MG-IOT01 IOT Gateway

User's Manual

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2018-11

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2019-06-27	V1.1	New communication dialing method	YZJ
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Version Information

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1 Product Overview

1.1 Product Function

Developed by Sichuan Odot Automation System Co., Ltd and based on market demand and years of project experience, MG-IOT01 is a protocol converter supporting to convert a variety of PLC protocols to MODBUS TCP and MQTT protocol.

Any device with RS485/RS422/RS232 interface and supporting Siemens (PPI), Omron (HOSTLINK), Mitsubishi (FX series), and Delta (MODBUS) can connect to MODBUS TCP network through this gateway, and through MQTT to cloud platform, so as to connect low-speed serial devices to high-speed Ethernet and cloud servers for industrial data collection. The gateway has two different working modes: "General mode" and "Bridge mode". Gateway in "General" mode is directly connected to PLC for data collection, and "Relay" mode can be used for data collection when it is compatible with the original PLC communication to HMI without adding more communication interfaces.

1.2 Features

- DC 9-36V wide voltage input, anti-reverse protection.
- Communication terminal isolation processing, 1500V isolation voltage.
- 2 Ethernet ports, with switch function, support cascade.
- 2KV network port isolation protection, 10M/100Mbps rate adaption, Auto-MDI/MDIX.
- Supports for connection to Siemens 200 PLC, Omron HOSTLINK protocol PLC, Mitsubishi FX protocol PLC, Delta MODBUS protocol PLC.
- Supports simultaneous connection of 5 MODBUS TCP clients.
- Supports 200 collection points.
- Supports MQTT connection to the cloud.
- Supports data sorting and exchange.
- Supports data type conversion.

- Supports data calculation.
- 4 serial ports real time refresh, short scanning period, strong loading capacity.
- Supports Bridge mode, collecting PLC data without affecting PLC and HMI communication.
- With watchdog function, and the watchdog time can be set.
- Support IAP download, update and upgrade the firmware program in the product through the network port.
- External termination resistor and bias circuit for high stability.
- Packet transmission interval can be adjusted freely and is more flexible to use.
- Supports one-button reset function to restore factory settings.
- 35mm standard rail installation.
- EMC complies with the international standards EN 55022:2010 & EN55024:2010.

1.3 Technical Parameters

The technical parameters related to this product are shown in Table 1. Please use this product within the parameters of this product for better performance.

Environmental parameters					
Working Temperature	-40 – 85℃				
Storage Temperature	-55 – 125℃				
Working Humidity	5% – 95% (No condensation)				
Power parameter					
Power Port No.	1				

	Table 1.	Technical	parameters
--	----------	-----------	------------

Input Voltage	9 – 36V DC			
Power Consumption	Max.200mA@24V			
	Ethernet Parameters			
Gateway Working	Transparent transmission mode, address mapping mode			
Mode	optional, Modbus TCP protocol			
Ethernet Ports No.	2 RJ45, 10M, 100M adaptive rate with switch function			
Network Protocol	ETHERNET, ARP, IP, TCP, ICMP, MQTT			
Number of TCP	Up to 5			
Serial Port Parameter				
Serial Ports No.	4 channel RS485/RS232 or 2channel RS422			
Communication	4 PLC protocols optional			
Baud Rate	2400 – 115200 bps			
Verification Mode	No parity, odd parity, even parity			
Supported Slaves	124 maximum (without repeater)			
Supported Data				
Points	200			

2 Hardware Description

2.1 Product Appearance



2.2 Indicator Description

The device has a total of 6 LED status indicators, and its symbol definition and status description are shown in Table 2.

Symbol	Definition	Status	Description
	Dowor indicator	ON	Power ON
	Power indicator	OFF	No power
FTH	Network failure	ON	TCP gateway communication error
	indication	OFF	TCP gateway communication normal
CO1	COM1 status indication	Blink	Data exchanging
		OFF	No data exchange
<u> </u>	COM2 status indication	Blink	Data exchanging
002		OFF	No data exchange
<u> </u>	COM2 status indication	<mark>Blink</mark>	Data exchanging
03	COMS status indication	OFF	No data exchange
CO4	COM4 status indication	<mark>Blink</mark>	Data exchanging
04		OFF	No data exchange
Notor	* Crean calar The a		MC IOT01 actower indicator

Table 2. Description of the indicators

Note: ^{*} Green color —— The status of the MG-IOT01 gateway indicator during normal communication

2.3 Terminal Definition

The device wiring adopts 16Pin 3.81mm pitch plug-in terminal block, and the terminal definition of RS485/RS232/RS422 interface is as shown in "Table 3".

No		RS485	RS232	RS422		
	Symbol	Definition	Definition	Definition		
1	1R/S-	COM 1 RS485-	COM 1 RS232_RX	1	RS422 Send Negative	
2	1T/S+	COM 1 RS485+	COM 1 RS232_TX	hanne	RS422 Send Positive	
3	GND	Shielding Layer	Ground	422 C	Shielding Layer	
4	2 R/S-	COM 2 RS485-	COM 2 RS232_RX	RS	RS422 Receive Negative	

Table 3. Terminal definitions

5	2 T/S+	COM 2 RS485+	COM 2 RS232_TX		RS422 Receive Positive		
6	GND	Shielding Layer	Ground		Shielding Layer		
7	3R/S-	COM 3 RS485-	COM 3 RS232_RX		Shielding Layer		
8	3T/S+	COM 3 RS485+	COM 3 RS232_TX	nel 2	RS422 Send Positive		
9	GND	Shielding Layer	Ground	2Char	Shielding Layer		
10	4R/S-	COM 4 RS485-	COM 4 RS232_RX	RS42	RS422 Receive Negative		
11	4T/S+	COM 4 RS485+	COM 4 RS232_TX		RS422 Receive Positive		
12	GND	Shielding Layer	Ground		Shielding Layer		
13	PE	Ground Terminal					
14	PE	Ground Terminal					
15	V-	Power Input Negative					
16	V+	Power Input Positive					

Note:

When using the RS422 channel, RS422 channel 1 on the configuration software needs to be configured to COM 1, the indicator light is the indicator light of COM 1; RS422 channel 2 needs to be configured to COM 3, and the indicator light is the indicator light of COM 3.

2.4 RS232/RS422 Dial Setting

1. If the 4 serial ports needs to use RS485 communication, there is no need to adjust the gateway dialing code. The factory default is RS485 communication mode.

2. When the gateway device adopts the RS232 communication interface, the hardware dialing code is as follows: loosen the bolt at the arrow and remove

the gateway cover.



Turn the gateway CH1 and CH3 DIP switches to the ON position, and the serial port 1 and

3 to the RS232 mode.



3. When the gateway device adopts the RS422 communication interface, the hardware dialing code is as follows:



2.5 System Reset

RESET

The device has a system reset button RESET. When the user forgets the IP address of the device and port number and cannot connect to the gateway, the reset button can be triggered. The system parameters will be restored to the factory settings and the device will be restarted. The reset button can be clicked with a paper clip. All the indicators flash once to indicate that the reset was successful. The technical parameters of the gateway are as follows:

	Parameter Name	Default Value
Е	Protocol Converter IP	192.168.1.254
Т	Subnet Mask	255.255.255.0
H F	LAN Gateway IP	192.168.1.1
R	Configuration Port	1024
Ν	DHCP Enable	Not Enable
E T	DNS server address	114.114.114
	Serial Port Collection Mode	Straight
S	Serial Port Type	RS485
R	Serial Port Baud Rate	9600bps
А	Parity Bit	No check
L	Data bit	8 bit
Р 0	Stop bit	1 bit
R	Receive Character Interval	3.5t
Т	Slave Response Timeout	100ms
	Timeout Processing Mode	Data-hold
	Data collection time	100ms

2.6 Installation Dimensions



2.7 Software Interface

1 Open the software and the main interface as follow:

IOT g	ateway confi	guration software						— U	×
File	View	Tools							
Progect			→ ậ	About					Ŧ
						odot IOT	gateway configuration software		
				Company 2003, is sp automatio technical s Distribute Modules a	profile: Sichu ecialized in inc n and control services.Produc d I/O, Industria and related acc	an Odot Autom dustrial commu system design, ct family include al Switches, Inde essories for inc	nation System Co.,Ltd. was founded in inications product development, industrial high-tech enterprise integration and es: Protocol Converter, Intelligent ustrial Wireless, Serial servers, Embedded lustrial communication	od•	t
				Version:	V 1.0.19.1018	3			
Property			т п	Website:	http://www.o	odot.com.cn			
2 ↓	Search		×	Tel:	(86)400-1024	1-485			
			_	Message					
				CATEGORY	TIME	SOURCE	CONTENT		
				🔵 Info	2019/12/4 10:3	OdotConfiguation.	Initialization complete!		

2. It consists of a Project bar, a Property bar, an Output bar, and a Configuration Information bar. Create a Project and select Configuration Information in the Project bar and configure it in the Configuration Information bar.

IOT gateway configuration software			- 0	×
File View Tools				
Progect 💌 🖡	About MG-IOT01-PP	I × PPI_1		÷
▲ MG-IOT01-PPI	Ethernet Port			
Collection channel	Parameter name	Parameter value		
PPI 1	MAC Address 4	0:01:E5:05:05:9F		
- > Publish channel	IP Address 1	92.168.1.254		
	Net Mask 2	55.255.255.0		
	Net Gateway 1	92.168.1.1		
	Configure Port 1	1024		
	DHCP enable	Disable •		_
	DNS server IP address 1			
	Serial Port 1			
	Parameter name	Parameter value		
Property 👻 🖡	Serial Enable	General 🔹		
Search X	Serial type	RS485 -		
Channel name Collection channel	BaudRate	9600 bps 🔹		
Collection command 11	Data Bits	8 bits 🔹		
	Parity Bits	Even •		
	Stop Bits	1 Bit 👻		
	Char Pitch(t)	3.5t •		
	Timeout time(ms)	500		
	Work mode	Keep 🔹		
	Message interval time(m	ns) 500		-

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Web: www.odotautomation.com

3 How to Use the Gateway

3.1 Serial Port Side Collection Channel

Each serial port of the gateway has two working modes: General mode and Bridge mode.

In the General mode, the gateway serial port is directly connected to the PLC for data collection.



In Bridge mode, PLC data is collected without affecting HMI and PLC communication. The connection method is HMI and PLC respectively connected to the two serial ports of the gateway (serial port 1 and serial port 3 are one group, serial port 2 and serial port 4 are One group, serial port 1, 2 to HMI, serial port 3, 4 to PLC). The HMI data enters the gateway through the serial ports 1, 2, and enters the PLC from the serial ports of the gateways 3 and 4.

3.2 Ethernet Port Side Publish Channel

There are two modes for the network port side publish channel, Modbus TCP publish channel and MQTT publish channel.

1. Modbus TCP publish channel

The data area has 4K (bit) DO (Coil), DI (Discrete Input) area, and 1K

(Uint16_t) AO (Hold Register), and the AI (Input Register) area is used to store the acquired data. The user can associate the collection point with the corresponding Modbus data area and address through the configuration software. After the Modbus publish channel is configured, the gateway will set up the Modbus server and publish the collection point data to the corresponding Modbus data area. Users can access the Modbus server for data exchange. The Modbus server supports 5 client accesses simultaneously. 2 MQTT publish channel

MQTT is an IoT transport protocol designed for lightweight publish /subscribe message transmission and is used to provide reliable network services for IoT devices in low bandwidth and unstable network environments. The gateway is based on the standard MQTT3.1.1 protocol for secondary development, supporting Alibaba Cloud, Baidu Cloud, Tencent Cloud, Onenet and other cloud platforms and private cloud connections and provides data collection. The device supports subscription and publish of 10 themes at the same time, and can install up to 50 data points under each theme. It supports triggering and configurable periodic data distribution, and supports the publish of messages in binary pass-through and JOSN format.

Json data format: plain text

{

Data Format(publish/Subscribe)

```
"version" : "1.0",

"params" : {

    "name" : data,

    "name" : data,

    "name" : data,

},

"id" : 31359,

"method" : "thing.event.property.post"
```

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}		
Field	Description	Туре
version	Version number, fixed at 1.0	String
name	Collection point name	String
Data	Collecting point data	
ld	ID number, fixed at 31359	Int32
method	Attributes, "thing.event.property.post"	String

3.3 Configuring Software Usage

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1. Open the configuration software "Odot Configuration Software", click Tools -Searching, select the local network card, click Searching, it will scan the IOT gateway on the same network segment, click OK to generate the IOT project on the left side. If there are multiple IOT gateways on the same network segment, you can click the light button, and the corresponding ETH light of the IOT gateway will flash five times to distinguish multiple MG-IOT01 modules on the same network. This document is demonstrated using the PPI protocol of the S7-200. Other protocols use the same method.

IOT gateway configuration software File View Tools 1		×
Progect 🗸 🗸	About MG-IOT01-PPI × PPI_1	,
MG-IOT01-PPI	Ethernet Port	<u>^</u>
♦ Collection channel	Parameter name Parameter value	<u>^</u>
N Bublish shapped	MAC Address 40:01:E5:05:9F	
Publish channel	IP Address 192.168. 1.254	
6	Net Mask 255.255.255.0	
-	Net Gateway 192 168 1 1	
	Searching 2	- L X
	Network card: 以太例 2:Intel(R) 82579LM Gigabit Network Connection #2	192.168.1.100 -
Property 👻 🖟	version MAC IP Subnet mask	Gatwayt ip DNS server ip DNS s
Search ×	0.6 40:01:E5:05:06:A9 192.168. 1 .254 255.255.255.0 1	92.168.1.1 114.114.114.114 0.0
Channel name Collection channel	•	
Collection command 11		
Collection command 200		
		9
	State: Search has been completed	OK

🔼 Sea	arching						—	
Netw	ork card:	以太网 2	2:Intel(R) 82579LM G	igabit Network Connection	n #2 192.168.1.10	0 🔻		
mask	Gatwa	ayt ip	DNS server ip	DNS server ip(spare)	Enable DHCP	Lighting	Parame	ter Setting
255.0	192.168	. 1 . 1	114.114.114.114	0.0.0.0		Execute	Dov	wnload
•								Þ
				Searching	ок		Cance	el
State:	Search has	been cor	npleted					

2. Double-click "MG-IOT01-PPI" in the project bar and configure the network port and serial port parameters in "Ethernet Port" and "Serial Port" window on the right.

🖲 IOT gateway configur	ration software				-	□ ×
File View	Tools					
Progect		- ‡	About MG-IOT01-PPI	× PPI_1		-
MG-IOT01-PPI			Ethernet Port			
Collection chai	▲ Collection channel		Parameter name	Parameter value		^
PPI 1			MAC Address 4	0:01:E5:05:05:9	F	
			IP Address 19	92.168. 1.254		
Publish channe	el		Net Mask 2	55.255.255.0		
			Net Gateway 19	92.168.1.1		
			Configure Port 1	024		
			DHCP enable D	isable 🔹		
			DNS server IP address 1	14.114.114.114		-
			Serial Port 1			
			Parameter name	Parameter value		-
Property		~ û	Serial Enable	General 🔹		
≩↓ Search		×	Serial type	RS485 -		
IP	192.168.1.254		BaudRate	9600 bps 🔹		
Remarks			Data Bits	8 bits 🔹		
Device type	MG-IOT01-PPI	_	Parity Bits	Even 🔻		
Communication port	1024		Stop Bits	1 Bit 🔹		
			Char Pitch(t)	3.5t 🔻		
			Timeout time(ms)	500		
			Work mode	Keen v		
			Mossage interval time/m	c) roo		
				5/ 500		
			Message			- 1

The main parameters have the following meanings:

IP address:

Gateway IP, the gateway creates the Modbus TCP server IP, the user

accesses this IP, port 502, and logs in to the Modbus TCP server.

