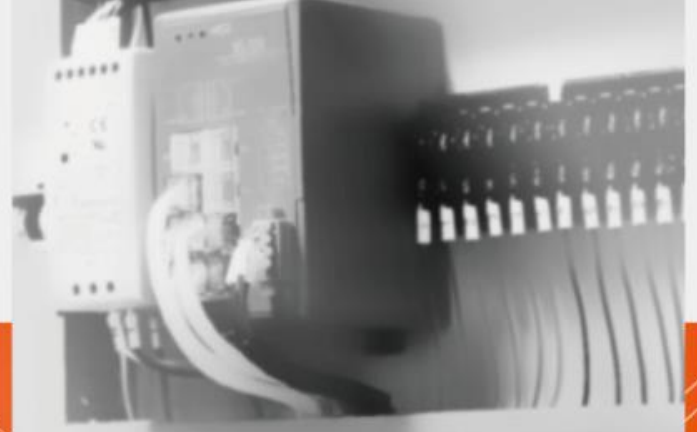
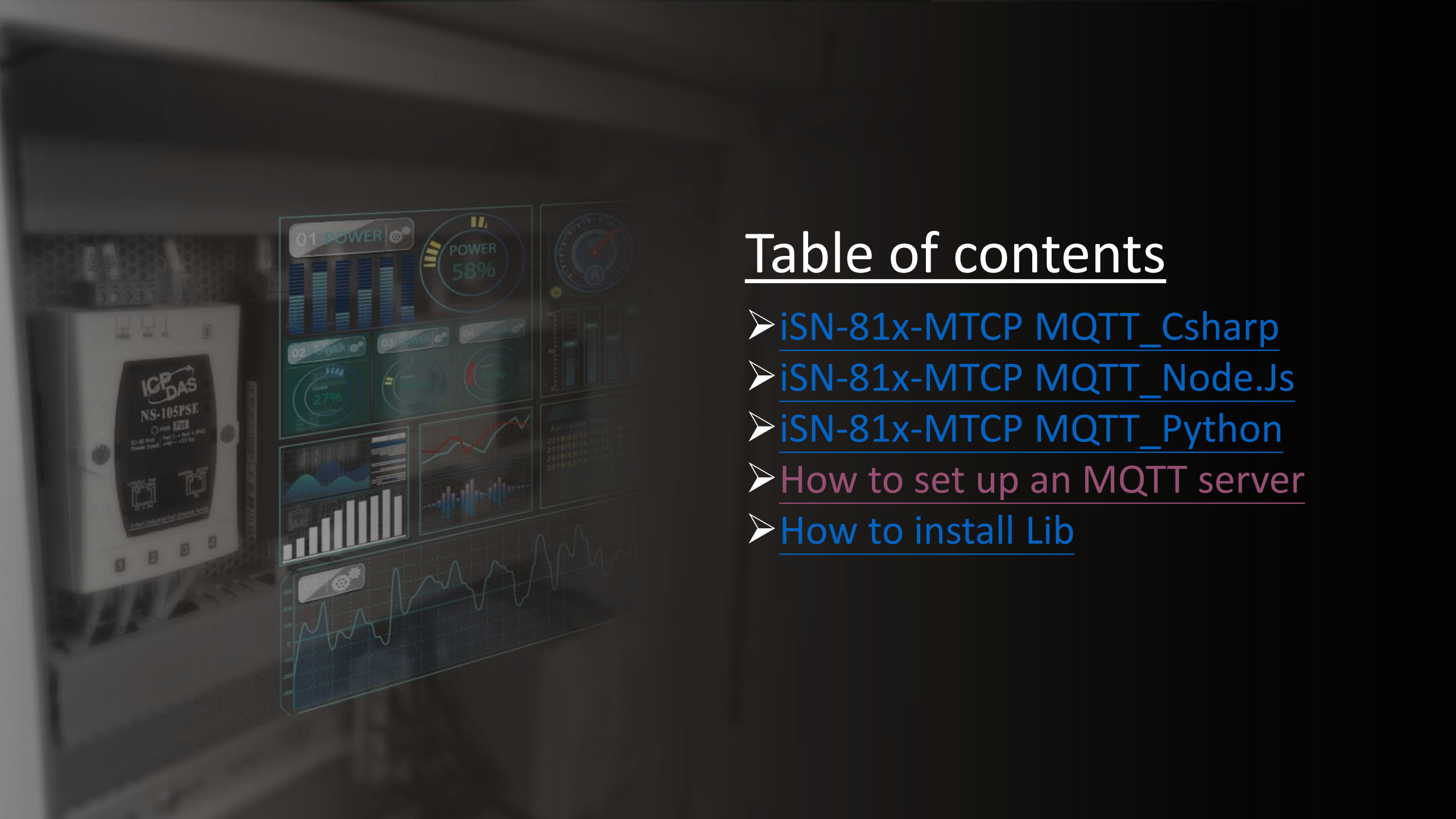
ICP DAS

Industrial Automation Technology
Innovator and Enhancer.

How to connect iSN-81x module through MQTT





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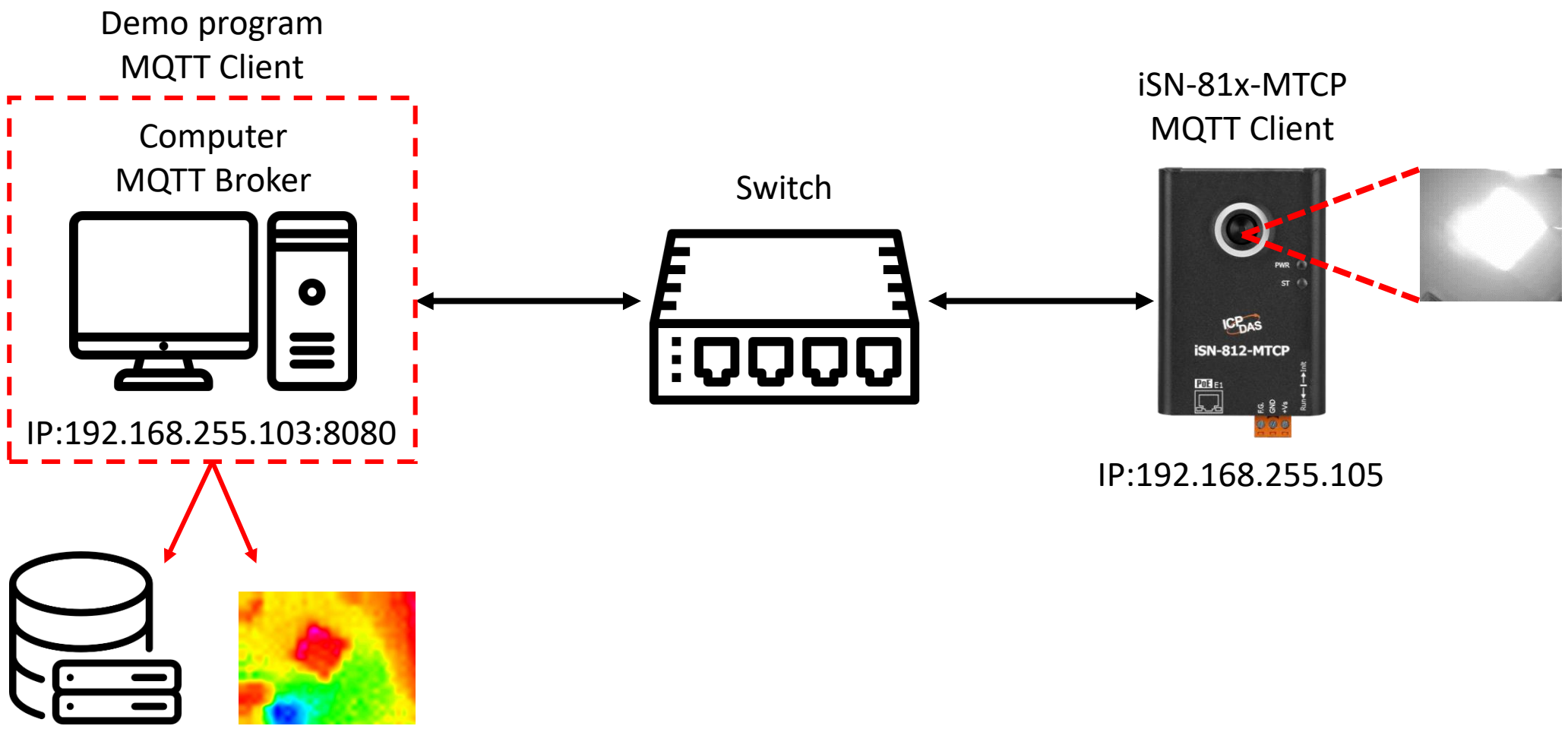
- Sample programs provide different programming languages for your reference, and you can obtain the following data through the demo programs :
  - Thermal image
  - Data measurement time
  - MAC Address of iSN-81x-MTCP
  - Model
  - IR data
  - Thermal image storage path
- The sample program uses SQLite to store measurement data, and you can change the database by yourself, such as MySQL, SQL Server, etc.

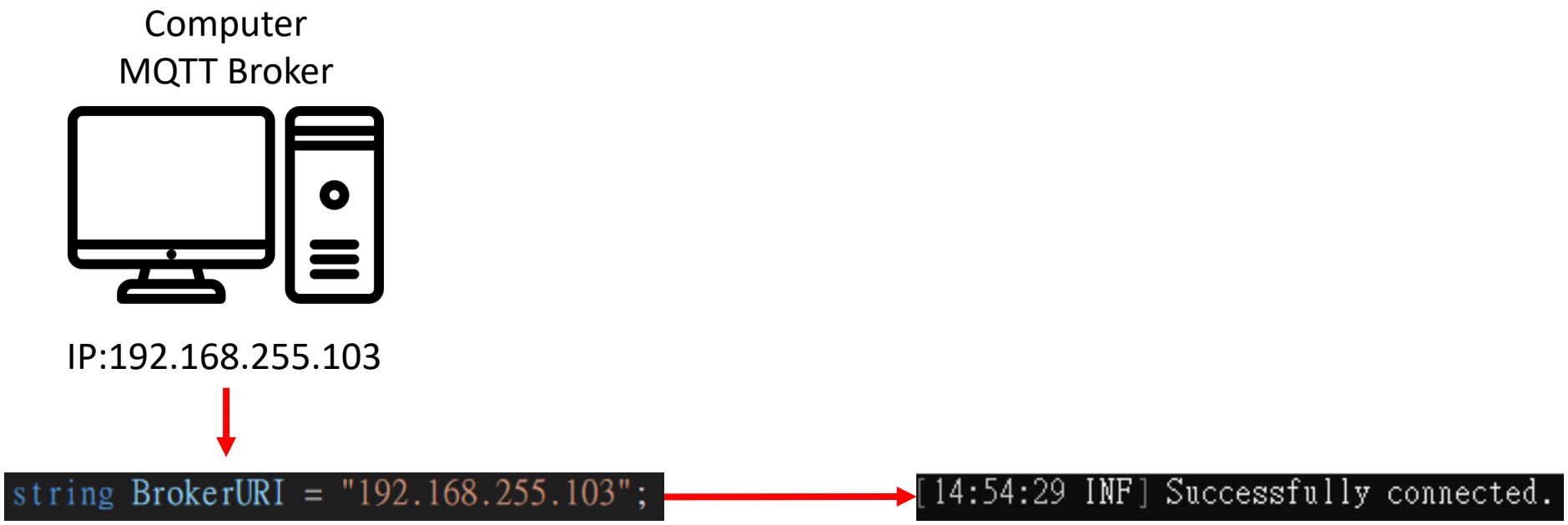
- Pre-install
  - Install-Package System.Data.SQLite
  - Install-Package MQTTnet.Extensions.ManagedClient -Version 3.0.16
  - Install-Package Serilog -Version 2.10.0
  - Install-Package Serilog.Sinks.Console -Version 3.1.1
  - Install-Package Newtonsoft.Json -Version 13.0.1

➢ Configuring iSN-81x-MTCP as a MQTT client



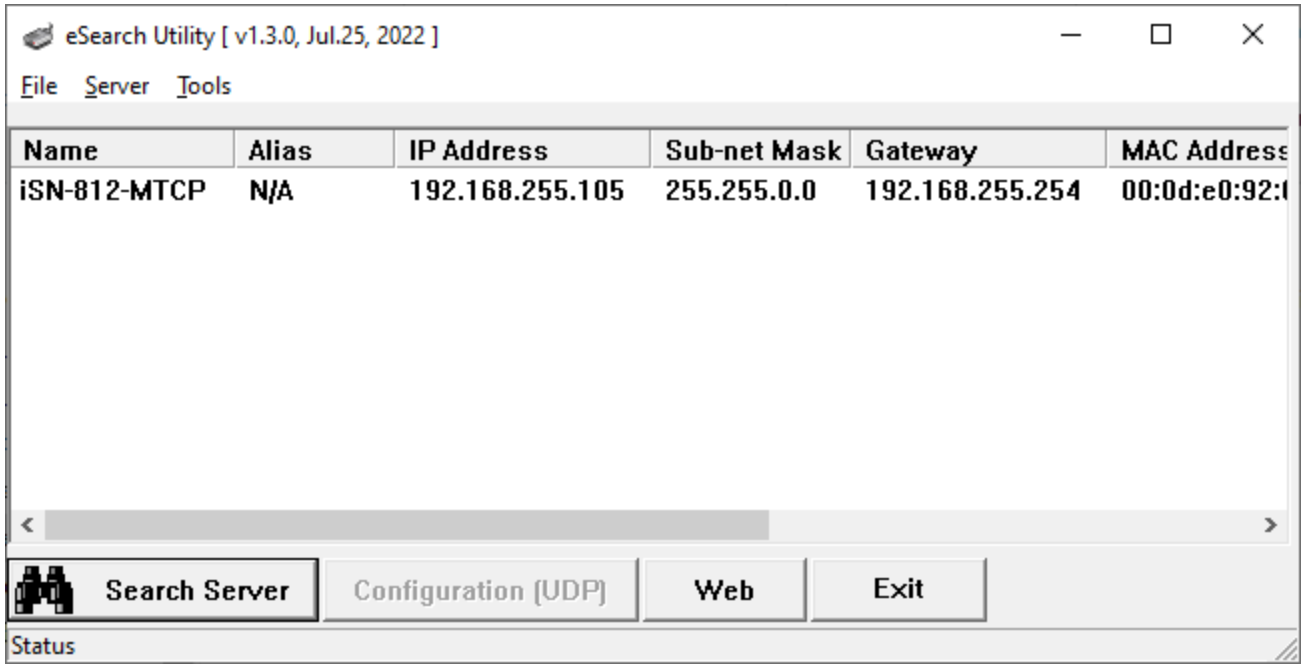
➢ Configuring iSN-81x-MTCP as a MQTT client

- The sample program needs to connect to Broker, Broker's IP=192.168.255.103, open "Program.cs" and find the function "Main", and then edit the value "BrokerURI".



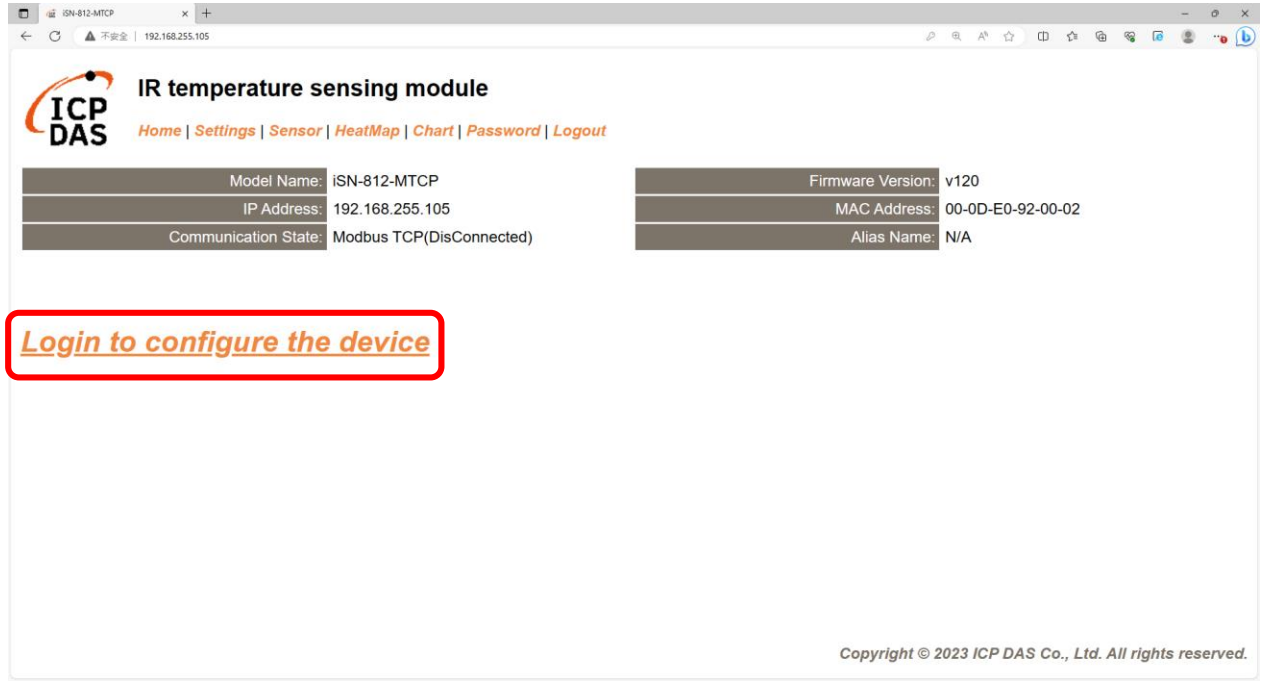
➢ Configuring iSN-81x-MTCP as a MQTT client

