

X2IEC104 User Manual

Shanghai Sunfull Automation Co., LTD

Singapore Milesgo IIoT Pte



Content

1 Preface	3
1.1 Disclaimer	3
1.2 Technical Support	3
1.3 Version History	3
2 Overview	3
2.1 Feature	
2.2 Operation Platform	
2.3 Application product models	5
2.4 Register types and numbers	5
2.5 Application Areas	5
3 Configuration and Operation	5
3.1 New Driver	6
3.2 New Channel	
3.3 New Device	11
3.4 New Tag	13
3.5 IEC104 Server	
3.5.1 IEC104 Setting	
3.6 Upload the project(Remote Gateway Monitor Mode)	20
3.7 Download the Project	
3.8 Local PC Monitor	23
4 Visit IEC104 Client	25
5 JS Script Editor	
5.1 Operation steps	
5.2 Function description	
5.2.1 ReadFromTag	35
5.2.2 WriteToTag	35
5.2.3 GetTagQuality	35
5.2.4 MoveValue	
5.2.5 GetTagBCD	
5.2.6 GetTagBCDR	37
5.3 Example	



1 Preface

1.1 Disclaimer

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1.2 Technical Support

- Email: support@opcmaster.com
- TEL: 021-58776098
- website: http://www.opcmaster.com/english/

http://www.bacnetchina.com/english/

1.3 Version History

Date	Version	Remark
2021.9.20	Sep 20 2021(Unicode)	English Version
2013.12.16	Dec 13 2013(Unicode)	Added Chinese Version

2 Overview

2.1 Feature

• X2IEC104 is a protocol gateway, X means different kind of

communication protocol, 2 means to. IEC104 means support standard



IEC104 electronic protocol. The software supports simulation test. Users can configure it according to the communication protocol of the onsite device and convert it to the standard IEC104 protocol. After PC simulation runs correctly, upload to hardware protocol conversion gateway. Note that the base addresses of the IEC104 registers at both the collecting and forwarding ends of the gateway start from 0.

• Working Principle: X2IEC104 as a communication bridge, it transfer different protocol to IEC104 Protocol. The upper computer system supporting IEC104 protocol can communicate with different devices through the hardware protocol gateway, convenient system integration.

• Advantage:

- 1. Green installation free, Easy to Configure and Operation,
- 2. Support JS scripts to achieve logical control.
- 3. Support Chinese and English switching, convenient operation.
- 4. User can simulator in PC monitoring mode by X2IEC104

5. The gateway has a built-in WEB server. Users can view real-time changing data and communication status through a browser, facilitating on-site debugging. In addition, you can also download the configuration software X2 IEC104 and engineering files.

6. Support different protocols to be converted to IEC104 protocols at the same time.

7. Analog gateway support linear conversion, support bit function, high and low byte exchange function.

2.2 Operation Platform

Support Windows XP/2000/2003/Win 7/Win8/Win Server 2003/Win
 Server2008/Win Vista



• WEB with above IE8 version, Opera, Safari of apple, Google

Chrome and firefox.

2.3 Application product models

IEC1001-ARM, IEC1002-ARM, IEC2004-ARM, IEC204-A9.

2.4 Register types and numbers

IEC104 Gateway support IEC104 server, support single point telemetry and Measure Float two register types. It's points are dynamically allocated, telemetry and telemetry support a total of 1024 points. Table 2-3-1 shows the range of different types of addresses.

Note: When configuring the project, ensure that addresses are arranged from small to large consecutively (do not leave any space in the middle) to improve the total call efficiency of the main station.

IEC104 Register Type	IEC2004 address	Register
Single Point	1-16384	
Measure Float	16385-20480	

Table 2-3-1 IEC104 register addresses table

2.5 Application Areas

Hardware Gateway IEC2004-ARM (2 Ethernet 4 RS485) support any protocols to IEC104 server. DDC, PLC, central air conditioning, precision air conditioning, elevator, fire control, lighting control system, electricity meter, water meter and other different on-site equipment used in building control and industrial control automation are integrated into the power system through IEC104 protocol.

3 Configuration and Operation

X2IEC104 is a configuration software that runs on the PC and is used to configure projects. After the project is configured, the software is uploaded to the hardware gateway.

First open and run the main program X2IEC104.exe. Enter the main program interface, click the View menu and choose "Language Settings", as shown in Figure 3-1.



🗅 🖼 🔚	Item Update Interval	X 16	🕨 🔳 🛠 👯 1	1	57				
⊞ <mark>Mod</mark>	Internal Tag JS Script Editor		Register Type	Register	DataType	Value	Quality	Timestamp	Туре
~	Clear Messages Log Errors Only Show Frame Frame Display Mode Save Log Bad Value	> >							
Date	Language Setting		()						
24/11/20 24/11/20	Toolbar Status Bar	Project 'D: Veb Serve							
	Explore to								
		_							

Figure 3-1 Selecting language Settings

Select language in the pop-up dialog box, as shown in Figure 3-2.

etting		×
Language:	英语(美国)	•
Default	中国(美国) 中文(简体,中国)	Cancel

Figure 3-2 Selecting language

3.1 New Driver

Click "Edit" of the menu bar to choose "New driver" or click on the toolbar icon

, open the Driver Properties window as the following figure 3-1-1.



	New Drive	r	🖻 🖻 🗙 🦓	🕨 🔳 🛠 🙀 🕻	†					
•	New Chan New Devic New Grou New Tag	n el e Ctrl+D p	tem ID	Register Type	Register	DataType	Value	Quality	Timestamp	Туре
	Cut Copy Paste Delete Batch Mod	Ctrl+X Ctrl+C Ctrl+V Del								
ate	Properties		Open Project 'D:							
24/1	1/2021	22:01:07	Local Web Serve.							

Figure 3-1-1 New Driver

In the pop-up window, Choose Driver Modbus RTU, As the below Figure 3-1-2.

Driver Properties X Driver List ModbusRTUClient -OK dbusRTUClient ModbusRTUServer Cancel ModbusRTU_GE_UPS ModbusRTU_TCPClient ModbusRTU_Thyssenkrupp_Elevator ModbusRTV_UDPClient ModbusTCPClient ModbusTCP_Thyssenkrupp_Elevator ModbusUDPClient Modbus_CNM Modbus_DAIKIN_IRACC Modbus_IEM3000 Modbus_Kent Modbus_Kone_Elevator Modbus_Kone_Elevator_ASCII Modbus_LCD Modbus_LDS Modbus_Otis_Elevator Modbus_PM800 Modbus_TG01W Modbus woyat

Figure 3-1-2 choose Driver

Input driver name in the name of the project, the default Scan Rate is 1000 milliseconds. Scan Rate can adjust the frequency of access to all devices. If the time required to access all the devices is greater than the set scan rate, this time is invalid. if the time required to access all the devices is less than the set scan rate, the waiting time needs to reach the set scan rate for the next visit. user can according to the actual situation, change the scan rate.



After finish adding driver, as the below figure 3-1-3.

	🚰 🖪 💣 🗇 🖆	' X 🖻 🖻 🗙 🦓	🕨 🔳 🛠 🙀 🗄	?			
⊞ ∰ Modbus R1	ru	Item ID	Register Type	Register	DataType	Value	Quality
		<					3
Date	Time	Event					
1 24/11/2021	22:01:07	Open Project 'D:					
1 24/11/2021	22:01:07	Local Web Serve					

Figure 3-1-3 Finish adding driver

3.2 New Channel

In the current driver, right click to select "New Channel" or click on the toolbar 🛃, As the following figure 3-2-1.

	I 🚰 🗒 🖆 🖬	📲 🕺 🖓 🖷 🖪 🗙	🍋 🕨 🔳 🛠 🗰 🛙	7			
± ∰ Modbus	RTU	Item ID	Register Type	Register	DataType	Value	Quality
	New Channel		M 1860 0040	10.0	2003 CON		
	Cut	Ctrl+X					
	Сору	Ctrl+C					
	Paste	Ctrl+V					
	Delete Del Properties						
			Properties				
	Explore to						
Date	Time	Event					
24/11/2021	22:01:07	Open Project	'D:				
24/11/2021	22:01:07	Local Web Se	erve				

Figure 3-2-1 New Channel

Add: 28 Senang Crescent,#05-11,Bizhub 28,Singapore 416601 Tel: +65 80385403 URL: www.bacnetchina.com milesgoiiot@gmail.com / sales@opcmaster.com



In the pop-up window, according to corresponding set by the driver communication protocol channel names can be arbitrary naming, As the following figure 3-2-2.

0000
9600
1 💌
None 💌

Figure 3-2-2 Set communication parameters

Since the acquisition terminal is intended to collect data from Modbus slave stations, so the setting of the setting of serial communication parameters should be consistent with the parameters in Modbus Slave.

When communication is normal, response timeout set longer does not affect communication speed. If the response speed of the device is relatively slow, it is recommended to set up a bit longer to avoid communication failure, As the following figure 3-2-3.



