

Contents

1.	Get Ready	1
2.	Get Started	2
	2.1 Enable Data Collect of TG451	2
	2.1.1 Basic Setting	2
	2.1.2 COM port config	2
	2.1.3 Modbus Rules Setting	3
	2.2 MQTT Broker Server Setting	3
	2.3 IoT Sensor Setting	4
	2.3.1 Establish connection	4
	2.3.2 Define parameters	5
	2.3.3 Input value	6
	2.3 Open MQTT.fx client	7
	2.3.1 Edit connection profiles	7
	2.3.2 Start connect button	7
	2.3.3 Subscribe the topics	8
	2.3.4 Report data	8

How to get Modbus data in Json format via MQTT

This is a quick guide to show you how to get your Modbus data from your IoT sensor and convert it to JSON format, then transfer the data to cloud via MQTT.

1. Get Ready

- 1) Bivocom IoT Gateway TG451
- 2) MQTT broker and client
- 3) Modbus IoT sensor(in this case, we use a software to simulate a sensor to collect data)



2. Get Started

Make sure your Bivocom TG451 is online and successfully connect to 4G cellular network(How

to make TG451 online?)

After that, connect your TG451 LAN port to laptop's ethernet port via ethernet cable, and connect the RS232 cable to RX, TX and GND of the TG451, use a RS232 to USB converter to connect to your laptop. (If your laptop doesn't have DB9 RS232 port)

2.1 Enable Data Collect of TG451

2.1.1 Basic Setting

Choose the collect and report period time you want.

> View	Basic Setting			
> Setup	Daoio coning			
> Secure	Data Collect	Enable O Disable		
> VPN	Collect Period	20	Seconds	
> Advanced				
✓ Data Collect	Report Period	20	Seconds	
Basic Setting	5 11 0 1	-		
Interface Setting Modbus Pulos Sotting	Enable Cache	🔲 🍘 Cache History Data		
Server Setting				
Data query				+
> Administrate				Save & Apply 5
Logout				

2.1.2 COM port config

Enable the COM port of RS232, and configure the baud rate to communicate with your IoT sensor accordingly. COM port protocol use Modbus.



>	View	Interface S	Setting				
>	Setup						
>	Secure	COM1/RS485	COM2/RS2	32			
>	VPN						
>	Advanced		Enabled	Enable O Disable			
\sim	Data Collect		Baudrate	9600	~		
_	Basic Setting						
L	Interface Setting		Databit	8	~		
	Noabus Rules Setting IO Setting Server Setting		Stopbit	1	~		
>	Data query Administrate		Parity	None	~	Modbuskio	
Lo	gout	Fra	me Interval	20		🕐 ms	
		СС	M Protocol	Modbus	~		
		Comma	and Interval	1		😰 ms	

2.1.3 Modbus Rules Setting

Setting order device name, interface, factor name, device ID, etc.

> View> Setup	Modbus	s Rules	Settin	g									
> Secure > VPN	Modbus F	Rules									Con	figure import	and export
 Advanced Data Collect Basic Setting 	Order Device Name	Interface	Factor Nar	ne	Device ID	Function Code	Start Address	Count	Data Type	Reporting Center	Enable		
Interface Setting Modbus Rules Setting IO Setting	1 temp	COM2	temp1		1	3	0	1	unsigned 16Bits AB	1		Z Edit	E Delete
Server Setting Data query > Administrate	New Modbus	Rule											
Logout	Order	Device Name	Interface	Factor Name	Device	ID Fun Co	tion de A	Start ddress	Count	Data 1	Гуре	Reporting Center	
			COM1 ¥		0~255	0~25	0~6	55535	1~120	Unsigned	16Bits 🗸	1-2-3-4-5	Add
										Save 8	& Apply	Save	Reset

2.2 MQTT Broker Server Setting

Input your MQTT broker's server IP and port, and the topic you want to subscribe.



e			
	> View	Server Setting	
	> Secure	Server1 Settings Server2	2 Settings Server3 Settings Server4 Settings Server5 Settings
	> VPN > Advanced	Enabled	Enable O Disable
	 Data Collect Basic Setting 	Protocol	MQTT ~
	Interface Setting Modbus Rules Setting	Encapsulation Type	VISON Y
	Server Setting Data query	Server Address	MOTT server
	> Administrate	Server Port	1883
)	Logout	Heartbeat Interval	Seconds, 0 means Default Heartbeat
		MQTT Public Topic	iot/msand/test
		MQTT Subscribe Topic	
		MQTT Username	user01
		MQTT Password	pass01
		Client ID	88998899
		Enable TLS/SSL	
		Enable Self Defined Variable	
		Connection Status	CONNECTED

2.3 IoT Sensor Setting

In this case, we use software to simulate Modbus slave sensor

2.3.1 Establish connection

Choose the right serial port and parameters (such as baud rate) same as TG451 config in 2.1.2