Serial port working mode:

Used to set the collection mode of the serial port of the gateway.

Disable:

Do not use this serial port.

"General mode":

Directly connected to the PLC for data collection.

"Bridge mode":

In this mode, two serial ports are a group, (1, 3 serial ports are a group or 2, 4 serial ports are a group). One serial port is connected to the HMI, and one serial port is connected to the PLC. In this mode, data collection can be performed using intermittent time without affecting the HMI to PLC

Baud rate:

Serial port baud rate, the range is 2400 – 115200bps, the default is 9600bps. Please set this parameter to be the same as the device connected to the serial port.

Check Digit:

No Parity, Odd Parity, Even Parity optional. No parity by default. Please set this parameter to be the same as the device connected to the serial port.

Stop bit:

1 and 2 stop bits are optional. The default is 1 stop bit. Please set this parameter to be consistent with the device connected to this serial port.

Char Pitch (t):

The time from after confirming the end of the received message and before the new serial port data received is considered that one frame of the message ends. 1.5t – 200t optional, default 3.5t (t is the time for single character transmission, related to baud rate). In general, you do not need to change this parameter.

Overtime time:

After the gateway sends a frame of the message, it waits for the reply message. If the message is not received at this time, the communication is timed out. This communication fails. Do not set the time to be too short, especially in three-way mode, otherwise communication may fail.

Message Interval Time (ms):

The cycle time of gateway collecting from the PLC, after one communication, the interval time (the delay of receiving the slave response message to the next command), 0ms-65535ms optional, the default is 100ms, it is recommended to set 100ms to prevent communication failure because of slow response of the connected device. In the three-way mode (bridge mode), it can be lengthened appropriately, and if too short it will affect the response of the HMI.

Work Mode:

If the slave responds over time when read data from PLC, the timeout data processing mode can select "data clear" or "data hold". The default is "data hold" mode. This parameter is only valid for the Modbus read command. Please set this value according to actual needs.

3. Right click on the "Collection Channel" in the project bar and select Add Siemens 200 (PPI) protocol. There will be an extra "PPI_1" below the Collection channel.

IOT gateway configuration software			- 0
File View Tools			
Progect - # Abou	ut MG-IOT01-PPI	PPI_1 ×	
▲ MG-IOT01-PPI	lection channel cor	nfig 🖊 Collection	point config
Collection channel	emens PPI		
Add	collection channel >	Siemens PPI	
v Publish channel	Channel Name PPI_1		
	Port Name Serial	Port 1 💌	
	Protocol PPI	*	
E	encode mode RTU	*	
	Slave ID 2		
Property ▼ 0 Stand L Search X Channel name Collection channel Collection command 11 Collection command 200			
Mess	sage		
1103	TIME	SOURCE	CONTENT
CAT	EGORT TIME		
	Info 2019/12/4 14	1:1 Collection channel	Collection channel
	Info 2019/12/4 14 Info 2019/12/4 14	2 OdotConfiguation.	Collection channel Imported:C\User\My\Desktop\\0T01配置\ppijjp
	Info 2019/12/4 14 Info 2019/12/4 14 Info 2019/12/4 14	Collection channel Collection channel Collection channel	Collection channel Imported:C\User\My\Desktop\OT01配置\ppiJjp Collection channel

Double-click PPI_1, and the Collection channel config window pops up on the right. In the Collection channel config window, set the serial port to confirm which serial port to collect and the Slave ID.

🐻 IOT gateway configur	ation software				-	×
File View	Tools					
Progect	▲ İİ	About MG-IOT	01-PPI PPI_1	x		Ŧ
▲ MG-IOT01-PPI		Collection chann	el config 🖊 C	ollection point config		
Collection char	nnel	Siemens PPI				
PPI 1		Parameter name	Parameter value	e		^
Dublish shares	1	Channel Name	PPI_1			
Publish channe	1	Port Name	Serial Port 1 🔹	,		
		Protocol	PPI -	7		
		Eencode mode	RTU -	r		
		Slave ID	2			-
Property	~ ↓					
	×					
Command amount	11					
Channel description	Siemens PPI Protocol					
Channel type	Siemens PPI					
		Message				▼ ậ

Click "Collection Points Config" and add: read or write commands in the "Add Collection Points" column. Then configure the collection point information in the parameter bar, such as: Register Area, Start address, PLC data type, etc.

MQTT × Abo	out MG-IOT01-PPI	PPI_1	× Modbus	TCP Message	÷
Collection chan	nel config <mark>/</mark> Collect	ion poiı	nt config		
Collection point				Parameter	
Command name	Collection point name	Delete	Сору	Parameter name	Parameter value
PPI read	Q0.1	Delete	Copy&Paste	Collection Point Name	Q0.1
PPI read	Q0.2	Delete	Copy&Paste	Read Or Write	Read 👻
PPI road	00.2	Delete	ConvigiDanta	Function code	PPI READ 👻
Frifedu	Q0.3	Delete	CopyaPaste	Register Area	Q area 🔻
PPI write	M0.0	Delete	Copy&Paste	Star address	0
PPI read	MW2	Delete	Copy&Paste	Data Offset Bits	1
PPI read	VW0	Delete	Copy&Paste	PLC data type	Bool 🔹
	14/00 0			Enable trigger mode	Enable 🔻
PPI write	WQ0.0	Delete	Copy&Paste	Calculation	No 🔻
PPI write	WQ0.1	Delete	Copy&Paste	Base	0
PPI write	WQ0.2	Delete	Copy&Paste	Multiple rate	0
PPI write	WQ0.3	Delete	Copy&Paste	Store data type sort	Default 🔹
L	_			Automatic publish	
			-	Automatic publish:	Disable To modbusTCP server
Add collection poi	nt			Data area:	4XXXX *
Command name	Operation			Star address:	0
PPI read	Add		<u></u>	Address interval:	1
PPI write	Add			Quick publish:	Publish All to modbusTCP server
4					•

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The main parameters are as follows:

Register Area: Which area the data point belongs to, such as Q, M, V, etc. of PPI

Start Address: The offset address of the area where the data point is located. **Data Offset Bits:** If in the selected register it is 1 address stores 1 word data (16 bits) and the PLC data type is Bool type. This parameter, together with the Start address, can determine which bit to be read in the 1 word data. If the register 1 address stores 1 bit, this parameter does not need to be configured, the default is 0.

PLC Data Type: Determine the data type and length of a data point read from PLC.

Enable trigger mode:

Enable: send a command to the PLC when data changes

Disable: Write command send to PLC in loop.

Data change mode:

Enable: Write command sends a command to PLC when data is changed.

Disabled: Write commands send a command to PLC cyclically.

Calculation processing:

None: no operation; multiplication/division: calculated value = cardinality +

magnification (*, /) collection value

Base: Same as above

Multiple rate: Same as above

Store data type sort: Default little endian, and other types are optional.

Storage type: The data type of the collected data storage. For example, if the PLC data type is int and the storage type float, the data will be type converted.

4. In the "Project" on the left, right-click the publish channel and select the publish channel to be added. There are 2 options, Modbus TCP channel and MQTT channel.

(1) Modbus TCP channel configuration

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When you choose to publish to the MODBUS TCP channel, you can click on Automatic Publish to publish the collection point to an address area of Modbus. If the user wants to publish to different data areas, you can manually configure the publish point.

🐔 IOT gateway configuration software						—	\times
File View Tools							
Progect 👻 🖡	MQTT	About MG-IOT01-I	PPI PP	1_1 × Mo	odbus TCP Message		Ŧ
▲ MG-IOT01-PPI	Collection c	hannel config <mark>/</mark> Col	lection	point config			!
 Collection channel 	ection point				Parameter		
PPI 1	mmand name	Collection point name	Delete	Сору	Parameter name	Parameter value	
 Publish channel 	PPI read	Q0.1	Delete	Copy&Paste	Collection Point Name	Q0.1	
Modbus TCP	PPI read	Q0.2	Delete	Copy&Paste	Read Or Write	Read *	
MOTT	PPI read	Q0.3	Delete	Copy&Paste	Function code	PPI READ 🔻	
Mart	DDI write	MO.O	Delete	ComuSiDoato	Register Area	Q area 🔹	
	PPI write	NO.0	Delete	Copyoraste	Star address	0	
	PPI read	MW2	Delete	Copy&Paste	Data Offset Bits	1	
	PPI read	VW0	Delete	Copy&Paste	PLC data type	Bool *	
Property 👻 🏨	PPI write	WQ0.0	Delete	Copy&Paste	Calculation	Enable *	_
Search X	PPI write	WQ0.1	Delete	Copy&Paste	Automatic publich		
Command amount 11	PPI write	WQ0.2	Delete	Copy&Paste	Automatic publish	Enable To modbusTCP server	
Channel description Siemens PPI Protocol Channel type Siemens PPI	DDI umite	W00.3	Delete	Comer Rillorate	Data area:	4XXXX *	
	PPI write	WQ0.3	Delete	CopyorPaste	Star address:	0	
					Address interval:	1	
	collection poi				Quick publish:	Publish All to modbusTCP server	
	mmand name	Operation			· `		
	PPI read	Add		A			
	PPI write	Add					
	4						

Selects the Modbus TCP channel as publish channel manually. Double-click on the right side to configure the publish channel parameters, such as Modbus port, Watchdog and other parameters.

🐻 IOT gateway configur	ration software												×
File View	Tools												
Progect		- 	About	MG-IOT	01-PPI	PPI_1	M	Nodbus TCP	×				Ŧ
▲ MG-IOT01-PPI		Î	Publish cr	lanner	contig	Publis	sh poin	t config					
Collection char	nnel		ModbusT	CP Serv	ver Para	meters							
PPI 1			Paramete	r name	Parame	ter value							
-	ما		Por	t	502								
			Watchdog	, Enable	Disable	-							
Modbus ICP		Ţ	Watchdog	Time(s)	30								
Property		~ ù											
A Search		×											
Command amount	11												
Channel description	Modbus TCP						_	_	_	_	_	_	_
Channel type	Modbus TCP		Message										- ‡
			CATEGORY	TIME	·	SOURCE		CONTENT					
			🔵 Info	2019/	/12/4 14:5	OdotConfi	iguation.	Progress:70	96	_			-
													•

Click "Publish Point config" and select Add in the "Add publish point" column. Configure the Point Name, Register Area, and Start address in the

Add.: No.6 Hongsheng Road, Hi-Tech District, Mianyang, Sichuan, China.

"Parameter" column. Then select the Collection channel in the relation column, Collect point, click the associated point, and complete the relation of the published data. As shown below:

IOT gateway configuration software								-	- 0	×
File View Tools										
Progect 💌 🎗	MQTT About	MG-I	ОТО1-РРІ РР	Ľ1	Modbus TCP	X Message				Ŧ
▲ MG-IOT01-PPI	Publish channel co	onfig <mark>/</mark> P	ublish point	con	fig					
 Collection channel 	Publish point						Parameter			
PPI_1	Publish point name	Data area	Star address	_	Collection channel	Collection point	Parameter name	Parameter value		
Publish channel	RPoint 1	0	0	<>	PPI_1	Q0.0	Point Name	RPoint 1	2	_
Modbus TCP	RPoint 2	4	1	<>	PPI_1	Q0.1	Register Area	0XXXX +		
MQTT	RPoint 3	4	2	<>	PPI_1	Q0.2	Star address	0		
	RPoint 4	4	3	<>	PPI_1	Q0.3				
	RPoint 5	4	4	<>	PPI_1	WQ0.0				
	RPoint 6	4	5	<>	PPI_1	WQ0.1				
Property 👻 🎚	RPoint 7	4	6	<>	PPI_1	WQ0.2				
E 2↓ Search ×	4					Þ				
Command amount 22	Add publish point									
Channel description Modbus TCP Channel type Modbus TCP	Command name O	peration								
	Read/Write	Add	1							
							Relation			
							Collection chann	nel: PPI_1 🔻		
							Collection point	PPI read Q0.0 🔻	8	
							Relation: Relation	on		

(2) MQTT channel configuration

Select MQTT channel as publish channel, and configure publish channel parameters on the right side, including Server parameter, Device parameter, and Communication parameter.

IOT gateway configuration soft	ware			- 0	×
File View Tools					
Progect 🝷 🏾	MQTT × About	MG-IOT01-	PPI PPI_1	Modbus TCP	=
 MG-IOT01-PPI Collection channel 	Publish channel co Server parameter	onfig / Publis	sh point config		1
PPI 1	Parameter name	Parameter valu	e		
✓ Publish channel	Port	502			-
Modbus TCP	TLS enable	Disable	, ,		-
MQTT	Server domain name	ServerHostName			-
	Server IP	0.0.0.0			-
	Device parameter				
	Parameter name	Parameter value			
Property 4	Device name	DeviceName			_
Command amount 0	Password I	Password			_
Channel description MQTT	Client ID (ClientID			-
Channel type MQTT	Communication p	arameter			
	Parameter name	e Parameter	value		
	Session Sign	Hold	•		
	Requst timeout time	e(ms) 1000			
	Keep alive time(m	is) 3000			
	Message				→ ņ

MQTT sever parameter

Parameter Name	Parameter Description
Port	Server remote port
Connection Mode	Connection method (IP address: IP address
	connection / domain name: domain name connection)
TLS enable	Encryption enable (currently encryption is not
	supported)
Server Domain	Server domain name (Connection by IP, can be
Name	ignored)
Server IP	Server IP (connected via domain name, can be
	ignored)

Device Parameter

Parameter Name	Parameter Description
Device name	Corresponding to the user name in the MQTT, the
	name of the connected user is used for authentication.
	The username must be less than 128 characters.
Password	Corresponding to the password in the MQTT, the
	password of the connected user can be used for
	authentication. The password must be less than 128
	characters.
	Corresponding to the client identifier (Client ID) in the
Client ID	MQTT, the unique identifier of the client to the server. It
	must be unique in the search for a client connected to
	a server and is the key in handling the message IDs for
	QoS level 1 and 2.

Communication Parameter

Parameter Name	Parameter Description										
	Corresponding to Clean Session in MQTT.										
Session sign	Hold: Maintains the previous session. After the										
	network is disconnected, the previous session										
	ormation is restored. The client and server need to										
	have a related session persistence mechanism.										
	Clear: Clears the previous session. Each time it is a										
	new session. The session only lasts as long as the										
	network connection.										
Request timeout time	MQTT request timeout (ms)										
Keep-alive time	MQTT Keep-alive Time(ms)										

Click Publish point config, and select the command to add (MQTT subscribe, MQTT publish) in the "Add publish point" column. Configure the publishing point Topic Name, QoS level, Send mode, Delay time, and data

format in the Parameter column. Then select the collection channel in the relation column, Collection point, click "Relation" or "Relation all" to complete the relation of the publish data.