- Use eSearch to find iSN-81x-MTCP
- Open the web of iSN-81x-MTCP



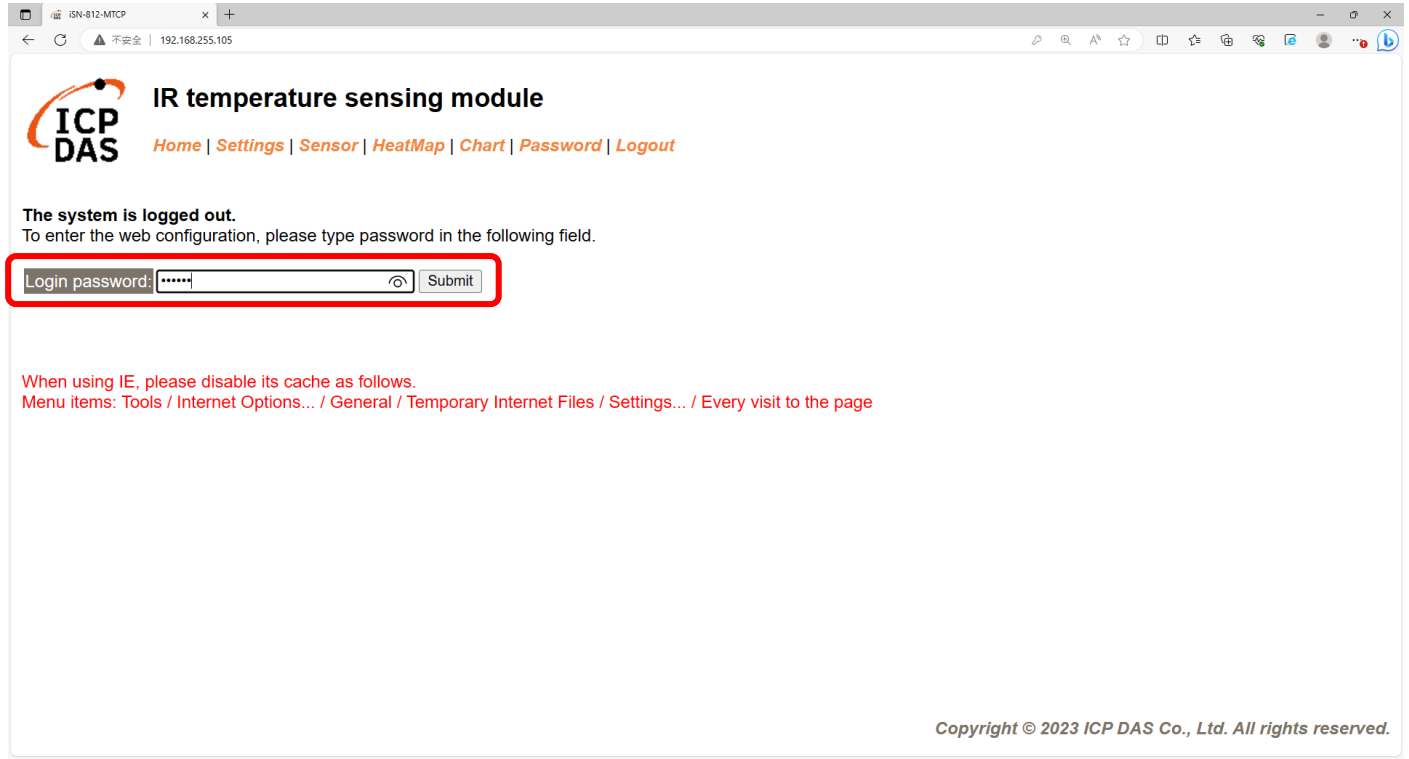
➢ Configuring iSN-81x-MTCP as a MQTT client

- Click ”Login to configure the device” to login



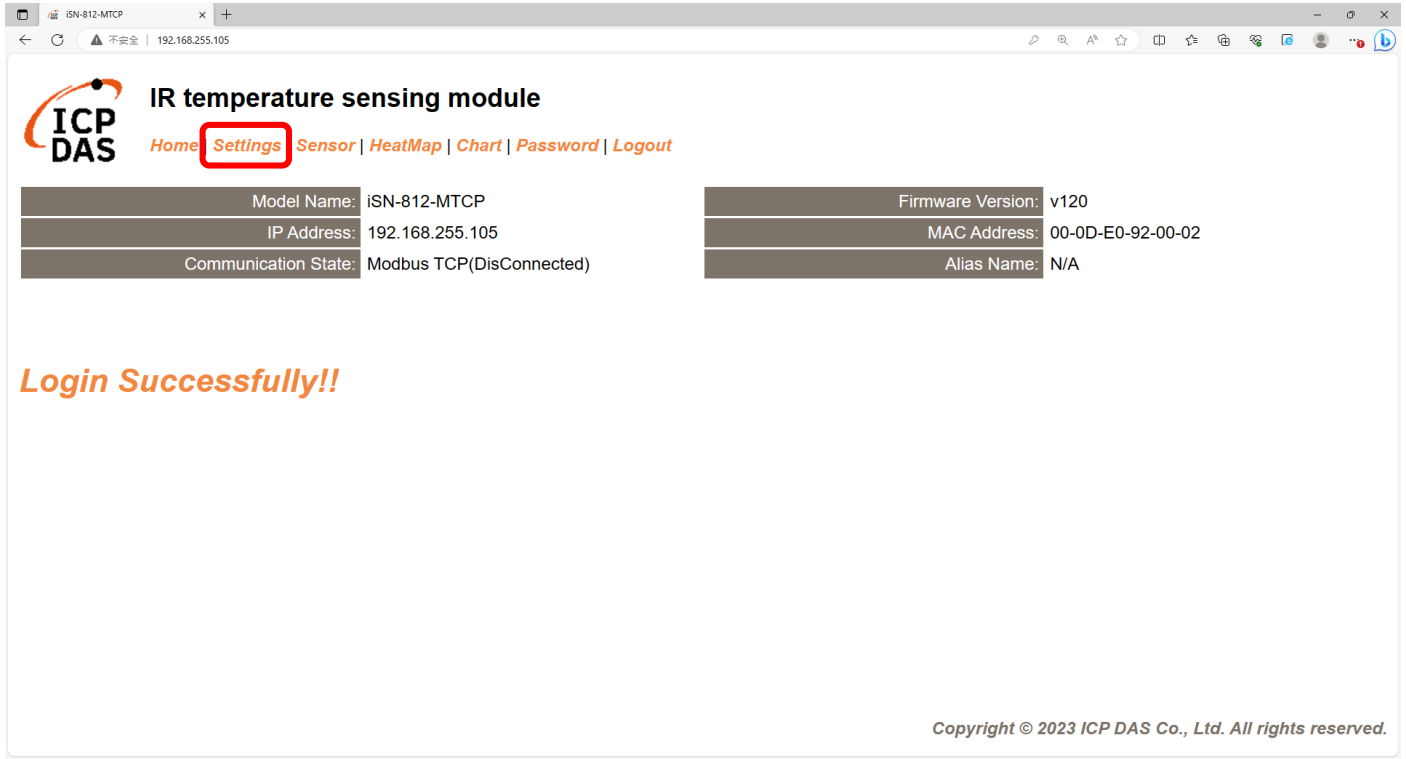
➢ Configuring iSN-81x-MTCP as a MQTT client

- Login(default password:admin)



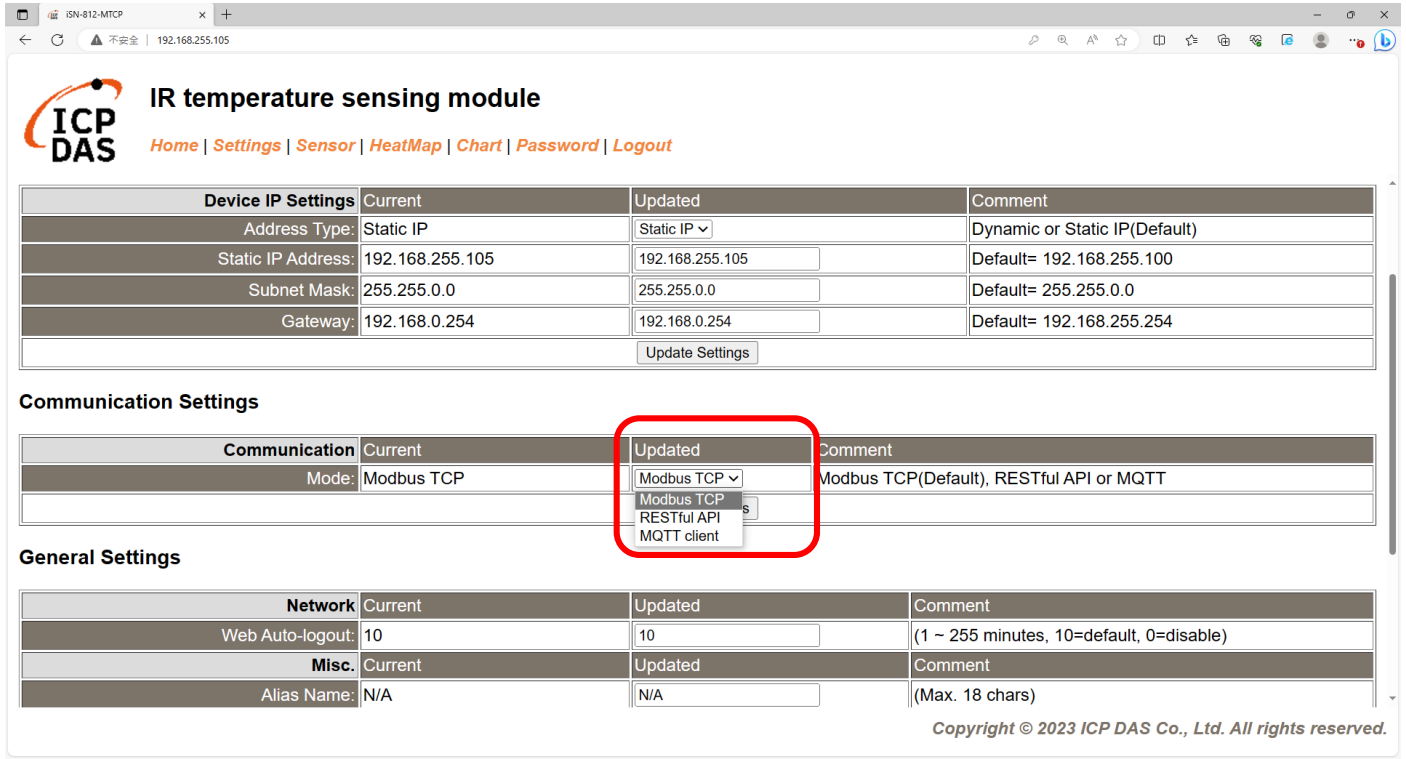
➢ Configuring iSN-81x-MTCP as a MQTT client

- Click ”Settings” to set communication mode



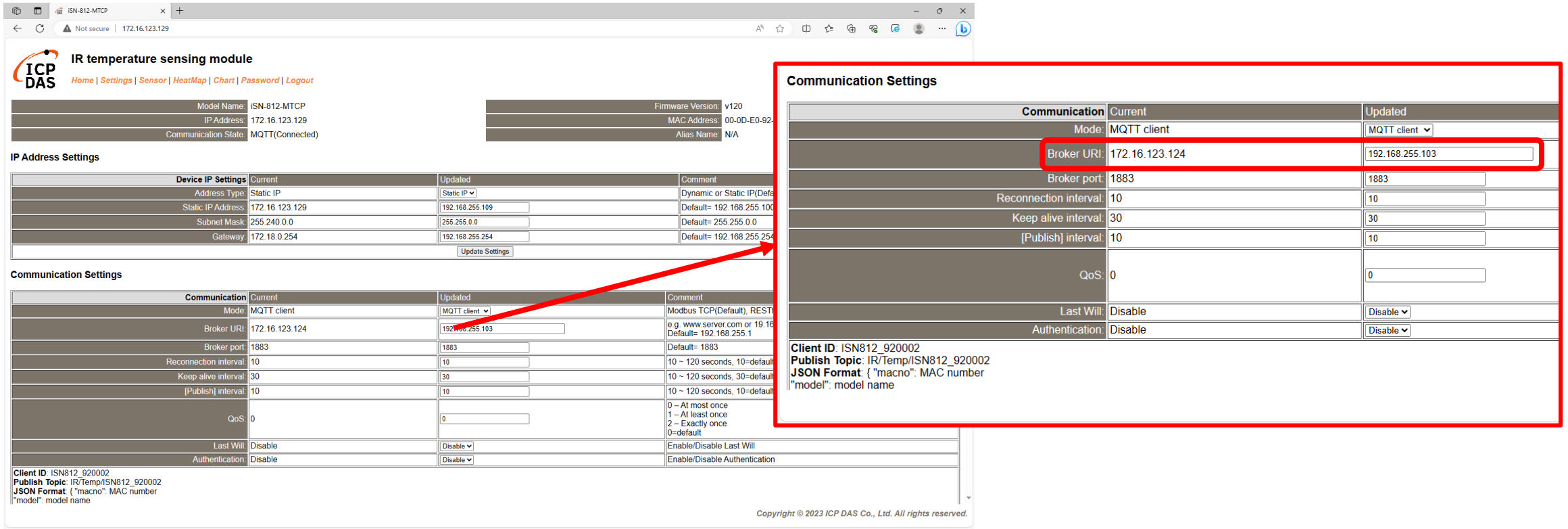
➢ Configuring iSN-81x-MTCP as a MQTT client

- Set communication mode to “MQTT client”



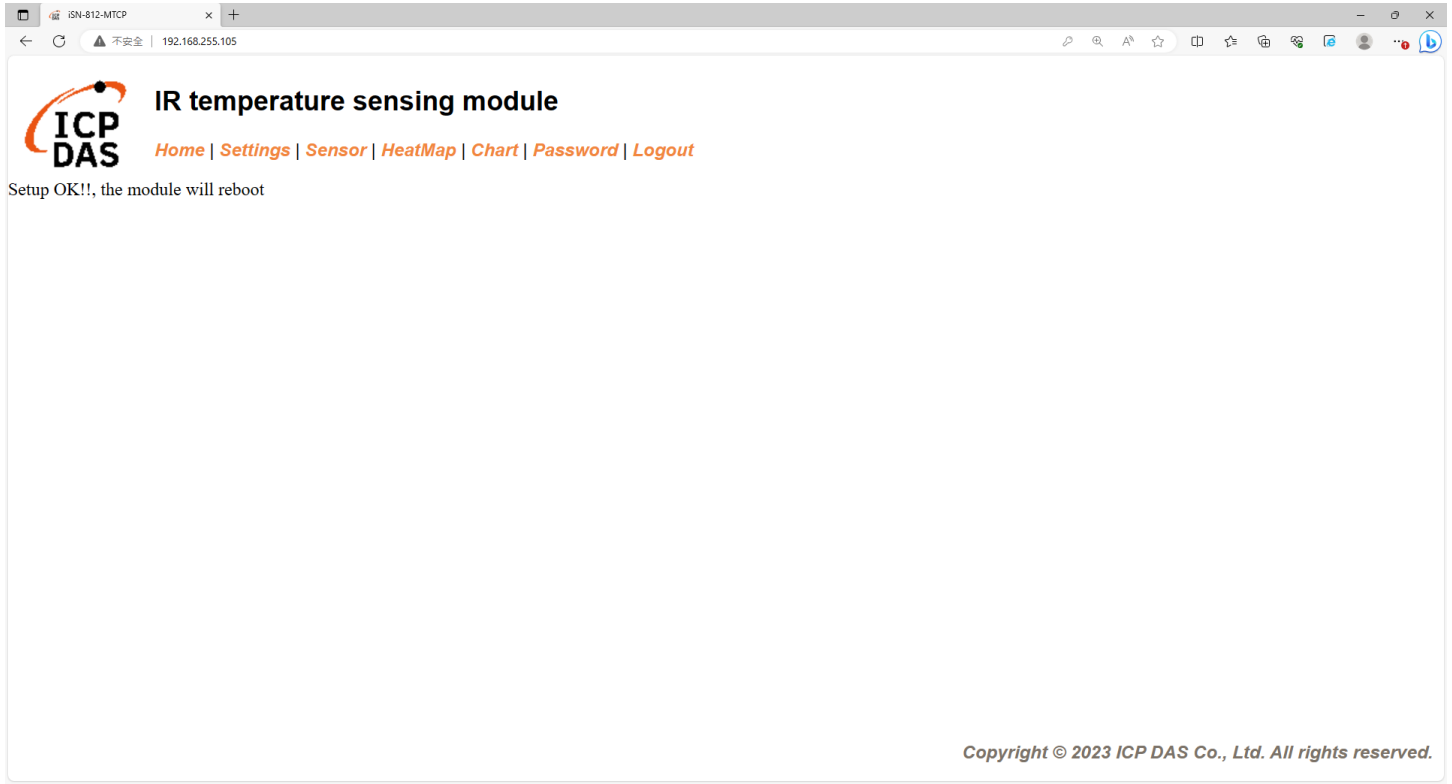
➢ Configuring iSN-81x-MTCP as a MQTT client

- Set the parameter follow Broker's IP, and update settings



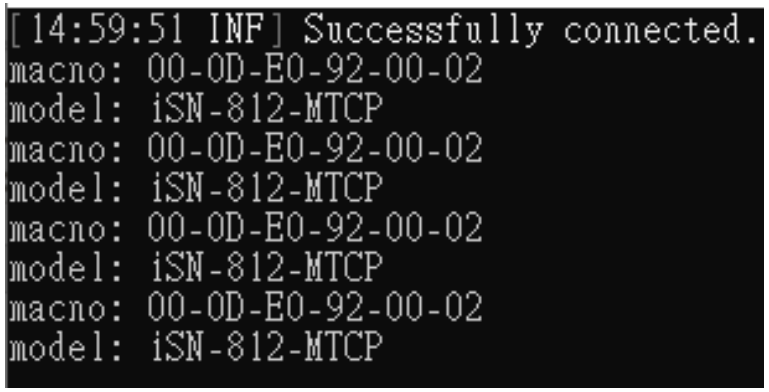
➢ Configuring iSN-81x-MTCP as a MQTT client

- Wait for reboot



➢ Configuring iSN-81x-MTCP as a MQTT client

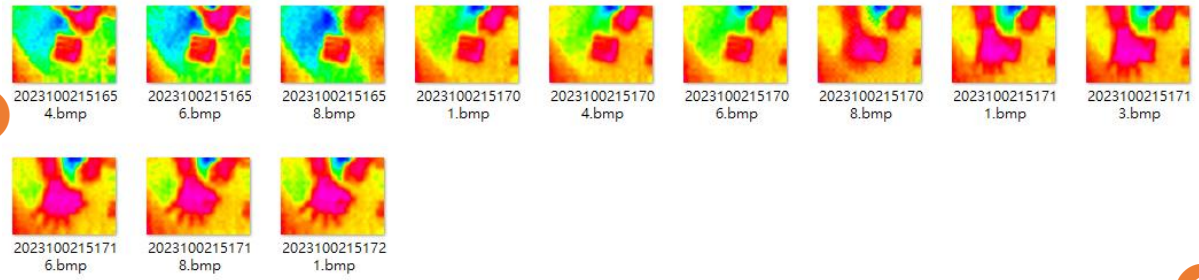
- If the connection is successful, iSN-81x-MTCP will publish data to broker.
- topic:IR/Temp/(model)_(mac). Ex:IR/Temp/ISN812_920002.



