

Wireless Modem

User Manual



E90-DTU(433L30E)-V8 Ethernet Gateway User Manual

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1. Product Overview

1.1. Product introduction

E90-DTU(433L30E)-V8 supports adaptive network rate (up to 100M full-duplex), provides six working modes of TCP Server, TCP Client, UDP Server, UDP Client, HTTP Client, and MQTT Client. Mode supports six-way client connection;

It supports a variety of Modbus gateways, which can perform simple interconversion between Modbus TCP data and Modbus RTU data, record and send the read commands, and actively upload to the server through pre-stored commands;



1.2. Features

- Support high-speed continuous transmission and uninterrupted transmission, no data packetization, unlimited data packet length, adapt to Modbus protocol;
- The industrial-grade design can work in the environment of -40°C~+85°C, and the wide voltage input (DC 8~28V) supports reverse polarity protection;
- All aluminum alloy shell, compact size, easy installation, good heat dissipation;
- Perfect shielding design, good electromagnetic compatibility, strong anti-interference ability;
- RJ45 adaptive 10/100M Ethernet interface;
- Support hardware reset to factory settings;
- Support multiple working modes (TCPS, TCPC, UDPS, UDPC, HTTPC, MQTTC);
- Support three configuration methods: configuration tool, web page and AT command;
- Server mode supports up to 6 socket connections;
- Support DHCP function;
- Support DNS (domain name resolution), and custom domain name resolution server;
- Support multiple Modbus gateways (simple protocol conversion, multi-host mode, storage gateway, configurable gateway, etc.);
- Supports quick access to Alibaba Cloud, Baidu Cloud, OneNET, Huawei Cloud, and standard MQTT servers of version 3.1;
- Support HTTP protocol (GET/POST request);
- Support timeout restart function and disconnection reconnection, and the number of times can be customized;
- Support short connection function, the short connection interval can be customized;
- Supports sending a variety of heartbeat packets and registration packets;
- Support serial port cache cleaning function;
- Support access to the external network, local area network, and virtual serial port tools;

• Support online upgrade function.

2. Quick Start

2.1. Hardware preparation before use

Take the transparent transmission between E90-DTU(433L30E)-V8 and E90-DTU(433L30)-V8 as an example. In order to test E90-DTU(433L30E)-V8, the following hardware is required:

- One PC with network port;
- One E90-DTU(433L30E)-V8, hereinafter referred to as "gateway radio";
- One E90-DTU (433L30)-V8 digital radio, hereinafter referred to as "serial radio" (for example, if necessary, buy it separately);
- TX433-JKD-20P 2 antennas (inner thread, inner needle);
- Two DC12V-1A power adapters;
- One network cable;
- One USB to RS-485 serial cable;

	Data Transcelver For CDVP manual Provide State and State and State State and State and State and State State and State and State and State and State State and State and State and State and State and State and State State and State		
PC	E90-DTU(433L30E)_V8	E90-DTU(433L30)-V8	
		2	
cable	DC12V-1A Power Supply*2	USB To serial port + several cables	TX433-JKD-20P*2

2.2. Software Preparation

The product details on the Ebyte official website provide the download of the network debugging assistant "NetAssist" and the serial port assistant "XCOM", as shown in the following figure. Official website address: <u>https://www.cdebyte.com</u>.

	网络调试助手	×	XCOM V2.6	100	□ ×
网络设置 (1)协议类型	数据日志	<u>NetAssist V5.0.2</u>		串口选择	PTAT CHOAC
TCP Client · (2) 远程主机地址				波特车 9	600 V
192.168.4.101 ▼ (3) 远程主机端口				停止位 1	~
8886				数据位 8	v I
				串口操作	打开串口
• ASCII C HEX				保存窗口	清除接收
▼ 技口志視式班小 ▼ 接收区自动执行 □ 接收数据字目示				□ 16进制显示	☆□ DTR □ 自动保存
□ 接收線成構小並小 □ 接收保存到文件				□ 时间戳	10 ns
			单条发送 多条发送 协议传输 帮助		
ASCII CHEN			EBVTE-TEST-UART	^	发送
▼ 複入付損受解析 ① □ 自动发送附加位 □ 打工立件教課項	 			~	清除发送
□ 17开入H数编源 □ 循环周期 1000 ms	EBYTE-TEST-NET	发送	□ 定时发送 周期: 1000 ms 打开文件	发送文件	停止发送
137 就绪!	0/0	RX:0 TX:0 夏位计数 //	www.openedv.com S:0 R:0 当	g]zhttp://www. 前时间 1 <mark>1:48:5</mark> 2	openedv.com/

Download the configuration tool corresponding to the product details, use the "Ebyte Network Configuration Tool" for "Gateway Radio", and use the "RF_Setting_E90.exe" configuration tool for "Serial Radio".

2.3. Hardware connection

Connect the antenna to the E90 radio and connect to the power supply (DC: 8~28V), RS485 connection, network cable connection:

		A USB B B B B B B B B B B B B B B B B B B	Ethernet PWR LINK CATA
Connect the antenna	Above: "Gateway Radio" on Next: "Serial Radio" is connected	Connect RS-485 for "Serial Radio"	Connect the network cable for the "Gateway Radio"

2.4. Wireless parameter configuration

2.4.1. Configure "Serial Modem"

Step 1: Turn on the power and connect the USB to RS-485 serial cable (serial cable A is connected to the radio 485_A, serial cable B is connected to the radio 485_B);

Step 2: Check whether the radio is working in configuration mode, if not in configuration mode, configure the DIP switch to enter configuration mode according to the figure below;



Transfer mode Configuration mode

Step 3: Open the configuration host computer "RF_Setting_E90.exe" and select the corresponding serial port;

E90 RF_Setting V1	1.9				×
	成都(Chengdu	C佰特电 Ebyte Elect	子科技 ronic Techno	<mark>与限公</mark> 同 plogy Co.,Lt	中文 English
COM3 v	OpenPort	GetParam	SetParam	Preset	Models

Step 4: "Open Serial Port" and click "Read Parameters", then click "Restore Factory Settings";

E90 RF_Setting V1.9				
((m)) EB	× 佰特电 × Ebyte Elect	<mark>子科技</mark>	<mark>有限公司</mark> ology Co.,Ltd.	中文 English
COM3 Param has been s	et GetParam	SetParam	Preset	Models
Version:		Present Air Speed Present Tx Power	:: 2.4Kbps :: 1W	
Work Fr		Present Frequence Present Adress Se	et: 0x02	
Features: lora, far distance,	strong anti-interference	Current Param: 0>	x0, 0x2, 0x1a, 0x2, 0x44	
UartRate 9600bps 🗸	 Parity 	8N1 ~	Fixed mode	Unvarnish \sim
AirRate 2.4Kbps 🗸	Power:	30dBm v	WOR timing	250ms ~
Channel 2	Address	2		
Copyright@ Chengdu EB	yte Electronic Technology	Co.Ltd	WebSite: www.	ebyte.com

Step 5: Set baud rate to 9600, check to 8N1, "continuous transmission" mode, as shown in the picture below, click "Write Parameter";

E90 RF Setting V1.9

	A. 佰特电	子科技有限公司 ronic Technology Co.,Ltd. English
COM3 Param has been set	GetParam	SetParam Preset Models
ID: E90- Version: Power: Work Fr Features: lora, far distance, stron	g anti-interference	Present Air Speed: 2.4Kbps Present Tx Power: 1W Present Frequence: 412.0MHz Present Adress Set: 0x02 Current Param: 0x0, 0x2, 0x1a, 0x2, 0x44
UartRate 9600bps 🗸	Parity	8N1 \sim Fixed mode Unvarnish \sim
AirRate 2.4Kbps 🗸	Power:	30dBm \checkmark WOR timing 250ms \checkmark
Channel 2	Address	2
Copyright@ Chengdu EByte E	electronic Technology	y Co.Ltd <u>WebSite: www.ebyte.com</u>

2.4.2. Configuring "Gateway Modem"

Step 1: Turn on the power and connect the PC and the "Gateway Radio" with a network cable;

Step 1: Perform factory configuration on the "Gateway Radio", press and hold the Reload button until the indicator lights are all on;

Step 2: Modify the IPv4 configuration of the PC, use a static IP, and ensure that the "gateway radio" and the PC are in the same network segment. The factory default IP is 192.168.4.101, so configure the static IP of the PC as 192.168.4.100 as shown in the following figure:

1 网络连接	🖗 Ethernet 状态	🖗 Ethernet 屬性	Internet 协议版本 4 (TCP/IPv4) 雇性	×
🗧 🚽 🗹 🛉 👰 > 控制面板 > 所有控制	常规	网络 共享	常规	
组织 ▼ 禁用此网络设备 诊断计行连接 Ethernet 未识别的网络	连接 IPv4 连接: IPv6 连接:	连接时使用: 🚽 Realtek PCIe GBE Family Contr	如果网络支持此功能,则可以获取自动指派的 IP 设置。否则,你需要从网络系统管理员处获得适当的 IP 设置。	
Realtek PCIe GBE Family Contr WLAN Ebyte_5G_2	媒体状态: 持续时间:		○ 自动获得 IP 地址(O) 「● 使用下面的 IP 地址(S):	
dilli Intel(R) Dual Band Wireless-A	速度: 详细信息(E).	 Microsoft 网络各产属 VMware Bridge Protocol Microsoft 网络的文件和1印机表 Microsoft 网络的文件和1印机表 	IP 地址(1): 192.168.4.100 子网掩码(U): 255.255.255.0	
	活动 ————	 ☑ 및 QoS 数据包计划新 ☑ Internet 协议版本 4 (TCP/IPv4) ☑ Microsoft 网络活动器名路传送器 	默认网关(D):	
		PROFINET IO protocol (DCP/L	● 田和泉代寺 UNS 版字S留和BJL(B) ● 使用下面的 DNS 服务器地址(E):	
	字节: 2	安装(N) 卸载(U)	首选 DNS 服务器(P):	
		描述 (在检验制地》(Internet 地》)(法地》)	备用 DNS 服务器(A):	
	●雇性(P)	于在不同的相互连接的网络上通信。	□退出时验证设置(L) 高级(V)	
			确定取消	

Step 3: Use "Ebyte Network Configuration Tool" or web page configuration;

E Ebyte network configuration tool V2.1 Menu language about	-	ebyte
Deries list: C. Saved. Local IP Gateway MA 1 192.168.4.101 192.168.4.1 68-C2	Better kare Beriel kasek Beriel kasek </th <th>Device info Device model (5001) Bit (5000) Device model (5001) Serial namber (5001) Bit (5000) Device model (5001) Device name (5001) Websever password (************************************</th>	Device info Device model (5001) Bit (5000) Device model (5001) Serial namber (5001) Bit (5000) Device model (5001) Device name (5001) Websever password (************************************
c >> lag: Clear lag >>> Broching >>> Brocking houd	Linking Image: Second Sec	ModBuS parameter MODBUS parameter ModBuS (See V Mosbus instructions ModBuS (See V Mosbus instructions) ModBuS (See V Mosbus instructions ModBuS (See V Mosbus instructions) See V Mosbus instructions ModBuS (See V Mosbus instructions) See V Mosbus instructions See V Mosbus instructions ModBuS (See V Mosbus instructions) ModBuS (See V Mosbus instructions) See V Mosbus instructions Mosbus instructions Mosbus instructions See V Mosbus instructions See V Mosbus instructions Mosbus instructions Mosbus instructions See V Mosbus instructions See V Mosbus instructions See V Mosbus instructions Mosbus instructions See V Mosbus instructions Mosbus instructins Mosbus instructins Mosbus Mosb
	khraed Reemastin tise Be dis untited time Be untited	Advanced Outgo restant is time 0:ff0:4:0N5-2555 Reconnection times is ange:1:=0 Nodsta reboot 0:ff0:8:ange:0:-655355 Hearbit cycle off0:8:ange:1:-00 Nodsta reboot 0:ff0:8:ange:0:-655355 Short connection 0:ff0:8:ange:2:255 Hearbit cycle off0:8:ange:1:-055355 Short connection 0:ff0:8:ange:2:255 NET connected clearbit Hearbit mode (Below Custom mersteel (Readem message) Hex registration custom registration (register message) Hex submit Submit Submit

Step 4: Configure the wireless parameters as shown in the figure above, the host computer clicks "Save Configuration" and then clicks "Restart Device", click Submit for the web page configuration, enter the configuration key: 123456, and wait for the configuration to complete;

[Note]

- > For browsers that do not support IE kernel, you can use Firefox, GOOGLE, the latest Edge and other browsers;
- > If the host computer fails to search for the device, first check whether the network cable is connected normally, and check whether the host computer is turned on for many times in the local area network. If it still cannot be used normally, you can close the firewall and restart the host computer;
- > Do not enter the web page in communication mode, otherwise the device will enter the configuration mode, and you can only exit the configuration mode by submitting data or restarting the device.

2.5. TCP server usage

Configure the Ethernet parameters of the "gateway radio", the host computer and web page are configured as follows:

网络参数设置	1			Network parameter					
设备名称	A0001	SM码	00001						
卫地址类型	静态IP	本地讓口	8886	DHCP	disable 🗸	Work mode	TCP server V	MAC	84-C2-E4-8F-50-3D
本地IP地址	192.168.4 .101	1085	114.114.114.114	Local IP	192.168.4.101	Local port	8886	Web port	80
子网摘码	255.255.255.0	网页访问编口	80 🗘				[
网关	192.168.4.1	网络工作模式	TCP 服务调 ~	MASK	255.255.255.0	Getway	192.168.4.1	DNS	114.114.114.114
目标IP/域名	192. 168. 4. 100	目标演口	8887	Target IP	192.168.4.100			Target port	8887

The network assistant (NetAssist) is connected to the "gateway radio" as shown in the figure below (the LINK indicator of the device is always on after the connection is successful, if it can be connected but the indicator is not on, the device is in configuration mode, which can be released by restarting the device), XCOM is connected to the "serial gateway" ":

<u>*</u> • / (Network Assistant	# ×	25 XCOM V2.6	-	ο×
Settings (1) Protocol (2) Remote Hoat Add (32) Remote Hoat Add (33) Remote Hoat Pot (33) Remote Hoat Pot (35) Beev Options (* ASCII ← HEX. (* Log Display Mode (* Auto Linefeed (* Hide Received Data (* Save Recv to File) (* Save Recv to File)	Data tog	NetAssist V5.0.2 🗇 🕀		Port COMMSSIL Baud rate Stop bits Data bits Parity Operation Save Date Max BATS Y TimeSta	cen Labs CF2 ~ 9600 ~ 1 ~ 8 ~ Wone ~ Wone ~ ① Close ~ Close ~ ① DTR ① 自动保存
Send Options ← ASCII ← HEX ↓ Use Escape Chars.① ⊢ Auto Append Bytes ⊢ Send from File ⊢ Cycle 1000 ms	Data Send EBITE-TEST-HET	€ Close & Close Send	Single Send Multi Send Protocol Transmit Help EBTTE-TEST-WART Timing Cycle 1000 ms Open File	Send File	Send Clear Send Stop Send
Shortout Mixtory	0/0 R×0	TX.0 Reset	□ Hex Send ✓ Worder ap 0% 正古原子官方 ☆ - www.openedv.com S.0 R:0 CTS=0 DSR=0 DCD=0 Curr	论是http://ww	w. openedv. com/

Data sending and receiving test:

	Network Assistant 🛛 🙀 – 🗆 🗙	20 XCOM V2.6	-	D X
Setting: 111 Protocol TCP Clent 121 Remote Host Add [52:168:410] [31 Remote Host Post © Discorrect -Recv Option: © ADDI: C HEX [10] Longitude Mode	Network Assertant Image: Control of the server is connected from local 192.168.4.100:61666 [2022-02-16.10:21:46.541]# SEND ACCII> Image: Control of the server is connected from local 192.168.4.100:61666 [2022-02-16.10:21:46.541]# SEND ACCII> Image: Control of the server is connected from local 192.168.4.100:61666 [2022-02-16.10:21:46.748]# BECV ACCII> Image: Control of the server is connected from local 192.168.4.100:61666 [2022-02-16.10:21:46.748]# BECV ACCII> Image: Control of the server is connected from local 192.168.4.100:61666	XCOM V2.6 1 (2022-02-16 10:21:46.616) 1 XI: ENTE-TEST-WET 1 C022-02-16 10:21:47.678] 1 TI: ENTE-TEST-WAT 1	Port COMMS:Silics Baud rate [Stop bits] Data bits [Parity] Operation [Save Data	Close Clesr Data
Cay Conjunction Cartered Cart		Single Send Multi Send Protocol Transmit Malp EBUTE-TEST-GART	☐ Mex ☐ RTS ☑ TimeStum	DTR 自动保存 10 ms
Use Escape Chars Auto Append Bytes Send from File	Dela Send Coar t Cloar		4	Clear Send
Cycle 1000 ms Shortcut Kistory	Send	□ Timing Cycle 1000 HS 0 0pen File S Nex Send Ø Verderap 0% 正台牌子能方法分	Send File	Stop Send openedw.com/
🕼 Sending finished	1/1 Rx17 Tx14 Reset	🔅 • www.openedv.com S:17 R:14 CTS=0 DSR=0 DCD=0 Current	t time10:21:4	48

2.6. TCP client usage

Configure the Ethernet parameters of the "Gateway Radio", the host computer and web page are configured as follows:

Network par	aneters			Network para	ameter			
Device name	A0001	Serial Mumber	00001	States of States				
DHCP	Disable	Local port	0	DHCP	disable 🗸	Work mode TCP client	MAC	84-C2-E4-8F-50-3D
Local IP	192.168.4 .101	105	114.114.114.114	Local IP	192.168.4.101	Local port 0	Web port	80
Mask	255.255.255.0	Web server port	80 🗘				2000	
Getway	192.168.4.1	Network mode	TCP client ~	MASK	255.255.255.0	Getway 192.168.4.1	DNS	114.114.114.114
Renote IP	192.168.4.100	Remote port	8887	Target IP	192.168.4.100		Target port	8887

