深圳市艾尔赛科技有限公司
Shenzhen LC Technology Co., Ltd.

Alssay single-way Modbus relay module

LC-Modbus -1R-D7

Mod bus R TU single circuit relay module RS485 / TTL UART 1 circuit input 1 circuit output

Shenzhen Elsay Technology Co., Ltd

2019-07

一、 summary

The Alsay single-circuit Modbus relay module is equipped with a mature and stable 8-bit MCU and RS485-level communication chip.Using the RS485 communication protocol of standard MODBUS RTU format, 1 optical coupled input signal detection, 1 relay output, which can be used for digital quantity detection or power control situations.

二、 functional characteristics

1，Mature and stable 8bit MCU and MAX485 level conversion chip on board;

2. Communication protocol: support for standard Modbus RTU protocol;

3. Communication interface: support RS485 / TTL UART interface;

4. Communication wave rate: 4800 / 9600 / 19200, default 9600bps, support power saving;

5. Photocoupled input signal range: DC3.3-30V (this input is not available for relay

control);

6. Output signal: relay switch signal, support manual, flash closed and flash mode, flash / flash delay base is 0.1S, maximum flash / flash time is 0xFFFF*0.1S=65535*0.1S=6553.5S;

7，Equipment address: range 1-255, default 255, support power saving;

8. Wave rate, optical coupling input state, relay status and equipment address can be read using software / instructions;

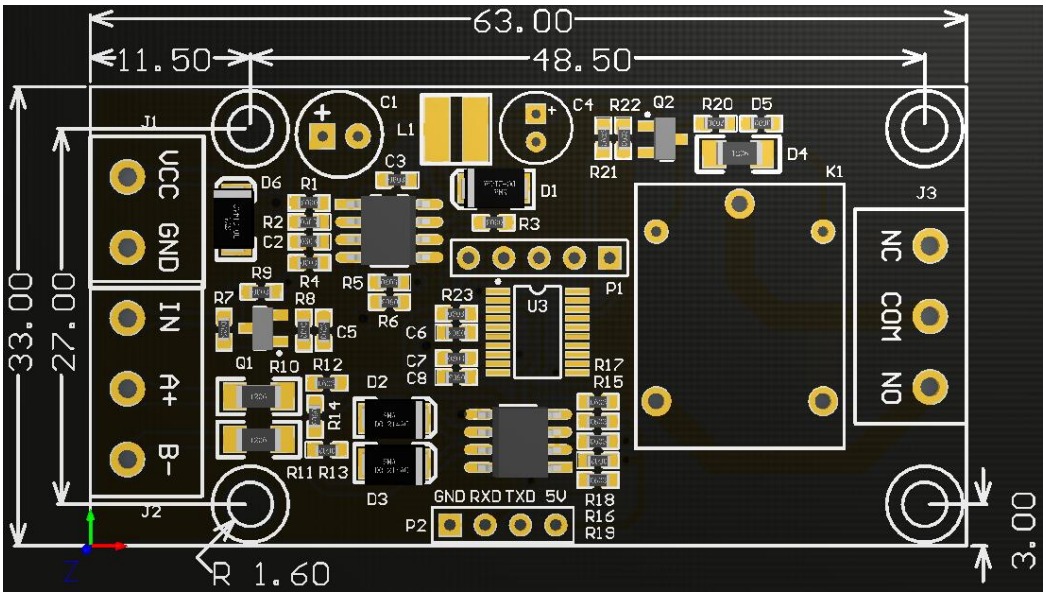
9, Onboard 15V, 10A / 250V AC 10A / 30V DC relay, can continuously absorb 100,000 times, with diode diarrhea protection, short response time;

10, onboard relay switch indicator;

