

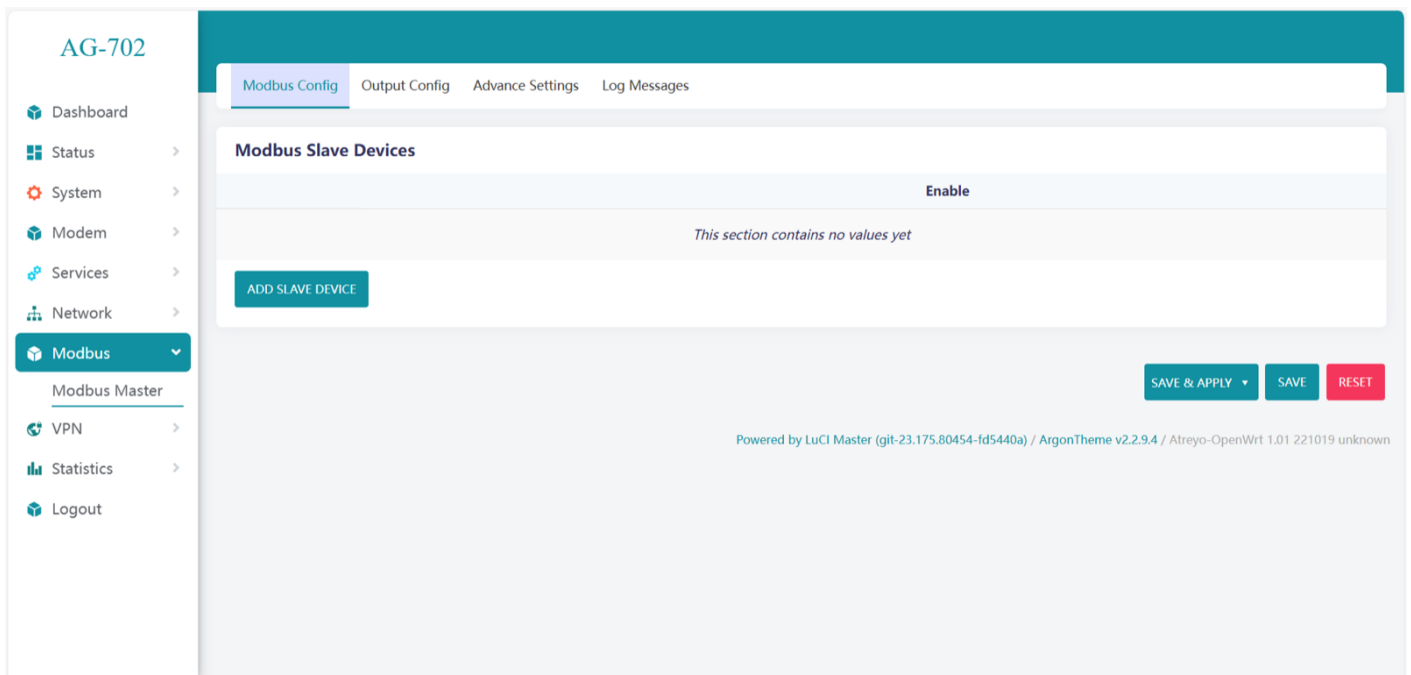
Modbus Master

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

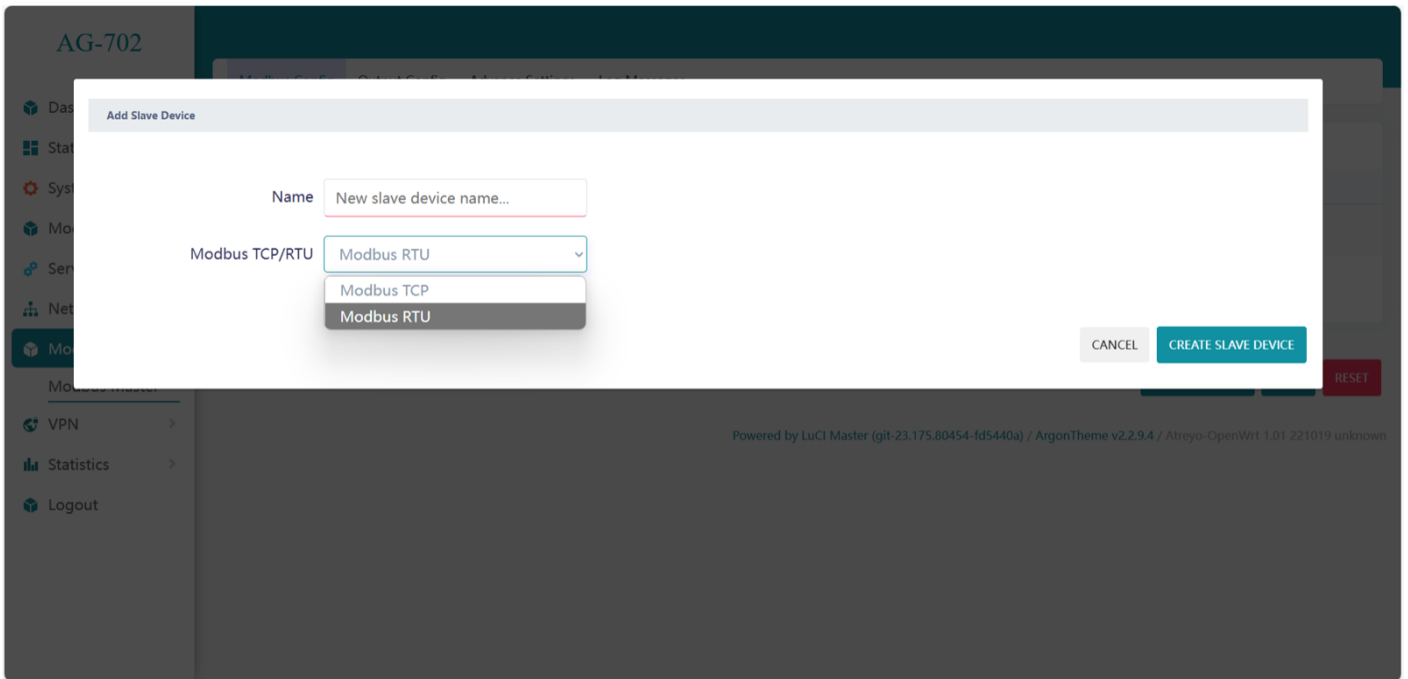
To open Modbus master, go to **Modbus > Modbus Master**

