

Wireless Modem User Manual



E90-DTU(xxxSLxx-ETH)_V2.0 Ethernet Gateway User Manual

All rights to interpret and modify this manual belong to Chengdu Ebyte Electronic Technology Co., Ltd.

Contents

1 Introduction	
Features	
2 Quick start	4
2.1 Hardware preparation	4
2.2 Software Preparation	5
2.3 Hardware connection	6
2.4 RF setting	6
2.4.1 Configuring "Serial Radio E9x-DTU(xxxSLxx)"	6
2.4.2 Configuring "Gateway Radio E90-DTU(xxxSLxx-ETH)_V2.0"	
2.5 TCP servers instructions	11
2.6 TCP client instructions	
2.7 UDP server instructions	
2.8 UDP client instruction	
3 Specification and parameter	16
3.1 General specifications	16
3.2 Frequency and number of channels	
3.3 Transmit power level	
3.4 Air speed	17
3.5 Subcontract length and method	
3.6 Communication distance	
3.7 Power consumption	
3.8 Size	19
3.9 Pin definition	20
4 Basic function	20
4.1 Default parameter	
4.2 LORA parameter	21
4.2.1 Basic wireless parameters	21
4.2.2 Broadcast and monitoring	21
4.2.3 Fixed point transmission	
4.2.4 Relay mode	23
4.2.5 Communication key	
4.2.6 LBT	24
4.2.7 WOR role	
4.2.8 RSSI	
4.2.9 Channel RSSI enable	25
4.3 Ethernet	25
4.3.1 IP Acquisition	25
4.3.2 Device port	
4.3.3 Subnet mask & gateway configuration	
4.3.4 Domain name resolution (DNS)	
4.6 SOCKET function	27
4.6.1 TCP Server	
4.6.2 TCP Client	

4.6.3 UDP server	
4.6.4 UDP Client	
4.6.5 HTTP Client	
4.6.6 MQTT Client	
4.7 Web configuration	
4.8 Hardware recovery factory	
5 Advanced Features	
5.1 Heartbeat Pack	
5.2 Registration package	
5.3 Short connection	
5.4 Disconnect and reconnect	
5.5 Timeout restart	
5.6 Cache cleaning	
5.7 Remote configuration	
5.8 Remote upgrades	
5.9 Modbus gateways	
5.9.1 Protocol conversion	
5.9.2 Simple protocol conversions	
5.9.3 Multi-host mode	
5.9.4 Storage gateway	
5.9.5 Configurable gateway	
5.9.6 Automatic upload	
5.9.7 Simple protocol conversion demo case	
6 Configuration method	
6.1 Web Configuration	
6.2 Software configuration	
6.3 AT command configuration	
Revision History	
About us	

1 Introduction

E90-DTU(xxxSLxx-ETH)_V2.0 supports adaptive network rate (up to 100M full duplex), providing six working modes of TCP Server, TCP Client, UDP Server, UDP Client, HTTP Client, MQTT Client, while in TCP Server mode supporting six client connections;

Supporting a variety of Modbus gateways, which can perform simple interchange of Modbus TCP data and Modbus RTU data, as well as record and send the read instructions, and also actively upload the server through pre-stored instructions;



Wireless communication adopts LoRa direct sequence spread spectrum technology, which will bring longer communication distance and has the advantages of concentrated power density and strong anti-interference ability. With software FEC forward error correction algorithm, which has high coding efficiency and strong error correction capability, it can actively correct the interfered packets in the case of sudden interference, which greatly improves the reliability and transmission distance, and can help users to complete long-distance data transparent transmission efficiently. Users can make relevant configurations via WEB pages;

E90-DTU(xxxSLxx-ETH)_V2.0 includes the following 6 models:

E90-DTU(230SL22-ETH)_V2.0, E90-DTU(230SL30-ETH)_V2.0, E90-DTU(400SL22-ETH)_V2.0 E90-DTU(400SL30-ETH) V2.0, E90-DTU(900SL22-ETH) V2.0, E90-DTU(900SL30-ETH) V2.0

Features

- Adopting the latest LoRa technology, which has a longer distance and more powerful performance than traditional LoRa digital radio;
- Adopting military grade LoRa modulation technology with data encryption and settable sub-packet length;
- Support LBT function, the radio waits to send according to the current environment noise intensity. Improving the radio's communication success rate in harsh environments;
- Support for wireless sending of command packets, remote configuration and communication encryption;
- Can realize multi-level relay network to effectively extend the communication distance and realize ultra-long distance communication;
- Industrial-grade design can work in -40°C \sim +85°C environment, wide voltage input (DC 8 \sim 28V);
- Full aluminum alloy housing, compact size, easy installation and good heat dissipation;
- perfect shielding design, good electromagnetic compatibility and strong anti-interference capability;
- RJ45 adaptive 10 Ethernet interface;
- Support for multiple operating modes (TCPS, TCPC, UDPS, UDPC, HTTPC, MQTTC);
- Support for three configuration modes: configuration tool, web page and AT command;
- Support for up to six socket connections in server mode;
- Support for DHCP functionality;
- Support for DNS (domain name resolution), with custom domain name resolution servers;
- Support for multiple Modbus gateways (simple protocol conversion, multi-host mode, storage gateway, configurable gateway, etc.)
- Support for fast access to Ali cloud, Baidu cloud, OneNET, Huawei cloud, version 3.1 standard MQTT

servers;

- Support for HTTP protocols (GET/POST requests);
- Support for time-out restart function with customizable time;
- Support short connection function, short connection interval time customization;
- Support for heartbeat packet and registration packet functions;
- Support for serial port cache cleaning function;
- Support for accessing external network, LAN, and virtual serial port tools;
- Support hardware restore factory settings and online upgrade

2 Quick start

2.1 Hardware preparation

E90-SL-ETH has three bands in total (E90-DTU(230SLxx-ETH)_V2.0, E90-DTU(400SLxx-ETH)_V2.0, E90-DTU(900SLxx-ETH)_V2.0), the use of different bands is the same, here the E90-DTU(xxxSLxx-ETH)_V2.0 with E90-DTU(xxxSLxx) for transparent transmission as an example.

In order to test the E90-DTU (xxxSLxx-ETH)_V2.0, the following hardware is required:

- A PC with a network port;
- One E90-DTU(xxxSLxx-ETH)_V2.0 (or other frequency band of the same series), hereinafter referred to as "gateway radio";
- One E90-DTU(xxxSLxx) digital radio, hereinafter referred to as "serial radio" (used as an example or purchased separately if needed);
- Two TX433-JKD-20P antennas (female thread, female pin);
- Two DC12V-1A power adapters;
- One network cable;
- One USB to RS-485 serial cable;

	Data Transceiver For TCP/IP CC-IN CC-IN EBWERNE EBWERNE PURE LINCEMA	EBUTTE DATA TRANSCEIVER	
PC	E90-DTU(xxxSLxx-ETH)_V2.0	E90-DTU(xxxSLxx)	
		2 3	
RJ45 cable	DC12V-1A Power supply*2	Serial cable	TX433-JKD-20P*2

2.2 Software Preparation

Download the network debugging assistant "NetAssist" and serial port assistant "XCOM" from the product details on Ebyte website, as shown below. Official website address: <u>https://www.cdebyte.com.</u>



Download the configuration tool for the corresponding product details, use "Ebyte Config Tool" for "Gateway Radio E90-DTU(xxxSLxx-ETH)_V2.0" and use corresponding configuration software (e.g. "RF_Setting(E90-DTU SL)") for "Serial Radio E9x-DTU(xxxSLxx)".

BE Ebyte config tool v5.0			- 🗆 X	E RF_Setting(E9	D-DTU SL)_	V1.6			_		×
Menu language about Blind IP: 192.168.0.104 ~]		Q Search		成者	亿佰特	电子和	科技有限	公司	中文	
Device model	Local IP	Version	MAC	EBYTE	Chen	gdu Ebyte Ele	ectronic	Technology C	o.,Ltd.	English	
								^ COM4 ~	Open	Modules	
								↓ Get	Set Param	Param Rese	t
log:			Clear log	Baud Rate	\sim	WOR Role	~	Relay	~ Addr	es	
				Parity	\sim	Wor Cycle	.~~	LBT	↓ Chan	nel	
				Air Rate	.~	Power	\sim	Packet RSSI	~ NET	ID	
				Packet Size	~	Tran Mode	~	Channel RSSI	~ Key		
				Copyright@ Che	ngdu Ebyte	e Electronic Techno	logy Co.Ltd		Website: w	ww.ebyte.com	

2.3 Hardware connection

Connecting the antenna to the E90 radio with power on (DC: 8 to 28V, DC12V/24V, 1A is recommended), RS485 connection, network cable connection:

beolaA		A USB B B B B B B B B B B B B B B B B B B	Elbernet PWR LINK CLAA
Antenna connection	Up: "Gateway radio" is connected Down: "Serial Radio" connection	RS-485 connection for Serial Radio	RJ45 cable connection for Gateway radio

2.4 RF setting

2.4.1 Configuring "Serial Radio E9x-DTU(xxxSLxx)"

Step 1: Power on and connect the USB to RS-485 serial cable (serial cable A to radio 485_A and serial cable B to radio 485_B);

Step 2: check if the radio is working in configuration mode, if not in configuration mode, please enter configuration mode according to the configuration dip switch in the figure below;

EB



Transmission Mode

Configuration Mode

Step 3: Open the configuration software for "E9x-DTU(xxxSLxx)" and select the corresponding serial port; RF_Setting(E90-DTU SL)_V1.6 - □ ×

成都亿佰特电子科技 Chengdu Ebyte Electronic Tec	友有 降 hnolog	R2	入司 D.,Ltd.	中文 English
^	COM4	~	Open	Modules
~	Get		Set Param	Param Reset

Step 4: "Open serial port" and click "Get" to read parameters, then click "Param Reset" to restore factory settings;

EBYI	Ec	nen	gdu Ebyte	Electr	ronic	Technolo	gy Co.	,Ltd.		English
Model: E90- Version: 4.0	DTU SL					^ COM4	\sim	Close		Modules
FrequencySt Parameter: (r: 433.125N 0xc0 0x00 0	Hz x09 0x	00 0x00 0x00 0x	62 0x00 0x1	17 0x03	↓ Ge	rt	Set Paran	n	Param Reset
Baud Rate	9600bps	~	WOR Role	Translate	~	Relay	Disable	~ Ac	ddres	0
Parity	8N1	~	Wor Cycle	2000ms	~	LBT	Disable	~ Cł	hanne	23
Air Rate	2.4Kbps	~	Power	22dBm	~	Packet RSSI	Disable	~ N	et id	0
Packet Size	240 Bytes	~	Tran Mode	Normal	~	Channel RSS	Disable	~ K	ey	0

Step 5: Configure the baud rate to 9600, parity to 8N1, null speed to 2.4Kbps, packet length to 240Bytes, etc., as shown in the figure below, click "Set Param";

(((•)))	Ig(LSU-DI	t ±	(17 (舌)	法曲	Zŧ	a H	古	想从			中文	τ
EBYT	EC	hen	gdu Ebyte	Electr	ronic	Tecl	nnolo	gy Co.	"Ltd		Engli	sh
Model: E90- Version: 4.0	DTU SL					^	COM4	~	Clo	ose	Module	s
FrequencySt Parameter: (r: 433.125N 0xc0 0x00 0	1Hz x09 0x	00 0x00 0x00 0x	62 0x00 0x1	17 0x03	~	Ge	t 👘	Set P	aram	Param Re	set
Baud Rate	9600bps	~	WOR Role	Translate	\sim	Relay		Disable	~	Addres	0	
Parity	8N1	\sim	Wor Cycle	2000ms	~	LBT		Disable	~	Channe	23	
Air Rate	2.4Kbps	~	Power	22dBm	~	Packe	et RSSI	Disable	~	NET ID	0	
Packet Size	240 Bytes	~	Tran Mode	Normal	~	Chan	nel RSSI	Disable	~	Key	0	_
Copyright@	Chengdu	Ebyt	e Electronic Te	chnology	Co.Ltd				Wet	osite: www	w.ebyte.com	m

Step 6: Exit "Configuration Mode" and enter "Transmission Mode" by changing the dip switch;

2.4.2 Configuring "Gateway Radio E90-DTU(xxxSLxx-ETH)_V2.0"

Step 1: Turn on the power and connect the PC to the "gateway radio" using a network cable;

Step 2: Factory configure the gateway radio by pressing and holding the Reload button until all the indicators are fully on;