➢ Configuring iSN-81x-MTCP as a MQTT client

- After receiving the data, two files will be generated, one is the DB file and the other is the thermal image.

ThermalImg



irdata_icpdas.db

1 timestamp	2 macno	3 model	4 irdata	5 imgpath
2023-10-02 15:16:54	00-0D-E0-92-00-02	iSN-812-MTCP	30.0,30.2,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:16:56	00-0D-E0-92-00-02	iSN-812-MTCP	30.2,30.5,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:16:58	00-0D-E0-92-00-02	iSN-812-MTCP	31.1,31.9,32	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:01	00-0D-E0-92-00-02	iSN-812-MTCP	31.2,30.9,32	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:04	00-0D-E0-92-00-02	iSN-812-MTCP	30.1,31.2,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:06	00-0D-E0-92-00-02	iSN-812-MTCP	30.9,31.6,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:08	00-0D-E0-92-00-02	iSN-812-MTCP	30.8,30.7,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:11	00-0D-E0-92-00-02	iSN-812-MTCP	30.7,30.4,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:13	00-0D-E0-92-00-02	iSN-812-MTCP	30.6,32.0,32	D:\0_CODE\IR\Demo\RESTfu

1 →The time when the data was obtained
2 →MAC Address of iSN-81x-MTCP
3 →Model
4 →IR data measured by iSN-81x-MTCP
5 →Thermal image storage path

➢ Change the name of the data table

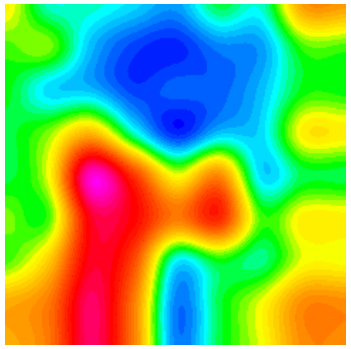
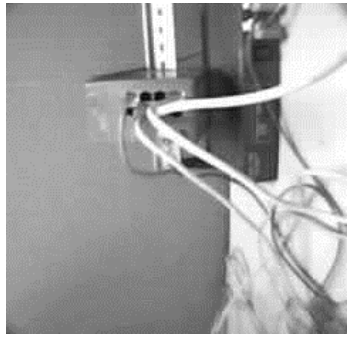
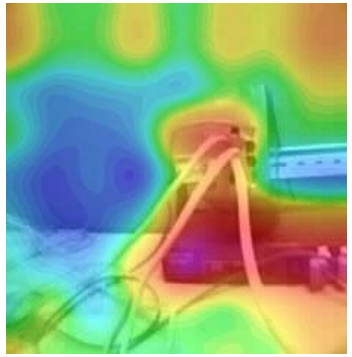
- If you want to change the file name of DB file, open “Program.cs” find the function “OnAppMessage”, and then edit the value “dbname”.

```
public static void OnAppMessage(MqttApplicationMessageReceivedEventArgs obj)
{
    //Log.Logger.Information("MSG:" + Encoding.UTF8.GetString(obj.Applicatior
    if (obj.ApplicationMessage.Payload != null && obj.ApplicationMessage.Payl
    {
        string dbname = "irdata_icpdas.db";
        string _connectionString = $"Data Source={dbname};";
```

➢ Change the transparency of a composite (for iSN-811C-MTCP)

- If you want to adjust the transparency of the composite image, open “Program.cs” find the function “MergeImg”, and then edit the value “transparencyIR” and “transparencyCrop”.

```
public static void MergeImg(Bitmap irBmp, Bitmap cropBmp, string filename)
{
    float transparencyIR = 0.8f;
    float transparencyCrop = 0.4f;
```

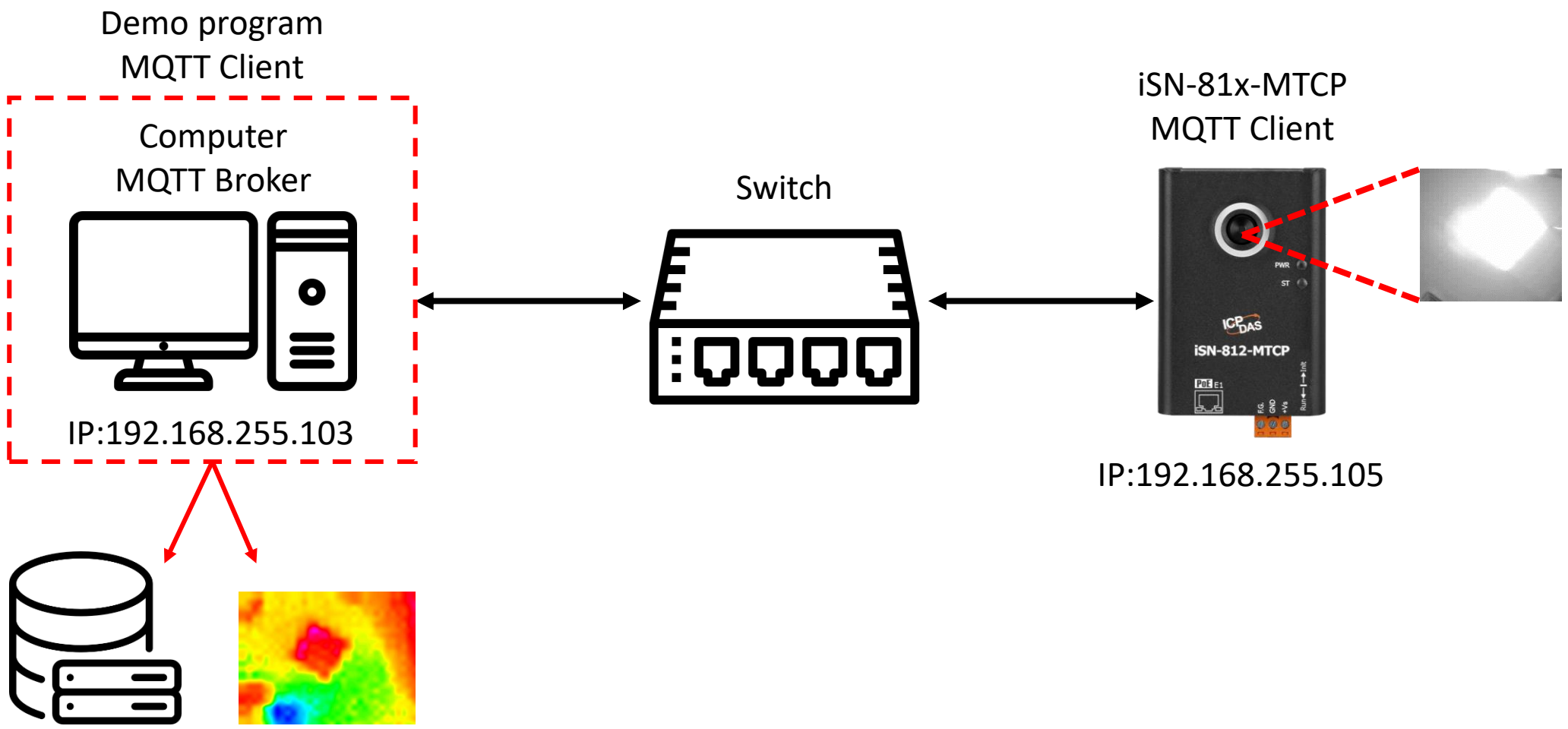
02

iSN-81x-MTCP MQTT_Node.Js

- Sample programs provide different programming languages for your reference, and you can obtain the following data through the demo programs :
  - Thermal image
  - Data measurement time
  - MAC Address of iSN-81x-MTCP
  - Model
  - IR data
  - Thermal image storage path
- The sample program uses SQLite to store measurement data, and you can change the database by yourself, such as MySQL, SQL Server, etc.

- Pre-install
  - npm install sqlite3
  - npm install mqtt
  - npm install sharp
  - npm install jimp

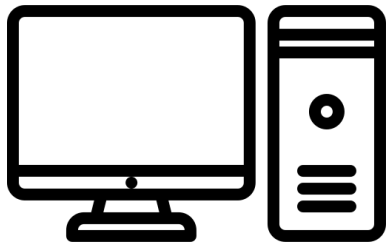
➢ Configuring iSN-81x-MTCP as a MQTT client



➢ Configuring iSN-81x-MTCP as a MQTT client

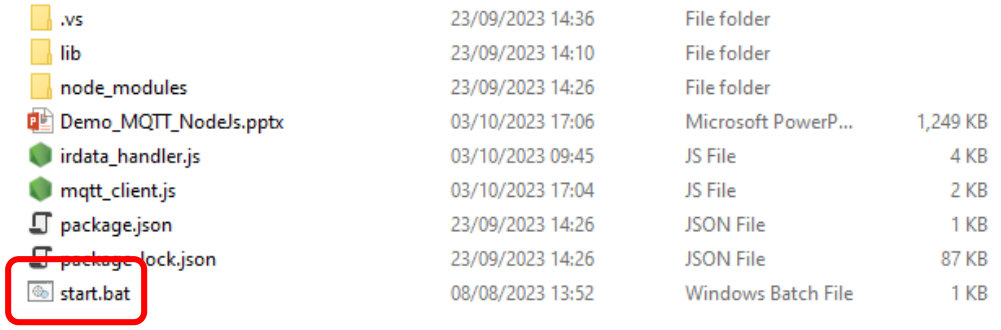
- The sample program needs to connect to Broker, Broker's IP=192.168.255.103, open "mqtt_client.js" and find the value “BrokerURI” and edit the value.
- Click “start.bat” to connect to broker

MQTT Broker



IP:192.168.255.103

```
const BrokerURI = "192.168.255.103";
```

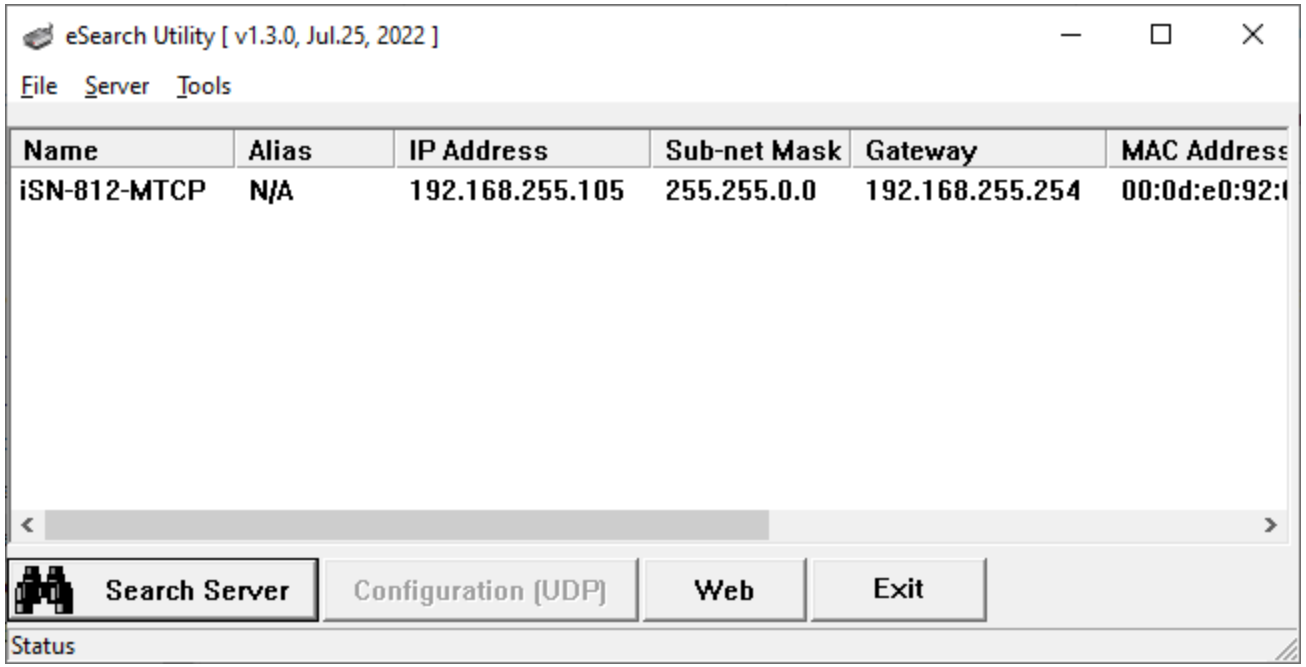



```
D:\0_CODE\IR\Demo\MQTT\NodeJs>cd /d D:\0_CODE\IR\Demo\MQTT\NodeJs\

D:\0_CODE\IR\Demo\MQTT\NodeJs>mqtt_client.js
Connected to MQTT broker: 192.168.255.103
Subscribed to topic: IR/Temp/#
```

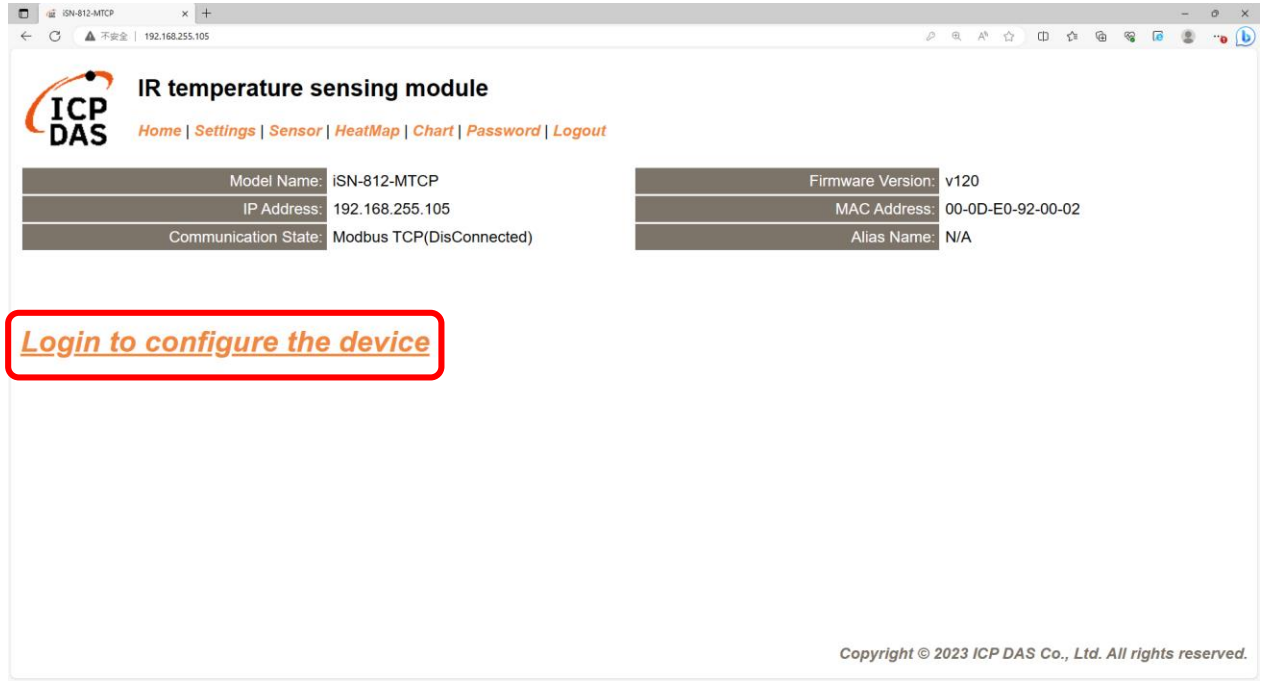
➢ Configuring iSN-81x-MTCP as a MQTT client

