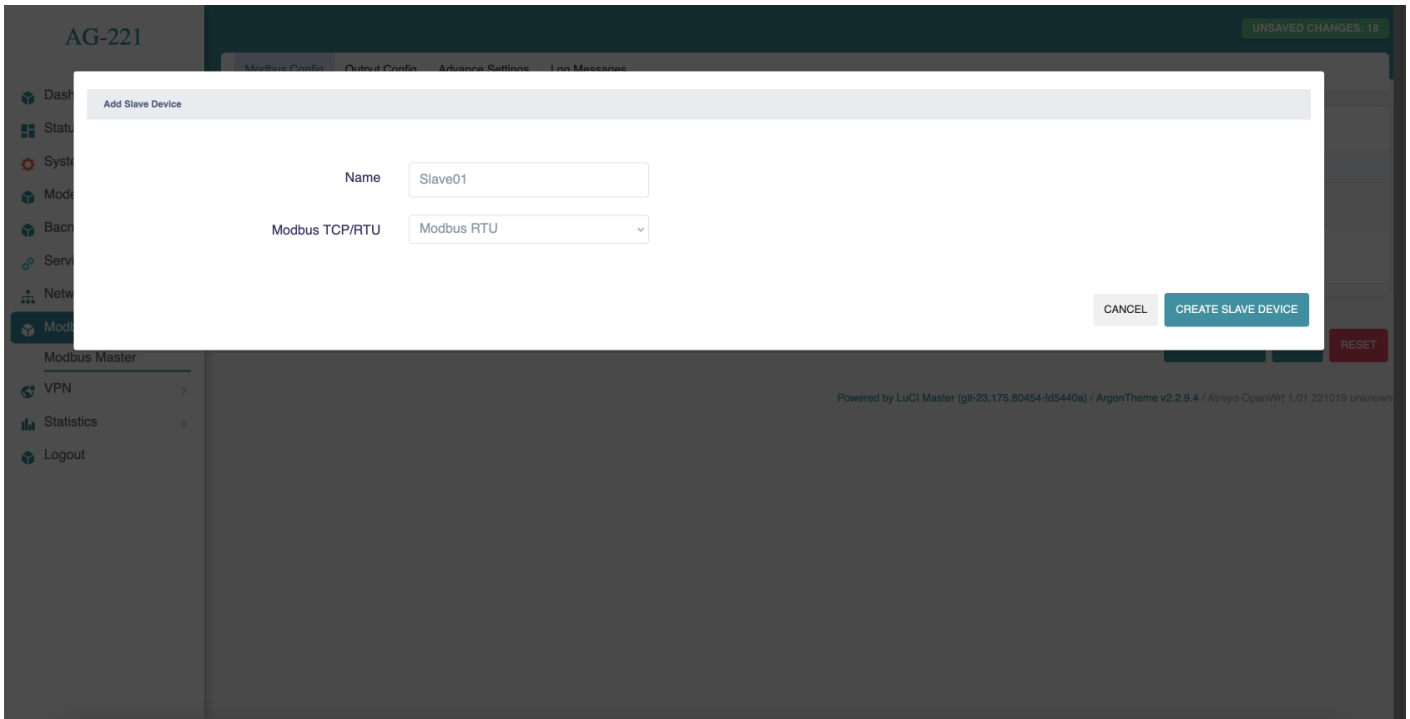
To open Modbus master, go to **Modbus > Modbus Master**

Add Slave Device in Modbus Slave Devices



The screenshot shows the configuration page for Modbus Master in a LuCI web interface. The interface has a teal header and a sidebar on the left. The sidebar is titled "AG-221" and contains a list of menu items: Dashboard, Status, System, Modem, Bacnet, Services, Network, Modbus (selected), VPN, Statistics, and Logout. The "Modbus" menu item is expanded, showing "Modbus Master" as the active page. The main content area has a teal header with tabs for "Modbus Config", "Output Config", "Advance Settings", and "Log Messages". The "Modbus Config" tab is active, and the page title is "Modbus Slave Devices". Below the title, there is a section with the heading "Modbus Slave Devices" and a sub-heading "Enable". The content area is empty, with the text "This section contains no values yet" centered. At the bottom of the content area, there is a blue button labeled "ADD SLAVE DEVICE". At the bottom right of the page, there are three buttons: "SAVE & APPLY" (with a dropdown arrow), "SAVE", and "RESET". At the very bottom of the page, there is a footer that reads "Powered by LuCI Master (git-23.175.80454-4d5440a) / ArgonTheme v2.2.9.4 / Atreyo-OpenWrt 1.01 221019 unknown".