Add Slave Device in Modbus Slave Devices



The screenshot displays the web interface for Modbus Master configuration. On the left, a sidebar menu lists various system settings, with 'Modbus' expanded to show 'Modbus Master'. The main panel is titled 'Modbus Slave Devices' and features an 'Enable' toggle switch. Below this, a message states 'This section contains no values yet' and an 'ADD SLAVE DEVICE' button is visible. At the bottom right of the panel, there are three buttons: 'SAVE & APPLY', 'SAVE', and 'RESET'. The footer of the page provides system information: 'Powered by LuCI Master (git-23.175.80454-1d5440a) / ArgonTheme v2.2.9.4 / Atreyo-OpenWrt 1.01 221019 unknown'.

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

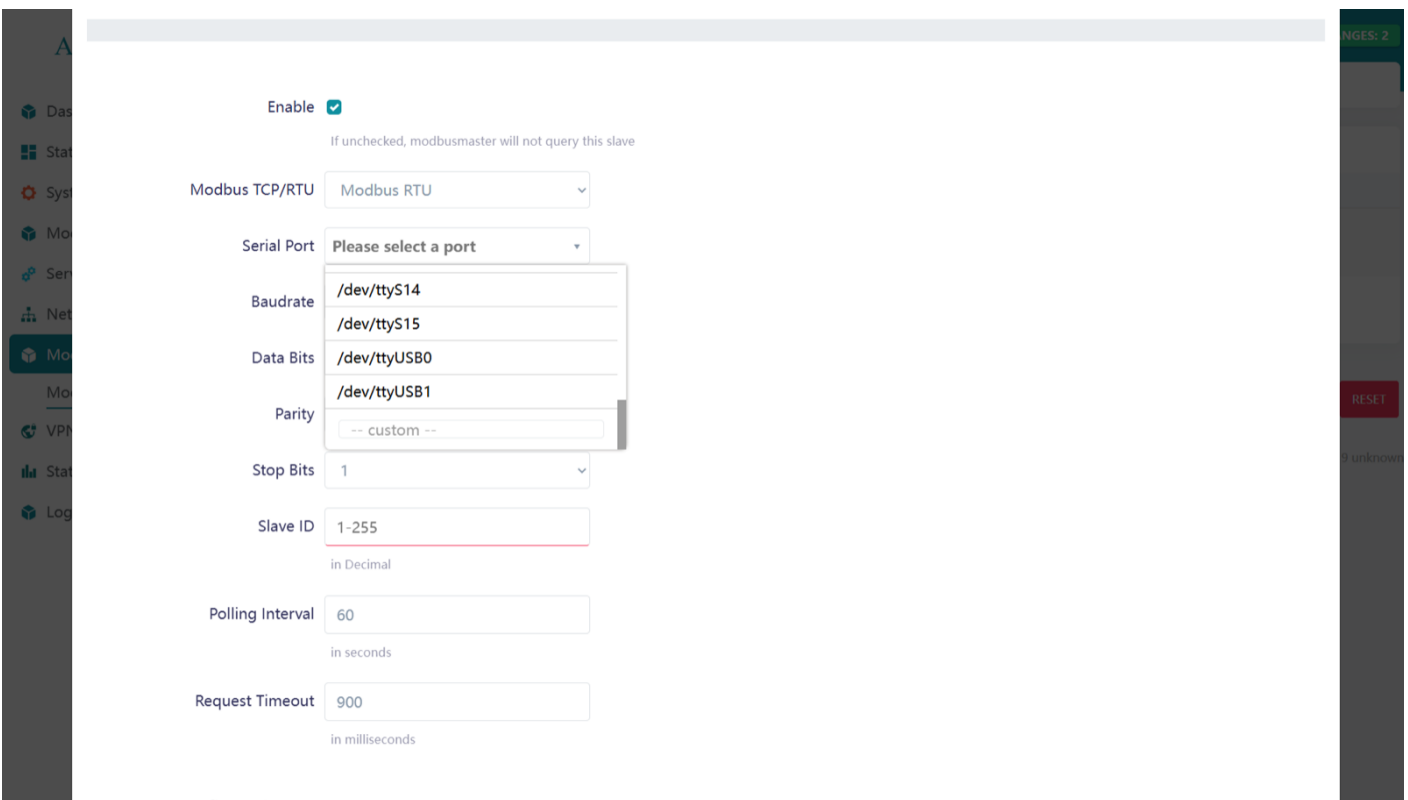


Modbus RTU

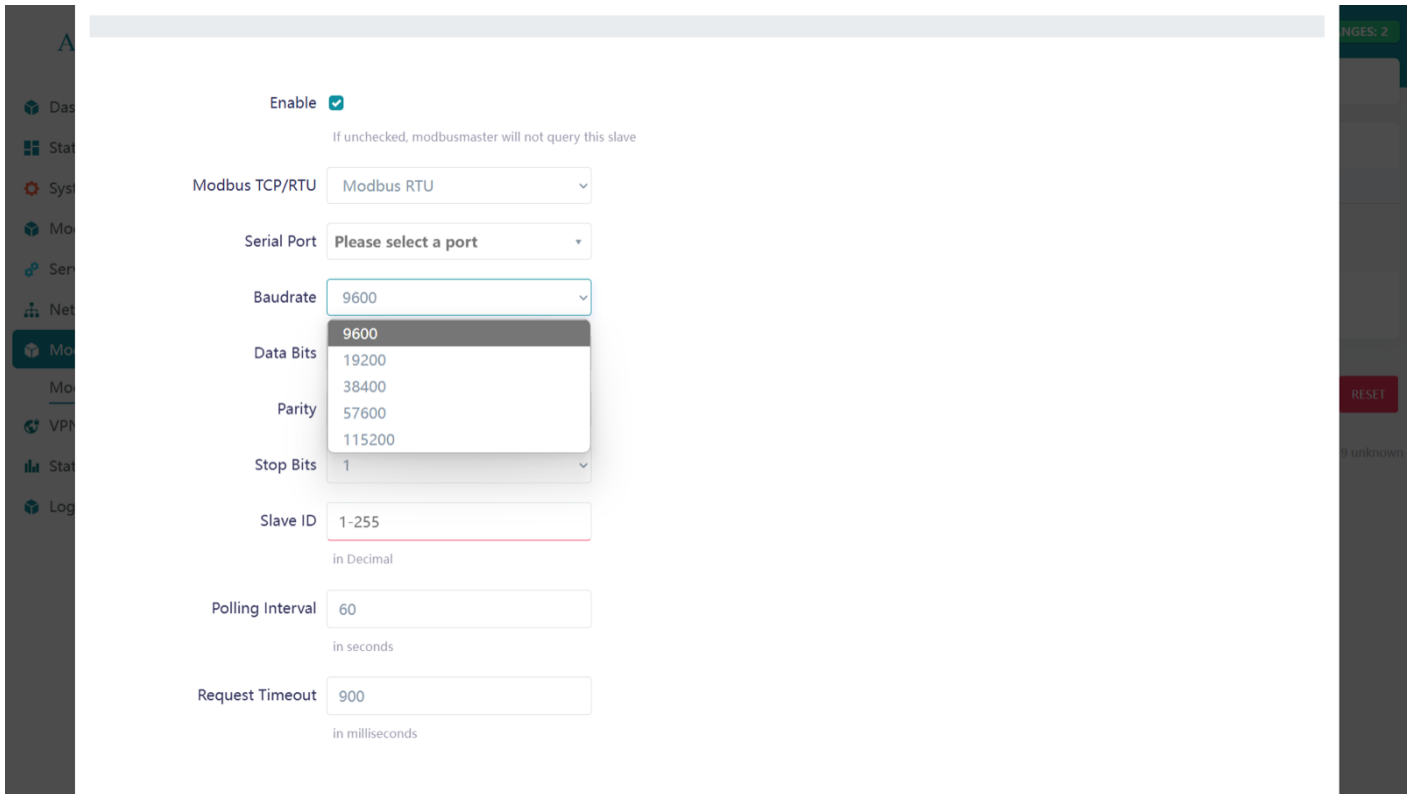
Need to enter the serial port configuration according to the slave device. Here in AG-702 serial port USB0 is for RS232 & USB1 is for RS485. If you use a USB to serial converter, you can customize the port name by adding another port.