- Use eSearch to find iSN-81x-MTCP
- Open the web of iSN-81x-MTCP



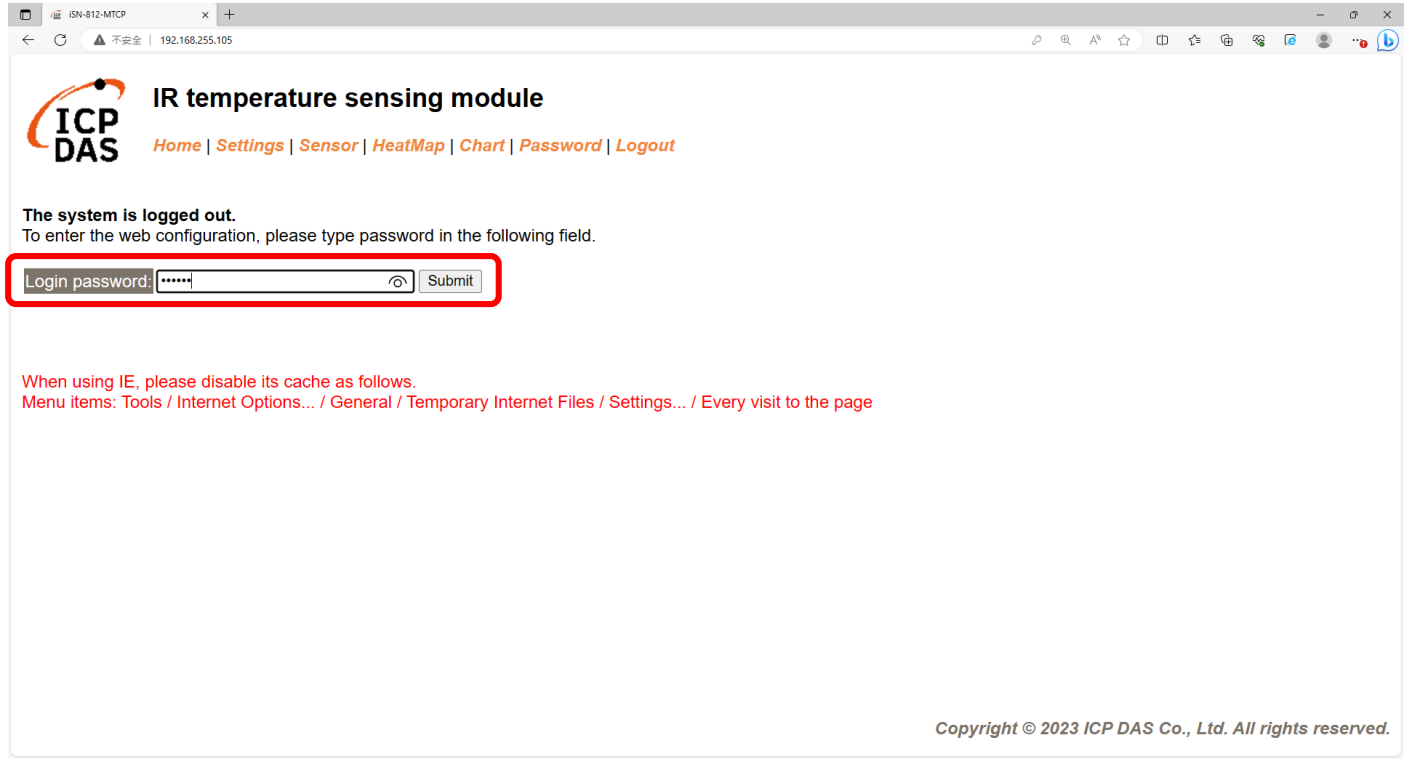
➢ Configuring iSN-81x-MTCP as a MQTT client

- Click ”Login to configure the device” to login



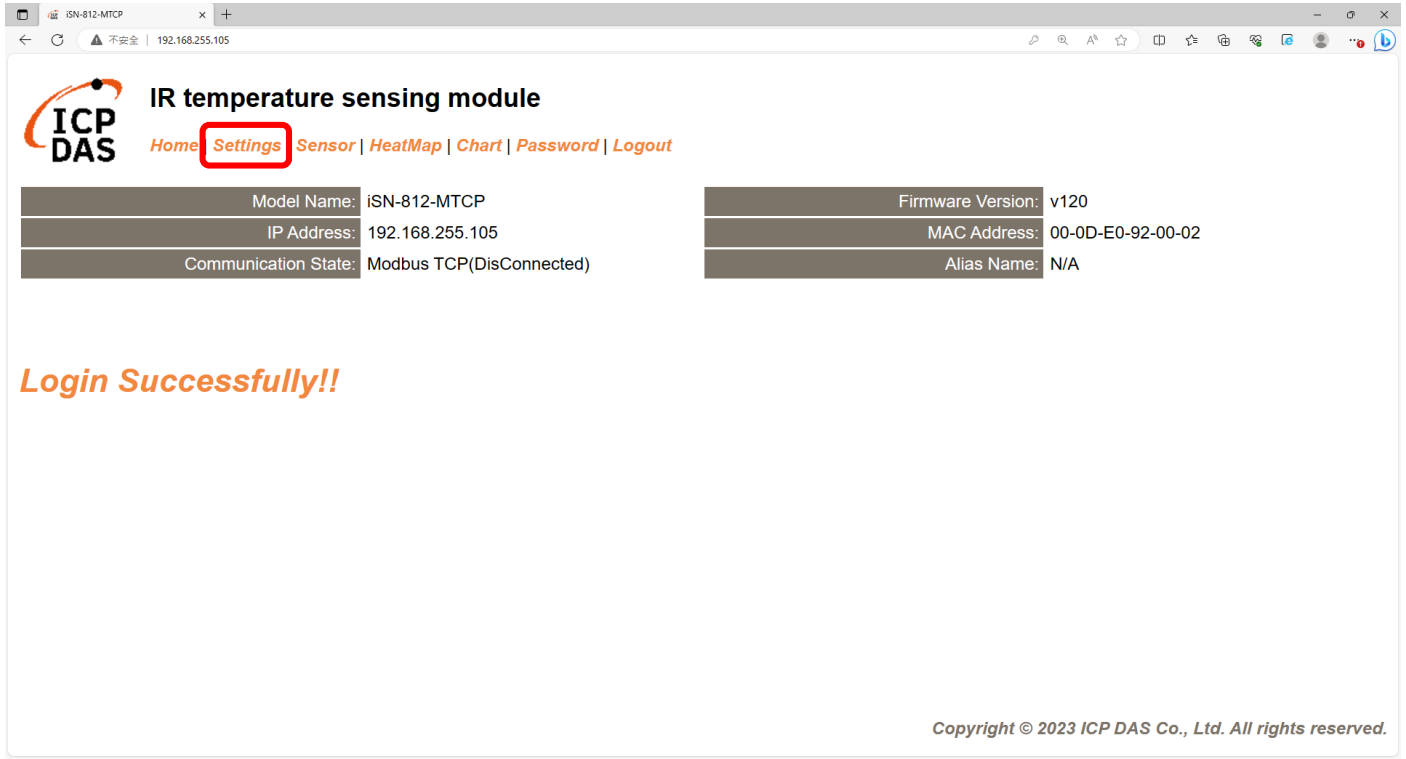
➢ Configuring iSN-81x-MTCP as a MQTT client

- Login(default password: admin)



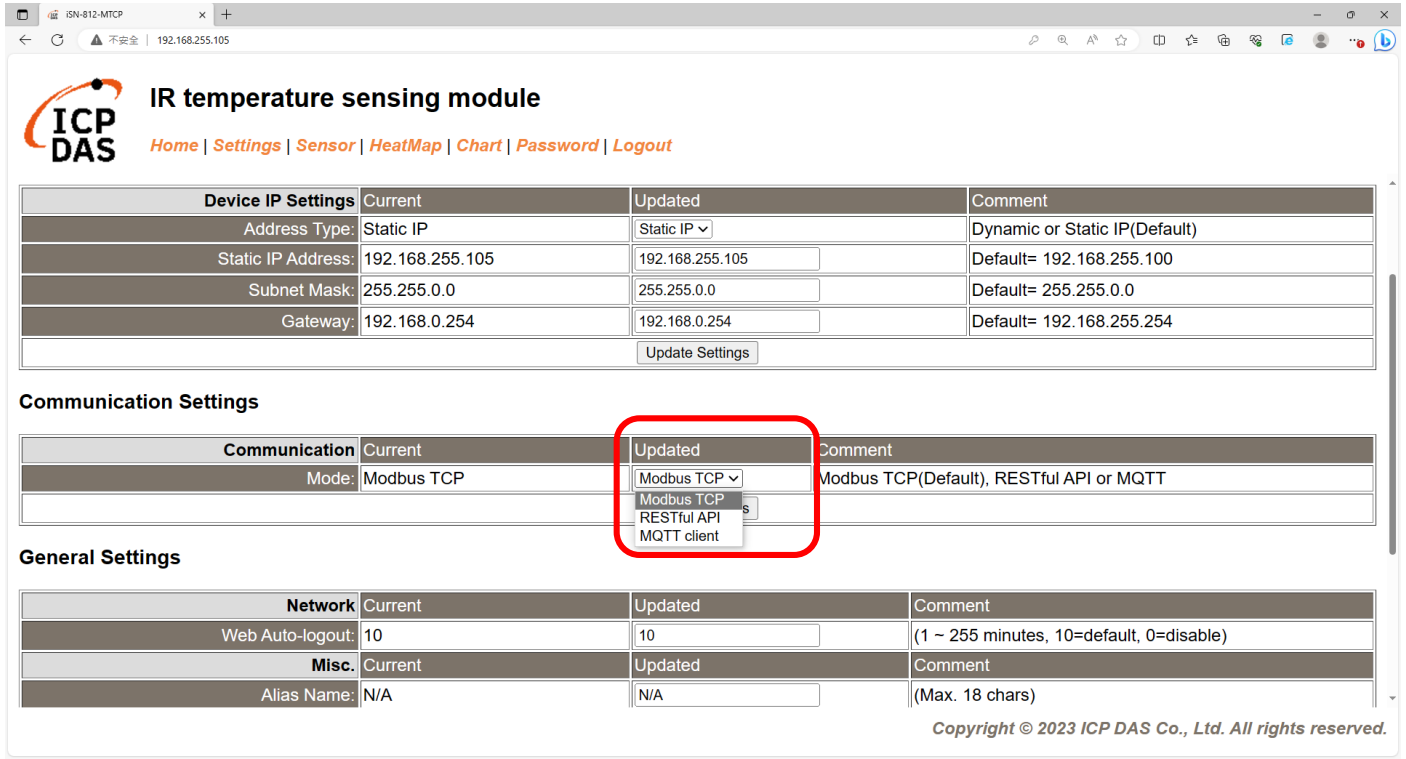
➢ Configuring iSN-81x-MTCP as a MQTT client

- Click ”Settings” to set communication mode



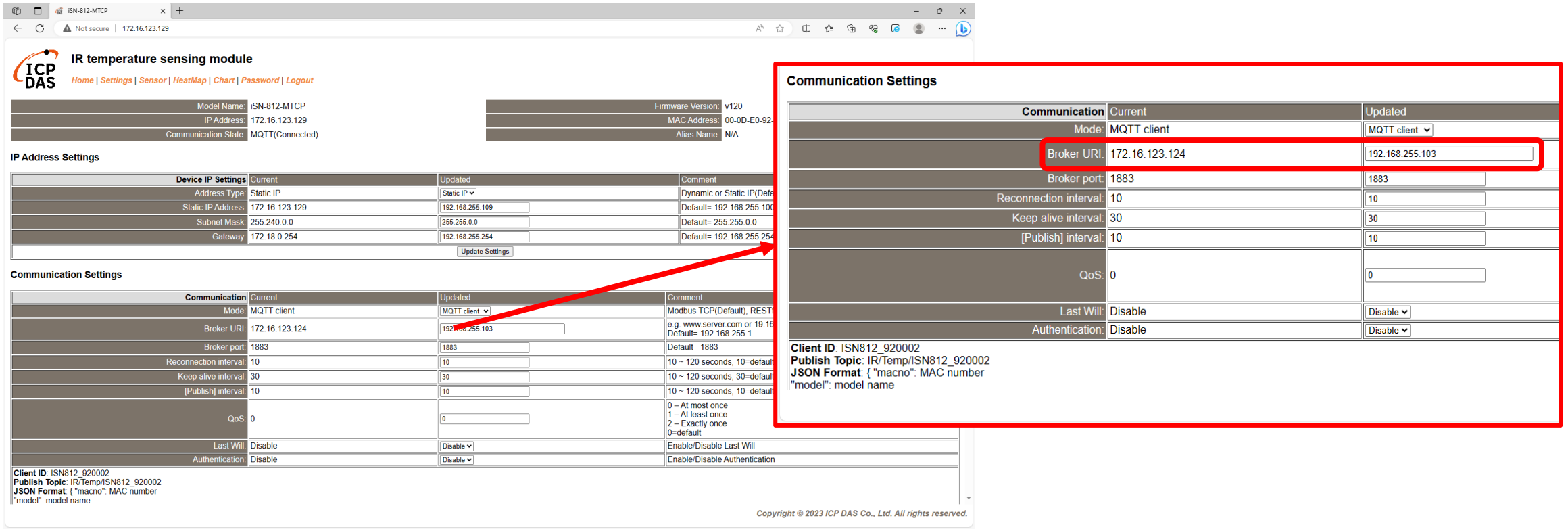
➢ Configuring iSN-81x-MTCP as a MQTT client

- Set communication mode to “MQTT client”



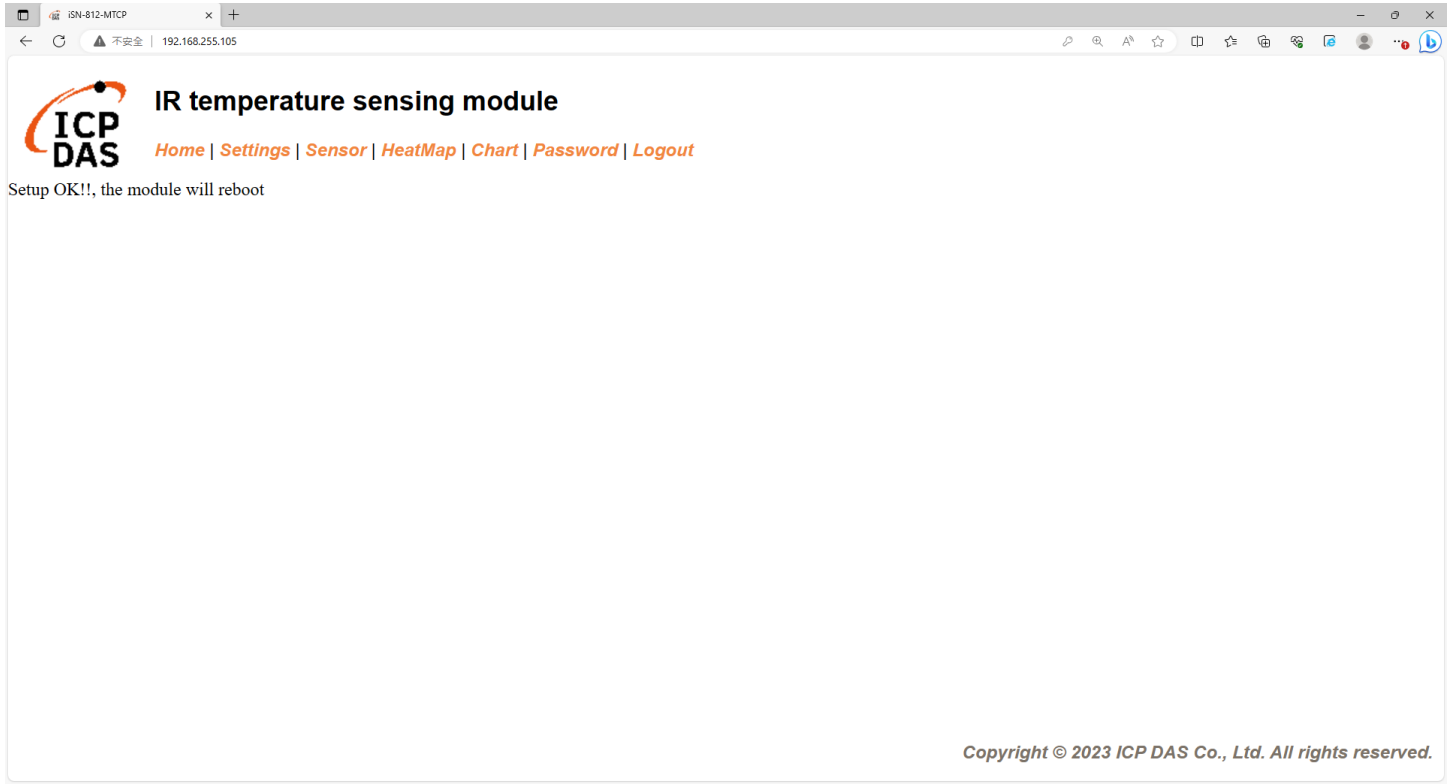
➢ Configuring iSN-81x-MTCP as a MQTT client

- Set the parameter follow Broker's IP, and update settings



➢ Configuring iSN-81x-MTCP as a MQTT client

- Wait for reboot



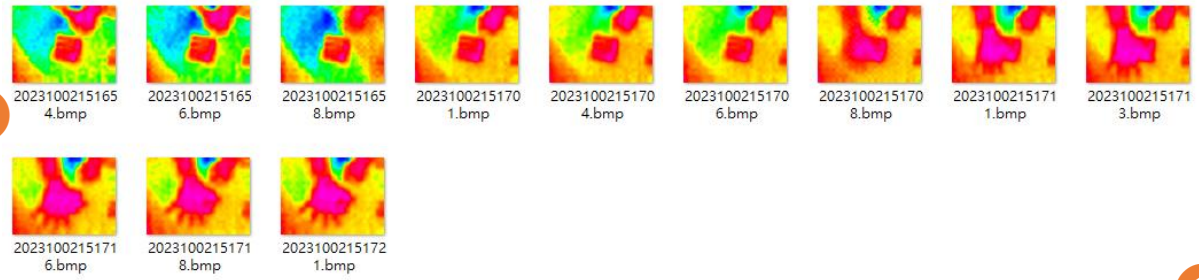
➢ Configuring iSN-81x-MTCP as a MQTT client

- If the connection is successful, iSN-81x-MTCP will publish data to broker.
- Topic:IR/Temp/(model)_(mac). Ex:IR/Temp/ISN812_920002.

➢ Configuring iSN-81x-MTCP as a MQTT client

- After receiving the data, two files will be generated, one is the DB file and the other is the thermal image.

