

MODEL: UT-5510A
Digital 4-channel opto-electronic isolation input,
4-channel relay output I/O controller
User manual

Version	Date	Remark
V1.0	2016-9-22	

I. Overview

The UT-5510A opto-electronic isolation data parallel I/O controller is an 8-bit, 4-channel data input and 8-bit, 4-channel data output, with each data input or output channel resembling several computer interfaces. The module can be remotely controlled by a series of commands via Modbus-RTU protocol, and the module communicate with the host by command data via RS-485 serial bus. The communication baud rate is software-configurable and the maximum transmission rate is up to 115200bps.

II. Product introduction

2.1. Appearance



Product Appearance

2.2. Interface

Interface Name	Description	Interface Name	Description
GND	GND	NO1	NO1
VCC	Power input	NC1	NC1
DATA+	RS485 A	COM1	COM1
DATA-	RS485 B	NO2	NO2
RESET	Reset	NC2	NC2
IN.COM	Voltage input common port	COM2	COM2
IN0	Voltage input 1	NO3	NO3
IN1	Voltage input 2	COM3	COM3
IN2	Voltage input 3	NO4	NO4
IN3	Voltage input4	COM4	COM4

2.3. Technical parameters

- ◆ Output channel: 4 port
- ◆ Input channel: 4 port
- ◆ Communication protocol: Modbus-RTU
- ◆ Baud rate: 1200/2400/4800/9600/19200/38400/57600/115200bps
- ◆ Data format: 1,8,N,1
- ◆ Address range: 1~247
- ◆ Communication interface: RS485
- ◆ Power supply voltage: +9 ~ +30V DC
- ◆ Operating current: 300mA@9V max
- ◆ Opto-electronic isolation voltage input: 0 ~ 24V
- ◆ Max. contact capacity: 62.5 VA, 60 W
- ◆ Isolated voltage: 2500V DC
- ◆ Operating temperature: -40°C ~ +85°C
- ◆ Storage temperature: -40°C ~ +85°C
- ◆ Relative Humidity: 5% ~ 95%RH, non-condensation

III. Description of protocols and instructions

3.1. MODBUS Protocol Description

Modbus is a set of communication protocols developed by MODICON Corporation in 1979. It is a standardized, open architecture based, and widely used communication protocol in industrial automation plants. The product supports the standard MODBUS-RTU command format. For a detailed description of MODBUS-RTU, please refer to 《MODBUS Protocol in Detail》.

3.2. Reading input/output status

Send instructions:

Description	Nnumber of bytes	Data value description
Device address	1	0x01~0xF7
Function code	1	0x02: Read input status 0x03: Read output status
Start address	2	0x0000
Number of bytes to read	2	0x0004
CRC Checking code	2	Little endian

Note : CRC checksum generates polynomial 0xA001(1010 0000 0000 0001)

Response:

Description	Number of bytes	Data value description
Device address	1	0x01 ~ 0xF7
Function code	1	0x02/0x03
Byte count	1	1
Input status	1	Input/output status (note 1)
CRC Checking code	2	Little endian

Note 1:

Output status byte bit value:

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Reserve	Reserve	Reserve	Reserve	IN3	IN2	IN1	IN0

For example:

Bit0 is 0, which means IN0 is disconnected; Bit0 is 1, which means IN0 is connected.

Output status byte bit value:

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Reserve	Reserve	Reserve	Reserve	ON3	ON2	ON1	ON0

For example:

Bit0 is 0, which means ON0 relay is open, Bit0 is 1, which means ON0 relay is closed

3.3. Control output

(1) Single channel output

Send instructions:

Description	Number of bytes	Data value description
Device address	1	0x01~0xF7
Function code	1	0x05
Relay output channel	2	0x0000:NO1 0x0001:NO2 0x0002:NO3 0x0003:NO4
Setting Status	2	0x0000:Relay open 0xFF00:Relay closed
CRC Checking code	2	Little endian

Response:

Description	Number of bytes	Data value description
Device address	1	0x01 ~ 0xF7
Function code	1	0x05
Channel	1	0x0000~0x0003
Setting Status	1	0x0000/0xFF00
CRC Checking code	2	Little endian

(2) Multi-channel synchronous output

Send instructions:

Description	number of bytes	Data value description
Device address	1	0x01~0xF7
Function code	1	0x0F
Start channel	2	0x0000
Number of channels	2	0x0004
Data length	1	0x01
Output content	1	0x00~0x0F(note 2)
CRC Checking code	2	Little endian

Response:

Description	number of bytes	Data value description
Device address	1	0x01~0xF7
Function code	1	0x0F
Start channel	2	0x0000
Number of channels	2	0x0004
CRC Checking code	2	Little endian

Note 2: Output status byte bit value:

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Reserve	Reserve	Reserve	Reserve	ON3	ON2	ON1	ON0

For example:

Bit0 of 0 indicates that the ON0 relay is open and Bit0 of 1 indicates that the ON0 relay is closed.

3.4. Set device address

Send instructions:

Description	number of bytes	Data value description
Current address of the device	1	0x01~0xF7
Function code	1	0x06
Register address	2	0x1388
New address of the device	2	0x0001~0x00F7
CRC Checking code	2	Little endian

Response:

Description	number of bytes	Data value description
Current address of the device	1	0x01~0xF7
Function code	1	0x06
Register address	2	0x1388
New address of the device	2	0x0001~0x00F7
CRC Checking code	2	Little endian

3.5. Set baud rate

Send instructions:

Description	number of bytes	Data value description
Current address of the device	1	0x01~0xF7
Function code	1	0x06
Register address	2	0x1389
Number of register	2	0x0001
CRC Checking code	2	Little endian

Response:

Description	number of bytes	Data value description
Current address of the device	1	0x01~0xF7
Function code	1	0x06
Register address	2	0x1389
Number of register	2	0x0001
CRC Checking code	2	Little endian

IV. Baud rate setting code table

4.1 Factory default status

Description	Default state
Device address	0x01
Baud rate	9600bps
ON1	Open
ON2	Open
ON3	Open
ON4	Open
NC1	Close
NC2	Close

4.2 Restore factory default status

Connect the RESET terminal to the GND terminal and re-power the device to restore it to the factory default state.