ZHC466C Manual

Content

1.Overview

1.1Product introduction

ZHC466C is a network IO product that supports 4 channels of 0-10V/4~20mA analog output, 4 channels of 0-10V/4~20mA analog input, and 1 channel of RS485 transparent transmission, compatible with Modbus RTU/TCP, and supports JSON protocol . With "remote monitoring" as the core function, it is simple and easy to use, and users can easily and quickly integrate it into their own systems to realize remote and local control based on LTE and RS485.

1.2Appearance description

DC power supply:5.5*2.5mm, 9~36V
Reset:reset button
Terminal power supply:3.88mm, 9~36V
Serial port:RS485, 3.8mm terminal block plug-in

SIM:SIM card interface
MAIN:main antenna

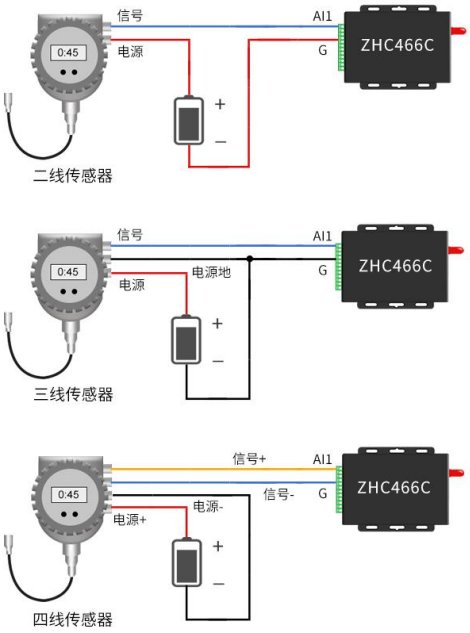
AO:AO1~AO4 are 4 channels Analog signal output (0~10V/4~20mA)
AI:AI1~4 are 4 channels analog signal input detection(0~10V/4~20mA)

2.Quick start

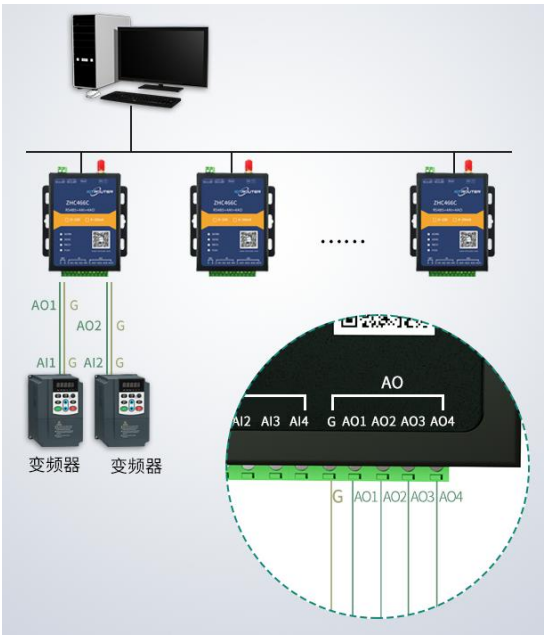
This chapter is a quick start introduction to the ZHC466C product. It is recommended that the user system read this chapter and follow the instructions to have a systematic understanding of the product. Refer to subsequent chapters for specific details and instructions.

Wiring: The computer is connected to the ZHC466C via USB to RS485.
Networking: Insert the SIM card in the power-off state.
Power supply: The working voltage of ZHC466C is DC9~36V.

