Multiple-Protocol IOT Gateway BL110

KING PIGEON

BL110 User Manual

Version: V1.0

Date: 2021-8-10

King Pigeon Communication Co., Ltd

Website: www.iot-solution.com

Preface

Thanks for choosing King Pigeon Multiple-Protocol IOT Gateway BL110. Reading this manual with full attention will help you quickly learn device functions and operation methods.

Copyright

Disclaimer

This document is designed for assisting user to better understand the device. As the described device BL110 is under continuous improvement, this manual may be updated or revised from time to time without prior notice. This Multiple-Protocol Gateway is mainly used for industrial data transmission over Ethernet or 4G network. Please follow the instructions in the manual. Any damages caused by wrong operation will be beyond warranty.

Revision History

Revision Date	Version	Description	Owner
Aug 10, 2021	V1.0	Initial Release	HYQ

Content

1 Product Introduction

1.1 General Introduction

Developed on Linux system, BL110 is a robust and cost-effective Multiple-Protocol IOT gateway with high stability. It has 1 RS232, 3 RS485, 1 CAN, 2 RJ45 (1WAN & 1LAN), 2 USB, 2 Power Input interfaces and 1 SIM Card Slot. Network can be connected via 4G or Ethernet to achieve high speed and low latency of data transmission.

In downlink, it supports various PLC protocols, Modbus RTU Master, Modbus TCP Master, DL/T645, IEC101, IEC104, BACnet IP and BACnet MS/TP protocols

In uplink, it supports Modbus TCP, MQTT, OPC UA, BACnet IP, HUAWEI Cloud, Alibaba Cloud, AWS Cloud, ThingsBoard Cloud and King Pigeon Cloud. Users can connect it to various clouds as well as SCADA, OPC UA, MES, BAS and other master computers for data processing. It can be online in different clouds and master systems simultaneously.

With TSL/SSL data encryption and routing function, it can be used to provide internet access for other devices with cyber security. More devices can be connected to it with cascaded switch for data processing. Due to complete functions and industrial grade quality, it can be used in many application areas.

1.2 Application Illustration

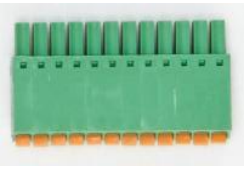
1.3 Packing List

Before connecting BL110 gateway, please make sure below items are included in the package: (Pictures are for reference only. Follow actual items.)

- 1XBL110 Gateway

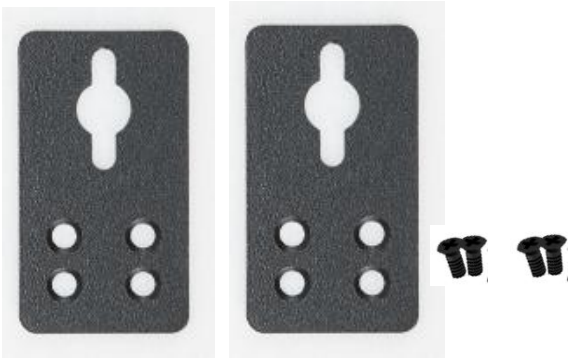
- 1x 4PIN 3.5mm wiring terminal for power input

- 1x 485 or 232 12PIN 3.5mm wiring terminal



- 1 x 4G SMA cellular network antenna

- 2 x wall-mounting clip kit



- 1 x DIN-Rail mounting clip kit

- 1 x User Manual (PDF Soft copy)
- 1 x SIM Card Picking PIN

- 1 x Product Qualification Certificate

- 1 x Warranty Card

Note: If any of above items are missing, please contact King Pigeon Sales team.

1.4 Features

- Downlink supports: various PLC protocols, Modbus RTU Master, Modbus TCP Master, DL/T645, IEC101, IEC104, BACnet IP, BACnet MS/TP, etc.
- Uplink supports: Modbus TCP, MQTT, OPC UA, BACnet IP, HUAWEI Cloud, Alibaba Cloud, AWS Cloud, ThingsBoard Cloud, King Pigeon Cloud, etc.
- DC 9-36V power supply with terminal wiring. 2 channels of redundancy power input with reverse wiring prevention protection design, either channel can be used.
- 1 RS232, 3 RS485 (Can be RS232 if required).

- Serial port baud rate supports 2400bps-115200bps; Stop bit supports 1, 2; Data bit supports 7, 8; Parity bit supports None, Odd, Even.
- 2 RJ45 Ethernet ports, 1WAN+1LAN. Data of equipment connected to LAN, WAN or cascade switch can be collected. Both network link and rate indicators are available. Built-in isolation transformer for up to 2KV electromagnetic insulation.
- Support TSL\SSL data encryption for security.
- Support routing function.
- Support 4G network with APN setting; Ethernet network will be firstly used if it's available, if Ethernet is disconnected, it will shift to 4G network automatically.
- Support Modbus RTU to Modbus TCP, transparent transmission.
- Support RESET button with function of returning to factory setting to prevent wrong parameter setting (long press RESET until RUN indicator is off).
- Support hardware and software watchdog with high reliability.
- Metal case with IP30 protection grade, safely isolated from inner system, especially suitable for industrial control application.
- Compact size: 109mm*31mm*145mm, support wall-mounting and DIN Rail mounting.

1.5 Technical Parameter

Category	Item	Description
System	Processor	ARM9, clock speed 300Mhz
	Storage	128MB(can be extended to 1G)
	Flash Memory	64MB
Power Supply	Input Voltage	DC 9～36V
	Power Consumption	Normal: 115mA@12V, Max: 168mA@12V。
	Wiring	Support reverse wiring prevention protection
Ethernet Port	Spec	2 x RJ45, 10/100Mbps, adaptive MDI/MDIX
	Protection	ESD ±16kV (contact), ±18kV (air); EFT 40A (5/50ns); Thunder strike 6A (8/20μs)
Serial Port	QTY	3x RS485/(optional RS232)+1xRS232
	Baud Rate	2400bps-115200bps
	Data Bit	7,8
	Parity Bit	None, Even, Odd

	Stop Bit	1, 2
	Protection	ESD ±8kV (contact), ±15kV (air); EFT 2KV, 40A (5/50ns)
CAN Port		Reserved for future development
SIM Card Slot	QTY	1
	Spec	Drawer type, support 1.8V/3V SIM/UIM card(NANO)
	Protection	Built-in 15KV ESD protection
USB Port	QTY	1*Firmware Upgrading+1*Program Debugging
	Spec	Micro USB OTG
	Protection	Over-Current Protection
4G (Optional)	Antenna QTY	1
	Antenna Type	SMA Hole
	L-E Version	GSM/EDGE:900,1800MHz WCDMA:B1,B5,B8 FDD-LTE:B1,B3,B5,B7,B8,B20 TDD-LTE:B38,B40,B41
	L-CE Version	GSM/EDGE:900,1800MHz WCDMA:B1,B8 TD-SCDMA:B34,B39 FDD-LTE:B1,B3,B8 TDD-LTE:B38,B39,B40,B41
	L-A Version	WCDMA:B2,B4,B5 FDD-LTE:B2,B4,B12
	L-AU Version	GSM/EDGE:850,900,1800MHz WCDMA:B1,B2,B5,B8 FDD-LTE:B1,B3,B4,B5,B7,B8,B28 TDD-LTE:B40
	L-AF Version	WCDMA:B2,B4,B5 FDD-LTE:B2,B4,B5,B12,B13,B14,B66,B71
	CAT-1 Version	GSM:900,1800 FDD-LTE:B1,B3,B5,B8 TDD-LTE:B34,B38,B39,B40,B41
GPS (Optional)	Antenna QTY	1
	Antenna Type	SMA Hole
	Tracking Sensitivity	> -148 dBm
	Flat Position Precision	2.5m
	Protocol	NMEA-0183 V2.3
Indicator	RUN Indicator	Stead on when powered on, flickering if running, off if not running
	ALARM Indicator	Stead on if alarm is triggered, off if alarm is recovered

	NET Indicator	Flickering if Ethernet is used, stead on if 4G is used, off if no network communication
	TXD Indicator	Flickering if it's transmitting data, off if no data transmission
	RXD Indicator	Flickering if it's receiving data, off if no data receiving
	GPS Indicator	Flickering if GPS signal is received, off if no signal
	4G Indicator	Weak signal (0-14), 1 indicator is on Intermediate signal (14-22), 2 indicators are on Strong signal (22-31), 3 indicators are on
Software	Internet Protocol	IPV4, TCP/UDP, DHCP, DNS, etc
	IP Retrieving	Static IP/DHCP
	Data Service	Support transparent transmission
	DNS	Support Domain Name resolution
	Configuration	PC software configuration, support WIN XP, WIN 7, WIN 8 & WIN 10
	Network Cache	Transmitting: 8Kbyte; Receiving: 8Kbyte
	Login Package	Support custom login package
	Heartbeat Package	Support custom heartbeat package
Safety	MTBF	≥100,000 hours
	EMC	EN 55022: 2006/A1: 2007 (CE &RE) Class B
		IEC 61000-4-2 (ESD) Level 4
		IEC 61000-4-3 (RS) Level 4
		IEC 61000-4-4 (EFT) Level 4
		IEC 61000-4-5 (Surge)Level 3
		IEC 61000-4-6 (CS)Level 4
		IEC 61000-4-8 (M/S) Level 4
	Others	CE, FCC
Environment	Working	-40～80℃，5～95% RH
	Storage	-40～85℃，5～95% RH
Others	Case Material	Metal Case
	Size	109mm×31mm×145mm(L*W*H)
	Protection Grade	IP30
	Net Weight	470g
	Mounting	Wall-mounting/DIN Rail Mounting

1.6 Model Selection

Model	WAN	LAN	CAN	COM1	COM (Default RS485) (can be RS232 if required)	OPC-UA	4G	GPS
BL110	1	1	1	RS232	3	×	√	Optional
BL110E	1	1	1	RS232	3	×	×	×
BL110UA	1	1	1	RS232	3	√	×	×
BL110Pro	1	1	1	RS232	3	√	√	Optional

Note: COM1 is RS232, 3 COM ports are RS485(Can be RS232 if required)

1.7 Supported Protocols

Downlink supported protocols

Brand	Connecting Interface	Protocol	Testing Status
Modbus	COM Port	Standard Modbus RTU	OK
	Ethernet Port	Standard Modbus TCP/IP	OK
Siemens	COM Port	S7-200 full series PLC	OK
		S7-200SMART full series PLC	OK
	Ethernet Port	S7-200SMART full series PLC	OK
		S7-300 full series PLC	OK
		S7-400 full series PLC	OK
		S7-1200 full series PLC	OK
		S7-1500 full series PLC	OK
Mitsubishi	COM Port	FX1S series, FX2N series FX3S series, FX3U series	OK
	Ethernet Port	Q series	Ongoing
OMRON	COM Port		Ongoing
	Ethernet Port	CJ/CS/CP/CP1H/CP1L series	Ongoing
Delta	COM Port	DVP series	Ongoing
FATEK	COM Port	FB series	Ongoing
AB	COM Port	DF1 protocol	Ongoing
Schneider	COM Port	full series	Ongoing
	Ethernet Port	full series	Ongoing
XINJIE	COM Port	XCseries	Ongoing
ABB		AC500series	To be started
Emerson			To be started
Hitachi			To be started
Keyence		KVseries	To be started
KOYO		Kseries	To be started
LG			To be started
VIGOR			To be started

Smart Meter	COM Port	DLT645-2007	OK
	Ethernet Port	IEC101、 IEC104	Ongoing
BACnet	COM Port		Ongoing
	Ethernet Port		Ongoing

If your PLC is included in above table, please contact King Pigeon after-sale service team.

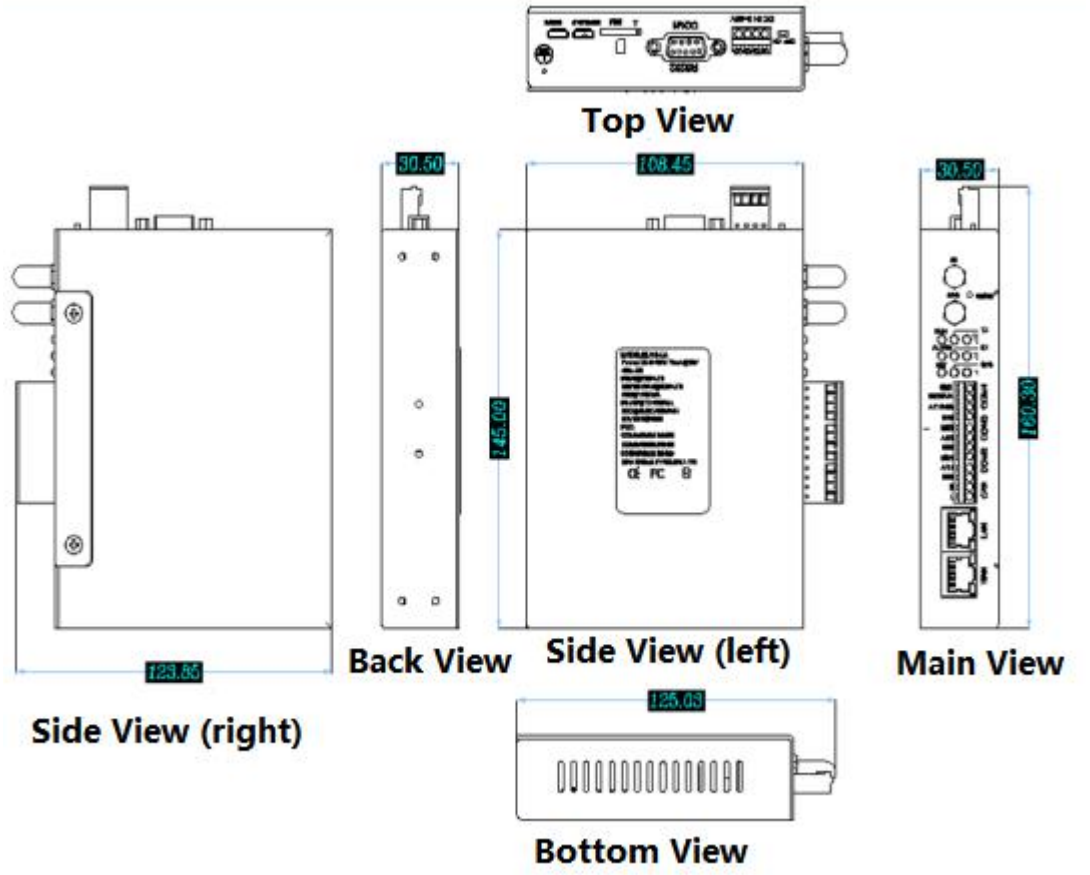
Uplink Supported Protocols

Protocol	Description
Transparent Transmission	Only support COM port transparent transmission
Modbus RTU to Modbus TCP	Yes, support Modbus RTU to Modbus TCP
Modbus TCP	Can only be server with Ethernet port communication
OPC UA	Can only be Modbus TCP server with Ethernet port communication
Custom MQTT	Currently only support “King Pigeon” & “thingsboard”JSON data format, others are under development
HUAWEI Cloud	Support Private Key /Certificate connection to HUAWEI Cloud
AWS Cloud	Yes, suppport AWS Cloud
Alibaba Cloud	Support Private Key /Certificate connection to Alibaba Cloud
ThingsBoard Cloud	Yes, support ThingsBoard cloud,Select ThingsBoard data module in custom MQTT
Modbus RTU	Yes, support Modbus RTU, configure it in King Pigeon Modbus
King Pigeon Cloud	Yes, support King Pigeon Cloud, configure Modbus RTU/MQTT
BACnet IP	Under development

2 Hardware Introduction

2.1 Outline Dimension

Unit: mm



2.2 Power Interface

2 channels of 9~36VDC power input with reverse connection protection

2.3 COM1 Port

COM1 is fixed RS232 interface

2.4 SIM Card Slot

Before placing SIM card, make sure device is powered off. Use the SIM card picking PIN to press the slot and take out the tray, place the SIM card and push back the tray with SIM card.

Note: make sure device is placed flatly like above picture when inserting or removing SIM card

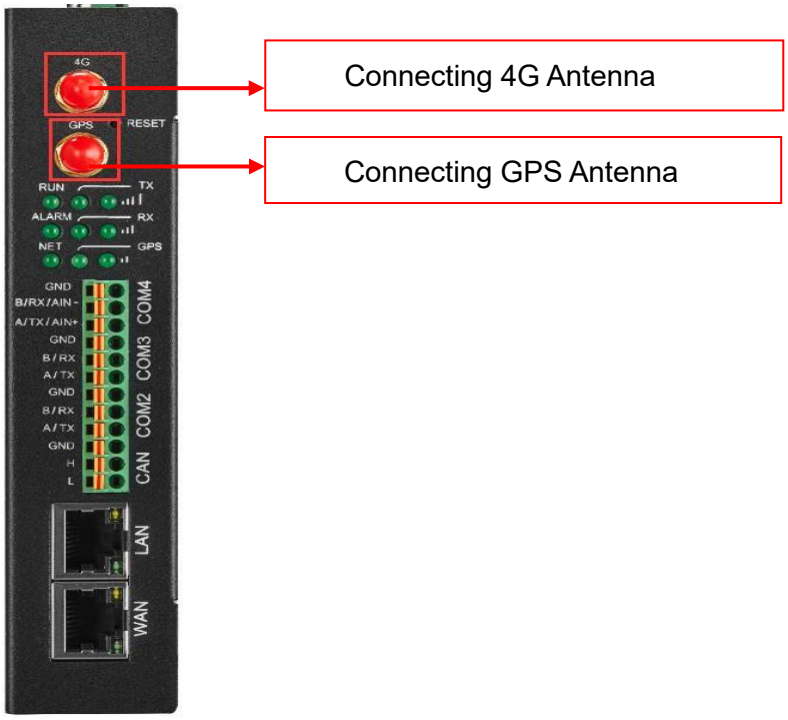
2.5 Debugging & Firmware Upgrading USB Interface

DEBUG is program debugging port, DOWNLOAD is firmware upgrading interface

2.6 Earthing Interface

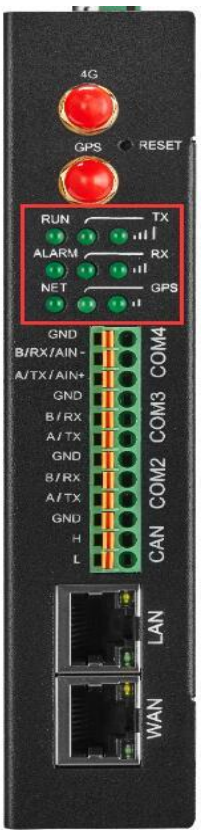
Before connecting Gateway device BL110, make sure it's grounded with grounding screw to prevent electromagnetic interference.

2.7 4G & GPS Antenna Interface



2.8 LED Indicator

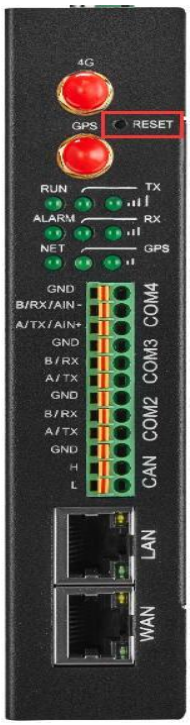
LED Indicator Introduction			
Item		Status	Description
RUN	Device Running	Flickering	Device is running normally
		Off	Device is in faulty
ALARM	Alarm	Stead on	Alarm is triggered
		Off	No alarm
NET	Ethernet/4G Communication	Flickering	Ethernet network is working
		Stead on	4G network is working



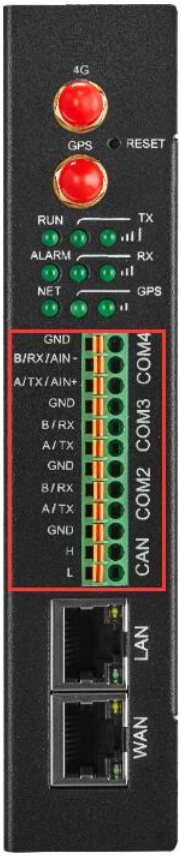
		Off	No Ethernet or 4G network
TX	Data transmitting	Flickering	Data is transmitted
		Off	No data transmitting
RX	Data Receiving	Flickering	Data is received
		Off	No data is received
GPS	GPS Signal	Flickering	GPS signal is received
		Off	No GPS signal is received
ıll	4G Signal	1 LED ON	Weak signal (0-14)
		2 LED ON	Intermediate Signal (14-22)
		3 LED ON	Strong signal (22-31)
Note: RUN indicator will be steady on once it's powered on, if it's not on, please check whether power source has problem or it's reversely connected.			

2.9 Reset Button

After gateway BL110 is running, long press RESET button with pin for 10 seconds until RUN indicator is off. Device will restart automatically and return to factory setting.



2.10 COM Port & CAN Port



RS485(or RS232) & CAN Port		
Item		Description
COM4	GND	Grounding wire
	B/RX/AIN-	RS485 data-(B)/ data receiving/ Analog input-
	A/TX/AIN+	RS485 data+(A)/ data transmitting/ Analog input+
COM3	GND	Grounding wire
	B/RX	RS485 data-(B)/ data receiving
	A/TX	RS485 data+(A)/ data transmitting
COM2	GND	Grounding wire
	B/RX	RS485 data-(B)/ data receiving
	A/TX	RS485 data+(A)/ data transmitting
CAN	GND	Grounding wire
	H	Signal wire
	L	Signal wire

2.11 WAN Port & LAN Port

以太网口			
Indicator	Color	Status	Description
Network speed	Green	Stead on	100Mbps mode
		Off	10Mbps mode
Network link	Yellow	Stead on	Network connected
		Flickering	Data is transmitting
		Off	Network disconnected

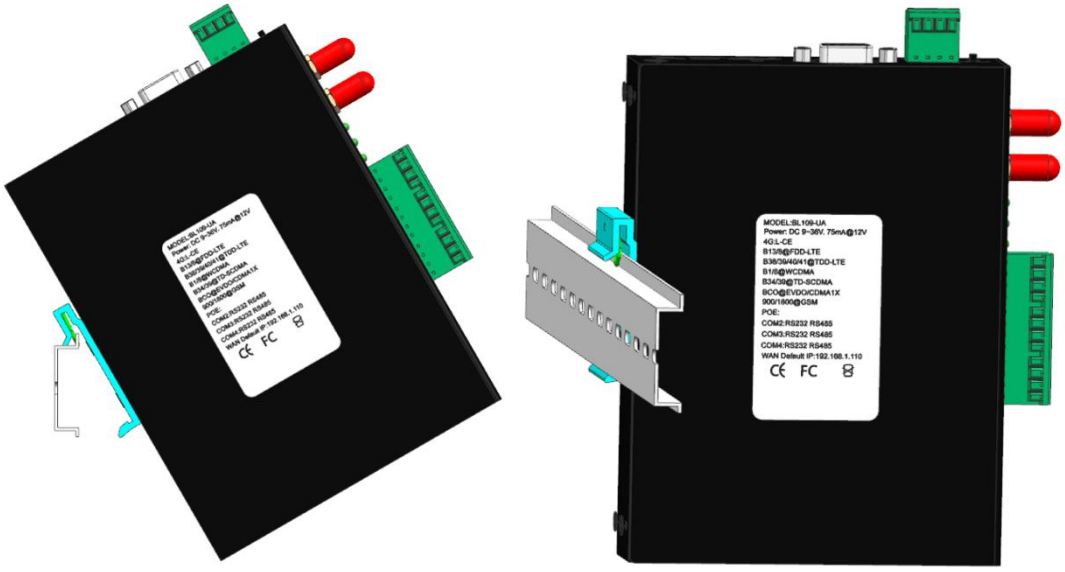
3 Product Mounting

BL110 can be placed on flat surface, mounted on the wall and DIN Rail

3.1 Wall-Mounting

Wall-Mounting

3.2 DIN Rail Mounting



DIN Rail Mounting

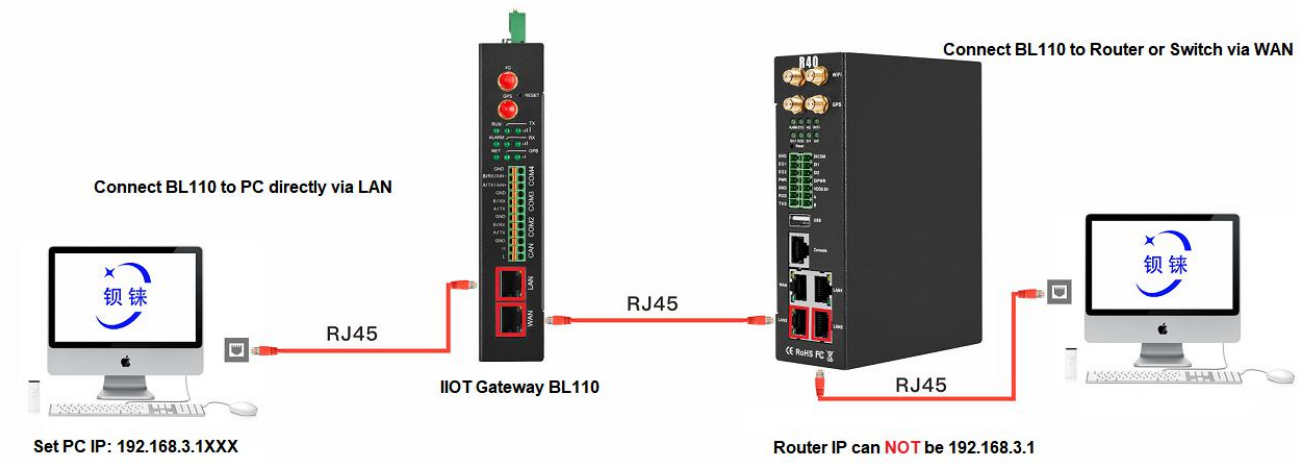
4 Configuration Software Introduction

4.1 Login to Configuration Software

Connect BL110 to router or switch through WAN port with standard direct network cable or cross network cable. Router or switch IP can't be the same as Gateway BL110 IP 192.168.3.1. Make sure BL110 and PC are in the same local area network. If it's necessary to connect the gateway to PC directly, use standard cross network cable to connect through BL110 LAN port. (If BL110 is connected to PC directly, PC IP must be specified to 192.168.3.1 as default LAN IP of gateway is 192.168.3.1 from factory setting. IP address, subset mask, MAC and DNS are needed for PC IP setting)

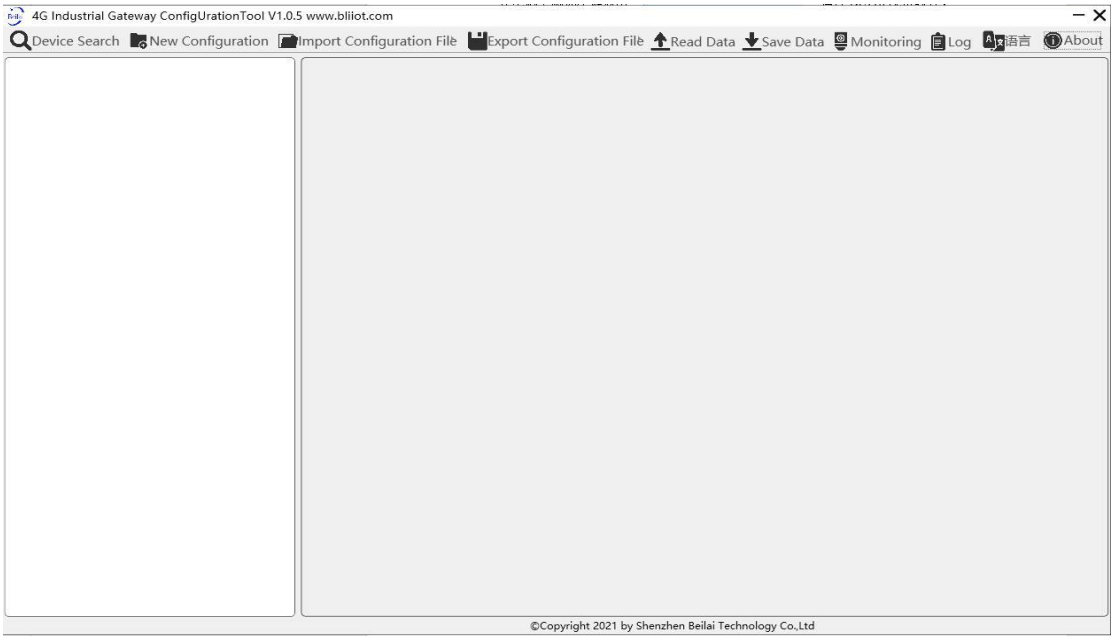
Note: WAN port IP is retrieved automatically, LAN port IP is 192.168.3.1 from factory setting

Wiring of Connecting BL110 to Router/Switch and PC:



4.1.1 Open Configuration Software

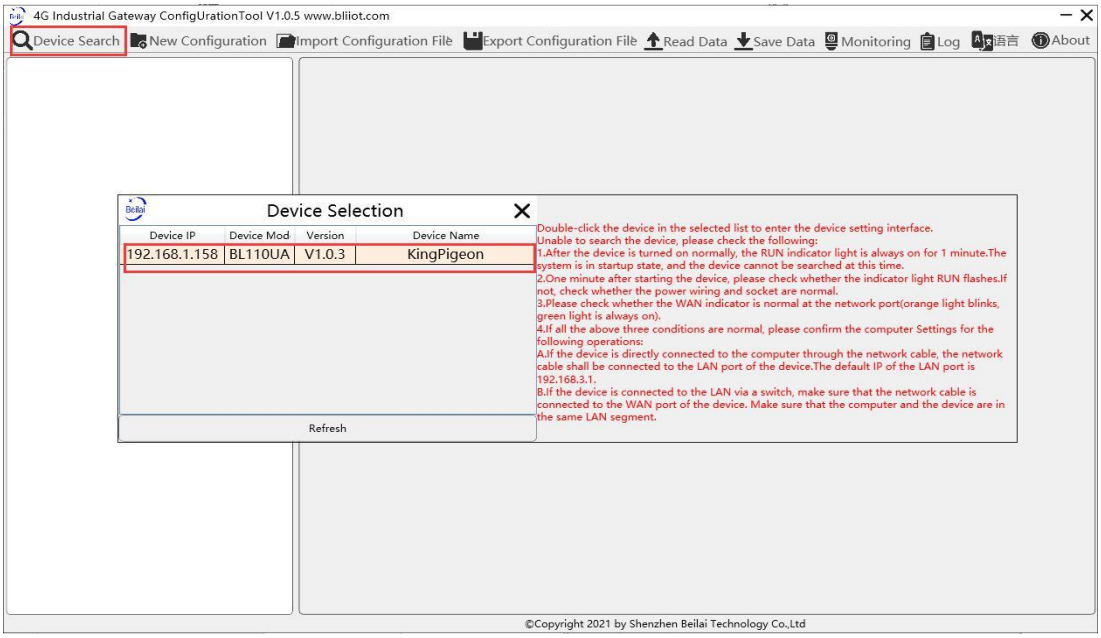
Double click BL10x_配置软件_V1.0.5.exe on PC to execute BL110 configuration software to open below page



4.1.2 Search for Gateway Device

Click Device Search to get all devices which are in the same local area network with PC. If no device is found, please follow the procedure on the right notice box to check the root cause. Below is the example of connecting Gateway BL110 with switch through WAN. A device with IP 192.168.1.158 is searched out.

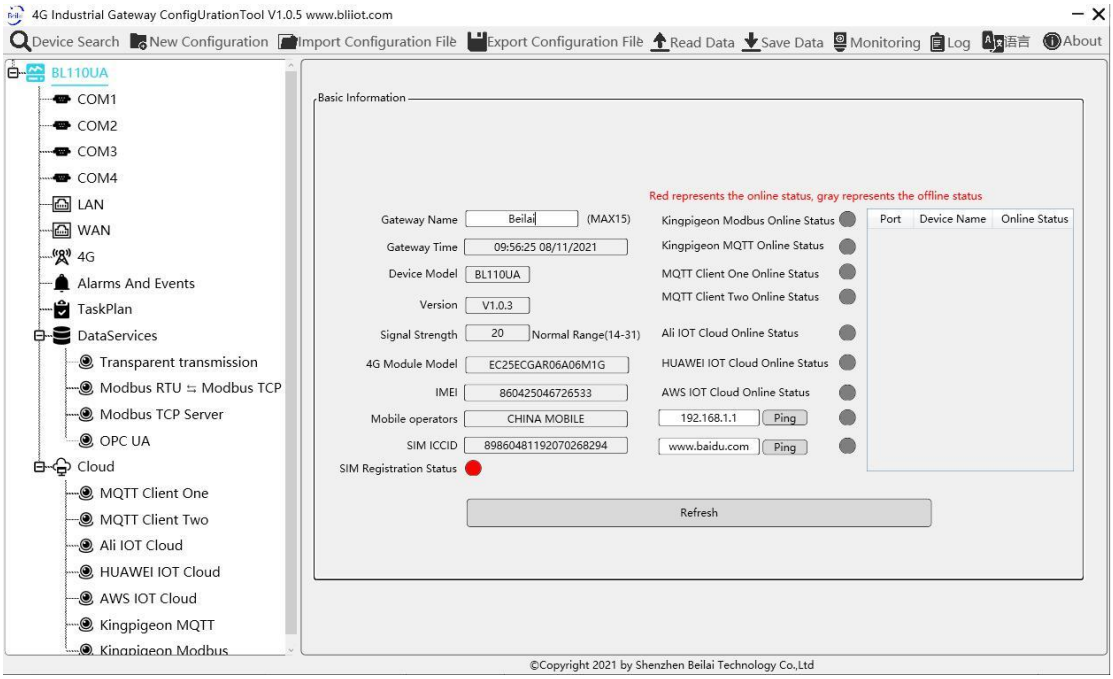
Note: If it's necessary to change PC or Gateway IP, make sure configuration software is closed and open it again.



4.1.3 Connecting Gateway

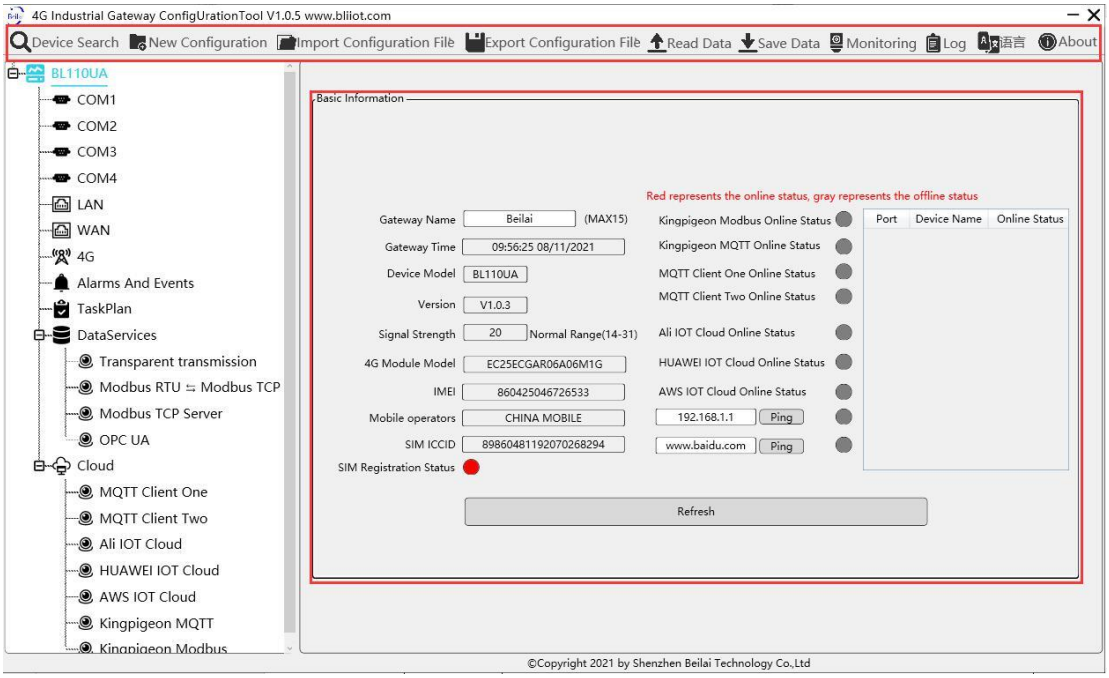
Double click the device to be configured (For example, double click device with IP 192.168.1.158) .

Once reading success message is shown in prompting box, click confirm to enter configuration



4.2 Configuration Software Introduction

4.2.1 System Function



System Function	
Item	**Description**
Device Search	Search for all BL110 gateways in the same local area network
New Configuration	Open a new default configuration file
Import Configuration File	Import gateway configuration file
Export Configuration File	Export gateway configuration file
Read Data	Read logged-in BL110 gateway configuration parameters
Save Data	Save all configuration parameters by clicking it. Every time configuration is done, make sure to click Save Data. After device restarts automatically, the setting will be valid
Monitoring	Monitor connected device value
Log	System running log. If device issue, click save log to send it to specified email box
Language	Click it to change language to English
About	Software Version, Issue Date, Firmware upgrade information

Basic Information of Gateway BL110	
Item	**Description**
Gateway Name	Default Name is KingPigeon
Gateway Time	Local time of reading gateway
Device Model	Read device model number
Version	Read device version
Signal Strength	4G module signal value. If it's less than 14, it means weak signal. Full signal value is 31
4G Module Model	Read 4G module model. If it's null, it means no 4G module
IMEI	Device IMEI code
Mobile Operators	SIM card service provider
SIM ICCID	Read SIM card ICCID
SIM Registration Status	Red indicates SIM card is registered. Gray indicates SIM card is not registered，
King Pigeon Cloud via Modbus Online Status	Red indicates King Pigeon cloud is connected via Modbus Gray indicates King Pigeon cloud is unconnected via Modbus
King Pigeon Cloud via MQTT Online Status	Red indicates King Pigeon cloud is connected via MQTT Gray indicates King Pigeon cloud is unconnected via MQTT
MQTT Client One Online Status	Red indicates MQTT Client One is connected Gray indicates MQTT Client One is unconnected
MQTT Client Two	Red indicates MQTT Client Two is connected

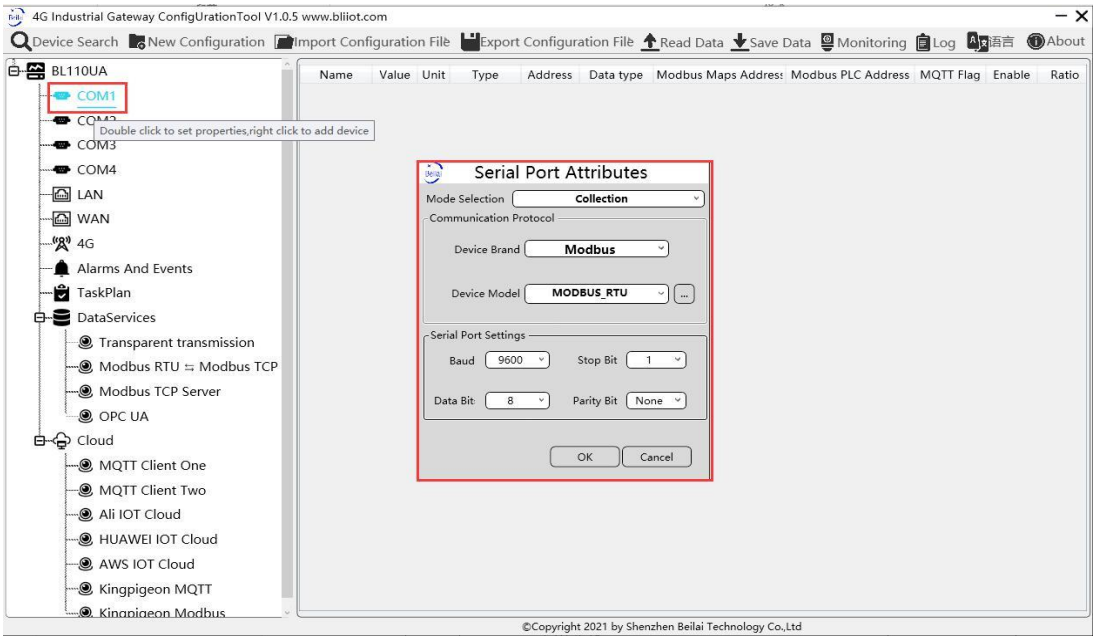
Online Status	Gray indicates MQTT Client Two is unconnected
Ali IOT Cloud Online Status	Red indicates Ali Cloud is connected Gray indicates Ali Cloud is unconnected
HUAWEI IOT Cloud Online Status	Red indicates HUAWEI Cloud is connected Gray indicates HUAWEI Cloud is unconnected
AWS IOT Cloud Online Status	Red indicates AWS is connected Gray indicates AWS is unconnected
192.168.1.1 Ping	Default factory setting Ping 192.168.1.1 gatway, IP can be changed. It's gateway through WAN. Click Ping button to check local area network status. Red indicates local area network is OK. Gray indicates local area network problem.
www.baidu.com Ping	Default factory setting Ping baidu website. Web address can be changed. Wide area network status can be checked by clicking Ping. Red indicates wide area network is OK. Gray indicates internet communication problem.
Device Online Status Prompting Box	Red indicates gateway is communicating with slave devices Gray indicates gateway fails to communicate with salve device
Refresh	Refresh basic information of gateway

4.2.2 COM Port Introduction

All 4 COM Port configuration is the same. Below is the introduction of COM1 configuration.

4.2.2.1 COM Port Attribute Configuration

Double click COM1 to open COM Port Attribute configuration box.

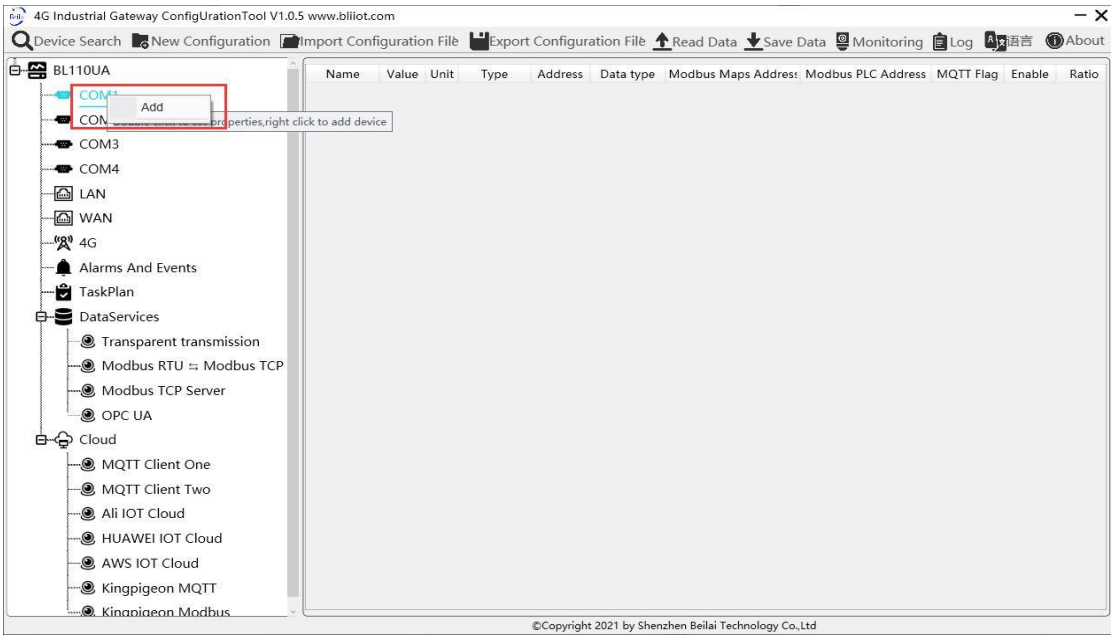


Item		Description
Mode Selection		Select mode: Collect/Transparent Transmission/Modbus RTU to Modbus TCP
Protocol	Device Brand	Select from Modbus, Mitsubish, Siemens, Smart Meter
	Device Model	Select device model
Serial Port Settings	Baud Rate	Select from “2400”, “4800”, “9600”, “19200”, “38400”, “57600”, “115200”
	Stop Bit	Select “1Bit” or “2Bit”
	Data Bit	Select “7Bit” or “8Bit”
	Parity Bit	Select “None”, “Even” ,“Odd”
OK		Confirm COM configuration
Cancel		Cancel COM port configuration

4.2.2.2 Add COM Port Device

Right click COM1 and click Add to add device. Device configuration box will pop up. For the added device, double click it to show device configuration information. Right click to delete device.

Note: Total 50 devices can be connected through the 4 COM ports.


4G Industrial Gateway ConfigUrationTool V1.0.5 www.bliiot.com
Device Search
New Configuration
Import Configuration File
Export Configuration File
Read Data
Save Data
Monitoring
Log
About
BL110UA
COM1
COM2
COM3
COM4
LAN
WAN
4G
Alarms And Events
TaskPlan
DataServices
Transparent transmission
Modbus RTU ⇆ Modbus TCP
Modbus TCP Server
OPC UA
Cloud
MQTT Client One
MQTT Client Two
Ali IOT Cloud
HUAWEI IOT Cloud
AWS IOT Cloud
Kingpigeon MQTT
Kingpigeon Modbus
Add
Name
Value
Unit
Type
Address
Data type
Modbus Maps Address
Modbus PLC Address
MQTT Flag
Enable
Ratio
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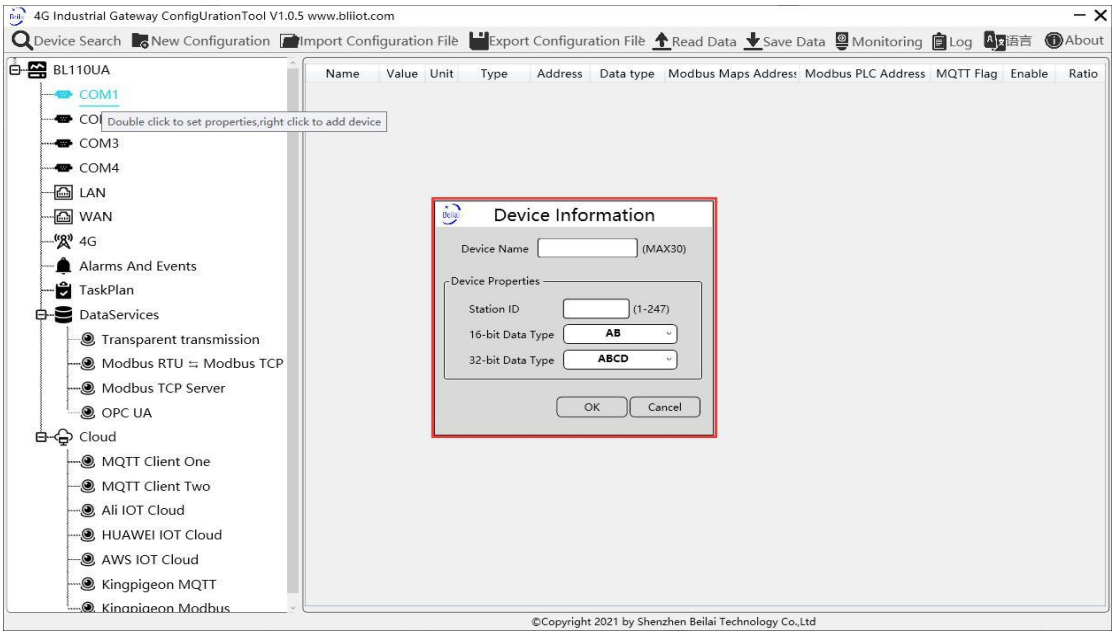
4G Industrial Gateway ConfigUrationTool V1.0.5 www.bliiot.com
Device Search
New Configuration
Import Configuration File
Export Configuration File
Read Data
Save Data
Monitoring
Log
About
BL110UA
COM1
COM3
COM4
LAN
WAN
4G
Alarms And Events
TaskPlan
DataServices
Transparent transmission
Modbus RTU ⇆ Modbus TCP
Modbus TCP Server
OPC UA
Cloud
MQTT Client One
MQTT Client Two
Ali IOT Cloud
HUAWEI IOT Cloud
AWS IOT Cloud
Kingpigeon MQTT
Kingpigeon Modbus
Double click to set properties,right click to add device
Name
Value
Unit
Type
Address
Data type
Modbus Maps Address
Modbus PLC Address
MQTT Flag
Enable
Ratio
Device Information
Device Name
(MAX30)
Device Properties
Station ID
(1-247)
16-bit Data Type
AB
32-bit Data Type
ABCD
OK
Cancel
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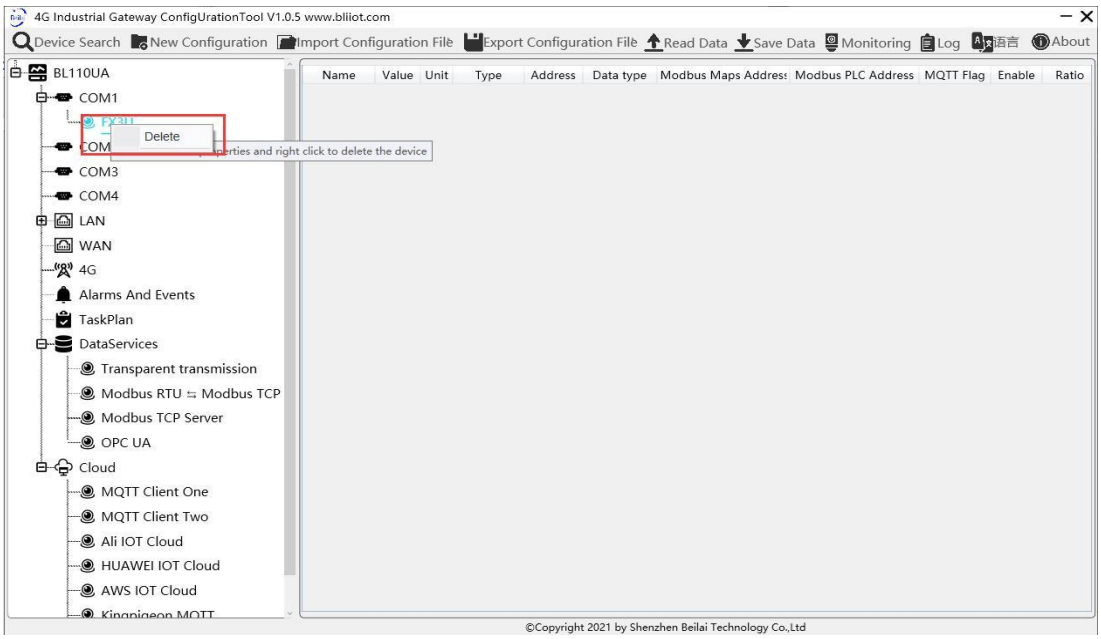
4G Industrial Gateway ConfigUrationTool V1.0.5 www.bliiot.com
Device Search
New Configuration
Import Configuration File
Export Configuration File
Read Data
Save Data
Monitoring
Log
About
BL110UA
COM1
COM3
COM4
LAN
WAN
4G
Alarms And Events
TaskPlan
DataServices
Transparent transmission
Modbus RTU ⇆ Modbus TCP
Modbus TCP Server
OPC UA
Cloud
MQTT Client One
MQTT Client Two
Ali IOT Cloud
HUAWEI IOT Cloud
AWS IOT Cloud
Kingpigeon MQTT
Delete
Name
Value
Unit
Type
Address
Data type
Modbus Maps Address
Modbus PLC Address
MQTT Flag
Enable
Ratio
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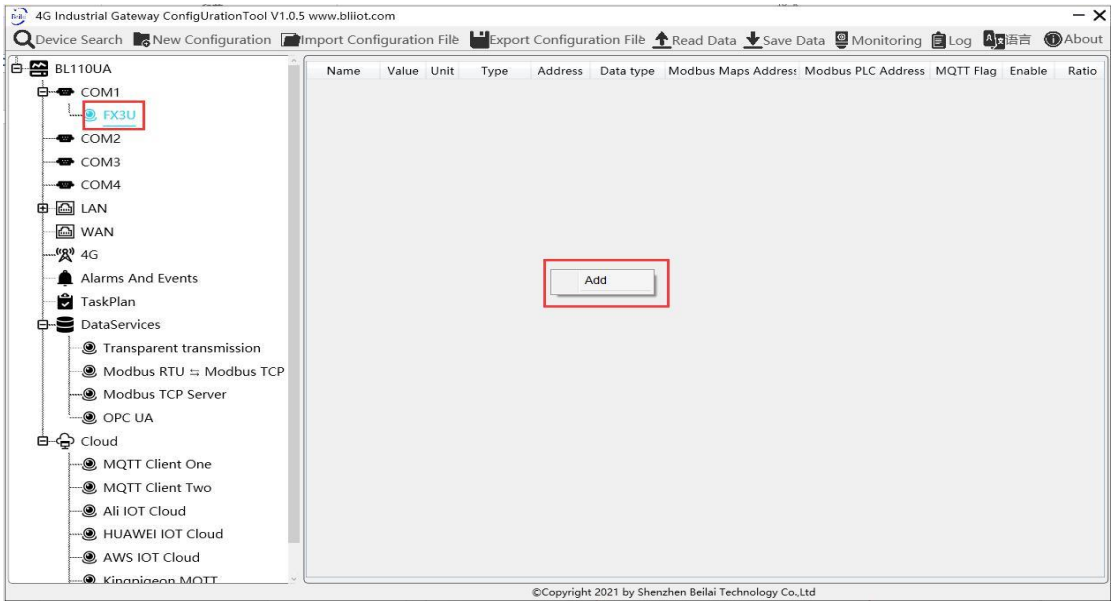
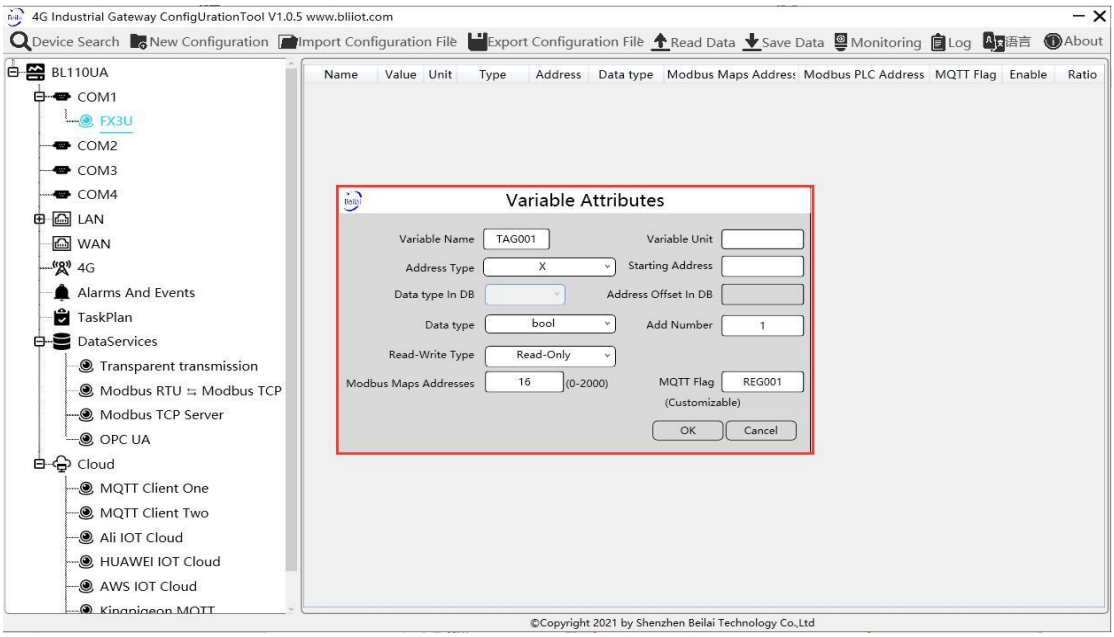
Note: device attributes are set according to the selected protocol. For example, device brand is Modbus, set attributes as below table

Device Information			
Item		**Description**	**Default**
Device Name		Name of Data Collecting Device	
Device Properties	Station ID	Data Collecting Device Modbus Communication Address	
	16-bit Data Type	Select “AB” or “BA”	AB
	32-bit Data Type	Select “ABCD”, “DCBA”, “BADC”, “CDAB”	ABCD
OK		Confirm device configuration	
Cancel		Cancel device configuration	

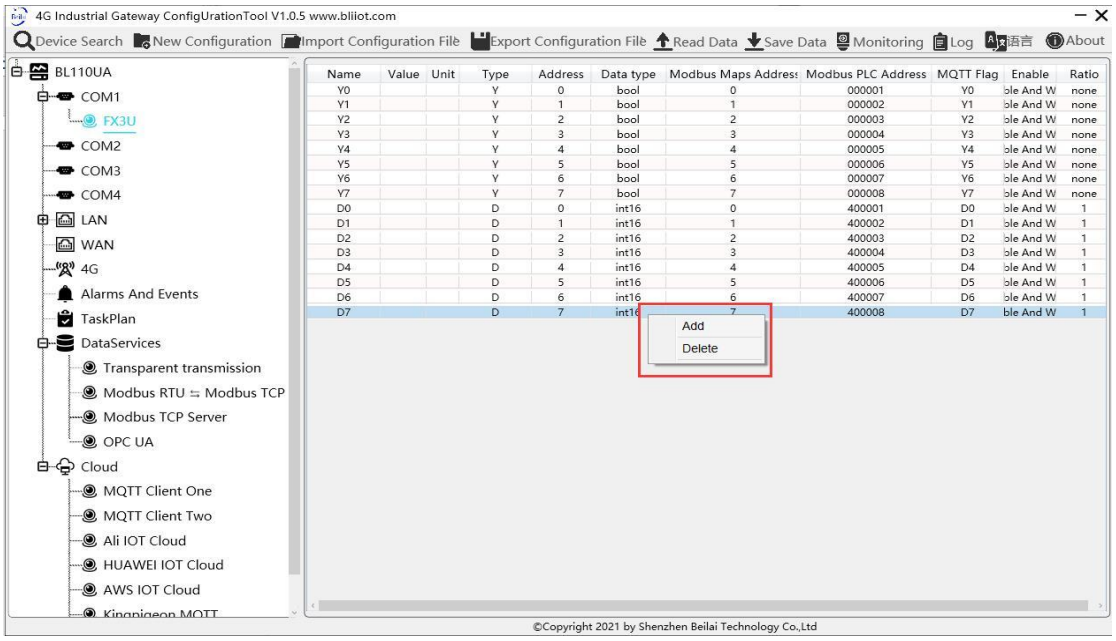
4.2.2.3 Add COM Port Device Datapoint

Click device name and then right click the box on the right. Add box will pop up. Click Add to enter datapoint configuration box. Right click the added datapoint to delete it. Double click the datapoint to edit it. To add more datapoints, right click the box and perform the same procedures.