Step 3: 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 for "gateway radio" is 192.168.4.101, so configure the PC's static IP 192.168.4.xxx, here we use 192.168.4.100 as an example, shown in the figure below:

t > Network Connections General General Connection Ethemet 2 Connection IPv4 Connectivity: IPv6 Connectivity:	General You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the agroup of the setting.
Ethernet 2 Connection Connection (4) 1215 What(R) Ethernet Connection IPv4 Connectivity: IPv6 Connectivity: IPv6 Connectivity: IPv6 Connectivity: IPv6 Connectivity: IPv6 Connectivity:	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Evalued Budsoch Duration: Duration: Duration: Details Details Biutsoch Device (Person Details Details Biutsoch Device (Person Details Details Biutsoch Device (Person Details Details Bytes: Bytes: Properties	Obtain an IP address automatically IP address: IP address: Subnet mask: Default gateway: Obtain DNS server address Preferred DNS server: Alternate DNS server: , , , Validate settings upon exit

	Menu language ab	out					- U	~	
		100.001							
	本地IP: 192.168.4.	100 V	Catoway	MAC	Dovico modol	Varcian	Q Searc	n .	
	1 0	192.168.4.101	192.168.4.1	84-C2-E4-8F-1	E90	9050-0-10	E90-DTU		
	log:						Clear 1	.og	
Ebyte config tool v3.	<pre>>>> Searching >>> Device search </pre>	completed,1 devic	es vere found						
地IP: 192.168.4.	 Search 	Network pa	rameters						
地IP: 192.168.4.	C Search	Network pa Device nam	nrameters ne <u>E0001</u>		Se:	rial Number	00001		
地 Inguage ab(地IP: 192.168.4. Device ID L 0 192	 Search ocal IP Gate 2.168.4 192.16 	Network pa Device nam DHCP Local IP Mask Getway Remote IP	rameters E0001 Disable <u>192.168.4</u> <u>255.255.255</u> <u>192.168.4</u> 192.168.4.	.101 5.0 .1 100	Se: Lo DN: Vel Ne Res	rial Number cal port S b server port twork mode mote port	00001 8886 114.114.114. 80 TCP server 8887	114	
地 Inguage abo 地IP: 192.168.4. Device ID Lo 0 192	 Search Search	Network pa Device nam DHCP Local IP Mask Getway Remote IP	rameters E E0001 Disable 192.168.4 255.255.25 192.168.4 192.168.4	.101 5.0 .1 100	Se: Lo. DN: Vel Ne Ren module	rial Number cal port S b server port twork mode mote port	00001 8886 114.114.114. 80 TCP server 8887	114	
地 Tanguage abd 地IP: 192.168.4. Device ID L 0 192	 Search Search	Network pa Device nam DHCP Local IP Mask Getway Remote IP Iora paran Adress Air Baud Packet siz key	rameters E <u>60001</u> Disable <u>192.168.4</u> <u>255.255.25</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>0</u> <u>2.4Kbps</u> <u>240 Bytes</u> <u>0</u>	.101 5.0 .1 100 figure remote Chann V WOR Ro WOR Ro LB7	Set Lo DN: Wel Ne Ret module el 23 s er maximum le Close	rial Number cal port S b server port twork mode mote port Net Trans mo WOR Cyc Relay enable	00001 8886 114.114.114. 80 TCP server 8887 ID 0 \$ de Normal \$ le 2000ms \$ Packet RSS	114	k
地 IP: 192.168.4. Device ID L 0 192	 Search Search	Network pa Device nam DHCP Local IP Mask Getway Remote IP Vora paran Adress Air Baud Packet siz key	arameters E <u>60001</u> Disable <u>192.168.4</u> <u>255.255.25</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4 <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4 <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4 <u>192.168.4</u> <u>192.168.4 <u>192.168.4</u> <u>192.168.4 <u>192.168.4</u> <u>192.168.4 <u>192.168.4 <u>192.168.4 <u>192.168.4 <u>192.168.4 <u>192.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>194.168.4 <u>194.168.4 <u>194.168.4 <u>194.168.4 </u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u>	.101 .5.0 .1 100 figure remote Chann V Pow VOR Ro V WOR Ro	Se: Lo DN: Wel Ne Ren module el 23 is er maximum le Close enable	rial Number cal port S b server port twork mode mote port Net Trans mo WOR Cyc Relay enable	00001 8886 114.114.114. 80 TCP server 8887 ID 0 \$ de Normal ~ le 2000ms ~ Packet RSS	114	SI
realized and the second secon	Search ocal IP Gate 2.168.4 192.16 Clear log completed, 1	Network pa Device nam DHCP Local IP Mask Getway Remote IP lora paran Adress Air Baud Packet siz key Modbus pa MODBUS G MODBUS R Storage	arameters Disable 192.168.4 255.255.25 192.168.4 1	.101 .5.0 .1 100 figure remote Chann V Pow WOR Ro WOR Ro E LBI timeou 3000ms ts ins 200s terval 500ms bus TCP	Se: Lo DN: Vel Ne Ren module el 23 k er maximum le Close renable	rial Number cal port S b server port twork mode mote port Net Trans mo WOR Cyc Relay enable <u>nstruction li</u> 01,03,00,00,0	00001 8886 114.114.114. 80 TCP server 8887 ID 0 \$ 0	114	SI
rg: >> Searching >> Device search evices were found	Search ocal IP Gate 2.168.4 192.16 Clear log completed, 1	Network pa Device nam DHCP Local IP Mask Getway Remote IP Iora paran Adress Air Baud Packet siz key Modbus pr MODBUS G MODBUS G MODBUS R Storage Modbus At	arameters me <u>E0001</u> Disable <u>192.168.4</u> <u>255.255.25</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>192.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4 <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4</u> <u>193.168.4 <u>193.168.4</u> <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4 <u>193.168.4</u></u></u></u></u></u></u></u></u></u></u></u></u></u></u>	.101 .5.0 .1 100 figure remote ♦ Chann ✓ Pow ✓ WOR Ro ♥ Chann ✓ Pow ✓ WOR Ro ■ LBT E LB	Se: DN: Velocities Ne Ren module el 23 is er maximum le Close c enable Delete Add Le count 5f ta autoboot	rial Number cal port S b server port twork mode mote port Net Trans mo WOR Cyc Relay enable nstruction li 01,03,00,00,0	00001 8886 114.114.114. 80 TCP server 8887 ID 0 4 de Normal ~ le 2000ms ~ Packet RSS st: 0,0A	114	SI

Step 3: Use "Ebyte Config Tool" or Web Configuration to configure the RF parameters;

ebyte

Device model	E90-DTU(400	SL30-ETH)	Serial namber	00001		语言	English	
Version	9050-0-10		Device name	E0001		websever	*****	
etwork para	ameter					passiona		
DHCP	disable	•	Work mode	TCP server	T	MAC	84-C2-E4-8F-10	-AC
Local IP	192.168.4.10	1	Local port	8886		Web port	80	
MASK	255.255.255.	0	Getway	192.168.4. <mark>1</mark>		DNS	114.114.114.114	
Target IP	192.168.4.10	0	-			Target port	8887	
ORA parame	eter							
modle adress	0 Range:1-655	35s	Channel	23 Range:0-83		Net ID	0 Range :0-255	
Air baud	2.4Kbps	۲	Tx_power	maximum	۲.	Trans_mode	Normal	
packetlength	240 Bytes	۲	WOR role	Close	•	WOR Cycle	2000ms	
KEY	0 Range:1-655	35s	LBT enable	📮 Eelay enable		Packet Rssi	Channel Rss	i
	Enable re	mote config			(Configure remote Lora	1	
IODBUS par	Enable re ameter	mote config			(Configure remote Lora	1	
IODBUS par MODBUS TCP to RTU	Enable re ameter Close	mote config	Mosbu	s instructions	(Configure remote Lora	add c	lear
ODBUS par MODBUS TCP to RTU Modbus mode	Enable re ameter Close disable	mote config v	Mosbu MODBUS Query time	s instructions	(Configure remote Lora	add c	lear
ODBUS par MODBUS TCP to RTU Modbus mode Modbus	Enable re ameter Close disable 3000	mote config v	Mosbu MODBUS Query time Modbus	s instructions 500 Range:0-65535ms 200	(Configure remote Lora spare space 01 03 00 00 00 0A	add c 49 X	lear
ODBUS par MODBUS TCP to RTU Modbus mode Modbus timeout	Enable re ameter Close disable 3000 Range: 0 - 65	v v v v v v v v v v v v v v v v v v v	Mosbu MODBUS Query time Modbus keep time	s instructions 500 Range:0-65535ms 200 Range:0-255s	(Configure remote Lora spare space 01 03 00 00 00 0A	a add c 49 X	lear
IODBUS par MODBUS TCP to RTU Modbus mode Modbus timeout struction forma	Enable re ameter Close disable 3000 Range: 0 - 65 tt: "XX XX XX XX	station fig	Mosbu MODBUS Query time Modbus keep time X°is a 2-digit hexade	s instructions 500 Range:0-65535ms 200 Range:0-255s ecimal number. Mus	(t add a:	Configure remote Lora spare space 01 03 00 00 00 0A	a add c 49. X	lear
IODBUS par MODBUS TCP to RTU Modbus mode Modbus timeout struction forma bace between ") p to 50 instruct	Enable re ameter Close disable 3000 Range: 0 - 65 Range: 0 - 65 rt: "XX XX XX XX"and "XX" ions can be co	station figured	Mosbu MODBUS Query time Modbus keep time X"is a 2-digit hexade	s instructions 500 Range:0-65535ms 200 Range:0-255s ecimal number. Mus	(t add a:	Configure remote Lora spare space 01 03 00 00 00 0A	add c 49 X	lear
IODBUS par MODBUS TCP to RTU Modbus mode Modbus timeout struction forma bace between "2 p to 50 instruct dvanced	Enable re Close disable 3000 Range: 0 - 65 ht: "XX XX XX XX"and "XX" ions can be co	i535ms XX XX XX";"X	Mosbu MODBUS Query time Modbus keep time X*is a 2-digit hexade	s instructions 500 Range:0-65535ms 200 Range:0-255s ecimal number. Mus	(it add a	Configure remote Lora spare space 01 03 00 00 00 0A	add c 49 X	lear
NODBUS par MODBUS TCP to RTU Modbus mode Modbus timeout struction forma bace between ") p to 50 instruct dvanced Outage restart time	Enable re ameter Close disable 3000 Range: 0 - 65 At: "XX XX XX XX"and "XX" ions can be co 5 Off:0;Range:1	s535ms XX XX XX";"X onfigured	Mosbu MODBUS Query time Modbus keep time X°is a 2-digit hexade Reconnection times	s instructions 500 Range:0-65535ms 200 Range:0-255s ecimal number. Mus 5 Range:1-60	(it add a	Configure remote Lora spare space 01 03 00 00 00 0A Nodata reboot	add c 49 X 300 Off:0;Range:60-	lear
NODBUS par MODBUS TCP to RTU Modbus mode Modbus timeout struction forma bace between ") p to 50 instruct dvanced Outage restart time Heartbit cycle	Enable re ameter Close disable 3000 Range: 0 - 65 rt: "XX XX XX XX"and "XX" ions can be co 5 Off:0;Range:1 0 Off:0;Range:1	i535ms XX XX XX";"X onfigured -255s	Mosbu MODBUS Query time Modbus keep time X*is a 2-digit hexade Reconnection times Short connection	s instructions 500 Range:0-65535ms 200 Range:0-255s ecimal number. Mus 5 Range:1-60 0 Off:0;Range:2-255s	(it add a	Spate space 01 03 00 00 00 0A Nodata reboot NET connected clear cache	add c 49 X 300 Off:0;Range:60- Enable	lear 65535s
NODBUS par MODBUS TCP to RTU Modbus mode Modbus timeout istruction forma bace between ") p to 50 instruct dvanced Outage restart time Heartbit cycle Heartbit mode	Enable re Close disable 3000 Range: 0 - 65 ft: "XX XX XX XX"and "XX" ions can be co 5 Off:0;Range:1 0 Off:0;Range:1 Network	rmote config 5535ms XX XX XX";"X onfigured 1-255s 1-65535s	Mosbu MODBUS Query time Modbus keep time X"is a 2-digit hexade Reconnection times Short connection Custom heartbeat	s instructions 500 Range:0-65535ms 200 Range:0-255s ecimal number. Mus 5 Range:1-60 0 Off:0;Range:2-255s keepalive message	(it add a	Spare space 01 03 00 00 00 0A Nodata reboot NET connected clear cache	add c 49 X 300 Off:0;Range:60- Enable Bex	lear 65535s

Step 4: Configure the wireless parameters as shown above;

If using "Ebyte Config Tool", please click "save parameters" and then click "Reboot device"; If using web configuration, please click "submit" and enter the password: 123456, waiting for the configuration to complete;

[Notes]

- Browsers with IE kernel are not supported, you can use Firefox, GOOGLE, the latest Edge etc.
- If the host computer failed to search the device, firstly check whether the network cable is connected well, then check whether the host computer has been turned on multiple times in the LAN, if it still failed to search the device, please close the firewall and restart the host computer;
- Please do not enter the web page in transmission mode, otherwise the device will enter the configuration mode. In this case, you can only exit the configuration mode by submitting data or restarting the device.