	III (# III))))))))))	X <u>२० 👘 ► </u>	🗙 🛄 🛗
Modbu	sRTU	Item ID	Register Type
⊕ ⊴ Cha	nnel_1		
	Serial Port Communication Configurati	ion [Devices:1]	×
	Channel Name		
	jenamer_i		
	Communication Farameters		-
	rort. COM1 -	Baud Kate: 9600	
	Data Bits: 8 💌 s	Stop Bits: 1	•
	Parity: None Flow	v Control: None	1
			-
	Response Timeout: 1500 ms		
Modbus	lave - Mbslav1		
le Conne	tion Setup Display View Windo	w Help	
	🛋 🗖 🗏 🗛 🧖 😡		
	Balla a la superior de la superior d		
Mbslav			
Mbslav	Connection	×	
Mbslav D = 1 To conne	Connection	~	
Mbslav D = 1 C conne	Connection Port 2 T RTV C AS	SCII OK	
D = 1 O conne 0001 = 0002 = 0003 =	Connection Port 2 V Node 9600 Baud V	SCII OK Cancel	
Mbslav D = 1 O conne 00001 = 00002 = 00003 = 00004 =	Connection Port 2 V Port 2 V C AS 9600 Baud V Ignore Unit	SCII OK Cancel ID	
Mbslav D = 1 lo conne 40001 = 40002 = 40003 = 40004 = 40005 =	Connection Port 2 Bode RTU C AS Bodo Baud Buata bits Flow Control	SCII OK Cancel ID	
Mbslav D = 1 C conne 40001 = 40002 = 40003 = 40004 = 40005 = 40005 = 40006 = 40007 =	Connection Connection Port 2 V Hode • RTU C AS 9600 Baud • Blata bits Flow Control None Parity • DSR CTS	SCII OK Cancel ID	
Mbslav D = 1 C conne 0001 = 0002 = 0003 = 0004 = 0005 = 0006 = 0007 = 0008 =	Connection Port 2 9600 Baud 8 Data bits Flow Control None Parity 1 Star Bit KTS Toggle	SCII OK Cancel ID 5 1 [ms] RTS disable	

Figure 3-2-3 Channel parameters are consistent

After finish adding the channel, As the following figure 3-2-4.



	🖻 🛄 📽 🔟 🖺	ן א 🕫 🖪 🗙 👘	å 🖷 🕫 🗙 № ► 📕 🛠 🗰							
⊡-∰ ModbusRTU ⊡-∰ Channel_1		Item ID	Register Type	Register	DataType	Value	Quality			
		<								
Date	lime	Event								
1 24/11/2021 1 24/11/2021	22:01:07	Local Web Serve.	N							

Figure 3-2-4 finish adding Channel

3.3 New Device

In the current Channel, Right-click to choose "New Device", or click on the toolbar

, As the following figure 3-3-1.

🗅 🖻 🗐 🎟	I 🖻 🛄 🎬 🚳 🖬	1 X 🖻 🐔	X 🌆	🕨 🔳 🛠 🙀 🕯	†			
ModbusR	TU	Item ID		Register Type	Register	DataType	Value	Quality
in sa ch	New Device	Ctrl+D						
	Export EXCEL		-					
	Cut	Ctrl+X						
	Сору	Ctrl+C						
	Paste	Ctrl+V						
	Delete	Del						
	Properties							
Date 24/11/202	Explore to		oject 'D:					
24/11/2021	22:01:07	Local \	Web Serve					

Figure 3-3-1 New Device

In the pop-up window set device properties , As the following figure 3-3-2.



Vevice Properties		×
Name:	Device_1	
Device ID:	1	
Delay Between Polls:	50	ms
Delay After Write	50	ms
2 Bytes Integer Order:	21	
4 Bytes Integer Order	4321 💌	
4 Bytes Float Order	4321 💌	
Bulk Transfe	r	
Analaog Ad	ljacent Span: 4	
Anals	og Max Span: 32	
Bir	ary Adjacent 4	
	we Have Server 104	

Figure 3-3-2 Device Properties

In order to improve the communication speed, the packet register communication can be realized under the continuous register address. When the device does not support packet communication, the parameters of the group package should be set to 0. In addition, when the response time of the device is slow, you can set the time interval between the data frame and the frame (that is Delay Between Polls). The default of Delay Between Polls is 100 microseconds. As the following figure 3-3-3.

2 Bytes Integer Order, 4Bytes Integer Order, and 4 Bytes Float Order means the combination of integer or floating point byte order, the default is 4321. These parameters are used in combination with field devices for data transmission.For example, some meters adjust the sequence of high and low byte in the transmission of data, which will be used at this time. The default parameters are generally used, As the following figure 3-3-3.



Name:	Device_1	
Device ID:	1	
Delay Between Polls:	50	ms
Delay After Write:	50	ms
Bytes Integer Order:	21 💌	
Bytes Integer Order:	4321	
4 Bytes Float Order:	4321 4312 3421	
-Bulk Transfer	3412	
Analaog Adj Analao	2143 1243 1234	
Bina	ry Adjacent 4	
Binar	y Max Span: 64	



After finish adding the device, As the following figure 3-3-4.

🗅 🐸 🖌 🎟	🏓 🗒 💕 🗊	' 👗 🖻 🖻 🗙 🌆	🕨 🔳 🛠 👯 🏌	†			
	U	Item ID	Register Type	Register	DataType	Value	Quality
	ice_1	<					
Date	Time	Event					
1 24/11/2021	22:01:07	Open Project 'D:					
1 24/11/2021	22:01:07	Local Web Serve					

Figure 3-3-4 finish adding device

3.4 New Tag

In the current Channel, Right-click to choose directly add tag (also add group first, and then new tag in the group), or click on the toolbar **1**, As the following figure 3-4-1.



🗅 🖨 🖬	🇊 🖪 🗒 💕 🗊	X 🖻	B × 16	🕨 🔳 🛠 🙀 1	†			
🗆 🗊 Modb	usRTU	Item	ID	Register Type	Register	DataType	Value	Quality
i⇔ ⊒ Cha i⊸ <mark>⊞</mark>	annel_1 Device 1		_					
	New Group		-					
	New Tag							
	Export EXCEL Import EXCEL							
	Cut	Ctrl+X						3
Date	Сору	Ctrl+C						
1 24/11/: 1 24/11/:	Paste Delete	Ctrl+V Del	Project 'D: Web Serve					
	Properties							
	Explore to		-					

Figure 3-4-1 New Tag

Or right-click on the right side of the edit box blank space, add a new tag. As the following figure 3-4-2.

	s 🛄 🗳 🚺 🖆	1 % 🖻 🖻 X 1	🐚 🕨 🔳 🖓 🗰 1	P		62	
🗆 🗊 ModbusRT	Ū	Item ID	Register Type	Register	DataType	Value	Quality
⊡ ु⊒ Channe ⊡ <mark>⊞</mark> Dev	l_1 ice_1		New Tag				
		<					
Date	Time	Event					
A 24/11/2021	22:01:07	Open Project	D:				
24/11/2021		1 1 1 1 1 1					

Figure 3-4-2 New Tag

In the pop-up window, Set the parameters of collection and transfer(IEC104 Server), As the following figure 3-4-3.



Name: Sipol		OK
Description:		Cancel
Data Type: Boolean	-	
Register Type: OX(Coil Status)-F5	•	
egister Address: 1		
Seele		
State		
Enable Setting		
Enable Setting		
State Setting		
ansfer(IEC104 Server)		
Source Enable Setting Sansfer(IEC104 Server) Type: Single Point(1-16384)		

Figure 3-4-3 Tag Properties

In the tag properties pop-up window ,fill in the Name, Description, Data type, register, Register Type, Register address etc. As above figure, a register address of collection end is 40001, data type is Word.

The supported type of registers are 0X, 1X, 3X, 4X. For the 0X and 4X register types, 0x (Coil Status) -F5 and 4x (Holding Register) -F6 are generally chosen by default. A write function code Behind the bar line.

Click "Scale", You can do the linear transformation, and two minimum value is invalid, you just need to set a maximum. To expand 100 times, Raw Data is set to 1, Engineer Date can be set to 100. As the following figure 3-4-5.



Tag Process Settings	
Conversion	
Offset: 0	1
-Raw Data	-Engineer Data
Min: 0	Min: 0
Max: 1	Max: 100
	福完 取消



After finish adding a tag, As the following figure 3-4-6.

	🖪 🖪 💕 j	률 🗗 🕷	, e e	🗙 🌆 🕨 🗉 🛠 🗱 😫					
🖃 🗊 ModbusRT	U	Item ID		Register Type	Register Address	DataType	Value	Quality	Timestamp
🖻 🖪 Channe	_1	Sine1		0X(Coil Status)-F5	3	Boolean		Uncertain	
Dev.	ice 1	D Sine2		0X(Coil Status)-F5	3	Boolean		Uncertain	
		Sine3		3X(Input Register)	4	Boolean		Uncertain	÷ + +
		Sine4		4X(Holding Register)-F16	6	Boolean		Uncertain	
		Sine5		4X(Holding Register)-F16	6	Boolean		Uncertain	
		Sine6		4X(Holding Register)-F6	9	Boolean		Uncertain	
		Sine7		4X(Holding Register)-F6	9	Boolean		Uncertain	
		Sine8		4X(Holding Register)-F6	9	Boolean		Uncertain	
		<							>
Date	Time		Event						^
24/11/2021	22:42:18		'Modbu	sRTU.Channel_1.Device_1.Sine5	o'iec104 register ty				
24/11/2021	22:42:18		'Modbu	sRTU.Channel_1.Device_1.Sine6	o'iec104 register ty				
24/11/2021	22:42:18		'Modbu	sRTU.Channel_1.Device_1.Sine7	"iec104 register ty				
				and at the second second second					

Figure 3-4-6 finish adding a tag

You can continue to add steps one by one, and suggest using the copy and paste of the toolbar. Select a tag to copy, click the copy button in the toolbar, or choose the copy on the right button, or use shortcut key Ctr+C and Ctrl+V.

