

# PLC Gateway BL102



**KING PIGEON**



## BL102 User Manual

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King Pigeon Communication Co.,Ltd

Website: [www.iot-solution.com](http://www.iot-solution.com)



## Preface

Thanks for choosing King Pigeon PLC Modbus IOT Gateway BL102. Reading this manual with full attention will help you quickly learn device functions and operation methods.

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## Disclaimer

This document is designed for assisting user to better understand the device. As the described device BL102 is under continuous improvement, this manual may be updated or revised from time to time without prior notice. This PLC 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
July 8, 2021	V1.0	Initial Release	HYQ

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# 1 Gateway Introduction

## 1.1 General Description

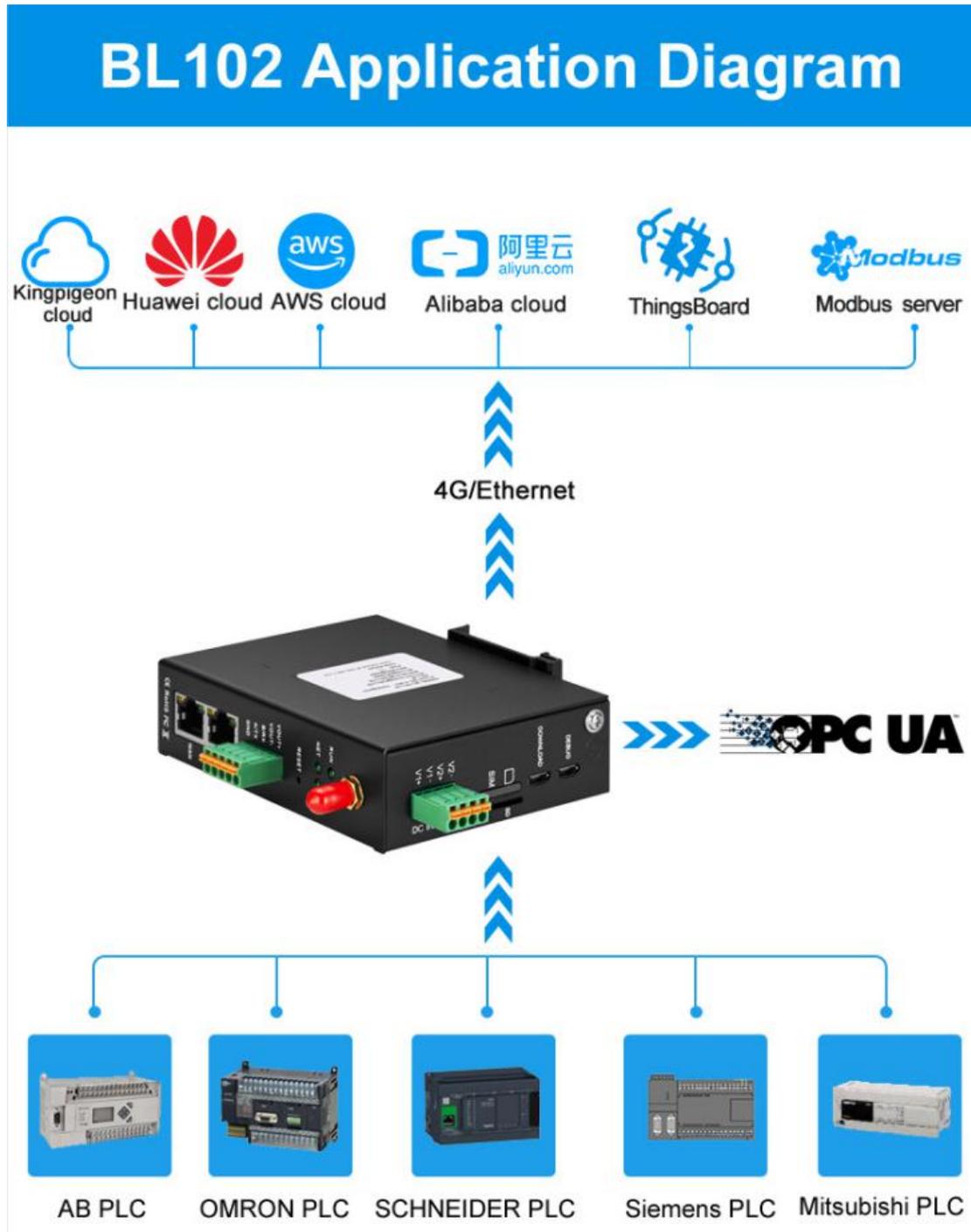
BL102 is a Gateway that collects Siemens, Mitsubishi, Omron, Delta, Allen-Bradley and Schneider PLC data and converts to Modbus TCP, OPC UA, MQTT, HUAWEI Cloud, AWS, Alibaba Cloud, King Pigeon Cloud protocols

It's developed on embedded Linux operation system with high stability and various interfaces, 1RS485(optional RS232), 2 power inputs, 1 power output, 2 RJ45 Ethernet ports, 2 USB port, 1 SIM card slot and 1 SD card slot. With 4G cellular and Ethernet network, it features with high speed and low latency data transmission.

From downlink it supports various PLCs like Siemens, Mitsubishi, Omron, Delta, Allen-Bradley, Schneider, etc. From uplink it supports Modbus TCP, MQTT, OPC UA, HUAWEI Cloud, Alibaba Cloud, AWS, ThingsBoard, King Pigeon cloud, etc. Users can quickly connect many different industrial equipment to cloud platforms, SCADA, OPC UA, MES and other master computers. Devices can be online in various cloud platforms and master computers simultaneously.

With TSL/SSL encryption, routing function and cascaded switch data collection, it can be used in most of industrial application scenarios for secure data acquisition and remote monitoring purpose.

## 1.2 Application Illustration



## 1.3 Packing List

Before using Gateway BL102, please make sure below parts are included in the package:  
 (Below pictures are for reference only. If any discrepancy, please follow real products)

- 1x Gateway BL102



- 1x 4PIN 3.5mm Wiring Terminal for power input



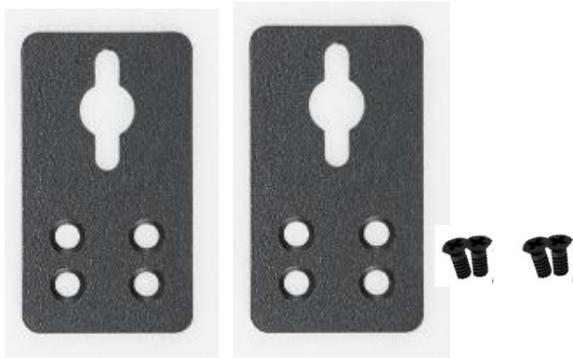
- 1x 5PIN 3.5mm Wiring Terminal for RS485 or RS232 power output



- 1 x 4G SMA Cellular Network Antenna



- 2 x Wall-Mount Clip Kit



- 1 x DIN-Rail Mount Clip Kit



- 1 x User Manual (PDF soft copy)  
(Note: Scan QR code to download the user manual)

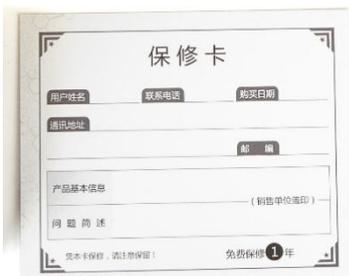
- 1 x SIM Card Picking Pin



- 1 x Product Qualification Certificate



- 1 x Warranty Card



Note: if any items are missing, please contact King Pigeon sales representative.

## 1.4 Features

- Downlink supports: Siemens, Mitsubishi, OMRON, Delta, Allen-Bradley, Schneider and other PLCs
- Uplink supports: Modbus TCP, MQTT, OPC UA, HUAWEI Cloud, Alibaba Cloud, AWS, ThingsBoard Cloud, King Pigeon Cloud, etc.
- DC 9-36V wide power voltage input with wiring terminal. There're 2 channels of power input redundancy design with inverse connection protection. Either channel can be selected.
- 1 power output, output voltage is equal to input voltage.
- 1 RS485/ (optional RS232) serial port input
- Serial port baud rate 2400bps-115200bps; stop bit supports 1, 2 bits; data bit supports 7,8 bits; parity bit supports None, Odd, Even.
- 2 RJ45 ports for Ethernet connection, 1 WAN and 1 LAN. Data can be collected from devices connected to WAN and LAN port or cascaded switch devices. Network link and rate indicators are available. Built-in isolation transformer with up to 2KV electromagnetic insulation.
- Support POE PD (Powered Device) for saving wiring cost (Optional function).
- Support TSL\SSL data encryption for security.
- Support routing function to provide network for other devices.
- Support 4G cellular network and APN setting. Ethernet network will be used if it's available. It will shift to 4G network automatically if Ethernet is not available.
- Support Modbus RTU to Modbus TCP and transparent transmission.
- Support RESET button for returning to factory settings (Long press the button until RUN indicator off with power) to avoid wrong parameter settings.
- Support software and hardware watchdog for high reliability.
- Metal case with IP30 protection grade. Metal case and system are safely isolated, especially suitable for industrial site applications.
- Compact device size: 30mm\*83mm\*110mm, support wall-mounting and DIN-Rail mounting.

## 1.5 Technical Parameters

Item	Parameter	Description
System	Processor	ARM9, clock speed 300Mhz
	Storage	128MB( scalable to 1G)
	Flash Memory	64MB
Power Source	Input Voltage	DC 9~36V
	Power Consumption	Normal: 85mA@12V, max 117mA@12V
	Wiring	Support Inverse Connection Protection
Ethernet Port	Interface Spec	2 x RJ45, 10/100Mbps, adaptive MDI/MDIX
	Port Protection	ESD $\pm 16\text{kV}$ (contact), $\pm 18\text{kV}$ (air), EFT 40A (5/50ns), Lightening 6A (8/20 $\mu\text{s}$ )
Serial Port	Serial Port Qty	1 x RS485/ optional RS232
	Baud Rate	2400bps-115200bps
	Data Bit	7, 8
	Parity Bit	None, Even, Odd
	Stop Bit	1, 2
	Port Protection	ESD $\pm 8\text{kV}$ (contact), $\pm 15\text{kV}$ (air) EFT 2KV, 40A (5/50ns)
Power Output	Output Voltage	1 channel DC 9~36 V power output (Output voltage is equal to input voltage)
SIM Card	Qty	1 SIM Card Slot
	Spec	Drawer type slot, support 1.8V/3V SIM/UIM card (NANO)
	Protection	Built-in 15KV ESD Protection
SD Card	Qty	1 SD Card slot reserved for future development
USB Port	Qty	1*program downloading+1* program debugging
	Spec	Micro USB OTG
	Protection	Over Current Protection
4G Network (Optional)	Antenna Qty	1
	Antenna Type	SMA Hole Type
	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
Indicator	RUN	Steady light if device is powered on Flickering if device is running Off if device is not running
	NET	Flickering if communication is over Ethernet network Steady light if communication is over 4G network Off if no data communication
	TXD	Flickering if device is transmitting data Off if there's no data transmitting
	RXD	Flickering if device is receiving data Off if there is no data receiving
Software Parameter	Internet Protocol	IPV4, TCP/UDP, DHCP, DNS, etc
	IP Retrieving	Static IP / DHCP
	Transmission	Support Transparent Transmission
	DNS	Support Domain Name Resolution
	Configuration	PC configuration software, support WIN XP, WIN 7, WIN 8 and WIN 10
	Internet Cache Size	Transmitting: 8Kbyte; Receiving: 8Kbyte
	Login Package	Support custom login package
	Heartbeat Package	Support custom heartbeat package
Safety	MTBF	≥100,000 hours
Certification	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
	Other	CE, FCC
Environment	Working	-40~80℃, 5~95% RH
	Storage	-40~85℃, 5~95% RH
Others	Case	Metal Case
	Size	30mm×83mm×110mm(L*W*H)
	Protection Grade	IP30
	Net Weight	291.2g
	Mounting	Wall-Mounting, DIN-Rail Mounting

## 1.6 Model Selection

Model No.	WAN	LAN	COM (Default is RS485 Optional RS232)	OPC-UA	4G	POE PD (Powered Device)
BL102	1	1	1	X	√	Optional
BL102E	1	1	1	X	X	Optional
BL102UA	1	1	1	√	X	Optional

## 2 Hardware Introduction

### 2.1 Outline Dimension

Unit: mm



Bottom view



Side view



Main view

## 2.2 Power Source Interface



2 optional channels of power input support DC 9~36V voltage with inverse connection protection.

## 2.3 SIM & SD Card Slots



Make sure device is powered off before inserting or removing SIM card. Insert SIM card Picking PIN into the hole with tiny force to eject out the card tray.

**Note:** Place the device flat like above picture if inserting or removing SIM card.

## 2.4 Debugging & Upgrading Interface



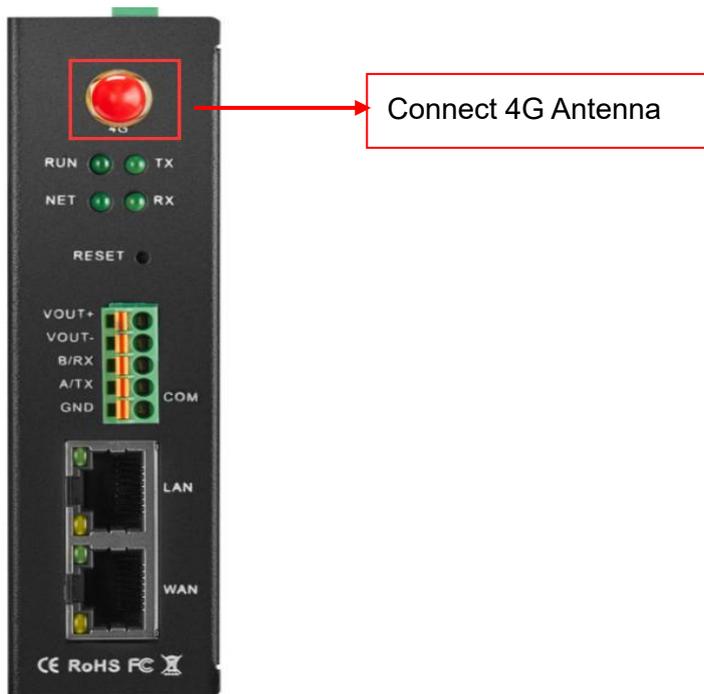
DEBUG is the interface for debugging, DOWNLOAD is the interface for upgrading.

## 2.5 Gateway Grounding



Before connecting the device, please do equipment grounding with grounding screw to prevent electromagnetic interference

## 2.6 4G Antenna Interface



## 2.7 LED Indicator



LED Indicator Introduction			
	Item Name	Status	Description
RUN	Device Running Indicator	Flickering	Device running normally
		Off	Device faulty
NET	Ethernet or 4G Communication Indicator	Flickering	Ethernet Communication
		On	4G communication
TX	Data Transmitting Indicator	Flickering	Serial port is transmitting data
		Off	No data transmitting in serial port
RX	Data Receiving Indicator	Flickering	Serial port is receiving data
		Off	No data receiving in serial port

Note: RUN indicator will be on if device is powered. If it's not on, please check whether there's reverse wiring or power source problem.

## 2.8 Reset Button

Once gateway is running normally, use a PIN to press RESET button for 10seconds until RUN

indicator is off. Gateway BL102 will return to default factory setting.



## 2.9 COM Port & Power Output Interface



RS485 or RS232 and Power Output	
Item	Description
VOUT+	Positive Pole of Power Output
VOUT-	Negative Pole of Power Output
B/RX	RS485 data-(B)/ receiving data
A/TX	RS485 data +(A)/ transmitting data
GND	Grounding
Note: Power output voltage is equal to input voltage: DC 9~36V	

## 2.10 WAN & LAN Ports

Ethernet Network Port			
Indicator	Color	Status	Description

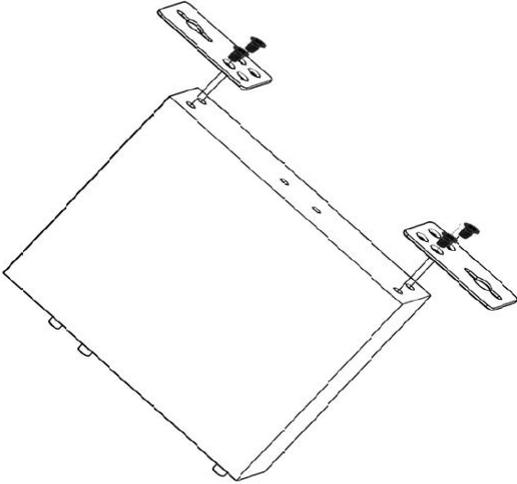


Rate Indicator	Green	ON	100Mbps mode
		OFF	10Mbps mode
Network Link Indicator	Yellow	ON	Connected
		Flickering	It's transferring data
		OFF	Disconnected

### 3 Gateway Mounting

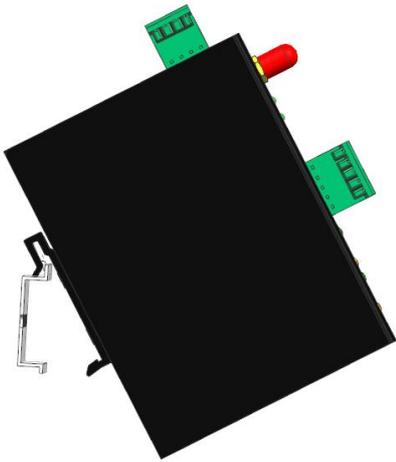
Gateway BL102 can be placed on desk, mounted on the wall and DIN-Rail.

#### 3.1 Wall-Mounting

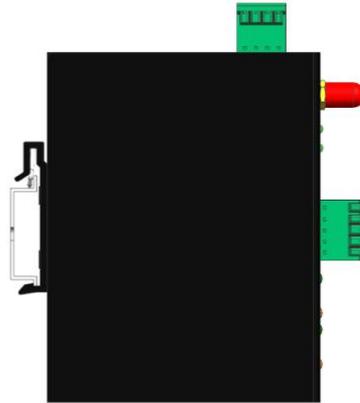


Wall Mounting

### 3.2 DIN Rail Mounting



DIN Rail Assembling



DIN Rail is Assembled

## 4 Configuration Software Introduction

### 4.1 Login to Configuration Software

Connect BL102 to router or switch through WAN port with standard direct network cable or cross network cable. Make sure BL102 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 BL102 LAN port. (If BL102 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)

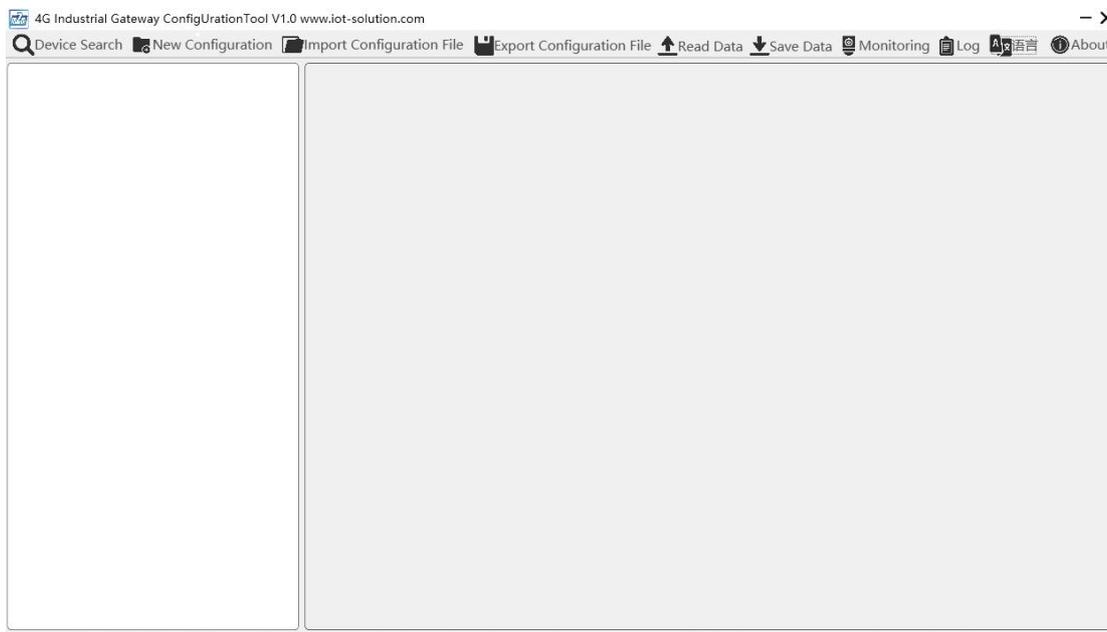
**Note:** WAN port IP is retrieved automatically, LAN port IP is 192.168.3.1 from factory setting

Connecting BL102 to Router, Switch or PC with following way.



## 4.1.1 Open Configuration Software

Double click  BL10x\_Configurator\_V1.0 on PC to run BL102 configuration software and enter below page



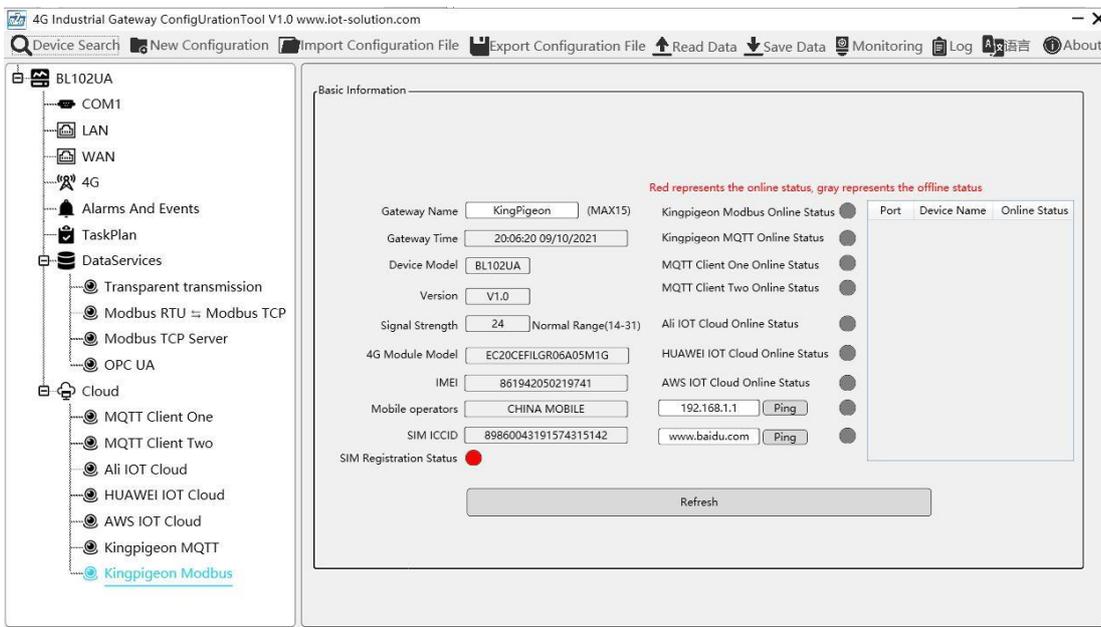
## 4.1.2 Search for Devices

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 BL102 with switch through WAN. A device with IP 192.168.1.164 is searched out.



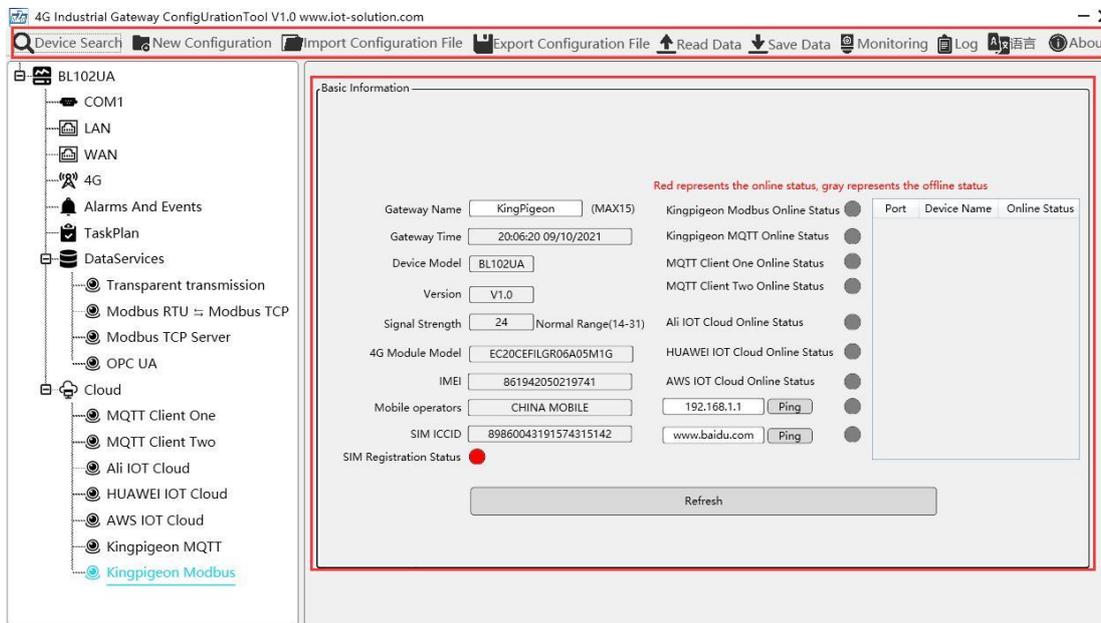
## 4.1.3 Connecting Gateway

Double click the device to be configured (For example, double click device with IP 192.168.1.164). Reading success message will be shown in prompting box. Click confirm to enter configuration page.