ThermalImg



irdata_icpdas.db

1 timestamp	2 macno	3 model	4 irdata	5 imgpath
2023-10-02 15:16:54	00-0D-E0-92-00-02	iSN-812-MTCP	30.0,30.2,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:16:56	00-0D-E0-92-00-02	iSN-812-MTCP	30.2,30.5,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:16:58	00-0D-E0-92-00-02	iSN-812-MTCP	31.1,31.9,32	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:01	00-0D-E0-92-00-02	iSN-812-MTCP	31.2,30.9,32	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:04	00-0D-E0-92-00-02	iSN-812-MTCP	30.1,31.2,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:06	00-0D-E0-92-00-02	iSN-812-MTCP	30.9,31.6,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:08	00-0D-E0-92-00-02	iSN-812-MTCP	30.8,30.7,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:11	00-0D-E0-92-00-02	iSN-812-MTCP	30.7,30.4,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:13	00-0D-E0-92-00-02	iSN-812-MTCP	30.6,32.0,32	D:\0_CODE\IR\Demo\RESTfu

1 →The time when the data was obtained
2 →MAC Address of iSN-81x-MTCP
3 →Model
4 →IR data measured by iSN-81x-MTCP
5 →Thermal image storage path

➢ Change the name of the data table

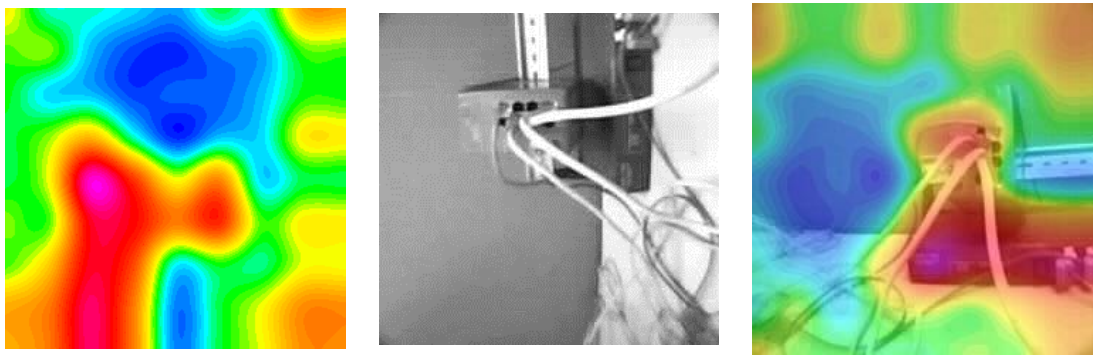
- If you want to change the file name of DB file, open “irdata_handler.js” find the value “dbPath”, and then edit the value.

```
const dbPath = './irdata_icpdas.db';
```

➢ Change the transparency of a composite (for iSN-811C-MTCP)

- If you want to adjust the transparency of the composite image, please open "RealImg.js" to find the code in the picture below, and then edit the code.

```
imageA.opacity(0.5);
```



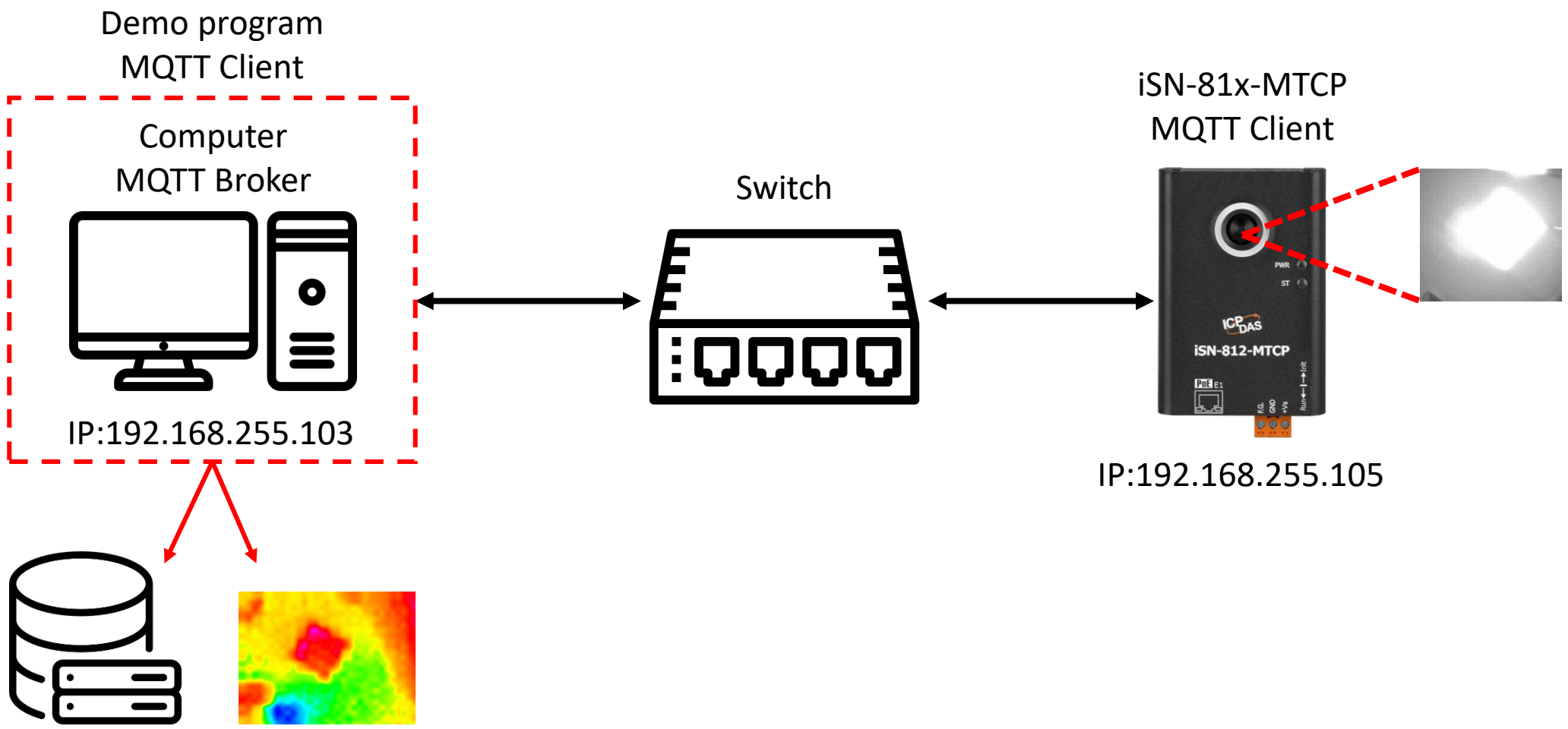
03

iSN-81x-MTCP MQTT_Python

- Sample programs provide different programming languages for your reference, and you can obtain the following data through the demo programs :
  - Thermal image
  - Data measurement time
  - MAC Address of iSN-81x-MTCP
  - Model
  - IR data
  - Thermal image storage path
- The sample program uses SQLite to store measurement data, and you can change the database by yourself, such as MySQL, SQL Server, etc.

- Pre-install
  - pip install paho-mqtt
  - pip install numpy
  - pip install opencv-python

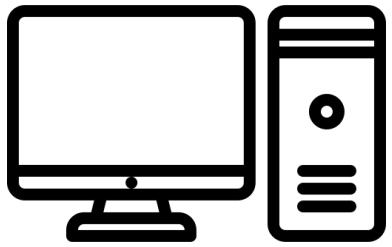
➢ Configuring iSN-81x-MTCP as a MQTT client



➢ Configuring iSN-81x-MTCP as a MQTT client

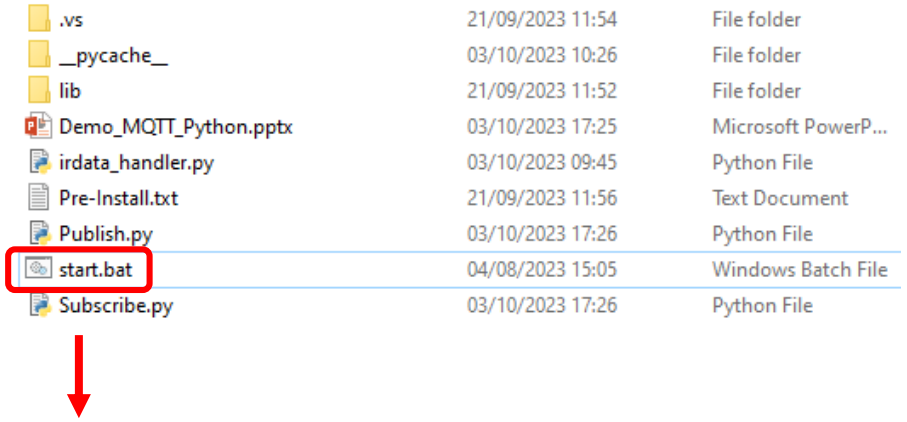
- The sample program needs to connect to Broker, Broker's IP=192.168.255.103, open "Subscribe.py" and find the value “BrokerURI” and edit the value.
- Click “start.bat” to connect to broker

MQTT Broker



IP:192.168.255.103

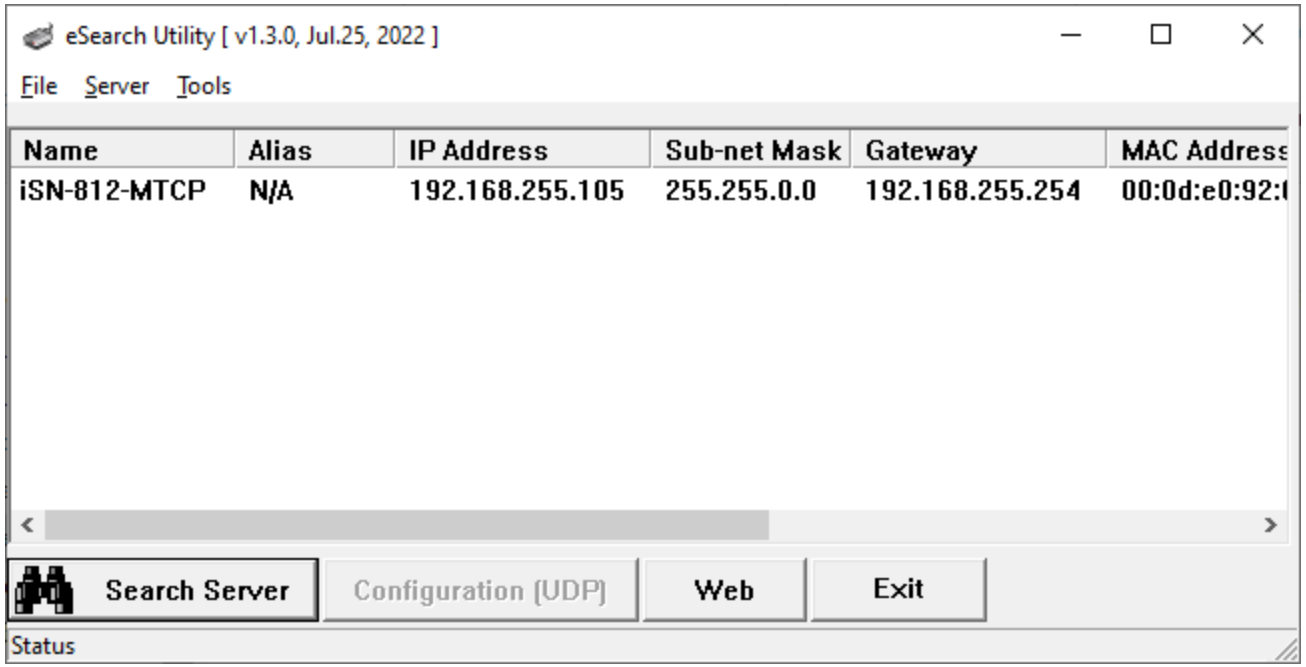
```
BrokerURI = "192.168.255.103"
```



```
D:\0_CODE\IR\Demo\MQTT\Python>Subscribe.py
Connected to 192.168.255.103 with result code 0
Subscribe Topic: IR/Temp/#
```

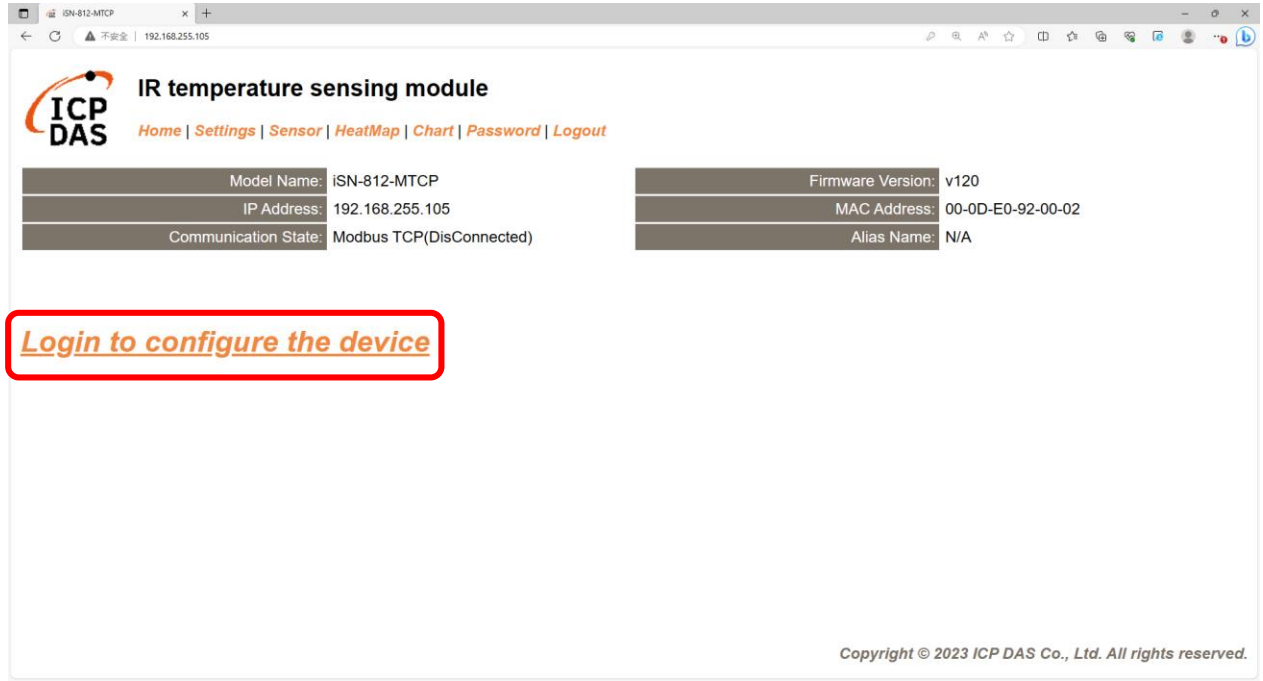
➢ Configuring iSN-81x-MTCP as a MQTT client

- Use eSearch to find iSN-81x-MTCP
- Open the web of iSN-81x-MTCP



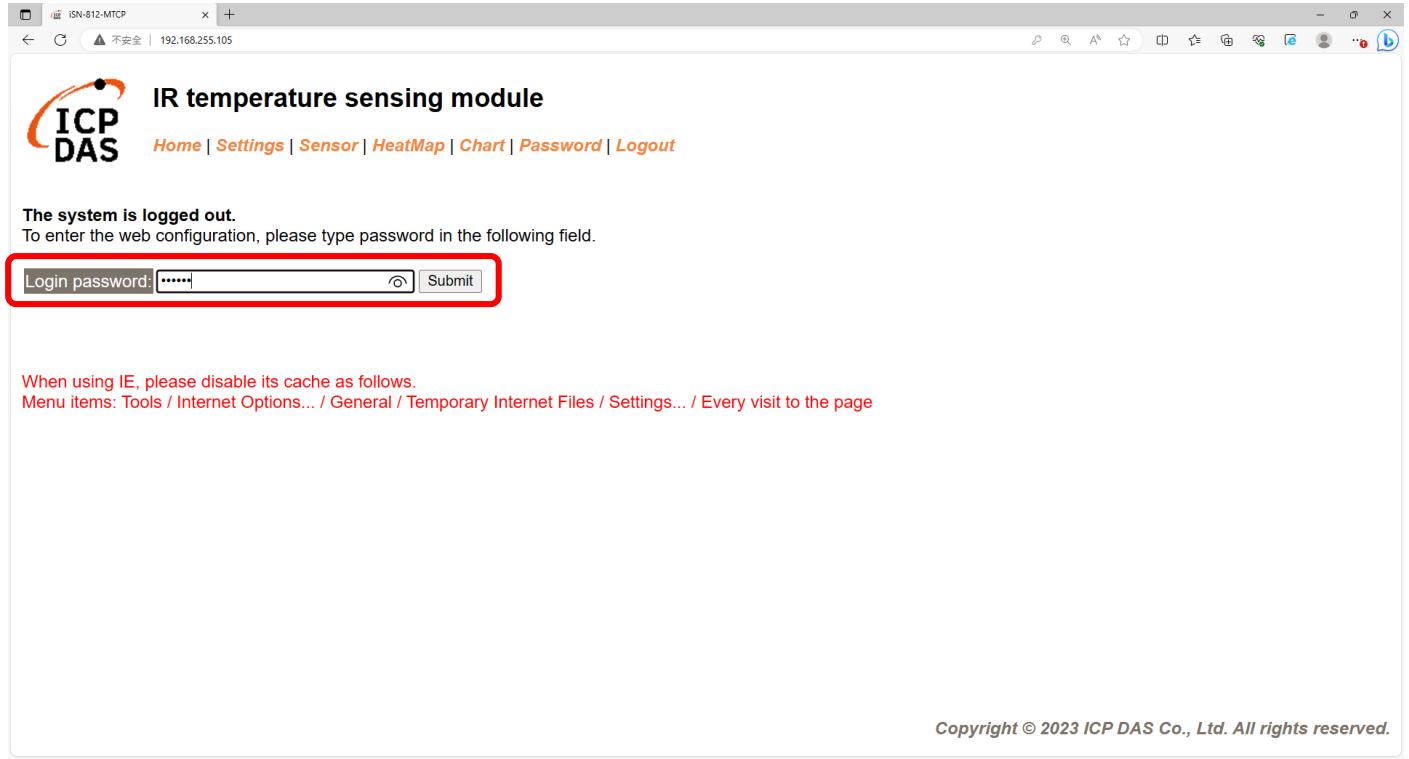
➢ Configuring iSN-81x-MTCP as a MQTT client