The network assistant (NetAssist) is connected to the "gateway radio" as shown in the figure below (the LINK indicator of the device is always on after the connection is successful), and the XCOM is connected to the "serial gateway":

ta ·	Network Assistant	4 - O ×	醫 XCOM V2.6	- 🗆 X
Setting: (1) Protocol	Data log	NetAssist V5.0.2 @ Q		Port
TCP Server 👻		<u></u>		COMS: Silicon Labs CP2
121 Local Host Addr				Baud rate 9600
132.100.4.100 ···				Stop bits 1
8887				Data bits 8
🔶 Close				Parity None
Recv Options				Operation 🛞 Close
ASCII C HEX				Save Data Clear Dat
Log Display Mode Auto Lineleed	<			Hex DTR
Hide Received Data				□ MTS □ 自动保
Save Recv to File				TimeStamp 10 .
AutoScroll Clear			Single Send Multi Send Protocol Transmit Help	
Send Options			EDITE-TEST-VART	Send
Auto Append Bytes	Data Send Clients: All Connections (1) - + Discon	Clear & Clear		Clear Sen
Cycle 1000 ms	EBTTE-TEST-NET [Al Connections [1] 192 168 4 101 : 34428	Send	Tising Cycle 1000 ms Open Fi	le Send File Stop Send
Shortcut Mixtory			□ Nex Send Ø Wordwrap 0% 正占原子	官方论坛http://www.openedr.com
🕼 Readyl	1/1 RX:17	TX:14 Repet	- www.openedv.com S:0 R:0 CTS=0 DSR=0 DCD=0	Current time10:29:23

Data sending and receiving test:

· · /	Network Assistant	- U ×	3 XCOM V2.6	-		×
- Setting: 11 Protocol TCP Serve:	Dealog [2002-02-06 10:29:36.902]# SEMO ASCII TO ALLO #BITE-TEST-KET [2002-02-06 10:29:30.204]# RECV ASCII FACM 192 168 4.101 :34428> ENTE-TEST-UART	NetAssist V5.0.2 🧇 🗘	[2022-02-16 10:29:37.066] 16: 801TE-TEST-WAT [2022-02-16 10:29:38.214] TR: 801TE-TEST-00AT	Port COME-Sili Bund rate Stop bits Parity Operation Sure Data Mrs V TimeStu	000 Labs 0 9600 1 8 None Clear DTR 10 10	コピン マ マ レン Data た か保存 の s
Send Options © ASCII © HEX © Use Excepe Chars ① □ Auto Append Bytes □ Send from File □ Cycle [1000 ms Shortest Nistery	Data Send Client:: All Connections (1)	F Clear & Clear Send	EBTE-TEST-UART Tising Cycle 1000 ms 0 0pen Mex Send V Verdersp 06 Eds	. File Send File	Seni Clear S Stop S	d Send Send
🕼 Sending finished	2/2 PX:34	TX:28 Reset	🔅 - www.openedv.com S:17 R:14 CTS=0 DSR=0 DCD=	0 Current time10:29	:38	

2.7. UDP server usage

Configure the Ethernet parameters of the "Gateway Radio", the host computer and web page are configured as follows:

Network par	aneters			Network para	ameter				
Device name	A0001	Serial Number	00001						
DHCP	Disable ~	Local port	0006	DHCP	disable	Work mode	UDP server V	MAC	84-C2-E4-8F-50-3D
Local IP	192.168.4 .101	DINS	114.114.114.114	Local IP	192.168.4.101	Local port	8886	Web port	80
Mask	255. 255. 255. 0	Reb server port	80 0						
Getway	192.168.4.1	Network node	10P server 🗸	MASK	255.255.255.0	Getway [192.168.4.1	DNS	114.114.114.114
Remote IP	192.168.4.100	Remote port	8887 \$	Target IP	192.168.4.100			Target port	8887

After the configuration is completed, the LINK indicator of the device is always on, and the NetAssist is connected to the "gateway radio" as shown in the figure below:

	Network Assistant	×□-□×
Settings (1) Protocol	Data log	NetAssist V5.0.2 🗇 🔶
UDP		
Recv Options C ASCII C HEX Log Display Mode Auto Linefeed Hide Received Data Save Recv to File AutoScroll Clear	192.168.4.101:8886	
Send Options		~
Auto Append Bytes	Data Send Remote: 192.168.4.101:8886	- Clean ↓ Clear
Cycle 1000 ms		Send
🕑 Ready!	0/0 RX:0	TX:0 Reset

Data sending and receiving test (in UDP server mode, data must be sent by PC first, then UDP can dynamically adjust the destination address, and the data sent by serial port can only be received by the UDP of the last communication):

3. · /	Network Assistant	4 - O ×	器 XCOM V2.6	-	ΟX
- Setting: TI Protocol UDP w (21 Local Host Add T32 168 4 100 w (31 Local Host Post 5997 Recv Options Recv Options Close Clos	Defa 6g [2002-00-16 [0:41:53:201]* SEMD ACCII TO 190 166 4 101 EDITE-TEST-WET [2002-00-16 10:41:56:309]* SUMY ACCIT FOOD EDITE-TEST-UMAT	NedAssist VS.0.2 🖓 🗘	[2022-02-16 10 41 53 317] R1 EBTE-TEST-MET [2022-02-16 10 41 56 239] T1 EBTE-TEST-WAT	Port CCMMG_Silie Band rate Stop bits Data bits Parity Operation Save Data Mex D RTS V TimeSter	en Labs CF2 ~ 9600 ~ 1 ~ 8 ~ Vone ~ Clear Data DFR =b)RFP sp 10 _ ms
Send Options G ASCII ⊂ HEX Use Excape Chars. C Auto Append Bytes C Send Iron File C Cycle [1000 ms Shortcat Kistery	Data Send Remote: 152.168.4.101.98965	F Des L Des Send	ENTE-TEST-UNET	n File Send File	Send Clear Send Stop Send
lor Ready	1/1 Bx17	TX14 Reset	🔅 • www.openedv.com S:17 R:14 CTS=0 DSR=0 DCD	0 Current time10:47	13 _{,11}

2.8. UDP client usage

Configure the Ethernet parameters of the "Gateway Radio", the host computer and web page are configured as follows:



Network par	meters			Network para	meter				
Device name	A0001	Serial Number	00001						
DHCP	Disable	/ Local port	8896	DHCP	disable	 Work mode 	UDP client V	MAC	84-C2-E4-8F-50-3D
Loral IP	192. 168. 4 . 101	DHS	114.114.114.114	Local IP	192.168.4.101	Local port	8886	Web port	80
Mask	255. 255. 255. 0	Reb server port	80						
Getway	192. 168. 4. 1	Network mode	WDP client 🗸	MASK	255.255.255.0	Getway	192.168.4.1	DNS	114.114.114.114
Remote IP	192. 168. 4. 100	Remote port	8887	Target IP	192 168 4 100			Target port	8887

After the configuration is completed, the LINK indicator of the device is always on, and the NetAssist is connected to the "gateway radio" as shown in the figure below:



Data sending and receiving test The data sent by the serial port will only be received by UDP (192.168.4.100:8887):



3. Technical Specifications

3.1. General Specifications

No.	Program	Specification	
1	voltage	8V~28V DC	
2	Network port specifications	Standard RJ45, support 10/100Mbps	
3	Network protocol	ARP、ICMP、IPv4、TCP/UDP、MQTT、HTTP	
4	Socket model	TCP Server、TCP Client、 UDP Server、UDP Client、 HTTP Client、MQTT Client	
5	TCP Server connect	Supports up to 6 TCP connections	
6	IP method of obtaining	Static IP, DHCP	
7	DNS	support	
8	domain name server	Customizable, default 114.114.114.114	
9	User configuration	Web configuration, host computer, AT commands	
10	Antenna interface	SMA (external thread inner hole)	
11	Size	84mm*82mm*25mm	
12	Average weight	$123 \pm 5g$	
13	Operating temperature	-40 ~ +85°C, Industrial grade	
14	Storage temperature	-40 \sim +125°C, Industrial grade	
15	Working humidity	$10\% \sim 90\%$, Relative humidity, non-condensing	

3.2. Wireless Specifications

			performance			
The m	ain parameters	minimum	Typical value	maximum	Remark	
		mmmum	Typical value	value		
bloc	king nower				The probability of	
blocking power		-	-	10	burning at close range is	
	(ubiii)				small	
					Support ISM frequency	
Work	ing frequency	410		4.4.1	band, 0~31	
(MHz)		410	-	441	Default: 23, Channel	
					Spacing: 1M	
Power	Emission		379.0mA @ 12V		Instantaneous power	