/dev/ttyUSB0 = RS232

/dev/ttyUSB1 = RS485

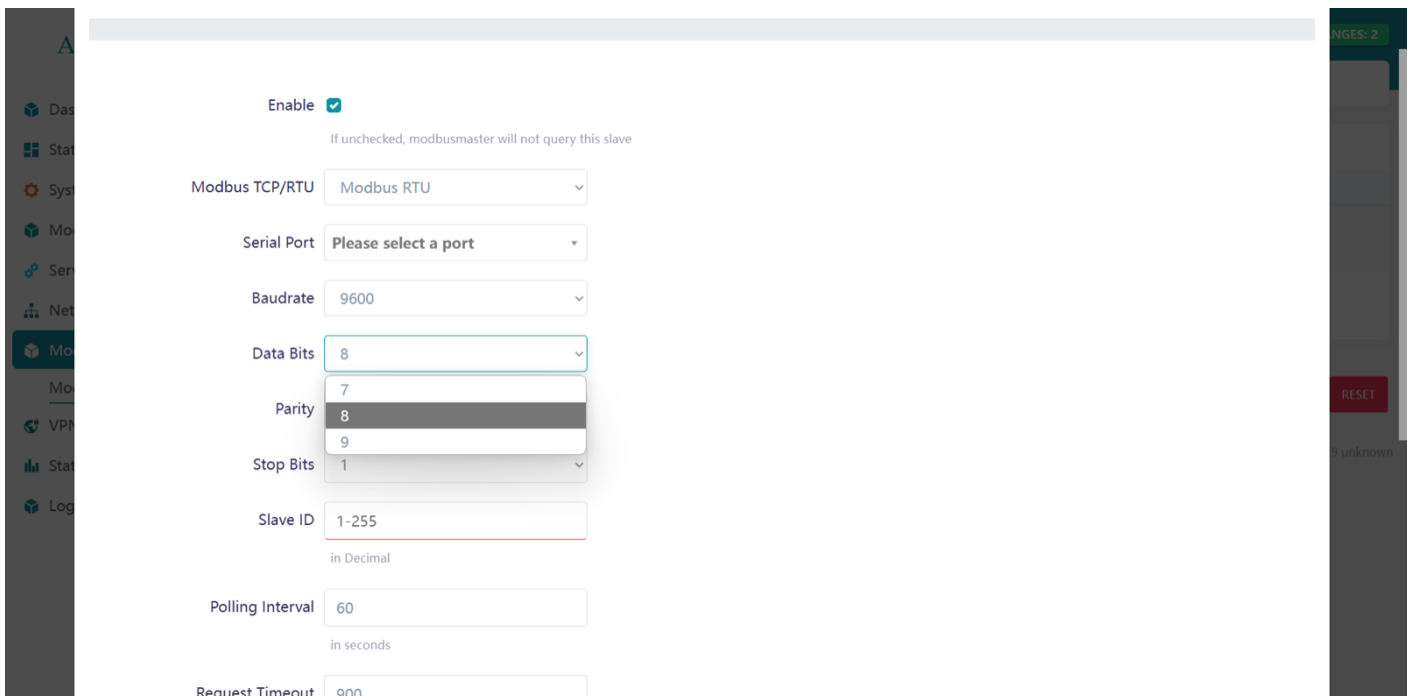


Change the baud-rate according to your slave device requirement. In Modbus RTU 9600 baud-rate is most common used.



The screenshot shows a configuration interface for a Modbus device. The 'Enable' checkbox is checked. The 'Modbus TCP/RTU' dropdown is set to 'Modbus RTU'. The 'Serial Port' dropdown is set to 'Please select a port'. The 'Baudrate' dropdown is set to '9600'. The 'Data Bits' dropdown menu is open, showing options: 9600, 19200, 38400, 57600, and 115200. The 'Parity' dropdown is set to '1'. The 'Stop Bits' dropdown is set to '1'. The 'Slave ID' text input is '1-255'. The 'Polling Interval' text input is '60'. The 'Request Timeout' text input is '900'.

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



The screenshot shows the same configuration interface as above, but with the 'Parity' dropdown menu open. The 'Data Bits' dropdown is now set to '8'. The 'Parity' dropdown menu shows options: 7, 8, 9, and 1. The 'Stop Bits' dropdown is set to '1'. The 'Slave ID' text input is '1-255'. The 'Polling Interval' text input is '60'. The 'Request Timeout' text input is '900'.

