

SenseLiveX7700D/7900

LoRa Gateway & Modbus

RTU to JSON

Configuration Datasheet

LoRa to RS232/485/442&TCP/IP



Catalogue

1. Introduction	3
2. Technical Parameters.....	3
3. Software Installation	4
4. Hardware Connection	4
5. Parameter Configuration	6
6. Control Panel Setting	8
7. Modbus Communication Settings	9
8. MQTT Communication Settings.....	10
9. JSON Creation.....	12
10. Output on MQTT Explore.....	14

1. Introduction:-

SLX7700D-7900: LORA enables long-range, low-cost wireless communication without monthly fees, outperforming WiFi and Zigbee in distance. The LORA devices use the SX1287 chip with -140dBm sensitivity and +20dBm power, achieving up to 8km outdoor range with low power consumption.

- **SLX7700D (Serial to LORA):** Supports RS232/485/422 for wireless serial communication.
- **SL7900 (Ethernet to LORA):** Connects LORA to the Internet, enabling Modbus TCP, JSON, and TCP/IP data transfer.

2. Technical Parameters:-

Data	Working voltage	DC9~24V
	Working current	9700 : 30mA@12V 9743 : 160mA@12V
	Environment Temperature	-40°C~85°C
	Environment humidity	< 95%RH
	Respond speed	The default wireless configuration of the 9600bps takes 70 milliseconds to send and receive 1 byte of data.
Wireless Communication	Transmit Distance	The outdoor area has no shelter of 6km~8km, and the indoor area crosses about 5 floors.
	Frequency range	410MHz~525MHz
	wireless channel	115
	Receiving sensitivity	-140dbm
	Transmission power	20dbm

	Modulation method	LoRa™ Patented modulation technology
	Wireless Connection	External SMA male antenna, suction cup antenna 1 meters; Working frequency : 490MHz
cable communication	Serial Port Data	Baud Rate : 1200~115200bps ; Check Bits : None, Even, Odd ; Digit 8 ; Stop bits 1。
	Ethernet Protocol	(Only 7900 support TCP/IP protocol) ETHERNET、 IP、 TCP、 UDP、 HTTP、 ARP、 ICMP、 DHCP、 DNS
Outline	Interface	485/422 : Terminal ; 232 : DB9 ; Ethernet : RJ45
	Power Supply	Positive inside and negative outside, standard power socket
	Size	L x W x H =9.4cm×6.5cm×2.5cm

3. Software Installation:-

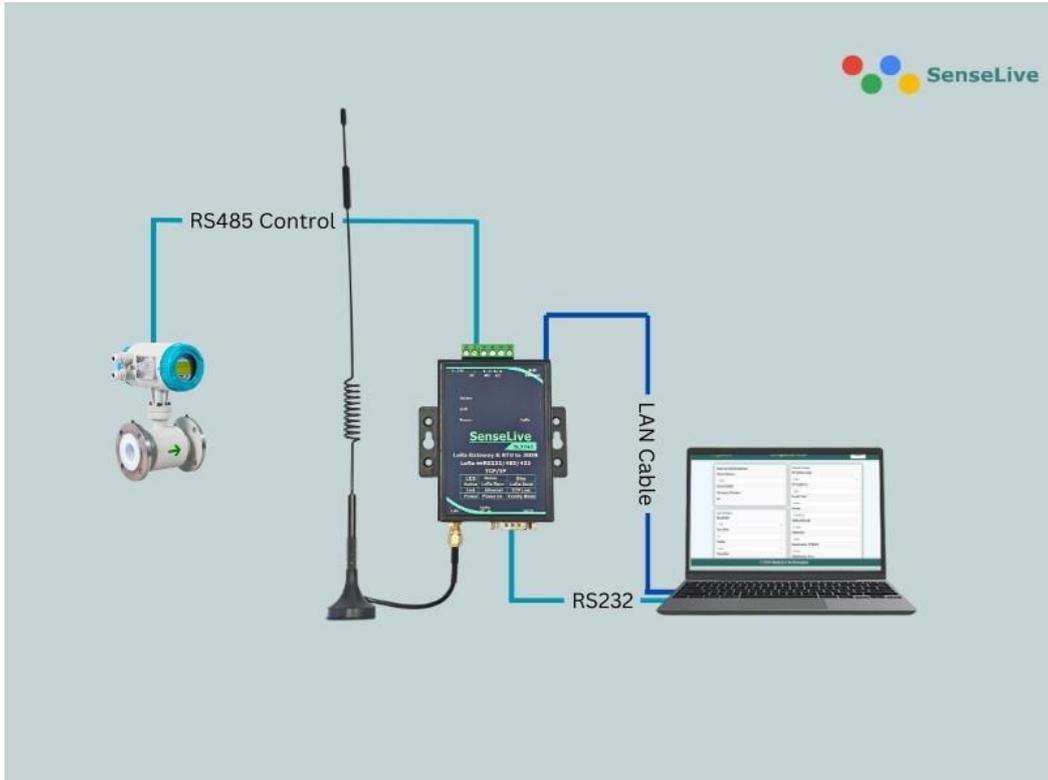
To download Vicrom software just click on the below link