IOT gateway configuration softwar	e							- 🗆 X
File View Tools								
Progect 👻 🖡	MQTT × Abo	out MG-IOT01-PP	1 PPI_1	Modbu	s TCP Message			:
▲ MG-IOT01-PPI	Publish channel	config / Publish	point con	fig				
Collection channel	Publish point		_		Parameter		Relation collection p	oint
PPI 1	Command name	Publish point name	Operation	Сору	Parameter name	Parameter value	 Collection channel 	Command na
▲ Publish channel	MQTT publish	TopicName 1	Delete	Copy&Paste	Topic Name	TopicName 1		
Modbus TCD	MQTT publish	TopicName 2	Delete	Copy&Paste	Qos	0 -		
	MOTT publish	TonicName 3	Delete	Conv&Paste	Send mode	Trigger 🔹		
MQTT	MQTT publish	ropicitume 5	Delete	copyceraste	Delay time(ms)	0		
					Data format	Binary 🔻		
Property 💌 🖡								
Search X								
Command amount 3 Channel description MOTT								
Channel type MQTT							Relation	
	Add publish point							
	Command name Operation						Collection channe	I: PPI_1 *
	MQTT Subscribe	Add					Collection point:	PPI read Q0.0 *
	MOTT publish	Add					Relation: Relation	Relation all
					•	Þ	×	
	4							

MQTT publish parameters

Parameter Name	Parameter Description
Topic Name	The name that needs to be published to the topic
Qos level	MQTT message level, currently only supports 0,1
Send mode	Message push method, Trigger: Triggered release
	Cycle: Periodic release
Delay time	The cycle time of publish, this can be ignored if the
	Send mode is Trigger
Data format	Published message format, Binary: binary, JSON

🖪 IOT gateway configuration software							- 0	×
File View Tools								
Progect • ‡	MQTT × Abo	ut MG-IOT01-PF	PPI_1	Modbu	s TCP Message			Ŧ
▲ MG-IOT01-PPI	Publish channel	config / Publish	point con	fig				
Collection channel	Publish point				Parameter		Relation collection point	
PPI 1	Command name	Publish point name	Operation	Сору	Parameter name	Parameter value	Collection channel Command n	ame
(Publish shapped	MQTT publish	TopicName 1	Delete	Copy&Paste	Topic Name	TopicName 4		
	MQTT publish	TopicName 2	Delete	Copy&Paste	Qos	0 .		
Modbus TCP					Data format	Binary •		
MQTT	MQTT publish	TopicName 3	Delete	Copy&Paste			3	
	MQTT Subscribe	TopicName 4	Delete	Copy&Paste				
Property 👻 🎵								
Search ×								
Command amount 4								
Channel description MQTT Channel type MOTT							Deletier	
	Add publish point						Relation	-
	Command name			Collection channel: PPI_1 -				
	NOTT Subscribe			Collection point: PPI read Q0.0	-			
	MQ11 Subscribe	Add						51
	MQTT publish	Add			•	•	Relation: Relation Relation a	1

MQTT Subscribe Parameters:

Parameter Name	Parameter Description
Topic Name	The name that needs to be published to the topic
Qos level	MQTT message level, currently only supports 0,1
Data format	Published message format, Binary: binary, JSON

5. Download, Upload, Import, Export Configuration

After all the collection points and publishing points are configured, right-click MG-IOT01-PPI, and you can choose to download and configure to the gateway. You can also choose to upload, import, and export configurations. When uploading and importing a configuration, you need to create an MG-IOT project first. If the download fails, please check if the computer IP address and the gateway IP address are on the same network segment, and check if the gateway IP address is set correctly. If you forget the gateway IP address, you can reset the gateway by reset button to the factory default IP address.

Note: When downloading and uploading, make sure that the computer and the gateway are on the same network segment.

🖪 IOT gateway configurati	ion softwa	re		1996 - 1997 - 1		~						_		×
File View To														
File view To	oois						_							
Progect	- ↓	MQTT	Abo	out MG-IOT01-PPI	PPI_1	× Modbu	ıs T(CP Message						=
▲ MG-IOT01-PPI	Up	load	on chan	nel config / Collect	ion poli	nt config						_	_	_
Collection chann	ie Do	wnlaod	point					Parameter						
PPI 1	5.0	windou	ıd name	Collection point name	Delete	Сору		Parameter name	Paran	neter val	ue			
Dublish shares	EXP	ort	ead	Q0.0	Delete	Copy&Paste		Collection Point Name	Q0.0					
Publish channel	Im	port	bead	00.1	Delete	Conv&Parte		Read Or Write	Read		*			
Modbus TCP	De	lete	euu	40.1	Delete	copyceraste		Function code	PPI RE	AD	·			
MQTT		PPI	read	Q0.2	Delete	Copy&Paste		Register Area	Q area	а	-			
	PPI read				Delete	Copy&Paste		Star address	0					
		PPI	write	M0.0	Delete	Copy&Paste		Data Offset Bits	0					
Property	- û	DDI	rand	MI\A/2	Delete	Conv?:Docto		PLC data type	Bool		•			
Search	×	PPI	read	101002	Delete	CopyorPaste		Enable trigger mode	Enable	e	•			
IP 1	92.168.1.;	PPI	read	VW0	Delete	Copy&Paste		Calculation	No		•			
Remarks		PPI	write	WQ0.0	Delete	Copy&Paste		Automatic publish						
Device type N	/IG-IOT0	DDL	urita	W00 1	Delete	ComultiDeste	Ļ	Automatic publish:	Disable	• To	modbusTCP serve	r		
Communication port 1	024	PPI	write	WQ0.1	Delete	CopyorPaste		Data area:	4XXXX	-				
Add collection point								Star address:	D					
Command name Operation								Address interval:	1					
		PPI	read	Add				Quick publish:	Publi	sh All	to modbusTCP serv	er		
		4												

3.4 IP Address Modification

First, power the gateway 24VDC, connect the network cable to the gateway and the computer, and change the IP address of the computer's local network card to the 192.168.1.* network segment.

PJrid 共享 第規 違療时便用: 第規 企園table PCIe FE Family Controller 配置(C) 配置(C) DL塗接使用下列项目(O): Microsoft 网络客户簿 Guide Consort 网络的文件和打印机共享 Guide Consort 网络的文件和打印机共享 Guide Consort 网络短短龍拳 S路传送器协议 Consort 网络短龍龍拳 S路传送器协议 Microsoft 网络适配器参路传送器协议 Microsoft 网络适配器参路传送器协议 Microsoft 网络适配器参路传送器协议 Microsoft DID protocol (DCP/LLDP) Microsoft ILDP 协议驱动理序 SIMATIC Industrial Ethernet (ISO) Guterbölt T/Jampin DNS 服务器他址(B) 使用下面的 DNS 服务器地址(E): 首选 DNS 服务器他址(E): 首选 DNS 服务器他址(E): 首选 DNS 服务器他址(B) Microsoft Junernet 协议, 该协议是默认的广域网络协议, 用 Texterbölt T/Tampin 		Internet 协议版本 4 (TCP/IPv4) 属性
Liberter (J) L	⁷⁹⁹⁸ 天皇 连接时使用: Realtek PCIe FE Family Controller	常规 如果网络支持此功能,则可以获取自动指派的 IP 设置。否则,你需要从网 络系统管理员处获得适当的 IP 设置。
	此连接使用下列项目(O): ✓	 ● 自动获得 IP 地址(O) ● 使用下面的 IP 地址(S): IP 地址(I): 192.168.1.50 子闷掩码(U): 255.255.255.0 默认网关(D): ・・ ● 使用下面的 DNS 服务器地址(B) ● 使用下面的 DNS 服务器地址(E): 首选 DNS 服务器(P): ・・ ・・ 御用 DNS 服务器(A): ・・

Then open the configuration software, click Tools-Searching for devices, select the local network card, click Searching, it will scan to the IOT gateway of the same network segment, click OK to create an IOT project on the left.

📧 IOT gateway configuration software					_		
File View Tools 🚺							
Progect	🔻 🖡 🛛 About	MG-IOT01-PF	PI × PPI_1			,	
▲ MG-IOT01-PPI	Ethe	ernet Port				^	
Collection channel	Pa	arameter name	Parameter value			^	
Publish channel		MAC Address	40:01:E5:05:05:9F				
v rubiish channer		IP Address	192.168.1.254				
6		Net Mask 2	255.255.255.0				
		Net Gateway	192 168 1 1				
	Sea	arching 2		3		- ·	
	Notw	ork card: 以太网 2:lr	ntel(R) 82579I M Gigabit Ne	etwork Connection #	±2 192.168.1.100 ▼	· •	
		-20200-1	includy of the signature of good in the	ction connection .	2	-	
Property	🗢 🏚 version	MAC	IP	Subnet mask	Gatwayt ip	DNS server i	ip DNS s
Property 	↓ ↓ version ×).6	MAC 40 : 01 : E5 : 05 : 06	IP 5 : A9 192.168. 1 .254	Subnet mask 255.255.255.0	Gatwayt ip 192.168.1.1	DNS server 114.114.	ip DNS s 114 0.0
Property 	version	MAC 40 : 01 : E5 : 05 : 00	IP 5 : A9 192.168.1.254	Subnet mask 255.255.255.0	Gatwayt ip 192.168.1.1	DNS server 114.114.	ip DNS s 114 0 . 0
Property	version	MAC 40:01:E5:05:06	IP 5 : A9 192.168. 1 .254	Subnet mask 255.255.255.0	Gatwayt ip 192.168.1.1	DNS server 114.114.114.	ip DNS s 114 0 . 0
Property Image: Search Channel name Collection chan Collection command 11 Collection command	version	MAC 40 : 01 : E5 : 05 : 06	IP 5 : A9 192.168. 1 .254	Subnet mask 255.255.255.0	Gatwayt ip 192.168.1.1	DNS server 114.114.114.	ip DNS so 114 0 . 0
Property Image: Search Channel name Collection command Collection command 11 Collection command	• a version	MAC	IP 5 : A9 192.168. 1 .254	Subnet mask 255.255.255.0	Gatwayt ip 192.168.1.1	DNS server 1	ip DNS so 114 0 . 0
Property Image: Search Channel name Collection command Collection command 11 Collection command	version .6 innel	MAC	IP 5 : A9 192.168. 1 .254	Subnet mask 255.255.255.0	Gatwayt ip 192.168.1.1	DNS server 1	ip DNS s 114 0 . 0
Property Image: Search Channel name Collection cha Collection command 11 Collection command 200	 a version b.6 annel 	MAC	IP 5 : A9 192.168. 1 .254	Subnet mask 255.255.255.0	Gatwayt ip 192.168.1.1	DNS server i 114.114.114.	ip DNS s 114 0 . 0
Property Image: Search Channel name Collection cha Collection command 11 Collection command 200	 a version b.6 innel 	MAC 40:01:E5:05:06	IP 5 : A9 192.168. 1 .254	Subnet mask 255.255.255.0	Gatwayt ip 192.168. 1 . 1	DNS server	ip DNS s 114 0 . 0
Property E 2↓ Search Channel name Collection cha Collection command 11 Collection command 200	version v.6 nnel	MAC 40:01:E5:05:00	IP 5 : A9 192.168. 1 .254	Subnet mask 255.255.255.0 Searching	Gatwayt ip 192.168. 1 . 1	DNS server 114.114.114.	ip DNS s 114 0 . 0

Modify the gateway IP address as: 192.168.10.12 (cross-segment), and change the LAN gateway IP to: 192.168.10.1. After the modification is Add.: No.6 Hongsheng Road, Hi-Tech District, Mianyang, Sichuan, China. Web: www.odotautomation.com

completed, right-click MG-IOT01-PPI and click the download parameter directly. You will see Download success in the lower right corner.

🖪 IOT gateway configur	ration software									×
File View	Tools									
Progect		– ‡	About N	IG-IOT01-PPI	×					Ŧ
▲ MG-IOT01-PPI	MG-IOT01-PPI									
Collection cha	nnel		Parameter	Parameter name Parameter value						<u>^</u>
Dublish shares	-1		MAC Add	dress 40	0:01	: E5 : 05 : 06 : A9				
Publish channe	91		IP Addr	IP Address 192.168.10.12						_
			Net Ma	ask 25	55.25	55.255.0				
			Net Gate	eway <mark>1</mark> 9	92.16	58.10.1				
			Configure Port		024					
			DHCP en	nable D	Disable 🔹					
			DNS server IP address 114.114.114.114							-
Property		– ù	Serial Port 1							
		×	Schurroren				_	_		-
IP	192.168.1.254		Message							– ą
Remarks			CATEGORY	TIME		SOURCE	CONTENT			-
Device type	MG-IOT01-PPI		🔵 Info	2019/12/5 1	13:3	OdotConfiguation.	Progress:94%			
Communication port	1024		🔵 Info	2019/12/5 1	13:3	OdotConfiguation.	Progress:96%			
			🔵 Info	2019/12/5 1	13:3	OdotConfiguation.	Progress:98%			
			🔵 Info	2019/12/5 1	13:3	OdotConfiguation.	Progress:100%			
IP			🔵 Info	2019/12/5 1	2/5 13:3 [.] OdotConfiguation. Download success					
										\rightarrow

After the IP address is successfully changed, you need to change the local computer's IP address to: 192.168.10. * Network segment.

	×	↓ Internet 协议版本 4 (TCP/IPv4) 犀	4
网络共享			-
连接时使用:			
🚽 Realtek PCIe FE Family Controller		如果网络文持此切能,则可以获取 络系统管理员处获得适当的 IP 设	(日动指派的 IP 设直。 谷则, 你需要从网 置。
配置(C	C)		
此连接使用下列项目(O):		○ 日初获得 IP 地址(O)	
☑ 4 Microsoft 网络客户端	^	使用下面的 IP 地址(S):	
☑ ৢ Microsoft 网络的文件和打印机共享		IP 地址(I):	192.168.10.50
🗹 🕎 QoS 数据包计划程序			
☑ _ Internet 协议版本 4 (TCP/IPv4)		子网掩码(U):	255.255.255.0
□ _ Microsoft 网络适配器多路传送器协议		默认网关(D):	· · ·
PROFINET IO protocol (DCP/LLDP)			
Imicrosoft LLDP (//txika)/(±)→ Imicrosoft LLDP (//txika)/(±)→ Imicrosoft LLDP (//txika)/(±)→ Imicrosoft LLDP (//txika)/(±)→ Imicrosoft LLDP (//txika)/(±)→	~	○ 自动获得 DNS 服务器地址(B	3)
<	>	▲ 使用下面的 DNS 服务器地址	+(F)
安装(N) (卸載(U)) 庫性(R)	0		
	·	首选 DNS 服务器(P):	• • •
一捆还 传输控制协议/Internet 协议。该协议是默认的广域网络协议	义,用	备用 DNS 服务器(A):	
于在不同的相互连接的网络上通信。		□ 退出时验证设置(L)	高级(M)
			高级(V)

Add.: No.6 Hongsheng Road, Hi-Tech District, Mianyang, Sichuan, China.

On the configuration software, change the IP address of the configuration parameters: 192.168.10.12, right-click MG-IOT01-PPI and click Upload. After the upload is successful, you can see that the upload is successful in the right lower corner. Complete the modification of the gateway IP address.

🖪 IOT gateway configuration software						– – ×
File View Tools						
Progect	🝷 🃮 🗛 Abo	out	MG-IOT01-P	$_{\rm PI}$ $ imes$		
MG-IOT01-PPI		Paramete	er name	Pa	rameter value	
A Collection channel	Upload	id Ad	dress	40:01	I:E5:05:05:9F	
	Downl	laod dd	lress	192.1	68.10.12	
Publish channel	Export	t M	lask	255.2	55.255.0	
	Import	iat	teway	192.1	68.10.1	
	Delete	ur jur	re Port	1024		
	Delete	e encel e	nable	Disab	le 🔹	
	D	NS server	IP address	114.1	14.114.114	-
	S	erial Port	1			
Property	• 	D				
Search	×	Parame	eter name		aramatar (sina	
IP 192,168,10,12	Me	essage				*
Remarks	CA	ATEGORY	TIME		SUURCE	CONTENT
Device type MG-IOT01-PPI		Info	2019/12/5	5 14:1	OdotConfiguation.	. Progress:40%
Communication port 1024	•	Info	2019/12/5	5 14:1	OdotConfiguation.	. Progress:50%
	•	Info	2019/12/5	5 14:1	OdotConfiguation.	. Progress:70%
	•	Info	2019/12/5	5 14:1	OdotConfiguation.	. Progress:90%
		Info	2019/12/5	5 14:1	OdotConfiguation.	. Upload success,on parsing
		Info	2019/12/5	5 14:1	OdotConfiguation.	. Success

4 Test Application for Collecting SIEMENS S7-200/200 Smart PLC Data

4.1 Implementing PPI Protocol to Modbus TCP Data Exchange

4.1.1 Smart 200 PLC Configuration

Power on the Smart 200 PLC, connect pin 3 of the RS485 serial port to the gateway serial port 1T/S+, and pin 8 to the gateway serial port 1R/S-. Serial

Add.: No.6 Hongsheng Road, Hi-Tech District, Mianyang, Sichuan, China. Web: www.odotautomation.com

port parameters: ID = 2,9600, E81.