AI wiring method

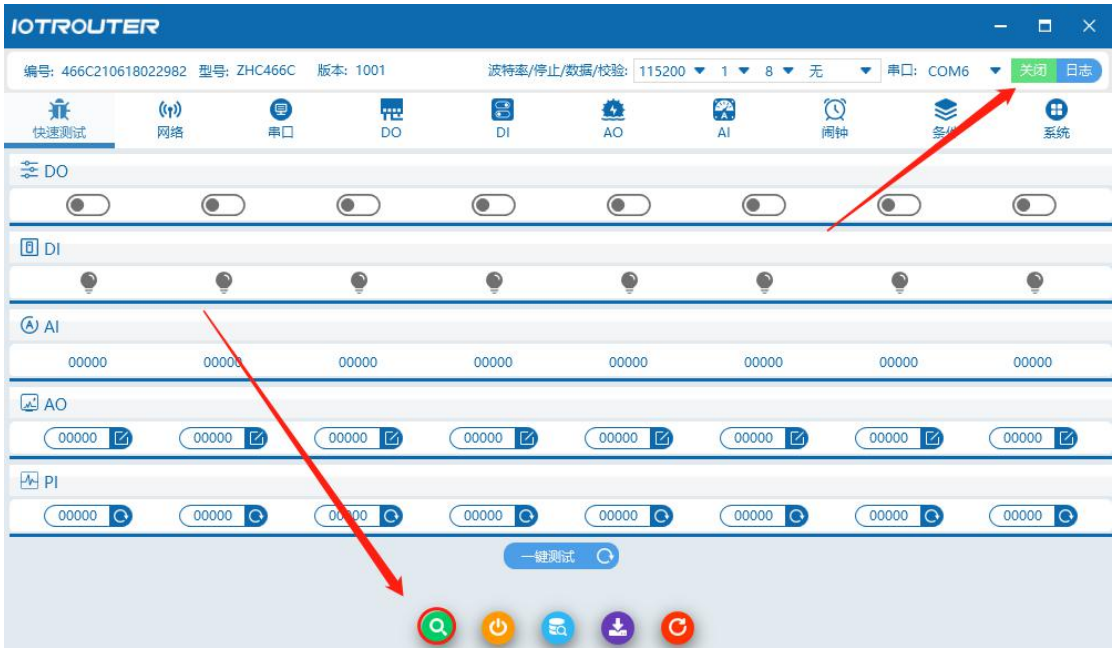


AO wiring method

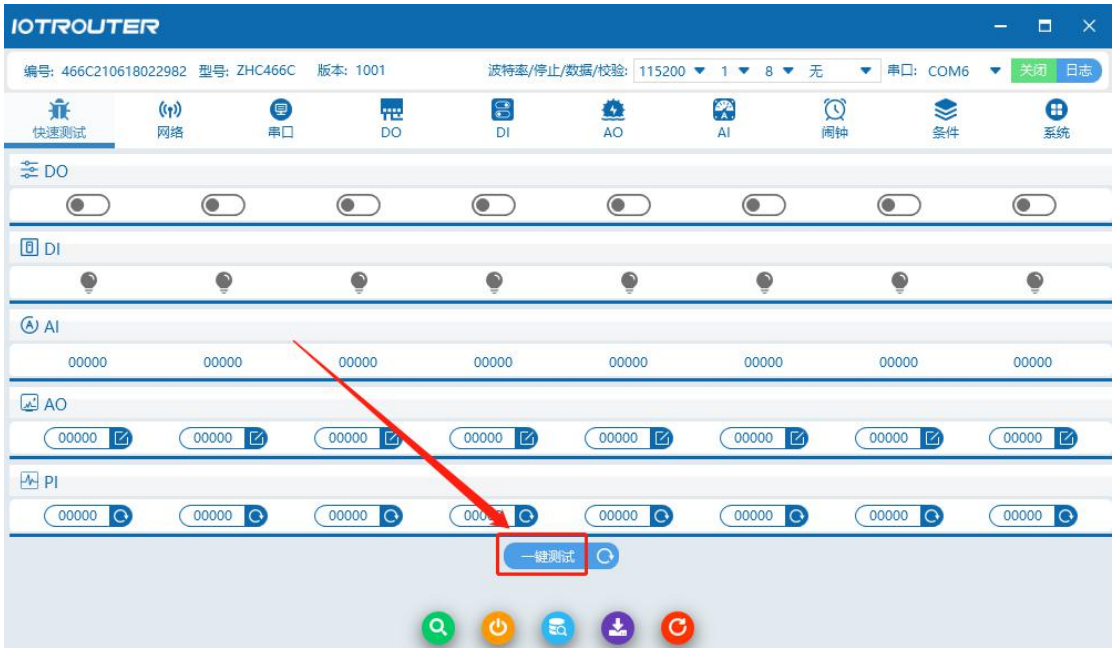


2.1.RS485bus control

Select the corresponding port and click Search to search for devices.



