

Wireless Modem

User Manual



E870-E1 Edge Collection Cloud IO Gateway

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Chapter 1 Product Description

1.1 Product introduction

E870-E1 is an Ethernet cloud IO gateway developed based on the communication protocol "Ebyte Cloud Device Communication Protocol" developed by our company. It can send commands to the device through the server to achieve control or acquisition functions, and open 4-way switch value acquisition on the device. .2-channel analog (0-20/4-20mA) acquisition, 2-channel A-type relay output, support multiple protocols (TCP, UDP, MQTT) access to the server, support heartbeat packet, registration packet settings;



At the same time, the product supports a variety of configuration methods and supports web platform;

Supports acquisition and control of edge RTU nodes, and can also be used as an RTU device to parse Modbus commands to acquire and control device IO;

Adopt industrial-grade design standards to ensure high reliability of the equipment.

1.2 Functional features

- Support "Ebyte Cloud Device Communication Protocol" open protocol ۲
- Support remote management of Ebyte cloud platform •
- Support edge acquisition and control 20 Modbus RTU data points •
- Support change reporting, periodic reporting and other reporting methods
- Supports adding edge computing formulas to upstream and downstream data
- Support Alibaba Cloud IoT model JSON protocol reporting
- Automatic 10/100M Ethernet interface •
- Support 4-way Socket independent connection to user-defined server
- Support TCPC, UDPC, MQTT3.1.1 protocol •
- Support registration package and heartbeat package
- Support various configuration methods such as Ebyte cloud platform, host computer, network, etc.
- Support the host computer to upgrade the device through the network and serial port •
- 2 analog inputs (0-20/4-20mA)
- 4-way switch input DI (dry contact) •
- 2-way switch output DO (A-type relay) •
- Support as an RTU device to parse the host Modbus RTU command to collect and control the IO of the control • device
- Industrial design supports -40~85°C working environment •

Chapter 2 Quick Use

[Note] This experiment needs to be carried out with the default factory parameters.

The following two methods are provided for quick access to the server, one is to access the Ebyte cloud platform by factory settings, and the other is to access the self-built server through the host computer configuration.

2.1 Devices Preparation

The following table shows the materials required for this test:

One computer, one E870-E1 (hereinafter referred to as "device"), one network cable, USB to RS485 converter, and several wires;

The most important thing is to need a routing environment that can access the Internet, otherwise the Ebyte cloud control device cannot be used;



2.2 Devices Connection

2.2.1. Connect Platform

Step 1: Connect the network cable to the device power supply (DC 8-28V) to ensure that the device can access the Internet normally;

Step 2: Use a browser to log in to cloud.ebyte.com, register and log in to the Ebyte cloud platform, and after successfully entering the platform:

①Click "Device Management" in the left column box

2 Click "Device Model", enter the Create Device Model, select "Add Device Model"

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O 设备实例	
8 场景管理	
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④ 设备运维	
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③Enter the relevant parameters, click "Add Slave", select "Ebyte Cloud IO", "Built-in IO", "E870-E1", enter the name of the slave, click "Save", and click "Confirm Add", you can create a device model.

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▲ 首页	首页 设备模型 🗙				
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直 报警联动		1 输入大关筛选	1 输入小关筛选	输入从机名称筛选	▲ 从机名称(*)
④ 设备运维		亿佰特云IO	内置10	E870-D1	内置点位
❷ 数据中心		Modbus云网关		E870-W1	
系統设置	<			E870-E1	
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(4) Click "Device Instance", enter and click "Add Device"

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8 场景管理		离线	厂区01		2022070600300002b6a2	dev02	未设置	未设置	

⁽⁵⁾The E870-E1 model created before "Device Model" select, then enter the SN code on the back of the device, fill in other parameters according to your own needs, and click "OK to add" to create the device.

▲ 首页	首页 设备模型 × 设备实例 ×
卫 设备监控	
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④ 设备运维	设备名称
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	0
	设备地址类型
	请选择设备地址关于
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⁽⁶⁾Restart the device, and when the STATE light of the device is always on, you can see that the device is online on the platform.

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O 设备实例		状态	设备模型		SN	设备名称	设备地址类型	设备地址
8 场景管理		在线	E870-E1		202207060030000186c1	E870-E1-DEV1	未设置	未设置

⑦Click "Device Operation and Maintenance", "Online Debugging" on the platform, and click "Debug" behind the device to enter the device debugging interface. Enter the corresponding command to control the device.

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O 在线	调试	校验位	NONE	~		
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		更多使用帮助,	,而由 读字开问步 读字配直参数开及这配直参数。 请参阅《亿佰特物联网平台在线文档 - 在线配置》相	关内容。	输入自定义配置服文 (JSON格式)	

⁽⁸⁾Or click "Device Instance" and click "Device Details" of the online device, you can see the information of the device data points in the device details, and you can read the data or operate the device on the interface.

