

## 8-ch DI Switch Signal to RS485/232 Converters (WJ62 Series)

### Features:

- >> Eight channels switch signal acquisition, isolated RS-485/232 output
- >> Each input channel adopts optical isolation
- >> Can read level status of each channel via the RS-485/232 interface
- >> Input/output: 3000VDC isolation
- >> Wide power supply range: 8 ~ 32VDC
- >> High reliability, easy programming, easy application
- >> DIN35 Rail-mounted
- >> Can programme setting module address, baud rate
- >> Support **Modbus RTU** communication protocol
- >> Dimensions: 120 mm x 70 mm x 43mm

### Applications:

- >> level signal measurement, monitoring and control
- >> RS-485 remote I / O, data acquisition
- >> Intelligent building control, security engineering applications
- >> RS-232/485 bus in industrial automation control system
- >> Industrial signal isolation and long-term transmission
- >> Equipment operation monitoring
- >> Sensor signal measurement
- >> Industrial data acquisition and recording
- >> Medical, industrial product development
- >> Switching signal acquisition

### Product Overview:

WAYJUN WJ62 series products realize the signal acquisition between sensor and host, to measure the switching signal. WJ62 series can be used in RS-232/485 bus industrial automation control system, switching signal measurement, monitoring and control, high and low level signal measurement, industrial field signal isolation and long-term industrial transmission and so on.

Products include power supply isolation, signal isolation, linearization, A/D conversion and RS-485 serial communication. Each serial interface can connect up to 255 pieces WJ62 Series modules, communication using **ASCII** code or **MODBUS RTU** communication protocol, and its instruction set compatible with the **ADAM** modules, baud rate can be set by the code, with other manufacturers control module hang in the same RS-485 bus for easy programming.



Figure 1 WJ62

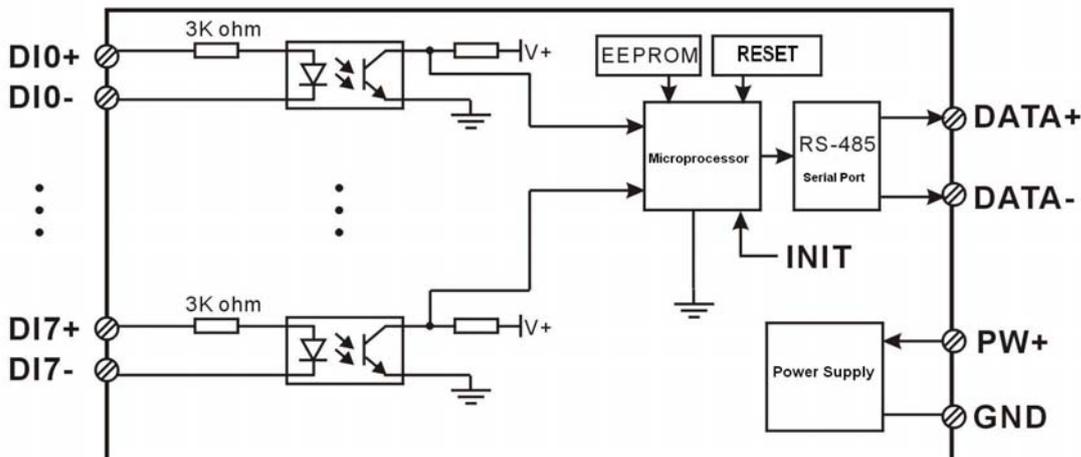


Figure 2: WJ62 Block Diagram

WJ62 series products are based on SCM's intelligent monitoring and control system, users set the calibration value, address, baud rate, data format, checksum status, and configuration information are all stored in nonvolatile memory **EEPROM**.

WJ62 products are according to industry standard design, isolation between signal input / output, can withstand voltage 3000VDC, high anti-interference ability and reliability. Operating temperature range is **- 45 ~ +85 °C**.

**Function Description:**

WJ62 Switch signal isolation acquisition module can be used to measure eight channels switching signal.

1. Switch signal input

eight channels switching signal. Not only each channel isolation, but also input/output isolation.

2. Communication protocol

Communication Interface: one channel standard RS-485 communication interface, or one standard RS-232 communication interface, specify when ordering.

Communication Protocols: supports two protocols, characters protocol of the command set defined and MODBUS RTU communication protocol. Can be programmed using the kind of communication protocol, can be achieved with PLC, RTU of many Brands or computer monitoring system for network communication.