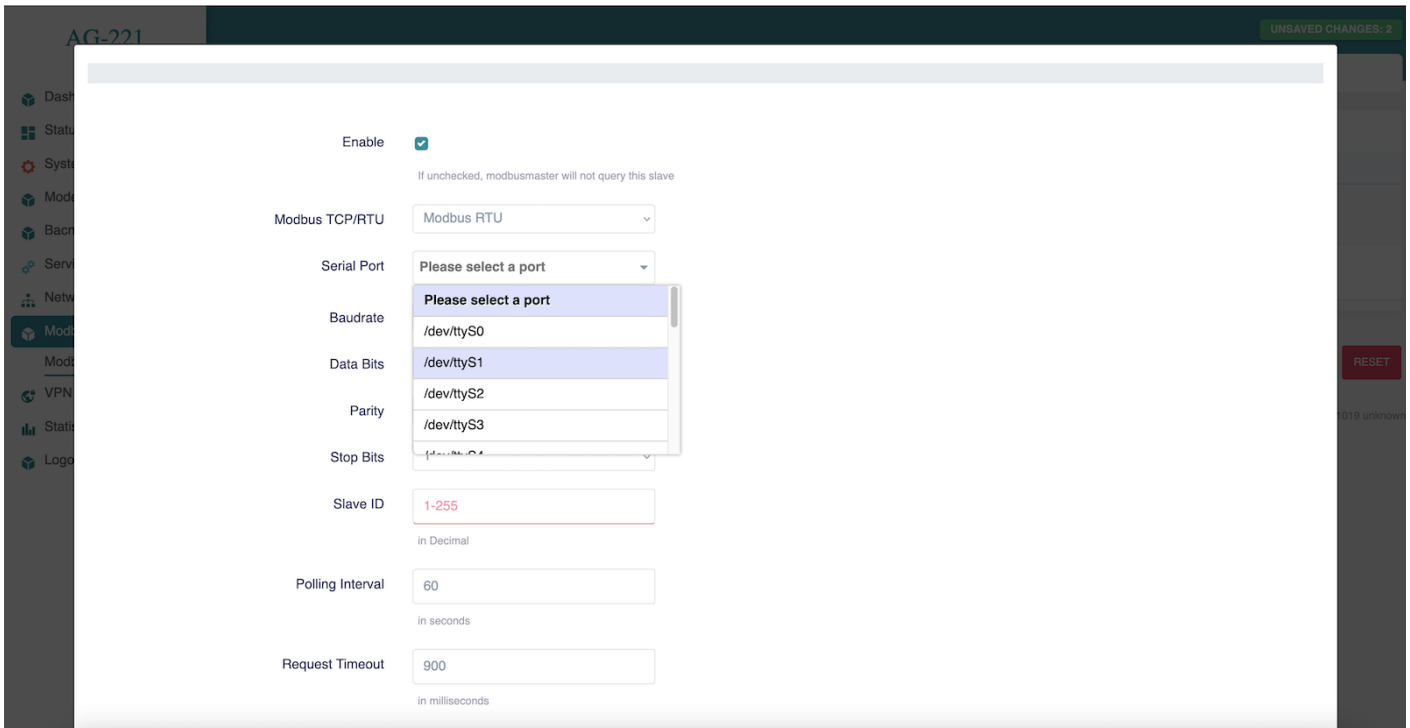
Enter a slave device name of your choice & Select communication protocol.