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直 报警联动		状态	设备模型	S	N	设备名称	设备地址类型	设备地址					
④ 设备运维		在线	E870-E1	2	202207060030000186c1	E870-E1-DEV1	未设置	未设置				设备详情	重启修改
O 在线调试		商线	厂区01	2	022070600300002b6a2	dev02	未设置	未设置				设备详情	重启修改
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			MAC	MAC	字符	8	383B263E433A			未设置	读取	不可用	
		DI	DI4	D14	布尔	值	220			未设置	读取	不可用	
		DI	DI1	DI1	布尔	值				未设置	識取	不可用	
		DI	DI2	DI2	布尔	值	in 1			未设置	读取	不可用	

Finally, click the DO control button to execute the DO output to the device;

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U SOLO			DI	DI2	DI2	布尔值	T .	未设置	读取	不可用	
			DI	DI3	DI3	布尔值	-	未设置	读取	不可用	
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			DO	DO1	DO1	布尔值	я	未设置	不可用	πO	
				AI2	AI2	浮点数	-	未设置	读取	不可用	
			4	Al1	Al1	浮点数	**)	未设置	读取	不可用	

2.2.2. Connect to the self-built serve

Step 1: Connect the network cable and power supply (DC 8-28V) to ensure that the device and the PC are in the same local area network environment;

Step 2: Open the host computer, click "Search Device", "Basic Parameters" to configure the network and serial port parameters, the device uses dynamic IP by default, it is recommended to connect directly to the PC under the same router:

Line				Basic parameters	User link parameter	Ebyte	cloud parameters	device IO point	parameters
uß T	IF: 192.168.3.		Search	-Basic parameters				-	
	Device ID	Local IP	Gatew	SN	20220923003000024c9e		Version	9070-0-10	
	0	192.168.0.190	192.168	Local IP	192.168.3 .190		DHCP	Enable	~
				Getway	192.168.3 .1		Subnask	255.255.255.0	
				DWS server	192.168.3 .1		Reconnect time	7s	\$
				Boud rate	9600	~	word length	8	~
_				Parity	NONE	~	Stop bit	1	~
		53	Clear lor	Modbus slave adr	ess 1	4			

Step 3: Use "NetAssist" to build a user server:

			网络	周试助手			×
网络设置 (1)协议类型 TCP Server ▼	数据日志					Net	(Assist V5.0.2 🗇 🧘
 (2) 本地主机地址 [192.168.3.100 丈] (3) 本地主机端口 [8887 							
美闲 接收设置	im						
← ASCII ④ HEX ▼ 按日志模式显示	<						~
☑ 接收区自动换行 □ 接收数据不显示	数据发送	客户端: 「	All Connection	s (0)	•	◆断开	√清除 1/1 清除
□ 接收保存到文件 自动滚屏 清除接收	1						
友送设置 ○ ASCII ⓒ HEX							安选
✓ 转义符指令解析 ① □ 自动发送附加位 □ 打开文件数据源 □ 孫环(甲期) □ ns							友达
 · ················· ······	ar BC trl +Ente	ar键发送, Shi	ft+Enter回车操行	i 0/0	RX:0	TX	:0 复位计数

Step 4: Fill in the correct server parameters and configure it as TCP client mode, destination address, destination port, etc., as shown in the following figure:

IP: 192.168.3.90 Image: Constraint of the second s	Basic parameters CH1 CH2 CH3 Gatew 92.166 link switch	User link parameter Eby CH4	te cloud parameters devia	re IO poi	int pe	ar an e
Device ID Local IP C 0 192.168.0.190 12	Gatew 92.168 CH1 CH2 CH3 Channel parameter link switch	CH4				
0 192.168.0.190 19	92.168 link switch	5				
0 192.168.0.190 1	92.168 link switch					
		open				
	Net worknode	TCP alient	Data report goda Ebuta in			~
	Remote in	192 168 3 100	bata report modei	on		
	Remote nort	8887	Local port 8880			
			-			
	Mqtt parameters					
N	MQTT server	MQTT standerd ~	MQTT Keepalive 120s			\$
2.	ClientID	test-iot				
V Clear	r log UserName	1234/all				
	Password	123456789			1	
	Subscribe topic	all/\${ID}/sub		QOS	0	~
	Fublish topic	all/\${ID}/pub		QOS	0	~
	Registration Para	meters				
	Registration swit	ch Close	~			
	Use Customize	🗌 Use device	MAC 🗌 Use veri:	sion		
	Customize the cor	tent register message				

Step 5: After configuring the parameters, save and restart. When the STATE light is always on, the device has been connected to the server platform normally, waiting for the device edge to collect parameters to report.

			网络调	武助手			→ 4 - □ ×
网络设置	数据日志					NetAssi	st V5.0.2 🗇 🗘
TUP Server ▼ (2) 本地主机地址 [192.168.3.100 ▼ (3) 本地主机端口 [3687	[2022-09-2 [2022-09-2 {"msgId":" {"b01":0}}	7 11:35:43. 7 11:35:49. 49709523454	090]# Client 192.16 227]# RECV ASCII FR 915445", "sn":"20220	8.3.161:8880 gets 3M 192.168.3.161 7060030000186 <i>6</i> 1 <i>",</i>	: online. :9890> "method":"device.	state. autoUp", "	bizContent":
▶ 按日志模式显示	<						· · ·
▶ 接收区自动换行	, ***#******	定 白油	All Consections (1)		#FII [*
送你数据不显示 下 接收保存到文件		167/73mg -	ALL COMPOLIONS	17		1017T V	
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▼ 转义符指今解析 ①							发送
□ 自动发送附加位							
□ 打开文件数据源 □ 循环周期 0 ms <u>快捷指令</u> <u>历史发送</u>							
☞ 就绪!				2/0	RX:222	TX:0	夏位计数

2.2.3. AI Analog input connection



Figure 7 Schematic diagram of AI acquisition connection

2.2.4. DI Switch input connection





2.2.5. Relay output connection



DO output connection diagram

2.3 Use of transparent transmission

Select channel 1 to configure TCP/UDP transparent transmission, fill in the target server parameters, select TCPC mode, target address 192.168.3.100:8887 (users can configure it as their own IP server), target port 8887 (if using their own IP, fill in the corresponding The port of the server) and other parameters remain default, click Exit Configuration to enter the transparent transmission mode.

