Modbus IoT Gateway
BL101

KING PIGEON

BL101
User Manual

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King Pigeon Communication Co., Ltd

Website: www.iot-solution.com

Preface

Thanks for choosing King Pigeon Modbus IOT Gateway BL101. Reading this manual with full attention will help you quickly learn device functions and operation methods.

Copyright

Disclaimer

This document is designed for assisting user to better understand the device. As the described device BL101 is under continuous improvement, this manual may be updated or revised from time to time without prior notice. This Modbus 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
June 1, 2021	V1.0	Initial Release	HYQ

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1 Brief Introduction to Device

1.1 General Description

Developed on embedded Linux operation system for robust stability, BL101 is an innovative gateway that converts Modbus to OPC UA / MQTT protocol.

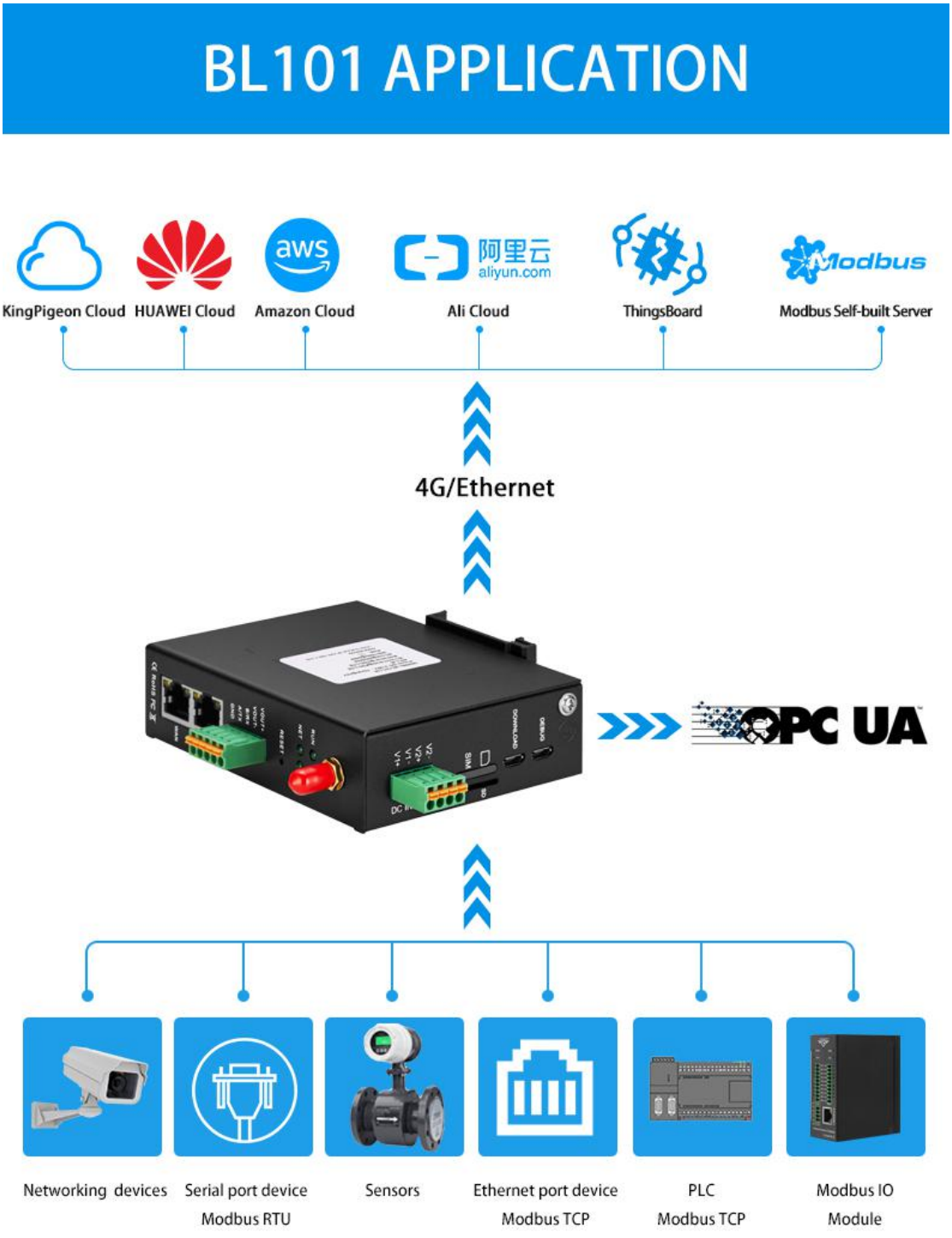
It's equipped with 1RS232/RS485(default RS485) serial port, 2 power source inputs, 1 power output, 2 Ethernet ports and 2 USB ports. Both SIM and SD card slots are available. Network can be connected either through 4G cellular or Ethernet for high transfer speed and low latency.

On downstream it supports Modbus RTU Master and Modbus TCP Master. on upstream, it supports Modbus TCP, MQTT, OPC UA, HUAWEI Cloud, Alibaba Cloud, AWS, King Pigeon Cloud, etc. Users can connect various devices to cloud, SCADA, OPC UA and MES system with this gateway. Mutiple platforms and host computers can be online simultaneously.

This gateway supports TSL\SSLencryption for data security as well as router function with switch for more industrial equipment data acquistion.

With complete functions and superior quality, it can be used in many industrial applications for remote monitoring and control.

1.2 Application Scenario



1.3 Packing List

Before operating the device, please make sure all below parts are in the package

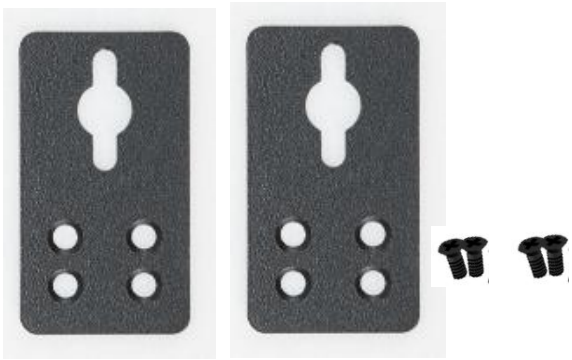
- 1XBL101 Gateway

- 1x 4PIN 3.5mm terminal for power input

- 1x RS485/232 5PIN 3.5mm terminal for power output

- 1 x 4G SMA Cellular Network Antenna

- 2 x Wall-mounting Clip Kit



- 1 x DIN Rail Clip Kit

- 1 x User Manual (Softcopy in PDF format)
  (Note: Please scan QR code to download)

- 1 x Data Card Picking PIN

- 1 x Product Qualification Certificate

- 1 x Warranty Card

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

1.4 Features

- Downlink: support Modbus RTU Master、Modbus TCP Master
  Uplink: support Modbus TCP, MQTT, OPC UA, HUAWEI Cloud, Alibaba Cloud.
- Support 9-36V DC power supply with terminal connection. 2 channels of power input redundancy design with inverse connection protection. Either channel can be selected for power input.
- 1 power output channel. Output voltage is the same as power input voltage
- 1 RS485 (can be RS232 if required)
- Baud rate 2400bps-115200bps, stop bit supports 1, 2 bits, data bit supports 7, 8 bits. Parity supports None, Odd, Even.
- Support 2 RJ45 Ethernet connection, 1WAN and 1LAN. Data of equipment connected to LAN, WAN or cascade switch can be acquisted. Both network link and rate indicators are available. Built-in isolation transformer for up to 2KV electromagnetic insulation.
- Support POE PD(Powered Device) for saving wiring cost (Optional function)
- Support TSL\SSL encryption for data security
- Support router function to provide network for other devices
- Support 4G network with APN setting. Ethernet network will be used first if it's available. If Ethernet is disconnected, it will shift to 4G cellular network automatically.
- Support Modbus to Modbus TCP, transparent transmission
- Support returning to factory setting (Long pressing RESET until RUN indicator is off) to avoid parameter setting error
- Support hardware and software watchdog for high reliability
- Metal case with IP30 protection grade. Safety isolation between metal case and system , especially suitable for industrial site applications
- Compact size: 30mm*83mm*110mm; Support wall-mounting and DIN rail mounting

1.5 Technical Parameters

Item	Parameter	Description
Power Source	Input Voltage	DC 9～36V
	Consumption	Normal 85mA@12V, Max 117mA@12V
	Wiring	Support inverse connection protection
Network Interface	Interface Spec	2 x RJ45, 10/100Mbps, Adaptive MDI/MDIX。
	Port Protection	ESD ±16kV(Contact); ±18kV(Air) EFT 40A (5/50ns) Lightening 6A（8/20μs）
Serial Port	Serial Port	1 x RS232/RS485 (Default is RS485, Optional RS232)
	Baud Rate	2400bps-115200bps
	Data Bit	7,8
	Parity Bit	None, Even, Odd
	Stop Bit	1, 2
	Port Protection	ESD ±8kV (Contact); ±15kV(Air); EFT 2KV, 40A （5/50ns）。
Power Output	Output Voltage	1 channel 9～36 V DC (Equal to input power voltage)
SIM Card Slot	Qty	1
	Spec	Drawer design, Support 1.8V/3V SIM/UIM card (NANO)
	Protection	Inbuilt 15KV ESD protection
SD Card Slot (Reserved function)		Reserved for future development
USB Port	Qty	1* program downloading+1*program debugging
	Spec	Micro USB OTG
	Protection	Over Current Protection
4G (Optional)	Antenna Qty	1
	Antenna Type	SMA
	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	Network Protocol	IPV4, TCP/UDP, DHCP, DNS
	IP Retrieving	Static IP/DHCP
	Transmission	Support Transparent Data Transmission
	DNS	Support Domain Name Resolution
	Configuration	PC configuration, support WIN XP/WIN 7/WIN 8/WIN 10
	Cache Size	Transmit: 8Kbyte, Receive: 8Kbyte。
	Register Pack	Support custom registration package
	Heartbeat PCK	Support custom heartbeat package
Safety Certification	MTBF	≥100,000 hours
	EMC	EN 55022: 2006/A1: 2007 (CE &RE) Class B
		IEC 61000-4-2 (ESD) Level 4
		IEC 61000-4-3 (RS) Level 4
		IEC 61000-4-4 (EFT) Level 4
		IEC 61000-4-5 (Surge)Level 3

		IEC 61000-4-6 (CS)Level 4
		IEC 61000-4-8 (M/S) Level 4
	Other	CE, FCC
Environment Condition	Working	-40～80℃, 5～95% RH
	Storage	-40～85℃，5～95% RH
Others	Case Material	Metal
	Size	30mm×83mm×110mm(L*W*H)
	Protection	IP30
	Net Weight	291.2g
	Mounting	Wall-mounting, DIN Rail mounting

1.6 Model Selection

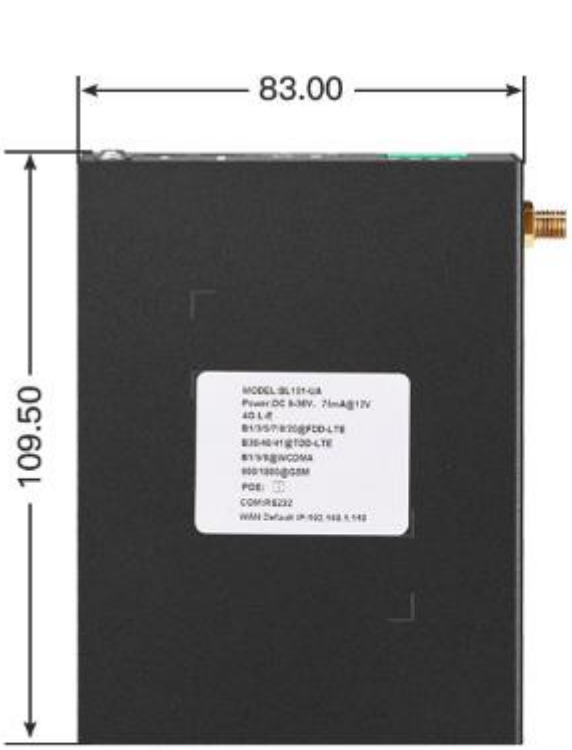
Model NO.	WAN	LAN	COM (Default RS485) (RS485/RS232 optional)	OPC-UA	4G	POE PD
BL101	√	√	√	**X**	√	**Optional**
BL101E	√	√	√	**X**	**X**	**Optional**
BL101UA	√	√	√	√	**X**	**Optional**

2 Hardware Introduction

2.1 Outline Dimension

Unit: mm

Top View



Side view

Main view

2.2 Power Source Input

2 optional power source input channels, support 9-36VDC voltage input, support

inverse connection protection.

2.3 SIM Card and SD Card Slots

Before inserting or removing SIM card, please make sure device is turned off. Insert SIM card picking PIN to the small hole of card slot and eject the card slot with tiny force.

Note: Place the device like above picture to insert/remove SIM card

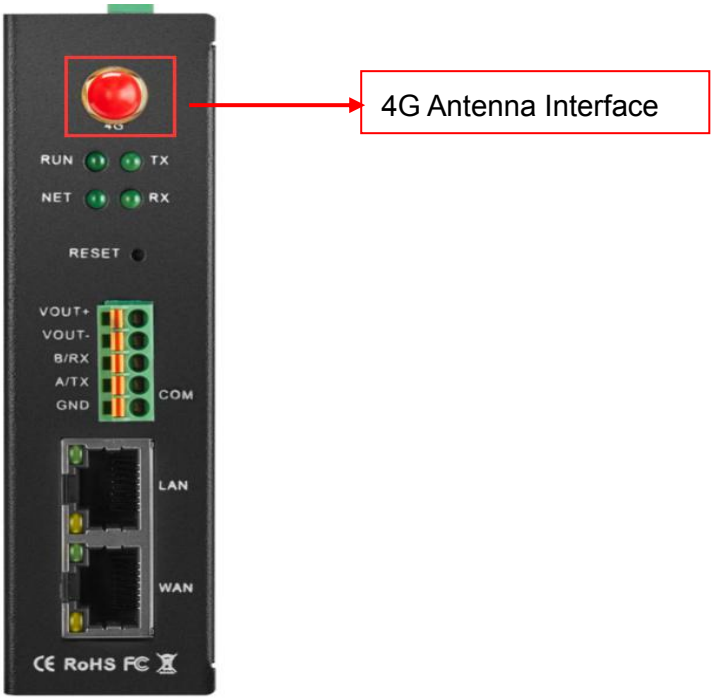
2.4 Program Debugging & Upgrading Interface

DEBUG USB port is for program debugging. DOWNLOAD USB port is for program upgrading.