<http://senselive.io/download/software/SLVirCom.zip>

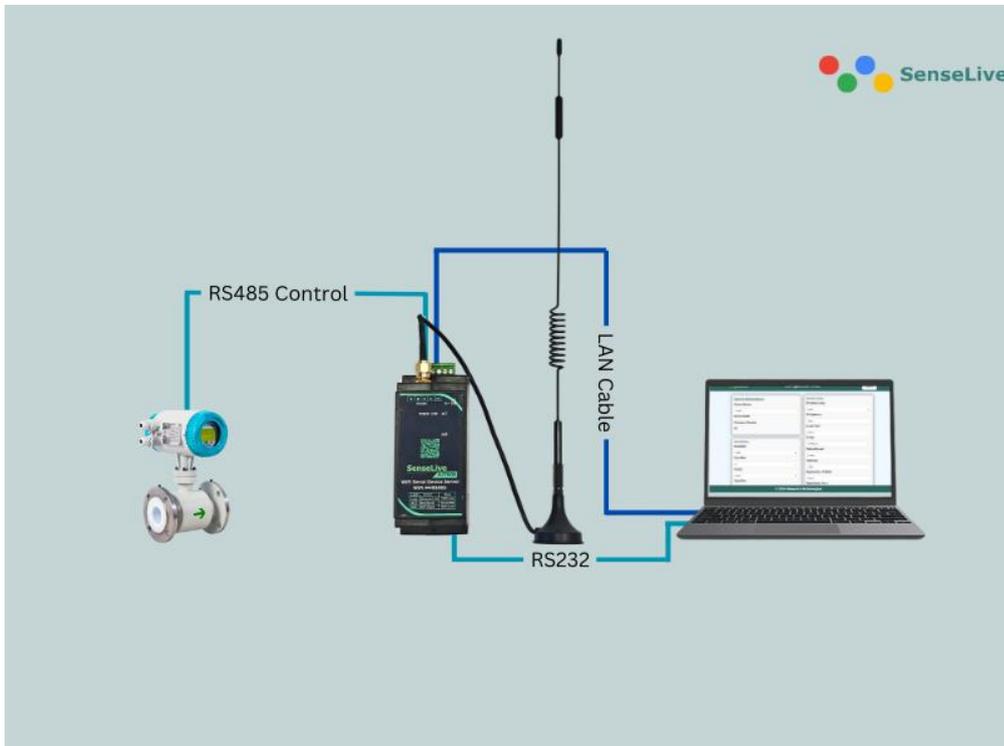
4. Hardware Connection:-

- **Power Supply:** Connect on-site 2-wire power to positive and negative terminals.
- **Serial Port:** Connect based on user device. For the first 485 port, connect 485+ to 1A and 485- to 1B.
- **Network:** Use a standard network cable to connect directly to a computer or through a switch.