## 4.2 Configuration Software Introduction

### 4.2.1 System



System Function	
Item	Description
Device Search	Search for all BL102 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 BL102 gateway configuration parameters
Save Data	Save all configuration parameters by clicking it
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 BL101	
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

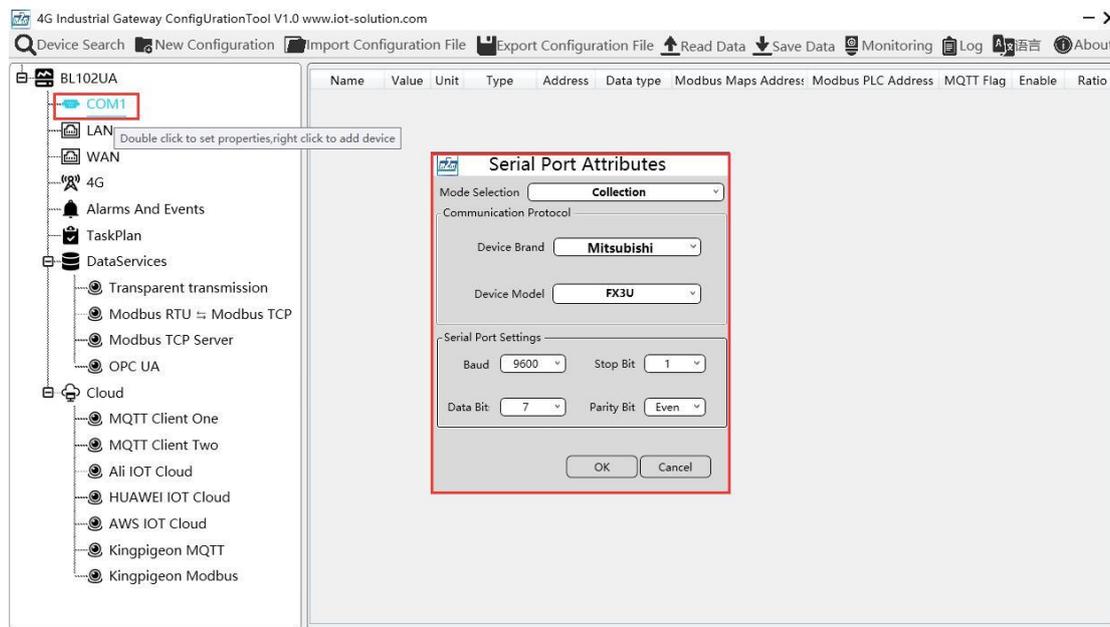


4G Module Model	Read 4G module model. If it's null, it means no 4G module
IMEI	Device IMEI code
Mobile Operators	SIM card service provider
SIM ICCID	Read SIM card ICCID
SIM Registration Status	Red indicates SIM card is registered. Gray indicates SIM card is not registered,
King Pigeon Cloud via Modbus 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 Online Status	Red indicates MQTT Client Two is connected 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 gateway, 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 slave device
Refresh	Refresh basic information of gateway

## 4.2.2 COM Port Configuration

### 4.2.2.1 COM Port Attribute Configuration

Double click COM1. Serial Port Attributes box will pop up for configuration

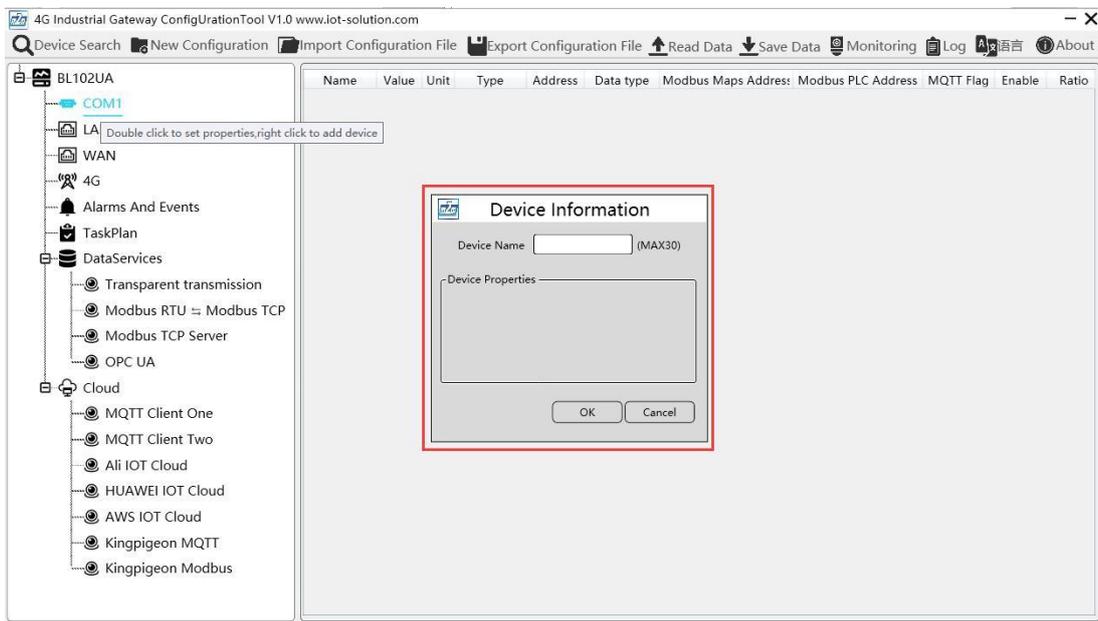
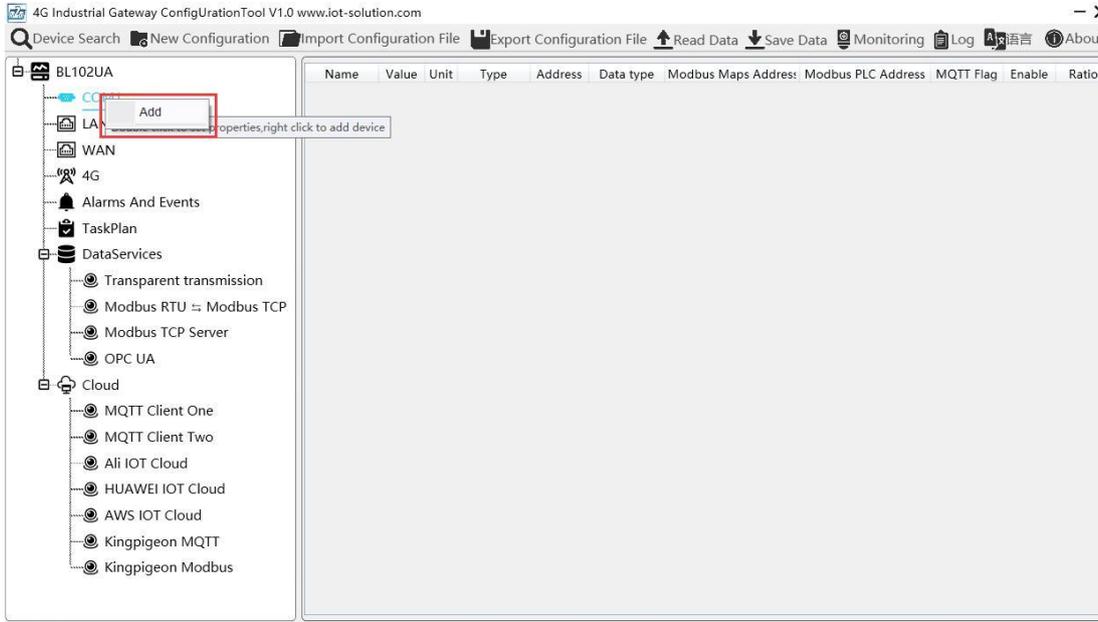


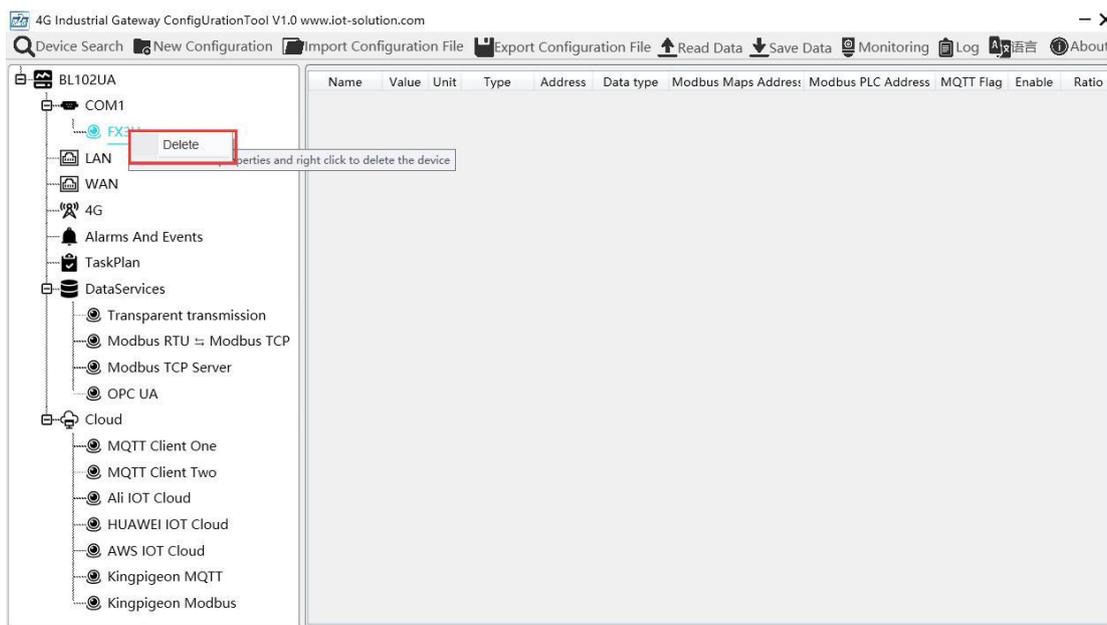
Serial Port Attributes		
Item	Description	Default
Mode Selection	Select mode: Collect/Transparent Transmission/Modbus RTU to Modbus TCP	Collect
Protocol	Device Brand	Select from Modbus, Mitsubish, Siemens
	Device Model	Select PLC model number
Serial Port Settings	Baud Rate	Select from "2400", "4800", "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 Connected Device

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

Note: Maximum 50 same model PLC data can be collected through COM





Device Information	
Item	Description
Device Name	Name of PLC to be connected
Device Property	Configure it according to different PLC model. Blank means no configuration items
OK	Confirm device configuration
Cancel	Cancel device configuration

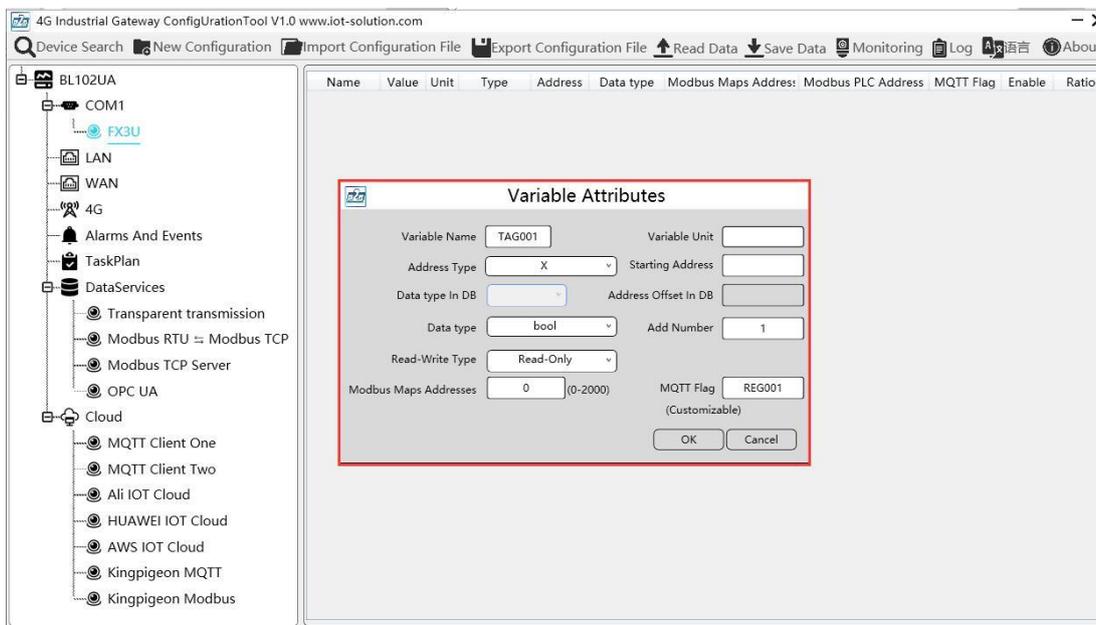
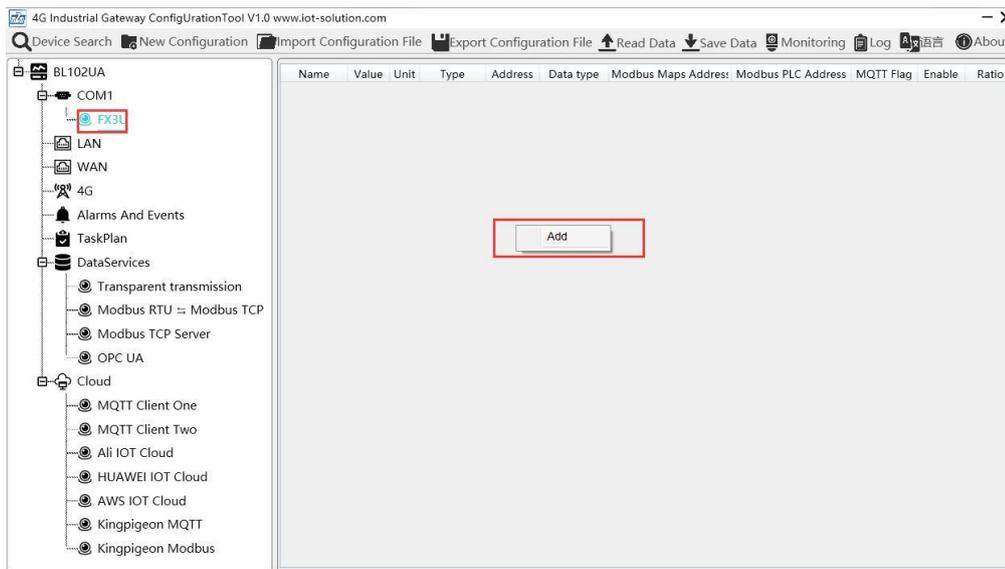
Note: For different PLCs, the protocols are different and the configuration items are different. For example, if selecting Modbus as device brand, then the configuration is as below table:

Device Information			
Item	Description	Default	
Device Name	Name of Device to be connected to COM		
Device Property	Station ID	COM port device Modbus communication address	
	16-bit Data Type	Select from "AB" and "BA"	AB
	32-bit Data Type	Select from "ABCD", "DCBA", "BADC" and "CDAB"	ABCD
OK	Confirm device configuration		
Cancel	Cancel device configuration		

### 4.2.2.3 Add COM Port Device Datapoint

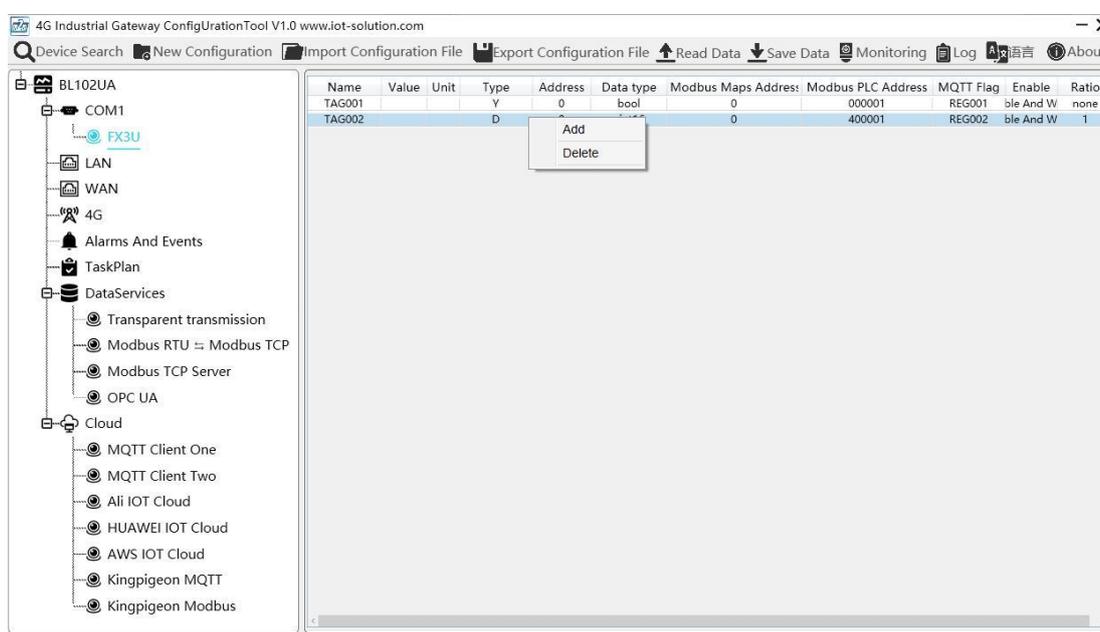
Click device name and then right click the box on the right. Add box will pop up. Click Add to enter datapoint configuration box and configure PLC datapoint. Right click the added datapoint to delete

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.
MQTT flag	Datapoint MQTT mark, can be any mark
OK	Confirm datapoint setting
Cancel	Cancel datapoint setting

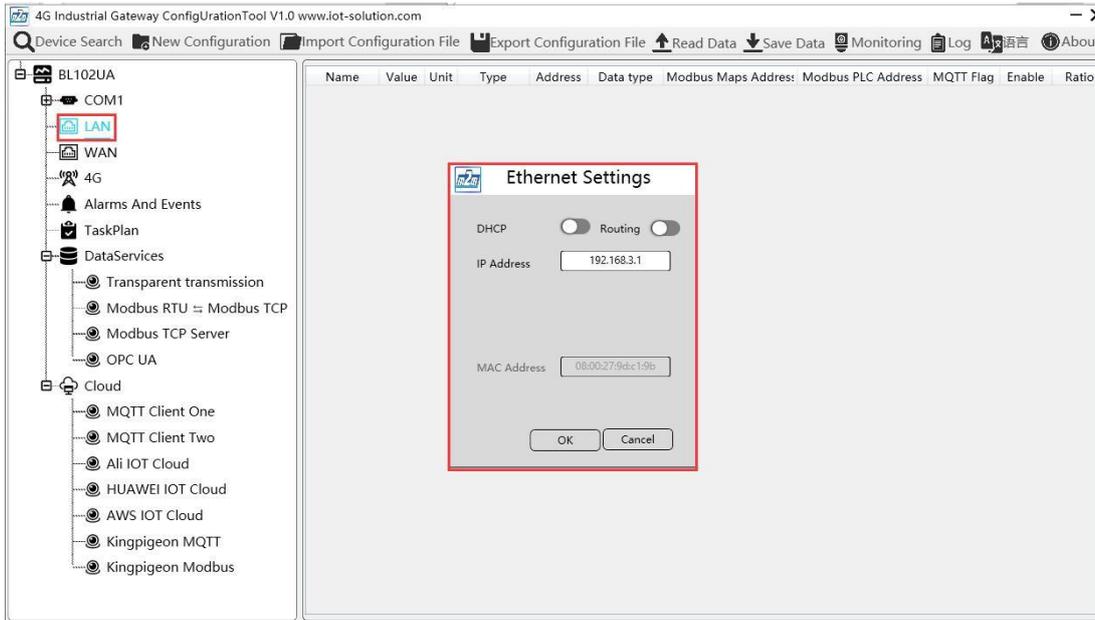


Right click datapoint to delete it and double click it to edit it.

## 4.2.3 LAN Port Configuration

### 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.

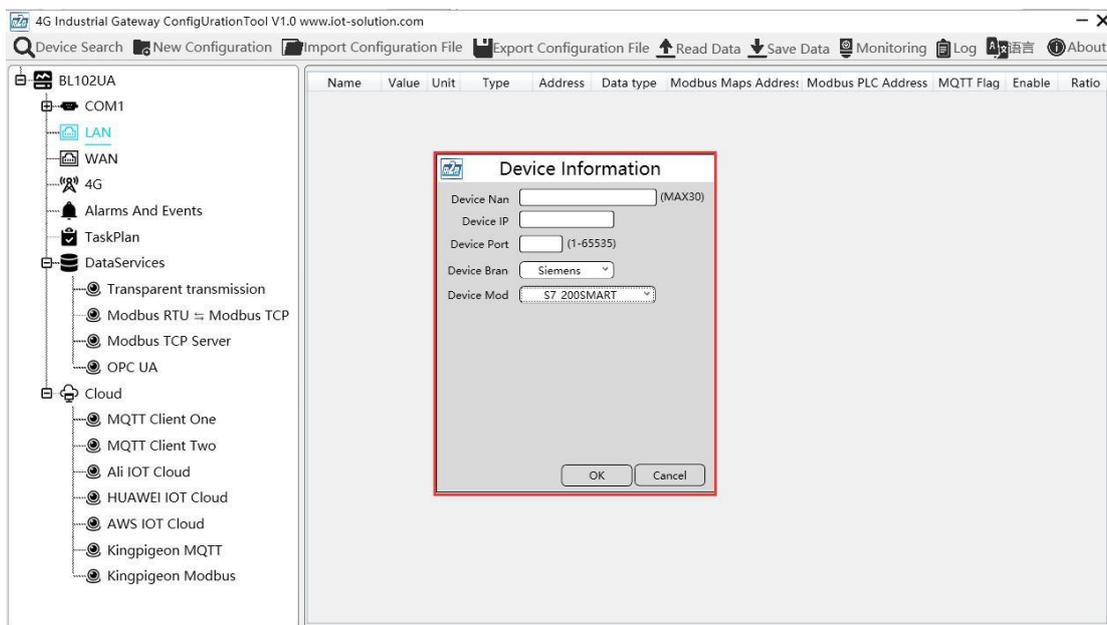
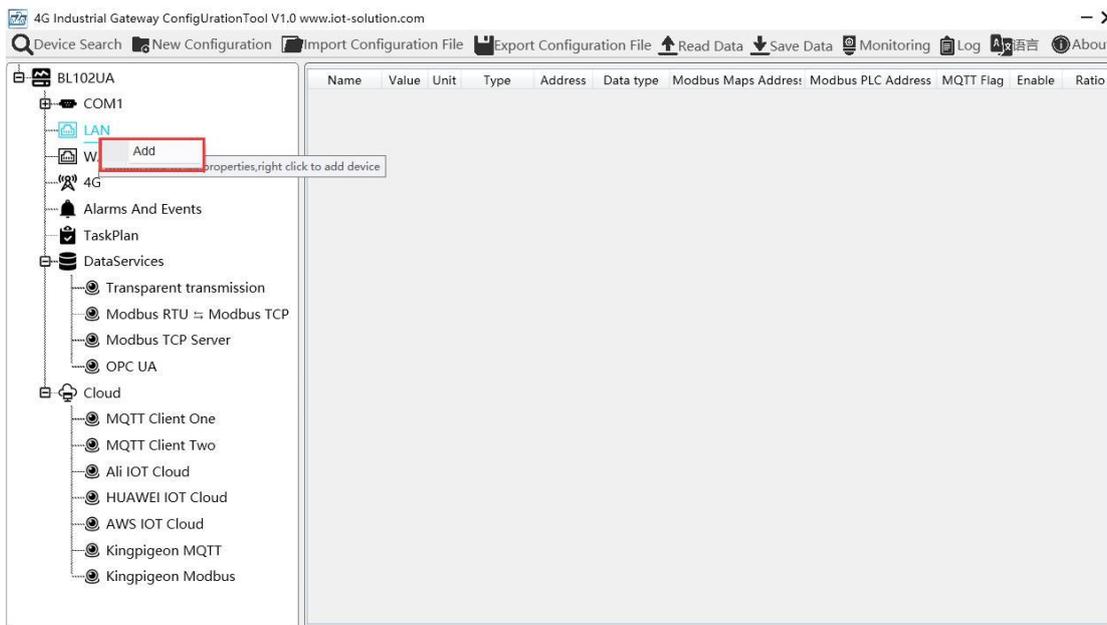


LAN Port Configuration	
Item	Description
DHCP	Green indicates auto IP distribution for LAN is enabled Gray indicates auto IP distribution for LAN is turned off
Routing	Green indicates routing function is enabled. Gray indicates routing function is turned off
IP Address	LAN port IP Address
MAC	LAN port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

## 4.2.3.2 Add Device to LAN Port

Right click LAN and click Add to enter device configuration page. PLC data can be collected through Gateway BL102 LAN Port or through switch which is connected with LAN.

Note: Total 50 PLCs can be connected through LAN and WAN, different models from different PLC makers can be connected simultaneously.



LAN Port Device Configuration	
Item	Description
Device Name	LAN Port PLC Name
Device IP	Set IP Address of LAN port PLC. <b>PLC IP Address must be the same as Gateway BL102 LAN IP Address.</b> If it's not the same, need to change PLC 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 PLC port
Device Brand	Select from Siemens, Modbus
Device Model	Select PLC 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

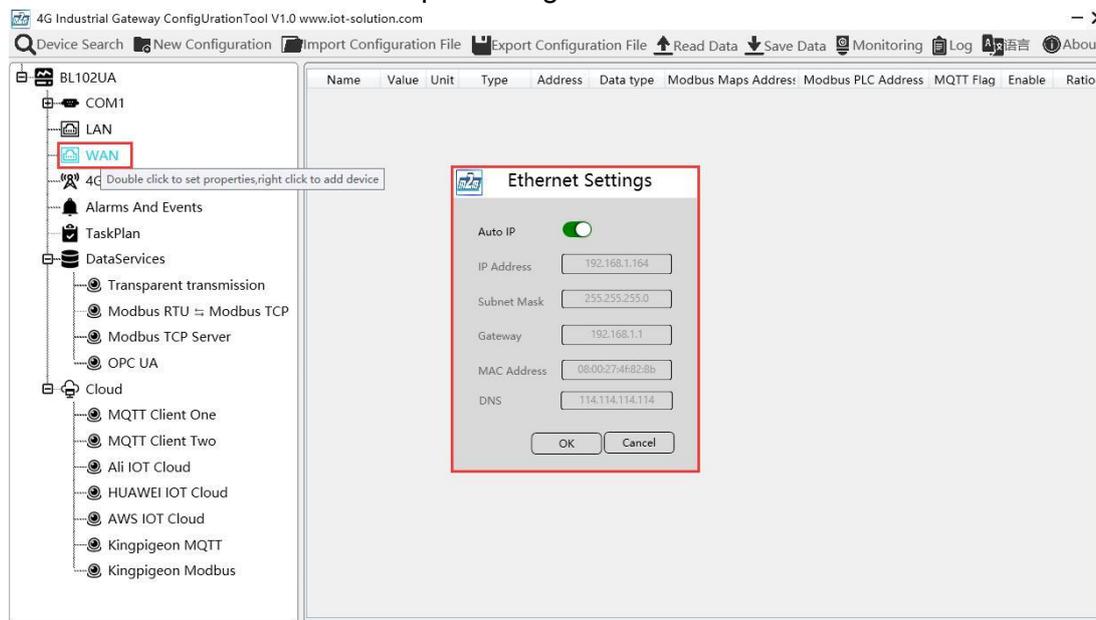
Follow the same procedure of adding datapoints for COM port device to add datapoints of LAN port device

[Add COM Port Device Datapoint](#)

## 4.2.4 WAN Port Configuration

### 4.2.4.1 WAN Port Attribute Configuration

Double click WAN to enter WAN port configuration box



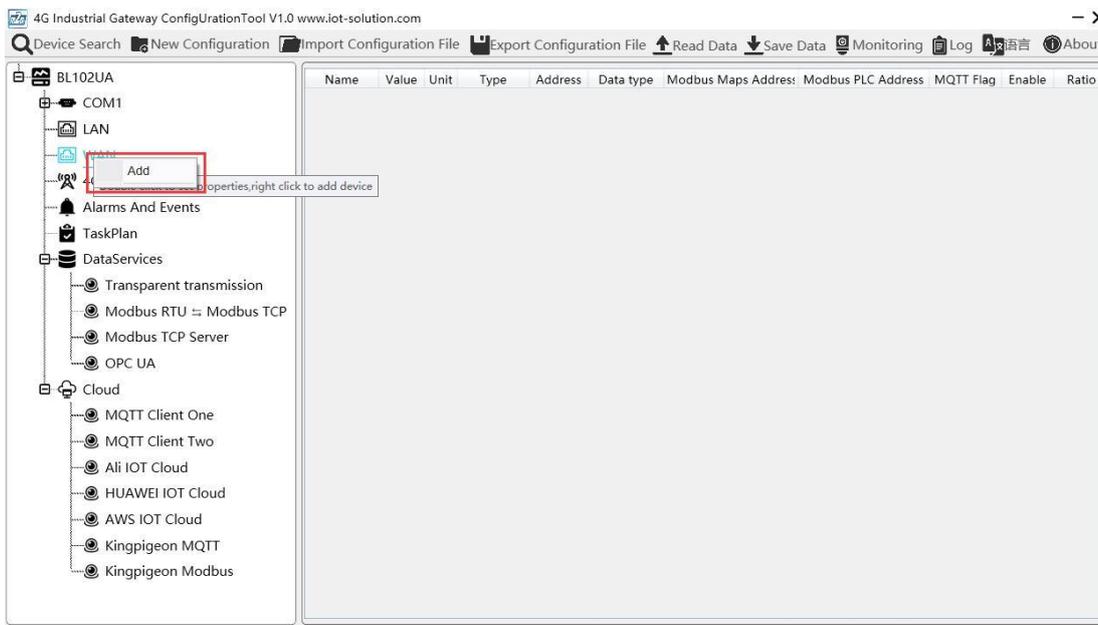
WAN Port Configuration	
Item	Description
Auto IP	Green indicates auto retrieving IP

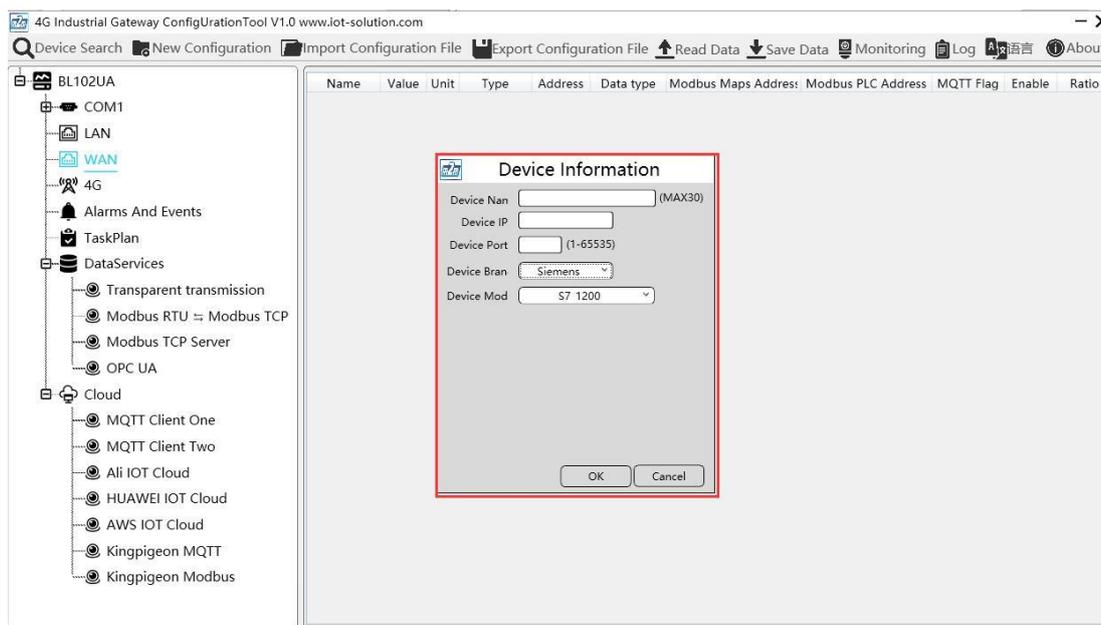
	Gray indicates IP is specified
IP Address	Current IP Address of WAN Port
Subnet Mask	Current WAN Subnet Mask
Gateway	Current WAN Gateway Address
MAC Address	WAN port MAC address
DNS	Current WAN port DNS server
OK	Confirm WAN port setting
Cancel	Cancel WAN port setting

### 4.2.4.2 Add Device to WAN Port

Right click WAN and click Add to enter device configuration page. PLC data can be collected through Gateway BL1012 WAN Port or through switch which is connected with WAN.