										- 0	×í
文件 编辑 视图	PL	.c 调试 .	IŖ #	勁						i	0
○ 2 打开 3 号入 - 3 号入 - 3 号入 - 3 号入 - 3 号八 - 3 S =			系统均	模块	版本	输入	输出	订货号	×		
***** ・*******************************	× -	TIA 1.200	11 CPU	CPU ST30 (DC/DC/DC)	V02.04.01_00.00	10.0	Q0.0	6ES7 288-1ST 30-0AA0			
操作		传送	SB						_		
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			EM 1							HHO I ME LEE	
E-IN test (C:\Lisers\Public\Docum: o		MAIN X	SDI EM 2				_				V
		程序注释	EM 3						-		<u>^</u>
- 🚍 CPU ST30	1	程序段注释	EM 4				_		-		
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The test programming interface is as follows: After editing, save and download.

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Put the PLC in RUN.

4.1.2 MG-IOT01 Configuration

Open the configuration software, click Tools-Searching for devices, select the local network card, click Searching for devices, it will scan to the IOT gateway of the same network segment, click OK to create an IOT project on the left. The IP address uses the default IP address: 192.168.1.254. The PLC is
connected to serial port 1. Set the parameters of serial port 1 to General, RS485 / 9600, even / 8/1, and other parameters default.

IOT gateway configuration software			
File View Tools			
Progect 👻 🖡	About MG-IOT01-PP	I X	
MG-IOT01-PPI	Ethernet Port		
 Collection channel 	Parameter name	Parameter value	
DDI 1	MAC Address 4	0 : 01 : E5 : 05 : 05 : 9F	
	IP Address 1	92.168.1.254	
Publish channel	Net Mask 2	55.255.255.0	
	Net Gateway 1	92.168.1.1	
	Configure Port 1	1024	
	DHCP enable	Disable 🔹	
	DNS server IP address 1	14.114.114.114	
	Serial Port 1		
	Parameter name	Parameter value	
	Serial Enable	General 🔹	
	Serial type	RS485 -	
Property 👻 🖡	BaudRate	9600 bps 🔹	
Search X	Data Bits	8 bits 🔻	
Channel name Collection channel	Parity Bits	Even 🔻	
Collection command 11	Stop Bits	1 Bit 🔻	
Collection command 200	Char Pitch(t)	3.5t 🔻	
	Timeout time(ms)	500	
	Work mode	Keep 🔹	
	Message interval time(m	ns) 500	
	Maaaaa		

Configure the collection channel parameters as shown below:

Select Serial Port 1 for the collection channel serial port and fill in 2 for the slave ID.

od•t	Sichuan	Odot Au	tomation	System	Co., Ltd
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🖸 IOT gateway configuration software						\times
File View Tools						
Progect • 1	About MG-IO	T01-PPI	PPI_1 ×			,
▲ MG-IOT01-PPI	Collection chan	nel confi	g 🖊 Collectio	n point config		
▲ Collection channel	Siemens PPI					^
	Parameter name	Paramet	ter value			
PPI_1	Channel Name	PPI_1				-
Publish channel	Port Name	Serial Po	rt 1 🔻			-
	Protocol	PPI	.			-
	Eencode mode	RTU	.			-
	Slave ID	2				-
Property T	-					-
Command amount 11 Channel description Siemens PPI Protocol						
Channel type Siemens PPI	Message					– ņ
	CATEGORY TIM	E	SOURCE	CONTENT		
	Info 201	9/12/5 14:2	OdotConfiguation	Initialization complete!		
	Info 201	9/12/5 14:2	Main	Build device: MG-IOT01-PPI Name: MG-IOT01-PPI		
	Info 201	9/12/5 14:2	OdotConfiguation	. Imported:C:\Users\My\Desktop\IOT01配置\ppi.ljp		

Configure the collection point and click Publish to area 4.

IOT gateway configuration software							– 🗆 X
File View Tools							
Progect 💌 ‡	About PPI_1	× MG-IOT01-PPI					:
▲ MG-IOT01-PPI	Collection chan	nel config <mark>/</mark> Collect	ion poi	nt config			
 Collection channel 	Collection point				Parameter		
PPI 1	Command name	Collection point name	Delete	Сору	Parameter name	Parameter v	/alue
Publish channel	PPi read	Q0.0	Delete	Copy&Paste	Collection Point Name	Q0.0	
	PPI read	Q0.1	Delete	Copy&Paste	Read Or Write	Read	Ŧ
	PPI read	00.2	Delete	Conv&Paste	Function code	PPI READ	*
				copyeriuste	Register Area	Q area	•
	PPI read	Q0.3	Delete	Copy&Paste	Star address	0	
	PPI write	M0.0	Delete	Copy&Paste	Data Offset Bits	0	
	PPI read	MW2	Delete	Copy&Paste	PLC data type	Bool	•
Droporty T	PPI read	VW0	Delete	Copy&Paste	Enable trigger mode	Enable	•
		11/00 0			Calculation	No	•
Command amount 11	PPI write	WQ0.0	Delete	Copy&Paste	Base	0	
Channel description Siemens PPI Protocol	PPI write	WQ0.1	Delete	Copy&Paste	Multiple rate	0	
Channel type Siemens PPI	PPI write	WQ0.2	Delete	Copy&Paste	Automatic publ sh		
				i	Automatic put lish:	Disable 🔹	To modbusTCP server
	Add collection poin	nt			Data area:	4XXXX 🔻	
	Command name	Operation			Star addres :	0	
	PPI read	Add		<u> </u>	Address interval:	1	
	PPI write	Add		-	Quick publish:	Publish A	II to modbusTCP server
							• • • • • • • • • • • • • • • • • • •

Click the Publish channel and click MODBUS TCP to view the correspondence relationship of the data publish address. After configuring all collection points and publish points, right-click MG-IOT01-PPI and select Download Configuration to Gateway.

IOT gateway configuration software											-	× □ ×
File View Tools												
Progect 💌 🕫	About PPI_1	MG-	IOT01-PPI M	odbus	тср ×							÷
▲ MG-IOT01-PPI	Publish channel co	onfig <mark>/</mark> P	Publish point	t con	fig							
Collection channel	Publish point										Parameter	
PPI 1	Publish point name	Data area	Star address		Collection channel	Collection point	Property	Data area	Star address		Parameter name	Parameter val
✓ Publish channel	RPoint 1	4	0	<>	PPI_1	Q0.0	Read	Q area	0		Point Name	RPoint 1
Modbus TCP	RPoint 2	4	1	<>	PPI_1	Q0.1	Read	Q area	0		Register Area	4XXXX
modeus rei	RPoint 3	4	2	<>	PPI_1	Q0.2	Read	Q area	0		Star address	0
	RPoint 4	4	3	<>	PPI 1	00.3	Read	O area	0			
	DD-1-4 F		-			4000			-			
	RPoint 5	4	4	<>	PPI_1	WQ0.0	Write	Q area	0			
	RPoint 6	4	5	<>	PPI_1	WQ0.1	Write	Q area	0			
Property 👻 🎗	RPoint 7	4	6	<>	PPI_1	WQ0.2	Write	Q area	0			
Search X	RPoint 8	4	7	<>	PPI_1	WQ0.3	Write	Q area	0			
Command amount 11 Channel description Modbus TCP	RPoint 9	4	8	<>	PPI_1	M0.0	Write	M area	0			
Channel type Modbus TCP	RPoint 10	4	9	<>	PPI_1	MW2	Read	M area	2		Relation	
	DDaint 11				DDI 1	1/1/1/0	Beed			Ŧ		
		_	_						,		Collection chann	er mil v
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	Message											- ₽
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After completing the above settings, the Modbus TCP client can use the Modbus TCP protocol to access the gateway through the gateway IP address 192.168.1.254 and Modbus data communication port 502 to access the collected data. This document uses Modbus Poll to simulate Modbus TCP client to collect data.

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4	W	20.0	1		0			
5	W	20.1	1		0			
6	W	Q0.2	0		0			
7	W	Q0.3	0		0			
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4.2 Implementing PPI Protocol to MQTT Data Exchange

4.2.1 Smart 200 PLC Configuration

Power on the Smart 200 PLC, connect pin 3 of the RS485 serial port to the gateway serial port 1T/S+, and pin 8 to the gateway serial port 1R/S-. Serial port parameters: ID = 2, 9600, E81.



The test programming interface is as follows: After editing, save and download. Put the PLC in RUN.

🗋 💕 🖬 🎒 🕫 项目 1 - STEP 7-Micro/WIN SMART 門) 文件 编辑 视图 □ 顶览 □ 页面设置 打印 保存 的上一个 💕 打开 27项目 创建 XML 🖆 关闭 **約**打开文件夹 POU 🎢 下载 GSDML 管理 n ⊥-^ 🗖 🖻 🖻 💻 💻 MAIN → 新常式加能 CPUST20 - 222 - 2 | 程序注释 程序段注释 M0.0 MOV 1 W ENG ENC К MW2 ΩI. 2 输入注释 3 输入注释 🛅 • 🛅 • | 🗩 💷 | 🔗 🥒 🕋 🐀 📸 🛞 | 🚈 🖘 格式 有符号 有符号 有符号 1 2 3 激活 Windows ▶ ▶ \图表1

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4.2.2 MG-IOT01 Configuration

Open the configuration software, click Tools-Searching for devices, select the local network card, click Searching for devices, it will scan to the IOT gateway of the same network segment, click OK to create an IOT project on the left. The IP address uses the default IP address: 192.168.1.254. The PLC is connected to serial port 1. Set the parameters of serial port 1 to General, RS485 / 9600, even / 8/1, and other parameters default.

IOT gateway configuration software			
File View Tools			
Progect 👻 🎚	About MG-IOT01-PP	I X	
MG-IOT01-PPI	Ethernet Port		
 Collection channel 	Parameter name	Parameter value	
PPI 1	MAC Address 4	l0 : 01 : E5 : 05 : 05 : 9F	
	IP Address 1	92.168.1.254	
Publish channel	Net Mask 2	55.255.255.0	
	Net Gateway 1	92.168.1.1	
	Configure Port	1024	
	DHCP enable	Disable 🔻	
	DNS server IP address 1	14.114.114.114	
	Serial Port 1		
	Parameter name	Parameter value	
	Serial Enable	General 🔹	
	Serial type	RS485 -	
Property 🝷 म्	BaudRate	9600 bps 🔹	
Search X	Data Bits	8 bits 🔹	
Channel name Collection channel	Parity Bits	Even 🔻	
Collection command 11	Stop Bits	1 Bit 🔻	
Collection command 200	Char Pitch(t)	3.5t 🔻	
	Timeout time(ms)	500	
	Work mode	Keep 🔹	
	Message interval time(n	ns) 500	
	Maaaaa		

Configure the collection channel parameters as shown below:

Select Serial Port 1 for the collection channel serial port and fill in 2 for the

slave ID.

🔄 IOT gateway configu	ration software								—		×
File View	Tools										
Progect	~ ù	About PPI_1	:	MG-IOT01-	PPI	Modbus TCP					÷
▲ MG-IOT01-PPI		Collection chann	el cor	nfig <mark>/</mark> Co	llectio	on point co	nfig				
▲ Collection cha	innel	Siemens PPI									<u>^</u>
DDI 1		Parameter name	Paran	neter value							^
- Dublish share	-1	Channel Name	PPI_1								
Publish chann	ei	Port Name	Serial	Port 1 🔻							
		Protocol	PPI	-							
		Eencode mode	RTU	-							
		Slave ID	2								_
Property	- ₫										
	×										
Command amount	11										
Channel description	Siemens PPI Protocol										
Channel type	Siemens PPI										
		Massage	_	_		_	_	_	_	_	~ 1
		Message									

Configure the collection point as shown in the following:

Add.: No.6 Hongsheng Road, Hi-Tech District, Mianyang, Sichuan, China. Web: www.odotautomation.com

IOT gateway configuration software							– 🗆 X
File View Tools							
Progect 👻 🖡	About PPI_1	× MG-IOT01-PPI	Modbus	тср			÷
▲ MG-IOT01-PPI	Collection chan	nel config <mark>/</mark> Collect	ion poi	nt config			
Collection channel	Collection point				Parameter		
PPI 1	Command name	Collection point name	Delete	Сору	Parameter name	Parameter valu	e
4 Publish shappel	PPI read	Q0.0	Delete	Copy&Paste	Collection Point Name	Q0.0	
	PPI read	Q0.1	Delete	Copy&Paste	Read Or Write	Read	r
Modbus ICP					Function code	PPI READ	·
	PPI read	Q0.2	Delete	Copy&Paste	Register Area	Q area	,
	PPI read	Q0.3	Delete	Copy&Paste	Star address	0	
	PPI write	M0.0	Delete	Copy&Paste	Data Offset Bits	0	
	PPI read	M1A/2	Delete	Converbate	PLC data type	Bool	,
	FFITEdu	IVIVVZ	Delete	Copyoraste	Enable trigger mode	Enable '	r
	PPI read	VW0	Delete	Copy&Paste	Calculation	No	•
Property 👻 🖡	PPI write	WQ0.0	Delete	Copy&Paste	Base	0	
Search X	PPI write	WQ0.1	Delete	Copy&Paste	Multiple rate	0	
Command amount 11	PPI write	W00.2	Delete	Conv&Pasto	Store data type sort	Default -	
Channel description Siemens PPI Protocol Channel type Siemens PPI	rri wite	WQ0.2	Delete	copyceraste	Store data type	Bool	
	PPI write	WQ0.3	Delete	Copy&Paste			
	Add collection poin				a Automatic publish		
	Command name	Operation			Automatic publish:	Disable To r	nodbusTCP server
	PPI read	Add			Data area:	4XXXX +	
					Star address:	1	
	PPI write	Add			Address Interval:		
					Quick publish:	Publish All to	modbus ICP server
	I						↓
	Message						~ ậ

Right-click the Publish channel config to manually add the MQTT channel and set the configuration parameters manually. Port number: 1883, Connection mode: IP address, MQTT server IP: 192.168.1.50 (local machine's network card IP address, the machine simulates an MQTT server).

IOT gateway configuration software							-		×
File View Tools									
Progect 🝷 🖡 Ab	oout PPI_1		MG-IOT01-PPI	Modbus TCP	MQTT	×			ŧ
MG-IOT01-PPI	ublish channel o	onfig	/ Publish p	oint config					
 Collection channel 	Server parameter								
PPI 1	Parameter name	Para	neter value						۰.
A Publish channel	Port	1883							
Madhus TCD	Connection mode	IP Ad	dress 🔻						
Modbus TCP	TLS enable	Disab	le •						
MQTT	Server domain nam	e Serve	rHostName						
	Server IP	192.1	68.1.50						~
	Device paramete								
	Parameter name	Parame	ter value						-
	Device name	DeviceN	lame						
	Password	Passwor	d						
Property 👻 🏾	Client ID	ClientID							-
2↓ Search ×	Communication	parame	ter						6.
Command amount 0 Channel description MOTT	Parameter nan	ne P	arameter valu	•				-	
Channel type MQTT	Session Sign	H	lold 🔻						
	Requst timeout tim	e(ms) 1	000						
	Keep alive time(r	ns) 3	000						
	essage ATEGORY TIME		SOURCE	CONTENT					
	Info 2019/	12/5 14:4	OdotConfiguat	on. Imported:C:\	Users\My\De	sktop\IOT01配置\ppi.ljp			
	Warning 2019/	12/5 14:4	Publish channe	Modbus TCP	Fail!				
	Info 2019/	12/5 15:0	Publish channe	MQTT Comp	leted!				Ţ

Click the Publish point config.