Data Format: 10 Bits. 1 start bit, 8 data bits, 1 stop bit.

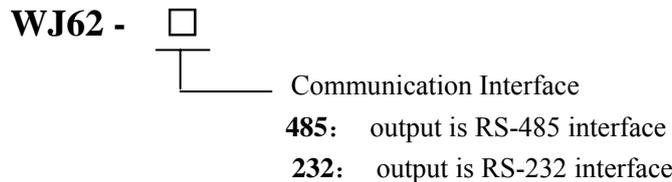
Address: (0 to 255) and baud rate (2400, 4800, 9600, 19200, 38400 bps) can be set, the most long-distance about communication networks is up to 1200 meters, through the twisted-pair shielded cable.

Communication interface of high anti-jamming design, ± 15KV ESD protection, communication response time is less than 100mS.

3. Anti-jamming

According to need to set the checksum. Module internal has transient suppression diodes, can inhibit a variety of surge pulse, protection module, and internal digital filter can also be well suppressed from the grid frequency interference.

**Product Selection:**



Sample 1: part No.: **WJ62-232** means output is RS-232 interface

Sample 2: part No.: **WJ62-485** means output is RS-485 interface

**WJ62 General parameters:**

(typical @ +25 °C, Vs is 24VDC)

Input type: switching input

Low level: input <1V

High level: input 4-30V

Input Resistance: 3KΩ

Communication: RS-485 protocol or RS-232 standard characters protocols and MODBUS RTU communication protocol

Baud Rate (2400, 4800, 9600, 19200, 38400 bps) can be selected via software

Address (0 to 255) can be selected via software

Communication Response Time: 100 ms maximum

Power Supply: +8 ~ 32VDC wide range power supply, internal anti-reverse and over-voltage protection circuit

Power Loss: less than 0.5W

Operating Temperature: - 45 ~ +85°C

Humidity: 10 ~ 90% (no condensation)

Storage Temperature: - 45 ~ +85°C

Storage Humidity: 10 ~ 95% (no condensation)

Isolation Voltage: input / output: 3KVDC, 1 minute, leak current: 1mA

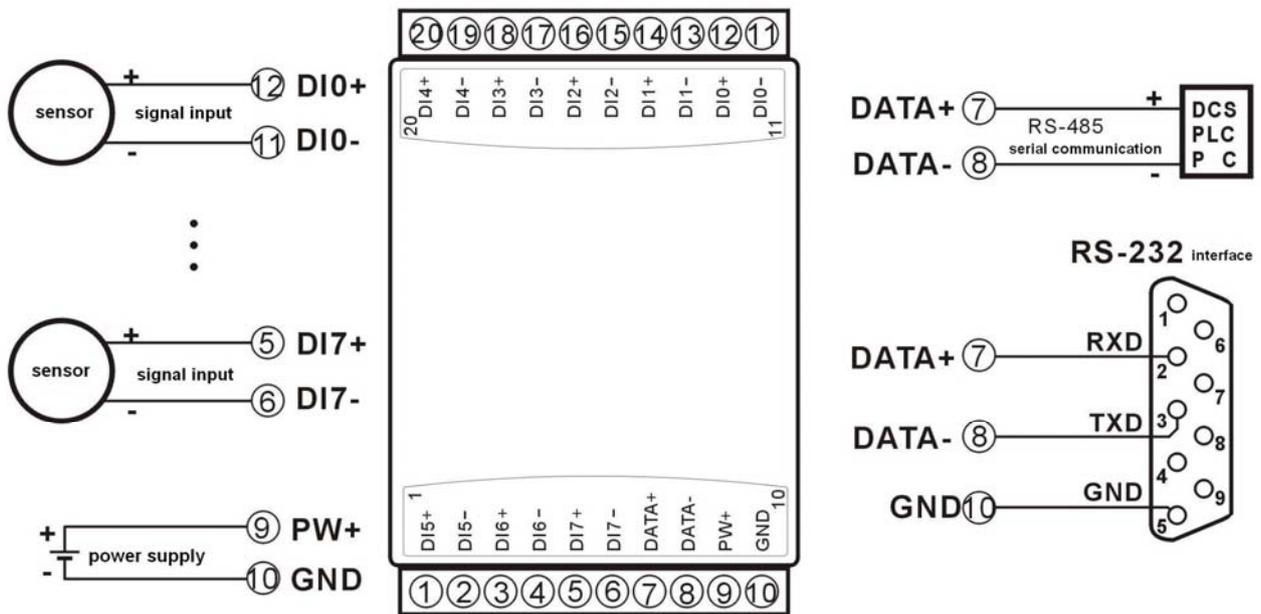
Which output signal and power supply are common ground.