One-click test



2.2.Aspect Cloud Control

Refer to "ZHC466C_Zongheng Cloud Platform_Application Guide"

3.Product Features

3.1.serial portRS485

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 bits	data bits	9/8
Check Digit	Check Digit	None/even parity/odd parity

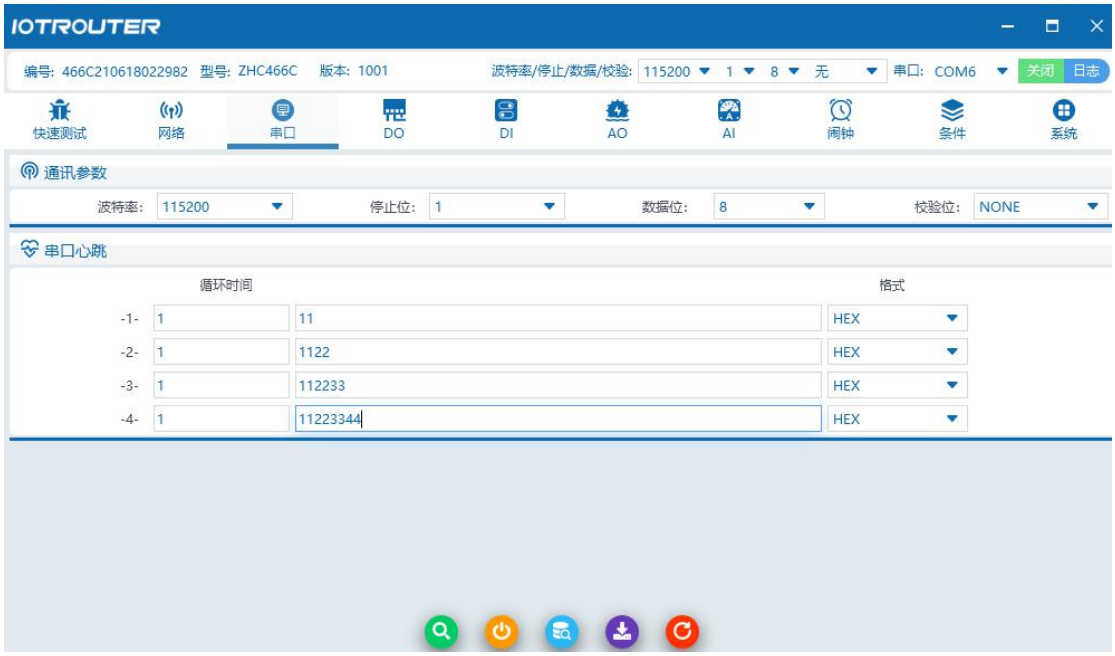
3.1.2.special function

ZHC466C supports the serial port to send heartbeat regularly.