🚺 IOT gateway configuration software								7	- 0 ×
File View Tools									
Progect 👻 🖗	About PPI_1	MG-IOT01-PP	1 Modbus	TCP MQTT	×				÷
▲ MG-IOT01-PPI	Publish channel	config / Publish	point con	fig					
 Collection channel 	Publish point				Parameter		Relation collection p	pint	
PPI 1	Command name	Publish point name	Operation	Сору	Parameter name	Parameter value	Collection channel	Command name	Collection poin
A Publish chappel	MQTT publish	TopicName 1	Delete	Copy&Paste	Topic Name	TopicName 1	PPI_1	PPI read	Q0.0
Medbus TCD	MQTT Subscribe	TopicName 2	Delete	Copy&Paste	Qos	0 •	PPI_1	PPI read	Q0.1
Modbus TCP	MOTT Subscribe	TonicName 2	Delete	ConvRiPorto	Send mode	Cycle 🔹	DDI 1	PPI read	00.2
MQTI	MQTT Subscribe	Topicidanie 5	Delete	copyceraste	Delay time(ms)	1000		Friteau	Q0.2
					Data format	Json 🔹	PPI_1	PPI read	Q0.3
					L		PPI_1	PPI write	M0.0
							PPI_1	PPI read	MW2
							PPI_1	PPI read	vwo
							PPI_1	PPI write	WQ0.0
Property • 0							PPI_1	PPI write	WQ0.1
Search X							PPI 1	PPI write	WQ0.2
Command amount 3 Channel description MQTT							Relation	,	
Channel type MQTT	Add publish point						Collection channel	PPI_1 T	
	Command name	Operation					Collection point:	PPI write WQ0.0 🔹	
	MQTT Subscribe	Add					Relation: Relation	Relation all	
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	4				Ľ		Į.		
	Message								~ ņ

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Fil	e View	Tools												
Proge	ct	~ ậ	About	PPI_1	MG-IOT01-PI	PI Modbus	ТСР	X TTQN						÷
⊿ M	G-IOT01-P	PI	Publis	h <mark>channe</mark> l	config / Publish	n point con	fig				-			
	Collection (hannel	Publish	point				Parameter			Relation collection p			
	DDI 1		Comm	and name	Publish point name	Operation	Copy	Parameter name	Parameter	value	Collection channel	Command name	Collection point name	Store typ
	Dublich cho	nnal	MQT	r publish	TopicName 1	Delete	Copy&P	Topic Name	TopicName 2	2	PPI_1	PPI write	WQ0.0	Bool
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Cha	innel type	MQTT	Add pul	blish point							Collection channe	I: PPI_1 ▼		
			Comm	and name	Operation						Collection point:	PPI write WQ0.0 -		
			MQTT	Subscribe	Add						Deletieur Deletieu	Deletion all		
			MQT	r publish	Add						Relation: Relation	Relation all		
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File View	Tools												
Progect	→ ‡	About	PPI_1	MG-IOT01-PF	1 Modbus	тср М	IQTT ×						
▲ MG-IOT01-PPI		Publish	channel	config / Publish	point con	fig							
Collection char	nnel	Publish p	oint				Parameter			Relation collection p	oint		
PPI_1		Comma	nd name	Publish point name	Operation	Copy	Parameter name	Paran	neter value	Collection channel	Command name	Collection point na	me
▲ Publish channe	el	MQTT	publish	TopicName 1	Delete	Copy&P	Topic Name	Topic	Name 3	PPI_1	PPI write	WQ0.0	
Modbus TCP		MQTT S	ubscribe	TopicName 2	Delete	Copy&P	Qos	0	•				
MOTT		MQTT S	ubscribe	TopicName 3	Delete	Copy&P	Data format	Json	•				
MQT													
Property	~ ậ												
Search	×												
IP	192.168.1.254									Relation			
Remarks		-					2				_		_
Device type	MG-IOT01-PPI	Add publ	ish point							Collection channe	: PPI_1 ▼		
Communication port	1024	Comma	nd name	Operation						Collection point:	PPI write WQ0.0 🔹		
		MQTT S		Add						Relation: Relation	Relation all		
		MQTT	publish	Add						Relation. Relation	INCLUSION ALL		
				N 7						L			_
		Message											-

After all the collection points and publish points are configured, right-click MG-IOT01-PPI, and you can choose to download the configuration to the gateway. After successful download, complete the data MQTT publish.

After completing the above settings, the MQTT client can use the MQTT.fx test software to access the gateway and access the collected data.



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5 Testing Applications for Collecting Mitsubishi FX Series PLC Data

5.1 Implementing FX Serial Port Protocol to Modbus TCP Data Exchange

5.1.1 MITSUBISHI PLC Configuration

Power on Mitsubishi PLC, connect 1 of RS422 serial port pin to gateway serial port 1T/S-, pin 2 to gateway serial port 1T/S+, pin 4 to gateway serial port 2R/S-, and pin 7 to Gateway serial port 2R/S+. Serial port parameters: ID = 2,9600, E71.

The test programming interface is as follows: After editing, save and download. Put PLC in RUN.



5.1.2 MG-IOT01 Configuration

Open the configuration software, click Tools-Searching for devices, select the local network card, click Searching for devices, it will scan to the IOT gateway of the same network segment, click OK to create an IOT project on the left. The IP address uses the default IP address: 192.168.1.254. The PLC is connected to serial port 1. Set the parameters of serial port 1 to General, RS422 / 9600, even / 7/1, and other parameters default.

IOT gateway configuration softw	ware	– 🗆 X
File View Tools		
Progect	✓ ᡎ About PPI_1 MG-IOT01-PPI Modbus TCP MQTT MG-IOT01-FX ×	
▶ MG-IOT01-PPI	Ethernet Port	
▲ MG-IOT01-FX	Parameter name Parameter value	
Collection channel	MAC Address 00:00:00:00:00:00	
	IP Address 192.168. 1 .254	
Publish channel	Net Mask 255.255.0	
	Net Gateway 192.168.1.1	
	Configure Port 1024	
	DHCP enable Disable •	
	DNS server IP address 114.114.114.114	
	Serial Port 1	
	Parameter name Parameter value	<u>^</u>
	Serial Enable General 🔻	
Property	↓ ■ Serial type RS422 ✓	
Search	BaudRate 9600 bps 🔻	
IP 192.168.1	1.254 Data Bits 7 bits 🔹	
Remarks	Parity Bits Even 🔻	
Device type MG-IOT0	01-FX Stop Bits 1 Bit 🔻	
Communication port 1024	Char Pitch(t) 3.5t 👻	
	Timeout time(ms) 500	
	Work mode Keep 🔻	
	Message interval time(ms) 500	
	Message	~ û

Configure the collection channel parameters as shown below:

Select Serial Port 1 for the collection channel serial port and fill in 1 for the slave ID.

IOT gateway configuration software							—	×
File View Tools								
Progect 💌 🖡	FX Series_1 × Abo	ut PPI_1		MG-IOT01-PPI	Modbus TCP	MQTT		Ŧ
▶ MG-IOT01-PPI	Collection chann	el config /	Collecti	on point con	fig			
▲ MG-IOT01-FX	Mitsubishi FX Se	ries						
 Collection channel 	Parameter name	Parameter v	alue					
FX Series 1	Channel Name	FX Series_1						
Publish channel	Port Name	Serial Port 1	•					
r ublish channel	Protocol	FX Series	*					
	Eencode mode	FX2N	•					
	Slave ID	1						
Property **								
Channel description Mitsubishi FX Series program port protocol								
Channel type Mitsubishi FX Series								
	Message							• ņ

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Configure the collection point and click Publish to area 4.

IOT gateway configuration software						– 🗆 X
File View Tools						
Progect 💌 🖡	FX Series_1 × Abo	out PPI_1	MG-IOT	01-PPI Modbus	тср мотт	MG-IOT01-FX =
▶ MG-IOT01-PPI	Collection chan	nel config / Collecti	ion poi	nt config		
▲ MG-IOT01-FX	Collection point			_	Parameter	
▲ Collection channel	Command name	Collection point name	Delete	Сору	Parameter name	Parameter value
EV Series 1	Read words	YO	Delete	Copy&Paste	Collection Point Name	YO
TA series_1	Read words	¥1	Delete	Copy&Paste	Read Or Write	Read 👻
Publish channel		240			Function code	Mitsubishi FX Series read 🔻
	Read words	¥2	Delete	Copy&Paste	Register Area	Y area 🔹
	Read words	Y3	Delete	Copy&Paste	Star address	0
	Read words	¥4	Delete	Copy&Paste	Data Offset Bits	0
	Read words	V5	Delete	Conv&Paste	PLC data type	Uint16 (16bit) -
			Delete	copyeraste	Enable trigger mode	Enable 🔻
	Add collection poll	n.			Calculation	No *
Property 👻 🎚	Command name	Operation	_	_	Base	0
Search ×	Read words	Add			Multiple rate	0
Command amount 6	Write words	Add			Automatic publish	
Channel description Mitsubishi FX Series program port protocol Channel type Mitsubishi FX Series	Force bit	Add			Automatic publish:	Enable 🔹 To modbusTCP server
<i>"</i>					Data area:	4XXXX -
					Star address:	0
					Address interval:	1
					Quick publish:	Publish All to modbusTCP server

Click the Publish channel and click MODBUS TCP to view the correspondence relationship of the data publish address. After configuring all collection points and publish points, right-click MG-IOT01-FX and select Download Configuration to Gateway.

🖸 IOT gateway configuration software												ØX
File View Tools												
Progect	▼ # FX Series_1 About	PPI_	1 N	IG-IOT01	-PPI Modbus TCP	MQTT	MG-IOT0	I-FX Mod	lbus TCP 🛛 🗙			÷
▶ MG-IOT01-PPI	Publish channel co	onfig <mark>/</mark> F	Publish poir	nt conf	ig							
A MC IOT01 EX	Publish point										Parameter	
A MG-IOTOT-FX	Publish point name	Data area	Star addres	s	Collection channel	Collection point	Property	Data area	Star address	Store t	Parameter name	Parameter
 Collection channel 	PPoint 1	4	0		EV Sories 1	vo.	Pond	Varoa	0	Boo	Point Name	RPoint 1
FX Series_1	KPOINT 1	-		<>	FX Series_1	10	Keau	T allea		000	Pergister Area	47777
Publish channel	RPoint 2	4	1	<>	FX Series_1	¥1	Read	Y area	1	Воо	Star address	4,,,,,
Modbus TCP	RPoint 3	4	2	<>	FX Series_1	Y2	Read	Y area	2	Boo	Star address	0
	RPoint 4	4	3	<>	FX Series_1	¥3	Read	Y area	3	Boo		
	RPoint 5	4	4	<>	FX Series_1	¥4	Read	Y area	4	Boo		
	RPoint 6	4	5	<>	FX Series_1	Y5	Read	Y area	5	Boo		
	RPoint 7	4	6	<>	FX Series_1	Y6	Read	Y area	6	Boo		
	RPoint 8	4	7	<>	FX Series_1	¥7	Read	Y area	7	Boo		
Property	- # RPoint 9	4	8	<>	FX Series_1	Y8	Read	Y area	8	Boo		
Search	RPoint 10	4	9	<>	FX Series_1	Y9	Read	Y area	9	Boo		
Channel description Modbus TCP	RPoint 11	4	10	<>	FX Series_1	¥10	Read	Y area	10	Boo		
Channel type Modbus TCP	RPoint 12	4	11	<>	FX Series 1	¥11	Read	Y area	11	Bool≂	Relation	
											Collection chann	el: FX Series_1
	Add publish point										Collection point:	
	Command name O	peration									conection point.	
	Read/Write	Add									Relation: Relatio	'n
	4										1	

After completing the above settings, the Modbus TCP client can use the Modbus TCP protocol to access the gateway through the gateway IP address 192.168.1.254 and Modbus data communication port 502 to access the collected data. This document uses Modbus Poll to simulate Modbus TCP client to collect data.

в¶ Мо	odbus Poll - [N	/bpoll1]					-	_			\times
👺 File	e Edit Conr	nection Setup F	unctions D	isplay	View	Win	dow	Help		-	8
🗋 🖻	; 🖬 🎒 🗙	Ē Ē≜ ∧	05 06 1	5 16	17 22	23	тс 🛯	1 7	1?		
x = 13	3827: Err = 1	11: ID = 1: F = 0	3: SR = 10	0ms							_
	Alias	00000									
0	YO	1									
1	Y1	0									
2	Y2	0									
3	¥3	0									
4	¥4	0									
5	Y5	0									
6	¥6	0									
7	¥7	0									
8	Y10	1									
9	Y11	0									
or Hel	p, press F1.		[192.168.1.	254]: 5	02						

5.2 Implementing FX Serial Port Protocol to MQTT Data Exchange

5.2.1 Same as 5.1.1

5.2.2 MG-IOT01 Configuration

Open the configuration software, click Tools-Searching for devices, select the

local network card, click Searching for devices, it will scan to the IOT gateway of the same network segment, click OK to create an IOT project on the left. The IP address uses the default IP address: 192.168.1.254. The PLC is connected to serial port 1. Set the parameters of serial port 1 to General, RS422 / 9600, even / 7/1, and other parameters default.

🔁 IOT gateway configuration software							—		×
File View Tools									
Progect 💌 म्	FX Series_1 Ab	out	PPI_1	MG-IOT01-PPI	Modbus TCP	MQTT			Ŧ
▶ MG-IOT01-PPI	Ethernet Port								
MG-IOT01-FX	Parameter nam	ie	Parameter val	ue					^
Collection channel	MAC Address	00	:00:00:00:00:0	0 : 00					
> Contection channel	IP Address	192	2.168.1.254	•					
Publish channel	Net Mask	255	5.255.255.0						
	Net Gateway	192	2.168.1.1						
	Configure Por	t 102	24						
	DHCP enable	Dis	able	•					
	DNS server IP add	Iress 114	1.114.114.11	4					× .
	Serial Port 1								
	Parameter na	ame	Parameter v	alue					Ê.
	Serial Enab	le	General	.					
Property 🝷 🎵	Serial type	e	RS422	-					
E AL Search X	BaudRate		9600 bps	-					
IP 192.168.1.254	Data Bits		7 bits	-					
Remarks	Parity Bits		Even	-					
Device type MG-IOT01-FX	Stop Bits		1 Bit	-					
Communication port 1024	Char Pitch	(t)	3.5t	•					
	Timeout time	(ms)	500						
	Work mod	e	Кеер	•				_	
	Message interval	time(ms)	500						-
	Serial Port 2								- -

Configure the collection channel parameters as shown below:

Select serial port 1 for the collection channel serial port, select FX2N for the Encode method, and set 1 for the slave ID.