It can also be edited in the EXCEL table, and then edit the engineering point by



importing excel and exporting excel functions.

Right-click the device to choose "Export Excel", As the figure 3-4-8. Save as xls

file.

New Group	•
New Tag	
Export EXCE	L
Import EXCE	L
Cut	Ctrl+X
Сору	Ctrl+C
Paste	Ctrl+V
Delete	De
Properties	
Explore to	

Figure 3-4-8 Export EXCEL

Save the completed, open the EXCEL for editing, As the figure 3-4-9.

0		9-(4-)	Ŧ.	Device_1.xls	[兼容模	式] - Mi	crosoft Ex	cel	-	-		×
	プロサ	台 插入	页面布局	公式 数	据	审阅	视图					⊜ x
彩	● ▲ いい ・ いい いい ・ いい いい ・ いい いい ・ いい ・ いい ・ いい ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・	Arial BIU ···································		 三 三		常规	* * *	A ¥式	計● 插 計● 删 開格: 单元	入 + Σ · 除 + ■ · 式 + ② · 格	▲ 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一	找 和 择→
	D7		• (• fx									×
	A	В	(C		D	E		F	G	Н	-
1	ID	Name	RegType		RegA	ddress	DataType	BA	CnetTy	BACnetAd	Descriptio	n 🗖
2		1 test1	4X(Holding R	egister)-F6	1		Word		1	0		
3								_				
4												
6												=
7	17				-		1	-				
8	14											
9												
10			-				-	-			-	
11								_				
12								-				
14					2							
		boot1	7		_				100			N.I.
前台	*	meeti / Co			_	_		n	1009	X (A)		•
-3963									100		~	

Figure 3-4-9 Open the EXCEL

After editing the Excel file, As the figure 3-4-10.

17 / 40

Add: 28 Senang Crescent,#05-11,Bizhub 28,Singapore 416601 Tel: +65 80385403 URL: www.bacnetchina.com milesgoiiot@gmail.com / sales@opcmaster.com



0	20	3 9	- (2 -)	Ŧ	Device_1.xls	兼容模	式] - Mie	crosoft E	xcel	-	A.M.		×
		开始	插入	页面布局	公式 数	据	审阅	视图				🥝 –	e x
影	。 跳 whto	× 1	Arial BBIU ⊡ ▼ <mark>③</mark> ⇒	• 10 • • A A • • A •	■ = = = = = = = = = = = = = = = = = = =		常规	* % 5	A 样式	計● 插 計● 删 開 格 単元	入▼ Σ ▼ 除▼ 』 ▼ 式▼ 2 ▼ 格	▲ 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一	找 和 择▼
		F12		, (*)	£						-		*
		Ą	В		С		D	E		F	G	Н	E
1	ID		Name	RegType		RegA	ddress	DataTyp	be BA	CnetTy	BACnetAd	Descriptio	n 🔒
2		1	test1	4X(Holding	Register)-F6		1	Word		1	0		
3		2	test2	4X(Holding	Register)-F6		2	Word		1	1		
4		3	test3	4X(Holding	Register)-F6		3	Word		1	2		
5		4	test4	4X(Holding	Register)-F6		4	Word		1	3		-
6		5	test5	4X(Holding	Register)-F6		5	Word		1	4		
7		6	test6	4X(Holding	Register)-F6		6	Word		1	5		
8													
9													
10													
11									-		2		
12													
13													
14													-
14	• • •	Sh	eetl 🦯	7						111			
就约	者							E		1009	% 😑		+ ,;

Figure 3-4-10 Edit the EXCEL

Back to X2BACnet software, Right-click the device to choose "Import Excel", find the edited Excel file to import. As the following figure 3-4-11.

New Group	
New Tag	
Export EXCEL	
Import EXCEL	
Cut	Ctrl+X
Сору	Ctrl+C
Paste	Ctrl+V
Delete	Del
Properties	
Explore to	

Figure 3-4-11 Import EXCEL

The import is complete, the following figure 3-4-12.



	🖻 🖪 💕	🗊 😭 👗	B (2)	🗙 🌆 🕨 🗉 🛠 🗱 😫					
🖃 🗊 ModbusRT	U	Item ID		Register Type	Register Address	DataType	Value	Quality	Timestamp
🗄 🚰 Channel	_1	Sine1		0X(Coil Status)-F5	3	Boolean		Uncertain	
Device_1		D Sine2		0X(Coil Status)-F5	3	Boolean		Uncertain	
		Sine3	-	3X(Input Register)	4	Boolean		Uncertain	H
		Sine4		4X(Holding Register)-F16	6	Boolean		Uncertain	
		Sine5		4X(Holding Register)-F16	6	Boolean		Uncertain	
		Sine6		4X(Holding Register)-F6	9	Boolean		Uncertain	
		Sine7		4X(Holding Register)-F6	9	Boolean		Uncertain	
		Sine8		4X(Holding Register)-F6	9	Boolean		Uncertain	
		<							>
Date	Time		Event		10000				^
24/11/2021	22:42:18		'Modbu	sRTU.Channel_1.Device_1.Sine!	5'iec104 register ty				
24/11/2021	22:42:18		'Modbu	sRTU.Channel_1.Device_1.Sine	5'iec104 register ty				
24/11/2021	22:42:18		'Modbu	sRTU.Channel_1.Device_1.Sine	7'iec104 register ty				
24/11/2021 22:42:16 Modbu		RTU Channel 1 Device 1 Sinel	Siec104 register by						

Figure 3-4-12 Complete the import

3.5 IEC104 Server

3.5.1 IEC104 Setting

The default port number of the IEC104 server is 2404, and the default public address is 1. If no special requirements are set for other parameters, use the default values. If users need to change, they can click "IEC104 Server" and select "IEC104 Settings" as shown in Figure 3-5-1-1.

	🗊 🖪 📙 📙	IEC104 9	Setting						
🗉 🇊 Modbus	RTU	Sort Rec	gister Address)e	Register Address	DataType	Value	Quality	Timestamp
🖻 🚰 Chan	nel_1	D Sine I	UX(COILS	tatus)-F5	3	Boolean		Uncertain	
Device_1		D Sine2	0X(Coil S	tatus)-F5	3	Boolean		Uncertain	
		Sine3	3X(Input	Register)	4	Boolean		Uncertain	
		Sine4	4X(Holdi	ng Register)-F16	6	Boolean		Uncertain	
		Sine5	4X(Holdi	ng Register)-F16	6	Boolean		Uncertain	
		Sine6	4X(Holdi	ng Register)-F6	9	Boolean		Uncertain	
		Sine7	4X(Holdin	ng Register)-F6	9	Boolean		Uncertain	
		Sine8	4X(Holdi	ng Register)-F6	9	Boolean		Uncertain	
		< No. 100							>
Date	Time		Event						

Figure 3-5-1-1 IEC104 Setting

19 / 40 Add: 28 Senang Crescent,#05-11,Bizhub 28,Singapore 416601 Tel: +65 80385403 URL: www.bacnetchina.com milesgoiiot@gmail.com / sales@opcmaster.com



In the displayed dialog box, set the IEC104 server parameters, as shown in Figure 3-5-1-2.

IEC104 Server Setting		×
Port:	2404	
Common Address:	1	
ASDU-Addr. (Byte):	2	
COT.(Byte):	2	_
Info Addr. (Byte):	3	_
T1 (S) :	1	
T2(S):	10	
T3(S):	30	
K :	20	
¥:	2	

Figure 3-5-1-2 IEC104 Parameter Setting

3.6 Upload the project(Remote Gateway Monitor Mode)

Before uploading project, we must ensure that the monitoring mode is Remote Gateway mode, and the specific mode switching operation is as follows.

- on the menu bar , monitor mode under the tool need to be chosen "Remote Gateway".
- Double click the "Monitor Mode" of the status bar at the bottom of the software can also switch monitoring mode.

After Configuring the project, the project can be uploaded to the hardware gateway(IEC2004-ARM) to debug by starting monitor.

If the project is modified, it is necessary to upload the project to the gateway for debugging until there is no problem, finally monitor by hardware gateway.

Click "Gateway" on the menu bar to choose "Upload " or click on the toolbar ^{‡‡} to upload the project, as the Figure 3-6-1.



	œ ∽ œ G	N 🖽 🧄		ŭ P	1	1		1
🗆 🇊 Modbu	ISRTU	Item ID	Register Type	Unload ster Address	DataType	Value	Quality	Timestamp
🗄 🚰 Cha	nnel_1	D Sine1	0X(Coil Status)-F5	3	Boolean		Uncertain	
L. III. I	Device_1	Sine2	0X(Coil Status)-F5	3	Boolean		Uncertain	
		Sine3	3X(Input Register)	4	Boolean		Uncertain	
		Sine4	4X(Holding Register)-F16	6	Boolean		Uncertain	
		Sine5	4X(Holding Register)-F16	6	Boolean		Uncertain	
		Sine6	4X(Holding Register)-F6	9	Boolean		Uncertain	
		Sine7	4X(Holding Register)-F6	9	Boolean		Uncertain	
		Sine8	4X(Holding Register)-F6	9	Boolean		Uncertain	
		-						
		<						>
Date	Time		Event					

Figure 3-6-1 Upload the project

In the pop up dialog box enter the gateway IP address, click the "Upload", As the Figure 3-6-2.