Datapoints Configuration	
Item	**Description**
Variable Name	Name of Added Datapoint
Variable Unit	Datapoint unit, fill it as required, can be blank
Address Type	Select PLC Register Address Type
Starting Address	PLC datapoint address
DB Block Data Type	Select from “DBX”, “DBB”, “DBW”, “DBD”. Only configure it if PLC supports DB block
DB Block Address Offset	DB Block address offset value
Data Type	Select from Boolean, 16-bit unsigned integer, 16-bit signed integer, 32-bit unsigned integer, 32-bit signed integer, 32-bit single precision floating point
Add Number	Datapoint qty
Read-Write Type	Select “read only”, “read and write”
Ratio	Only set for numeric data. Data can be magnified or minified with certain ratio before sending to cloud
Modbus Mapping Address	Address in Gateway where datapoints are stored. Boolean: 0~2000 addresses, Numeric: 0-2000 addresses. Each register address space is one character
MQTT flag	Datapoint MQTT mark, can be any mark
OK	Confirm datapoint setting
Cancel	Cancel datapoint setting



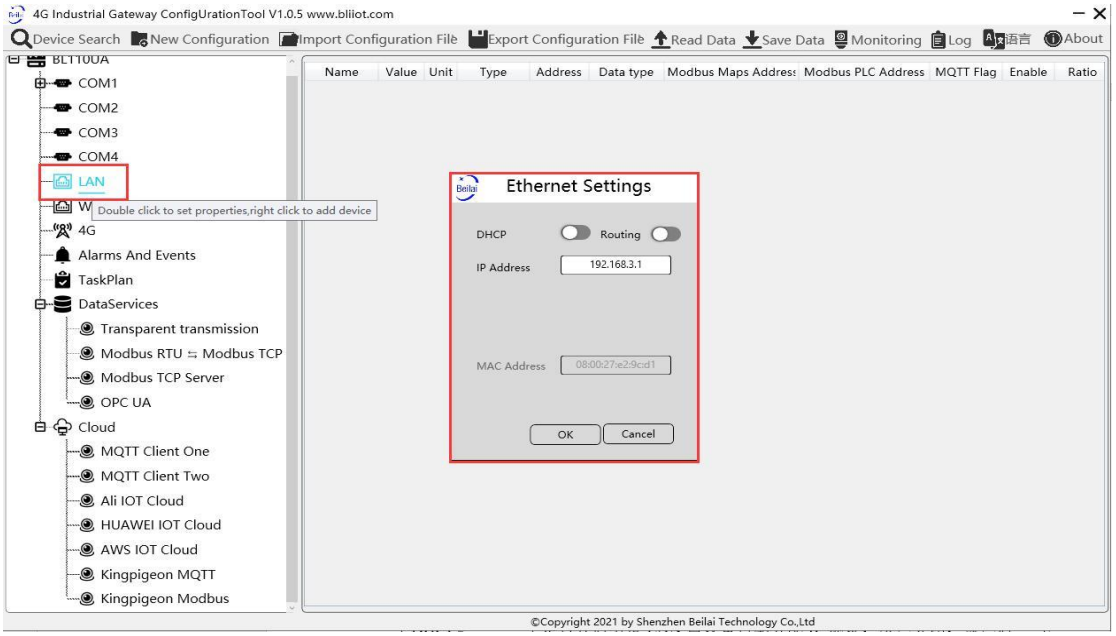
Select datapoint and right click it to delete datapoint. Double click datapoint to edit it.

4.2.3 LAN Port Introduction

4.2.3.1 LAN Port Attribute Configuration

Double click LAN port to enter setting page. Factory default IP of LAN is 192.168.3.1. Auto IP address distribution and routing functions are turned off in factory setting.

Note: If LAN port is connected to switch, the IP of all devices connected to switch must be the same as LAN port IP.



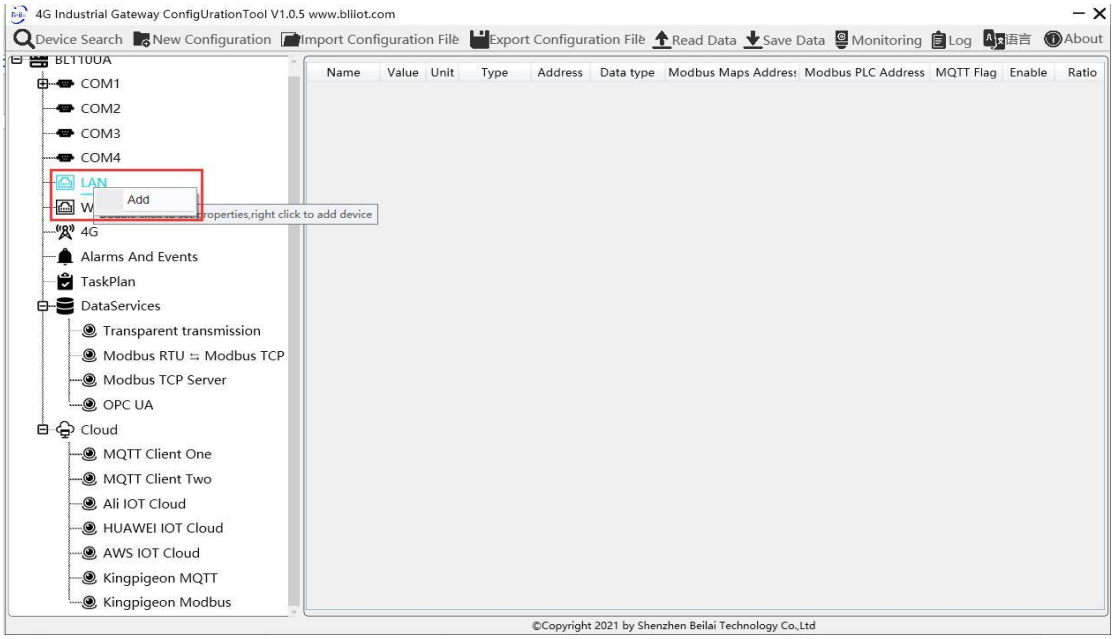
LAN Port Configuration	
Item	**Description**

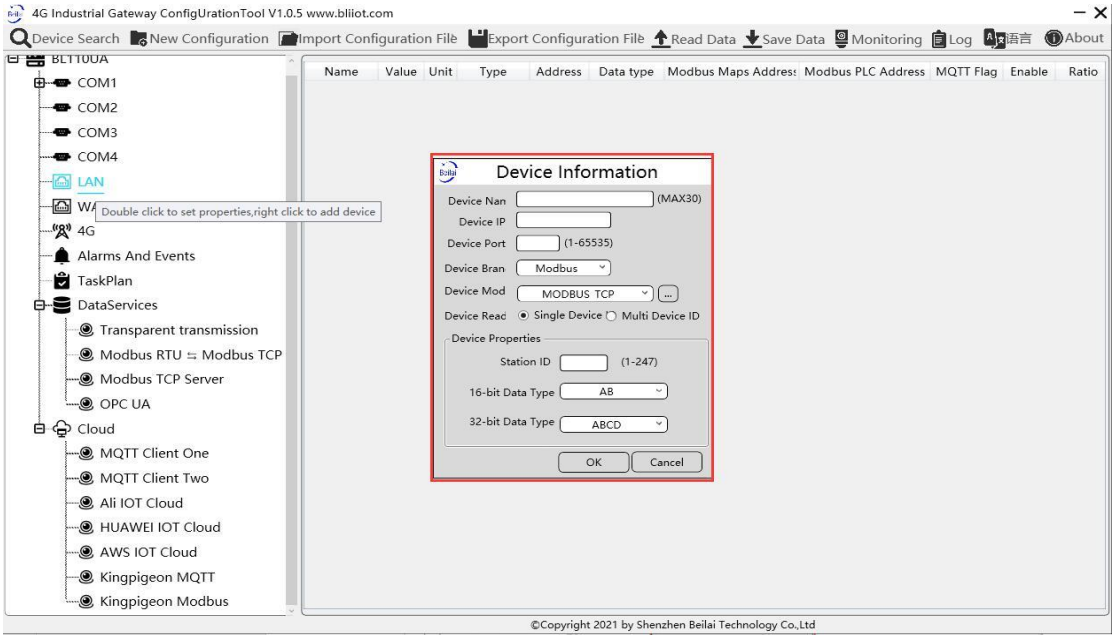
DHCP	Green indicates auto IP distribution for LAN is enabled Gray indicates auto IP distribution for LAN is turned off
Routing	Green indicates routing function is enabled. Gray indicates routing function is turned off
IP Address	LAN port IP Address
MAC	LAN port MAC
OK	Confirm LAN port Setting
Cancel	Cancel LAN port setting

4.2.3.2 Add LAN Port Device

After configuring LAN port attribute, right click LAN and clik Add to enter device configuration page. Device data can be collected through Gateway BL110 LAN Port or through switch which is connected with LAN.

Note: Total 50 devices can be connected through LAN and WAN





LAN Port Device Configuration	
Item	**Description**
Device Name	LAN Port Device Name
Device IP	Set IP Address of LAN port device. PLC IP Address must be the same as Gateway BL110 LAN IP Address. If it's not the same, need to change device IP address or LAN port IP address. To change LAN port configuration, it will not take effective until restart after power off
Device Port	Set LAN device port
Device Brand	Select from Siemens, Modbus, OMRON
Device Model	Select device Model
Station ID	LAN port device Modbus communication address, only configure it if Modbus is selected as device brand
16-bit Data Type	Select "AB" or "BA", only configure it if Modbus is selected as device brand.
32-bit Data Type	Select"ABCD", "DCBA", "BADC" or "CDAB", only configure it if Modbus is selected as device brand.
OK	Confirm LAN port device setting
Cancel	Cancel LAN port device setting

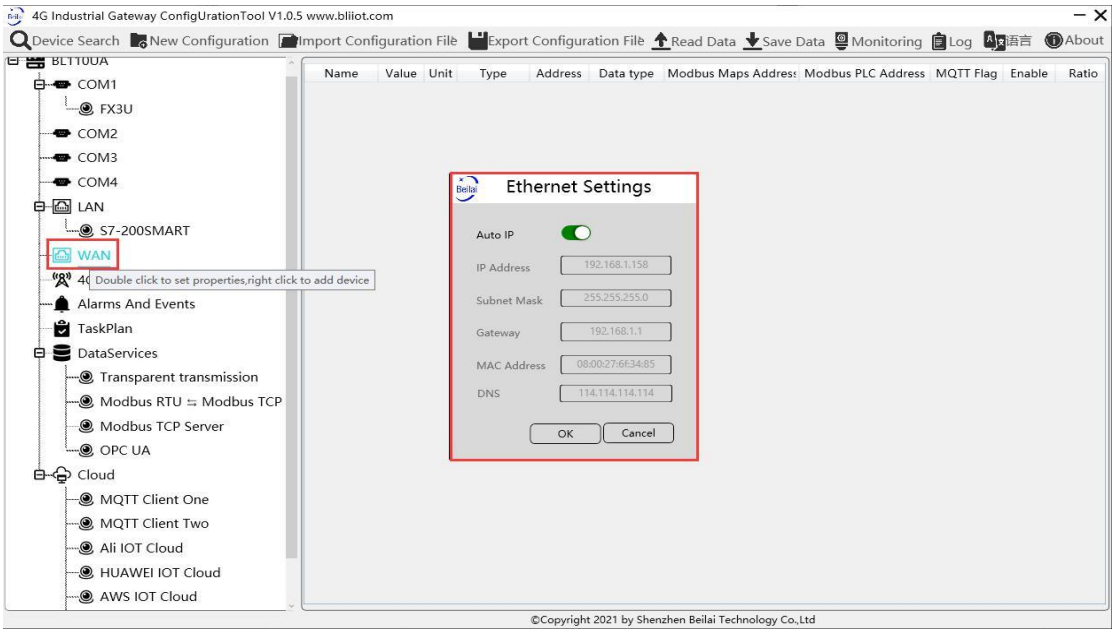
4.2.3.3 Add LAN Port Device Datapoint

The procedure to add LAN Port device datapoint is the same as that of adding COM port device datapoint. Refer to Add COM Port Device Datapoint

4.2.4 WAN Port Introduction

4.2.4.1 WAN Port Attribute Configuration

Double click WAN to enter WAN Port Attribute configuration box.

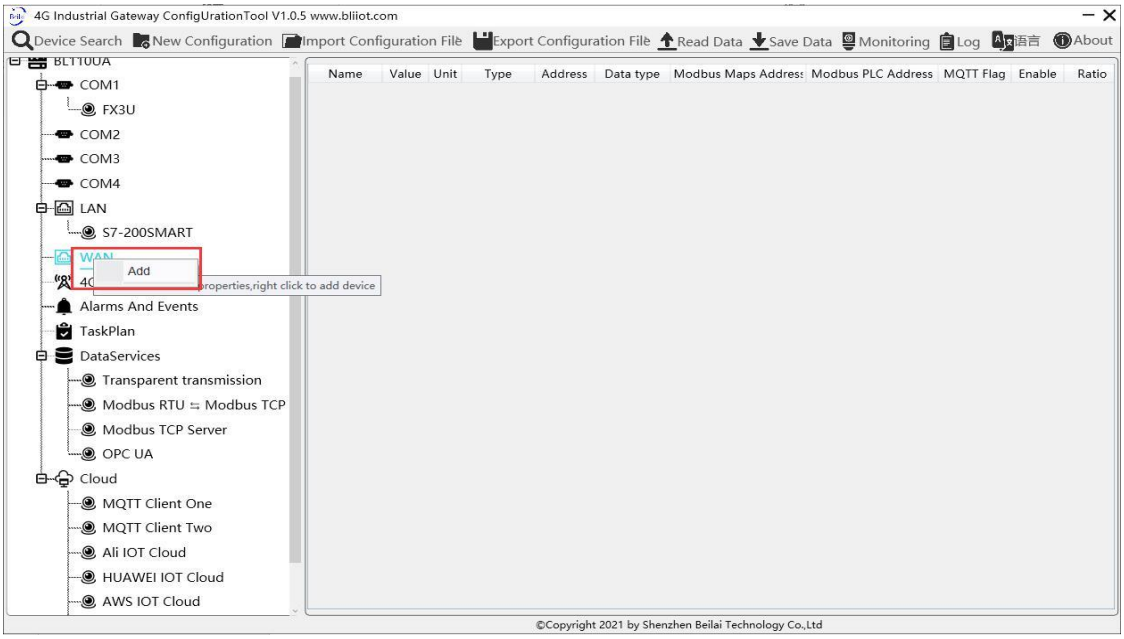


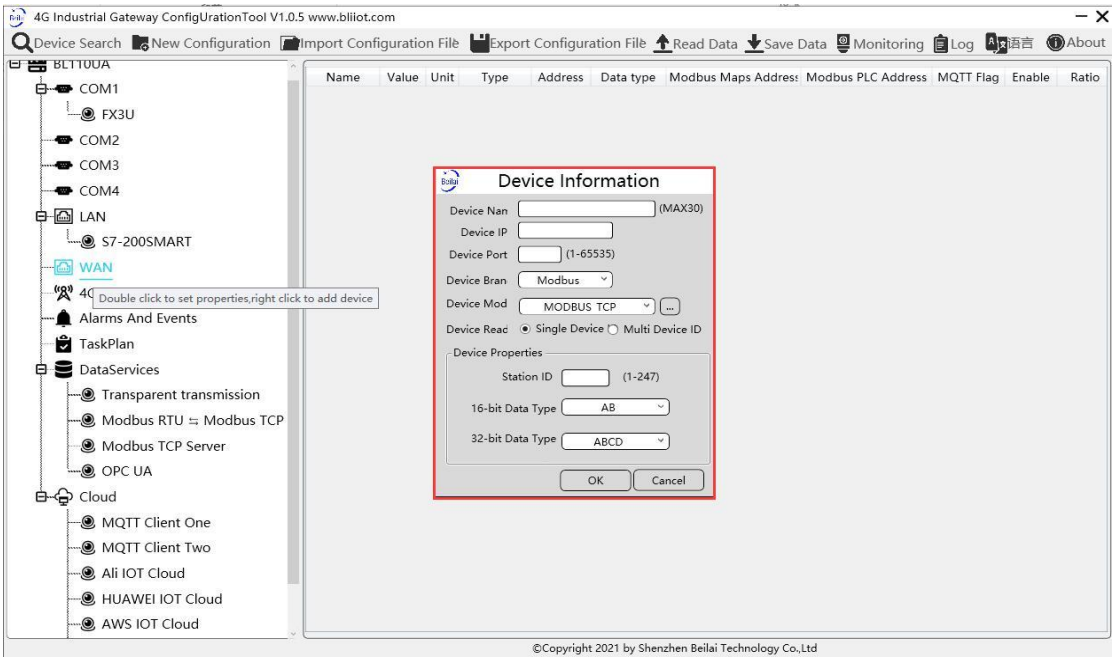
WAN Port Attribute Configuration	
Item	**Description**
Auto IP	Green indicates auto retrieving IP Gray indicates IP is specified
IP Address	Current IP Address of WAN Port
Subnet Mask	Current WAN Subnet Mask
Gateway	Current WAN Gateway Address
MAC Address	WAN port MAC address
DNS	Current WAN port DNS server
OK	Confirm WAN port setting
Cancel	Cancel WAN port setting

4.2.4.2 Add WAN Port Device

Right click WAN and clik Add to enter device configuration page. Device data can be collected through Gateway BL110 WAN Port or through switch which is connected with WAN.

Note: Total 50 devices can be connected through LAN and WAN.





WAN Port Device Configuration	
Item	**Description**
Device Name	Name of WAN Port Device
Device IP	IP Address of WAN Port Device
Device Port	WAN port device Port
Device Brand	Select from Siemens, Modbus, OMRON
Device Model	Select device Model
Station ID	WAN port device Modbus communication address, only configure it if Modbus is selected as device brand.
16-bit Data Type	Select “AB” or “BA”, only configure it if Modbus is selected as device brand.
32-bit Data Type	Select “ABCD”, “DCBA”, “BADC” or “CDAB”, only configure it if

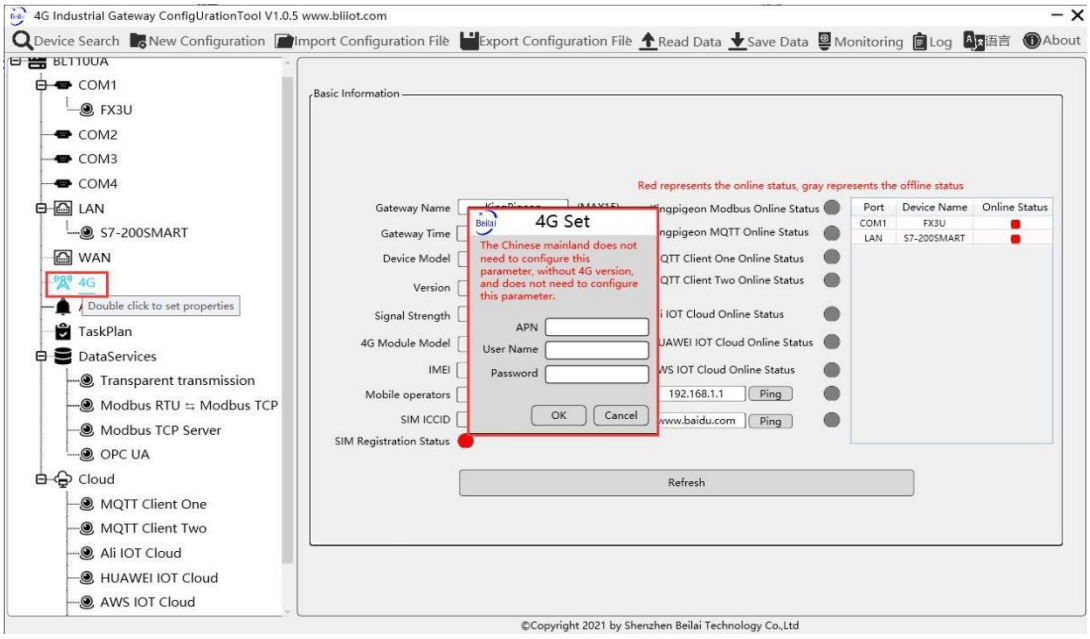
	Modbus is selected as device brand.
OK	Confirm WAN port device setting
Cancel	Cancel WAN port device setting

4.2.4.3 Add WAN Port Device Datapoint

The procedure to add WAN Port device datapoint is the same as that of adding COM port device datapoint. Refer to Add COM Port Device Datapoint

4.2.5 4G Introduction

Double click 4G to enter APN setting box. Note: It's not necessary to set APN for China mainland 4G network. If no 4G module in the device, it's not needed to set it either

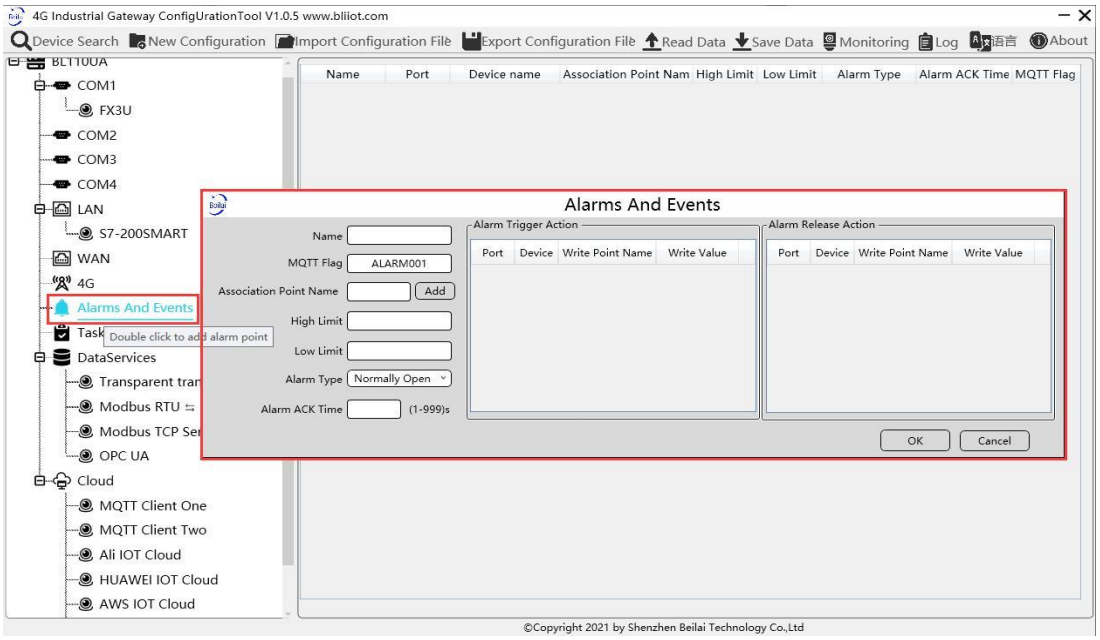


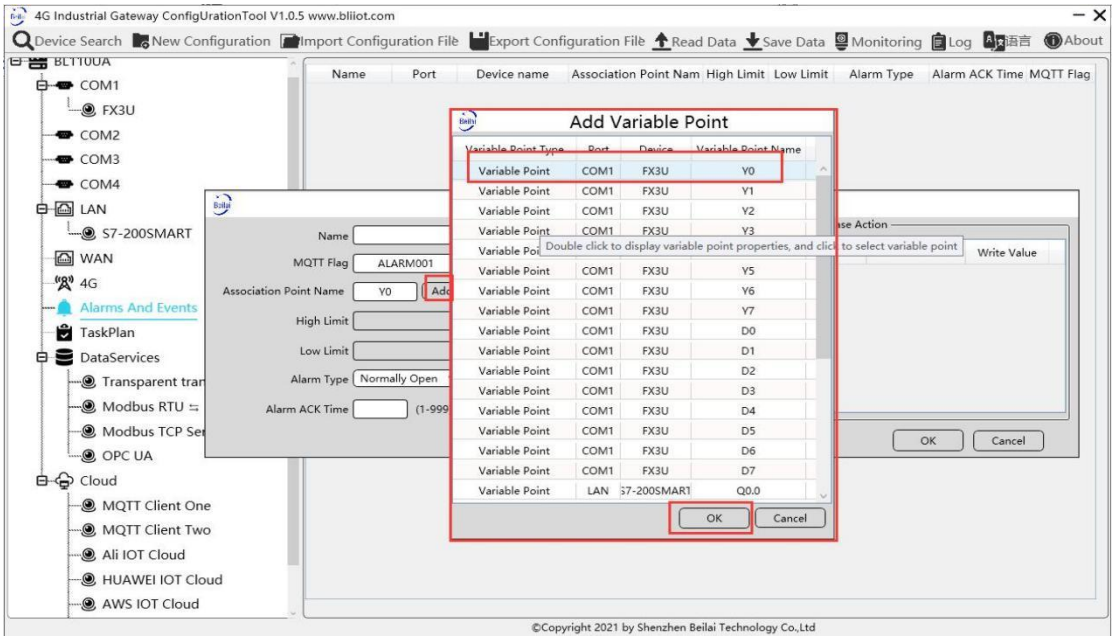
4G Configuration	
Item	**Description**
APN	Access Point Name of SIM card cellular network
User Name	User Name of SIM card cellular network
Password	Password of SIM card cellular network

4.2.6 Alarm and Event Configuration

Double click Alarms and Events to enter setting box. Alarm points, actions and alarm recovery actions can be set according to requirement

4.2.6.1 Alarm Point Configuration



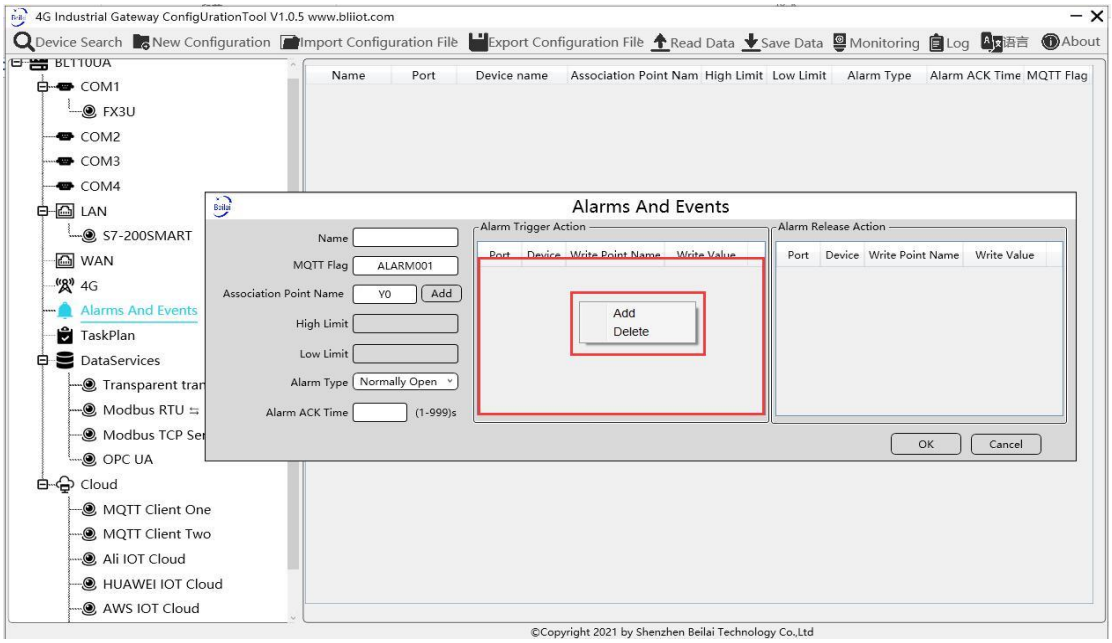


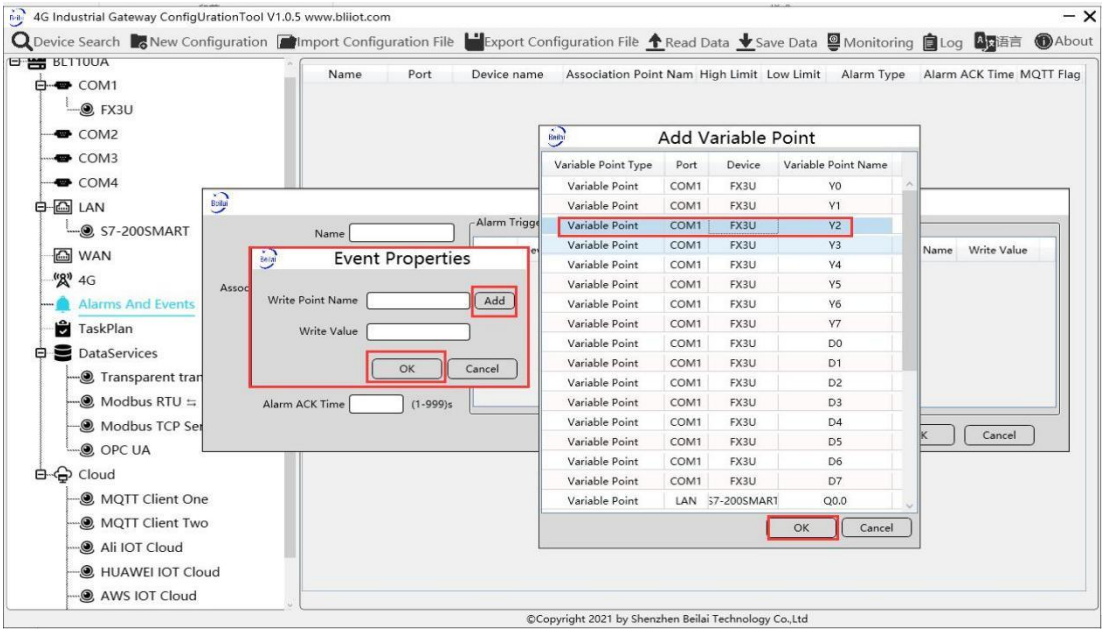
Alarm and Events Configuration	
Item	**Description**
Name	Name of Alarm Point
MQTT Flag	MQTT flag of alarm point, can be randomly set
Association Point Name	Select alarm point and click Add. Datapoint box will pop up. Click the point to be set for alarm and click OK to confirm. Double click datapoint to enter datapoint attribute page
High Limit	High Limit alarm value of numeric datapoints
Low Limit	Low limit alarm value of numeric datapoints
Digital Alarm Type	Select from digital alarm mode: Normally Open or Normally Close

Alarm ACK Time	Within alarm acknowledge time, if data will recover to normal value, no alarm will be triggered. Otherwise it will generate alarm
OK	Confirm alarms and events setting
Cancel	Cancel alarms and events setting

4.2.6.2 Alarm Event Configuration

Right click Alarm Trigger Action box and click Add to enter Event configuration box for setting actions to be performed when alarm is triggered. Right click Alarm Release Action box to set actions to be performed when alarm is released



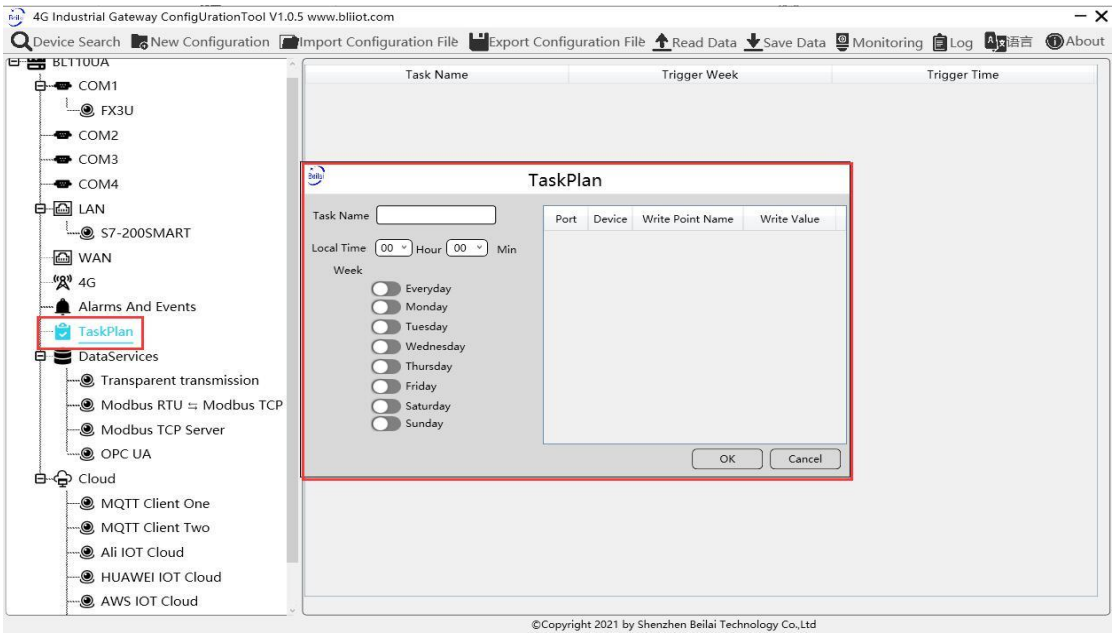


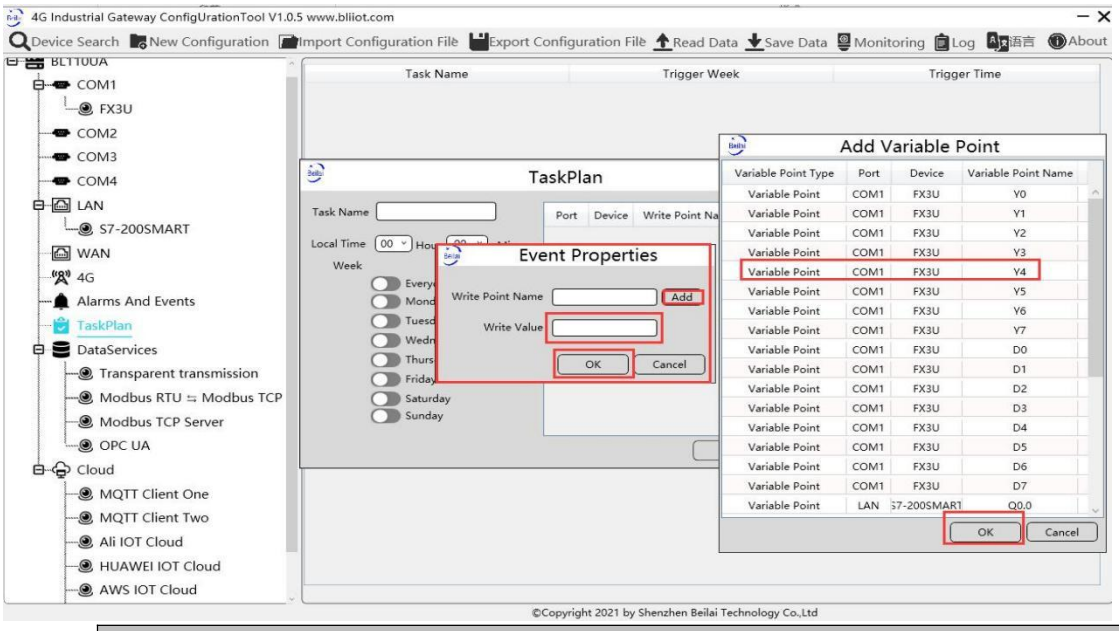
Event Configuration

Item	Introduction
Write Point Name	Write Point Name is generated based on selected datapoint. Click Add, select datapoint and click OK to confirm. Double click datapoint to view its attributes
Write Value	Write datapoint value. For Boolean value, select 1 or 0

4.2.7 Task Plan Configuration

Double click Task Plan to enter configuration box. Move mouse cursor to the right box, right click the box and click Add to enter configuration box.





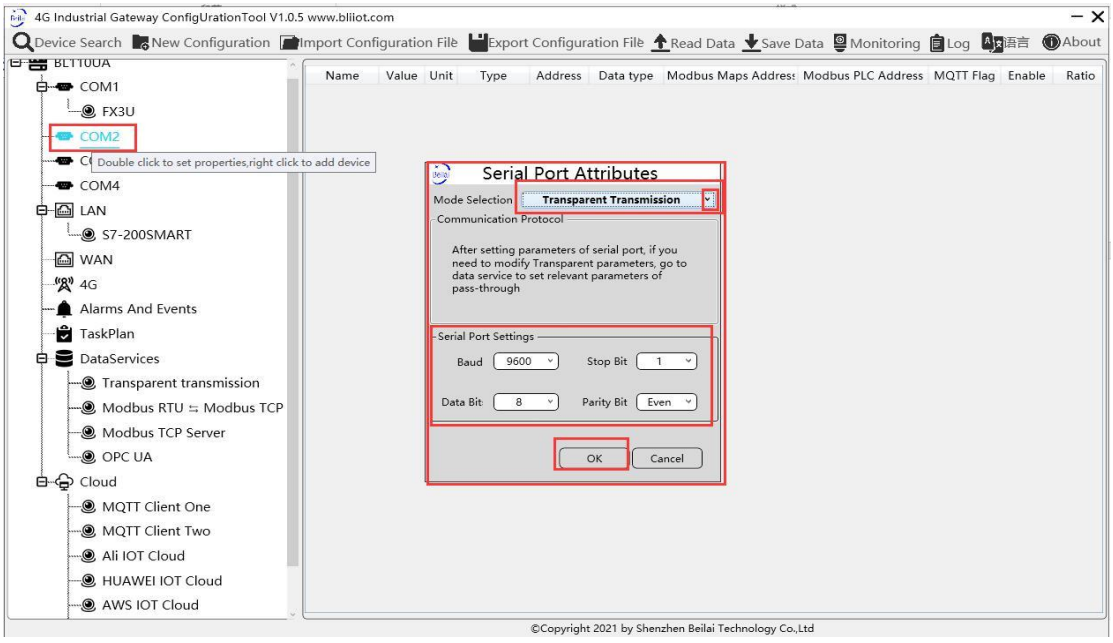
Task Plan Configuration	
Item	**Description**

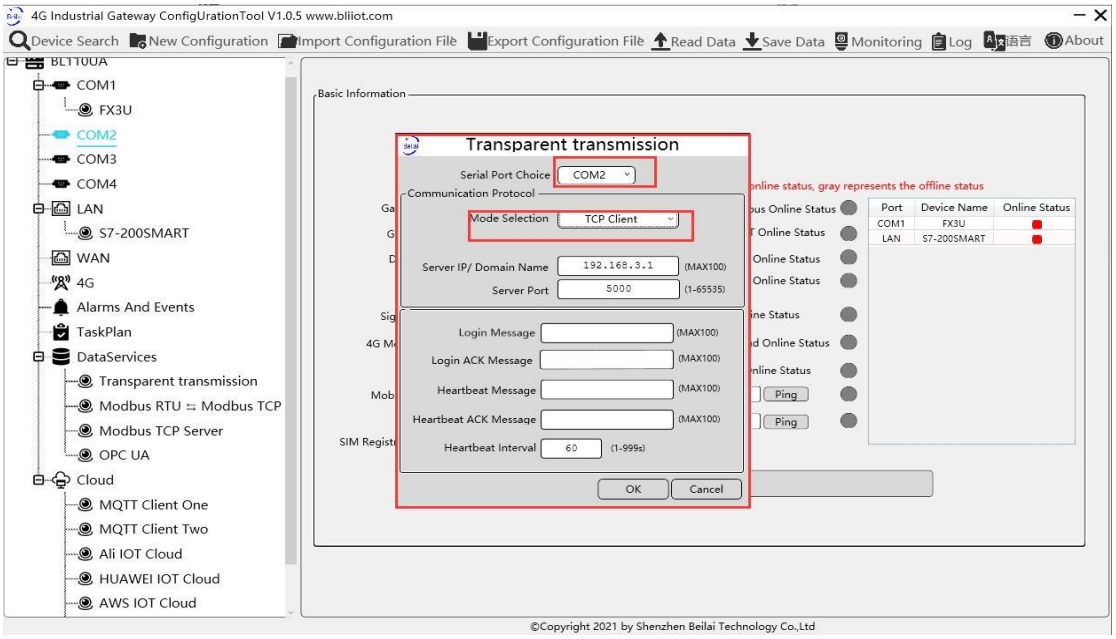
Task Name	Name of Task Plan
Local Time	Set time to perform the planned task (local time)
Week	Set week day to perform the planned task
Write Point Name	Write Point Name will be generated based on selected datapoint.Click Add , select the datapoint and click OK to confirm. Double click datapoint to view its attributes
Write Value	Write datapoint value. For Boolean value, select 1 or 0
OK	Confirm Task Plan setting
Cancel	Cancel Task Plan setting

4.2.8 Data Service

4.2.8.1 Transparent Transmission

Set COM mode to Transparent Transmission, set COM parameters and then configure Transparent Transmission parameters. All 4 COM ports can be used for Transparent Transmission. The configuration procedures are the same. Below is the example of setting COM2 for transparent transmission: 1. select transparent transmission mode in COM2, 2. configure COM2 attributes, click OK to enter Data Service configuration page



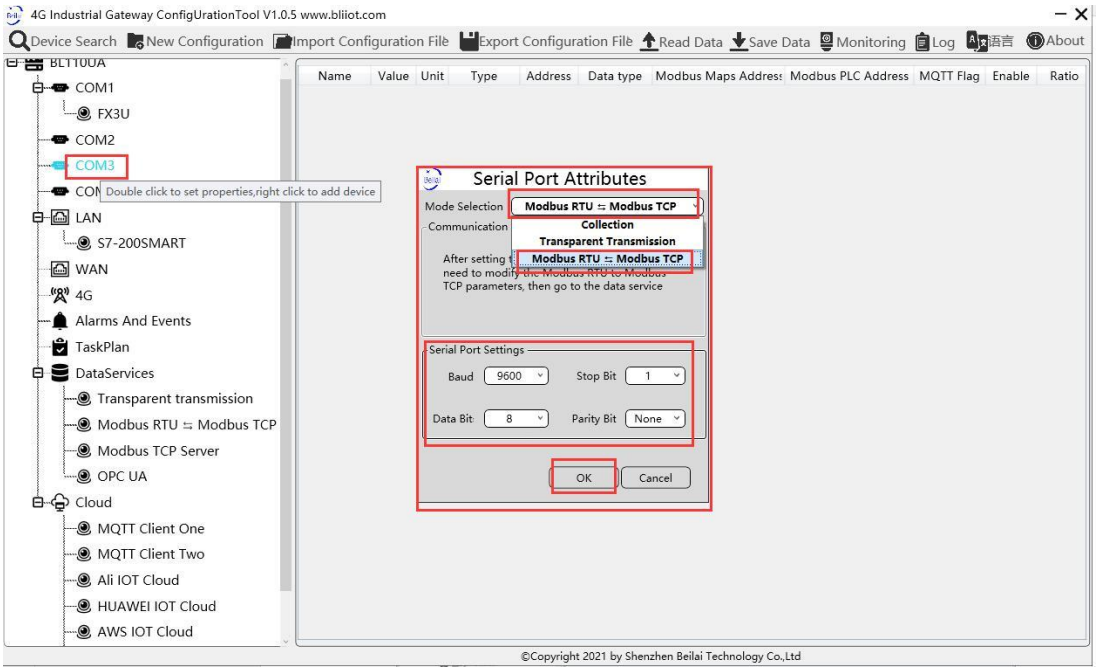


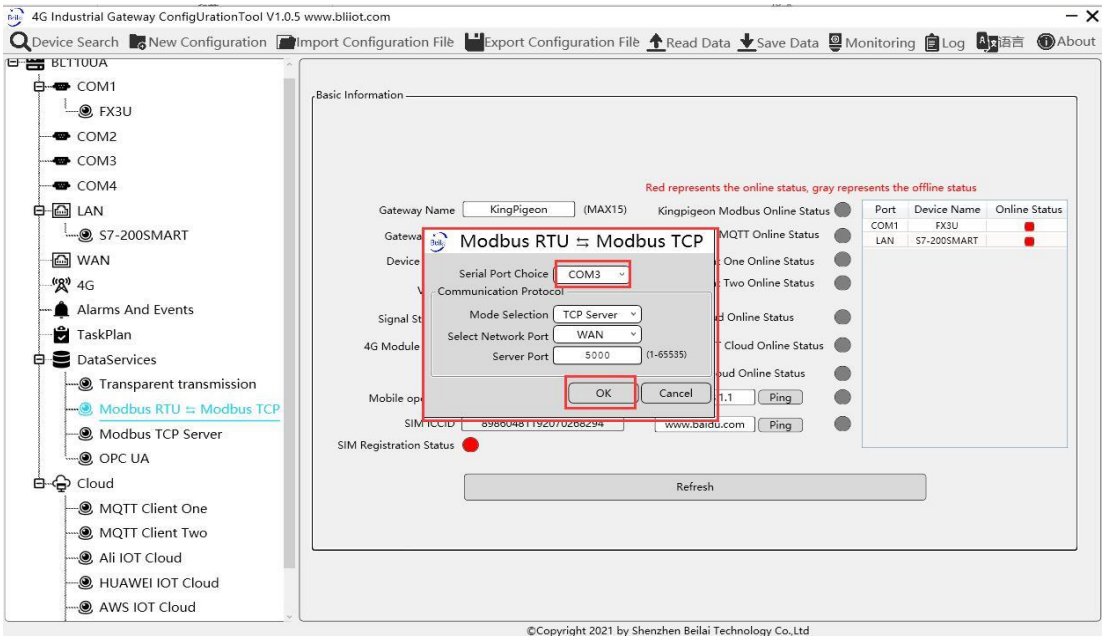
Transparent Transmission Configuration	
Item	**Description**
Serial Port Choice	COM2
Mode Selection	Select Gateway as “TCP Server” or “TCP Client”
Select Network Port	Only set it when BL110 Gateway is used as TCP server Select WAN or LAN
Server IP /Domain Name	If BL110 is used as server, it can’t be set but automatically show selected WAN or LAN IP If BL110 is used as client, input transparent transmission server IP
Monitoring Port /Server Port	If BL110 is used as server, input monitoring port If BL110 is used as client, input server port
Login Message	Data Package of logging in to server
Login ACK Message	Data Package of server response to login
Heartbeat Message	Heartbeat Data Package to keep connection
Heartbeat ACK Message	Data Package of server response to heartbeat
Heartbeat Interval	Cycle time of sending heartbeat package. Default is 60s
OK	Confirm Transparent Transmission setting
Cancel	Cancel Transparent Transmission setting

4.2.8.2 Modbus RTU to Modbus TCP

Set COM mode to Modbus RTU to Modbus TCP, set COM parameter and then configure Modbus RTU to Modbus TCP parameters in Data Service. All 4 COM ports can be used as Modbus RTU to

Modbus TCP. The setting procedure is the same. Below is the example of setting COM3 as Modbus RTU to TCP: 1. Select Modbus RTU to Modbus TCP mode, 2. Set COM port attributes. 3. Click OK to enter Data Service for configuring Modbus RTU to Modbus TCP.