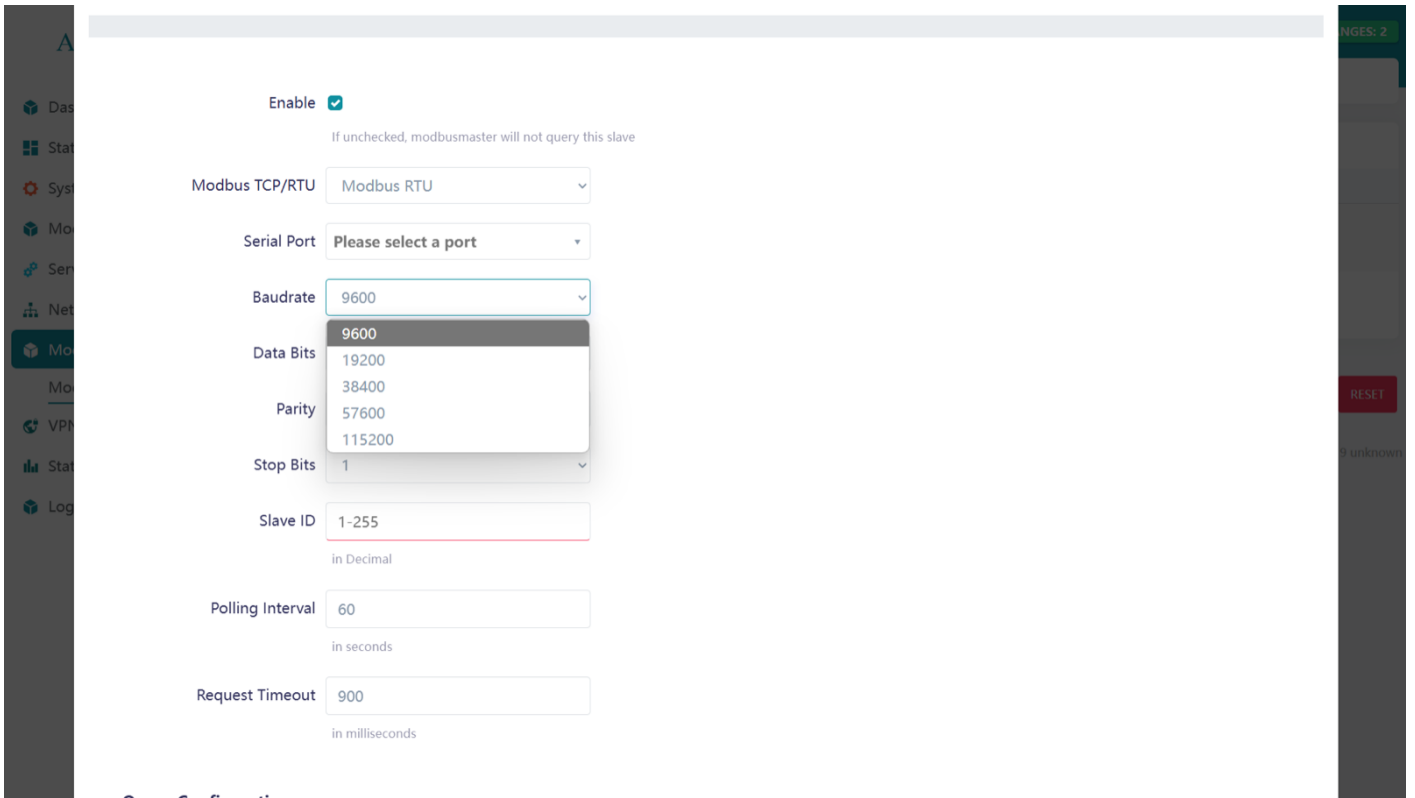
Modbus RTU

Need to enter the serial port configuration according to the slave device. In AG-221 is for RS485 **dev/ttyS1**.

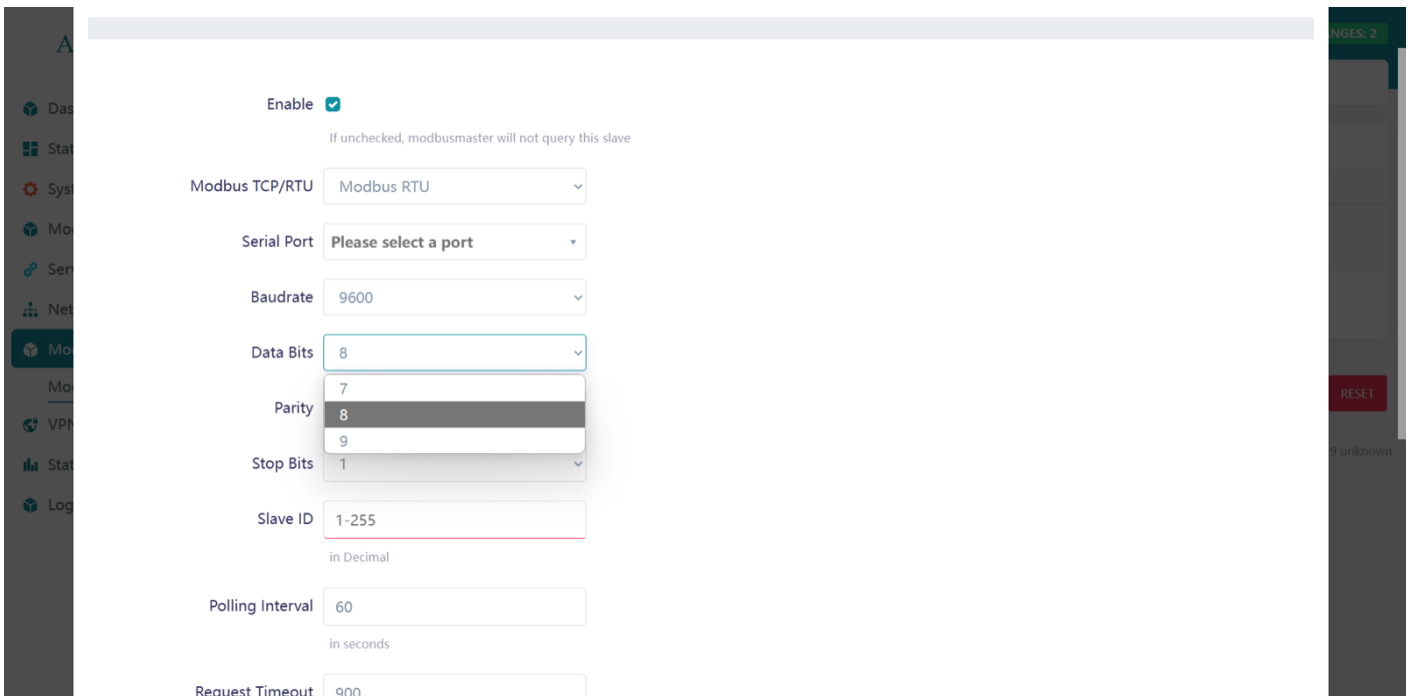
/dev/ttyS1 = RS485



Change the baud-rate according to your slave device requirement. In Modbus RTU 9600 baud-rate is most common used.