Note: Total 50 PLCs can be connected through LAN and WAN, different models from different PLC makers can be connected simultaneously.





WAN Port Device Configuration	
Item	Description
Device Name	Name of WAN Port PLC
Device IP	IP Address of WAN Port PLC
Device Port	WAN port PLC Port
Device Brand	Select from Siemens, Modbus
Device Model	Select PLC 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

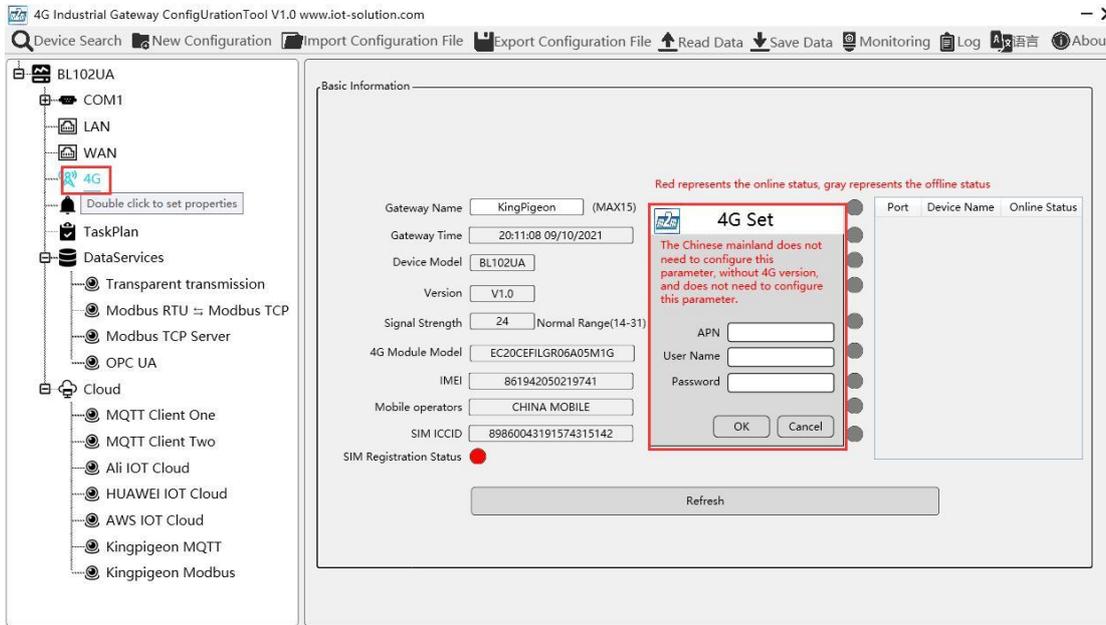
Follow the same procedure of adding datapoints for COM port device to add datapoints of WAN port device

[Add COM Port Device Datapoint](#)

## 4.2.5 4G Network 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

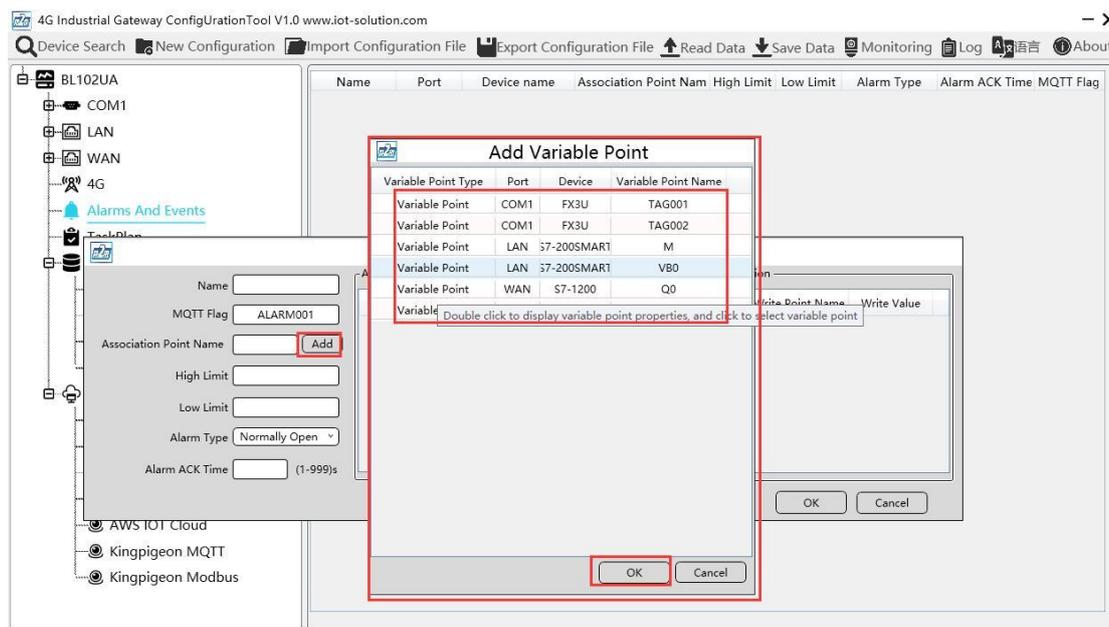
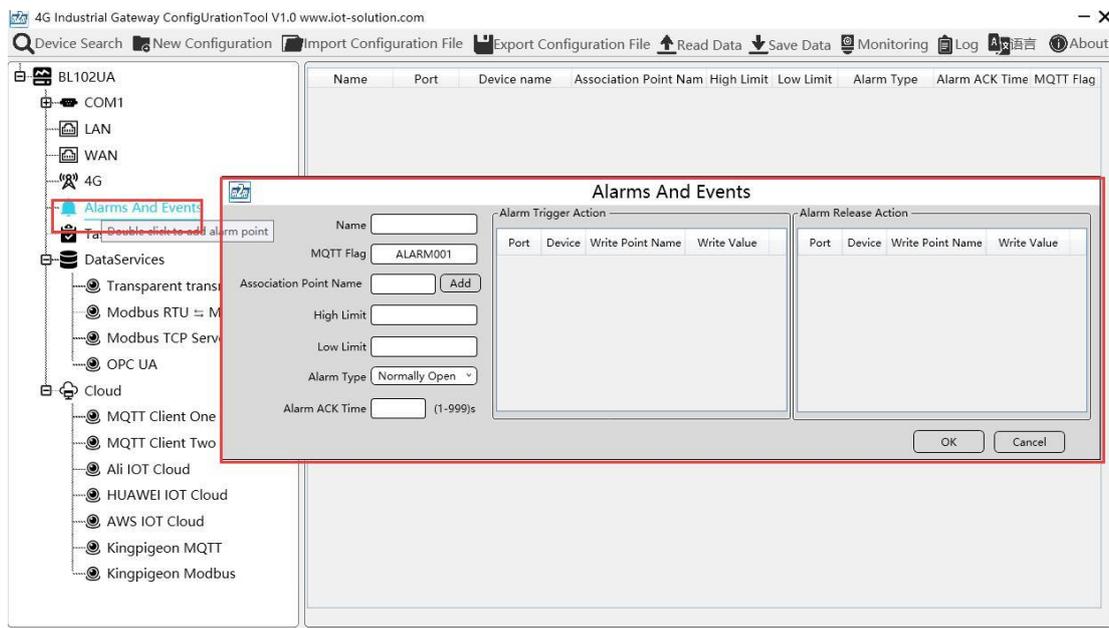


4G Configuration	
Item	Description
APN	Access Point Name of SIM card cellular network
User Name	User Name of SIM card cellular network
Password	Password of SIM card cellular network

## 4.2.6 Alarms and Events 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

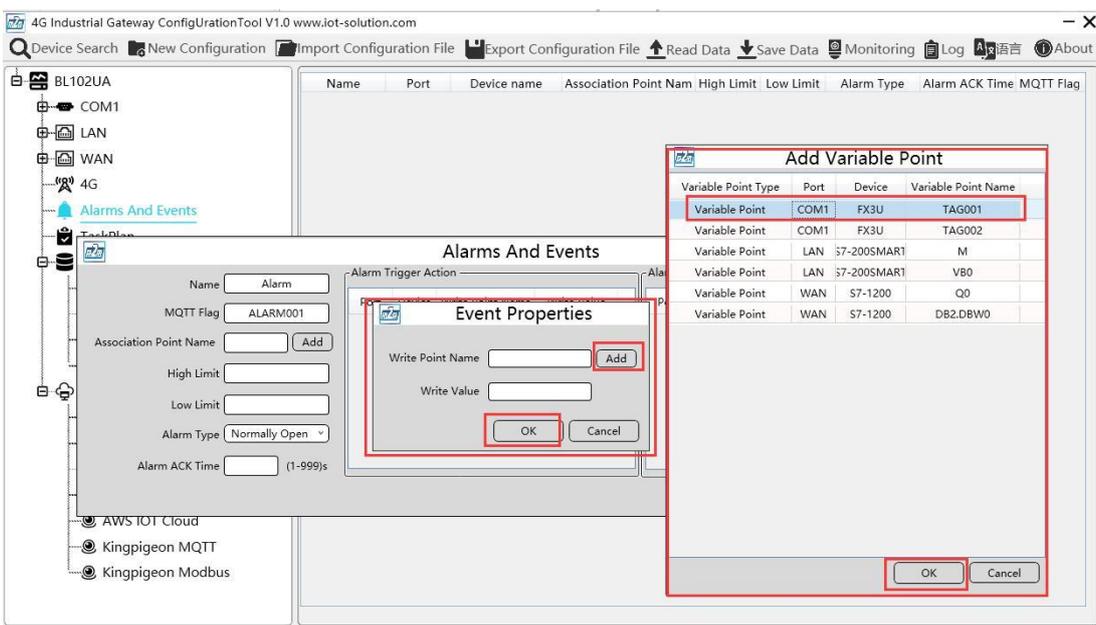
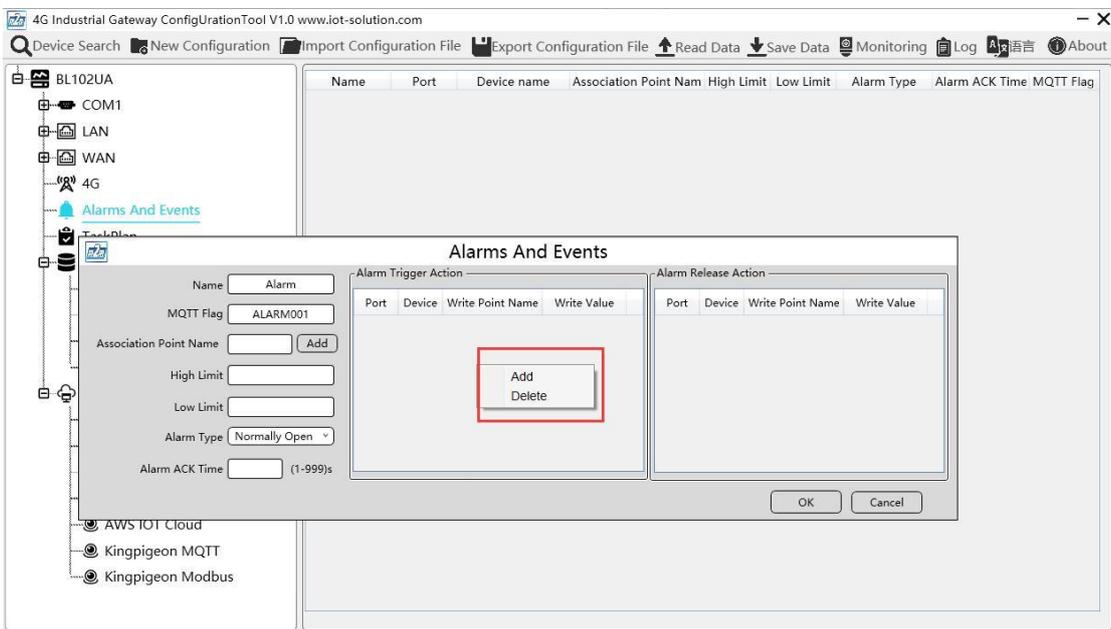


Alarm and Events Configuration	
Item	Description
Name	Name of Alarm Point
MQTT Flag	MQTT flag of alarm point, can be randomly set
Association Point Name	Select alarm point and click Add. Datapoint box will pop up. Click the point to be set for alarm and click OK to confirm. Double click datapoint to 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

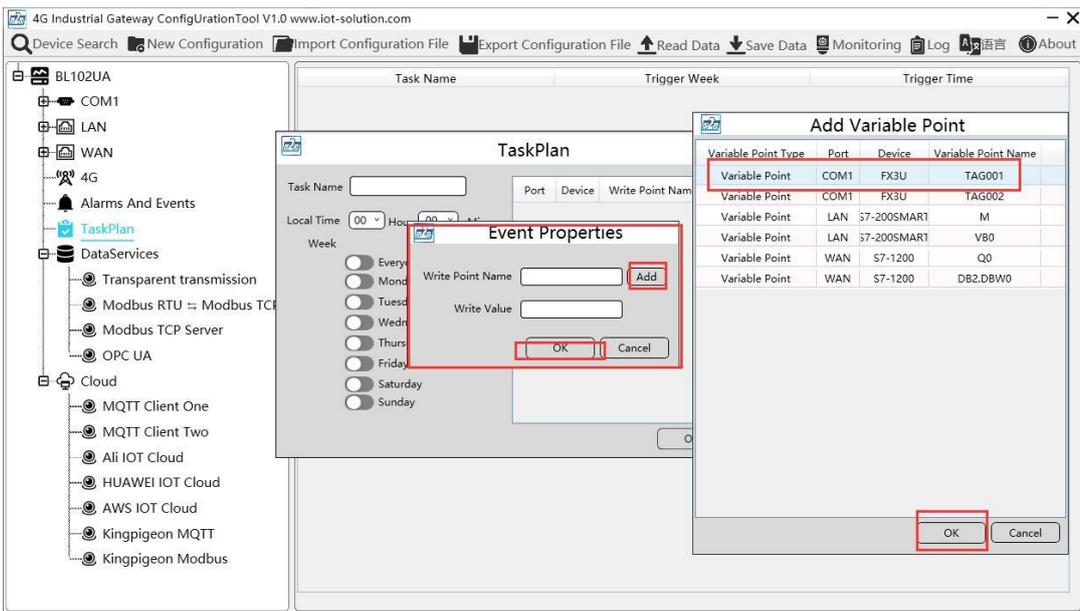
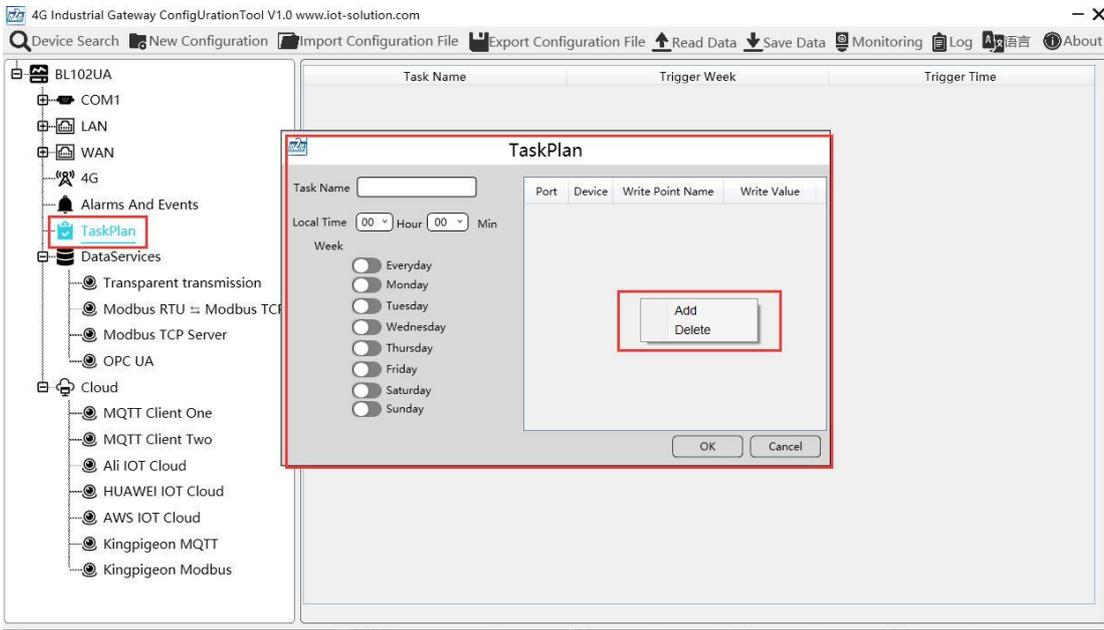
Right click Alarm Trigger Action box and click Add to enter Event configuration box for setting actions to be performed when alarm is triggered. Right click Alarm Release Action box to set actions to be performed when alarm is released



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.



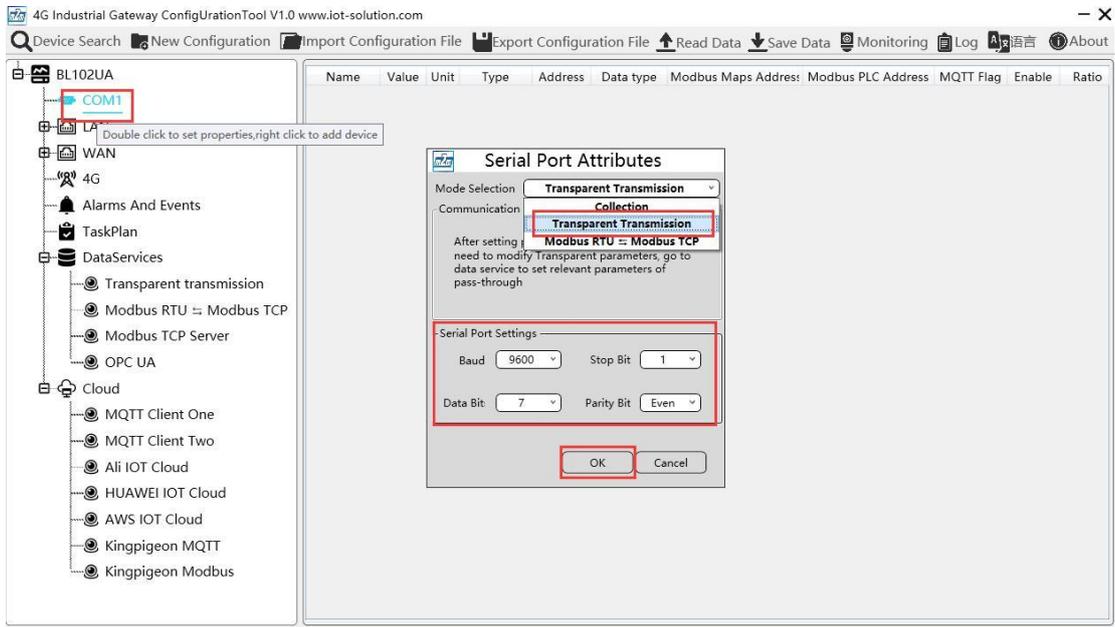
**Task Plan Configuration**

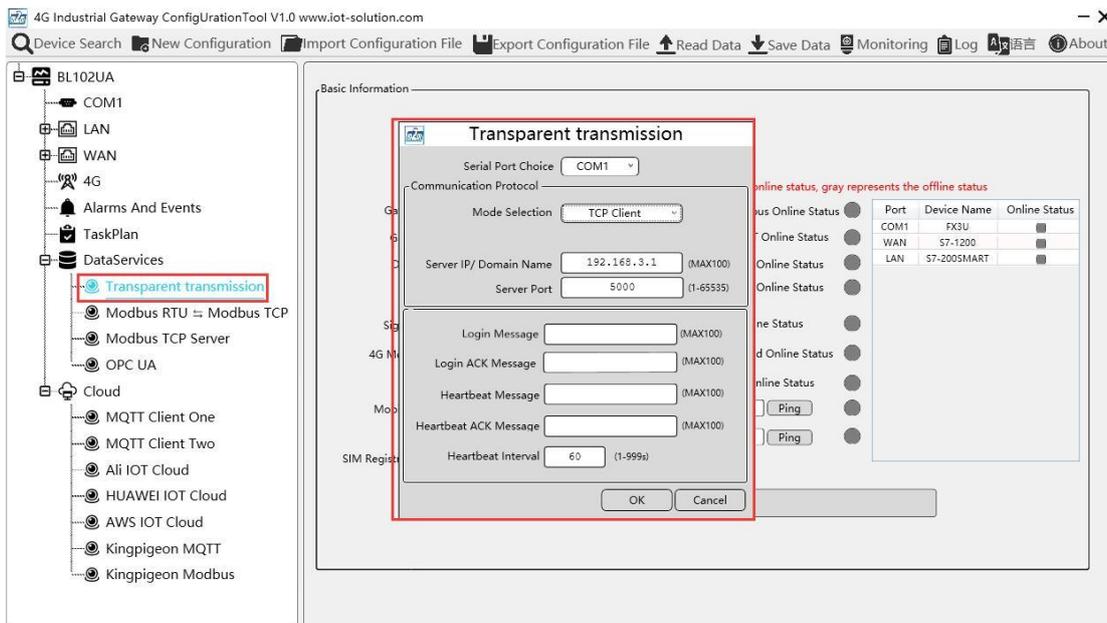
Item	Description
Task Name	Name of Task Plan
Local Time	Set time to perform the planned task (local time)
Week	Set week day to perform the planned task
Write Point Name	Write Point Name will be generated based on selected datapoint. Click Add , select the datapoint and click OK to confirm. Double click 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

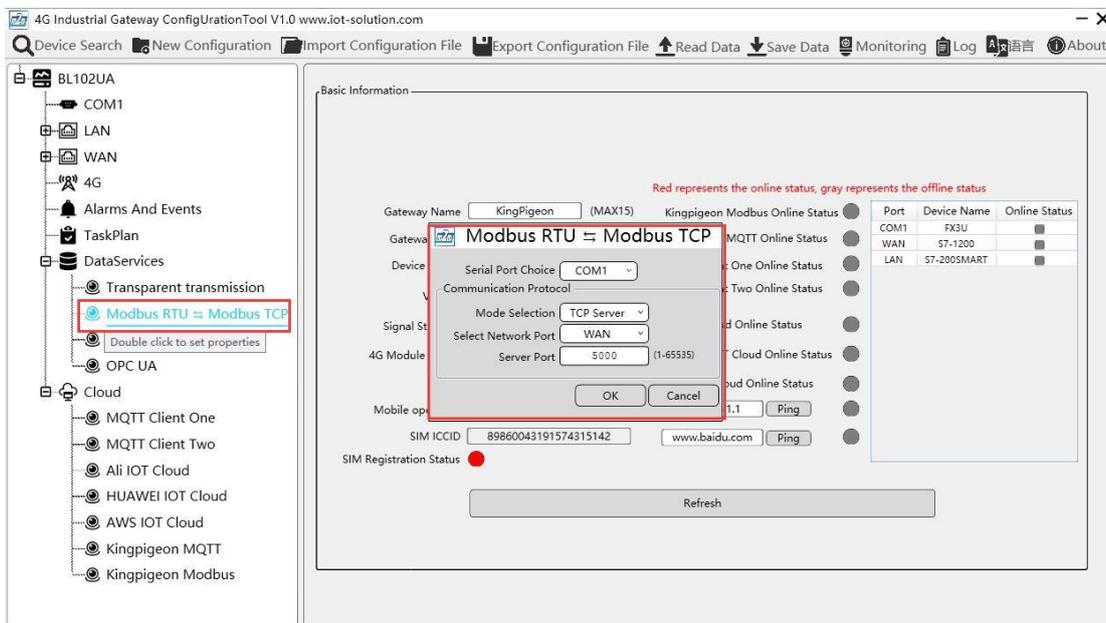
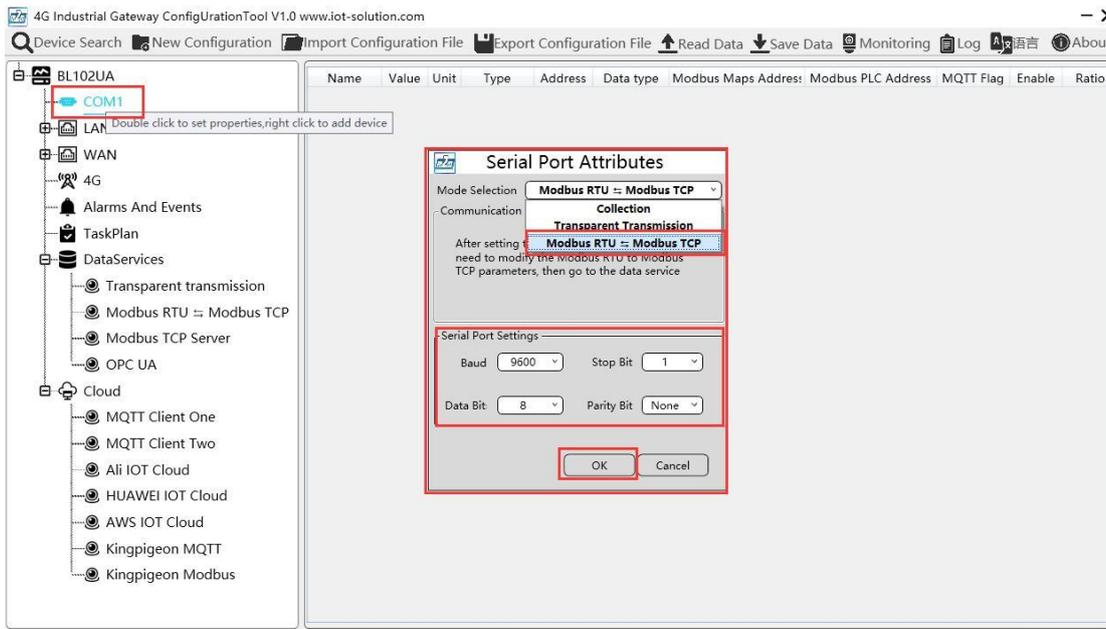




Transparent Transmission Configuration	
Item	Description
Serial Port Choice	COM1
Mode Selection	Select Gateway as “TCP Server” or “TCP Client”
Select Network Port	Only set it when BL102 Gateway is used as TCP server Select WAN or LAN
Server IP /Domain Name	If BL102 is used as server, it can't be set but automatically show selected WAN or LAN IP If BL102 is used as client, input transparent transmission server IP
Monitoring Port /Server Port	If BL102 is used as server, input monitoring port If BL102 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

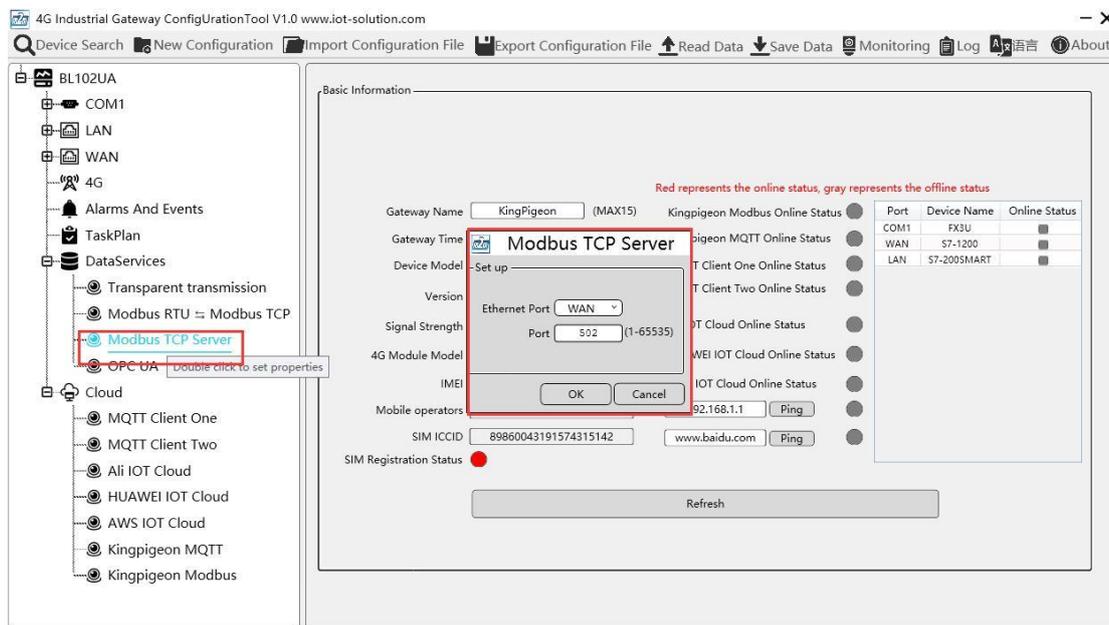


Modbus RTU to Modbus TCP Configuration	
Item	Description
Serial Port Choice	COM1
Mode Selection	TCP Server (Gateway can only be TCP Server)
Select Network Port	Select "WAN" or "LAN"
Monitoring Port	Input port of monitoring BL102 Gateway (required)
OK	Confirm Modbus RTU to Modbus TCP configuration
Cancel	Cancel Modbus RTU to Modbus TCP configuration

## 4.2.8.3 Modbus TCP Server

BL102 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 [5.2.2.2 View Data in KEPServerEX 6](#)

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

## 4.2.8.4 OPC UA

Gateway BL102 supports OPC UA and provides data as OPC UA server.

