



ZHC1931 Application Guidance

Ethernet series

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contents

Content

1.Overview...	1
1.1 Product introduction.....	1
1.2 Appearance description.....	1
2.Product Features.....	2
2.1.WEB Configuration... ..	2
2.1.1.Wiring.....	2
2.1.2.basic functions.....	3
2.2.The internet.....	4
2.2.1.Basic parameters.....	4
2.2.2.Internet connection.....	5
2.2.3.Wiring.....	6
2.3 Serial port RS485	7
2.3.1.Basic parameters.....	7
2.3.2.Special feature.....	7
2.4.DO.....	9
2.4.1.Reading and writing status.....	9
2.4.2.Special feature.....	9
2.5.DI.....	10
2.5.1.Reading status.....	10
2.5.2.Special feature.....	10
2.6.AI.....	11
2.6.1.Reading status.....	11
2.6.2.Special feature.....	11
2.7.logic.....	12
2.7.1.Local logic.....	12
2.7.2.Inter-device logic.....	13
2.8.system message.....	14
2.9.Status Indicator.....	15
2.10.reset.....	16
2.11.Firmware upgrade.....	17

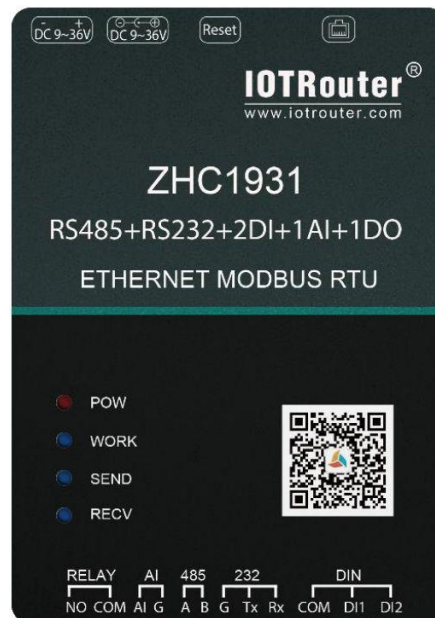
3.Applications.....	18
3.1.Transparent Cloud.....	18
3.2.Local monitoring.....	19
3.3.MQTT.....	19
3.4.Vertical and horizontal cloud transparent transmission.....	19
3.5.Zonghengyun Platform.....	19
4.Modbus Command frame.....	20
4.1 Modbus Command frame... ..	20
4.2 Register allocation	20
5.Update history.....	twenty one
6.Contact information.....	twenty two

1. Overview

1.1 Product Introduction

ZHC1931 is a support 2 Road dry (wet) node detection, 1 Relay (COM, NO) Output, 1 Analog quantity (current 4~20mA) Detection, 2 Serial port transparent transmission network IO Products, compatible 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 system to realize Ethernet, RS485/RS232 Remote and local control.

1.2 Appearance description



Ethernet: RJ45 Interface, user-provided

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

Reset: Reset button

Serial port: RS485, 5.08mm Terminal plug-in

For the specific wiring method of the following interfaces, please refer to "ZHC1931 Wiring Process Manual"