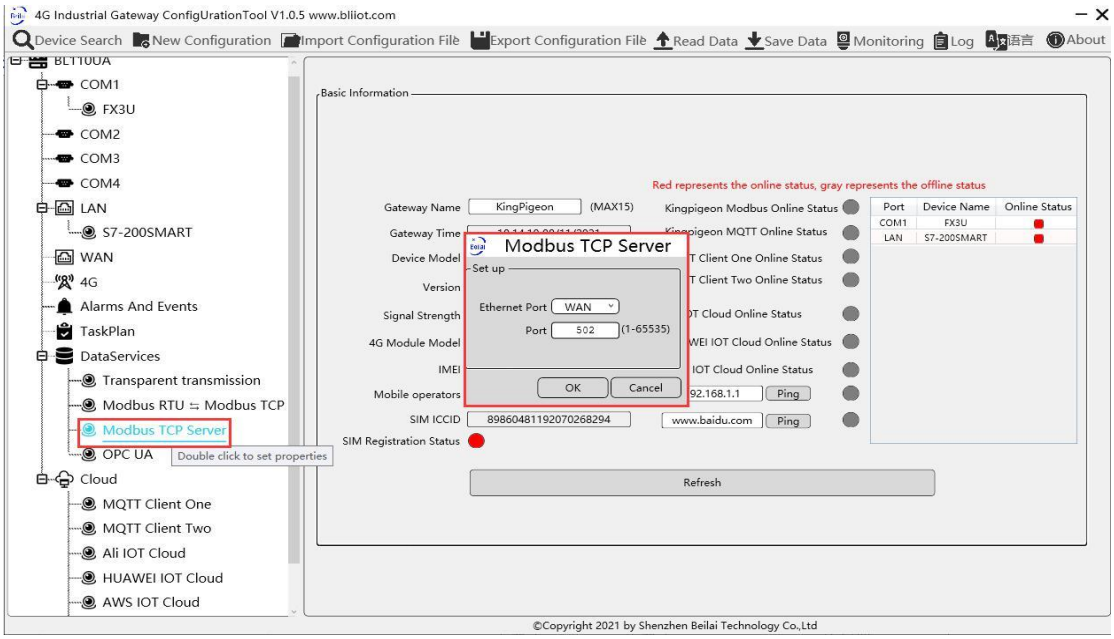




Modbus RTU to Modbus TCP Configuration	
Item	**Description**
Serial Port Choice	COM3
Mode Selection	TCP Server (Gateway can only be TCP Server)
Select Network Port	Select “WAN” or “LAN”
Monitoring Port	Input port of monitoring BL110 Gateway (required)
OK	Confirm Modbus RTU to Modbus TCP configuration
Cancel	Cancel Modbus RTU to Modbus TCP configuration

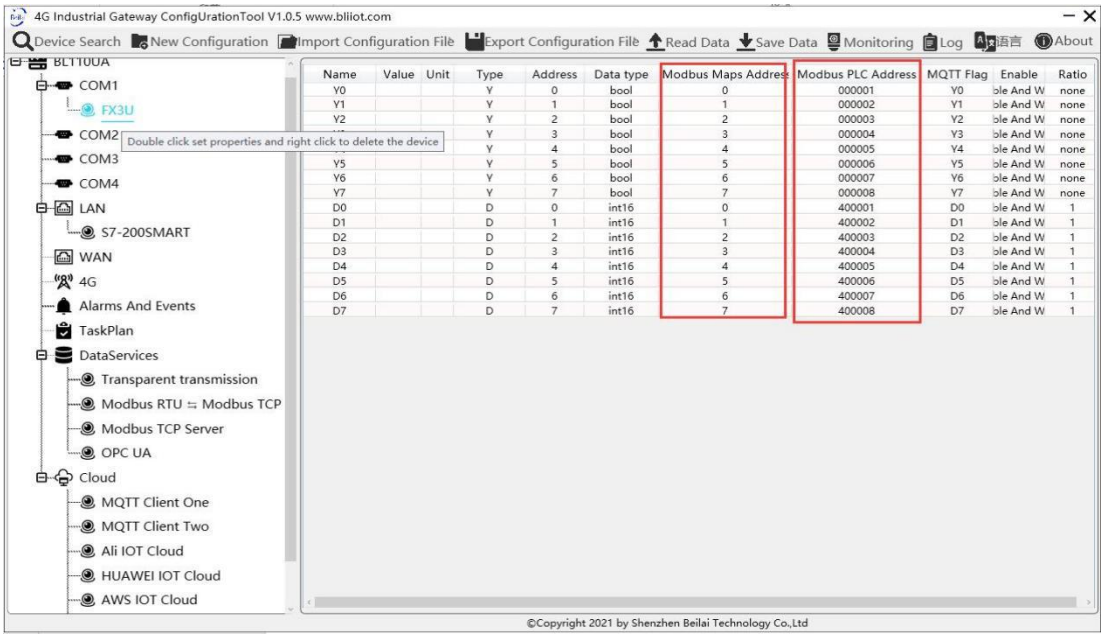
4.2.8.3 Modbus TCP Server

BL110 Gateway supports Modbus TCP protocol and provides data as Modbus TCP server. Modbus TCP server is enabled permanently. Only configure Ethernet port and monitoring port. WAN /LAN IP address can be viewed by clicking WAN/LAN



Modbus TCP Server Configuration	
Item	**Description**
Ethernet Port	Select “WAN” or “LAN”
Port	Input gateway monitoring port (required)
OK	Confirm Modbus TCP Server setting
Cancel	Cancel Modbus TCP Server setting

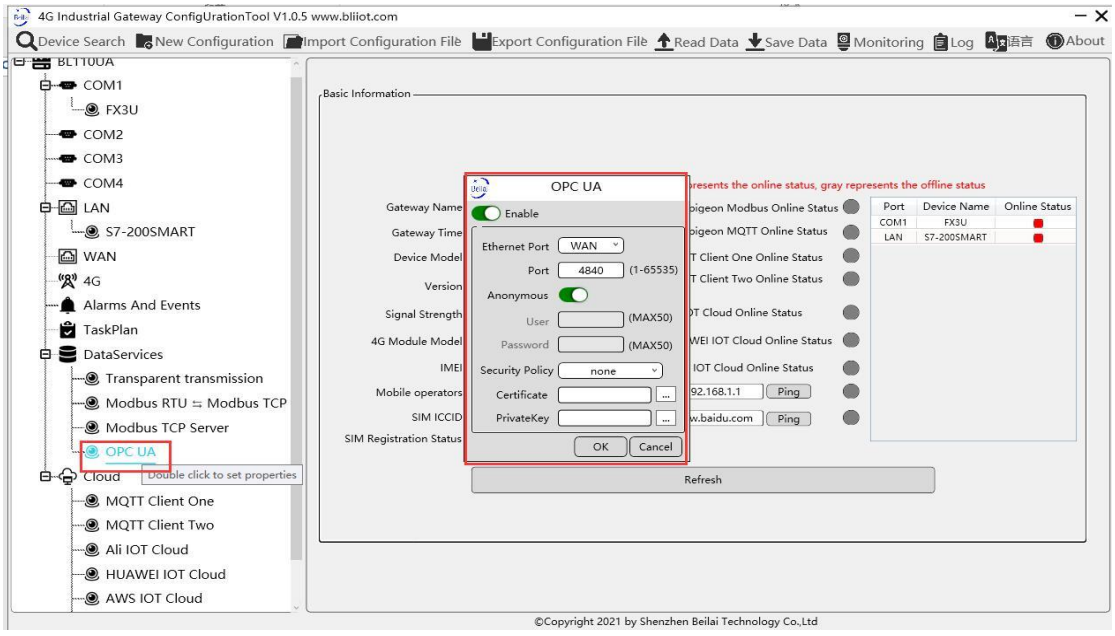
Modbus TCP master computer is used as client to collect function codes supported by Gateway data. Boolean data supports 01, 05, numerical data supports 03, 06, 16-bit byte sequence is AB and 32-bit bytes sequence is ABCD. Follow master computer to put Modbus address or PLC Modbus address (The Modbus Address in configuration software). Refer to below datapoint picture. Master computer configuration refers to 5.4.2View Data with KingView



4.2.8.4 OPC UA

Gateway BL110 supports OPC UA and provides data as OPC UA server.

WAN/LAN IP Address can be viewed by clicking WAN LAN



OPC UA Configuration	
Item	**Description**
Enable	Green indicates OPC UA is enabled Gray indicates OPC UA is disabled. Default is disabled
Ethernet Port	Select “WAN” or “LAN”
Port	Input server port (required)
Anonymous	Green indicates login anonymously. Default is Green.

	Gray indicates login with Account and Password.
User	Input User Name
Password	Input User Password
Security Policy	Encryption policy. Select “none”, “basic256”, “basic128rsa15” or “basic256sha256”
Certificate	OPC UA certificate, select file to upload
PrivateKey	OPC UA encryption key, select file to upload
OK	Confirm OPC UA setting
Cancel	Cancel OPC UA setting

OPC UA Client configuration refer to: 5.4.4 View Data with UaExpert
OPC UA Client datapoints are retrieved by gateway and generated automatically. It’s not necessary to set it.

4.2.9 Cloud Platform

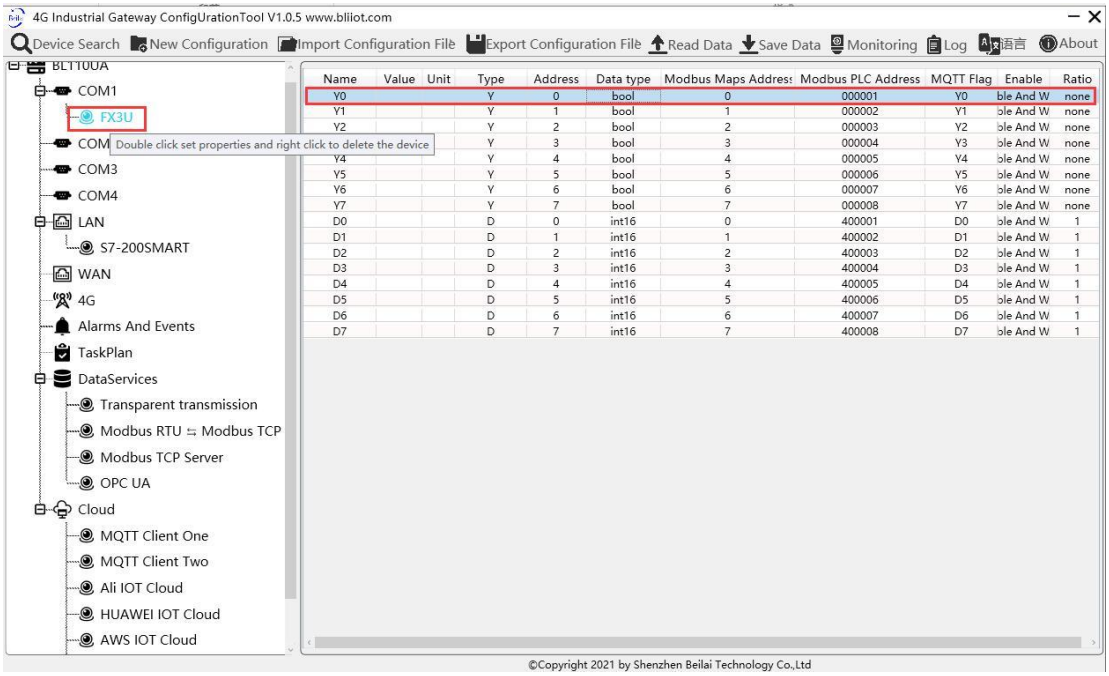
BL110 can be online in multiple cloud platform simultaneously.

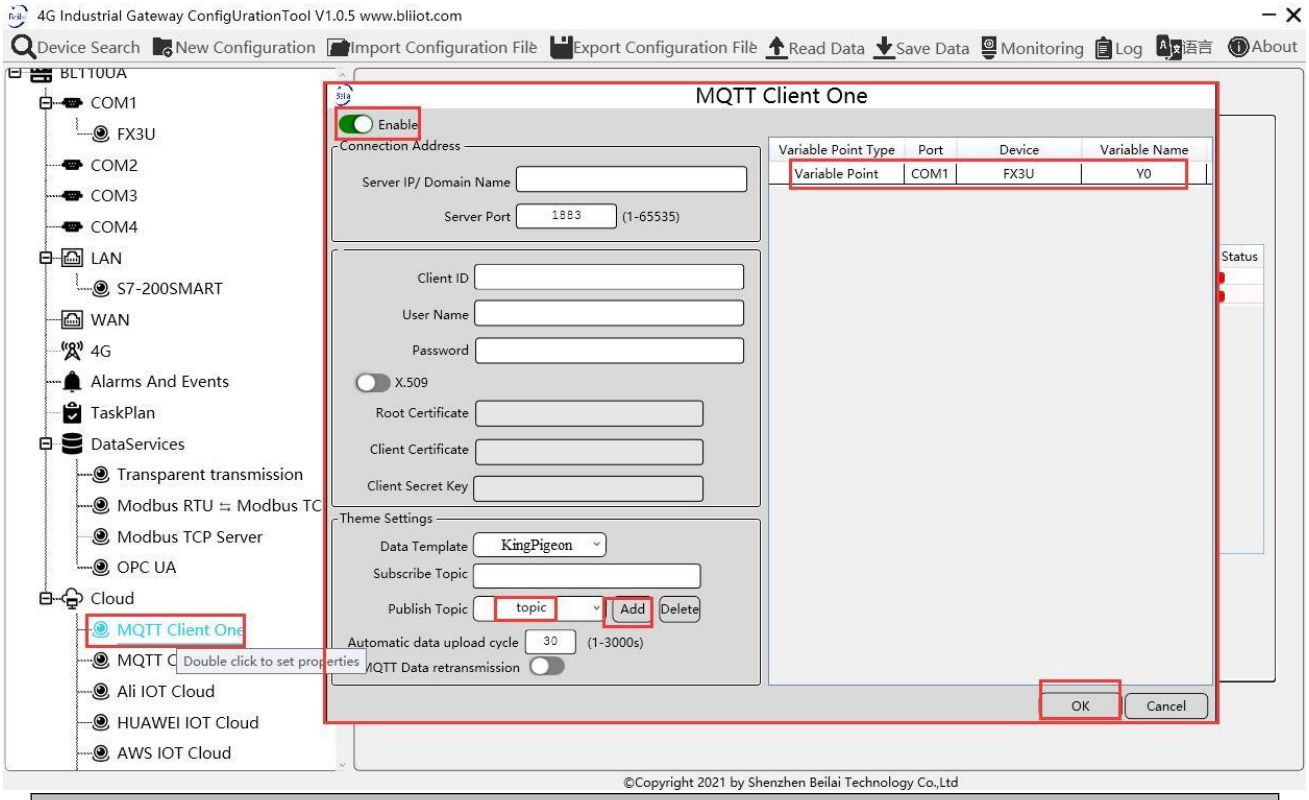
4.2.9.1 MQTT Client One

MQTT Client One can be connected to cloud with certificate or without certificate.
MQTT data formats only support King Pigeon and ThingsBoard JSON message format. Will support more JSON data formats in the future. If connecting BL110 to ThingsBoard, ThingsBoard JSON data format must be selected
It supports multiple publishing topics.
Click Add to set publish topic. Publish topic name can be viewed from drop-down list of Publish Topic. Select Publish Topic Name and click Delete to delete publish topic. MQTT Client One supports publishing certain datapoints of each topic. Move mouse cursor to the right box, right click it and click Add to enter datapoint dialog box. Select the datapoint to publish and click OK to confirm it. Double click datapoint to view its attributes.
Take below picture for example, only datapoint Y0 of COM1 Device FX3U is published and other datapoints are not published.

MQTT Client One , MQTT Client Two data format is the same as King Pigeon cloud MQTT data format. Refer to：King Pigeon MQTT Data Format

Note: Datapoint box is blank in default which means all datapoints will be published in default. If multiple topics are published, only the first topic datapoint box can be blank. Other topic datapoints must be selected.





MQTT Client One Configuration	
Item	**Description**
Enable	Green indicates MQTT Client One is enabled Gray indicates MQTT Client One is not enabled.
Server IP/ Domain Name	Input Server IP/Domain name
Server Port	Input server port(required), default is 1883
Client ID	Client Identifier of MQTT Connecting message. Server uses it to identify Client
User Name	User Name of MQTT Connecting message.

	Server uses it for ID verification and authorization
Password	Password of MQTT Connecting message Server uses it for ID verification and authorization
X.509 (Enable Certificate)	Green indicates certificate is enabled Gray indicates certificate is not enabled
Root Certificate	Select file to upload (Need enable Certificate first)
Client Certificate	Select file to upload (Need enable Certificate first)
Client Private Key	Select file to upload (Need enable Certificate first)
Data Block	Select King Pigeon or ThingsBoard JSON Data format, default is King Pigeon
Subscribe Topic	Topic of MQTT subscribing message. After subscribing server can send message to client for controlling
Publish Topic	Topic of MQTT publishing message. It's used for MQTT to identify message channel of sending valid load data. Wildcard can't be included in publishing message topic name. Click Add to add more public topics. Click Delete to delete Public Topic
Uploading Interval	Cycle time of MQTT data sending. Default is 30s
MQTT Data Re-transmission (Enable data re-transmission)	Green indicates offline data will be transmitted once network recovers; Gray indicates offline data will not be transmitted once network resumes. Max 100,000 datapoints can be re-transmitted. If more than that, the previous ones will be deleted
OK	Confirm MQTT Client One setting
Cancel	Cancel MQTT Client One setting

4.2.9.2 MQTT Client Two

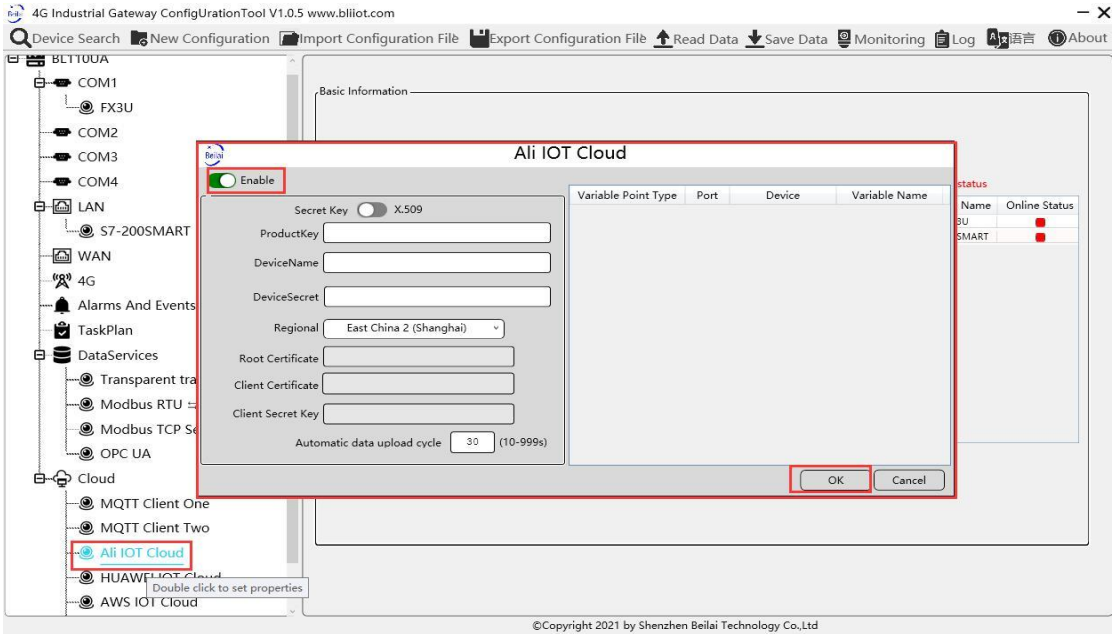
MQTT Client Two Configuration is the same as MQTT Client One

MQTT Client Two subscribe topic will not be working. MQTT Client Two is used for view data but not control data from cloud.

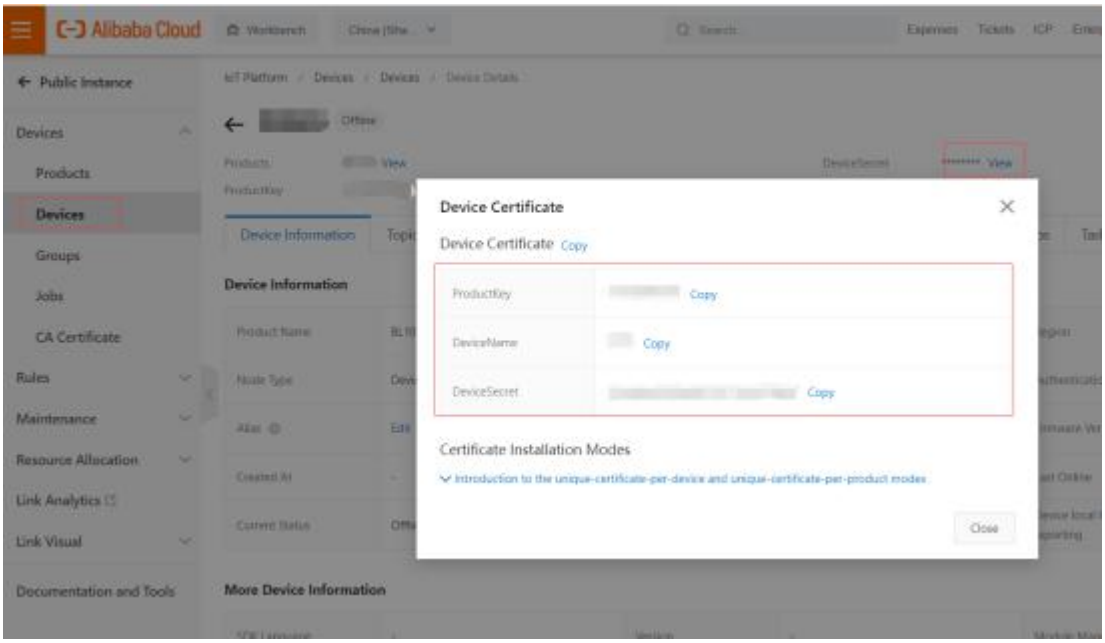
MQTT Client One , MQTT Client Two data format is the same as King Pigeon cloud MQTT data format. Refer to：King Pigeon MQTT Data Format

MQTT Client Two configuration refer to MQTT Client One

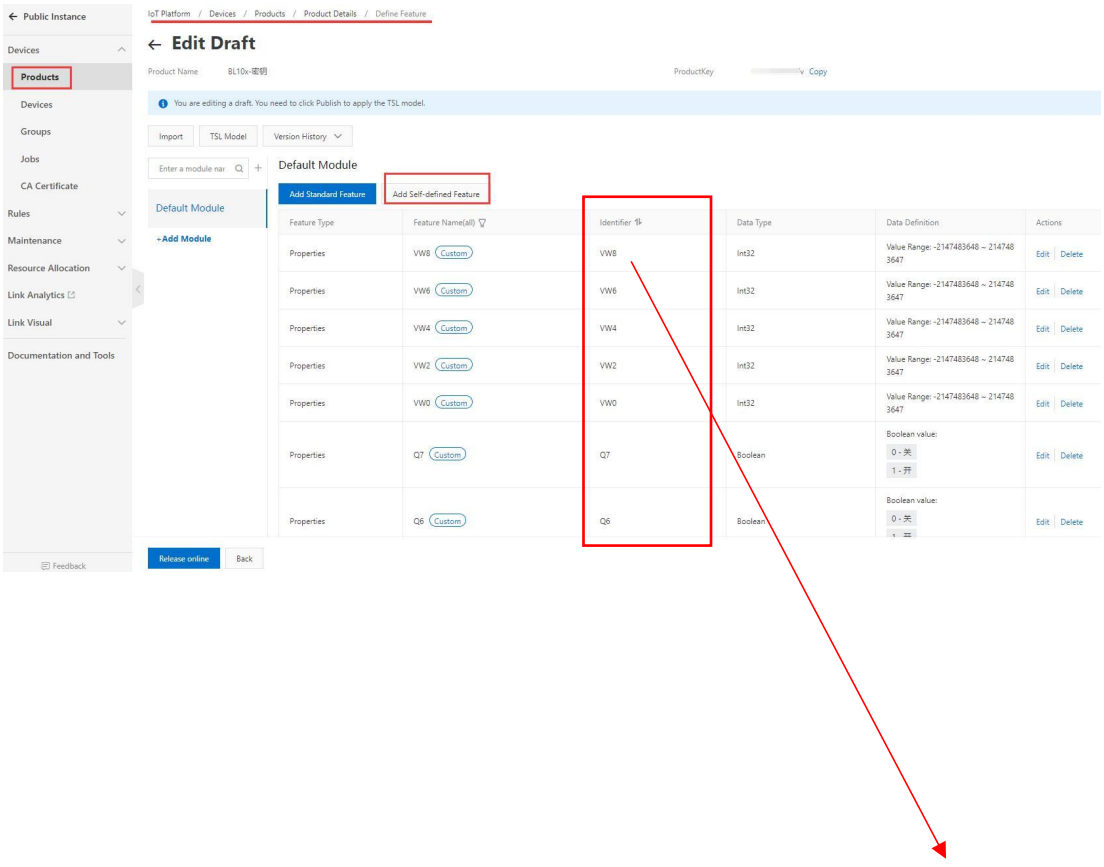
4.2.9.3 Alibaba Cloud

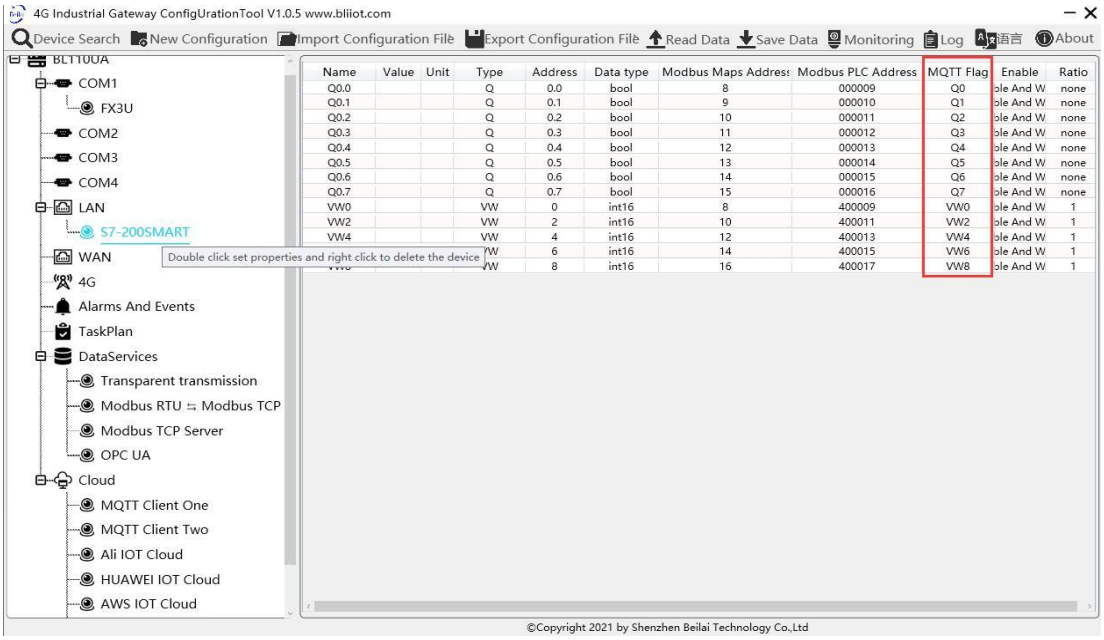


Alibaba Cloud Configuration	
Item	**Description**
Enable	Green indicates Alibaba Cloud is enabled Gray indicates Alibaba Cloud is not enabled. Default is disabled
Secret Key/X.509	Default is connecting with Secret Key. Click it to move the button on the right for connecting with Certificate.
ProductKey	Set the same ProductKey as the one in Ali Cloud. See below illustration (Device-Click DeviceSecret to view it)
DeviceName	Set the same DeviceName as the one in Ali Cloud See below illustration (Device-Click DeviceSecret to view it)
DeviceSecret	Set the same DeviceSecret as the one in Ali Cloud See below illustration (Device-Click DeviceSecret to view it)
Region	Select Alibaba Cloud Region, default is East China 2(Shanghai)
Root Certificate	Select file to upload (Need to select certificate X.509 first)
Client Certificate	Select file to upload (Need to select certificate X.509 first)
Client Secret Key	Select file to upload (Need to select certificate X.509 first)
Automatic Data Upload Cycle	Cycle time of data sending. Default is 30s
Publish Datapoint Selection	Default is blank box with all datapoints to be uploaded Right click the box and click Add to select datapoint for uploading. Click OK to confirm it.
OK	Confirm Alibaba Cloud setting
Cancel	Cancel Alibaba Cloud setting



Alibaba Cloud device model is under development. Thus datapoint must be added one by one. MQTT flag must be the same as the one in configuration software. For example, collect datapoint VW8 of PLCS7-200SMART. MQTT flag in configuration software is VW8. Then set datapoint as VW8 in cloud. Function name can be different from variable name in configuration software.





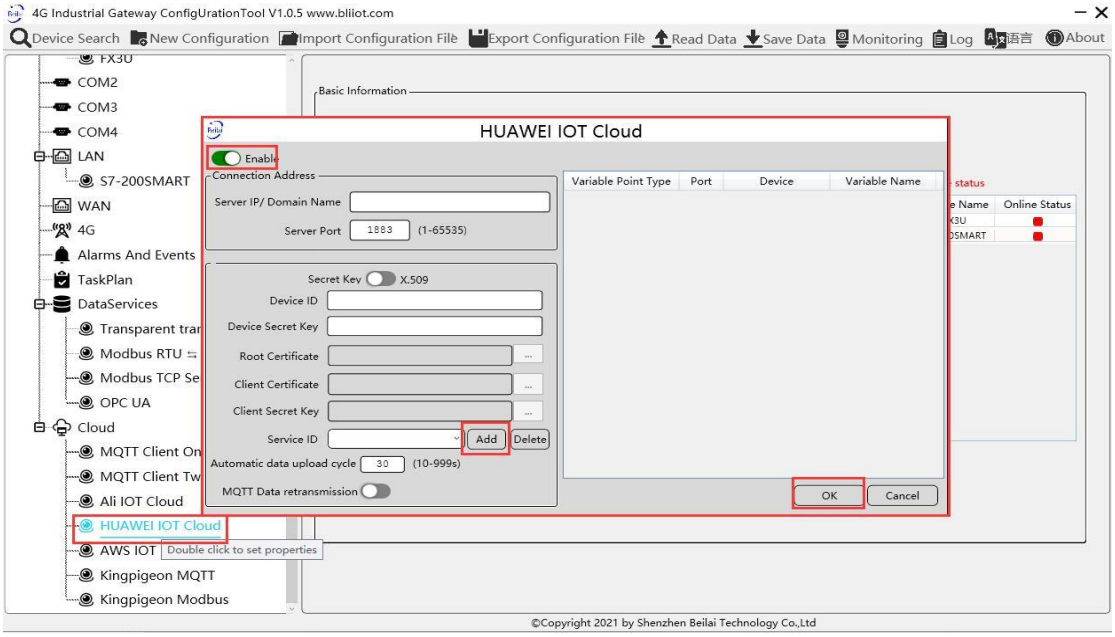
Note: Currently Alibaba cloud device shadow is not supported. Data is written through online debugging. Multiple data sending is not supported.

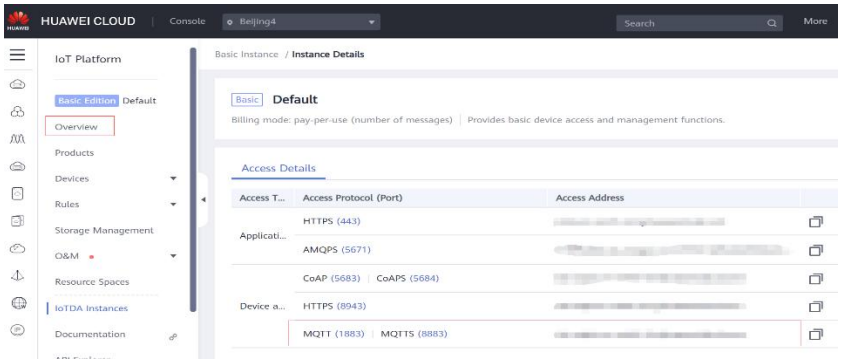
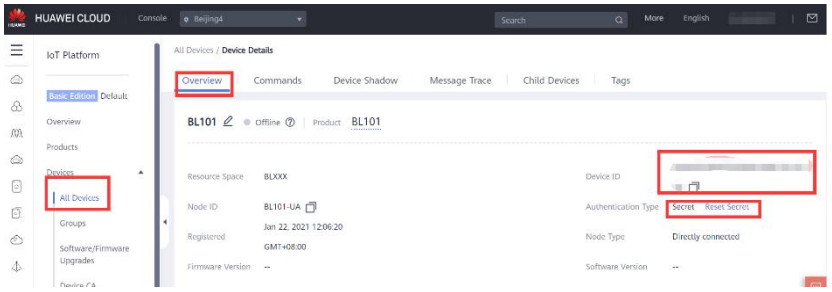
4.2.9.4 HUAWEI Cloud

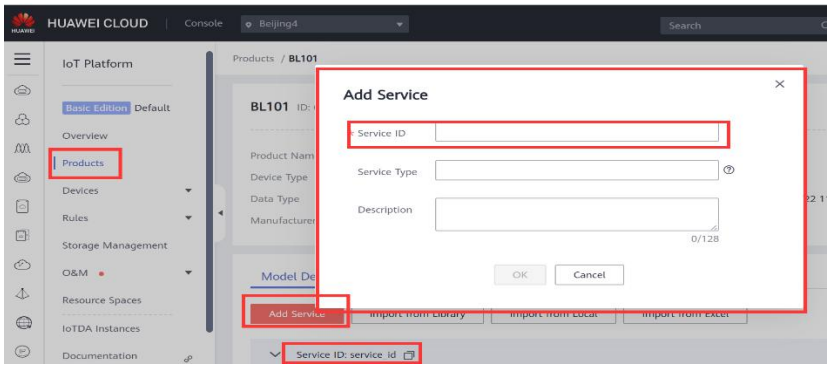
HUAWEI Cloud can be connected with or without Certificate. It supports multiple service IDs. Click Add to set Service ID. ID can be viewed from the drop-down list. Click Delete to delete service ID. HUAWEI Cloud supports uploading certain datapoints of each Service ID. Right click the box and click Add to enter datapoint dialog box. Select the datapoint to upload and click OK to confirm it. Double click the datapoint to view its attributes.

Note: 1. Datapoint box is blank in default which means all datapoints will be uploaded. If there're multiple Service IDs, only one Service ID datapoint box can be blank. Datapoints for uploading must be selected for other Service IDs.

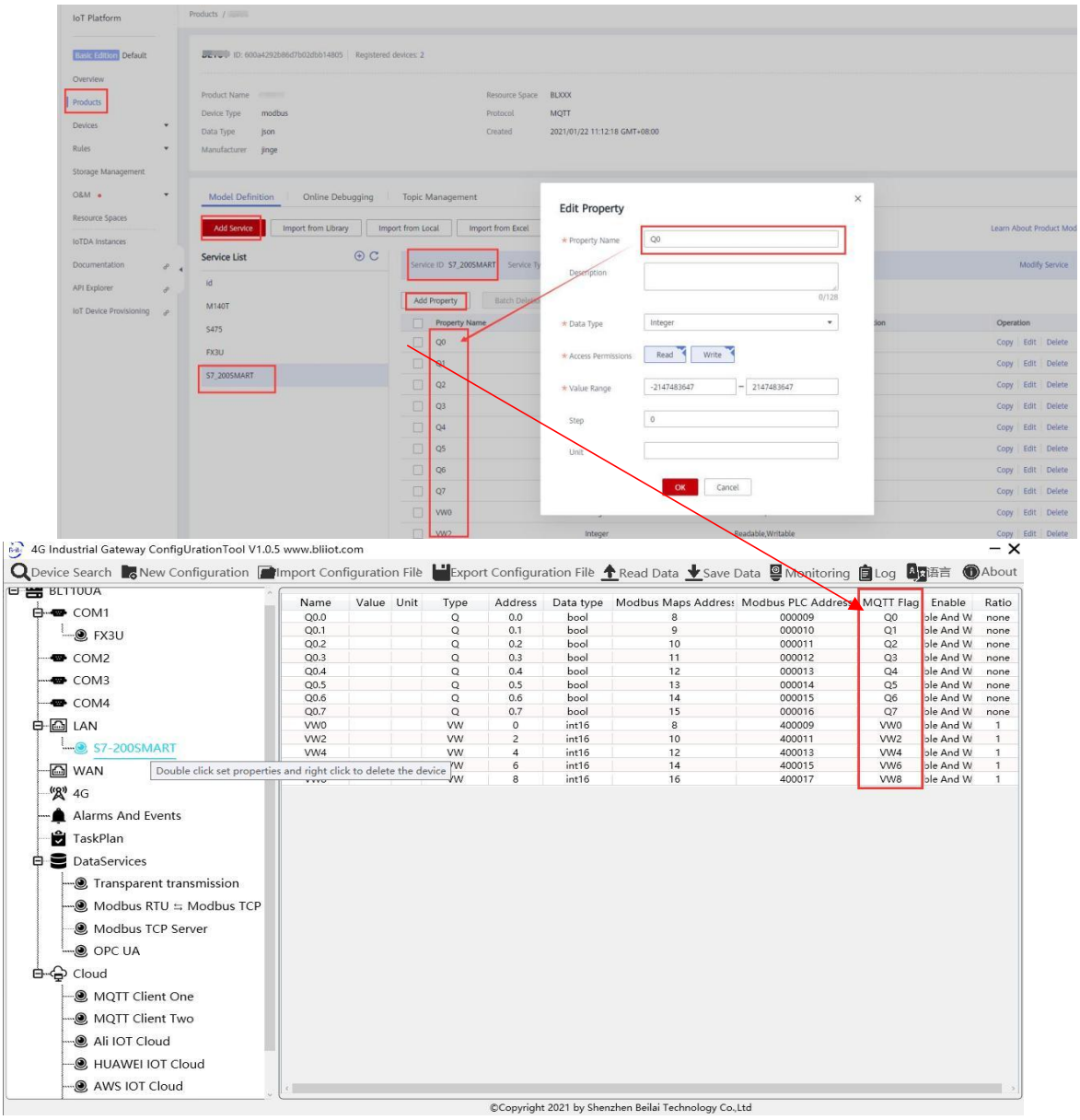
2. HUAWEI Cloud device shadow function is not supported. Data is written through synchronization command.



HUAWEI Cloud Configuration	
Item	**Description**
Enable	Green indicates HUAWEI Cloud is enabled. Gray indicates HUAWEI Cloud is disabled. Default is disabled
Server IP/ Domain Name	Select connecting to HUAWEI Cloud via MQTT to enter console. Click Overview to get server IP address of device connection 
Server Port	Default is 1883, input 1883 for connecting with Secret Key Input 8883 for connecting with Certificate (Required)
Secret Key/X.509	Default is connecting with Secret Key. Click it to move the button on the right for connecting with Certificate
Device ID	Set the same ID as the one in HUAWEI Cloud(Device-Device ID) 
Device Secret	Set the same Device Secret Key as the one in HUAWEI Cloud

Key	when creating device in HUAWEI Cloud. If it's forgot, it can be reset in device authentication. (Not necessary if connecting with certificate is selected)
Root Certificate	Select file to upload (Need to select certificate X.509 first)
Client Certificate	Select file to upload (Need to select certificate X.509 first)
Client Secret Key	Select file to upload (Need to select certificate X.509 first)
Service ID	Set the same Service ID as the one in HUAWEI Cloud. (IOT Platform-Products-Add Service-Service ID)  Multiple Service IDs are supported
Automatic Data Upload Cycle	Cycle time of data uploading. Default is 30s
MQTT Data Re-transmission	Green indicates offline data will be transmitted once network recovers; Gray indicates offline data will not be transmitted once network resumes. Max 100000 datapoints can be re-transmitted. If more than that, the previous ones will be deleted.
Datapoint Uploading Selection	Default is blank box with all datapoints to be uploaded Right click the box and click Add to select datapoint for uploading. Click OK to confirm it.
OK	Confirm HUAWEI Cloud setting
Cancel	Cancel HUWEI Cloud setting

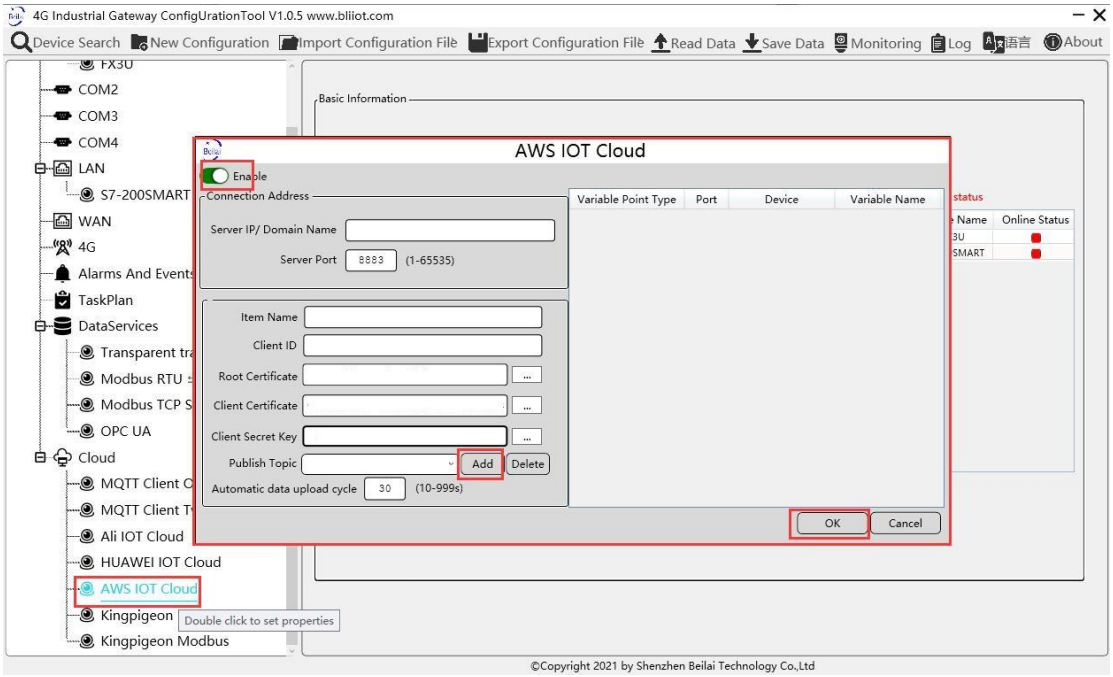
Set datapoint in HUAWEI Cloud as below picture. If there're multiple service IDs in configuration software and each service ID has different datapoints, configure the same service ID in HUAWEI Cloud. Put MQTT flag as attribute name. For example, collect datapoint Q0 of PLC S7-200SMART, put configuration software MQTT flag Q0 as attribute name.

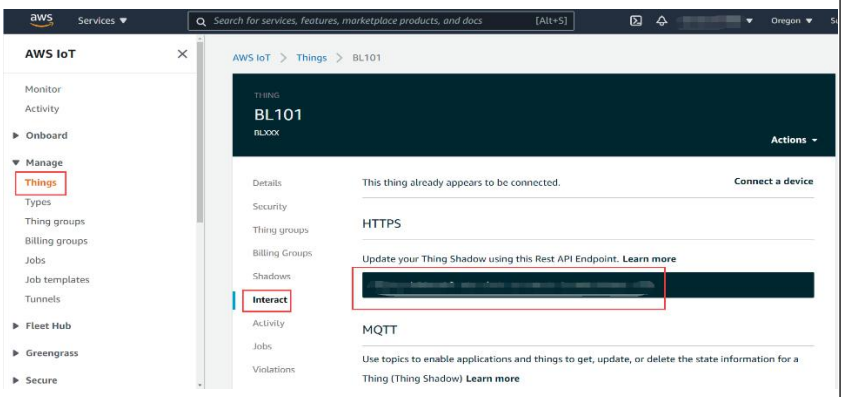


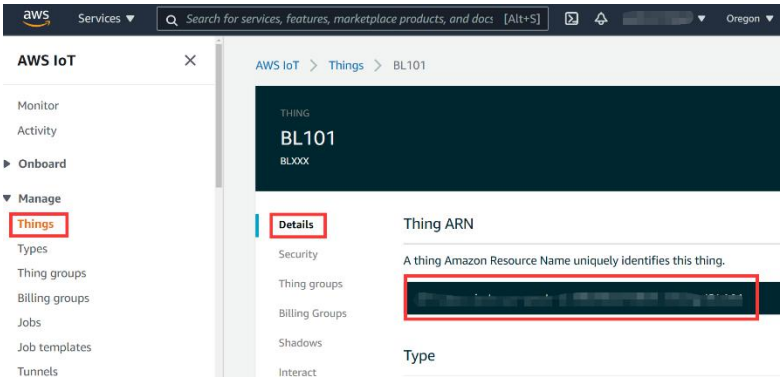
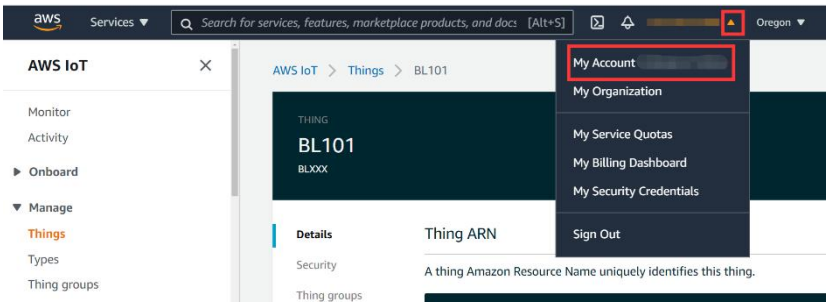
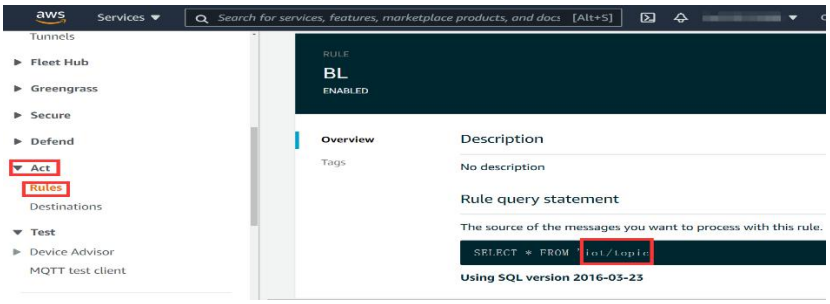
4.2.9.5 AWS (Amazon Web Service)

Note: 1. Datapoint box is blank in default which means all datapoints will be published. If multiple topics are published, only one topic datapoint box can be blank. For other topics, datapoints for publishing must be selected.

2.AWS Cloud data writing function is not supported



AWS Configuration	
Item	**Description**
Enable	Green indicates AWS is enabled. Gray indicates AWS is disabled. Default is disabled
Server IP/ Domain Name	Input AWS Connection Endpoint (Sign up for an AWS account, create a user and grant permissions. Open AWS IoT Console, click Manage, click Things, click created device BL101 and then click Interact to get the endpoint) 
Server Port	8883 (Required)
Item Name	Set Item Name

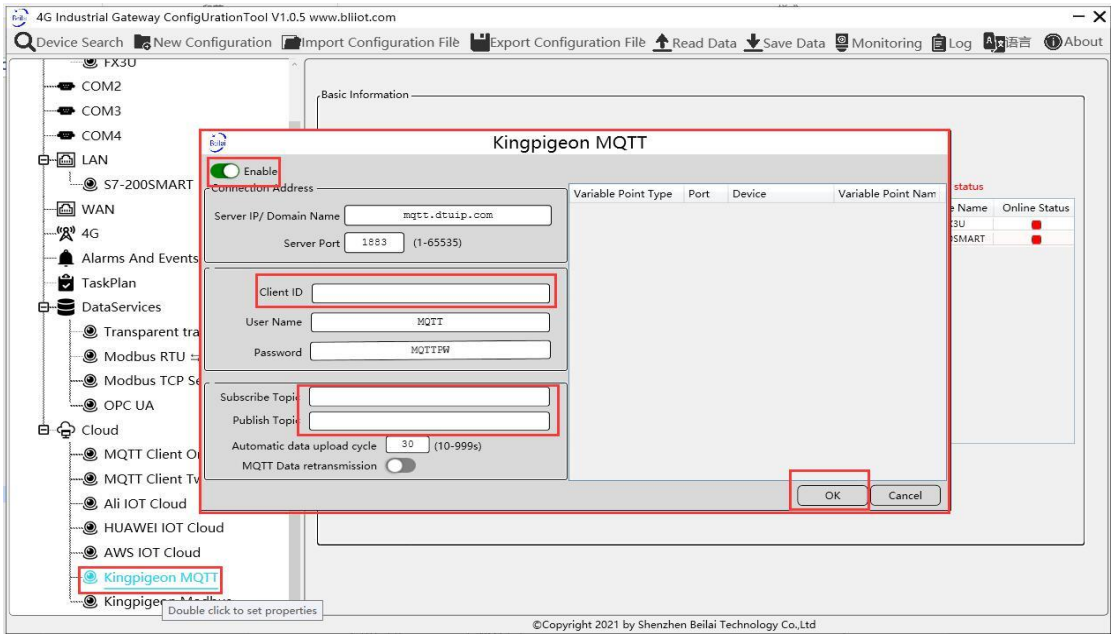
	
Client ID	Input AWS Account ID 
Root Certificate	Download AmazonRootCA1.pem from AWS cloud platform and upload it to device.
Device Certificate	Download device certificate from AWS cloud platform and upload it to device.
Device Private Key	Download device private key from AWS cloud platform and upload it to device.
Publish Topic	Input the same topic when creating rules in AWS cloud. It's the topic used for MQTT publishing message. Click Add to create more Publish Topics. Select Publish Topic and click Delete to delete it. 
Automatic Data Upload Cycle	Cycle time of data uploading. Default is 30s
Datapoint Publishing Selection	Default is blank box with all datapoints to be published Right click the box and click Add to select datapoint for publishing. Click OK to confirm it.。
OK	Confirm AWS setting

Cancel	Cancel AWS setting

4.2.9.6 King Pigeon Cloud via MQTT

King Pigeon MQTT Data Format refer to: King Pigeon MQTT Data Format

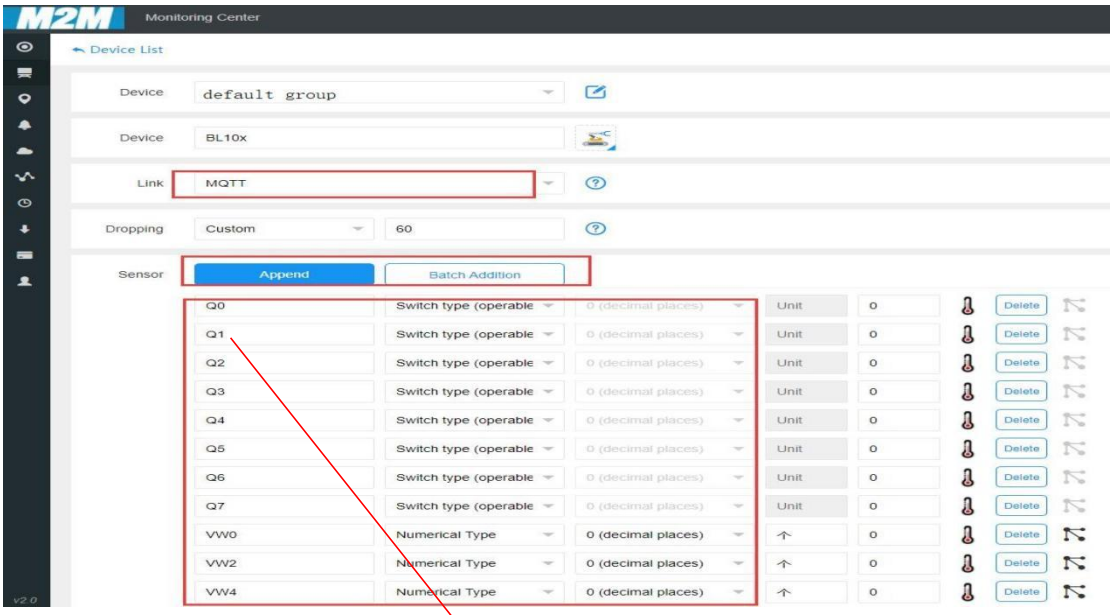
Configure it as below:

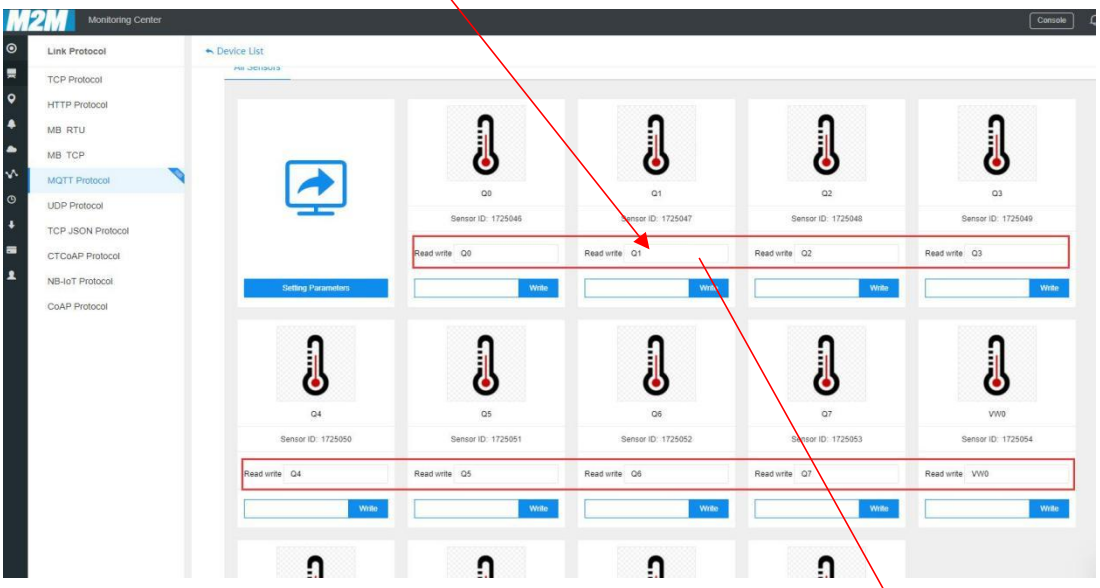


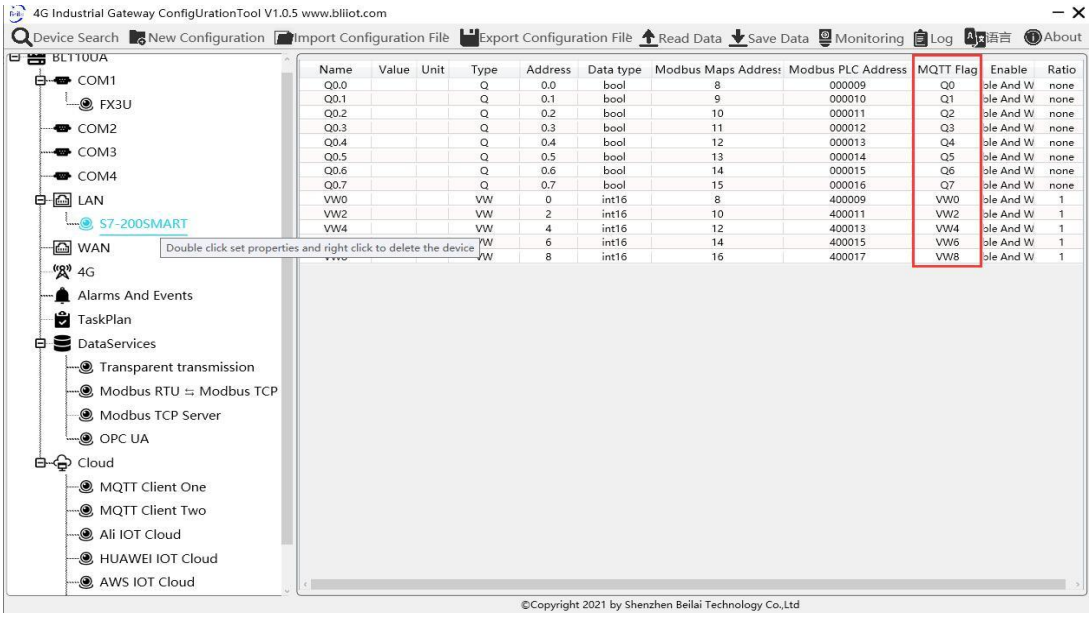
King Pigeon Cloud via MQTT Configuration	
Item	**Description**
Enable	Green indicates King Pigeon cloud via MQTT is enabled Gray indicates King Pigeon cloud via MQTT is disabled
Server IP/Domain Name	mqtt.dtuip.com
Server Port	1883(Required)
Client ID	Input device serial number issued by King Pigeon (Contact King Pigeon sales to get the serial number if required to connect to King Pigeon cloud)
User Name	MQTT
Password	MQTTPW
Subscribe Topic	King Pigeon Device Serial Number/+
Publish Topic	King Pigeon Device Serial Number
Automatic Data Upload Cycle	Cycle time of data uploading. Default is 30s
MQTT Data Retransmission	Green indicates offline data will be transmitted once network recovers; Gray indicates offline data will not be transmitted once network resumes. Max 100, 000 datapoints can be retransmitted. If more than that, the

	previous ones will be deleted
Publishing Datapoint Selection	Default is blank box with all datapoints to be published Right click the box and click Add to select datapoint for publishing. Click OK to confirm it.
OK	Confirm King Pigeon Cloud via MQTT setting
Cancel	Cancel King Pigeon Cloud via MQTT setting

Configure datapoint with below procedure. First add datatpoint and then configure datapoint mark. It must be the same as MQTT flag in configuration software. For example, collect datapoint Q1 of PLC S7-200SMART, in configuration software MQTT flag is Q1, then set Q1 as read-write mark in King Pigeon cloud.