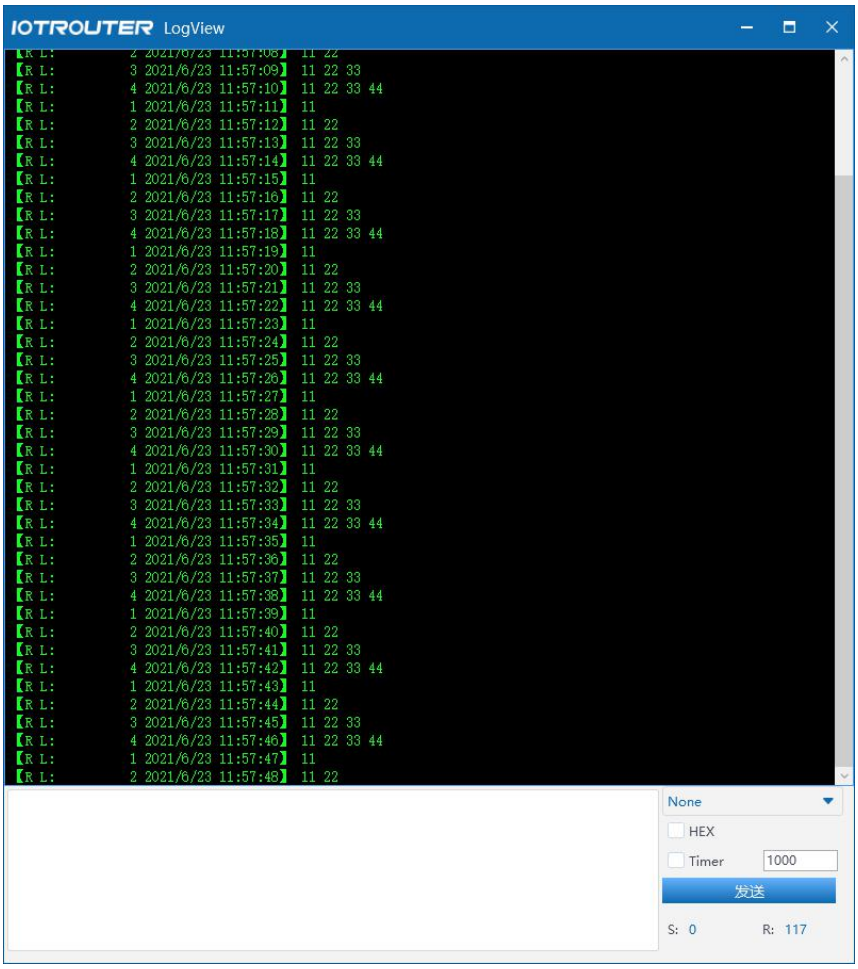
project	Attributes	parameter
cycle	The time interval from the last serial port heartbeat	0~65535 s
length	Serial Heartbeat Packet Length	0~16
content	Hex format data	Example: read 4 analog inputs with address code 0x55 55 04 00 00 00 04 FC 1D

Serial heartbeat application example:

Write serial heartbeat



Effect


IOTROUTER LogView
【R L: 3 2021/6/23 11:57:09】 11 22 33
【R L: 4 2021/6/23 11:57:10】 11 22 33 44
【R L: 1 2021/6/23 11:57:11】 11
【R L: 2 2021/6/23 11:57:12】 11 22
【R L: 3 2021/6/23 11:57:13】 11 22 33
【R L: 4 2021/6/23 11:57:14】 11 22 33 44
【R L: 1 2021/6/23 11:57:15】 11
【R L: 2 2021/6/23 11:57:16】 11 22
【R L: 3 2021/6/23 11:57:17】 11 22 33
【R L: 4 2021/6/23 11:57:18】 11 22 33 44
【R L: 1 2021/6/23 11:57:19】 11
【R L: 2 2021/6/23 11:57:20】 11 22
【R L: 3 2021/6/23 11:57:21】 11 22 33
【R L: 4 2021/6/23 11:57:22】 11 22 33 44
【R L: 1 2021/6/23 11:57:23】 11
【R L: 2 2021/6/23 11:57:24】 11 22
【R L: 3 2021/6/23 11:57:25】 11 22 33
【R L: 4 2021/6/23 11:57:26】 11 22 33 44
【R L: 1 2021/6/23 11:57:27】 11
【R L: 2 2021/6/23 11:57:28】 11 22
【R L: 3 2021/6/23 11:57:29】 11 22 33
【R L: 4 2021/6/23 11:57:30】 11 22 33 44
【R L: 1 2021/6/23 11:57:31】 11
【R L: 2 2021/6/23 11:57:32】 11 22
【R L: 3 2021/6/23 11:57:33】 11 22 33
【R L: 4 2021/6/23 11:57:34】 11 22 33 44
【R L: 1 2021/6/23 11:57:35】 11
【R L: 2 2021/6/23 11:57:36】 11 22
【R L: 3 2021/6/23 11:57:37】 11 22 33
【R L: 4 2021/6/23 11:57:38】 11 22 33 44
【R L: 1 2021/6/23 11:57:39】 11
【R L: 2 2021/6/23 11:57:40】 11 22
【R L: 3 2021/6/23 11:57:41】 11 22 33
【R L: 4 2021/6/23 11:57:42】 11 22 33 44
【R L: 1 2021/6/23 11:57:43】 11
【R L: 2 2021/6/23 11:57:44】 11 22
【R L: 3 2021/6/23 11:57:45】 11 22 33
【R L: 4 2021/6/23 11:57:46】 11 22 33 44
【R L: 1 2021/6/23 11:57:47】 11
【R L: 2 2021/6/23 11:57:48】 11 22
None
HEX
Timer
1000
发送
S: 0
R: 117

