WoMaster

SCB DEMO KIT
QUICK INSTALLATION GUIDE

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www.womaster.eu

WoMaster

SCB Demo Box

Quick Installation Guide

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About This QIG

This user QIG is intended to guide a professional installer to install and establish the SCB Demo Kit. It includes procedures to assist you in avoiding unforeseen problems.

NOTE:

Only qualified and trained personnel should be involved with installation, inspection, and repairs of this router.

Disclaimer

WoMaster reserves the right to make changes to this Manual or to the product hardware at any time without notice. Information provided here is intended to be accurate and reliable. However, it might not cover all details and variations in the equipment and does not claim to provide for every possible contingency met in the process of installation, operation, or maintenance. Should further information be required or should particular problem arise which are not covered sufficiently for the user's purposes, the matter should be referred to WoMaster. Users must be aware that updates and amendments will be made from time to time to add new information and/or correct possible unintentional technical or typographical mistakes. It is the user's responsibility to determine whether there have been any such updates or amendments of the Manual. WoMaster assumes no responsibility for its use by the third parties.

WoMaster Online Technical Services

At WoMaster, you can use the online service forms to request the support. The submitted forms are stored in server for WoMaster team member to assign tasks and monitor the status of your service. Please feel free to write to help@womaster.eu if you encounter any problems.

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1. PRODUCT OVERVIEW

The SCB Demo Kit provides a quick and easy method for evaluating the SCB1200 within its basic application and feature. Reading the SCB1200 Data Sheet before using the Demo Kit is recommended for understanding the operation of the SCB1200 and the Demo kit.

The SCB1200 series are fully integrated and embedded communication systems within an IP67 box for Smart City and Industrial Internet of Thing (IIoT) applications. It is protected by IP67 waterproof enclosure, and cable gland connectors for Gigabit 802.3bt ultra PoE /802.3at PoE plus ports, Fiber SFP, Serial, Voice, DI, DO. It is greatly flexible with different power in/outsources, internal USB, SD, Ethernet and mCPIe socket for wireless expansion. Comparing with traditional cabinet, the SCB1000/1200 series save a lot of time and effort to assemble the power source, different media interfaces, wireless expansion, software test and system adjustments. The other special thing is this SCB is support with IIoT platform that called ThingsMaster. ThingsMaster provides dynamic, fast and flexible dashboard.

1.1 DEMO BOX PACKAGES



When the package received by the customer, customer will receive a box of SCB demo kit that includes the SCB devices and the demo kit such as a sensor, alarm, speaker, IP camera, and also several cables.



1.2 SCB DEMO KIT PACKAGE CHECKLIST

Below is the content of the SCB Demo Box:

Model Name	Description
SCB1200-AC	Industrial Smart City Box with 4GT PoE + 2GF, IIoT interfaces, AC Input (IIoT Interfaces: External 1xCOM,2xDI,2xDO,Voice; Internal 1GT WAN, 1xCOM, 1xUSB, 1xSD)
SCB LTE Module & Antenna EU	Industrial LTE Cellular Module EU: FDD B1/B3/B5/B7/B8/B20, TDD B38/B40/B41, WCDMA: B1/B5/B8, GSM: B3/B8 Antenna: LTE+GPS Antenna on the top of case.
SCB Wi-Fi Module	Industrial 5G/2.4G 802.11ac/n Wi-Fi 2T2R Module Pre-install 2x N-Type Female Antenna sockets on the top of case 2x External 2.4G/5G 3dbi Omni-Directional Antenna
Sensor	CO2 / Temperature / Humidity Sensor 12~36VDC + 50 centimeters RJ45 cable
Alarm	24 VDC Power Input
Camera	802.3af/ at/ bt IP Camera + 1 meter RJ45 cable.
Speaker	8 Ω 25 W
Power Cables	1 x 4 Pin IP67 M12 power connector + Converter.
DC Output	1x 4 Pin IP67 M12 power connector 24VDC, 1.25A max. (DC 1+, DC 1-, DC 2+, DC 2-)

Please check the SCB demo kit and contact the sales, if customer finds out any defected product.

1.3 DEMO ENVIRONMENT DISPLAY

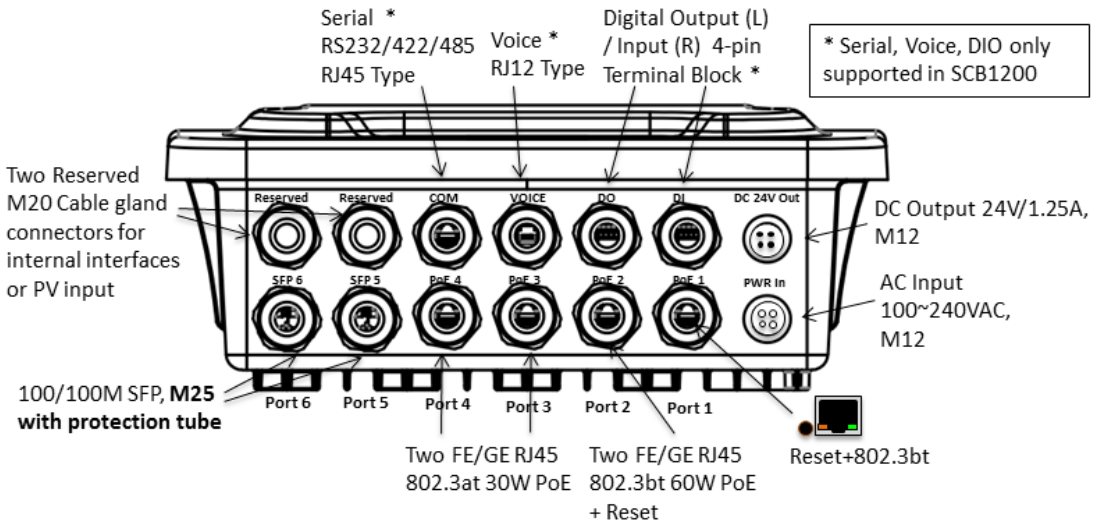
The goal of this QIG is to help the installer to establish the demo environment and establish the connection between the demonstration kits with the SCB. And also help the user to connect the SCB to the cloud service. Below is the demo environment display.



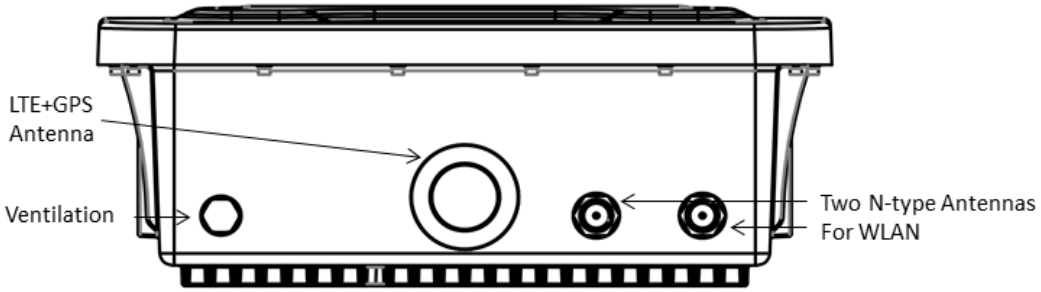
1.4 SCB INTERFACE

This section is the SCB interface with the front panel and back panel appearance. It could assist the user to install and establish the connection by understanding the interface.

Front Panel



Back Panel

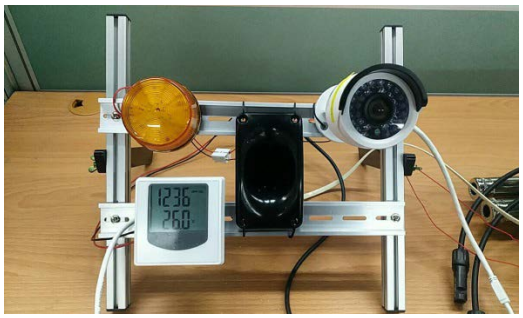


2. DEMO ENVIRONMENT INSTALLATION

2.1 HOW TO INSTALL THE DEMONSTRATION RACK

The Demo Kit rack is provided, in order to install the sensor, alarm, speaker, and the IP camera. The demonstration rack is easy to be installed. To install the demonstration rack, user just needs to set up the rack leg to a proper position and tighten the screw.





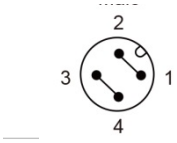
2.2 HOW TO USE THE SMART CITY BOX

2.2.1 POWER INPUT INSTALLATION

The Smart City Box 1200 Series needs a 100~240 VAC power connection. The device must be powered using the power input cable that provided by WoMaster.

How to power up the SCB 1200

1. The power input is supported with AC model, 100~240 VAC. The power input is 4-pin M12 power connector.

Male M12 Connector	Pin	Description	Pin Color
	1	V+	Red
	2		
	3	V-	Blue
	4		

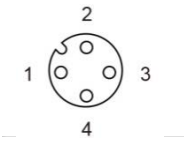
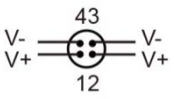
2. Tighten the nuts to prevent the loosening of M12 connectors.



3. Plug the power connector to a power source then the SCB is powered up and ready to operate. For European power socket, the adapter is provided.



2.2.2 POWER OUTPUT INSTALLATION

Female M12 Connector	Power	Pin	Description	Pin Color
 DC24V Output 	1	2	V+	Brown
		3	V-	Black
	2	1	V+	White
		4	V-	Blue

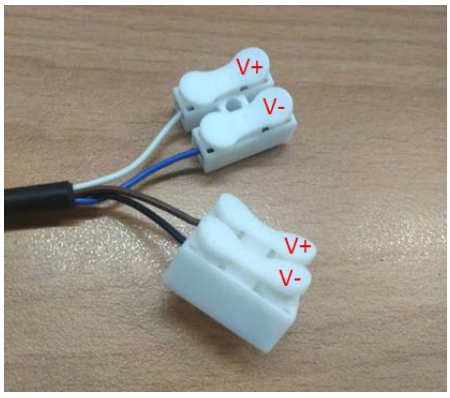
The Smart City Box 1200 Series is supported with Dual Power Outputs, 4-pin M12 power connector. This power output in this Demo Box is used to power up the CO2, temperature and humidity sensor also the alarm. And it can deliver maximum 24VDC/1.25A power output.

How to install the power output cable

1. Tighten the nuts to prevent the loosening of M12 connectors.



2. On the other side of the cable it has 4 pins that connected to two connectors. Each connector needs to be connected to the Sensor or the Alarm. Below is the appearance.

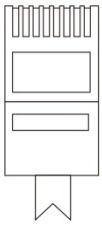


2.2.3 HOW TO INSTALL CO2, TEMPERATURE, AND HUMIDITY SENSOR

This device is equipped with RS232/422/485 serial ports that able to connect to local serial devices. To connect the sensor, we may use the RJ-45 Connector or M20 Cable Gland. A 3 in 1 sensor has been prepared, so the user just needs to connect the RJ-45 to the Serial Port. **Please refer to the SCB Interface (COM).**



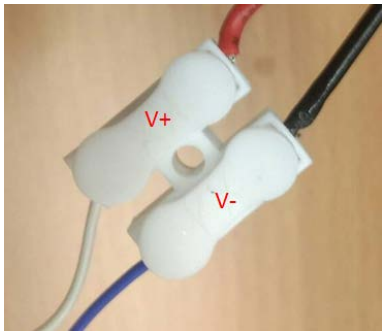

Below is the table for cabling the serial connector:

RJ45		RS-232	RS-422/485 (4 wire)	RS-485 (2 wire)
1 2 3 4 5 6 7 8 	1	DSR		
	2	RTS		
	3		GND	
	4	TxD	RX+	
	5	RxD	TX+	Data+
	6	DCD	TX-	Data-
	7	CTS		
	8	DTR	RX-	

Note: *The sensor is supported with RS-485 with 2 wires, please wire the pin based on the table above. At the sensor, user will see 485+ and 485- label, wire the pin number 5 (Blue-White color) to 485- and wire the pin number 6 (Green Color) to 485+ to get the data from the sensor. After it is done, connect the RJ45 to the Serial Port.*

How to power the sensor

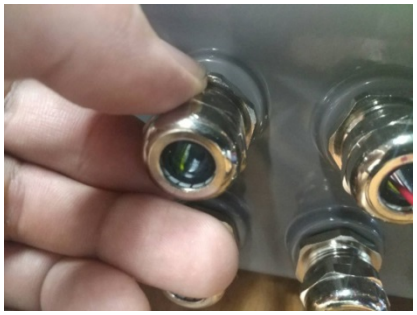
As mentioned in the Power Output section above, there are two connectors that free to used. To power the Sensor, user can connect the wire from the sensor to the power output cable with the connector. After that the sensor will ready to use.





2.2.4 HOW TO INSTALL THE SPEAKER

The SCB1200 Series is provided with audio feature, which uses the RJ12 for any kind of audio adapter. To install and power the speaker, open the M20 connector and connect the RJ12 to the Voice Port. **Please refer to the SCB Interface (Voice Port).**





When the speaker is connected to the voice port, it will get the power directly and ready to use.



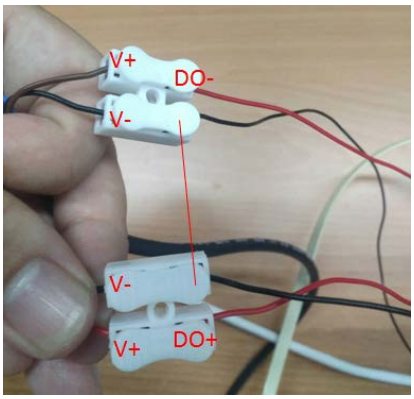
2.2.5 HOW TO INSTALL THE ALARM

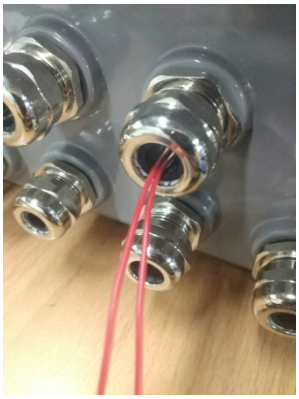
Two wires have been attached to the digital output connector, and when a user-configured event occurs then a fault contact forms a closed circuit. If a user-configured event does not occur, the fault circuit remains opened and will not trigger the alarm on.