2.5 TCP servers instructions

Configure the Ethernet parameters of the "Gateway Radio", using the host computer and the web configuration as follows:

Network para	imeters				
Device name	E0001		Serial Number	00001	
DHCP	Disable	~	Local port	8886	
Local IP	192.168.4 .101		DNS	114. 114. 114. 114	
Mask	255.255.255.0		Web server port	80	
Getway	192.168.4 .1		Network mode	TCP server	~
Remote IP	192.168.4.100		Remote port	8887	\$
lora parame	ters Configure :	remote module			
Adress	0	Channel 23	😫 Net I	D 0 😫	
Air Baud	2.4Kbps ~	Power maximu	m 🗸 Trans mod	e Normal 🗸	
Packet size	240 Bytes 🗸	WOR Role Close	V WOR Cycl	e 2000ms ~	
key	0	🗌 LBT enable	🗌 Relay enable (Packet RSSI 🗌 🤇	Channel RSSI
letwork para	imeter				
DHCP	disable	Work mode	TCP server	▼ MAC	84-C2-E4-8F-10-AC
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
ORA parame	ter				
modle adress	0 Range:1-65535s	Channel	23 Range:0-83	Net ID	0 Range :0-255
Air baud	2.4Kbps	Tx_power	maximum	 Trans_mode 	Normal
packetlength	240 Bytes	WOR role	Close	 WOR Cycle 	2000ms
KEY	0 Range:1-65535s	LBT enable	Eelay enable	Packet Rssi	Channel Rssi
	Enable remote config			Configure remote Lora	

NetAssist connects to the "Gateway Radio" as shown below (the device LINK indicator is always on after successful connection, if it is connected but the indicator is not on, the device is in configuration mode and can be lifted by rebooting the device (power off, and then power on the device)), XCOM connects to the "Serial Radio":

<u>⊪</u> •∕	Network Assistant	₩ - □ ×	XCOM V2.6	- 🗆 X
Settings	Data log User Support	NetAssist V5.0.2 🗇 🖓		Port
TCP Client	[2023-04-25 16:36:48.212]# The server is connec	sted from local		COM3:USB-SERIAL CH34C \sim
(2) Remote Host Addr	192.168.4.100:61985			Baud rate 9600 \checkmark
192.168.4.101 -				Stop bits 1 \sim
8886				Data bits 8 🗸
Disconnect				Parity None 🗸
				Operation 🔴 Close
Recy Options				
I Lon Display Mode				Save Data Clear Data
Auto Linefeed				🗌 Hex 🗌 DTR
Hide Received Data				□ RTS □ 自动保存
Save Recv to File				🗌 TimeStamp 1000 ms
AutoScroll Clear				
Canad Options			Single Send Multi Send Protocol Transmit Help	
			正点原子技术论坛: 开源电子网:www.openedv.com	Send
E Lise Escape Chars (i)		-		
Auto Append Bytes		E		Claur Sand
Send from File	Data Send	t Clear ↑_ Clear		Ulear Send
Cycle 1000 ms	http://www.cmsoft.cn	e	Diming Cycle:1000 ms Open File	Send File Stop Send
Shortcut History	<u> </u>	Send	□ Hex Send 🕑 Wordwrap 0% 正点原子官方	Èizhttp://www.openedv.com/
🕼 Ready!	0/7 RX:0	TX:140 Reset	🔅 - www.openedv.com S:0 R:0 CTS=0	DSR=0 DCD=0

Data sending and receiving tests:

	Network Assistant	×□- \₩	XCOM V2.6	- 🗆 🗙
Settings Settings TCP Client II Protocol TCP Client I2 Remote Host Addr I3 Remote Host Port Settings Disconnect Recv Options C ASCII C HEX IV Log Display Mode Add Log Englishes Add Log Englishes Add Log Englishes IV Log Display Mode IV Log Display Mode IV Log Display Mode IV Log Display Mode IV Log Display Mode	Detwork Assistant Data log User Support [2023-04-25:17:16:20:60)# The server is come 192:168.4.100:6391 [2023-04-25:17:16:20:60)# [2023-04-25:17:16:47:762]# RECV ASCID EBYTE TEST 04/25 [2023-04-25:17:16:54:017]# [2023-04-25:17:16:54:017]# SEND ASCID reply to EBYTE TEST 04/25 [3023-04-25:17:16:54:017]#	NetAssist V5.0.2 Cted from local	INN XUUM V2.6 [2023-04-25 17:16:47.472] IX: ENTE TEST 0425 [2023-04-25 17:16:55.400] R: reply to EBVTE TEST 0425	Fort COMS:USB-SERIAL CH34C Baud rate 9600 Stop bits 1 Data bits 8 Parity None Operation ● Close Save Data Clear Data Hax DTR RTS 自动保存
Save Rec Vor File AutoScroll Clear Send Options C ASCII C HEX Use Escape Chars () Auto Append Bytes Send from File Cycle [1000 ms Shortcut Xiistory	Data Send reply to EBYTE TEST 0425	v F Dear € Dear Send	Single Send Multi Send Frotocol Transmit Help EBYTE TEST 0425 Timing Cycle:1000 ms Open File Hex Send @ Wordwrap 0% 正古陽子官方論	Clear Send Send File Stop Send
🞯 Ready!	6/10 RX:100	TX:212 Reset	🔅 🔹 www.openedv.com S:17 R:24 CTS=0 DSR=0 DCD=0 Curr	rent time17:17:32 .:

2.6 TCP client instructions

Configure the Ethernet parameters of the "Gateway Radio", using the host computer and the web configuration as follows:

Network para	ameters						
Device name	E0001			Serial Number	0000	1	
HCP	Disable		~	Local port	0		\$
.ocal IP	192.168.4 .101			DNS	114.	114.114.114	
lask	255. 255. 255. 0			Web server port	80		
etway	192.168.4 .1			Network mode	TCP	client	~
emote IP.	192.168.4.100			Remote port	8887		_
Aaress Air Baud Packet size Rey	0 ♥ 2.4Kbps ∨ 240 Bytes ∨ 0 ♥	Channel Power WOR Role LBT e	naximum Close enable	Net 1 Trans mod WOR Cycl Relay enable	de No le 20	rmal ~ 100ms ~ cket RSSI 🗌 Ch	annel RSSI
etwork para	disable	•	Work mode	TCP client	×	МАС	84-C2-E4-8F-10-AC
Local IP	192.168.4.101	L	Local port	0		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
RA param	eter						
modle adress	o Range:1-65535s		Channel	23 Range:0-83		Net ID	0 Range :0-255
Air baud	2.4Kbps	•	Tx_power	maximum	۲	Trans_mode	Normal
packetlength	240 Bytes	•	WOR role	Close	•	WOR Cycle	2000ms
KEY	o Range:1-65535s	LBT	enable	Eelay enable		Packet Rssi	Channel Rssi
	Enable remote cor	nfig				Configure remote Lora	

NetAssist connects to the "Gateway Radio" as shown below (the device LINK indicator is always on after successful connection), and XCOM connects to the "Serial Radio":

	Network Assistant	(山) - □ ×	XCOM V2.6	- 🗆 🗙
Settings	Data log User Support	NetAssist V5.0.2 @ Q	Po	ort
TCP Server	[2023-04-25 17:40:21.012]# Client 192:168.4.101:5	54336 gets online.	0	COM3:USB-SERIAL CH34C 🕓
(2) Local Host Addr	[2023-04-25 17:40:21.509]# Client 192.168.4.101:5	54337 gets online.	Be	aud rate 9600 🔍
192.168.4.100 -			St	top bits 1 🕓
(3) Local Host Port 8887			D	ata bits 8
· Close			Pa	arity None
· · · · · · · · · · · · · · · · · · ·			Op	peration 🥘 Close
Recy Options				
ASUI CHEX			2	Save Data Clear Data
Auto Linefeed] Hex 🗌 DTR
Hide Received Data				_ RTS □ 自动保存
Save Recv to File				TimeStamp 1000 ms
AutoScroll Clear				
Send Options			Single Send Multi Send Frotocol Transmit Help	
ASCIL C HEX			EBYTE TEST 0425	Send
Use Escape Chars (i)		-		
Auto Append Bytes		1 5		Clear Sand
Send from File	Data Send Litents: All Conr - All Conr	on] 🛊 Llear 🐔 Clear		Crear Send
Cycle 1000 ms	reply to EBYTE TEST 0425	See. 4	Timing Cycle:1000 ms Open File Se	end File Stop Send
<u>Shortcut</u> <u>History</u>		Send	□ Hex Send 🕑 Wordwrap 0% 正点原子官方论坛	http://www.openedv.com,
🞯 Ready!	0/0 RX:0	TX:0 Reset	🔅 🔹 www.openedv.com S:0 R:0 CTS=0 DSR=0 DCD=0 Currer	nt time17:40:40

Data sending and receiving tests:



2.7 UDP server instructions

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

Device name	<u>E0001</u>		Serial Number	00001		
DHCP	Disable	~	Local port	8886	l.	
Local IP	192.168.4 .10	1	DNS	114. 114. 114. 114		
Mask	255.255.255.0		Web server port	't 80		
Getway	192.168.4 .1		Network mode	UDP server		
Remote IP	192.168.4.100		Remote port	8887	\$	
lora parame	ters Configu	re remote module				
Adress	0	Channel 23	🔹 Net :	ID <u>0</u>		
Air Baud	2.4Kbps ~	Power maximu	m 🖂 – Trans mod	de Normal 🗸		
Packet size	240 Bytes \vee	WOR Role Close	V WOR Cyc	le 2000ms 🗸		
2		O	OD1 11		DOOT	

Netwo	ork para	meter						
	DHCP	disable •		Work mode	UDP server	•	MAC	84-C2-E4-8F-10-AC
	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 Targe					Target port	8887
LORA	parame	eter						
mod	lle adress	0 Range:1-65535s		Channel	23 Range:0-83		Net ID	0 Range :0-255
	Air baud	2.4Kbps 🔹		Tx_power	maximum	•	Trans_mode	Normal •
pack	cetlength	240 Bytes 🔹		WOR role	Close	•	WOR Cycle	2000ms •
	KEY	0 Range:1-65535s	■ LB	l enable	Eelay enable		Packet Rssi	Channel Rssi
		Enable remote config					Configure remote Lora	

After the configuration is complete, the device's LINK indicator is always on and the NetAssist connection to the "Gateway Radio" is as shown below:

1. · / (Network Assis	×□- 🔟 (nat
Settings	Data log User Support	NetAssist V5.0.2 🧇 🗘
(1) Protocol		A
UDP		
(2) Local Host Addr		
192.168.4.100		
(3) Local Host Port		
8887		
Close		
Recv Options		
🔽 Log Display Mode		
🔽 Auto Linefeed		102 169 4 101. 9996
Hide Received Data		192.100.4.101: 0000
Save Recv to File		
AutoScroll Clear		
Send Options		
🔲 Use Escape Chars 🛈		
T Auto Append Bytes	Data Send Bemote: 192168410	11 8886 \star 📥 Clean 🗍 🗸 Clear 🛧 Clear
Send from File	reply to EBVTE TEST 0425	
Cycle 1000 ms	1600 00 00 110 100 0425	Send
Shortcut <u>History</u>	1	
🞯 Ready!	3/1	RX:51 TX:24 Reset

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

<u>⊪</u> •∕(Network Assistant	¥□-□×	XCOM V2.6	– 🗆 X
Settings	Data log User Support	NetAssist V5.0.2 🗇 🗘	[0003-04-05 10.07.00 000]	Port
11)Protocol 10 P	[2023/94] USER SUPPORT [2023/94/2518:07:27:609H SEND ASCII TO 192.168.4.101:88865 [2023/94:2518:07:36:319]# RECV ASCII FROM 192.168.4.101:88 reply to EBYTE TEST 0425	first setp	[2023-04-45 19:07:28.92] 30: EWT IFST 0455 [2023-04-45 19:07:35.975] IX: reply to ENTE TEST 0425	COMD: USB-SERIAL CHO4C ~ Baud rate 9600 ~ Stop bits 1 ~ Data bits 8 ~ Parity None ~ Operation 💓 Close Save Data Clear Data
Cog Dispay Holde Auto Linefeed Hide Received Data Save Recv to File AutoSoroll Clear			Single Send Multi Sand Protocol Transmit Maln	● Hex ● DTR ● RTS ● 自动保存 ❷ TimeStamp 1000 mg
Send Options ASCII C HEX Use Escape Chars () Auto Append Bytes	Data Send Remote: 192 168.4.101 :8886 • Clean	v ↓ Clear	reply to EBYTE TEST 0425	Send Clear Send
Send from File Cycle 1000 ms <u>Shortcut</u> <u>History</u>	EBYTE TEST 0425	Send	□ Timing Cycle:1000 ms 0pen File □ Kex Send ❷ Fordersp 0% 正点票子言方	Send File Stop Send
🕼 Readyl	4/2 RX:77	TX:39 Reset //	🔅 🔹 www.openedv.com S:26 R:15 CTS=0 DSR=0 DCD=0 C	urrent time18:07:40

Copyright ©2012–2023, Chengdu Ebyte Electronic Technology Co.,Ltd.