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consu	current (mA)		257.8mA @ 24V		consumption
mptio	receive		16.7mA @ 12V		
n	current (mA)		8.6mA @ 24V		
					High (30dBm), Medium
					(27dBm), Low
					(24dBm), Very low
					(21dBm)
					Except for "high", the
					other transmit power is
Movi	mum transmit				the reference value, the
nouv	$d\mathbf{Pm}$	29.5	30.0	30.5	actual value may be
pow					different, and reducing
					the transmit power will
					not reduce the power
					consumption of the
					device, it is
					recommended to use the
					maximum power
					Airspeed adaptation in
					continuous transmission
	ata (hna)	0.21	2 41	10.21	mode;
all	ate (ops)	0.5K	2.4K	19.2K	Fixed length mode
					(0.3,1.2,2.4,4.8,9.6,19.2
					Kbps)
reference distance					Clear and open
					environment, antenna
			8000m		gain 5dBi, antenna
					height 2.5 meters, air
				rate 2.4 kbps	
Pa	cket length		197Btye		

(Note)

> Use multiple groups of digital radio stations to communicate one-to-one at the same time in the same area. It is recommended that each group of digital radio stations set the channel interval to be more than 2MHz;

The lower the transmit power, the closer the transmission distance, but the working current will not decrease \triangleright proportionally. It is recommended to use the maximum transmit power;

The power adjustment function cannot accurately feedback the actual transmit power of "medium", "low" and \geqslant "extremely low". The values in the table are for reference only, and other powers can be customized;

3.3. Mechanical dimension drawing



Unit: mm

3.4. Pin Definition



No.	identification name	Function Description
1	DC IN	Power interface, $8 \sim 28$ V DC female socket (inner needle
1		diameter 2.0mm, hole diameter 6.4mm)
2	ETHERNET	Ethernet interface, standard RJ45 interface
3	PWR	Power Indicator
4	LINK	connection established indicator
5	DATA	Data transceiver indicator
6	ANT	SMA antenna interface, male screw female
7	Reload	Reset to factory settings button

4. Basic Functions of the Product

4.1. Default parameters

category	item	value
	Module address	0
	channel	23
Wireless parameters	transfer mode	continuous transmission
	Work mode	normal
	transmit power	High
	IP method of obtaining	static
	native port	8886
	Native IP	192.168.4.101
N	subnet mask	255.255.255.0
Network parameters	gateway	192.168.4.1
	DNS server	114.114.114.114
	web access port	80
	network working mode	TCP server

4.2. Wireless part

4.2.1. Basic Wireless Parameters

Channel: The devices that need to communicate should work on the same channel, and the current working frequency band can be calculated according to the channel value;

Working frequency = lowest frequency band + channel value * channel spacing

Module address: Transparent transmission should ensure that the addresses of the devices that need to be communicated are the same, and the configuration range is 0 to 65535;

Airspeed: Ensure that the airspeeds of the devices that need to communicate are the same, and only take effect in "fixed-length transmission", and "continuous transmission" airspeed adaptation does not require user configuration;

4.2.2. Work mode

General mode:

The radio station receives the user data from the wireless, and can also send the data through the wireless, and the sent data is automatically divided into 58 bytes for transmission.

Wake Mode:

The radio will automatically add a wake-up code before each data packet, and the length of the wake-up code depends on the wake-up time set in the user parameters;

The purpose of the wake-up code is to wake up the digital radio working in the "power saving mode", and the data sent by the "wake-up mode" will also be received in the "normal mode" and "wake-up mode";

[Note] This product does not support the configuration of "power saving mode" as a gateway;

4.2.3. Communication key

The key can only be configured and cannot be read. The configuration is always displayed as 0 (the configuration range is 0 to 255). The key is used for user encryption to avoid the interception of wireless data in the air by similar modules. The "gateway" will use these two bytes as a calculation factor to transform and encrypt the wireless signal in the air.

Since the key cannot be read, the correct key needs to be entered during configuration, otherwise the device will encrypt the communication data with 0.

To configure the key, you need to enable the "ciphertext function"

4.2.4. Broadcast monitoring

Set the "gateway" wireless address to 0xFFFF: it can monitor the data transmission of all modules on the same channel; the sent data can be received by modules with any address on the same channel, thus playing the role of broadcasting and monitoring

4.2.5. fixed point transmission

Support address function, the host can transmit data to any address, any channel module, to achieve networking applications: For example: module A (address is 0x00 0A, channel is 0x0A) needs to send data to module B (address is 0x00 05, channel is 0x05) Transmit data AA BB CC (HEX: 41 41 20 42 42 20 43 43), its communication format is: 00 05 05 41 41 20 42 42 20 43 43, where 00 05 is the address of module B, and 05 is the channel of module B, then Module B can receive AA BB CC (other stations do not receive data).

For example, configure the device (DEV01) as the parameters in the figure, connect the PC to the "gateway radio", refer to "Quick Start", (DEV02) is the same series of "serial radio" (sold separately), and also configure the corresponding parameters in the figure.



Fixed-point sending demo:

Sending from DEV01 to DEV02 needs to add 00 05 05 (HEX) before the data; Sending from DEV02 to DEV01 needs to add 00 0A 0A (HEX) before the data;



4.3. Ethernet part

4.3.1. IP Acquisition

Dynamic acquisition (DHCP):

The dynamic acquisition device will automatically obtain the IP address and subnet mask from the router and synchronize the router's gateway and DNS server. Therefore, in the dynamic acquisition mode, only the working mode and target parameters of the device can be configured.

Static configuration (STATIC):

You need to manually configure the device's IP (factory default: 192.168.3.7), subnet mask (factory default: 255.255.255.0), gateway (factory default: 192.168.3.1), DNS server (factory default: 114.114.114.114) and other parameters, the configuration is to ensure that the communication devices are located in the same network segment and to avoid IP conflicts, otherwise the device cannot pass through and configure the web page normally.

4.3.2. Device Port

random port:

TCP client, UDP client, HTTP client, MQTT client can configure the local port to 0 (use random local port), and server mode cannot use random port, otherwise the client cannot establish the connection correctly (the device does not correctly port listening).

Using a random port connection can quickly re-establish the connection when the device disconnects from the server unexpectedly, preventing the server from rejecting the connection due to four waves of incompleteness. It is recommended to use a random port in client mode.

When the device configures the TCP client, HTTP client, and MQTT client mode on the web page, it will automatically configure a random port, which can be customized to cancel. Static port:

Device fixed port (factory default: 8886), TCP server mode device listens to the configured port, accepts client connection requests and establishes a connection for data communication, TCP client mode device fixed port initiates connection requests.

4.3.3. Subnet Mask and Gateway Configuration

The subnet mask is mainly used to determine the network number and host number of the IP address, to indicate the number of subnets, and to determine whether the module is in the subnet.

The subnet mask must be set. Our commonly used class C subnet mask: 255.255.255.0, the network number is the first 24 bits, the host number is the last 8 bits, the number of subnets is 255, and the module IP is in the range of 255 within this subnet, the module IP is considered to be in this subnet.

Gateway refers to the network number of the network where the current IP address of the module is located. If a device such as a router is connected to the external network, the gateway is the router.

4.3.4. Domain Name Resolution (DNS)

Domain name resolution translates domain names into network-recognized IP addresses through Domain Name Resolution (DNS) servers. The domain name resolution (DNS) server address of this product supports user-defined, and can realize domain name resolution through a custom domain name resolution server in the event of an abnormal domain name server. The device will report the resolution to the custom domain name resolution (DNS) server during domain name resolution. Request, return the device connection parameters (usually the IP address) after the parsing is completed.

In DHCP mode, the domain name resolution (DNS) server address is automatically obtained (synchronized with the router's domain name resolution address) and cannot be customized.

In static IP mode, the factory default address of the domain name resolution (DNS) server is 114.114.114.114, which can be customized by the user.

4.3.5. Target IP/Domain Name

The target IP parameter can automatically identify whether the configuration parameter is an IP address or a domain name input, and the domain name input supports a maximum of 128 characters for configuration.

4.4. SOCKET function

4.4.1. TCP Server

TCP Server is the TCP server. In TCP Server mode, the device listens to the local port, accepts the client's connection request and establishes a connection for data communication. When the Modbus gateway function is disabled, the device sends the data received by the serial port to all client devices that establish connections with the device, and supports up to 6 clients. After the Modbus gateway function is enabled, the non-Modbus data will be cleared and not forwarded.

Typically used for communication with TCP clients within a local area network.

The connection request is no longer accepted after more than 6 clients, and the web page configuration cannot be used when the 6 clients remain connected.

4.4.2. TCP Client

TCP Client is the TCP client. When the device is working, it will actively initiate a connection request to the server and establish a connection to realize the interaction between serial port data and server data.

To use the client, you need to configure the target IP address/domain name and target port accurately.

4.4.3. UDP Server

UDP Server means that the device does not verify the IP address of the data source when it communicates using the UDP protocol. After receiving a UDP data packet, it saves the source IP address and source port of the data packet, and sets it as the destination IP and port, so the device sends The data only sends data packets to the source IP address and port where the device received the data last time.

This mode is usually used in scenarios where multiple network devices communicate with this device, and the frequency is high, and the TCP Server cannot meet the conditions.