2.5 Device Grounding

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

2.6 4G Antenna



2.7 LED Indicator

LED Indicator Introduction			
Item Name		Status	Description
RUN	Device Running	Flickering	Device is running
		Off	Device faulty
NET	Ethernet/4G Network	Flickering	Ethernet network
		On	4G network
		Off	No communication
TX	Data Transmitting	Flickering	Serial port is transmitting data
		Off	No data transfer from serial port
RX	Data Receiving	Flickering	Serial port is receiving data
		Off	No data is received 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 has run for some time, use a tiny stick to press Reset button for about 10 seconds until RUN indicator is off. Then Gateway will restart and return to factory setting.

2.9 COM & Power Output Port

RS485/RS232 & Power Output Terminal	
Item	Description
VOUT+	Power Output Positive Terminal
VOUT-	Power Output Negative Terminal
B/RX	RS485 Data-(B)/Receiving Data
A/TX	RS485 Data+(A)/Transmitting Data
GND	Grounding
Note: Power output voltage is equal to power input voltage: 9~36VDC.	

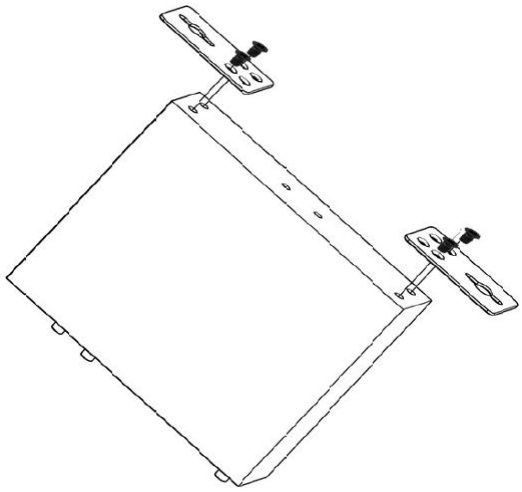
2.10 WAN & LAN Port

Ethernet Port			
Indicator	**Color**	**Status**	**Description**
Rate	Green	On	100Mbps mode
		Off	10Mbps mode
Link	Yellow	On	Connected
		Flickering	Transferring data
		Off	Disconnected

3 Device Mounting

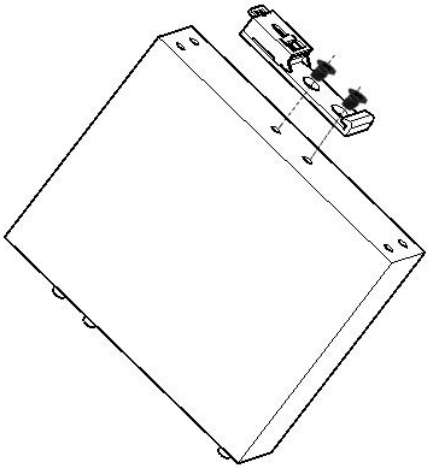
BL101 Gateway can be placed on desk, mounted on the wall and DIN Rail

3.1 Wall-Mounting

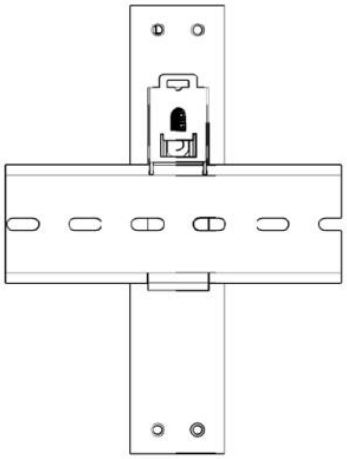


Wall-Mounting

3.2 DIN Rail Mounting



Clip Assembling



DIN Rail Mounting

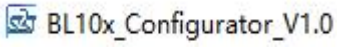
4 Configurator Operation

4.1 Login to Configuration Software

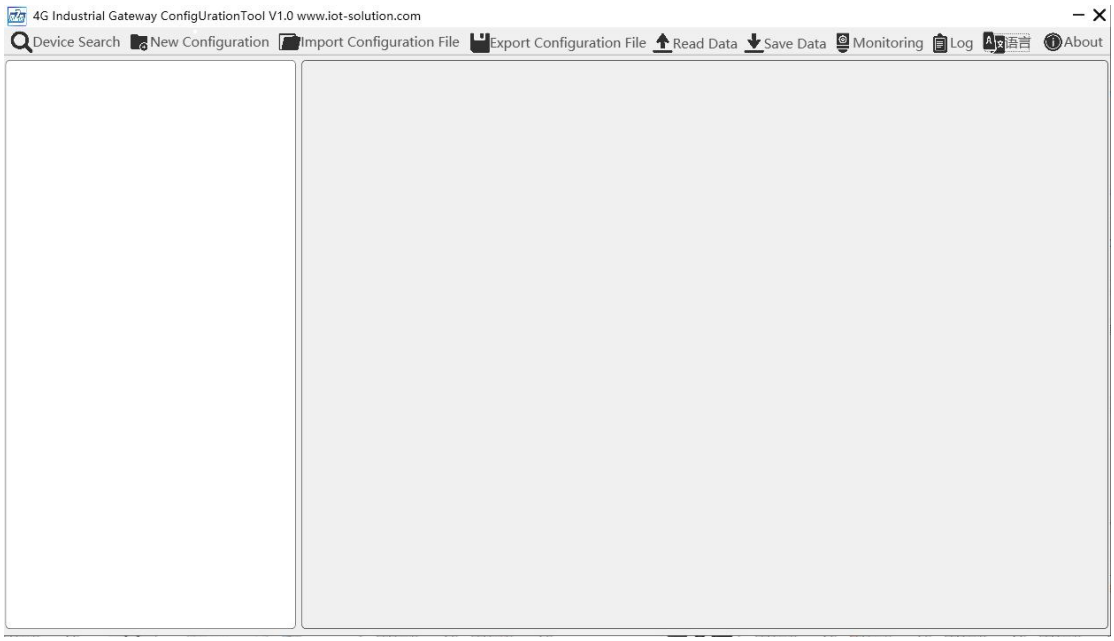
Connect BL101 to router or switch through WAN port with standard direct network cable or cross network cable. Make sure BL101 and PC are in the same local area network. If it's necessary to connect the gateway to PC directly, use standard cross network cable to connect through BL101 LAN port. (If BL101 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

4.1.1 Open Configuration Software

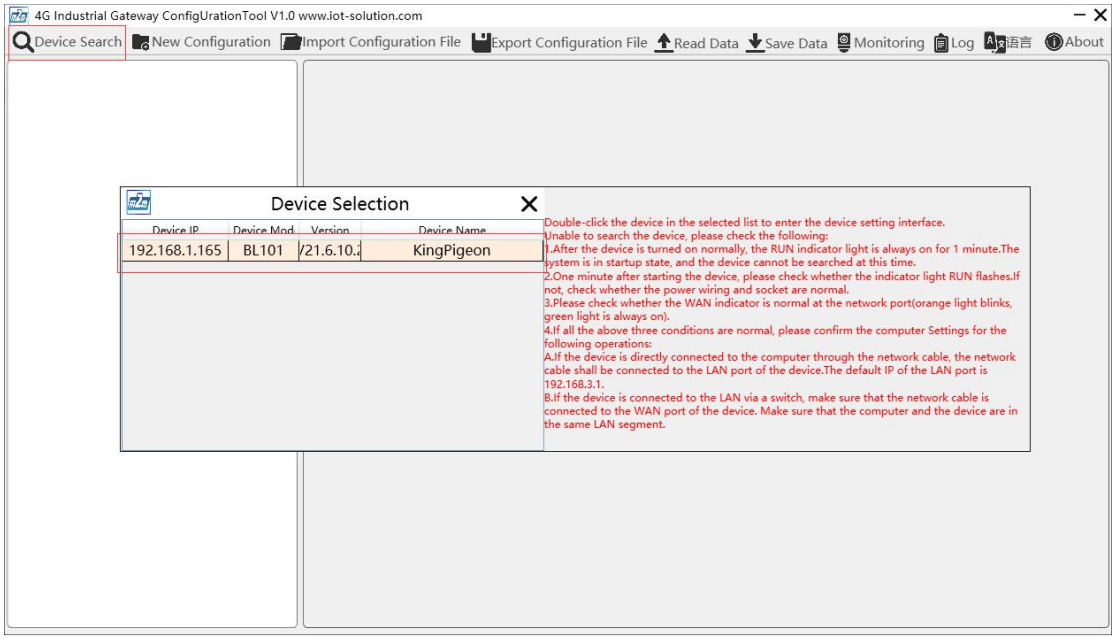
Double click 

on PC to run BL101 configuration software and enter below page



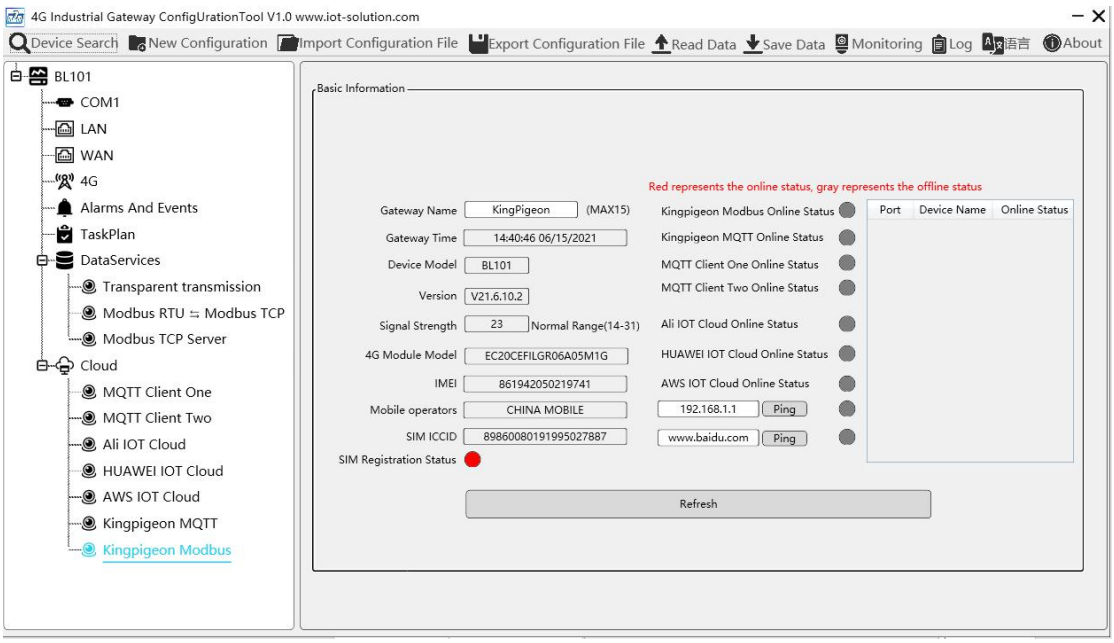
4.1.2 Search for Device

Click Device Search to get all devices which are in the same local area network with PC. If no device is found, please follow the procedure on the right notice box to check the root cause. Below is the example of connecting Gateway BL101 with switch through WAN. A device with IP 192.168.1.165 is searched out.



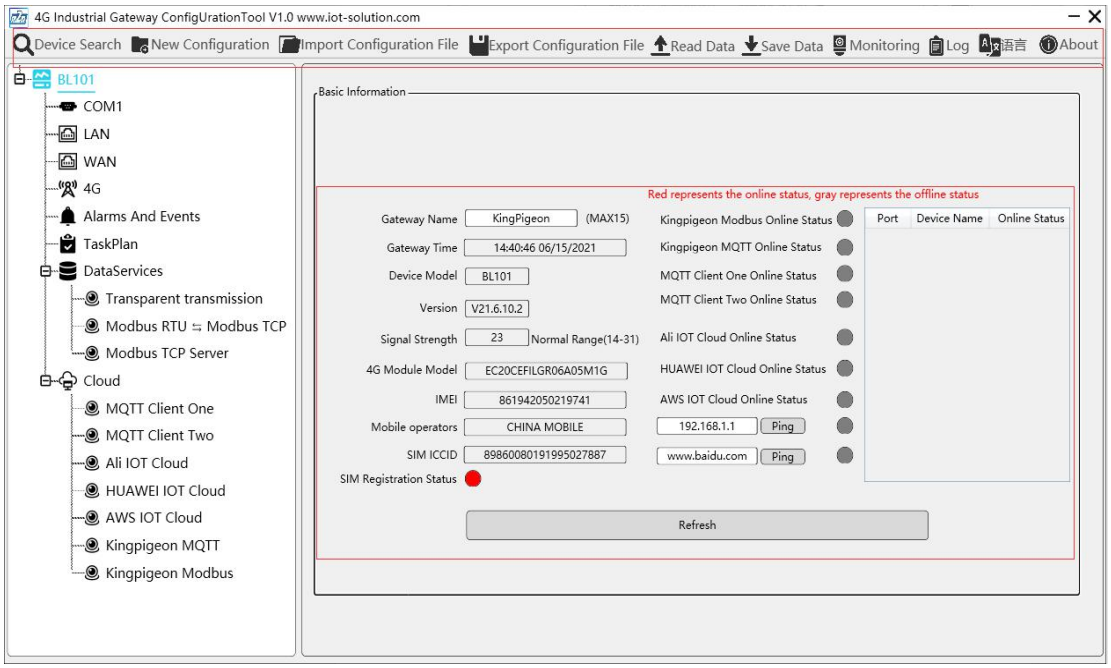
4.1.3 Connect Gateway Device

Double click the device to be configured (For example, double click device with IP 192.168.1.165) . Reading success message will be shown in prompting box. Click confirm to enter configuration page.