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

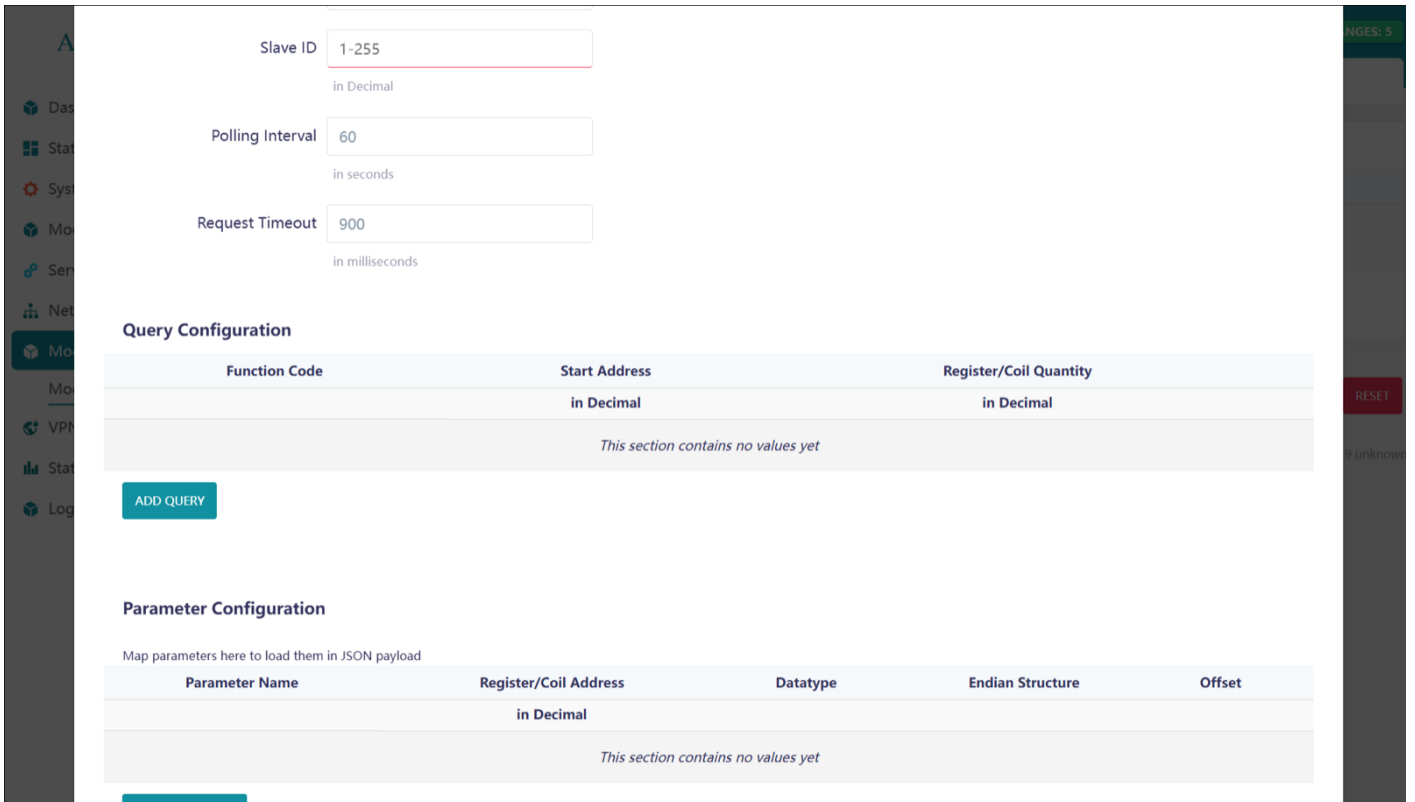
Function Code	Start Address in Decimal	Register/Coil Quantity in Decimal
<i>This section contains no values yet</i>		