Upload Project	×
IP Address: 192.168.1.88	Ping
Project Path: D:\工作文件夹\products\网关产品\凌动网关30\X2IEC104\X2IEC1	Upload

Figure 3-6-2 Upload

After uploading, the pop-up dialog prompt succeed to upload, As the Figure 3-6-3.

If uploading is failed, it will also pop up the failure prompt box.



Figure 3-6-3 Succeed to upload

Note: the IP address of the gateway must be correct.

the default gateway IP address is 192.168.1.88, the IP address of PC to set up to

21/40

Add: 28 Senang Crescent,#05-11,Bizhub 28,Singapore 416601 Tel: +65 80385403 URL: www.bacnetchina.com milesgoiiot@gmail.com / sales@opcmaster.com



the same network segment, the project can be uploaded after successfully Ping.

After uploading the project, click the menu bar "Tools" to select "Start Monitor" or click the toolbar icon ,you can see real time data on the device. As the Figure 3-6-4, The collected data is consistent with the slave simulated data.

Second Se	Server Web 5 P X Ib B New 10 @Tag,1	lerver Gateway Help × (ib) ► ■ (大 東 M Register Type	Thursday 14									-
1 ar 68 a	herr 10	× (ib) ► ■ ☆ at M Register Type	Leader et	_								
	Tag,1	Register Type		1 m 1 m	Test		La h	Le.	I man to make to the	Table 14	Transformer:	
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39	Tan 2	ONICO2 Status) 25		Boolean	0.1048	-	Good	2018-06-2171	80	0	-	
	Tag 3	080Coll Status)-#5	1	Boolean	0 10/7	_	Good	2018-06-2171_	ev.	0	5	
	Clag.4	40(Holding Register)-16	4	Word	44 (degrees-cels	[mild	Good	2018-06-2171_	Al	0	6	1.6
	Cost S	40(Holding Register)-F6	5	Word	35 (degrees-celo	sive)	Good	2018-06-2171_	AD	0	6	1
	6 Del 1	40(Holding Register)-F6	6	Word	6		Good	2018-06-2171_	AV	0	6	
12	STag.7	40(Holding Register)-F6	7	Word	777		Good	2018-06-2171_	MSI	0	6	
- 23	STag,8	40(Holding Register)-F6		Word	88		Good	3018-06-3171_	MIO	0	.6	
3	BTag.9	Billing Baginton He	-	and a second			Good	2018-06-2171_	MSV	0	6	
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						ad more	IDEN SARVE - NO	onara minata an	int de la de	-		
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ne .	forst			1.0		Protos and				-		
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24.16	Modbus	RTU.Channel_LDevice_1.000.051	01 01 01 90 4B			00001	* 1					
24:16	Modbus	RTU.Channel_1.Device_1.(TX) 01 (03 00 03 00 06 35 0	CIE		000002						
24.16	Modbus	RTU.Channel_1.Device_1.(R0) 011	03 00 00 20 00 23	00 06 03 09 00	58 00 09 71 36					_		
2437	Modbut	RTU.Channel_1.Device_1.(TX) 01	01 00 00 00 03 70	08		DM	L'ester 1					
2417	Modbut	RTU.Channel_L.Device_1.000.01	01 01 01 90 48			20.0	4	_		_		
2437	Modbus	RTUChannel_LDevice_11TX) 011	03 00 03 00 06 35 0									
2437	Modbus	RTUChannel_LDevice_1.000.01	03.00.00.20.00.23	00 00 03 04 00	28 00 09 11 16	40004						
24:18	Modbus	RTULAnnel, LDevice, 111X) 011	of on on on on the	-		40005	- 25					
2418	Modbus	RTUCKannel LDevice 1000 01	05 05 05 90 48	-		40004						
24.18	Madau	STUCKannel Device 1 (80) 011	13 00 03 00 00 33 1	00.04.03.00.00	51 IT 00.00 TI	10007	- 177					
34.10	Modbut	STUChannel 1 Desire 1 (700 01)	1.00.00.00.03.20	NE 04 03 04 00	NE VA VE 74 80.	40000						
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34.10	Modhur	STUChannel L Desire 1/70/01	12 40 40 10 10 10 10	CB		and the second		and all the	haranda 1	-		
24-19	Modbut	RTU Channel 1 Device 1 (800 01)	03 OC 00 2C 00 23	00 06 03 09 00	58 00 09 71 36	0	555 - A-1-2-2-1	and the	Con a range			10
	** 2416 2416 2416 2417 2417 2417 2417 2418 2418 2418 2419 2419 2419 2419 2419	re Event 2415 Modbar 2415 Modbar 2419 Modbar 2419 Modbar 2419 Modbar 2419 Modbar 2419 Modbar	Ing., 6 Adjecting Regimented Ing., 7 Adjecting Regimented Ing., 7 Adjecting Regimented Ing., 8 Tag., 8 Ing., 7 Adjecting Regimented Ing., 7 Adjecting Regimented Ing., 8 Tag., 8 Ing., 7 Adjecting Regimented Ing., 7 Adjecting Regimented Ing., 7 Adjecting Regimented Ing., 8 Tag., 8 Ing., 7 Adjecting Regimented Ing., 7 Adjecting Reginged Ing., 7	Tag,0 40,1Holding Register)-16 0 Tag,1 40,Holding Register)-16 7 Tag,1 40,Holding Register)-16 8 Tag,0 40,Holding Register)-16 8 Tag,0 40,Holding Register)-16 8 Tag,0 10,Holding Register)-16 8 Tag,0 Modbull/Lineare],Lineare],10,0000000000000000000000000000000000	Tag,0 40,160.dog Register)-6 0 Word Tag,7 40,160.dog Register)-6 1 Word Tag,8 Tag,9 40,160.dog Register)-6 1 Word Tag,9 40,160.dog Register)-6 1 Word 1 Tag,9 10,116.dog Register)-6 1 Word 1 Tag,9 10,116.go Register)-6 1 Word 1 All 10,116.go Register)-6 1 Word 1 All 10,116.go Register)-6 1 Word 1 All 10,116.go Register)-6 1 1 1 1 All ModbusRTU.Channel, L.Device, 1,1700 01 01 00 00 03 7C 08 1	Fig.0 40/100/mg/segister/-16 0 Wordt 0 Tig.0 40/100/mg/segister/-16 0 Wordt 88 Tig.0 40/100/mg/segister/-16 8 Wordt 88 File Exercit 8 Wordt 88 All Modbas/TU/Darred_Libre/co.1/100 01 01 00 00 01 7C 08 9 9 9 All Modbas/TU/Darred_Libre/co.1/100 01 01 00 00 00 17C 08 9 9 9 9 All Modbas/TU/Darred_Libre/co.1/100 01 01 00 00 00 17C 08 9 <	Ing.0 Add/Holding Register/16 C Word 0 Ting.7 Add/Holding Register/16 C Word 88 Ting.7 Add/Holding Register/16 S Word 88 Ting.7 Add/Holding Register/16 S Word 88 Ting.7 Add/Holding Register/16 S Word 88 Ting.9 Add/Holding Register/16 S Word 88 Add/Holding Register/17 Add/Holding Register/17 Add/Holding Register/17 Add/Holding Register/17 Add/Holding Register/17 Add/Holding Register/17 Add/Holding Register	Eng.0 Add(holding Regime)-160 0 Word 0 Tag.0 Add(holding Regime)-160 0 Word 87 Good Tag.0 Add(holding Regime)-161 B Word BB Good Good Tag.0 Add(holding Regime)-161 B Word BB Good Good Tag.0 Add(holding Regime)-161 B Word BB Good Good Tag.0 Add(holding Regime)-161 B Word BB Cood Good Add(holding Regime)-161 B Word B Correct(nr.9) D D D D D D D D D D D D D D	Bits_0.7 Addressing Negetter)-16 C Wordt 0 Used 2018-06-2111. Good Good 2018-06-2111. Good Weight Modisal Modis	Imp.0 Addressing Register/46 0 Word 0 00001 2018-06-2171_ AV Imp.0 Addressing Register/46 0 Word 85 00001 2018-06-2171_ AV Imp.0 Addressing Register/46 0 Word 85 00001 2018-06-2171_ AV Imp.0 Addressing Register/46 0 Word 85 00001 2018-06-2171_ AV Imp.0 ModustR1U Channel L Device, 1470 01 01 00 00 00 017 06 00001 00001 100001 00001 100001 00001 100001 00001 100001 00001 100001 00001 100001 00001 100001 00001 100001 00001 100001 00001 100001 00001 00001 100001 00001 100001 00001 00001 100001 00001 100001 00001 00001 100001 00001 100001 00001 100001 00001 00001 100001 00001 100001 00001 00001 00001 100001 00001 100001 00001 000001 000001 00001<	Tag,0 Allfelding Register/16 0 Wordt 0 Tag,1 Allfelding Register/16 1 Wordt 177 Tag,0 Allfelding Register/16 1 Wordt 18 Good 2018-06-111 Mill 0 Good 2018-06-1211 Mill 0 Mill 0 0 0 0 0 0 0 Mill 0 0 0 0 0 0 0 0 0 0 0 0	Frg. J Altholder jaguster/H0 S Word Fr Good 2018-06-111L MU 0 6 Frg. J Altholder jaguster/H0 S Word BI Good 2018-06-111L MU 0 6 Frg. J Altholder jaguster/H0 S Word BI Good 2018-06-111L MU 0 6 Frg. J Altholder jaguster/H0 S Word BI Good 2018-06-111L MU 0 6 Frg. J Altholder jaguster/H0 S Word BI Good 2018-06-111L MU 0 6 Frg. J Altholder jaguster/H0 S Word BI Good 2018-06-111L MU 0 6 Frg. J Altholder jaguster/H0 S Word BI Good 2018-06-111L MU 0 6 Altholder jaguster/H0 Multical jaguster/H0

Figure 3-6-4 Remote gateway monitor

3.7 Download the Project

Before uploading project, we must ensure that the monitoring mode is Remote Gateway mode, and the specific mode switching operation is as follows.