2.8 UDP client instruction

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

Merwork bar:	ameters				
Device name	E0001		_ Serial Number _ 🤇	00001	
DHCP	Disable	~	Local port <u>B</u>	3886	
Local IP	192.168.4 .101		DNS 1	.14. 114. 114. 114	
Mask	255. 255. 255. 0		Web server port 8	30	(
Getway	192.168.4 .1		Network mode U	JDP client	~
Remote IP	192.168.4.100		Remote port <u>8</u>	3887	\\$
lora parame	eters Configure 1	remote module			
Adress		Channel <u>23</u>	Net ID		
Air Baud	2.4Kbps ~	Power maximu	um 🗡 Trans mode	Normal ~	
Packet size	240 Bytes \sim	WOR Role Close	✓ WOR Cycle	2000ms ~	
key	0	🗌 LBT enable	🗌 Relay enable 🗌] Packet RSSI 🔲 🤇	Channel RSSI
etwork parai DHCP (Local IP 1	meter disable • 192.168.4.101	Work mode	UDP client .	MAC Web port	84-C2-E4-8F-10-AC 80
MASK 2	255.255.255.0	Getway	192.168.4.1	DNS	114.114.114.114
Target IP 1	192.168.4.100			Target port	8887
ORA paramet	ter				
modle adress) Range:1-65535s	Channel	23 Range:0-83	Net ID	0 Range :0-255
Air baud	2.4Kbps 🔻	Tx_power	maximum	Trans_mode	Normal
packetlength	240 Bytes 🔹	WOR role	Close	WOR Cycle	2000ms
KEY R) Range:1-65535s	LBT enable	Eelay enable	Packet Rssi	Channel Rssi
	Enable remote config			Configure remote Lora	

After the configuration is complete, the device's LINK indicator is always on and the NetAssist connection to the "Gateway Radio" is as shown below:



Copyright ©2012-2023, Chengdu Ebyte Electronic Technology Co., Ltd.

*·/	Network Assistant	4 - 🗆 ×	XCOM V2.6	- 🗆 ×
Settings	Data log User Support	NetAssist V5.0.2	[2023-04-25 18:24:36 554]	Port
UDP -	[2023-04-25 18:24:35.234]# SEND ASCII TO 192.168.4.101 :88865	-	W: EBYTE TEST 0425	COM3:USB-SERIAL CH34C \sim
(2) Local Host Addr	EBYTE TEST 0425		TX: reply to EBVTE TEST 0425	Baud rate 9600 \checkmark
192.168.4.100 💌	[2023-04-25 18:24:39.446]# RECV ASCII FROM 192.168.4.101 :88 reply to EBYTE TEST 0425	36)		Stop bits 1 \sim
3) Local Host Port				Data bits 8 ~
Close				Parity None ~
Becy Options				Operation 💽 Close
				Save Data Clear Data
Log Display Mode Auto Linefeed	<			🗌 Hex 🗌 DTR
Hide Received Data				□ RTS □ 自动保存
Save Recv to File				TimeStamp 1000 ms
AutoScroll Clear			Single Send Multi Send Protocol Transmit Help	
Send Options			reply to EBYTE TEST 0425	▲ Send
Use Escape Chars (i)	<u> </u>	v		
Send from File	Data Send Remote: 192.168.4.101 :8886 • Clean	Clear Clear		Clear Send
Cycle 1000 ms	EBYTE TEST 0425	Send	Dining Cycle:1000 ms Open File	Send File Stop Send
Shortcut History			□ Hex Send 🕑 Wordwrap 0% 正点原子官方论	thttp://www.openedw.com/
🕼 Readyl	6/5 RX:129	TX:84 Reset	🔅 • www.openedv.com S:26 R:15 CTS=0 DSR=0 DCD=0 Cur	rrent time18:24:43

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

3 Specification and parameter

3.1 General specifications

No.	Item	Specification
1	Power supply voltage	8V~28VDC, 12V or 24V power supply recommended
2	Network port specification	Standard RJ45, support 10/100Mbps
3	Network Protocol	IP, TCP/UDP, ARP, ICMP, IPv4, MQTT, HTTP
4	Socket Mode	TCP Server, TCP Client,
5	TCP Server Connection	UDP Server, UDP Client, HTTP Client, MQTT Client,
6	IP Acquisition Method	HTTP Client, MQTT Client
7	Domain Name Resolution	Support up to 6 TCP connections
8	Domain Name Server	Static IP, DHCP
9	User Configuration	Support
10	Antenna Interface	Customizable, default 114.114.114.114
11	Operating temperature	Web configuration, uplink, AT command
12	Operating Humidity	SMA (external screw, internal hole)
13	Size	$-40 \sim +85^{\circ}$ C, industrial grade
14	Average weight	$10\% \sim 90\%$, relative humidity, non-condensing
15	Storage Temperature	84mm*82mm*25mm

3.2 Frequency and number of channels

Madal	Default frequency	Frequency band	Channel spacing	Number of channels
Widdei	MHz	MHz	Hz	Number of channels
E90-DTU	220 125	220 125 - 226 125	250V	0~64 (Default 40)
(230SL-22/30-ETH)_V2.0	230.123	220.123 ~ 230.123	230K	Half Duplex
E90-DTU	422 125	410 125 - 402 125	114	0~83 (Default 23)
(400SL-22/30-ETH)_V2.0	455.125	410.125~495.125	1 1/1	Half Duplex
E90-DTU	969 125	850 125 - 020 125	114	0~80 (Default 18)
(900SL-22/30-ETH)_V2.0	00SL-22/30-ETH)_V2.0		1 1/1	Half Duplex

[Note]:

In the same area using multiple groups of digital radios to communicate one-to-one at the same time, it is recommended that each group of digital radios set the channel interval above 3MHz.

3.3 Transmit power level

	E90-DTU	E90-DTU
	(230/400/900SL22-ETH)_V2.0	(230/400/900SL30-ETH)_V2.0
High	22 (dBm) (Default)	30 (dBm) (Default)
Medium	17 (dBm)	27 (dBm)
Low	13 (dBm)	24 (dBm)
Very low	10 (dBm)	21 (dBm)

[Note]

1, the lower the transmitting power, the closer the transmission distance, but the working current does not decrease in proportion, it is recommended to use the maximum transmitting power;

2, software to adjust the power can not be accurately adjusted there are errors;

3.4 Air speed

Model	Airspeed range	Default parameters
E90-DTU(230SL-22/30-ETH)_V2.0	2.4、4.8、9.6、15.6Kbps	2.4Kbps
E90-DTU(400SL-22/30-ETH)_V2.0	2.4、4.8、9.6、19.2、38.4、62.5Kbps	2.4Kbps
E90-DTU(900SL-22/30-ETH)_V2.0	2.4, 4.8, 9.6, 19.2, 38.4, 62.5 Kbps	2.4Kbps

3.5 Subcontract length and method

Model	Subcontracted bytes	Default parameters
E90-DTU(230SL-22/30-ETH)_V2.0	32、64、128、240Bytes	240 Bytes
E90-DTU(400SL-22/30-ETH)_V2.0	32、64、128、240Bytes	240 Bytes
E90-DTU(900SL-22/30-ETH)_V2.0	32、64、128、240Bytes	240 Bytes

[Note]

It is recommended to use the default parameter 240Bytes for subpackaging;

3.6 Communication distance

Model	Distance	Remarks
E90-DTU(230SI -22-ETH) V2.0	5K M	Clear and open environment, antenna gain 5dBi,
E90-D10(2503E-22-E111)_V2.0	JKIVI	antenna height 2.5m, air rate 2.4Kbps
E00 DTU(220SL 20 ETH) V2 0	10VM	Clear and open environment, antenna gain 5dBi,
E90-D10(2303L-30-E1H)_V2.0	IUKM	antenna height 2.5m, air rate 2.4Kbps
E00 DTU(400SL 22 ETH) V2 0	5VM	Clear and open environment, antenna gain 5dBi,
E90-D10(4003E-22-E111)_V2.0	JKIVI	antenna height 2.5m, air rate 2.4Kbps
EQUIDITI(AQQSI 20 ETH) $V2.0$	10VM	Clear and open environment, antenna gain 5dBi,
E90-D10(4003L-30-E1H)_V2.0	IUKM	antenna height 2.5m, air rate 2.4Kbps
E00 DTU(000SL 22 ETH) V2 0	5V M	Clear and open environment, antenna gain 5dBi,
E90-D10(9003L-22-E1H)_V2.0	JKIVI	antenna height 2.5m, air rate 2.4Kbps
E00 DTU(000SL 20 ETH) V2 0	10VM	Clear and open environment, antenna gain 5dBi,
E90-D10(9003L-30-E1H)_V2.0	TUKINI	antenna height 2.5m, air rate 2.4Kbps

3.7 Power consumption

Madal	TX Cur	rent mA	Holding current mA		
Model	12V	24V	12V	24V	
E90-DTU(230SL-22-ETH)_V2.0	72.9	35.9	10.2	7.8	
E90-DTU(230SL-30-ETH)_V2.0	163.6	92.4	16.7	7.1	
E90-DTU(400SL-22-ETH)_V2.0	63.8	29.7	10.4	6.2	
E90-DTU(400SL-30-ETH)_V2.0	405.1	218.1	14.2	7.7	
E90-DTU(900SL-22-ETH)_V2.0	84.1	42.9	10.3	6.0	
E90-DTU(900SL-30-ETH)_V2.0	332.0	146.1	14.2	7.4	

[Note]

The test data here is the instantaneous peak. It is recommended to retain more than 50% current margin when selecting power supply, which is beneficial to the long-term stable operation of the radio.

3.8 Size



3.9 Pin definition





No	Name	Description				
1	DC IN	Power connector, 8 to 28V DC female connector (inner pin diameter				
1	DC_IN	2.0mm, hole diameter 6.4mm)				
2	ETHERNET	Ethernet interface, standard RJ45 interface				
3	PWR	Power indicator				
4	LINK	Connection establishment indicator				
5	DATA	Serial port send/receive indicator				
6	ANT	SMA antenna connector (external screw, internal hole)				
7	Reload	Restore to factory settings button				

4 Basic function

4.1 Default parameter

Category	Item	Parameter
LODA	Module Address	0
LUKA	Channel	40(230SL), 23(400SL), 18(900SL)

	Network ID	0
	Air Rate	2.4Kbps
	Transmission method	Transparent transmission
	Packet Length	240 Bytes
	WOR Role	Close
	WOR period	2000ms
	Communication key	0
	LBT enable	Disable
	Relay Enable	Disable
	Data RSSI	Disable
	Channel RSSI	Disable
	IP acquisition method	Static
	Local Port	8886
	Local IP	192.168.4.101
	Subnet Mask	255.255.255.0
Networking	Gateway	192.168.4.1
	DNS server	114.114.114.114
	Web Access Port	80
	Network operating	TCD Service
	mode	ICr Server

4.2 LORA parameter

4.2.1 Basic wireless parameters

Channel: The equipment that needs to communicate should work on the same channel, and the current operating band can be calculated based on the channel value;

Operating frequency = minimum frequency band + channel value * channel interval

Module address: Transparent transmission should ensure that the devices that need to communicate have the same address, in fixed mode to distinguish between different devices on the same channel, relay mode is used to configure the relay address of the data, the configuration range 0 to 65535;

Network ID: Transparent transmission should ensure that the network IDs of the devices that need to communicate are the same, and in relay mode is used to distinguish the destination of the data, with a configuration range of 0 to 255;

Airspeed: ensure that the devices that need to communicate have the same airspeed;

Sub-packet length: to ensure that the devices that need to communicate have the same sub-packet;

4.2.2 Broadcast and monitoring

Set the DTU wireless address to 0xFFFF: it can listen to 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 listening.

4.2.3 Fixed point transmission

Support address function, the host can transmit data to any address, any channel module, to achieve networking, relay and other applications: for example: module A needs to transmit data AA BB CC (HEX:41 41 20 42 42 20 43 43) to module B (address 0x0005, channel 0x05), its communication format is: 00 05 05 41 41 20 42 42 42 20 43 43, where 00 05 is module B address, 05 is module B channel, then module B can receive AA BB CC (other radio does not receive data). 43 43, where 00 05 is the module B address and 05 is the module B channel, then module B can receive AA BB CC (other stations do not receive data).