El Ebyte Ethernet Cloud IO config tool v1.0 Menu language about				2	2	
本地IP: 192.168.3.90 V Q Search	Basic parameters CH1 CH2 CH3	User link parameter CH4	Ebyte cloud parameters devic	e IO po	int p≈	ramet <i>é</i> l's)
Device ID Local IP Gatew 1 0 192.168.0.190 192.166	- Channel parameter link switch	s open				
	Net workmode Remote ip	TCP client 192.168.3.100	∨ Data report mode NONE			~
	Remote port	8887	the bocal port <u>8880</u>			_
	Mqtt parameters	MOTT standerd	MOTT Keepalive 120s			•
	ClientID	test-iot				
log:	UserName Password	1234/all 123456789				-
	Subscribe topic	all/\${ID}/sub		QOS	0	~
	Publish topic	all/\${ID}/pub		QOS	0	\sim
	Registration Para Registration swit	meters :ch Close	vice MAC	ion		
	Customize the cor	itent register message		. 61	بر الا	

Connect the RS485 interface, open the serial port assistant (XCOM) and the network debugging assistant (NetAssist), and directly send the transparent data "E870-E1 TSET", which can be used as a serial port server:

XCOM V2.6	1000		×		网络调试助手	ŝ	₩ - □ ×
[2022-09-27 11:42:30.669] TX: E870-EL_TEST [2022-09-27 11:42:30.061] RX: E870-EL_TEST [2022-09-27 11:42:33.195] RX: E870-EL_TEST [2022-09-27 11:42:34.379] TX: E870-EL_TEST [2022-09-27 11:42:34.973] TX: E870-EL_TEST	串口选择 COM6:USB→ 波特率 停止位 数据位 検验位 串口操作 【保存窗口 16进制题 】16进制题 、RTS ☑ 时间戳	SERIAL C 9600 1 8 None ④ 关 3 同 100	H34C ~ ~ ~ ~ 闭串口 游集收 "R 动保存 	阿銘设置 (1) 协议类型 TCF Server (2) 本地主机地址 192.168.3.100 (3) 本地主机端口 8887 (3) 本地主机端口 8887 (4) 本地主机端口 8887 (5) 未地主机端口 8887 (5) 未送田 接收设置 (* ASCII ℃ HEX 「按田志模式显示 「接收区目动执行 「接收数据不显示 「接收保存到文件	数据日志 E870-E1_TEST [2022-09-27 11:42:31.928]# E870-E1_TEST [2022-09-27 11:42:33.045]# E870-E1_TEST [2022-09-27 11:42:34.394]# E880> E870-E1_TEST [2022-09-27 11:42:34.987]# [8800) E870-E1_TEST [2022-09-27 11:42:34.987]# [8800] E870-E1_TEST 数据发送 容戶端: 私11 E870-E1_TEST	NetAss SEND ASCII TO ALL> SEND ASCII TO ALL> RECV ASCII FROM 192.160 RECV ASCII FROM 192.160 (Image: Ascii FROM 192.160 (Image: Ascii FROM 192.160	at V5.0.2 《 () () 3.3.161 3.3.161 了清除 1 清除
 单条发送 多条发送 协议传输 帮助 E870-E1_TEST □ 定时发送 周期: 1000 ms 打开文件 □ 16进制发送 □ 发送新行 0% 【火爆全网】正 	发送文件 :点原子DS100	发 清除 停止 手持示波	送 发送 发送 器上市	自訪發展 書餘接收 发送设置 ○ ASCII ○ HEX ▼ 转义符指令解析 ③ □ 自动发送附加位 □ 打开文件数据源 □ 循环周期 □ ms 快捷指令 历史发送			发送
🔅 🔸 www.openedv.com 🛛 S:36	R:24			🞯 输入发送内容,按Ente	r或 5/2 RX:	258 TX:24	复位计数

Chaper 3 Technical Indicators

3.1 Specifications

Category	Name	Parameters			
noworgunnly	Working voltage	DC 8~28V			
power supply	Power indicator	Red LED indication			
network port	RJ45	10/100 adaptive RJ45 Ethernet interface			
	Communication	DS 495			
	interface				
serial port	Baud rate	9600bps(default)			
	Protocol	"Ebyte Cloud Device Communication Protocol", transparent transmission			
	Number of DI	•			
	channels	4 way			
DI Input	Input type	Default dry contact			
	Collection				
	frequency	l kHz			
	Number of AI	2			
	channels	2 way			
	Acquisition	single-ended input			
	characteristics				
AI Input	Input type	0-20mA(default)/4-20mA			
	AI acquisition	3%			
	accuracy	5700			
	Collection	10Hz			
	frequency				
	Number of DO	2 way			
	channels	2 wuy			
DO Output	DO output type	A type relay			
Do output	DO output mode	Level output, pulse output			
	Relay contact	DC: 30V/7A, AC: 250V/7A			
		125 - 5-			
	Product weight	155±5g			
Others	Operation	$-40 \sim +85^{\circ}$, 5% \sim 95%KH(no			
	Temp/Humi	Condensation)			
	installation method	Positioning hole installation			