3.2.AO

3.2.1.read and write status

Send Modbus commands to ZHC466C through the network and serial port, you can read and write the AO status.

project	parameter
register address range	30001~30002 (0x0000~0x0001)
Support function code	01, 03, 06,10

to read 1 channel AO
Example of output status:
Inquire:55 03 00 00 00 01 89 DE
Query response:55 03 02 FF FF 88 38
Write the first AO output value:
Write enter:55 06 00 00 0F A0 81 96
response:55 06 00 00 0F A0 81 96

3.2.2.special function

ZHC466C AO supports active reporting, restart keeping output status, output hold time,Default output value, loop output Wait.

project	Attributes	parameter
Take the initiative to report	A Report all AO state values immediately after the O state changes	enable/disable
restart state	Whether to maintain the last AO output state after the device is powered on	enable/disable
Output hold time	The new state of AO is maintained for a specified time and then flipped	0~65535 s
loop output	Every "set time",AO output specified value, each channel supports setting up to 8 output values	0~65535uA/mV
default output	Turn on "default output" and turn on "output hold time" at the same time, when the output hold time expires, output "default output value"	0~65535uA/mV

3.3.AI

3.3.1. Read status

Calculation formula:

Current value = return value / 1000 Unit: mA

The AI value can be read by sending Modbus commands to ZHC466C through the network and serial port.

project	parameter
register address range	30001~30004 (0x0000~0x0003)
function code	04

Take the first current detection as an example:

Inquire:55 04 00 00 00 01 3C 1E

Query response:55 04 02 10 00 82 0C

The returned data is 0x1000, which means 4096uA, that is, 4.096mA

3.3.2. Special function

ZHC466C AI Support Setting proactive reporting conditions.

project	Attributes	parameter
Take the initiative to report	Whether to enable AI status reporting	enable/disable
circulation time	When the AI status does not change, the period for reporting the status	0~65535 s
Reporting mode	Trigger mode for AI state change reporting	Inside/Outside/Disabled
the lower limit of the interval	The lower limit of the interval that triggers reporting	4000~20000uA
upper limit of the interval	The lower limit of the interval that triggers reporting	4000~20000uA

AI proactive reporting instructions:

Disable reporting mode: report all AI values cyclically according to the set period.

Report within the interval: When the set AI channel value enters the interval from outside the interval, all AI channel values are reported immediately and the cycle time is reset.

Out-of-range reporting: When the set AI channel value enters the out-of-range from within the range, all AI channel values are reported immediately and the cycle time is reset.