For example, configure this Gateway Radio (DTU_1) with the parameters in the diagram, PC connection "Gateway Radio" refers to "Quick Start", (DTU_2) is a Serial Radio with the same frequency band (need to buy separately), also been configured as the corresponding parameters in the figure.

modle adress									
	5 Range:1-65535s		Channel	83 Range:0-83			Net ID	0 Range :	0-255
Air baud	62.5Kbps	•	Tx_power	maximum	•		Trans_mode	Fixed	
packetlength	240 Bytes	•	WOR role	Close	•		WOR Cycle	2000ms	
KEY	0 Range:1-65535s	e u	3T enable	Eelay enable		Pacl	ket Rssi	Cha	nnel Rssi
	Enable remote	e config				Configure	e remote Lora		
lora param	eters Conf	igure remot	te module		DTI	J-1			
Adress	5	Cha	annel <u>83</u>		Net ID	0	•		
Air Baud	62.5Kbps	~ H	ower maxin	num 🗸 🏻 Tra	ns mode	Fixed	~		
Packet siz	e 240 Bytes	✓ WOR	Role Close	e v Wo	R Cycle	2000m	IS V		
key	0	•	LBT enable	🗌 Relay en	nable 🗌	Packe	t RSSI) Chann	el RSSI
	成都	亿佰	特电	子科技	有阳	 	司		中文
(((•))) EBYT Model: E22 /ersion: 4.0	成都 E Cheng	了 du Ebyte	特电子 Electro TU-2	子科技 onic Tech		艮公 y co.,	Ltd.		中文 English Modules
(((•))) EBYT Model: E22 /ersion: 4.0 FrequencyStr: Parameter: 0x	E Cheng	る の の の の の の の の の の の の の	特电- Electro TU-2	子科技 onic Tech	有的 nology COM3 Get	又公 y Co.,	Close Set Paran	-) [中文 English Modules Param Reset
(((•))) EBYT Model: E22 /ersion: 4.0 FrequencyStr: Parameter: 0x Baud Rate	E Cheng	0 0x00 0x00 0 WOR Role	特电子 Electro TU-2 x62 0x00 0x17 Recieve	子科技 Diric Techi 0x03	有的 nology Get	y Co.,	Close Set Paran	n	中文 English Modules Param Reset
(((•))) EBYTI Model: E22 /ersion: 4.0 FrequencyStr: Parameter: 0x Baud Rate	E Cheng 433.125MHz cc0 0x00 0x09 0x0 115200bp ~ 8N1 ~	WOR Role Wor Cycle	特电子 TU-2 x62 0x00 0x17 Recieve 2000ms	子科技 onic Tech 0x03 へ Relay	有関 nology COM3 Get D	y Co., isable	Close Set Paran	n ddres	中文 English Modules Param Reset
(((•))) EBYT Model: E22 Version: 4.0 FrequencyStr: Parameter: 0x Baud Rate Parity	E Cheng 433.125MHz cc0 0x00 0x09 0x0 115200bp ~ 8N1 ~ 62.5Kbps ~	WOR Role Wor Cycle Power	特电子 Electro TU-2 x62 0x00 0x17 Recieve 2000ms 22dBm	子科技 onic Techn oxo3 へ Relay く LBT	有関 nology Get D RSSI D	isable isable	Close Set Paran	n ddres hannel ET ID	中文 English Modules Param Reset 5 5 0
(((•))) EBYTI Model: E22 /ersion: 4.0 FrequencyStr: Parameter: 0x Baud Rate Parity Air Rate Packet Size	E Cheng 433.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 434.125MHz 444.127MH	WOR Role Wor Cycle Power Tran Mode	特电子 Electro TU-2 x62 0x00 0x17 Recieve 2000ms 22dBm Fixed	子科技 onic Techn ox03 へのx03 へのx03 へのx03 へのx03 へのx03 へのx03 へのx04 、 のx04 、 の の の の の の の の の の の の の の の の の の	有関 coms Get D RSSI D	isable isable	Close Set Paran	n ddres hannel ET ID ey	中文 English Modules Param Reset 5 5 0 0

Fixed-point sending demo:

DTU_1 to DTU_2 requires 00 05 05 (HEX) before the data;

DTU_2 to DTU_1 needs to add 00 05 53 (HEX) before the data;

<u>⊪·</u> ∕ (Network Assistant	¥□-□×	ATTS TEM XCOM V2.6	- 🗆 🗙
Settings	Data log User Support	NetAssist V5.0.2 🗇 🗘	[2003-04-25 18-51-23 520]	Port
TCP Client	[2023-04-25 18:51:22:513]# SEND HEX>	A	RX: 31 32 33 34 35 36 37 38	COM3:USB-SERIAL CH34C \sim
(2) Remote Host Addr	00 05 05 31 32 33 34 35 36 37 38		[2023-04-25 18:51:26:218] #X: 0005533132333435363738	Baud rate 115200 \checkmark
192.168.4.101 👻	2023-04-25 18:51:28:240]# RECV HEXS 31 32 33 34 35 36 37 38			Stop bits $1 \sim$
(3) Remote Host Port				Data bits 8 🗸
Disconnect				Parity None 🗸
				Operation 🛞 Close
Recy Options				
C ASCII @ HEX			-	Save Data Clear Data
Log Display Mode				Hex DTR
Auto Linefeed				
Hide Received Data				Z TineStern 1000
Save Recv to File			DTU-2 sent data to DTU-1	a rindoramp 1000 ms
AutoScroll Clear			Single Send Multi Send Protocol Transmit Help	
Send Options			00.05.53 31.32 33.34.35.36.37.38	
C ASCII @ HEX				Send
🔲 Use Escape Chars 🛈	DTU-1 sent data to DTU-2	w		
Auto Append Bytes	Data Sand	E Clay & Clay		_ Clear Send
Send from File		tiear Clear		<u> </u>
Cycle 1000 ms	00 05 05 31 32 33 34 35 36 37 38	Sand	Timing Cycle: 1000 MS Open File	Send File Stop Send
Shortout History	<u> </u>	Senu	S Hex Send 🗌 Wordwrap 0% 正点原子宣方i	台云http://www.openedv.com/
🕼 Ready!	10/14 BX:163	TX:183 Reset	🔅 🔹 www.openedv.com S:11 R:8 CTS=0 DSR=0 DCD=0 Cu	urrent time18:51:52 .:

4.2.4 Relay mode

No	Relay mode description
1	After setting the trunking mode by the configuration mode, the trunking starts to work when switching to the general mode.
2	In trunk mode, the "Module Address" is no longer in effect as an address parameter, but is forwarded to the pair as a Network ID (NETID), and if one of the networks is received, it is forwarded to the other network. The repeater's own network ID (NETID) is not valid.
3	In trunk mode, the repeater module cannot send and receive data and cannot perform low-power operation.

Relay networking rules description:

1. Forwarding rules, relay can forward data between two network IDs (NETID) in both directions.

2. In trunking mode, the "module address" is no longer in effect as an address parameter but as a network ID (NETID) forwarding pair.

As shown in the figure:

①One level relay

"Node 1" NETID is 08 (0x08).

"Node 2" NETID is 33 (0x21).

The module address of Relay 1 is 2081 (0x0821,ADDH:0x08,ADDL:0x21).

So the signal sent by node 1 (0x08) can be forwarded to node 2 (0x21)

Also node 1 and node 2 have the same address, so the data sent by node 1 can be received by node 2.

②Secondary Relay

The address of relay 2 is 8453 (0x2105,ADDH:0x21,ADDL:0x05).

So Relay 2 can forward data from Relay 1 to Network NETID: 05 (0x05).

Thereby node 3 and node 4 can receive node 1 data. Node 3 outputs data normally, and Node 4 has a different address from Node 1, so it does not output data.

③Two-way relay

As configured in the figure: the data sent by node 1 can be received by nodes 2 and 3, and the data sent by nodes 2 and 3 can be received by node 1.



4.2.5 Communication key

The web configuration always shows 0 (configuration range 0 to 65535), the communication key is used for user encryption to avoid interception of over-the-air wireless data by similar modules. the DTU will internally use these two bytes as a calculation factor to transform the encryption process for the over-the-air wireless signal.

Web page configuration needs to configure the key every time, otherwise the device will encrypt the communication data with 0.

AT command and the upper computer can query the communication key of the current device, web configuration cannot query the communication key fixed return 0.

4.2.6 LBT

DTU has Listen before talk (LBT) function, when this function is turned on, the wireless data will actively listen to the channel environment noise before transmitting, the noise exceeds the threshold value will delay the transmission, this function can greatly improve the communication success rate of DTU in harsh environment, can be used for network transmission, anti-collision processing, but may bring data delay, LBT maximum dwell time 2 seconds.

4.2.7 WOR role

WOR off. the DTU works in transmission mode, the user input data through Ethernet, the DTU will start wireless transmitting out. Wireless receive function is on, and wireless data is received and output through Ethernet.

WOR transmitting side. DTU transmitting and receiving is on, and a certain time wake-up code is added when transmitting data.

WOR receiver. the DTU can not transmit data, working in WOR listening mode, the longer the WOR listening interval cycle time, the lower the average power consumption, but the greater the data delay, the receiving and transmitting sides must be consistent (very important).

4.2.8 **RSSI**

That is, the signal strength indication function. When enabled, data received wirelessly by the DTU will be followed by an RSSI strength byte (in hex) after the user data. It can be used to evaluate the signal quality, improve the communication network, range measurement, and can be used to implement the LBT function manually.

4.2.9 Channel RSSI enable

When enabled, the command C0 C1 C2 C3 can be sent in transmit mode or WOR send mode Read register.

- Register 0x00 : Current ambient noise RSSI;
- Register 0x01 : RSSI at the last received data. (Current channel noise is: dBm = -RSSI/2);
- Command format: C0 C1 C2 C3 + start address + read length;
- Return: C1 + address + read length + read valid value; for example: send C0 C1 C2 C3 00 01
- Return C1 00 01 RSSI

Demonstration note, open data RSSI and channel RSSI, first send 0x31 with the remote device, the gateway receives data (0x30) + RSSI (0xCE), and then query the channel RSSI and data RSSI results through the instruction C0 C1 C2 C3 00 02 (HEX) as shown in the following figure:



4.3 Ethernet

4.3.1 IP Acquisition

Dynamic acquisition (DHCP) :

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

Static configuration (STATIC) :

You need to manually configure the 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 of the device, the configuration should ensure that the communication device is located in the same network segment and ensure to avoid IP conflict, otherwise the device can not be normal passage and web configuration.

4.3.2 Device port

Random ports:

TCP clients, UDP clients, HTTP clients, and MQTT clients can configure the native port to 0 (using a random native port), and server mode cannot use a random port, otherwise the client cannot establish a connection correctly (the device is not listening on the port correctly).

Using a random port connection can quickly re-establish the connection when the device accidentally disconnects from the server, preventing the server from rejecting the connection due to four incomplete waves, and it is recommended to use a random port in client mode.

The device will automatically configure random ports when configuring TCP client, HTTP client, and MQTT client modes on the web page, and can be customized to cancel.

Static port:

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

4.3.3 Subnet mask & gateway configuration

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

The subnet mask must be set, we commonly use the 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, the module IP in the range of 255, the module IP is considered to be in this subnet.

The gateway is the network number of the network where the module's current IP address is located. If you connect to an external network with a router or other device, the gateway is the route.

4.3.4 Domain name resolution (DNS)

Domain name resolution converts domain names into network-identified IP addresses through domain name resolution (DNS) servers. The domain name resolution (DNS) server address of this product supports user-defined, which can achieve domain name resolution by customizing the domain name resolution server in case of domain name server abnormality, and the device will report the resolution request to the custom domain name resolution (DNS) server when the domain name resolution is done, and return the device connection parameters (usually IP address) after the resolution is completed.

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

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

Destination IP/domain name 4.3.5

Target IP parameter can automatically identify whether the configuration parameter is IP address or domain name input, domain name input supports up to 128 characters configuration.

4.6 SOCKET function

4.6.1 TCP Server

TCP Server is the TCP server. In TCP Server mode, the device listens to the local port, accepts connection requests from clients and establishes connections for data communication. When the Modbus gateway function is disabled, the device sends the data received from the serial port to all client devices connected to the device, and supports connecting up to 6 clients.

It is usually used for communication with TCP clients in LAN.

Connection requests are no longer accepted after 6 clients are exceeded, and the web configuration is not available when 6 clients remain connected.