📧 IOT gateway configu	ration software					- 🗆	\times
File View	Tools						
Progect	~ ‡	FX Series_1 × Abou	ut MG-IOT01	-FX Modbus TCP			Ŧ
▲ MG-IOT01-FX		Collection chann	el config / Co	llection point con	fig		_
Collection character	nnel	Mitsubishi FX Se	ries				Î
EX Series 1		Parameter name	Parameter value				^
> Publish channel		Channel Name	FX Series_1				
v Fublish channe	51	Port Name	Serial Port 1 🔹 🔻				
		Protocol	FX Series 🔹				
		Eencode mode	FX2N 🔻				
		Slave ID	1				-
Property	~ ₫						
	×						
Command amount	12						
Channel description	Mitsubishi FX S						
Channel type	Mitsubishi FX S						

Configure the collection point as shown in the following figure:

IOT gateway configuration software								- 0	×
File View Tools									
Progect 💌 🖡	FX Series_1 × Abo	ut MG-IOT01-FX	Modbus	тср					
▲ MG-IOT01-FX	Collection chann	nel config <mark>/</mark> Collect	ion poir	nt config	_				
Collection channel	Collection point					Parameter			
FX Series 1	Command name	Collection point name	Delete	Сору		Parameter name	Param	neter value	
N Bublish chappel	Read words		Delete	Copy&Paste	î	Collection Point Name	YO		
	Read words	Y1	Delete	Copy&Paste		Read Or Write	Read		•
	Read words	¥2	Delete	Conv&Paste		Function code	Mitsubishi F	FX Series read	*
	includ fromus		Delete	copyeeraste	4	Register Area	Y area		•
	Read words	Y3	Delete	Copy&Paste		Star address	0		
	Read words	Y4	Delete	Copy&Paste		Data Offset Bits	0		
	Read words	Y5	Delete	Conv&Paste		PLC data type	Uint16 (16b	oit)	•
			Delete	copyeeraste	-	Enable trigger mode	Enable		•
	Add collection poir	nt				Calculation	No		•
Property 💌 🖡	Command name	Operation				Base	0		
Search X	Read words	Add				Multiple rate	0		
Command amount 12	Write words	Add			1	Store data type sort	Default		-
Channel description Mitsubishi FX S Channel type Mitsubishi FX S		- AMM				Automatic publish			
	Force bit	Add				Automatic publish:	Enable 🔻	To modbusT	CP ser
						Data area:	4XXXX -		
						Star address:	0		
						Address interval:	1		
						Quick publish:	Publish 4	All to modbus	TCP se
	4					L			
	Message								– (
	CATEGORY TIME	E SOURCE	CON	TENT					
	2019	1/12/5 16:0. OdotConfiguati	on. Progr	ess:92%					

Right-click the PUBLISH channel to manually add the MQTT channel and set the configuration parameters manually. Port number: 1883, connection mode: IP address, MQTT server IP: 192.168.1.50 (local computer network card IP address, the computer simulates MQTT server).

🚺 IOT gateway configuration software					
File View Tools					
Progect 💌 म्	FX Series_1 About	MG-IOT01-F	X Modbus TCP	MQTT	×
▲ MG-IOT01-FX	Publish channel c	onfig <mark>/</mark> Publisl	n point config		
Collection channel	Server parameter				
FX Series 1	Parameter name	Parameter value			
(Dublich channel	Port	1883			
 Publish channel 	Connection mode	IP Address 🔹			
Modbus TCP	TLS enable	Disable 🔻			
MQTT	Server domain name	ServerHostName			
	Server IP	192.168.1.50			
	Device parameter				
	Parameter name	Parameter value			
	Device name	DeviceName			
	Password	Password			
Property 🔻 🖡	Client ID	ClientID			
Search X	Communication p	arameter			
Command amount 0	Parameter nam	e Parameter v	alue		
Channel type MQTT	Session Sign	Hold			
	Regust timeout time	e(ms) 1000			
	Keep alive time(n	(i) 3000			
		,			

Click Publishing Point config.

IOT gateway configuration software									-
File View Tools									
Progect v 🏾	FX Series_1 Ab	out MG-IOT01-FX	Modbus	TCP MQTT	×				
▲ MG-IOT01-FX	Publish channe	l config / Publish	point con	ifig					
 Collection channel 	Publish point				Parameter		Relation collection	point	
FX Series 1	Command name	Publish point name	Operation	Сору	Parameter name	Parameter value	Collection channe	I Command name	Collection point na
 Publish channel 	MQTT publish	TopicName 1	Delete	Copy&Paste	Topic Name	TopicName 1	FX Series_1	Read words	YO
Modbus TCP					Qos	0 •	FX Series_1	Read words	¥1
MOTT					Send mode	Cycle 🔹	FX Series 1	Read words	Y2
MiQTI					Delay time(ms)	1000	-	Bandwards	¥2
					Data format	Json 🝷	FA Series_1	Read words	13
						L	FX Series_1	Read words	¥4
							FX Series_1	Read words	Y5
							FX Series_1	Read words	Y6
Property 👻 🎚	1						FX Series_1	Read words	¥7
Search X							FX Series_1	Read words	Y8
Command amount 1 Channel description MQTT							FX Series_1	Read words	Y9
Channel type MQTT							FX Series 1	Read words	Y10
							Relation		
	Add publish point	:					Collection chann	el: EX Serier 1 T	
	Command name	Operation					conection chann	a. TX Series_1	
	MQTT Subscribe	Add					Collection point:	•	
	MQTT publish	Add					Relation: Relatio	n Relation all	
	4	р. — Л			3				

After all the collection points and publishing points are configured, right-click MG-IOT01-FX and choose to download and configure to the gateway. After successful download, complete the data MQTT publish.

After completing the above settings, the MQTT client can use the MQTT.fx test software to access the gateway and access the collected data.

WQTT.tx - 1.7.1			- U X
File Extras Help	_		
local mosquitto	Connect Disconnect		
Edit Connection Profiles			- 0
M2M Eclipse			
read local mosquitto	Profile Name loca	al mosquitto	
	Profile Type MC	QTT Broker 🔹	MQ
	MQ11 Broker Profile Settings		
	Broker Address 192	2.168.1.50	
	Broker Port 188	83	
	Client ID MC	QTT_FX_Client	Generate
	Constal User Credentials SSL	TIS Drovy IWT	
	General Oser Credentials 55L/	TLS PIOXY LWT	
	Connection Timeout 30		
	Keen Alive Interval		
Topics	Clean Session V		
ODOT	Auto Reconnect		
odot	Max Inflight 10		
read	MQTT Version 🗸 U	Use Default	
	3.1	.1	
odot	a	lear Publish History	
	a	lear Subscription History	湟
			转
MQTT.fx - 1.7.1 File Extras Help		- 0	×
local mosquitto	Connect Disconnect		• •
Publish Subscribe Scripts Broker Status Log			
		QoS0 QoS1 QoS2 Autoscrol	(CC+)
TopicName 1	(1369) TonicName 1		1366
Dump Messages	Mute Unsubscribe		QoS 0
\mathbf{X}	TopicName 1		QoS 0
	TopicName 1		QoS 0
	TonicName 1		QoS 0
	19-11-2019 13:41:45.49305699		1369 QoS 0
Topics Collector (1)	{ "version" : "1.0", "natams" : {		
TopicName 1	"Y0" : 1, "Y1" : 0, "Y2" : 0.		
	"Y3" : 0, "Y4" : 0, "Y5" : 0		
read	"Y6": 0, "Y7": 0, "Y10": 1		
	10 : 31399, "method" : "thing.ev.nt.property.post"	激活 Windows 转到"设置"以激活 Windows。	
		Payload decoded by ISON Pratty Format Decode	

6 Test Application for Collecting Omron PLC Data

6.1 Implementing the Hostlink Protocol to Modbus TCP Data Exchange

6.1.1 Omron PLC Configuration

Power on the Omron PLC, and add a CP1W-CIF11 (485 communication module). This communication module has a DIP switch to set the communication mode. It is necessary to turn 2, 3 to ON (RS485 mode). Connect the second terminal interface RDB + on the front to the gateway serial port 1T/S+, and the first terminal interface RDA- on the front to the gateway serial port 1R/S-. Set serial port parameters: unit number 1, 9600, 7/E/2, Hostlink mode.



The test programming interface is as follows: After editing, save and download. Put PLC in RUN.

CP1Houmulong - CX-Program ⑦ 文件(F) 編集(E) 税置(M) ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	nmer - (新 插入() PL 副 配 副 <mark>開 電</mark> 部 [] 電 の 0	PLC1新程序1.段1 [辨 C 編程(P) 模拟(S) 2 C M 编 录 10 11 44 11 44 14 10 30 30 55 14 12 12 45 15 14 12 12 45 15 14 12 12 45 15 14 12 14 15 15 14 12 14 15 15 14 12 14 15 15 15 15 15 15 15 15 15 15 15 15 15	形图]] 工具(T) 金口 、 ? N? ・ ー	1(W) ##0(H) ▲ 急 ▲ L Ⅱ 匝 ダ 日 野 元 L ᅛ ∬ 圏 型 転 ① 会 ▶	₽ ८ १८ <i>३ ८</i> ड ♥ 曲 १ १ ■ П ► 1 ¥ ¥	· ■		<u>₩₩</u> └┐	 施挽上传	
□ ● 新PLC1(CPHI) 憲法 ○ ● 新PLC1(CPHI) 憲法 ○ ⑦ 符号 ● ⑦ 10表和单元设置 ● ⑦ 20 ● ⑦ 20		-(300) 	10007 ↓↓ 10000 ↓↓				Q:100,00 TDF Q:000 #40 Q:100,01 Q:100,01 Q:100,00 Q:100,00	100% 运时器 (运时器) 运时器号 设置值 互位 位	[bcn典型]	
		名称:			地址值:	注释:				
▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲ 単 ▲ ▲ ト ト 、 编译 入 寻找探表 秦要報助, 请按F1	λ 传送 / ¯				新PLC	1(网络:0,节点:0) - 裔纳	Ê		1, 4) - 100%	

6.1.2, MG-IOT01 Configuration

Open the configuration software "Odot Configuration Software", click Tools-Search for devices, select the local network card, click Search for devices, and the IOT gateway on the same network segment will be scanned. Click OK to generate an IOT project. : 192.168.1.254. PLC serial port 1, set the parameters of serial port 1 to pass-through, RS485 / 9600, even / 7/2, and other parameter settings.

S IOI gateway configuration software				- L ×	Ś
File View Tools					
Progect	▼ # About MG-IOT0	I-OM ×			
MG-IOT01-OM	Ethernet Port				í
	Parameter name	Parameter v	alue	<u>^</u>	
	MAC Address	00:00:00:00:	00:00		
	IP Address	192.168.1.25	54		
	Net Mask	255.255.255.	0		
	Net Gateway	192.168.1.1			
	Configure Port	1024			
	DHCP enable	Disable	-		
	DNS server IP addres	ss 114.114.114.1	14		ľ
	Serial Port 1				
	Parameter nam	e Parameter	value	A	
	Serial Enable	General	-		
Property	Serial type	RS485	-		
Search	BaudRate	9600 bps	•		
IP 192.168.1.254	Data Bits	7 bits	-		
Remarks Device type MG-IOT01-OM	Parity Bits	Even	•		
Communication port 1024	Stop Bits	2 Bits	•		
	Char Pitch(t)	3.5t	•		
	Timeout time(m	s) 500			
	Work mode	Keep	•		
	Message interval tim	ne(ms) 500		•	

Configure the Collection channel parameters as shown below:

Select serial port 1 for the collection channel serial port and fill in 1 for the slave ID.

IOT gateway configuration software				-
File View Tools				
Progect 👻 🖡	About MG-IO1	01-OM Hostlink_1	×	
▲ MG-IOT01-OM	Collection chan	el config 🖊 Collec	tion point config	
 Collection channel 	Hostlink			
Hostlink 1	Parameter name	Parameter value		
Publish chappel	Channel Name	Hostlink_1		
	Port Name	Serial Port 1 🔹		
	Protocol	HostLink 🔻		
·	Eencode mode	RTU 🔻		
	Slave ID	1		
Property ● Ø Search Command amount O Channel description Omron Hostlink Protocol Channel type Hostlink				Q
	CATEGORY TIM	SOURCE	CONTENT	

Configure the collection point and click Publish to area 4.

IOT gateway configuration software							– 🗆 X		
File View Tools									
Progect 👻 म्	About MG-IO	101-OM Hostlink_1	×				5		
▲ MG-IOT01-OM	Collection chan	nel config / Collect	ion poi						
 Collection channel 	Collection point				Parameter				
Hostlink 1	Command name	Collection point name	Delete	Сору	Parameter name	Parameter	value		
Publish channel	Read	CPoint 1	Delete	Copy&Paste	Collection Point Name	e CPoint 1			
v Fublish channel	Read	CPoint 1(2)	Delete	Copy&Paste	Read Or Write	Read	Ŧ		
	Band	(Delint 1(2)			Function code	Hostlink read	d 👻		
	Read	CPOINT I(3)	Delete	CopyaPaste	Register Area	CIO area	•		
	Read	CPoint 1(4)	Delete	Copy&Paste	Star address	101			
	Read	CPoint 1(5)	Delete	Copy&Paste	Data Offset Bits	1			
	Read	ead CPoint 1(6)		Conv&Paste	PLC data type	Bool	•		
			Delete	copyer usee	Enable trigger mode	Enable	•		
Property 👻 🗸	Add collection poir	nt			Calculation	No	•		
Search X	Command name	Operation	_		Base	0			
Command amount 10	Read	Add			Multiple rate	0			
Channel description Omron Hostlink Protocol	Write	Add			Automatic publish				
Channel type Hostlink					Automatic publish:	Enable 🔻	To modbusTCP server		
					Data area:	4XXXX -			
					Star address:	0			
					Address interval:	1			
					Quick publish:	Publish A	II to modbusTCP server		
	4				L		•		
	Message						- ų		

Click the Publish channel and click MODBUS TCP to view the correspondence relationship of the data publish address. After configuring all collection points and publish points, right-click MG-IOT01-OM and select Download Configuration to Gateway.

💁 IOT gateway configura	ation software											la X
File View	Tools											
Progect	~ å	About MG-IOT01-	OM Host	link_1 <mark>№</mark>	lodbus	TCP ×						÷
▲ MG-IOT01-OM		Publish channel co	nfig <mark>/</mark> P	ublish point	conf	ig						
A Collection cha	nnel	Publish point									Parameter	
Hostlink 1		Publish point name	Data area	Star address		Collection channel	Collection point	Property	Data area	Star address	Parameter name	Parameter v
A Publish chappe	al	RPoint 1				Hostlink_1	CPoint 1			100	Point Name	RPoint 1
Andbus TCP		RPoint 2	4	1	<>	Hostlink_1	CPoint 1(2)	Read	CIO area	100	Register Area	4XXXX
Modbus ICF		RPoint 3	4	2	<>	Hostlink 1	CPoint 1(3)	Read	CIO area	100	Star address	0
		RPoint 4	4	3	<>	Hostlink 1	CPoint 1(4)	Read	CIO area	100		
		PRoint 5	4	-		Hostlink 1	(Point 1(5)	Read	CIO area	100		
		RFoline 5	-	-	~ <i>></i>	Hostink_1		Kedu	cio area	100		
		RPoint 6	4	5	<>	Hostlink_1	CPoint 1(6)	Read	CIO area	100		
		RPoint 7	4	6	<>	Hostlink_1	CPoint 1(7)	Read	CIO area	100		
		RPoint 8	4	7	<>	Hostlink_1	CPoint 1(8)	Read	CIO area	100		
Property	~ ù	RPoint 9	4	8	<>	Hostlink_1	CPoint 1(9)	Read	CIO area	101		
21 Search	×	RPoint 10	4	9	<>	Hostlink_1	CPoint 1(10)	Read	CIO area	101		
Channel description	Modbus TCP											
Channel type	Modbus TCP										Q	
											Deletion	
			_							•	Relation	
		Add publish point									Collection chann	el: Hostlink_1
		Command name Op	peration								Collection point:	•
		Read/Write	Add								Relation: Relatio	'n
		I									1	
		1										

After completing the above settings, the Modbus TCP client can use the Modbus TCP protocol to access the gateway through the gateway IP address 192.168.1.254 and Modbus data communication port 502 to access the collected data. This document uses Modbus Poll to simulate Modbus TCP client to collect data.