ZHC466C AI Support Set low-pass filter parameters.

project	Attributes	parameter
Low pass parameters	Increasing this parameter can shrink the fluctuation range of AI collection	0~100

3.4. Logic

ZHC466C supports setting 8 logics.

project	Attributes	parameter
Triggering conditions	Logic Trigger Condition	**Follow forward:**When DI is closed, DO is closed **Follow in reverse:**When DI is closed, DO is open, and when DI is open, DO is closed. **greater or equal to:**Trigger DO output when AI input is greater than or equal to the set value **Less than or equal to:**Trigger DO output when AI input is less than or equal to the set value **AO follows AI:**AO output value = AI input value Disabled: Turn off local logic
remote address	This logic will be triggered when a packet with the specified address code is received	01~FE; 00 is set to local logic
enter	Input conditions that trigger logic	Can be specified to be triggered by DI X, AI X
AI threshold	Trigger logic when AI reaches a certain value **(greater than or equal to, less than or equal to mode takes effect)**	0~20000
output type	Output type after logic trigger	optional DO
output	Output channel after logic trigger	DO X, AO X output can be specified
DO value	Specifies the value of the DO channel output	Normally open, normally closed, flip

3.5. System message

project	Attributes	parameter
Modbus address code	Modbus address code	01~FE
DEVID	Equipment factory unique number	read only
password	The password used to access the Zongheng cloud platform	16 bytes supported
Reporting mode	Format and channel of actively reported data	Network modbus RTU report Network modbus TCP report Network JSON report Serial port modbus RTU reporting Serial port modbus TCP reporting Serial JSON report Serial port + network modbus RTU reporting Serial port + network modbus TCP reporting Serial port + network JSON reporting
networking mode	Use the networking mode when accessing the Aspect Cloud transparent transmission	enable/disable
group id group password	Devices with the same group ID and group password can establish networking mode	16 bytes supported
group type	Within the same group, different types of devices can exchange data	A/B

3.6.Timed trigger

ZHC466C supports "reach a set time point (Beijing time), trigger an action".

project	Attributes	parameter
model	Whether to enable this timing trigger	enable/disable
Timing	The time point when the action was triggered	Hour: 00~23; Minute: 00~59; Second: 00~60
Action type	Type of action to perform	restart/AO
execution channel	When the action type is AO, the output channel of AO	AO1~4
execution status	When the action type is AO, the AO channel output value	0~65535

3.7. Network Affiliate Information

ZHC466C supports obtaining SIM card number, signal strength, setting APN, reading and writing positioning information, etc.

project	Attributes	parameter
CCID	SIM unique identification number	20 digits and letter combinations. read only
signal strength	The signal strength of the environment in which the device is located	See Appendix QCSQ for details
APN address	Access point settings, private network card needs to set this	provided by the operator
APN username	Username required to access the specified network	provided by the operator
APN password	Passwords required to access the specified network	provided by the operator
positioning mode	Whether to enable the device's own positioning function	enable/disable
positioning data	The device's own location data/user settings	When the device's own positioning function is enabled, it conforms to the NMEA1803 protocol

3.8.Status Indicator

name	Features	state	Status Description
POW	Power Indicator	Always bright	system startup
		Always off	System does not start
WORK	System working status indicator	Always bright	network module not started
		1000ms off 1000ms on	Network module is starting
		1500ms off for 100ms on for 100ms off for 100ms on	SIM card error
		200ms off 200ms on	get IP
		500ms off 500ms on	The network is normal
SEND	Network data sending indicator	Always off	SOCKET not established
		Always bright	SOCKET has been established
		flicker	send network data
RECV	Network data reception indicator	Always off	default
		Always bright	module not started
		flicker	receive network data

3.9. Reset

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 all the indicator lights of the device are off, release the reset button immediately, and the device is successfully restored to factory settings.

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 is 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.