4.6.2 TCP Client

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

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

4.6.3 UDP server

UDP Server means that the device does not verify the IP address of the data source when communicating using the UDP protocol. After each UDP packet is received, the source IP address and the source port of the packet are saved and set as the destination IP and port, so the data sent by the device only sends packets to the source IP address and port of the last time the device received data.

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

Using UDP Server requires the remote UDP device to send data first, otherwise it cannot send data properly.

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

4.6.4 UDP Client

UDP Client is a connectionless transport protocol that provides a simple transaction-oriented unreliable messaging service with no connection establishment and disconnection, only the destination IP and destination port need to be configured to send data to each other. It is typically used in data transfer scenarios where there is no requirement for packet loss, where packets are small and sent quickly, and where the data is destined for a specified IP.

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

In this mode, the destination address is set to 255.255.255.255 and the sent data will be broadcasted in the whole network segment, but the sending and receiving devices need to ensure that the ports are the same, and the device can also receive broadcasted data.

4.6.5 HTTP Client

This mode can achieve HTTP automatic packet function, providing two modes GET and POST, customers can configure URL, Header and other parameters by the device to send packets, to achieve fast communication between the digital radio and HTTP server, using HTTP client mode is recommended to use random ports and open a short connection to save HTTP server resources, the request single packet size is affected by LORA packet, when LORA configured for 240 bytes packet, the single packet data can not be larger than 240.

(1), GET usage demonstration

Use OneNET multi-protocol access HTTP mode to test the device HTTP-GET request.

Through OneNET-HTTP access instructions query (does not provide support for the use of OneNET, the user needs to query the use of the method, only to provide the parameters to fill in the instructions).

{

URL:/devices/863876867/datapoints?

Header:api-key:xxxxxxxx (only demo instructions, users need to register their own accounts to use) Host:api.heclouds.com

HTTP Server: api.heclouds.com

HTTP Port:80

Get send: datastream id=char

}

The device needs to access the Internet, it is recommended to use dynamic IP acquisition to prevent the device from accessing the network normally due to unreasonable parameter configuration, it is recommended to enable short links to save server resources and open random ports (local port: 0), take the above configuration as an example.

Network para	ameters					
Device name	E0001			Serial Number	00001	
DHCP	Enable			🗹 Local port	0	•
Local IP	192.16	8.4 .152		DNS	192.168.4 .1	
Mask	255.25	5.255.0		Web server port	80	
Getway	192.16	8.4 .1		Network mode	HTTP client	~
Remote IP	api.he	clouds.com		Remote port	80	÷
Reconnection No data auto	time boot 1	<u>5s</u> 300s ♦ ☑	Reconnect cou No data autob	nt <u>5freq</u> ∉ cache poot	when connected Enable	~
Short connec	tion 1	<u>5s</u> 😫 🔽	Short connect	tion		
keepalive mo	de	Disable	✓ Ke	eepalive cycle Os	\$	
Keepalive co	ntent	keepalive :	message		□ H	HEX
Registration	mode	Disable			~	
Custom regis	trati	register m	essage			HEX

Return data configuration without packet headers (HTTP packet header input box can be entered with newlines):

TP requ G	ET	<u> </u>	VRL VRL	
TP URL /de	evices/863870)867/datapoints	?	
payload w	/ithout http]	head		
Http head			_ Header	

"Serial Radio" (additional purchase required), wireless connection refer to "Quick Start", no further explanation here, request data demonstration:

1112	VCOM	VO C
SCI184	XCOIM	V2.0



Return data configuration with packet header:



Request Data Presentation:

XCOM V2.6		
2022-01-18 16:23:06.724]		
X: datastream_id=char		
2022-01-18 16:23:09.672]		
X: HTTP/1.1 200 OK		
ate: Tue, 18 Jan 2022 08:23:07 GMT		
ontent-Type: application/json		
ontent-Length: 134		
onnection: keep-alive		
erver: Apache-Coyote/1.1		
ragma: no-cache		
"errno":0, "data": {"count":1, "datastream	":[{"datapoints":[{"at":"2022-01-	-05
"errno":0, "data": {"count":1, "datastreams 7:30:47.506", "value":25}], "id": "char"}]} Char	":[["datapoints":[{"at":"2022-01 "error":"succ"}	-05
"errno":0, "data": {"count":1, "datastreams 7:30:47.506", "value":25}], "id": "char"}} Char 2022-01-05 17:30:47	":[{"datapoints":[{"at":"2022-01: "error":"suco"}	-05
"errno":0, "data": {"count":1, "datastreams 7:30:47.506", "value":25}], "id": "char"}]} char 2022-01-05 17:30:47 25	":[{"datapoints":[{"at":"2022-01 "error":"succ"}	-05

(2), POST

HTTP mode using OneNET multi-protocol access to test the device HTTP-POST requests.

Through OneNET-HTTP access instructions query (does not provide support for the use of OneNET, users need to check the use of their own, only to provide instructions for filling in the parameters).

{

URL:/devices/863876867/datapoints

Header:api-key:xxxxxxxx (only demo instructions, users need to register their own accounts to use) Host:api.heclouds.com

HTTP Server: api.heclouds.com HTTP Port:80 Post send: {"datastreams":[{"id": "char", "datapoints":[{"value":28}]}]} }

The device needs to access the Internet, it is recommended to use dynamic IP to prevent the device from accessing the network normally due to unreasonable parameter configuration, it is recommended to enable short links to save server resources and open random ports (local port: 0), refer to GET configuration.

Without packet header return data configuration (HTTP packet header input box can be entered newline character):

HTTP parameters	HTTP parameters
HTTP requ CET ~	HTTP requ GET 🗸 🗸
HTTP URL /devices/863876867/datapoints?	HTTP URL /devices/863876867/datapoints?
< payload without http head	payload without http head
Http head	Http head
api-key: Host:api.heclouds.com	api-key: Host:api.heclouds.com

"Serial Radio" (additional purchase required), wireless connection refer to "Quick Start", no further explanation here, request data demonstration:

XCOM V2.6	4 XCOM V2.6
0022-01-18 16:38:29.997] 1: ['datastreams":[['id'."char", "datapoints":[["value":50]]]] 0022-01-18 16:38:31.608] 1: ["errno":0, "error":"succ"] 升	[2022-01-18 16:28:09 045] TX: ['datatreans": [['id':"char", "datapoints": [['value":50]])]) [2022-01-18 16:28:11.789] EX: MTTP/1.1 200 0K Date: Tue. 18 Jan.2022 08:28:09 GMT Content-Type: application/json Content-Length: 26 Connection: keep-alive Server: Apsche-Coyote/1.1 Pragma: no-cache
char 2022-01-18 16:28:09	{"errbo":0, "error": "suce"} char 2022-01-18 16:28:09
50	50

4.6.6 MQTT Client

Supports fast access to standard MQTT3.1.1 protocol servers (OneNET, Baidu Cloud, Huawei Cloud,

user-built and other server types) and Aliyun servers, supports quality of service level configuration (Qos 0, Qos 1), supports extra-long text configuration, facilitates better access to network service operators (server address, three elements, subscription and publishing addresses support up to 128 characters) configuration).

Advanced settings such as short links should be turned off using the MQTT feature as shown in the following diagram (upper diagram for the upper computer, lower diagram for the web configuration):

Advanced				
Reconnection time <u>5s</u> 🖨	Reconnect coun	t <u>5freq</u> t cache wh	en connected Ena	ble 🗸
No data autoboot 1 <u>300s</u> 🖨 🔽	No data autobo	ot		
Short connection 1 Os 🛭 🖨 🗌)Short connecti	on		
keepalive mode Disable	✓ Kee	palive cycle Os	\$	
Keepalive content keepalive	message			HEX
Registration mode Disable		~		
Custom registrati< register m	essage			HEX
dvanced Outage restart 5 time Off:0;Range:1-255s	Reconnection times	5 Range:1-60	Nodata reboot	300 Off:0;Range:60-65535s
Heartbit cycle 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	Custom registration	register message		Hex

(1), Standard MQTT3.1.1

Standard MQTT3.1.1 cloud parameters configuration (left figure is the upper computer, right figure is the web configuration):

Network para	ameters					
Device name	E0001			Serial Number	00001	
DHCP	Enable	8	~	Local port	0	
Local IP	192.16	8.4 .152		DNS	192.168.4 .1	
Mask	255.25	5.255.0		- Web server port	80	
Getway	192.16	8.4 .1		Network mode	MOTT client	~
Remote IP	0	MQTT Serv	ver	Remote port	MQTT Port	\
lora parame	ters	Configure 1	remote module			
Adress	5	 	Channel 5	Net 1	ID O	
Air Baud	62.5Kh	ins 🗸	Power maxim	um × Trans mod	de Normal 🖂	
Packot cizo	240 Bu	toc V	WOR Role Close			
lacket Size	240 Dy	(65	I DT anabla	nok oye.		
кеу	0		U LEI enable	🗌 Kelay enable	Facket K551	Junannei KSSI
Password (Dowice of ProductKe Subscribe Publish t	error) ey e topic topic	Password 123456 SUB-TOPIC PUB-TOPIC				Qos 0 V Qos 0 V
Network para	meter					
DHCP	enable	•	Work mode	MQTT client	MAC	84-C2-E4-8F-10-AC
Local IP	192.168.4.10	1	Local port	0	Web port	80
MASK	255.255.255.0	D	Getway	192.168.4.1	DNS	114.114.114.114
	a manua a fu	MQTT Serve	·		Target port	MQTT Port
MOTT crient p	Standard 3.1	4 1	koonAlivo:	Pange:1-255	ŝ	
Device name (Client ID)	Client	ID	Keepoirve.	Nange. 1 255 s		
user name: (Device name)	User	Name				
password: (Device secret)	Pas	sword				
PrductKey						
Publish topic	PU	B-TOPIC				Qos 0 •
Subscribe topic						Qos 0 ·

Demonstration of connecting to standard MQTT3.1.1 through the Tencent standard MQTT3.1.1 platform to achieve communication:

4.7 Web configuration

The device has a built-in web server, which is convenient for users to set and query parameters through the web.

Web server port is customizable (2-65535), default: 80

(((•))) Chengdu Ebyte Electronic Technology Co.,Ltd.

Operation method (Microsoft Edge version 94.0.992.50 for example, IE kernel browser is not supported)

(1) , open the browser, the address bar, enter the IP address of the device, such as 192.168.4.101 (IP address and computer need to maintain the same network segment, if you can not use the firewall to close try again), forget the local IP can be queried through AT commands and configuration software;

Device model	E90-DTU(400SL30-ETH)	Serial namber	00001	语言	English
Device model		Jenar namber		websever	
Version	9050-0-10	Device name	E0001	password	*****
letwork para	meter				
DHCP	disable 🔹	Work mode	TCP server 🔹	MAC	84-C2-E4-8F-10-AC
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
ORA narame	ter			9 p	
	0		40		0
modie adress	Range:1-65535s	Channel	Range:0-83	Net ID	Range :0-255
Air baud	2.4Kbps 🔹	Tx_power	maximum 🔻	Trans_mode	Normal
packetlength	240 Bytes 🔹	WOR role	Close 🔹	WOR Cycle	2000ms
KEY	0 Papagal 65525c	LBT enable	Eelay enable	Packet Rssi	Channel Rssi
	Enable remote config			Configure remote Lora	
	ameter			Consigned to the Lore	
MODBUS	annetter				
TCP to RTU	Close •	Mosbu	s instructions		add clear
Modbus	disable 🔻	MODBUS	500	spare space	49
mode		Query time	Range:0-65535ms	01 03 00 00 00 0A	X
Modbus	3000	Modbus keep time	200		
struction format	Kange: U - 00030ms • "XX XX XX XX XX XX"•"	XX"is a 2-digit herade	Kange:U-2005 acimal number. Must add :	a	
pace between "X	X"and "XX"	and a congretionade		7	
p to 50 instruction	ons can be configured				
dvanced					
Outage restart time	5 Off:0;Range:1-255s	Reconnection times	5 Range:1-60	Nodata reboot	300 Off:0;Range:60-65535
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	Disable	Custom	register message		Hey

ebyte

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

(3), click submit after entering the correct key can save the configuration parameters, the factory default key is: 123456;

MODBUS TCP to RTU	Close	۲	Mosbu	s instructions		add clear
Modbus mode	disable	•	MODBUS Query time	500 Range:0-65535ms	spare space 01.03.00.00.00.0A	49
Modbus timeout	3000 Range: 0 - 65	535ms	Modbus keep time	200 Range:0-255s		
Instruction forma space between "> Up to 50 instructi	t: "XX XX XX X (X"and "XX" ons can be co	XX XX XX";"X onfigured	X"is a 2-digit hexade	ecimal number. Must ad	d a	
Outage restart time	5 Off:0;Range:1	-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	192.168	.4.101 显示		×	Hex
		Please in	put a password:			
		123456				
				-	定 取消	

(4) , the progress bar prompts the configuration progress, please do not refresh the web page again after the configuration is complete (refresh the web page to enter the configuration mode again, you can reboot the device or submit again to enter the communication mode).