Using UDP Server requires the remote UDP device to send data first, otherwise the data cannot be sent normally.

[Note] In UDP mode, the data sent by the network to the device should be less than 512Bit per packet, otherwise it will cause data loss.

4.4.4. UDP Client

UDP Client is a connectionless transmission protocol that provides transaction-oriented simple and unreliable information transmission services. There is no connection establishment and disconnection, and data can be sent to the other party only by configuring the destination IP and destination port. It is usually used in data transmission scenarios where there is no requirement for the packet loss rate, the data packets are small and the transmission frequency is fast, and the data is to be transmitted to the specified IP.

In UDP Client mode, the device will only communicate with the configured (target IP and target port) remote UDP devices.

In this mode, the target address is set to 255.255.255.255, and the sent data will be broadcast on the entire network segment, but the transceiver device needs to ensure that the ports are consistent, and the device can also receive broadcast data.

4.4.5. HTTP Client

This mode can realize the function of HTTP automatic packet grouping. It provides two modes: GET and POST. Customers can configure URL, Header and other parameters by themselves, and the device will send packets to achieve fast communication between the digital radio station and the HTTP server. Using HTTP client In terminal mode, it is recommended to use random ports and enable short connections to save HTTP server resources. The size of a single request packet is affected by wireless sub-packets.



Supports configuring whether to return HTTP protocol headers. The returned data is shown in the following figure:



Protocol configuration instructions, enable DHCP to configure the HTTP server address and corresponding port number (the picture below is the host computer, and the picture above is the webpage):

Network pa	iran	neter					
DH	CP e	nable 🗸	Work mode	HTTP client	~	MAC	84-C2-E4-8F-50-3D
Local	Local IP 192.168.4.165		Local port	0		Web port	80
MA	5K 2	55.255.255.0	Getway	192.168.4.1		DNS	192.168.4.1
Target	IP H	TTP Server				Target port	80/其他
Network para	wnete	rs					
Device name	A000	01		Serial Number	00001		
DHCP	Enal	ble		∨ Local port	0		٢
Local IP	192.	168.4 .165		DNS	192.1	68.4.1	
Mask	255.	255. 255. 0	Web server port	80	÷		
Getway	192.	168. 4. 1	Network mode	HTTP	~		
Remote TP	HTTH	° Server	Remote port	80			

Mode configuration description, take the packet header not returned as an example (the picture on the left is the configuration of the host computer, and the picture on the right is the configuration of the web page):

Xity parameters	HTTP client par	ameter	
MTF VEL For example //rea/day/	HTTP请求方式 G	T ¥	
Trayload whiteest http: head Nttp: head	URL: Fo	r example:/free/day?	
Per example Hest:tiangingi.com	HTTP head:	r example:Host:tianqiapl.com	🛱 without http head
Nttp parameters	HTTP client par	ameter	-21
NTTF request FOST	HTTP请求方式 PC	DST V	
Project shitest http://www. Nttp://www.	URL: Fo	r example:/free/day	
Per example Next tisaqispi enn	Fo HTTP head:	r example:Host:tlanqlapi.com	without http head

4.4.6. MQTT Client

Supports quick access to standard MQTT3.1.1 protocol servers (OneNET, Baidu Cloud, Huawei Cloud, user-built and other server types) and Alibaba Cloud servers, supports QoS level configuration (QoS 0, QoS 1), supports super-long text configuration, Convenient and better access to network service operators (server address, three elements, subscription and publishing addresses support up to 128 characters of configuration).



When using the MQTT function, the advanced settings such as short links should be closed as shown in the following figure (the upper picture is the host computer, and the following picture is the web page configuration):

Advanced										
Reconnection time	5s 🗘	Reconnect	count 5freq 🖨 Emp	pty cache when com	meeted Enable \sim					
No data autoboot time	300s 🜲	🗹 No data autobo	ot							
Short connection time	0s 🜲	🗌 Short connecti	on							
keepalive mode	Disable	~	Keepalive cycle	0s 🗘						
Keepalive content keepalive message										
Registration mode	gistration mode 🗸 🗸 🗸 🗸 🗸 🗸									
Custom registration	register me	essage			HEX					
Advanced										
Outage restart 5 time Off:0;Rang	e:1-255s	Reconnection times	5 Range:1-60	Nodata reboot	300 Off:0;Range:60-65535s					
Heartbit cycle Off:0;Rang		Short connection	0 Off:0;Range:2-255s	NET connected clear cache	Enable					
Heartbit mode Network	~	Custom heartbeat	keepalive message		Hex					
Registration Disable	~]	Custom registration	register message		Hex					

, select the standard MQTT3.1.1, Baidu Cloud, OneNET, Huawei Cloud configuration can refer to the following table to fill in the parameters:

parameter	standard MQTT3.3.1	Baidu cloud	OneNET		
Equipment name (Client ID)	Client ID	DeviceKey	equipment ID		
username (Device name)	User Name	IoTCoreId/DeviceKe y	product ID		

password	Deseword	DaviasSaarat	Equip	ment r	ame				
(Device secret)	rassword	DeviceSeciei	/User Password						
PrductKey	Alibaba Cloud par	Alibaba Cloud parameters, optional							
Dest terris	MQTT Publish	topic address	(dynar	ynamically generate					
Post topic	OneNET)								
Subscribe to	MQTT Subscript	MQTT Subscription topic address (dynamically generated by							
topics	OneNET)								

[Note]

Dynamically generated topic addresses can use the same parameters to achieve the effect of data return, for example: OneNET publishes and subscribes to the same topic address: 123456, which can achieve data return;

Due to the adjustment of the MQTT platform (Baidu Cloud, Huawei Cloud, OneNET), the connection cannot be made after filling in the parameters, and the platform rules shall prevail;

Take the standard MQTT3.1.1 parameter filling as an example, as shown below:

Natural par	ana tara				Network para	meter							
Derica name	40001	Serial Bacher	00000		DHCP	enable	*	Work mode	MQTT client	~	MAC	84-C2-E4-8	F-50-3D
	interes a sur-	of Long peri	line has a line		Level 10	100 100 1 105			0		111-1	80	e avanear
Loral IF	102 048 4		192 100.4 .1	11	Local IP	192.168.4.165		Local port	0		Web port	80	
interar	192 148 4 1	Sabeurb anda	MIT diest		MASK	255.255.255.0		Getway	192.168.4.1		DN	92.168.4.1	
desets IF	NOT Server	Sancts port	1983	1	Target IP	MOTT Server					Target port	PORT	
					MQTT client	parameter							
					MQTT server	Standard 3.1.1	Ŷ	keepAlive:	60 Ran	ge:1-255 s			
NUTI SAFT	er typical Mitt 3.1.1 v 1	lespalive sysle [00s			Device name (Client ID)	Client ID							
Client ID oper name Operire n	(Client ID (Vier Xuns			_	user name:	User Name							
Passened Garries a	arrat) Passened				(Device name)								
Production	y un fredritty				(Device secret)	Password							
Sabarriba	topie Subscribe			Que O 🗸	Deductives	uppr Productives							
Publish t-	opie Publish			Que 0 v	Prouctivey	user rioussory							
					Publish topic	Publish						Qos 0	~
					Subscribe tonic	Subscribe					12.5	Oosla	

(2)Alibaba Cloud

Supports the use of Alibaba Cloud's "Three Elements" to directly connect to the server, and obtains the "Three Elements" required to connect to Alibaba Cloud, as shown in the figure (only for demonstration cases, users need to use self-built parameters to connect):

😑 C-J Alibaba Clou	d 🔉 Workbench Cl	hina (Shanghai) 🗸						Q Search	Ave
← Public Instance	IoT Platform / Devices	/ Devices / Device Details							
Devices ^		Offline					-		
Products	Products EBYT	TE View					DeviceS	ecret	View
Devices									
Groups	Device Information	Topic List TSL Data	Device Shadow	Manage Files	Device Log	Online Debug	Groups	Task	
Jobs	Device Information								
CA Certificate	Product Name	EBYTE			ProductKey	a1GlhuTU1y/	N Сору		
Rules Engine V	Node Type	Devices			DeviceName	DEV04 Cop	/		

To configure a topic for communication testing:

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C-J Alibaba Clo	oud	🖄 Workbench China (Shanghai)		Q. Search	Expenses	Tickets ICP	Enfetprise Su
← Public Instance		IoT Platform / Devices / Deducts / Product Details					
Devices	~	← EBYTE	0				
Products		Productikey a1GhuTU1yN Copy		ProductSecret View			
Devices							
Groups		Product information topic Categories Define Heature D	ata Parsing Strer-side Subscription Device	Provisioning			
Jobs		Topics for Basic Communications Topics for TSL Communications	Topic Category				
CA Certificate		Edit Topic Category					
Rules Engine	×	Topic Category	Operation Authorization	Descrip	ion)		Actions
Maintenance	4	/a1GhuTU1vN/SideviceNameI/user/1234	Publish and Subscribe	(c)			Edit Delete

Configuration theme description:

Chengdu Ebyte Electronic Technology Co.,Ltd.