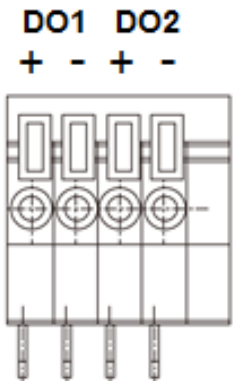


Wire the alarm by connecting the V+ from the power output to the cable that connected to DO-. And the cable from the alarm also needs to be connected to the cable that connected to the DO+. The

other cable from the alarm should be connected to the V- from the power output. **Please refer to the SCB Interface (DO).** Open the M20 interface to check the cable position.

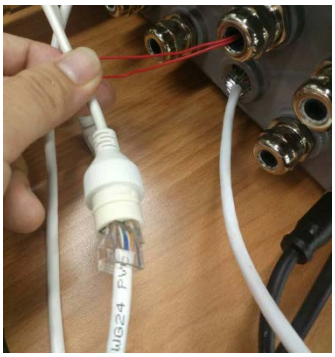






2.2.6 HOW TO INSTALL THE POE CAMERA

The SCB1200 Series is equipped with two 802.3bt ultra PoE++ (Port 1/2) and two 802.3at high power PoE+ (Port 3/4) Ethernet ports for high power IP PTZ Cameras. To install the IP Camera, please connect the IP Camera by using RJ45 connector to PoE port at the SCB. To deliver the PoE, user should enable the PoE function from the Web Management. **Please refer to the SCB Interface (PoE port).**

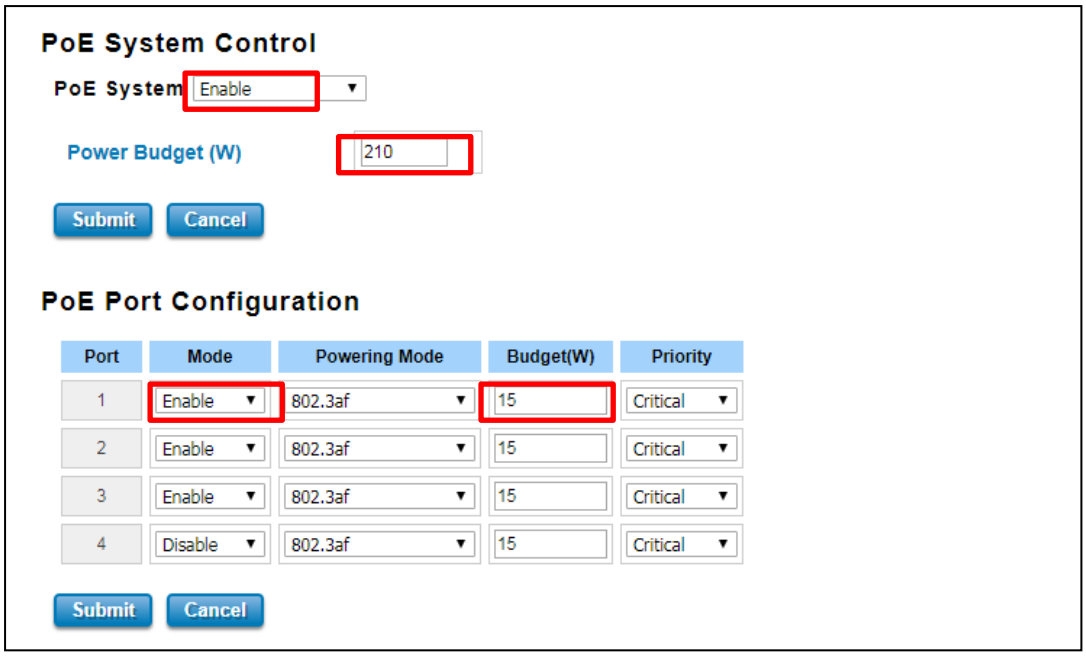




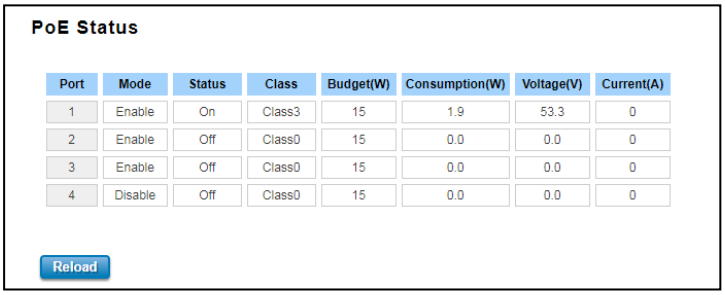
How to power the IP Camera

Please go to SCB Web Management to enable the PoE function.

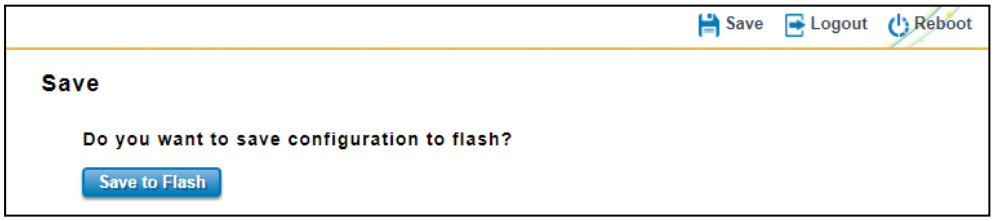
- Type **http://IP_address** in your browser (the default IP address is **http://192.168.10.1/**)
- Key in the user name and password in the login screen. The default username and password is ***admin***.
- After you click OK, the Welcome page of the web-based management interface will appear.
- On the left side you can see the list of software features, on the right side – available settings.
- Go to **PoE** -> **PoE Control**, enable the PoE System and configure the Power Budget. Then at the PoE Port Configuration, choose the port that user wants to use and enable it. Don't forget to set the Power budget. Click **Submit** to apply the function.



- After that, go to the PoE Status, and user will see the PoE is delivered.

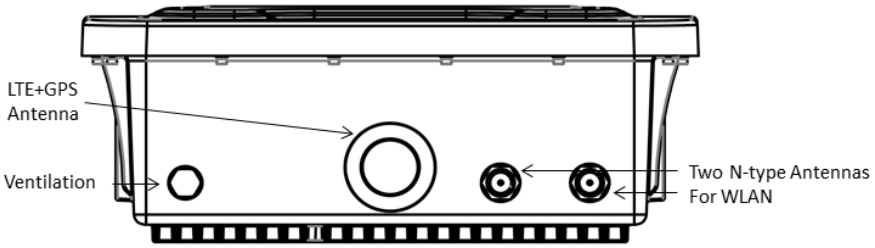


- Don't forget to save the configuration every time user made any changes.



2.2.7 HOW TO INSTALL THE ANTENNAS

The SCB1200 Series is supported with Industrial 5G/2.4G 802.11ac/n Wi-Fi 2T2R Module and Industrial LTE Cellular Module. The LTE and GPS Antenna have been installed on the top of case **(Please refer to the Back Panel interface).**



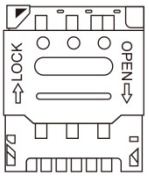
For the Wi-Fi Antenna, 2x N-Type Female Antenna sockets are provided on the top of case and user need to screw the External Omni Antenna.

The antennas have to be gently screwed on the connector. Do not force the antenna; if you need too much strength to screw it is probably being installed in a wrong position. If you have any reception issue with 4G or GPS, please contact our sales.

2.3 HOW TO GET INTERNET CONNECTION

The SCB Series 1200 is equipped with 2 SIM Card slot inside the box.

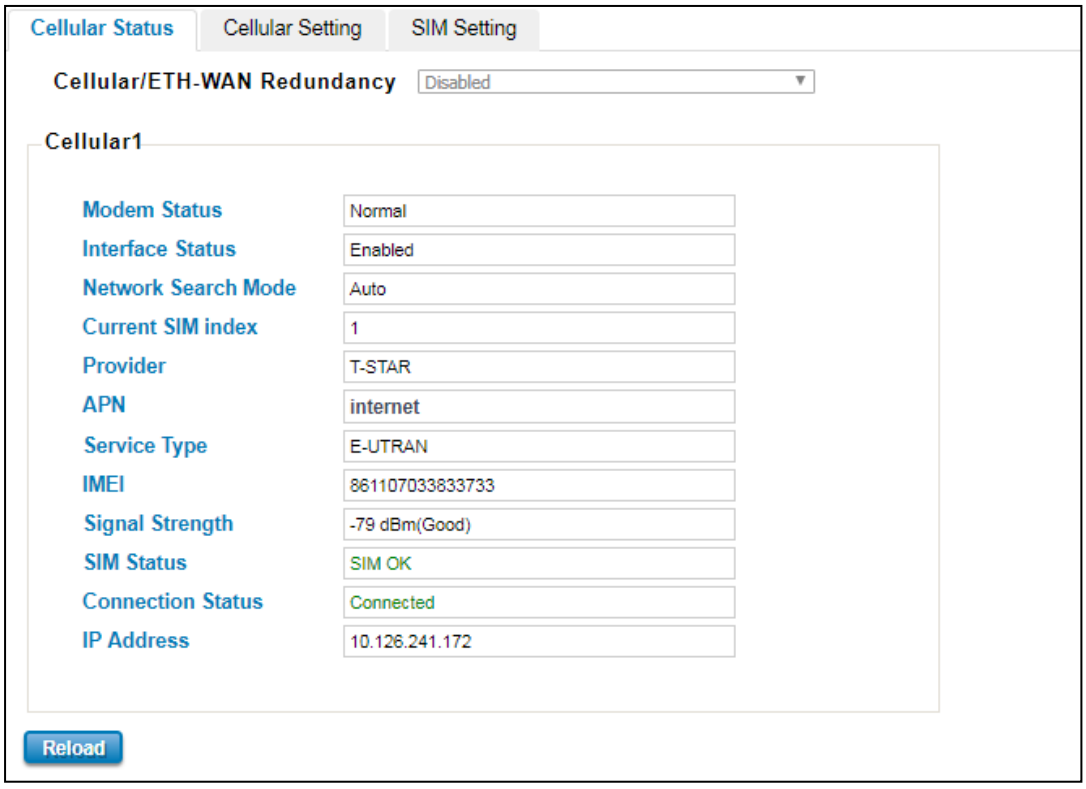
Nano SIM Card Slot



There are two SIM Card Slots are used to insert the cellular card, they are located under the SCB cover. The SIM card is supported redundant SIM. To get the internet connection, please insert a cellular card with the internet service.

***Warning**: Be careful when install the SIM Card, wrong installation procedure will cause damage. Make sure the SIM card facing the correct position.*

User can go to the Web GUI to the Cellular Status and check if LTE connection has established. Then try to ping 8.8.8.8. Please make sure if the user's computer or laptop IP Setting is on the same subnet with the SCB.



3. GET CONNECTED TO THE CLOUD PLATFORM

The aim of this chapter is to introduce the user to the WoMaster Cloud platform functionality. This section will help user to connect the SCB1200 Series to ThingsMaster or third party cloud platform, AWS and Microsoft Azure.

3.1 THINGSMASTER (PRIVATE CLOUD)

3.1.1 ESTABLISH THE THINGSMASTER CLOUD SERVER

1. Download and install VMware Workstation Player.

Please click the link below.

https://my.vmware.com/en/web/vmware/free#desktop_end_user_computing/vmware_workstation_player/14_0

2. Download the server file from our website. (https://www.womaster.eu/)

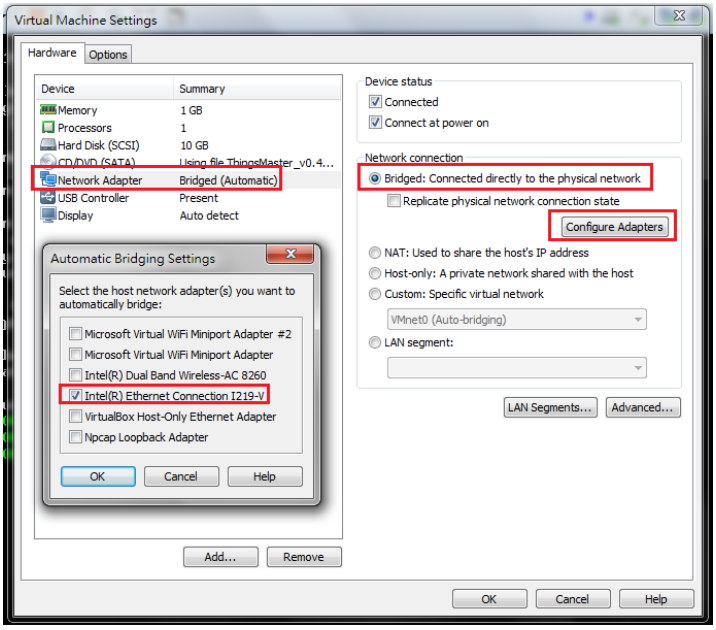
Go to support -> Software & Literature

3. Open a Virtual Machine from disk and import.

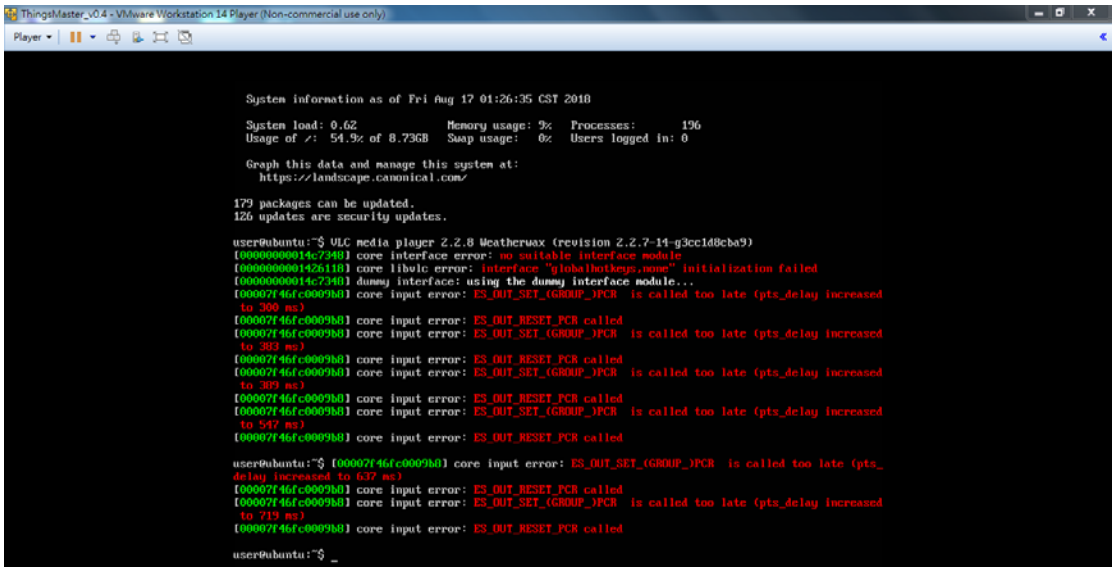
Note: Ignore the warning message, check “Do not show this message again” then click Retry.