1. SLX7900:-



2. SLX7700D:-



5. Parameter Configuration:-

1. After installing Vircom and connecting the hardware, run the software and click on "Device Management."

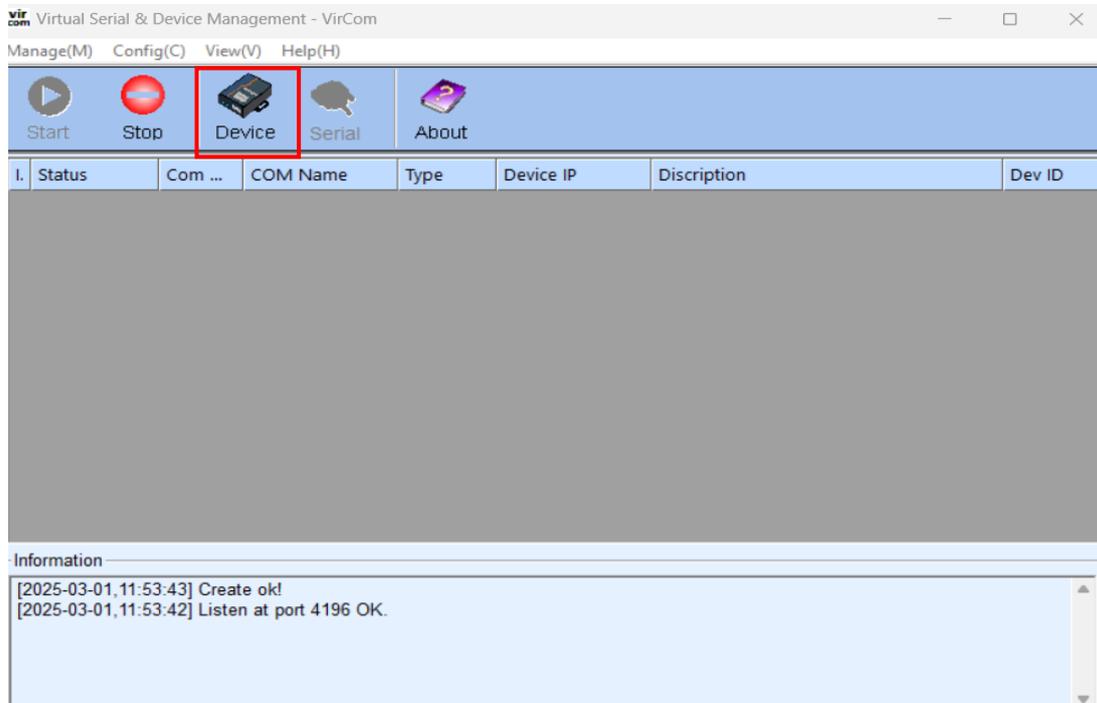


Fig. 1 Vircom Main Interface

2. In device interface click on "Auto search". As you can see, the connected device is visible in the Device Manager, as shown in Figure 2.
3. Click "Edit Device" to set the parameters.

L...	Ty...	Name	type	f	Dev IP	Loc...	Dest IP	Work Mode	TCP ...	Virtual S...	Vircom St...	Dev ID	T...	R...	
1	Su...	SL5143D			192.168.1.200	0	192.168.1.3	TCP Client	Not ...	Haven't ...	Not Linked	8819AA78	0	0	Auto Search

Buttons in sidebar: Edit Device, Batch Edit, Search Serial, Add Manually, P2P Device, IO Controller, Search List, Back.

Fig. 2 Device List

- IN network setting you have to change IP address, port and baud rate and then click “modify setting”.

Device Settings

Device Info

- Virtual Serial: Not Use
- Dev Type: [Empty]
- Dev Name: SL5143D
- Dev ID: 28788B19AA78
- MAC Addr: 04EEE819AA90
- Firmware Ver: V1.470

Function of the device

- Web Download
- DNS System
- REAL_COM Protocol
- Modbus TCP To RTU
- Serial Commnad
- DHCP Support
- Storage Extend
- Multi-TCP Connection

Network

- IP Mode: Static
- IP Address: 192 . 168 . 1 . 200
- Port: 501
- Work Mode: TCP Server
- Net Mask: 255 . 255 . 255 . 0
- Gateway: 192 . 168 . 1 . 1
- Dest. IP/Domain: 192.168.1.3
- Dest. Port: 1883

Serial

- Baud Rate: 9600
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Flow Control: None

Advanced Settings

- DNS Server IP: 8 . 8 . 4 . 4
- Dest. Mode: Dynamic
- Transfer Protocol: None
- Keep Alive Time: 60 (s)
- Reconnet Time: 12 (s)
- Http Port: 80
- UDP Group IP: 230 . 90 . 76 . 1
- Register Pkt: [Empty]
- Restart If No Data: every 300 Sec.
- Enable Parameter Send: every 5 Min.
- Max Frame Length: 1300 (Byte)
- Max Interval(Smaller Is Better): 3 (Ms)

Buttons: Get Default, Save As Default, Load Default, Modify Key, Firmware/Config, Restart Dev, **Modify Setting**, Cancel.