Select the corresponding product, go to "Custom Topic" under the Topic class list (for details, please refer to the Alibaba Cloud documentation), click "Define Topic Class", set the name to 1234 and grant publish and subscribe permissions (for data return pass).

Configure the device connection parameters, as shown in the following figure (the picture on the left is the host computer, and the picture on the right is the web page configuration):

{

```
"ProductKey": "a1GlhuTU1yN",
```

"DeviceName": "DEV04",

```
"DeviceSecret": "xxxxxxxxxxxxxxxxxxxxxxxxxxxxx
```

}

Alibaba Cloud server address: ProductKey.iot-as-mqtt.cn-shanghai.aliyuncs.com:1883 Topic for subscription and publication: /a1GlhuTU1yN/DEV04/user/1234

Network par	anotara Jacoba		family		Network para	ameter						
2807	Radia v	Local port	0	(1)	DHCP	enable	~	Work mode	MQTT client	×	MAC	84-C2-E4-8F-50-3D
Loral IF	192 100 4 105	395	192 168 4 1		Local IP	192.168.4.165		Local port	0		Web port	80
Rash Geteny	195 196 195 0 192 198 4 1	Nob server port	NUT client	-	MASK	255.255.255.0		Getway	192.168.4.1		DNS	192.168.4.1
Sanote 17	fredertfay, ist-armytt or%haghai aliyaara	Remote port	1863	•	Target IP	ProductKey. iot-as-mq	tt.cn-shanghai	aliyuncs.com			Target port	1883
					MQTT client	parameter						
					MQTT server	Ali	*	keepAlive:	60 Ra	nge:1-255 s		
NUTT parame NUTT server Flight TR	Alibda cloud v Ropeliy Repeliy	e sysle 60a			Device name (Client ID)	DeviceName						
ster name Ovrice nam	a) DericeRate				user name: (Device name)	DeviceName						
tasseord (Derica sac FradactKau	ret) DeviceSecret				password:	DeviceSecret						
Subscribe 1	ogis Subseribe			Q+x 0 ~	(Device secret)							
Publish top	is Publish			Qes 0 ~	Prouctkey	Productivey						
					Publish topic	Publish						Qos 0 v
					Subscribe topic	Subscribe						Qos 0 V

Alibaba Cloud MQTT platform communication test:

描 ХСОМ V2.6	TV	
[2021-10-22 09:11:09.499] TX: EBYTE_ALIYUNN_MQT2 [2021-10-22 09:11:09.669] RX: EBYTE_ALIYUNN_MQTT	RX	

4.5. Web page configuration

The device has a built-in web server, which is convenient for users to set and query parameters through web pages. The port of the web server can be customized (2-65535), default: 80

Operation method (Microsoft Edge version 94.0.992.50 as an example, does not support IE kernel browser): Open the browser, enter the IP address of the device in the address bar, for example 192.168.4.101 (the IP address and the computer need to be kept on the same network segment, if the firewall cannot be used and try again), if you forget the local IP, you can use AT commands and configuration software inquiry;

 ▲ 不安全 192.168.4.10 ■ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●		104 💼 407 Fe 100 F		@ 120	🚥 📵 🗑 🔚 🛡 🕄 🎼
			ebyte		
Device info			-		
Device model		Serial namber	00001	语言	(English ~
Version		Device name	A0001	websever password	*****
Network para	imeter				
DHCP	disable v	Work mode	TCP server	MAC	84-C2-E4-8F-50-3D
Local IP	192.168.4.101	Local port	8886	Web port	80
MASK	255.255.255.0	Getway	192.168.4.1	DNS	114.114.114.114
Target IP	192.168.4.100			Target port	8887
LORA parame	eter				
modle adress	0 Range:1-65535s	UartRate	9600 ~	Parity	8N1 ~
Air baud	1.2Kbps ~	Tx_power	maximum 🗸	Channel	80 Range :0-255
Trans_mode	Normal	Кеу	0 Range :0-255	FEC	Encryption
MODBUS par	ameter				
MODBUS TCP to RTU	Close	Most	ous instructions		add clear
Modbus	disable 🗸	MODBUS	500	spare space	49

(2) The web page pops up the main interface, and you can query and set relevant parameters;

(3) Click Submit to save the configuration parameters after entering the correct key. The factory default key is: 123456;

) 🔺 不安全 192.168.4.10	1			@ to	🚥 📵 🐸 🚮 🛡 🔇 🕼
TCP to RTU Modbus	Close V	192.168.4.101 显示 Please input a passwor 123456	rd:		
mode Modbus timeout	3000 Range: 0 - 65535ms	Modbus keep time	الاللة الاللة 200 Range:0-255s	01 03 00 00 00 0A	X
Instruction formation a space between Up to 50 instruction Advanced	t: "XX XX XX XX XX XX XX";"XX "XX"and "XX" ons can be configured	"is a 2-digit hexac	lecimal number. Must add		
Outage restart time	5 Off:0-4;ON:5-255s	Reconnection times	5 Range:1-60	Nodata reboot	300 Off:0;Range:60-65535s
Heartbit cycle	0 Off:0;Range:1-65535s	Short connection	0 Off:0;Range:2-255s	NET connected clear cache	Enable ~
Heartbit mode	Network ~	Custom heartbeat	keepalive message		Hex
Registration mode	Disable ~	Custom registration	register message		Hex

The progress bar indicates the configuration progress. Do not refresh the web page again after the configuration is completed (refresh the web page to enter the configuration mode again, you can enter the communication mode by restarting the device or submitting again);



It can also be opened through the Open Web Configuration button of the configuration software.

[Note] If the port number is modified, the port number should be added to the address input field. For example, if the web page access port is modified to 8080, the connection web page configuration needs to enter 192.168.4.101:8080 in the address bar.

) () 192.168.4.101.8080		-				•		6	۵	0	51
			ebyte	y many in							
Device info			~								
Device model	E9040TU0435C30E1	Serial namber	(1000)		语言	English					×
Version	8068-0-10	Device name	AD0011		websever password	•••••					
Network para	meter										
DHCP	disable 🗸	Work mode	TCP server	<	MAC	84-C2-	E4-8F	-50-3	BD		
Local IP	192.168.4.101	Local port	8886		Web port	8080					
MASK	255.255.255.0	Getway	192.168.4.1		DNS	114.114	.114.	114			
Target IP	192.168.4.100				Target port	8887					_

4.6. Hardware reset to factory

To restore the keys to the factory, you need to effectively connect the network cable and power supply. Keep pressing the Reload pin of the device until the LED indicators are all on to release the keys.

5. Advanced Functions

5.1. Heartbeat Packet

In client mode, users can choose to send heartbeat packets and set the time of heartbeat packets by themselves. The heartbeat packet can be selected in two modes: network heartbeat packet and serial heartbeat packet. It supports hexadecimal and ASCII transmission. This heartbeat packet is not an MQTT heartbeat and needs to be turned off in MQTT client mode. MQTT heartbeat only needs to configure KeepAlive in "MQTT function settings" Time, it is

recommended not to configure less than 60s.

Heartbeat packet sending mode:

(1) The default is to turn off the heartbeat packet mode.

(2), serial port mode -> the device sends heartbeat content to the serial port bus according to the set heartbeat time interval.

(3) Network port mode -> The device sends heartbeat content to the network port bus according to the set heartbeat time interval.

Customize heartbeat packet content (maximum support 40 bytes (ASCII) data, 20 bytes (HEX) data)

Customize the heartbeat packet sending interval. When it is set to 0, the heartbeat packet function is turned off. If the setting value is greater than zero, the heartbeat packet function is turned on.

5.2. Registration Package

In the client mode, the user can choose to send the registration package, and set the registration package time by definition.

The registration package supports the following modes:

(1) The MAC address (OLMAC) is sent when the network establishes a connection with the device

(2) The data of the custom registration package sent when the network establishes a connection with the device (OLCSTM)

(3) After the network and the device are connected, each packet of data sent by the device to the network is preceded by a MAC address (EMBMAC)

(4) After the network and the device are connected, each packet of data sent by the device to the network is prepended with custom registration packet data (EMBCSTM)

Custom registration package content (maximum support 40 bytes (ASCII) data, 20 bytes (HEX) data)

[Note] Please do not use special characters (such as ",", "\", etc.) when configuring the registration package on the web page. The host computer can configure special characters, but it may cause the web page configuration to be inaccessible.

5.3. Short connection

In client mode, short network connection is supported (this function is disabled by default). TCP short connection is mainly used to save server resource overhead, and is generally used in multi-point (multi-client)-to-point (server) scenarios.

The TCP short connection function is applied in the TCP Client mode. After the short connection function is turned on, it only requests to connect with the server when sending information. The device will automatically disconnect. When the short link hold time is set to 0, the short link function is turned off. When the setting range is (2-255) seconds, the short link function is turned on, and the default hold time is 0 seconds (short link is turned off).