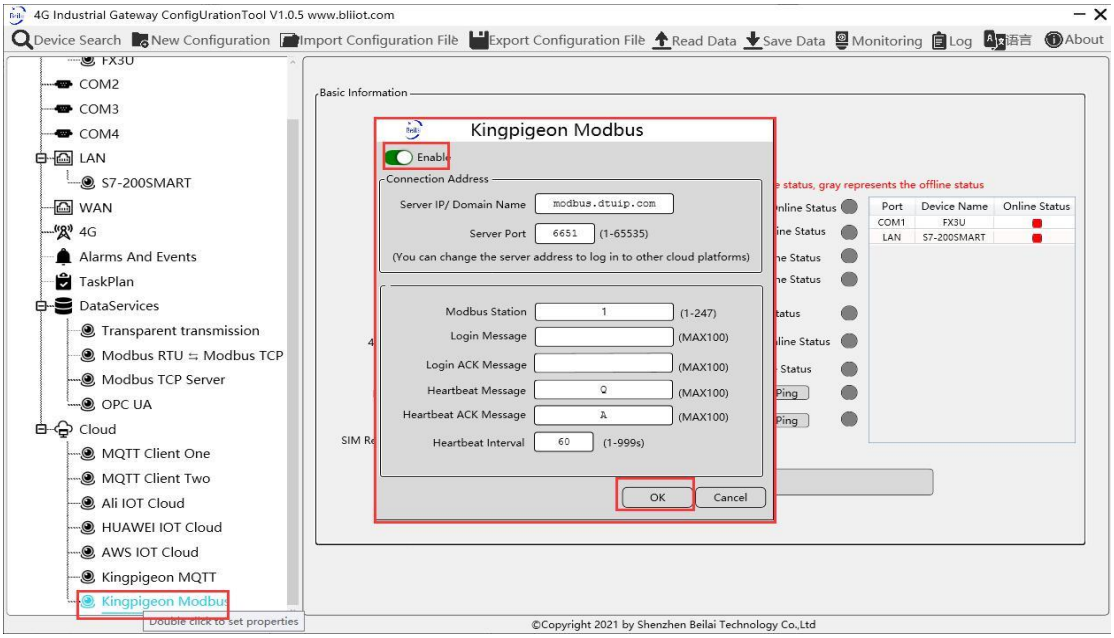






4.2.9.7 King Pigeon Cloud via Modbus

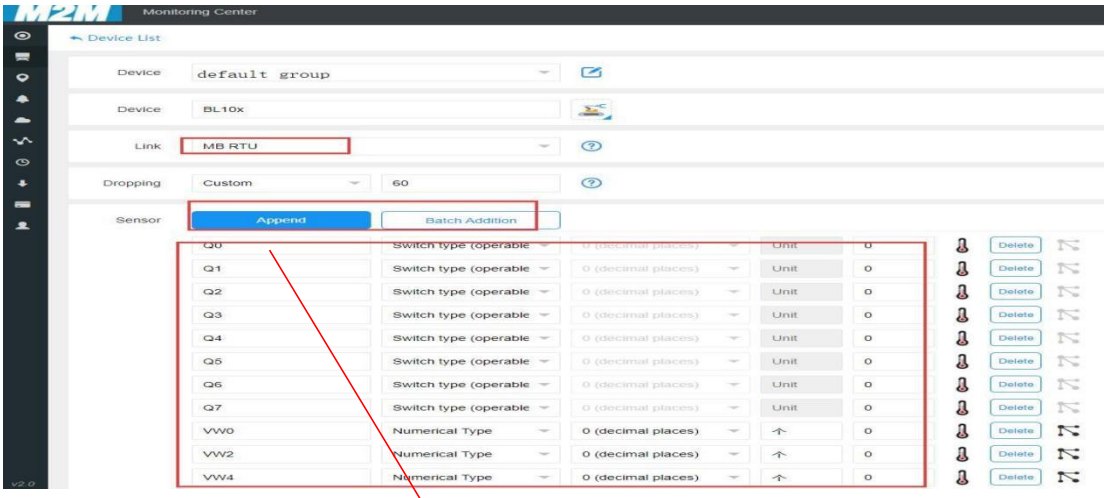
Both King Pigeon Cloud and custom Modbus cloud can be connected via Modbus RTU protocol. BL110 supports function code 01, 05 of Boolean data and function codes 03, 06 of numerical data. 16-bit byte sequence is AB and 32-bit byte sequence is ABCD.

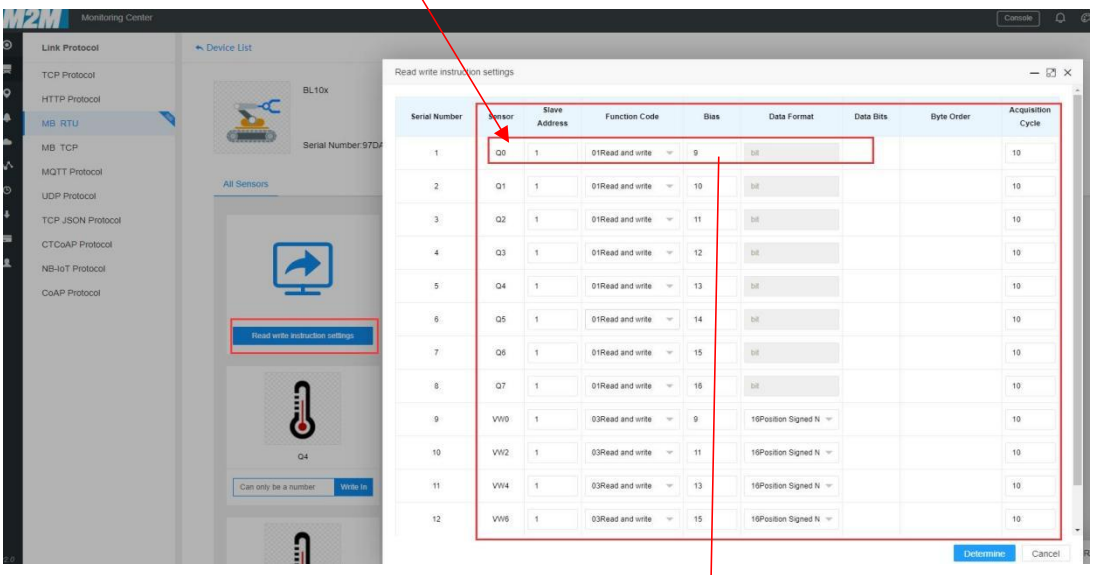


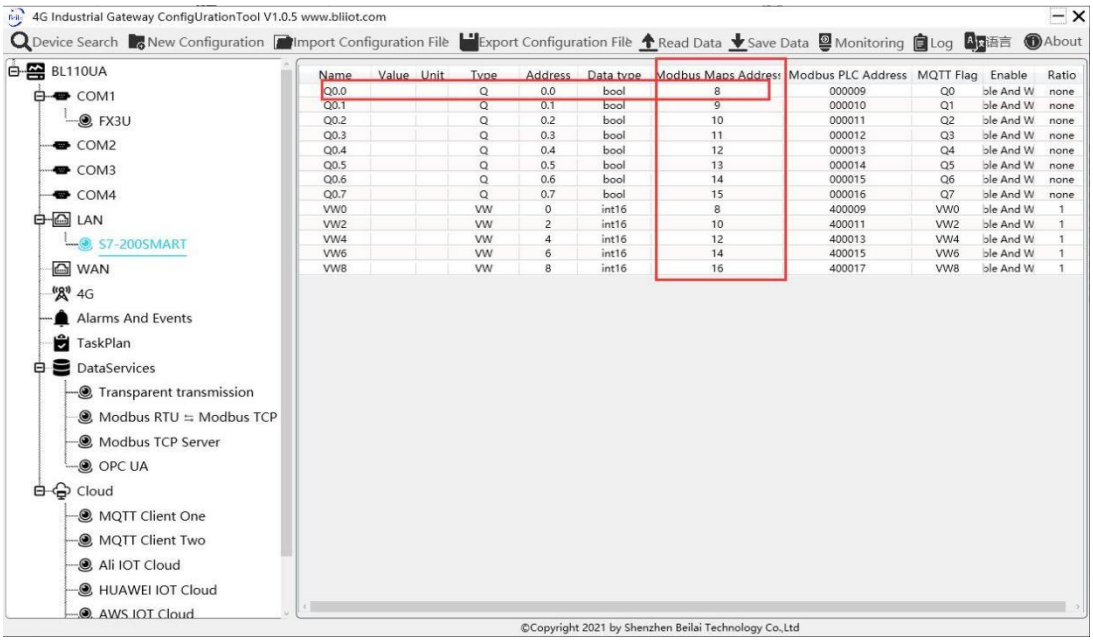
King Pigeon Cloud via Modbus	
Item	**Description**
Enable	Green indicates King Pigeon Cloud via Modbus is enabled Gray indicates King Pigeon Cloud via Modbus is disabled
Server IP/Domain Name	modbus.dtuip.com
Server Port	6651 (Required)
Modbus Station/ID	Set Modbus communication address of this Gateway device

Login Message	Input device serial number issued by King Pigeon (Contact King Pigeon sales to get the serial number)
Login ACK Message	Server acknowledges login messages (Not necessary for King Pigeon Cloud)
Heartbeat Message	Q (Heartbeat message to keep connection)
Heartbeat ACK Message	A (Server acknowledges heartbeat messages)
Heartbeat Interval	Cycle time of sending Heartbeat messages, default is 60s
OK	Confirm King Pigeon Cloud via Modbus setting
Cancel	Cancel King Pigeon Cloud via Modbus setting

Configure datapoint in King Pigeon Cloud as below picture. First create datapoint, then configure Modbus ID, function code, address, data format, byte sequence and data collection cycle. Modbus address in King Pigeon cloud and configuration software is deviated by 1. For example, datapoint Q0 of PLC S7-200SMART in configuration software is 8, then put 9 in cloud. Sensor names in cloud can be different from those in configuration software





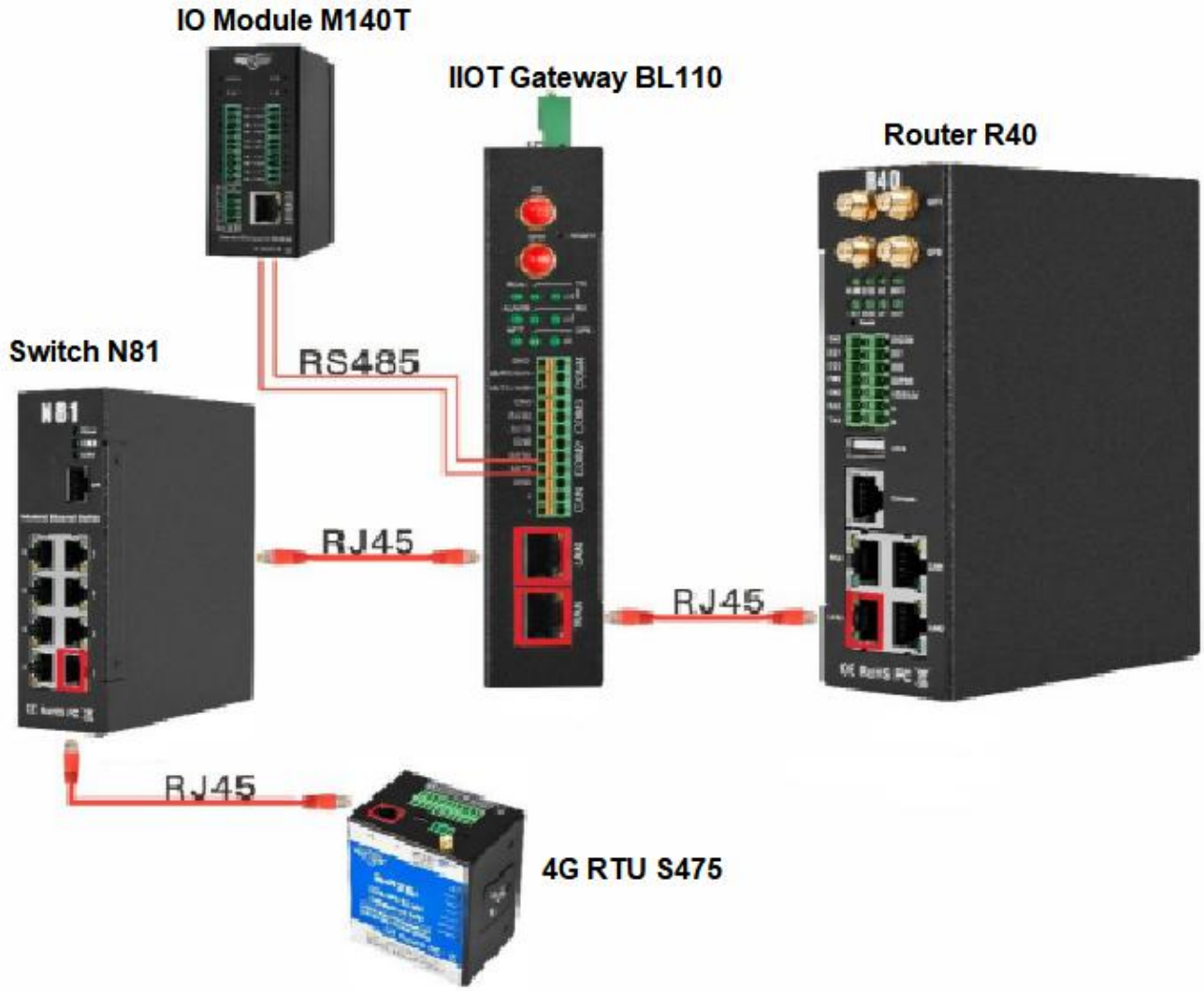


5 BL110 Gateway Application Example

5.1 Add Modbus Device

Connect IO Module M140 to BL110 COM2 port and connect 4G RTU S475 to BL110 LAN port. M140T DI DO data is collected from COM2 via Modbus RTU protocol. S475 device data is collected from LAN port via Modbus TCP protocol. Connect BL110 WAN port to industrial router R40 LAN port. Router R40 provides network to BL110 Gateway.

5.1.1 Connect M140T & S475 to BL110



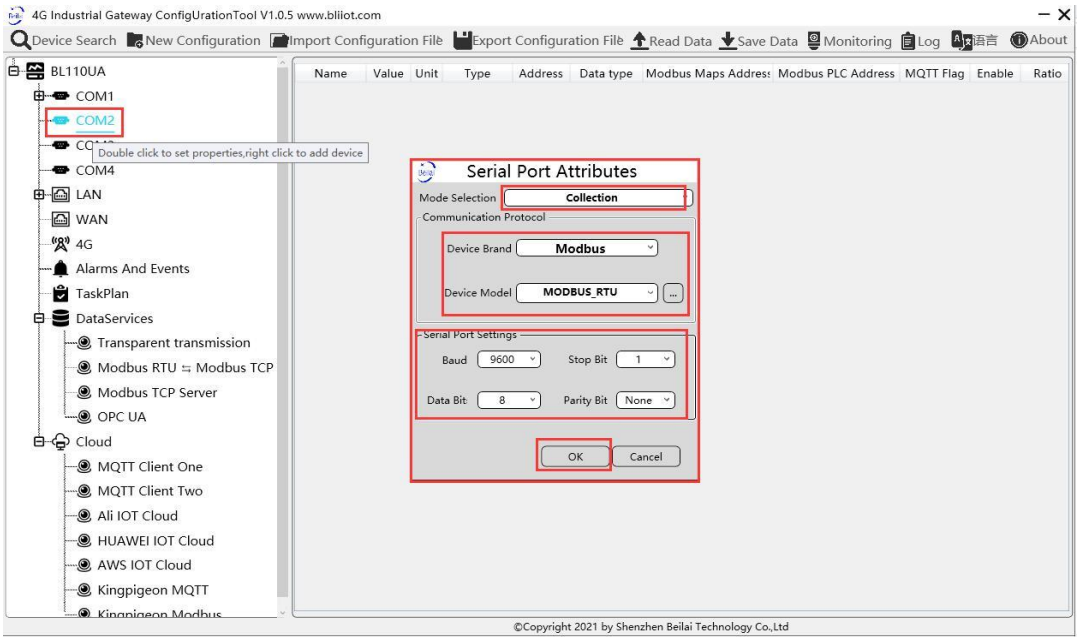
Network Switch N81 is connected to BL110 LAN port. S475 is connected to Switch N81. S475 device data is collected through LAN via Modbus TCP. M14T data is collected through COM2 via Modbus RTU protocol. Collected data will be sent to various clouds via 4G router R40 with its routing function. Note: Both WAN and LAN can collect device data. The configuration procedure is the same. This example is introduction to LAN port configuration.

5.1.2 COM Port Configuration

All 4 COM ports configuration procedure are the same. COM1 is RS232. COM2, COM3 and COM4 are RS485. Below example is connecting IO Module M140T to COM2 via RS485

5.1.2.1 COM2 Configuration

COM2 collect M140T data via Modbus RTU. Below is the configuration.



(1) Double click “COM2” to enter configuration window

(2) Mode Selection: Collection

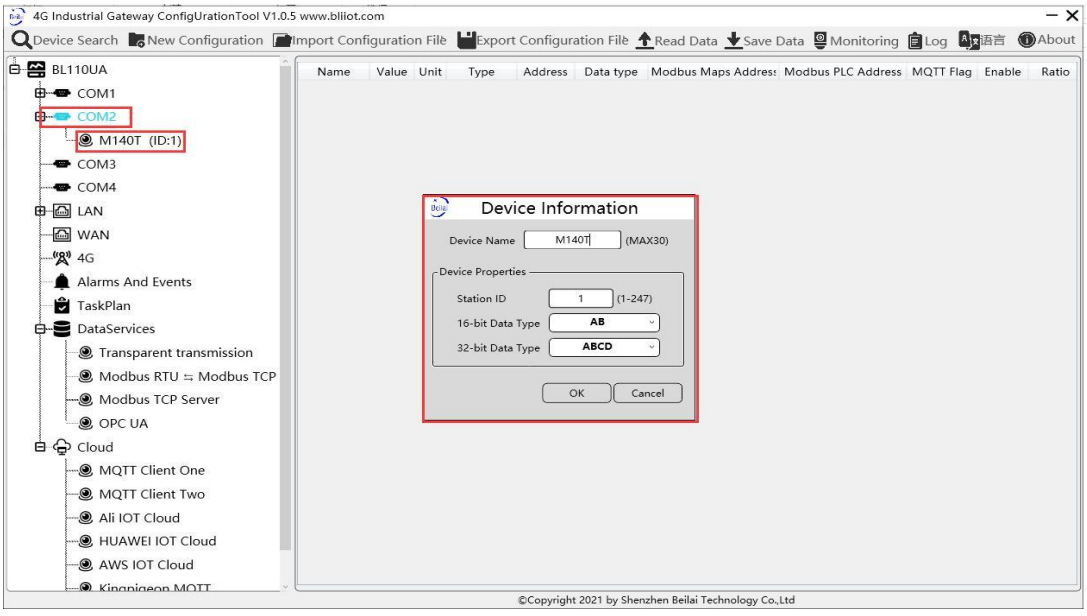
(3) Device Brand: Modbus; Device Model: Modbus RTU

(4) Baud rate, Stop bit, Data Bit and Parity Bit will be set the same as that in M140T RS485 port

(5) Click OK to confirm

Note: Click Save Data. Gateway will restart automatically. COM configuration will be valid after device restarting

5.1.2.2 Add COM Port Device M140T



(1) Click COM2, right click the mouse and click Add to enter configuration box

(2) Set device name, for example, set M140T as device name

(3) Input device modbus adress, for example, if M140T Modbus ID is 1, put 1

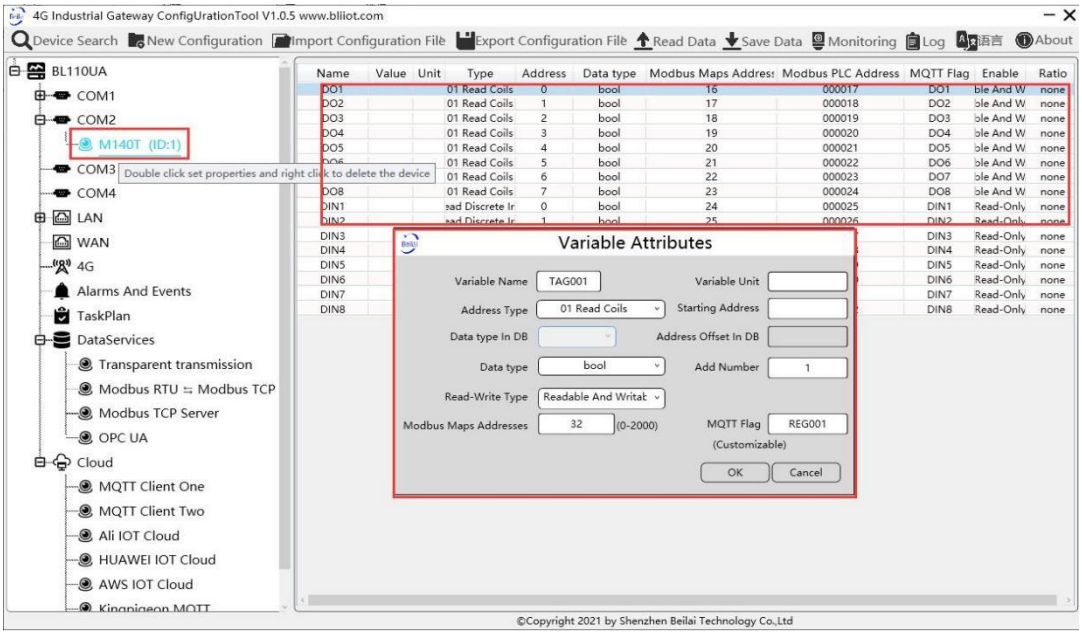
(4) Select Type of data to be collected.

(5) Click OK to confirm adding M140T

(6) Click COM1 to view the added device M140T. If more devices to be added, perform the same procedures as above Step (1)-(5)

Note: Click Save Data. Gateway BL110 will restart automatically. After restarting, M140T is added successfully.

5.1.2.3 Add COM Port Device M140T Datapoint



(1) Click M140T, move mouse cursor to the right box, right click mouse to enter datapoint configuration window

(2) Set datapoint name, for example, DO1

(3) Address Type: Select the address type to be supported by the function code of datapoint, for example, select 01 reading holding coil for M140T DO as it supports function code 01; select 02 read input coil for M140T DI as it supports function code 02

(4) Data Type: Select datapoint data type. For example, select bool for M140T DI & DO as both are coil type.

(5) Read-write Type：Automatic identifying read-write type according to Address Type

(6) Variable Unit: Input any required unit

(7) Starting Address: Input datapint register address, for example, DO1 register address in M140T is 0, input 0

(8) Adding Qty: if consecutive addresses are collected, the same function code can multiply be collected

(9) Modbus Mapping Address: Input the address where the collected datapoint is saved in BL110. It

can be any address from 0-2000 but can't be repeated. For example, DO1 data is saved in register address 0 of BL110

(10) MQTT Flag: can be any identification mark, but can't be repeated

(11) Click OK to confirm

Note: After clicking OK to confirm the configuration, datapoints will appear in the box lik above picture. If more datapoints to be added, right click the box and click Add to enter datapoint configuration box, repeat Step (2)-(11)

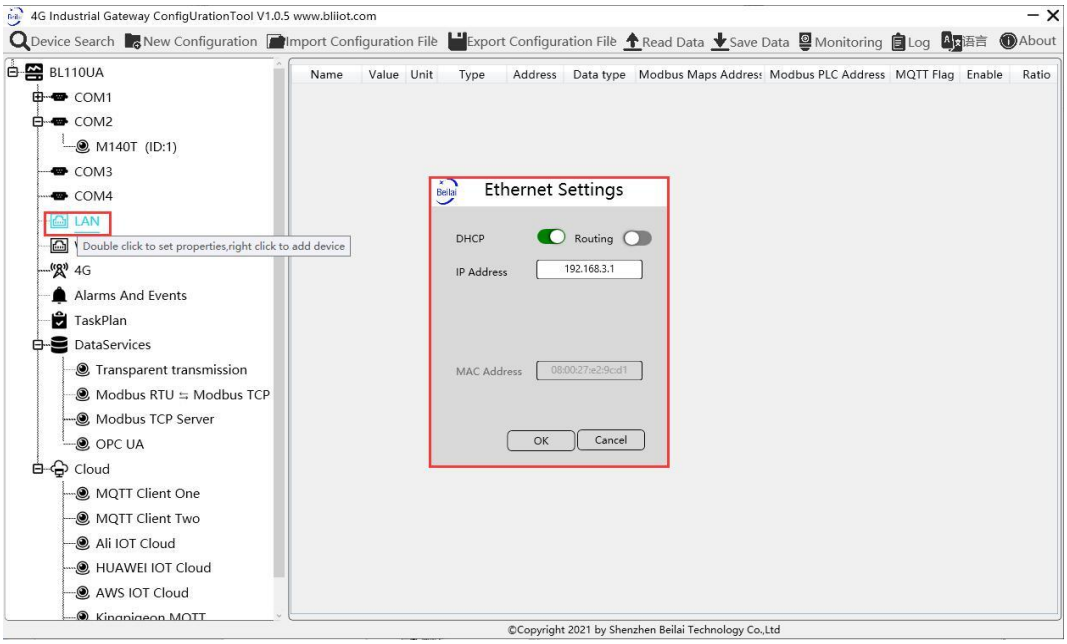
Note: Click Save Data. Gateway will restart automatically. After restarting, M140T datapoints are added successfully

5.1.3 Ethernet Port Configuration

Both WAN and LAN can collect device data. The configuration procedure is the same.

5.1.3.1 LAN Port Configuration

Below is the example of configuring LAN port to connect S475.



(1) Double click LAN to enter configuration box

(2) DHCP: enable auto IP distribution. Default is disabled. For examples, S475 has been set to auto retrieving IP, then LAN port must enable DHCP.

(3) Routing: Enable network rounting function. Default is disabled. For example, S475 data will be collected without network requirement, then disable routing function

(4) IP Address: defaut is 192.168.3.1, the IP addresses assigned to LAN port devices must be within the range. It can be changed according to requirement. For example, S475 is set to auto retrieving IP and the range is not limited,thus it's not necessary to change it.

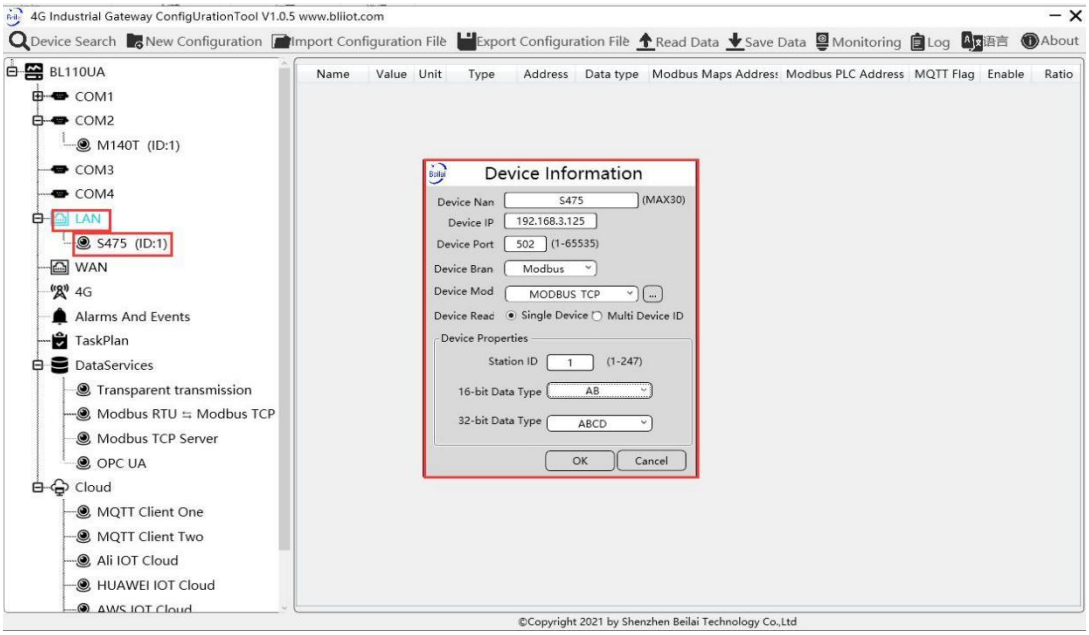
(5) MAC Addres: Input LAN port MAC address

(6) Click OK to confirm it

Note: Click Save Data and Gateway will restart. Turn off the power of Gateway and restart it. After that LAN port configuration is done successfully

Note: LAN Port IP Address specifies the IP address arrange of LAN port device. If device IP address is not within the range, data can't be collected. Thus it's necessary to change LAN port IP address according to requirement. IP Address change will not be effective until gateway is powered off and powered on again

5.1.3.2 Add LAN Port Device S475



(1) Click LAN and right click mouse to enter device configuration box

(2) Device Name: input the name of device to be added, S475

(3) Device IP: input S475 IP address. For example, S475 is set to auto retrieving IP. Open S475 configuration software and view its IP(192.168.3.125). Thus input S475 IP 192.168.3.125.

Note: if LAN port IP is changed and LAN port device auto retrieves IP, please click Save Data, power off gateway and power it on again. Then IP change can be viewed

(4) Device Port: input LAN port device port. For example, S475 Modbus TCP port is 502. Thus put 502

(5) Device Brand: Modbus; Device Model: Modbus TCP
(BL110 collects S475 through LAN port through Modbus TCP protocol)

(6) Station ID: 1, (S475 Modbus ID is 1)

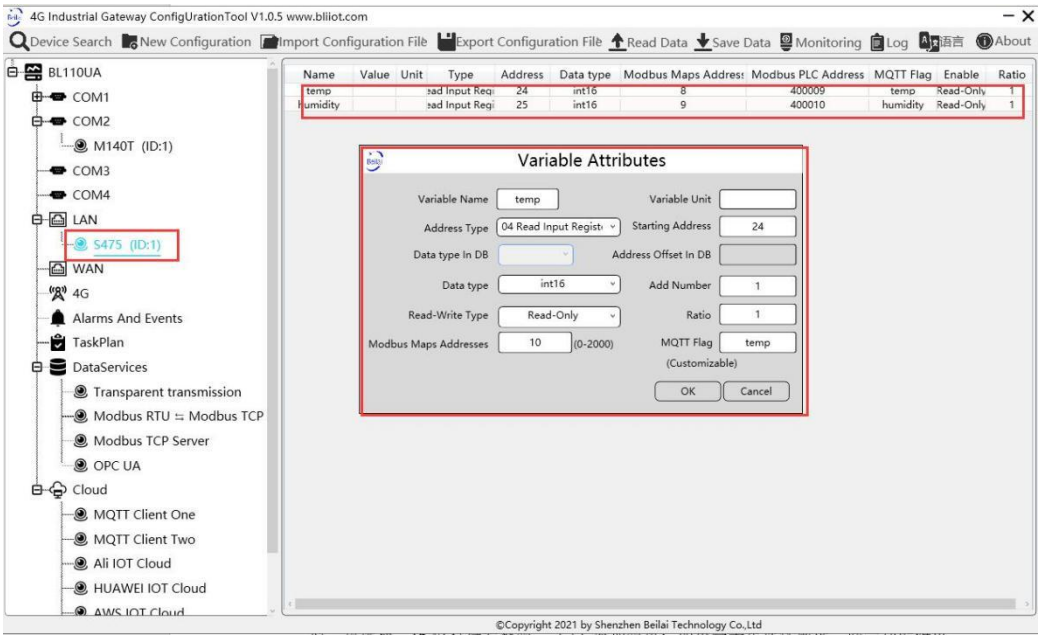
(7) Select Data Type. For example, S475 power source and temperature & humidity data is 16-bit AB type, 32-bit data is not collected. Thus select 16-bit AB type and keep 32-bit data type with default setting

(8) Click OK to confirm the setting

Note: S475 device icon will appear after confirming the configuration. If more devices to be added, perform the same procedure as Step (1)-(8)

Note: Click Save Data and gateway will restart automatically. After restarting, device S475 is added successfully

5.1.3.3 Add LAN Port Device S475 Datapoint



(1) Click S475, move mouse cursor to the right box, right click the mouse and click Add to enter datapoint configuration box

(2) Variable Name: Set the name of datapoint, for example, temp

(3) Variable Unit: set any unit according to actual requirement, can be blank

(4) Address Type: S475 temperature supports function code 04, thus select 04 read input register

(5) Starting Address: 24 (Datapoint temperature register address in S475 is 24)

(6) Data Type: S475 temperature is 16-bit signed numeric data, thus select int16

(7) Adding Qty: If consecutive addresses to be collected, the same function code can collect it simultaneously.

(8) Read-Write Type: Automatic Identifying it according to Address Type

(9) Ratio: set the ratio to be multiplied or minified for uploading to cloud

(10) Modbus Mapping Address: For example, S475 temperature data is saved in register address 8 of BL110).

Modbus mapping address can be any from 0 to 2000 and it can't be repeated

(11) MQTT Flag: temp. It can be any identification mark and can't be repeated. For example, temperature datapoint MQTT flag is temp

(12) Click OK to confirm.

Note: After confirming the configuration, datapoints will appear in the box like above picture. To add

more datapoints, right click the box and click Add to enter configuration box. Perform the same procedure as Step (2)-(12)

Note: Click Save Data. Gateway will restart automatically. After device restarting, S475 datapoint is added successfully.

5.1.4 Uploading Data to Various Clouds

BL110 collects data of different protocols. The configuration procedures of uploading data to various clouds are the same. Here only introduce configuration of collecting PLC data and send it to various clouds. Refer to 5.4 Configuration of Uploading Data to Various Clouds

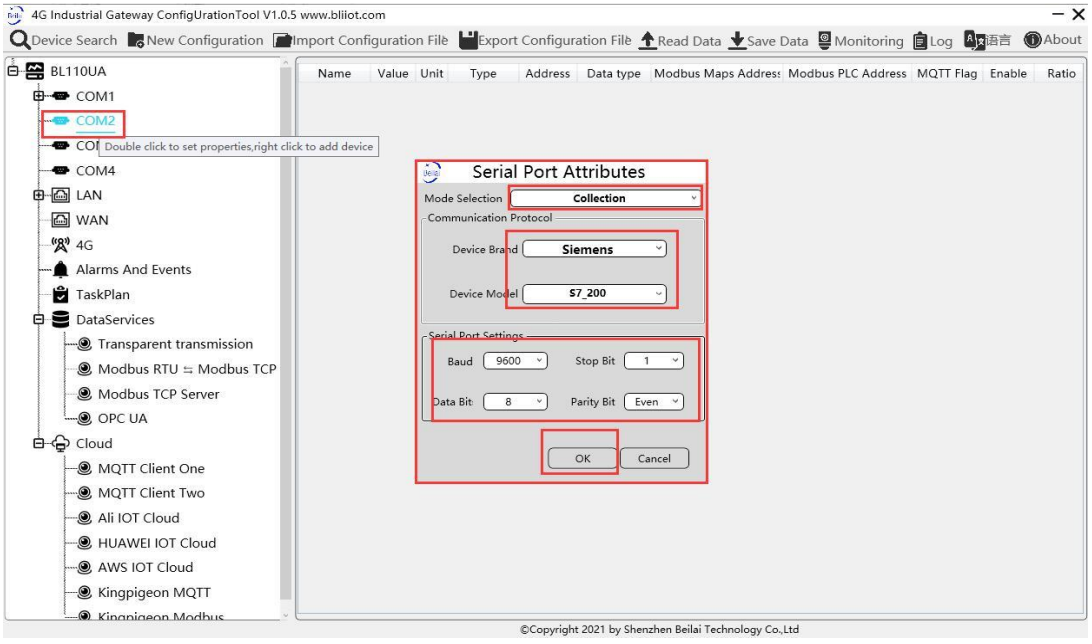
5.2 Collecting PLC Data

5.2.1 Configuring Collecting Siemens PLC Data

5.2.1.1 Add Siemens PLC to COM Port

S7-200 COM is RS485. Below is example of adding Siemens PLC S7-200 to COM2. Connect S7-200 RS485 to DB9 signal pin 3 & 8. PIN 3 connects to COM2 RS485 A and PIN 8 connects to COM2 RS485 B

5.2.1.1.1 COM Port Configuration



(1) Double click COM2 to enter COM attribute configuration box.

(2) Select data collection Mode

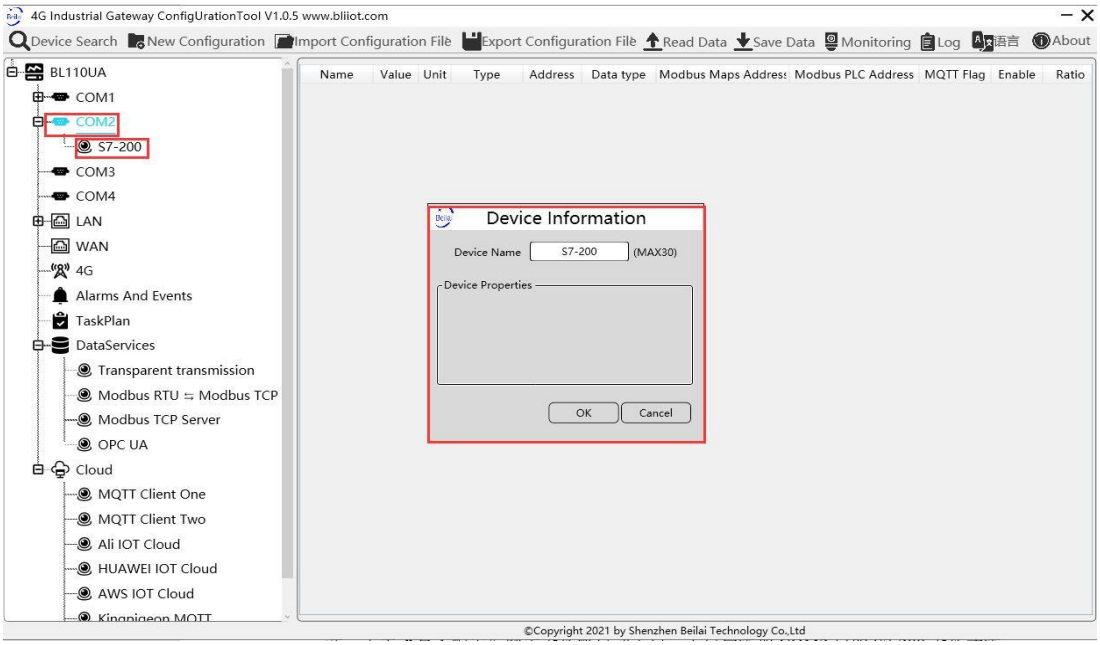
(3) Select Siemens as Device Brand and select S7-200 as Device Model

(4) Follow Siemens RS485 port parameters to set the same baud rate 9600, stop bit 1, data bit 8 and parity bit Even

(5) Click OK to confirm it.

Note: Click Save Data. COM port configuration will be effective after gateway restart automatically.

5.2.1.1.2 Add COM Port Device S7-200



(1) Click COM2, right click it and click Add to enter device configuration box

(2) Set Device Name at random like S7-200

(3) Attributes will be set according to the actual device information. If no configuration, keep it blank

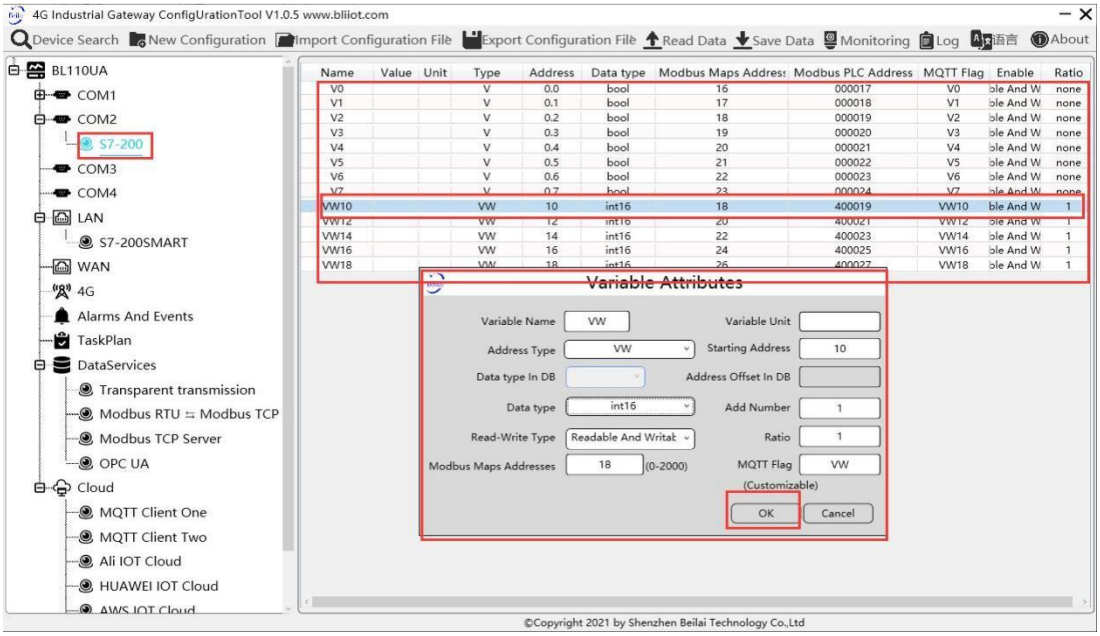
(4) Click OK to confirm adding S7-200

Note: After confirming configuration, S7-200 device icon will appear below COM2. To add more devices, follow the same steps (1)-(4)

Note: Click Save Data. Gateway will restart automatically and adding PLC S7-200 is effective

5.2.1.1.3 Add COM Port Device S7-200 Datapoint

Below is part of S7-200 register V & VW data configuration



(1)Click S7-200, move mouse cursor to the right box, right click the mouse and click Add to enter datapoint configuration box

(2)Variable Name: Set the name of datapoint to be collected, for example, VW10

(3)Variable Unit: set any unit according to actual requirement

(4)Address Type: select address type according to PLC register. Here VW10 address type is VW

(5)Starting Address: Register address of datapoint. Here VW0 address is 10

(6)Data Type: select data type according to PLC register type

(7)Adding Qty: If addresses are consecutive, the same register will collect multiple addresses.

(8)Read-Write Type: select from Read only and Read & Write.

(9)Ratio: set the ratio to be multiplied or minified for uploading to cloud

(10)Modbus Mapping Address: Set address where datapoint will be saved in BL110.

Modbus mapping address can be any from 0 to 2000 and it can't be repeated

For example, set 18 as VW10 mapping address

(11)MQTT Flag: It can be any identification mark and can't be repeated. For example: VW10

(12)Click OK to confirm.

Note: After confirming the configuration, datapoints will appear in the box like above picture. To add more datapoints, right click the box and click Add to enter configuration box. Perform the same procedure as Step (2)-(12)

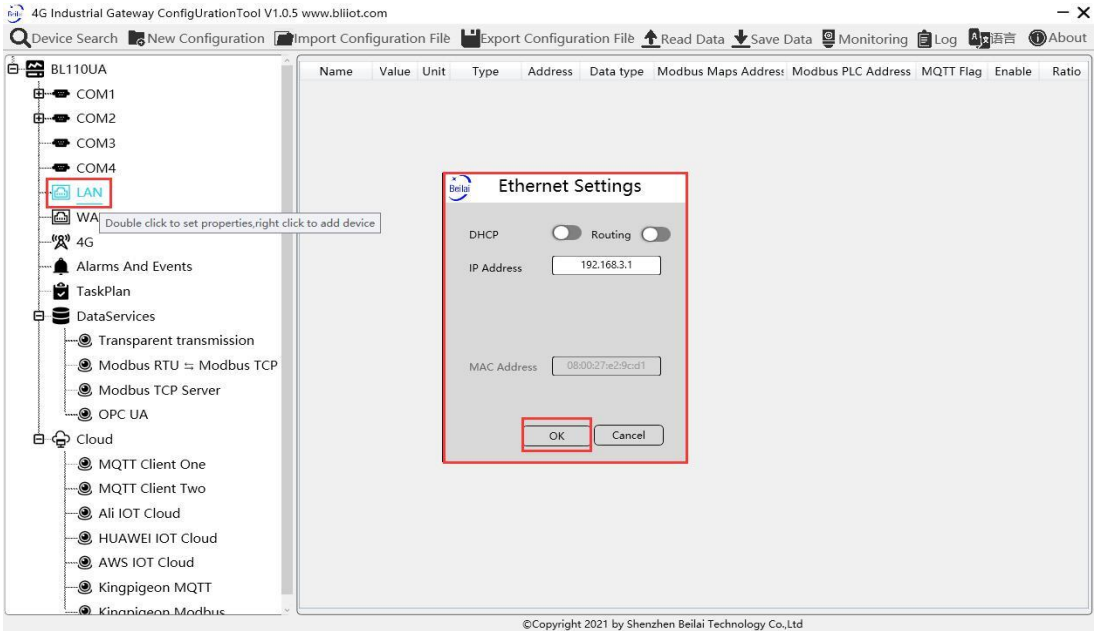
Note: Click Save Data. Gateway will restart automatically and S7-200 datapoint is added successfully.

5.2.1.2 Adding Siemens PLC via Ethernet Port

Siemens PLC data can be collected through WAN, LAN and cascaded switch.

5.2.1.2.1 LAN Port Configuration

Below is example of connecting Siemens PLC S7-200SMART to BL110 LAN port. LAN port configuration is as below:



(1) Double click LAN to enter configuration box

(2) DHCP: enable auto IP distribution. Default is disabled.

(3) Routing: Enable network routing function. Default is disabled. For example, PLC S7-200SMART does not need network. Thus it's necessary to enable it.

(4) IP Address: defaut is 192.168.3.1, the IP addresses assigned to LAN port devices must be within the range. WAN and LAN IP address can't be the same. For example, S7-200SMART IP is fixed, then change IP address of gateway.

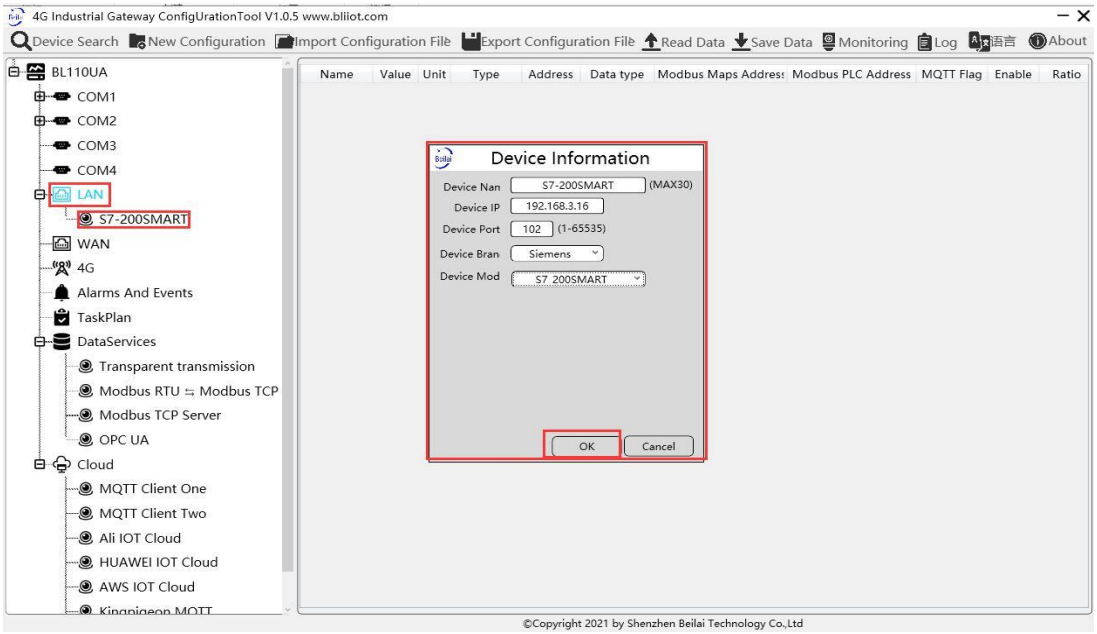
(5) MAC Addres: Input LAN port MAC address

(6) Click OK to confirm it

Note: Click Save Data and Gateway will restart. Turn off the power of Gateway and restart it. After that LAN port configuration is done successfully

Note: LAN Port IP Address specifies the IP address arrange of LAN port device. If device IP address is not within the range, data can't be collected. Thus it's necessary to change LAN port IP address according to requirement. IP Address change will not be effective until gateway is power off and powered on again

5.2.1.2.2 Add LAN Port Siemens PLC S7-200SMART



(1) Click LAN and right click mouse and click Add to enter device configuration box

(2) Device Name: set device name, for example, set S7-200SMART as device name.

(3) Device IP: input PLC IP address. For example, PLC S7-200SMART IP is 192.168.3.16, thus put 192.168.3.16 here. This is PLC IP address. PLC IP address and LAN Port IP address must be in the same range.

(4) Device Port: input LAN port device port. Default port of S7-200SMART is 102. Thus put 102.