Fig. 3 Device setting

6. Control Panel Setting:-

Open the control panel → Click Network and Internet → Click Network and Sharing Center → Click Change adapter settings → Open IPv4 Properties, Right-click on your active network connection (Ethernet/Wi-Fi) → Click Properties.

To Connect to a Network (LAN or Internet)

Add the network credential, it need to be same as your device but last two digit should be different.

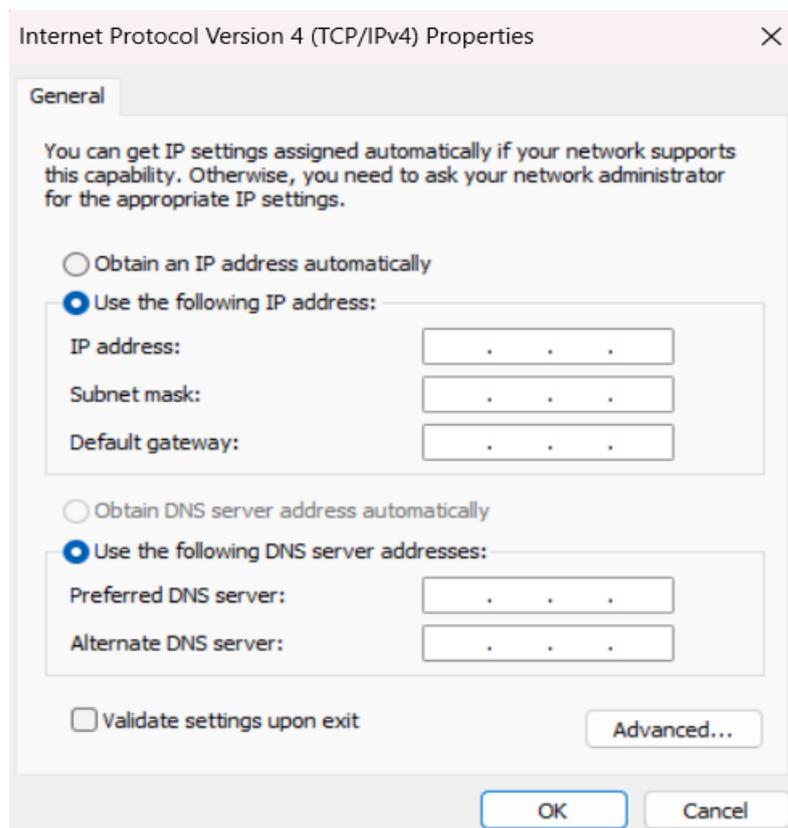
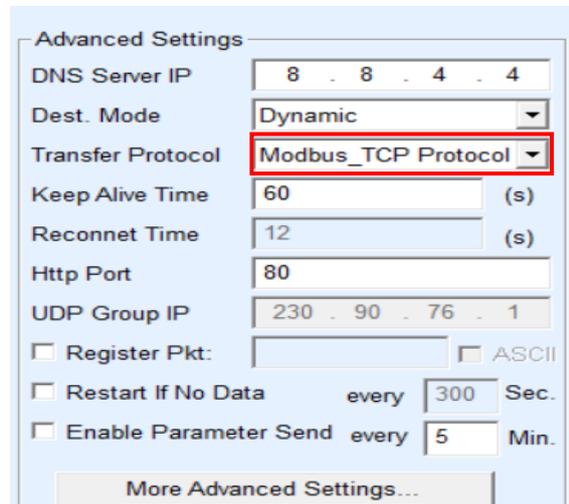


Fig.4 To Connect to a Network (LAN or Internet)

7. Modbus Communication Settings :-

1. In advance setting, set transfer protocol as Modbus_TCP protocol.



Advanced Settings

DNS Server IP: 8 . 8 . 4 . 4

Dest. Mode: Dynamic

Transfer Protocol: **Modbus_TCP Protocol**

Keep Alive Time: 60 (s)

Reconnet Time: 12 (s)

Http Port: 80

UDP Group IP: 230 . 90 . 76 . 1

Register Pkt: ASCII

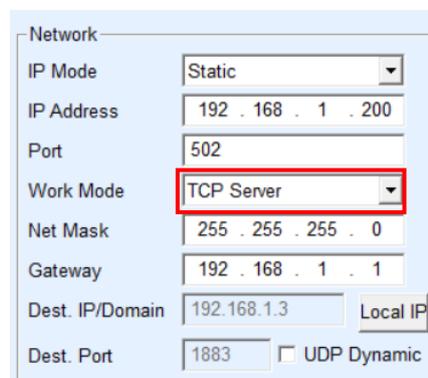
Restart If No Data every 300 Sec.

