



ZHC4013 Application Guide

LTE Cat 1 Modbus RTU

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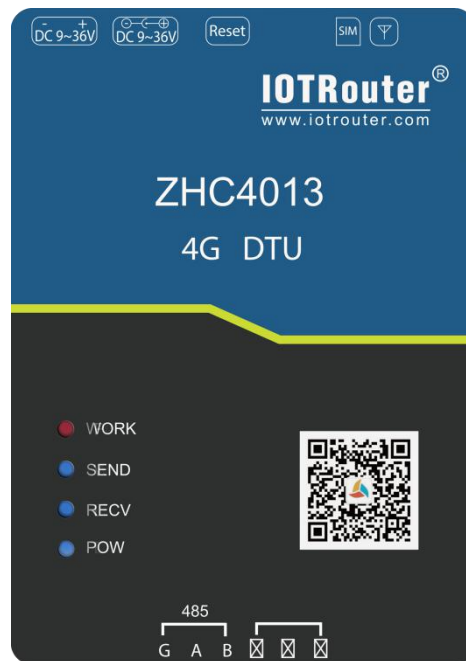
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1 Overview

1.1 Product introduction

ZHC4013 is a Network IO products with transparent transmission through serial port, compatible with Modbus RTU/TCP protocol. With "remote control" as the core function, it is highly easy to use, and users can easily and quickly integrate into their own systems to realize LTE, RS485 remote and local data collection.

1.2 Appearance description



DC power supply:5.5*2.5mm, 9~36V

Terminal power supply: 3.81mm, 9~36V

Serial port:RS485, 3.81mm terminal block plug-in

SIM:SIM card interface

MAIN:Main antenna

2. Quick start

This chapter is a quick introduction to the ZHC4013 product. It is recommended that users read this chapter systematically and follow the instructions to operate it again, and they will have a systematic understanding of the product. For specific details and instructions, please refer to the subsequent chapters.

Wiring: The computer connects to ZHC4013 via USB to RS485

Networking: Insert the SIM card when the power is off.

Power supply: ZHC4013 working voltage is DC9~36V.

2.1. RS485 bus control

Select the corresponding port and click "Search" to search for the device.



IO control



For detailed functions of the host computer, please refer to "ZHC4013_Host".
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Computer_Application Guide".

2.2. Across Cloud Control

Refer to "ZHC4013_Zongheng Cloud Platform_Application Guide"

3. Product features

3.1. Serial RS485

3.1.1. Basic parameters

project	Attributes	parameter
Baud rate	Serial port rate	1200~921600bit/s
Stop bit	Stop bit	1/1.5/2
Data bit	Data bit	8/7
Check Digit	Check Digit	None/even parity/odd parity

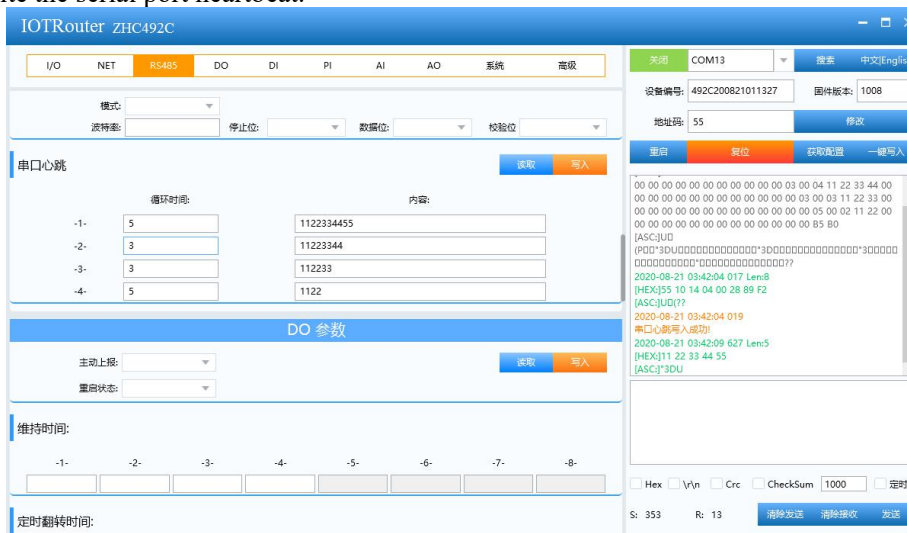
3.1.2. Features

ZHC4013 supports serial port timing to send heartbeat.

project	Attributes	parameter
cycle	Time interval from the last serial port heartbeat	0~65535 s
length	Serial port heartbeat packet length	0~16
content	Hex format data	Example: Read the address code as 0x554 analog inputs 55 04 00 00 00 04 FC 1D