Shock Voltage: 3KVAC, 1.2/50us (peak)

Dimensions: 120 mm x 70 mm x 43mm

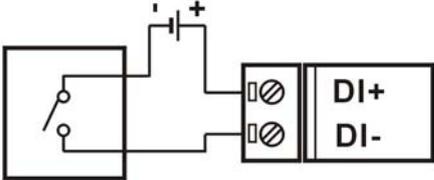
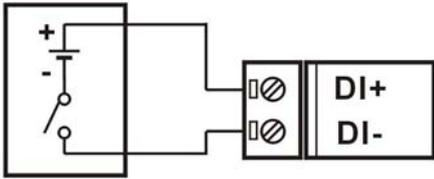
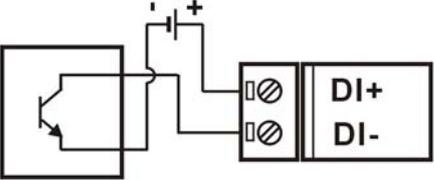
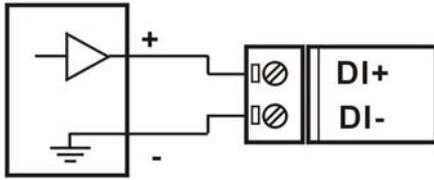
**Footprint Function:**

PIN	Name	Function	PIN	Name	Function
1	DI5+	Channel 5 switching input +	11	DI0-	Channel 0 switching input -
2	DI5-	Channel 5 switching input -	12	DI0+	Channel 0 switching input +
3	DI6+	Channel 6 switching input +	13	DI1-	Channel 1 switching input -
4	DI6-	Channel 6 switching input -	14	DI1+	Channel 1 switching input +
5	DI7+	Channel 7 switching input +	15	DI2-	Channel 2 switching input -
6	DI7-	Channel 7 switching input -	16	DI2+	Channel 2 switching input +
7	DATA+	RS-485 signal +	17	DI3-	Channel 3 switching input -
8	DATA-	RS-485 signal -	18	DI3+	Channel 3 switching input +
9	PW+	Power supply +	19	DI4-	Channel 4 switching input -
10	GND	Power supply -, output ground	20	DI4+	Channel 4 switching input +



**Figure 3 WJ62 Wiring Diagram**

## Switch signal input wiring diagram

Dry contact	Wet contact
 <p data-bbox="256 528 624 562">Power supply range:5 ~ 30VDC</p>	
Open collector input	TTL/CMOS level, 24V level input
 <p data-bbox="256 943 624 976">Power supply range:5 ~ 30VDC</p>	

### Initialization WJ62 module:

All WJ62 modules, if you use RS-485 network, must be assigned a unique address code, address code value of hexadecimal numbers between 00 and FF. However, all new WJ62 module uses a factory initial settings, as follows:

- Address code: 01
- Baud rate: 9600 bps
- Checksum is disable

As the new module address codes are the same, their address will be contradictory to other modules, so when you set up the system, you must reconfigure each WJ62 module address. WJ62 module can be connected the power cord and RS485 communication lines, through configuration commands to modify the WJ62 module address. Baud rate, parity and status, communication protocols also need to be adjusted according to user requirements. In the modified baud rate, parity and status, communication protocol, you must first enter the module to the default state, or can not be modified.

### Let the module into the default state:

WJ62 module has a **INIT** switch, in the flank position. Connecting the **INIT** switch to **INIT** position, then open power, the module into the default state. In this state, the module is configured as follows:

- Address code:**00**
- Baud rate:**9600 bps**
- Checksum is disable

At this time, via configuration commands you can modify WJ62 module baud rate,checksum state and other parameters, by setting the module communication protocol command to select the communication protocol. When are not sure a module specific configuration, can also be configured by putting the **INIT** switch to **INIT** position, so that the module into the default state, then reconfigure the module. If clients need set the module to **MODBUS RTU** communication protocol, see the **MODBUS** protocol section for instructions.