RELAY: RELAY1~RELAY4 for 4 Relay output

DI: DI1~DI6 for 6 Road dry/wet node input detection

PIN: PIN1~2 for 2 Pulse input count

AI: AI1~4 for 4 Current input detection

2.Product Features

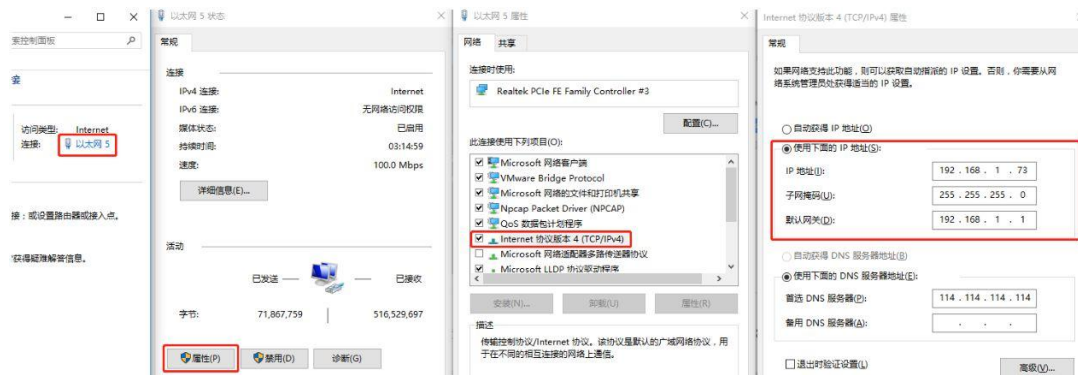
2.1.WEBConfiguration

2.1.1.Wiring

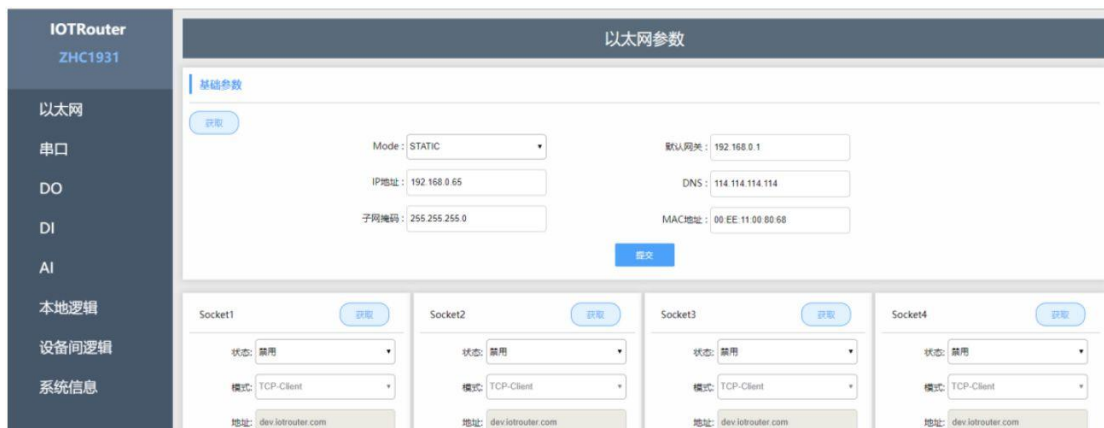
Connect the device and the computer with a network cable, and observe after the device is powered on WORK The indicator light is always on, indicating that the network hardware environment of the device is normal and it can communicate with the device.



ZHC1931 default IP Address is 192.168.0.65. The configuration requires the computer and ZHC1931 of IP Set to the same IP Address segment, otherwise the device cannot communicate with the computer. As shown below:



Open the browser and type in the address bar 192.168.0.65To enter the configuration page



2.1.2.basic functions

ZHC1931 Built-in parameter configuration webpage, users who use this device do not need to pay attention to the device-related holding registers, but only need to understand the reported data of the device. The following figure shows the recommended registers:

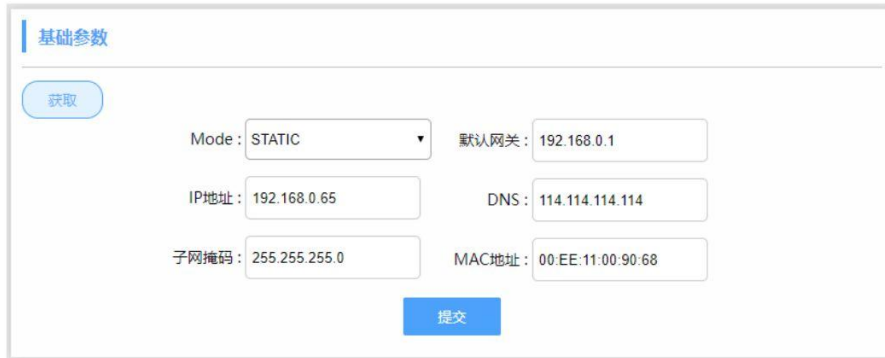
南向接口寄存器								
线圈 0x00	D0	00001	0x0000	1	D01开关量输出	读/写	0x0000/0xFF00 (0x05功能码)	0x01 (读线圈)
触点 0x01	D1	10001	0x0000	1	D11开关量输入	只读	0_bit/1_bit	0x02 (读离散量)
		10002	0x0001	1	D12开关量输入	只读		
						保留		
输入寄存器 0x03	AI	30001	0x0000	1	AI1输入值	只读	unsigned short, 单位(V/mA)	0x04 (读输入寄存器)

In the corresponding section of this document WEB The configuration items are described.