4. Configure network adapter of ThingsMaster VM to make sure that the laptop or the computer can ping the Virtual Machine.

- Go to Player -> Managed -> Virtual Machine Settings
- Choose the Network Adapter
- Set the Network Connection to Bridged
- Click Configure Adapters
- Select the Network Card that user used, user may choose either Wireless or Ethernet connection.



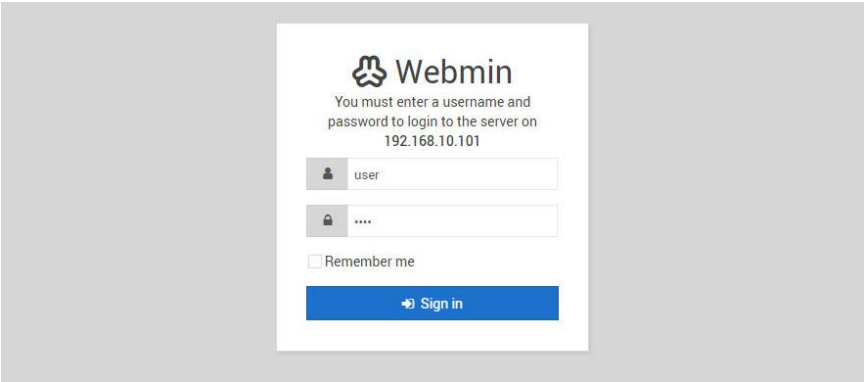
5. Start the Virtual Machine, wait till the starting process is done.



6. Open a web browser to Login to Webmin by SSL in order to change some VM configurations.

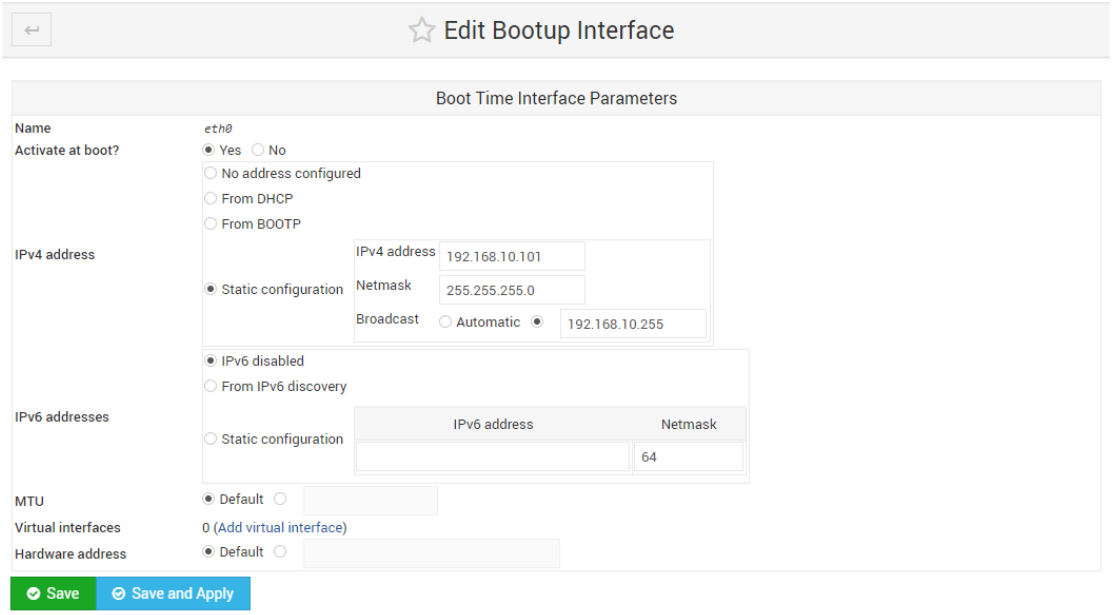
Default: https://192.168.10.101:10000

User Name/Password: user/user



7. Configure the IP address and Gateway (optional). Select 'eth0' to change IP address and add default gateway if needed.

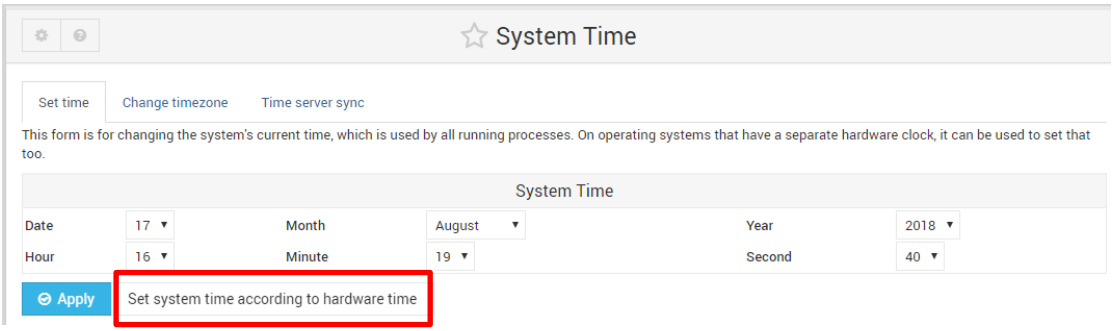
Go to Networking -> Network Configuration -> Network Interface -> Click eth0



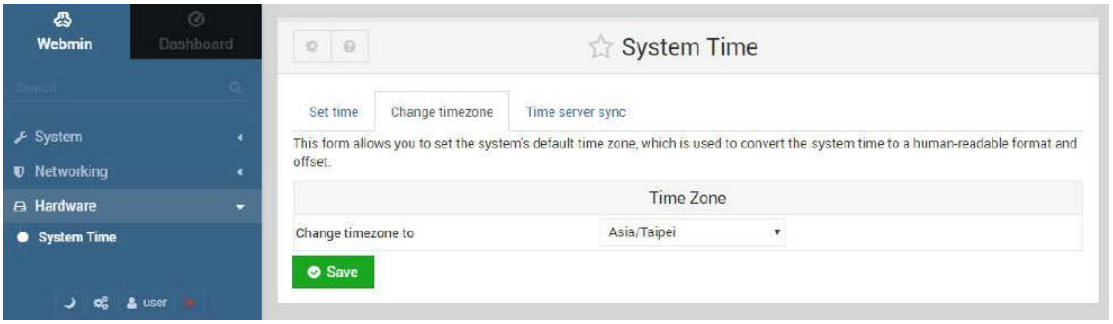
8. Configure Date & Time of the ThingsMaster Virtual Machine.

Please adjust the time and change time zone of the VM first. User can configure it from the Webmin interface. Go to Hardware -> System Time -> Set Time -> Change Time Zone

Set the System time according to the hardware.



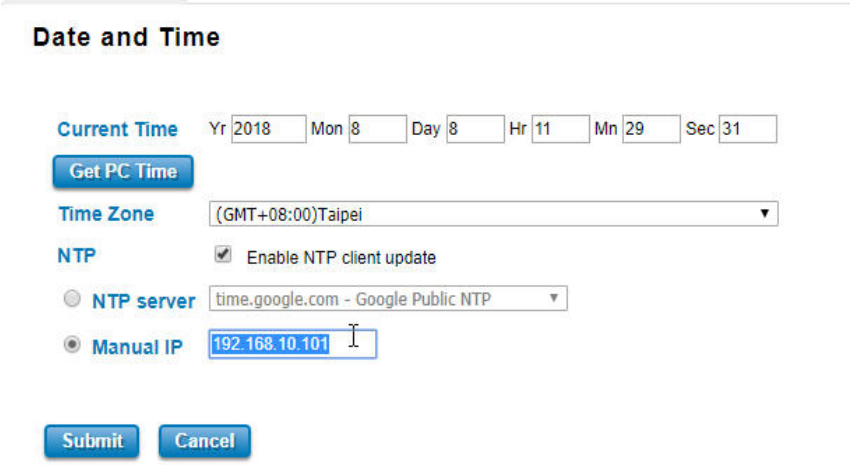
Change the time zone to current user's time zone.



9. Adjust time setting of SCB1200

ThingsMaster server has already enabled the NTP service; user can synchronize the system time of the device by using NTP client.

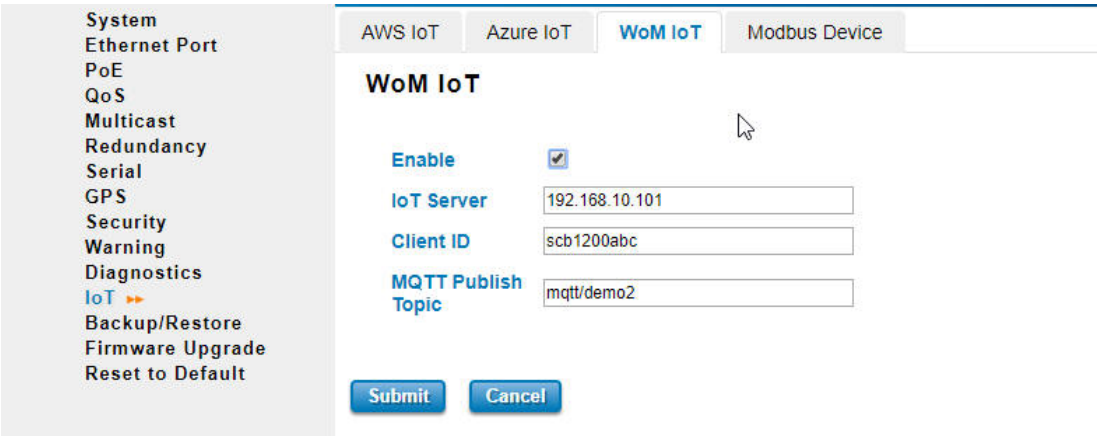
- Enable SCB1200 NTP from WEB GUI-> System-> Date and Time -> Enable the NTP Client -> choose the Manual IP -> enter the server IP Address (192.168.10.101)



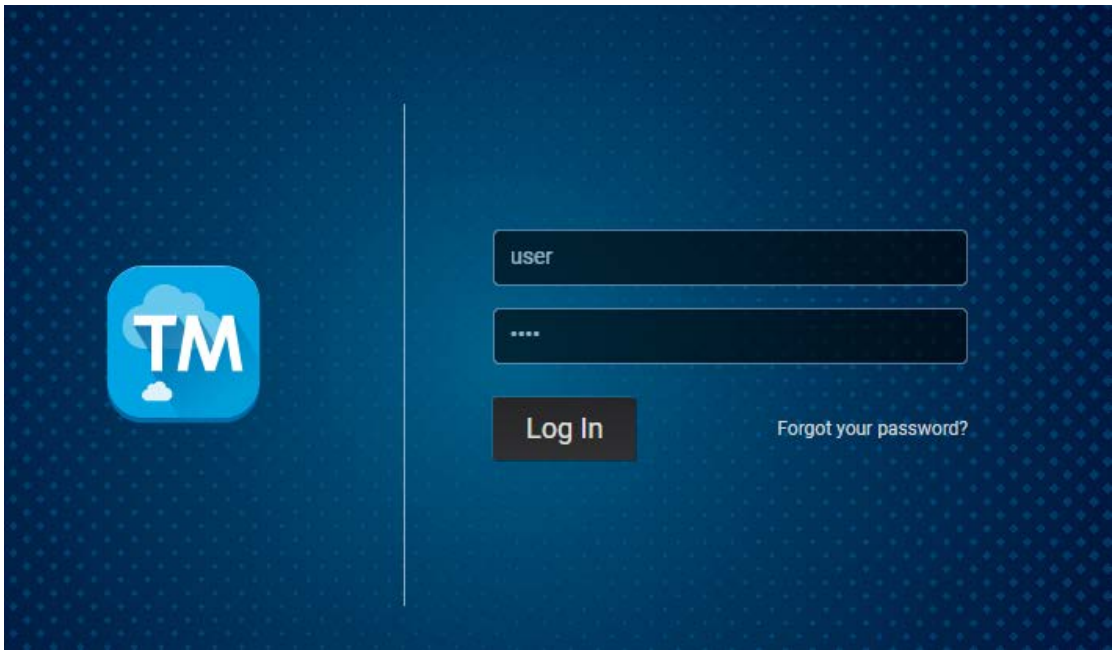
10. Configure the SCB1200 WoM IoT

- Enable WoM IoT service

  Note: Please use '**mqtt/demo2**' as the MQTT topic and do not change it in this demo kit.