(5) Device Brand: Select Siemens as Device Brand and select S7-200SMART as device model

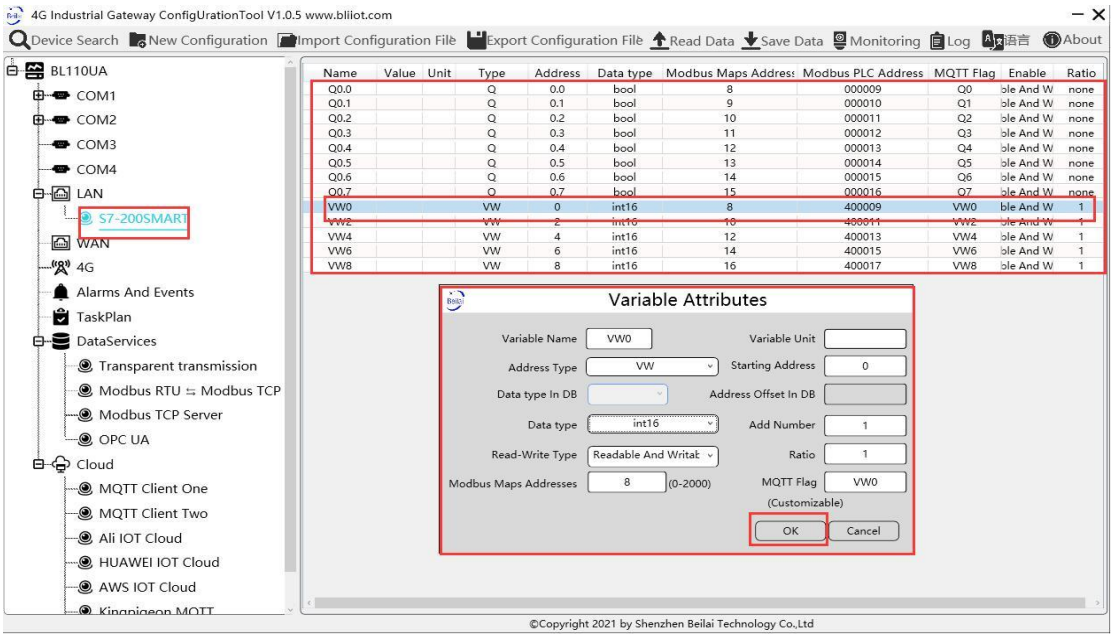
(6) Click OK to confirm adding PLC S7-200SMART

Note: S7-200SMART device icon will appear after confirming the configuration. If more devices to be added, perform the same procedure as Step (1)-(6)

Note: Click Save Data and gateway will restart automatically. After restarting, PLC S7-200SMART is added successfully

5.2.1.2.3 Add LAN Port PLC S7-200SMART Datapoint

Below is part of S7-200SMART register Q & VW data configuration



(1) Click S7-200SMART, move mouse cursor to the right box, right click the mouse and click Add to enter datapoint configuration box

(2) Variable Name: Set the name of datapoint, for example, VW0

(3) Variable Unit: set any unit according to actual requirement

(4) Address Type: select address type according to PLC register. Here VW0 address type is VW

(5) Starting Address: Register address of datapoint. Here VW0 address is 0

(6) Data Type: select data type according to PLC register type

(7) Adding Qty: If addresses are consecutive, the same register will collect multiple addresses.

(8) Read-Write Type: select from Read only and Read & Write.

(9) Ratio: set the ratio to be multiplied or minified for uploading to cloud

(10) Modbus Mapping Address: Set address where datapoint will be saved in BL110.
Modbus mapping address can be any from 0 to 2000 and it can't be repeated
For example, set 8 as VW0 mapping address

(11) MQTT Flag: It can be any identification mark and can't be repeated. For example: VW0

(12) Click OK to confirm.

Note: After confirming the configuration, datapoints will appear in the box like above picture. To add more datapoints, right click the box and click Add to enter configuration box. Perform the same procedure as Step (2)-(12)

Note: Click Save Data. Gateway will restart automatically and S7-200SMART datapoint is added successfully.

5.2.1.3 Uploading Data to Various Clouds

BL110 collects data of different protocols. The configuration procedures of uploading data to various clouds are the same. Here only introduce configuration of collecting PLC data and send it to various

clouds. Refer to 5.4 Configuration of Uploading Data to Various Clouds

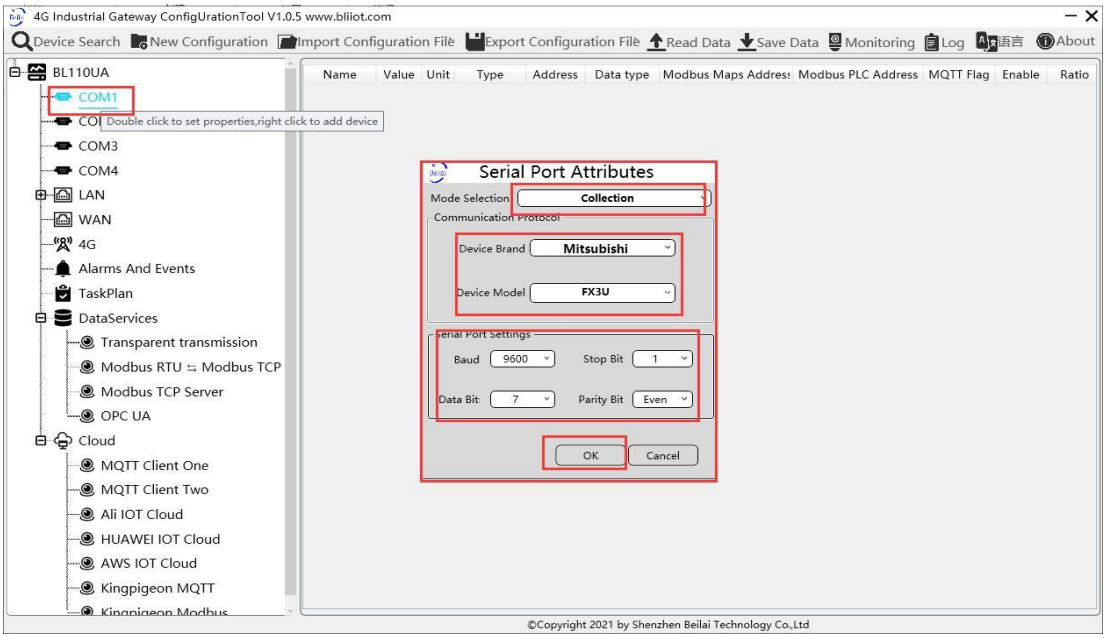
5.2.2 Configuring Collecting Mitsubishi PLC Data

5.2.2.1 Add Mitsubishi PLC to COM Port

FX3U has RS422 port. Connects Mitsubishi PLC FX3U with RS422 to RS232 converting cable to COM1. Configure it as below procedure.

5.2.2.1.1 COM1 Configuration

Connect FX3U with RS422 to RS232 converting cable to COM1. Configure it as below



(1) Double click COM1 to enter COM attribute configuration box.

(2) Select data collection Mode

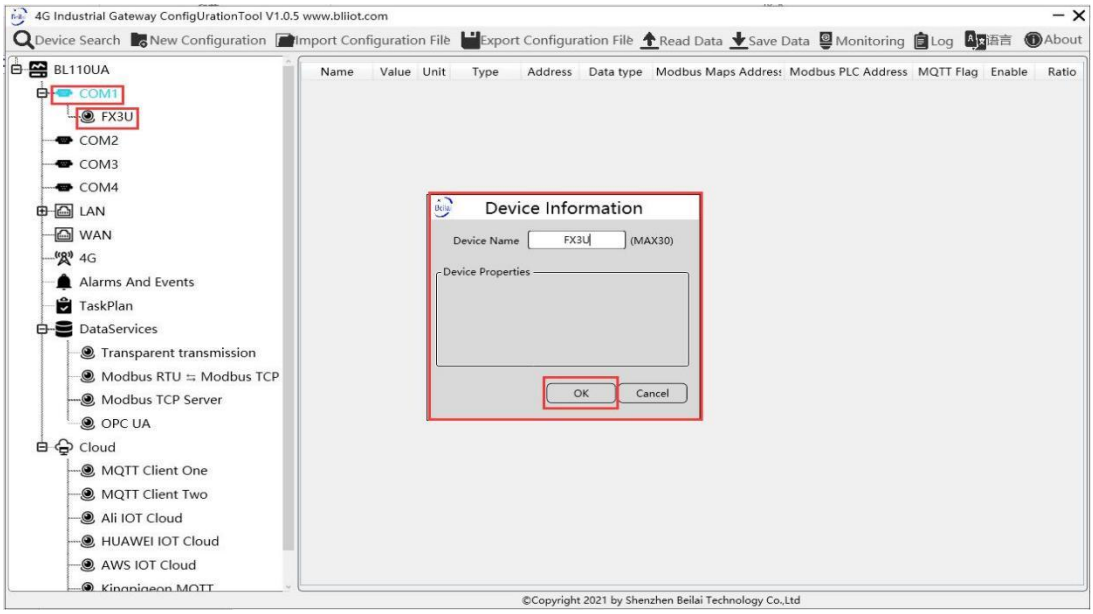
(3) Select Mitsubishi as Device Brand and select FX3U as Device Model

(4) Follow PLC FX3U RS422 port parameters to set the same baud rate 9600, stop bit 1, data bit 7 and parity bit Even

(5) Click OK to confirm it.

Note: Click Save Data. COM port configuration will be effective after gateway restart automatically.

5.2.2.1.2 Add Mitsubishi PLC FX3U to COM Port



(1) Click COM1, right click it and click Add to enter device configuration box

(2) Set Device Name at random like FX3U

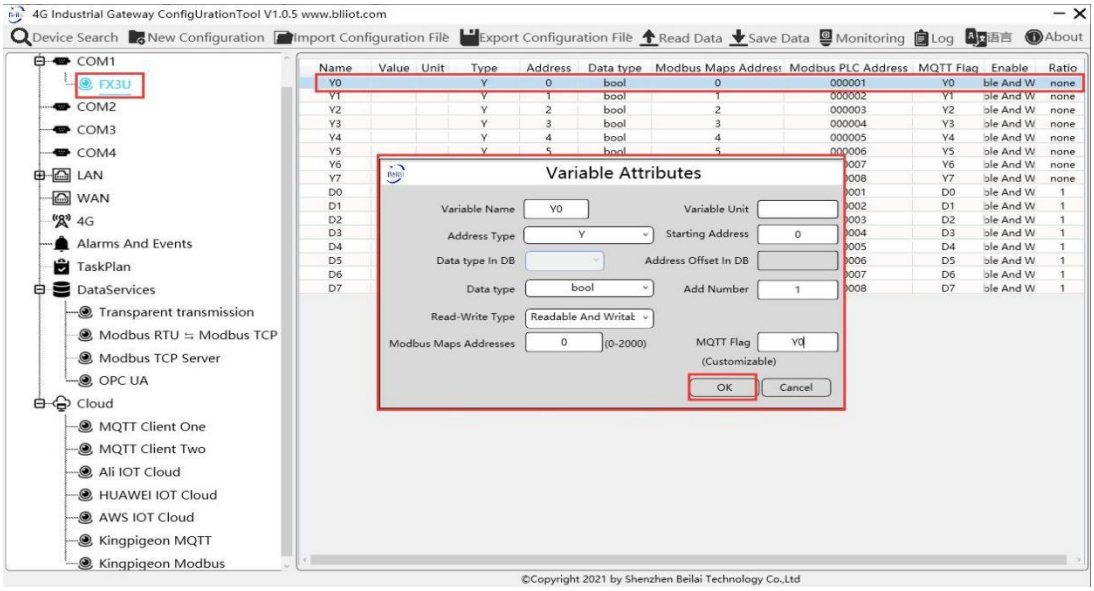
(3) Click OK to confirm adding FX3U PLC.

Note: After confirming configuration, FX3U device icon will appear below COM1. To add more devices, follow the same steps (1)-(3)

Note: Click Save Data. Gateway will restart automatically and adding PLC FX3U is effective

5.2.2.1.3 Add COM Port Mitsubishi PLC FX3U Datapoint

Below is example of collecting PLC FX3U datapoints Y0-Y7 & D0-7



(1) Click FX3U, move mouse cursor to the right box, right click mouse and click Add to enter datapoint configuration window

(2) Set datapoint name, for example, Y0
(3) Variable unit: Set any unit as required.
(4) Address Type: Select the address type of Mitsubishi PLC register. Select Y for collecting Y0 datapoint
(5) Starting Address: Input datapint register address, for example, Y0 register address in FX3U is 0, input 0
(6) Data Type: Select data type according to PLC register. For example, select bool for Y as it's coil type.
(7) Adding Qty: if consecutive addresses are collected, the same register can collect multiple addresses.
(8) Read-write Type： Select from Read only and Read & Write according to PLC register.
(9) Modbus Mapping Address: Input the address where the collected datapoint is saved in BL110. It can be any address from 0-2000 but can't be repeated. For example, Y0 data is saved in register address 0 of BL110
(10) MQTT Flag: can be any identification mark, but can't be repeated. For example, set Y0 as the MQTT flag of datapoint Y0
(11) Click OK to confirm

Note: After clicking OK to confirm the configuration, datapoints will appear in the box lik above picture. If more datapoints to be added, right click the box and click Add to enter datapoint configuration box, repeat Step (2)-(11)

Note: Click Save Data. Gateway will restart automatically. After restarting, PLC FX3U datapoints are added successfully

5.2.2.2 Adding Mitsubishi PLC to Ethernet Port

Collecting Mitsubishi PLC via Ethernet port is under development

5.2.2.3 Uploading Data to Various Clouds

BL110 collects data of different protocols. The configuration procedures of uploading data to various clouds are the same. Here only introduce configuration of collecting PLC data and send it to various clouds. Refer to 5.4 Configuration of Uploading Data to Various Clouds

5.2.3 Collecting OMRON PLC Data

5.2.3.1 Add OMRON PLC to COM Port

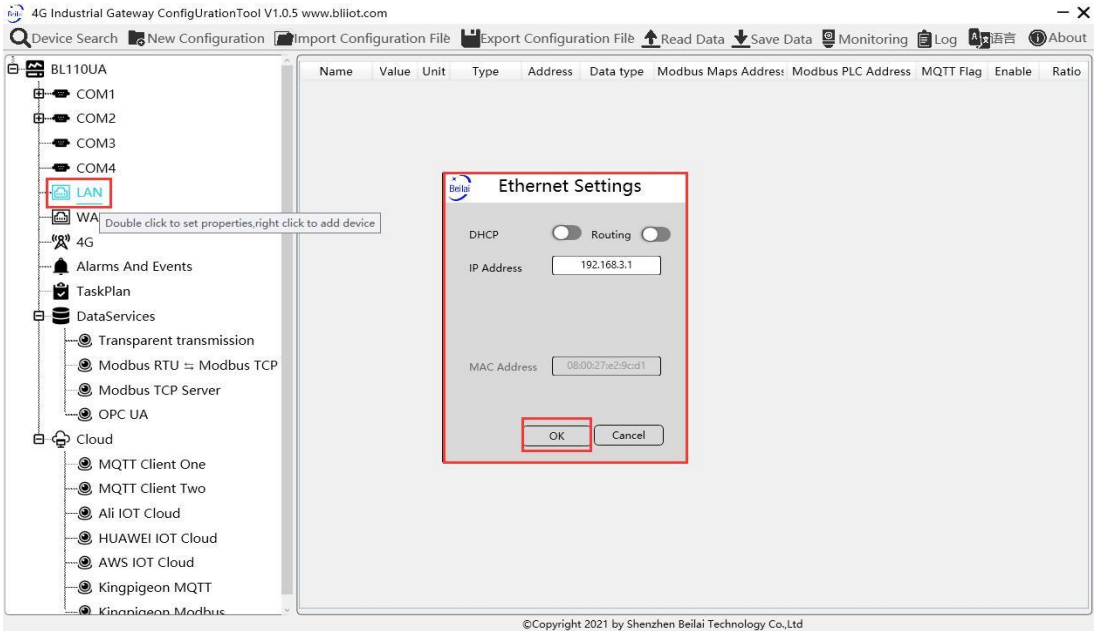
Add OMRON PLC via COM port is under development

5.2.3.2 Add OMRON PLC via Ethernet Port

OMRON PLC data can be collected through WAN, LAN and cascaded switch

5.2.3.2.1 LAN Port Configuration

Below is example of adding OMRON PLC CP1L-EL to LAN port. Configure it as below



(1) Double click LAN to enter configuration box

(2) DHCP: enable auto IP distribution. Default is disabled.

(3) Routing: Enable network routing function. Default is disabled. For example, PLC CP1L-EL does not need network. Thus it's necessary to enable it.

(4) IP Address: defaut is 192.168.3.1, the IP addresses assigned to LAN port devices must be within the range. WAN and LAN IP address can't be the same. For example, CP1L-EL IP is fixed, then change IP address of gateway.

(5) MAC Addres: Input LAN port MAC address

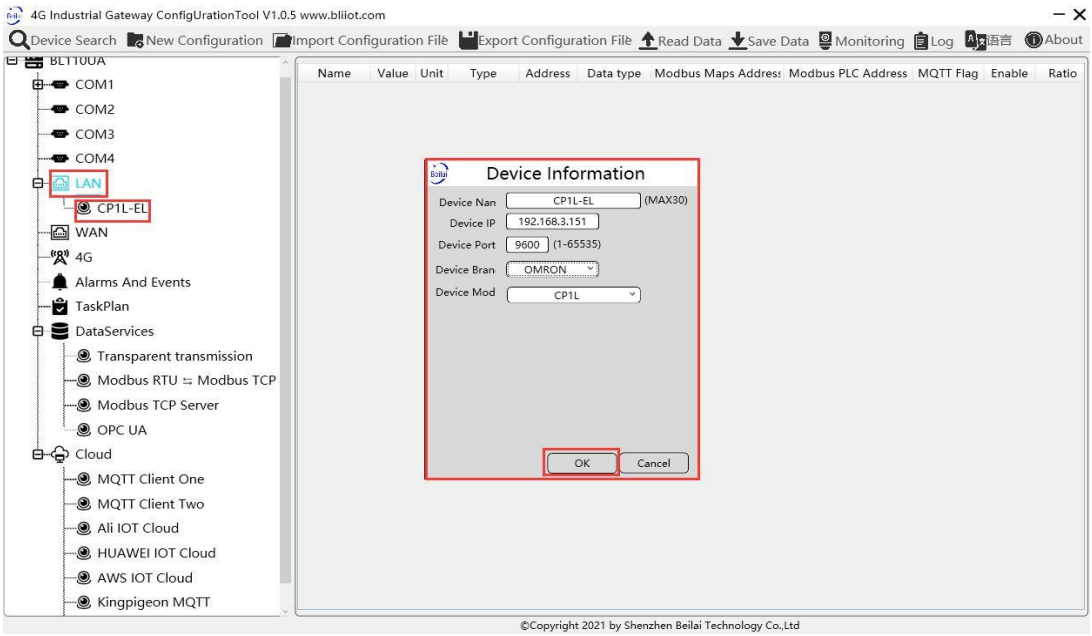
(6) Click OK to confirm it

Note: Click Save Data and Gateway will restart. Turn off the power of Gateway and restart it. After that LAN port configuration is done successfully

Note: LAN Port IP Address specifies the IP address arrange of LAN port device. If device IP address

is not within the range, data can't be collected. Thus it's necessary to change LAN port IP address according to requirement. IP Address change will not be effective until gateway is powered off and powered on again

5.2.3.2.2 Add OMRON PLC CP1L-EL to LAN Port



(1) Click LAN and right click mouse and click Add to enter device configuration box

(2) Device Name: set device name, for example, set CP1L-EL as device name.

(3) Device IP: input PLC IP address. For example, PLC CP1L-EL IP is 192.168.3.151, thus put 192.168.3.151 here. This is PLC IP address. PLC IP address and LAN Port IP address must be in the same range.

(4) Device Port: input LAN port device port. CP1L-EL default port is 9600

(5) Device Brand: Select Siemens as Device Brand and select CP1L-EL as device model

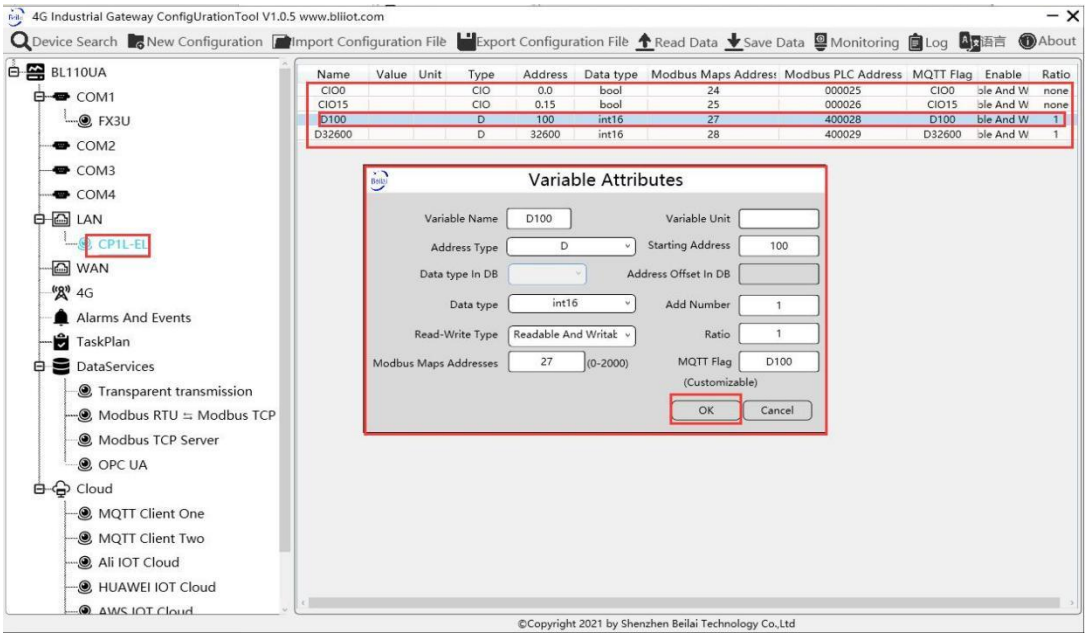
(6) Click OK to confirm adding PLC CP1L-EL

Note: CP1L-EL device icon will appear after confirming the configuration. If more devices to be added, perform the same procedure as Step (1)-(6)

Note: Click Save Data and gateway will restart automatically. After restarting, PLC CP1L-EL is added successfully

5.2.3.2.3 Add LAN Port OMRON PLC CP1L-EL Datapoint

Below example is part of PLC CP1L-EL register CIO & D data configuration



(1) Click CP1L-EL, move mouse cursor to the right box, right click the mouse and click Add to enter datapoint configuration box

(2) Variable Name: Set the name of datapoint, for example, D100

(3) Variable Unit: set any unit according to actual requirement

(4) Address Type: select address type according to PLC register. Here D100 address type is D

(5) Starting Address: Register address of datapoint. Here D100 address is 100

(6) Data Type: select data type according to PLC register type

(7) Adding Qty: If addresses are consecutive, the same register will collect multiple addresses.

(8) Read-Write Type: select from Read only and Read & Write.

(9) Ratio: set the ratio to be multiplied or minified for uploading to cloud

(10) Modbus Mapping Address: Set address where datapoint will be saved in BL110.
Modbus mapping address can be any from 0 to 2000 and it can't be repeated
For example, set 27 as D100 mapping address

(11) MQTT Flag: It can be any identification mark and can't be repeated. For example: D100

(12) Click OK to confirm.

Note: After confirming the configuration, datapoints will appear in the box like above picture. To add more datapoints, right click the box and click Add to enter configuration box. Perform the same procedure as Step (2)-(12)

Note: Click Save Data. Gateway will restart automatically and CP1L-EL datapoint is added successfully.

5.2.3.3 Uploading Data to Various Clouds

BL110 collects data of different protocols. The configuration procedures of uploading data to various clouds are the same. Here only introduce configuration of collecting PLC data and send it to various

clouds. Refer to 5.4 Configuration of Uploading Data to Various Clouds

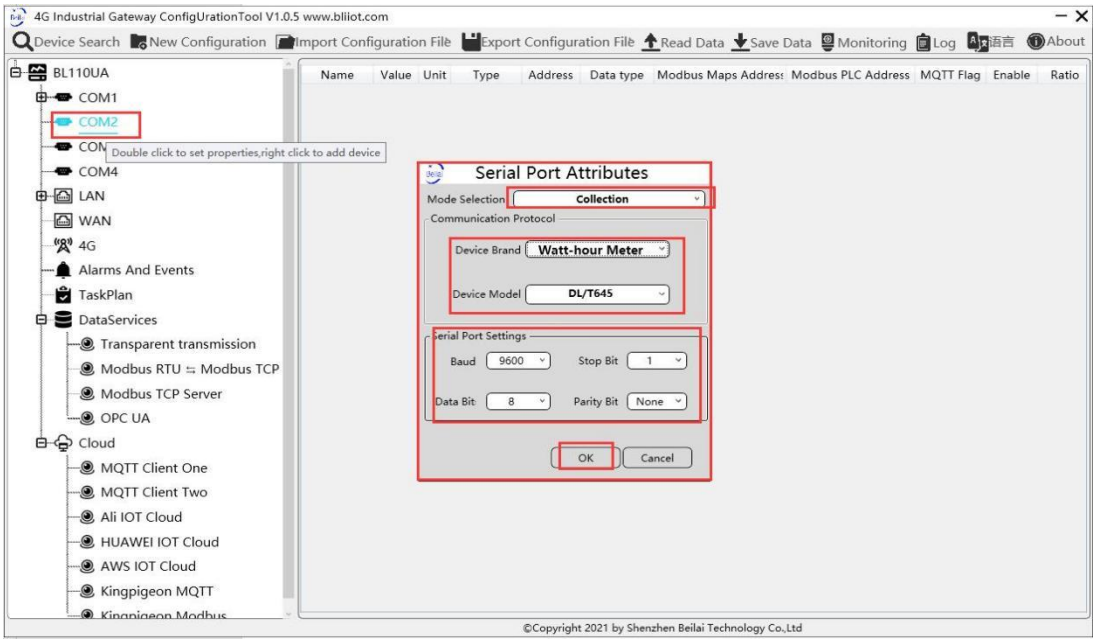
5.3 Collecting Watt-Hour Meter Data

5.3.1 Adding Watt-Hour Meter to COM Port

Currently COM ports can only collect watt-hour meter with DL/T645 protocol. COM1 isRS232. COM2, COM3 and COM4 are RS485 ports. Below is example of collecting watt-hour meter data through COM2 as the meter has RS485 interface.

5.3.1.1 COM Port Configuration

Below is example of collecting watt-hour meter with DL/T645-2007 protocol through COM2



(1) Double click COM2 to enter COM attribute configuration box.

(2) Select data collection Mode

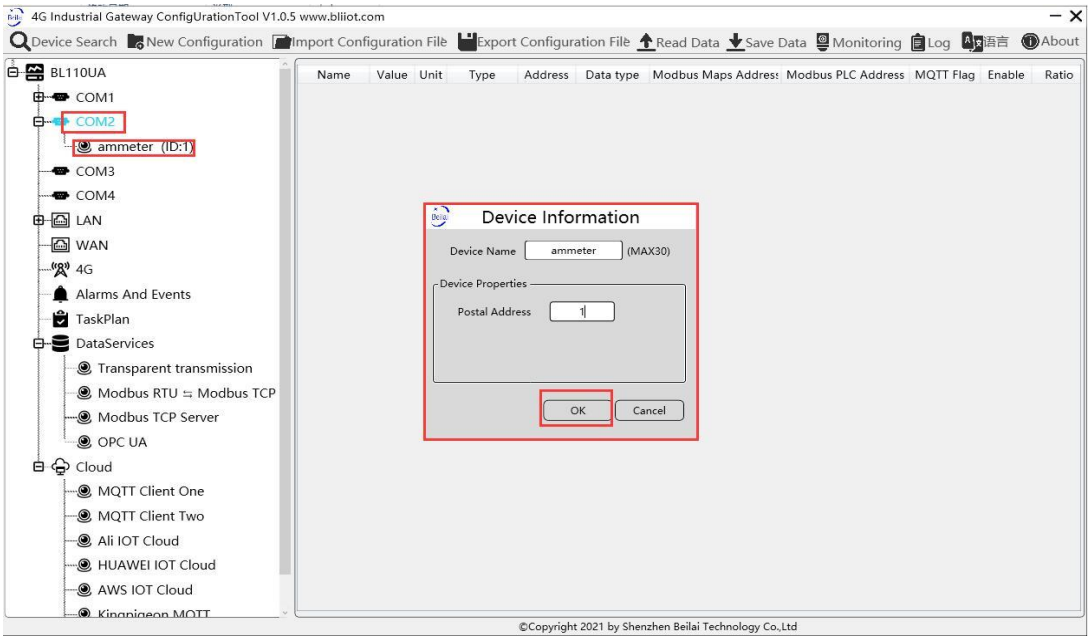
(3) Select Watt-hour Meter as Device Brand and select DL/T645 as Device Model

(4) Follow Watt-hour Meter COM port parameters to set the same baud rate, stop bit, data bit and parity bit

(5) Click OK to confirm it.

Note: Click Save Data. COM2 port configuration will be effective after gateway restart automatically.

5.3.1.2 Add Watt-hour Meter to COM Port



(1) Click COM2, right click it and click Add to enter device configuration box

(2) Set Device Name at random like ammeter

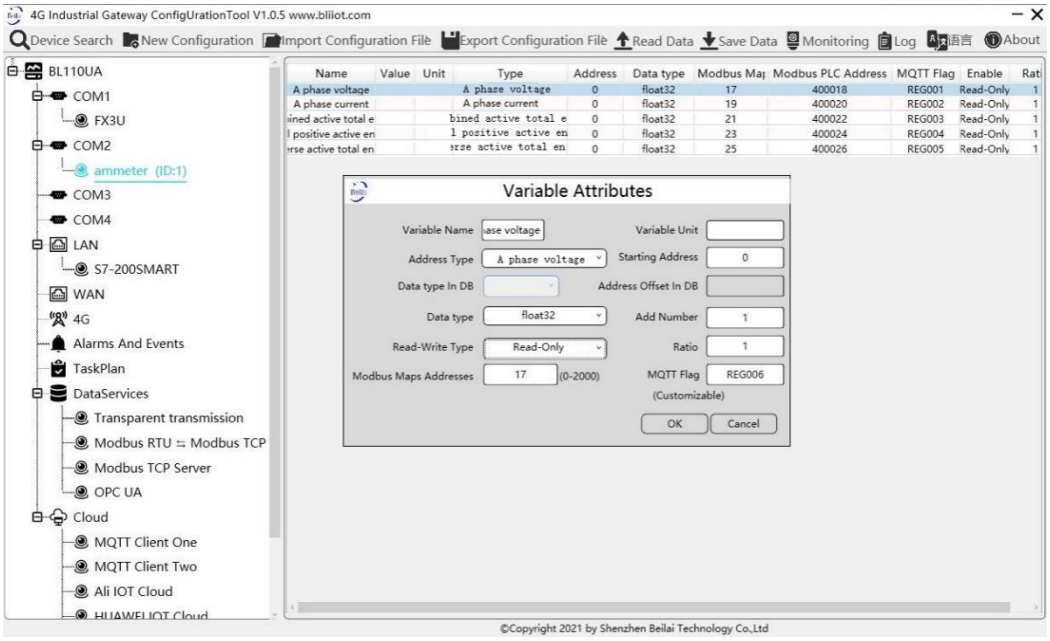
(3) Communication Address: put watt-hour meter communication address

(4) Click OK to confirm adding watt-hour meter.

Note: After confirming configuration, ammeter icon will appear below COM2. To add more devices, follow the same steps (1)-(4)

Note: Click Save Data. Gateway will restart automatically and adding watt-hour meter is effective

5.3.1.3 Add COM Port Watt-hour Meter Datapoint



(1) Click ammeter, move mouse cursor to the right box, right click mouse and click Add to enter datapoint configuration window

(2) Set datapoint name, for example, Phase A Voltage

(3) Variable unit: Set any unit as required, can be blank

(4) Address Type: Select the address type of the meter. For example, Phase A Voltage

(5) Starting Address: N/A keep it blank

(6) Data Type: Select 32-bit single-precision floating data type

(7) Adding Qty: N/A keep it blank

(8) Read-write Type：Select from Read only

(9) Modbus Mapping Address: Input the address where the collected datapoint is saved in BL110. It can be any address from 0-2000 but can't be repeated. For example, Phase A Voltage is saved in register address 17 of BL110

(10) MQTT Flag: can be any identification mark, but can't be repeated. For example, set REG001 as the MQTT flag of datapoint Phase A voltage

(11) Click OK to confirm

Note: After clicking OK to confirm the configuration, datapoints will appear in the box lik above picture. If more datapoints to be added, right click the box and click Add to enter datapoint configuration box, repeat Step (2)-(12)

Note: Click Save Data. Gateway will restart automatically. After restarting, watt-hour meter datapoints are added successfully

If your required datapoint is not in the list, please contact King Pigeon after-sale service team.

5.3.2 Add Wat-hour Meter to Ethernet Port

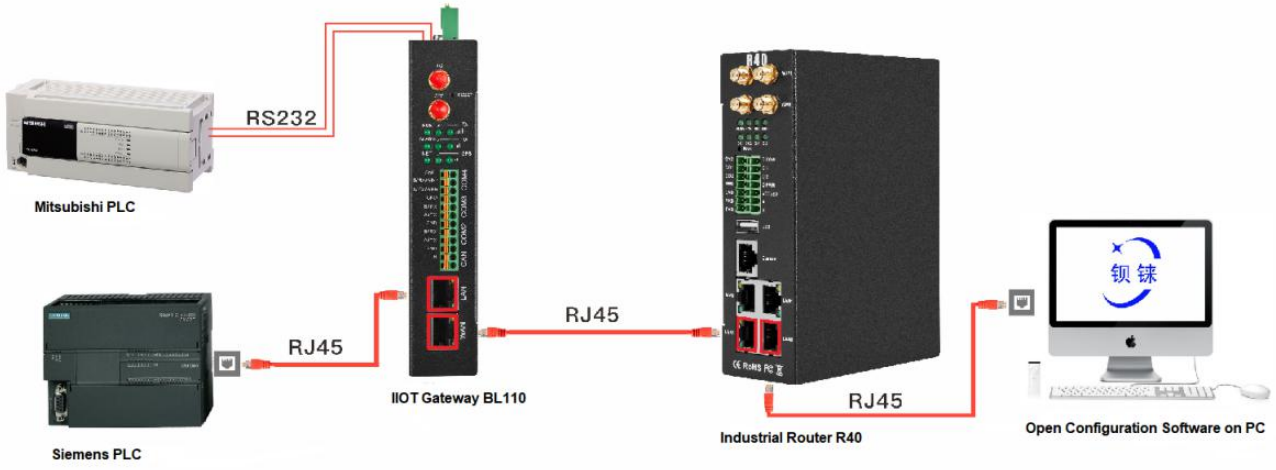
Collecting Watt-hour meter data with IEC101 & IEC104 protocols is under development.

5.3.3 Uploading Data to Various Clouds

BL110 collects data of different protocols. The configuration procedures of uploading data to various clouds are the same. Here only introduce configuration of collecting PLC data and send it to various clouds. Refer to 5.4 Configuration of Uploading Data to Various Clouds

5.4 Configuration of Uploading Data to Various Clouds

Below is the example of connecting Mitsubishi PLC FX3U to BL110 COM1 port and connecting Siemens PLC S7-200SMART to BL110 LAN port. BL110 WAN port is connected to router R40 LAN port. R40 provides network for BL110. See below wiring diagram:

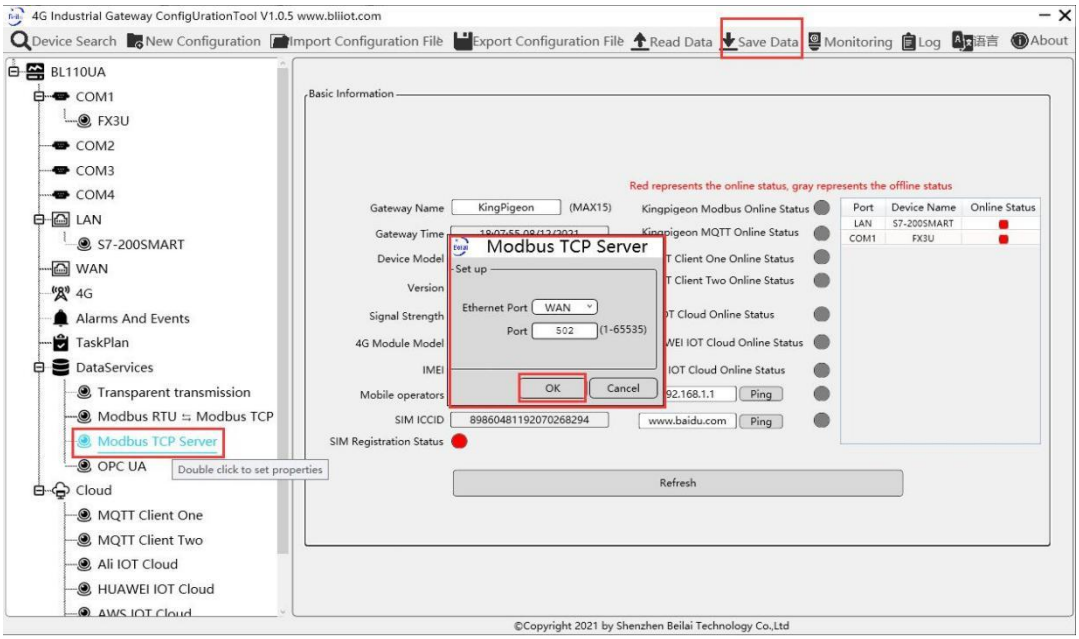


BL110 LAN port is connected to Siemens PLC S7-200SMART Ethernet port, COM1 is connected toMitsubishi PLC FX3U via RS232 to RS422 converting cable. BL110 collects both PLC data and send to various clouds with network provided by R40 through WAN.

Note: Both WAN and LAN ports can collect device data. This example is collecting data through LAN port. WAN and LAN port configurations are the same as stated in previous introduction.

Below is only the introduction to cloud connection configuration

5.4.1 Modbus TCP Server Configuration



(1) Doubel click Modbus TCP Server to enter configuration box

(2) Ethernet Port: Select WAN (In this example, industrial router R40 is connected through WAN) . Click WAN to view its IP address: 192.168.1.155

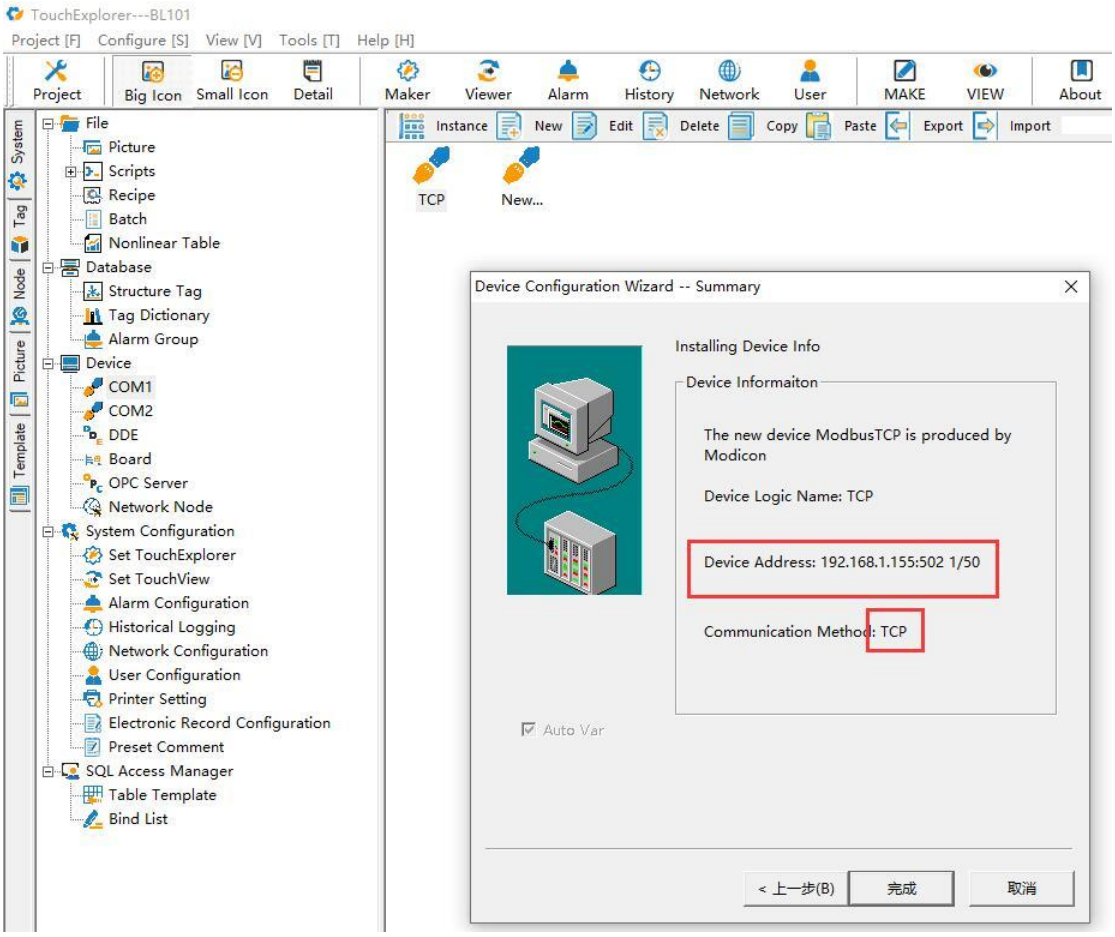
(3) Port: This gateway is used as Modbus TCP Server monitoring port. Input any port within range 1-65535. For example, put 502

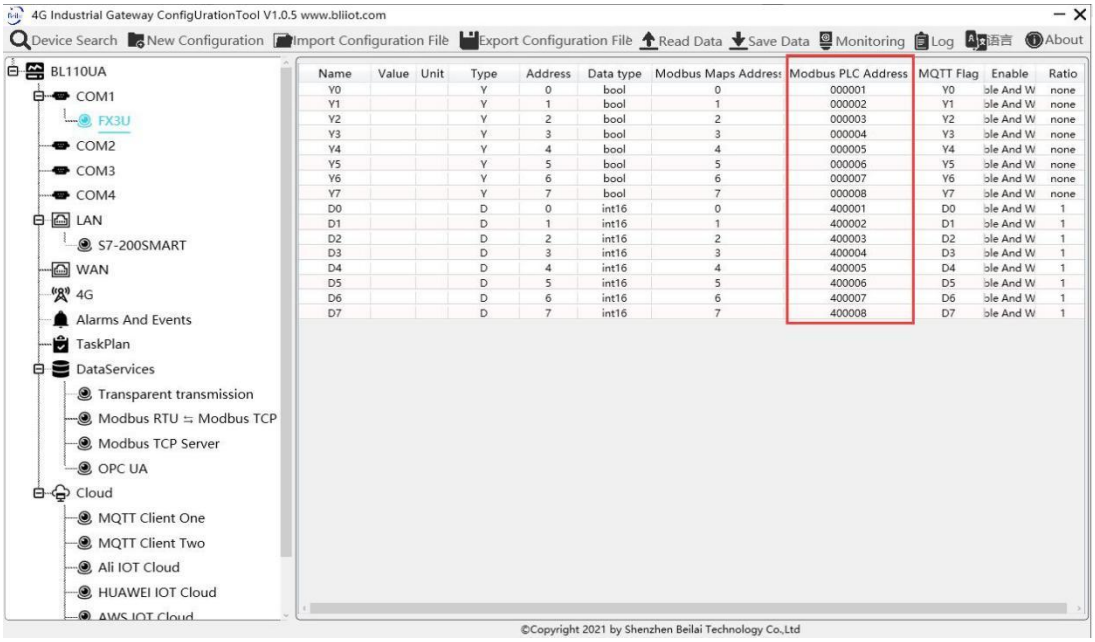
(4) Click OK to confirm the setting of Modbus TCP Server.

(5) Click Save Data. Gateway will restart automatically. After restarting, Modbus TCP Server configuration is done successfully.

5.4.2 View Data with KingView

Gateway provides data as Modbus TCP server. Modbus TCP host computer will collect data from BL110, like SCADA, MES host PCs. Function codes supported for collecting gateway data: 01 & 05 for boolean data; 03 & 06 for numerical data. Below example is using KingView to view BL110 device data. WAN port IP: 192.168.1.155, Modbus TCP Server port: 502


TouchExplorer---BL101
Project [F] Configure [S] View [V] Tools [T] Help [H]
Project
Big Icon
Small Icon
Detail
Maker
Viewer
Alarm
History
Network
User
MAKE
VIEW
About
System
Tag
Node
Picture
Template
File
Picture
Scripts
Recipe
Batch
Nonlinear Table
Database
Structure Tag
Tag Dictionary
Alarm Group
Device
COM1
COM2
DDE
Board
OPC Server
Network Node
System Configuration
Set TouchExplorer
Set TouchView
Alarm Configuration
Historical Logging
Network Configuration
User Configuration
Printer Setting
Electronic Record Configuration
Preset Comment
SQL Access Manager
Table Template
Bind List
Instance
New
Edit
Delete
Copy
Paste
Export
Import
TCP
New...
Device Configuration Wizard -- Summary
Installing Device Info
Device Informaiton
The new device ModbusTCP is produced by Modicon
Device Logic Name: TCP
Device Address: 192.168.1.155:502 1/50
Communication Method: TCP
Auto Var
< 上一步(B)
完成
取消


4G Industrial Gateway ConfigUrationTool V1.0.5 www.bliiot.com
Device Search
New Configuration
Import Configuration File
Export Configuration File
Read Data
Save Data
Monitoring
Log
About
BL110UA
COM1
FX3U
COM2
COM3
COM4
LAN
S7-200SMART
WAN
4G
Alarms And Events
TaskPlan
DataServices
Transparent transmission
Modbus RTU ⇆ Modbus TCP
Modbus TCP Server
OPC UA
Cloud
MQTT Client One
MQTT Client Two
Ali IOT Cloud
HUAWEI IOT Cloud
AWS IOT Cloud
Name Value Unit Type Address Data type Modbus Maps Address Modbus PLC Address MQTT Flag Enable Ratio
Y0 Y 0 bool 0 000001 Y0 ble And W none
Y1 Y 1 bool 1 000002 Y1 ble And W none
Y2 Y 2 bool 2 000003 Y2 ble And W none
Y3 Y 3 bool 3 000004 Y3 ble And W none
Y4 Y 4 bool 4 000005 Y4 ble And W none
Y5 Y 5 bool 5 000006 Y5 ble And W none
Y6 Y 6 bool 6 000007 Y6 ble And W none
Y7 Y 7 bool 7 000008 Y7 ble And W none
D0 D 0 int16 0 400001 D0 ble And W 1
D1 D 1 int16 1 400002 D1 ble And W 1
D2 D 2 int16 2 400003 D2 ble And W 1
D3 D 3 int16 3 400004 D3 ble And W 1
D4 D 4 int16 4 400005 D4 ble And W 1
D5 D 5 int16 5 400006 D5 ble And W 1
D6 D 6 int16 6 400007 D6 ble And W 1
D7 D 7 int16 7 400008 D7 ble And W 1
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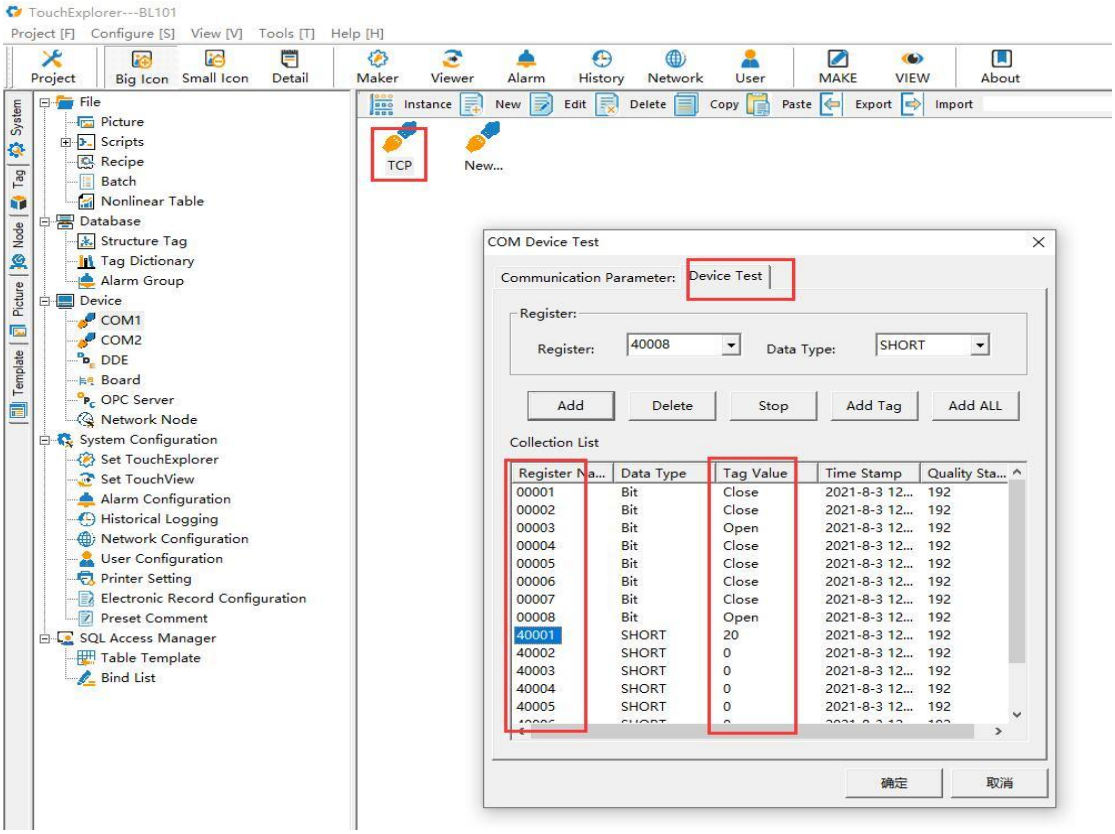
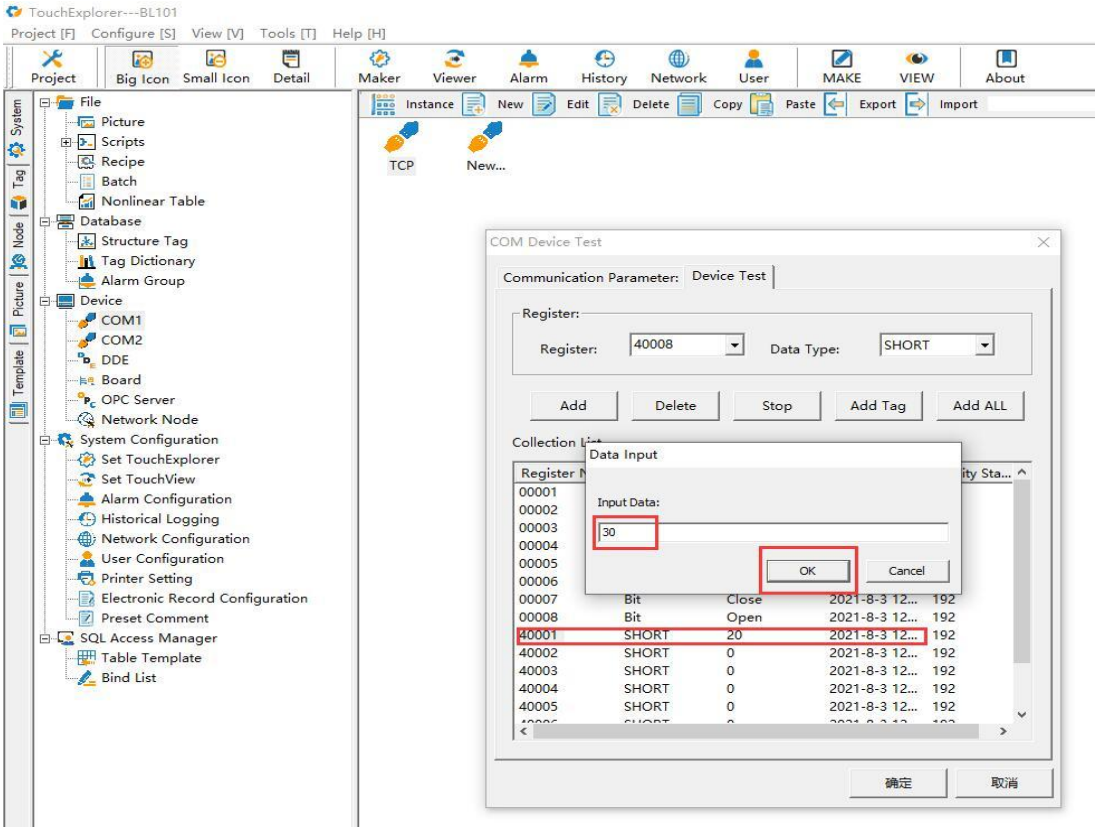
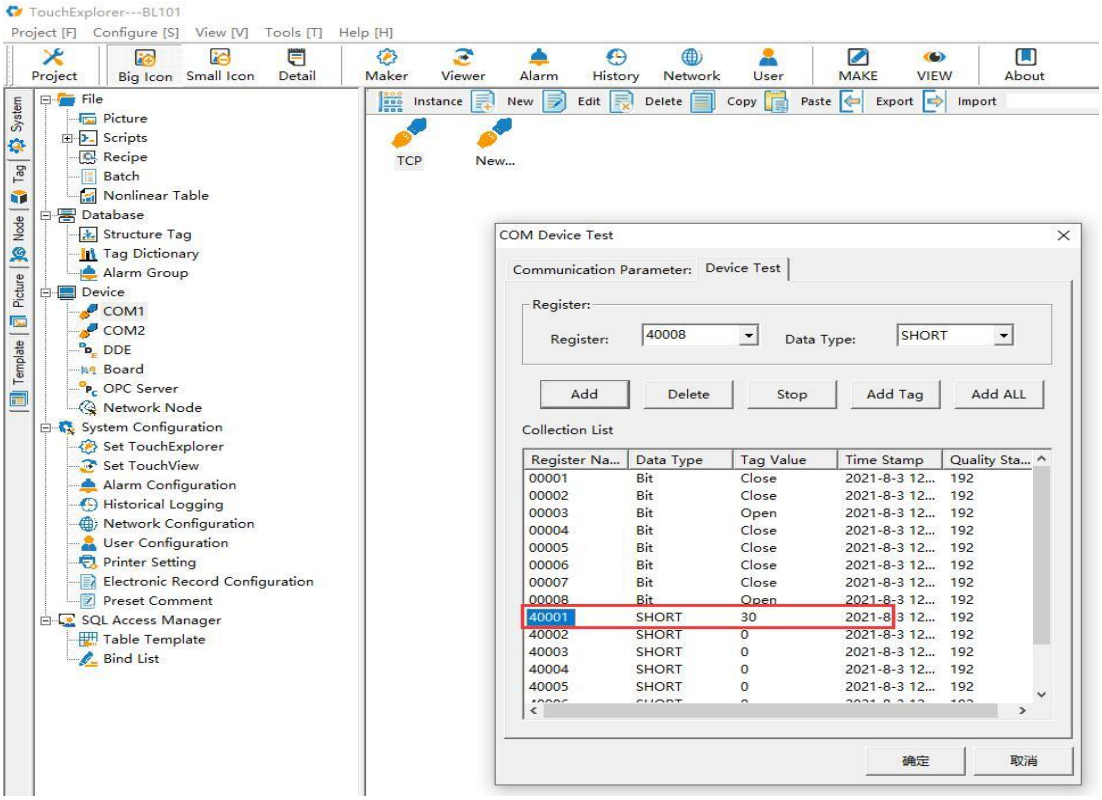
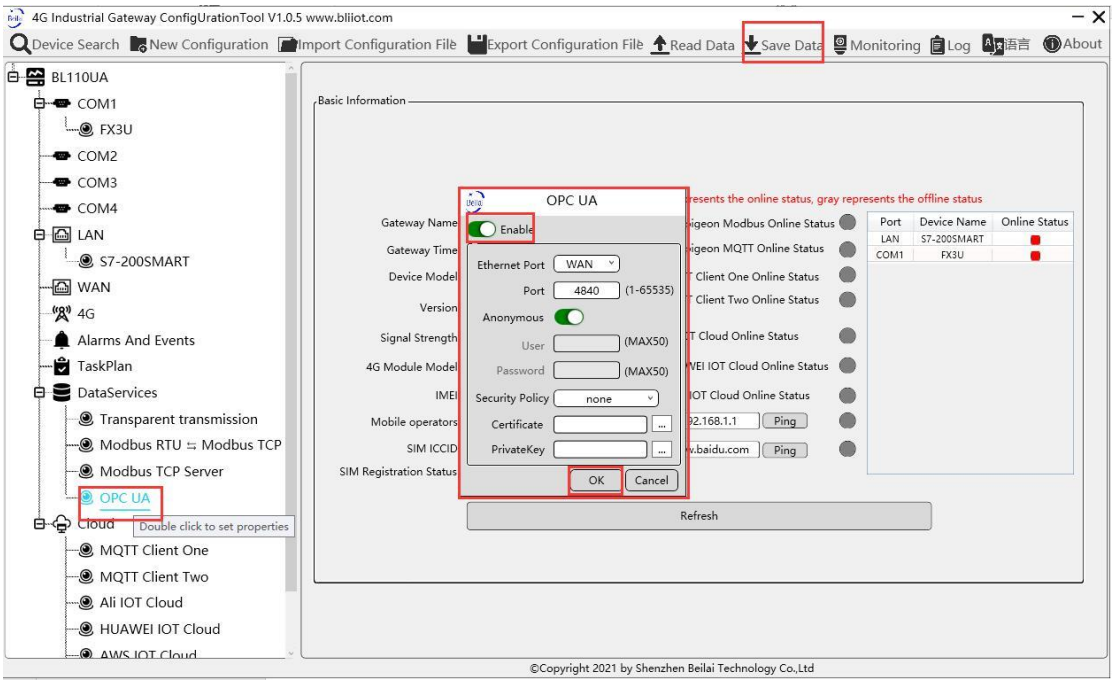


Send command from cloud to control device





5.4.3 OPC UA Configuration



(1) Double click OPC UA to enter configuration box

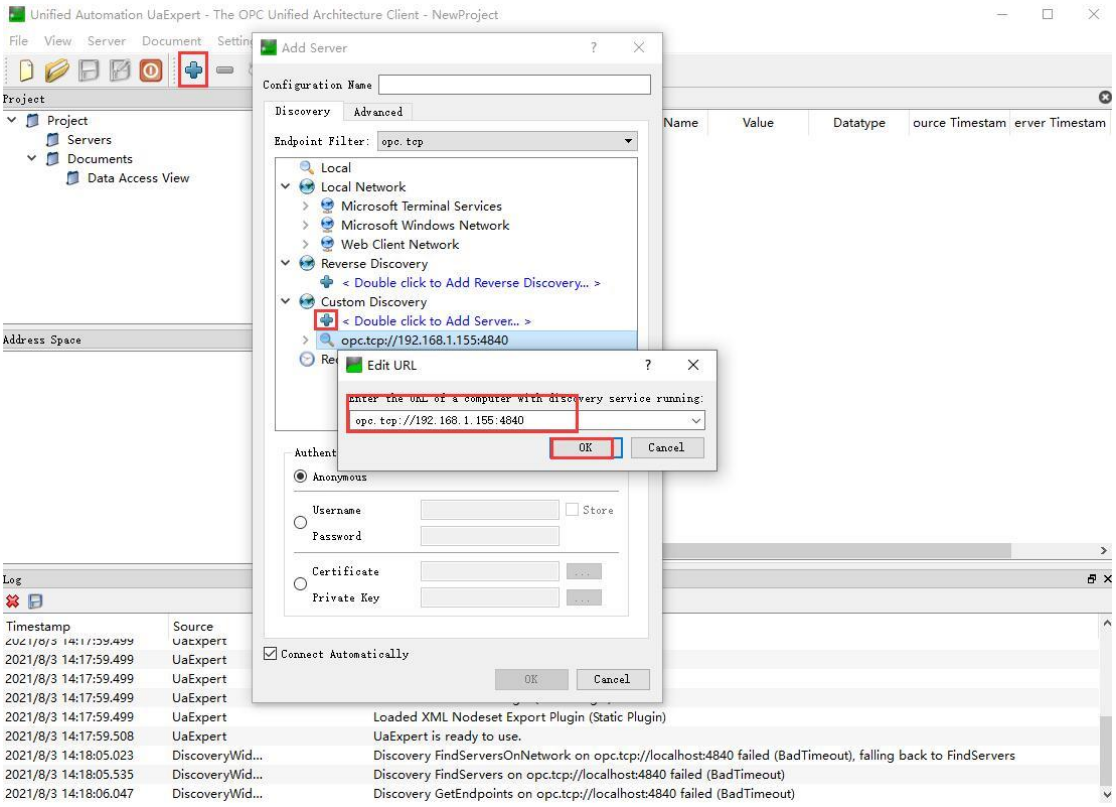
(2) Click Enable to enable(green color) OPC UA. Default is disabled(gray color).