ADD QUERY

Modbus slave

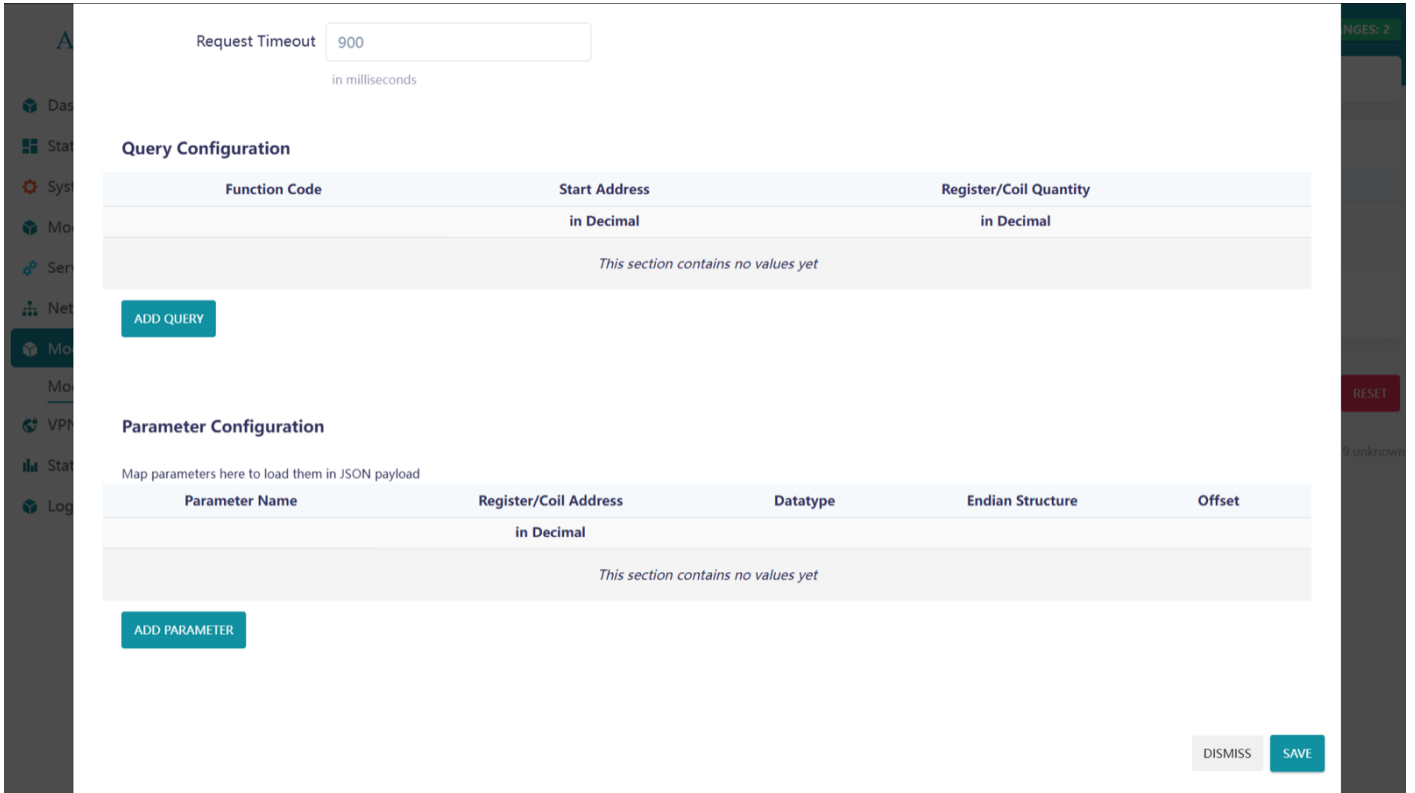
After entering these parameters, the next configuration steps are the same for both Modbus TCP and Modbus RTU.