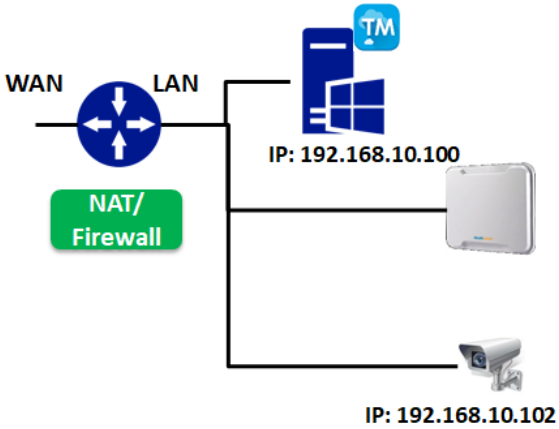


11. Open the web browser and type the ThingsMaster server IP Address (192.168.10.101).



Enter the username/password: user/user

3.1.2 HOW TO ACCESS THINGSMASTER OUTSIDE THE FIREWALL/NAT



- **Add Firewall Rule to the router device that the user used :**

  Forward “WAN IP”:80 -> LAN: 192.168.10.101:80

  Forward “WAN IP”:554 -> LAN: 192.168.10.102:554

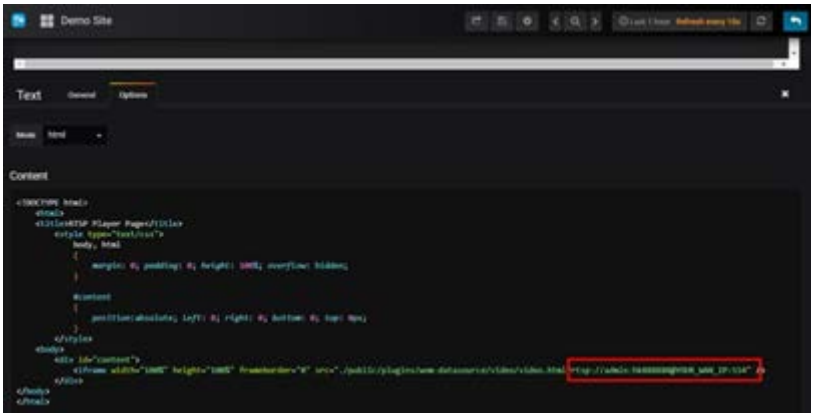
- **Modify Alarm (CO2 Alarm Dropdown list -> Edit)**

  Update “YOUR WAN IP” according to the network environment.



- **Modify IP Camera (Stream Dropdown list -> Edit)**

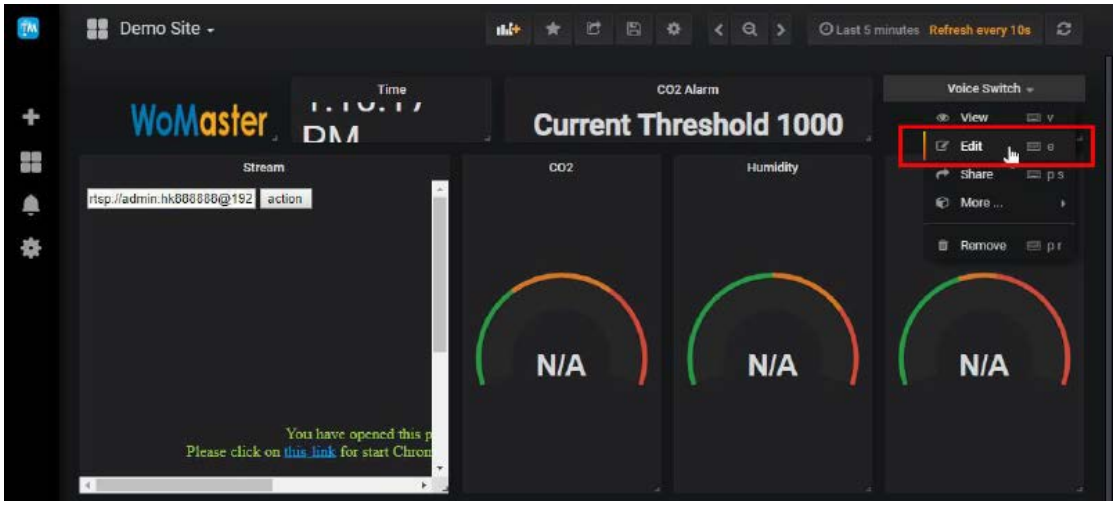
  Update “YOUR WAN IP” according to the network environment.



3.1.3 ADDITIONAL THINGSMASTER CONFIGURATION

Audio/VoIP configuration: modify the IP address of the Device & ThingsMaster.

Set the value from the Voice Switch setting panel. Click the drop down list -> Click Edit.



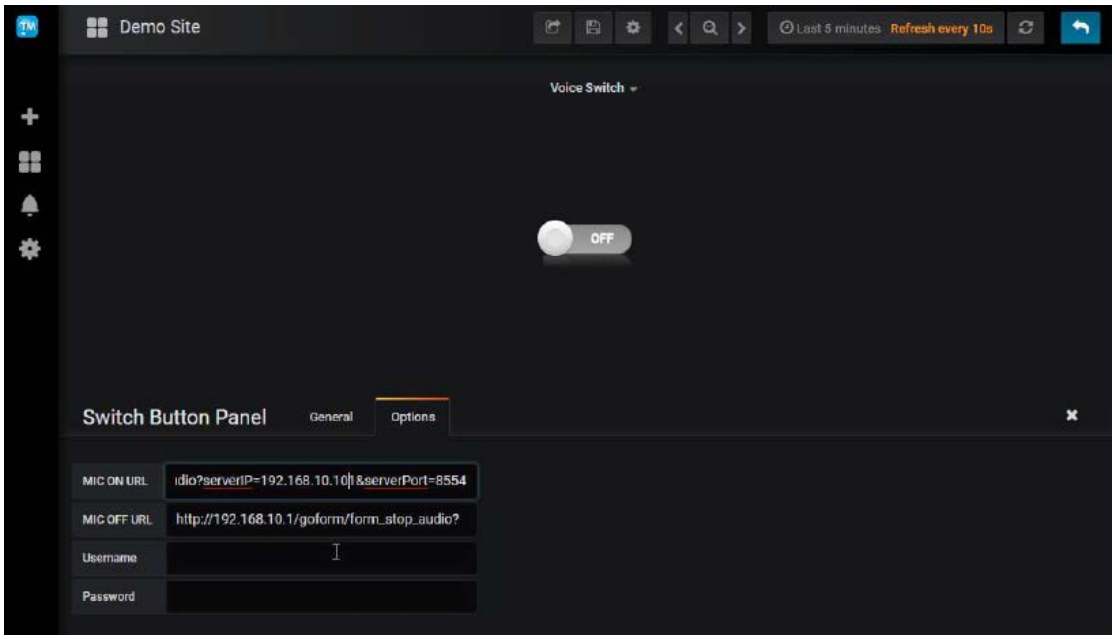
Set the value of Device IP based on the IP Address of the SCB1200.

MIC ON URL:

http://DEVICE_IP/goform/form_play_audio?serverIP=SERVER_IP&serverPort=8554

MIC OFF URL:

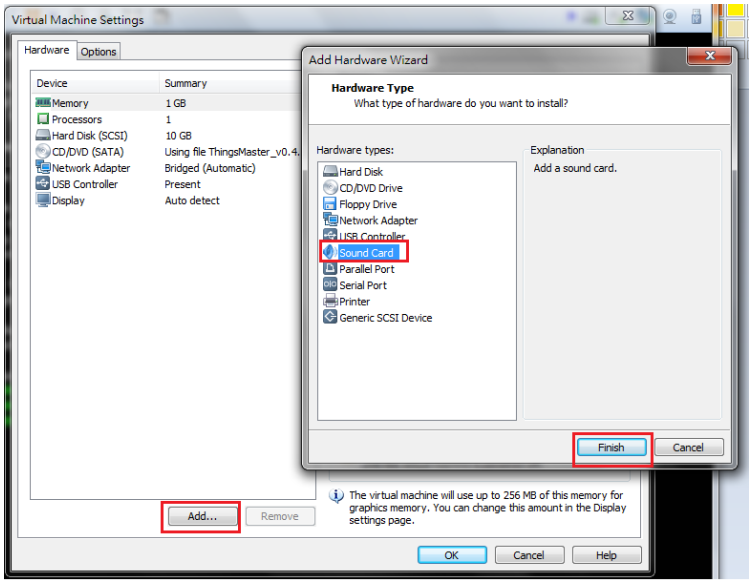
http://DEVICE_IP/goform/form_stop_audio?



Add the SoundCard hardware to Virtual Machine configuration.

Because the default setting does not include the SoundCard hardware, then user need to add it. Add the soundcard hardware, so user can use any kind of microphones to make a sound through the Voice Switch feature.

Hardware Tab -> Click Add button -> Choose SoundCard -> finish.



After user added the SoundCard hardware, please restart the Virtual Machine.

Test the Audio/VOIP

The ThingsMaster dashboard provides the Voice Switch button. To activate the VOIP feature please switch the ON/OFF button.



3.1.4 DEFAULT VALUE

Default settings for ThingsMaster:

IP Address: 192.168.10.101

Netmask: 255.255.255.0

Default Gateway: 192.168.10.100

ThingsMaster Web Dashboard User/Password: user/user

Webmin User/Password: user/user

Default settings for SCB1200 Series:

IP Address: 192.168.10.1

Netmask: 255.255.255.0

Web GUI User/Password: admin/admin

IP Camera:

IP Address: 192.168.10.102

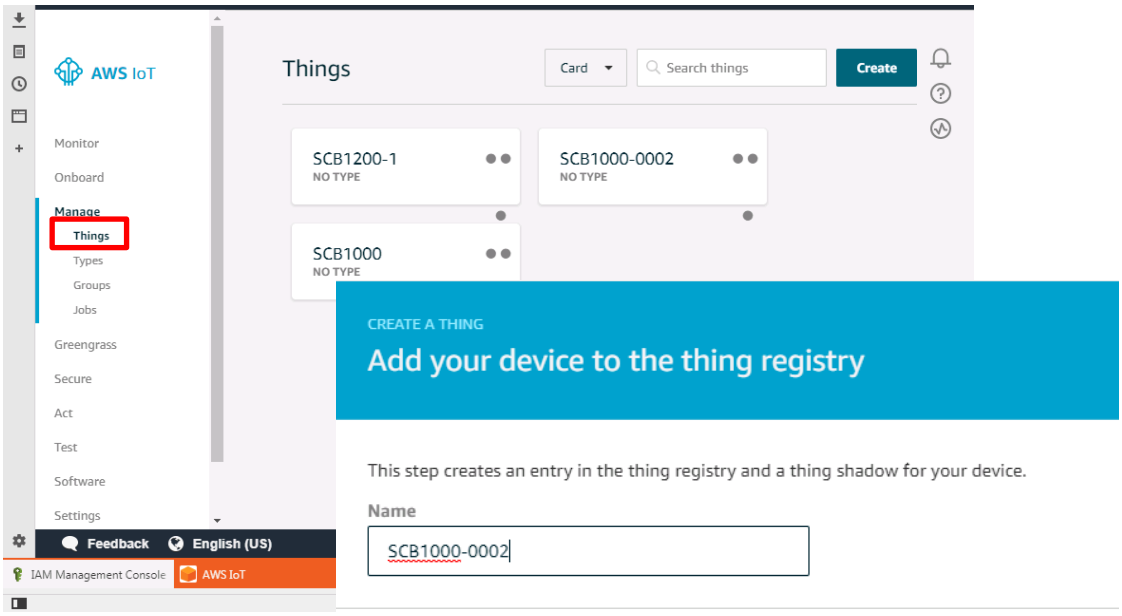
3.2 AWS IOT (PUBLIC CLOUD)

3.2.1 HOW TO CONNECT THE SCB1200 SERIES TO AWS

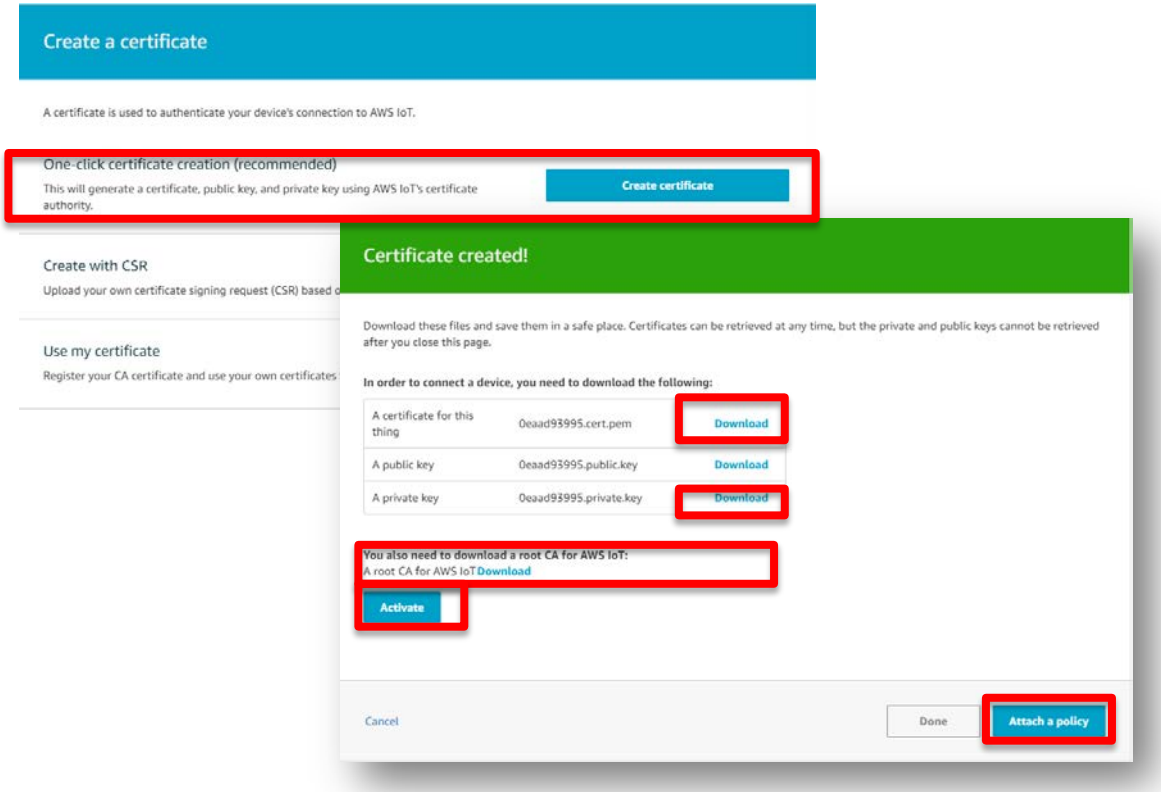
- Create and login to AWS account.
- Select AWS IoT Services - IoT Core –



- Go to Manage - click Thing. Create a “Thing”.