Enable Parameter Send every 5 Min.

More Advanced Settings...

Fig.5 Enable Modbus TCP Function

2. In network setting, set work mode as TCP server and then click on “modify setting”.



Network

IP Mode: Static

IP Address: 192 . 168 . 1 . 200

Port: 502

Work Mode: **TCP Server**

Net Mask: 255 . 255 . 255 . 0

Gateway: 192 . 168 . 1 . 1

Dest. IP/Domain: 192.168.1.3

Dest. Port: 1883 UDP Dynamic

Fig.6 Modbus TCP as client.

8. MQTT Communication Settings :-

1. In device setting interface click on firmware configuration as show in fig 7.
2. In configuration save location select folder which is created on your PC, as show in fig 8.
3. Then click on MQTT configuration.

Device Settings

Device Info

- Virtual Serial: Not Use
- Dev Type:
- Dev Name: SL5143D
- Dev ID: 28788B19AA78
- MAC Addr: 04EEE819AA90
- Firmware Ver: V1.470

Function of the device

- Web Download
- DNS System
- REAL_COM Protocol
- Modbus TCP To RTU
- Serial Commnad
- DHCP Support
- Storage Extend
- Multi-TCP Connection

Network

- IP Mode: Static
- IP Address: 192 . 168 . 1 . 200
- Port: 501
- Work Mode: TCP Server
- Net Mask: 255 . 255 . 255 . 0
- Gateway: 192 . 168 . 1 . 1
- Dest. IP/Domain: 192.168.1.3 Local IP
- Dest. Port: 1883 UDP Dynamic

Serial

- Baud Rate: 9600
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Flow Control: None

Advanced Settings

- DNS Server IP: 8 . 8 . 4 . 4
- Dest. Mode: Dynamic
- Transfer Protocol: None
- Keep Alive Time: 60 (s)
- Reconnet Time: 12 (s)
- Http Port: 80
- UDP Group IP: 230 . 90 . 76 . 1
- Register Pkt: ASCII
- Restart If No Data every 300 Sec.
- Enable Parameter Send every 5 Min.
- More Advanced Settings...
- Framing Rule:
 - Max Frame Length: 1300 (Byte)
 - Max Interval(Smaller Is Better): 3 (Ms)

Buttons: Get Default, Save As Default, Load Default, Modify Key, **Firmware/Config**, Restart Dev, Modify Setting, Cancel

Fig.7 Device Setting

Webpage&code download tool

Direct download mode

- Configuration save location: C:\Users\haris\OneDrive\Desktop\SL5143D
- Special configs:
 - Config file source: Read from local directory
 - Modbus cfg. **MQTT cfg.** **JSON cfg.** Reg packet Cmd change HTTP cfg. Param file
 - Clear local dir.

Code file download mode

- Select code file: C:\firmware.bin

Download through the network

- Device IP address or domain: 192.168.1.200
- Download port (Don't modify): 1092

Download through serial port

- Serial port:
- Baud Rate: 115200

Flash size: 256 KB

DevID: 28788B19AA78 Bind ID

Please close any other configuration window before downloading.

Download

Fig.8 firmware configuration

MQTT settings

Port for MQTT (only supported by XX12 series):	1
MQTT server IP:	192.168.1.3
MQTT server port:	1883
User name:	Sense2023
Key:	*****
MQTT ID (Unique):	
Subscribe Topic1:	mqttsub
Subscribe Topic2:	
Subscribe Topic3:	
Publish Topic:	Sense/Live/SL5143D

Fig.9 MQTT Setting

4. Configure the MQTT Broker, MQTT server IP, port, username, password, subscribe topic, publish topic and save it, then click on "Download" as you see in fig 8 .