**Note:** Normal use,please put the **INIT** switch to **NORMAL** position.

## WJ62 character protocol command set:

Order is by a series of characters, such as first code, address ID, variables, an optional checksum byte and a terminator (**cr**) which can show command. In addition to wildcard address “\*\*\*”synchronization command, the host only commands a WJ62 module once.

Command format: **(Leading Code) (Addr) (Command) [data] [checksum] (cr)**

**(Leading code)** prefix is the first letter of the command. All commands require a command prefix, such as %,\$,#,@,... etc.

**(Addr)** module address code, if not specified below, range is from 00 ~ FF (hexadecimal).

**(Command)** shows the command code or variable values.

**[Data]** some output command needs data

**[Checksum]** brackets Checksum (checksum) shows an optional parameter, only the checksum is enabled, need this option.

**(Cr)** a control code character as identify , **(cr)** as a carriage return character, its value is 0x0D.

**1 - Character**

**2 - Character**

**Variable length**

**Variable length**

**2 - Character**

**1 - Character**

When enabled checksum (**checksum**), users need **[Checksum]**. It accounted for 2 - character. Commands and responses must be attached checksum feature. Checksum used to check all input commands to help you find the host to the module command module to the host response to errors and mistakes. Checksum characters placed in command or in response to the character after the carriage return before.

Calculated as follows: two characters, the hexadecimal number for all issued prior to the **ASCII** values of and, then with hexadecimal digits **0xFF** phase proceeds.

Examples: Disable checksum (**checksum**)

command: **\$002(cr)**

response: **!00020600 (cr)**

Enable checksum

command: **\$002B6 (cr)**

response: **!00020600 A9 (cr)**

'\$' = 0x24 '0' = 0x30 '2' = 0x32

B6=(0x24+0x30+0x30+0x32) AND 0xFF

'!' = 0x21 '0' = 0x30 '2' = 0x32 '6' = 0x36

A9=(0x21+0x30+0x30+0x30+0x32+0x30+0x36+0x30+0x30) AND 0xFF

## Command response:

Response message depends on a variety of commands. Response also is consists of several characters, includes leading code, variables and end tags. The first code of response signal has two: '!' Or '>' indicates that a valid command and '?' means invalid. By checking the response information, you can monitor whether the command is valid

### Note:

1. In some cases, many commands use the same command format. To ensure that you use a command in the address is correct, if you use the wrong address and this address represents another module, then the command will take effect in another module, resulting in an error.
2. the command must be entered in uppercase letters.

## 1、Read Switch Status Command

**Description: Read all channels switch input state from the module**

Command Format: **\$AA6(cr)**

Parameters: **\$** delimiter character. Hexadecimal **24H**

**AA** module address, range is **00-FF**(hexadecimal). Factory address is **01**, converted to hexadecimal **ASCII** code for each character. Such as address **01** into hexadecimal are **30H** and **31H**.

**(cr)** is the terminating character, carriage return (**0DH**)

Response : **!(dataInput)0000(cr)** command is valid.

**?AA(cr)** invalid command or illegal operation.

Parameter Description: **!** delimiter character, hexadecimal **21H**

**(dataInput)** means read switch status,two hexadecimal

The first represents **7~4** channel

The second represents **3~0** channel

Value 0:input is low level

Value 1:input is high level

IN7	IN6	IN5	IN4	IN3	IN2	IN1	IN0
Bit7	Bit 6	Bit 5	Bit 4	Bit 3	Bit2	Bit 1	Bit 0
<b>Data Input</b>							

Hexadecimal is each character **ASCII**

**(cr)** terminating character, carriage return (**0Dh**)

There is no response if the module is format error or communication error or address does not exist, the module does not respond. If you are using serial communication software, but can not enter the return key characters, please switch to hexadecimal format for communicate

**Example:** Commands (character format) **\$016(cr)**  
 (Hexadecimal format) **243031360D**  
 Module response (character format) **!110000 (cr)**  
 (Hexadecimal format) **213131303030300D**

Description: read data is **18**,into 2 hexadecimal is **00010001**, then at address **01H** module ,input switch state is:

Channel 0: high level    Channel 1: low level    Channel 2: low level    Channel 3: low level  
 Channel 4: high level    Channel 5: low level    Channel 6: low level    Channel 7: low level