5.4. Network disconnection and reconnection

In client mode, after the device is disconnected from the network, it will try to actively connect to the server at the specified time. If the request times out and the set number of reconnections has not been successfully reconnected,

the device will restart to prevent the device from disconnecting from the network. Unable to restore connection. Disconnection and reconnection time: The time interval between each attempt of the device to re-establish the network.

Number of reconnections: The number of times the device tries to re-establish the network, and the cumulative number of requests reaches the preset value. If the connection is not successful, the device will automatically restart.

The actual restart time is the network disconnection reconnection period multiplied by the number of reconnections. It is recommended to use the factory default parameters without special requirements.

5.5. Restart after timeout

Support timeout restart function (default: 300 seconds), this function is mainly used to ensure long-term stable operation of the device. If data is not sent and received within the set timeout restart time, the device will restart to avoid the impact of abnormal conditions on communication.

The parameter range of timeout restart time is (60-65535) seconds. If it is set to 0, it means shutdown timeout restart. The default is 300 seconds.

5.6. Cache cleaning

The device is in the client mode. When the TCP connection is not established, the data received by the serial port will be placed in the buffer area. The serial port receiving buffer is 1024 bytes, and the data larger than 1024 bytes will cover the earliest received data. After the network connection is successful, you can Select to clear the serial port cache or send the cache through the network through configuration.

Enable: The device does not save the data received by the serial port before the connection is established. Disabled: After the connection is established, the network will receive the serial buffered data.

5.7. Remote upgrade

In order to facilitate later maintenance and upgrade functions and to replace different firmware, this product supports online firmware upgrade, users can upgrade or replace the current firmware through the host computer through the upgrade firmware provided by our company (the firmware provided on the official website shall prevail, the official website only provides the latest firmware Firmware, please read the upgrade instructions carefully before upgrading, the firmware number in the picture may be inconsistent with the firmware provided on the official website, but the upgrade method is the same).

Network upgrade firmware operation steps:

Step 1: Open the host computer, open the device upgrade assistant in the menu bar, and select the required firmware (the official website provides download firmware);

(((*)))	
EBYTE	Chengdu Ebyte Electronic Technology Co., Ltd.
	enengaa de ju ditterine ruthinereg eengdaa

upgrade tool	B Network upgrade ass	istant			-	;	×
Device ID	C:/Users/PC/Desktop/固件	/test.ebin		🍃 Open	Q Search	🔒 Upgrea	d
	Device ID	IP 医探圈件		MAC	Devi	ce type	
			11		~	0 P 1111	in- 10 • 0
		E 50-DTU(433C30E)_V2.0	n in testebin	*	2022/2/8 10:06	eBIN 文件	101 KB

Step 2: Click to search for devices, and click to stop searching after finding the device;

:/Vsers/	/PC/Desktop/固件/test.e	bin		🝃 Open	🔍 Stop searc	h 🛛 🖓	gread	
	Device ID	IP	٨	1AC	Dev	rice type		
1	0	192.168.4.101	84-C2-E4	4-8F-50-3D	E90	-DTU-C		
	Detwork upgra	ade assistant					_	
	C:/Users/PC/Deskt	cop/固件/test.ebin			😂 Open	Q Sear	ch] Upgread
	Dev	ice ID	IP	N	IAC		Device type	e
	1	0 192.	168.4.101	84-C2-E4	-8F-50-3D		E90-DTU-C	2

Step 3: Select the corresponding device that needs to be upgraded;

MAC	МАС	De	evice type
4-8F-50-3D	C2-E4-8F-50-3D	E	E90-DTU-C
MAC 4-8F-	MAC 2-E4-8F-	50-3D	50-3D

Step 4: Click to start the upgrade, the device indicator flashes, and wait for the upgrade to complete.

[Note] When the device is just powered on, click the "Search Device" of the upgrade assistant, the device will enter the firmware burning state, and it will return to normal mode after power off and restart.

/Vsers	s/PC/Desktop/固件/test.eb	in	tär Open	🔾 Search 📄 Stop upgre
		26	6%	
	Device ID	IP	MAC	Device type
		192.168.4.101	84-C2-E4-8F-50-3D	E90-DTU-C
Netwo	ork upgrade assistant			- D
Vetwo Users	ork upgrade assistant /PC/Desktop/固件/test.ebi	n	Dpen C	– 🗆 Search 📄 Start upgre
Vetwo Users	ork upgrade assistant /FC/Desktop/固件/test.ebi Device ID	n 1990-11	Dpen C	- D Search Start upgre Device type

5.8. Modbus Gateway

5.8.1. Protocol Conversion

MODBUS Getway	Disadle	\sim	
MODBUS RTV Res	ponse timeout time	3000ms	* *
Storage time o	f Modbus instruction	200s	\$
Modbus Auto qu	ery interval	500ms	*
🗌 Modbus RTV	<-> Modbus TCP		
	Instruction li	st:	Delete
			Add

Enabled: Modbus data is checked and non-Modbus data (RTU/TCP) is discarded and not transmitted, and the Modbus RTU protocol and the Modbus TCP protocol are interconverted.

Disabled: Do not perform protocol conversion but verify Modbus data, discard non-Modbus data (RTU/TCP) and not transmit.

[Note] Due to the packetization mechanism of wireless modulation, the maximum size of a single packet is 58 bytes.

5.8.2. Simple Protocol Conversion

Convert Modbus RTU data to Modbus TCP data, or convert Modbus TCP data to Modbus RTU data, to realize the mutual conversion of Ethernet Modbus data and serial port Modbus data.

Simple protocol conversion can work in any mode (TCP client, TCP server, UDP client, UDP server, MQTT client), no matter what mode it is working in, there can only be one Modbus master.



Simple protocol conversion configuration description (TCP server mode as an example, the left picture is the upper computer, the right picture is the webpage):

Betwork pas	meters				32	Network para	meter							
Derice name	A0001		Serial Number	00001		DUICO	(all shares		100-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0	TAD				04 00 E4 05 50 00
2407	2isable .		Local port	3004	8	DHCP	disable	~	Work mode	TCP server		•	MAC	84-G2-E4-6F-50-3D
Local IF	192.168.4 101		105	114 114 114 114		Local IP	192.168.4.101		Local port	8886			Web port	80
Mask	266.256.256.0)	Veb server port	80	(۵	MACK	255 255 255 0		Coturn	102 168 4 1			DMC	114 114 114 114
Getray	192.168.4.1		Notourk mode	DCP server	Y	MASK	200.200.200.0		Getway	102.100.4.1			DNS	194.194.194.19
Renote IF	110, 168, 4, 100		Remoto port	8907	1	Target IP	192.168.4.100						Target port	8887
		Rollins parameters					MODB	JS parame	ter					
		MIDDIE Getway Simple pro	tical cases ~											
		SCORES RAY Response times	nt ties 2000	a D			M	ODBUS Open		~	Mos	bus instruction	ons	
		Storage time of Modeus in	atraities 201	2			ICP	to RIU						
		Rollos Anto query intervo	d 100e-	\$,	Modbus Simple	la l	~	MODBUS	500		
		🛃 Medius MTF (*) Medius	TCP					mode			Query time	Range:0-65	535ms	
		Inst	truction lists	Beletz			1	Modbus 3000			Modbus	200		
				444				imeout Rang	e: 0 - 65535ms		keep time	Range:0-25	5s	

5.8.3. Multi-host mode

There is only one Modbus master station for relatively simple protocol conversion, while the multi-master mode can handle up to 4 Modbus TCP masters. One request is processed at a time, while the multi-host mode will be sorted and processed according to the TCP request, and other links will wait), thereby solving the bus conflict problem (currently only 4 host connections are supported), only supports working in TCP server mode, slave machine Only in the serial port, otherwise it will not work properly.

With the increase of the number of hosts, the Modbus timeout time should be increased accordingly, and the request interval should be increased. If multiple hosts are required to make continuous high-speed requests, it is recommended to use a "storage gateway".

It is recommended to configure "Simple Protocol Conversion" when no multi-channel host is used.

Multi-host mode configuration (the picture on the left is the host computer, and the picture on the right is the webpage):

Betrurk pa	ruhatars				N	letwork para	meter						
Device nue	A0001	54	erial Busher	00001		DHCP	dicable	×	Work mode	TCP serve		MAC	84.02.E4.8E.50.3D
1407	2isable	Li	ical port	0006	0	DHCP	UISADIO	*	work mode	TOP Server		MAC	04-02-24-01-00-00
eral IF	192.168.4 101	20	e	(114 114 114 114		Local IP	192.168.4.101		Local port	8886)	Web port	80
lask	268.256.258.0	7.	d server port	80	٢	MASK	255 255 255 0	_	Getway	192 168 4	1	DNS	114.114.114.114
etesy	192.168.4.1	34	trock node	DCP server	Y	mean			occuray			DING	
anote IF	192, 168, 4, 100		moto port	868.7	3	Target IP	192.168.4.100					Target port	8887
		Rollen paraestern					MOR						
		MIDDIE Gatasy Haltihast a	ada 🔍 😳				MOD	BUS parar	neter				
		MIGDIE MTV Response timore	t tie+ 3000	•• E				MODBUS	bén	~	Moshus instr	uctions	
		Storage time of Rodbus inc	tration 2005	2			T	CP to RTU			mosbasinsa	ucuona	
		Rollins Anto query interval	100w	• •				Modbus	di hoat		MODBUS 500		
		🖾 Rodius HTV (~) Rodius 7	17					mode	and hoose	100	Query time Range:	0-65535ms	
		Inste	netion lists	Bulans				Modbus 30	00		Modbus 200		
				. 8-12				timeout Ra	nge: 0 - 65535ms		keep time Ranged	0-255s	

5.8.4. Storage Gateway

The storage gateway not only arbitrates the bus data but also stores the repeated read commands. When different hosts request the same data, the gateway does not need to query the register status of the RTU device multiple times, but directly returns the data cached in the storage area. To a certain extent, the multi-host request processing capability of the gateway is improved, and the time consumed by the entire request process is also shortened. Users can customize the storage area command polling interval and command storage time according to their needs.