Configuration succeeded

100.0%

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 you modify the web access port to 8080, you need to enter 192.168.4.101:8080 in the address field to connect to the web configuration.

192.168.4.101:8080	*						Gr
wyte-工作 🔁 📕							
			(ebyte			
	Device info						
	Device model	E90-DTU(400SL30-ETH)	Serial namber	00001	语言	English	~
	Version	9050-0-10	Device name	E0001	websever password	*****	
	Network para	ameter					
	DHCP	disable 🗸	Work mode	TCP server	MAC	84-C2-E4-8F-10-AC	1
	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	5
	Target IP	192.168.4.100			Target port	8887	

4.8 Hardware recovery factory

Pressing the key to restore the factory requires a valid connection to the network cable and power supply. Press the Reload pin of the device continuously until the LED is fully lit to release the key.

5 Advanced Features

5.1 Heartbeat Pack

In client mode, users can choose to send heartbeat packets and customize the heartbeat packet time. The heartbeat packet can be sent in two modes: network heartbeat packet and serial heartbeat packet, which supports hexadecimal and ASCII code. It is recommended that you do not configure the KeepAlive time to be less than 60s, for example, 120s is recommended in the AliCloud manual.

Heartbeat packet sending mode:

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

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

(3), Network port mode -> the device sends heartbeat content to the network bus at the set heartbeat interval.

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

Custom heartbeat packet sending interval, set to 0 to turn off the heartbeat packet function, set value greater than zero to turn on the heartbeat packet function, settable range when turned on: (1-65536) seconds, default value is 0.

5.2 Registration package

In client mode, users can choose to send registration packets and customize the registration packet time settings.

The registration packet supports the following modes:

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

(2), the network and the device to establish a connection to send a custom registration packet of data (OLCSTM)

(3), the network and the device to establish a connection, the device to the network to send each packet of data in front of the MAC address (EMBMAC)

(4), after the network and the device establish a connection, each packet of data sent by the device to the network is preceded by custom registration packet data (EMBCSTM)

Custom registration packet 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 packet on the web page, the host computer can configure special characters, but it may cause the web page configuration can not access.

5.3 Short connection

In client mode, it supports network short connection (the function is disabled by default). TCP short connection is mainly used to save server resource overhead and is generally applied to multi-point (multiple clients) to one-point (server) scenarios.

The TCP short connection function is used in TCP Client mode. When the short connection function is enabled, the device will only request to connect with the server when sending information, and after the connection is

successful, the device will automatically disconnect if no data is received from the serial port or no data is sent or received from the network port within the set time.

The short link hold time is set to 0 to turn off the short connection function. When the setting range is (2-255) seconds, the short connection function is turned on, and the default hold time is 0 seconds (short link is turned off).

5.4 Disconnect and reconnect

In client mode, the device tries to actively connect to the server at the specified time after the network is disconnected. If the request times out and reaches the set number of reconnections and is not successfully reconnected, the device will perform a reboot to prevent the network from being reconnected after the device is disconnected.

Disconnection reconnection time: the time interval between each attempt of the device to re-establish the network.

Reconnect times: The number of times the device tries to re-establish the network. If the cumulative number of requests reaches the preset value, the device will automatically reboot if the connection is not yet successful.

The actual reboot time is the disconnection period multiplied by the number of reconnection times, and it is recommended to use the factory default parameters without special requirements.

5.5 Timeout restart

Support timeout restart function (default: 300 seconds), this function is mainly used to ensure the long-term stable operation of the device. If no data is sent or received within the set timeout restart time, the device will be restarted to avoid the abnormal situation to affect the communication.

Timeout restart time parameter range (60-65535) seconds, configured as 0 means turn off timeout restart. The default is 300 seconds.

5.6 Cache cleaning

The device is in client mode, when the TCP connection is not established, the data received by the serial port will be put in the cache area, the serial port receive cache is 1024 bytes, greater than 1024 bytes will overwrite the earliest received data, after the network connection is successful, you can choose to clear the serial port cache or send the cache through the network by configuration.

Enable: The device does not save the data received by the serial port before the connection is established. Disable: The network will receive the data cached on the serial port after the connection is established.

5.7 Remote configuration

The remote configuration function of the upper computer and web page can be used to configure the remote digital radio. This series of products (E90-DTU(xxxSLxx-ETH)_V2.0) does not support being remotely configured, and remote configuration requires the remote device and the configuration device to communicate normally, otherwise the configuration command cannot reach the remote device.

After sending the remote configuration command, the indicator DATA double blinks and receives the remote

device return success, the indicator DATA blinks three times the configuration is sent but does not receive the configuration success return.

Remote configuration use instructions are shown in the following figure (the upper figure is the upper remote configuration, the lower figure is the web remote configuration):

ldress	0	C	Channel 23	Net ID	0	٢	bau	d 9600	\sim	
ir Baud	2.4Kbps	\sim	Pover naxinum	Trans mode Trans mode	Norma	1 ~	Parit	y 8N1	×	
acket size	240 Bytes	s v WC	R Role Close	✓ WOR Cycle	2000m	s v	ke	y 0		
RA paramet	ter			22		Denia	1		W	
RA paramet	ter Range:1-6553	55	Channel	23 Range:0-83		bena	Net ID R	ange :0-25	55	
RA paramet modle adress Air baud	er 0 Range:1-6553! 2.4Kbps	55	Channel	23 Range:0-83 maximum		Tran	Net ID R	ange :0-2! Iormal	55	
RA paramet modle adress Air baud packetlength	ter Range:1-6553 2.4Kbps 240 Bytes	55	Channel Tx_power	23 Range:0-83 maximum Close	•) •)	Tran	Net ID R s_mode	ange :0-2! Iormal 000ms	55	

[Note] It is recommended that the remote configuration be used in transparent transmission mode and with air speed ≥ 2.4 Kbps, and the web remote configuration needs to click "Start Remote Configuration" first.

5.8 Remote upgrades

In order to facilitate later maintenance and upgrade functions and replace different firmware, this product supports online firmware upgrade, through the upgrade firmware provided by our company users can upgrade or replace the current firmware through the host computer.

Network upgrade firmware operation steps:

Step 1: Open the host computer, open the device upgrade assistant in the menu bar, select the firmware needed (download firmware provided by the official website);

Venu	language at	bout	Notwork up grade assistant					~
Seri	ial port upgra	de tool	vetwork upgrade assistant					-
	Device ID	Loca	choose firmware		🝃 Open	🔾 Search	📄 Upg	read
1	0	192.168	Device ID	IP	MAC	Dev	ice type	

Step 2: click to search for the device and click to stop the search when the device is found;

Step 3: Select the device corresponding to the need to upgrade;

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

[Note] When the device is just powered on, click "Search Device" of the upgrade assistant, the device will

enter the firmware burning state, and resume normal mode after power off and reboot.

5.9 Modbus gateways

5.9.1 Protocol conversion

Modbus parameters		
MODBUS Getway Simple proto	col ~	
MODBUS RTU Response timeou	1000ms	•
Storage time of Modbus ins	200s	\$
Modbus Auto query interval	500ms	4
🗌 Modbus RTU <-> Modbus TC	Ρ	
Instructio	on list	Delete
1 1 1 1 1		Add

Enable: Checksumming of Modbus data Non-Modbus data (RTU/TCP) discards are not transmitted, interchanging Modbus RTU protocol with Modbus TCP protocol.

Disable: No protocol conversion but checksumming of Modbus data, non-Modbus data (RTU/TCP) discards are not transmitted.

[Note] Since there is a packetization mechanism for LORA wireless modulation, the maximum single packet is 240 bytes, so a maximum of 117 registers (03 and 04 function codes) or 1872 discrete quantities (01 and 02 function codes) can be read continuously in Modbus at one time.

5.9.2 Simple protocol conversions

Converts Modbus RTU data to Modbus TCP data or Modbus TCP data to Modbus RTU data, realizing the interconversion of Ethernet Modbus data and serial Modbus data.

Simple protocol conversion can work in any mode (TCP client, TCP server, UDP client, UDP server, MQTT client), and only one Modbus master can exist no matter what mode it works in. Simple protocol conversion configuration (server mode as an example, left image is the upper computer, right image is the web page):

Device name	E0001		Serial Number	00001		
DHCP	Disable	~	Local port	8886		¢
Local IP	192.168.4 .101		DNS	192.168.4	.1	
Mask	255. 255. 255. 0		Web server port	8080		•
Getway	192.168.4 .1		Network mode	TCP server		~
Remote IP	192.168.4.100		Remote port	8886		\$
		NODBUS NODBUS Storage Nodbus	Getway Simple pr RTU Response time time of Modbus i Auto query interv us RTU <-> Modbus Instru	otocol ~ sou <u>3000ms</u> ins 200s val 500ms : TCP ction list	¢ ¢ Delete	

Copyright ©2012-2023, Chengdu Ebyte Electronic Technology Co., Ltd.

DHCP	disable	~	Work mode	TCP server 🗸	MAC	84-C2-E4-8F-10-AC
Local IP	192.168.4.101		Local port	8886	Web port	80
MASK	255.255.255.0		Getway	192.168.4.1	DNS	192.168.4.1
Target IP	192.168.4.100				Target port	8886
DBUS par	ameter					
MODBUS TCP to RTU	Open	~	Mosbu	is instructions		add clear
Modbus	Simple	~	MODBUS	500	spare space	49
Mode	3000		Query time	Range:0-65535ms	01 03 00 00 00 0A	x
timeout	Range: 0 - 65535m	s	keep time	Range:0-255s		
timeout ruction forma	Range: 0 - 65535m t: "XX XX XX XX XX	s XX";"XX"is	keep time a 2-digit hexadec	Range:0-255s imal number. Must add a		

Modbus Poll and Modbus Slave software commissioning:

Software connection settings:

	く □ 県 直 几 05 06 15 16 17 22 23 TC 1	2 🖀 🤻 👯 >	_ D ☞ ■ @ [□ 및 @ ? ₩
x = 1296: Err lo connection 0 1 2 3 4 4 5 5	Connection Modbus TCP/IP Serial Settings USB-SERIAL CH340 (COM4) 115200 Baud 8 Data bits None Parity 1 Stop Bit Advanced	OK Cancel Mode © RTU O ASCII Response Timeout [1000 [ms] Delay Between Pols [20 [ms]	Mbslave1 Connection Setup D = 1: F = 03 No connection Connection Name Setial Settings 1 USB-SERIAL CH340 (COM11) 2 115200 Baud 3 B Data bits 5 None Parity 0 DSR _ CTS _ RTS Toggle 1 Istop Bit
Help, press F	Remote Modbus Server IP Address or Node Name 192.168.4.164 Server Port 2000 [ms]	 ✓ ✓ ✓ ✓ ✓ 	8 TCP/IP Server IP Address Port 192.158.3.3 8886 Any Address 0 IPv4 Ignore Unit ID 1Pv6

Software register reading and emulation configuration:

Poll menu select SetupRead/Write Definition

Read/Wri	te Definition	1			
Slave ID:	1				ОК
Function:	03 Read	Holding Re	gisters (4x)	~	Cancel
Address:	0	PLC ad	idress = 4000	01	
Quantity:	5		Poll		
Scan Rate	1000	[ms]	1 OII		Apply
Disable	d/Write <mark>Disab</mark> ble on error	led		Read	l/Write Once
View Rows 10	0 20	O 50 C)100 O Fit	to Quant	tity
Hide	Alias Column	s		dresses (E	Base 1)
Add	ress in Cell		Enron/D	aniel Moo	de
Request					
RTU	01 03 00 00	00 05 85	C9		
ASCII	3A 30 31 30	33 30 30	30 30 30 30	30 35 4	6 37 0D 0A

Slave menu select SetupSlave Definition

Slave Defini	tion		×
Slave ID:	1		ОК
Function:	03 Holding Register (4	ix) ~	Cancel
Address n Dec	O Hex		
Address:	0 PLC addr	ess = 40001	
Quantity:	5		
View			
Rows			
10	○20 ○50 ○1	00 O Fit to Quan	tity
Hide N	ame Columns	PLC Addresses (I	Base 1)
Error Simu	lation		
Skip re	sponse	Insert CRC/LRC	error
0	[ms] Response Delay	Return excepti	on 06, Busy

Communication demonstration:

월 Modbus Poll - Mbpoll1				- 🗆 X
File Edit Connection Setup Functions Dis	splay View Window Help			
🗅 🖨 🖨 🗙 🛅 🗒 🛓 л. 05 06	15 16 17 22 23 TC 🖳 🖀	8 K?		
	Commission Traffic			×
Ty = 260; Err = 0; ID = 1; E = 03; SR = 1(Communication Tranic			~
1X - 300. EII - 0. ID - 1. I - 03. SIX - 10	Exit Continue	Clear Save	Copy Log	Stop on Error Time stamp
Alias 00000	P000113-01 7E 00 0	0 00 0D 01 03 0A 00	01 00 02 00 03 00 04 00	05
	Tx:000114-01 7F 00 0	0 00 06 01 03 00 00	00 05	05
0	Rx:000115-01 7F 00 0	0 00 0D 01 03 0A 00	0 01 00 02 00 03 00 04 00	05
1 2	Tx:000116-01 80 00 0/	0 00 06 01 03 00 00	00 05	
2 3	Rx:000117-01 80 00 00	0 00 0D 01 03 0A 00	01 00 02 00 03 00 04 00	05
3 4	Tx:000118-01 81 00 0	0 00 06 01 03 00 00	00 05	OF.
4 5	m000119-01 81 00 0	0 00 00 01 03 0A 00		05
	Rx:000121-01 82 00 0	0 00 0D 01 03 0A 00	01 00 02 00 03 00 04 00	05
	Tx:000122-01 83 00 0	0 00 06 01 03 00 00	00 05	
	Rx:000123-01 83 00 0	0 00 0D 01 03 0A 00	01 00 02 00 03 00 04 00	05
	Tx:000124-01 84 00 0	0 00 06 01 03 00 00	00 05	
	Rx:000125-01 84 00 0	0 00 0D 01 03 0A 00	01 00 02 00 03 00 04 00	05
	Rx:000127-01 85 00 0	0 00 0D 01 03 0A 00	01 00 02 00 03 00 04 00	05
24				
3 Modbus Slave - Mbslave I				- 🗆 🔨
File Edit Connection Setup Display View	Window Help			
	Communication Traffic			x
💬 Mbslave1 🕞 🔍 🖾				
ID = 1: F = 03	Exit Continue	Clear Save	Copy Log I ime stamp	
	Tx:000091-01 03 0A (0 01 00 02 00 03 00	0 04 00 05 CF 24	^
Name 00000 ^	Rx:000092-01 03 00 0	00 00 05 85 C9		
1	Tx:000093-01 03 0A U	0 01 00 02 00 03 00	0 04 00 05 CF 24	
	Rx:000094-01 03 00 0		0 04 00 05 CF 24	
1 2	Rx:000096-01 03 00 (0 00 05 85 C9	0 04 00 03 CF 24	
2 3	Tx:000097-01 03 0A (0 01 00 02 00 03 00	0 04 00 05 CF 24	
3 4	Rx:000098-01 03 00 0	00 00 05 85 C9		
4 5	Tx:000099-01 03 0A 0	00 01 00 02 00 03 00	0 04 00 05 CF 24	
Y V	Rx:000100-01 03 00 0	00 00 05 85 C9	0.04.00.05.05.04	
	Tx:000101-01 03 0A 0		0 04 00 05 CF 24	
	Tx:000103-01 03 0A (000000000000000000000000000000000000	0 04 00 05 CF 24	
				~

5.9.3 Multi-host mode

Relatively simple protocol conversion can only exist one Modbus master, while multi-master mode can handle up to 4 Modbus TCP hosts, when multiple Modbus hosts access at the same time Modbus gateway will perform bus occupancy scheduling (RS-485 bus can only handle one request at a time, while multi-master mode will sort and process TCP requests according to the order of Other links will wait), thus solving the bus conflict problem (currently only 4 hosts are supported), and only supports working in TCP server mode, slaves can only be on the serial port, otherwise they cannot work properly.

As the number of hosts increases, the Modbus timeout time should be increased accordingly, and the request interval should be increased. If multiple hosts need to request continuously at high speed, it is recommended to use

a "storage gateway".

It is recommended to configure it as "simple protocol conversion" when no multiple hosts are used. Multi-host mode configuration (left image is the upper computer, right image is the web page):

Device name	E0001		Serial Number	00001	
DHCP	Disable	~	Local port	8886	0
Local IP	192.168.4 .101		DNS	192.168.4 .1	
Mask	255. 255. 255. 0		¥eb server port	8080	•
Getway	192.168.4 .1		Network mode	TCP server	~
Remote IP	192.168.4.100		Remote port	8886	\$
		Nodbus paramet NODBUS Getway NODBUS RTU Res Storage time o Nodbus Auto qu Vodbus RTU	Multihost mode ponse timeou <u>300</u> of Modbus ins 200 mery interval 500 <-> Modbus TCP Instruction 1	∨ 10ns € 1s ≎	
			Instruction 1	Add	

Network para	meter				
DHCP	disable 🗸	Work mode	TCP server 🗸	MAC	84-C2-E4-8F-10-AC
Local IP	192.168.4.101	Local port	8886	Web port	80
MASK	255.255.255.0	Getway	192.168.4.1	DNS	192.168.4.1
Target IP	192.168.4.100			Target port	8886
MODBUS par	ameter				
MODBUS TCP to RTU	Open 🗸	Mosbu	is instructions		add clear
Modbus mode	Multi host 🗸	MODBUS Query time	500 Range:0-65535ms	spare space	49
Modbus timeout	3000 Range: 0 - 65535ms	Modbus keep time	200 Range:0-255s	01 03 00 00 00 0A	X
Instruction forma space between "X	t: "XX XX XX XX XX XX XX";"XX (X"and "XX" ons can be configured	("is a 2-digit hexaded	imal number. Must add a		

Modbus Poll and Modbus Slave software debugging:

Refer to "Simple Protocol Conversion" for software configuration and register configuration, and open multiple Modbus Poll software at the same time (3 channels for example, up to 4 channels can be supported).

ER



5.9.4 Storage gateway

The storage gateway not only arbitrates bus data but also stores repeated read commands. When different hosts request the same data, the gateway does not need to ask the RTU device register status several times, but directly returns the cached data in the storage area, which greatly improves the gateway's multi-host request processing capability and shortens the time consumed by the whole request process. Users can customize the command polling interval and command storage time in the storage area according to their needs.

The storage type gateway, as an optimization of the performance of multi-host requests, also works only in TCP server mode, improving the response speed on the network side.

Features:

(1) The gateway has a 3K cache for storage of instructions and return results (read 10 holding registers for example, roughly 100 instructions and return results can be stored);

(2) RTU response timeout automatically empties the cache to ensure real-time data and authenticity;

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

(4) the gateway will be used to configure the instruction storage time polling RTU equipment, MODBUS host in the storage time is not again query the instruction, the gateway automatically delete the stored instructions to release the cache;

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

(6) only support 01, 02, 03, 04 Modbus function code query result storage;

Storage type gateway configuration (left picture is the upper computer, right picture is the web page):

5.9.5 Configurable gateway

The gateway automatically polls the RTU device registers according to the pre-configured MODBUS commands

(only the configuration of MODBUS read commands is supported), and commands not stored in the table will operate the RTU device directly. It is possible to store frequently read commands in advance in the gateway, which can shorten the response time (querying for configured commands). Due to the above features, only Modbus slaves can be connected to the serial side of the configurable gateway.

5.9.6 Automatic upload

In client mode (TCP client, UDP client, MQTT client, HTTP client) the gateway will automatically poll the command table to store the commands and upload them to the server, and the feedback format (Modbus RTU format or Modbus TCP format) and the command polling interval (0-65535ms) can be selected according to requirements.

Refer to "Configurable Gateway - Instruction Storage Instructions" for instruction pre-storage and automatic upload to the host computer/web page for configuration:

5.9.7 Simple protocol conversion demo case

Step 1: adjust the Modbus timeout time of the gateway according to the actual application distance test data delay;

Use transparent transmission mode through XCOM with the network debugging assistant log roughly calculate the acceptance of the demonstration, as follows:

The Modbus timeout for the E90 gateway should be greater than the calculated time (it is recommended to use the maximum value for multiple transmissions). 2000ms timeout can be configured here (leave some margin, do not use 1400ms directly), and the timeout for the end device (e.g. Modbus Poll software) should be greater than or equal to the gateway timeout.

🖞 Modbus Poll - Mbp	oll1	
ile Edit Connection	Setup Functions Dis	play View Window
D 🖻 🖬 🎒 🗙 🕻	1 🗏 🚊 IL 05 06	15 16 17 22 23 TO
📆 Mbpoll1		
Connection Setup		×
Connection		OK
Modbus TCP/IP	~	
Serial Settings		Cancel
COM1	\sim	Mode
9600 Baud \sim		RTU OASCII
8 Data bits \sim		Response Timeout 2000 [ms]
Even Parity \sim		- Delau Between Polls
1 Stop Bit \sim	<u>A</u> dvanced	20 [ms]
Remote Modbus Server		
IP Address or Node Nar	me	
192.168.4.101		~
Server Port	Connect Timeout	IPv4
8886	3000 [ms]	O IPv6

Step 2: Enabling Modbus gateway functionality (simple protocol conversion);

Modbus parameters	MODBUS parameter
MODBUS Getway Simple protocol \sim	MODBUS TCP to RTU
MODBUS RTU Response timeou 2000ms 🖨 Storage time of Modbus ins 200s 🗘	Modbus mode
Modbus Auto query interval 500ms 🗢	Modbus 2000 timeout Range: 0 - 65535ms
Instruction list Delet 01, 03, 00, 00, 00, 02 Add	Instruction format: "XX XX XX XX XX XX XX";"XX"is a 2-d space between "XX" and "XX" Up to 50 instructions can be configured

Step 3: Use Modbus Poll and Modbus Slave software to test the configuration as described in "Simple Protocol Conversion";

oll1		💽 Com	municati	on Tr	affic																			×
= 86: Err = 0: ID =	1: F = 03: SR = 1000ms	Exit		Stop	i i		Clear			Save		1	Сору	1	[Log			itop o	n Erro	· 🗆	Time	stamp	,
Alias	00000	Tx:000	147-0	0 50	00	00	00	06	01	03	00	00	00	0A										^
	14	Rx:000	148-0	0 50	00	00	00	17	01	03	14	00	04	00	00	00	00	00	00	00	00	00	00	
	0	Tx:000	149-0	0 51	00	00	00	17	01	03	14	00	00	00	0.0	00	00	00	0.0	00	00	0.0	00	
	0	Tx:000	151-0	0 52	00	00	00	06	01	03	00	00	00	OA	00		00			00			00	
	0	Rx:000	152-0	0 52	00	00	00	17	01	03	14	00	07	00	00	00	00	00	00	00	00	00	00	
	0	Tx:000	153-0	0 53	00	00	00	06	01	03	00	00	00	0A										
	0	Rx:000	154-0	0 53	00	00	00	17	01	03	14	00	AO	00	00	00	00	00	00	00	00	00	00	
	0	Tx:000	155-0	0 54	00	00	00	17	01	03	14	00	00	0A	00	00	00	00	00	00	00	00	00	
	0	Rx:000	157-0	0 55	00	00	00	11	01	03	00	00	00	00	00	00	00	00	00	00	00	00	00	
	0	Bx:000	158-0	0 55	00	00	00	17	01	03	14	00	OE	00	00	00	00	00	0.0	0.0	00	00	00	
		Tx:000	159-0	0 56	00	00	00	06	01	03	00	00	00	OA										~
	0	<																					>	
	0																_							

6 Configuration method

6.1 Web Configuration

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

Note: Please do not enter the web page configuration in normal use, it may lead to data loss, if you enter the web page configuration, you need to reboot to enter the communication mode.

Web configuration initialization password: 123456, customizable configuration, only supports 6 upper and lower case letters and numeric configuration.

Web configuration requires the use of newer kernel browsers 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 that use IE kernel are not supported to use the web configuration.

6.2 Software configuration

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

[Note]:

Please do not use more than one host computer in the same LAN environment, multi-network card industrial control machine need to temporarily disable not to use the network card, otherwise the host computer will not be able to search for the device normally (the same device is displayed multiple times, can not search for the device and other abnormal occurrences)

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

6.3 AT command configuration

The relevant parameters of the device can be configured by AT commands. For specific AT commands, please refer to "E90-DTU(xxxSLxx-ETH) V2.0-AT Command Set".

The final interpretation right belongs to Chengdu Ebyte Electronic Technology Co., Ltd.

Revision History

Version	Date	Description	Maintainers
1.0	2023-4-26	Initial version	LYL

About us

Technical support: support@cdebyte.com

Documents and RF Setting download link: https://www.cdebyte.com

Thank you for using Ebyte products! Please contact us with any questions or suggestions: info@cdebyte.com

Phone: +86 028-61399028

Web:https://www.cdebyte.com

Address: B5 Mould Park, 199# Xiqu Ave, High-tech District, Sichuan, China

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