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



Query Configuration

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



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			
03	0-65535	1-50	DELETE
04			
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			
<i>This section contains no values yet</i>				

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

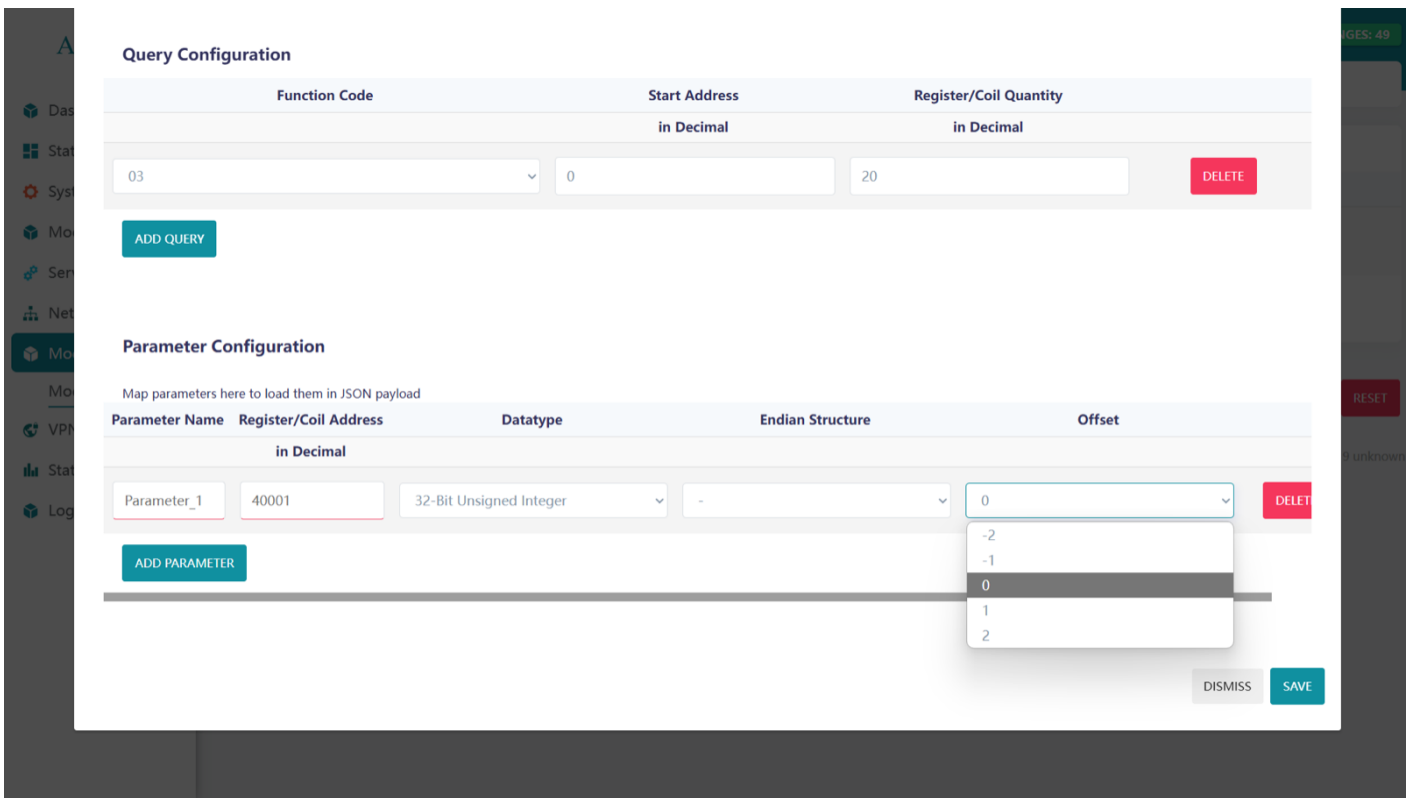
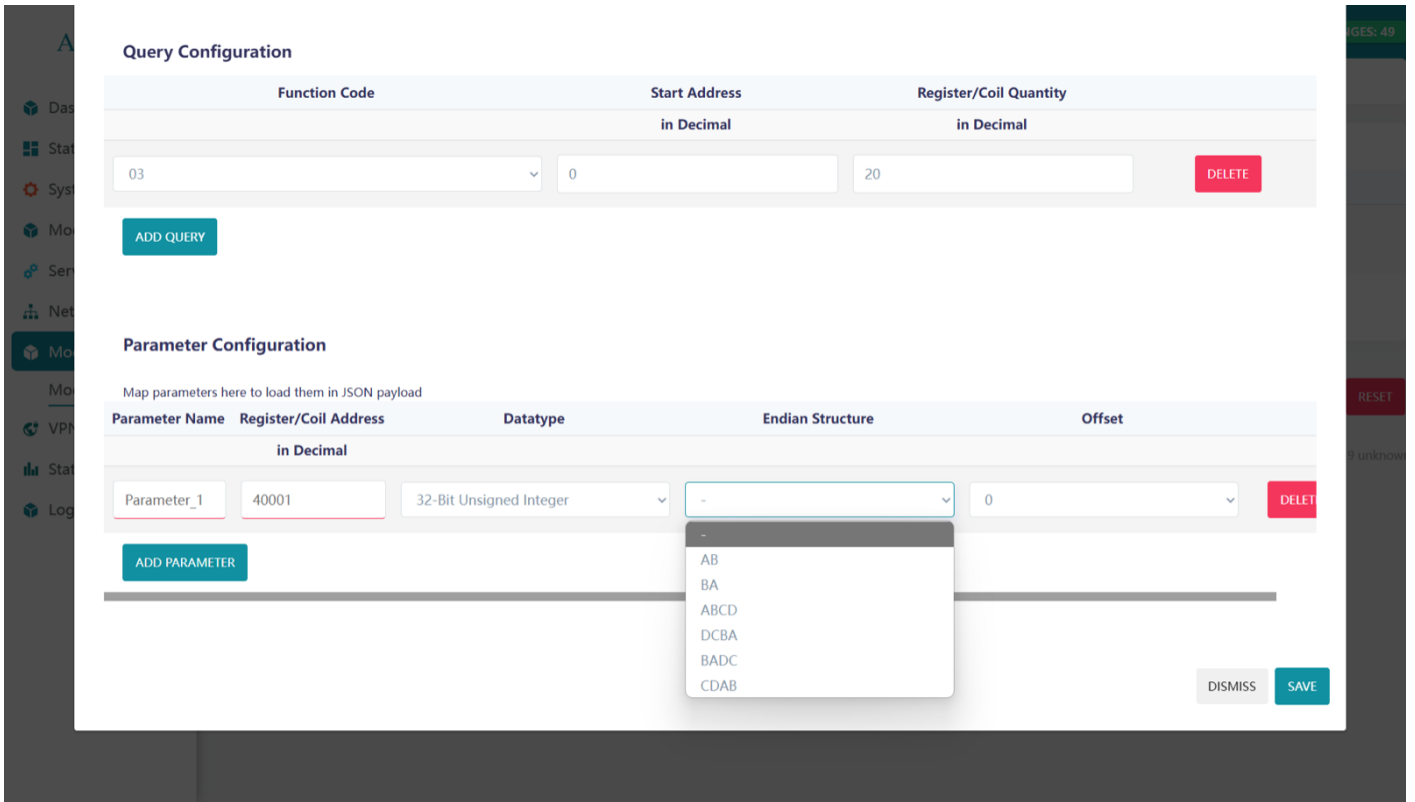
Map parameters here to load them in JSON payload

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**.