Data bits are used to represent each character or data unit in a communication protocol. Select the appropriate setting.



Parity is an error-checking mechanism to detect data transmission errors. Most devices use the **None** option.

Enable If unchecked, modbusmaster will not query this slave

Modbus TCP/RTU: Modbus RTU

Serial Port: Please select a port

Baudrate: 9600

Data Bits: 8

Parity: None

Stop Bits: **None**
Even
Odd

Slave ID: 1-255
in Decimal

Polling Interval: 60
in seconds

Request Timeout: 900
in milliseconds

A stop bit signals the end of a data frame, helping the receiver recognize when one byte is complete.

- 1 Stop Bit: For stable connections and higher speed.
- 2 Stop Bits: For increased reliability or when devices need more processing time.

Select the option according to the slave device.

Modbus TCP/RTU: Modbus RTU

Serial Port: Please select a port

Baudrate: 9600

Data Bits: 8

Parity: None

Stop Bits: 1

Slave ID: 1
2
in Decimal

Polling Interval: 60
in seconds

Request Timeout: 900
in milliseconds

Query Configuration

Function Code	Start Address	Register/Coil Quantity
	in Decimal	in Decimal
<i>This section contains no values yet</i>		

Modbus TCP/IP

In Modbus TCP/IP, only the IP address and port number (typically 502) are required for communication.

Enable

If unchecked, modbusmaster will not query this slave

Modbus TCP/RTU: Modbus TCP

IP Address: 127.0.0.1

Port: 502

Slave ID: 1-255
in Decimal

Polling Interval: 60
in seconds

Request Timeout: 900
in milliseconds

Query Configuration

Function Code	Start Address	Register/Coil Quantity
	in Decimal	in Decimal
<i>This section contains no values yet</i>		

ADD QUERY

Modbus slave

After entering these parameters, the next configuration steps are the same for both Modbus TCP and Modbus RTU.

You should enter the slave ID (1-255), polling interval, and request timeout according to your requirements.

Slave ID
in Decimal

Polling Interval
in seconds

Request Timeout
in milliseconds

Query Configuration

Function Code	Start Address	Register/Coil Quantity
	in Decimal	in Decimal
<i>This section contains no values yet</i>		

[ADD QUERY](#)

Parameter Configuration

Map parameters here to load them in JSON payload

Parameter Name	Register/Coil Address	Datatype	Endian Structure	Offset
	in Decimal			
<i>This section contains no values yet</i>				

Query Configuration

To make a Query, click on **ADD QUERY**

Request Timeout
in milliseconds

Query Configuration

Function Code	Start Address	Register/Coil Quantity
	in Decimal	in Decimal
<i>This section contains no values yet</i>		

[ADD QUERY](#)

Parameter Configuration

Map parameters here to load them in JSON payload

Parameter Name	Register/Coil Address	Datatype	Endian Structure	Offset
	in Decimal			
<i>This section contains no values yet</i>				

[ADD PARAMETER](#)

[DISMISS](#) [SAVE](#)

Enter the **Function code**, **Start Address**, Register/Coil number as per the Slave documentation or instruction. Here 1-50 register/coil quantity is supported.

Query Configuration

Function Code	Start Address	Register/Coil Quantity	
	in Decimal	in Decimal	
03	0-65535	1-50	DELETE
01			
02	0-65535	1-50	DELETE
03	0-65535	1-50	DELETE

ADD QUERY

Parameter Configuration

Map parameters here to load them in JSON payload

Parameter Name	Register/Coil Address	Datatype	Endian Structure	Offset
	in Decimal			
This section contains no values yet				

ADD PARAMETER

DISMISS SAVE

Parameter Configuration

Enter and select the option as per your requirement.

Query Configuration

Function Code	Start Address	Register/Coil Quantity	
	in Decimal	in Decimal	
03	0	20	DELETE