9. JSON Configuration:-

1. After configuring MQTT, return to the firmware configuration interface and click on the JSON configuration, as shown in Figure 8, Download JSON.
2. To set (water, energy) meters parameter, Click on the "JSON upload".
3. Add slave address.
4. Add the corresponding JSON keyword to store multiple readings of the energy meter. This keyword can be a number or a character, depending on the energy meter.

JSON To Modbus RTU Settings

Config and Options

Select port (only supported by XX12 series): Time sharing collection for each port

Time zone: The keyword name is Unicode encoding

1. Data transmit interval to (ms, range: 100 - 31718940, max 8.8hours, 0 is no send)

Enable short link, when time come start link, then wait ms for establish TCP connection

Then send data, then after 1s close connection. Upload according to NTP time.

2. Select the cloud platform to access:

3. The Uplayer Protocol of JSON:

GET/POST URL(not include the ahead "http://")

The Variable Name of the POST(No need for pure json):

4. Add prefix to upload data(e.g. 01 02): Format:

Reg packet (sent when connecting to server):

5. After times of upload, serial send data: Condition(Def. empty):

Design timing send serial command table(support transparent transmission when NO JSON):

6. Add or Remove Modbus Registers:

7. Click to save JSON settings and display the results:

8. Export/Import config file.

```
{
  "":0,
  "":0,
  "":0,
  "":0
}
```

Fig.10 MQTT Setting

5. Add the Modbus function code so that you know which number corresponds to which function.
6. Add register address as per energy meter.

7. Then, click on "Enter Next." The register address will increase by 1, and you must assign the corresponding JSON keyword one by one after every click.
8. Click on "Save and Exit." The saved JSON parameters will be visible. Then, go back to firmware configuration interface and click on "Download as show in fig 8."

Following is the 1. th design of register. It has been added:

JSON node data type: Object data(Default value, including this node and later ones with { }, need Input JSON keyword)
 Array data(including data by [], without JSON keyword)

Other Data source
 Current Time Format: 2025-02-22 16:05:10
 Fixed String: No quotation

Corresponding JSON Keyword: 1 Data source: Modbus RTU

Modbus RTU Settings
 - Slave Address: 1 - IP: 0 . 0 . 0 . 0
 - Modbus Function Code: 3 - Port: 502
 - Register Address: 0

645/698 Protocol
 - 645/698 Version: 97 Version - Read FE numbers: 0
 - Device ID(6B): 000000000001 - Write FE numbers: 0
 - Data type: 9410 - 698 Data type: Total positiv
 - Keep invalid 0 - 698 Client Addr(CA): 0

1. Data length: 2 Bytes. 4 Bytes order: Big Endian (AI) (big-endin 4 bytes: Data ABCD, low address store 2 bytes AB)
 2. Decimal point places: 4 digit. After get as intenger left shift the decimal point.
 3. Enable shift and scale: Subtract integer: 0 then divide float: 1 Register is float
 4. Data format: Unsigned int Bool value at postion bit: 1
 5. Add unit name to rear:
 6. Add quotation to data:
 7. The Period between two RTU cmd: 100 (ms) minimum 10. 100ms for 9600bps, and 500ms for 2400bps.
 If timeout wait more: 0 (ms), before send next command. Set 0 to disable this function.
 8. Transmit data to server when data changes:
 9. If RS485 device offline, set special value: Special value type: Special va , special value: 0 .Set data to 1 if online:
 10. Enable overrun alarm: , minimum normal value: 0 maximum normal value: 0