- Click ”Login to configure the device” to login



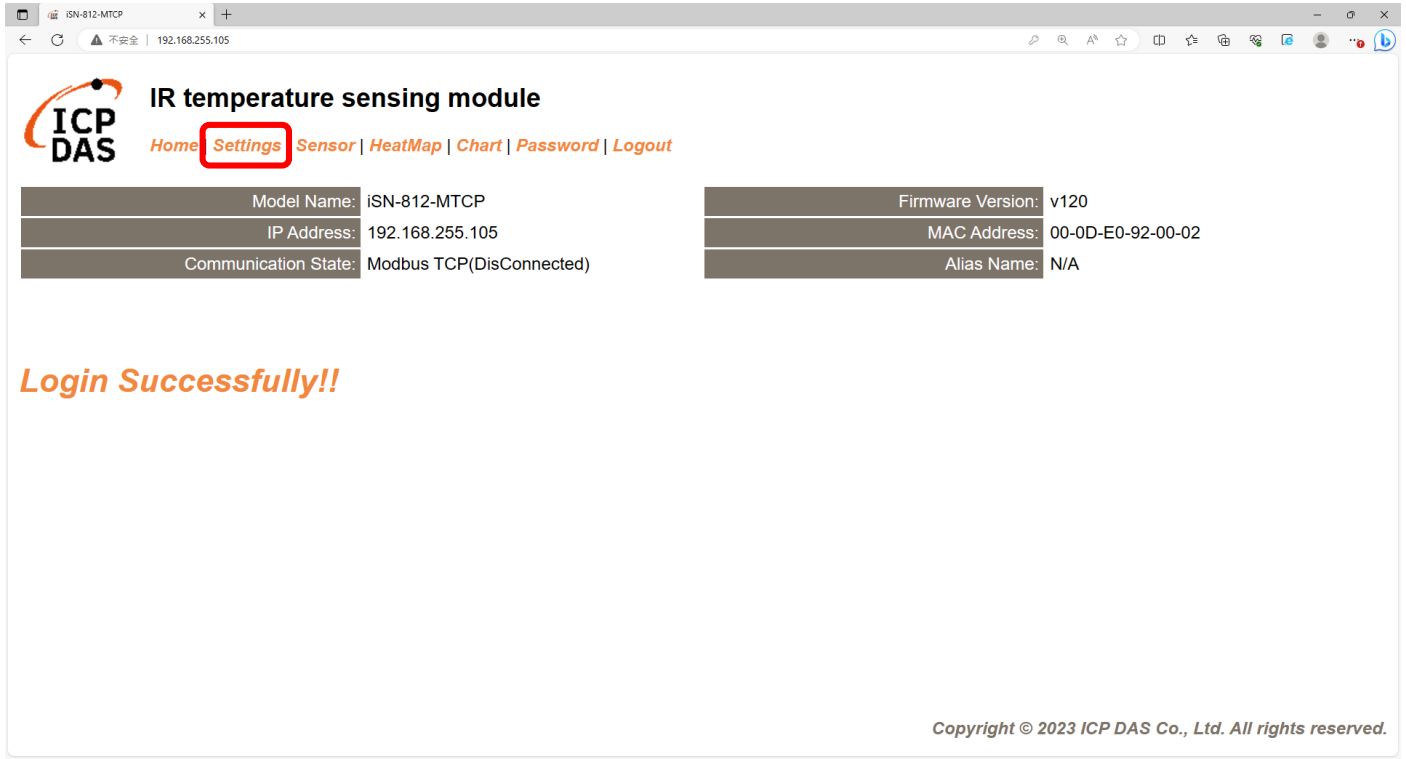
➢ Configuring iSN-81x-MTCP as a MQTT client

- Login(default password: admin)



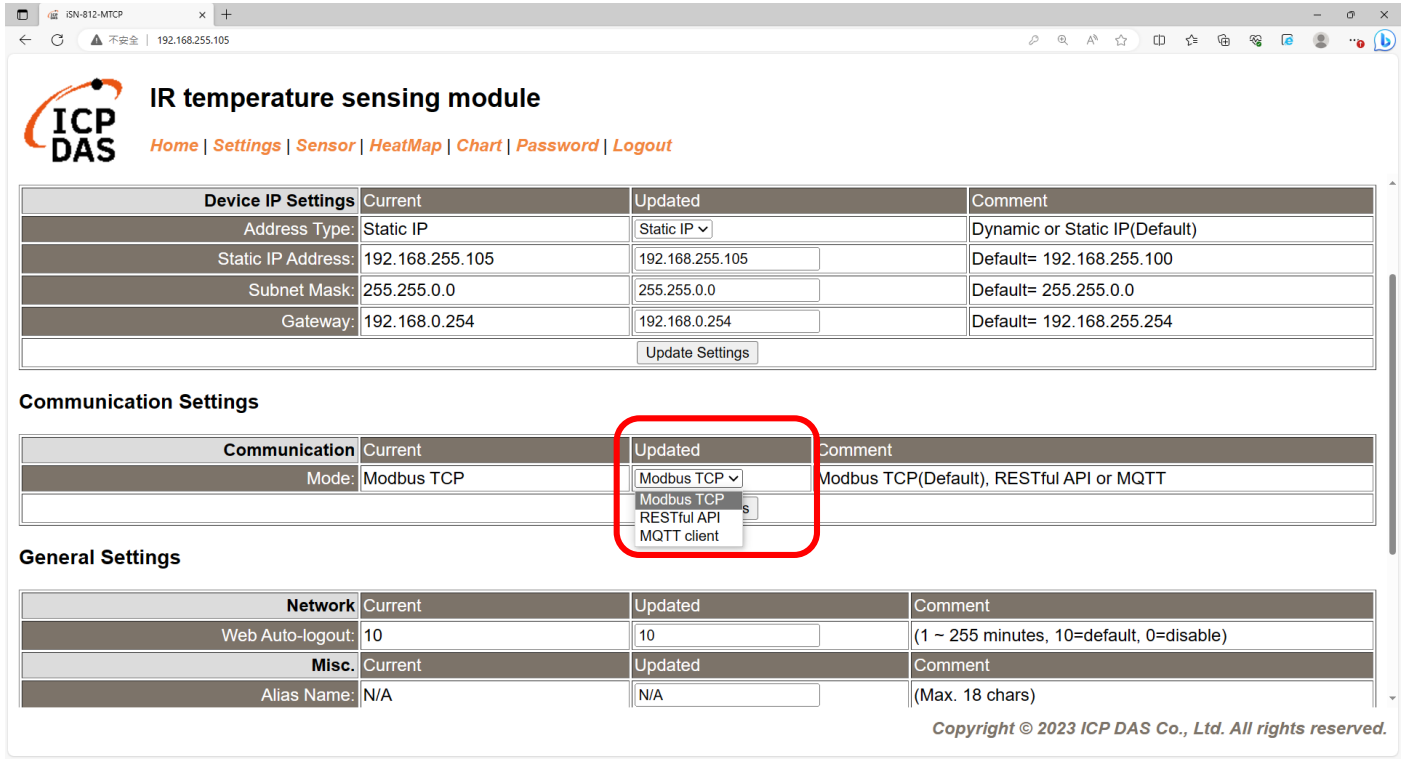
➢ Configuring iSN-81x-MTCP as a MQTT client

- Click ”Settings” to set communication mode



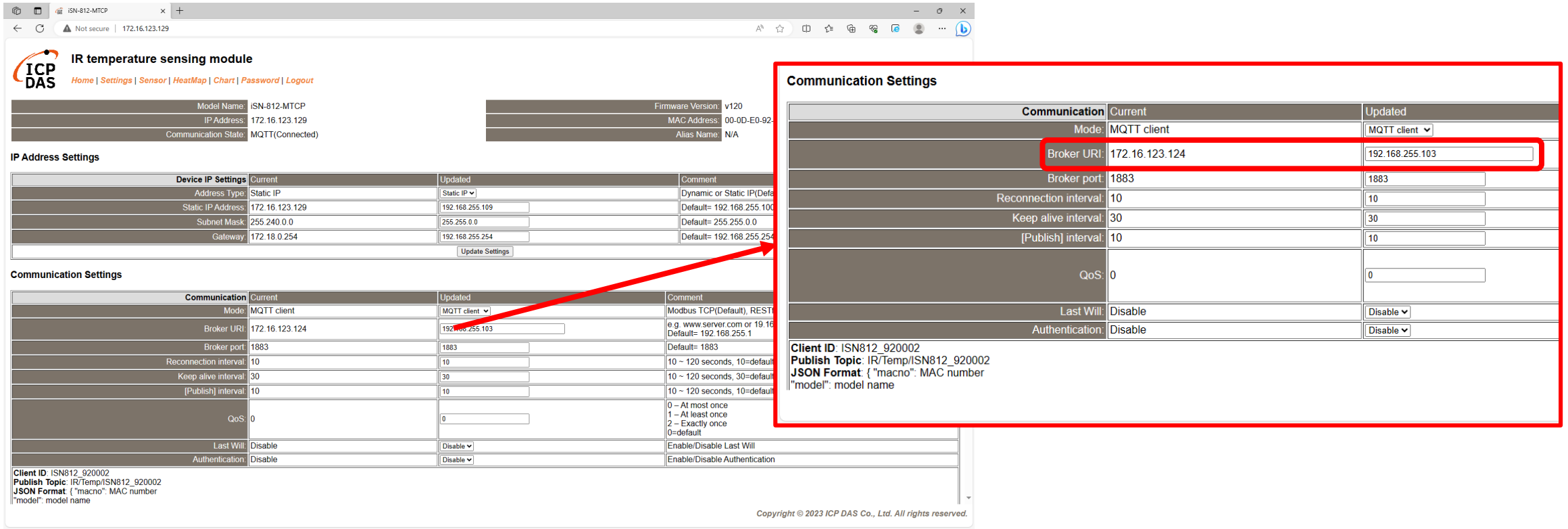
➢ Configuring iSN-81x-MTCP as a MQTT client

- Set communication mode to “MQTT client”



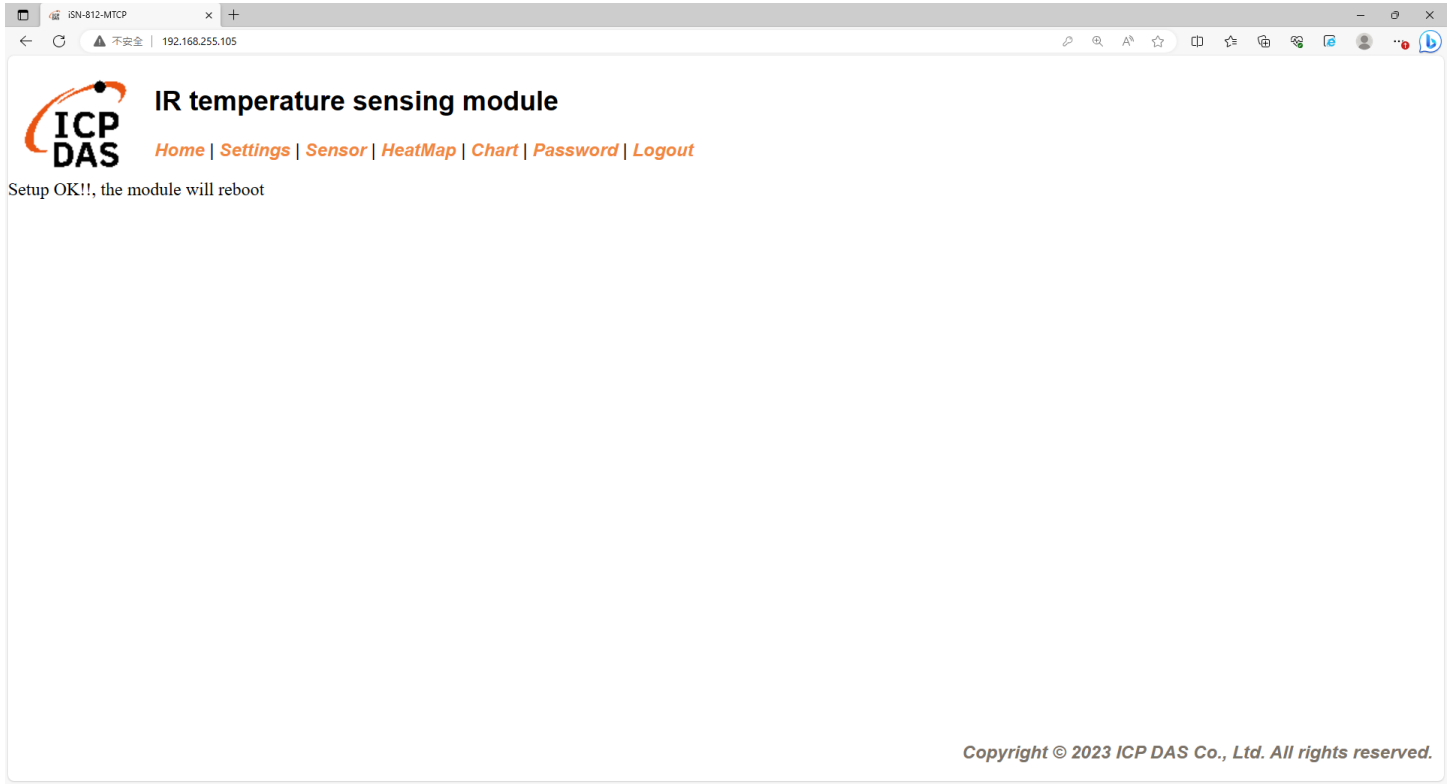
➢ Configuring iSN-81x-MTCP as a MQTT client

- Set the parameter follow Broker's IP, and update settings



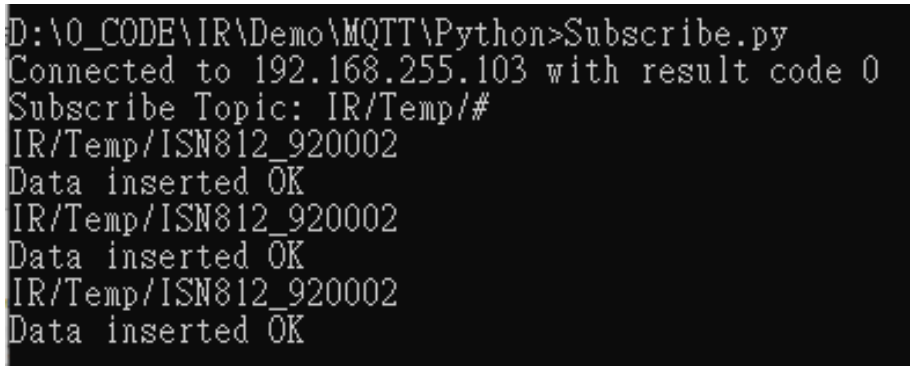
➢ Configuring iSN-81x-MTCP as a MQTT client

- Wait for reboot



➢ Configuring iSN-81x-MTCP as a MQTT client

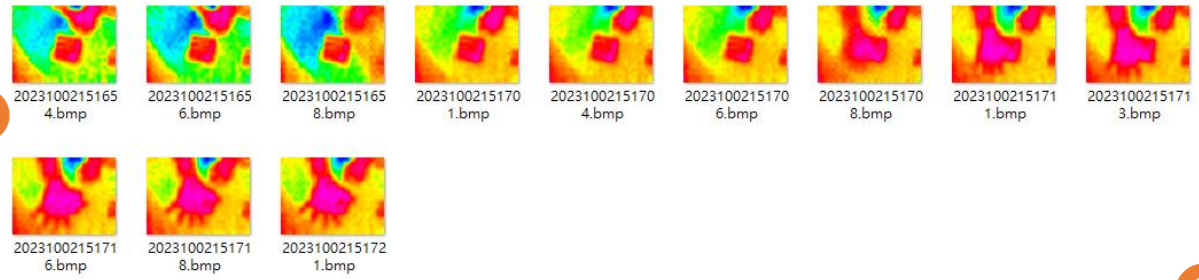
- If the connection is successful, iSN-81x-MTCP will publish data to broker.
- Topic:IR/Temp/(model)_(mac). Ex:IR/Temp/ISN812_920002.



➢ Configuring iSN-81x-MTCP as a MQTT client

- After receiving the data, two files will be generated, one is the DB file and the other is the thermal image.