- on the menu bar , monitor mode under the tool need to be chosen "Remote Gateway".
- Double click the "Monitor Mode" of the status bar at the bottom of the software can also switch monitoring mode.

Download project is to download the last configuration project from the hardware gateway to PC, and edit the project and view real-time data on the PC to facilitate user debugging. Click on the "Gateway" choose "Download ", user name: admin, password: admin123456. As the Figure 3-7-1.



X2IEC104 - D	emo.x2i	104 Serve	r Web Server	Gateway Help				9 <u>77</u> 9	D X
	A . C	🗊 😭 🐰		Setting	1				
	U	Item ID	Reg	Download	legister Address	DataType	Value	Quality	Timestamp
🖻 🚰 Channel	L1	Sine1	0X(Ci Upload		Boolean		Uncertain	
Devi	ice_1	Sine2	0X(Comparation) - piload		Boolean			Uncertain	
	-	Sine3	3X(nput Register)	4	Boolean		Uncertain	
		Sine4	4X(Holding Register)-F16	6	Boolean		Uncertain	
		Sine5	4X(Holding Register)-F16	6	Boolean		Uncertain	
			4X(Holding Register)-F6	9	Boolean		Uncertain	
		Sine7	4X(Holding Register)-F6	9	Boolean		Uncertain	
		Sine8	4X(Holding Register)-F6	9	Boolean		Uncertain	
		<							>
Date	Time		Event						
0 24/11/2021	22:58:12		Succeed to li	nk IEC104 type!					
24/11/2021 22:58:12 24/11/2021 22:58:12			Single Point r	egister number:9					
Download r Moni	Download r Monitor Mode:Remo			88 Total Items:9 Valid	Items:1024 www.opcr	naster.com 1	3564889340	support@opcm	aster.com

Figure 3-7-1 Download Project

In the pop up dialog box enter the gateway IP address, can be downloaded from the gateway of the current project, as the Figure 3-7-2.

ModbusRTU Channel1 Device1 Download Project IP Address: 192-168-1-88 Ping DownLead	DataType Value Quality	Ti
Download Project X IP Address: 102.168.1.68 Ping DownLead		
Date Time Event		
① 2025-06-23 11:29:12 打开工程'E:\msg\		
11:29:12 本地WEB服务器的		
11:54:04 Succeed to link I		

Figure 3-7-2 Download Project

Users can also through the WEB server log in to the gateway, download the project.

3.8 Local PC Monitor

After completing the project configuration, click the menu bar "Tools" to select

"Start Monitor" or click the toolbar icon >, as shown in figure 3-8-1 below. It will start



the X2BACnetRunTime.exe program. User only need to start the program in the

background to realize the function of gateway conversion on PC.

🗅 🖻 🖬 🎯	Monitor	r Mode	> }	🗙 🌆 🕨 🛯 🛠 🛱 😫					
🖃 🗊 ModbusRTl	Start M	onitor		Register Type	Register Address	DataType	Value	Quality	Timestamp
🗄 🚰 Channel	Stop M	onitor		0X(Coil Status)-F5	3	Boolean		Uncertain	
🛄 Devi	b. t.			0X(Coil Status)-F5	3	Boolean		Uncertain	
	Device		1	3X(Input Register)	4	Boolean		Uncertain	
	Group		>	4X(Holding Register)-F16	6	Boolean		Uncertain	
	Tag		>	4X(Holding Register)-F16	6	Boolean		Uncertain	
L		AJ Sine6		4X(Holding Register)-F6	9	Boolean		Uncertain	
		Sine7		4X(Holding Register)-F6	9	Boolean		Uncertain	
		Sine8		4X(Holding Register)-F6	9	Boolean		Uncertain	
		<							>
Date	Time	Ev	rent						
24/11/2021	22:58:12	Su	icceed	to link IEC104 type!					
24/11/2021	22:58:12	Si	ngle Po	oint register number:9					

Start monite Monitor Mode:Remote GateWay 192.168.1.88 | Total Items:9 | Valid Items:1024 | www.opcmaster.com 13564889340 support@opcmaster.com //

Figure 3-8-1 Start Monitor

X2IEC104RunTime run successfully. We can view the running log .As the Figure 3-8-2.

	······		0.000 X	
Settting Licence	Log			
Date	Time	Event		
24/11/2021	23:01:24	Licence is invalid, Welcome		
24/11/2021	23:01:24	Succeed to Load 'D:\工作文		
24/11/2021	23:01:24	Web Server Listening Port:81		

Figure 3-8-2 Log

Return procedure monitoring interface, can see some real time data on the device

and the data on the interface is consistent, As the Figure 3-8-3.



X2IEC104 User Manual

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Modbu	ISRTL Ite	em ID		Regi	ister Type	Register A.	Data	аТуре	Value	Quality
🖻 🚰 Cha	innel 👩	test1		4X(H	lolding Register)	1	Wor	rd	223	Good
	Device_1	test2		4X(H	Iolding Register)	2	Wor	rd	1	Good
2. Tota -	A	test3		4X(H	Iolding Register)	3	Wor	rd	44	Good
	Â	test4		4X(H	Iolding Register)	4	Wor	rd	0	Good
	A	test5		4X(H	Iolding Register)	5	Wor	rd	97	Good
	Â	test6		4X(H	Iolding Register)	6	Wor	rd	0	Good
	A	test7		4X(H	Iolding Register)	7	Wor	rd	0	Good
		Sector State								
		test8		4X(⊢	Iolding Register)	8	Wor	rd	567	Good
Monitor M	ہ م ode:Loca	test8 test9 I PC Total	Items:	4X(F 4X(F 10 Val	Holding Register) Holding Register) III id Items:1024 www	8 9 w.opcmaster.o	Wor Wor om 135	rd rd i6488934	567 0 0 support@op	Good Good F ocmaster.com
Monitor M	د مde:Loca	test8 test9 I PC Total	Items:	4X(F 4X(F	Holding Register) Holding Register) III id Items:1024 ww	8 9 w.opcmaster.o	Wor Wor om 135	rd rd i6488934	567 0 0 support@op	Good Good P ocmaster.com
Monitor M 10. – 1 10001 =	ode:Loca	test8 test9 I PC Total 40011	Items:	4X(F 4X(F 10 Val	Holding Register) Holding Register) III id Items:1024 www 40021 =	8 9 w.opcmaster.o	Wor Wor om 135 =	rd rd 6488934	567 0 0 support@op	Good Good
Monitor M D - 1 0001 = 0002 =	+ + + + + + + + + + + + + + + + + + +	test8 test9 I PC Total 40011 40012	Items:1	4X(F 4X(F 10 Val	Holding Register) Holding Register) III id Items:1024 www 40021 = 40022 =	8 9 0.0pcmaster.0 0 40031 0 40032	Wor Wor om 135 = =	rd rd 6488934 0 0	567 0 0 support@op	Good Good
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Monitor M 	• • • • • • • • • • • • • • • • • • •	test8 test9 I PC Total 40011 40012 40013 40014 40015	Items: = = = =	4X(F 4X(F 10 Val 0 0 0 0 0	Holding Register) Holding Register) iii id Items:1024 www 40021 = 40022 = 40023 = 40023 = 40024 = 40025 =	8 9 0 40031 0 40032 0 40032 0 40033 0 40034 0 40035	Wor Wor om 135 = = = = =	rd i6488934 0 0 0 0 0	567 0 0 support@op	Good Good
Monitor M D - 1 10001 = 10002 = 10003 = 10004 = 10005 = 10006 =	• • • • • • • • • • • • • • • • • • •	test8 test9 I PC Total 40011 40012 40013 40014 40015 40016	Items:: = = = = =	4X(F 4X(F 10 Val 0 0 0 0 0 0 0	Holding Register) Holding Register) III id Items:1024 www 40021 = 40022 = 40023 = 40023 = 40024 = 40025 = 40025 =	8 9 0 40031 0 40032 0 40033 0 40034 0 40035 0 40036	Wor Wor om 135 = = = = = =	rd i6488934 0 0 0 0 0 0 0	567 0 0 support@op	Good Good
Monitor M 1001 = 10002 = 10003 = 10004 = 10005 = 10006 = 10007 =	• • • • • • • • • • • • • • • • • • •	test8 test9 I PC Total 40011 40012 40013 40014 40015 40016 40017	Items: = = = = =	4X(F 4X(F 10 Val 0 0 0 0 0 0 0	Holding Register) Holding Register) III id Items:1024 www 40021 = 40022 = 40023 = 40023 = 40024 = 40025 = 40025 = 40026 = 40027 =	8 9 0 40031 0 40032 0 40033 0 40034 0 40035 0 40036 0 40037	Wor Wor om 135 = = = = = = = =	rd 6488934 0 0 0 0 0 0 0	567 0 0 support@op	Good Good
Monitor M (D - 1 10001 = 10002 = 10003 = 10004 = 10005 = 10006 = 10007 = 10008 =	• • • • • • • • • • • • • • • • • • •	test8 test9 40011 40012 40013 40014 40015 40016 40017 40018	Items:1 = = = = = =	4X(F 4X(F 10 Val 0 0 0 0 0 0 0 0 0 0	Holding Register) Holding Register) III id Items:1024 www 40021 = 40022 = 40023 = 40023 = 40024 = 40025 = 40025 = 40026 = 40027 = 40028 =	8 9 9 0 40031 0 40032 0 40033 0 40034 0 40035 0 40036 0 40037 0 40038	Wor Wor om 135 = = = = = = = = = = =	rd 6488934 0 0 0 0 0 0 0 0 0 0	567 0 0 support@op	Good Good
Monitor M 100 - 1 10001 = 10002 = 10003 = 10004 = 10005 = 10006 = 10006 = 10007 = 10008 = 10008 = 10009 =	• • • • • • • • • • • • • • • • • • •	test8 test9 40011 40012 40013 40014 40015 40016 40017 40018 40019	= = = = = =	4X(F 4X(F 10 Val	Holding Register) Holding Register) III id Items:1024 www 40021 = 40022 = 40023 = 40023 = 40024 = 40025 = 40025 = 40026 = 40027 = 40028 = 40029 =	8 9 9 0 40031 0 40032 0 40033 0 40034 0 40035 0 40036 0 40036 0 40036 0 40036	Wor Wor 0 m 135 = = = = = = = = = = = =	rd 6488934 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	567 0 0 support@op	Good Good
Monitor M 	• • • • • • • • • • • • • • • • • • •	test8 test9 40011 40012 40013 40014 40015 40016 40017 40018 40019 40020	= = = = = = = = =	4X(F 4X(F 10 Val	Holding Register) Holding Register) III id Items:1024 www 40021 = 40022 = 40023 = 40024 = 40025 = 40025 = 40026 = 40027 = 40028 = 40029 = 40030 =	8 9 9 0 40031 0 40032 0 40033 0 40034 0 40035 0 40036 0 40036 0 40036 0 40036 0 40036 0 40036	Wor Wor 0 135 = = = = = = = = = = = = =	rd 6488934 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	567 0 0 support@op	Good Good