4.2 Configuration Software Introduction

4.2.1 System Function



System Function	
Item	**Description**
Device Search	Search for all BL101 gateways in the same loca 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 BL101 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

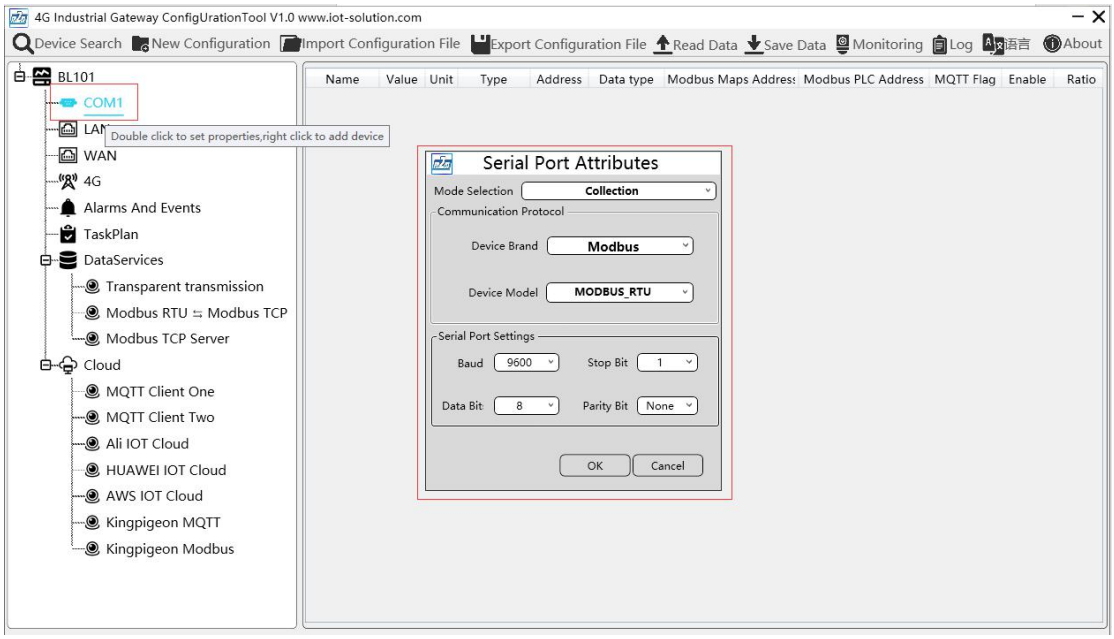
Gateway Time	Local time of reading gateway
Device Model	Read device model number
Version	Read device version
Signal Strength	4G module signal value. If it's less than 14, it means weak signal. Full signal value is 31
4G Module Model	Read 4G module model. If it's null, it means no 4G module
IMEI	Device 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 gatway, IP can be changed. It's gateway through WAN. Click Ping button to check local area network status. Red indicates local area network is OK. Gray indicates local area network problem.
www.baidu.com Ping	Default factory setting Ping baidu website. Web address can be changed. Wide area network status can be checked by clicking Ping. Red indicates wide area network is OK. Gray indicates internet communication problem.
Device Online Status Prompting Box	Red indicates gateway is communicating with slave devices Gray indicates gateway fails to communicate with salve device

Refresh	Refresh basic information of gateway

4.2.2 COM Port Introduction

4.2.2.1 COM Port Configuration

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



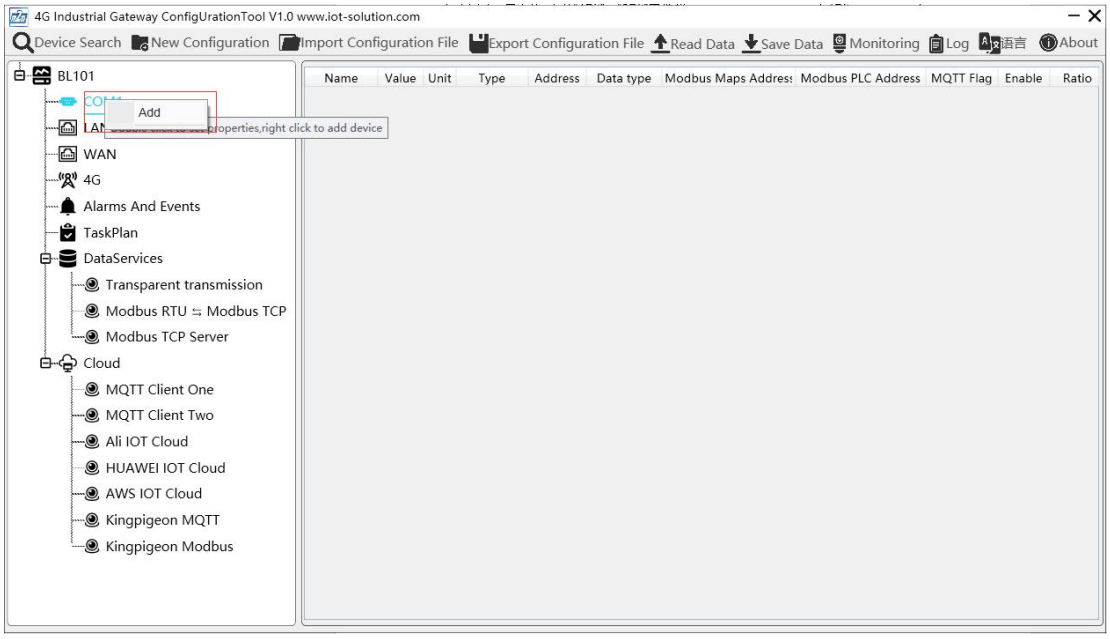
Serial Port Attributes			
Item		**Description**	**Default**
Mode Selection		Select mode: Collect/Transparent Transmission/Modbus RTU to Modbus TCP	Collect
Protocol	Device Brand	Modbus	Modbus
	Device Model	Modbus RTU	Modbus RTU
Serial Port Settings	Baud Rate	Select from “2400”, “4800”, “9600”, “19200”,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

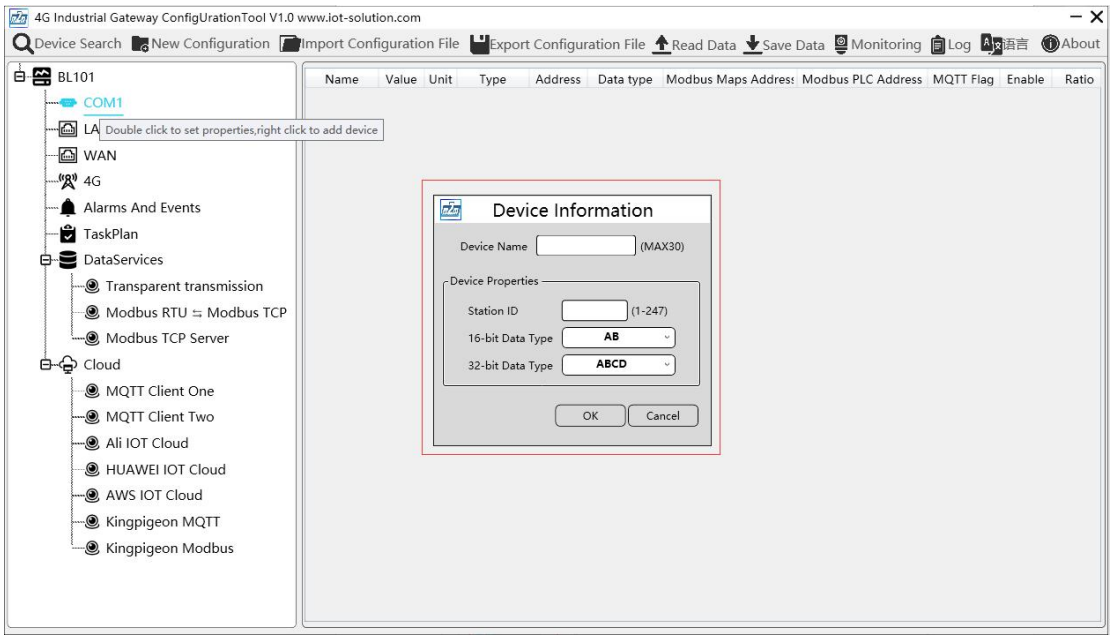
Cancel	Cancel COM port configuration	

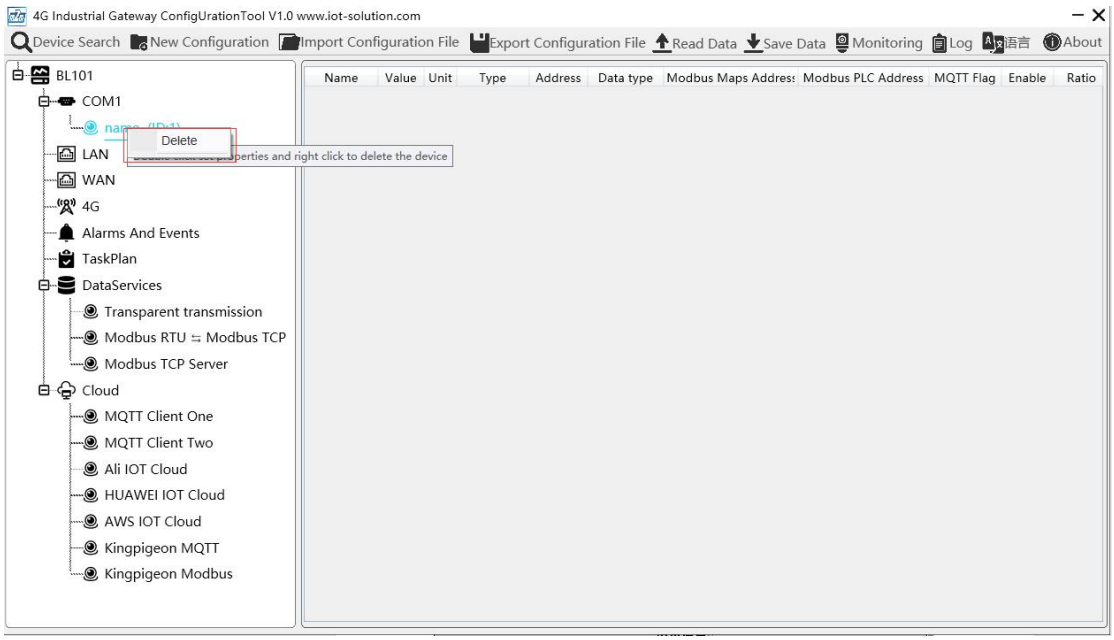
4.2.2.2 Add COM Port Devices

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

Note: Maximum 50 Modbus RTU devices' data can be collected through COM



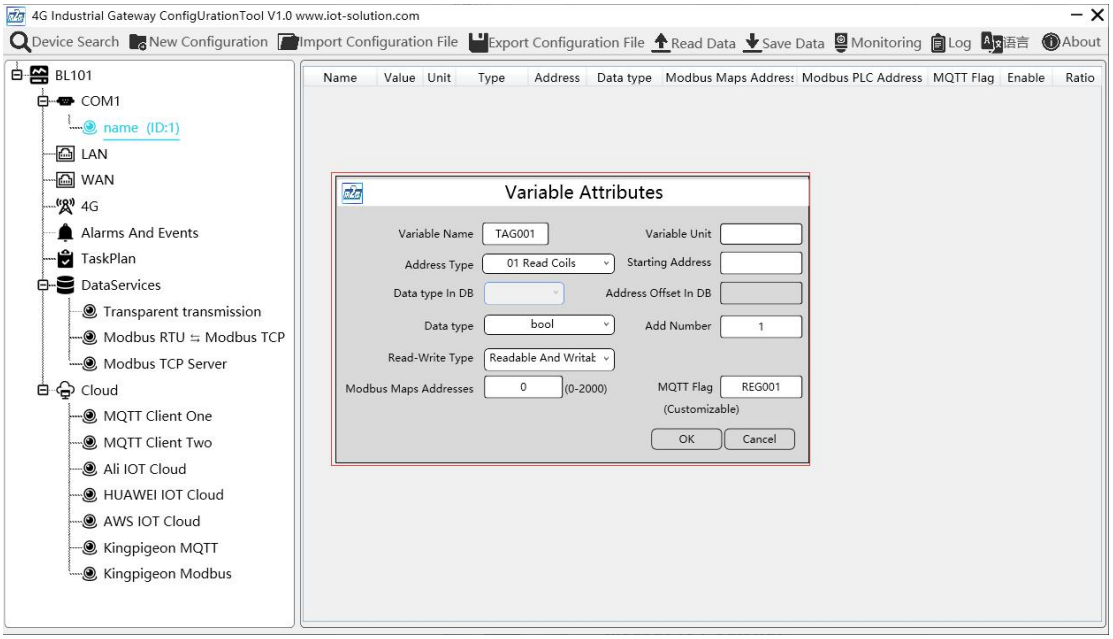




Device Information			
Item		**Description**	**Default**
Device Name		Name of Data Collecting Device	
Device Properties	Station ID	Data Collecting Device Modbus Communication Address	
	16-bit Data Type	Select “AB” or “BA”	AB
	32-bit Data Type	Select “ABCD”, “DCBA”, “BADC”, “CDAB”	ABCD
OK		Confirm device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

