

MODBUS RTU to TCP, RS232/485 to Ethernet Module

(WJ102-232/485-RJ45 : Multifunctional serial server module)

Features:

- >> MODBUS RTU protocol is converted into MODBUS TCP protocol automatically
- >> 100M high-speed LAN, 10 / 100M adaptive Ethernet interface by itself
- >> Support AUTO MDI / MDIX, you can use a crossover cable or parallel cable connection
- >> RS232 baud rate can be set from 300-256000
- >> Working mode selectable TCP Server, TCP Client
 UDP mode, UDP Server mode
- >> Supports virtual port mode
- >> Can across the gateway, across switches and routers
- >> Can work in LAN, you can also work on the Internet (extranet)
- >> Working port, destination IP address and port can be set easily
- >> Flexible serial data sub-frame is set to meet user demand for subcontracting
- >> Dimensions: 120 x 60 x 43mm

Typical applications:

- >> Serial to Industrial Ethernet
- >> For networking, real-time monitoring network and field device communication
- >> Intelligent building control, security engineering and other applications
- >> Ethernet industrial automation and control systems
- >> Industrial field signal isolation and long-term transmission
- >> Monitoring and control equipment operation
- >> Measuring sensor signal
- >> Things signal switch acquisition

Product Overview:

WAYJUN WJ102-232/485-RJ45 is a industrial protocol converter between RS232/485 and TCP/IP. This server uses the TCP port network packets or UDP packets and RS232 or RS485 interface data to achieve transparent transmission, achieve transmission, serial servers so that you can easily connect serial devices to Ethernet and Internet, Network management of serial devices. And compared to similar products, its distinguishing feature is the stability of full-duplex, non-stop sending large amounts of data without losing a byte.

INIT: initialization

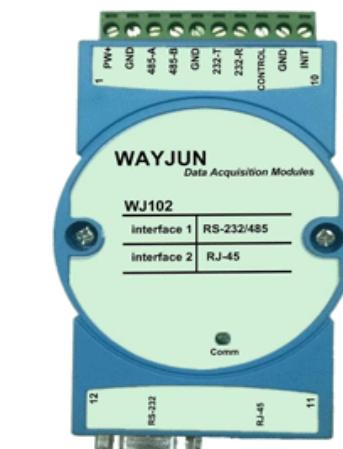
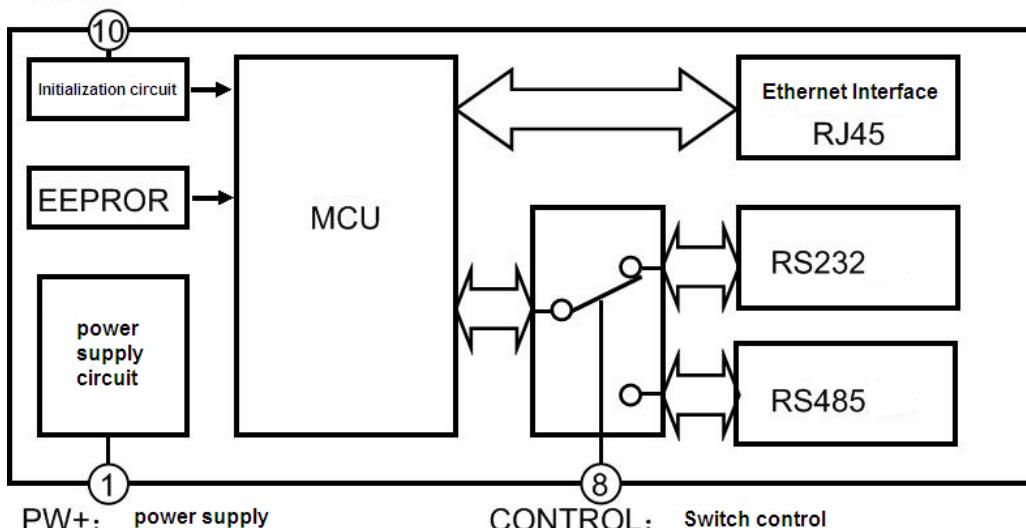