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

**OPC UA Configuration**

Gateway Name:  Enable

Gateway Time: \_\_\_\_\_

Device Model: \_\_\_\_\_

Version: \_\_\_\_\_

Signal Strength: \_\_\_\_\_

4G Module Model: \_\_\_\_\_

IMEI: \_\_\_\_\_

Mobile operators: \_\_\_\_\_

SIM ICCID: \_\_\_\_\_

SIM Registration Status: \_\_\_\_\_

Ethernet Port:  (1-65535)

Port:  (1-65535)

Anonymous:

User:  (MAX50)

Password:  (MAX50)

Security Policy:

Certificate:  ...

PrivateKey:  ...

OK Cancel

Refresh

Online Status Legend:  represents the online status, gray represents the offline status

Port	Device Name	Online Status
COM1	FX3U	<input checked="" type="checkbox"/>
WAN	S7-1200	<input checked="" type="checkbox"/>
LAN	S7-200SMART	<input checked="" type="checkbox"/>

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

Refer to [5.2.2.4 View Data in KEPServerEX 6](#) for OPC UA Client configuration

OPC UA Client datapoints are retrieved from gateway and automatically generated. It's not necessary to configure.

## 4.2.9 Cloud Platform

Gateway BL102 can be online simultaneously in multiple cloud platforms.

### 4.2.9.1 MQTT Client One

MQTT Client One can be connected to cloud with certificate or without certificate

It supports multiple publishing topics.

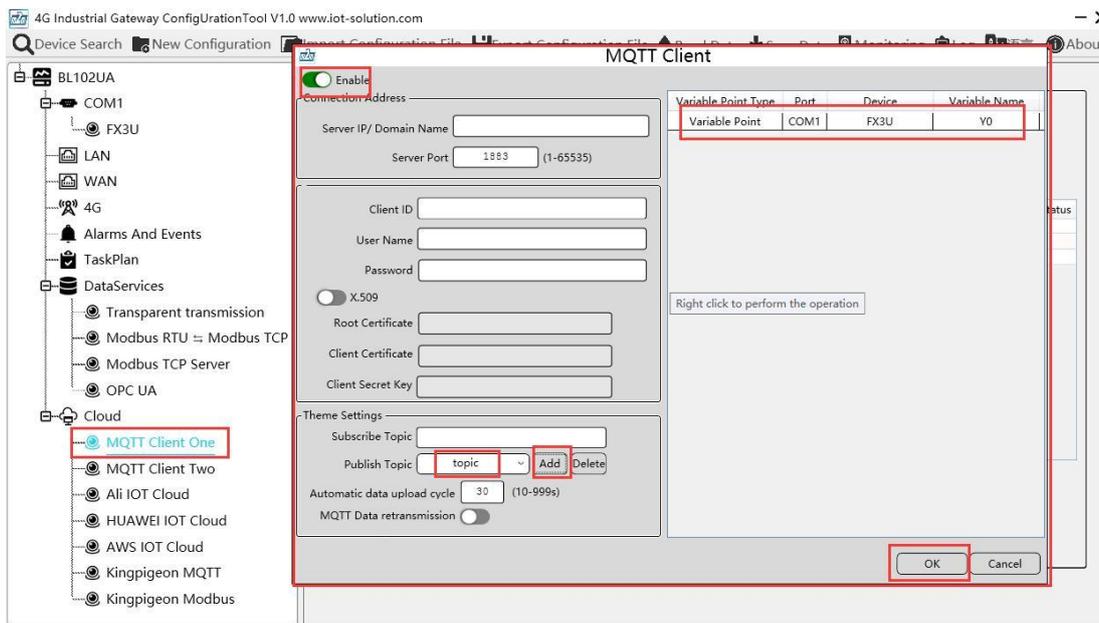
Click Add to set publish topic. Publish topic name can be viewed from drop-down list of Publish Topic.

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 Cloud 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)
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

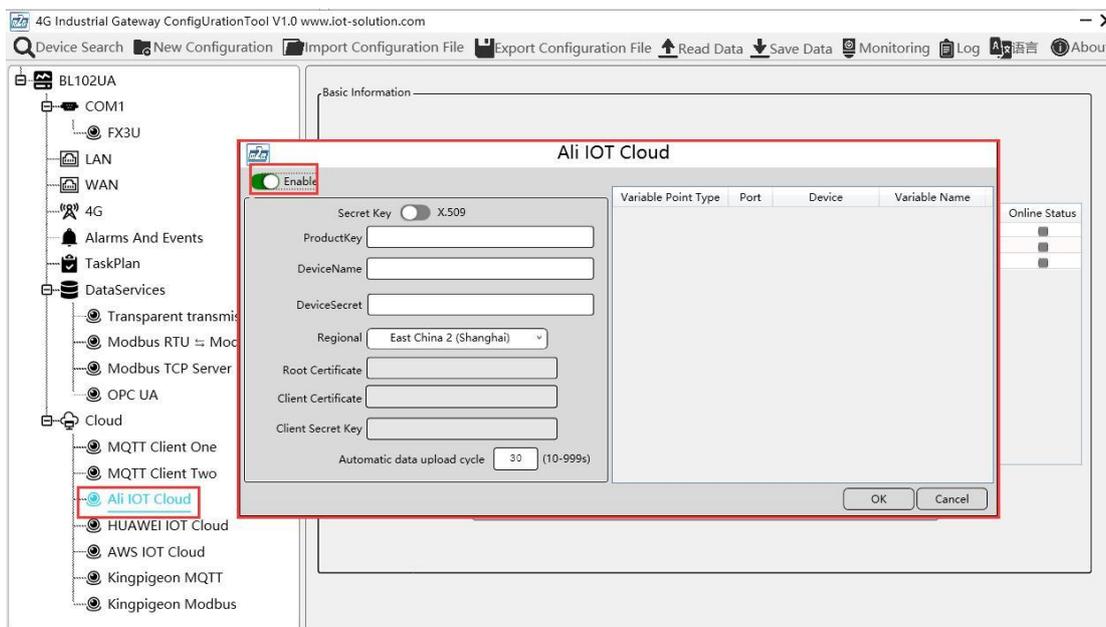
MQTT Client Two Configuration is the same as MQTT Client One

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 Cloud MQTT Data Format](#)

MQTT Client Two configuration refer to [MQTT Client One](#)

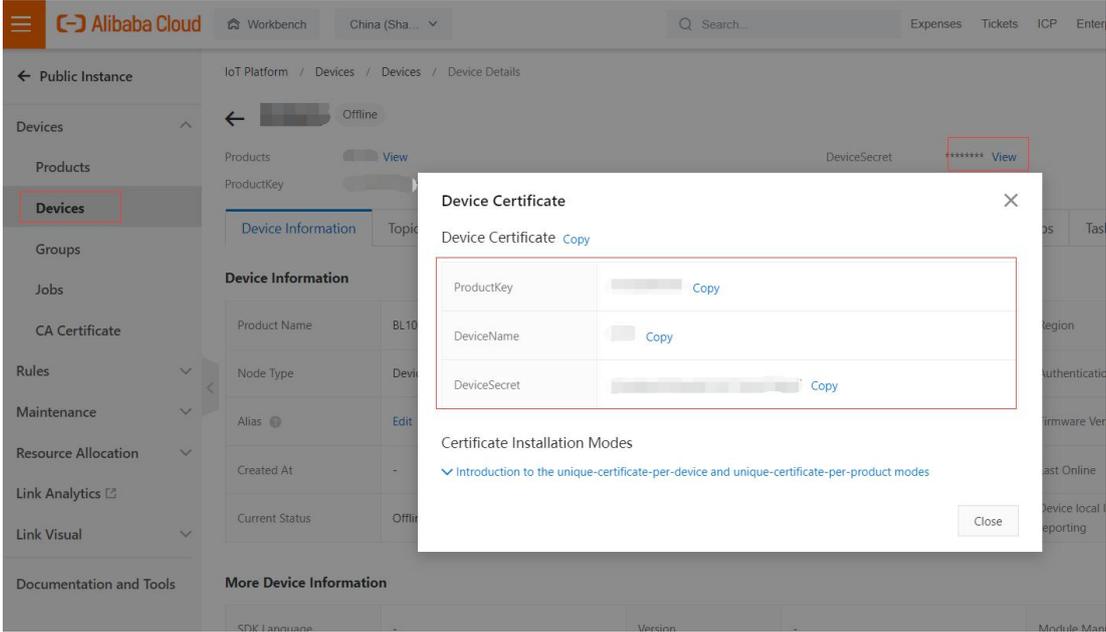
### 4.2.9.3 Alibaba Cloud

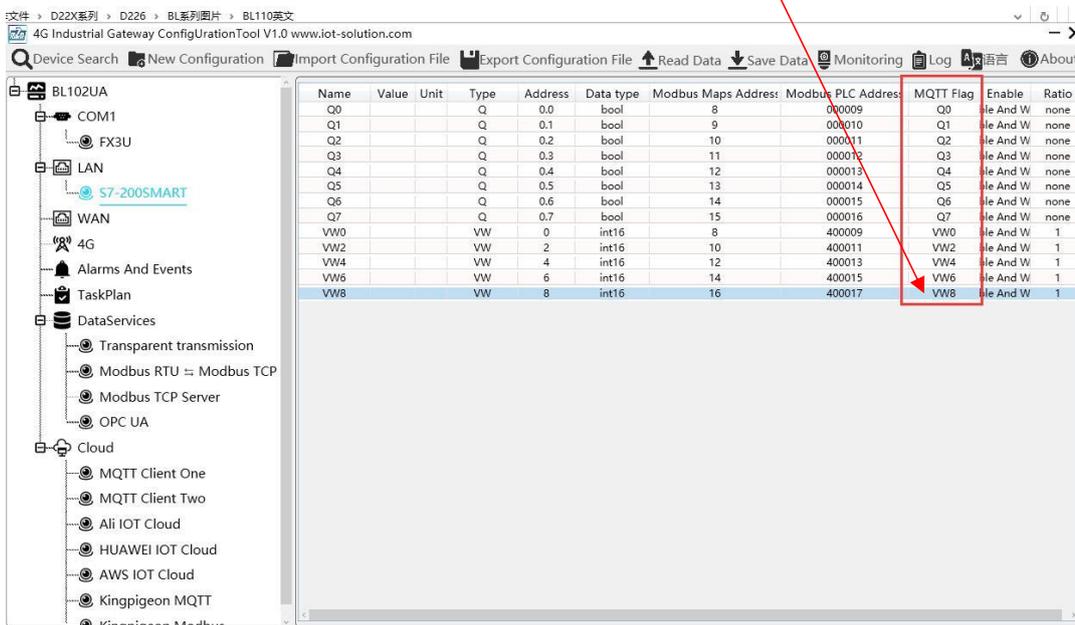
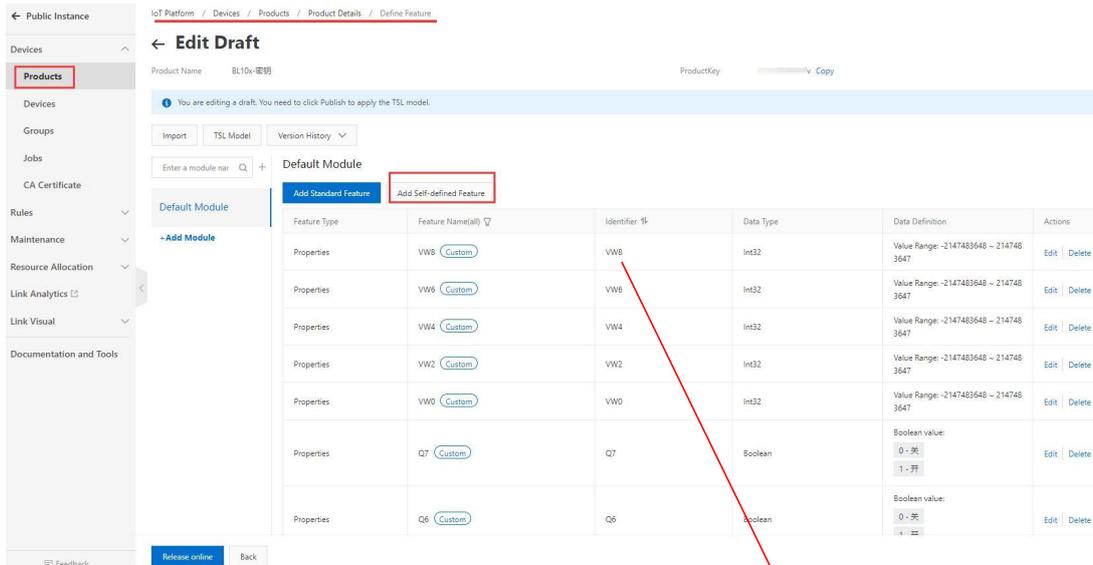


Alibaba Cloud Configuration	
Item	Description
Enable	Green indicates Alibaba Cloud is enabled

	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.

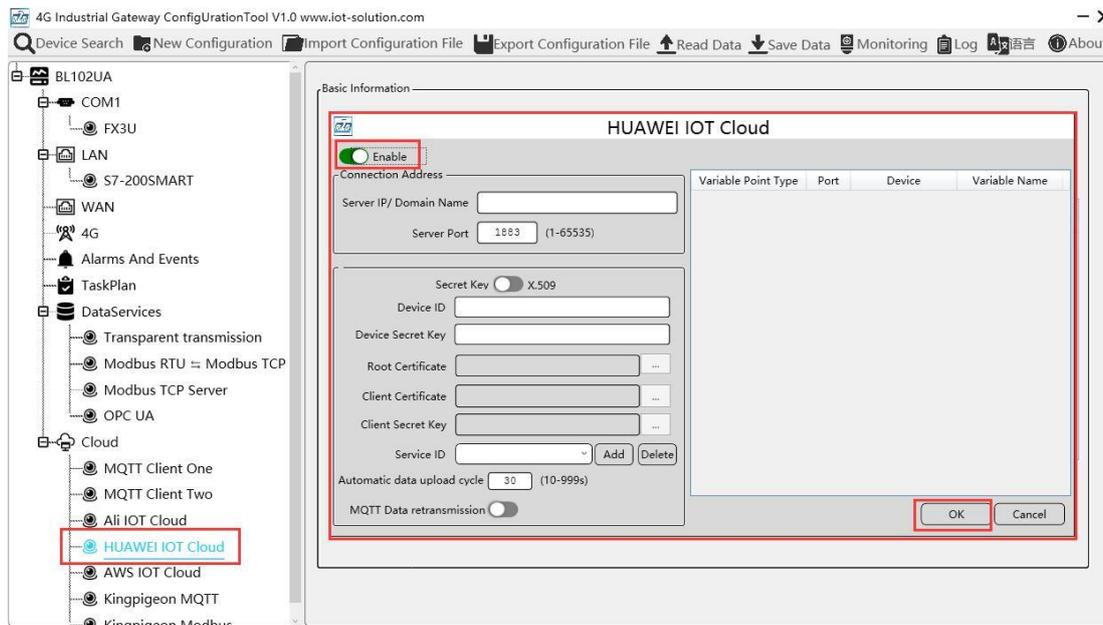
## 4.2.9.4 HUAWEI Cloud

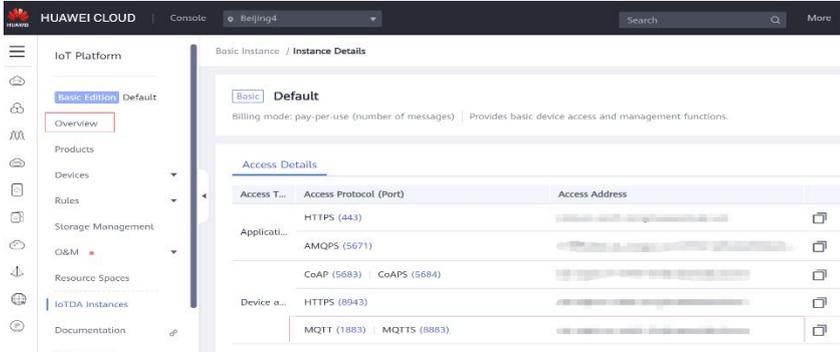
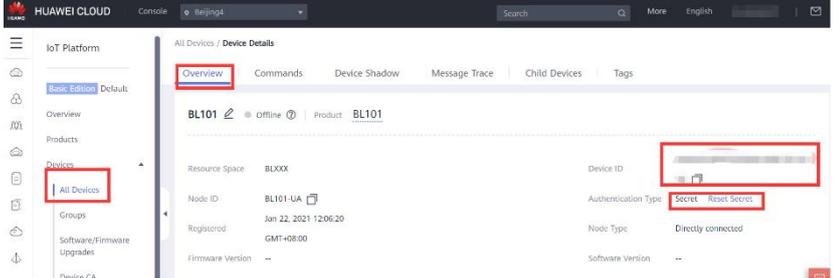
HUAWEI Cloud can be connected with or without Certificate. It supports multiple service IDs. Click Add to set Service ID. ID can be viewed from the drop-down list. Click Delete to delete service ID. HUAWEI Cloud supports uploading certain datapoints of each Service ID. Right click the box and click Add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

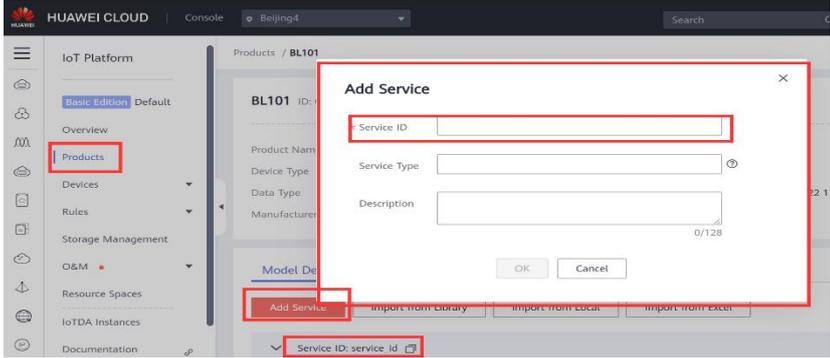
**Note: 1. Datapoint box is blank in default which means all datapoints will be uploaded. If there're multiple Service IDs, only one Service ID datapoint box can be blank. Datapoints for uploading must be selected for other Service IDs.**

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

command.

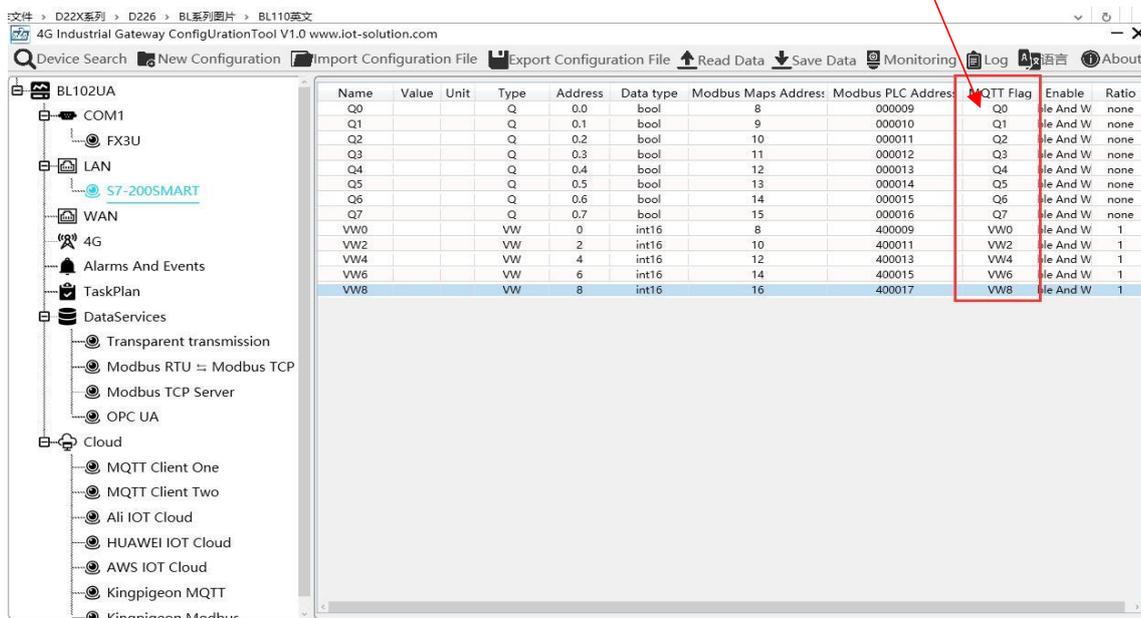
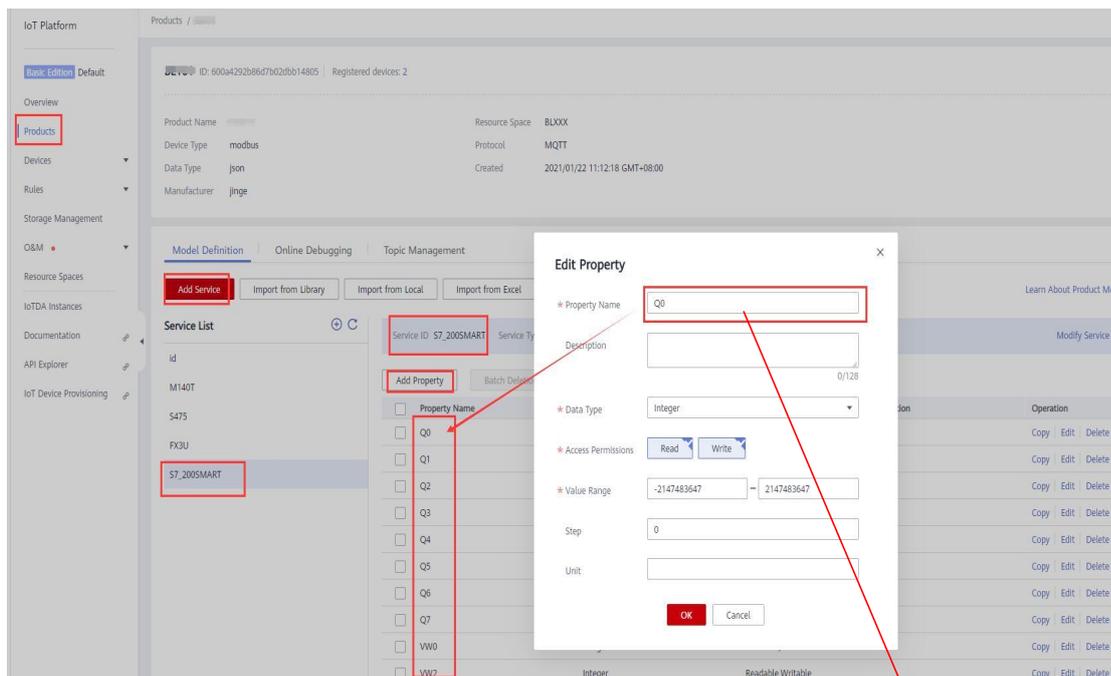


HUAWEI Cloud Configuration	
Item	Description
Enable	Green indicates HUAWEI Cloud is enabled. Gray indicates HUAWEI Cloud is disabled. Default is disabled
Server IP/ Domain Name	Select connecting to HUAWEI Cloud via MQTT to enter console. Click Overview to get server IP address of device connection 
Server 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 Key	Set the same Device Secret Key as the one in HUAWEI Cloud 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	<p>Set the same Service ID as the one in HUAWEI Cloud. (IOT Platform-Products-Add Service-Service ID)</p>  <p>Multiple Service IDs are supported</p>
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

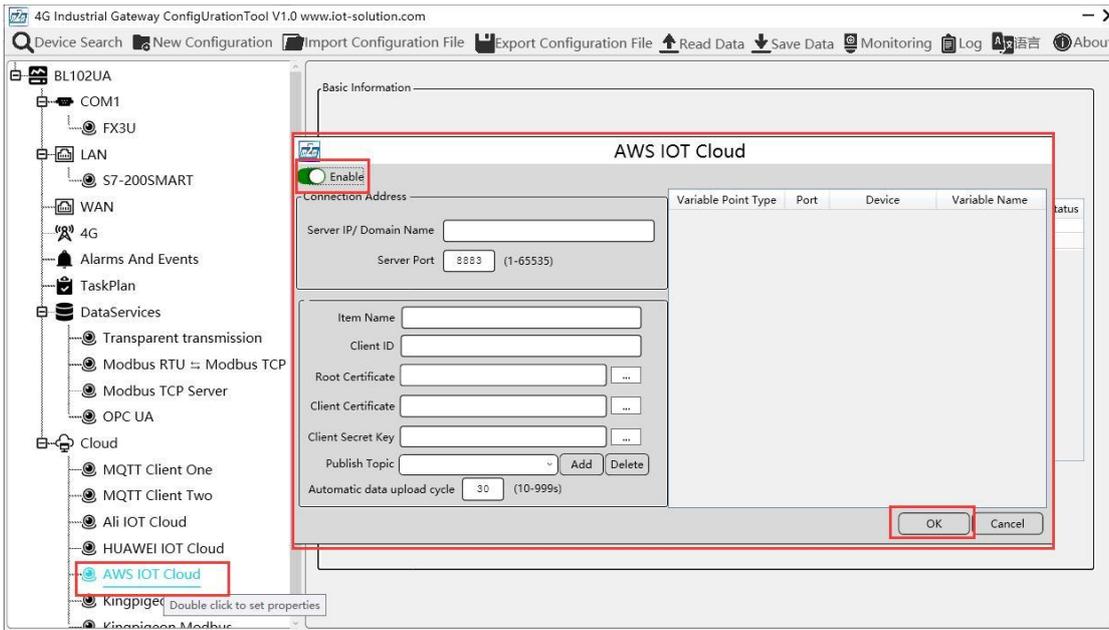
Set

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.