ADD QUERY

Parameter Configuration

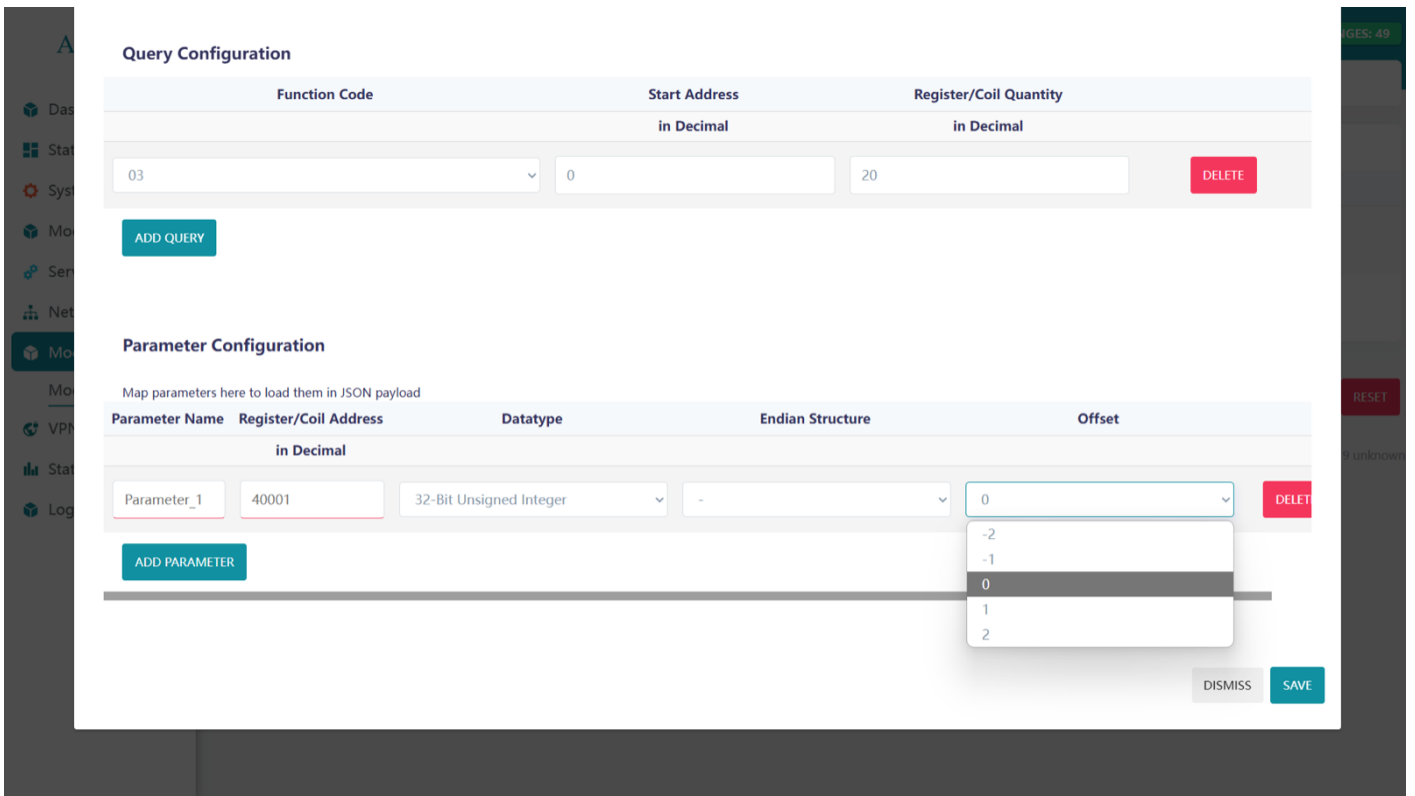
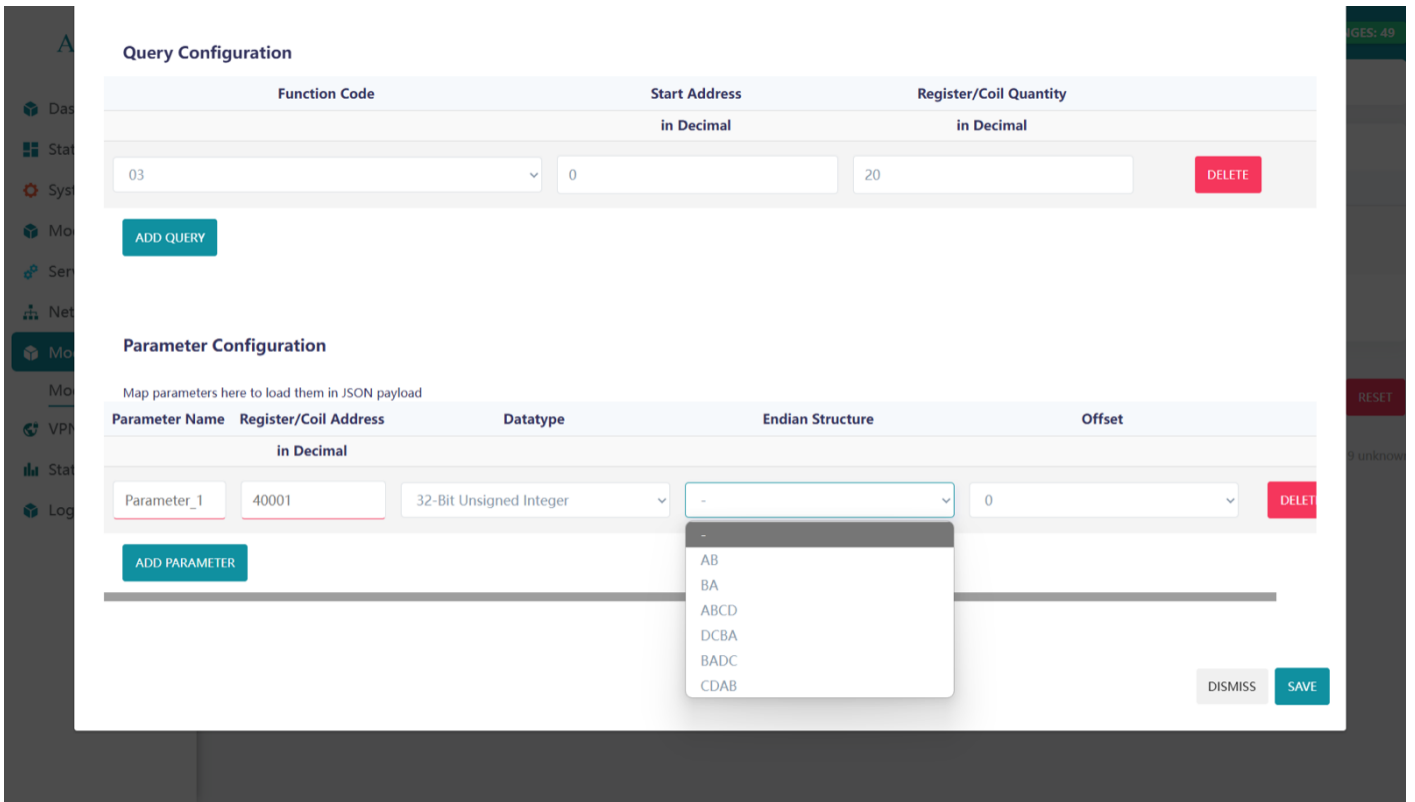
Map parameters here to load them in JSON payload