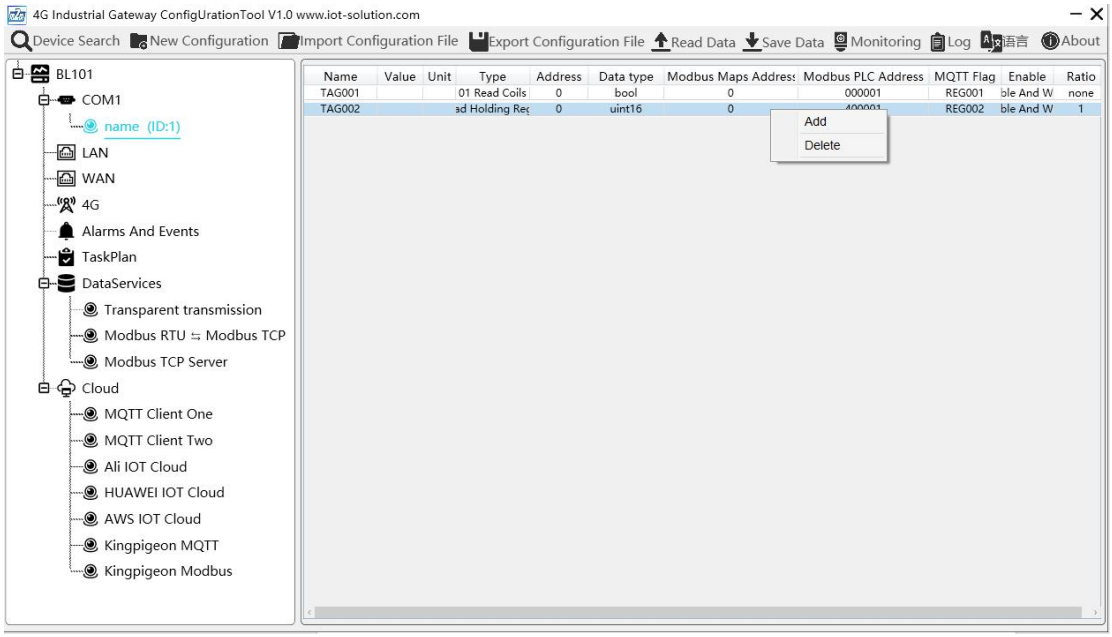
4.2.2.3 Add COM Port Device Datapoints

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



Datapoints Configuration	
Item	**Description**
Variable Name	Name of Added Datapoint
Variable Unit	Datapoint unit
Address Type	Select datapoint Modbus function code: 01 read holding coil, 02 read input coil, 03 read holding register, 04 read input register
Starting Address	Datapoint address
Data Type	Select from Bool, 16-bit unsigned integer, 16-bit signed integer, 32-bitunsigned 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

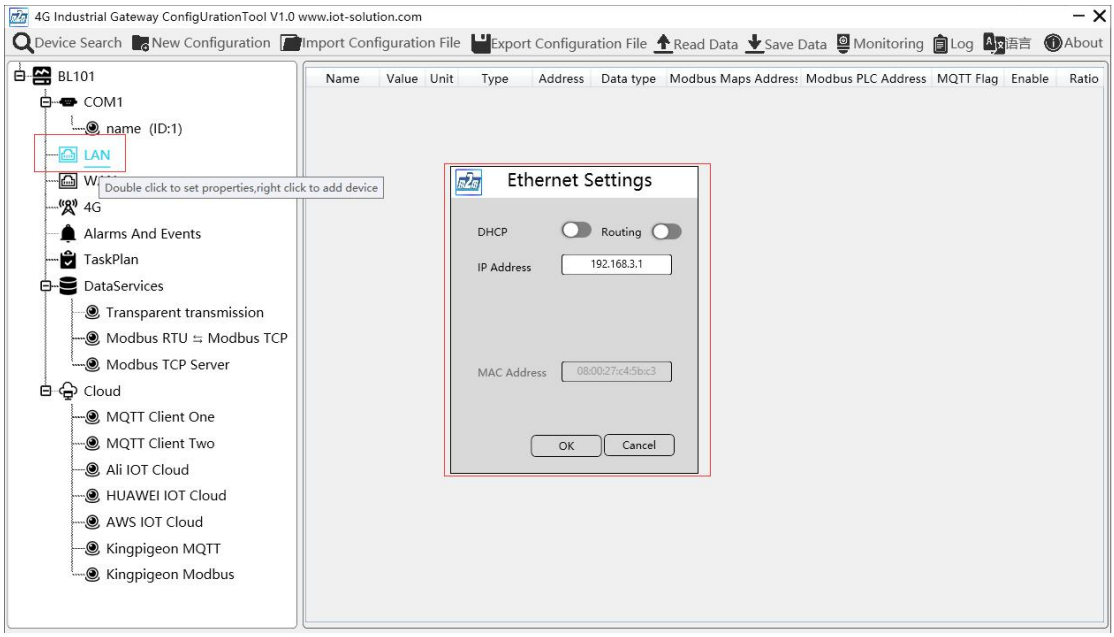


Right click datapoint to delete it and double click it to edit it.

4.2.3 LAN Port Introduction

4.2.3.1 LAN Port Attributes 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 from factory setting in default

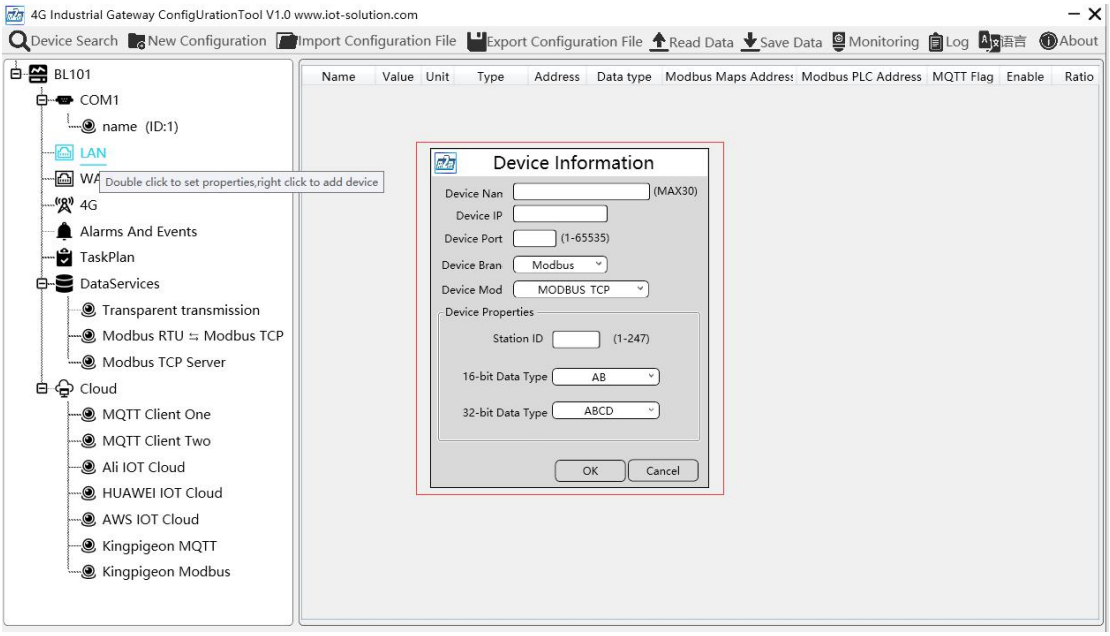


LAN Port Configuration	
Item	**Description**
DHCP	Green indicates auto IP distribution for LAN is enabled Gray indicates auto IP distribution for LAN is turned off
Routing	Green indicates routing function is enabled. Gray indicates routing function is turned off
IP Address	LAN port IP Address
MAC	LAN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

4.2.3.2 Add LAN Port Device

Right click LAN and clik Add to enter device configuration page. Device can be connected directly with Gateway BL101 through LAN or through switch which is connected with LAN.

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



LAN Port Device Configuration	
Item	**Description**
Device Name	Name of Device to connect through LAN
Device IP	Set IP Address of LAN port device
Device Port	Set LAN device port
Device Brand	Modbus
Device Model	Modbus TCP
Station ID	LAN port device Modbus communication address
16-bit Data Type	Select “AB” or “BA”
32-bit Data Type	Select“ABCD”, “DCBA”, “BADC” or “CDAB”

OK	Confirm LAN port device setting
Cancel	Cancel LAN port device setting

4.2.3.3 Add LAN Port Device Datapoints

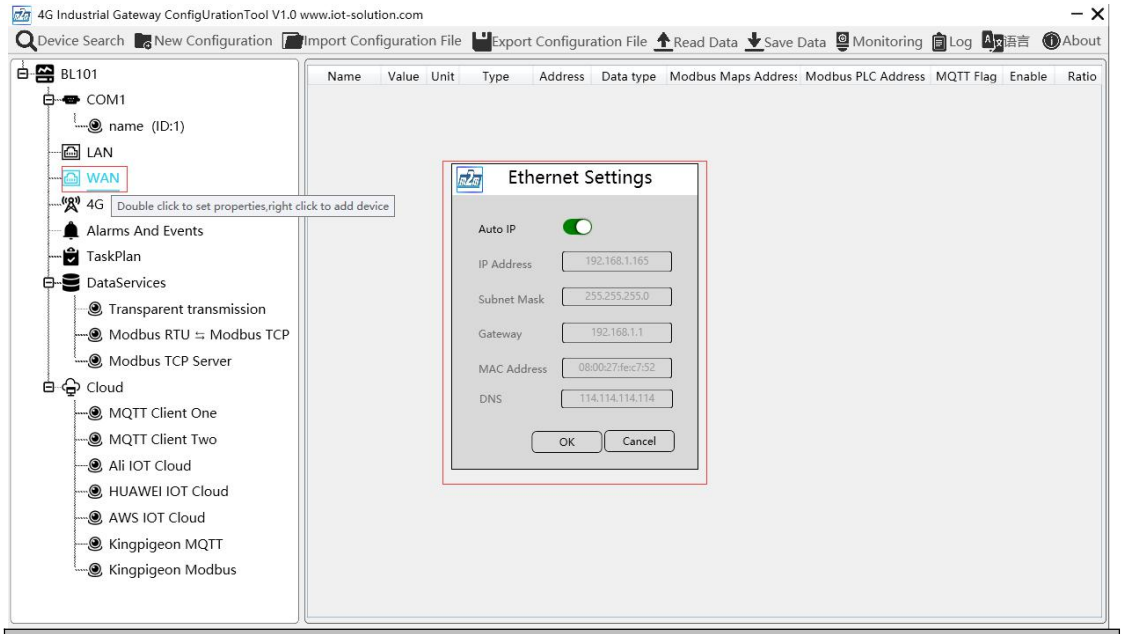
Follow the same procedure of adding datapoints for COM port device to add datapoints of LAN port device