As the optimization of multi-host request performance, the storage gateway can only work in the TCP server mode, which improves the response speed of the network side.

Features:

(1) The gateway has a 3K cache for storing instructions and returning results (reading 10 holding registers as an example, about 100 instructions and returning results can be stored);

(2) The RTU response time-out automatically clears the cache to ensure the real-time and authenticity of the data;

(3) The polling interval can be customized, 0-65535ms (default: 500ms);

(4) The gateway will poll the RTU device according to the storage time of the instruction used for configuration. If the MODBUS host does not query the instruction again during the storage time, the gateway will automatically delete the storage instruction to release the cache;

(5) The first command and control command (05, 06, 0F, 10 function codes) will directly access the RTU device;

(6) Only 01, 02, 03, 04 Modbus function code query result storage is supported;

Storage gateway configuration (the picture on the left is the host computer, and the picture on the right is the webpage):

Retwork pas	reaters				Network para	imeter						
Device name	A0001	Serial Suber	00001		DHCD	dicable		Week mede	TOD convet		MAG	94 02 E4 8E 50 3D
1477	Disable	w Local port	8006	5	DHCP	disable	•	work mode	TCP Server	•)	MAC	04+02+E++01+00-3D
aral IF	192.168.4 .101	105	114 114 114 114		Local IP	192.168.4.101		Local port	8886		Web port	80
tas).	265.255.255.0	Wah surver port	80	1	MACK	255 255 255 0		Cohumu	102 168 4 1		DAIC	114 114 114 114
latany	192.168.4.1	Setrork ands	DCF server	¥	MASK	200.200.200.0		Getway	192.100.4.1		DINS	114.114.114.114
imote If	192, 168, 4, 100	Bancto port	688.7	4	Target IP	192.168.4.100					Target port	8887
	Rodon parateter					M	ODBUS para	meter				
	MODUS Getwey S MODUS XIV Respo Storage time of	urable getray v un timerat time 3000 fodban instruction 2000	• 0				MODBUS TCP to RTU	Open	2	Mosbus instr	uctions	
	Bodius Anto quer	Interval 800s Rodou TCP	• 0				Modbus mode	Storable	~	MODBUS 500 Query time Range:0	0-65535ms	
		Instruction lists	Balane				Modbus timeout R	000 ange: 0 - 65535n	15	Modbus 200 keep time Range:	0-255s	

5.8.5. Configurable Gateway

The gateway automatically polls the RTU device register according to the pre-configured MODBUS command (only supports the configuration of the MODBUS read command), and the commands in the non-storage table will directly operate the RTU device. Frequently read commands can be stored in the gateway in advance, which can shorten the response time (query configured commands). Due to the above features, the serial port side of the configurable gateway can only be connected to Modbus slaves.

Instruction storage description (increase, the instruction error and format error cannot be added, the left picture is the host computer, the right picture is the webpage):

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Modbus parameters MDDBUS Getway Configurable getway 🗸	Instruction list:	01 02 00 00 00 02 add clear
MUDBUS RTU Response timeout time 3000ms Storage time of Modbus instruction 200s Modbus Auto query interval 500ms Modbus RTU (-> Modbus TCP Instruction list: Delete 01,02,00,00,00,01 Add	<	spare space 47 01 02 00 00 00 02 × 01 02 00 00 00 01 × 01 03 00 00 00 0A ×

Instruction storage description (delete, the picture on the left is the host computer, and the picture on the right is the webpage):

Modbus parameters		
MODBUS Getway Configurable getway ~	nstruction list:	add clear
MDDBUS RTV Response timeout time 3000ms 🜩	01,03,00,00,00,04	spare space 49
Storage time of Modbus instruction 200s 🜩	.0	01 03 00 00 00 0A ×
Modbus Auto query interval 500ms		
🗹 Modbus RTU (-> Modbus TCP		
Instruction list: Delete	•	
01, 02, 00, 00, 00, 01 Add 4	٢	>

Instruction storage description (clear, web page and AT command support):

01 02 00 00 00 02	add clear
spare space	47
01 02 00 00 00 02	X
01 02 00 00 00 01	X
01 03 00 00 00 0A	X

Configurable gateway configuration (the picture on the left is the host computer, and the picture on the right is the webpage):

leteurk pa	weters .				Network para	meter						
leries same	80005	Serial Musher	00001]	DUICD	daabta		March and a second s	700			04 00 E4 9E 50 9D
CP .	Disable	Lord port	0006		DHCP	disable	•	work mode	TCP server	•	MAC	04-02-04-01-00-30
al IF	192.568.4 .501	385	114 114 114 114		Local IP	192.168.4.101		Local port	8886		Web port	80
à.	255 258 256 0	Reb surver port	90	•	MACK	255 255 255 0		Caturne	102 169 4 1		DNIC	*** ***
***	192.568.4.1	Network node	TCP server	4	WASK	200.200.200.0		Getway	102.100.9.1		DNS	114,114,114,114
nte If	100 100 4 100	Bancte port	0007.	\$	Target IP	IP 192.168.4.100					Target port	8887
dus par	motors	-				MODBUS parameter						
BHE Gate	ny Configurable getrey v Response timeret time 2000mg 🗘	1 01,03,00,00.00	*1 0,0A	-		MODBUS TCP to RTU	\$	Mo	sbus instructions		add	clear
terage time of Modbus instruction 200s [2]					Modbus mode	×	MODBL Query tim	JS 500 Range:0-65535ms	spare space 49			
Rođen I	17 ↔ Roßen 107					Modbus 3000 timeout Range: 0 - 1	55535ms	Modbe keep tim	us 200 ne Range:0-255s			
Instruction list: Palets 00.00.00.00.01 Add c >			li a	Instruction format: "XX XX XX XX XXX XXX";"XX" is a 2-digit hexadecimal number. Must add a space between "XX" and "XX" Up to 50 instructions can be configured								

5.8.6. Automatic upload

In the client mode (TCP client, UDP client, etc.), the gateway will automatically poll the instructions in the stored instruction table and upload it to the server. The feedback format (Modbus RTU format or Modbus TCP format) and the instruction polling interval can be selected according to requirements. (0-65535ms).

For instruction pre-storage, refer to "Configurable Gateway - Instruction Storage Instructions", and automatically upload the upper computer/web page configuration:



TCP client demonstration (Modbus RTU format on the left, Modbus TCP format on the right):



6. Configuration Mode

6.1. Web configuration

You can customize the relevant parameters through the Web setting method. Open the browser, enter the device IP in the address bar (default: 192.168.4.101), enter the page, you can query and set parameters, and finally click the "Submit" menu to wait for the page to return to the successful prompt, and it will take effect.

Note: Do not enter the web page configuration during normal use, which may cause data loss. If you enter the web page configuration, you need to restart to enter the communication mode.

Web page configuration initialization password: 123456, can be customized configuration, only supports 6-bit

uppercase and lowercase letters and numerical configuration.

The webpage configuration requires browsers with newer kernels to work properly, such as Microsoft Edge (96.0.1054.62), Google chrome (96.0.4664.110), Firefox (95.0.2), etc.

[Note] IE, 360 compatibility mode, QQ browser compatibility mode and other browsers using IE core are not supported to use web page configuration.

6.2. Host computer configuration

Open the configuration tool software, search for devices, double-click the identified device, and the parameter query configuration interface will pop up. You can customize and modify relevant parameters according to your needs, then save the configuration, restart the device, and complete the parameter modification.

Note :

Do not use multiple host computers in the same local area network environment. Multi-network card industrial computers need to temporarily disable and do not use network cards, otherwise the host computer will not be able to search for devices normally (the same device is displayed multiple times, no device can be found, etc.)

The host computer shields the wireless network card, so the network cable must be connected to use the host computer, and the wireless network card can be configured through the web page.

6.3. AT command configuration

The query and modification of relevant parameters of the device can be completed through AT command configuration. For specific AT commands, please refer to "E90-DTU(433L30E)-V8 AT Command".

Revise history

Version	Revision date	Revision Notes	Maintenance man		
1.0	2022-06-06	initial version	LC		
1.1	2022-09-08	Update manual product diagram	XXN		

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