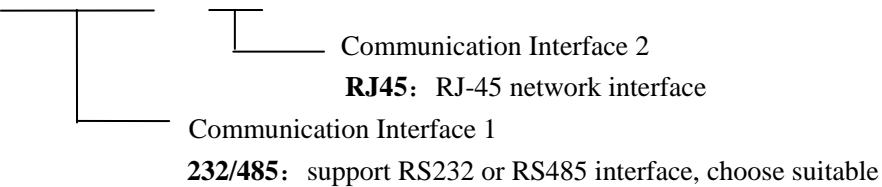
Figure 1 WJ102 Appearance

Figure 2 WJ102 Block Diagram

WAYJUN WJ102 products include power conditioning, analog switch exchange, RS232 interface communication, RS485 communication interface and RJ-45 network interface communication. It is an embedded Ethernet serial data conversion device, integrated TCP / IP protocol stack, users using it, you can complete networking capabilities of the embedded device easily, equipped with ARM processors, fast speed, fast response, high stability. Integrated 10 / 100M adaptive Ethernet interface, serial communication maximum baud rate up to 230.4Kbps, with TCP Server, TCP Client, UDP and UDP server operation mode ,it can be set via the network port.

Product Part No.:

WJ102 - 232/485 - RJ45



232/485: support RS232 or RS485 interface, choose suitable

WJ102 General Parameters:

(typical @ +25 °C, Vs to 24VDC)

Transmission Distance: RS232---15 meters

RS485----1000m

Wires 200m (connect into the internet through the switch, unlimited distance)

CPU: 32 bits ARM CPU

Ethernet LAN: 10/100Mbps

Protection: 2KV electromagnetic isolation

Communication: Serial to Ethernet transparent transmission

It can also be set MODBUS TCP to MODBUS RTU communication protocol.

Web: support web to access module, support web setting module parameters

Interface: RJ-45 network interface, RS232 interface or RS485 interface

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

Power Loss: less than 1W

Operating Temperature: - 45 ~ +80 °C

Humidity: 10 ~ 90% (no condensation)

Storage Temperature: - 45 ~ +80 °C

Storage Humidity: 10 ~ 95% (no condensation)

Isolation Voltage: Non-isolated

Footprint Function:

PIN	Name	Function	PIN	Name	Function
1	PW+	Power supply +	12	232-R	232 data sending RXD
2	GND	Power supply -, signal GROUND	13	CONTROL	Switch Control
3	485-A	485 data interface A	14	GND	Power supply-, signal GROUND
4	485-B	485 data interface B	15	INIT	Restore factory settings
5	GND	Power supply -, signal GROUND	16	RJ-45	Network Interface
6	232-T	232 data sending TXD	17	RS232	RS232 interface(9-PIN female hole)