Add COM Device Datapoint

4.2.4 WAN Port Introduction

4.2.4.1 WAN Port Attributes Configuration

Double click WAN to enter 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

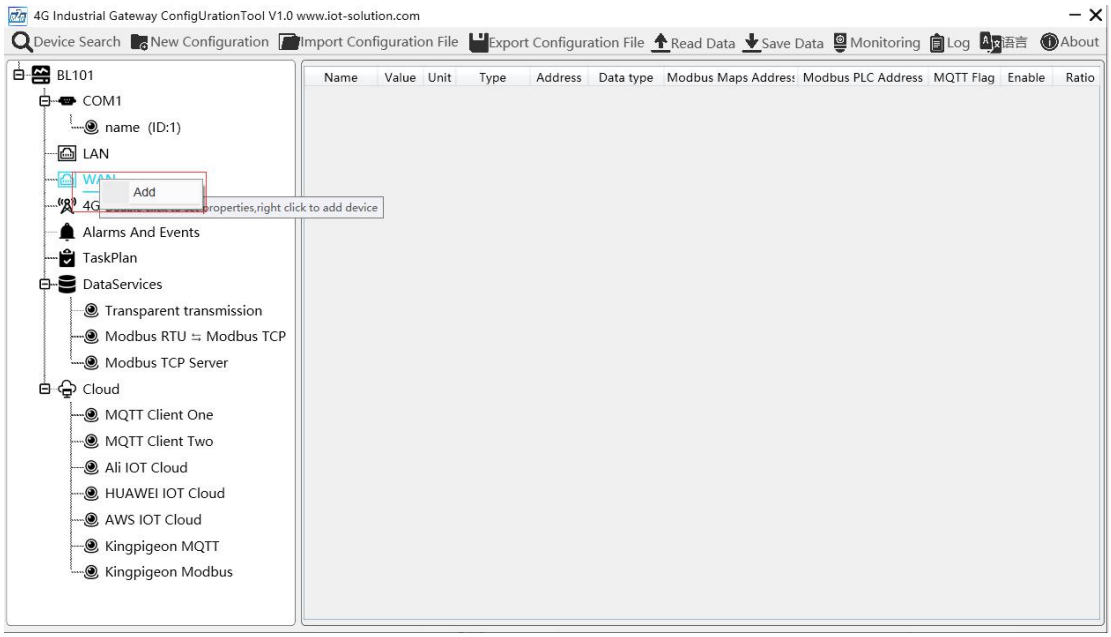
Cancel	Cancel WAN port setting

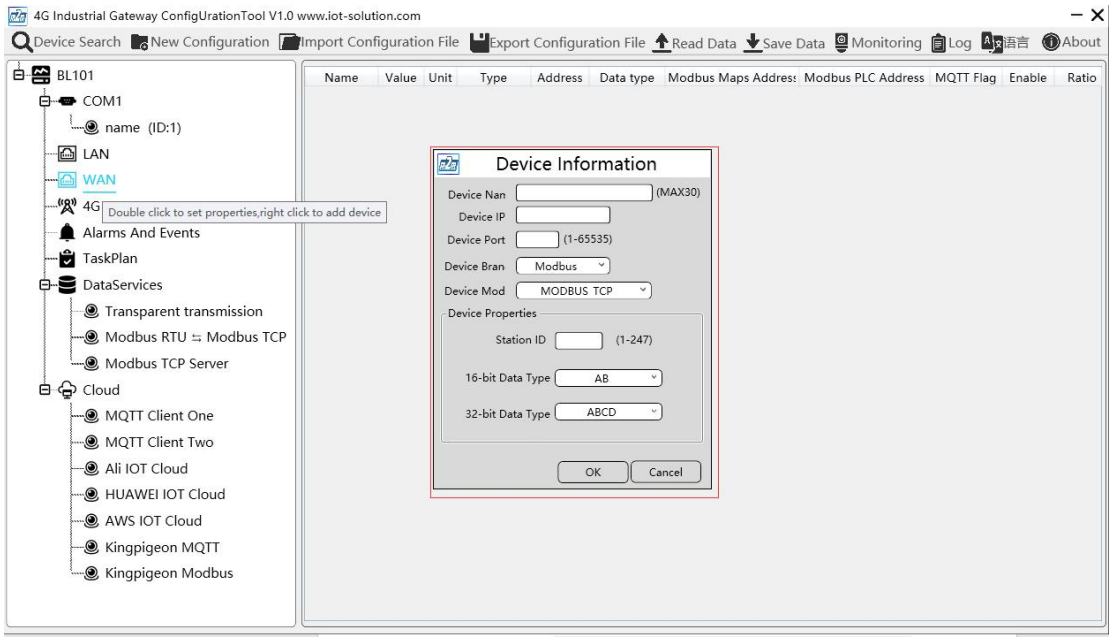
4.2.4.2 Add WAN Port Device

Right click WAN and then click add to enter device configuration page

More devices can be connected with switch connecting WAN port

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





WAN Port Device Configuration

Item	Description
Device Name	Name of WAN Port Device
Device IP	WAN Port device IP address
Device Port	WAN port device Port
Device Brand	Modbus
Device Model	Modbus TCP
Station ID	WAN port device Modbus communication address
16-bit Data Type	Select “AB” or “BA”
32-bit Data Type	Select “ABCD”, “DCBA”, “BADC” or “CDAB”
OK	Confirm WAN port device setting
Cancel	Cancel WAN port device setting

4.2.4.3 Add WAN Port Device Datapoints

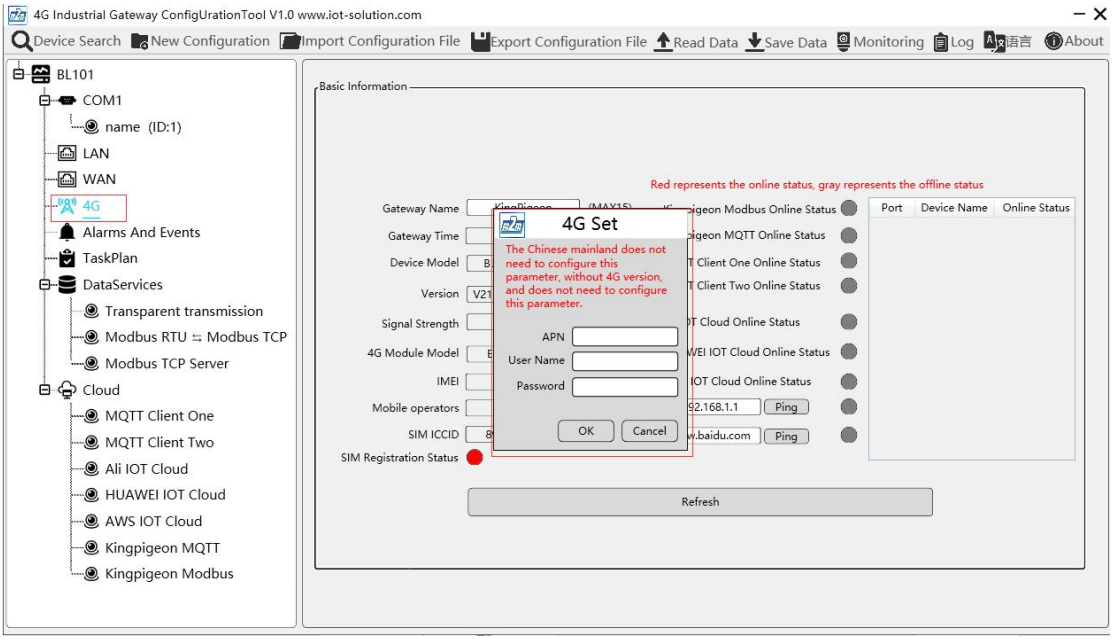
Follow the same procedure of adding datapoints for COM port device to add datapoints of WAN port device

Add COM Port Device Datapoints

4.2.5 4G Cellular 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

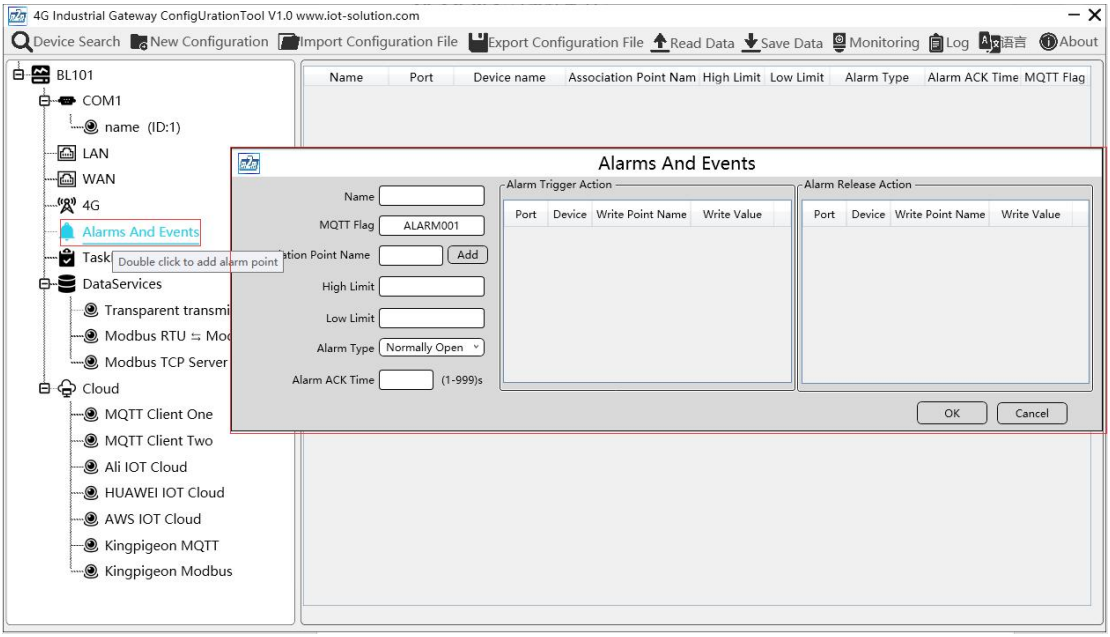


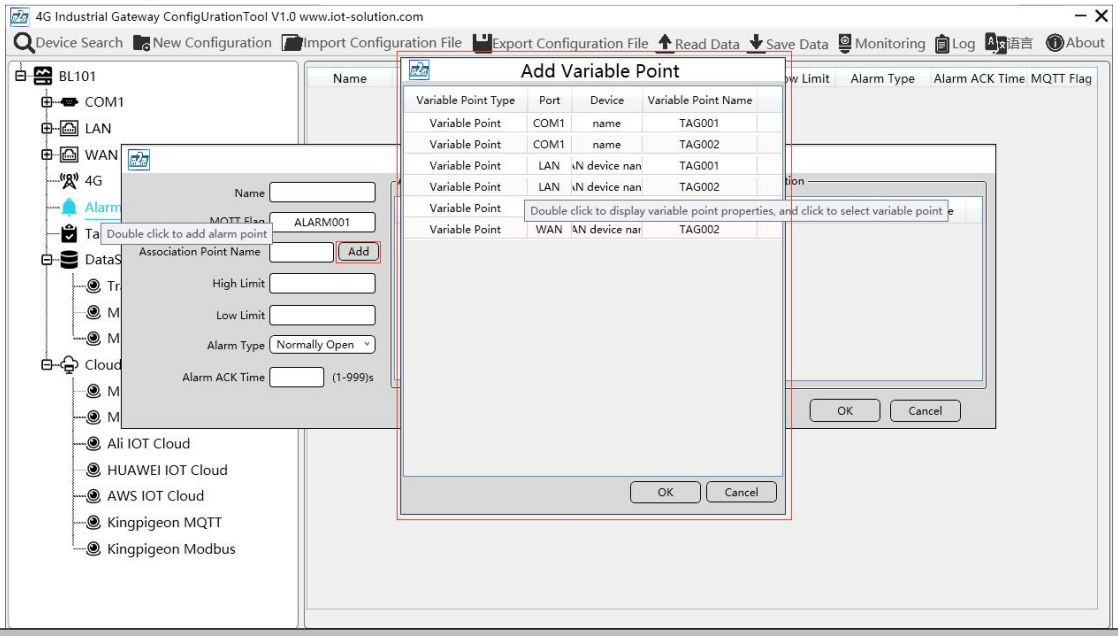
4G Configuration	
Item	**Description**
APN	Access Point Name of SIM card cellular network
User Name	User Name of SIM card cellular network
Password	Password of SIM card cellular network

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 Points Configuration

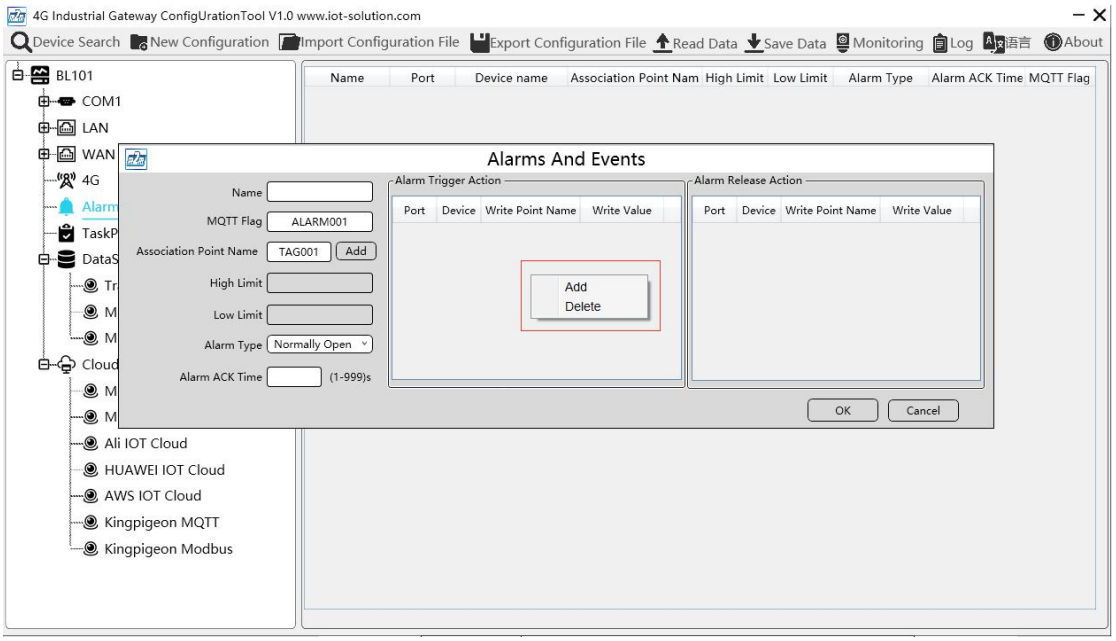


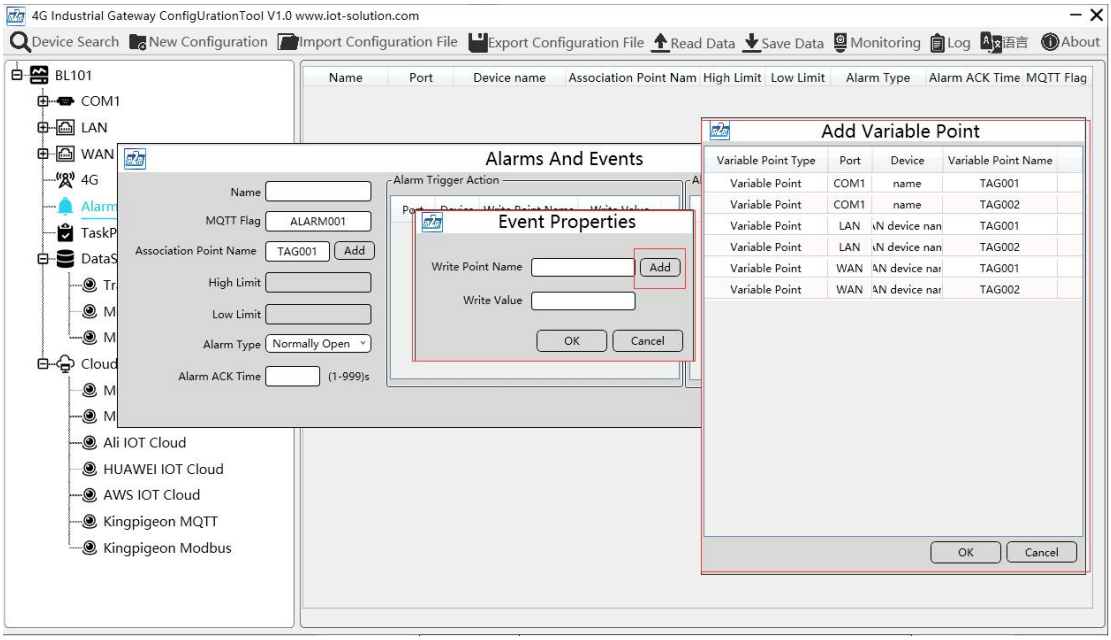


Alarm and Events Configuration	
Item	**Description**
Name	Name of Alarm Point
MQTT Flag	MQTT flag of alarm point, can be randomly set
Association Point Name	Select alarm point and click Add. Datapoint box will pop up. Click the point to be set for alarm and click OK to confirm. Double click datapoint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