-									_				
	Modbu	is Slave - Mb	slave1									-	\times
File	e Edit	Connection	Setup	Display	View	Window	Help						
C) 🗃 🖥	Connec	t	F3	2								
P		Disconr	nect	F4	-								
	2 IVIDSIA	Auto Co	onnect	>							_		
N		Quick C	Connect	F5	L 1						_		
F		A.1"		00000							<u>^</u>		
	_	Alias		00000									
			1 4										 0
-	Modb	us Slave - Mb	slave1									_	~
Fil	e Edit	Connection	Setup	Display	View	Window	Help						
] 🗁 🖥		- <u>e</u>	8 🕅									
	🛛 Mbsla	ive1									23		
Į) = 1: F	= 03		Connectio	on Setu	р				×			
11	lo conn	ection		Connec	tion					אר			
11		Alias		Serial	Port			~		Л	^		
lľ	0			Serial F	Port			3	Ca	ncel			
Ш	1			Modbu	s UDP/II	P							
lŀ	2			Modbu Modbu	s RTU O s RTU O	ver TCP/IP							
lŀ	3			9600 E	aud	Mode							
H	А			9 Data	bite	• RT							
H	4 c			00000	Dita	Flow C	Control	_					
H	2		_	Even F	Parity		R CTS	RTS To	ggle				
H	6		_	1 Stop	Bit	v 1	[ms] RTS d	isable delay					
H	7		_										
1	8		_	TCP/IP	Server								
	9		_	IP Addr	ess 11				Port 9001		~		
				127.0.0				×	3001				
				✓ Any	Address		IPv4						
				Igno	re Unit II		/IPv6						

2.3.2 Define parameters

Setting the parameters consistent with the web UI config of TG451 in 2.1.3



	Slave Definitio	n F8 2		
Mbslave1	Use as Default	t.		
ID = 1: F = 03	3			
Modbus Sla	ve - Mbslave1			- 0 >
ile Edit Con	nection Setup Display Vie	w Window Help		
0 🗃 🖬 🚳	🗖 🗏 🏚 🤋 📢			
Mbslave1			002	
ID = 1: F = 03		2		
No connection		3		
	Alias 00000	Slave Definition ×		
0	0	Slave ID: DK		
1	0	Function: 03 tolding Register (4x) V Cancel		
2	0	Address: 0		
3	0	Quantity: 10		
4	0	View		
5	0	10 0 20 0 50 0 100 0 Fit to Quantity		
6	0	Hide Alian Columns DRIC Addresses (Base 1)		
7	0			
8	0	Error Simulation		
9	0	Skip response Insett CRC/LRC error		
		0 [ms] Response Delay Return exception 06, Busy		

2.3.3 Input value

Input a value to simulate the data from IoT sensor

33 Modbus Slave - Mbslave1									
File Edit Connection Setup Display View Window Help									
📅 Mbslave1									
ID = 1: F = 03									
Alias	00000								
0	13								
1	14								
2	0								
3	0								
4	0								
5	0								
6	0								
7	0								
8	0								
9	0								

Then you can go to Data query to view the data on Web UI of TG451.

> View		
> Setup	Real-time data collection	
> Secure	temp2: 14	temp: 13
> VPN		
V Data Collect		
Basic Setting		
Interface Setting		
Modbus Rules Setting		
Server Setting		
Data query		
> Advanced		
> Administrate		
Logout		



2.3 Open MQTT.fx client

In this quick guide, we use MQTT client from https://www.jensd.de/

2.3.1 Edit connection profiles

Edit Connection Profiles			– 🗆 X
TR321 TR511	Profile Name	TR321	
	Profile Type	MQTT Broker	MQTT
	MQTT Broker Profile Settings	Í	Qu50 Qu51
	Broker Addres	. 227.152	the same to Web UI config
	Broker Por Client ID	1883 MQTT FX Client	Generate
	General User Credentials	SSL/TLS Proxy LWT	
		-	
	Connection Timeout	30	
	Clean Session	v	
	Auto Reconnect		
	Max Inflight	10	
	MQTT Version	✓ Use Default	
		8.1.1 *	
		Clear Publish History	
		Clear Subscription History	
+ -	Revert		Cancel OK Apply
+ -	Revert		Cancel OK Apply

2.3.2 Start connect button

- mag			
File Extras Help			
TR321	- O Connet Disconnect		🖬 💼
Publish Subscribe Scripts Broker Status	Log	green	
iot/msand/test	★ Subscribe	QoSO QoS1 QoS2 Autoscrol	



2.3.3 Subscribe the topics

File Extras Help					
TR321	- 🔅 Conne	Disconnect	t		₽
Publish Subscribe Scripts	Broker Status Log				
iot/msand/test	▼ Subscrib	<u>Ae</u>			Quốc Quốc Quốc Quốc Quốc Quốc Quốc Quốc
iot/msand/test			85	lot/msand/test	QoS
		Dump Messages	Mute Unsubscribe	iot/msand/test	e contra
				iot/msand/test	E Oos
				iot/msand/test	Oos
				iot/msand/test	QoS
				iot/msand/test	QoS
				iot/msand/test	Qo5
				iot/msand/test	
Topics Collector (0)			Sran Ston of -	13-01-2022 11-43:39.42219357	Q
Topics Conector (o)			Kell July wer	{ ts:1642045420344, pprms?{ tcmp?:14,"tcmp:13 }	

2.3.4 Report data

Then you can receive the data based on the topic you subscribe.