Serial port heartbeat application example:

Write the serial port heartbeat.



effect

```
[HEX:]11 22  
[ASC:]"  
2020-08-21 03:42:26 713 Len:5  
[HEX:]11 22 33 44 55  
[ASC:]"3DU  
2020-08-21 03:42:29 775 Len:4  
[HEX:]11 22 33 44  
[ASC:]"3D  
2020-08-21 03:42:32 579 Len:3  
[HEX:]11 22 33  
[ASC:]"3  
2020-08-21 03:42:37 680 Len:2  
[HEX:]11 22  
[ASC:]"  
2020-08-21 03:42:43 546 Len:5  
[HEX:]11 22 33 44 55  
[ASC:]"3DU  
2020-08-21 03:42:46 606 Len:4  
[HEX:]11 22 33 44  
[ASC:]"3D  
2020-08-21 03:42:49 667 Len:3  
[HEX:]11 22 33  
[ASC:]"3  
2020-08-21 03:42:54 767 Len:2  
[HEX:]11 22  
[ASC:]"  
2020-08-21 03:43:00 633 Len:5  
[HEX:]11 22 33 44 55  
[ASC:]"3DU
```



3.2. System Information

project	Attributes	parameter
Modbus address code	Modbus address code	01~FE
DEVID	Factory unique number	Read only
password	The password used to access the ZH-cloud platform	Support 16byte
Escalation mode	Format and channel of actively reported data	Network modbus RTU report Network modbus TCP report Network JSON report Serial modbus RTU report Serial modbus TCP report Serial JSON report Serial + network modbus RTU report Serial + network modbus TCP report Serial port + network JSON report
Networking mode	Use the networking mode when accessing to the crossbar cloud transparent transmission	Enable/Disable
Group ID Group password	Group ID Devices with the same group password can establish a networking mode	Support 16byte
Group type	In the same group, different types of equipment can exchange data	A/B



3.3. Timing trigger

ZHC4013 supports "Arrival at the set time point (Beijing time), scheduled restart".

project	Attributes	parameter
mode	Whether to turn on this timing trigger	Enable/disable
Timing	Time point when the action is triggered	Hour: 00~twenty three; Minutes: 00~59; Seconds: 00~60
Action type	Type of action performed	Reboot

3.4. Network subsidiary information

ZHC4013 supports obtaining SIM card number, signal strength, setting APN, etc.

project	Attributes	parameter
CCID	SIM unique identification number	A combination of 20 numbers and letters. Read only
Signal strength	The signal strength of the environment where the device is located	See appendix QCSQ for details
APN address	Access point settings, dedicated network card needs to set this	Provided by the operator
APN username	The username required to access the specified network	Provided by the operator
APN password	The password required to access the specified network	Provided by the operator



3.5. Status indicator

name	Features	status	State description
POW	Power Indicator	Chang Liang	System start
		Always off	The system does not start
WORK	System working status indicator	Chang Liang	The network module does not start
		1000ms off 1000ms on	Network module is starting
		1500ms off 100ms on	SIM card error
		100ms off 100ms on	
		200ms off 200ms on	Get IP
500ms off, 500ms on	The network is normal		
SEND	Network data sending indicator	Always off	SOCKET is not established
		Chang Liang	SOCKET has been established
		Flashing	Send network data
RECV	Network data receiving indicator	Always off	default
		Chang Liang	Module not started
		Flashing	Receive network data



3.6. Restore factory settings

A) The device can be restored to factory settings by operating the RESET button.

Steps:

Step 1: Power on the device.

Step 2: Press and hold the RESET button until the indicator lights of the device are all off, and immediately release the reset button, the device is restored to factory settings successfully.

If it is found that the serial port of the device starts to actively send JSON data packets after reset, it indicates that the reset button has been pressed for too long and the device enters the local firmware upgrade mode. At this time, power off the device and perform the reset operation again.

B) Restore factory settings by issuing Modbus/JSON commands.

Modbus instructions:55 06 20 14 00 02 4E 1B

JSON command:{"msgType":"setDeviceConfig","data": {" sysCmd ": "2"}}



3.7. Firmware upgrade

For the firmware upgrade process, please refer to "ZHC4013_PC_Application Guide"