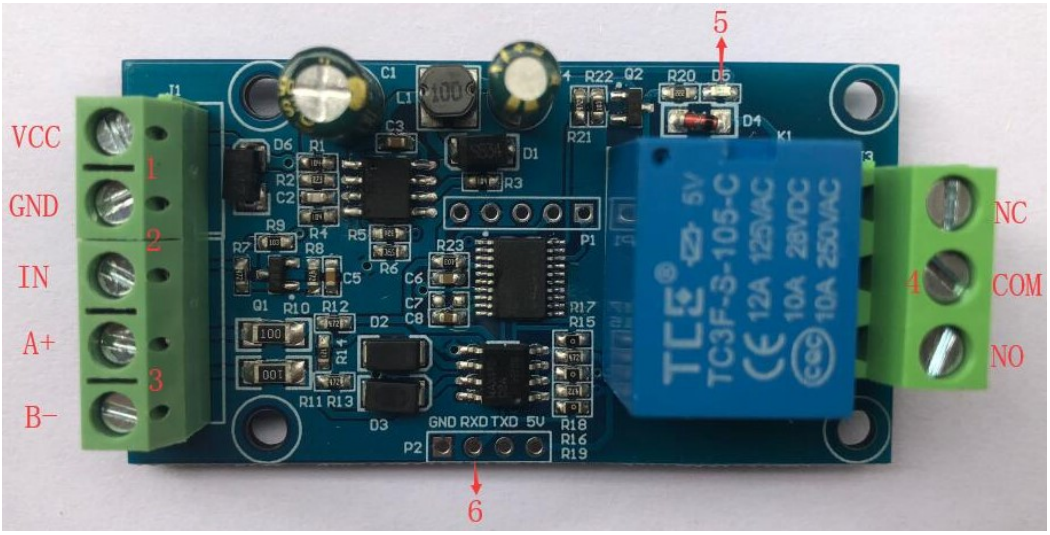
11. Power supply voltage: DC7-24V, with input anti-reverse connection protection;

Three, hardware introduction and description

1. Board size



2，Interface introduction



1，VCC, GND: DC7-24V power supply input;
2，IN, GND: DC3.3-30V optical coupling signal input;
3，A +, B-: RS485 communication interface, A +, B-respectively connected to A +, B-of the external control terminal;

4. Relay switch signal output:

NC: often closed end, relay short connection with COM before absorption, suspended after suction;

COM: common port;

NO: Usually beginning, the relay is suspended before suction, and is short connected with COM after suction.

5. Relay indicator lamp: light up when the relay is engaged;

6, GND, RXD, TXD: TTL level UART communication interface, GND, RXD, TXD are respectively connected to the external control end, GND, TXD, RXD;

3，Modbus RTU instruction introduction

The Modbus device performs related operations by receiving Modbus RTU instructions from the external control terminal (e. g., upper computer / MCU). A frame instruction is generally composed of device address, function code, register address, register data and check code, and the frame length is related to function code.Generally, the first byte of each frame data is the device address, with the range of 1-255, the default of 255 (0xFF), and the last 2 bytes are the CRC check code.

Assuming the equipment address is 255, the common Modbus RTU instructions are as follows:

1，Open Relay # 1 (Manual mode)

Send to: FF 05 00 00 FF 00 99 E4

As-is return: FF 05 00 00 FF 00 99 E4

Note: (1) the 3- -4 bytes of the sending frame represent the relay address, the relay 1- -relay 8 address is 0x0000,0x0001,0x0002,0x0003,0x0004,0x0005,0x0006,0x0007, respectively

（2）The 5-6 bytes of the send frame represent the data, 0xFF00 the on relay and 0x0000 the off relay

2，Turn off relay # 1 (manual mode)

Send to: FF 05 00 00 00 00 D8 14

As-is return: FF 05 00 00 00 00 D8 14

3，Turn on all of the relays

Send to: FF 0F 00 00 00 08 01 FF 30 1D

Return: FF 0F 00 00 00 08 41 D3

4，Turn off all of the relays

Send to: FF 0F 00 00 00 08 01 00 70 5D

Return: FF 0F 00 00 00 08 41 D3

5，Set the device address to 1

Send: 00 10 00 00 00 01 02 00 01 6A 00

Original return: 00 10 00 00 00 01 02 00 01 6A 00

Note: The ninth byte 0x01 of the send frame is the written device address

6，Set the device address to 255

Sent: 00 10 00 00 00 01 02 00 FF EB 80

Original return: 00 10 00 00 00 01 02 00 FF EB 80

Note: The 9th byte 0xFF of the send frame is the written device address

7. Read the device address

Sent: 00 03 00 00 00 01 85 DB

Return: 00 03 02 00 FF C5 C4

Note: The fifth byte 0xFF of the returned frame is the read device address

8. Read out the relay status

Send to: FF 01 00 00 00 08 28 12

Return: FF 01 01 01 A1 A0

Note: The Bit0- -Bit7 of the fourth byte 0x01 of the return frame represents the relay 1- -the relay 8,0 is closed and 1 is open