- Create and download key to your SCB.

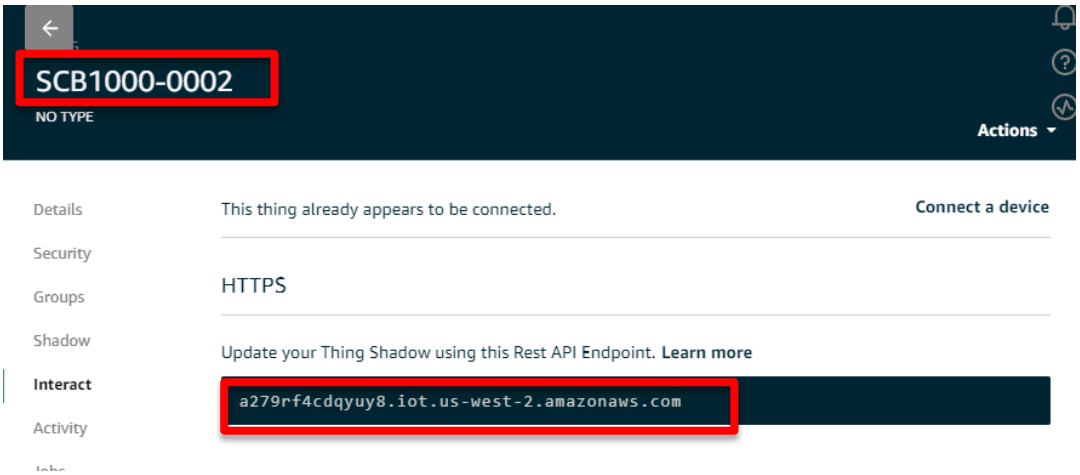


Certificate, private key, root CA is necessary. Public key is used by AWS server to authenticate with private key. The public key and private cannot be downloaded back after the user close the page. Policy can be added later

- Get the Target host to connect with the SCB

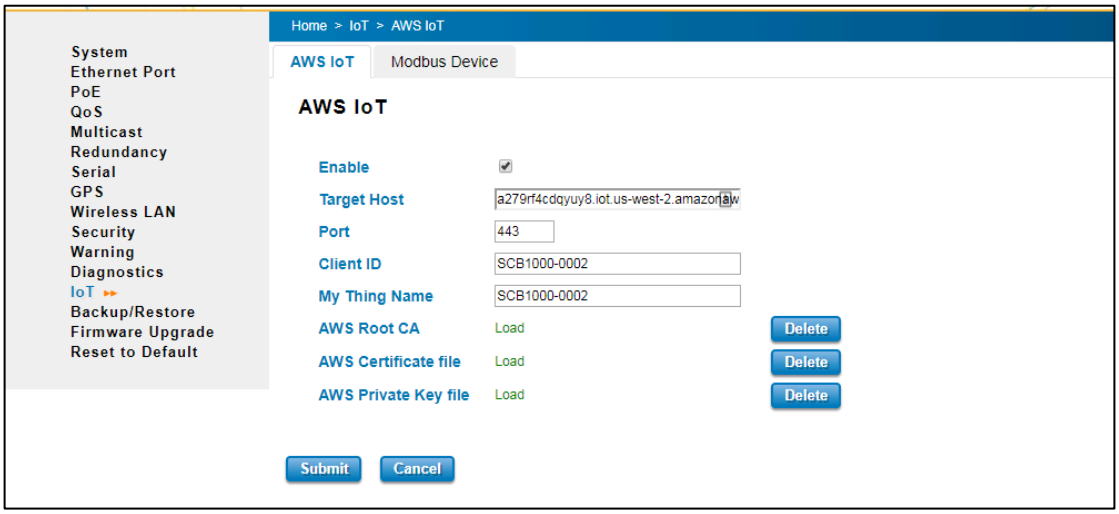
  Go to Manage -> Things -> click the device name -> Click Interact

  Copy the HTTPS link to update user's Thing Shadow using this Rest API Endpoint.



- Connect the SCB1200 to AWS

  Copy the link and paste on the Target Host field at the AWS IoT page.

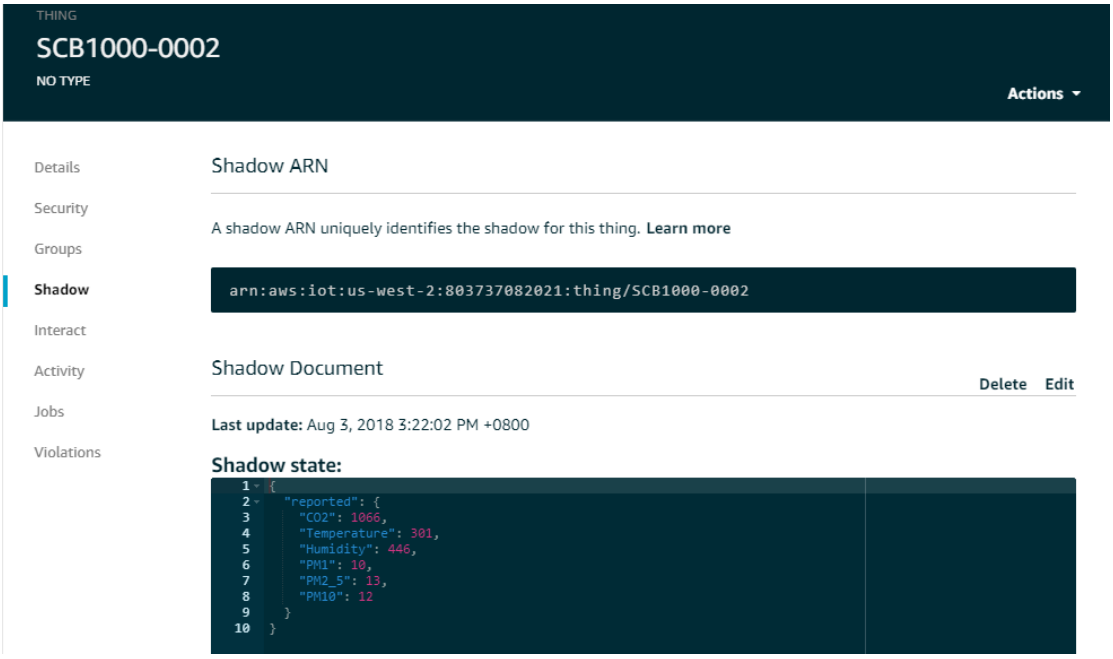


- Add the Modbus Device parameter to Modbus Logging field to register the sensor. Go to **Modbus Logging** Section.

3.2.2 HOW TO CHECK THE DATA IS UPLOADED TO THE CLOUD

- Go to Thing -> Click shadow

  In this page, user may see the value from each sensor that is used by the user.



- User may use other visualization methods by using AWS ElasticSearch & Kabina to display and to monitor the data.

3.3 MICROSOFT AZURE IOT

3.3.1 HOW TO CREATE IOT HUB

To register the SCB device in Azure Portal, user has to follow the guide “Get started with Azure IoT Hub for

Java”: https://azure.microsoft.com/en-us/documentation/articles/iot-hub-java-java-getstarted/.

The guide explains how to create an IoT Hub and a device entity. It is important to annotate the connection string generated after creating the device entity. User will need this parameter later for the SCB1200 configuration (WoM IoT Configuration).

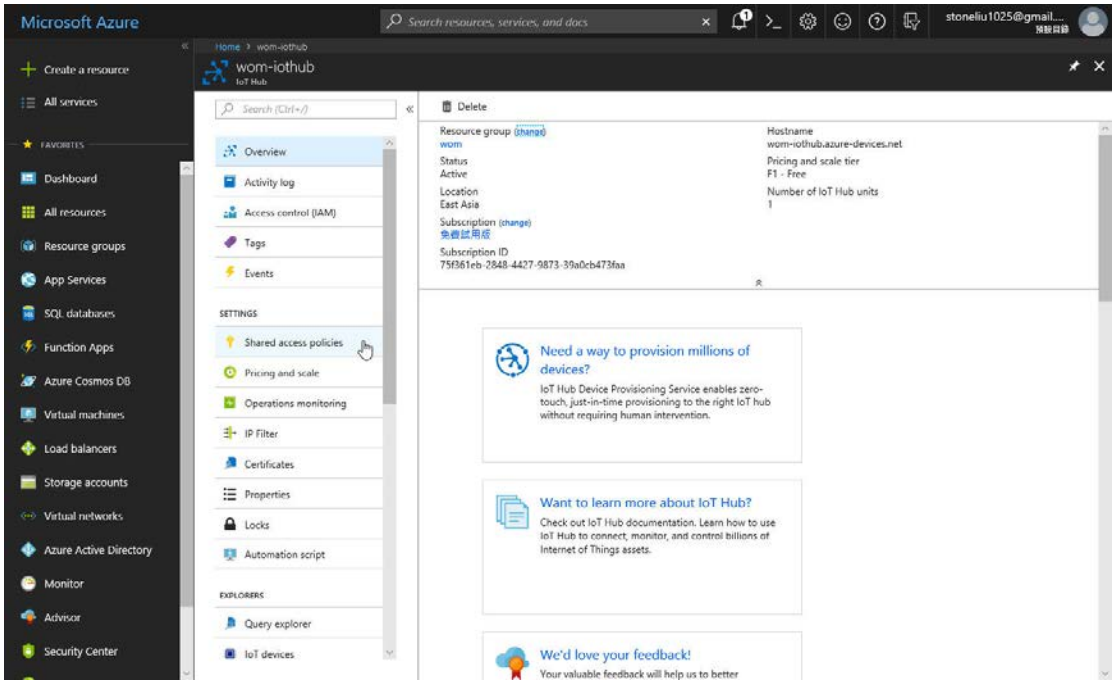
3.3.2 CONFIGURE THE SCB1200 AS A MQTT CLIENT

In the Microsoft Azure Portal, go to IoT Hub menu and select:

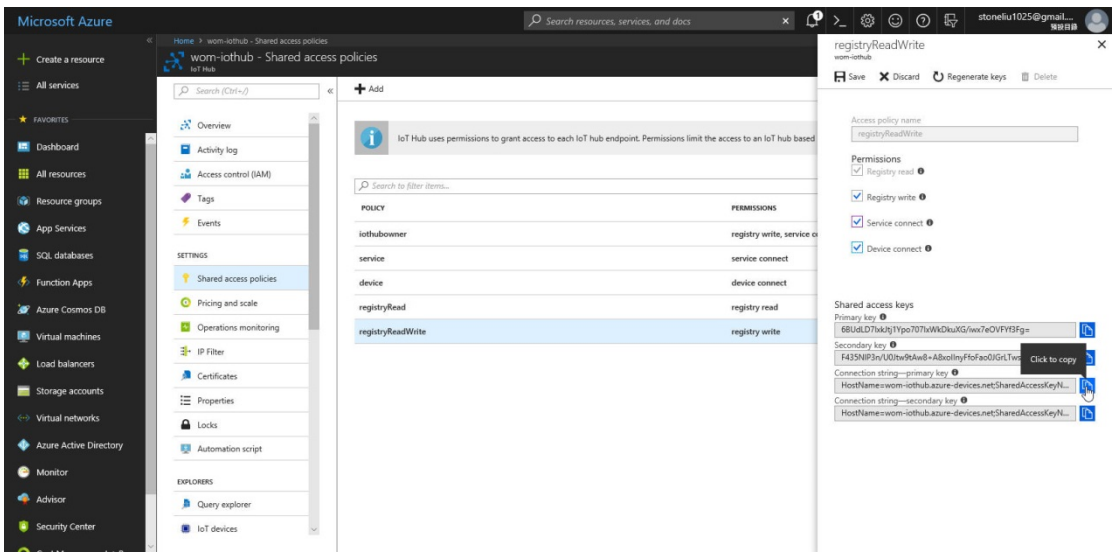
Devices > myCreatedDevice > Shared access policies > iothubowner > Connection string - primary key

User has to annotate the value of this field.