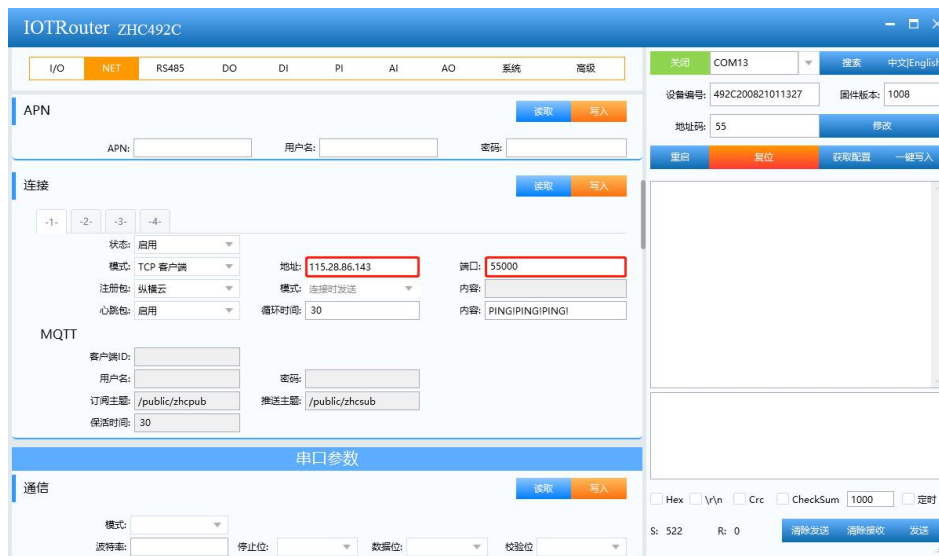
4. Product application

4.1. Transparent Cloud

Operation process (take socket1 as an example):

1. Set socket1 parameters

Please confirm the IP address and port of the server to be connected; the registration package and the heartbeat package are recommended to be enabled, and can be customized if necessary, and the settings are complete and restarted.



2. Server operation

After the device is connected to the user server, a custom registration package will be sent to facilitate the customer to identify the device, and then the customer can Modbus , JSONprotocol(Please refer to CAT1_JSON_Application guidance)To operate the device, the device adapts to Modbus RTU/TCP , JSONprotocol.

4.2.MQTT

ZHC4013 supports one MQTT application (connection 1).

When the device actively pushes data, it will select the mode according to the "Data Active Reporting" option.



In the MQTT application, the picture above means that "application data is encapsulated in JSON format" and reported through the network in the MQTT protocol. The server can parse the application data of MQTT according to "CAT1_JSON_Application Guide".



4.3. Transparent transmission of vertical and horizontal clouds

Refer to "CAT1_Zonghengyun Transparent Transmission_Application Guide"

4.4. Zongheng Cloud Platform

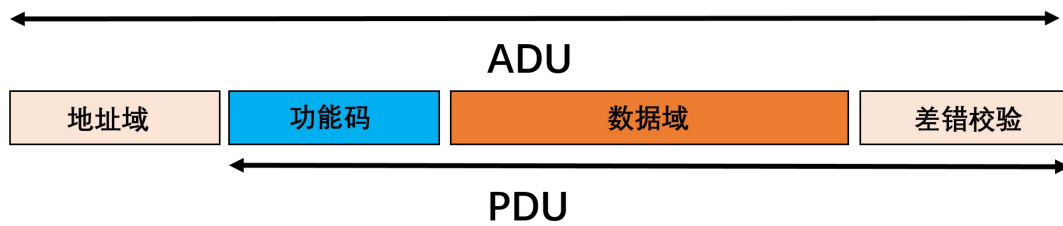
Refer to "CAT1_Zonghengyun Platform_Application Guide"

5. Modbus command frame

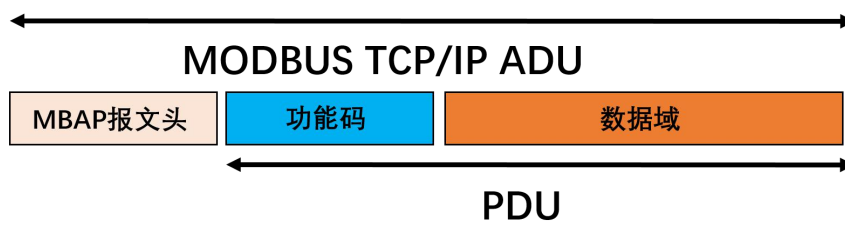
5.1 Modbus command frame

The ZHC4013 data format follows the general Modbus frame format, and the device can parse the Modbus RTU/TCP protocol and perform related operations.

Modbus RTU:



Modbus TCP:



5.2 Register allocation

For register address allocation, please refer to "ZHC4013_Register Address Table"



6.JSON protocol

ZHC4013 supports JSON protocol, please refer to "JSON_Application Guide"



7. Update history



8. Contact

Company: Chengdu Zongheng Intelligent Technology Co., Ltd.

Address: 19th Floor, Zhidi Gotan, No. 888 Yizhou Avenue, High-tech Zone, Chengdu, Sichuan Province

Website: www.iotrouter.com

Phone: 028-83268936