9. Read the photocoupled input state

Send to: FF 02 00 00 00 08 6C 12

Return: FF 02 01 01 51 A0

Note: IN1-IN8 of 0x01 on byte 4 represents optical coupling 1- -optical coupling 8 input signal, 0 represents low level and 1 represents high level

10, Set the baud rate to 4,800

Send to: FF 10 03 E9 00 01 02 00 02 4A 0C

Return: FF 10 03 E9 00 01 C5 A7

Note: The 9th byte of the sent frame is the baud rate setting value, 0x02,0x03, and x04 represent 4800,9600,19200, respectively

11, Set the baud rate to 9,600

Send to: FF 10 03 E9 00 01 02 00 03 8B CC

Return: FF 10 03 E9 00 01 C5 A7

12, Set the baud rate to 19,200

Send to: FF 10 03 E9 00 01 02 00 04 CA 0E

Return: FF 10 03 E9 00 01 C5 A7

13, Read the Porter rate

Send to: FF 03 03 E8 00 01 11 A4

Return: FF 03 02 00 04 90 53

Note: The fifth byte of the return frame represents the port rate read, 0x02,0x03, x04 represents 4800,9600,19200, respectively

14, Open relay # 1 (flash closed mode 2S)

Send to: FF 10 00 03 00 02 04 00 04 00 14 C5 9F

Return: FF 10 00 03 00 02 A4 16

Note: (1) The 3- -4 bytes of the sending frame represent the relay address, relay 1- -relay 8 is 0x0003,0x0008,0x000D, 00x0012,0x0017,0x001C, 0x0021,0x0026 respectively

（2）The 10th-11th byte of the sending frame represents the delay setting value. The delay base is 0.1S, so the delay time is 0x0014*0.1=20*0.1S=2S, and the delay is automatically closed after the relay opens 2S

15. Turn off relay # 1 (flash break mode 3S)

Send to: FF 10 00 03 00 02 04 00 02 00 1E A5 99

Return: FF 10 00 03 00 02 A4 16

Note: (1) The 3- -4 bytes of the sending frame represent the relay address, relay 1- -relay 8 is 0x0003,0x0008,0x000D, 00x0012,0x0017,0x001C, 0x0021,0x0026 respectively

(2) The 10-11 bytes of the sending frame represent the delay setting value. The delay base is 0.1S, so the delay time is 0x001E*0.1=30*0.1S=3S, and the relay is automatically opened after turning off 3S

4，Simple use instructions

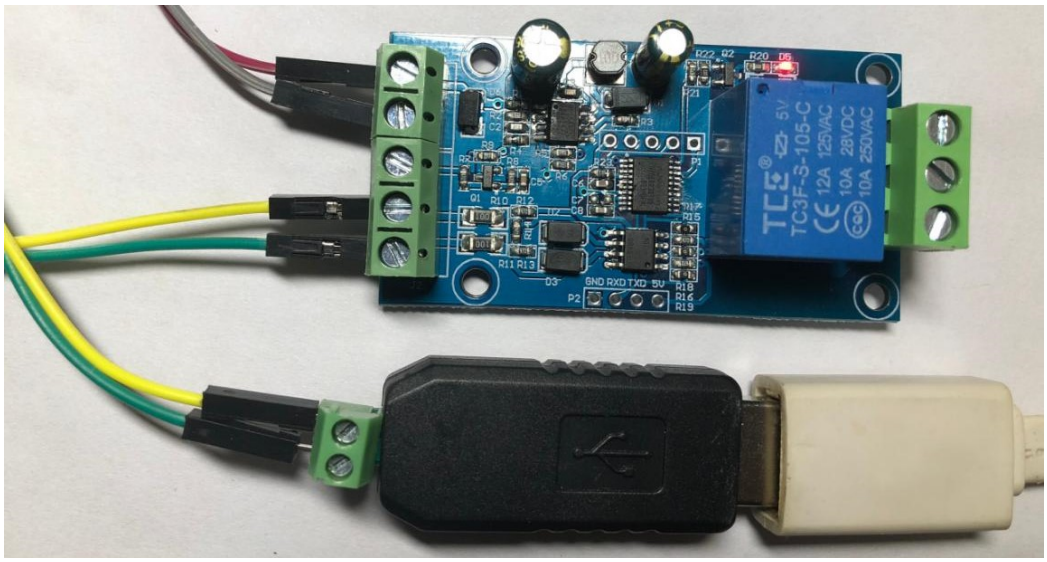
The Modbus relay module may receive Modbus RTU instructions from the upper computer / MCU via the RS485 / TTL UART interface to perform related operations.Using the RS485 interface, assuming the device address is 255 and the port rate is 9600, the steps are as follows:

1. VCC and GND are connected to positive and negative power supply;

2, A +, B-A + and B-respectively at the output of USB to RS485 module;

3. Open the upper computer software "ModbusRTU Configuration Tool", select the correct port number, the port rate to select 9600, the address is set to 255, click "Open serial port";

4. Click "JD1 Open" again to turn on relay 1, and the indicator light of relay 1 lights on.as illustrated in following figure:


TC3F-S-105-C
12A 125VAC
10A 28VDC
10A 250VAC
GND RXD TXD 5V


ModbusRTU 配置工具
串口设定
串口
COM9
波特率
9600
设备型号
DAM1012-A
地址
255
打开串口
设置地址
打开全部
JD1-JD8开
开始地址
1
至
10
JD1-JD8开
关闭串口
读取地址
关闭全部
JD1-JD8关
调试信息
清空
JD1-JD8开
继电器
JD1关
JD2开
JD3开
JD4开
JD5开
JD6开
JD7开
JD8开
光耦
调试信息
串口打开成功22:24:22
发送FF 05 00 00 FF 00 99 E4
22:24:24
返回FF 05 00 00 FF 00 99 E4
22:24:24
成功! 22:24:24
FF 05 00 00 FF 00 99 E4
直接发送
FF 05 00 00 FF 00 99 E4
微嵌智能www.micro-embsys.com 微嵌电子淘宝店 168开发板论坛
0
唐氏集团荣誉出口
ModbusRTU 配置工具V20170706.1.00

5，How to generate a check code

When the Modbus RTU command is sent through off-made software (such as ModbusRTU configuration tool), CRC check code is automatically generated. If you want to use serial debugging software (such as SSCOM) to test Modbus relay module, CRC check code needs to be manually generated at the end of the sending frame, such as opening the route 1 relay (manual mode):

1. The sending frame composition of the on / off relay (manual mode) is:

Device Address (1Byte) + Function code (1Byte) + Register address (2Byte) + Register data (2Byte) + CRC check code (2Byte)

2, Assuming the device address is 0xFF, the first 6 bytes of the send frame are:

FF 05 00 00 FF 00

3. Use the CRC calibration tool to check the 6 bytes: http: / / www.ip33.com/crc.html

4，The high and low byte position of the verification calculation result E499 obtains the CRC check code 99E4, and the complete transmission frame: FF 05 00 00 FF 00 99 E4

5. Send the transmission frame to the Modbus relay module through the serial port debugging software SSCOM V5.13.1 to open the first circuit relay (manual mode), as follows:

For more Modbus RTU instructions and using the upper machine to control the Modbus relay, please refer to our information, thank you!

Shenzhen LC Technology Co., Ltd.

Room 1803-1804, Block C, Hongdu Square, No.3008, Yitian Road, Futian District, Shenzhen City, Guangdong Province
Address: Room 1803-1804, Block C, Huangdu Plaza, No.3008 Yitian Road, Futian District, Shenzhen,Guangdong,China,518000

Website / Web: www.lctech-inc.com /www.chinalctech.com