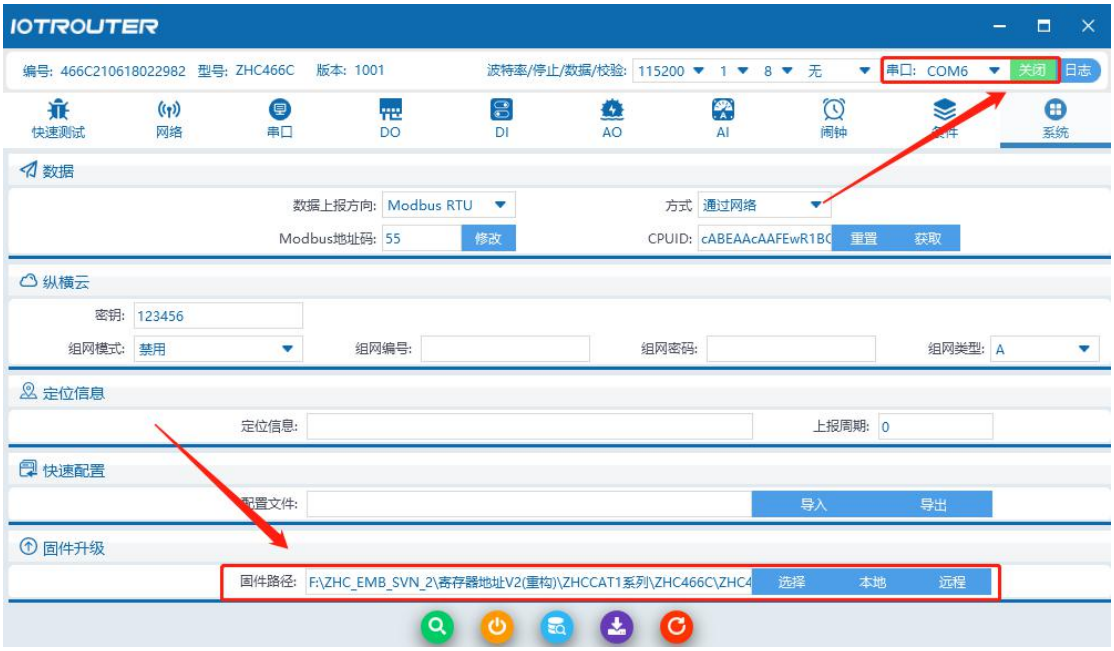
B) Restore factory settings by sending Modbus/JSON commands.

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

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

3.10. Firmware upgrade

Before upgrading, you need to configuration software
Select the corresponding firmware upgrade and open the corresponding serial port.



Configure software received ENC466C upgrade request, it will automatically start responding to the upgrade package

ZHC466CYou can enter the upgrade mode by issuing an instruction, or enter the upgrade mode by pressing the reset button and then power on.

ENC466After C enters the upgrade mode, the indicator light flashes; if the upgrade data package has been received, the upgrade progress will be displayed.

For details on remote upgrade, please refer to “IORouter ZH Cloud Transmission Instructions”