Parameter Name	Register/Coil Address	Datatype	Endian Structure	Offset
	in Decimal			
Parameter_1	40001	32-Bit Unsigned Integer	-	0

ADD PARAMETER

- Binary
- 16-Bit Unsigned Integer
- 16-Bit Signed Integer
- 16-Bit Hexadecimal
- 32-Bit Unsigned Integer
- 32-Bit Signed Integer
- 32-Bit Floating Point
- 32-Bit Hexadecimal

DISMISS SAVE



Click on **SAVE** after entering and selecting the Parameters.

This is how we can configure Modbus and view the details.

And for another slave do the same process by click on **ADD SLAVE DEVICE**.

The screenshot shows the 'Modbus Slave Devices' configuration page in the AG-221 interface. The left sidebar contains a navigation menu with items like Dashboard, Status, System, Modem, Bacnet, Services, Network, Modbus (selected), Modbus Master, VPN, Statistics, and Logout. The main content area has tabs for 'Modbus Config', 'Output Config', 'Advance Settings', and 'Log Messages'. The 'Modbus Config' tab is active, displaying a table of slave devices. One device is listed with details: Type: modbusrtu, Serial Port: /dev/ttyS1, Baudrate: 9600, Data Bits: 8, Parity Bit: N, Stop Bit: 1, Slave ID: 56, Polling Interval: 60sec, and a note that the slave has 14 pending changes. The device is currently enabled, as indicated by a checked checkbox. There are 'EDIT' and 'DELETE' buttons for this device. At the bottom of the page, there are 'SAVE & APPLY', 'SAVE', and 'RESET' buttons. A footer note states: 'Powered by LuCI Master (git-23.175.80454-1d5440a) / ArgonTheme v2.2.9.4 / Atreyo-OpenWrt 1.01 221019 unknown'.

Data output configuration

Click on Output configuration. There are two option:

1. Save Data to File.
2. Send Data to Server.

We can choose both options and then the data is both sent to the server and saved locally.

The screenshot shows the 'Output Settings' configuration page in the AG-221 interface. The left sidebar is the same as in the previous screenshot. The main content area has tabs for 'Modbus Config', 'Output Config', 'Advance Settings', and 'Log Messages'. The 'Output Config' tab is active, displaying the 'Output Configuration' section. It contains two checkboxes: 'Save Data to File' and 'Send Data to Server', both of which are currently unchecked. At the bottom of the page, there are 'SAVE & APPLY', 'SAVE', and 'RESET' buttons. The same footer note is present: 'Powered by LuCI Master (git-23.175.80454-1d5440a) / ArgonTheme v2.2.9.4 / Atreyo-OpenWrt 1.01 221019 unknown'.

If Save Data to File is selected, it is necessary to specify the folder path.

Send data to server

In Send Data to Server. There are 2 option:

- ATRA-DATA
- 3rd-PARTY-PLATFORM

Atra-Data is Atreyo's system for quick and easy presentation of data in the cloud. In the case of 3rd-PARTY-PLATFORM, we can choose any data platform that communicates using one of the selected ports: HTTP, MQTT or TCP/IP.

ATRA-DATA

ATRA-DATA. In This Data is send direct to the ATRA server without any aditional configuration.