## 2、Set WJ62 Module Command

**Description: Set address, input ranges, baud rate, checksum state for a WJ62 module, counter data are stored in a EEPROM.**

Command Format: **%AANN TTCCFF(cr)**

Parameter : **%** delimiter character

**AA** module address, (range **00~FF**) , the factory address is **01**,convert 16 hexadecimal for each characters **ASCII** code.Such as changes address **01** to 16 hexadecimal is **30H** and **31H**

**NN** indicates new module 16 hexadecimal address, value **NN** range is **00~FF**. convert 16 hexadecimal for each characters **ASCII** code.Such as changes address **18** to 16 hexadecimal is **31H** and **38H**

**TT** 16 hexadecimal indicates type code.**WJ62** must been set **00**

**CC** Baud Rate code (16 hexadecimal)

Baud rate code	Baud rate
03	1200 baud
04	2400 baud
05	4800 baud
06	9600 baud
07	19200 baud
08	38400 baud

Table 2 Baud rate code

**FF** Hexadecimal 8-bit represents the data format, checksum. Note from bits2 to bits5 not be set to zero.

Bit7	Bit 6	Bit 5	Bit 4	Bit 3	Bit2	Bit 1	Bit 0
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Table 3 Data format, checksum code

Bit 7: Reserved bits (must set to 0)

Bit 6: checksum states, if 0:Disabled, if 1: Enabled

Bit 5-bit 0: Not used(must set to 0)

(cr) terminating character, carriage return (**0Dh**)

**Response: !AA(cr)** command is valid

**?AA(cr)** command is invalid or illegal operation, or before changing baud rate or checksum, do not put **INIT** switch to **INIT** position

Parameter Description:

**!** delimiter character which indicates a valid command.

**?** delimiter character which indicates a invalid command.

**AA** represents input module address

**(cr)** terminating character, carriage return (**0Dh**)

If you configure module for the first time, **AA=01H** and **NN** equal to new address. If reconfigure module changing address, input range, data formats, **AA** equals to present configured address, **NN** equals to the current or new address. If reconfigure module changing baud rate or checksum state, must put **INIT** switch to **INIT** position, make them in listening mode, module address is **00H**, also **AA=00H**, **NN**=present or new address.

There is no response if the format error or communication error or address does not exist.

**Example: command %0111000600(cr)**

**response !11(cr)**

**Description: %** delimiter character

**00** indicates you want to configure the **WJ62** module original address set to **01H**.

**11** indicates new module 16 hexadecimal address is **11H**

**00** indicates type code, WJ62 must been set to **00**

**06** indicates baud rate: **9600 baud**

**00** indicates checksum is disabled

### 3、Read Set Status Command

**Description: Read configuration for a specified WJ62 module.**

**Command Format: \$AA2(cr)**

**Parameter: \$** delimiter character

**AA** module address, (range **00-FF**) 16 hexadecimal

**2** indicates read set state command

**(cr)** terminating character, carriage return (**0Dh**)

**Response: !AATTCCFF(cr)** command is valid

**?AA(cr)** command is invalid or illegal operation

**!** delimiter character

**AA** represents input module address

**TT** Type Code

**CC** Baud rate code, Table 2

**FF** Table 3

**(cr)** terminating character, carriage return (**0Dh**)

There is no response if the format error or communication error or address does not exist.

**Example: command \$302(cr)**

**response !300F0600(cr)**

**!** delimiter character

- 30** indicates WJ62 module address is **30H**
- 00** indicates input type code
- 06** represents that baud rate is **9600 baud**
- 00** represents that data format is Engineering Units, disable checksum

#### 4、 Read Module Name Command

**Description:** Return the module name from the specified WJ62 module

Command Format: **\$AAM(cr)**

- Parameter: **\$** delimiter character
- AA** module address, (range 00-FF) 16 hexadecimal
  - M** represents Read module name command
  - (cr)** terminating character, carriage return (0Dh)

- Response:** **!AA(Module Name)(cr)** command is valid
- ?AA(cr)** command is invalid or illegal operation
  - !** delimiter character which indicates a valid command.
  - ?** delimiter character which indicates a invalid command.
  - AA** represents input module address
  - (Module Name)** module name WJ62
  - (cr)** terminating character, carriage return (0Dh)

There is no response if the format error or communication error or address does not exist.