Note: same name PIN interior are connected

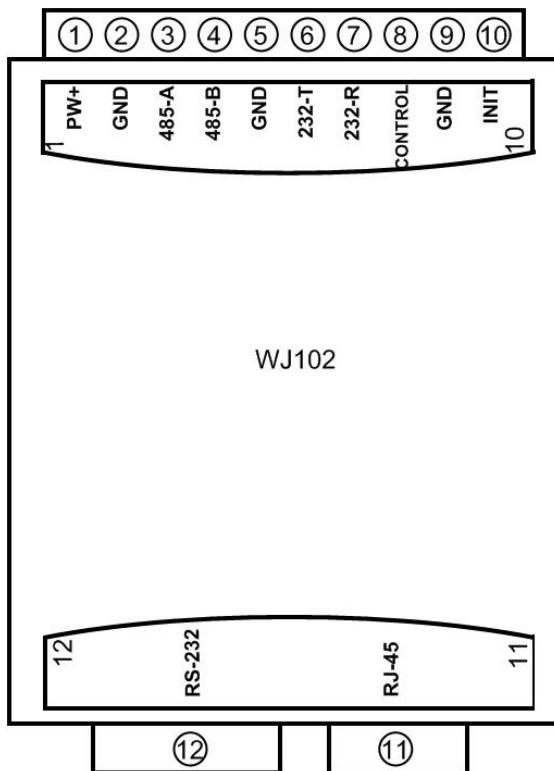
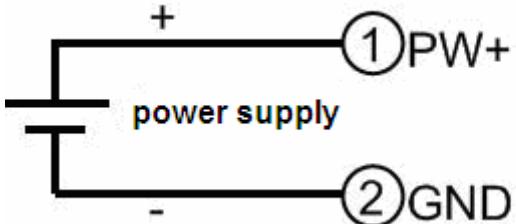
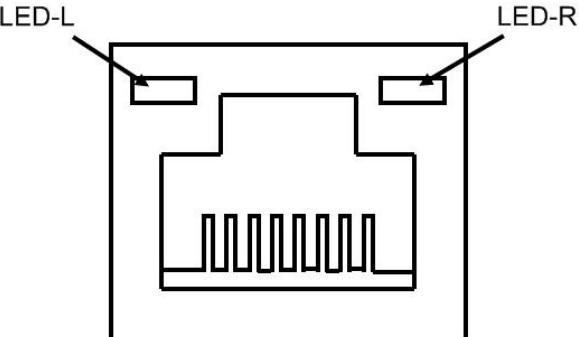


Figure 3 WJ102 Wiring Diagram

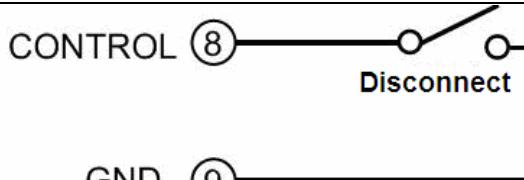
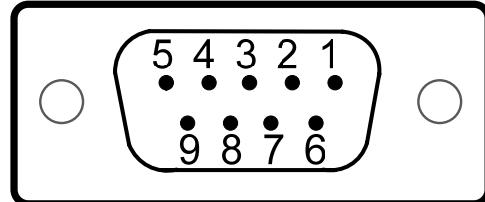
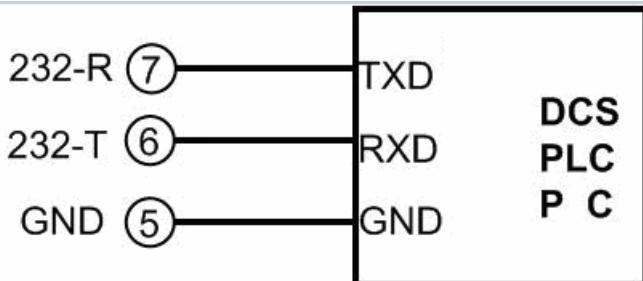
Power supply wiring diagram

wiring	explanation
 <p>power supply</p>	<p>Use PIN1, PIN2 screw terminals to connect the power supply. +8~32VDC Wide power supply range</p>

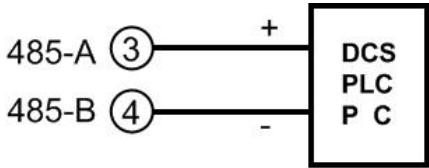
RJ-45 wiring diagram

wiring	explanation
 <p>LED-L LED-R</p>	<p>RJ-45 network interface plug the crystal head which is connected to the network. About the two LED of net position, after you plug in the network cable, Link (Green Light) is long light, Data (Yellow Light) will be blink periodically</p>

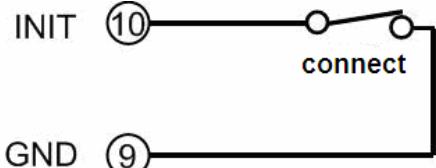
RS-232 wiring diagram

wiring	explanation
	Channel Selection: Take off PIN8 and PIN9 connection, to choose RS232 channel, take off RS485 channel
	Connection method 1: The RS-232 interface plug RS-232 socket (9 PIN male pole) of connecting the device.
	Connection method 2: If you do not have a RS232 plug, you can also use PIN 5, PIN6, PIN7 to connect as the left picture. But note that TXD and RXD have to cross connect.