AG-221

Dashboard
Status >
System >
Modem >
Bacnet
Services >
Network >
Modbus >
Modbus Master
VPN >
Statistics >
Logout

Modbus Config | **Output Config** | Advance Settings | Log Messages

Output Settings

Output Configuration

Save Data to File

Directory Path
Configure the path of directory that already exists

Send Data to Server

Connect To ATRA-DATA 3rd-PARTY-PLATFORM

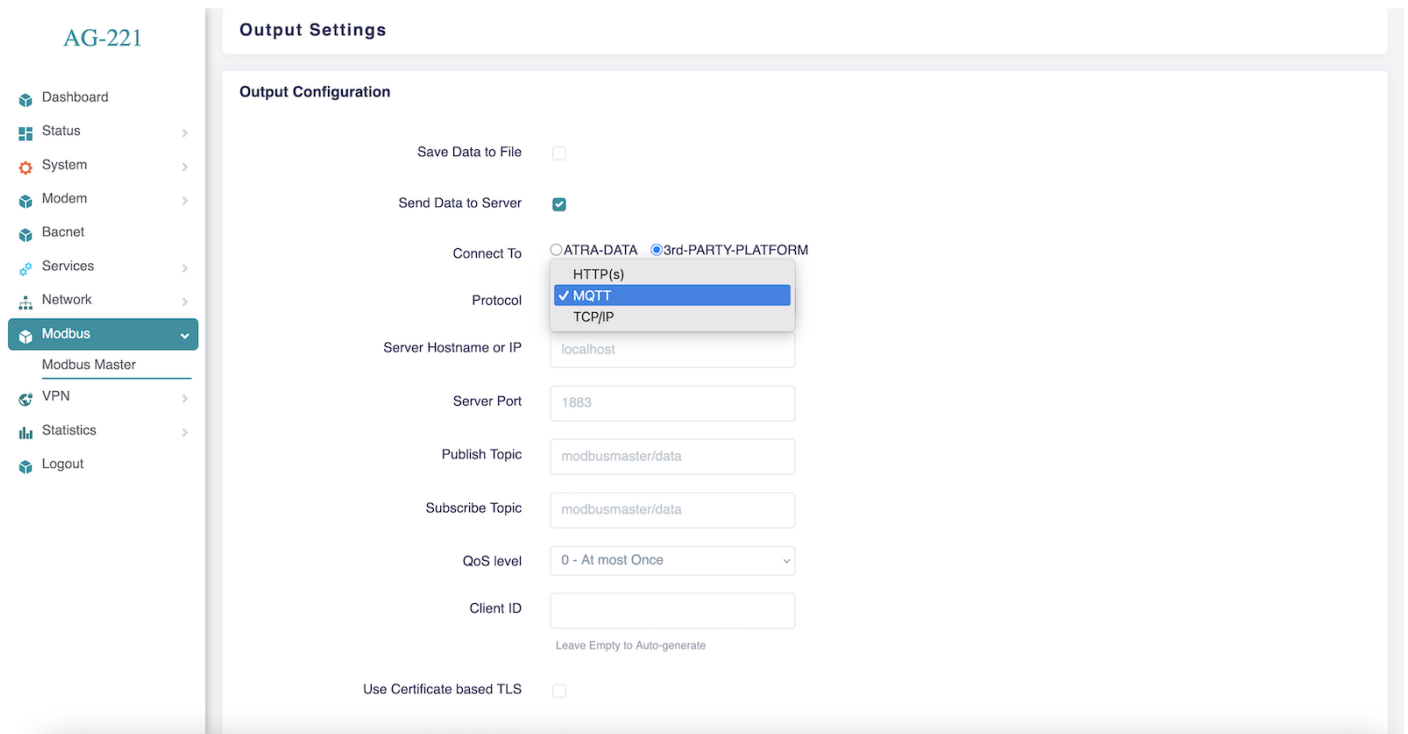
Add Slave information in Payload

SAVE & APPLY | SAVE | RESET

Powered by LuCI Master (git-23.175.80454-Id5440a) / ArgonTheme v2.2.9.4 / Atreyo-OpenWrt 1.01 221019 unknown