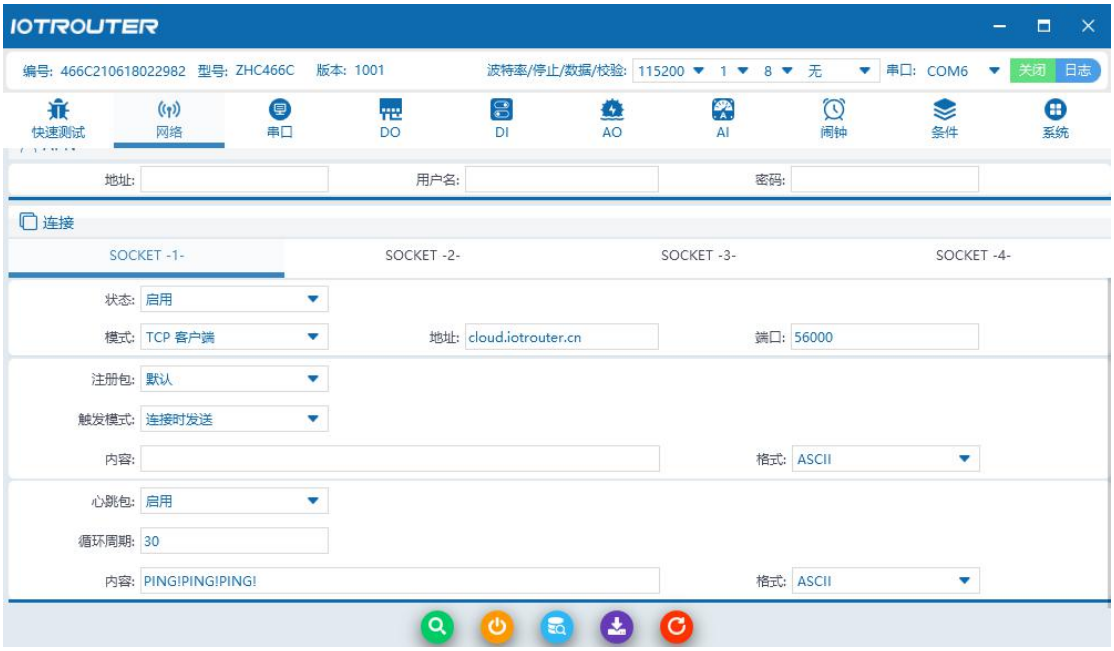
4. Applications

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 you need to connect to; it is recommended to open the registration package and heartbeat package. If necessary, you can customize it and restart after setting.



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. After that, the customer can operate the device according to the Modbus and JSON protocols (please refer to ZHC466C_JSON_Application Guide), and the device adapts to Modbus RTU/TCP and JSON protocol.

4.2.MQTT

ZHC466C supports one MQTT application (connection 1).

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

In the MQTT application, the above figure indicates that "application data is in JSON format"

is encapsulated in the MQTT protocol and reported through the network. The server can parse the application data of MQTT according to "ZHC466C_JSON_Application Guide".

4.3.Across the Clouds

Refer to "ZHC466C_ Vertical and Horizontal Cloud Transparent Transmission_ Application Guide"

4.4.Aspect Cloud Platform

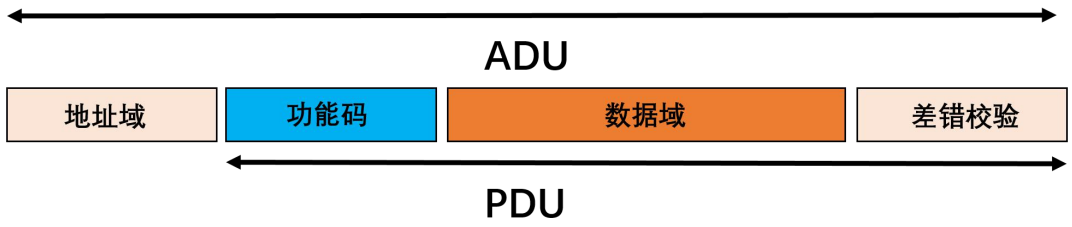
Refer to "ZHC466C_Zongheng Cloud Platform_Application Guide"

5. Modbus command frame

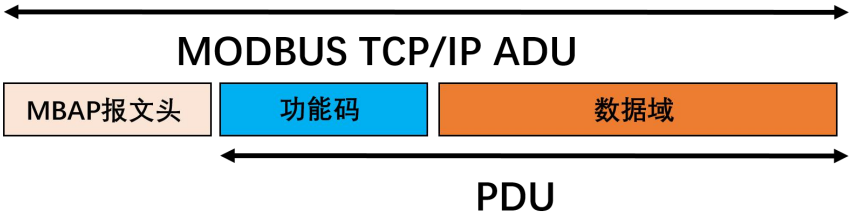
5.1 Modbus command frame

The ZHC466C 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 "ZHC466C_register address table"

6. JSON Protocol

ZHC466C supports JSON protocol, please refer to "IORouter_JSON_ Application Guide
ZHC466C AO AI Only supports getting data values through JSON, does not support reading and writing AO AI related configuration.

7.Update history

2021/6/23	Establish	wyr

8.Contact information

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