Figure 3-8-3 Successful Communication

4 Visit IEC104 Client

(1) Use the IEC test software (IEC870-5-104 Simlator) to access X2IEC. The test process is as follows. First, start the IEC test software (IEC870-5-104 Simlator) and establish the corresponding master station, as shown in Figure 4-1.



Datitled - IEC 870-5 - <u>F</u> ile <u>E</u> dit <u>V</u> iew Device Sector	1 04 Simulat o r Tag <u>H</u> elp	ι Γ				
🗋 🗁 🔛 🏅	K	P +				?
IEC 870-5-104 Master	Nama	Kam	nta IP	Fort		
	IEC 870-5-1	04 Master	Properties			
	Name	Master1				
	IP Address	127 . 0	. 0 . 1	Can	cel	
	Port	2404	-			
	GI Period	20	(seconds)			
	TimeSync	0	(seconds)			
		Auto create	tag from Interroga	ation respons	e	
Ready					NUM	_ //

Figure 4-1 IEC Client access

(2) Set the Port number (Port) to 2404, set the preceding X2IEC slave station parameters to the same, set the public number to 1, set the preceding X2IEC slave station parameters to the same. See Figure 4-2.

Configuratio	on File.sim -	IEC 870-5-	104 Simul	ator			0 23
		Sector		, r	+		
E- IEC 870	or / CAASDI	er J Propertie	s	and a			Acti
(+)44 IE4	Name	Sector 1			ОК		
	Sector	Enable			Canc	el	
			Ĩ				
					ш		,
Ready						1	1

Figure 4-2 Public Address is 1

(3) Add Tag, as the below figure 4-3



📑 Untitled - IEC 870	-5-104 Simula	itor	_ 🗆 🗙
<u>F</u> ile <u>E</u> dit <u>V</u> iew Device S	Tag Properti	es	
IEC 870-5-104 Master Master1 Sector1 IEC 870-5-104 Slave	Name Type SBO IOA IOA Structure Ar	Tag1 Single Status Direct Operate Direct Operate I 0 1 0 1 1 0 1 1 0 1 1 1 0 1 <	Cancel
Ready			NUM

figure4-3 Tag

(4) Click IEC870—5—104 Simlator " Privation", You can read the value of single point remote data, 1, which is on, and then change the value of this point in the OPC server to 0. It can be seen that the relevant data value in the IEC master station changes from ON to OFF, indicating that X2IEC104 has successfully converted ModbusRTU into IEC slave station.



PPE OPC2IEC104	– Un	titled.oti						<u> </u>	
<u>F</u> ile <u>E</u> dit <u>V</u> iew	Tools	s IEC60875 Web VB Sci	ript W	atchDog <u>H</u> e	lp				
🗋 🖻 🖬 🛫	ď e	, 🖻 🖁 🖁 🖌							
🖃 📹 KEPware. KI	PServ	Item ID		Data Type	Value	Regist	Point Number	Timestamp	Qu
🔤 Group	L I	Channel_4. Device_5. SI	hort_1	Short	12581	短浮点遥测	0	20:39:59:484	Go
		Channel_4. Device_5. T	ag_1	Boolean	0	单点遥信	0	20:21:36:234	Go
		Channel_4. Device_5. W	ord_1	Word	12581	短浮点遥测	1	20:39:59:484	Go
Date 2013-9-15 2013-9-15		IEC 870-5-104 Master Master1 Sector1 IEC 870-5-104 Slave	Noma Tagl	Tw Si:	na ngle	IIIa 111a X++ 0 0/0/0	Valna Um Off Go	aiıtw Tımartamn od 2013-09-1	*
0 2013-9-15			<					>	~
Ready	Ready							INUM	

(5) Change the value of channel_4.device_5.tag_1 on the OPC server to 0, and the data whose address is 0 in the IEC remote variable also changes from on to OFF, as shown in Figure 4-5.

PES OPC2IEC104	l – Un	titled.oti									
<u>F</u> ile <u>E</u> dit <u>V</u> iew	r <u>T</u> ool:	s IEC60875 Web VB So	cript W	atchDog <u>H</u>	élp						
🗅 🖼 🖬 🐋	í 🗳 🖬	j 🗗 👗 🖻 🖻 🗙									
🖃 📹 KEPware. K	EPServ	Item ID		Data Type	e Value	. 18	Regist	Point Numb	er	Timestamp	Qu
🔄 Group	1	Channel_4. Device_5. S	Short_1	Short	12926	3	豆浮点遥测	0	;	20:40:37:250	Goi
		Channel_4. Device_5. 1	[ag_1	Boolean	1		单点遥信	0	3	20:40:21:703	Gov
		Channel_4. Device_5. #	ford_1	Word	12926	\$	短浮点遥测	1	:	20:40:37:250	Gov
		IEC 870-5-104 Master	Nama			1114		Valua	Linal 1 tw	Timestamn	
Date 2013-9-15 2013-9-15		IEC 870-5-104 Slave	Iagi	51	ngie	U	0/0/0	Un	0000	2013-09-1	
2013-9-15			<u> </u>							>	~
Ready	Ready									NUM	1

5 JS Script Editor

Hardware gateway also has JS script editor. Users can achieve some logic control by editing script language. There are some common functions in the script editor. The user can select some functions to edit the language. After the editor is complete, click



"Syntax Check", and the syntax will be checked automatically. If there are any grammatical errors, it will prompt which specific line of grammar has problems.

5.1 Operation steps

Click the menu bar view to select the JS script editor, or click the toolbar to open the script editor, as shown in figure 5-1-1.

🗅 🖼 🛛		Item Update Interval		🗙 [🌆 📘 🖌 🚆 👹					
∃ 🗊 Mo	d	Internal Tag		Register Type	Register Address	DataType	Value	Quality	Timestamp
ė 🚰	С	JS Script Editor		0X(Coil Status)-F5	3	Boolean	0	Uncertain	
			-	0X(Coil Status)-F5	3	Boolean	0	Uncertain	
		Clear Messages		3X(Input Register)	4	Boolean	0	Uncertain	
		Log Errors Only		4X(Holding Register)-F16	6	Boolean	0	Uncertain	
	~	Show Frame		4X(Holding Register)-F16	6	Boolean	0	Uncertain	
		France Director Marda		4X(Holding Register)-F6	9	Boolean	0	Uncertain	
		Frame Display Mode	,	4X(Holding Register)-F6	9	Boolean	0	Uncertain	
		Save Log		4X(Holding Register)-F6	9	Boolean	0	Uncertain	
		Bad Value	>						
		Language Setting							
	~	Toolbar							
	~	Status Bar							>
Date		Explore to							^
24/11/	2021	23:01:22	Succee	d to link IEC104 type!					
24/11/	2021	23:01:22	Single	Point register number:9					
24/11/	2021	23:01:22	X2IEC1	04RunTime is stop!					
24/11/	2021	23:01:24	X2IEC1	04RunTime is running now!					

Figure 5-1-1 Open JS Script editor

Right click on the script editor to choose "New JS Script", as shown in figure 5-1-2.

ID	JS Script	Description	Execute Cycle	
		New Delet Modi	JS Script e JS Script fy JS Script	

Figure 5-1-2 New JS Script

Open to see JS editing script, as shown in figure 5-1-3 below.