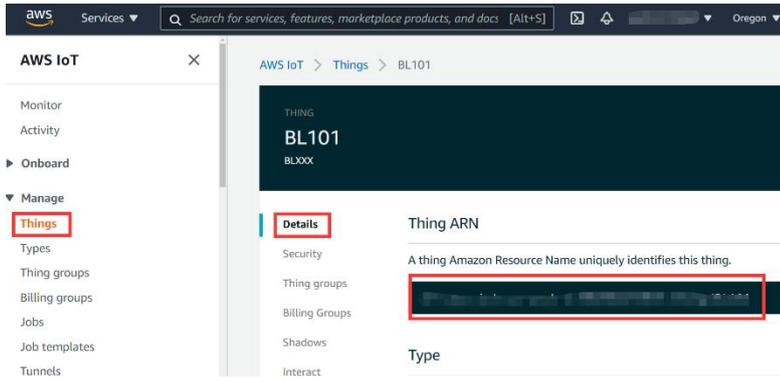
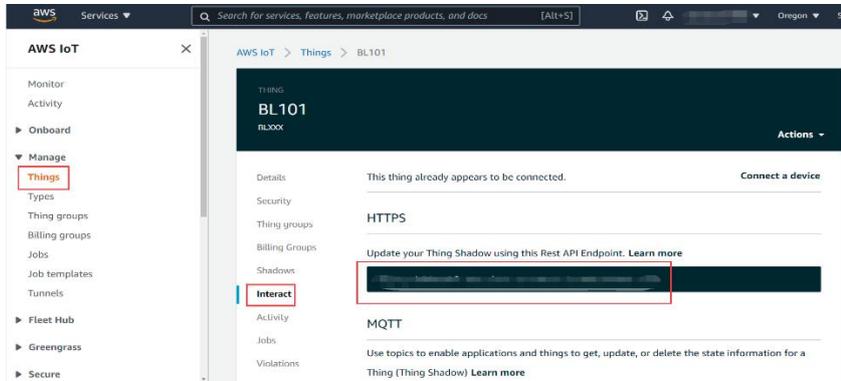


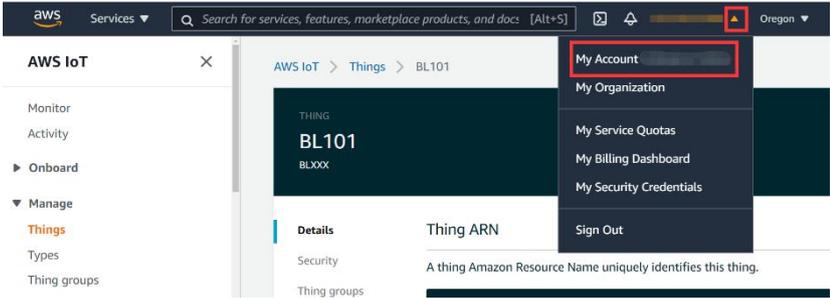
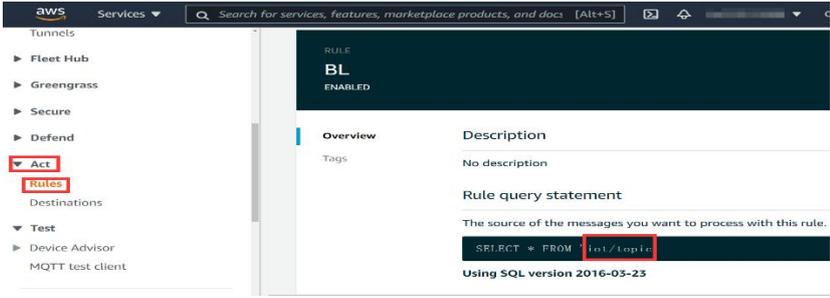
## 4.2.9.5 AWS Cloud

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 (Enter Console, click Things and then click Interact to get it)
Server Port	8883 (Required)
Item Name	Input Thing ARN

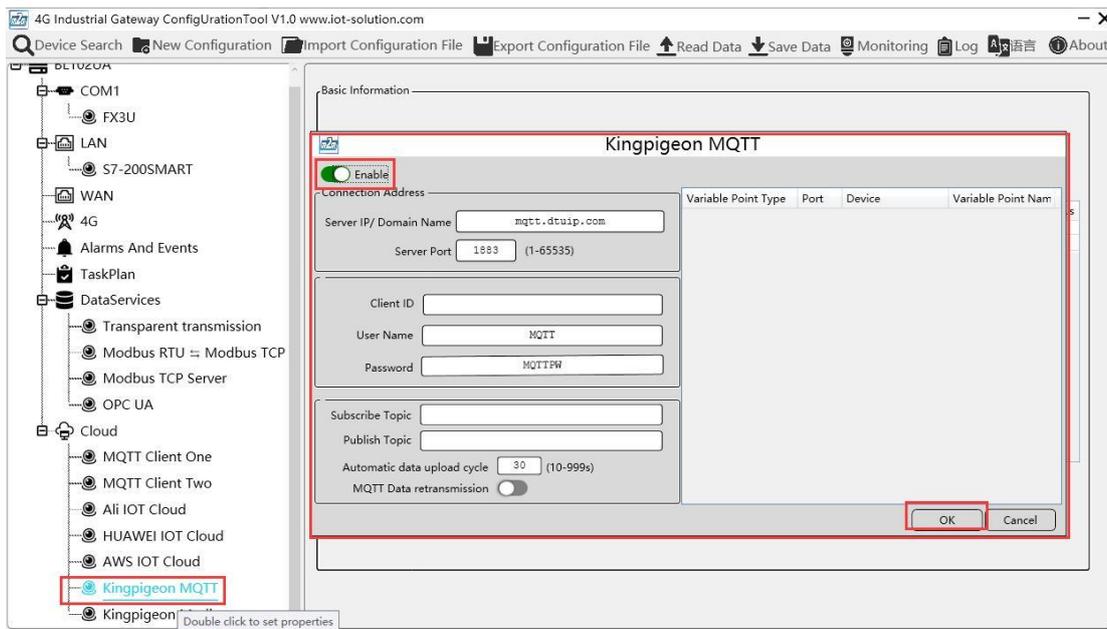


<p>Client ID</p>	<p>Input AWS Account ID</p> 
<p>Root Certificate</p>	<p>Select file to upload it</p>
<p>Client Certificate</p>	<p>Select file to upload it</p>
<p>Client Secret Key</p>	<p>Select file to upload it</p>
<p>Publish Topic</p>	<p>Input the same topic when creating rules in AWS cloud. It's the topic used for MQTT publishing message. Click Add to create more Publish Topics. Select Publish Topic and click Delete to delete it.</p> 
<p>Automatic Data Upload Cycle</p>	<p>Cycle time of data uploading. Default is 30s</p>
<p>Datapoint Publishing Selection</p>	<p>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. .</p>
<p>OK</p>	<p>Confirm AWS setting</p>
<p>Cancel</p>	<p>Cancel AWS setting</p>

### 4.2.9.6 King Pigeon Cloud via MQTT

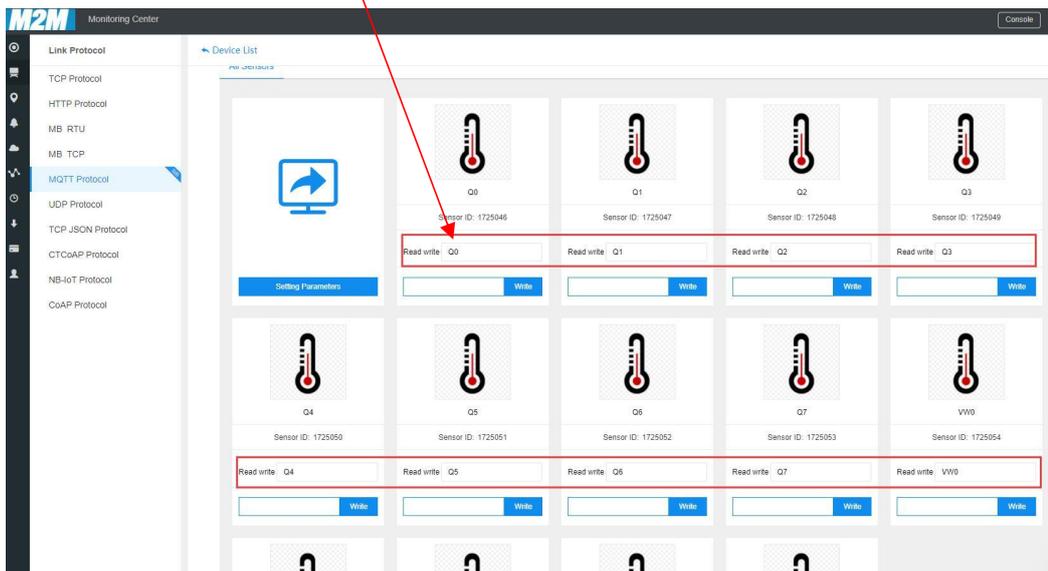
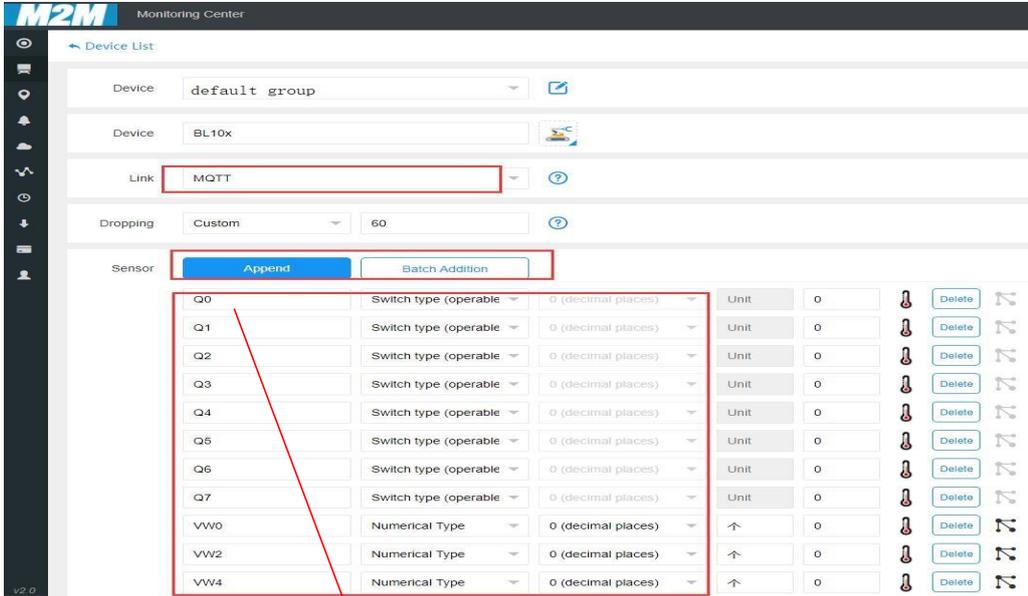
King Pigeon Cloud MQTT data format refer to: [King Pigeon Cloud MQTT Data Format](#)

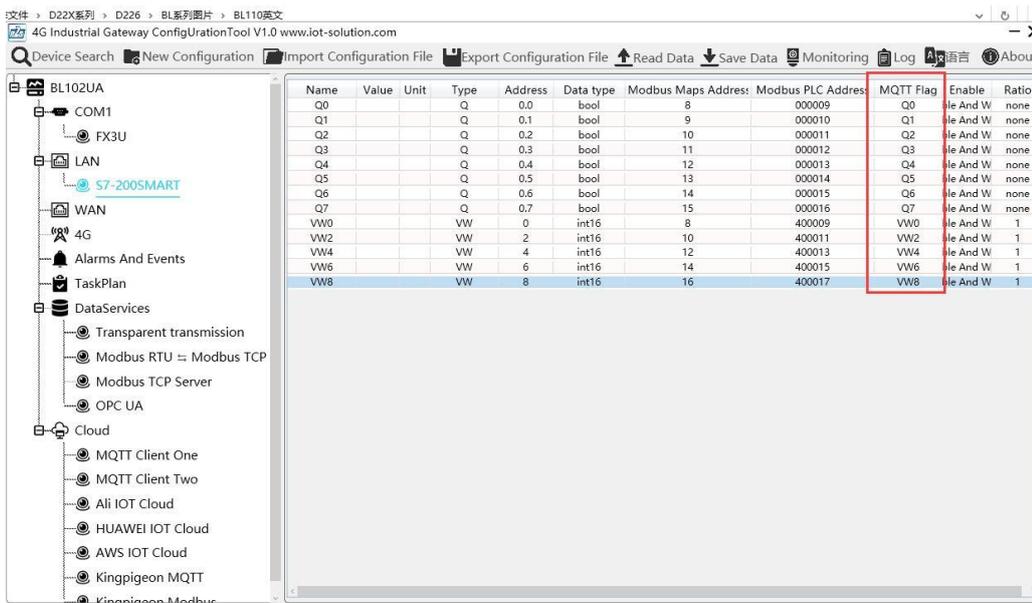
Configure it as below picture :



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

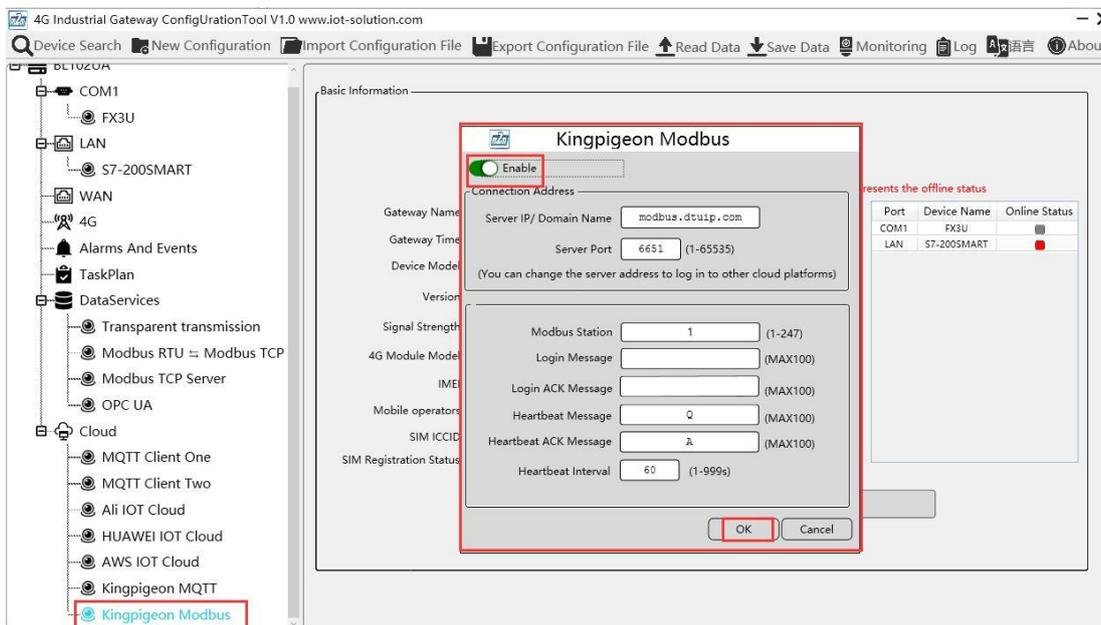
Configure datapoint with below procedure. First add datapoint and then configure datapoint mark. It must be the same as MQTT flag in configuration software. For example, collect datapoint Q1 of PLC S7-200SMART, in configuration software MQTT flag is Q1, then set Q1 as read-write mark in King Pigeon cloud.





## 4.2.9.7 King Pigeon Cloud via Modbus

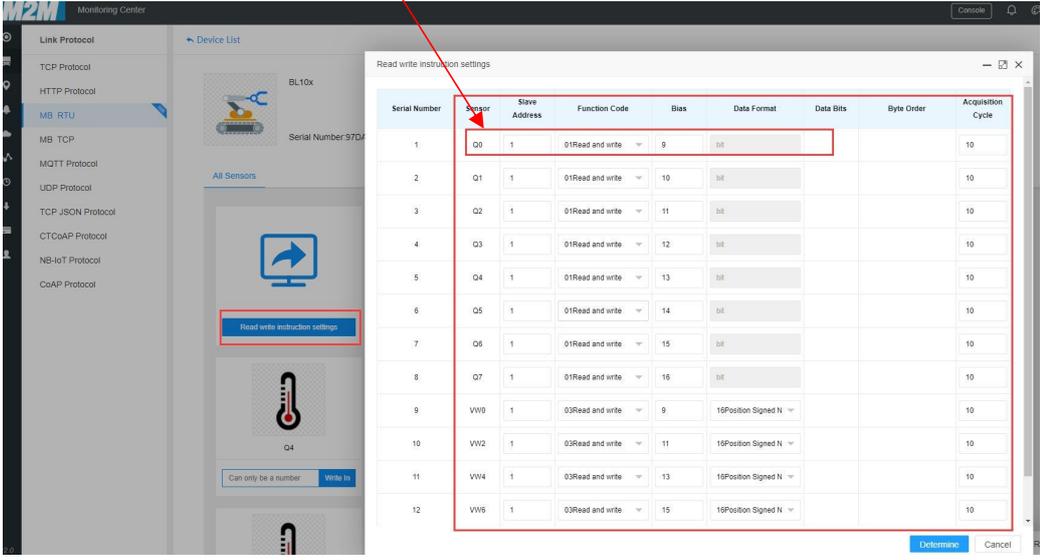
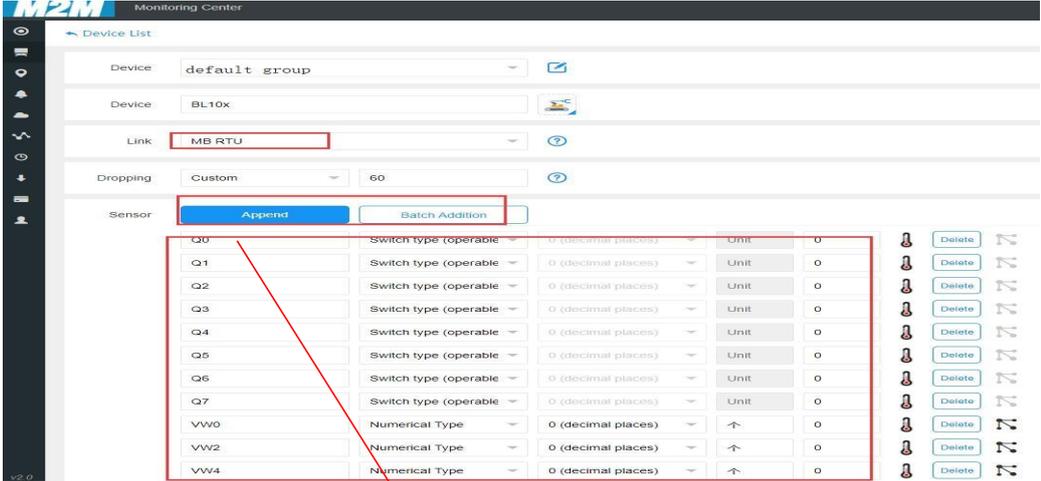
Both King Pigeon Cloud and custom Modbus cloud can be connected via Modbus RTU protocol. BL102 supports function code 01, 05 of Boolean data and function codes 03, 06 of numerical data. 16-bit byte sequence is AB and 32-bit byte sequence is ABCD.



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



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Device Search | New Configuration | Import Configuration File | Export Configuration File | Read Data | Save Data | Monitoring | Log | About

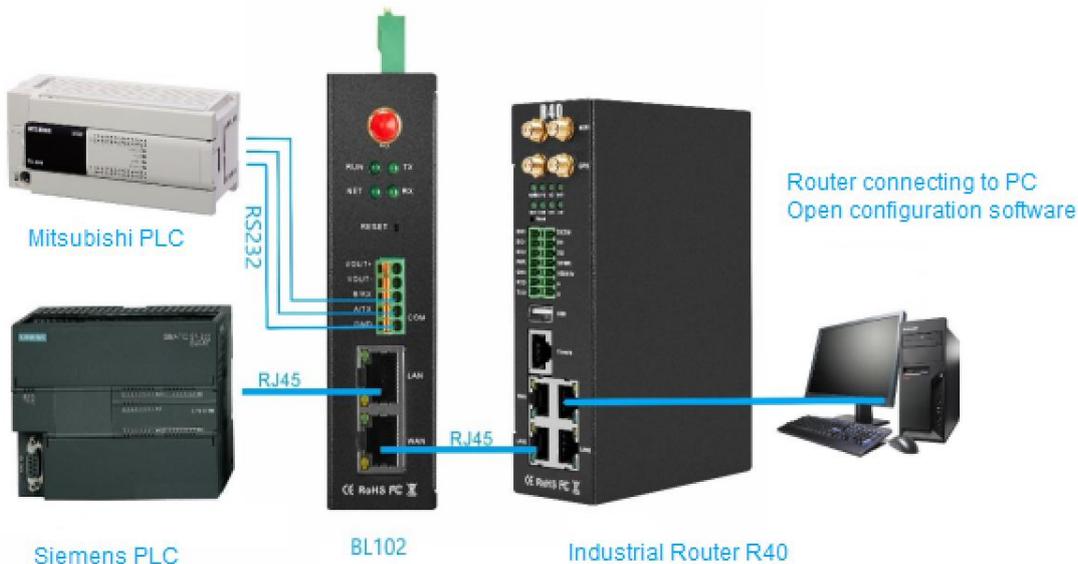
Name	Value	Unit	Type	Address	Data type	Modbus Maps Address	Modbus PLC Address	MQTT Flag	Enable	Ratio
Q0			Q	0.0	bool	8	000009	Q0	ble And W	none
Q1			Q	0.1	bool	9	000010	Q1	ble And W	none
Q2			Q	0.2	bool	10	000011	Q2	ble And W	none
Q3			Q	0.3	bool	11	000012	Q3	ble And W	none
Q4			Q	0.4	bool	12	000013	Q4	ble And W	none
Q5			Q	0.5	bool	13	000014	Q5	ble And W	none
Q6			Q	0.6	bool	14	000015	Q6	ble And W	none
Q7			Q	0.7	bool	15	000016	Q7	ble And W	none
VW0			VW	0	int16	8	400009	VW0	ble And W	1
VW2			VW	2	int16	10	400011	VW2	ble And W	1
VW4			VW	4	int16	12	400013	VW4	ble And W	1
VW6			VW	6	int16	14	400015	VW6	ble And W	1
VW8			VW	8	int16	16	400017	VW8	ble And W	1

## 5 Gateway BL102 Application Example

Below is the example of BL102 Gateway COM port collecting data of Mitsubishi PLC FX3U and LAN port collecting data of Siemens PLC S7-200SMART. Other PLC configuration procedures are the same. Just set Device Brand and Device Model of the PLC to collect data. BL102 Gateway WAN port connects to industrial Router R40 for internet access.

### 5.1 FX3U & S7-200SMART Connect to Gateway BL102

BL102 Gateway Wiring Diagram:



Connect Siemens PLC S7-200SMART to Gateway BL102 LAN Port. Connect Mitsubishi PLC FX3U to Gateway BL102 COM Port with RS232 to RS422 converting cable. Connect Industrial Router R40 to BL102 Gateway WAN port. Collected PLC data is sent to cloud through 4G industrial router R40. Note: Both WAN and LAN ports can collect PLC data. This example is introduction to LAN port data collecting. WAN port configuration is the same as LAN port configuration.

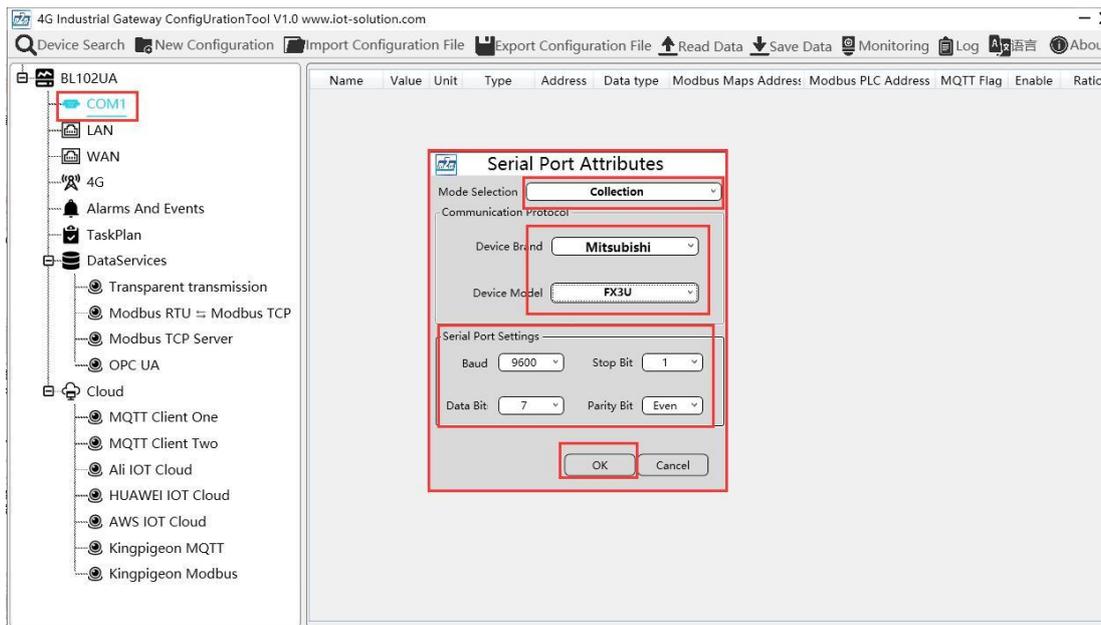
## 5.2 Configuration Software

Device, Datapoint and cloud connection should be configured.

### 5.2.1 Add Device and Datapoint

#### 5.2.1.1 COM Port Configuration

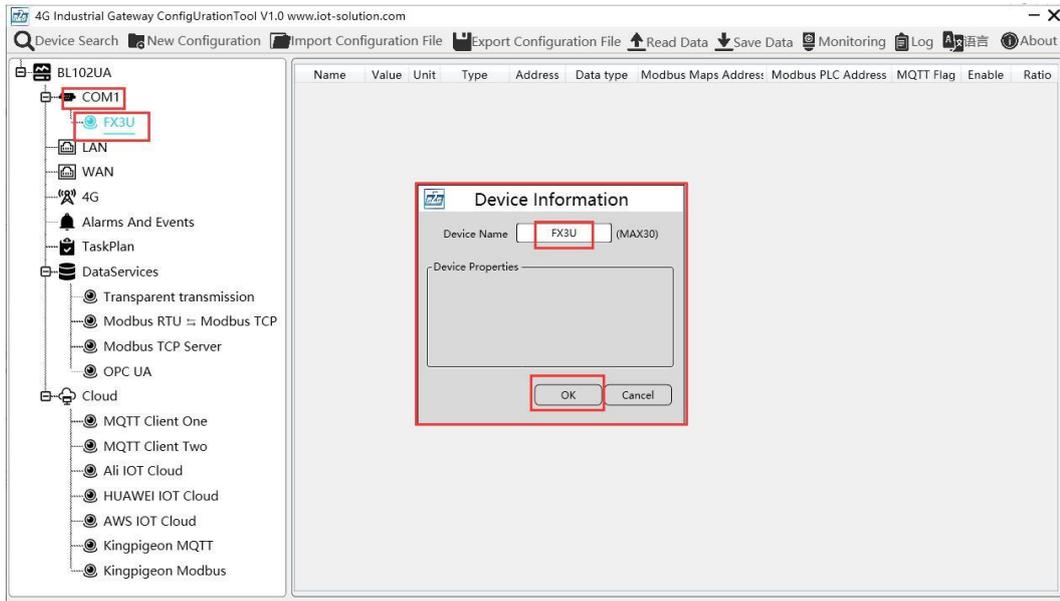
COM port connects Mitsubish PLC FX3U with RS232 to RS422 converting cable. Configure it as below procedure.