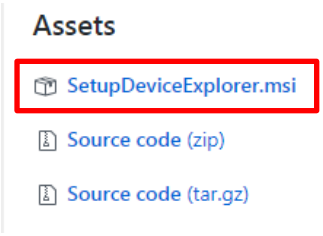
1. Get the connection string. Click the IoT Hub -> Shared access policies



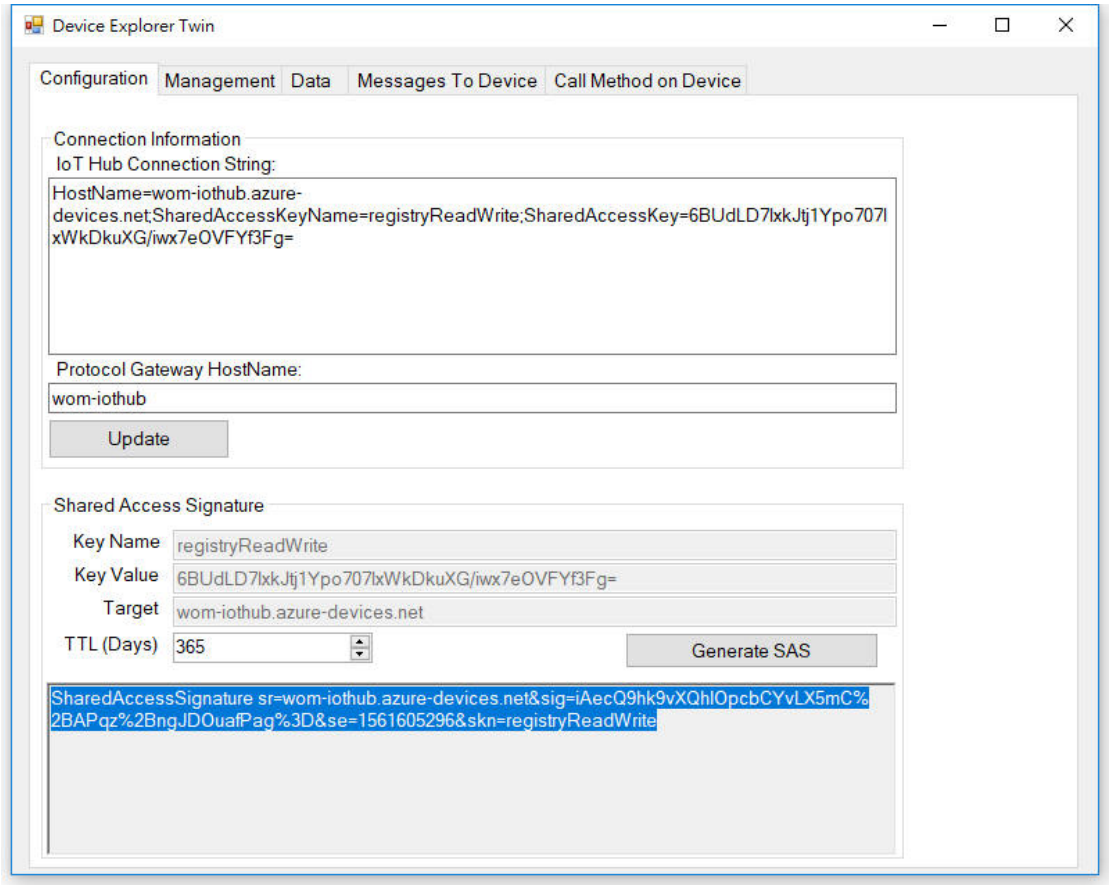
2. Click registryReadWrite -> copy the Connection string---Primary Key.



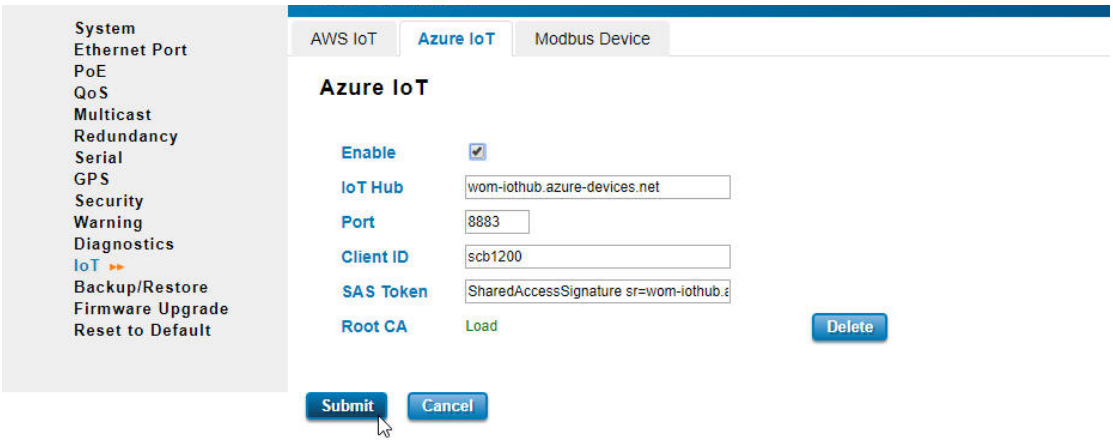
3. Download and install the Azure Device Explorer to generate the SAS Token. Go to this link to download the software: https://github.com/Azure/azure-iot-sdk-csharp/releases/download/2018-3-13/SetupDeviceExplorer.msi



4. Paste the Connection String --- Primary Key to the IoT Hub Connection String box. Then type the Protocol Gateway HostName and click Update. In the end, generate the SAS Token.



5. Configure the MQTT Client from the Web GUI. Enter the value based on the IoT Hub setting.

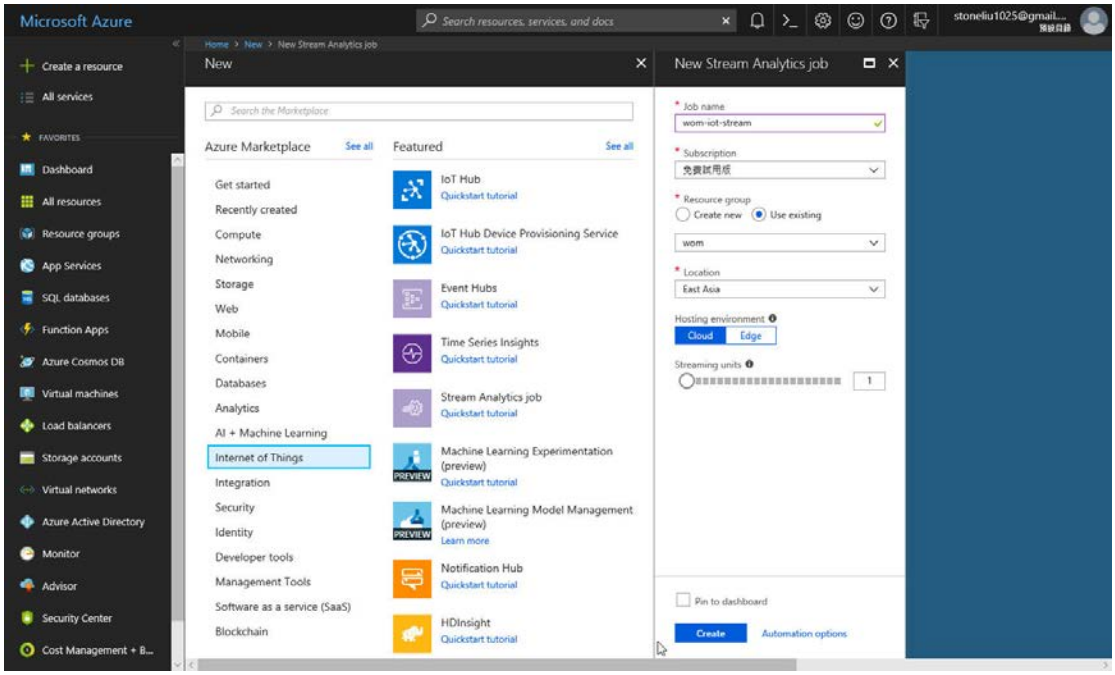


Please find the Root CA through this

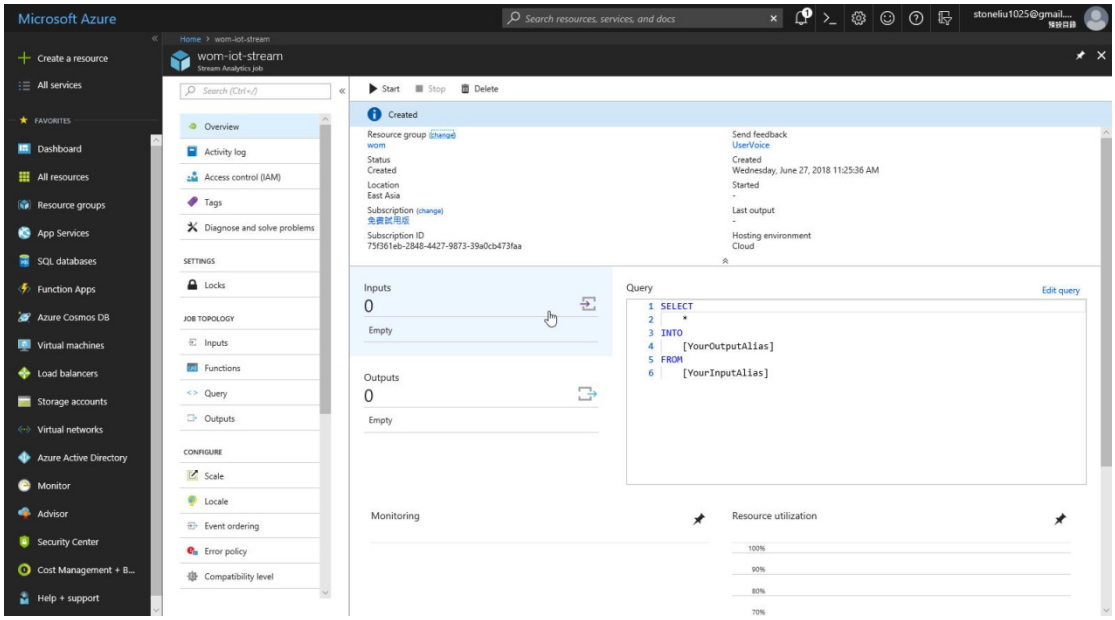
link: https://github.com/Azure/azure-iot-sdk-c/blob/master/certs/certs.c

3.3.3 CREATE STREAM ANALYTICS & OUTPUT TO POWER BI

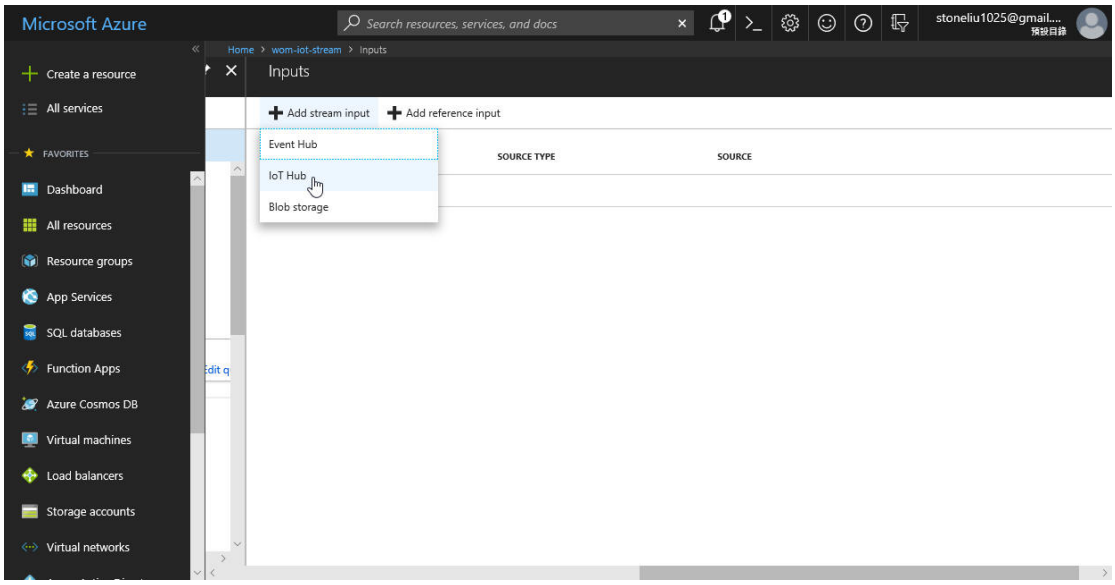
1. Add the Stream Analytics. Go to “Create a resource -> Internet of Things -> Stream Analytics job”



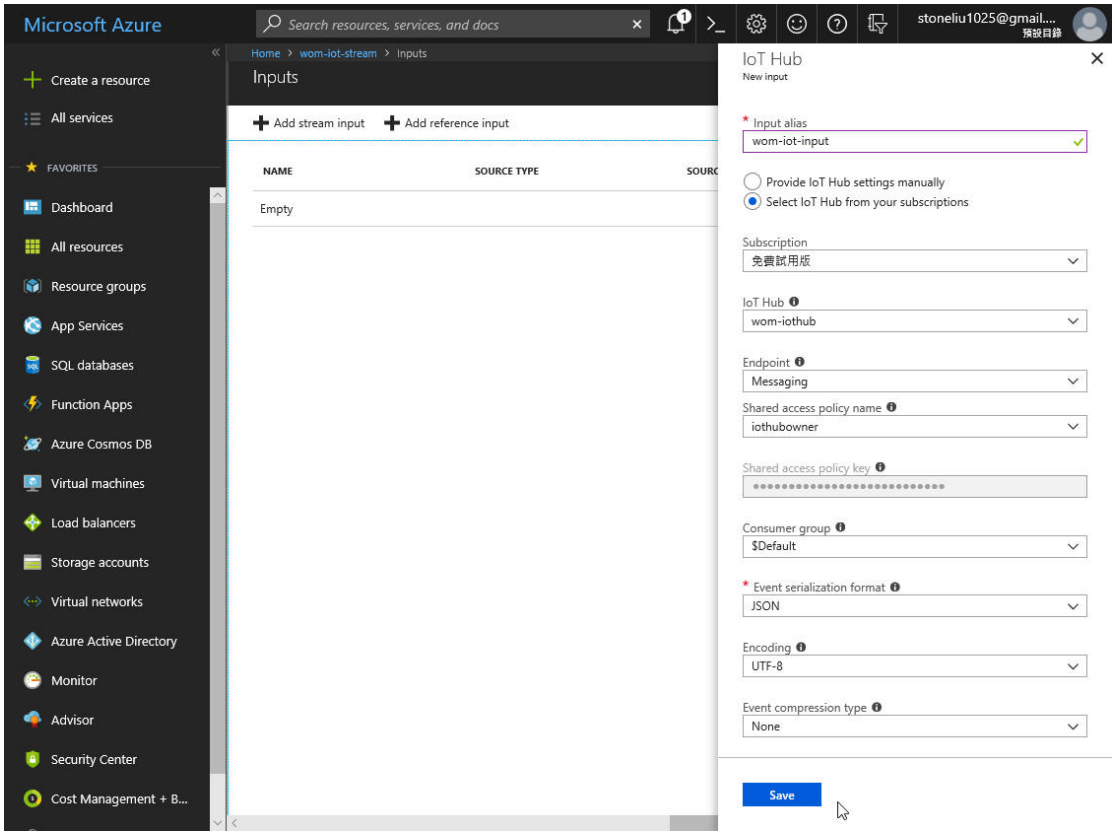
2. Add the Stream Input. Go to the stream analytics and find the input stream, then click it.