2.2.The internet

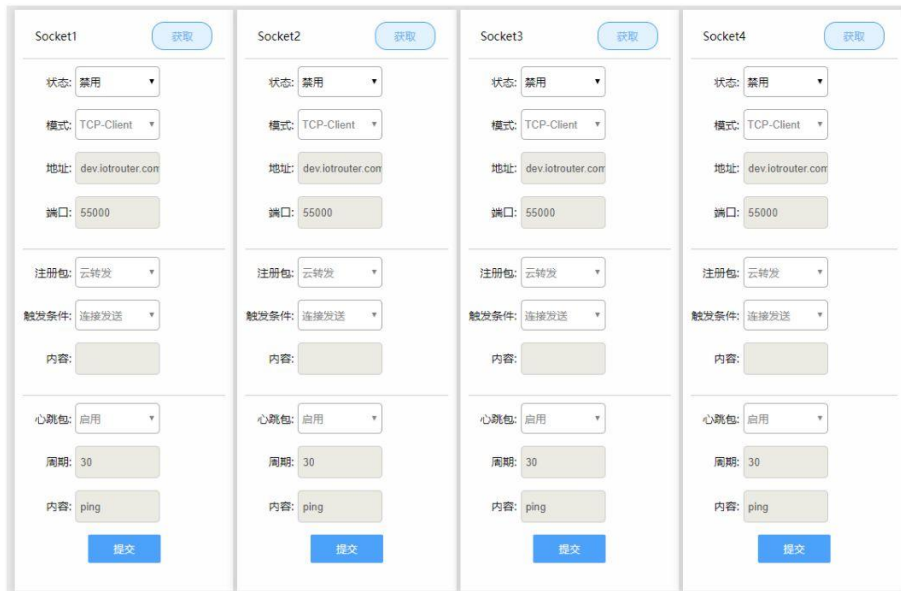
2.2.1.Basic parameters

ZHC1931 Provide all the way RJ45 Ethernet communication.



project	parameter
Mode	<p>STATIC: Static IP It needs to be set manually by the user, pay attention to write at the same time during the setting process IP, Subnet mask and gateway, static IP Suitable for needs IP Make statistics with the equipment and have a one-to-one correspondence with the scene.</p> <ul style="list-style-type: none"> ◆Advantages: access cannot be allocated IP The address of the device can be searched through the full network segment broadcast mode. ◆Disadvantages: different network segments in different LANs can not perform normal operations TCP/UDP communication. <p>DHCP: DHCP The main function is to dynamically obtain from the gateway host IP address, Gateway address, DNS Server address and other information, thus eliminating the need for setting IP The cumbersome steps to address. Apply to IP No requirements, no demands IP One-to-one scenes corresponding to the modules.</p> <ul style="list-style-type: none"> ◆Advantages: access to routers, etc. DHCP Server Devices can communicate directly, reducing settings IP Trouble with address gateway and subnet mask. ◆Disadvantages: no access DHCP Serve If the network is directly connected to a computer, the device will not work properly.
IP address	<p>IP The address is the identity of the module in the local area network, and it is unique in the local area network, so it cannot be repeated with other devices in the same local area network.</p> <ul style="list-style-type: none"> ◆Device supports static IP with DHCP Two ways to obtain.
Subnet mask	<p>The subnet mask is mainly used to determine IP The network number and host number of the address indicate the number of subnets and a mark for judging whether the module is in the subnet.</p> <ul style="list-style-type: none"> ◆The subnet mask must be set, what we commonly use C Class subnet mask:255.255.255.0, The network number is before twenty four Bit, the host number is after 8 Bits, the number of subnets is 255 Modules IP exist 255 Within the range, the module is considered IP In this subnet
Default gateway	<p>Gateway refers to the current module IP The network number of the network where the address is located. If you connect to a device such as a router when connecting to the external network, the gateway is the router IP Address. If you set the wrong address, you can't access the Internet correctly. If you don't connect to a router, you don't need to set it. The default is OK.</p>
DNS	<p>DNS The server is mainly used to convert the domain name into a network identifiable IP address. Users can set according to their needs specific DNS The address of the server.</p>
MAC address	<p>MAC The address is used to identify the network device.</p> <ul style="list-style-type: none"> ◆equipment MAC Address according to device ID generate