RS-485 wiring diagram

wiring	explanation
	Channel selection: Short connect PIN8, PIN9, and turn off the RS232 channel in order to select the RS485 channel
	Connection method: Use PIN3, PIN4 screw terminal connection as the left picture.

Restore factory settings

wiring	explanation
	First connect PIN9, PIN10 short, then Give the WJ102 to restart the power up, after 5~10s, take off PIN4, PIN5, the device can be restored to the factory configuration.

Protocol Converter: MODBUS RTU to MODBUS TCP

WJ102 factory default parameters:

Account: admin Password: admin

Module itself IP: 192.168.0.7

Subnet Mask: 255.255.255.0

Gateway: 192.168.0.1

IP address mode: Static IP, means using a static IP address

Baud Rate: 115,200 bps Data bits: 8 Parity Check: None Stop bits: 1bit

Local port No.: 23 Remote Port No.: 23

TTL1 → work mode → TCP Serve → None

Figure 4 WJ102 Factory Default

1>> How to restore factory setting?

1. Short Connect PIN9 and PIN10
2. connect the power supply line
3. Switch on the power, wait 10 seconds, module restored to the factory settings automatically.
4. Take off PIN9 and PIN10 connection
5. Module has been restored to factory settings successfully

2>> How to set up MODBUS TCP communication protocol

After restore factory setting, if required using MODBUS RTU to MODBUS TCP, we need to set the baud rate of TTL1 entry, the local port and work mode.

Baud Rate: 9600 (According to the current MODBUS RTU to set the baud rate)

Local Port: 502 Work Mode: TCP Serve → MODBUS TCP

Modify click save settings. And then click restart module.