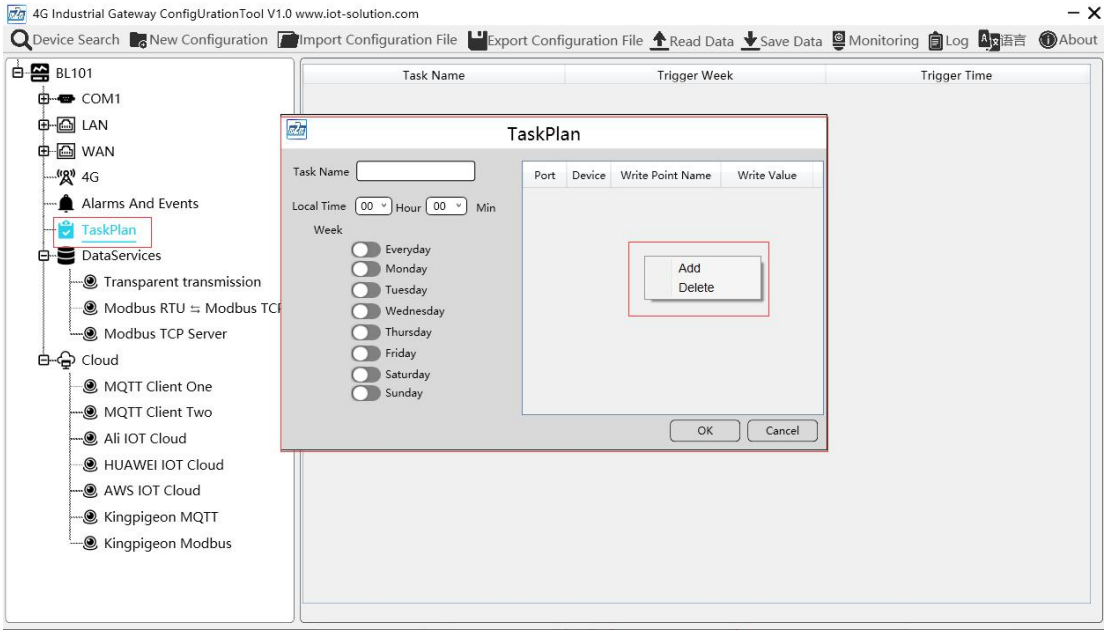


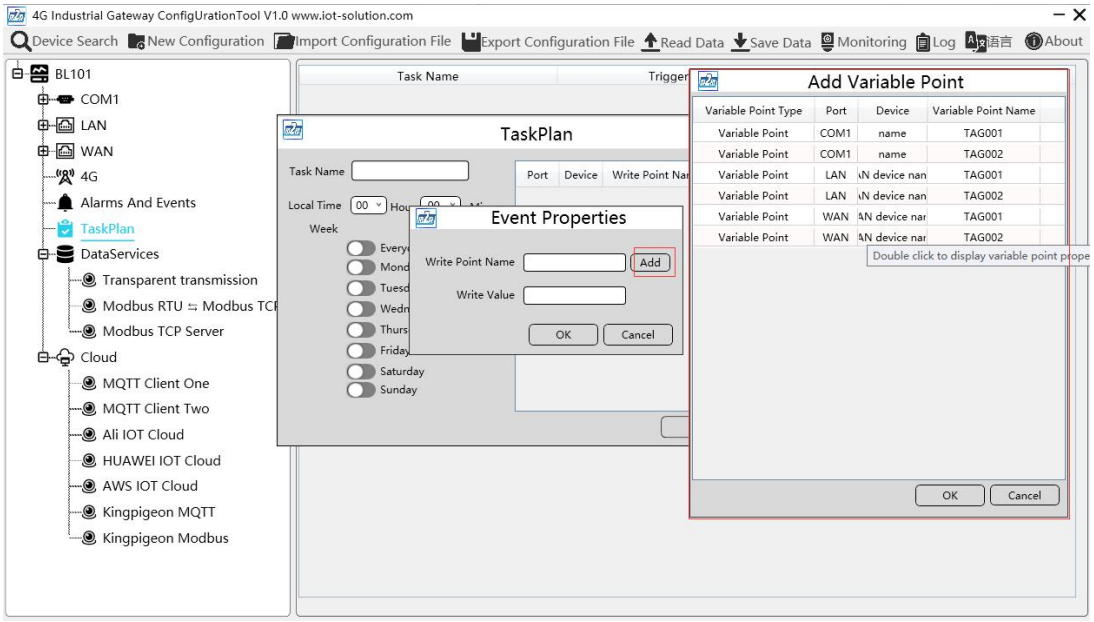


Event Configuration	
Item	**Introduction**
Write Point Name	Write Point Name is generated based on selected datapoint. Click Add, select datapoint and click OK to confirm. Double click datapoint to view its attributes
Write Value	Write datapoint value. For Boolean value, select 1 or 0

4.2.7 Task Plan Configuration

Double click Task Plan to enter configuration box. Right click the box and click Add to enter configuration box





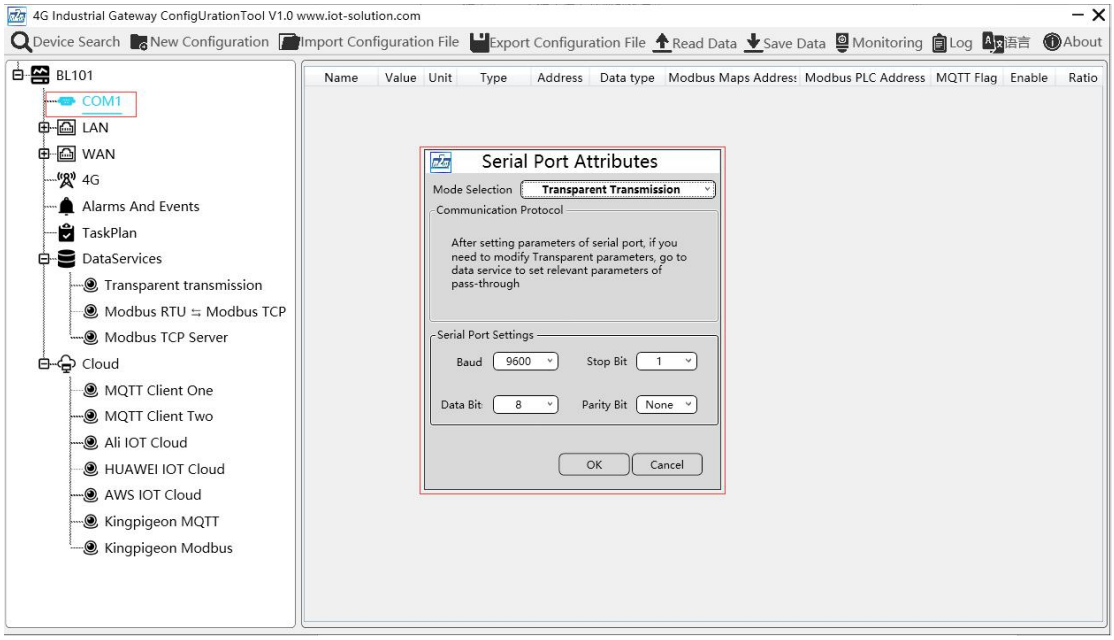
Task Plan Configuration	
Item	**Description**
Task Name	Name of Task Plan
UTC Time	Set time to perform the planned task (UTC time)
Week	Set week day to perform the planned task
Write Point Name	Write Point Name will be generated based on selected

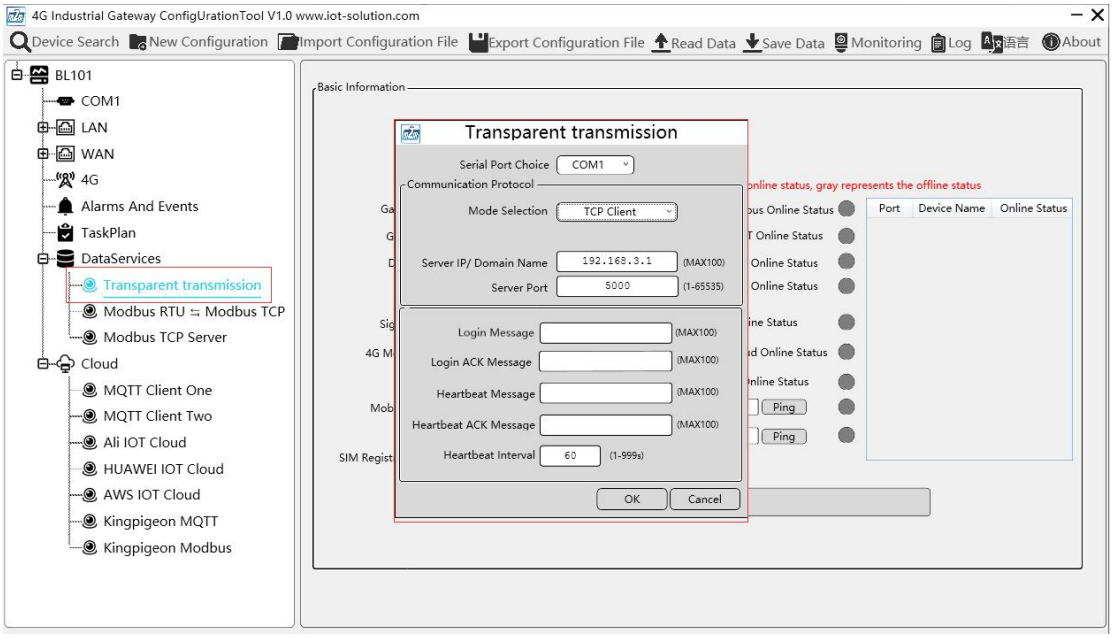
	datapoint.Click Add , select the datapoint and click OK to confirm. Double click datapoint to view its attributes
Write Value	Write datapoint value. For Boolean value, select 1 or 0
OK	Confirm Task Plan setting
Cancel	Cancel Task Plan setting

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

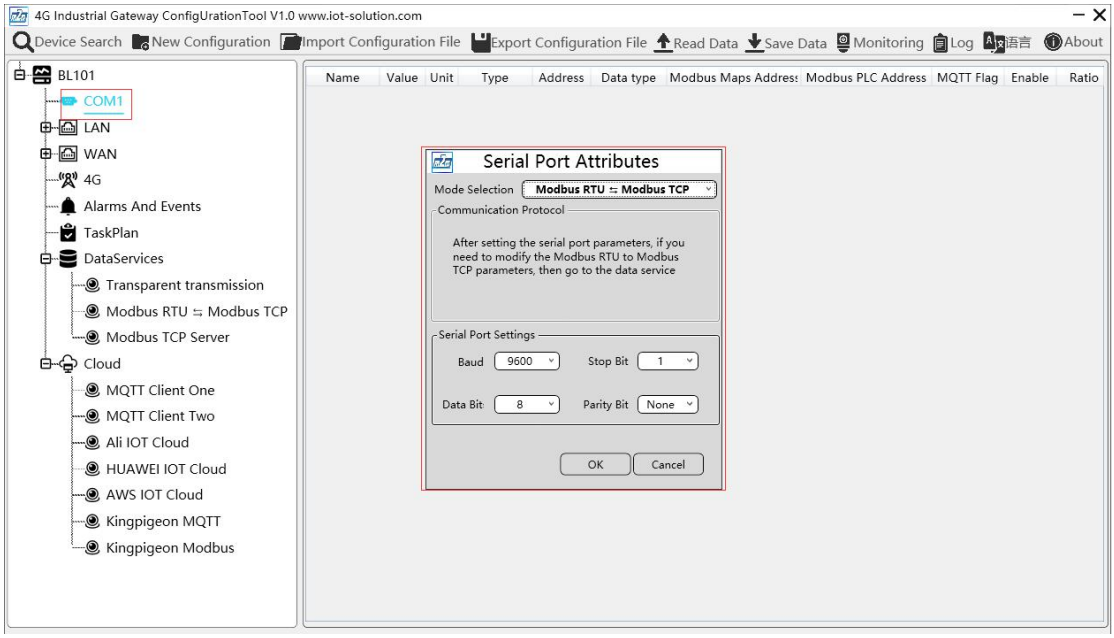


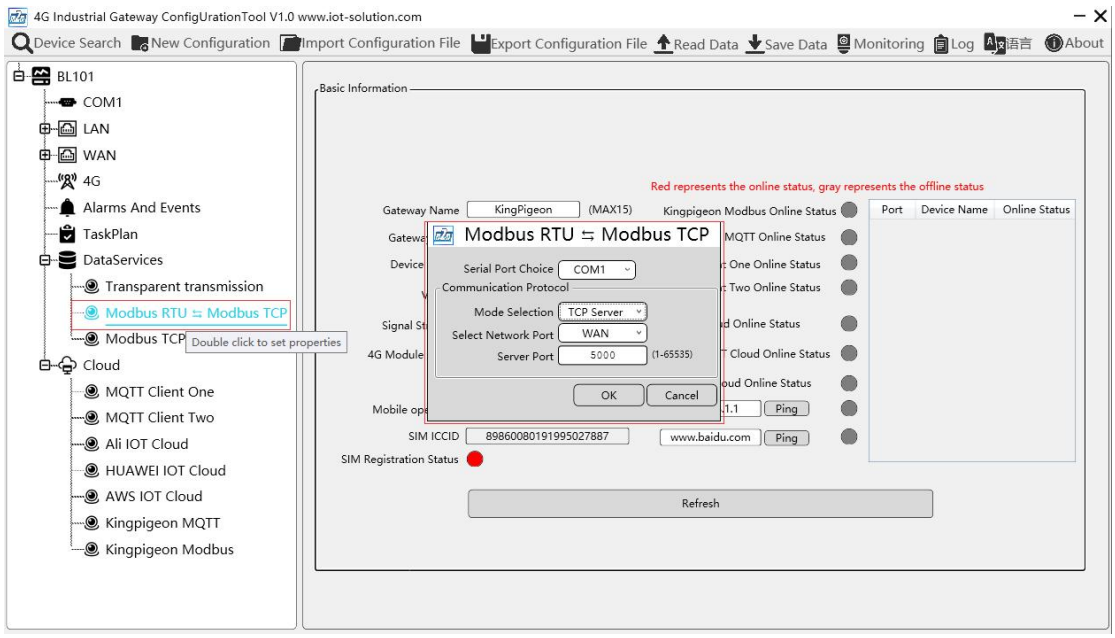


Transparent Transmission Configuration	
Item	**Description**
Serial Port Choice	COM1
Mode Selection	Select Gateway as “TCP Server” or “TCP Client”
Select Network Port	Only set it when BL101 Gateway is used as TCP server Select WAN or LAN
Server IP /Domain Name	If BL101 is used as server, it can’t be set but automatically show selected WAN or LAN IP If BL101 is used as client, input transparent transmission server IP
Monitoring Port /Server Port	If BL101 is used as server, input monitoring port If BL101 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
Heatbeat Message	Heatbeat Data Package to keep connection
Heatbeat ACK Message	Data Package of server response to heartbeat
Heatbeat Interval	Cycle time of sending heatbeat 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.