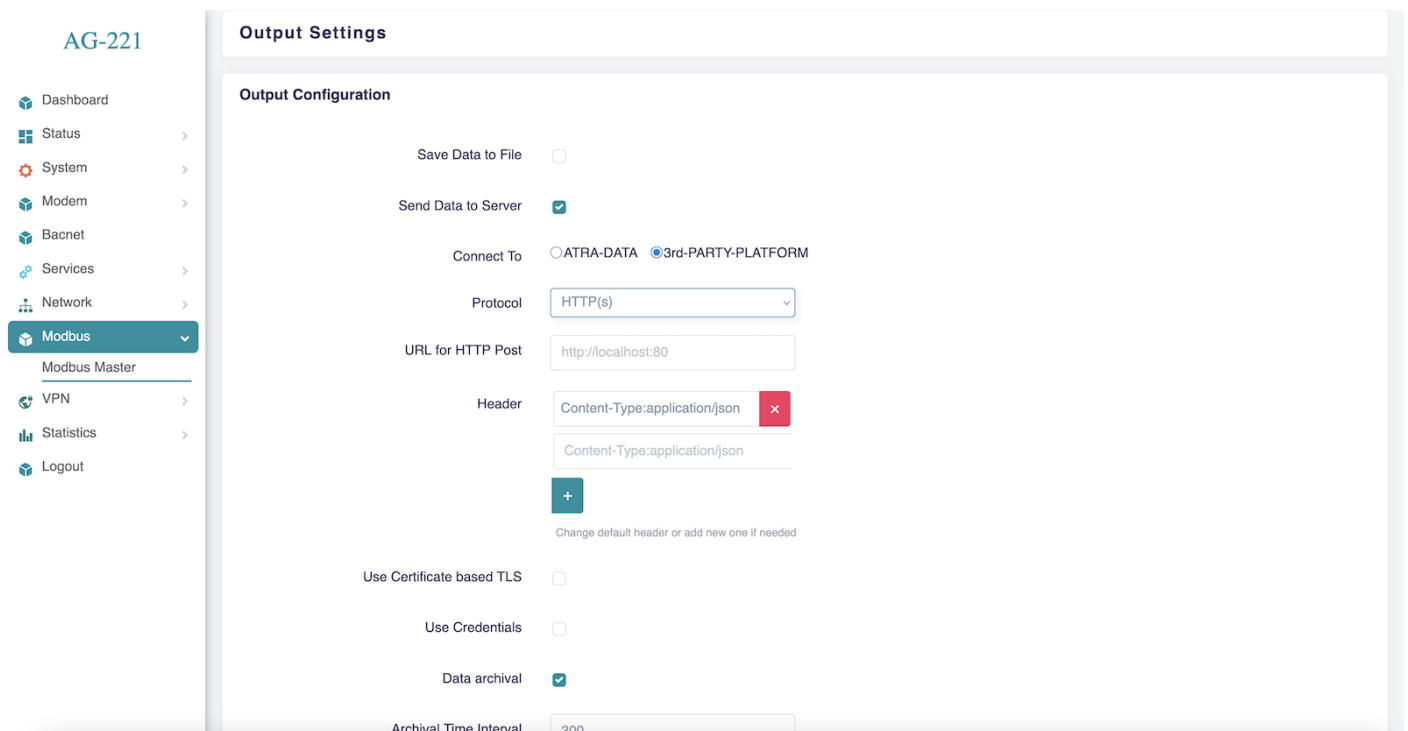
3rd-PARTY-PLATFORM.

There are some parameter required to select protocol – HTTP, MQTT, TCP/IP.



HTTP(s)

Enter the URL For HTTP Post and Header. Where able to Change default header or add new one if needed.



Certificates

To enhance security for data transmission, you can use **certificate-based TLS** along with **credentials**.

Certificate-based TLS (Transport Layer Security) require **CA(Certificate Authorities)** file,

Client Certificate and Private key

Credentials often require a username and password for authentication and access control in secure systems.

The screenshot shows the configuration page for AG-221 Modbus Master. The left sidebar contains a navigation menu with options: Dashboard, Status, System, Modem, Bacnet, Services, Network, Modbus (selected), Modbus Master, VPN, Statistics, and Logout. The main content area is titled 'Use Certificate based TLS' and is checked. Below this, there are three 'SELECT FILE...' buttons for CA File, Client Certificate, and Private Key. The 'Use Credentials' checkbox is unchecked. The 'Data archival' checkbox is checked, and the 'Archival Time Interval' is set to 300 seconds. The 'Payload Type' is set to 'List of Objects'. A note at the bottom states: 'Selecting Payload type 'List of Objects' and 'Single Object' will show a non-editable sample payload below. While by selecting 'Custom Payload' one can design their own payload schema.'

MQTT

Enter the Server **Hostname/IP**, **Server Port**, **Publish Topic** and **Subscribe Topic**. Select **QoS level** as per requirement and Client ID it is Auto-generate.

The screenshot shows the configuration page for AG-221 Modbus Master. The left sidebar is the same as in the previous image. The main content area is titled 'Connect To' and has two radio buttons: 'ATRA-DATA' (unchecked) and '3rd-PARTY-PLATFORM' (checked). The 'Protocol' is set to 'MQTT'. The 'Server Hostname or IP' is 'localhost', 'Server Port' is '1883', 'Publish Topic' is 'modbusmaster/data', and 'Subscribe Topic' is 'modbusmaster/data'. The 'QoS level' is set to '0 - At most Once'. The 'Client ID' field is empty, with a note below it: 'Leave Empty to Auto-generate'. The 'Use Certificate based TLS' checkbox is unchecked. The 'Use Credentials' checkbox is unchecked. The 'Data archival' checkbox is checked, and the 'Archival Time Interval' is set to 300 seconds. The 'Payload Type' is set to 'List of Objects'.

QoS (Quality of Service) level

- QoS 0 (At most once): Fast, no acknowledgment, possible message loss.
- QoS 1 (At least once): Acknowledged, possible duplicates.
- QoS 2 (Exactly once): Highest reliability, no duplicates, uses a four-step handshake.

Revision #3

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