**Example:** **command** **\$08M(cr)**  
**response** **!08WJ62 (cr)**

Module is WJ62 at address 08H

#### 5、 Set Communication Protocol Command.

**Description:** Set the module communication protocol to characters protocol or Modbus RTU protocol.

Command Format: **\$AAPV(cr)**

- Parameter: **\$** delimiter character
- AA** module address, (range 00-FF) 16 hexadecimal
  - P** set communication protocol command
  - V** protocol code, 0 or 1
    - 0:** characters protocol
    - 1:** Modbus RTU protocol
  - (cr)** terminating character, carriage return (0Dh)

- Response:** **!AA(cr)** command is valid
- ?AA(cr)** command is invalid or illegal operation
  - !** delimiter character which indicates a valid command.
  - ?** delimiter character which indicates a invalid command.
  - AA** represents input module address
  - (cr)** terminating character, carriage return (0Dh)

There is no response if the format error or communication error or address does not exist.

Set command protocol must be effective by default.

**Example 1:** **command** **\$00P1(cr)**  
**response** **!00 (cr)**

Set protocol command to **Modbus RTU** protocol

**Example 2:** **command** **\$00P0(cr)**

response **!00 (cr)**

Set protocol command to characters protocol

### Modbus RTU communication protocol:

Module factory default protocol module is character communication protocol, if you want the module is **Modbus RTU** communication protocol, please set according to the following steps:

1. Put the **INIT** switch to **INIT** position.
2. Connect the power line and communication interface line correctly.
3. Switch on the power, module enter into the default state automatically, communication address is **00**, baud rate is **9600**.
4. Wait 5 seconds, the module initialization.
5. Send the command **\$00P1(cr)**, check the answer, if is **!00 (cr)**, means setting successful.
6. Turn off the power, put **INIT** switch to the **NORMAL** position.
7. The module has been set to the **Modbus RTU** communication protocol.

### Communication instructions:

Support the function code **01**, read coil status.

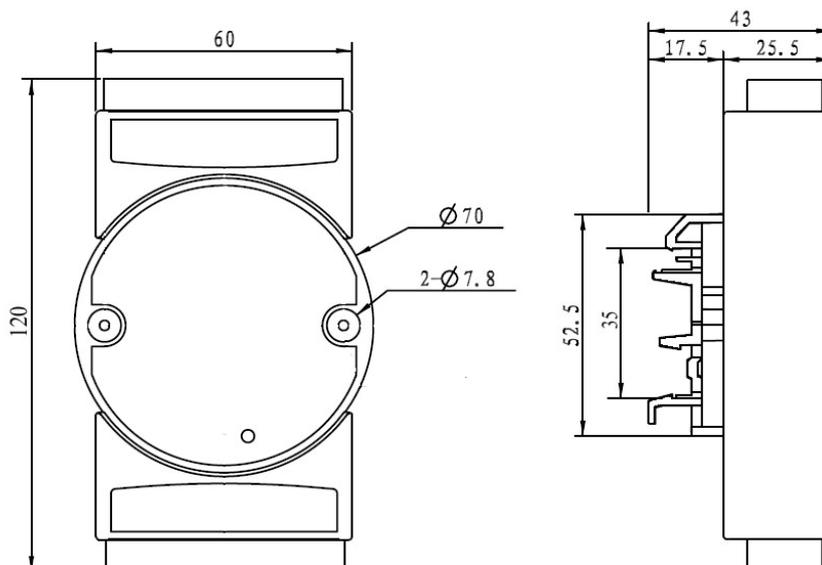
**1** represents high level, **0** represents low level.

### Register Description:

Address 0X (PLC)	Address (PC, DCS)	Data	Property	Data Explanation
00033	0032	Input switch	Read Only	level status of channel 0
00034	0033	Input switch	Read Only	level status of channel 1
00035	0034	Input switch	Read Only	level status of channel 2
00036	0035	Input switch	Read Only	level status of channel 3
00037	0036	Input switch	Read Only	level status of channel 4
00038	0037	Input switch	Read Only	level status of channel 5
00039	0038	Input switch	Read Only	level status of channel 6
00040	0039	Input switch	Read Only	level status of channel 7
40211	0210	Module Name	Read Only	High: 0x00 Low: 0x62

**Table 5 Modbus RTU register description**

Size(unit:mm)



**Warranty**

Two years (but violate operating rules and requirements to create damage, clients need pay maintenance costs)

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