2.2.2. Internet connection



project	Attributes	parameter
state	Whether to enable current socket	Enable/disable
model	Role in Ethernet communication	TCP Client TCP Server ◆MQTT Client
address	Designated as Client When connected far away End server address	◆Support domain name resolution ◆TCP Sever Mode is not selectable
port	Port used to establish the connection	Client In mode, it is the port of the destination server Server In mode, the current socket Port cloud forwarding: the necessary
Registration package	Establish TCP After connecting, to the service The device sends the specified data to facilitate the service Mark the current socket data SOURCE	registration package to connect to the "Zongkong Cloud Platform" Customization: Customize the contents of the registration package and support the longest 200 byte DEVID: Unique device number Disable: Turn off the registration package function
Triggering conditions	Trigger condition for sending registration package	Connection sending: establishment TCP Send the specified registration package immediately after connection. Data carrying: temporarily unavailable
content	Register package content	Customize the contents of the registration package, only "Custom" mode is available
Heartbeat package	Used to maintain TCP Long connection	Enable/disable TCP Client TCP Server Mode takes effect
cycle	Heartbeat packet cycle	0~65535 s
content	Heartbeat packet content	Support custom, the longest 40 byte

◆ZHC1931 socket1 support MQTT

Socket1
获取

状态: 启用

模式: MQTT-Client

地址: dev.iotrout.com

端口: 55000

ClientID: clientid-XOyVRm2TWo

username:

password:

订阅Topic1: /public/TEST/1

订阅Topic2: /public/TEST/2

发布Topic1: /public/TEST/3

发布Topic2: /public/TEST/4

keepAlive:

cleanSession:

提交

project	Attributes	parameter
ClientID	equipment ID	Support the longest 60 byte
username	username	Support the longest 60 byte
password	password	Support the longest 60 byte
subscription Topic1	subscription Topic1	Temporary support 1 indivual Topic
subscription Topic2	subscription Topic2	
release Topic1	release Topic1	Responding to the request topic
release Topic2	release Topic2	Unsolicited topic
keepAlive	MQTT Heartbeat cycle	0~65535s
cleanSession	Clean up session flags	Only supports "Clear Session"

2.2.3.Wiring

Set up ZHC1931 After setting the parameters, use an Ethernet cable to connect the network port of the network device (router/switch/other) to the ZHC1931 Connected to the network port, observe after powering on the device WORK The indicator light should be 3s Blinking, it indicates that the network hardware environment of the device is normal, and Ethernet data interaction can be carried out.



2.3 Serial port RS485

2.3.1. Basic parameters

基础参数

主从模式: 主机

波特率: 115200

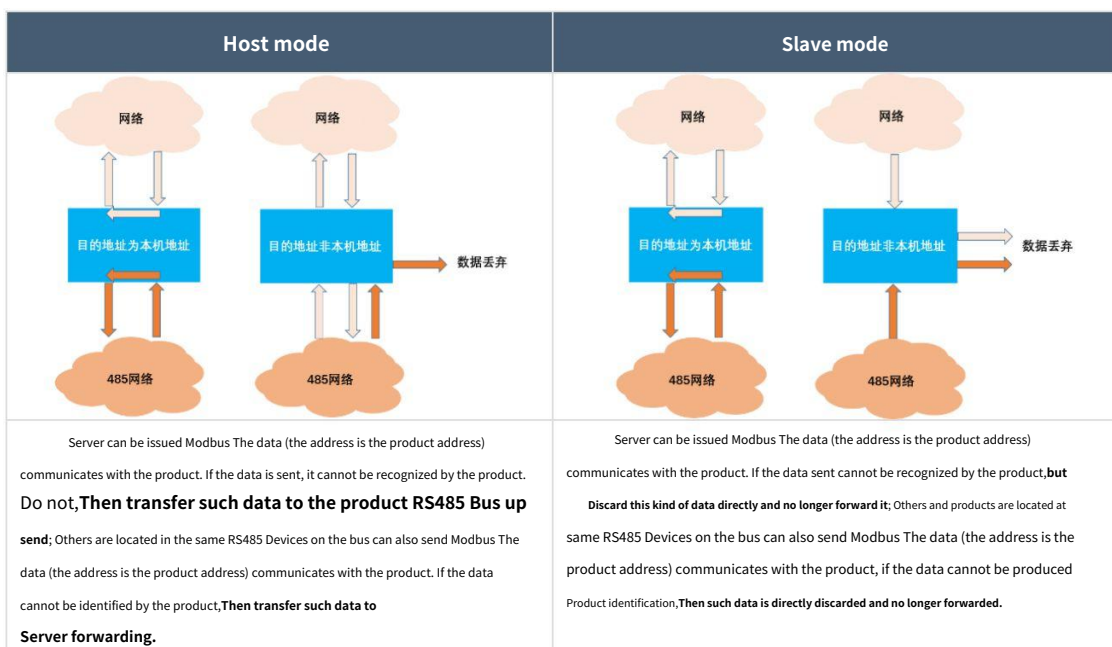
停止位: 1

数据位: 8

校验位: 无

提交

project	Attributes	parameter
Master-slave mode	RS485 Role in communication	Master/slave
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