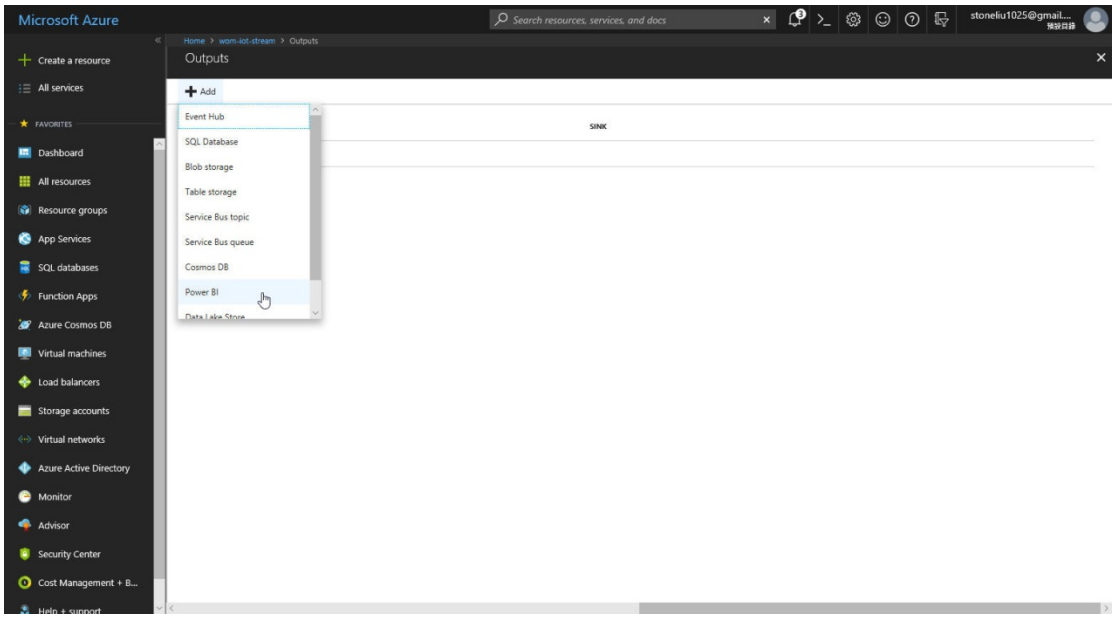
3. Add the Stream Input for user's IoT Hub.



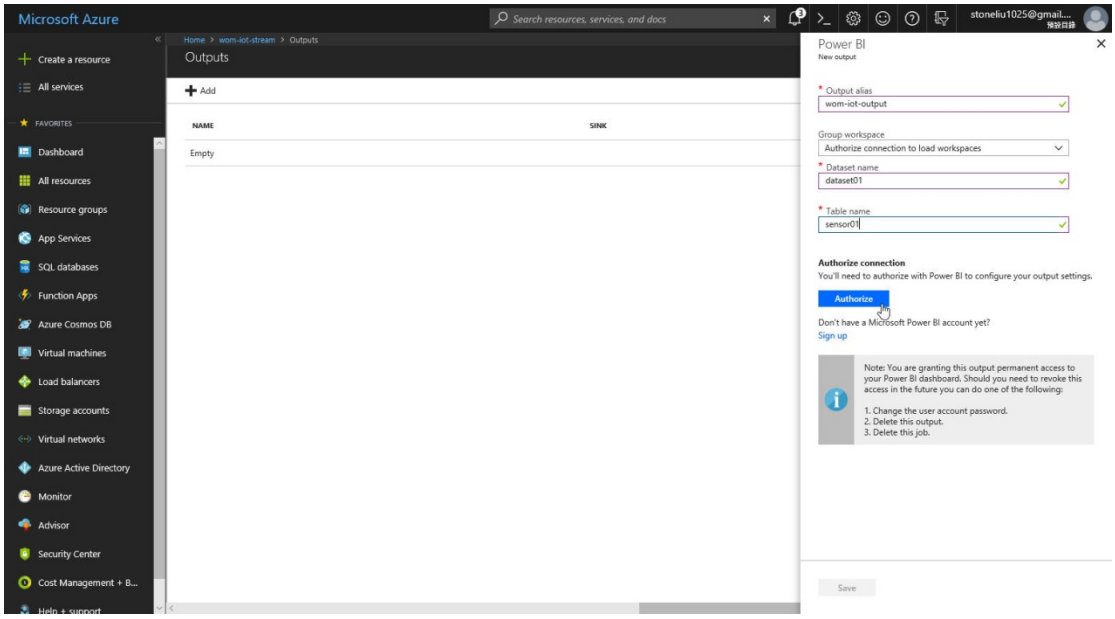
4. Set the parameters for the Stream Input. Then click Save.



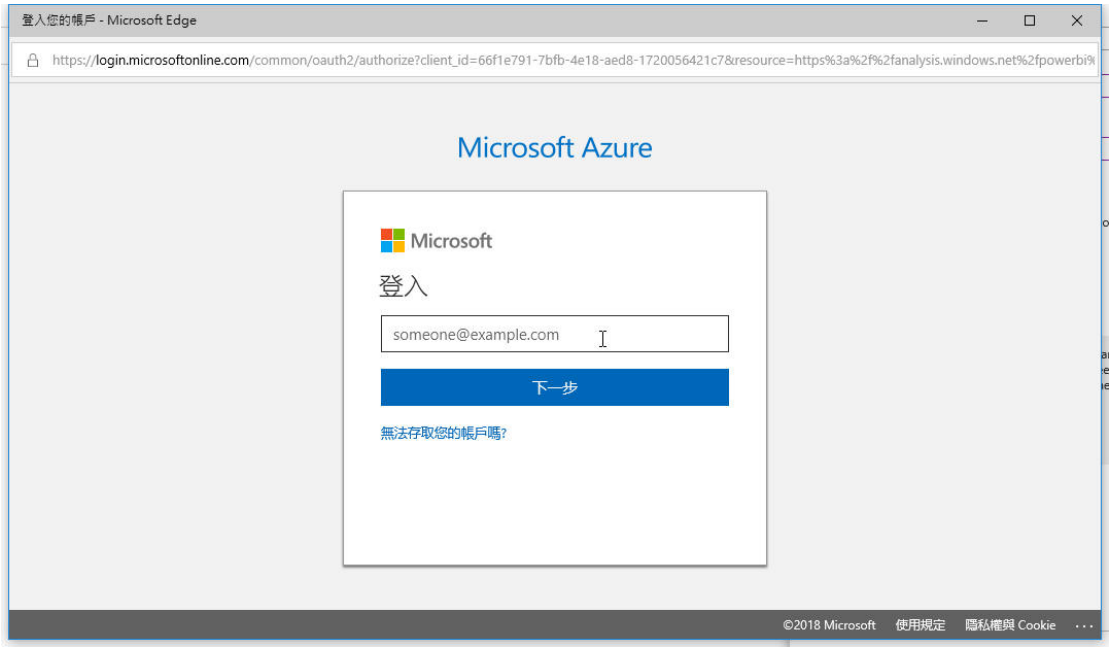
5. Add the Stream Output. Click the output section. Then Add the Power BI output streaming for the visualization.



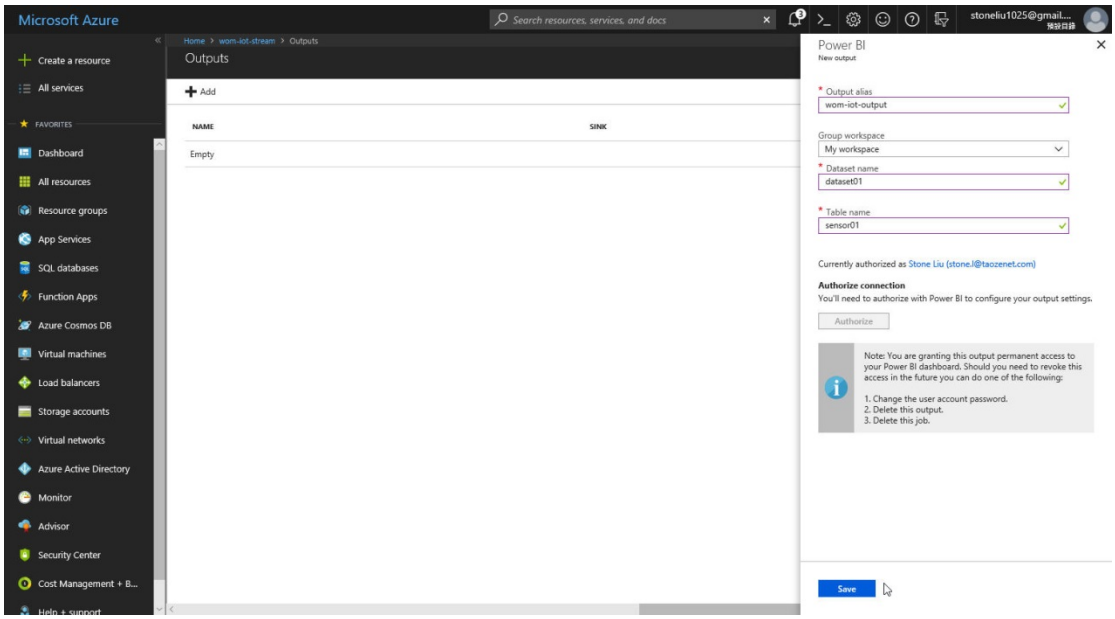
6. Set the parameters for the Power BI to link the Data Streaming, input the dataset and the table name then authorize the setting.



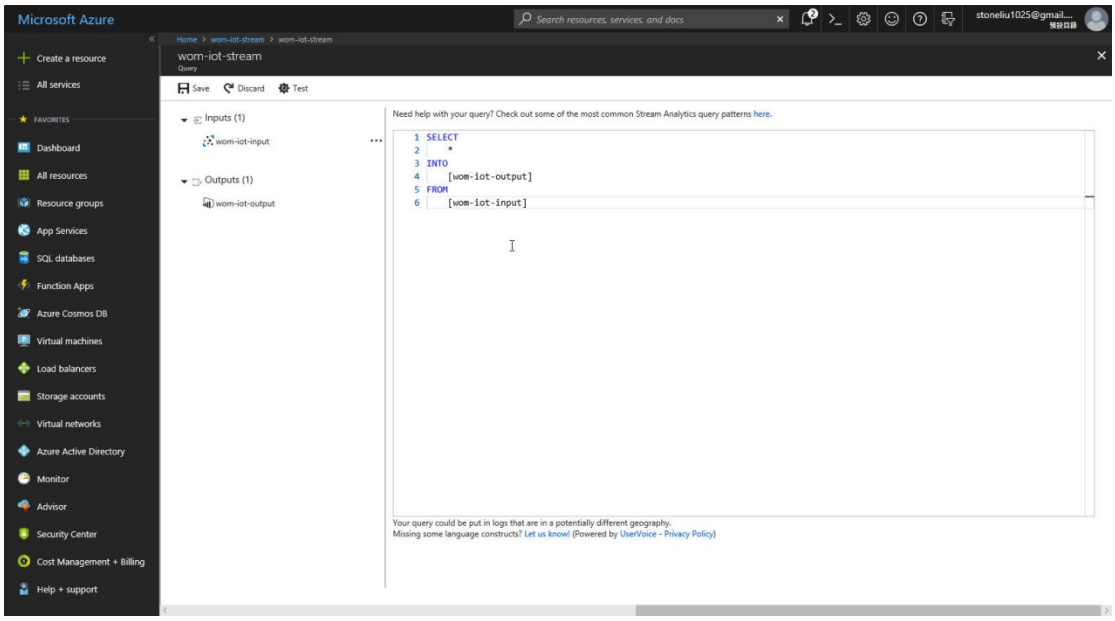
7. For the Power BI Authorization, make sure that user has the Power BI account (go to https://powerbi.microsoft.com/en-us/ then free sign up)