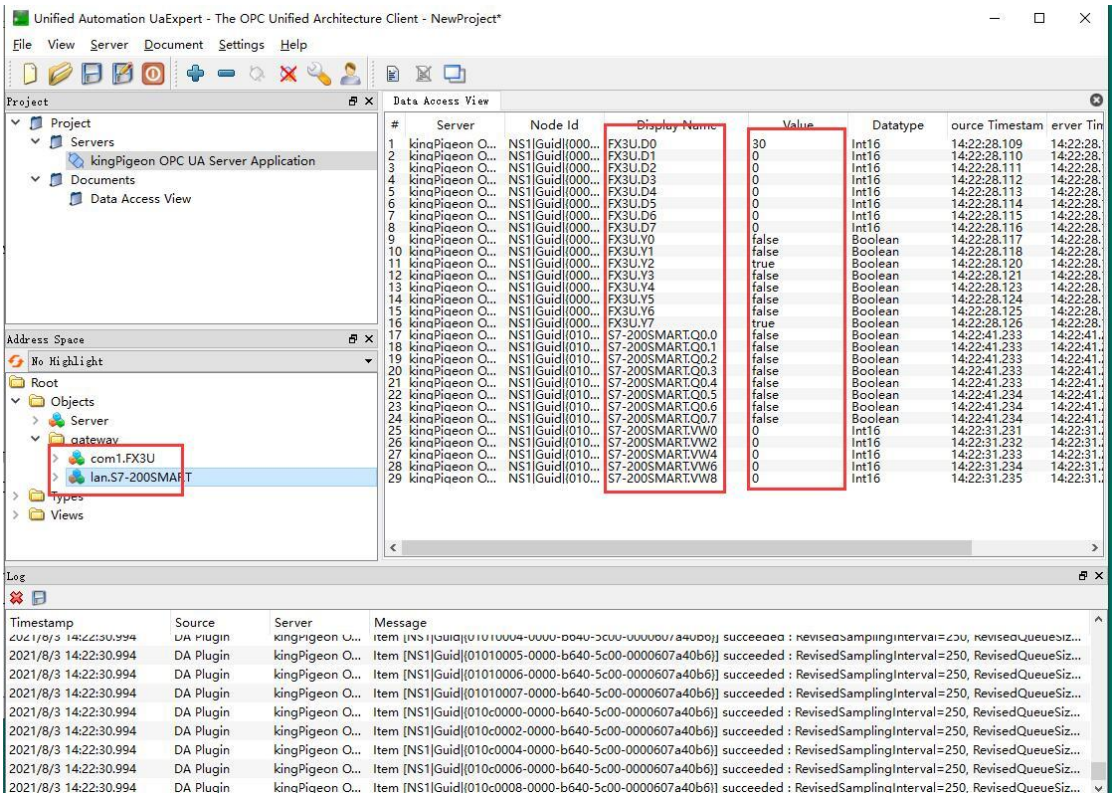
(3) Ethernet Port: Select WAN (This example is connecting router R40 through WAN)
Click WAN to view its IP address: 192.168.1.155

(4) Port: OPC UA Port, default is 4840
(5) Anonymous: If enabled, OPC UA can be connected without ID and password
(6) User, Password: only to be set when anonymous is disabled
(7) Security Policy: Select connection encryption policy(This example is connecting without encryption, thus select None)
(8) Certificate, PrivateKey: This example is connecting without encryption, then it's not necessary to upload certificate and privatekey.
(9) Click OK to confirm OPC UA configuration
(10) Click Save Data. Gateway will restart automatically. After device restarting, OPC UA is configured successfully.

5.4.4 View Data with UaExpert

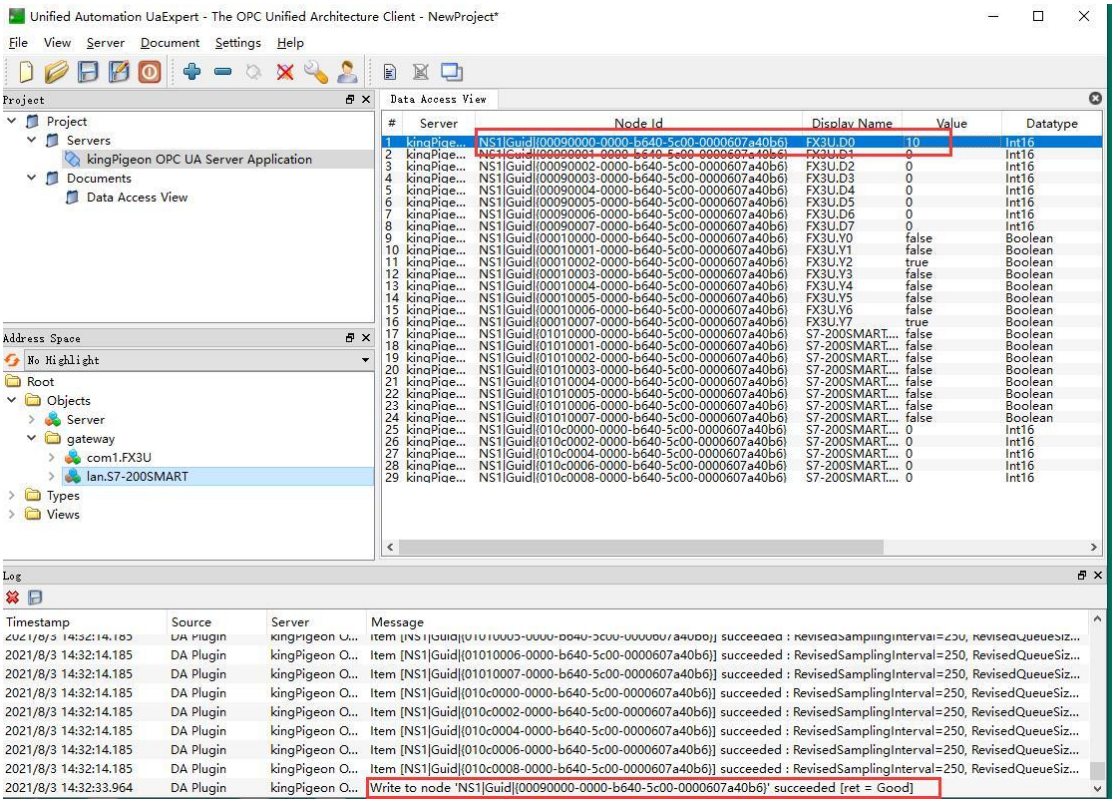
BL110 provides data as OPC UA server. Below is the example of collecting BL110 data with UaExpert(OPC UA Client). Connecting UaExpert with BL110 OPC UA server. Datapoint will be generated automatically. Datapoint names are the same as variable names in configuration software.





Sending command from cloud to control device remotely.

Double click datapoint value, input value and press enter to confirm it.



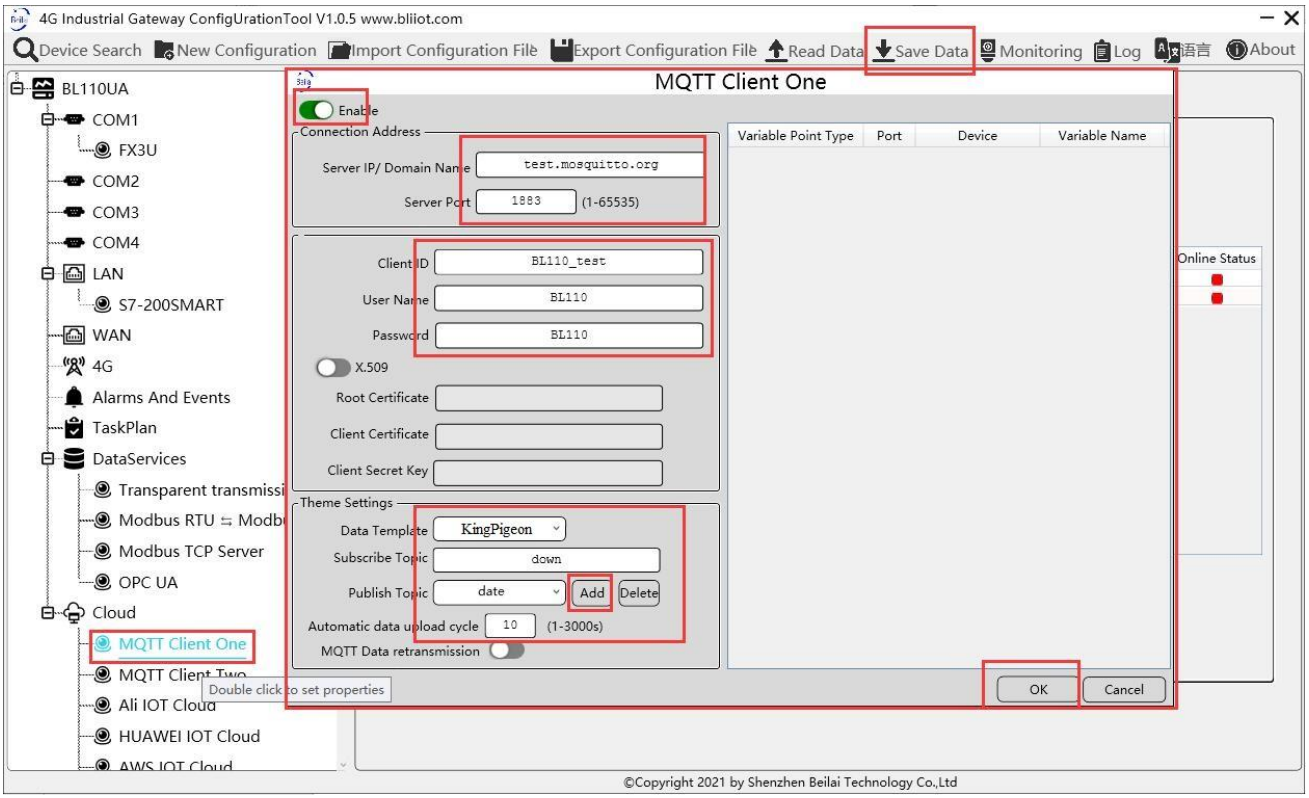
5.4.5 MQTT Client One

MQTT Client One , MQTT Client Two data format is the same as King Pigeon cloud MQTT data format. Refer to：King Pigeon MQTT Data Format

If connecting to ThingsBoard, please select ThingsBoard JSON data format.

The difference between MQTT Client One and MQTT Client Two is that MQTT Client Two Subscription Topic is not working. It's only used for viewing data in the cloud.

Below is the example of configuring MQTT Client One connection without certificate using King Pigeon JSON data format.



(1) Double click MQTT Client One to enter configuration box

(2) Click Enable to activate MQTT Client One(green button), default is disabled(gray button).

(3) Server IP/Domain Name: Inpput MQTT server IP/Domain Name

(4) Port: Input MQTT server port, default is 1883

(5) Client ID: Client Identifier of MQTT connection message, used for server to identify client

(6) User Name: user name of MQTT connection, used for server to verify identification and authorization

(7) Password: password of MQTT connecting message, used for server to verify identification and authorization

(8) Data Template: select MQTT supported JSON template. Default is King Pigeon JSON template

(9) Subscription Topic: Topic Name of subscribing MQTT message, after subscription server can send message to client for controlling

(10) Publishing Topic: Topic Name of MQTT publishing message. It's used for identifying which message channel to send the valid payload

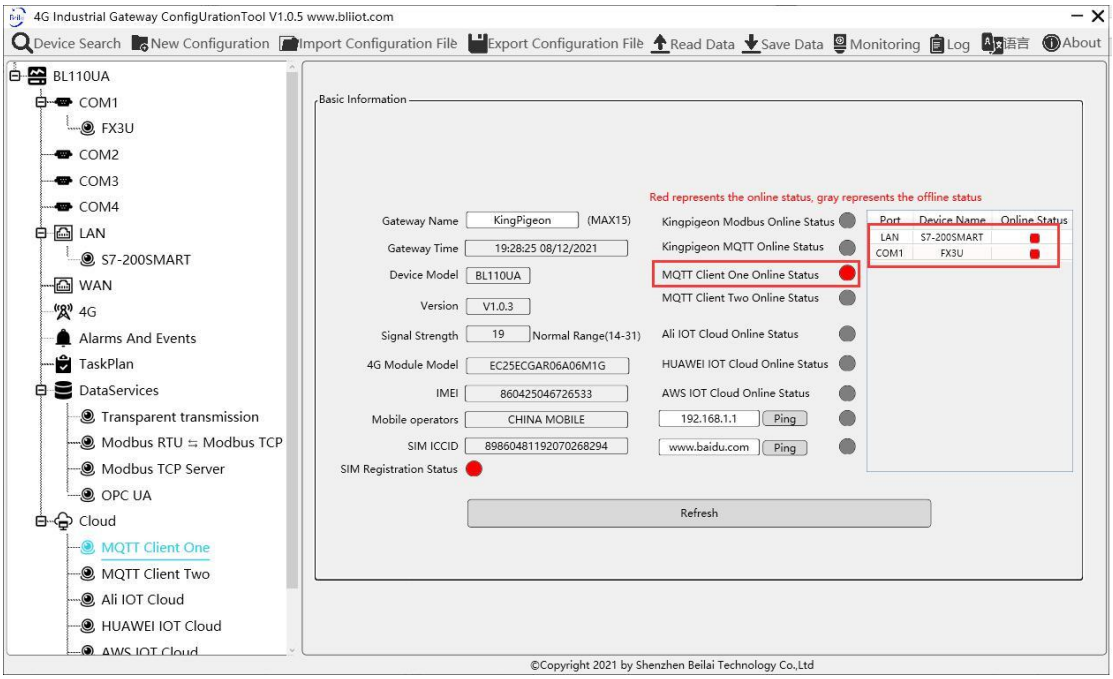
(11) Uploading Cycle: the interval of regular data sending, default is 30s

(12) MQTT Re-transmission: Enable offline data re-transmitting once network recovers, green is enabled, gray is disabled

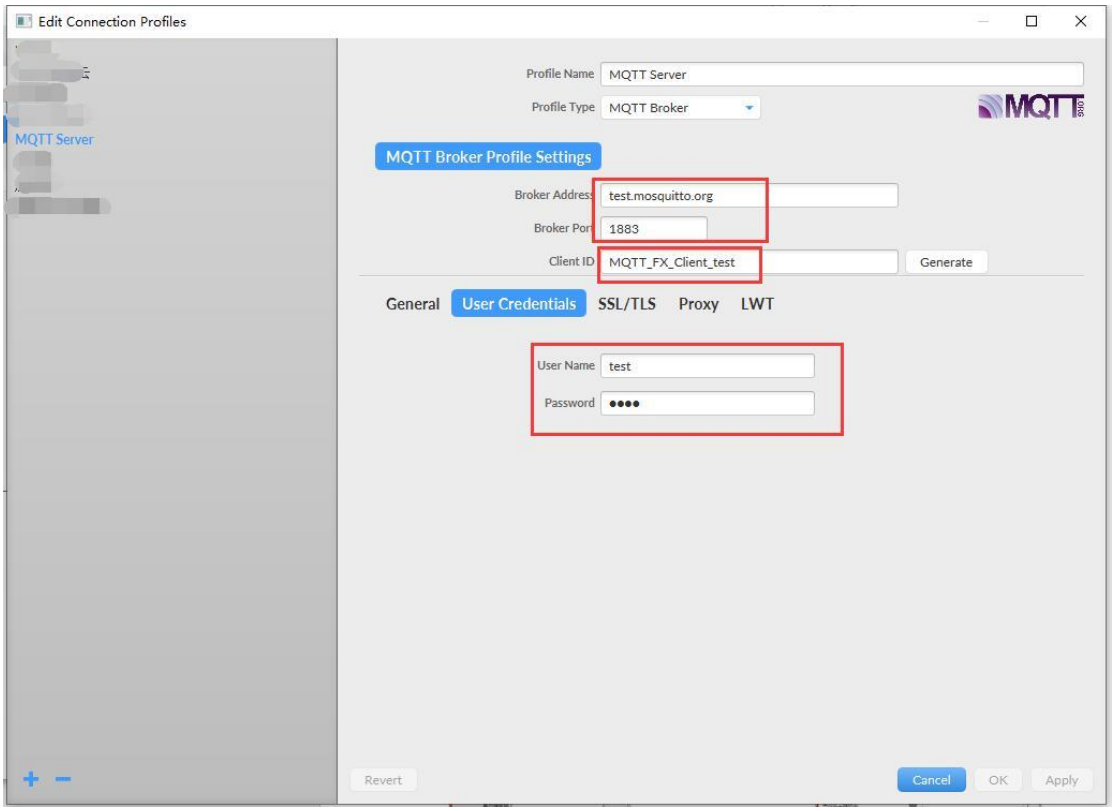
(13) Select datapoints to be uploaded in the right box, default is blank with all datapoints to be uploaded.

(14) Click OK to confirm MQTT Client One configuration

(15) Click Save Data. Gateway will restart automatically. After that MQTT Client One is enabled. Open configuration software and the MQTT Client One button is red which means it's online. Slave device online status is shown on the right side.



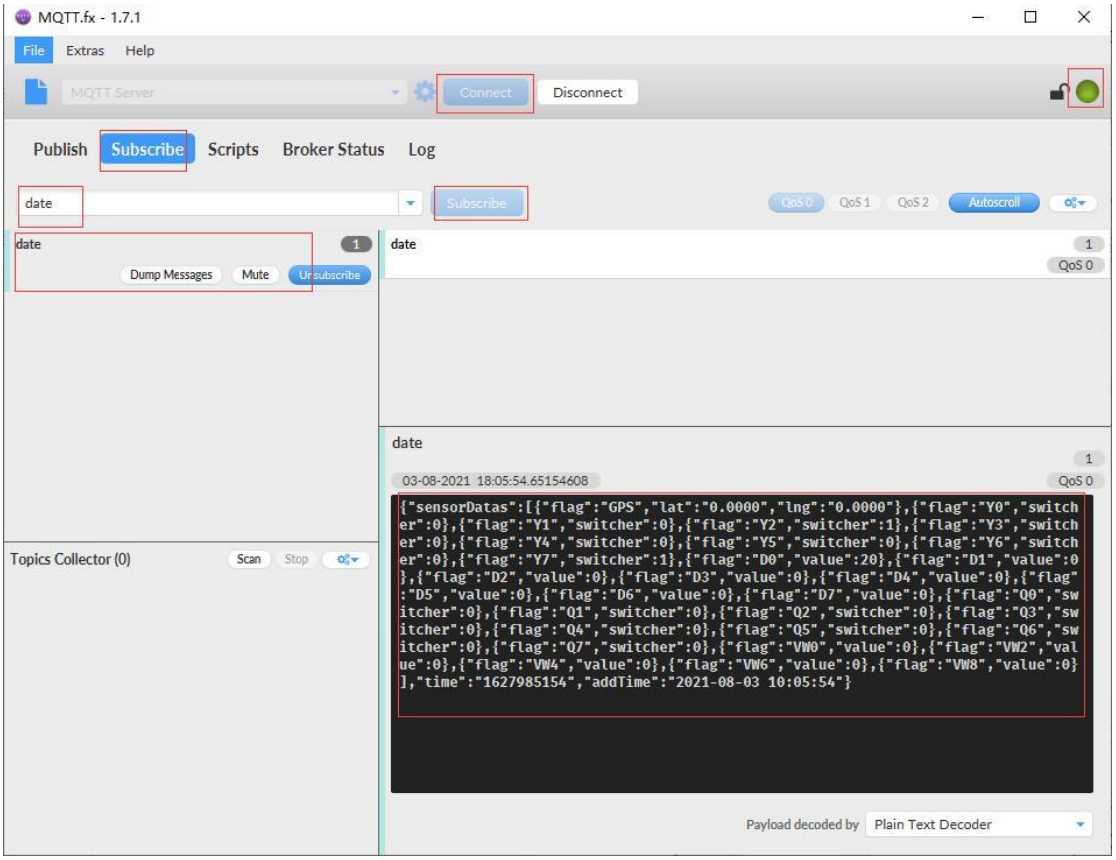
5.4.6 View Data with MQTT.fx



Note: Client ID can not be the same the Client ID in configuration software

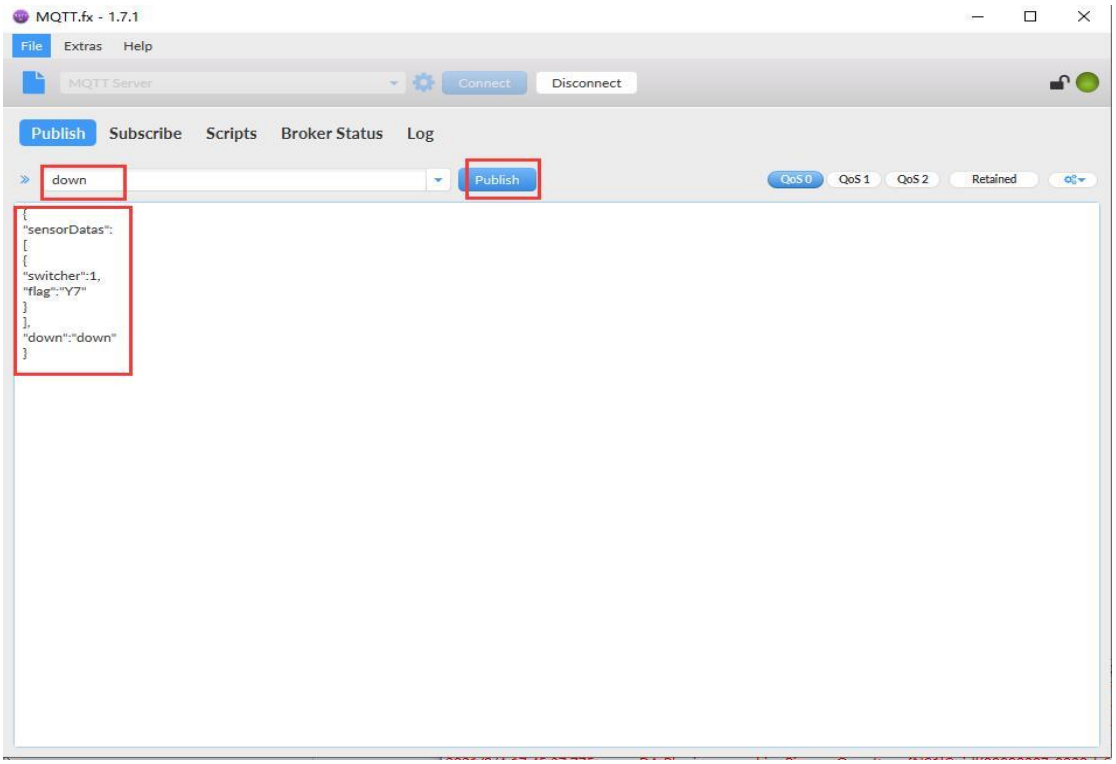
Message received in MQTT.fx:

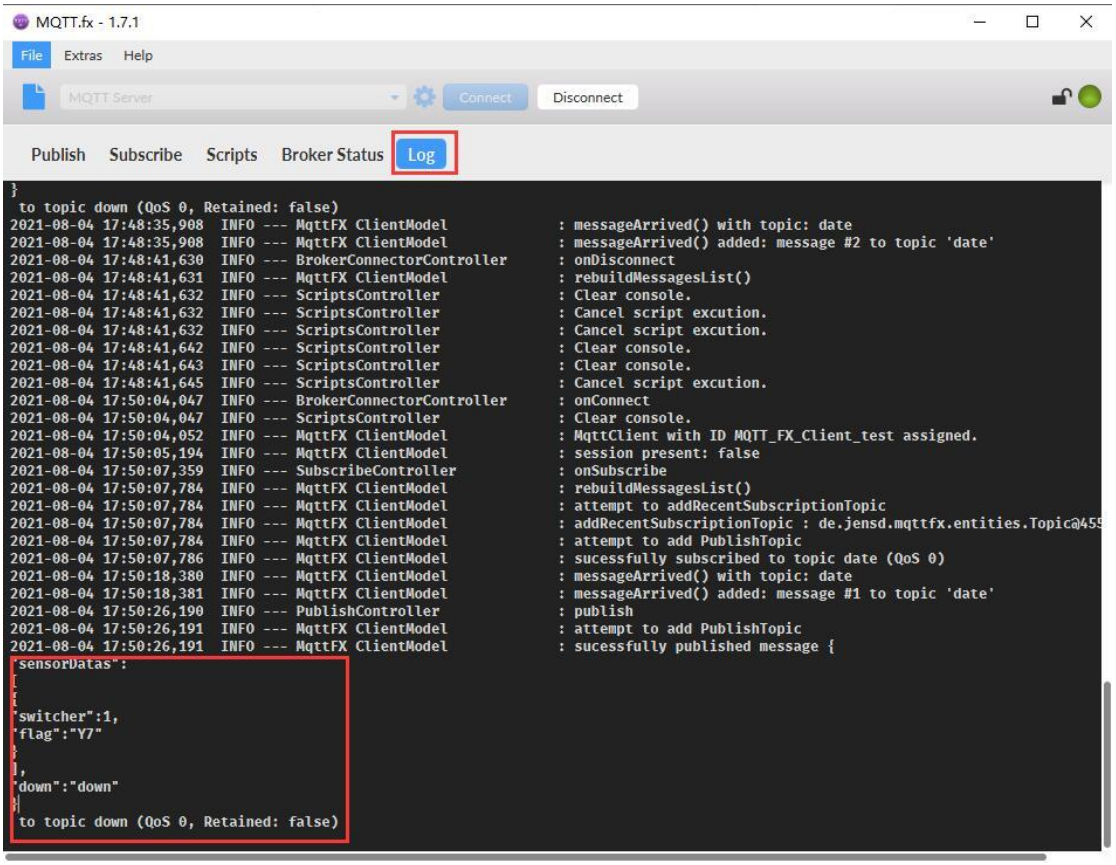
Subscription Topic of MQTT.fx is the Publishing Topic configured in MQTT Client One

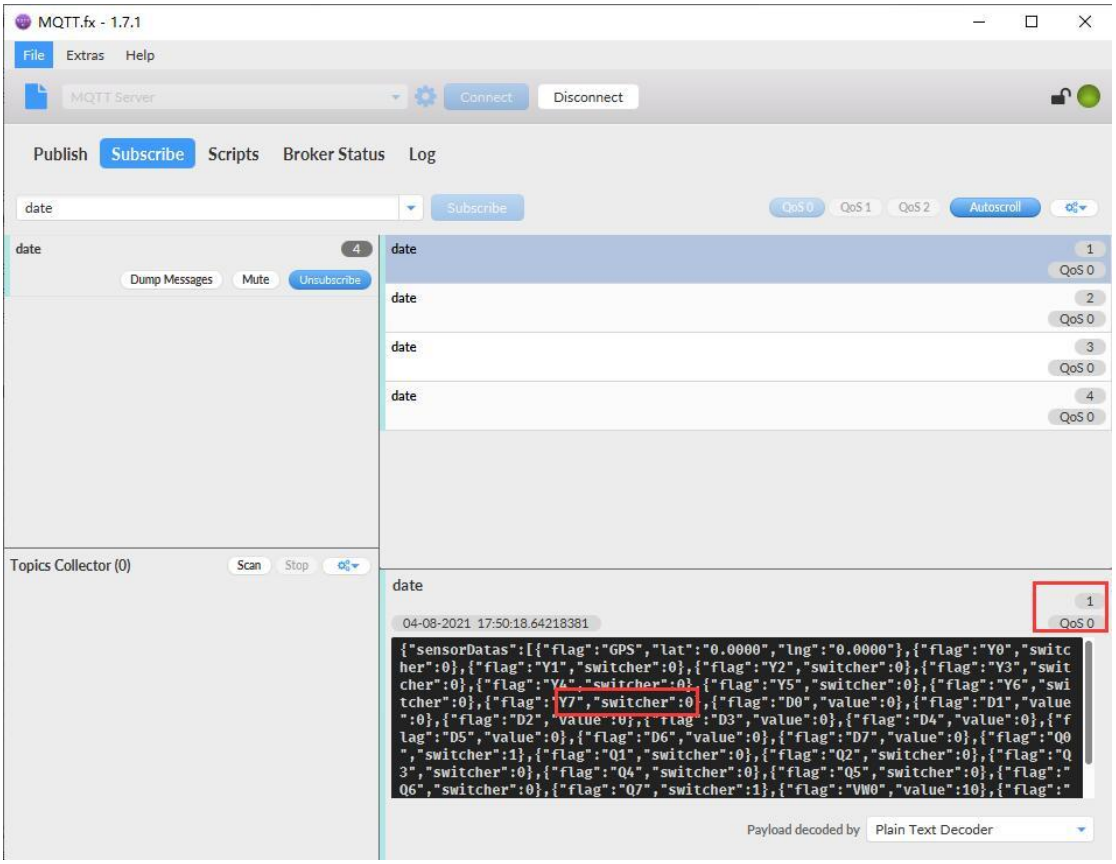


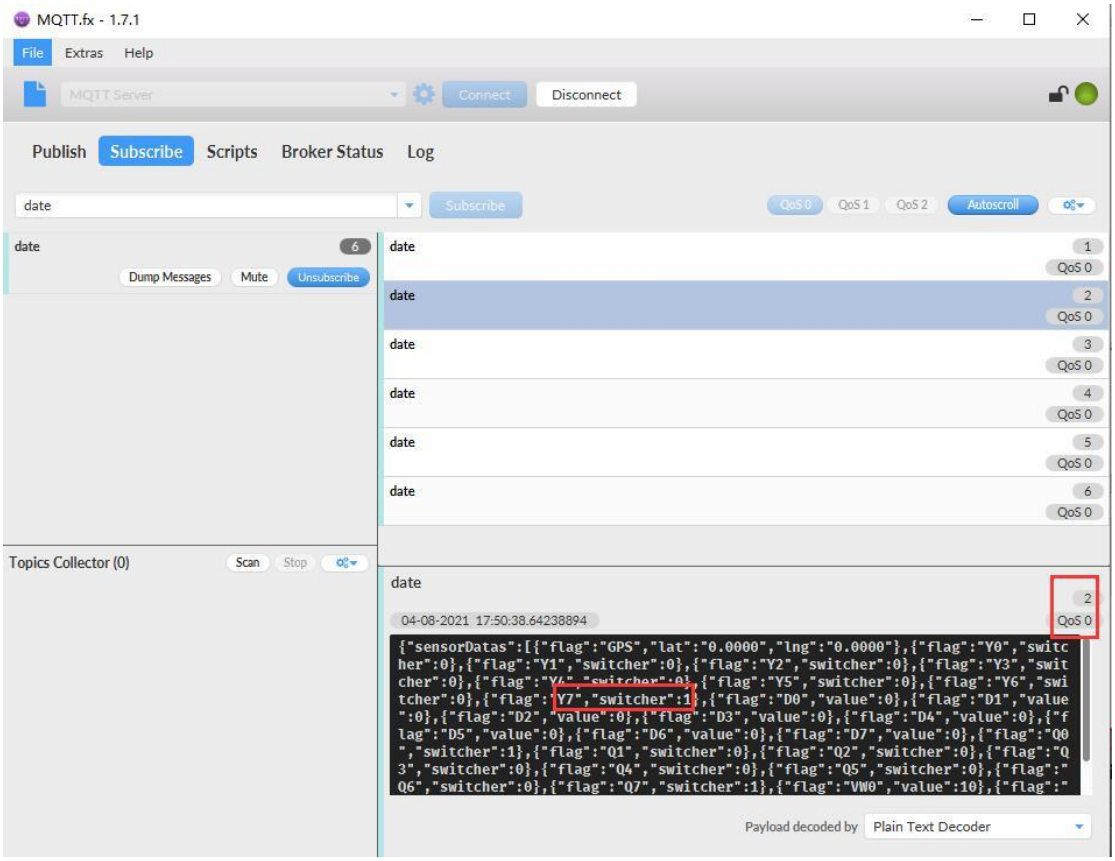
Use MQTT.fx to publish:

Public Topic is the Subscription Topic Configured in MQTT Client One

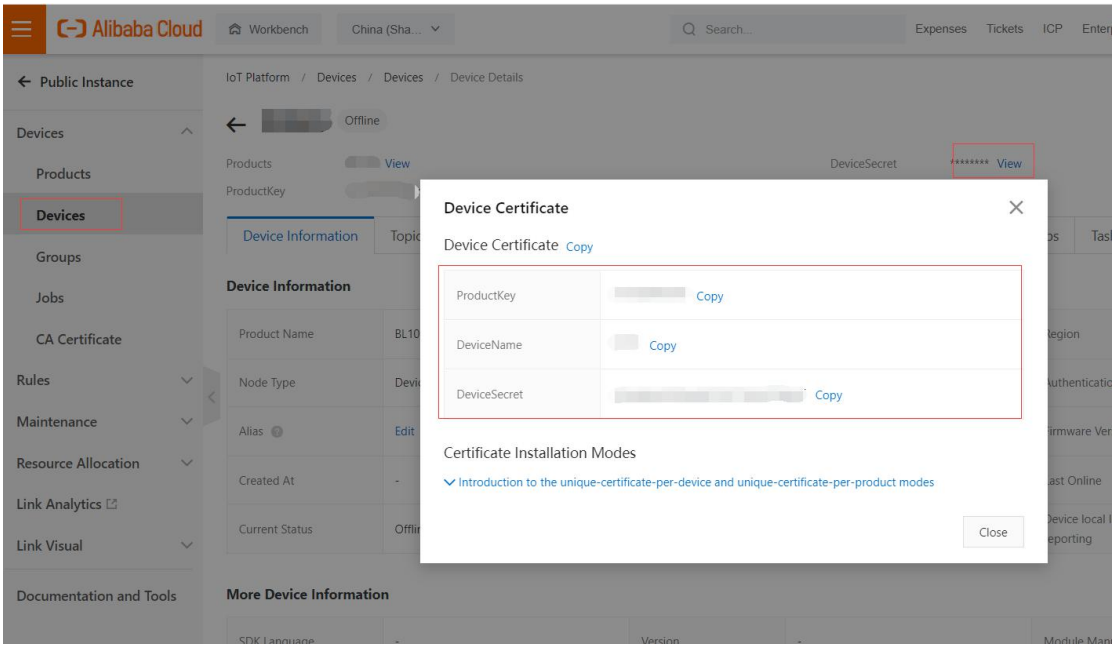


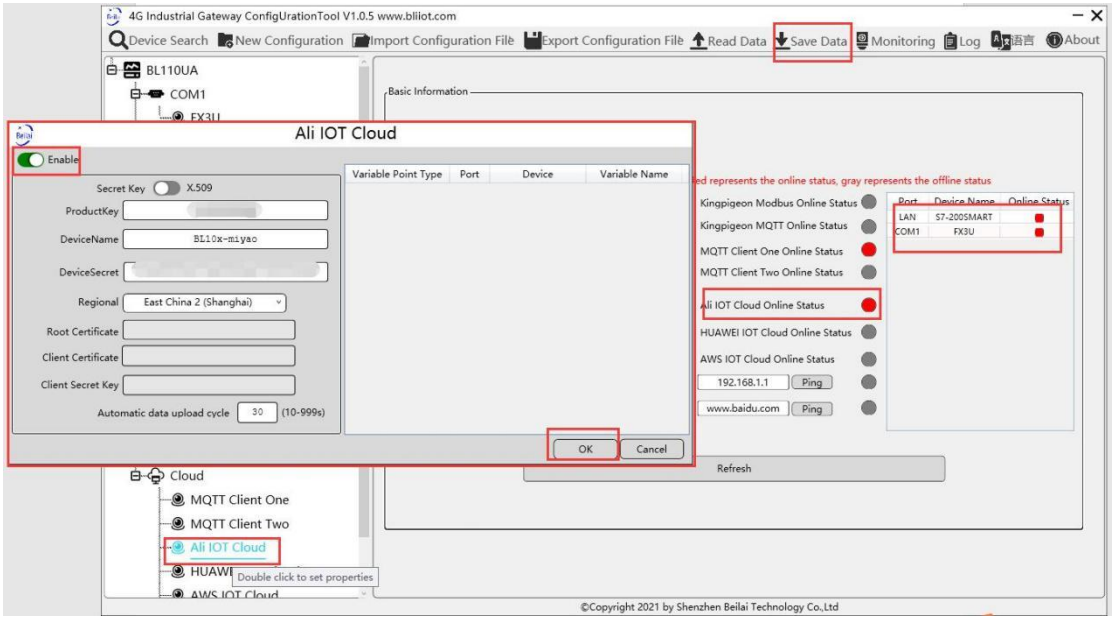

MQTT.fx - 1.7.1
File Extras Help
MQTT Server
Connect
Disconnect
Publish Subscribe Scripts Broker Status Log
} to topic down (QoS 0, Retained: false)
2021-08-04 17:48:35,908 INFO --- MqttFX ClientModel : messageArrived() with topic: date
2021-08-04 17:48:35,908 INFO --- MqttFX ClientModel : messageArrived() added: message #2 to topic 'date'
2021-08-04 17:48:41,630 INFO --- BrokerConnectorController : onDisconnect
2021-08-04 17:48:41,631 INFO --- MqttFX ClientModel : rebuildMessagesList()
2021-08-04 17:48:41,632 INFO --- ScriptsController : Clear console.
2021-08-04 17:48:41,632 INFO --- ScriptsController : Cancel script excution.
2021-08-04 17:48:41,632 INFO --- ScriptsController : Cancel script excution.
2021-08-04 17:48:41,642 INFO --- ScriptsController : Clear console.
2021-08-04 17:48:41,643 INFO --- ScriptsController : Clear console.
2021-08-04 17:48:41,645 INFO --- ScriptsController : Cancel script excution.
2021-08-04 17:50:04,047 INFO --- BrokerConnectorController : onConnect
2021-08-04 17:50:04,047 INFO --- ScriptsController : Clear console.
2021-08-04 17:50:04,052 INFO --- MqttFX ClientModel : MqttClient with ID MQTT_FX_Client_test assigned.
2021-08-04 17:50:05,194 INFO --- MqttFX ClientModel : session present: false
2021-08-04 17:50:07,359 INFO --- SubscribeController : onSubscribe
2021-08-04 17:50:07,784 INFO --- MqttFX ClientModel : rebuildMessagesList()
2021-08-04 17:50:07,784 INFO --- MqttFX ClientModel : attempt to addRecentSubscriptionTopic
2021-08-04 17:50:07,784 INFO --- MqttFX ClientModel : addRecentSubscriptionTopic : de.jensd.mqttfx.entities.Topic@455
2021-08-04 17:50:07,784 INFO --- MqttFX ClientModel : attempt to add PublishTopic
2021-08-04 17:50:07,786 INFO --- MqttFX ClientModel : sucessfully subscribed to topic date (QoS 0)
2021-08-04 17:50:18,380 INFO --- MqttFX ClientModel : messageArrived() with topic: date
2021-08-04 17:50:18,381 INFO --- MqttFX ClientModel : messageArrived() added: message #1 to topic 'date'
2021-08-04 17:50:26,190 INFO --- PublishController : publish
2021-08-04 17:50:26,191 INFO --- MqttFX ClientModel : attempt to add PublishTopic
2021-08-04 17:50:26,191 INFO --- MqttFX ClientModel : sucessfully published message {
"sensorDatas":
[
{
"switcher":1,
"flag":"Y7"
}
],
"down":"down"
}
to topic down (QoS 0, Retained: false)


MQTT.fx - 1.7.1
File Extras Help
MQTT Server
Connect
Disconnect
Publish Subscribe Scripts Broker Status Log
date
Subscribe
QoS 0 QoS 1 QoS 2 Autoscroll
date 4
Dump Messages Mute Unsubscribe
date 1 QoS 0
date 2 QoS 0
date 3 QoS 0
date 4 QoS 0
Topics Collector (0)
Scan Stop
date
1
QoS 0
04-08-2021 17:50:18.64218381
{"sensorDatas":[{"flag":"GPS","lat":"0.0000","lng":"0.0000"},{"flag":"Y0","switcher":0},{"flag":"Y1","switcher":0},{"flag":"Y2","switcher":0},{"flag":"Y3","switcher":0},{"flag":"Y4","switcher":0},{"flag":"Y5","switcher":0},{"flag":"Y6","switcher":0},{"flag":"Y7","switcher":0},{"flag":"D0","value":0},{"flag":"D1","value":0},{"flag":"D2","value":0},{"flag":"D3","value":0},{"flag":"D4","value":0},{"flag":"D5","value":0},{"flag":"D6","value":0},{"flag":"D7","value":0},{"flag":"Q0","switcher":1},{"flag":"Q1","switcher":0},{"flag":"Q2","switcher":0},{"flag":"Q3","switcher":0},{"flag":"Q4","switcher":0},{"flag":"Q5","switcher":0},{"flag":"Q6","switcher":0},{"flag":"Q7","switcher":1},{"flag":"VW0","value":10},{"flag":"
Payload decoded by Plain Text Decoder



5.4.7 Alibaba Cloud Configuration





(1) Double click Ali IOT Cloud to enter configuration box

(2) Click Enable to enable(Green) Alibaba Cloud. Default is disabled (Gray)

(3) Secret Key/X.509: Click it to move the button on the right for connecting with certificate. Default is connecting with Private Key with button on the left

(4) Product Key: Input the same ProductKey as the one in Alibaba cloud

(5) Device Name: Input the same device name as the one in Alibaba cloud

(6) Device Secret: Input the same device secret as the one in Alibaba cloud

(7) Region: Select Alibaba cloud region. Default is East China 2(Shanghai)

(8) Root Certificate: Upload root certificate if connecting with certificate is enabled

(9) Client Certificate: Upload client certificate if connecting with certificate is enabled

(10) Client Secret Key: Upload client secret key if connecting with certificate is enabled

(11) Automatic Data Upload Cycle: Cycle time of data uploading, default is 30s

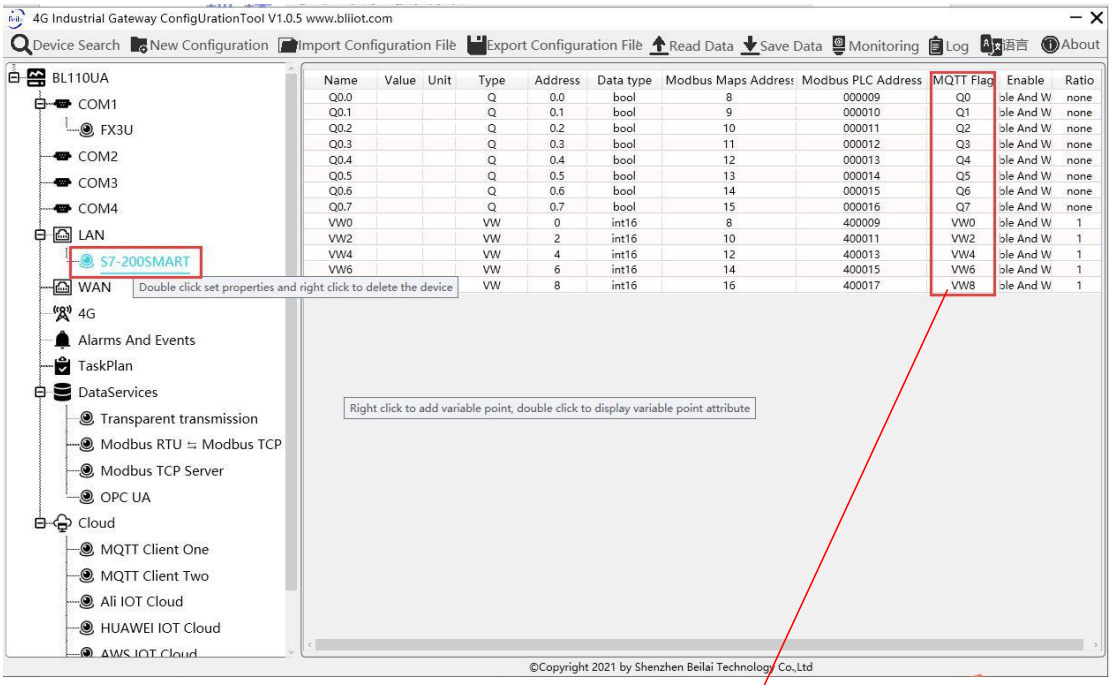
(12) Datapoint Uploading Selection: select the datapoints to be uploaded on the right box. In default the box is blank with all datapoints to be uploaded.