2.3.2. Special feature

ZHC1931 Support the serial port to send heartbeat regularly.

基础参数

获取

串口心跳001周期: 0 长度: 0 内容(HEX):

串口心跳002周期: 0 长度: 0 内容(HEX):

串口心跳003周期: 0 长度: 0 内容(HEX):

串口心跳004周期: 0 长度: 0 内容(HEX):

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 0x55 of 4 Analog input 55 04 00 00 00 04 FC 1D

Serial port heartbeat application example:

基础参数
获取

串口心跳001周期:	<input type="text" value="10"/>	长度:	<input type="text" value="8"/>	内容(HEX):	<input type="text" value="55 04 02 10 00 02 7C 62"/>
串口心跳002周期:	<input type="text" value="10"/>	长度:	<input type="text" value="8"/>	内容(HEX):	<input type="text" value="55 02 00 00 00 06 F5 DC"/>
串口心跳003周期:	<input type="text" value="10"/>	长度:	<input type="text" value="8"/>	内容(HEX):	<input type="text" value="55 04 00 00 00 04 FC 1D"/>
串口心跳004周期:	<input type="text" value="0"/>	长度:	<input type="text" value="0"/>	内容(HEX):	<input type="text"/>

提交



2.4.DO

2.4.1.Read and write status

Via network, serial port ZHC1931 send Modbus Instruction, can read and write DO state.

project	parameter
Register address range	00001(0x0000)
Support function code	01,05,0F

To read 1 Take the relay output status as an example:

Inquire:55 01 00 00 00 01 F0 1E

Query response:55 01 01 01 80 78

NS 1 Relay control 05 function code:

Control closure:55 05 00 00 FF 00 8D EB

response:55 05 00 00 FF 00 8D EB

Control disconnect:55 05 00 00 00 00 CC 1B

response:55 05 00 00 00 00 CC 1B

2.4.2.Special feature

ZHC1931 DO Support active reporting, restart to keep relay status, output hold time, etc.



project	Attributes	parameter
Proactively report	DO Report all immediately after status changes DO Whether the status value	Enable/disable
Restart state	is maintained after the device is powered on DO Output state	Enable/disable
Output hold time	DO Reverse after the new state remains for a specified time	0,1000~65535ms

2.5.DI

2.5.1.Read status

Via network, serial port ZHC1931 send Modbus Instruction, can be read DI state.

project	parameter
Register address range	10001~10002(0x0000~0x0001)
function code	02

Detection level:The default state is 0, After the input signal, the state is 1, The detection method is,Modbus Agreement 02 function code.

In the first place I Take road detection as an example:

Inquire:55 02 00 00 00 01 B4 1E

Query response: (detected 0):55 02 01 00 B1 B8

Query response: (detected 1):55 02 01 01 70 78

2.5.2.Special feature

ZHC1931 DI Support active reporting, periodic reporting, etc.



project	Attributes	parameter
Proactively report	Whether to open DI Status report	Enable/disable
circulation time	DI Period of reporting status when there is no change in status	0~65535 s

DI Proactive report description:

If nothing after power-on DI State changes, press 60s(0x003C) Circular reporting, if there is one way DI If the status changes, all statuses will be reported immediately and the cycle time will be reset.

2.6.AI

2.6.1.Read status

Calculation formula:

Current value = return value / 1000 **unit:mA**

Via network, serial port ZHC1931 send Modbus Instruction, can be read AI value.

project	parameter
Register address range	30001(0x0000)
function code	04

In the first place 1 Take circuit current detection as an example:

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

Query response:55 04 02 10 00 82 0C

The return data is 0x1000,Express 4096uA,which is 4.096mA

2.6.2.Special feature



project	Attributes	parameter
Proactively report	Whether to open AI Status report	Enable/disable
circulation time	AI Period of reporting status when there is no change in status	0~65535 s
Escalation mode	AI Trigger mode for reporting status changes	Inside/Outside/Prohibited
Lower limit of interval	The lower limit of the interval that triggers the report	4000~20000 uA
Upper bound	The lower limit of the interval that triggers the report	4000~20000 uA

AI Proactive report description:

Disable report mode: report all the AI value. Report within the interval: setAI When the channel value enters the interval from outside the interval, it will be reported to all AI Channel value, and reset the cycle time.