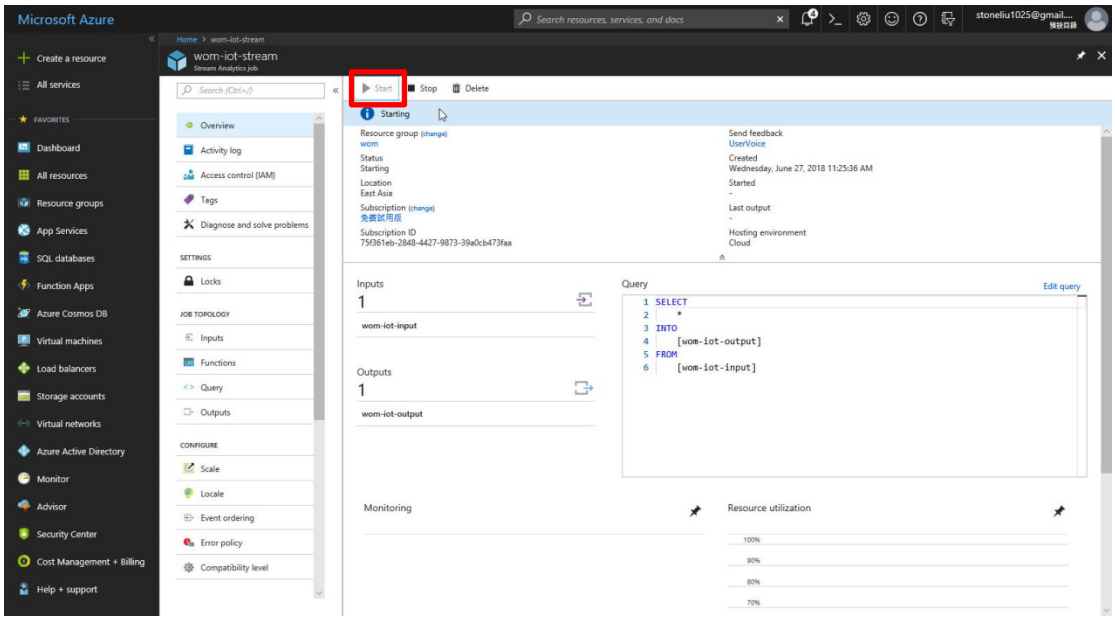
8. After the authorization is successful then click save to keep the output stream.



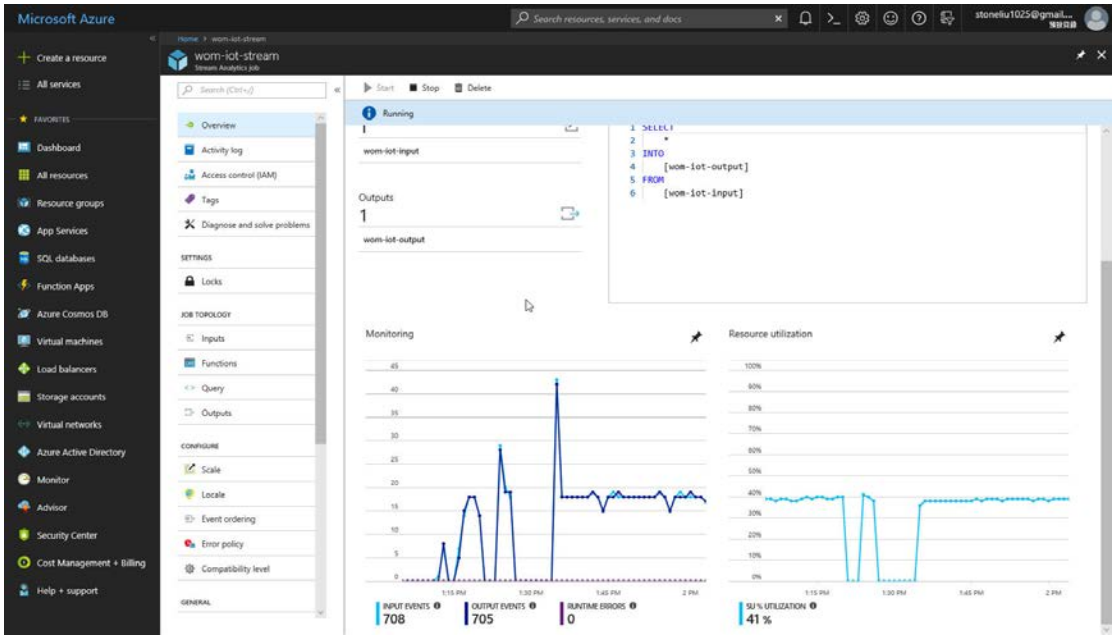
9. After finishing create the Input and Output Stream, now configure the query for the input and output data flow. Please follow this section.



10. After that, run the streaming by click the start button.

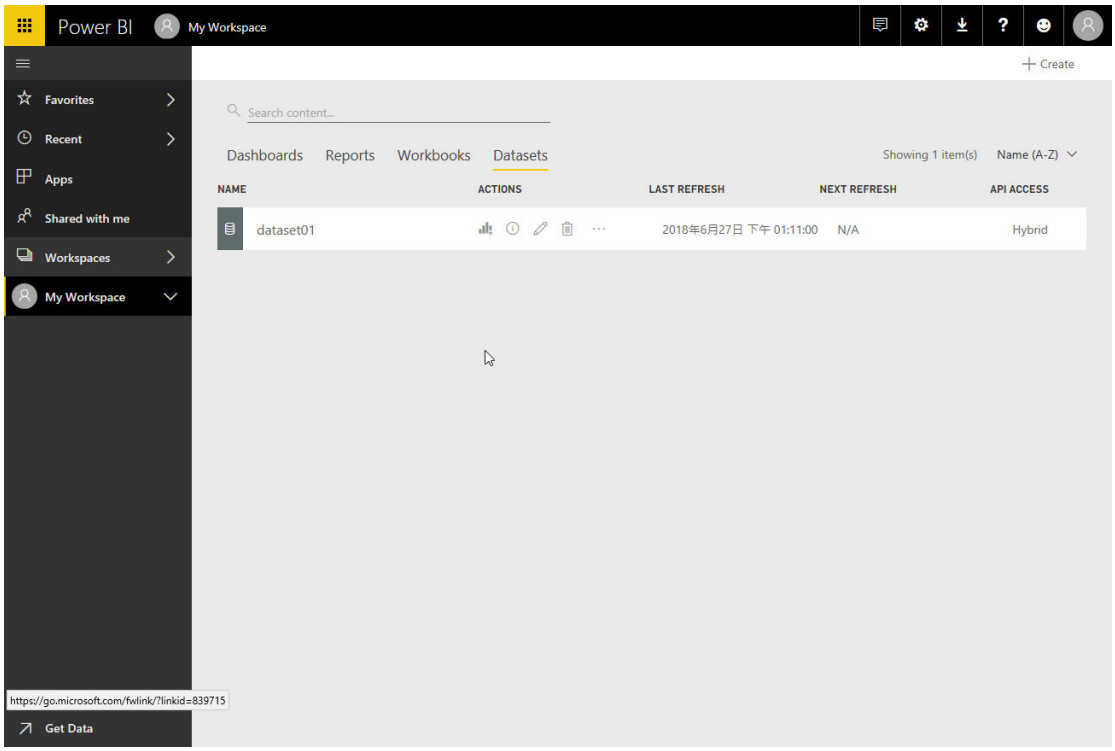


After the status change to running then the streaming data will appear.

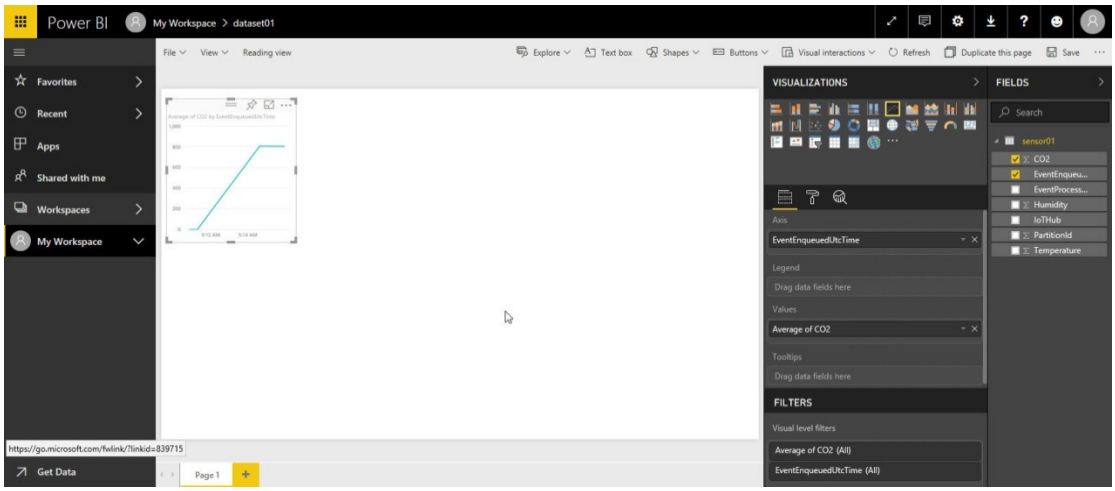


3.3.4 GENERATE THE POWER BI APPEARANCE AND DASHBOARD.

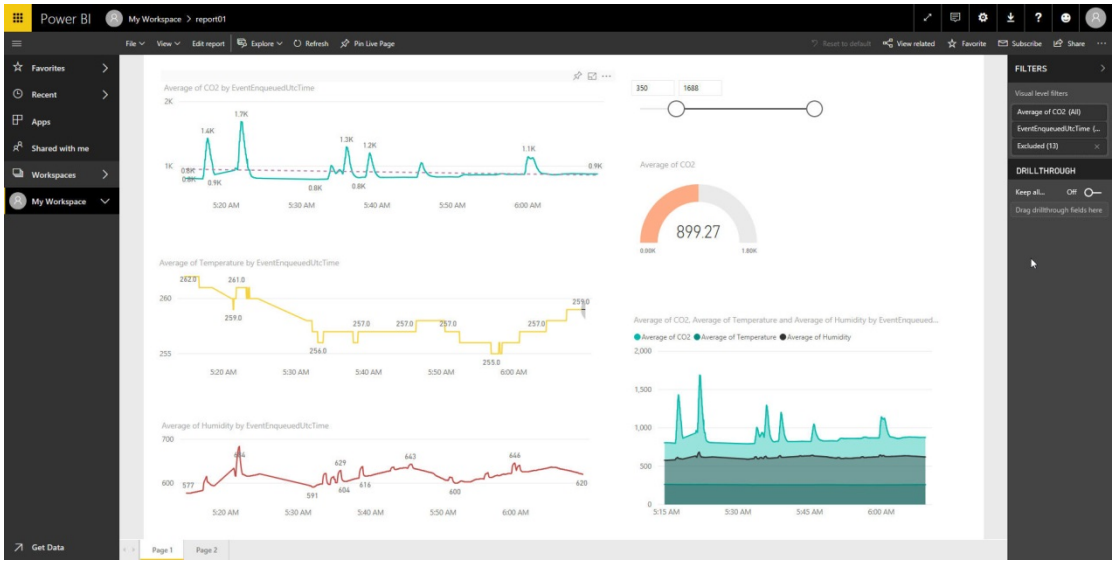
1. Configure the Power BI to convert the data streaming to a better visualization.



2. User may generate the streaming by create a diagram to draw the streaming result from the sensor.



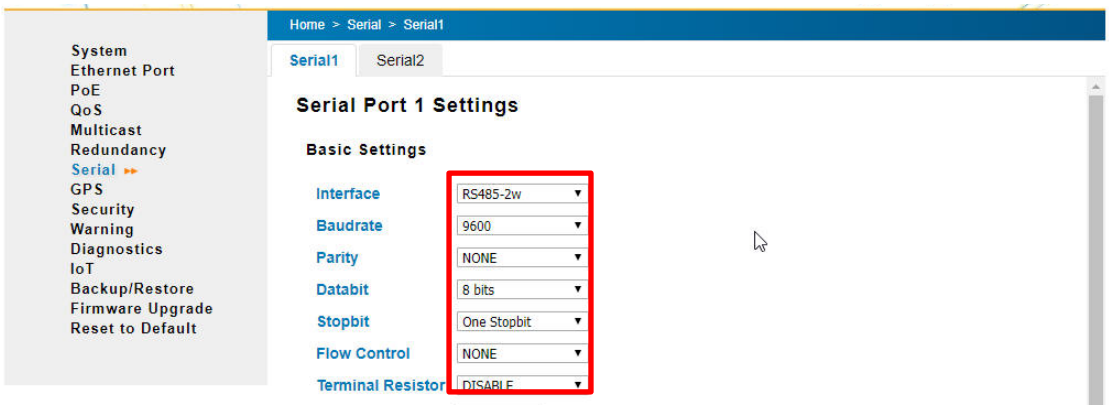
3. User can arrange the dashboard for better appearance.



3.4 SERIAL SETTING AND MODBUS LOGGING

➢ **Configure the Serial and Modbus from the Web GUI (ThingsMaster, AWS and Azure)**

- **Serial**
  - Set the value for Serial 1(Interface: RS485-2w, Baudrate: 9600, Force TX Length: 1024)
  - Click **Submit**



- **Modbus**
  - Enable the Modbus Logging
  - Add the Modbus device that is used (Name: CO2/Temperature/Humidity, Slave ID: 1, Address: CO2 (562) / Temperature (564)/ Humidity (566), Function: 03 Read Holding Registers).
  - Click **Submit**

    Note: The **Name** of the device is case-sensitive and should not be changed in this demo kit.