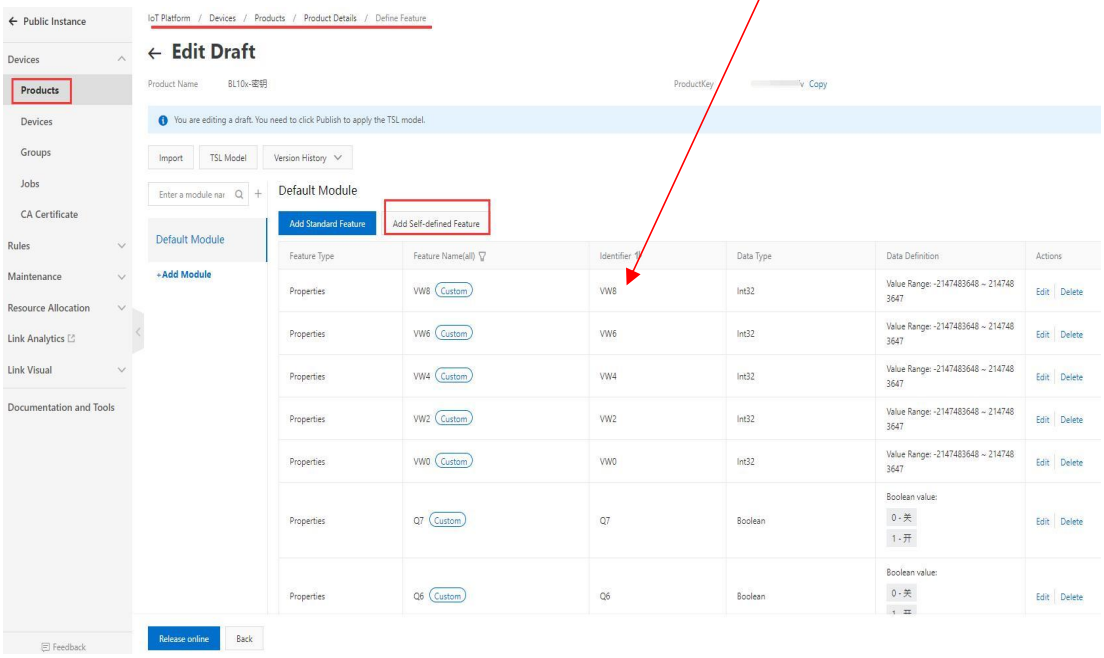
(13) Click OK to confirm the setting

(14) Click Save Data. Gateway will restart automatically and Alibaba cloud is enabled successfully. Open configuration software and login the device. Alibaba cloud connection status can be viewed from basic information. If indicator button is red, it means device is connected with Alibaba cloud. Slave device connection status can be viewed from the right box

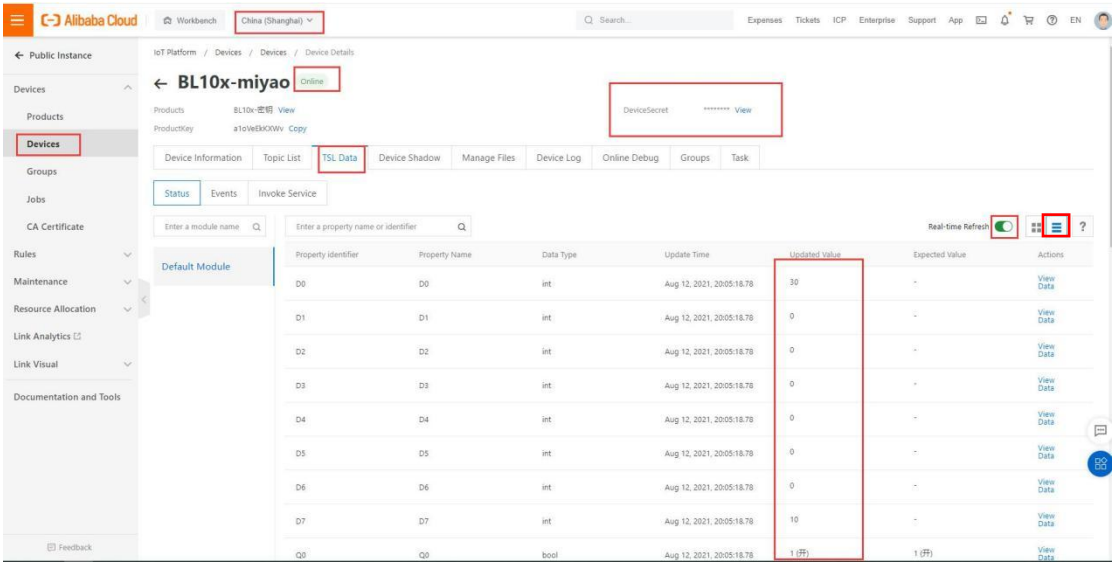
5.4.8 View Data in Alibaba Cloud

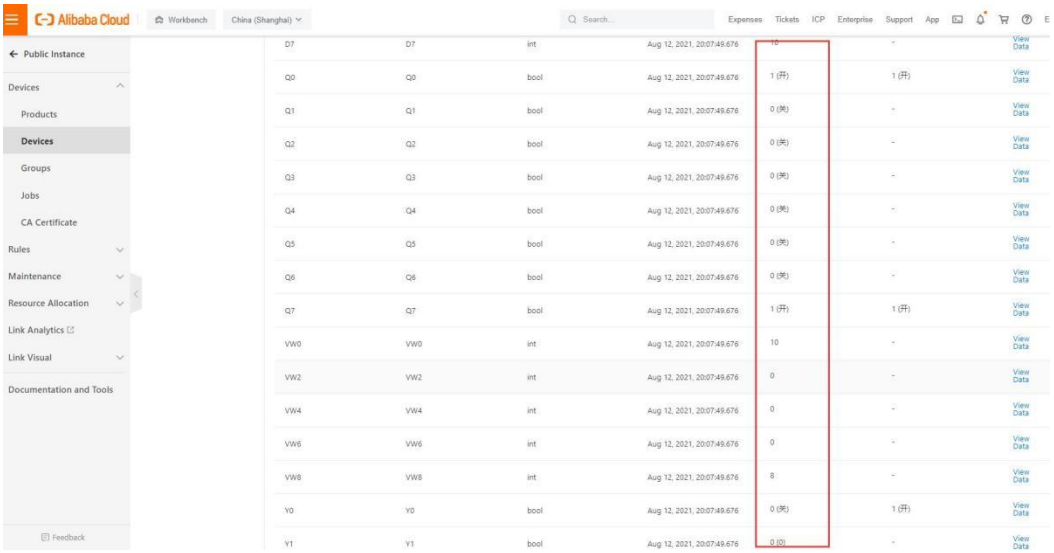
Add datapoint to Alibaba Cloud as below picture. Make sure datapoint mark is the same as MQTT flag in configuration software. For example, MQTT flag of datapoint VW8 of PLC S7-200SMART is VW8 in configuration software, then set VW8 as datapoint mark in Ali Cloud. Function name and variable name can be different.

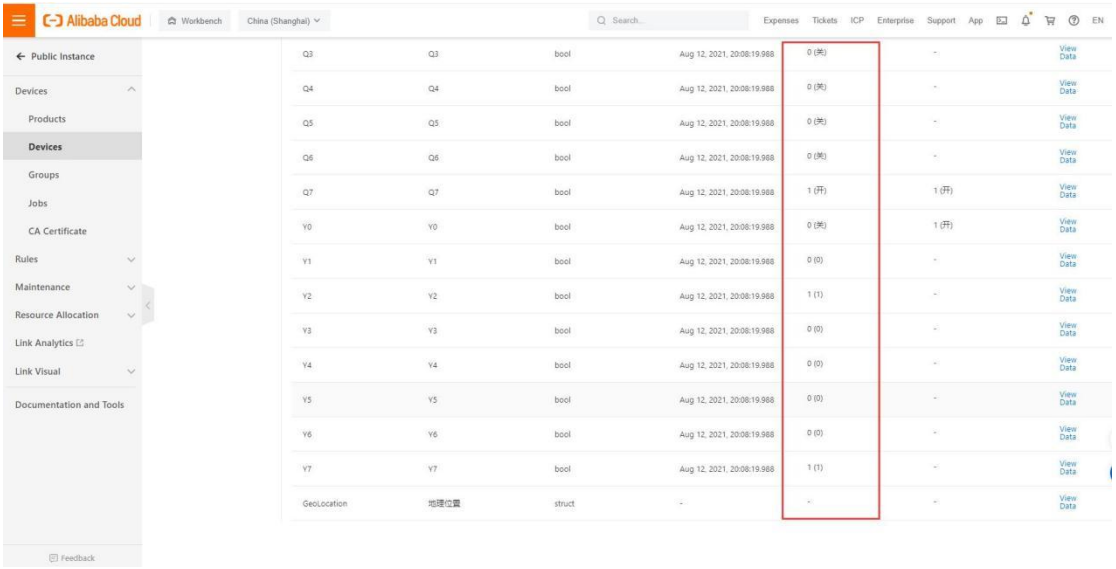




Data received in Alibaba Cloud is as below:

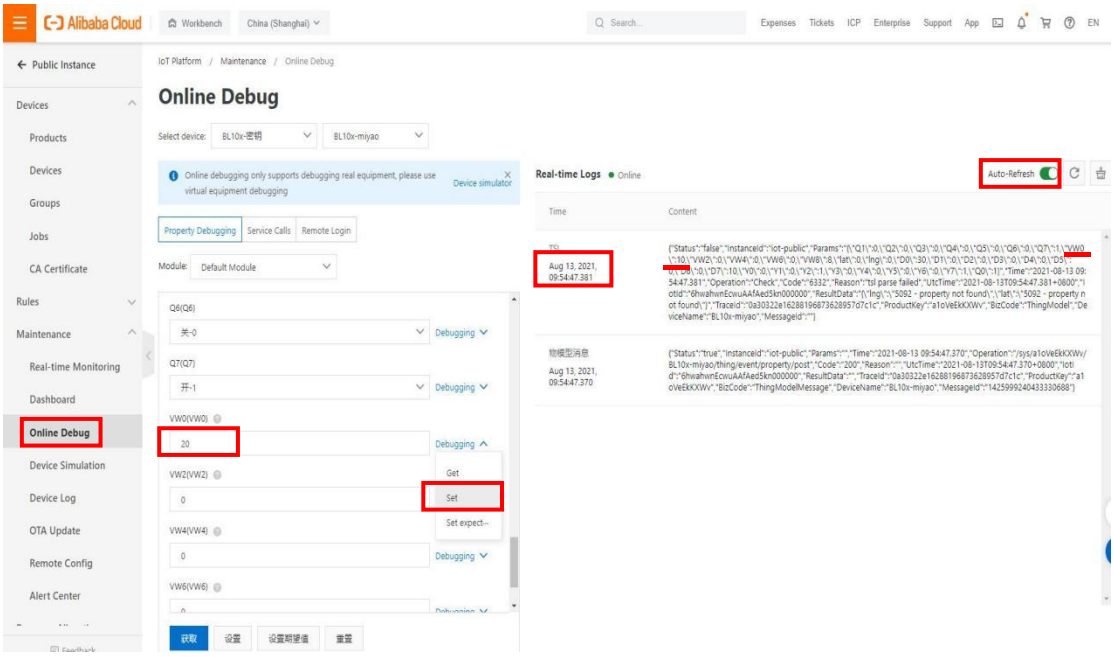


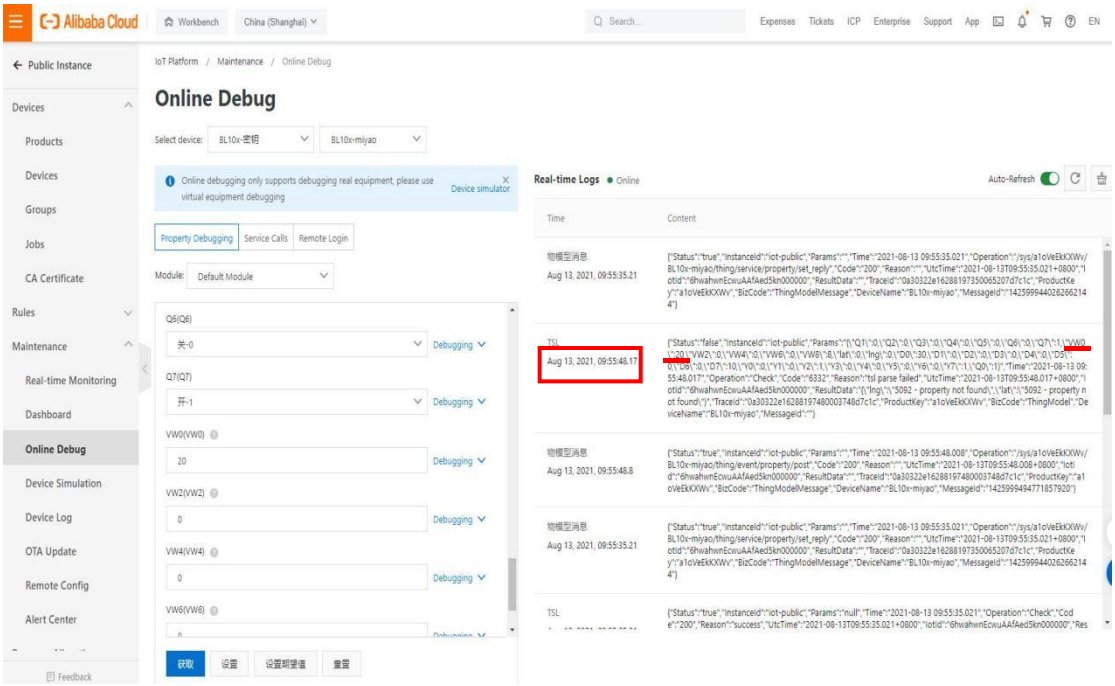




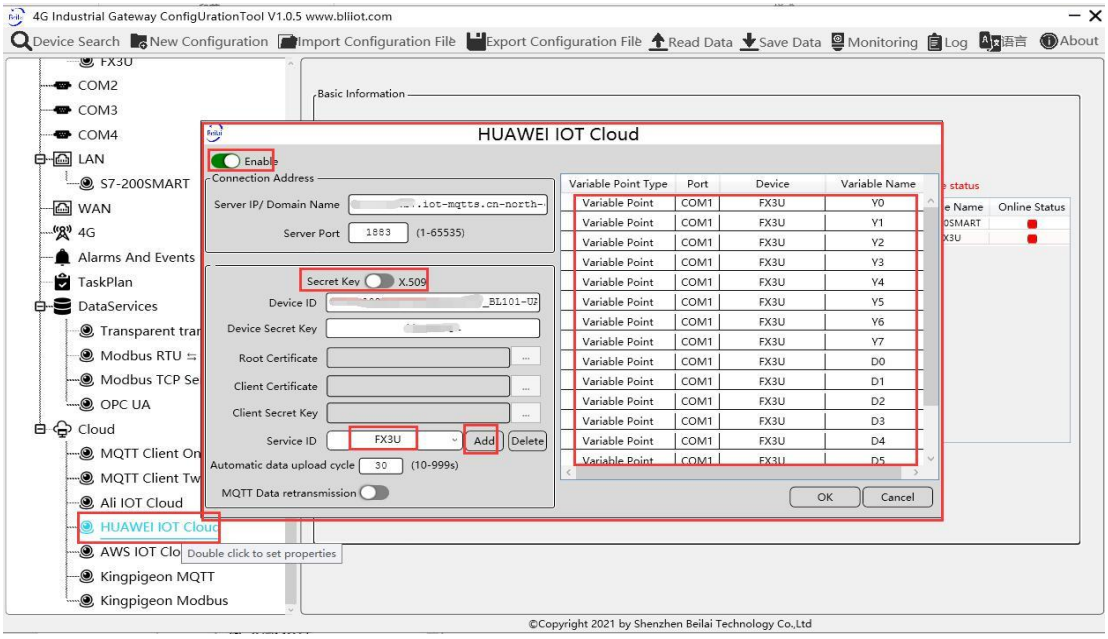
Sending command from Alibaba Cloud

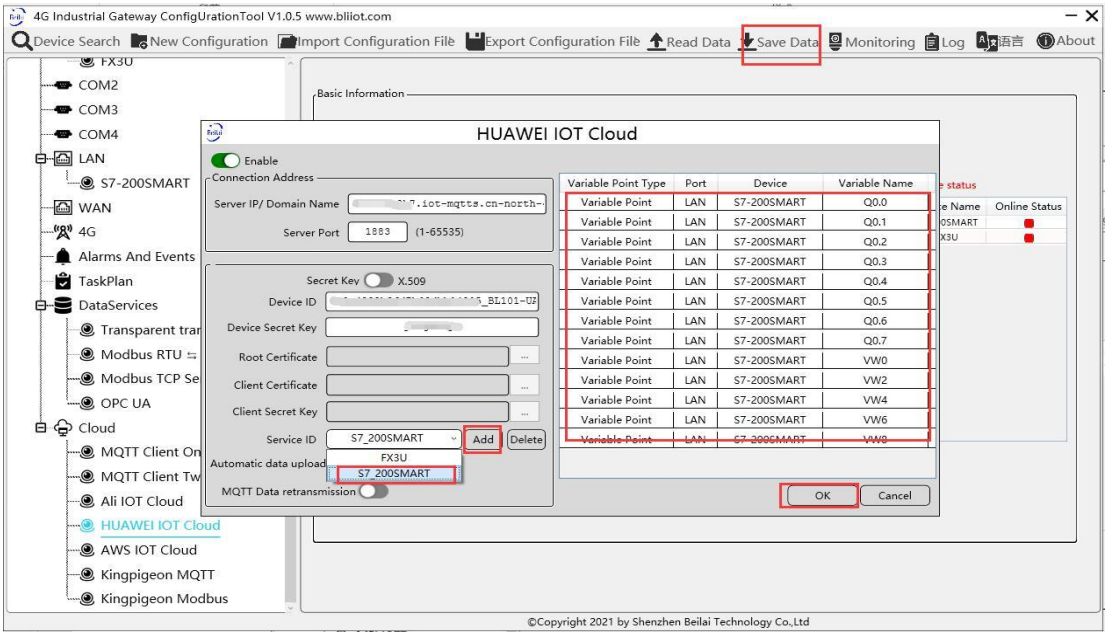
Note: Currently Alibaba shadow function is not supported. Need to send command from online debugging


Alibaba Cloud
Workbench
China (Shanghai)
Public Instance
Devices
Products
Devices
Groups
Jobs
CA Certificate
Rules
Maintenance
Real-time Monitoring
Dashboard
Online Debug
Device Simulation
Device Log
OTA Update
Remote Config
Alert Center
IoT Platform / Maintenance / Online Debug
Online Debug
Select device:
BL10x-密钥
BL10x-miyao
Online debugging only supports debugging real equipment, please use virtual equipment debugging
Device simulator
Property Debugging
Service Calls
Remote Login
Module:
Default Module
Q6(Q6)
关-0
Debugging
Q7(Q7)
开-1
VW0(VW0)
20
VW2(VW2)
0
VW4(VW4)
VW6(VW6)
Get
Set
Set expect-
获取
设置
设置期望值
重置
Real-time Logs
Online
Auto-Refresh
Time
Content
Aug 13, 2021, 09:54:47.381
物模型消息
Aug 13, 2021, 09:54:47.370


Alibaba Cloud
Workbench
China (Shanghai)
Public Instance
Devices
Products
Devices
Groups
Jobs
CA Certificate
Rules
Maintenance
Real-time Monitoring
Dashboard
Online Debug
Device Simulation
Device Log
OTA Update
Remote Config
Alert Center
IoT Platform / Maintenance / Online Debug
Online Debug
Select device:
BL10x-密钥
BL10x-miyao
Online debugging only supports debugging real equipment, please use virtual equipment debugging
Device simulator
Property Debugging
Service Calls
Remote Login
Module:
Default Module
Q6(Q6)
关-0
Debugging
Q7(Q7)
开-1
VW0(VW0)
20
VW2(VW2)
0
VW4(VW4)
VW6(VW6)
获取
设置
设置期望值
重置
Real-time Logs
Online
Auto-Refresh
Time
Content
物模型消息
Aug 13, 2021, 09:55:35.21
TSL
Aug 13, 2021, 09:55:48.17
物模型消息
Aug 13, 2021, 09:55:48.8
物模型消息
Aug 13, 2021, 09:55:35.21
TSL

5.4.9 HUAWEI Cloud Configuration





(1) Double click HUAWEI IOT Cloud to enter configuration box

(2) Click Enable to enable(green) HUAWEI Cloud. Default is disabled(gray)

(3) Server IP/Domain Name: input HUAWEI Cloud connecting address(Login to HUAWEI Cloud, enter console, click overview to get server IP address)

(4) Server Port: Default is 1883 for connecting with secret key. If connecting with certificate is selected, server port is 8883

(5) Secret Key/X.509: click it to move the button on the right to set connecting with certificate. In default the button is on the left with setting of connecting with secret key.

(6) Device ID: set the same device ID as the one in HUAWEI Cloud

(7) Device Secret Key: Set the same device secret key as the one in HUAWEI Cloud

(8) Root Certificate: Upload root certificate if connecting with certificate is selected

(9) Client Certificate: Upload client certificate if connecting with certificate is selected

(10) Client Secret Key: Upload client secret key if connecting with certificate is selected.

(11) Service ID: Input the same service ID as the one in HUAWEI Cloud. Mutiple service IDs can be set. This example is service IDs FX3U and S7_200SMART

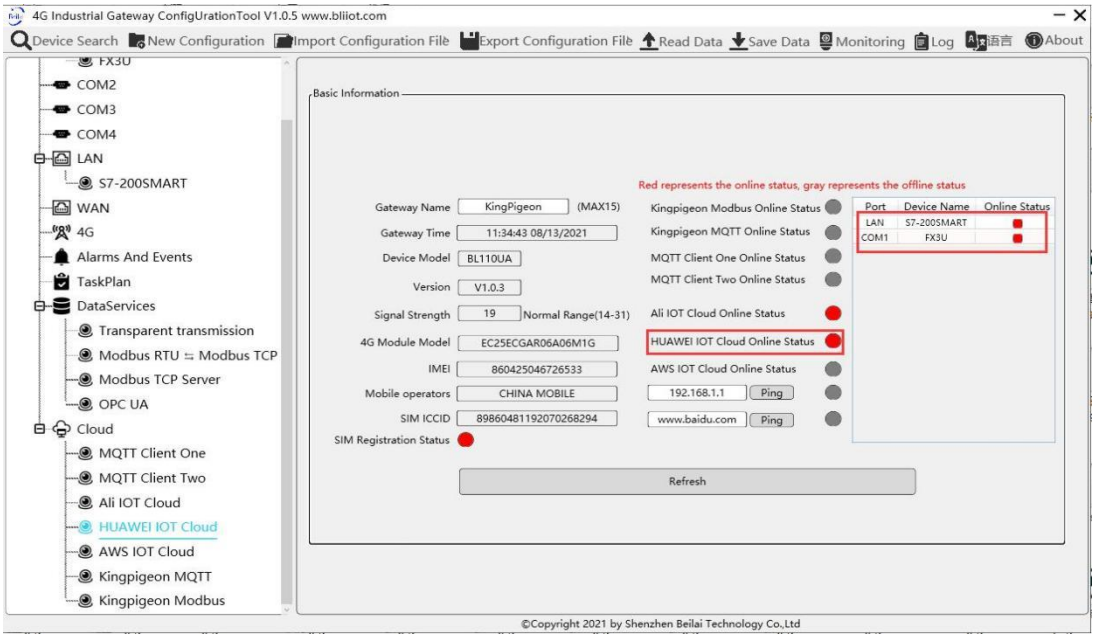
(12) Automatic Data Upload Cycle: Cycle time of uploading data, default is 30s

(13) MQTT Data Retransmission: Click it to enable(green) MQTT offline data retransmission once network resumes. Gray indicates disabled

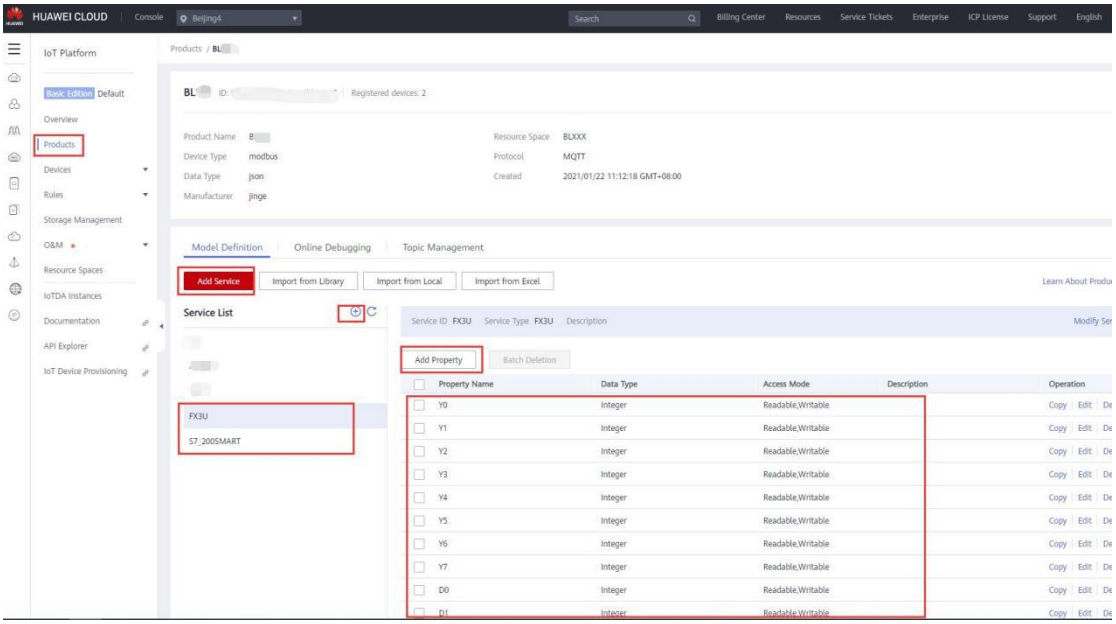
(14) Datapoint Uploading Selection: Right click the box to select datapoints for uploading. In default the right box is blank with all datapoints to be uploaded. For example, select Service ID FX3U datapoints to upload. Right click the box to enter datapoint box, select FX3U datapoint Y0 and hold the mouse to drag it to uploading points. Click OK to confirm and the datapoint will appear in the box. Select service ID S7_200SMART, right click the box to enter datapoint box, select datapoint and click OK to confirm it.

(15) Click OK to confirm HUAWEI Cloud configuration

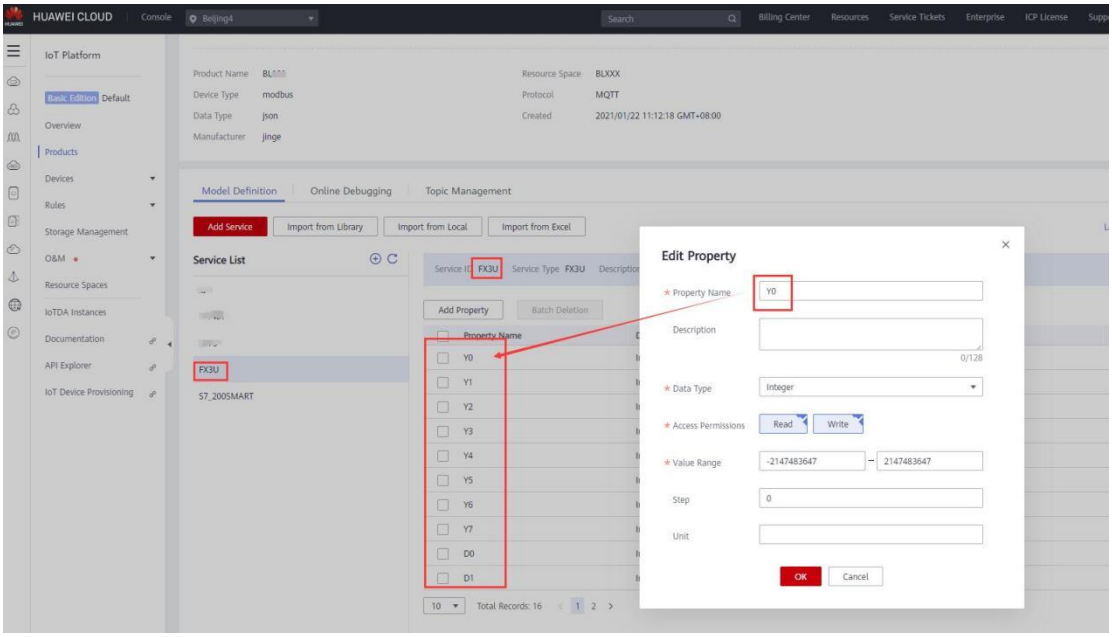
(16) Click Save Data. Gateway will restart automatically and HUAWEI Cloud is enabled successfully. Open gateway configuration software and login device. HUAWEI Cloud connection status can be viewed from basic information. Red indicates device is connected with HUAWEI Cloud. On the right side, slave device connection status can be viewed

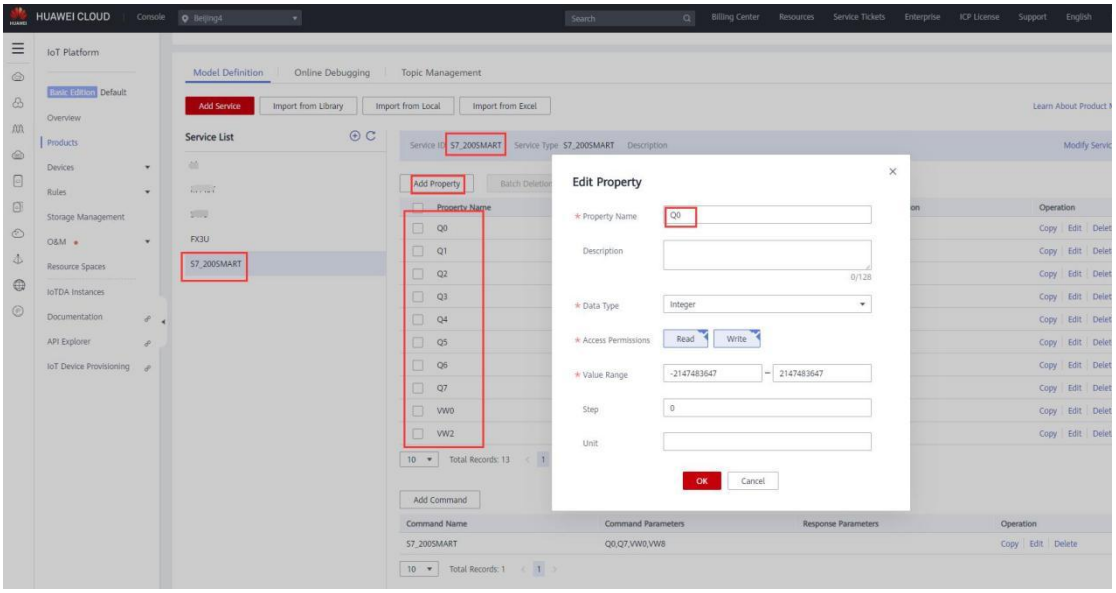


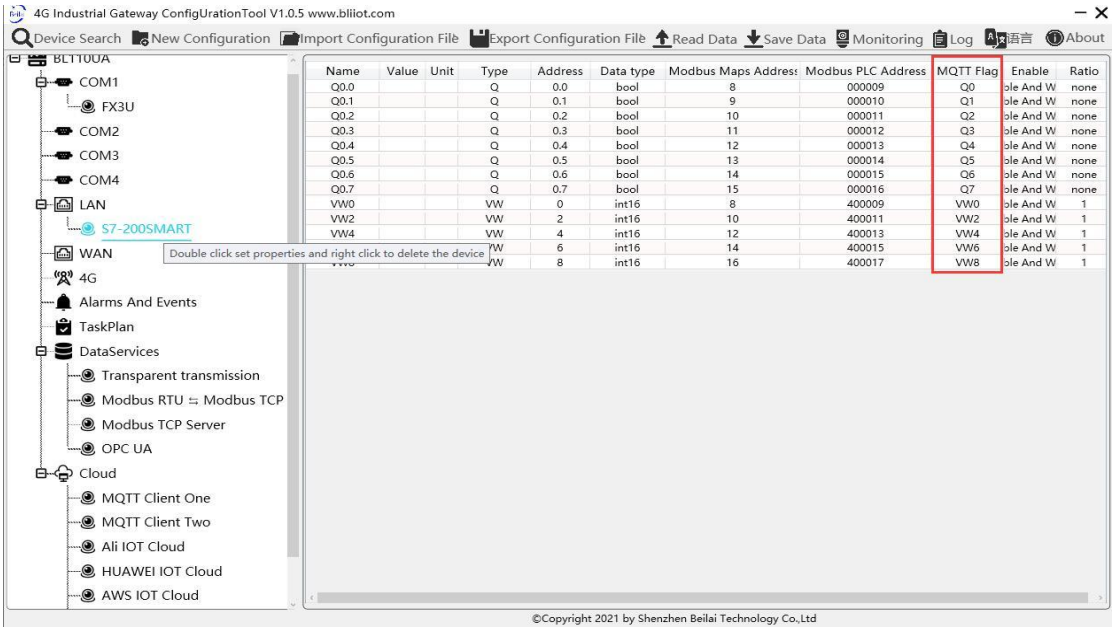
5.4.10 View Data in HUAWEI Cloud



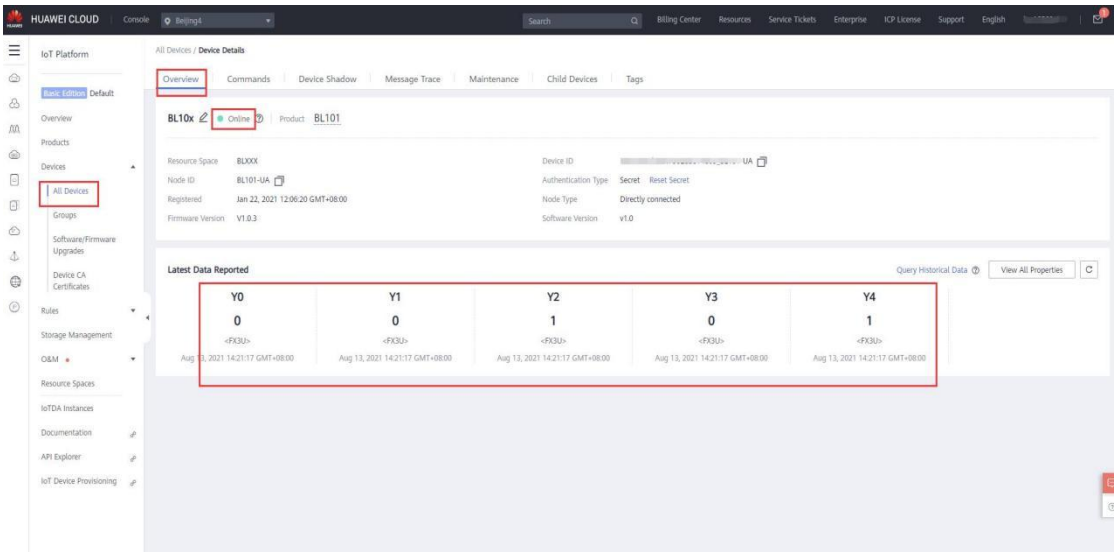
Property Name is the MQTT Mark in configuration software



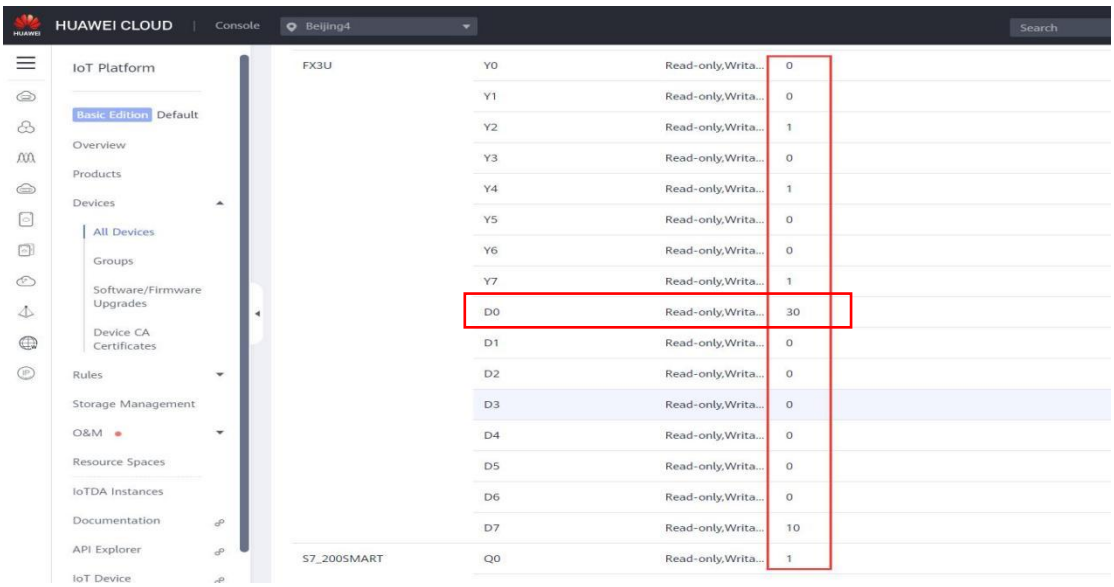


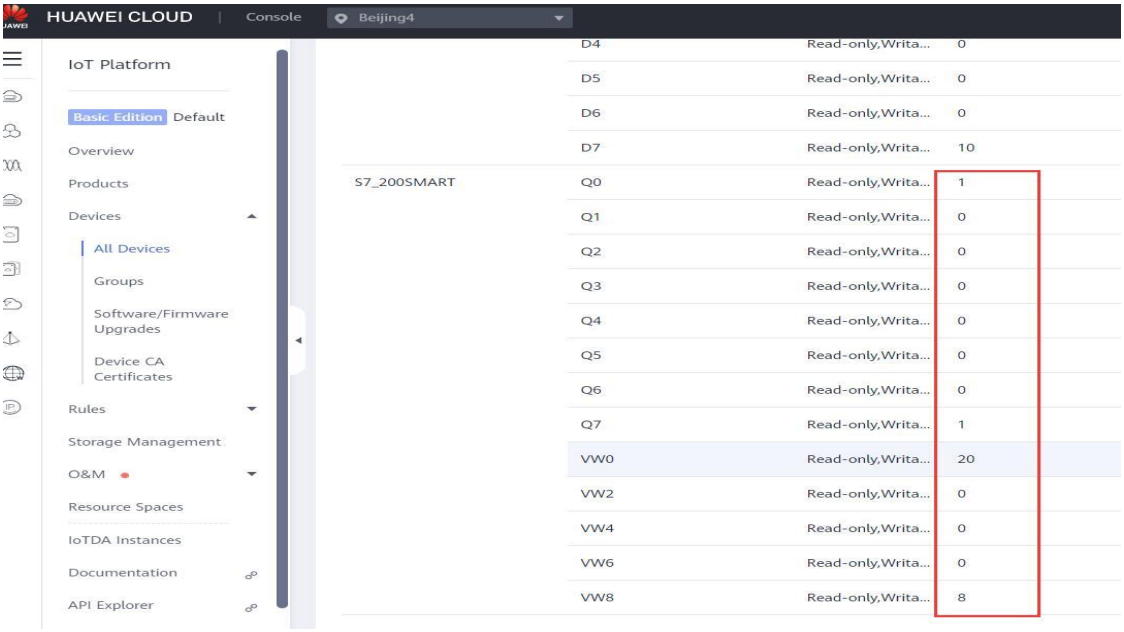


Data received in HUAWEI Cloud:



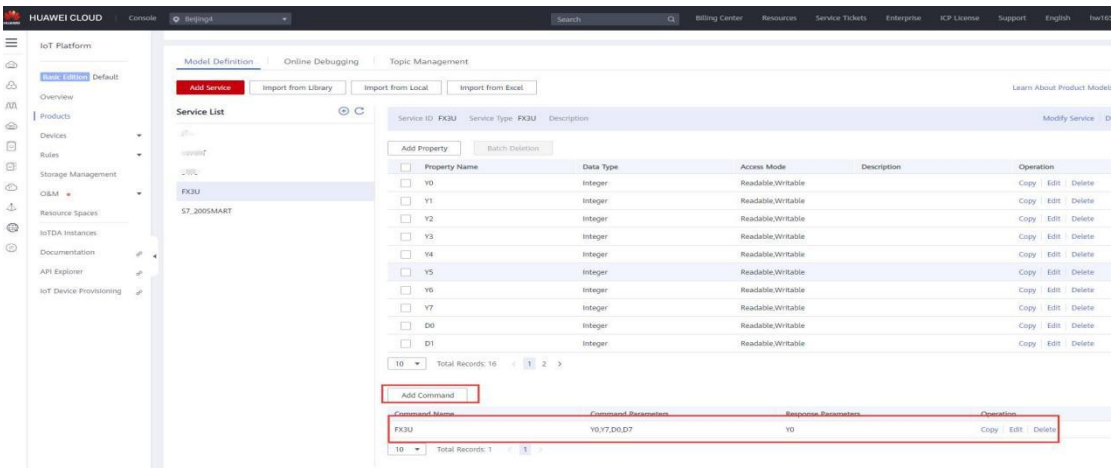
Click View All Properties or Device Shadow to check all data as below:

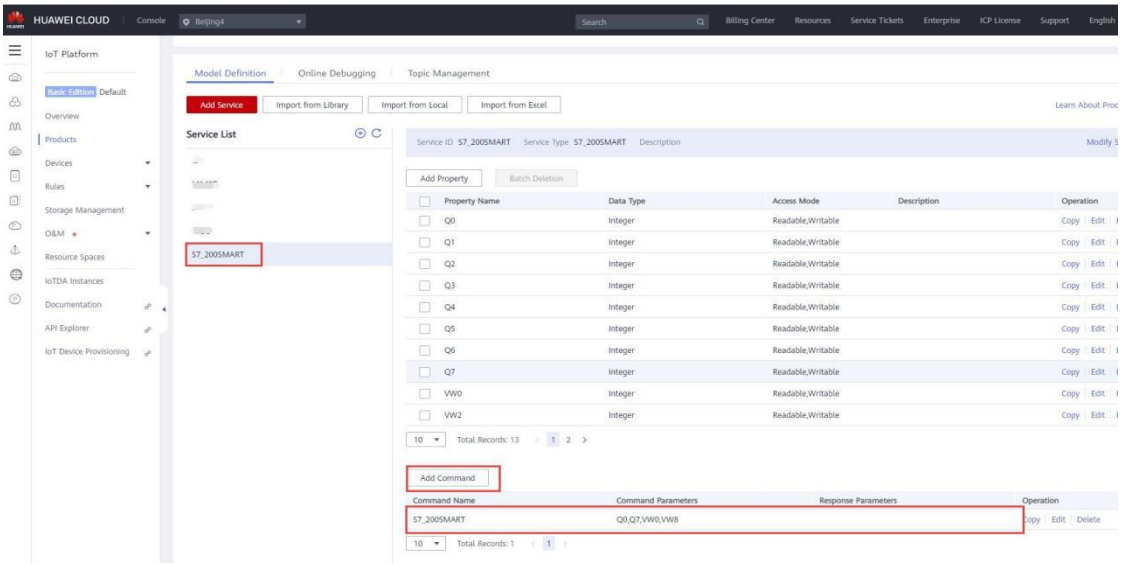




Send command from HUAWEI Cloud

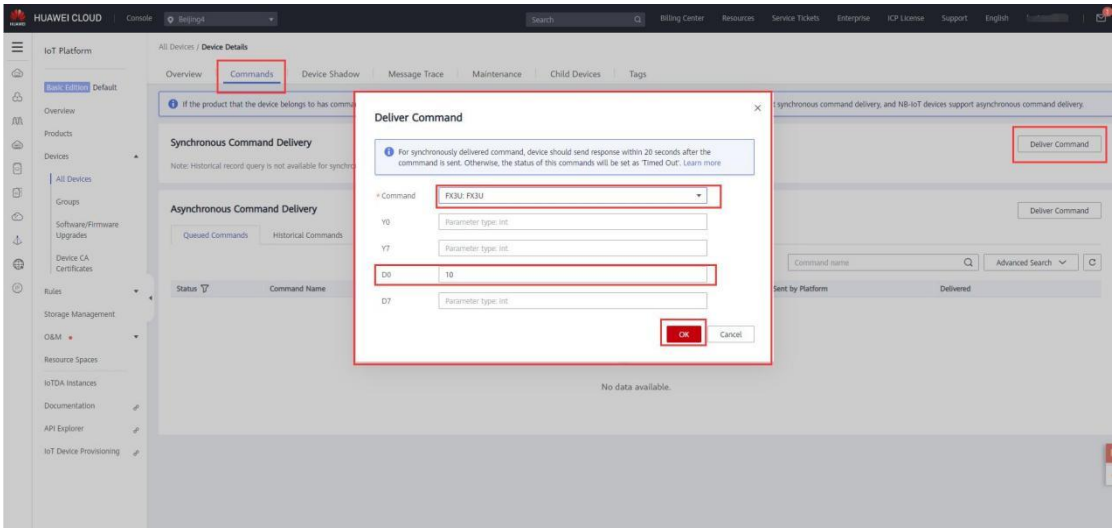
Add command to be sent



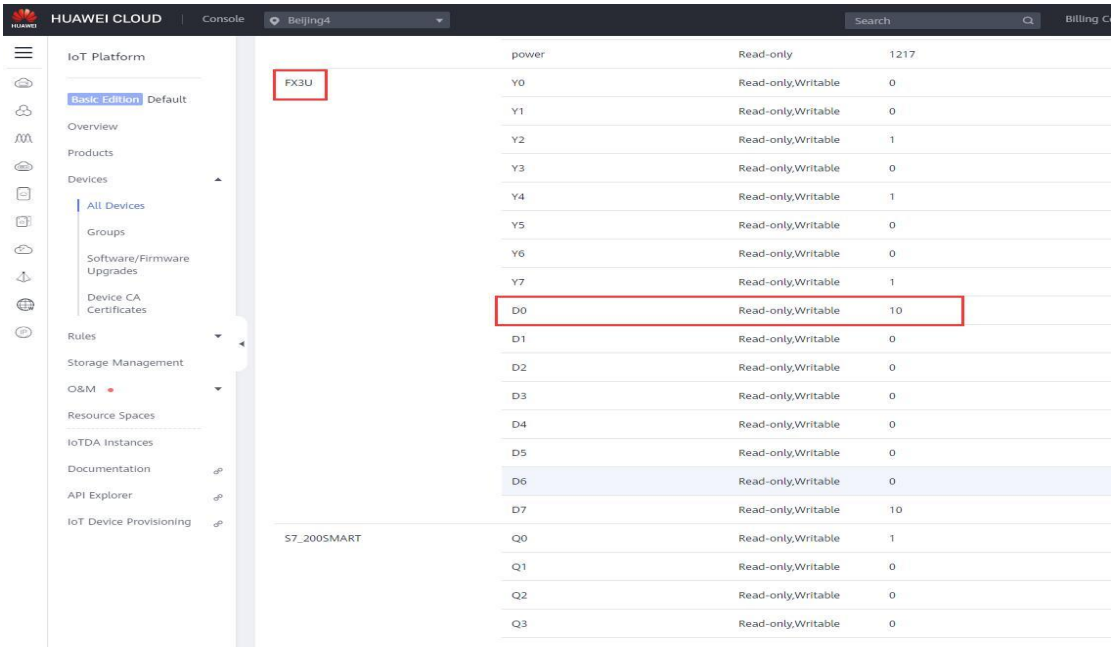


Below is example of sending data to FX3U D0.

In device shadow we can see D0 data is 30

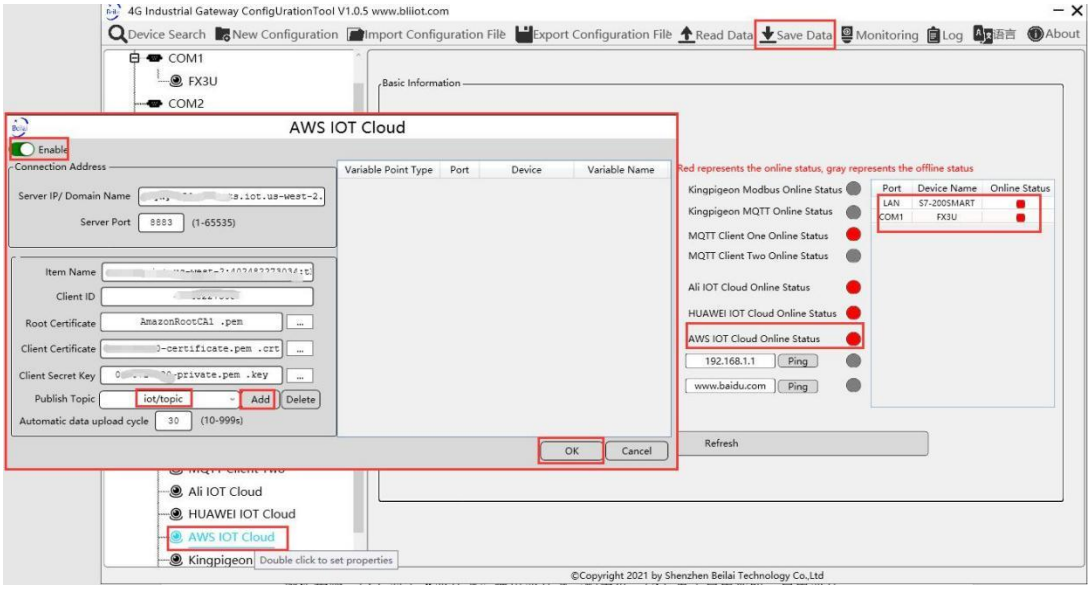


Check whether D0 data is changed or not in device shadow



5.4.11 AWS Cloud Configuration

AWS supports publishing multiple topics. Configuration is the same as that of configuring multiple service ID of HUAWEI Cloud. Below example is configuring single topic with all datapoints to be published.



(1) Double click AWS to enter configuration box

(2) Click Enable to enable(green) AWS, default is disabled(gray)

(3) Server IP/Domain Name: Input endpoint of connecting to AWS
(Login to AWS, enter console, click Things and click Interact to view it)

(4) Server Port: 8883

(5) Item Name: Input thing ARN(Click Details of Thing to view ARN in AWS)

(6) Client ID: Input AWS Account ID (view from user information in AWS)

(7) Root Certificate: Select root certificate and upload it

(8) Client Certificate: Select client certificate and upload it

(9) Client Secret Key: Select client secret key and upload it.

(10) Publish Topic: Input the topic of rule created in AWS. It's the topic of MQTT message publishing. Click Add to set more publishing topics. Click Delete to delete selected topic. For example, login to AWS, click Act and click Rules to view the topic. It's iot/topic, thus input iot/topic

(11) Automatic Data Upload Cycle: Cycle time of uploading data, default is 30s.

(12) Datapoint Uploading Selection: Select datapoint to upload in the right box. Default is blank box with all datapoints to be uploaded

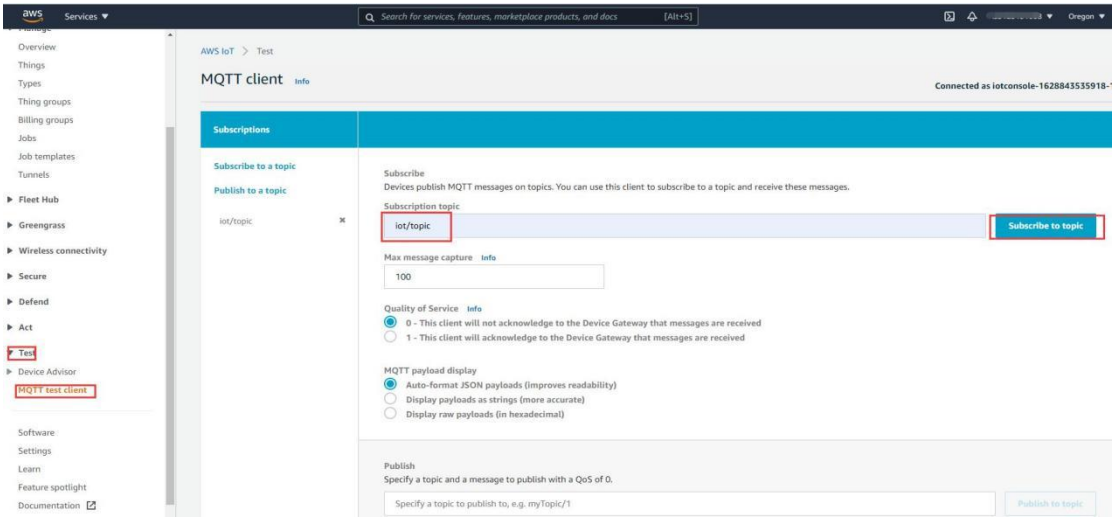
(13) Click OK to confirm AWS configuration

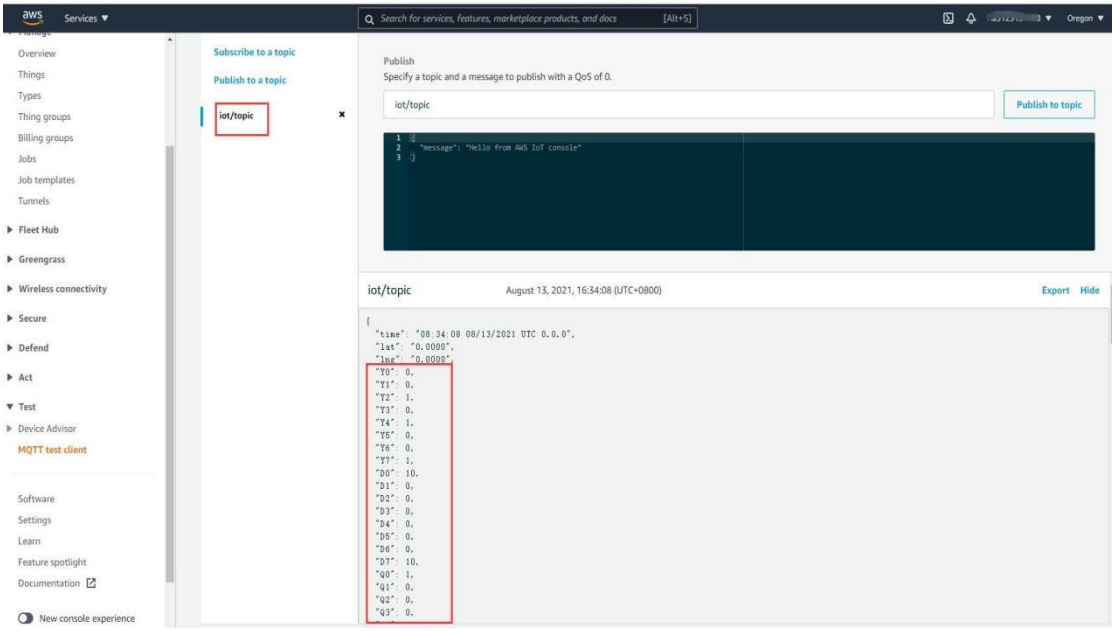
(14) Click Save Data. Gateway will restart and AWS is enabled successfully. Open configuration software and login the device. AWS connection status can be viewed from basic information.