ThermalImg



irdata_icpdas.db

1 timestamp	2 macno	3 model	4 irdata	5 imgpath
2023-10-02 15:16:54	00-0D-E0-92-00-02	iSN-812-MTCP	30.0,30.2,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:16:56	00-0D-E0-92-00-02	iSN-812-MTCP	30.2,30.5,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:16:58	00-0D-E0-92-00-02	iSN-812-MTCP	31.1,31.9,32	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:01	00-0D-E0-92-00-02	iSN-812-MTCP	31.2,30.9,32	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:04	00-0D-E0-92-00-02	iSN-812-MTCP	30.1,31.2,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:06	00-0D-E0-92-00-02	iSN-812-MTCP	30.9,31.6,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:08	00-0D-E0-92-00-02	iSN-812-MTCP	30.8,30.7,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:11	00-0D-E0-92-00-02	iSN-812-MTCP	30.7,30.4,31	D:\0_CODE\IR\Demo\RESTfu
2023-10-02 15:17:13	00-0D-E0-92-00-02	iSN-812-MTCP	30.6,32.0,32	D:\0_CODE\IR\Demo\RESTfu

1 →The time when the data was obtained
2 →MAC Address of iSN-81x-MTCP
3 →Model
4 →IR data measured by iSN-81x-MTCP
5 →Thermal image storage path

➢ Change the name of the data table

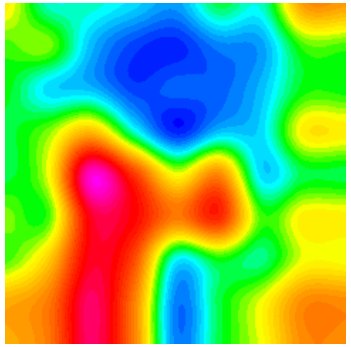
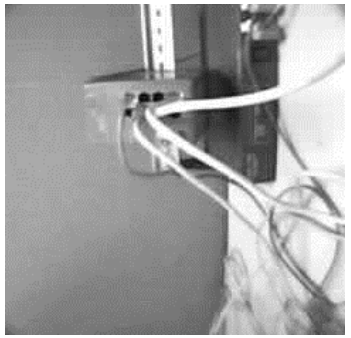
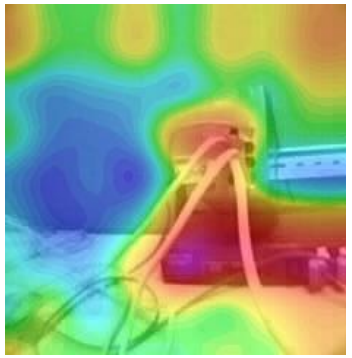
- If you want to change the file name of DB file, open “irdata_handler.py” find the value “conn”, and then edit the value.

```
conn = sqlite3.connect('irdata_icpdas.db')
```

➢ Change the transparency of a composite (for iSN-811C-MTCP)

- If you want to adjust the transparency of the composite image, please open "RealImg.py" to find the code in the picture below, and then edit the code.

```
mergeBmp = cv2.addWeighted(cropBmp, 0.5, irBmp_with_transparency, 0.5, 0, dtype=cv2.CV_8U)
```

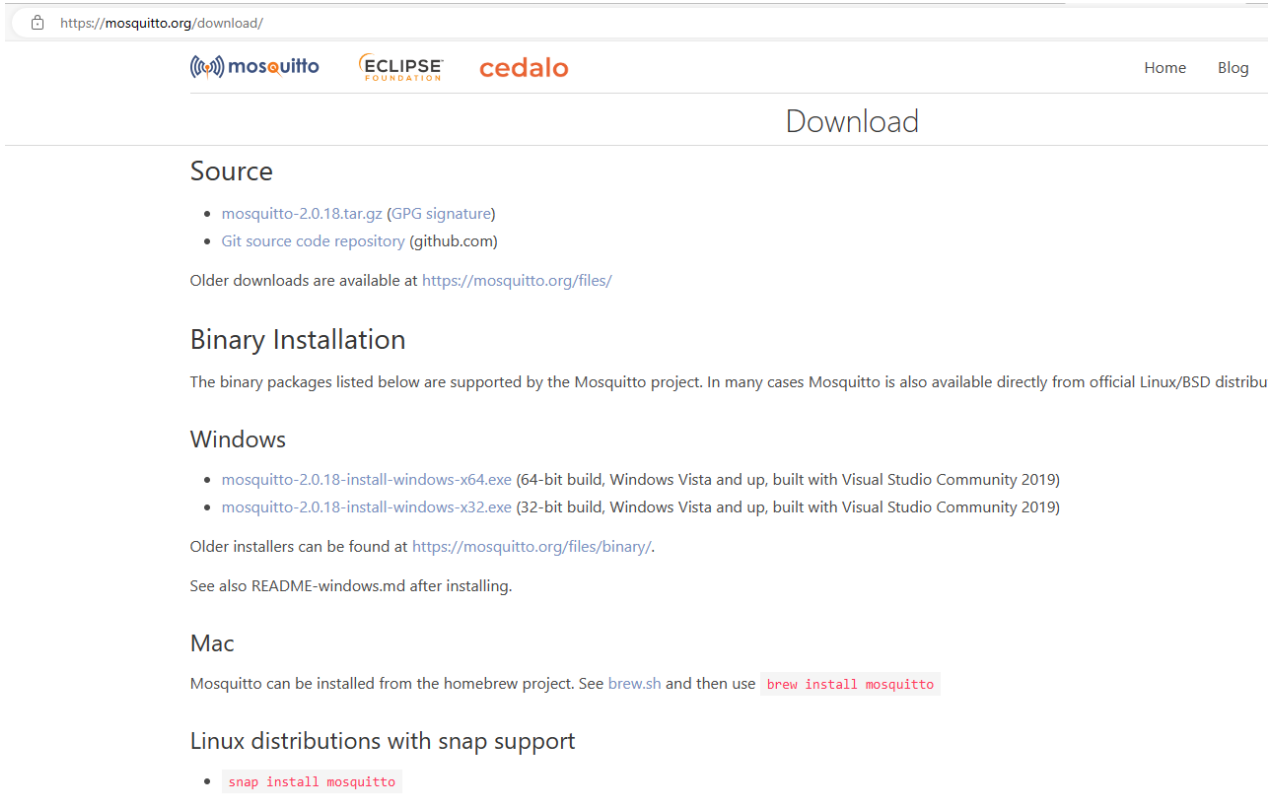




04

How to set up an MQTT server

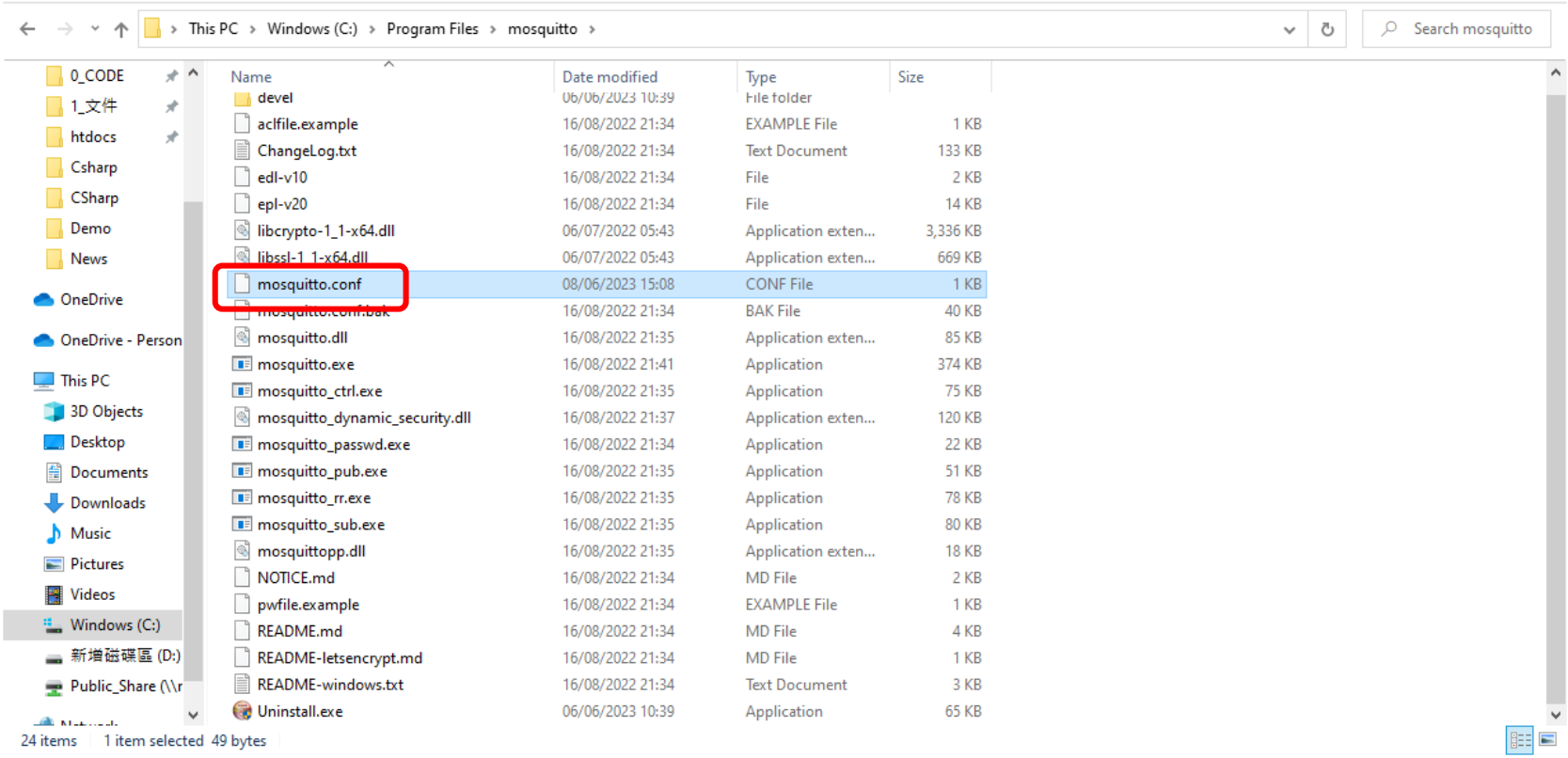
➢ How to set up an MQTT server

- Install MQTT broker “mosquitto”



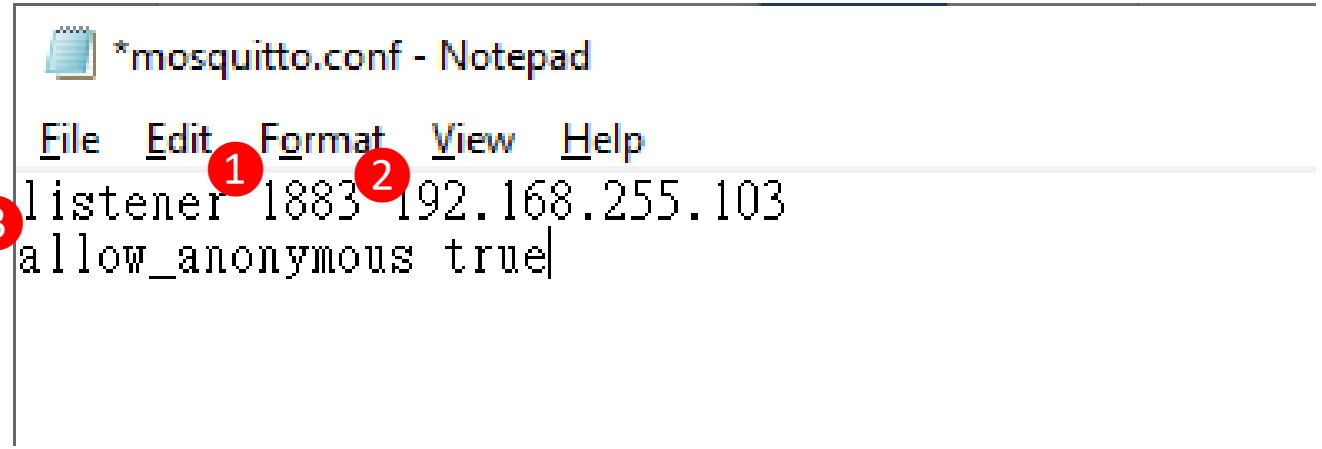
➢ How to set up an MQTT server

- Edit the conf file to allow external devices to connect to the broker



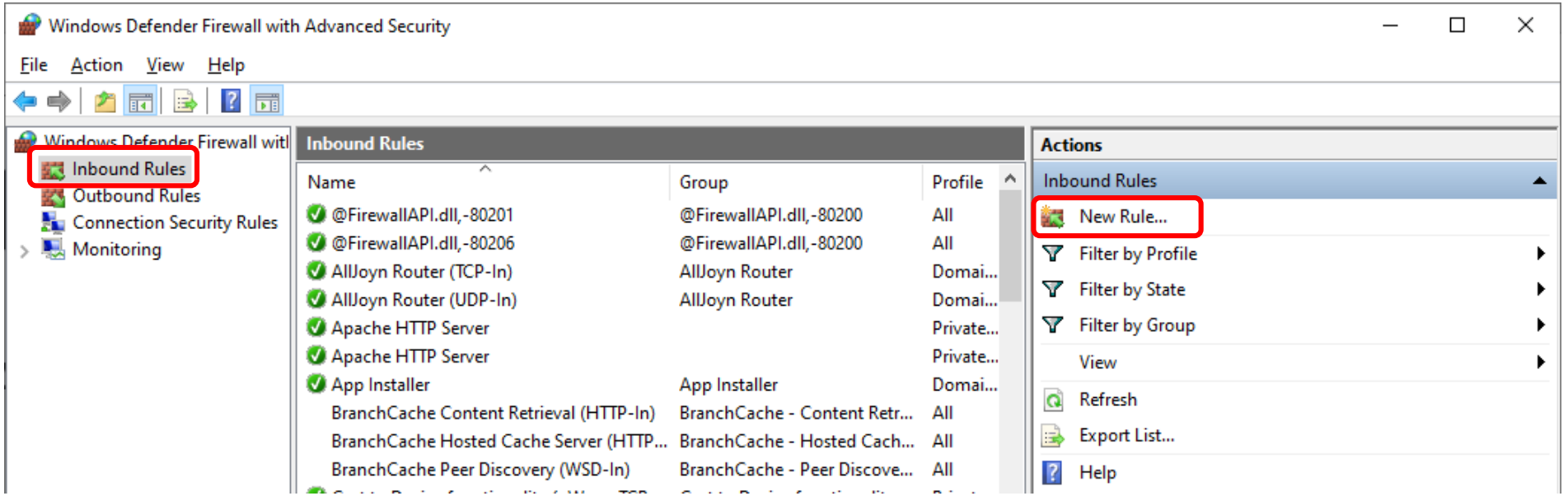
➢ How to set up an MQTT server

1. MQTT default port
2. Broker's IP
3. Allow external devices to connect to the broker



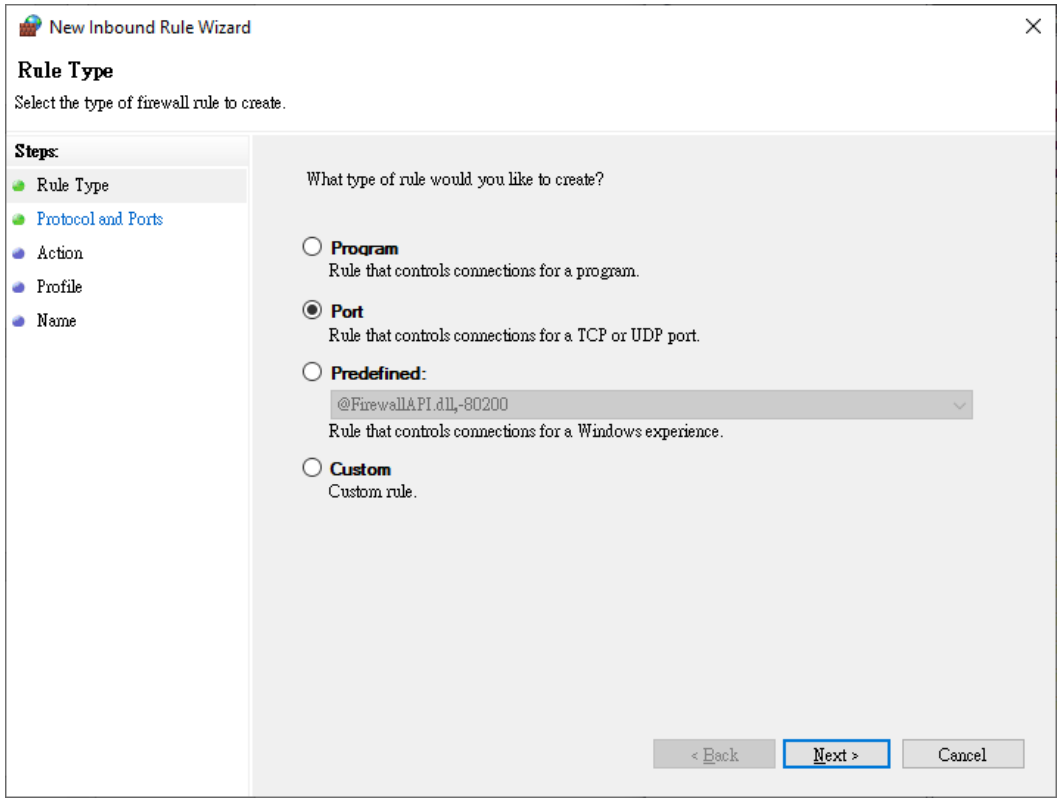
➢ How to set up an MQTT server

- Click “Inbound rules”, and then click “New rule”



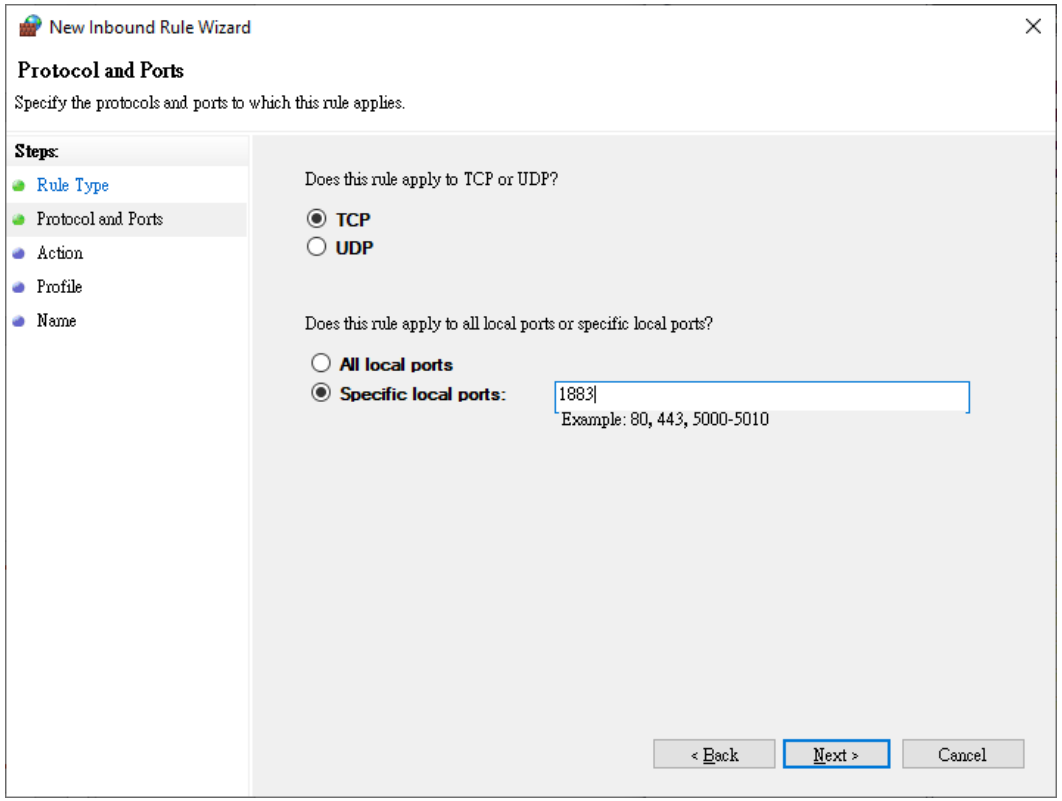
➢ How to set up an MQTT server

- Select “Port”