Report outside the interval: set AI When the channel value enters the interval from inside the interval, it will be reported to all AI Channel value, and reset the cycle time.

2.7.logic

2.7.1.Local logic

ZHC1931 Support settings 8 Article local logic.



project	Attributes	parameter
Triggering conditions	Logic trigger condition	Forward follow: DI Closed DO closure Follow in reverse: DI Closed DO disconnect,DI Disconnect DO closure greater or equal to:AI Trigger when the input is greater than or equal to the set value DO Output Less than or equal to:AI Trigger when the input is less than or equal to the set value DO Output AO follow AI: AO Output value = AI Input value disabled: Turn off local logic
enter	Trigger logic input conditions	Can be specified by DI X,AI X trigger
AI Threshold	AI Trigger logic after reaching a certain value (Greater than or equal, 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	Can be specified DO X,AO X Output
DO value	Specify DO Channel output value	normally open, normally closed, flip

2.7.2. Inter-device logic

ZHC1931 Support settings 8 Inter-device logic.

设备间逻辑

基础参数

获取

-1-

触发条件: 禁用

远端地址: 1

输入: DI1/AI1

AI阈值: 0

输出类型: DO输出

输出: DO1

DO值: 常开

AO值: 0

-2-

触发条件: 禁用

远端地址: 1

输入: DI1/AI1

AI阈值: 0

输出类型: DO输出

输出: DO1

DO值: 常开

AO值: 0

-3-

触发条件: 禁用

远端地址: 1

输入: DI1/AI1

AI阈值: 0

输出类型: DO输出

输出: DO1

DO值: 常开

AO值: 0

-4-

触发条件: 禁用

远端地址: 1

输入: DI1/AI1

AI阈值: 0

输出类型: DO输出

输出: DO1

DO值: 常开

AO值: 0

-5-

触发条件: 禁用

远端地址: 1

输入: DI1/AI1

AI阈值: 0

输出类型: DO输出

输出: DO1

DO值: 常开

AO值: 0

project	Attributes	parameter
Triggering conditions	Logic trigger condition	Forward follow: DI Closed DO closure Follow in reverse: DI Closed DO disconnect,DI Disconnect DO closure greater or equal to:AI Trigger when the input is greater than or equal to the set value DO Output Less than or equal to:AI Trigger when the input is less than or equal to the set value DO Output AO follow AI: AO Output value = AI Input value disabled: Turn off local logic
Remote address	This logic will receive the specified address code Trigger when the data packet	01~FE
enter	Trigger logic input conditions	Can be specified by DI X,AI X trigger
AI Threshold	AI Trigger logic after reaching a certain value (Greater than or equal, 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	Can be specified DO X ,AO X Output normally
DO value	Specify DO Channel output value	open, normally closed, flip

2.8.system message

系统信息

基础参数

修改

modbus 地址码: 55		组网模式: 禁用
DEVID: 1921290521008062		组ID: <input type="text"/>
密码: 123456		组密码: <input type="text"/>
上报模式: 网络 modbus-TCP 上报		组类型: TYPE A

project	Attributes	parameter
Modbus address code	Modbus address code	01~FE
DEVID	Factory unique number of the device	Read only
password	Password used to access the Zongkong cloud platform	support 16 byte
Escalation mode	Format and channel of actively reported data	The internet modbus RTU Report network modbus TCP Report to the serial port modbus RTU Report to the serial port modbus TCP Report serial port + network modbus RTU Report serial port + network modbus TCP Report enable/disable
Networking mode	Use the networking mode when accessing the transparent transmission of the vertical and horizontal cloud	
Group ID Group password	Group ID Devices with the same group password can establish a networking mode	support 16 byte
Group type	In the same group, different types of equipment can exchange data	A/B

2.9. Status Indicator

name	Function	state	State description
POW	Power Indicator	Chang Liang	System start
		Always off	The system does not start
WORK	System working status indicator	Always off	network anomaly(IP Failed to obtain)
		2000ms Off/300ms	Network cable abnormal
		Bright/300msOff/300msBright	
		100ms Bright 100ms Extinguish	Domain name resolution
SEND	Network data sending indicator	Chang Liang	default
		Always off	Module not started
		200ms Extinguish	Send network data
RECV	Network data receiving indicator	Chang Liang	default
		Always off	Module not started
		200ms Extinguish	Receive network data

2.10.reset

By operation RESET Press the button to restore the equipment to the field settings.