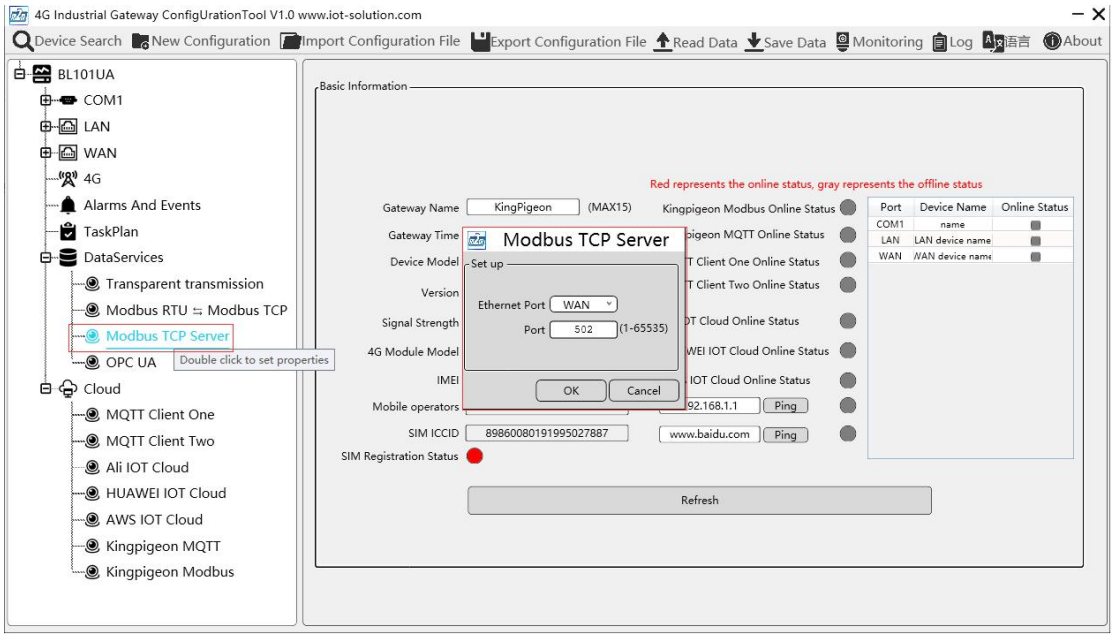




Modbus RTU to Modbus TCP Configuration	
Item	**Description**
Serial Port Choice	COM1
Mode Selection	TCP Server (Gateway can only be TCP Server)
Select Network Port	Select “WAN” or “LAN”
Monitoring Port	Input port of monitoring BL101 Gateway (required)
OK	Confirm Modbus RTU to Modbus TCP configuration
Cancel	Cancel Modbus RTU to Modbus TCP configuration

4.2.8.3 Modbus TCP Server

BL101 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

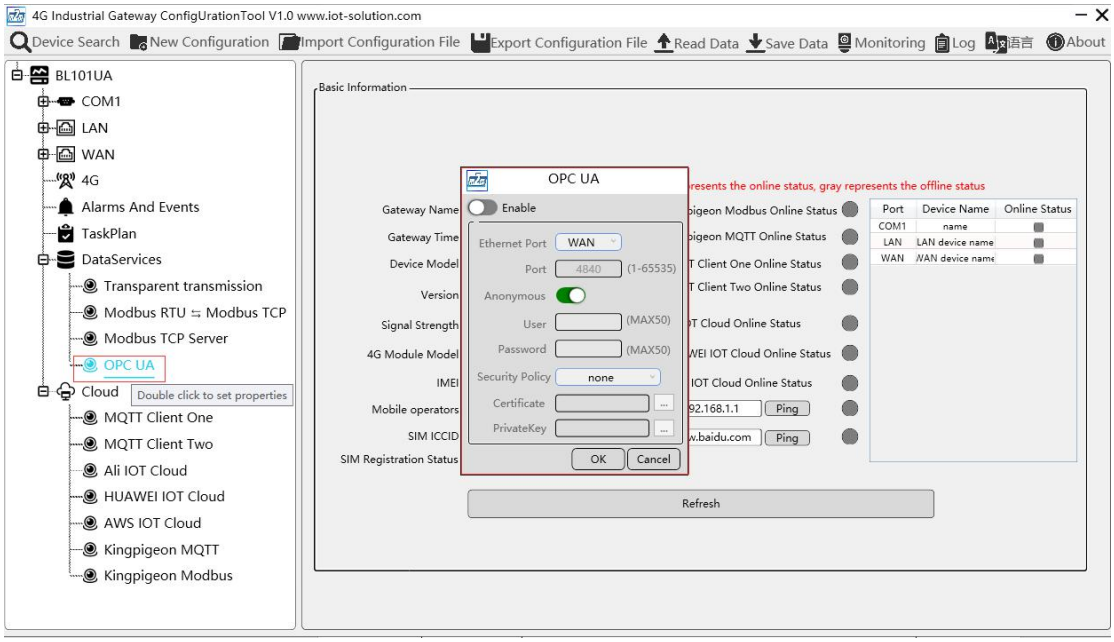


Modbus TCP Server Configuration	
Item	**Description**
Ethernet Port	Select “WAN” or “LAN”
Port	Input gateway monitoring port (required)
OK	Confirm Modbus TCP Server setting
Cancel	Cancel Modbus TCP Server setting

4.2.8.4 OPC UA

BL101 Gateway supports OPC UA protocol and provides data as OPC UA server

Note: Only the model which supports OPC UA needs this configuration



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

4.2.9 Cloud Platform Connection

BL101 Gateway supports device online in multiple cloud platforms simultaneously.

4.2.9.1 MQTT Client One

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

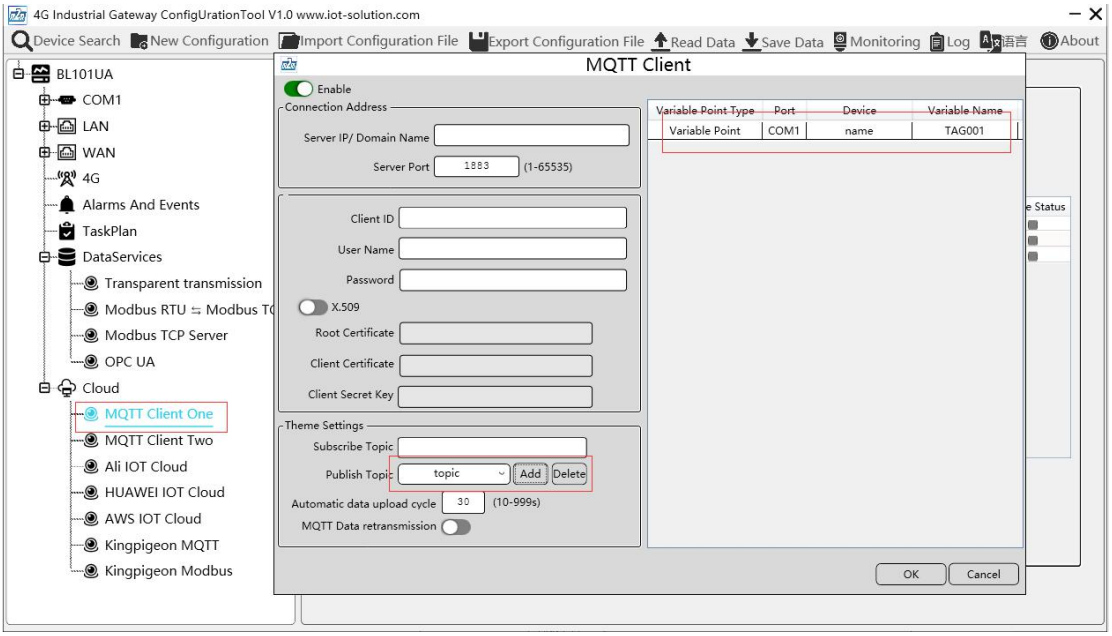
It supports multiple publishing topics.

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 TAG001 of COM Device 1 is published and other datapoints are not published.

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



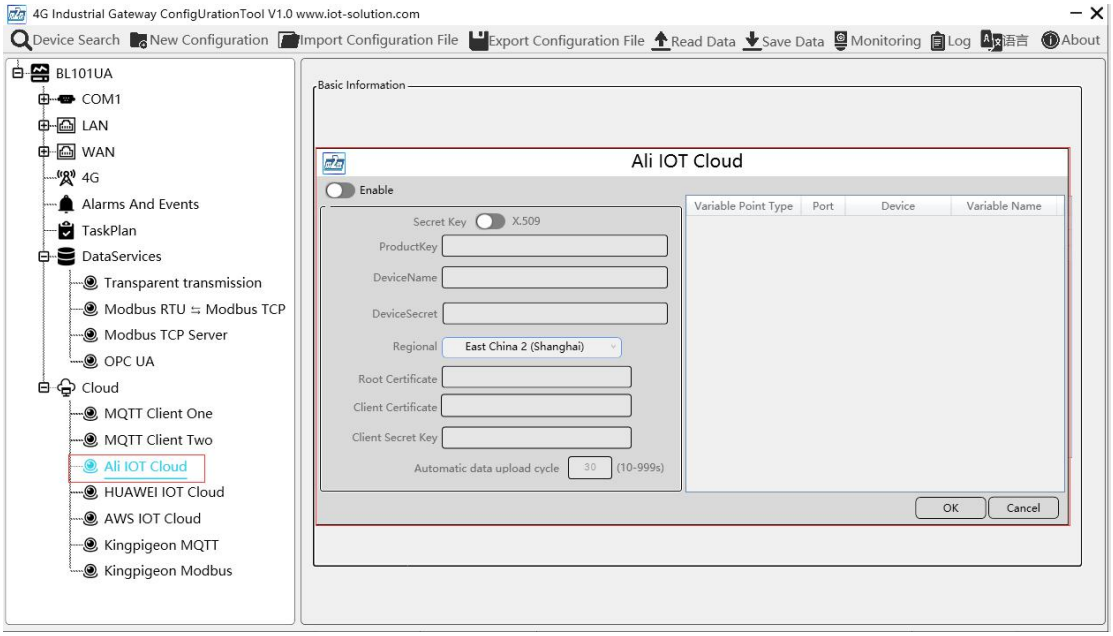
MQTT Client One Configuration	
Item	**Description**
Enable	Green indicates MQTT Client One is enabled Gray indicates MQTT Client One is not enabled.
Server IP/ Domain Name	Input Server IP/Domain name
Server Port	Input server port(required), default is 1883
Client ID	Client Identifier of MQTT Connecting 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
OK	Confirm MQTT Client One setting
Cancel	Cancel MQTT Client One setting

4.2.9.2 MQTT Client Two

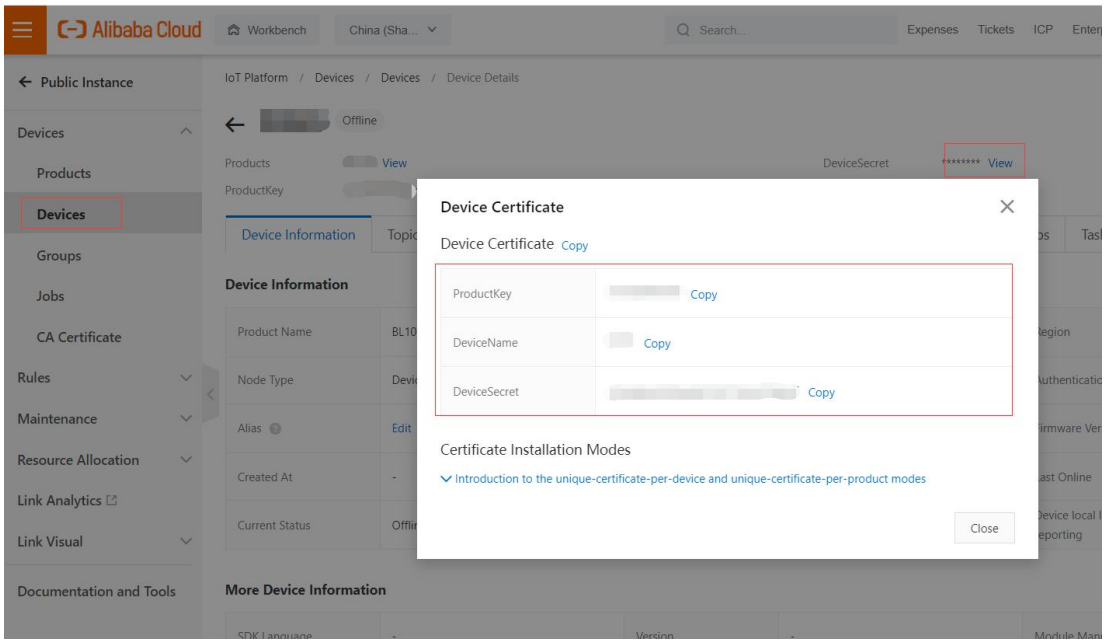
Follow the same procedure of configuring MQTT Client One to set MQTT Client Two
MQTT Client Two subscribe topic does not work. MQTT Client Two is used for viewing data from cloud but not controlling data
MQTT Client Two Configuration refer to MQTT Client One