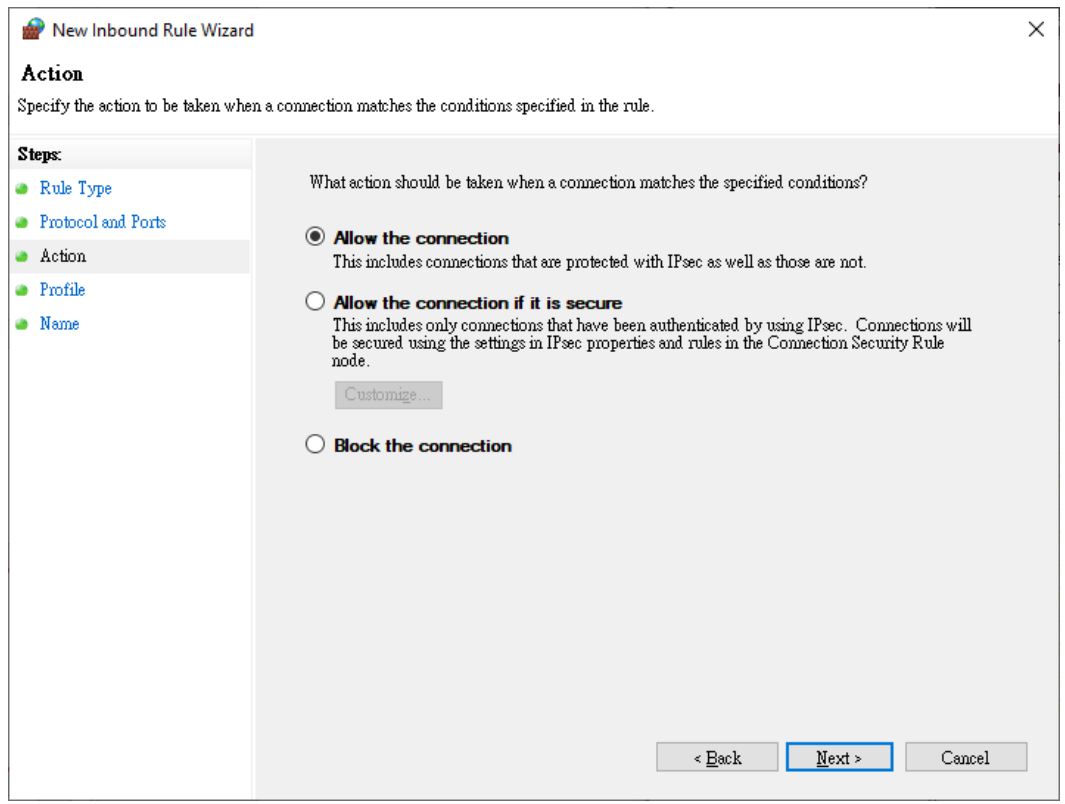
➢ How to set up an MQTT server

- Select “TCP” and Specific local ports :1883



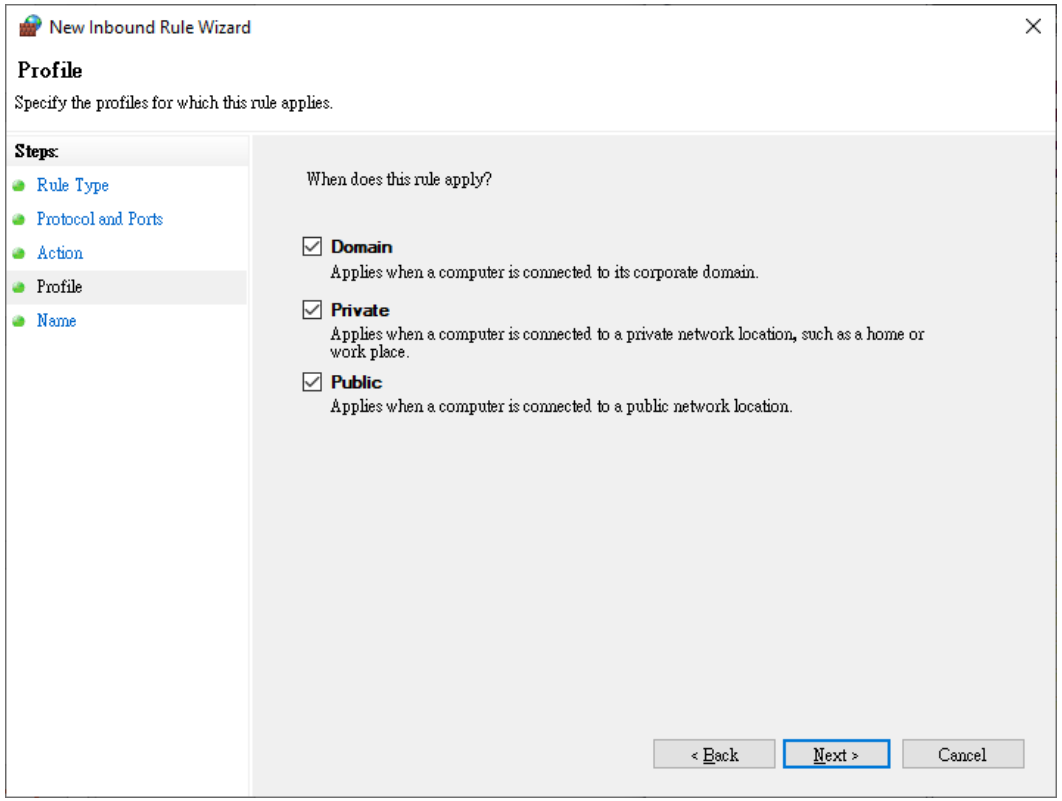
➢ How to set up an MQTT server

- Select “Allow the connection”



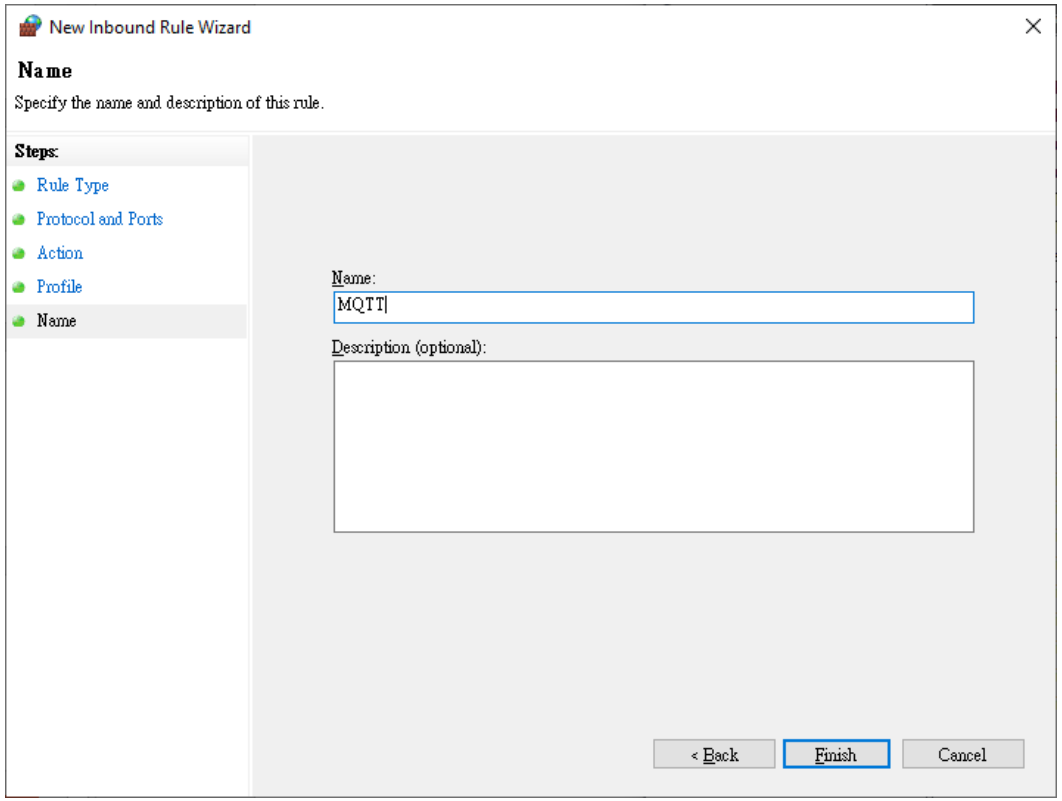
➢ How to set up an MQTT server

- Check all options



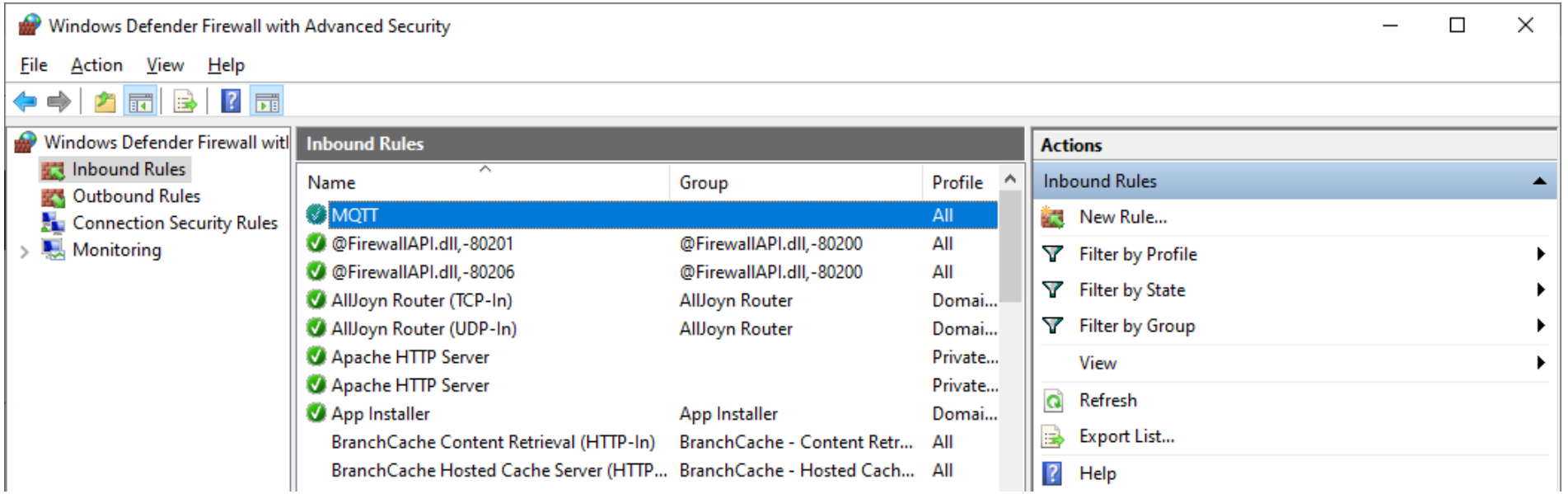
➢ How to set up an MQTT server

- Name:MQTT



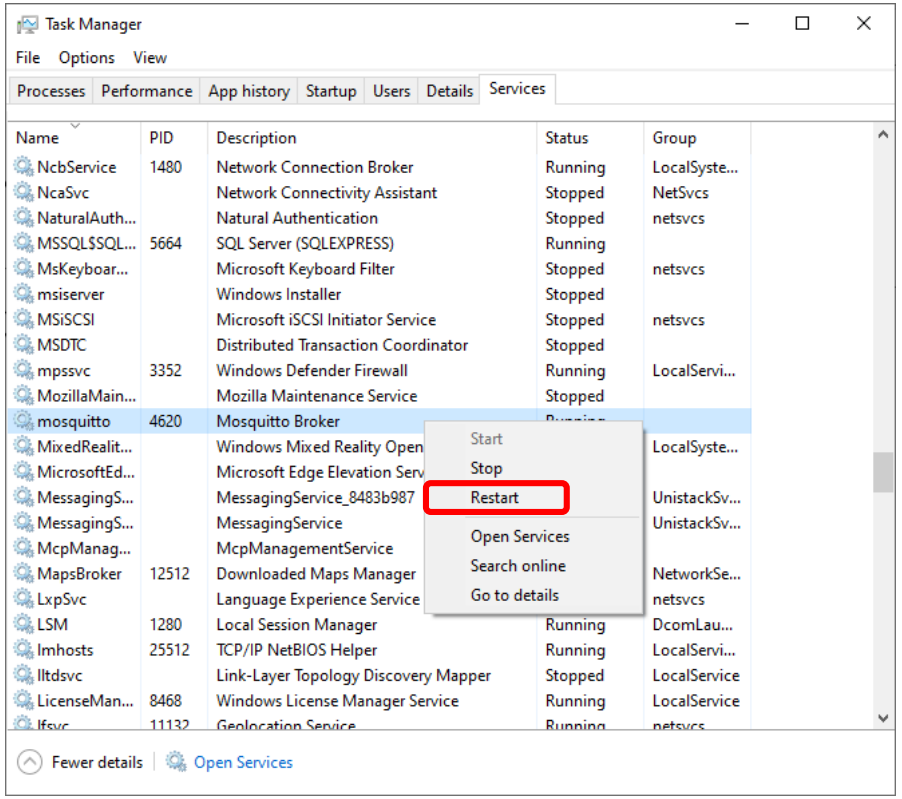
➢ How to set up an MQTT server

- Complete



➢ How to set up an MQTT server

- Restart mosquitto broker

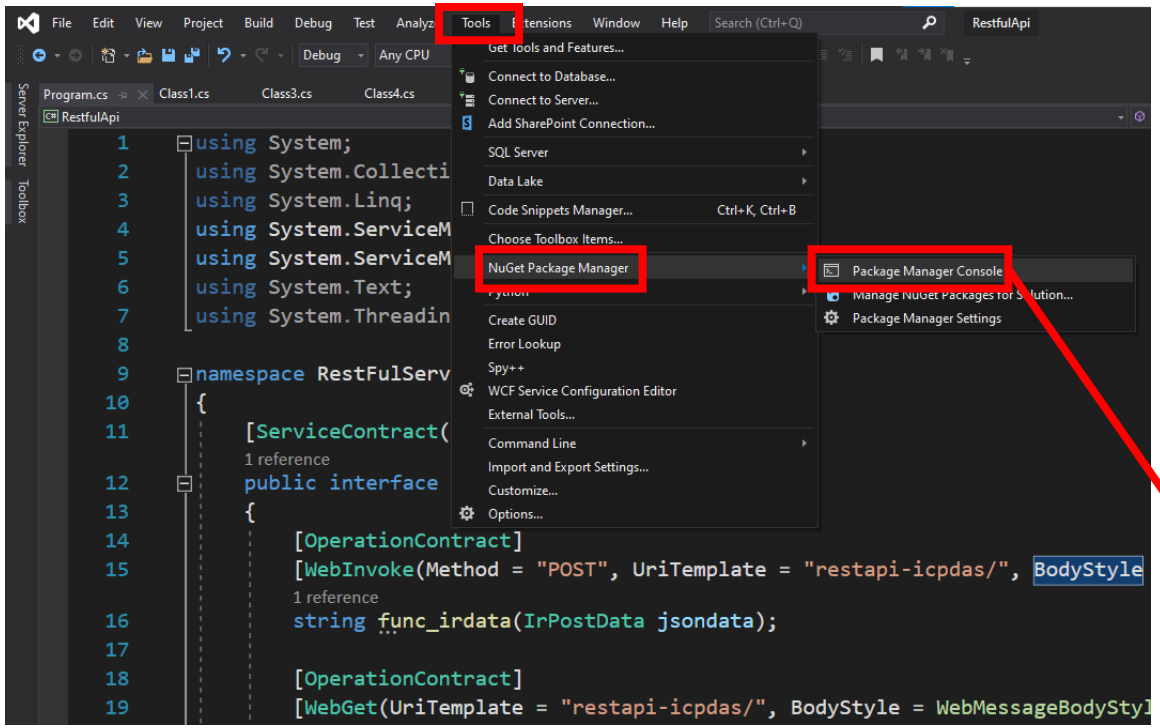


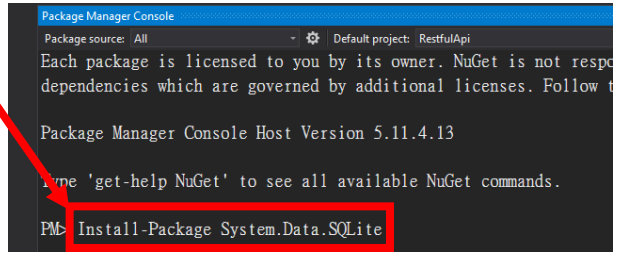
05

How to install Lib

➢ How to install Lib in CSharp

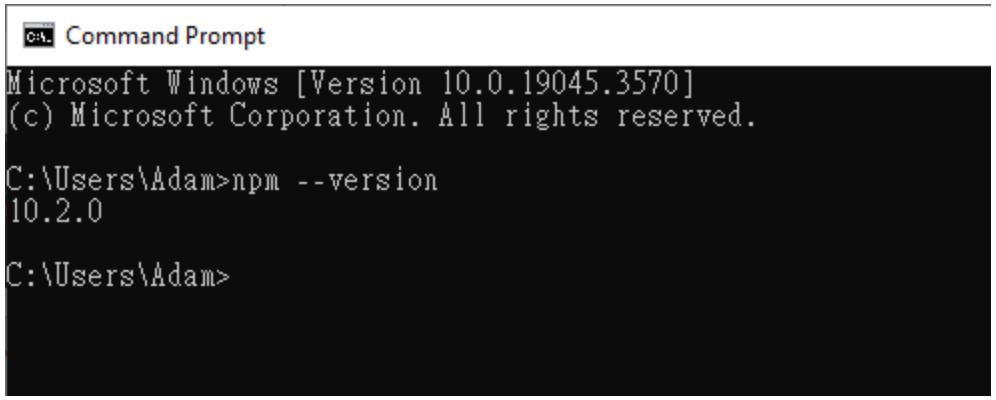
- NuGet
- Install Command→Install-Package System.Data.SQLite (libraries's name)





➢ How to install Lib in Node.js

- When you install the node.js environment, npm is also installed. npm is used to install various libraries in the node.js environment.
- Use the command to check whether npm is installed →npm --version
- Install Command→npm install modbus-serial(libraries's name)



➢ How to install Lib in Python

- Python uses pip to manage function libraries. When installing python, pip will also be installed.
- Use the command to check whether pip is installed →pip --version
- Install Command→ pip install pymodbus(libraries's name)