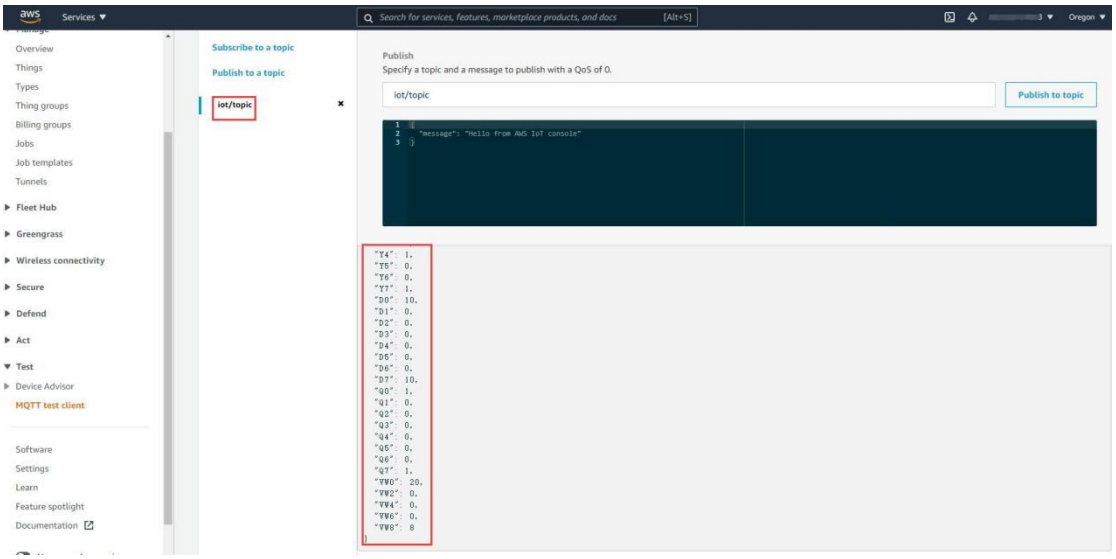
Red light indicates AWS is connected. Slave device connection status can be viewed from the right box

5.4.12 View Data in AWS Cloud

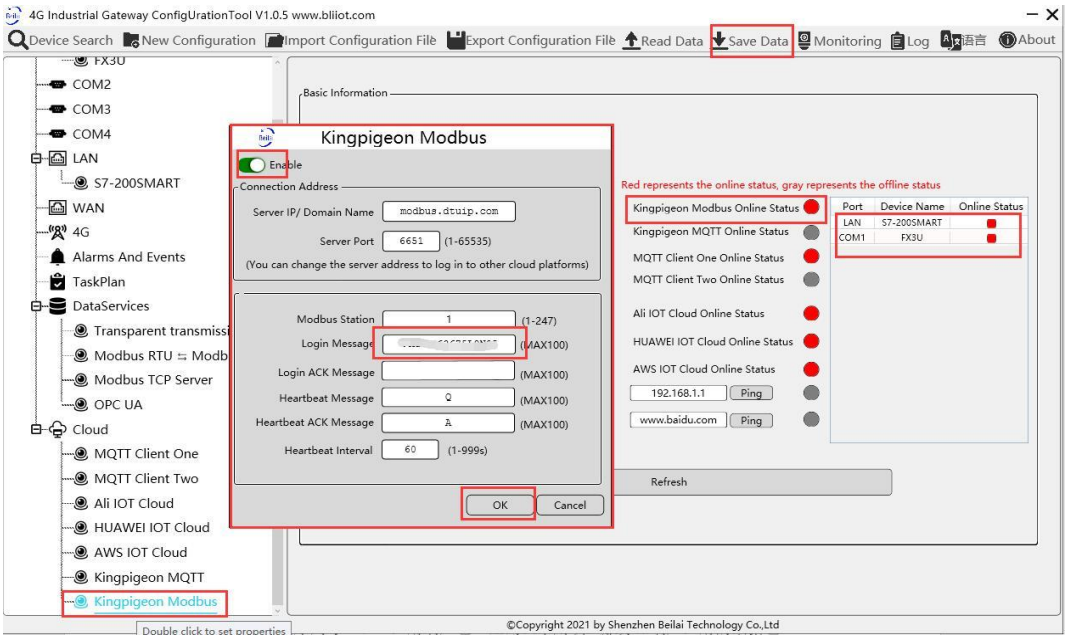
Login to AWS, click Act, click Test and select subscription topic “iot/topic” to view messages published by BL110 gateway







5.4.13 King Pigeon Cloud via Modbus



(1) Double click KingPigeon Modbus to enter configuration window

(2) Click Enable to enable(green) King Pigeon cloud via Modbus. Default is disabled (Gray)

(3) Server IP/Domain Name: modbus.dtuip.com. (Automatic filling in default)

(4) Server Port: 6651 (Automatic filling in default)

(5) Modbus Station: Set Gateway BL110 Modbus communication address

(6) Login Message: Input device serial number issued by King Pigeon.

(7) Login ACK Message: Not necessary for King Pigeon cloud connection

(8) Heartbeat Message: Q (Automatic filling in default)

(9) Heartbeat ACK Message: A(Automatic filling in default)

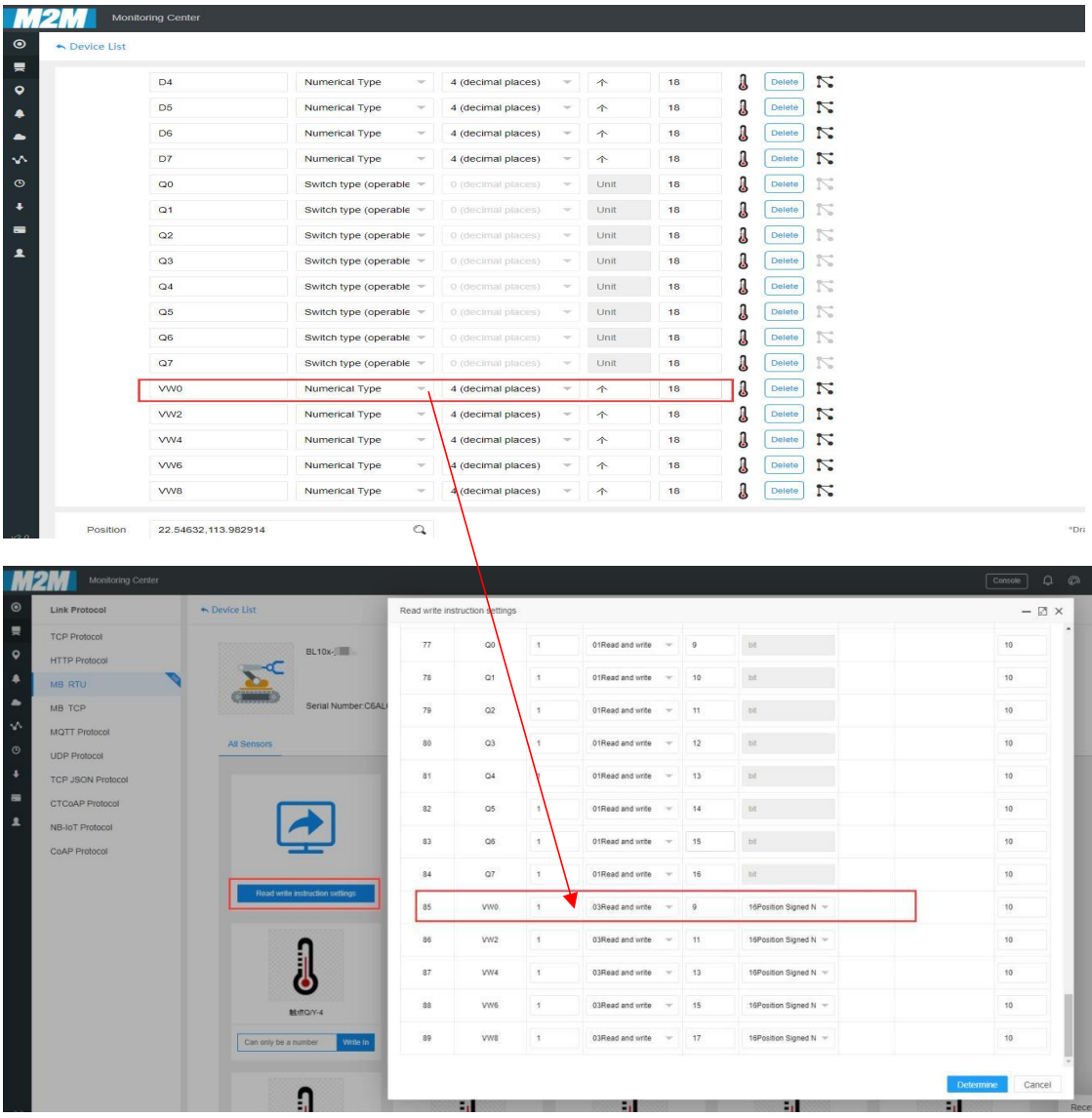
(10) Heartbeat Interval: Set cycle time of sending Heartbeat message. Default is 60s

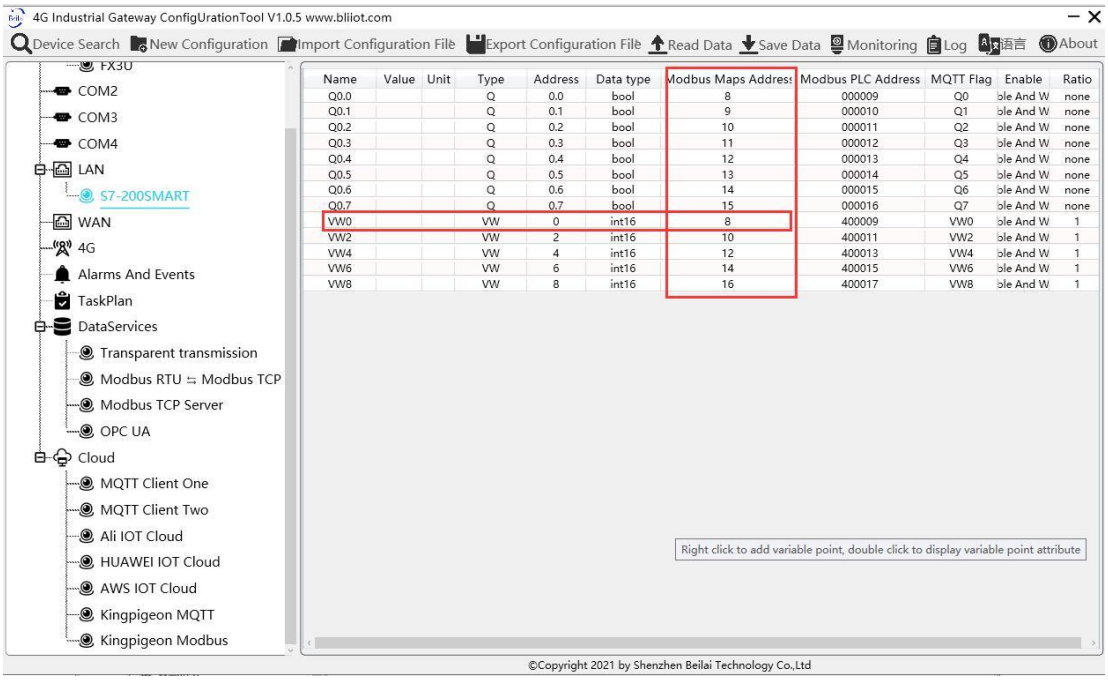
(11) Click OK to confirm the configuration.

(12) Click Save Data. Gateway will restart and King Pigeon Cloud via Modbus is enabled successfully. Open configuration software and login device. King Pigeon cloud via Modbus connection status can be viewed from basic information. Red indicates device is connected King Pigeon cloud via Modbus. Slave devices connection status can be viewed from the right box.

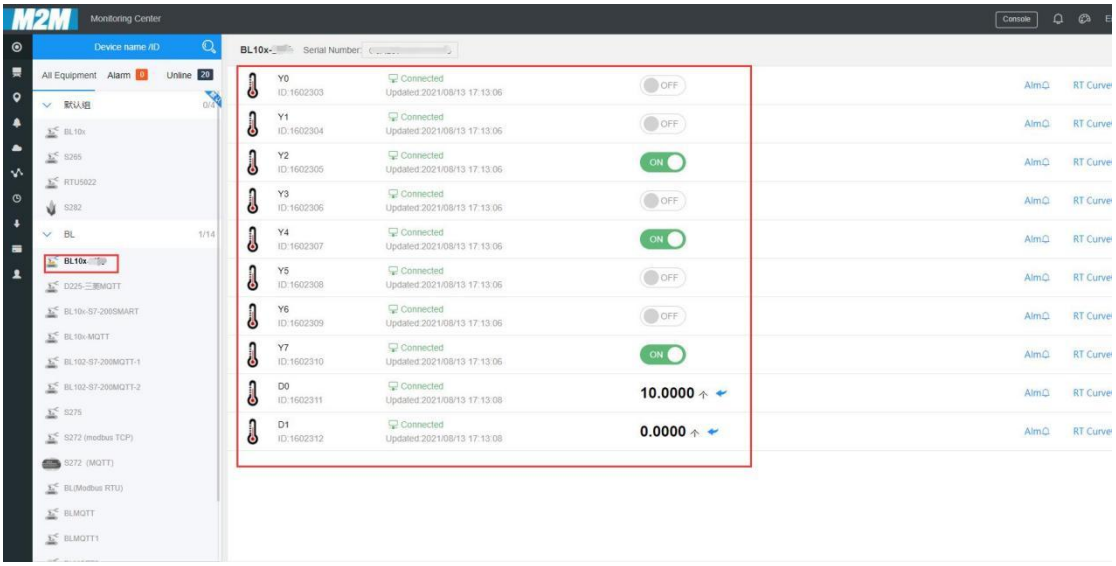
5.4.14 View Data in King Pigeon Cloud via Modbus

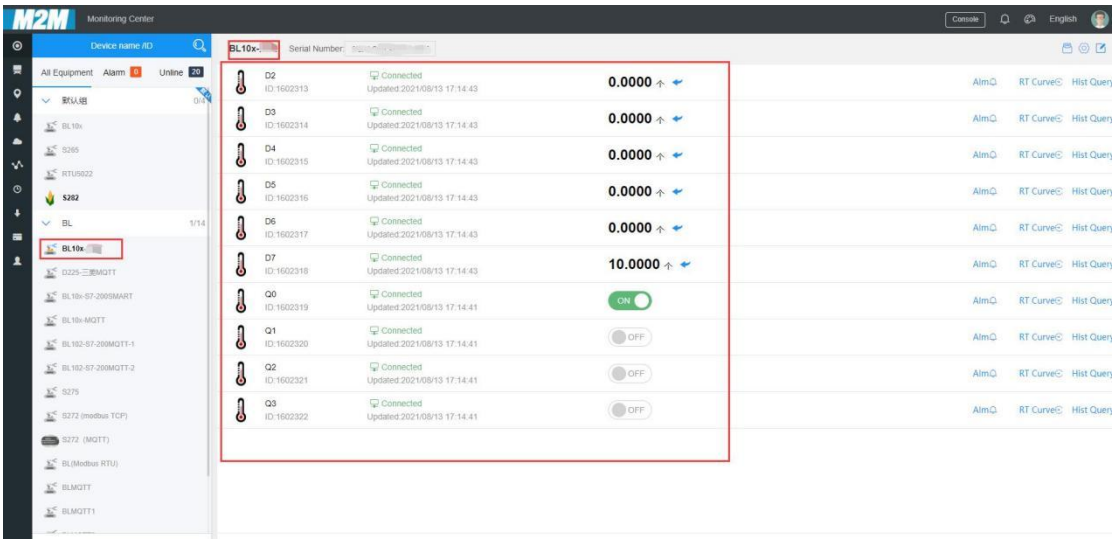
Configure datapoint in cloud like below picture. First create datapoint, then enter connection setting and put datapoint Modbus ID, function code, address, data format, byte sequence and collecting cycle. Modbus address in King Pigeon cloud and configuration software is deviated by 1. For example, datapoint VW0 of PLC S7-200SMART in configuration software is 8, then put 9 in cloud. Sensor names in cloud can be different from those in configuration software

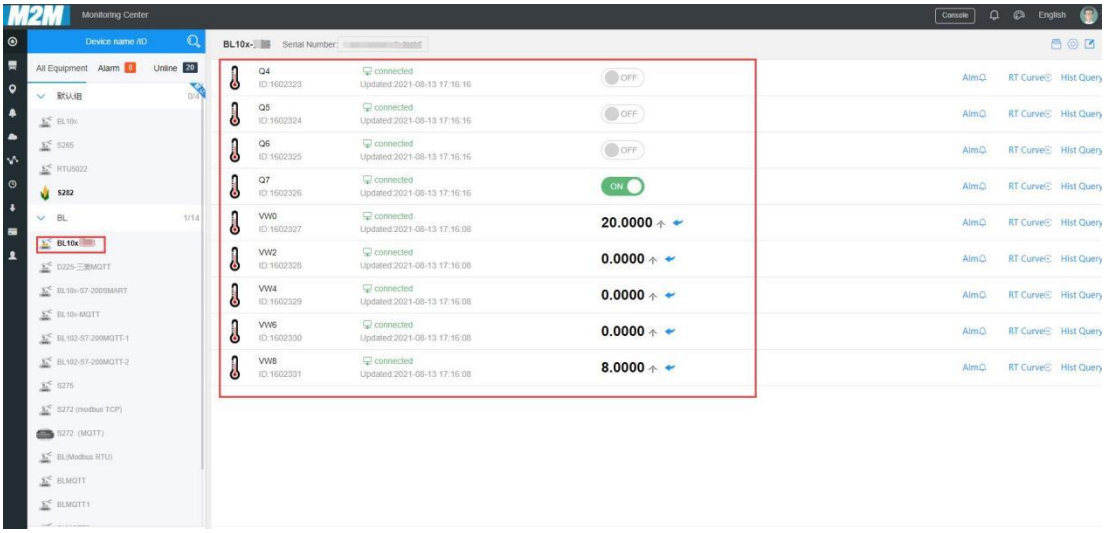




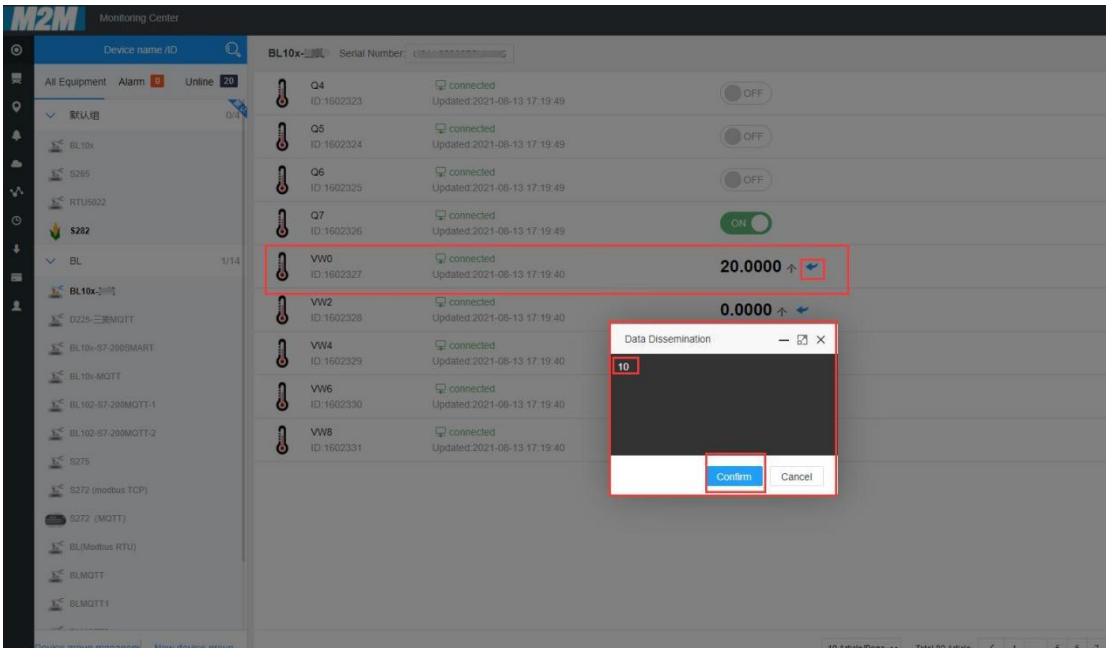
Collected data value is as below:

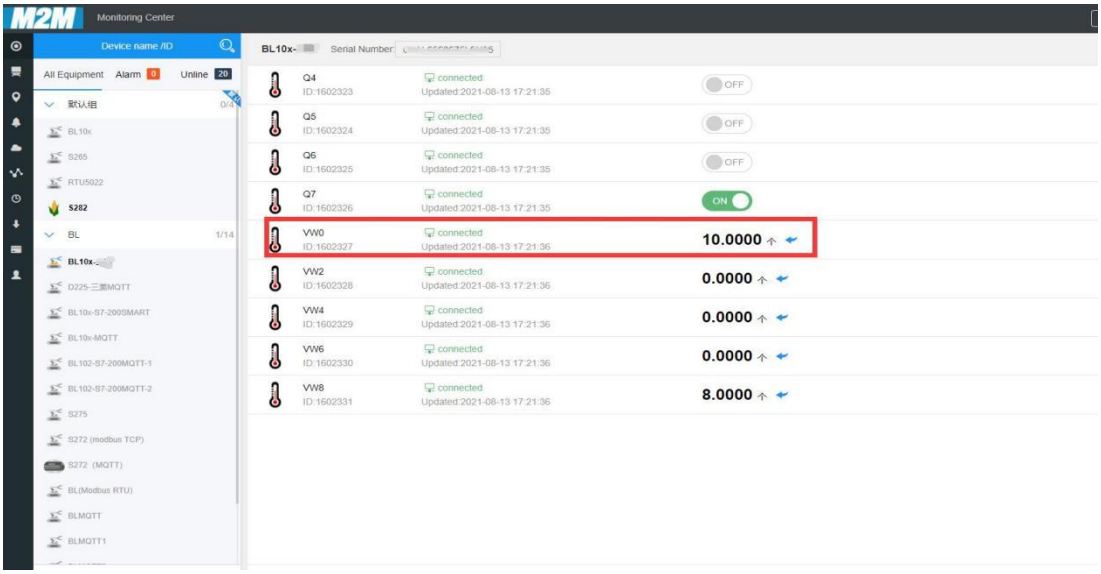




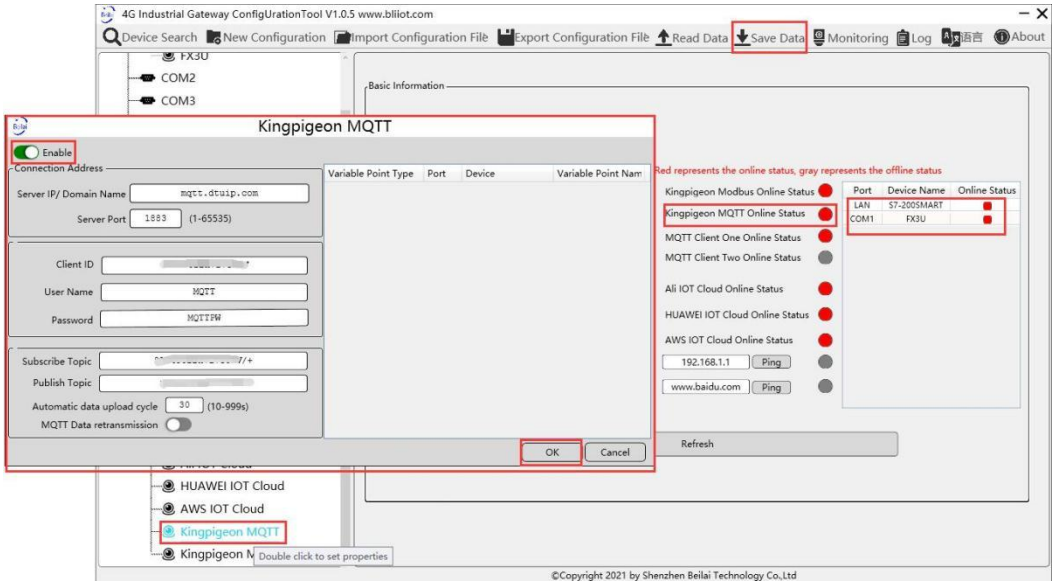


Send command from cloud





5.4.15 King Pigeon Cloud via MQTT



(1) Double click King Pigeon MQTT to enter configuration box

(2) Click Enable to enable(green) King Pigeon cloud connection via MQTT. Default is disabled(gray)

(3) Server IP/Domain Name: mqtt.dtuip.com(Automatic filling in default)

(4) Server Port: 1883 (Automatic filling in default)

(5) Client ID: Input device serial number issued by King Pigeon

(6) User Name: MQTT (Automatic filling in default)

(7) Password: MQTTPW(Automatic filling in default)

(8) Subscribe Topic: Input device serial number/+ issued by King Pigeon

(9) Publish Topic: Input device serial number issued by King Pigeon.

(10) Automatic Data Upload Cycle: Cycle time of uploading data. In default it's 30s

(11) MQTT Data Retransmission: Click it to enable(green) offline data retransmission once network resumes.

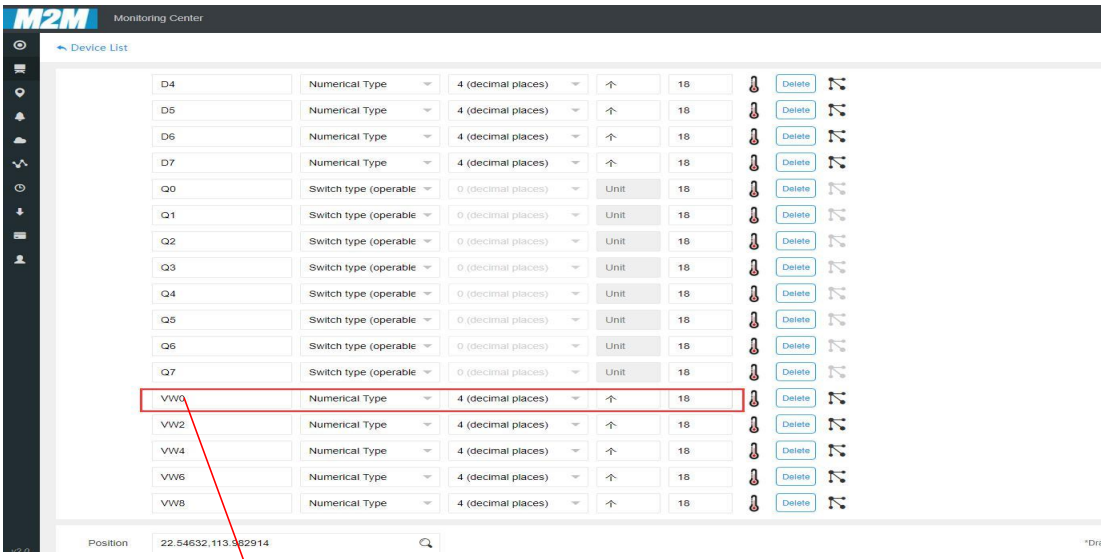
(12) Datapoint Uploading Selection: Select the datapoint to upload in the right box. In default it's blank with all datapoints to be uploaded

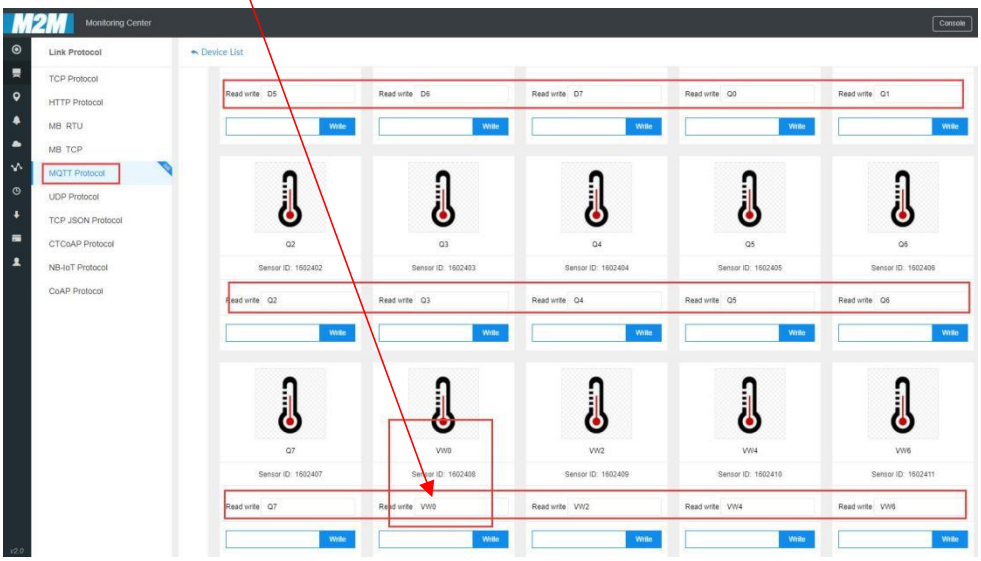
(13) Click OK to confirm King Pigeon Cloud via MQTT configuration

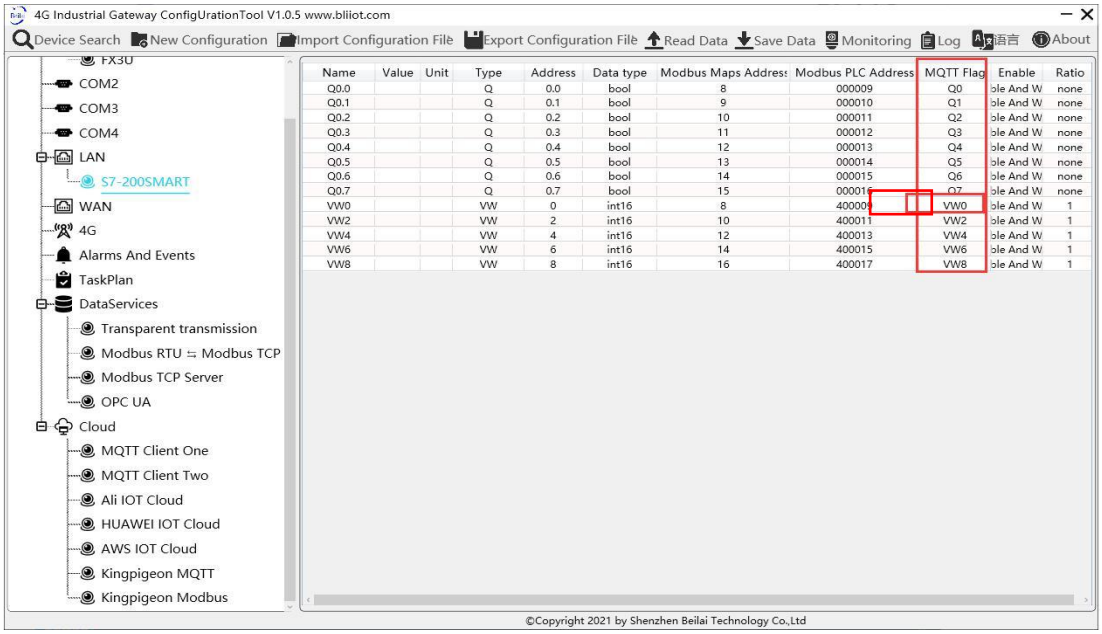
(14) Click Save Data. Gateway will restart and King Pigeon Cloud via MQTT is configured successfully. Open configuration software and login the device. King Pigeon Cloud connection status via MQTT can be viewed from basic information. Red indicates King Pigeon cloud via MQTT is connected. Slave device connection status can be viewed from the right box.

5.4.16 View Data in King Pigeon Cloud via MQTT

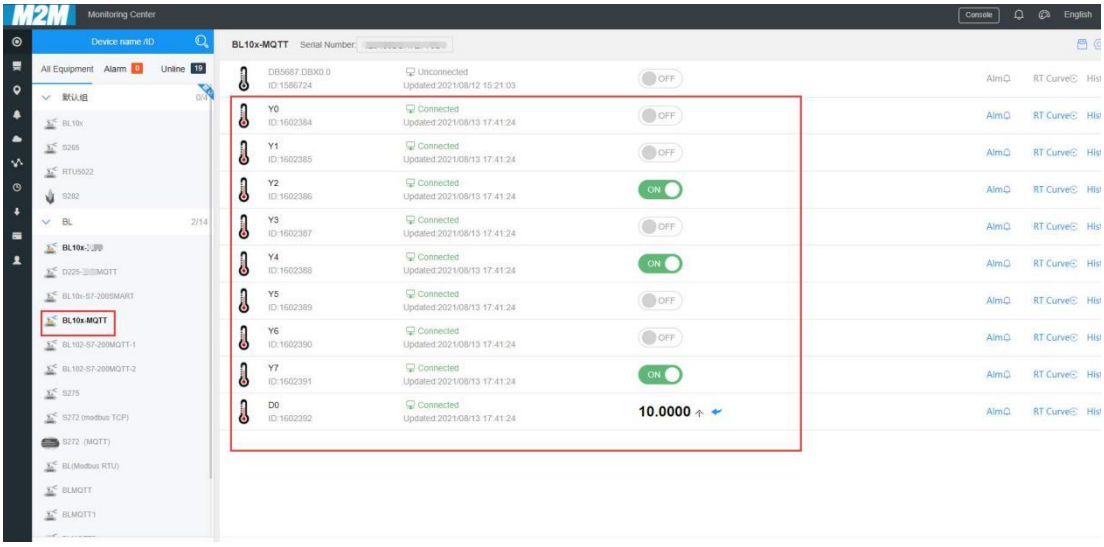
Create datapoint in cloud first. Set datapoint mark is the same as MQTT flag in configuration software. Below is example of some datapoint configuration. For example, MQTT flag of datapoint VW0 in configuration software is VW0, then set read-write mark VW0 in King Pigeon cloud

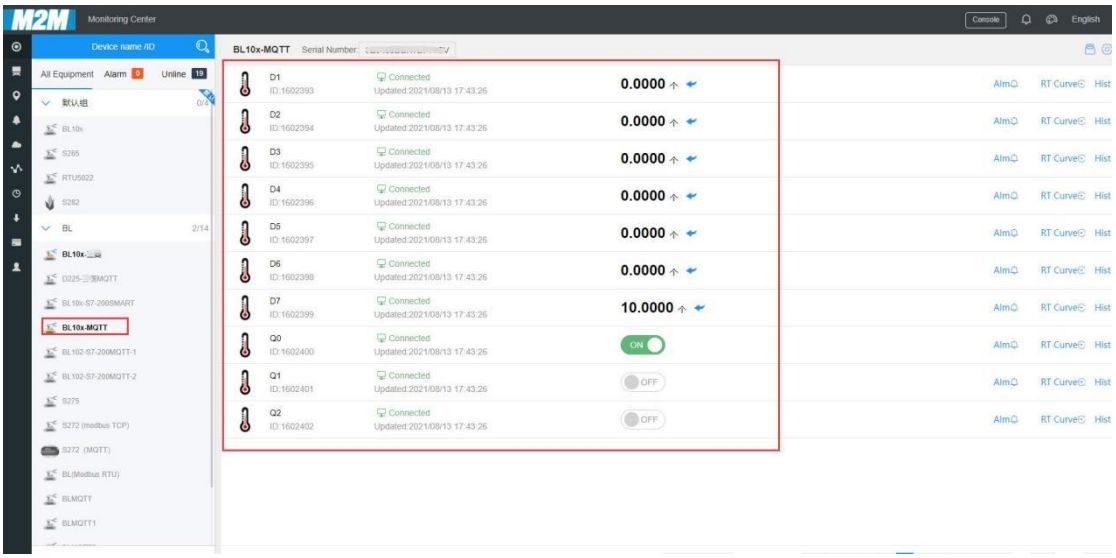


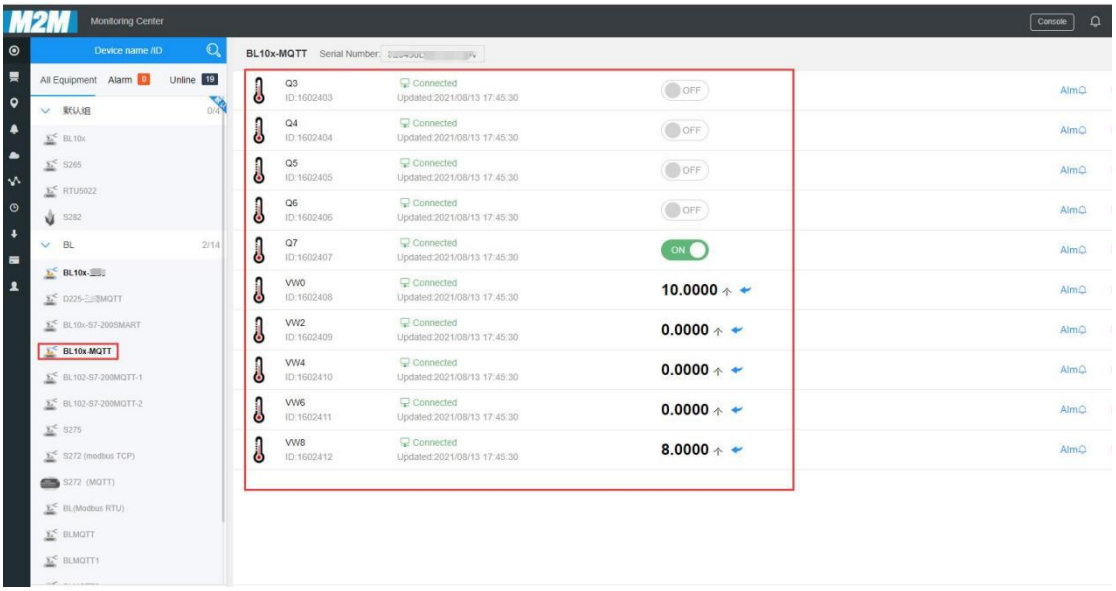




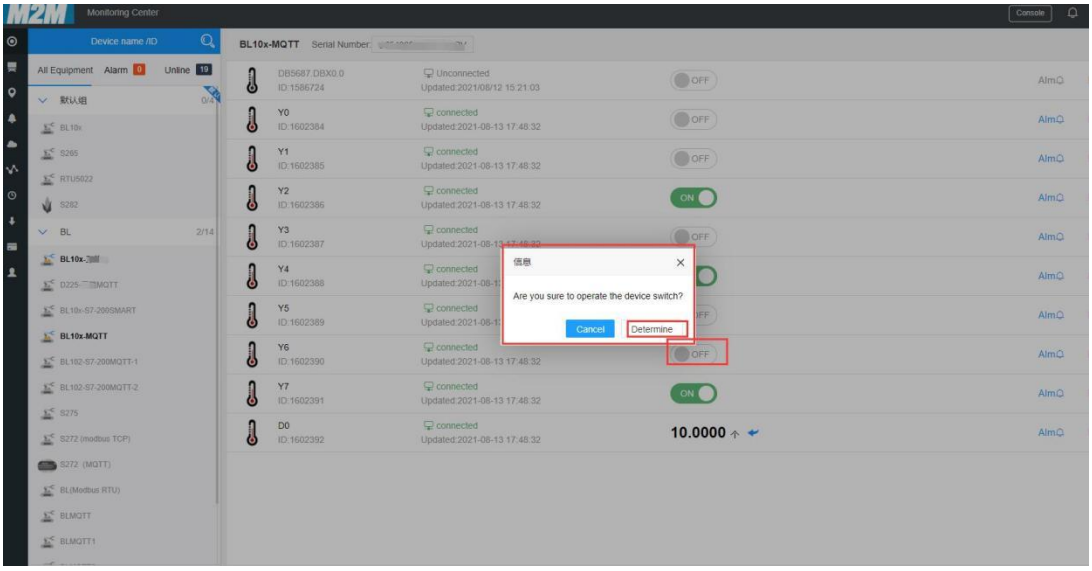
Collected data value is as below:

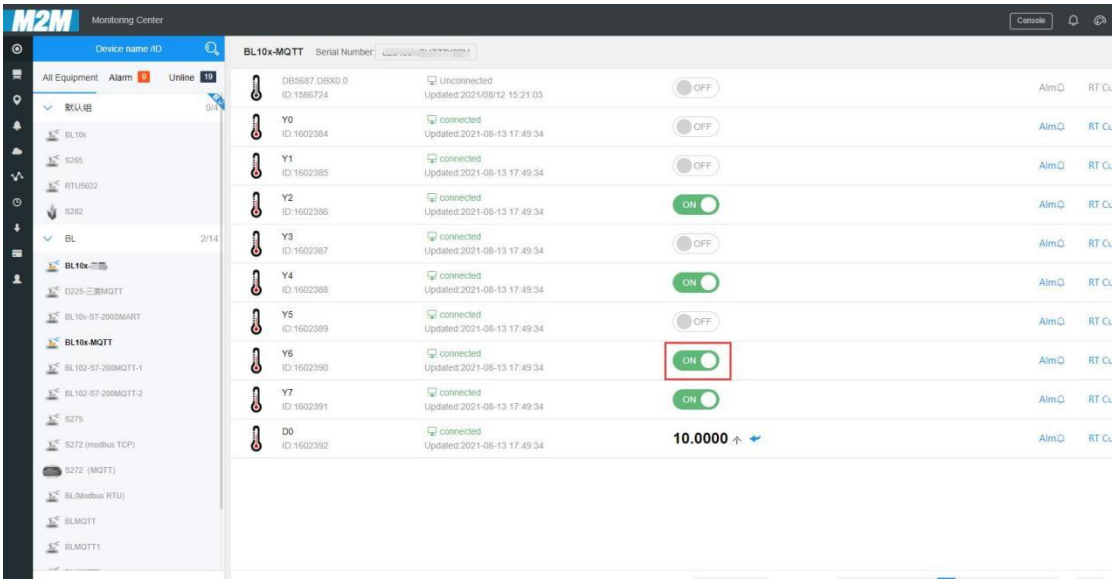

M2M
Monitoring Center
Console
English
Device name /ID
All Equipment
Alarm 0
Online 19
BL10x-MQTT
Serial Number:
Y0 ID:1602384 Connected Updated:2021/08/13 17:41:24 OFF
Y1 ID:1602385 Connected Updated:2021/08/13 17:41:24 OFF
Y2 ID:1602386 Connected Updated:2021/08/13 17:41:24 ON
Y3 ID:1602387 Connected Updated:2021/08/13 17:41:24 OFF
Y4 ID:1602388 Connected Updated:2021/08/13 17:41:24 ON
Y5 ID:1602389 Connected Updated:2021/08/13 17:41:24 OFF
Y6 ID:1602390 Connected Updated:2021/08/13 17:41:24 OFF
Y7 ID:1602391 Connected Updated:2021/08/13 17:41:24 ON
D0 ID:1602392 Connected Updated:2021/08/13 17:41:24 10.0000
Alm RT Curve Hist


M2M
Monitoring Center
Console
English
Device name /ID
All Equipment
Alarm 0
Online 19
BL10x-MQTT
Serial Number:
D1 ID:1602393 Connected Updated:2021/08/13 17:43:26 0.0000
D2 ID:1602394 Connected Updated:2021/08/13 17:43:26 0.0000
D3 ID:1602395 Connected Updated:2021/08/13 17:43:26 0.0000
D4 ID:1602396 Connected Updated:2021/08/13 17:43:26 0.0000
D5 ID:1602397 Connected Updated:2021/08/13 17:43:26 0.0000
D6 ID:1602398 Connected Updated:2021/08/13 17:43:26 0.0000
D7 ID:1602399 Connected Updated:2021/08/13 17:43:26 10.0000
Q0 ID:1602400 Connected Updated:2021/08/13 17:43:26 ON
Q1 ID:1602401 Connected Updated:2021/08/13 17:43:26 OFF
Q2 ID:1602402 Connected Updated:2021/08/13 17:43:26 OFF
Alm RT Curve Hist


M2M
Monitoring Center
Console
Device name /ID
All Equipment
Alarm 0
Online 19
BL10x-MQTT
Serial Number:
Q3 ID:1602403 Connected Updated:2021/08/13 17:45:30 OFF
Q4 ID:1602404 Connected Updated:2021/08/13 17:45:30 OFF
Q5 ID:1602405 Connected Updated:2021/08/13 17:45:30 OFF
Q6 ID:1602406 Connected Updated:2021/08/13 17:45:30 OFF
Q7 ID:1602407 Connected Updated:2021/08/13 17:45:30 ON
VW0 ID:1602408 Connected Updated:2021/08/13 17:45:30 10.0000
VW2 ID:1602409 Connected Updated:2021/08/13 17:45:30 0.0000
VW4 ID:1602410 Connected Updated:2021/08/13 17:45:30 0.0000
VW6 ID:1602411 Connected Updated:2021/08/13 17:45:30 0.0000
VW8 ID:1602412 Connected Updated:2021/08/13 17:45:30 8.0000
Alm

Send command from cloud, below is example of controlling FX3U datapoint Y6





5.4.17 King Pigeon MQTT Data Format

MQTT Client One , MQTT Client Two and King Pigeon Cloud MQTT data formats are the same. See below:

(1) Valid Load Data Format in device Publishing messages

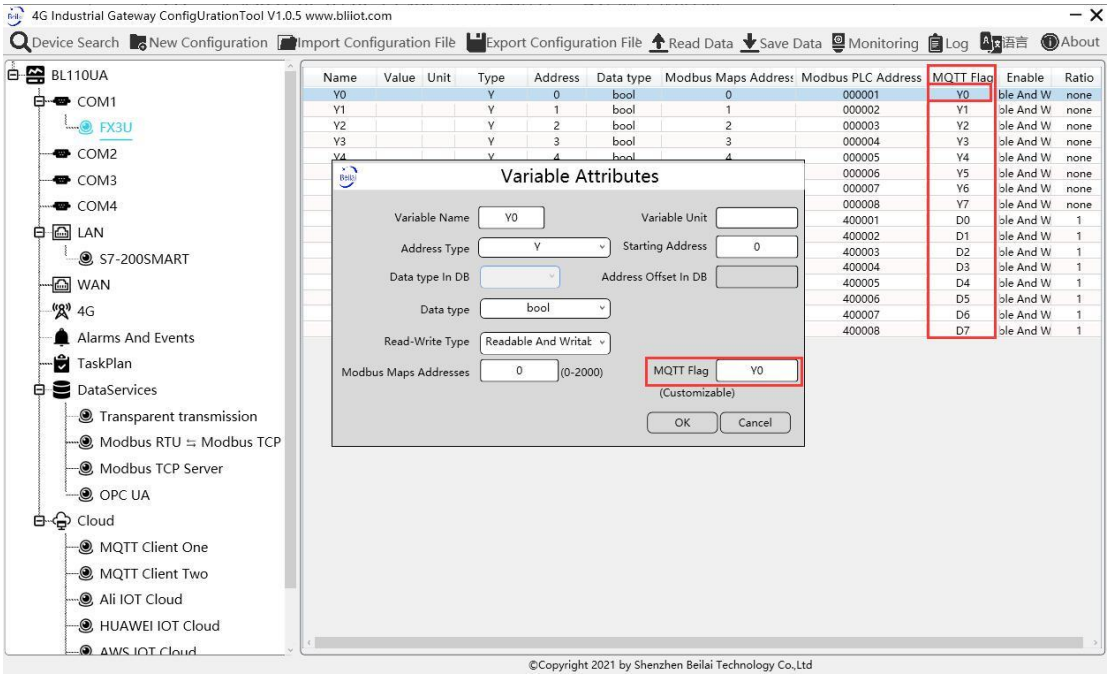
Publish Topic: Serial Number (Configured publish topic)

```
{
   "sensorDatas": [
        {
              //Boolean value
            "flag": "REG001",    //Read-write identification mark
            "switcher": 0 //Data Type and Value
        },
       {
```

```
            //Numeric Type
            "flag": "REG005", //Read-Write identification mark
            "value": 3    //Data Type and Value
        }
    ],
    "state":"alarm", //Alarm mark(Set Alarm Event in configuration software. Once alarm is trigger, this mark will appear. It's not included in scheduled automatically uploaded data)
    "state":"recovery", //Alarm recovery mark (Only appear when there's alarm recovery. It's not included in scheduled automatically uploaded data)
    "time": "1622700769", //Time mark, it's time stamp of data uploading
    "addTime": "2021-06-03 06:12:49" //Time mark, it's time of device data uploading
    "retransmit":"enable" //Retransmission mark, MQTT historical data (Only appear when there's historical data retransmission. It's not included in scheduled automatically uploaded data)
}
```

Note:

//Read-Wrtie Mark：character is "flag", followed by " Datapoint MQTT flag", it's the MQTT mark set in configuration software when adding datapoint. It can be customized



//Data Type and Value:

1) Boolean data: character is "switcher", followed by "0" or "1"(0 represents open, 1 represents close)
2) Numeric Data: character is "value", followed by actual value

//Alarm, Recover mark, character is "state", followed by "alarm" or "recovery"(alarm represents alarm data, recovery represents alarm recovery data)

//Time mark: character is "time", followed by actually data uploading timestamp

//Time mark, character is "addtime", followed by "gateway time"

//Retransmission mark: character is "retransmit", followed by "enable"

Offline collected data will be temporarily saved in gateway device. Once network resmues, the data will be retransmitted. Use “retransmit” mark for historical data (MQTT Data Retransmission must be enabled in configuration software)

(2) Valid Load Data Format in device Subscribing messages

Subscribe Topic: Serial Number/+ (Subscribe topic set in configuration software)

(King Pigeon cloud message publishing topic is “serial number/sensor ID”, thus wildcard “/+” must be added for device Subscribing Topic so that cloud can publishing data for controlling)

```
{
    "sensorDatas":
    [
        {
          "sensorsId": 211267,    // cloud sensor ID
          "switcher":1,   //Data Type and Value
          "flag":"REG001"    //Read-Write Mark
          }
        ],
        "down":"down"   //Cloud downlink message mark
}
```

Note:

//cloud sensor ID: character is "sensorsID", followed by ID (automatically generated by cloud. Not necessary if it’s self-built cloud)

//Data Type and Value:

1) Boolean Data: character is "switcher", followed by "0" or "1"
   (0 represents open, 1 represents close)
2) Numeric Data: character is "value", followed by "actual value"

//Read-Write Mark: character is "flag", followed by "datapoint MQTT flag"

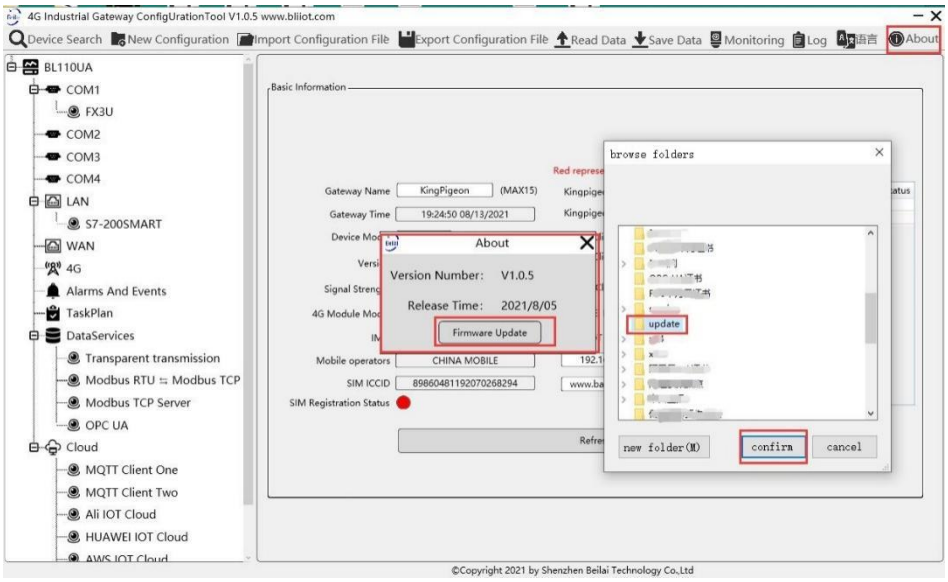
//Cloud Downlink Message Mark: character is "down", followed by "down", representing cloud downlink data.

Note: Boolean data will not have double quotation mark, numeric data will have double quotation mark.

6 Firmware Upgrading

Please contact King Pigeon if it’s necessary to upgrade firmware for any new requirements.

This gateway supports upgrading firmware via configuration software. Click About in configuration software, click Firmware Upgrade, select update folder and click OK to confirm. Once upgrading is completed, a prompt box will pop up. Click it to confirm. Contact King Pigeon technical support to get update folder.



7 Warranty Term

1) Warranty period is 1 year from the date of purchase. If any quality issues within warranty period, it will be repaired for free.
2) Device fault caused by wrong operation is beyond warranty.

8 Technical Support

King Pigeon Communication Co., Ltd.
Telephone: 0086-755-29451836
Website: www.iot-solution.com