29 / 40

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Execute Typ	e: Cycle	▼ Execute	Cycle(ms):	1000	5		Cance
if	else	else if	switch	for	while	var	
>	<	>=	<=			88	
1	<u>a</u>	>>>		_	~	=	
+	?	*	1	11			
KeyBoard	. Fun	ction In	nternal Tag	. External ?	Iag Synt	ax Check	
1		1	2	3		4	

Figure 5-1-3 JS Script Editor

1. Function

Users can choose different functions to implement logical functions. See the 5-2 chapter for specific functions. As shown in figure 5-1-4.

e (ms): IC /itch (<=	000 for == // External	while	var && = 	k .	Cancel
ritch	for == ^ // External • • • • •	while	var && = 		0 2
<= / al Tag 0 1	== ^ // External	II Tag Syr	atax Check		
//J. TagtID01	// // External	 Tag 		k	
/	// External	 Tag] Syr	""	k	
al Tag	External Function	Tag Syr	ntax Check	k	0 2
t ID 0 1	▼) Functi				0 2
t ID 0 1	• Functi				Ω Σ
t ID 0 1	• Functi				
t ID 0 1	Functi				
t ID 0 1) Functi				
0	C	ion Parameter	1	Parameter	Туре
1	Source	e Tag Name	1	In	
	Destin	nation Tag Nam	ne .	ln	

Figure 5-1-4 select Function

2. Internal Tag



Users can use the "Internal Tag" function to build a new variable and related functions, used to receive or store variable data, such as taking the current value of Tag, and mapping to a new internal variable. In the script editor, click the "Internal Tag", or In menu bar click "view" to select "Internal Tag", open the window of Internal tag list. In the pop-up window, right click "New", as shown in figure 5-1-5.

Name: JS1	Description:							K
Xecute Type: Cycl	e 💌 Execute	Cycle(ms): 10	000				Car	ncel
if else	else if	switch	for	while	v	ur 🛛		
> <	>=	<=	==		8	ð.		
_ &	>>>	<<		~	-	-		
+ ?	*	1	//		"	"		
			1		- 25			
1 MoveValue(' 2 Internal Tag List	MODBUS-RTU.2	nternal Tag 2F.KT30.Comm	Externa Status');	l Tag Syn:	tax Che	ck		2
1 MoveValue(') 2 Internal Tag List 0 Item ID	Sunction III	2F.KT30.Comm DataType	External Status'); Value	BACnet Object	tax Che Type	ck BACnet	Instance	Nur
KeyBoard 1 MoveValue(': 2 Internal Tag List 0 Item ID 1 \$.MODBUS-RTU.2	Function Ir	2F.KT30.Comm DataType us Boolean	External Status'); Value	BACnet Object	tax Che Type	ck BACnet 7	Instance	X Nur
KeyBoard 1 MoveValue(': 2 Internal Tag List 0 Item ID 1 \$. MODBUS-RTU.2 2 Sum	Sunction Ir	DataType US Boolean DWord New	Externa Status'); Value	BACnet Object BI AI	tax Che Type	ck BACnet 7	Instance	Nur
KeyBoard 1 MoveValue(': 2 Internal Tag List 0 Item ID 1 \$.MODBUS-RTU.2 2 Sum	Sunction Ir	DataType 2F.KT30.Comm DataType us Boolean DWord New Cut Copy Paste	External Status'); Value	BACnet Object BI AI Ctrl+X Ctrl+C Ctrl+V	Type	ck BACnet 7 1	Instance	X Nun

Figure 5-1-5 New Internal tag

Note: in the above figure, there is an internal variable BI point that address is 7, which represents the communication state of the Device"KT30". at least one point is communicated normally under the device, the value of the internal variable is 1, if all the points under the device are not normal (that is, the device is off-line), this internal change The value of the quantity is 0. If there are currently N devices, it will automatically generate N internal variables. Users should avoid duplication of register addresses when configuring the project.

In the pop-up window, set the variable related properties. If you want to quickly view the current value of the internal variable, you can click the menu bar "view" option and select the "internal variable" to see the real time data in the pop-up window, as shown in figure 5-1-6.



🗅 🗳 🔒		Item Update Interval		XIO	~ 🕼 🕨 🖩	🛠 🙀 諸					
🗆 🗊 Mod		Channel List		1	em ID	Register Type	Register	DataType	Value	Quality	Timestam
🗄 🚰 C		Device List		Á	Sine1	4X(Holding Regi	1	Word		Uncertain	
ė- II		Device List		Á	Sine2	4X(Holding Regi	3	Word		Uncertain	
1		Internal Tag		Á	Sine3	4X(Holding Regi	5	Word		Uncertain	
		IS Script Editor		Á	Sine4	4X(Holding Regi	7	Word		Uncertain	
	-	so ochpe Editoria		Á	Sine5	4X(Holding Regi	9	Word		Uncertain	
		Clear Messages									
		Log Errors Only									
		Show Frame									
	Ť	Show Hand									
		Frame Display Mode	,								
		Save Log									
		Bad Value	>								
		Language Setting									
	~	Toolbar									
	~	Status Bar									
		Templete									
Date											
0 2025-06		Explore to Project		'E:\msa							
0 2025-06		Explore to Software		3服务器的	5						
0 2025-06	-23	11:54:04	Succeed	d to link							
A 2025-06	-22	11.54.04	Single D	Doint real							

Figure 5-1-6 Open Internal tag to check real-time data

Click on the internal variable, as shown in figure 5-1-7.

Inte	rnal Tag List			x
ID	Item ID	DataType	Value	BACne
61	\$.Simulator.Channel_1.Device_1.CommS	Boolean	1 [Online]	BI
-				

Figure 5-1-7 real-time data

3. external variables

In addition, users can also use relevant functions for logical control according to the changes in the data of external variables, such as different logical controls based on the range of numerical changes of an external variable. In the script editor, click "external variables", and double-click on a variable in the expanded variable table, as shown in figure 5-1-8.



JavaScr	ipt					- 84		23
Name: JS	51 D	escription:						OK
Execute 1	fype: Cycle	💌 Execu	te Cycle(ms):	1000			ſ.	ncel
if	else	else if	switch	for	while	var		uicer
>	<	>=	<=	=		8.8.		
	&	 >>			~	-	1	
+	?	*						
KeyBoard	1 Fund		Internal Tag	External Tag	g Synt	ax Check	1	
Select E	xternal Tag							23
		TD	TANK TD	Determine	PAC- 14 C	11. J	PAC- 14 T-	
51m	ulator Channel 1		T 2	Uatalype	AO	Jbject lype	A DALNET IN	stance
	Device 1		Tag_3	Word	λ0		4	
			Tag_t	Word do	ublink:	to coloct o	Suternal	tan
			Tag 6	Word		to select a	9	tag
		1 5	Tag 7	Word	AO		12	
		6	Tag 8	Word	AO		13	
		1 7	Tag 1	Word	AO		0	
		1 8	Tag_2	Word	AO		1	
				III				
		S.1						
		Simulator	tag name Chennel 1 Devi	co 1 Tog 3		-		
		Dimdrator	. channer_1. bevi	ce_1.1ag_0				
1		1.						
			OK		Cancel			

Figure 5-1-8 select the external tag

4. grammar check

After completing the programming, users can check the grammatical error with the syntax check function, and give hints if the program has problems.

5. execution mode

- ♦ execution mode selection cycle, cycle (MS): 1000, which represents a script execution every 1000ms.
- change of execution mode. Roll call needs input. The following figure 5-1-9, which assigns the value of internal variable VarName_1 to the return Tag_3 and Tag, The initial value of the internal variable VarName_1 can be assigned to batch names.



JavaScript							
Name: JS1	D	escription:					N
Execute Typ	e: Change	💌 Tag Na	ne: [VarName_]	1			Cancel
if	else	else if	switch	for	while	var	
>	<	≻=	<=	==		88	
	æ	>>>	~~	•	~	=	
+	?	*	1	11		""	
KeyBoard	Fun	ction	iternal Tag	External 1	lag Synt	ax Check	
2 Move	Value('Var	Name_1','Simu	ulator.Channe	UI			
< [•	

Figure 5-1-9 change script

Note:

- In order to prevent the mistake, you can point out external variables, or internal variables in the script force box, double click to select a name and then copy it from the script box to the top name box.
- Only when the value of internal variable VarName_1 changes, can script be executed to save resources.
- execution mode selection timing, select a time point, after the arrival of this time,
 the implementation of the script. It can be applied to the timing switchgear.

Name: JS1	I)escription: [OK
Execute Typ	pe: AtTime	▼ OnTime	: 0:00:00 🕂				Cancel
if	else	else if	switch	for	while	var	
>	<	>=	<=	==		ð.ð.	
	a	>>	~~	•	~	=	
+	?	*	1	11		~~	
KeyBoard	. Fun	ction In	nternal Tag	. External ?	Iag Synt	ax Check	
2	eToTag('Sir	nulator.Chann	el_1.Device_1	L.BO.StartSto	p',1);		
2	eToTag('Sır	nulator.Chann	el_1.Device_1	L.BO.StartSto	p',1);		

Figure 5-1-10 timing switchgear

34 / 40

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5.2 Function description

The commonly used functions in the JS script editor are as follows:

Operating function

5.2.1 ReadFromTag

It is a value function from Tag.

Grammar:

Var szValue = ReadFromTag ("ModbusRTU.Channel_1.Device_1.tag_1");

5.2.2 WriteToTag

It is a write value to a Tag function, used to assign an external variable to a Tag, to perform a write operation on the device, or to assign a new internal variable to the user.

Grammar:

var szValue = 100;

WriteToTag('ModbusRTU.Channel_1.Device_1.tag_1',0); //write the value to the 'tag_1'

5.2.3 GetTagQuality

It is a quality stamp from Tag.