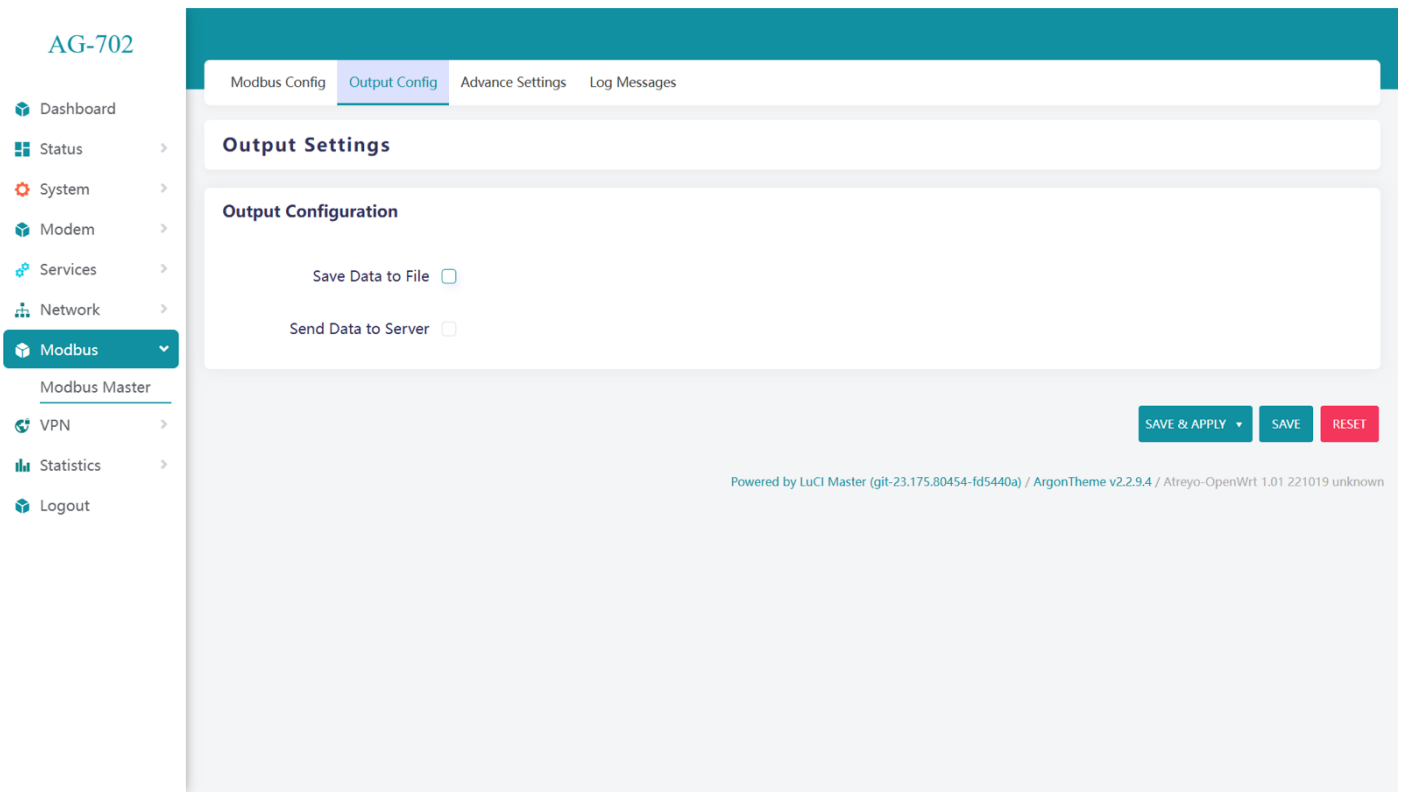
The screenshot shows a web interface for configuring Modbus Slave Devices. The page has a teal header with navigation tabs: "Modbus Config" (selected), "Output Config", "Advance Settings", and "Log Messages". Below the header is a section titled "Modbus Slave Devices" with an "Enable" toggle. A table lists a single device, "Slave01", with the following details: Type: modbusrtu, Serial Port: /dev/ttyUSB0, Baudrate: 9600, Data Bits: 8, Parity Bit: N, Stop Bit: 1, and Polling Interval: 60sec. The device has "Defined queries: 1" and "Defined parameters: 1". Action buttons for "EDIT" and "DELETE" are present. An "ADD SLAVE DEVICE" button is at the bottom left. At the bottom right, there are "SAVE & APPLY", "SAVE", and "RESET" buttons. The footer text reads: "Powered by LuCI Master (git-23.175.80454-fd5440a) / 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.



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 additional configuration.

- Dashboard
- Status
- System
- Modem
- 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**

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3rd-PARTY-PLATFORM.

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

- Dashboard
- Status
- System
- Modem
- Services
- Network
- Modbus**
- Modbus Master
- VPN
- Statistics
- Logout

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

Protocol

Server Hostname or IP

Server Port

Publish Topic

Subscribe Topic

QoS level

Client ID
Leave Empty to Auto-generate

Use Certificate based TLS

Use Credentials

Payload Type List of Objects

HTTP(s)

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

AG-702

Dashboard

Status

System

Modem

Services

Network

Modbus

Modbus Master

VPN

Statistics

Logout

Send Data to Server

Connect To ATRA-DATA 3rd-PARTY-PLATFORM

Protocol

URL for HTTP Post

Header

Content-Type:application/json

Content-Type:application/json

+

Change default header or add new one if needed

Use Certificate based TLS

Use Credentials

Payload Type List of Objects

Single Object

Custom Payload

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.

Add Slave information in

Payload

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.

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

URL for HTTP Post

Header

+

Change default header or add new one if needed

Use Certificate based TLS

CA File

Client Certificate

Private Key

Use Credentials

Username

Password

Payload Type List of Objects
 Single Object
 Custom Payload

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.

Add Slave information in

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.

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

Send Data to Server

Connect To ATRA-DATA 3rd-PARTY-PLATFORM

Protocol

Server Hostname or IP

Server Port

Publish Topic

Subscribe Topic

QoS level

Client ID

Leave Empty to Auto-generate

Use Certificate based TLS

Use Credentials

Payload Type List of Objects
 Single Object
 Custom Payload

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.

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.

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