3.2 Mechanical dimension drawing





3.3 Port Description



No.	Label	Explanation
1	V+	Positive pole of power input terminal, DC 8V~28V
2	V-	Negative pole of power input terminal, DC 8V~28V
3	485-В	RS485 interface B is connected to the external device B interface
4	485-A	The RS485 interface A is connected to the external device A interface
5	Reload	Factory reset button
6	Ethernet	RJ45 Ethernet interface
7	NO1	Relay 1 normally open pin, used with the common terminal of relay 1
8	COM1	Common terminal of relay 1, used in conjunction with the normally open pin of relay 1
9	NO2	Relay 2 normally open pin, used in conjunction with the common terminal of relay 2
10	COM2	Common terminal of relay 2, used in conjunction with the normally open pin of relay 2
11	DI1	Switch input channel 1
12	DI2	Switch input channel 2
13	DI3	Switch input channel 3
14	DI4	Switch input channel 4
15	DGND	Switch input ground
16	AI1	Analog input channel 1
17	AI2	Analog input channel 2
18	AGND	Analog input ground

Label	Color	Explanation			
PWR	Red	Power indicator			
		Blinking slowly, connecting to the server			
OTATE	Crear	Fast blinking, waiting for network cable			
STATE	Green	or waiting for dynamic IP acquisition			
		Steady on, the server is connected			
	Vallary	Blinking: Server interacts with serial port			
DAIA	rellow	data			

3.4 LED Indicator Description

Note

Indicator status during firmware upgrade:

Waiting for the upgrade (host computer, serial port), STATE and TX/RX flash alternately, if the upgrade package is not sent within 3s, the upgrade wait is exited;

Upgrading, STATE and TX/RX flash alternately slowly;

3.5 Serial port description

The serial port supports the following parameter configurations:

Project	Parameters				
Doud note	1200, 2400, 4800, 9600, 19200,				
Baud fate	38400, 57600, 115200, 230400				
Data bits	8				
Check bit	NONE, ODD, EVEN				
Stop bit	1、2				

Chapter 4 Product function introduction

4.1 DO Output

Two-way A-type relay outputs are used, and 3.81mm phoenix terminals are used to lead out normally open contacts and common points respectively, which can shut off AC 250V/7A and DC 30V/7A at most.

It can be turned on or off to switch input DO to collect signals and report actively. The active report function of DO supports configuration change report, period, change report + period to realize the device's active report function;

Periodic report: report the current status according to the configured time period, the time interval can be 1-65535, unit: minute;

Change reporting: that is, when the DO status changes, the DO status is reported once, and the range needs to be set to a non-zero value.

4.2 DI input

Support 4-way dry contact acquisition, switch input DI acquisition signal can be turned on or off to actively report, DI's active reporting function implementation conditions support configuration change reporting, period, change reporting + period to realize the active reporting function of the device;

Periodic report: report the current status according to the configured time period, the time interval can be 1-65535, unit: minute;

Change reporting: that is, when the DI status changes, the DI status is reported once, and the range needs to be set to a non-zero value.

4.3 AI input mode

It supports 2-channel current signal acquisition, adopts high-resolution ADC, and the acquisition accuracy can reach 3‰. The factory default configuration is 0-20mA. It supports configuring the acquisition range (register address is 0x044c) and obtaining the current current signal (floating point) through the Modbus RTU command. : register is 0x00c8, integer: 0x0064), the maximum current cannot exceed 25mA (more than 25mA will cause equipment damage);

Support mode 0x00 (0-20mA): directly output the collected current signal;

Mode 0x01 (4-20mA): The current input device below 3.5mA is used for disconnection detection to output 0mA, and the current greater than 3.5mA is directly output;

Take the Modbus address of the device as 1 as an example (the edge acquisition function needs to be turned off to use this function, and the following commands are in hexadecimal):

Read the collected current signal (integer):

Send: 01 04 00 64 00 02 30 14

Return: 01 04 04 0F A0 13 88 F5 E4 (1st road: 4000uA, 2nd road: 5000uA)

Read the collected current signal (floating point):

Send: 01 04 00 C8 00 04 30 14

Return: 01 04 08 40 80 00 00 40 A0 00 00 B4 17 (The first channel: 4mA, the second channel: 5mA)

Configured as 0-20mA acquisition mode (the first and second channels are configured at the same time):

Send: 01 10 04 4C 00 02 04 00 00 00 00 C5 0A

Configured as 4-20mA acquisition mode (the first and second channels are configured at the same time): Send: 01 10 04 4C 00 02 04 00 01 00 01 55 0A

[Note] Floating point numbers are stored in IEEE754 single-precision big-endian format (ABCD), for example, 12.5mA uses hexadecimal number 0x41480000;

The switch can be turned on or off to input AI acquisition signals to actively report, and the conditions for the realization of AI's active reporting function support configuration change reporting, periodical, change reporting+periodic realization of the device's active reporting function;

Periodic report: report the current status according to the configured time period, the time interval can be 1-65535, unit: minute;

Change reporting: that is, when the AI status changes, the AI status is reported once. The range condition is a minimum configuration of five decimal places supported.