The results returned conformed to the OPC specification. That is, Good returns 192, Bad returns 0, Uncertainn is 64, indicating that the value is not assigned and has not been updated.

Var varQuality = GetTagQuality ('szTagName'); //where 'szTagName' is selected from external variables.

5.2.4 MoveValue

It is implements the transfer of source data to destination data and data transfer between different points.

Grammar:

MoveValue ('Source Tag Name', 'Destination Tag Name'); //Source Tag Name is



the name of the source data point, and Destination Tag is the destination data name. The parameters here can be either external variables or internal variables. As shown in figure 5-1-9.

MoveValue function application scenario:

(1) the gateway collection side can access and control each other (no matter what protocol can be interchanged).

Gateway acquisition gateway uses two COM ports to collect different ModbusRTU slave devices, one for collecting temperature points of air conditioning equipment, and one for collecting IO modules. According to the temperature of the air conditioner, the IO module is controlled by the output of a sound and light alarm, that is, the MoveValue function can be used for logical editing, and the data of two acquisition terminals are accessed and controlled by each other.

(2)use one internal variable point to control all external variables.

MoveValue ('internal variable', 'external variable 1' ');

MoveValue ('internal variable', 'external variable 2' ');

MoveValue ('internal variable', 'external variable 3' ');

MoveValue ('internal variable', 'external variable 4' ');

MoveValue ('internal variable', 'external variable n' ');

This is the realization that when the internal variables change, the external variable 1-N can change at the same time.

For example, if you change the temperature on the interface, the setting temperature of the N thermostat of the gateway will be changed together.

5.2.5 GetTagBCD

It is used to get the BCD code of a label.

Grammar:

Var mBCD = GetTagBCD ('szTagName');

If the single register (Word, Short) value is 4660 (0x1234), the GetTagBCDR function is used to get BCD data to be decimal number 1234.

If the double register (Dword, Long) value is 305419896 (0x12345678), the



GetTagBCDR function is used to get BCD data to be decimal number 12345678.

5.2.6 GetTagBCDR

It is used to get the BCD code of a tag, but the value is BCD code with high and low inversion.

Grammar:

Var mBCDR = GetTagBCDR ('szTagName');

	unction Type Function Name Output Description		ln iv		R .: D .	Proventer Trees		
runction lype	Function Name	output	Description		Function Farameter	farameter lype		
ag	GetTagBUD	int	Get BCD from tag	U	Tag Name	In		
ag	GetTagBUDK	lint	Get inverse BUD from tag					
ag	GetlagQuality	int	wet quality from tag	_				
ag	moveyalue P.JPT.	var	move value P.J	_				
ag	Cl	var	Class	_				
ystem	Sieep	Vold	Sieep	_				
ag 	nritelolag	0001	Sham a second diala	_				
ystem	arent	,014	Diton a message diatog	_				
				_				
				_				

figure 5-2-6-1 Get BCDR

If the single register (Word, Short) value is 4660 (0x1234), the GetTagBCDR function is used to get BCD data to be decimal number **3412**.

If the double register (Dword, Long) value is 305419896 (0x12345678), the GetTagBCDR function is used to get BCD data to be decimal number **56781234**.

For an example:

If you need to get the BCD code of Simulator.Channel_1.Device_1.Tag_1', assign it to T1. Get the Simulator.Channel_1.Device_1.Tag_2'inverse BCD code and assign it to T2. The code is shown as shown in figure 5-2-6-2.



JavaSci	ript				- Read			
Name: J	51 D	escription: 🗌						OK
Execute	Type: Cycle	💌 Execute	Cycle(ms):	1000				Cancel
if	else	else if	switch	for	while	var		
>	<	>=	<=	==		<u>aa</u>		
1	&	>>>		<u> </u>	~	=		
+	?	*	1	11		""		
KeyBoar	d Fun	ction In	iternal Tag	External	Tag Synt	tax Check		
1 v 2 w 3 v 4 w	ar mBCD=Get 'riteToTag('T1' ar mBCDR=G 'riteToTag('T2'	:TagBCD('Simu ,mBCD);// ass etTagBCDR('Si <mark>,mBCDR); //a</mark> e	ulator, Channe ign mBCD to imulator, Chan ssign mBCDR	_1.Device_ T1 nel_1.Devic to T2	1.Tag_1');//ge	et BCD code from	Tag_1 BCD code from Tag_2	2
•	III]					•

figure 5-2-6-2 Get BCD

Start monitor later, in the Internal tag list value display is as the figure 5-2-6-3.

X2IEC104 - Simulator.x2b *	-	-		PH18		44.65				X
<u>File Edit View T</u> ools BACne	et Server	Web Se	erver Gateway <u>H</u>	elp						
□☞日ョ≠∎♂∅	1 X	B 6 :	X íig 🕨 🔳 🖻	き論論						
🖃 🏢 Simulator	Item I	D	Register Type	Register Address	DataType	Value	Quality	Timestamp		BACne
🗄 🚝 Channel_1		_8	Ramp	8	Word	0	Good 2018-06-27		7T09:05	AO
Device_1	Tag	_7	Ramp	Ramp 7		0	Good 2018-06-27T09:05.		7T09:05	AO
	🚺 Tag	_6	Random	6	Word	84	Good	2018-06-2	7T09:07	AO
	🚺 Tag	_5	Random	5	Word	72	Good	2018-06-2	7T09:07	AO
	🚺 Tag	_4	Sine	4	Word	0	Good	2018-06-2	7T09:07	AO
	🚺 Tag	_3	Sine	3	Word	0	Good	2018-06-2	7T09:07	AO
	Tag	_2	Const	2	Word	4660	Good	2018-06-2	7T09:06	AO
	🚺 Tag	_1	Const	1	Word	4660	Good	2018-06-2	7T09:06	AO
		Inter	_	0 23						
		ID	Item ID		DataType	Value	BACnet Object Type BAC			ta
	-	D 1	 Simulator.Char 	mel_1.Device_1.CommS.	Boolean	1 [Online]	BI		D	
		2	T1		Word	1234	AI	(Dik I	_
		A 3	T2		Word	3412	AI		1	_
										_
		-								
										- 1
										•
Ready		∢ [m						· · /

figure 5-2-6-3 check BCD value

System function

The output string of alert () function is mainly used for debugging. The results returned are displayed on the log of Runtime.exe. It can also be displayed on the state of the web communication.

Grammar:

For example, the return value of the output quality stamp



Alert (varQuality.toString ());

The Sleep (1000) function is used for latency, indicating a delay of 1 seconds. Unit milliseconds.

5.3 Example

Open the script editor to reduce the current value of Tag "

Simulator.Channel_1.Device_1.Tag_1" by 20 times and map it to the internal variable T1.

var szValue=ReadFromTag('Simulator.Channel_1.Device_1.Tag_1');

var newValue=Number(szValue);//String strongly transformed integer

newValue=newValue*0.5;

WriteToTag("T3",newValue.toString());

The script editor supports all mathematical calculations, such as taking random numbers between 0-255.

Examples are as follows:

Var Rand = Math.round (Math.random () * 255);

Alert (rand.toString ());

Note: Excute Type represents how long the execution of a script!



JavaScript	D	escription:	-		in an an		
Execute Typ	e: Cycle	- Execute	Cycle(ms): 1	000			Cancel
if	else	else if	switch	for	while	var	
>	<	_≍	<=	==		<u>aa</u>	
1	&	>>>	«	• [~	=	
+	?	*		11		""	
KeyBoard		 ction In	nternal Tag	External 1		ax Check	
1 var 2 var 3 new 4 Write 5	szvalue=Re newValue= /alue=new\ atoTag("T3"	adFromTag('S Number(szVal /alue*0.05; ",newValue.to	simulator,Chani ue);//String str String());	nel_1.Devic	e_1.1ag_1'); formed intege	r	
(II						•	

Figure 5-3-1 script example

View the T1 real-time data under the internal variables in the View menu bar. As shown in figure 5-3-2.

- 40 et	and the second s	- X H0 P	► ■ 🛠	调整						
E Simulator	Item ID	Register	r Type	Register Address	DataType	Value		Quality		nestamp
🖻 👼 Channel_1	Tag_8	Ramp		8	Word	0	-	Good	203	18-06-27T17:42_
Device_1	Tag_7	ag_7 Ramp		7 1		0		Good	203	18-06-27717:42_
	Tag_6	Randon	n	6	Word	76		Good	20	L8-06-27T17:43
	Tag_5	Randon	n	5	Word	30		Good	203	18-06-27T17:43_
	Tag_4	Sine		4	Word	57		Good	203	18-06-27T17:43_
	Tag_3	Sine		3	Word	57		Good	20	L8-06-27T17:43_
	Tag_2	Const		2	Word	0	_	Good	201	L8-06-27T17:42_
	Tag_1	Const		1	Word	4660		Good	20	L8-06-27T17:42
		Intern	al Tag List	t i i i i i i i i i i i i i i i i i i i					22	
	-	ID	Iten ID	·		DataType	Valu	ur	BACnet C	
		1	\$. Sinul	ator. Channel_1. Devic	e_1. ConnS	Boolean	1 [0	nline]	BI	
		2	T1			Word.	1234		AI	
		3	T2			Ford	.0	_	AI	
		1	T 3			Yord.	233		AI	
	-			radu	and I	20.	tim			
	-	-		redu	ceai	5y 20	un	ies		

Figure 5-3-1 reduced by 20 times