큀	Modbus P	oll - [N	/bpoll1]					_		\times
	File Edit	Conr	ection Setup Fu	inctions	Display	View	Window	Help		. 8 ×
Ľ) 🖻 🖪 성	3 X	🗖 📮 🚊 Л	05 06	15 16	17 22	23 TC	2 ?	\?	
Тх	= 1337: Er	rr = 0:	ID = 1: F = 03: S	R = 100	ms					
		Alize	00000							
0		100.0	00000							
1		100.1	0							
2		100.2	0							
3		100.3	0							
4		100.4	0							
5		100.5	0							
6		100.6	0							
7		100.7	1							
8		101.0	0							
9		101.1	0							

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6.2 Implementing the Hostlink Protocol to MQTT Data Exchange

6.2.1 Same as 6.1.1

6.2.2 MG-IOT01 Configuration

Open the configuration software "Odot Configuration Software", click Tools-Search for devices, select the local network card, click Search for devices, it will scan to the IOT gateway of the same network segment, click OK to generate an IOT project on the left. The IP address uses the default IP address: 192.168.1.254. The PLC is connected to serial port 1. Set the parameters of serial port 1 to General, RS485 / 9600, even / 7/2, and other parameters are default.

🖪 IOT gateway configu	ration software						- 0	×
File View	Tools							
Progect		- A	About I	MG-IOT01-O	M × Hostlink_1		Modbus TCP	Ŧ
MG-IOT01-OM			Ethernet Po	ort				Ê
			Paramete	r name	Parameter valu	е		~
			MAC Ad	dress	00:00:00:00:00	:00		
			IP Add	ress [192.168. 1 .254			
			Net M	ask ä	255.255.255.0			
			Net Gat	eway	192.168.1.1			
		Configur	e Port	1024				
			DHCP e	nable	Disable	•		
		DNS server IP address 114.114.114.114					-	
			Serial Port	1				
			Parame	Parameter val	ue			
			Serial	Enable	General	•		
Property		→ ậ	Seria	l type	RS485	•		_
Search 2 ↓		×	Bau	dRate	9600 bps	•		-
IP	192.168.1.254		Dat	a Bits	7 bits	•		-
Remarks	MC IOTAL OM		Parit	y Bits	Even	•		-
Communication port	1024	_ 1	Sto	o Bits	2 Bits	•		-
			Char	Pitch(t)	3.5t	•		-
			Timeout	time(ms)	500			-
			Work	mode	Keen	•		-
			Message int	anyal time(r	mc) 500			
			wessage int	ervar unie(i	500			•
		_	Message					~ û
			CATEGORY	TIME	SOURCE		CONTENT	

Configure the collection channel parameters as shown below:

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Select serial port 1 for the collection channel serial port, and fill 1 in the slave

ID.

🖾 IOT gateway configuration software		-	
File View Tools			
Progect ▼ ₽ ▲ MG-IOT01-OM	About MG-IOT Collection chann	OT01-OM Hostlink 1 × Modbus TCP nnel config / Collection point config	
 Collection channel Hostlink_1 Publish channel 	Hostlink Parameter name Channel Name Port Name Protocol Eencode mode Slave ID	Parameter value e Hostlink_1 Serial Port 1 • HostLink • RTU • 1 •	
Property ♥ Property ♥ Search Command amount 10 Channel description Omron Hostlink Protocol Channel type Hostlink			
	Message CATEGORY TIME	ME SOURCE CONTENT	•

Configure the collection point as shown in the following figure:

IOT gateway configuration software							—	
File View Tools								
Progect 💌 🖡	About MG-IO	T01-OM Hostlink_1	× Modbu	IS TCP				
▲ MG-IOT01-OM	Collection chan	nel config <mark>/</mark> Collect	ion poi	nt config				
 Collection channel 	Collection point				Parameter			
Hostlink 1	Command name	Collection point name	Delete	Сору	Parameter name	Parameter val	ue	
Publish channel	Read	CPoint 1	Delete	Copy&Paste	Collection Point Name	e CPoint 1		
	Read	CPoint 1(2)	Delete	Copy&Paste	Read Or Write	Read	-	
Modbus TCP	Baad	(Deint 1(2)	D.1.4	Course	Function code	Hostlink read	-	
	Read	CPOINT T(3)	Delete	Copy&Paste	Register Area	CIO area	•	
	Read	CPoint 1(4)	Delete	Copy&Paste	Star address	100		
	Read	CPoint 1(5)	Delete	Copy&Paste	Data Offset Bits	1		
	Read	CPoint 1(6)	Delete	Copy&Paste	PLC data type	Bool	•	
	Pood	(Point 1(7)	Delete	ConvelDeste	Enable trigger mode	Enable	•	
Property 💌 🖡	Redu	CPOINT T(7)	Delete	CopyorPaste	Calculation	No	•	
Search X	Read	CPoint 1(8)	Delete	Copy&Paste	Base	0		
Command amount 10	Read	CPoint 1(9)	Delete	Copy&Paste	Multiple rate	0		
Channel description Omron Hostlink Protocol	Read	CPoint 1(10)	Delete	Copy&Paste	Automatic publish			
					Automatic publish:	Enable • To	modbusTC	P server
				_	Data area:	4XXXX -		
	Add collection poi	nt			Star address:	0		
	Command name	Operation	_	Address interval:	1			
	Read	Add			Quick publish:	Publish All t	o modbusT	CP server
	•							Þ

Right-click the publishing channel to manually add the MQTT channel and set the configuration parameters manually. Port number: 1883, connection mode: IP address, MQTT server IP: 192.168.1.50 (local machine network card IP address, the machine simulates the MQTT server).

🕙 IOT gateway configuration software		>
File View Tools		
Progect	About MG-IOT01-OM Hostlink_1 MQTT X	
MG-IOT01-OM	Publish channel config Publish point config	
 Collection channel 	Server parameter	
Hostlink 1	Parameter name Parameter value	A
 ▲ Publish channel	Port 1883	
MOTT	Connection mode IP Address 🔹	
MQTI	TLS enable Visable V	
	Server domain name ServerHostName	
	Server IP 192.168. 1 . 50	
	Device parameter	
	Parameter name Parameter value	A
	Device name DeviceName	
operty	✓	
Search Search	Client ID ClientID	
Command amount 0	Communication parameter	
Channel description MQTT Channel type MOTT	Parameter name Parameter value	<u>^</u>
71	Session Sign Hold 🔻	
	Requst timeout time(ms) 1000	
	Keep alive time(ms) 3000	
	CALEGORI INTE SOURCE CONTENT	

Click Publishing Point config.

🚯 IOT gateway configuration softwar	re								- 0	×
File View Tools										
Progect 👻 🖡	About MG-IOT01-OM Hostlink_1	MQTT	×							
▲ MG-IOT01-OM	Publish channel config / Publish	n point config								
 Collection channel 	Publish point	Parameter		Relation co	llection p	oint				
Hostlink_1	Command name Publish point name	Parameter name	Parameter value	Collection	channel	Command name	Collection point name	Store type	Operation	
Publish channel	MQTT publish TopicName 1	Topic Name	TopicName 1	Hostli	nk_1	Read	CPoint 1	Bool	Delete	
мотт		Qos	0 -	Hostli	nk_1	Read	CPoint 1(2)	Bool	Delete	
		Send mode	Cycle 🔻	Hostli	nk_1	Read	CPoint 1(3)	Bool	Delete	
		Delay time(ms)	1000	Hostli	nk 1	Read	CPoint 1(4)	Bool	Delete	
		Data format	Json 🔹				CD : 4 (5)			•
				Hostil	nk_1	кеаа	CPoint 1(5)	BOOI	Delete	
				Hostli	nk_1	Read	CPoint 1(6)	Bool	Delete	
Droporty T				Hostli	nk_1	Read	CPoint 1(7)	Bool	Delete	
Z Search X				Hostli	nk_1	Read	CPoint 1(8)	Bool	Delete	
Command amount 1				Hostli	nk_1	Read	CPoint 1(9)	Bool	Delete	1
Channel description MQTT Channel type MQTT				Hostli	nk_1	Read	CPoint 1(10)	Bool	Delete	-
				Relation						
	Add publish point			Collectio	n channe	l: Hostlink_1 ▼				
	Command name Operation			Collectio	n point:	•				
	MQTT Subscribe Add			Deletion	Deletion	Deletien ell				
	MQTT publish Add		-	Relation:	Relation	Relation all				
	Message									•

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After configuring all collection points and publishing points, right-click MG-IOT01-OM and choose to download and configure to the gateway. After successful download, complete the data MQTT publish.

After completing the above settings, the MQTT client can use the MQTT.fx test software to access the gateway and access the collected data.



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7 Collection of Test Data for Delta PLC Data

7.1 Implementing Modbus RTU Protocol to Modbus TCP Data

Exchange

7.1.1 DELTA PLC Configuration

Power on the Delta PLC, connect 4 RXD of the RS232 serial port pin to the gateway serial port 1T / S +, pin 5 TXD to the gateway serial port 1R / S-, and pin 8 to the gateway serial port GND. Serial port parameters: ID = 1, RS232, 9600, 7E1.



The test programming interface is as follows: After editing, save and download. Put PLC in RUN.



7.1.2 MG-IOT01 Configuration

Open the configuration software "Odot Configuration Software", click Tools-Search for devices, select the local network card, click Search for devices, it will scan to the IOT gateway of the same network segment, click OK to generate an IOT project on the left. The IP address uses the default IP address: 192.168.1.254. The PLC is connected to serial port 1. Set the parameters of serial port 1 to General, RS232 / 9600, 7 / even / 1, and other parameters are default.

🙆 IOT gateway configu	ration software					
File View	Tools					
Progect	~ џ	About M	G-IOT01-OM	Hostlink_1	MQTT	MG-IOT01-MB × Modbus_1
▶ MG-IOT01-OM		Message inter	val time(ms)	1000		
▶ MG-IOT01-MB		Serial Port 3]			
		Paramete	er name	Parameter va	lue	
		Serial E	nable	General	•	
		Serial	type	RS232	•	
		Baud	Rate	9600 bps	•	
		Data	Bits	7 bits	•	
		Parity	Bits	Even	•	
		Stop	Bits	1 Bit	•	
		Char P	tch(t)	3.5t	•	
		Timeout t	ime(ms)	500		
Property	- 4 	Work r	node	Keep	•	
Search	×	Message inter	val time(ms)	500		
IP	192.168.1.254	Serial Port 4				
Device type	MG-IOT01-MB	Paramete	er name	Parameter va	ue	
Communication port	1024	Serial E	nable	General	•	
		Serial	type	RS485	•	
		Baud	Rate	9600 bps	•	
		Data	Bits	8 bits	•	
		Parity	Bits	None	•	
		Message				

Configure the collection channel parameters as shown below:

The serial port of the collection channel is selected as serial port 3, the encoding method is ASCII, and the slave ID is 1.

🐻 IOT gateway configu	iration software								
File View	Tools								
Progect	~ џ	About MG-IO	T01-OM Host	link_1	MQTT	MG-IOT01-MB	Modbus_1	×	
▶ MG-IOT01-OM		Collection chan	nel config /	Collection	n point confi	g			
▲ MG-IOT01-MB		Modbus RTU/A	SCII						
4 Collection cha			Parameter va	lue					
- collection cha		Channel Name	Modbus_1						
Modbus_1		Port Name	Serial Port 3	•					
Publish chann	el	Protocol	Modbus	-					
		Eencode mode	ASCII	•					
		Slave ID	1						
Descrite	~ 1								
Z Search	~								
Command amount Channel description	0 Modbus RTU/A								
Channel type	Modbus RTU/A								
		Message CATEGORY TIM	E SOU	RCE	CONTENT				
			- 300						

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The corresponding Modbus address of Delta's PLC output coil Y is shown in the table below. Configure the collection points according to the point table. After the configuration is complete, click to publish to Zone 4.

裝置	範圍	類別	DVP 通訊位址 (Hex)	Modbus 通訊位址 (Dec)
S	000~255	Bit	0000~00FF	000001~000256
S	246~511	Bit	0100~01FF	000247~000512
S	512~767	Bit	0200~02FF	000513~000768
S	768~1023	Bit	0300~03FF	000769~001024
Х	000~377 (Octal)	Bit	0400~04FF	101025~101280
Υ	000~377 (Octal)	Bit	0500~05FF	001281~ <mark>001536</mark>
Т	000~255	Bit	0600~06FF	001537~001792
	000-233	Word	0600~06FF	401537~401792
М	000~255	Bit	0800~08FF	002049~002304 激活 Windows
Μ	256~511	Bit	0900~09FF	002305~002560

2.12 DVP 系列 PLC 装置通讯地址

O IOT gateway configuration software							—
File View Tools							
Progect 👻 🖡	About MG-IO	101-OM Hostlink_1	MQTT	MG-IC	T01-MB Modbus_1	×	
▶ MG-IOT01-OM	Collection chan	nel config <mark>/</mark> Collect	ion poir	nt config			
▲ MG-IOT01-MB	Collection point				Parameter		
4 Collection channel	Command name	Collection point name	Delete	Сору	Parameter name	Parameter value	
	Read 0XXXX	CPoint 1	Delete	Copy & Paste	Collection Point Name	e CPoint 4	
Modbus_1	Read 0XXXX	CPoint 2	Delete	ConvePaste	Read Or Write	Read 🔻	
Publish channel			Delete	copyter aste	Function code	01 Read 0XXXX 👻	
	Read 0XXXX	CPoint 3	Delete	Copy&Paste	Register Area	OXXXX -	
	Read 0XXXX	CPoint 4	Delete	Copy&Paste	Star address	1283	
				n	Data Offset Bits	0	
	L				PLC data type	Bool 👻	
					Enable trigger mode	Enable -	
	Add collection poir	nt			Calculation	No -	
Property •	Command name	Operation			Base	0	
2↓ Search ×	Road OVVVV	Add			Multiple rate	0	
Command amount 4 Channel description Modbus BTU/A	Keau OAAAA	Add			Store data type sort	Pofault *	
Channel type Modbus RTU/A	Read 1XXXX	Add			Automatic publish		
	Read 3XXXX	Add			Automatic publish:	Enable To modbusTCP server	
	Read AXXXX	Add			Data area:	4XXXX -	
					Star address:	0	
	Write 0XXXX	Add			Address interval:	1	
	Write 4XXXX	Add			Quick publish:	Publish AI to modbusTCP server	
	Massage		_	_			
	CATEGORY TIM	E SOURCE	CON	TENT			
			12.514				

Click the publish channel and click MODBUS TCP to view the correspondence relationship of the data address. After configuring all collection points and publishing points, right-click MG-IOT01-MB and select Download Configuration to Gateway.