4.4 Network transparent transmission mode

This product supports TCP client (TCPC) and UDP client (UDPC) transparent communication.

In this mode, the user's serial device can send data to the specified server on the network through this device. The device can also accept data from the server, and forward the information to the serial device, supporting four-way independent configuration.

Sasic :	paramet	ers	User li	nk parameter	Eby	te cloud parameter	s device IO poi	nt parameters
СН1	CH2	СНЗ	CH4					
Chann	el pars	weters		•				1
link	switch		ODOD		~			
TIN	381 1011		open					
Net w	orkmode	2	TCP clie	ent	~	Data report mode	NONE	~
Net w Remot	orkmode e ip	2	TCP clie 192.168.	ent 3. 100	~	Data report mode	NONE	~

Users do not need to pay attention to the data conversion process between serial port data and network data packets, and only through simple parameter settings, the data transparent communication between the serial port device and the network server can be realized.

4.5 MOQTT Mode

Set the corresponding MQTT parameters, including ClientID, server address, port, username, password, and topics to publish and subscribe to. MQTT connection can be realized.

(1) Product key, device name, device key, device ID, product ID, authentication information, device name, client ID, user name, password, subscription, and publishing can be configured with a maximum of 128Bit, and Alibaba

(((•))) [®] EBYTE Chengdu Ebyte Electronic Technology Co., Ltd.

Cloud product key is 64Bit;

- (2) The maximum address can be configured with 128Bit domain name;
- (3) Support 0, 1 message release level;

4.5.1 Alibaba Cloud

Supports the use of Alibaba Cloud's "Three Elements" to directly connect to the server to obtain the "Three Elements" required to connect to Alibaba Cloud, as shown in the figure:



Configure the device connection parameters, as shown in the following figure:

甲 谐i	目 天士		操奏语名	基本参数	1 用户	湖路 亿佰特云参款	本机IO	8数 边缘网关线	診教			
4	4&TD	IP M	N STATUS	通道1	通道2	通道3 通道4						
	0	192 168 3 161	192 168	销路基	本参数							
	•	152.100.3.101	152.100	链路开	¥	开启	~					
				网络工作	作模式	MQTT 客户端	~	数据上报模式	阿里云协议			~
				目标地	μ	alfqkvFL52X.iot-a	s-ngtt. on-s	hanghai. aliyuncs	. com			
				目标端		1883	+	本机端口	0		_	¢
				MQTT参	数							
				平台选	怿	阿里云	~	MQTT保活时间	120秒			\$
			>	Devicel	Name	dev01						
5:		5	清空日志	Devices	Secret	f4aa7e2db6XXXXXX	*******	XX				
北て	_{设示以面} 设备完成,共	楊索到1个设备	^	Product	tKey	al fokvFL52X						
> 正在	被索设备	他带到1人仍然		订阅主	語	/sys/alfqkvFL52X/	dev01/thing	/service/propert	y/set	QOS	0	~
になった	保存配置	资产进行 以目		发布主	题	/sys/a1fqkvFL52X/	dev01/thing	/event/property/	post	QOS	0	~
正在	重启设备			注册包	参数							
> 里启	设备队功 保存配置			注册包.	上报	关闭	~					
> 保存 > 正在	酒造成功! 「重启设备			自定	2)义内容	i	NAC地址上报		版本信息上的	Æ		
> 重启 > 正在	设备成功 保存配置			自定义	数据内 容	register message						
>保存	配置成功!			L								_

4.5.2 Baidu Cloud

Support the use of Baidu Cloud "Three Elements" to directly connect to the server to obtain the "Three Elements" required to connect to Baidu Cloud, as shown in the figure:

		◆ 全局	
		28 く 返回设备列表	
	○ 2 ± 5	> 通	tatici∂as
	BB < EBYTE岸例	◎ 基础信息	
◆百度智能云 ◎ 全局	> 名称: EBVTES時代 ② 6提 編述: ②	名称: 描述:	DOME • Zi
2 总观 实例列表	◆ (28世現 ^ + 61世の6		
· 呈服务 > + 创建toT Core	- 设备列表 设备名称	は正方式 (正方式)	连接所需的"三要素"
地积局统心良件 * 名称/ID	- WR DOME (2) - 11	loTCoreld:	amidojs 🖸
ENTER ENTERIN	- 宣用校業	DeviceKey:	DOME D
amkinjs UIAX		程务调理证:	重新;26
EBYTEm:例			
名称: EBVTE\$\$\$\$\$] ② 描述: ②	他躍的明日 2021-07-20	13:13:02	證入意: amkinjs.iot.gz.baidubce.com ①
·····································		服冬哭地址 端口使田18	8.2 请能入名称
· 设备列表 - 设备名称	い辺方式 描述	加大力音が近れ、如日子の日での	<u>夏</u> 作
横板	matrix 17		

Configure the device connection parameters, as shown in the following figure:

通道1	通道2	通道3	通道4						
链路基本	本参数								
链路开关	ŧ	开启		~					
网络工作	乍模式	MQTT 窘	斜 户端	~	数据上报模式	阿里云协i	Ŷ		~
目标地址	Ŀ	awrfrai	n. iot. gz. bai	i dubce, com					
目标端口	3	1883		.	本机端口	0			\$
MQTT参数	数								
平台选挂	¥	百度云		~	MQTT保活时间	120秒			•
ClientI	D	DEV04							
UserNam	ie	awrfrai	n/DEVO4						
Passwor	d	XXXXXXX	*****						
订阅主题	5	\$iot/DI	EVO4/msg				QOS	0	~
发布主题	5	\$iot/DI	EVO4/events				QOS	0	~
注册包翻	参数								
注册包」	L报	关闭		~					
自定	义内容		M N	ac地址上报		版本信息	上报		
自定义数	微据内容	registe	er message						

Subscription and publishing need to establish a rule engine to realize the return of data. First, a message template needs to be established, as shown below:

$\hat{\mathbf{O}}$	♀ 全局		Q	¢	
			添加模板		×
88	く EBYTE举例			2 配置模板名称	
>	名称: EBYTE举例		* 模板名称:	TEST ?	
怒	描述: 🛛		1		Î
۲					
0	设备管理 ^	+ 添加模板 ● 点	击添加模板	商认	取消
æ	- 设备列表	模板名称/ID	0		
⊕	◎ 模板	TECT		Sint/(davienNama)/avante	
	• 应用权限	t85m0rw2		\$iot/{deviceName}/msg	

Create a rule engine for data return, as shown in the following figure:

$\left(\left(\left(\begin{smallmatrix}\bullet\\\bullet\end{smallmatrix}\right)\right)\right)^{\mathbb{R}}$			
EBYTE	Chengdu Ebyte Electronic Technology Co., Ltd.		E870-E1_User Manual_EN
	◆ ② 全局		

Ų	♥ 全局				数据输入	2 配置设	备的发布地址为数据来源	
== ► ፼	< EBYTE 名称: 描述:	举例 EBYTE举(区	n Z		*数握朱源:	Siot/DOME/events		topic模板
@ @ @	设备管理 • 设备列表	^	+ elæ	ม 1 (点击创建规则,输入规则名称"back"	■数据目的: *数据目的地:	地	配置设备订阅地址为数据目的地	
	• 横板			back 8ez/9b16didwkse30hpozdoao2p05bn6		类型	值	
	规则引擎	^				MQTT主题	loT Core: amklnjs 主题: \$iot/DOME/msg Qos: 1	
	• 规则列表							

Enable the rule engine, restart the device (re-subscribe, publish), and the communication test is as follows:

Е ХСОМ V2.6	
[2021-09-13 13:09:12.818] TX: EBYTE-BAIDU-TEST [2021-09-13 13:09:13.278] RX: EBYTE-BAIDU-TEST	发送 收到服务器返回

4.5.3 **OneNET**

Support the use of OneNET's "three elements" to directly connect to the server to obtain the "three elements" required to connect to OneNET, as shown in the figure:

\odot	c OneNET	MQTT物联网套件			IT物联网套件	
ŵ	产品概况	产品概况?		前 产品规况	设备列表	
Ξ	设备列表			Ξ 124371#	设备数量(个) ① 在现没者	
N	数据高模板	EBYTE举例	产品ID		1 0)
22	將息代理	其它 编辑 详情	Allegen	 ABBSINE 	设备列表 能次列目	a
୍ତ	ARRISINE	HamtziekiOda		а женамо	在成状态(全部) ~	段等名称 ~ 网络入胆泥内容 Q 搜索
ā	消息队列MQ	0	- X.	□□ 成用性理	设备ID 设备名称	设数状态
88	应用管理	设备接入总数(台) 今日新增设备	数据点总数 (条)	三 日志直復	749264669 DOME	218
	日志查询	1 0	0		共1项	< 1 ×

Configure the device connection parameters, as shown in the following figure:

基本参数	用户	道路 (A	乙佰特云参数	为 本机10参	國 边缘网关	参数				
通道1	通道2	通道3	通道4							
链路基本	参数									^
链路开关		开启		~						
网络工作	摸式	MQTT Z	客户端	~	数据上报模式	阿里云协议			~	
目标地址		183.23	0. 40. 39							
目标端口		6002			本机端口	0			-	
MQTT参数										
平台选择		OneNET	호	~	MQTT保活时间	120秒			-	
ClientID		Device	ID							
UserName		Produc	t ID							
Password		XXXXXX	XXXXXXXXX							
订阅主题		123456)				QOS	0	~	
发布主题		123456					QOS	0	~	
注册包参约	数									
注册包上打	辰	关闭		~						
🗌 自定义	内容			MAC地址上报		□ 版本信息上打	F			
自定义数据	据内容	regist	er message							

OneNET supports the automatic generation of topics with subscription and publishing attributes. Data can be returned only by subscribing and publishing the same address. Communication test:

\odot	COOneNET MC	QTT物联网套件			XCOM V2.6
ũ	产品概况	设备列表 - 设备	详情 [DOME] ?		[2021-09-13 13:37:46.651]
≡	设备列表	设备详情	数据流展示	在线记录	TX: EBVTE-OneNET-TEST [2021-09-13 13:37:47.081]
N	数据流模板				RX: EBYTE-OneNET-TEST 发送
M	消息代理	DOME	在线	编辑	收到服务器返回

4.5.4 Standard MQTT3.1.1

The standard MQTT3.1.1 connection here takes Tencent's standard MQTT3.1.1 server as an example. The "three elements" described in the standard can be obtained from the Tencent server as shown in the following figure:

Client ID	ELD0ERCUKDDEV01 复制
MQTT Username	ELD0ERCUKDDEV01;12010126;B3GLI;1667511713 复制
MQTT Password	80ff56c、

The parameter configuration description is shown in the following figure:

通道1	通道2	通道3	通道4						
链路基	本参数								
链路开:	¥	开启		~					
网络工	作模式	MQTT Ş	客户端	~	数据上报模式	阿里云协议			~
目标地:	ΨĿ	mqtt s	erver	18					- 1
目标端		1883		÷	本机端口	0			\$
MQTT参	数								
平台选	择	标准和Q	TT	~	MQTT保活时间	120秒			÷
Client:	ED	Client	ID	3H.					
UserNa	ne	MQTT U	sername						
Passwor	rd	MQTT P	assword						
订阅主	题	sub-to	pic				QOS	0	~
发布主	题	pub-to	pic				QOS	0	~
注册包	参数								
注册包	上报	关闭		~					
自定	2. 义内容		M	aC地址上报		□ 版本信息上	报		
自定义	数据内容	regist	er message						

Configure the corresponding subscription publishing address, and use the platform online debugging to send data for communication testing:

设备信息	权限列表	在线调试	设备影子	设备模拟器				
() 建议(又在开发调试阶段使	用此功能,若设备	已正式投入使用,	下发消息时请评估是	否会影响您的正常	创业务		
下发消息								
在线状态	在线					实时日志		
Topic *	ELD0ERCUKD/I	DEV01/SUB		×		类型	时间	内容
	topic不能为空					云端下发消息	2021-09-13 13:56:52	EBYTE-USERMQTT-TEST
QoS *	00 01					XCOM V2.6		
消息内容★	EBYTE-USERM	QTT-TEST				[2021-09-13 13:56:52. RX: EBYTE-USERMQIT-TE	^{206]} T 收到服务器T	∽发数据
	消息内容不能为空	,长度不大于16K	В					

Chapter 5 Special Function

5.1 Ebyte Cloud Modbus to JSON

It supports converting the Modbus RTU data of the serial port into the JSON message format of the Ebyte cloud device communication protocol for data transmission and reception.

5.2 Alibaba Cloud Modbus to JSON

It supports converting the serial port Modbus RTU data into the JSON message format of Alibaba Cloud device communication protocol for data sending and receiving.

5.3 Edge acquisition

Support 20 external data points collection, data points can be established through the host computer or Ebyte cloud device communication protocol, the server can read or set data points by sending JSON messages through Ebyte cloud communication protocol or Alibaba cloud protocol, and then The device automatically converts JSON commands to Modbus commands for setting or reading, and then reports the return value in JSON format. After the data points are set, the device will poll and read all data points (enable) every one second. If the external data points are set to report changes, once the data points are changed, they will actively report the status of the data points or value.

5.4 Registration packet

In the network transparent transmission mode (TCPC/UDPC), the user can choose to let the device send the registration packet to the server. The registration package is used to allow the server to identify the source of the data, or as a password to obtain authorization for server functions. The registration packet can be sent when the device establishes a connection with the server, or the registration packet data can be spliced at the front end of each data packet as the header of a data packet. The data of the registration package can be MAC, FW version information or custom registration data (support ASCII configuration of custom registration package, ASCII can be configured up to 128Bit).

5.5 Heartbeat packet

In the network transparent transmission mode (TCPC/UDPC), the user can select the module to send heartbeat packets. The main purpose of sending to the network is to keep alive with the server, so that devices that are idle

(will not send data to the server for a long time) remain connected to the server. The data of the heartbeat packet can be MAC, FW version information or custom registration data (supports ASCII configuration of custom registration packets, ASCII can be configured with a maximum of 128Bit).

5.6 Firmware upgrade

Firmware upgrade is to write firmware through the host computer, and supports upgrade through the use of serial ports and network;

5.6.1 Network Upgrade:

Step 1: Select the network card connected to the device;

菜单语	這关于	
本地IP:	192. 168. 3. 100 🗸	搜索设备
	10, 145, 3, 100 170, 168, 3, 100 192, 168, 1, 100	网关
1	192.168.3.100 192.168.4.100	192.168

Step 2: Open the host computer and select "Device Upgrade Assistant" under "Menu";

E1 17	Z佰特以太网云IC	D配置工具 v1.0	
菜单	语言关于		
i	设备升级助手	0~ 0	搜索设备
	设备ID	IP	网关
1	0	192.168.3.161	192.168

Step 3: Select the product firmware provided under the corresponding product details on the official website;

3 设备网络升级助手				2-1		×
/2022年度产品资料/E870-E1(TX2022	A003)项目资料/测试资料/固件,	/E870-E1-36. ebin	🍃 选择固件	🔍 搜索设备	ÐŦ	₩
设备ID	IP	MAC	地址	固件类	型	

Step 4: Click to search for devices, and click "Stop Search" after finding the device;

11 设备网	网络升级助手			_	
/2022年)	度产品资料/E870-E1(TX202	2 AOO3)项目资料/测试资料/固件/M	1870-E1-36. ebin 陆 选择固件	□ 搜索设备	🔒 升级
	设备ID	IP	MAC地址	固件类	型
1	0	192.168.3.161	38-3B-26-3E-43-3A	E870-	E1

Step 5: Select the device to be upgraded and click Upgrade;