- (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, stop bit, data bit and parity bit
- (5) Click OK to confirm it.

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

### 5.2.1.2 Add COM Port Device-Mitsubish PLC FX3U



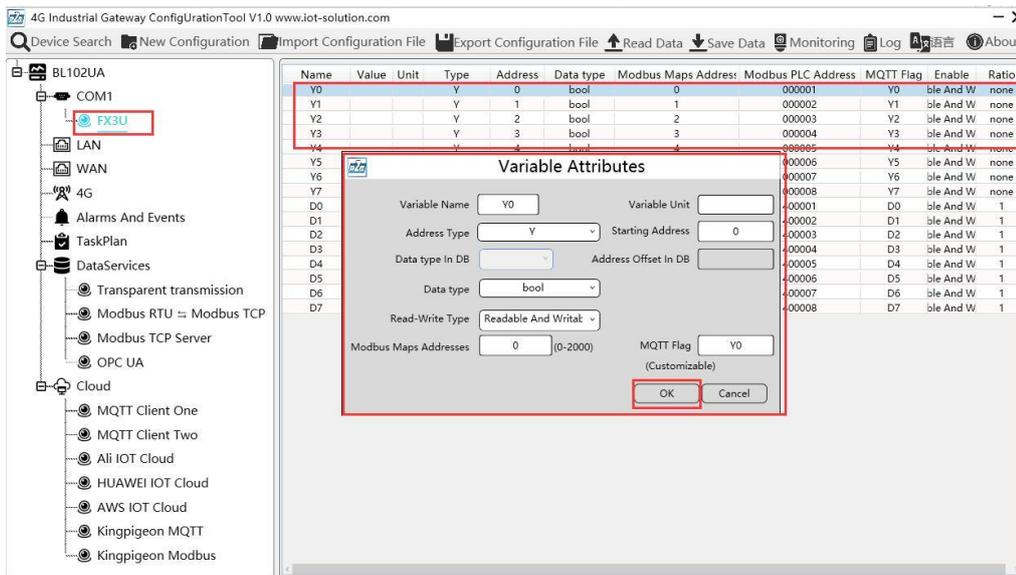
- (1) Click COM1, right click it and click Add to enter device configuration box
- (2) Set Device Name at random like FX3U
- (3) Click OK to confirm adding FX3U PLC.

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

### 5.2.1.3 Add FX3U Datapoints

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

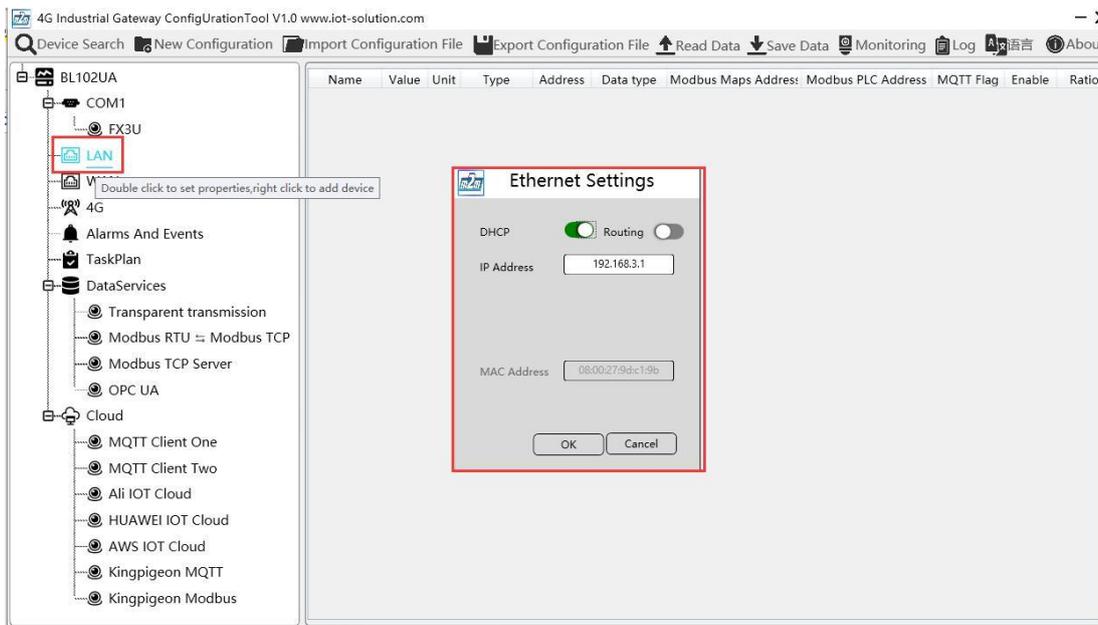
- (2) Set datapoint name, for example, Y0
- (3) Variable unit: Set any unit as required.
- (4) Address Type: Select the address type of Mitsubishi PLC register. Select Y for collecting Y0 datapoint
- (5) Starting Address: Input datapoint register address, for example, Y0 register address in FX3U is 0, 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 BL102. It can be any address from 0-2000 but can't be repeated. For example, Y0 data is saved in register address 0 of BL102
- (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 like 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**

## 5.2.1.4 LAN Port Configuration

Below is the example of connecting Siemens PLC S7-200SMART to BL102 LAN port.

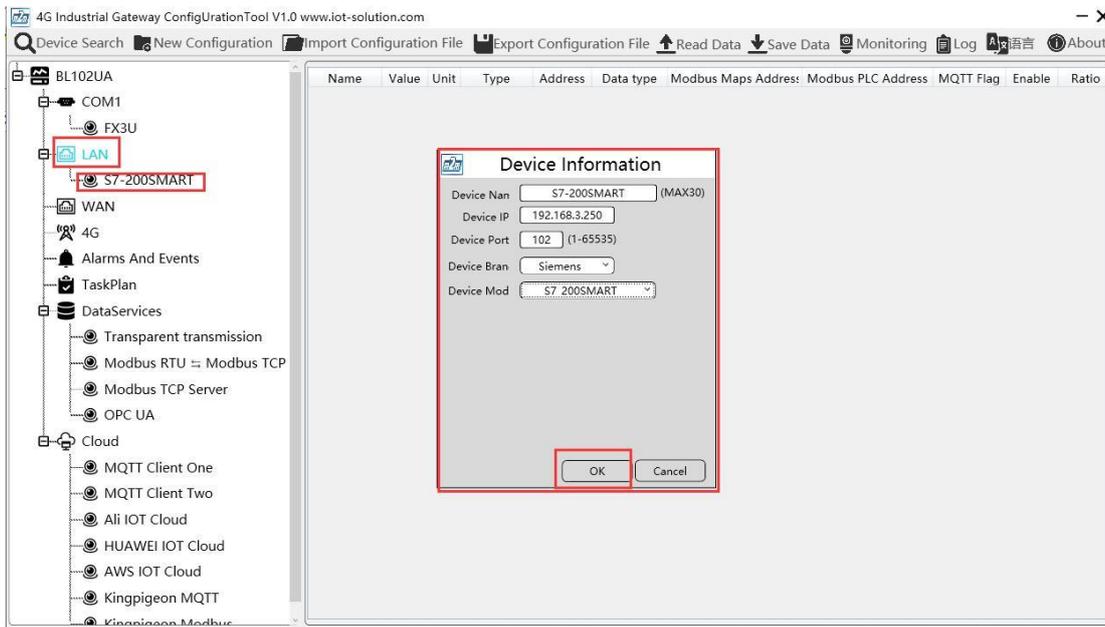


- (1) Double click LAN to enter configuration box
- (2) DHCP: enable auto IP distribution. Default is disabled.
- (3) Routing: Enable network routing function. Default is disabled. For example, PLC S7-200SMART does not need network. Thus it's necessary to enable it.
- (4) IP Address: default is 192.168.3.1, 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 Address: 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

## 5.2.1.5 Add LAN Port Device-Siemens PLC S7-200SMART



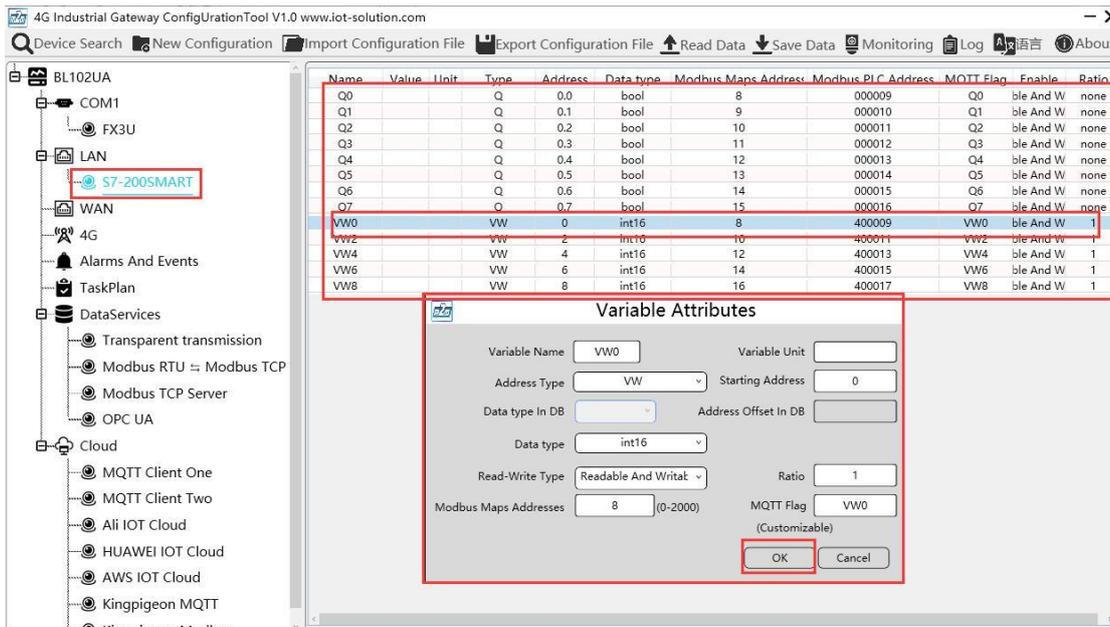
- (1) Click LAN and right click mouse and click Add to enter device configuration box
- (2) Device Name: set device name, for example, set S7-200SMART as device name.
- (3) Device IP: input PLC IP address. For example, PLC S7-200SMART IP is 192.168.3.250, thus put 192.168.3.250 here. **This is PLC IP address. PLC IP address and LAN Port IP address must be in the same range.**
- (4) Device Port: input LAN port device port.
- (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**

## 5.2.1.6 Add LAN Port Device PLC S7-200SMART Datapoints

Below is example of adding some datapoints of PLC S7-200SMART register Q & VW



- (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 BL102.  
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)-(11)

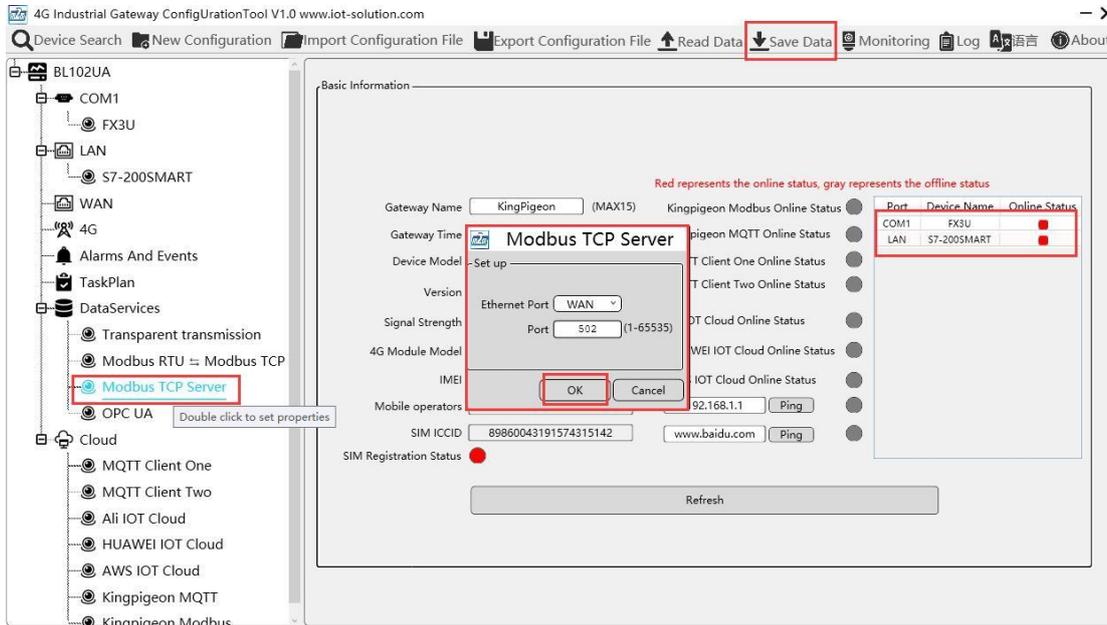
**Note: Click Save Data. Gateway will restart automatically and S7-200SMART datapoint is added successfully.**

## 5.2.2 Upload PLC FX3U & S7-200SMART Data to Cloud

Below is the example of unloading PLC FX3U & S7-200SMART data to Modbus TCP Server, OPCUA, Alibaba Cloud, HUAWEI Cloud, AWS, and King Pigeon Cloud via MQTT & Modbus simultaneously. MQTT Client One and MQTT Client Two are for private platform and support connection with

certificate. Configuration procedure is the same as King Pigeon cloud via MQTT.

### 5.2.2.1 Modbus TCP Server Configuration



- (1) Double 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: 192.168.1.164
- (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.

### 5.2.2.2 View Data in KEPServerEX 6

Gateway provides data as Modbus TCP server. Modbus TCP host computer will collect data from BL102, 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 simulating KEPServerEX 6 as host computer to collect BL102 data.

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Device Search | New Configuration | Import Configuration File | Export Configuration File | Read Data | Save Data | Monitoring | Log | 语言 | About

BL102UA

- COM1
  - FX3U
- 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

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

Right click to add variable point, double click to display variable point attribute

已连接到运行时 - KEPServerEX 6 配置

文件(F) | 编辑(E) | 视图(V) | 工具(T) | 运行时(R) | 帮助(H)

项目

- 连接性
  - BL102-TCP Server
    - BL102**
    - BL102UA-OPC UA
    - BL102UA-OPC UA
    - gateway
      - com1\_FX3U
      - lan\_S7-200SMART
- 模拟示例
- 数据类型示例
- 别名
- Advanced Tags
- Alarms & Events
- Data Logger
- 添加日志组...
- EPF Exporter
- Add Poll Group...
- IDF for Splunk
- Add Splunk Connection...
- IoT Gateway
  - Add Agent...
- Local Historian
  - Add Datastore...
- Scheduler
  - Add Schedule...
- SNMP Agent
  - Add Agent...

标记名称	地址	数据类型	扫描速率	缩放
D0	400001	Word	100	无
D1	400002	Word	100	无
D2	400003	Word	100	无
D3	400004	Word	100	无
D4	400005	Word	100	无
D5	400006	Word	100	无
D6	400007	Word	100	无
D7	400008	Word	100	无
Q0	000009	Word	100	无
Q1	000010	Word	100	无
Q2	000011	Word	100	无
Q3	000012	Word	100	无
Q4	000013	Word	100	无
Q5	000014	Word	100	无
Q6	000015	Word	100	无
Q7	000016	Word	100	无
VW0	400009	Word	100	无
VW2	400011	Word	100	无
VW4	400013	Word	100	无
VW6	400015	Word	100	无
VW8	400017	Word	100	无
Y0	000001	Word	100	无
Y1	000002	Word	100	无
Y2	000003	Word	100	无
Y3	000004	Word	100	无
Y4	000005	Word	100	无
Y5	000006	Word	100	无
Y6	000007	Word	100	无
Y7	000008	Word	100	无

属性编辑器 - BL102-TCP Server.BL102

属性组	名称	值
标识	名称	BL102
常规	说明	Modbus TCP/IP Ethernet
	驱动程序	Modbus
	型号	BL102-TCP Server
	通信分配	<192.168.1.164>:0
操作模式	数据收集	启用
	模拟	否
标记计数	静态标记	29
	名称	指定此对象的标识。

[已连接到运行时] - KEPServerEX 6 配置

文件(F) 编辑(E) 视图(V) 工具(T) 运行时(R) 帮助(H)

标记名称	地址	数据类型	扫描速率	编址	说明
D0	400001	Word	100	无	
D1	400002	Word	100	无	
D2	400003	Word	100	无	
D3	400004	Word	100	无	
D4	400005	Word	100	无	
D5	400006	Word	100	无	
D6	400007	Word	100	无	
D7	400008	Word	100	无	

属性编辑器 - BL102-TCP Server.BL102.D0

名称: D0

地址: 400001

数据类型: 字

客户访问: 读/写

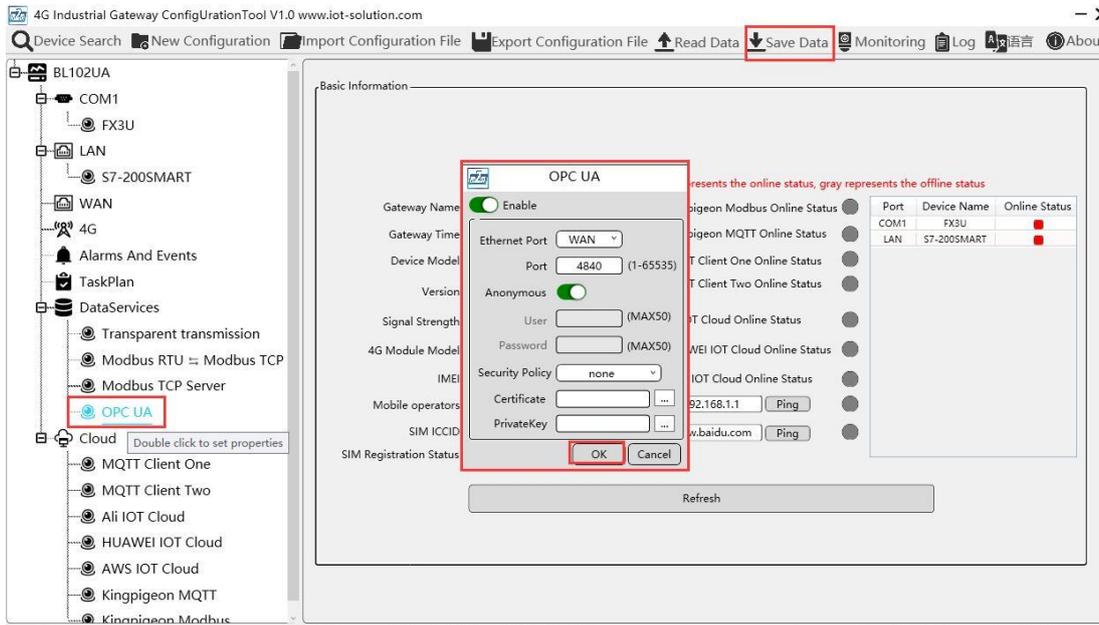
扫描速率(毫秒): 100

Keeware KEPServerEX.V6

- \_DataLogger
- \_System
- \_ThingWox
- BL102-TCP Server\_CommunicationSerialization
- BL102-TCP Server\_Statistics
- BL102-TCP Server\_System
- BL102-TCP Server.BL102**
- BL102-TCP Server.BL102\_Statistics
- BL102-TCP Server.BL102\_System
- BL102UA-OPC UA\_Statistics
- BL102UA-OPC UA\_System
- BL102UA-OPC UA.BL102UA-OPC UA\_System
- BL102UA-OPC UA.BL102UA-OPC UA.gateway
- 模拟器示例\_Statistics
- 模拟器示例\_System
- 模拟器示例.函数
- 模拟器示例.函数\_System
- 数据类型示例\_Statistics
- 数据类型示例\_System
- 数据类型示例.16 位设备\_System
- 数据类型示例.16 位设备.B 寄存器
- 数据类型示例.16 位设备.K 寄存器
- 数据类型示例.16 位设备.R 寄存器
- 数据类型示例.16 位设备.S 寄存器
- 数据类型示例.8 位设备\_System
- 数据类型示例.8 位设备.B 寄存器
- 数据类型示例.8 位设备.K 寄存器
- 数据类型示例.8 位设备.R 寄存器
- 数据类型示例.8 位设备.S 寄存器

项ID	数据类型	值	Timestamp	Quality	Update Count
BL102-TCP Server.BL102.VW0	Word	8	16:52:40.165	良好	21
BL102-TCP Server.BL102.Q0	Boolean	1	16:52:56.169	良好	17
BL102-TCP Server.BL102.Q7	Boolean	1	16:52:56.169	良好	17
BL102-TCP Server.BL102.D0	Word	27	16:47:15.167	良好	2
BL102-TCP Server.BL102.D7	Word	85	16:47:33.166	良好	2
BL102-TCP Server.BL102.Y0	Boolean	1	16:46:51.167	良好	2
BL102-TCP Server.BL102.Y7	Boolean	1	16:46:54.163	良好	2
BL102-TCP Server.BL102.D1	Word	0	16:45:51.172	良好	1
BL102-TCP Server.BL102.D2	Word	0	16:45:51.172	良好	1
BL102-TCP Server.BL102.D3	Word	0	16:45:51.172	良好	1
BL102-TCP Server.BL102.D4	Word	0	16:45:51.172	良好	1
BL102-TCP Server.BL102.D5	Word	0	16:45:51.172	良好	1
BL102-TCP Server.BL102.D6	Word	0	16:45:51.172	良好	1
BL102-TCP Server.BL102.Q1	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.Q2	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.Q3	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.Q4	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.Q5	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.Q6	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.VW2	Word	0	16:45:51.172	良好	1
BL102-TCP Server.BL102.VW4	Word	0	16:45:51.172	良好	1
BL102-TCP Server.BL102.VW6	Word	0	16:45:51.172	良好	1
BL102-TCP Server.BL102.VW8	Word	18	16:45:51.172	良好	1
BL102-TCP Server.BL102.Y1	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.Y2	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.Y3	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.Y4	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.Y5	Boolean	0	16:45:51.174	良好	1
BL102-TCP Server.BL102.Y6	Boolean	0	16:45:51.174	良好	1

### 5.2.2.3 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: 192.168.1.164
- (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.

### 5.2.2.4 View Data in KEPServerEX 6

Gateway BL102 provides data as OPC UA server. View data in KEPServerEX 6 as below:

设备名称: BL102UA-OPC UA / 型号: OPC UA / ID: / 说明:

属性组	端点
名称	opc.tcp://192.168.1.164:4840
写优化	无
高级	无

UA 服务器  
UA 证书  
身份验证

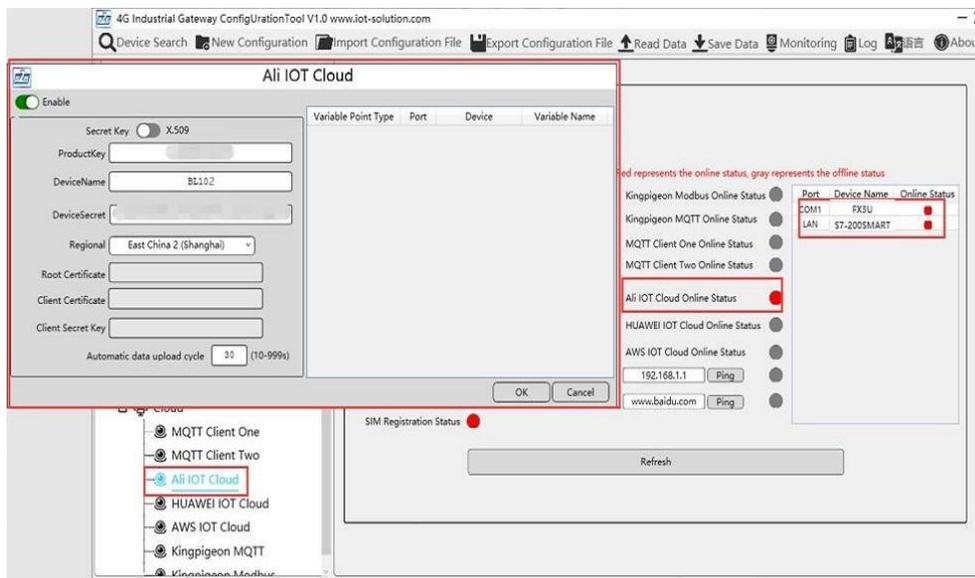
默认值 确定 取消 应用 帮助

标记名称	地址	数据类型	扫描速率	缩放	说明
FX3U_D0	ns=1-g=(00090000-0000-b660-...	Word	100	无	
FX3U_D1	ns=1-g=(00090001-0000-b660-...	Word	100	无	
FX3U_D2	ns=1-g=(00090002-0000-b660-...	Word	100	无	
FX3U_D3	ns=1-g=(00090003-0000-b660-...	Word	100	无	
FX3U_D4	ns=1-g=(00090004-0000-b660-...	Word	100	无	
FX3U_D5	ns=1-g=(00090005-0000-b660-...	Word	100	无	
FX3U_D6	ns=1-g=(00090006-0000-b660-...	Word	100	无	
FX3U_D7	ns=1-g=(00090007-0000-b660-...	Word	100	无	
FX3U_Y0	ns=1-g=(00100000-0000-b660-...	Boolean	100	无	
FX3U_Y1	ns=1-g=(00100001-0000-b660-...	Boolean	100	无	
FX3U_Y2	ns=1-g=(00100002-0000-b660-...	Boolean	100	无	
FX3U_Y3	ns=1-g=(00100003-0000-b660-...	Boolean	100	无	
FX3U_Y4	ns=1-g=(00100004-0000-b660-...	Boolean	100	无	
FX3U_Y5	ns=1-g=(00100005-0000-b660-...	Boolean	100	无	
FX3U_Y6	ns=1-g=(00100006-0000-b660-...	Boolean	100	无	
FX3U_Y7	ns=1-g=(00100007-0000-b660-...	Boolean	100	无	

标记名称	地址	数据类型	扫描速率	缩放	说明
S7-200SMART_Q0	ns=1-g=(01010000-0000-b660-...	Boolean	100	无	
S7-200SMART_Q1	ns=1-g=(01010001-0000-b660-...	Boolean	100	无	
S7-200SMART_Q2	ns=1-g=(01010002-0000-b660-...	Boolean	100	无	
S7-200SMART_Q3	ns=1-g=(01010003-0000-b660-...	Boolean	100	无	
S7-200SMART_Q4	ns=1-g=(01010004-0000-b660-...	Boolean	100	无	
S7-200SMART_Q5	ns=1-g=(01010005-0000-b660-...	Boolean	100	无	
S7-200SMART_Q6	ns=1-g=(01010006-0000-b660-...	Boolean	100	无	
S7-200SMART_Q7	ns=1-g=(01010007-0000-b660-...	Boolean	100	无	
S7-200SMART_VW0	ns=1-g=(010c0000-0000-b660-...	Word	100	无	
S7-200SMART_VW2	ns=1-g=(010c0002-0000-b660-...	Word	100	无	
S7-200SMART_VW4	ns=1-g=(010c0004-0000-b660-...	Word	100	无	
S7-200SMART_VW6	ns=1-g=(010c0006-0000-b660-...	Word	100	无	
S7-200SMART_VW8	ns=1-g=(010c0008-0000-b660-...	Word	100	无	