Embedded JSON Related
 Enter Embedded Exit Embedded

Design and View
 Enter Next Del and Next

Exit Design
 Save and Exit Cancel and Exit

Fig.11 Add JSON node

10. Output on MQTT Explore:-

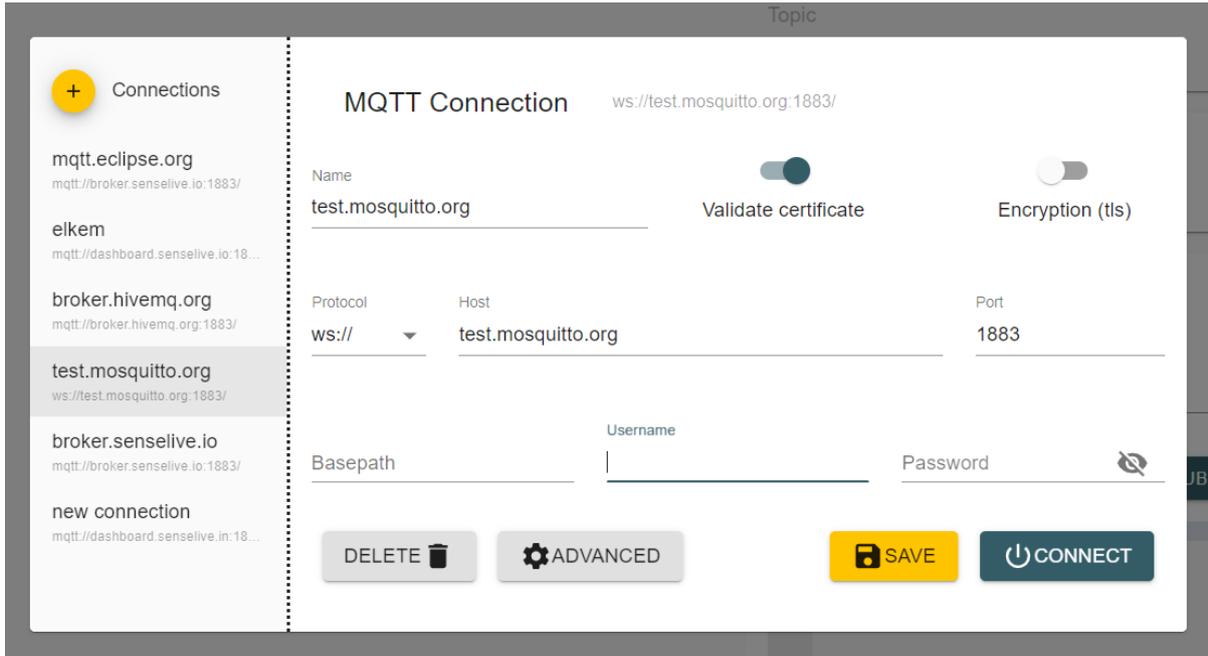


Fig.12 MQTT Explore Application

➤ You can search the topic which is configure in device.

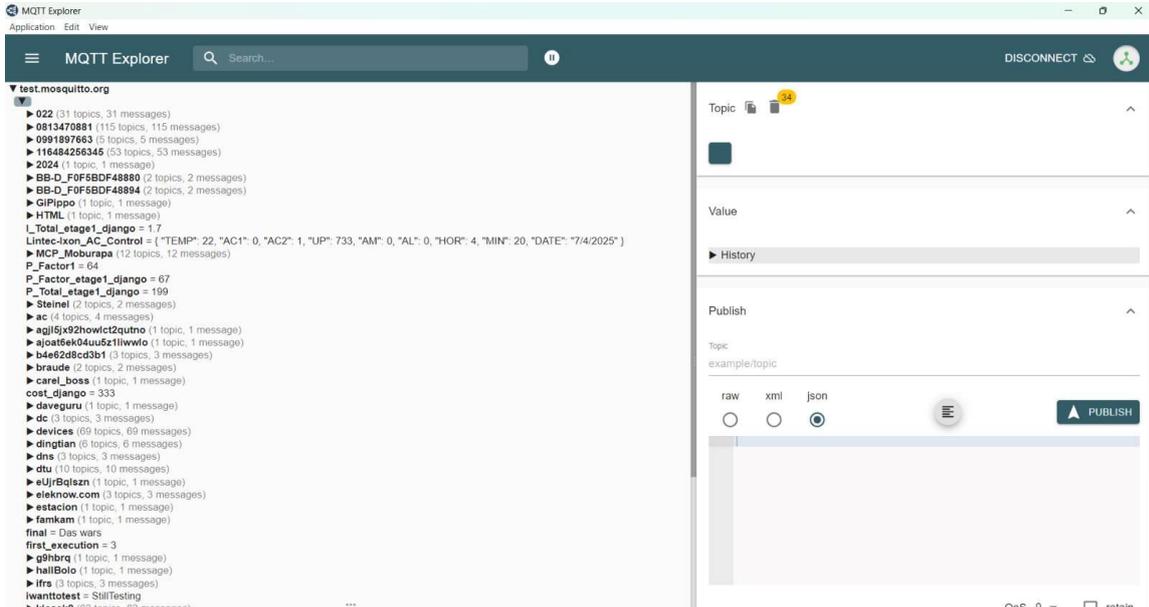


Fig.13 Broker interface