Steps:

Step 1: Power on the device.

Step 2: Hold RESET Key until the device indicators are all off, immediately release the reset button, the device resumes

The factory reset was successful.

If it is found that the serial port of the device starts to send actively after resetting **JSON** The data packet 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.

2.11. Firmware upgrade

For the firmware upgrade process, please refer to "ZHC1931 Instructions for use of the host computer"

3.Applications

3.1.Transparent Cloud

Operation process (with socket1 For example):

1,set up socket1 parameter

Socket1 获取

状态: 启用 ▼

模式: TCP-Client ▼

地址: dev.iotrouter.com

端口: 55000

注册包: 自定义 ▼

触发条件: 连接发送 ▼

内容: 4921910260003972

心跳包: 启用 ▼

周期: 30

内容: ping

提交

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

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 the customer can follow Modbus Protocol to operate the equipment, equipment self-adaptation Modbus RTU/TCP protocol.

3.2. Local monitoring

Operation process (with socket2 For example):

1, set up socket2 parameter

Socket2 获取

状态: 启用

模式: TCP-Server

地址:

端口: 56000

注册包:

触发条件:

内容:

心跳包: 启用

周期: 30

内容: ping

提交

2, Client device operation

Customers can be based on Modbus Protocol to operate the equipment, equipment self-adaptation Modbus RTU/TCP protocol.

3.3. MQTT

refer to "IOTRouter_Modbus_On_MQTT_Application Guidance"

3.4. Cross-cloud transparent transmission

refer to "ZHC1931 How to use Zongyun transparent transmission"

3.5. Aspect cloud platform

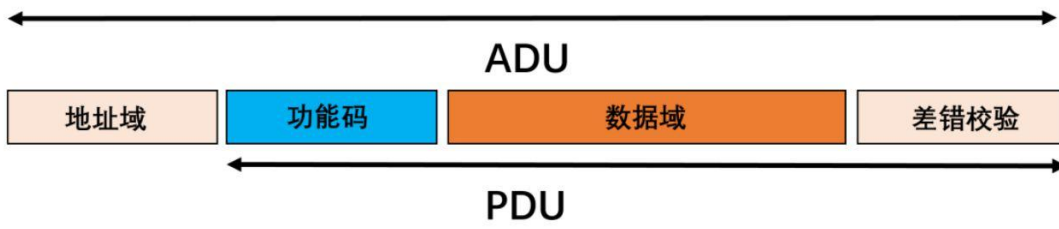
refer to "ZHC1931 Instructions for use of the cloud platform"

4.ModbusCommand frame

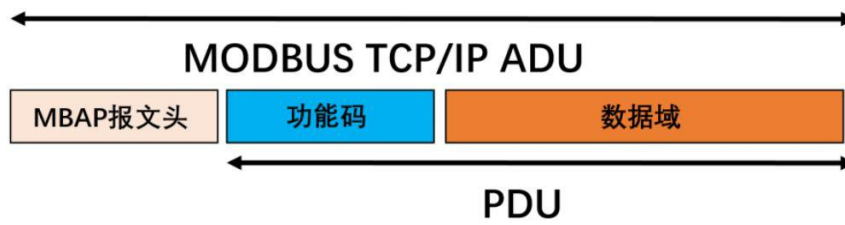
4.1 ModbusCommand frame

ZHC1931 The data format follows the general Modbus Frame format, device can parse Modbus RTU/TCP Agreement and implementation Line related operations.

Modbus RTU:



Modbus TCP:



4.2 Register allocation

For register address allocation, please refer to "ZHC1931 Register address table "

5.Update history

6.Contact information

Company: Chengdu Zongheng Intelligent Control Technology Co., Ltd.

Address: Yizhou Avenue, High-tech Zone, Chengdu City, Sichuan Province 888 Gotham 19 building

URL:www.iotrout.com

telephone:028-83268936