项 ID	数据类型	值	Timestamp	Quality	Update Count
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_VW0	Word	8	17:13:57.501	良好	75
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_VW2	Word	0	17:13:57.501	良好	75
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_VW4	Word	0	17:13:57.501	良好	75
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_VW6	Word	0	17:13:57.501	良好	75
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_VW8	Word	18	17:13:57.502	良好	75
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_Q0	Boolean	1	17:09:11.491	良好	25
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_Q1	Boolean	0	17:09:11.491	良好	25
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_Q2	Boolean	0	17:09:11.492	良好	25
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_Q3	Boolean	0	17:09:11.492	良好	25
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_Q4	Boolean	0	17:09:11.492	良好	25
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_Q5	Boolean	0	17:09:11.492	良好	25
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_Q6	Boolean	0	17:09:11.492	良好	25
BL102UA-OPC UA.BL102UA-OPC UA.gateway.lan_S7-200SMART_S7-200SMART_Q7	Boolean	1	17:09:11.492	良好	25
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_D0	Word	27	17:01:50.464	良好	4
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_D1	Word	85	17:01:50.473	良好	4
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_D2	Word	0	17:01:50.472	良好	3
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_D3	Word	0	17:01:50.472	良好	3
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_D4	Word	0	17:01:50.472	良好	3
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_D5	Word	0	17:01:50.472	良好	3
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_D6	Word	0	17:01:50.473	良好	3
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_D7	Word	1	16:45:51.361	良好	2
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_Y0	Boolean	1	16:45:54.483	良好	2
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_Y1	Boolean	0	16:45:52.475	良好	1
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_Y2	Boolean	0	16:45:52.476	良好	1
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_Y3	Boolean	0	16:45:52.477	良好	1
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_Y4	Boolean	0	16:45:52.478	良好	1
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_Y5	Boolean	0	16:45:52.479	良好	1
BL102UA-OPC UA.BL102UA-OPC UA.gateway.com1_FX3U_FX3U_Y6	Boolean	0	16:45:52.480	良好	1

## 5.2.2.5 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

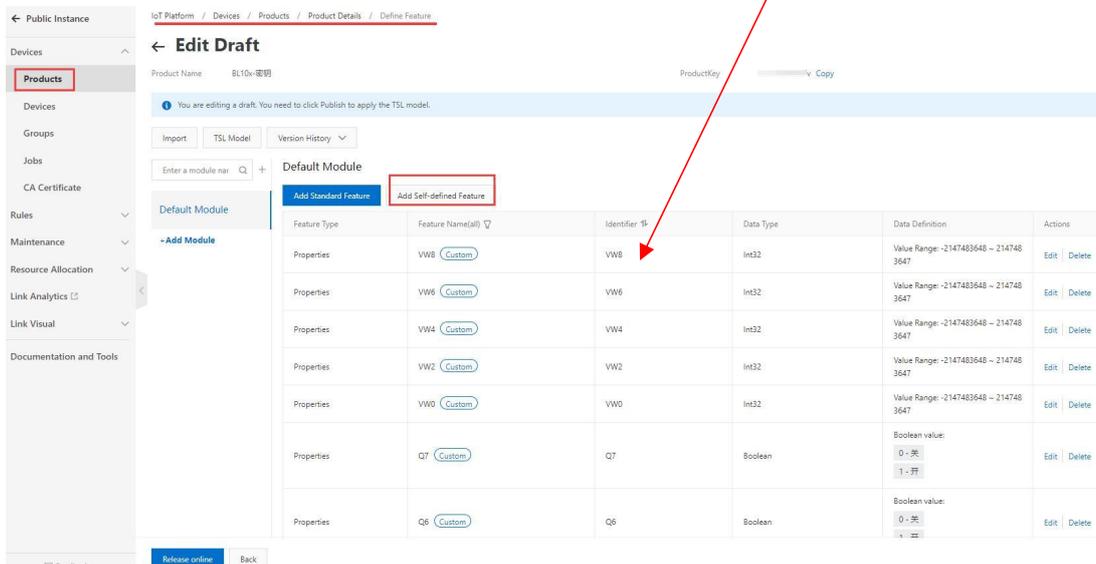
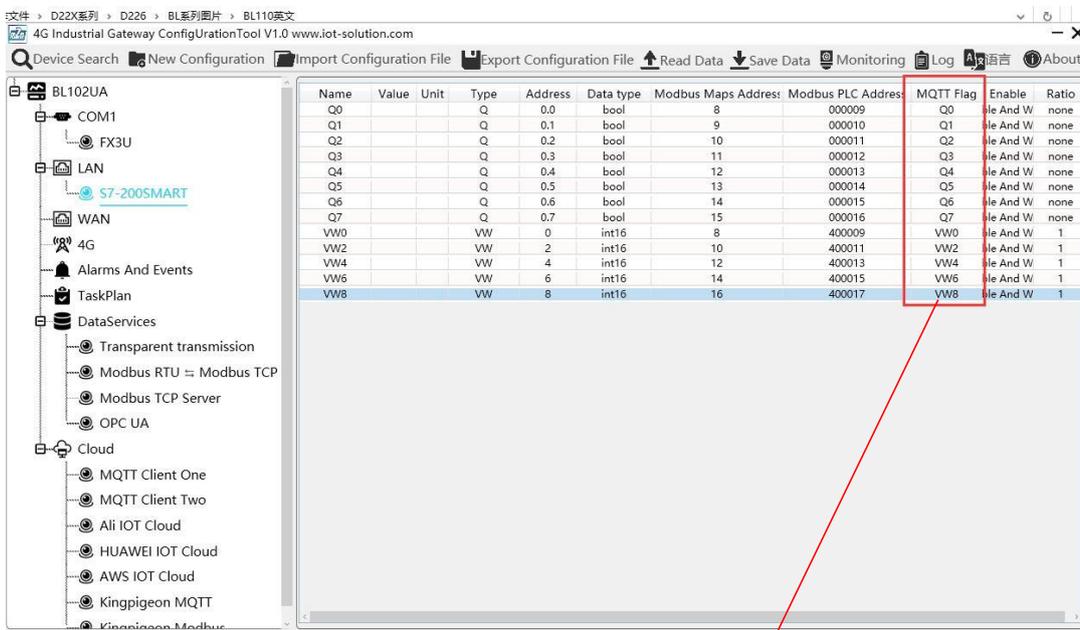
(14) Click Save Data. Gateway will restart automatically and Alibaba cloud is enabled successfully.

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

### 5.2.2.6 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:



# PLC/Modbus to MQTT/OPC UA Gateway BL102

Alibaba Cloud Workbench China (Shanghai)

Public Instance IoT Platform / Devices / Devices / Device Details

**BL10x-miyao** Online

DeviceSecret \*\*\*\*\* View

Device Information Topic List **TSL Data** Device Shadow Manage Files Device Log Online Debug Groups Task

Status Events Invoke Service

Enter a module name Enter a property name or identifier

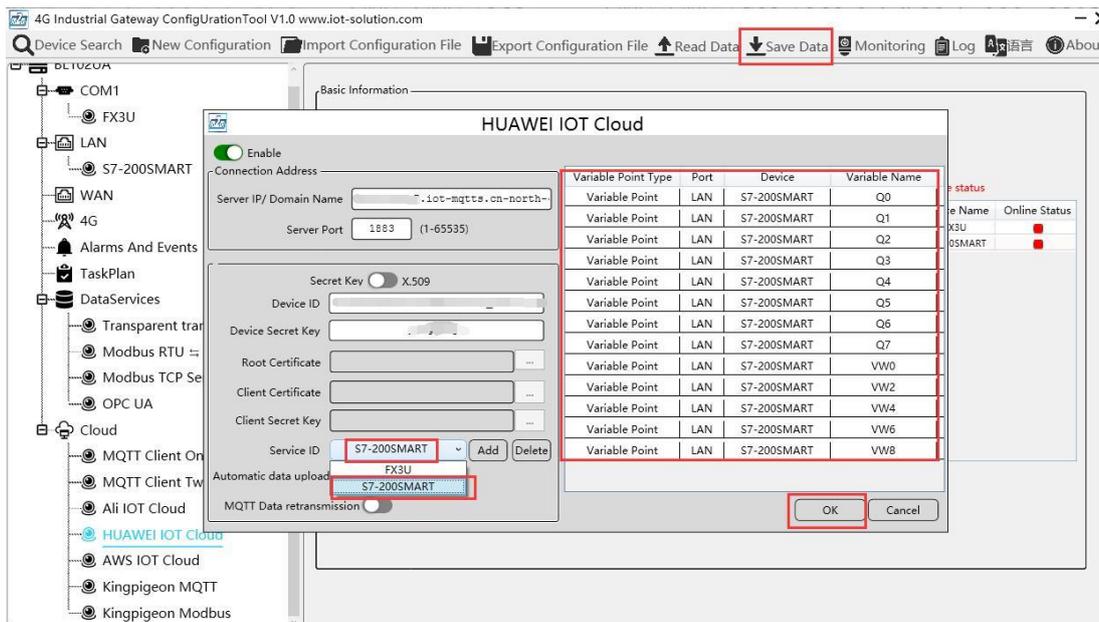
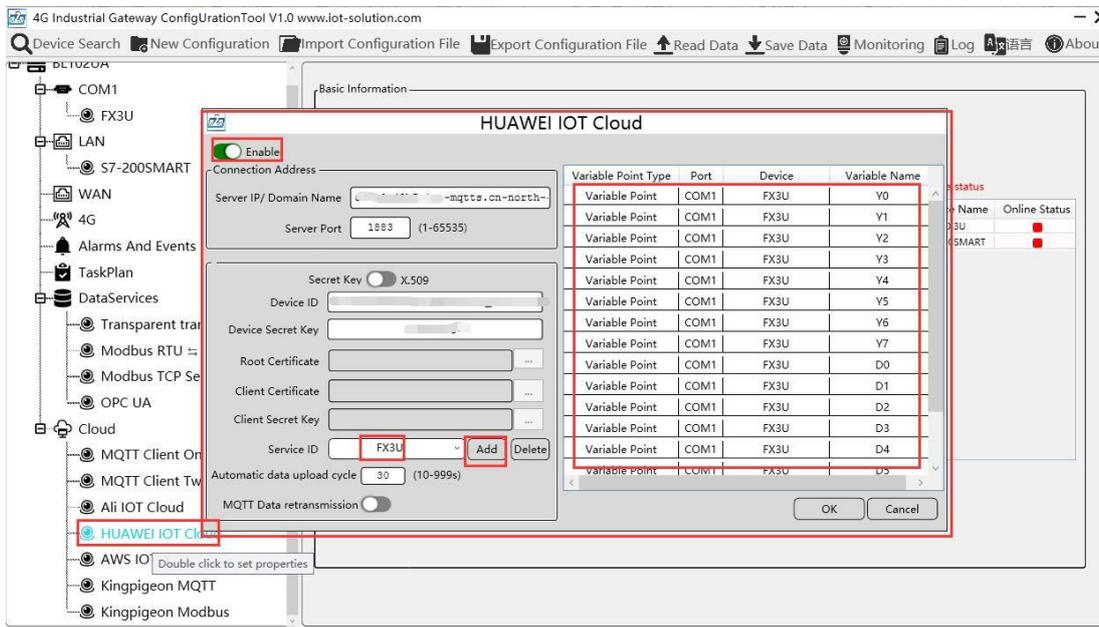
Property identifier	Property Name	Data Type	Update Time	Updated Value	Expected Value	Actions
D0	D0	int	Jun 29, 2021, 09:13:29.990	24	-	View Data
D1	D1	int	Jun 29, 2021, 09:13:29.990	0	-	View Data
D2	D2	int	Jun 29, 2021, 09:13:29.990	0	-	View Data
D3	D3	int	Jun 29, 2021, 09:13:29.990	0	-	View Data
D4	D4	int	Jun 29, 2021, 09:13:29.990	0	-	View Data
D5	D5	int	Jun 29, 2021, 09:13:29.990	0	-	View Data
D6	D6	int	Jun 29, 2021, 09:13:29.990	0	-	View Data
D7	D7	int	Jun 29, 2021, 09:13:29.990	85	-	View Data
Q0	Q0	bool	Jun 29, 2021, 09:13:29.990	1 (开)	-	View Data
Q1	Q1	bool	Jun 29, 2021, 09:13:29.990	0 (关)	-	View Data

Alibaba Cloud Workbench China (Shanghai)

Public Instance IoT Platform / Devices / Devices / Device Details

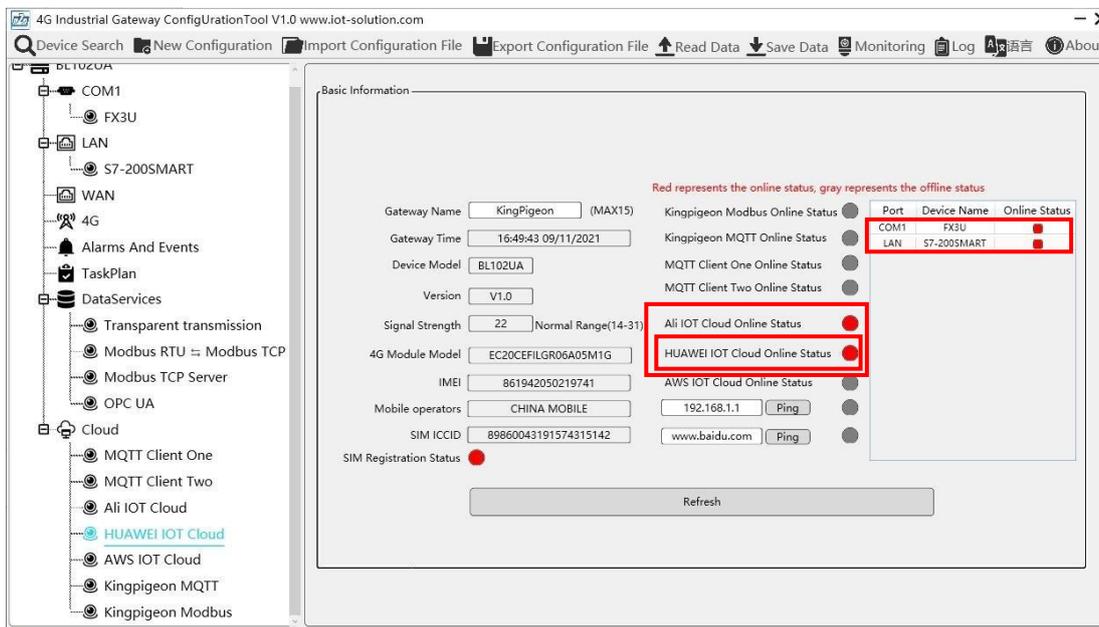
Q5	Q5	bool	Jun 29, 2021, 09:19:02.918	0 (关)	-	View Data
Q6	Q6	bool	Jun 29, 2021, 09:19:02.918	0 (关)	-	View Data
Q7	Q7	bool	Jun 29, 2021, 09:19:02.918	0 (关)	-	View Data
VW0	VW0	int	Jun 29, 2021, 09:19:02.918	8	-	View Data
VW2	VW2	int	Jun 29, 2021, 09:19:02.918	0	-	View Data
VW4	VW4	int	Jun 29, 2021, 09:19:02.918	0	-	View Data
VW6	VW6	int	Jun 29, 2021, 09:19:02.918	0	-	View Data
VW8	VW8	int	Jun 29, 2021, 09:19:02.918	0	-	View Data
Y0	Y0	bool	Jun 29, 2021, 09:19:02.918	1 (开)	-	View Data
Y1	Y1	bool	Jun 29, 2021, 09:19:02.918	0 (关)	-	View Data
Y2	Y2	bool	Jun 29, 2021, 09:19:02.918	0 (关)	-	View Data
Y3	Y3	bool	Jun 29, 2021, 09:19:02.918	0 (关)	-	View Data
Y4	Y4	bool	Jun 29, 2021, 09:19:02.918	0 (关)	-	View Data
Y5	Y5	bool	Jun 29, 2021, 09:19:02.918	0 (关)	-	View Data
Y6	Y6	bool	Jun 29, 2021, 09:19:02.918	0 (关)	-	View Data
Y7	Y7	bool	Jun 29, 2021, 09:19:02.918	1 (开)	-	View Data

## 5.2.2.7 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. Multiple 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. Click OK to confirm HUAWEI Cloud configuration
- (15) 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



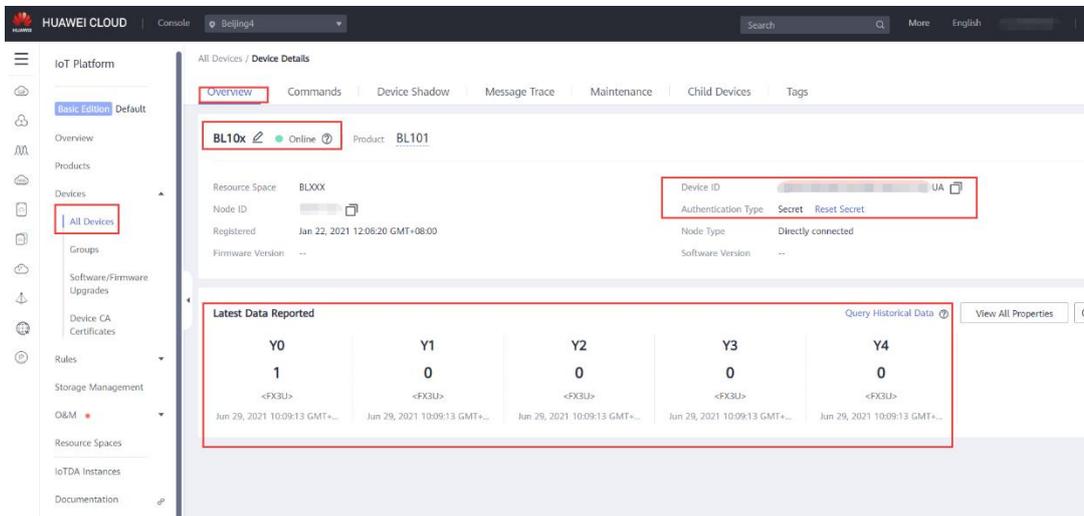
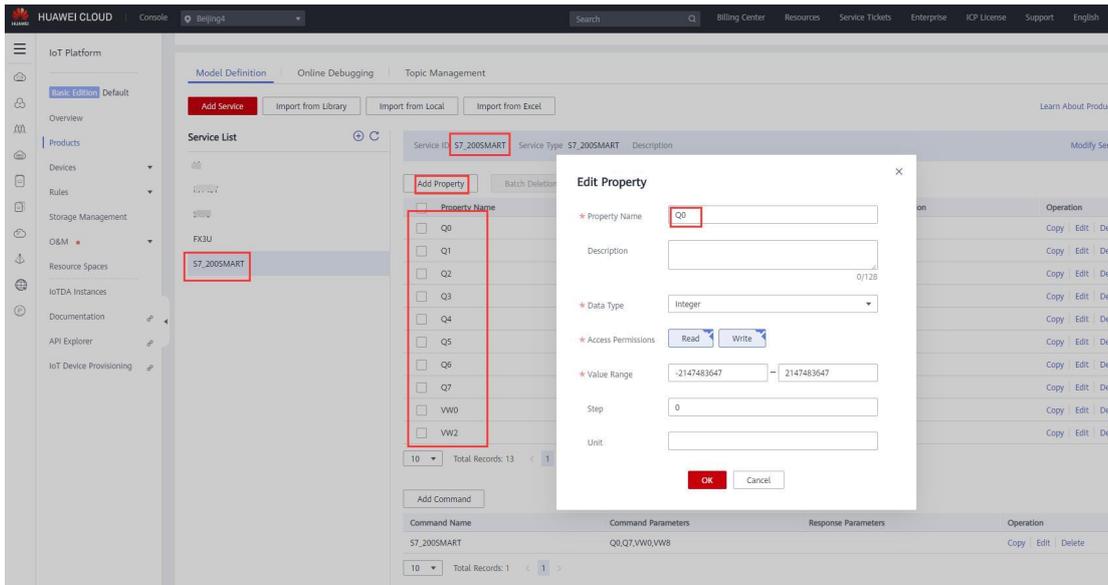
## 5.2.2.8 View Data in HUAWEI Cloud

The screenshot shows the Huawei Cloud IoT Platform console. The 'Products / BL102' page is active. The 'Service List' section is expanded, showing a table of properties. The 'Add Property' button is highlighted with a red box. The table contains the following data:

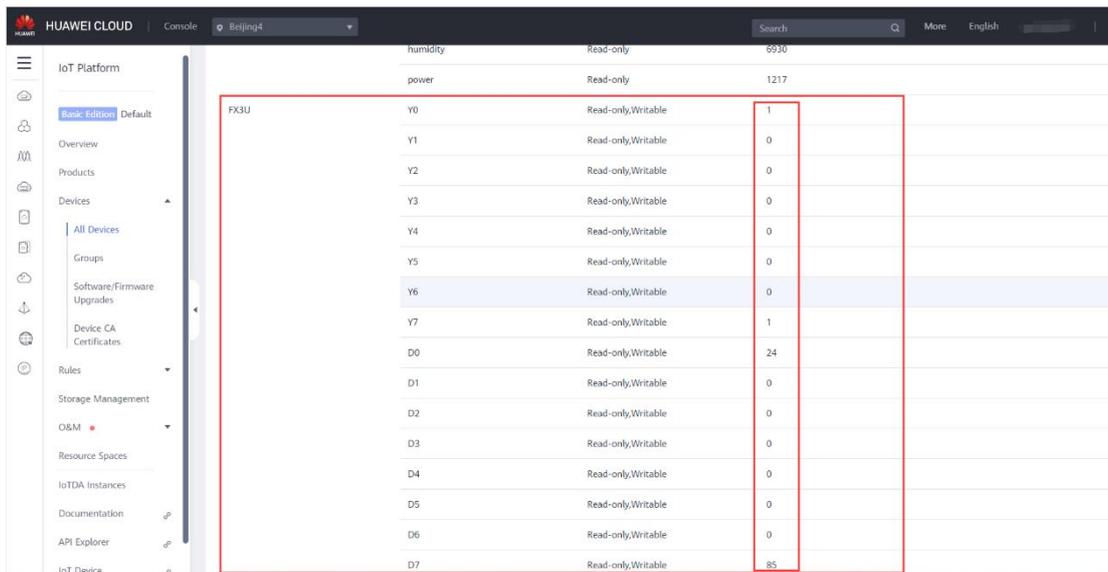
Property Name	Data Type	Access Mode	Description	Operation
Y0	Integer	Readable,Writable		Copy Edit De
Y1	Integer	Readable,Writable		Copy Edit De
Y2	Integer	Readable,Writable		Copy Edit De
Y3	Integer	Readable,Writable		Copy Edit De
Y4	Integer	Readable,Writable		Copy Edit De
Y5	Integer	Readable,Writable		Copy Edit De
Y6	Integer	Readable,Writable		Copy Edit De
Y7	Integer	Readable,Writable		Copy Edit De
D0	Integer	Readable,Writable		Copy Edit De
D1	Integer	Readable,Writable		Copy Edit De

The screenshot shows the 'Edit Property' dialog box for property 'Y0'. The dialog box contains the following fields:

- Property Name: Y0
- Description: (empty)
- Data Type: Integer
- Access Permissions: Read, Write
- Value Range: -2147483647 - 2147483647
- Step: 0
- Unit: (empty)



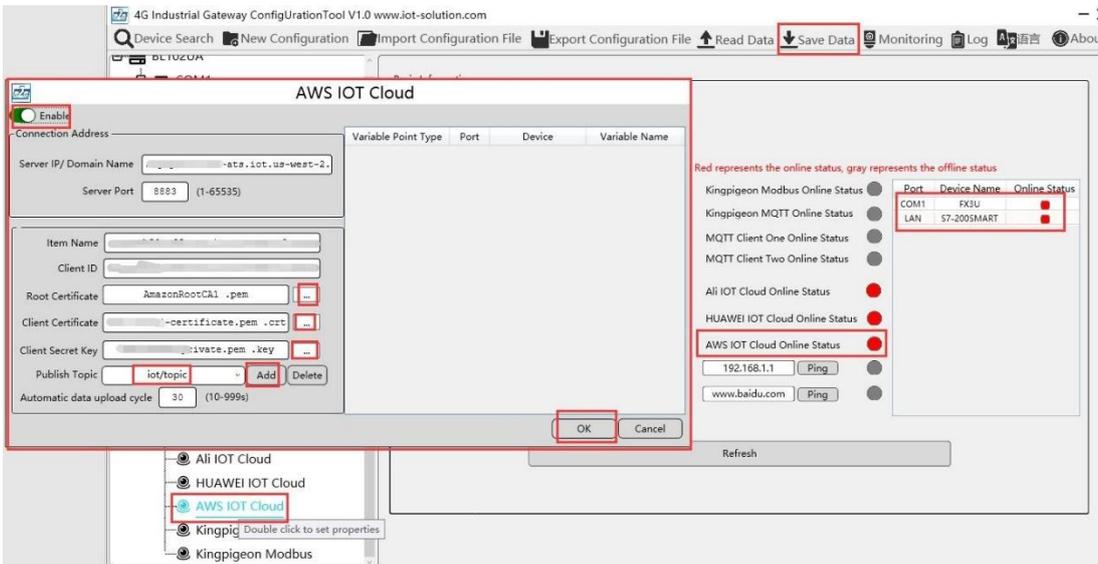
Click View All Attributes or Device Shadows to view all data as below picture:



Variable Name	Point Type	Port	Device	Variable Value
L4	Read-only/Writable			0
D5	Read-only/Writable			0
D6	Read-only/Writable			0
D7	Read-only/Writable			85
S7_200SMART				
Q0	Read-only/Writable			1
Q1	Read-only/Writable			0
Q2	Read-only/Writable			0
Q3	Read-only/Writable			0
Q4	Read-only/Writable			0
Q5	Read-only/Writable			0
Q6	Read-only/Writable			0
Q7	Read-only/Writable			0
VW0	Read-only/Writable			8
VW2	Read-only/Writable			0
VW4	Read-only/Writable			0
VW6	Read-only/Writable			0
VW8	Read-only/Writable			0

## 5.2.2.9 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

**Rule query statement**

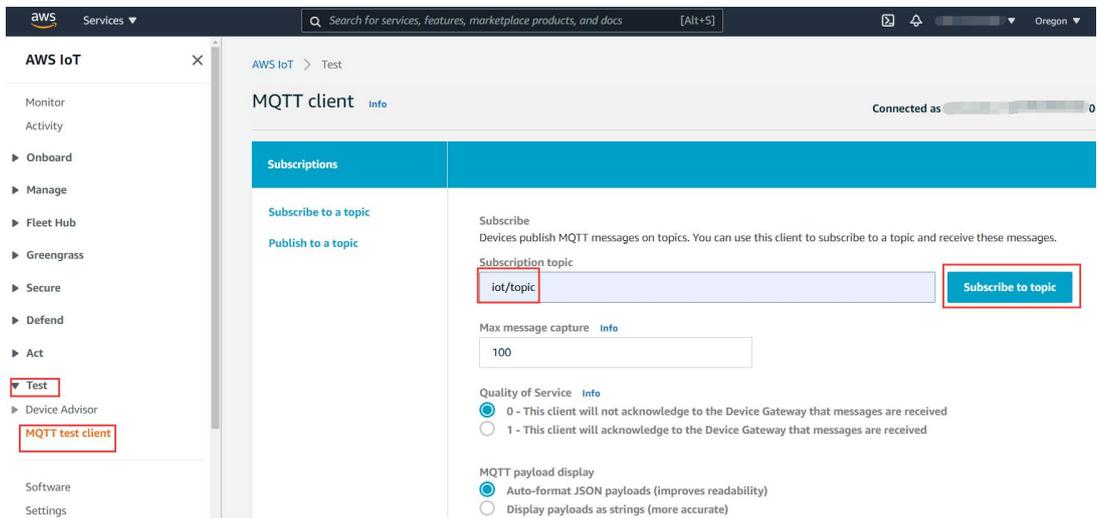
The source of the messages you want to process with this rule.

```
SELECT * FROM '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

### 5.2.2.10 View Data in AWS Cloud

Login to AWS, click Act, click Test and select subscription topic "iot/topic" to view messages published by BL102 gateway





# PLC/Modbus to MQTT/OPC UA Gateway BL102

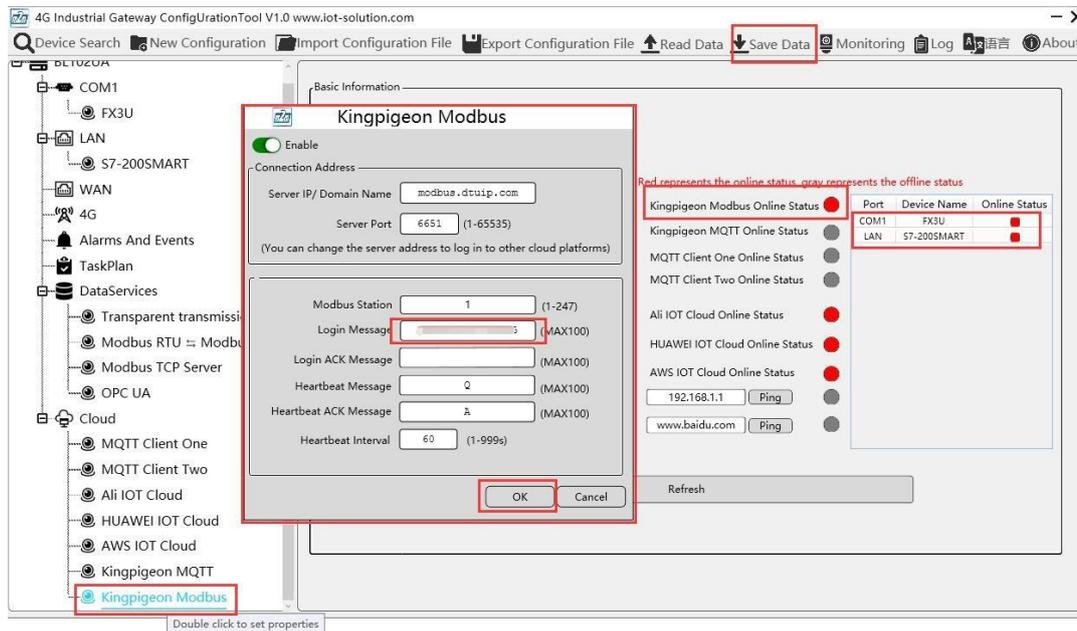
The screenshot shows the AWS IoT console interface. On the left, the navigation menu includes 'Monitor', 'Activity', 'Onboard', 'Manage', 'Fleet Hub', 'Greengrass', 'Secure', 'Defend', 'Act', 'Test', 'Device Advisor', and 'MQTT test client'. The main area is titled 'Subscriptions' and shows a subscription for 'iot/topic'. Below this, there is a 'Publish' section with a text input field containing 'iot/topic' and a 'Publish to topic' button. A message history table shows a single entry for 'iot/topic' at 'June 29, 2021, 10:53:30 (UTC+0800)'. The message content is a JSON object with the following structure:

```
{  
  "time": "02:53:30 06/29/2021 UTC 0.0.0",  
  "lat": "0.0000",  
  "lng": "0.0000",  
  "Y0": 1,  
  "Y1": 0,  
  "Y2": 0,  
  "Y3": 0,  
  "Y4": 0,  
  "Y5": 0,  
  "Y6": 0,  
  "Y7": 1  
}
```

The screenshot shows the AWS IoT console interface. On the left, the navigation menu includes 'Monitor', 'Activity', 'Onboard', 'Manage', 'Fleet Hub', 'Greengrass', 'Secure', 'Defend', 'Act', 'Test', 'Device Advisor', and 'MQTT test client'. The main area is titled 'Subscriptions' and shows a subscription for 'iot/topic'. Below this, there is a 'Publish' section with a text input field containing 'iot/topic' and a 'Publish to topic' button. A message history table shows a single entry for 'iot/topic' at 'June 29, 2021, 10:54:03 (UTC+0800)'. The message content is a JSON object with the following structure:

```
{  
  "Q3": 0,  
  "Q4": 0,  
  "Q5": 0,  
  "Q6": 0,  
  "Q7": 0,  
  "V#0": 8,  
  "V#2": 0,  
  "V#4": 0,  
  "V#6": 0,  
  "V#8": 0  
}
```

## 5.2.2.11 King Pigeon Cloud via Modbus Configuration



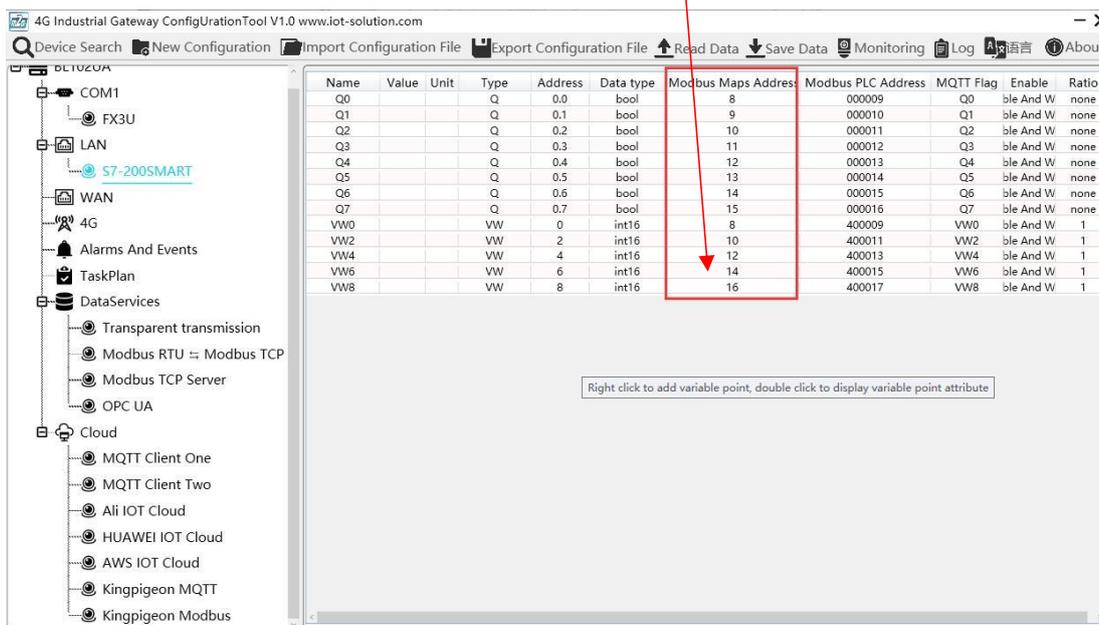
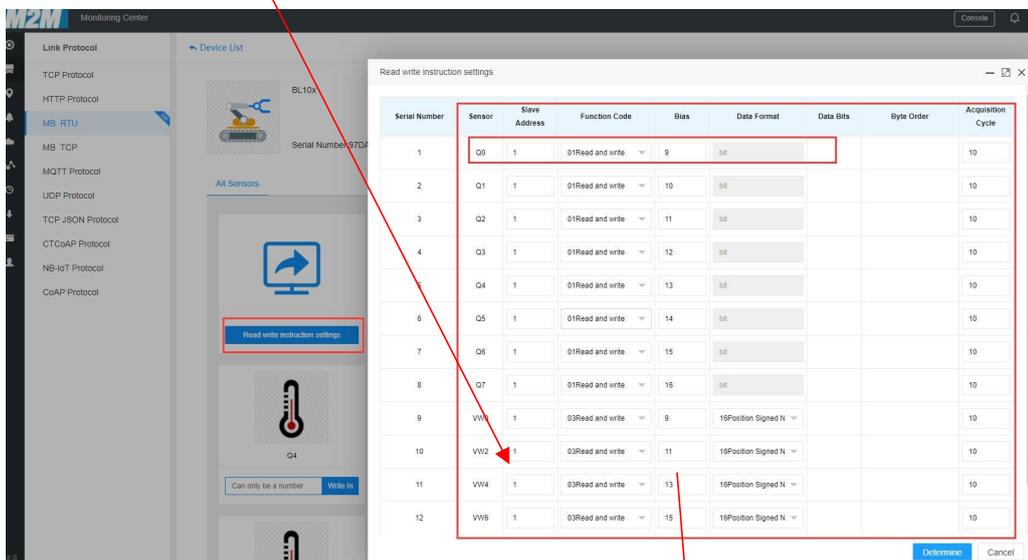
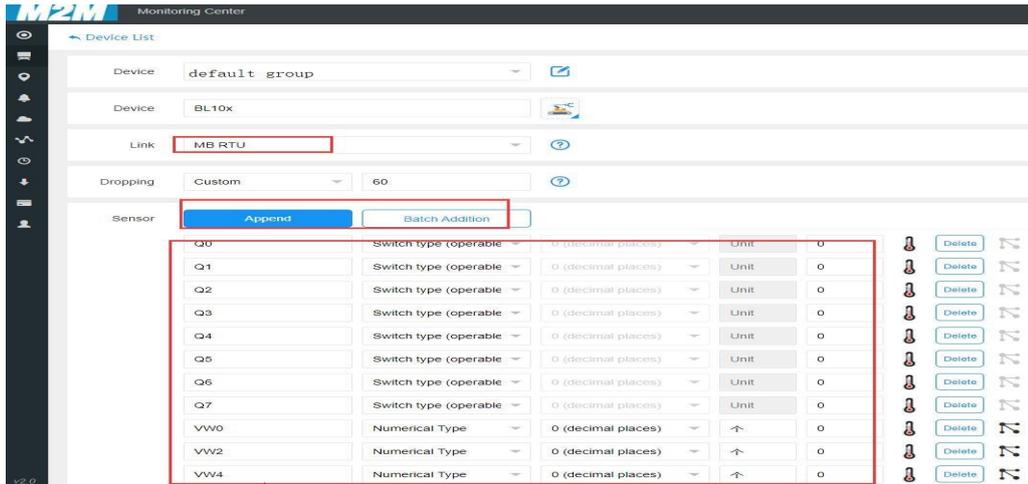
- (1) Double click KingPigeon Modbus to enter configuration window
- (2) Click Enable to enable(green) King Pigeon cloud via Modbus. Default is disabled (Gray)
- (3) Server IP/Domain Name: modbus.dtuip.com. (Automatic filling in default)
- (4) Server Port: 6651 (Automatic filling in default)
- (5) Modbus Station: Set Gateway BL102 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.

## 5.2.2.12 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



Data collected is like below picture

**M2M Monitoring Center**

Device name: BL10x-三美

ID	Status	Updated	Value	Unit	Alm	RT Curve	Hist Query
Y0	Connected	2021/05/29 11:56:50	<input checked="" type="checkbox"/>				
Y1	Connected	2021/05/29 11:56:50	<input type="checkbox"/>				
Y2	Connected	2021/05/29 11:56:50	<input type="checkbox"/>				
Y3	Connected	2021/05/29 11:56:50	<input type="checkbox"/>				
Y4	Connected	2021/05/29 11:56:50	<input type="checkbox"/>				
Y5	Connected	2021/05/29 11:56:50	<input type="checkbox"/>				
Y6	Connected	2021/05/29 11:56:50	<input type="checkbox"/>				
Y7	Connected	2021/05/29 11:56:50	<input checked="" type="checkbox"/>				
D0	Connected	2021/05/29 11:56:49	24.0000	个			
D1	Connected	2021/05/29 11:56:49	0.0000	个			

**M2M Monitoring Center**

Device name: BL10x-三美

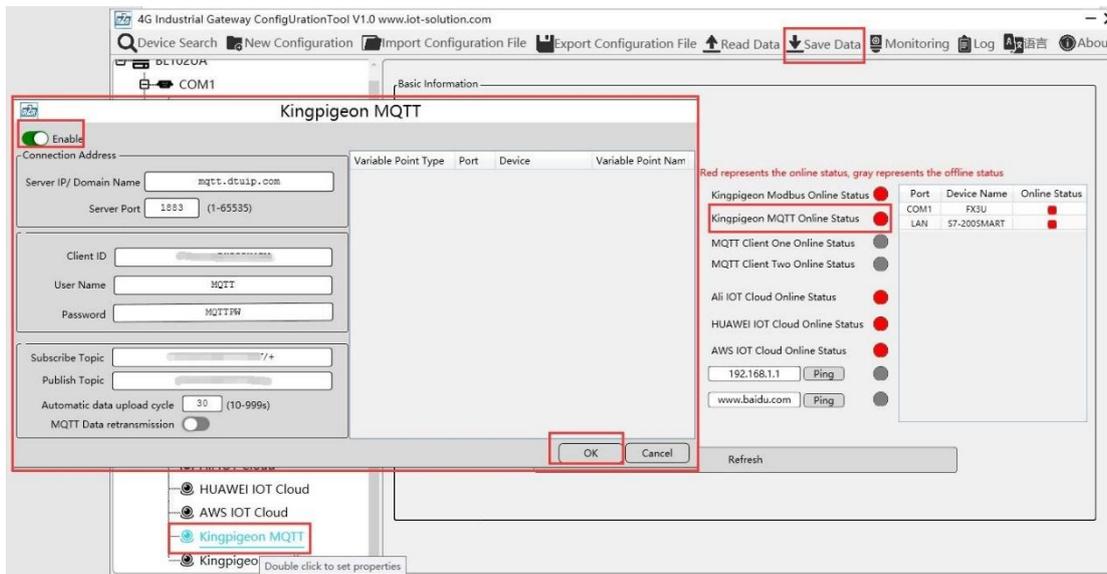
ID	Status	Updated	Value	Unit	Alm	RT Curve	Hist Query
D2	Connected	2021/05/29 11:59:03	0.0000	个			
D3	Connected	2021/05/29 11:59:03	0.0000	个			
D4	Connected	2021/05/29 11:59:03	0.0000	个			
D5	Connected	2021/05/29 11:59:03	0.0000	个			
D6	Connected	2021/05/29 11:59:03	0.0000	个			
D7	Connected	2021/05/29 11:59:03	85.0000	个			
Q0	Connected	2021/05/29 11:59:05	<input checked="" type="checkbox"/>				
Q1	Connected	2021/05/29 11:59:05	<input type="checkbox"/>				
Q2	Connected	2021/05/29 11:59:05	<input type="checkbox"/>				
Q3	Connected	2021/05/29 11:59:05	<input type="checkbox"/>				

**M2M Monitoring Center**

Device name: BL10x-三美

ID	Status	Updated	Value	Unit	Alm	RT Curve	Hist Query
Q4	Connected	2021/06/29 12:00:05	<input type="checkbox"/>				
Q5	Connected	2021/06/29 12:00:05	<input type="checkbox"/>				
Q6	Connected	2021/06/29 12:00:05	<input type="checkbox"/>				
Q7	Connected	2021/06/29 12:00:05	<input type="checkbox"/>				
VW0	Connected	2021/06/29 12:00:04	8.0000	个			
VW2	Connected	2021/06/29 12:00:04	0.0000	个			
VW4	Connected	2021/06/29 12:00:04	0.0000	个			
VW6	Connected	2021/06/29 12:00:04	0.0000	个			
VW8	Connected	2021/06/29 12:00:04	0.0000	个			

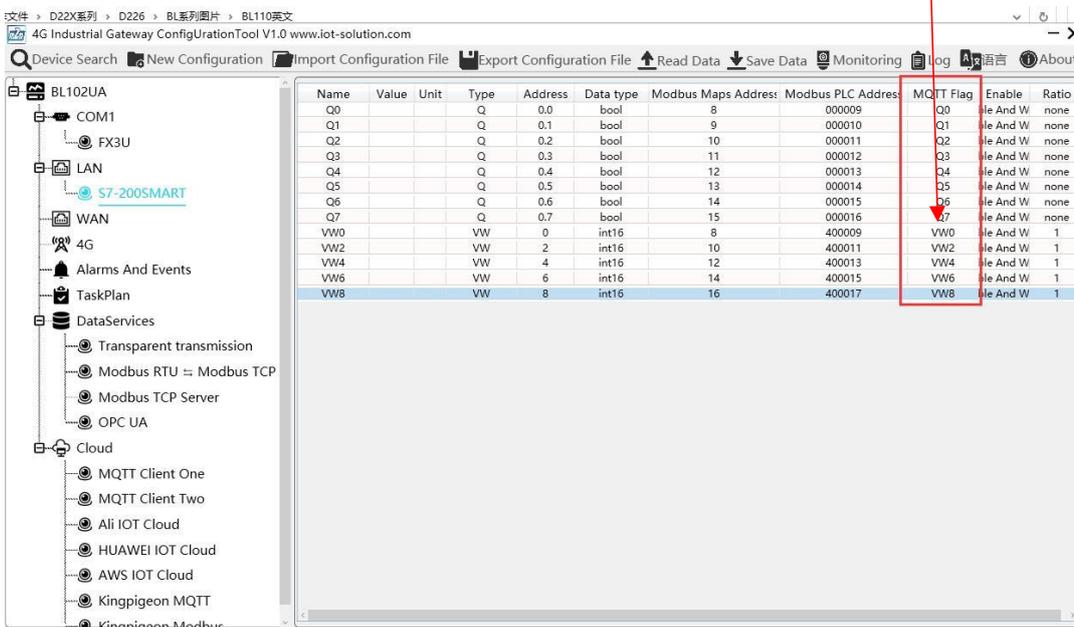
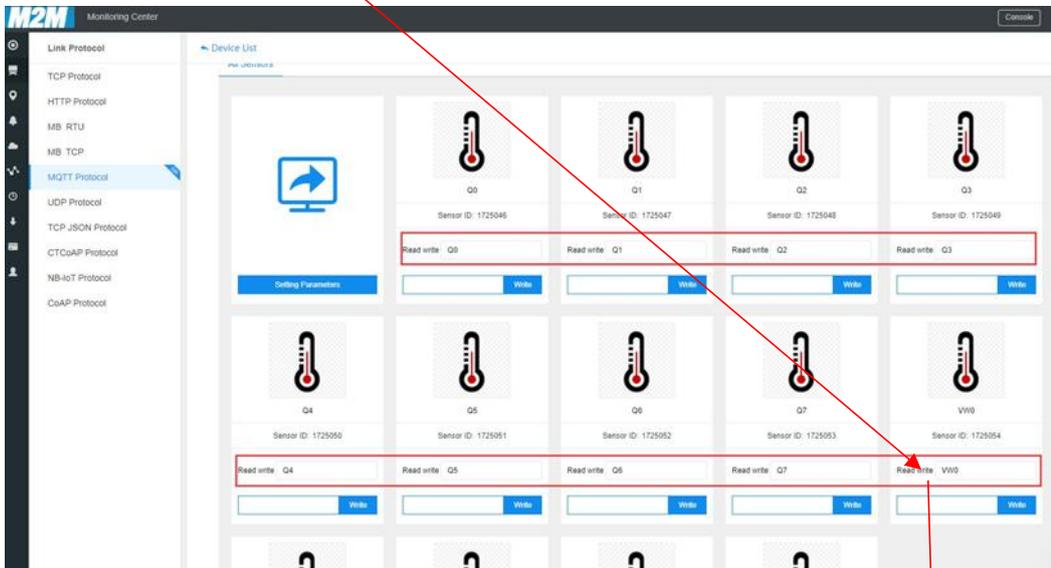
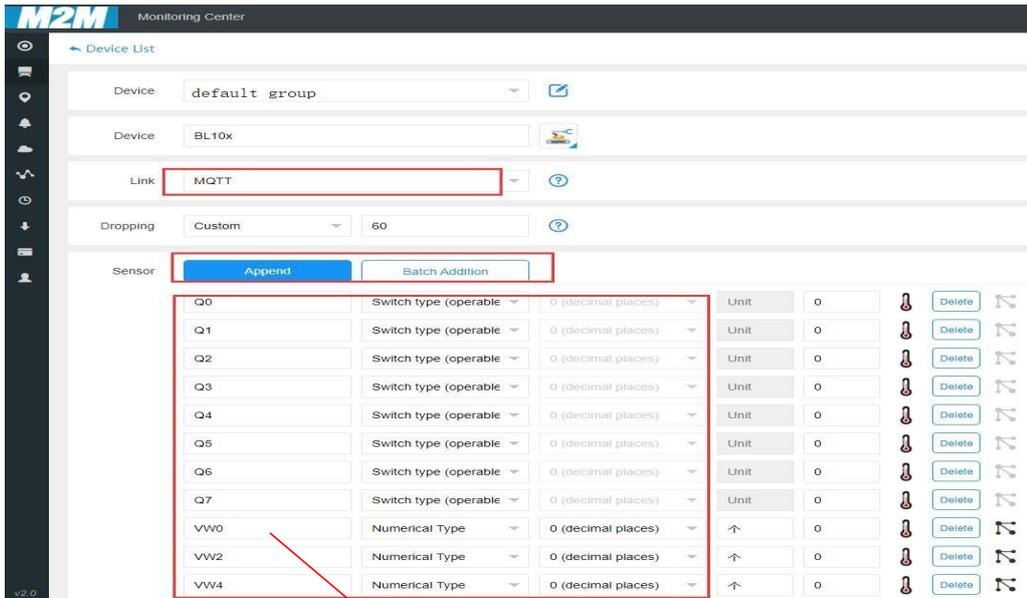
### 5.2.2.13 King Pigeon Cloud via MQTT Configuration



- (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.

### 5.2.2.14 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



Data collected is as below picture:

**BL102-S7-200MQTT** Serial Number: XXXXXXXXXXXX

ID	Status	Updated	Value	Control
D5587 (DEV0.0)	Unconnected	Updated 2021/06/29 09:03:02		ON
Y0	Connected	Updated 2021/06/29 12:26:26		ON
Y1	Connected	Updated 2021/06/29 12:26:26		OFF
Y2	Connected	Updated 2021/06/29 12:26:26		OFF
Y3	Connected	Updated 2021/06/29 12:26:26		OFF
Y4	Connected	Updated 2021/06/29 12:26:26		OFF
Y5	Connected	Updated 2021/06/29 12:26:26		OFF
Y6	Connected	Updated 2021/06/29 12:26:26		OFF
Y7	Connected	Updated 2021/06/29 12:26:26		ON
D0	Connected	Updated 2021/06/29 12:26:26	24.0000 ↑	

**BL102-S7-200MQTT** Serial Number: XXXXXXXXXXXX

ID	Status	Updated	Value	Control
D1	Connected	Updated 2021/06/29 12:27:27	0.0000 ↑	
D2	Connected	Updated 2021/06/29 12:27:27	0.0000 ↑	
D3	Connected	Updated 2021/06/29 12:27:27	0.0000 ↑	
D4	Connected	Updated 2021/06/29 12:27:27	0.0000 ↑	
D5	Connected	Updated 2021/06/29 12:27:27	0.0000 ↑	
D6	Connected	Updated 2021/06/29 12:27:27	0.0000 ↑	
D7	Connected	Updated 2021/06/29 12:27:27	85.0000 ↑	
Q0	Connected	Updated 2021/06/29 12:27:27		ON
Q1	Connected	Updated 2021/06/29 12:27:27		OFF
Q2	Connected	Updated 2021/06/29 12:27:27		OFF

**BL102-S7-200MQTT** Serial Number: XXXXXXXXXXXX

ID	Status	Updated	Value	Control
Q3	Connected	Updated 2021/06/29 12:28:59		OFF
Q4	Connected	Updated 2021/06/29 12:28:59		OFF
Q5	Connected	Updated 2021/06/29 12:28:59		OFF
Q6	Connected	Updated 2021/06/29 12:28:59		OFF
Q7	Connected	Updated 2021/06/29 12:28:59		OFF
VW0	Connected	Updated 2021/06/29 12:28:59	8.0000 ↑	
VW2	Connected	Updated 2021/06/29 12:28:59	0.0000 ↑	
VW4	Connected	Updated 2021/06/29 12:28:59	0.0000 ↑	
VW6	Connected	Updated 2021/06/29 12:28:59	0.0000 ↑	
VW8	Connected	Updated 2021/06/29 12:28:59	0.0000 ↑	

## 5.2.2.15 King Pigeon Cloud 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)

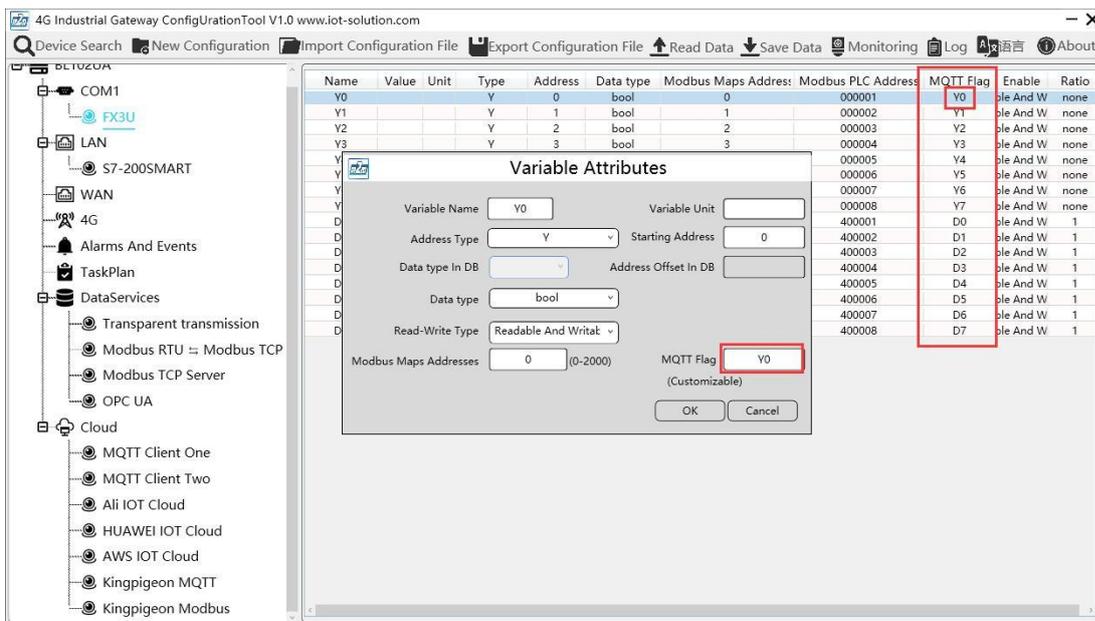
```
{
  "sensorDatas": [
    {
      //Boolean value
      "flag": "REG001", //Read-write identification mark
      "switcher": 0 //Data Type and Value
    },
    {
      //Numeric Type
      "flag": "REG005", //Read-Write identification mark
      "value": 3 //Data Type and Value
    }
  ],
  "state": "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.

Note:

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



//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 resumes, the data will be re-transmitted. 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":
  [
    {
      "sensorId": 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"

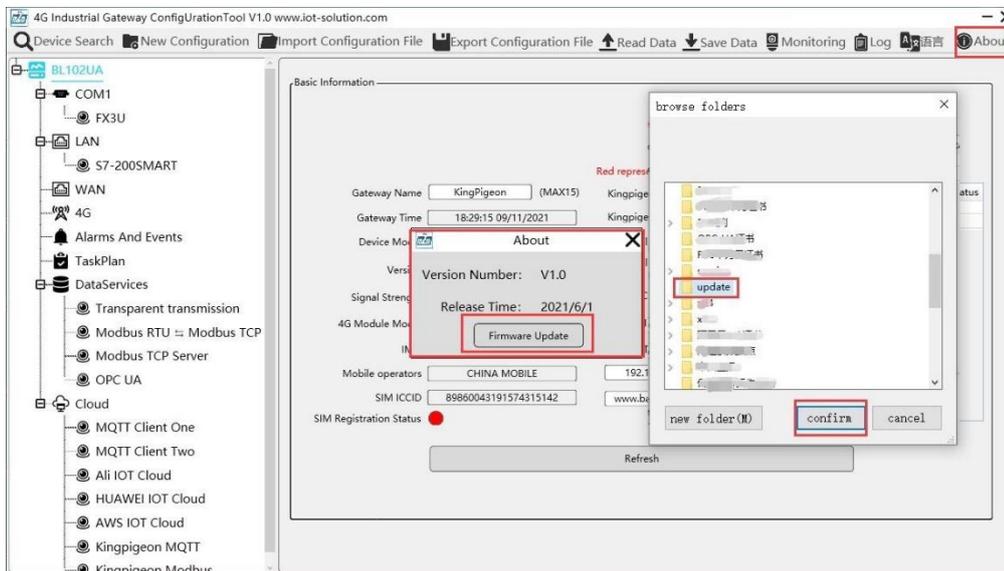
//Read-Write Mark: character is "flag", followed by "datapoint MQTT flag"

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

## 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 Terms

- 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](http://www.iot-solution.com)