/2022	年度产品资料/E870-E1(TX202	2 A003)项目资料/测试资料/固件/B	870-E1-36.ebin 🝃 选择固件	🔍 搜索设备 📄 升级
	设备ID	IP	MAC地址	固件类
1		192.168.3.161	38-3B-26-3E-43-3A	2)70-E1

Wait for the upgrade to complete;

5.6.2 Serial port upgrade

Step 1: Use USB to RS-485 to connect the serial port of the device, open the host computer, and select "Serial port upgrade assistant" under "Menu";

Ei (Z	G佰特以太网云IC	配置工具 v1.0	
菜单	语言关于	/	
ì	设备升级助手 事口升级助手 ▲		搜索设备
	设备ID	IP	网关
1	0	192.168.3.161	192.168

Step 2: Select the serial port number connected to the device, open the serial port, import the upgrade file (the product firmware provided under the product details on the official website), and click to start the upgrade;

B Form	_		×
СОМ6		关闭串	
/固件/E870-E1-36.ebin	选择固件	开始升	级
usart-)TX:131 usart-)TX:132	/		^
usart=>TX:133 usart=>TX:134 usart=>TX:135			

Step 3: Disconnect the power of the device, press and hold the "Reload" of the device to turn on the power, and wait for the device to upgrade;

COM6 🗸		关闭串口
/固件/E870-E1-36.ebin	选择固件	取消
usart=>TX:131		^
usart=>TX:132		
usart->TX:133		
usart->TX:134		
usart=>TX:135		
usart=>TX:136		
usart=>TX:137		
usart=>TX:138		
usart=>TX:139		
usart=>TX:140		
usart->TX:141		
usart=>TX:142		
usart=>TX:143		
usart=>TX:144		~
usart=>TX:144		

5.7 Hardware is restored to factory default

To restore the factory default parameters, after power on, press the Reload button for 5~10S until all STATE flashes rapidly, and then release, the device parameters can be restored to the factory default parameters, and the device will automatically restart.

5.8 RTU slave

When the edge acquisition function is turned off, the device can be used as an RTU slave device, receive Modbus RTU commands sent by the host device (HMI\SCADA, etc.) and collect the IO status of the control device; The Modbus address of the device in factory mode is: 1.

DO related						
Register function	Register	Register	Number	operate	Data Range/Remarks	Related
	audress	type				Tunction codes
					0: release;	
	00000	i	2	DW	1: suction;	R: 0x01
DO status	0x0000	con	2	K VV	Write control value $(0/1)$ to	W: 0x05, 0x0F
					operate device DO output	
DI related						

The function register table is as follows:

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Register function	Register address	Register type	Number	operate	Data Range/Remarks	Related function codes
DI status	0x0000	Discrete	4	R	0: No DI input; 1: DI input exists; The storage device DI captures the discrete input state	R: 0x02
AI related						
Register function	Register address	Register type	Number	operate	Data Range/Remarks	Related function codes
AI integer value	0x0064	input register	2	R	0-20000, unit uA	R: 0x04
AI floating point	0x00C8	input register	2	R	0-20, unit mA; 4-byte IEEE754 single-precision floating-point value, big-endian storage ABCD	R: 0x04
AI filter parameters	0x04B0	holding register	1	RW	Analog input filter parameter, the range is 1-16, the smaller the number, the more sensitive, the larger the more stable, the default is 6	R: 0x03 W: 0x06、0x10
AI sampling range	0x044C	holding register	4	RW	AI channel sampling range 0x0000: 0 to 20 mA 0x0001: 4-20mA	R: 0x03 W: 0x06, 0x10
Device property rela	ated					
Register function	Register address	Register type	Number	operate	Data Range/Remarks	Related function codes
Modbus address	0X07E8	holding register	1	RW	Modbus address, $1 \sim 247$ configurable addresses	R: 0x03 W: 0x06
Module restart	0x07EA	holding register	1	W	Write 0xFE55 to restart	W: 0x06
baud rate	0x0834	holding register	1	RW	See the baud rate code table, Default is 9600 (0x0003)	R: 0x03 W: 0x06、0x10
Check digit	0x0836	holding register	1	RW	0x0000 no checksum (default) 0x0001 odd parity 0x0002 Even parity	R: 0x03 W: 0x06、0x10
Stop bit	0x0837	holding register	1	RW	0x0000 1bit(default) 0x0001 2bit	R: 0x03 W: 0x06、0x10

Chapter 6 Configuration methods

Support the configuration of the host computer and the "Ebyte Cloud Device Communication Protocol";

Chapter 7 About customization

- ◆ Support various public cloud and private cloud platforms to customize IoT gateway access;
- Supports the customization of various transmission protocols such as Json, Modbus, and private protocols;
- Support MQTT, TCP, UDP, HTTP various transmission protocol equipment customization;
- ◆ Ethernet, WiFi, 4G, 433M and other gateways;
- Customization of switch value, analog value and various sensors connected to cloud platform;
- ◆LoRa, Zigbee, BLE Mesh, WiFi and other local area network access cloud platforms;
- Support customized explosion-proof, high-temperature, high-power industrial-grade communication equipment;

◆The company has its own SMT production line, which supports batch customers to customize product appearance and model identification.

Revise history

Version	Revision Date	Revision Notes	Maintainer
1.0	2022-09-27	Initial version	LC

About US



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