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

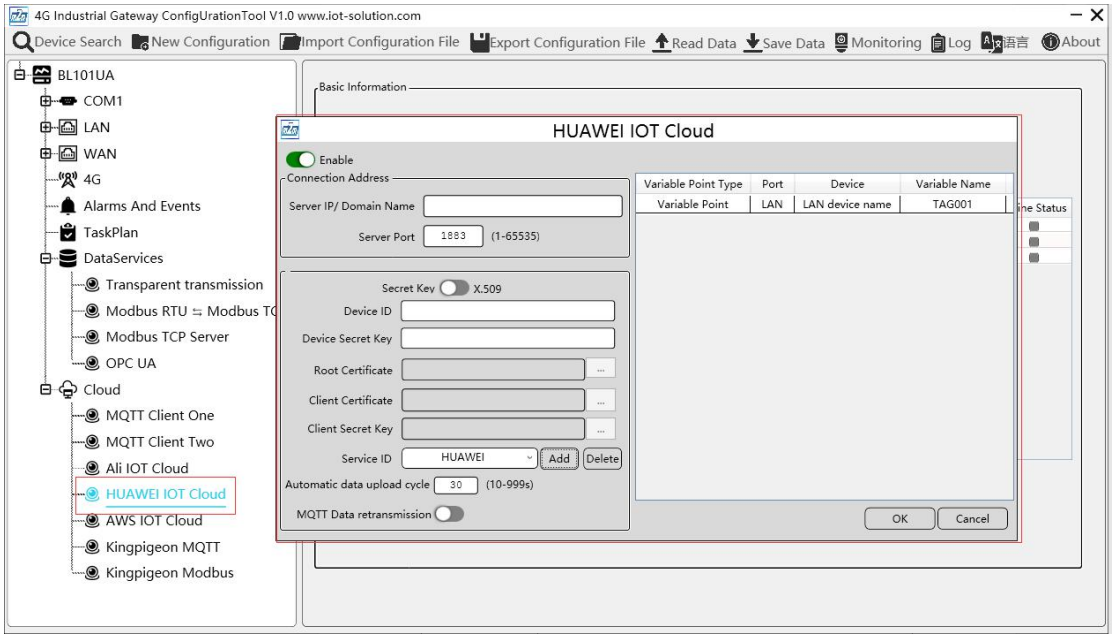


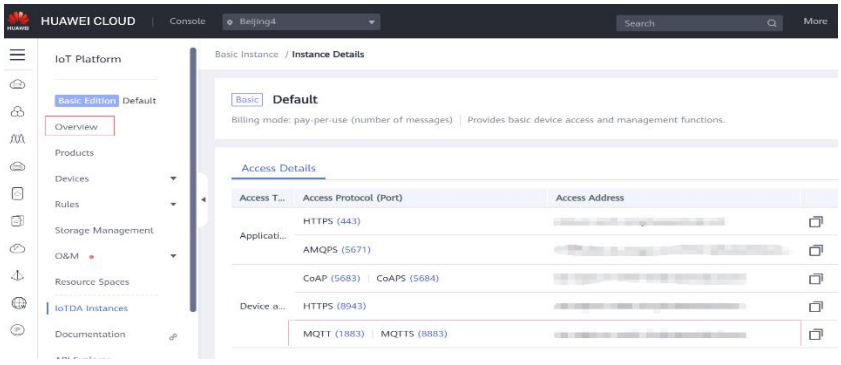
4.2.9.4 HUAWEI Cloud

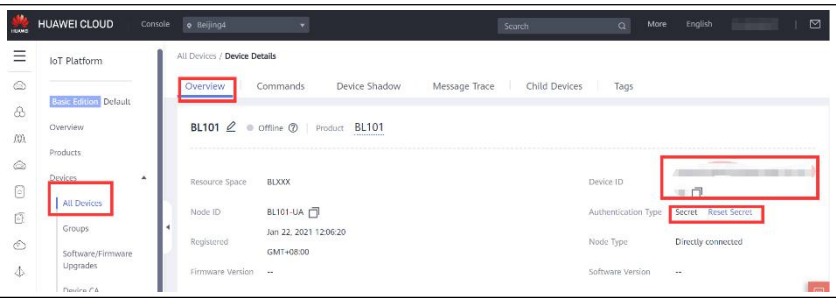
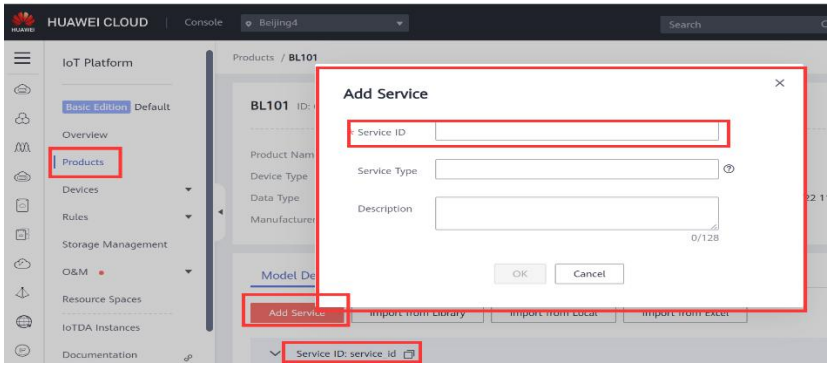
HUAWEI Cloud can be connected with or without Certificate. It supports multiple service IDs. Click Add to set Service ID. ID can be viewed from the drop-down list. Click Delete to delete service ID.

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: 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.



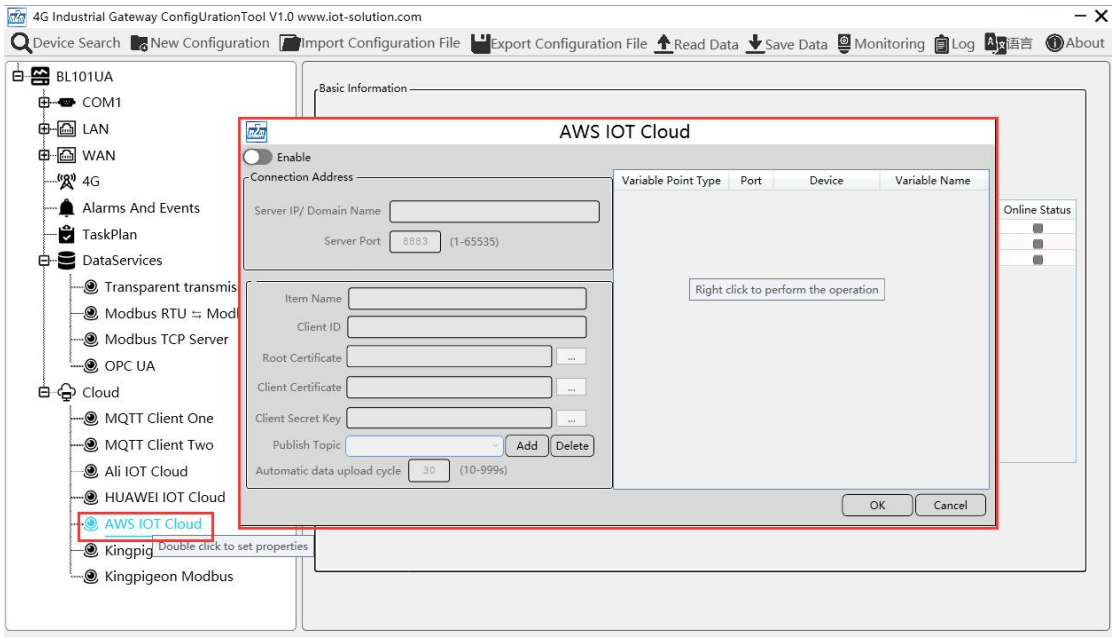
HUAWEI Cloud Configuration	
Item	**Description**
Enable	Green indicates HUAWEI Cloud is enabled. Gray indicates HUAWEI Cloud is disabled. Default is disabled
Server IP/ Domain Name	Select connecting to HUAWEI Cloud via MQTT to enter console. Click Overview to get server IP address of device connection 
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)

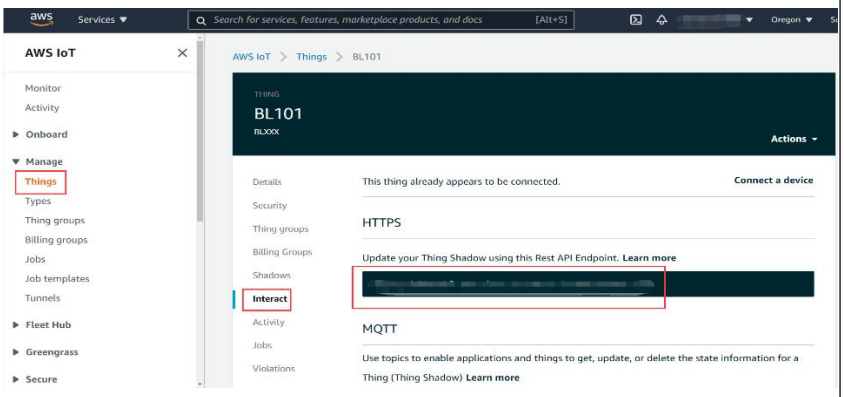
	
Device Secret Key	Set the same Device Secret Key as the one in HUAWEI Cloud when creating device in HUAWEI Cloud. If it's forgot, it can be reset in device authentication. (Not necessary if connecting with certificate is selected)
Root Certificate	Select file to upload (Need to select certificate X.509 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	Set the same Service ID as the one in HUAWEI Cloud. (IOT Platform-Products-Add Service-Service ID)  Multiple Service IDs are supported
Automatic Data Upload Cycle	Cycle time of data uploading. Default is 30s
MQTT Data Re-transmission	Green indicates offline data will be transmitted once network recovers; Gray indicates offline data will not be transmitted once network resumes
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

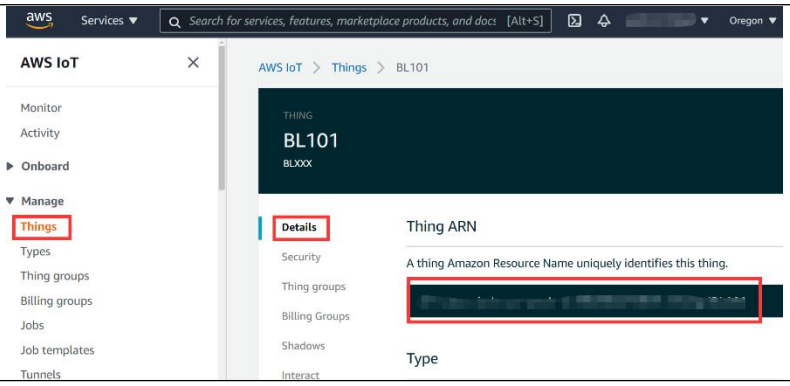
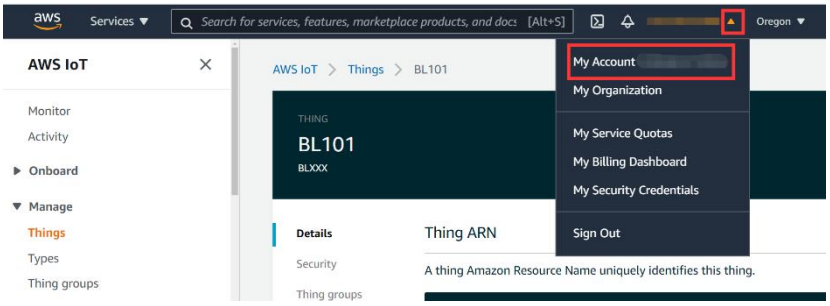
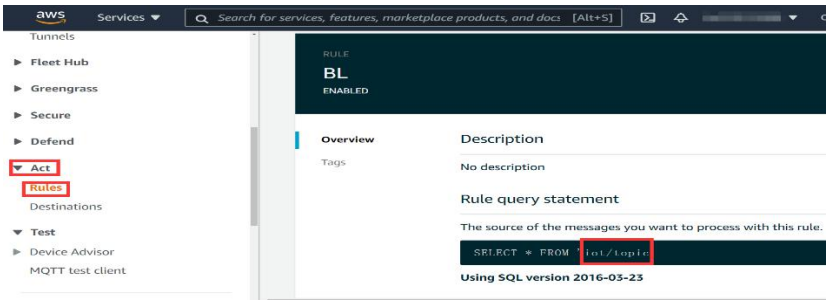
4.2.9.5 AWS (Amazon Web Service)

Note: 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.



AWS Configuration	
Item	**Description**
Enable	Green indicates AWS is enabled. Gray indicates AWS is disabled. Default is disabled
Server IP/ Domain Name	Input ASW Connection Endpoint (Enter Console, click Things and then click Interact to get it) 
Server Port	8883 (Required)
Item Name	Input Thing ARN

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