File View Tools Progect • 0 About MG-IOT01-0M Modbus 1 Provint 1 Parameter Param
Progect Modult Collection channel <l< td=""></l<>
MG-IOT01-OM Publish channel config Publish point config
A MG-IOT01-MB Publish point name Data area Star address Star ad
Publish point name Data area Star address Collection channel Collection point Property Data area Store of the point Parameter name Parameter
Reside RPoint 1 4 0 <-> Modbus_1 Read 0XXXX 1280 Bool Point Name RPoint 1 Modbus_1 RPoint 2 4 1 <-> Modbus_1 CPoint 2 Read 0XXXX 1280 Bool Point Name RPoint 1 Modbus_1 RPoint 3 4 2 <-> Modbus_1 CPoint 3 Read 0XXXX 1281 Bool Staraddress 0 Modbus TCP RPoint 3 4 2 <-> Modbus_1 CPoint 3 Read 0XXXX 1282 Bool Staraddress 0 RPoint 4 4 3 <-> Modbus_1 CPoint 4 Read 0XXXX 1283 Bool Staraddress 0
Modulus_1 Repoint 2 4 1 <-> Modulus_1 CPoint 2 Read 0XXXX 1281 Bool Register Area 4XXXX 1 <-> Modulus_1 CPoint 3 Read 0XXXX 1281 Bool Register Area 4XXXX 3 <-> Modulus_1 CPoint 3 Read 0XXXX 1282 Bool Read/res 0 Modbus TCP Repoint 4 4 3 <-> Modbus_1 CPoint 4 Read 0XXXX 1283 Bool Read/res 0
Profinition RPoint 3 4 2 <> Modbus_1 CPoint 3 Read 0XXXX 1282 Bool RPoint 4 4 3 <> Modbus_1 CPoint 4 Read 0XXXX 1282 Bool
Modpus ICP RPoint 4 4 3 <> Modbus_1 CPoint 4 Read 0XXXX 1283 Bool
RPoint 4 4 3 <> Modbus_1 CPoint 4 Read 0XXXX 1283 Bool
Property <
El 24 Search X
Command amount 4
Channel description Modbus TCP
Channel type Modous ICP
Collection channel; Modbus, 1
Add publish point Collection point ·
Command name Operation
Read/Write Add Relation: Relation
Message 👻 🗘
CATEGORY TIME SOURCE CONTENT

After completing the above settings, the Modbus TCP client can use the Modbus TCP protocol to access the gateway through the gateway IP address 192.168.1.254, Modbus data communication port 502, and access the collected data. This document uses Modbus Poll to simulate Modbus TCP client to collect data.

Modbus Poll - [Mbpoll1] \times 🖼 File Edit Connection Setup Functions Display View Window Help _ 8 × 🗅 🗃 🔚 🎒 🗙 🛅 🖳 🚊 🕮 05 06 15 16 17 22 23 TC 🔍 🤶 🌾 Tx = 5121: Err = 0: ID = 1: F = 03: SR = 100ms Alias 00000 0 001281 0 1 001282 0 2 1 001283 3 001284 0 4 5 6 7 8 9

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7.2 Implementing Modbus RTU Protocol to MQTT Data Exchange

7.2.1 Same as 7.1.1

7.2.2 MG-IOT01 Configuration

Open the configuration software "Odot Configuration Software", click Tools-Search for devices, select the local network card, click Search for devices, it will scan to the IOT gateway of the same network segment, click OK to generate an IOT project on the left. The IP address uses the default IP address: 192.168.1.254. The PLC is connected to serial port 1. Set the parameters of serial port 1 to General, RS232 / 9600, even / 7/1, and other parameters are default.

IOT gateway configuration s	software							
File View Tools								
Progect	- û	About N	IG-IOT01-OM	Hostlink_1	MC	QTT MG-IOT01-MB ×	Modbus_1	Modbus TCP
▶ MG-IOT01-OM		Message inte	erval time(ms)	1000				
MG-IOT01-MB		Serial Port	3					
		Parame	ter name	Parameter valu	ie			
		Serial	Enable	General	-			
		Seria	l type	RS232	•			
		Baud	dRate	9600 bps	•			
		Data	a Bits	7 bits	-			
		Parit	y Bits	Even	•			
		Stop	o Bits	1 Bit	•			
		Char F	Pitch(t)	3.5t	•			
		Timeout time(ms)		500				
Property	~ û	Work	mode	Keep	•			
	×	Message inte	erval time(ms)	500				
IP 192.1	168.1.254	Serial Port 4	4					
Remarks	0704.140	Parame	ter name	Parameter valu	ie			
Communication port 1024	O101-MB	Serial Enable		General	•			
		Seria	l type	RS485	•			
		Baud	dRate	9600 bps	•			
		Data	a Bits	8 bits	•			
		Parit	y Bits	None	•			
		Message						
		CATEGORY	TIME	SOURCE	C	CONTENT		

Configure the collection channel parameters as shown below:

Select serial port 1 for the collection channel serial port, the encoding method

is ASCII, and the slave ID is 1.

IOT gateway configuration software									
File View Tools									
Progect 👻 🖡	About MG-IOT	01-OM Hostlink_1	MQTT	MG-IOT01-MB	Modbus_1	× Modbus TCP			
▶ MG-IOT01-OM	Collection chann	nel config 🖊 Col	lection point confi	g					
▲ MG-IOT01-MB	Modbus RTU/ASCI								
Collection channel	Parameter name	Parameter value							
Modhus 1	Channel Name	Modbus_1							
	Port Name	Serial Port 3 🔹							
Publish channel	Protocol	Modbus -							
	Eencode mode	ASCII 🔹							
	Slave ID	1							
Property 🔻 🖟									
Search X									
Command amount 4 Channel description Modbus RTU/ASCII Protocol									
Channel type Modbus RTU/ASCII									

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The corresponding Modbus address of Delta PLC output coil Y is shown in the table below, and the collection points are configured according to the point table.

裝置	範圍	類別	DVP 通訊位址	Modbus 通訊位址				
			(Hex)	(Dec)				
S	000~255	Bit	0000~00FF	000001~000256				
S	246~511 Bit		0100~01FF	000247~000512				
S	512~767 Bit		0200~02FF	000513~000768				
S	768~1023	Bit	0300~03FF	000769~001024				
X	000~377 (Octal)	Bit	0400~04FF	101025~101280				
Υ	000~377 (Octal)	Bit	0500~05FF	001281~001536				
Ţ	000~255	Bit	0600~06FF	001537~001792				
'	Word		0600~06FF	401537~401792				
М	000~255	Bit	0800~08FF	002049~002304 激活 Windows				
М	256~511 Bit		0900~09FF	002305~002560				

2.12 DVP 系列 PLC 装置通讯地址

IOT gateway configuration software							-
File View Tools							
Progect • 4	About MG-IO1	01-OM Hostlink_1	MQTT	MG-IC	DT01-MB Modbus_1	× Modbus TCP	
▶ MG-IOT01-OM	Collection chan	nel config <mark>/</mark> Collect	ion poir	it config			
▲ MG-IOT01-MB	Collection point				Parameter		7
 Collection channel 	Command name	Collection point name	Delete	Сору	Parameter name	Parameter value	
Modbus 1	Read 0XXXX	CPoint 1	Delete	Copy&Paste	Collection Point Name	CPoint 4	
N Publich channel	Read 0XXXX	CPoint 2	Delete	Copy&Paste	Read Or Write	Read 🔻	
v Publish channel	Read 0XXXX	CPoint 3	Delete	Conv&Paste	Function code	01 Read 0XXXX 🔻	
		er onte s	Delete	copydraste	Register Area	0XXXX -	
	Read 0XXXX	CPoint 4	Delete	Copy&Paste	Star address	1283	
					Data Offset Bits	0	
					PLC data type	Bool 💌	
			_		Enable trigger mode	Enable •	
Property 👻 🖡	Add collection poir	nt			Calculation	No 🔻	
Search ×	Command name	Operation	_	_	Base	0	
Command amount 4	Read 0XXXX	Add		Ê	Multiple rate	0	
Channel description Modbus RTU/ASCII Protocol	Read 1XXXX	Add			Automatic publish		
Channel type Modbus RTU/ASCII	Pead 2XXXX	Add		_	Automatic publish:	Enable T To mode	
	Read Social	Auu		_	Data area:	4XXXX -	
	Read 4XXXX	Add			Star address:	0	
	Write 0XXXX	Add			Address interval:	1	
	Write 4XXXX	Add			Quick publish:	Publish All to more	dbusTCP server
	Message	counct	601				
	CATEGORY TIM	SOURCE	CON	ENI			

Right-click the publish channel to manually add the MQTT channel and set the configuration parameters manually. Port number: 1883, connection mode: IP address, MQTT server IP: 192.168.1.50 (local machine network card IP address, the machine simulates the MQTT server).

💋 IOT gateway configuration software								
File View Tools								
Progect 👻 🖡	About MG-IOT01-0	DM Hostlink_1	MQTT	MG-IOT01-MB	Modbus_1	Modbus TCP	MQTT	×
▶ MG-IOT01-OM	Publish channel co	n <mark>fig /</mark> Publish	point config					
▲ MG-IOT01-MB	Server parameter							
 Collection channel 	Parameter name	Parameter value						
Modbus 1	Port	1883						
4 Publish shappel	Connection mode	IP Address 🔹						
	TLS enable	Disable •						
Modbus TCP	Server domain name	ServerHostName						
MQTT	Server IP	192.168.1.50						
	Device parameter							
	Parameter name Parameter value							
	Device name De	viceName						
Property 👻 🖡	Password Pa	ssword						
Search X	Client ID Cl	entID						
Command amount 0	Communication pa	rameter						
Channel description MQTT Channel type MOTT	Parameter name	Parameter val	Je					
	Session Sign	Hold	•					
	Requst timeout time(r	ms) 1000						
	Keep alive time(ms	3000						
	L							
	Message	_				_	_	_

📧 IOT gateway configuration software										
File View Tools										
Progect 👻 👎	About MG-IOT01	-OM Hostlink	1 MQTT	MG-IOT01-MB	Modbus_1	Modbus TCP	MQTT	×		
▶ MG-IOT01-OM	Publish channel co	onfig <mark>/</mark> Publ	ish point config							
▲ MG-IOT01-MB	Server parameter									
 Collection channel 	Parameter name	Parameter val	ue							
Modbus 1	Port	1883								
4 Publish shapped	Connection mode	IP Address	•							
	TLS enable	Disable	•							
Modbus ICP	Server domain name	ServerHostNam	e							
MQTT	Server IP	192.168.1.5	0							
	Device parameter									
	Parameter name Parameter value									
	Device name	DeviceName								
Property 👻 🎚	Password	Password								
Search ★	Client ID	ClientID								
Command amount 0	Communication parameter									
Channel description MQTT Channel type MOTT	Parameter nam	e Paramete	value							
	Session Sign	Hold	•							
	Requst timeout time	e(ms) 1000								
	Keep alive time(m	ns) 3000								
	L									
	Massaga	_			_	_	_	_		
	CATEGORY TIME	SOURCE	CONTENT							

Click Publishing Point config.

📕 IOT gateway configuration so	ftware										- 🗆	×
File View Tools												
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▶ MG-IOT01-OM	Publish channel co	onfig <mark>/</mark> Publish	point con	fig								
▲ MG-IOT01-MB	Publish point				Parameter			Relation col	lection po	bint		
Collection channel	Command name Pu	ublish point name	Operation	Сору	Parameter name	Param	eter value	Collection	channei	Command name	Collectio	n point
Modbus 1	MQTT publish	TopicName 1	Delete	Copy&Paste	Topic Name	TopicN	ame 1	Modbu	s_1	Read 0XXXX	С	Point 1
A Publish channel					Qos	0	•	Modbu	s_1	Read 0XXXX	с	Point 2
					Send mode	Cycle	•	Modbu	s 1	Read 0XXXX	с	Point 3
MQTT					Delay time(ms)	1000		Marilia	- 1		-	
					Data format	Json	•	woodu	s_1	Read UXXXX	C C	Point 4
Property • 1												
Search X												
Command amount 1 Channel description MOTT												
Channel type MQTT	4	_	_	•				Relation				
	Add publish point							Collection	channel	Modbus_1 🔻		
	Command name Op	peration						Collection	noint [.]	•		
	MQTT Subscribe	Add							point			
	MQTT publish	Add						Relation:	Relation	Relation all		
	4				,F							•
	Message											- û
	CATEGORY TIME	SOURCE	CONT	TENT								^

After configuring all collection points and publishing points, right-click MG-IOT01-OM and choose to download and configure to the gateway. After successful download, complete the data MQTT publish.

After completing the above settings, the MQTT client can use the MQTT.fx test software to access the gateway and access the collected data.

😳 MQTT.fx - 1.7.1			- 🗆 🗙
File Extras Help			
local mosquitto	Connect Disconnect		•
Pu Edit Connection Profiles			- 0
M2M Eclipse			
read local mosquitto	Profile Name	local mosquitto	
	Profile Type	MQTT Broker	NO.
	MQTT Broker Profile Settings		
	Broker Address	192 168 1 50	
	broker Port	1883	
	Client ID	MQTT_FX_Client	Generate
	General User Credentials	SSL/TLS Proxy LWT	
		,	
	Connection Timeout	30	
	Keen Aline Internet		
Topics	Clean Sersion		
ОДОТ	Auto Reconnect		
odot	Max Inflight	10	
read	MQTT Version	✓ Use Default	
		3.1.1 -	
-11			
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WQTT.fx - 1.7.1	- 0 ×	,
File Extras Help		Ŧ
local mosquitto	£ 🔴	l
Publish Subscribe Scripts Broker Status Log		
▼ Subscribe	QoS D QoS 1 QoS 2 Autoscrol 00*	ľ
TopicName 1 66 Dump Messages Mute Umsuburitie	TopicName 1 3 QQ50	
	TopicName 1 4 QoS 0	l
	TopicName 1 5 QoS 0	
	TopicName 1 6 Qos 0	
	TopicName 1 6 19-11-2019 11-40-25-42025937 Q650 { vycastant + - + 0****************************	
Topics Collector (1) Sam Step Otv	"aramas": { "CPoint 1": 1, "CPoint 2 : 0,	
read	<pre>CPOInt 4 * : 0 } 'CPOint 4 * : 0 'id * : 31359, "method" : "thing.event.property.post" }</pre>	
	激活 Windows	

8 Appendix

8.1 Siemens S7-200/200 SMART PLC Serial Wiring

PLC serial port supports RS485 interface.

PLC DB9 (female)

COM0 5 4 3 2 1 female	9pin DB9	Terminal	MG-IOT Gateway
9 8 7 6 0		No.	terminal definition
COM1	8 D-	 1/4/7/10	R/S-
• • · · • •	3 D+	 2/5/8/11	T/S+
	5 GND	 3/6/9/12	GND

8.2 Mitsubishi FX series PLC Serial Port Wiring

Mitsubishi PLC serial communication is RS422, so you need to open the shell of the gateway before testing, and change the position of the jumper wire as described in 2.4.

PLC MD8 interface is female. The figure below is the pin number of the male.

	8 MD8	Terminal	MG-IOT Gateway
08 07 06		No.	terminal definition
$\circ_5 \circ_4 \circ_3$	4 TX-	 4/10	R/S-
	7 TX+	 5/11	T/S+
	3 GND	 3/9	GND
•8 •7 •6	1 RX-	 1/7	R/S-
	2 RX+	 2/8	T/S+

8.3 Omron series PLC serial port wiring

Need to install a CP1W-CIF11 (485 communication module) in the PLC, this communication module has a DIP switch to set the communication method,

you need to dial 2, 3 to ON (RS485 method).



8.4 Delta DVP series PLC serial port wiring

Delta's DVP PLC serial communication is RS232, so before testing, you need to open the shell of the gateway and change the position of the jumper wire as described in 2.4.

The PLC MD8 interface is the female header, the figure below is the pin number of the male header.

08 07 06	8 pin	Terminal	MG-IOT Gateway
$\circ_5 \circ_4 \circ_3$	MD8	No.	terminal definition
$\circ_2 \circ_1$	4 RXD	 2/5/8/11	T/S+
	5 TXD	 1/4/7/10	R/S-
•8 •7 •6	8 GND	 3/6/9/12	GND

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