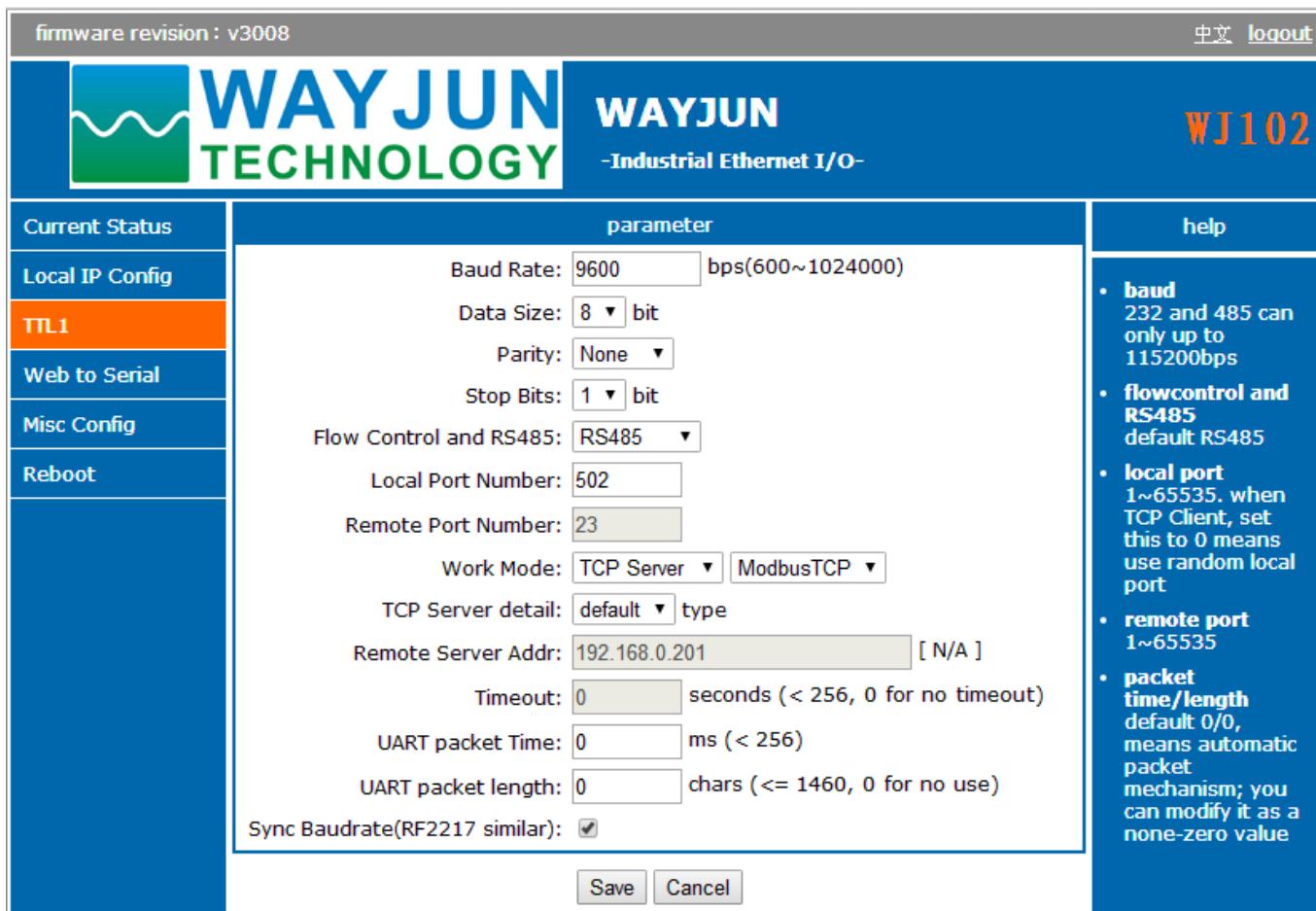


Figure 5 WJ102 Parameters after setting MODBUS TCP

3>> MODBUS RTU to MODBUS TCP samples

Open MODBUS testing software: ModScan32

Choose the menu under Connection→Connect

In the pop-up window, press the following settings:

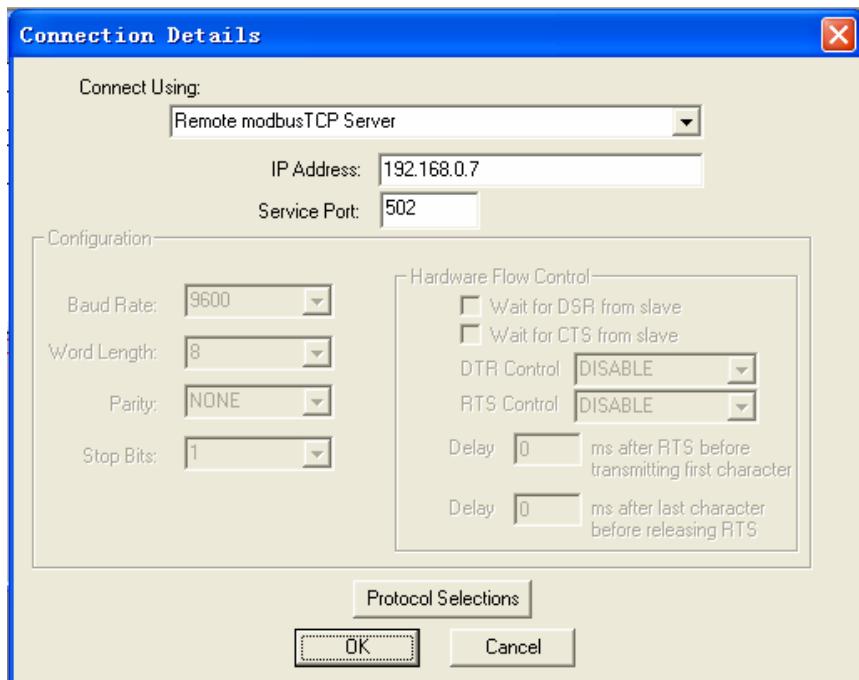


Figure 6 WJ102 using MODSCAN software settings

After setup is completer, you can read the data which is uploaded over the existing device. As follows:

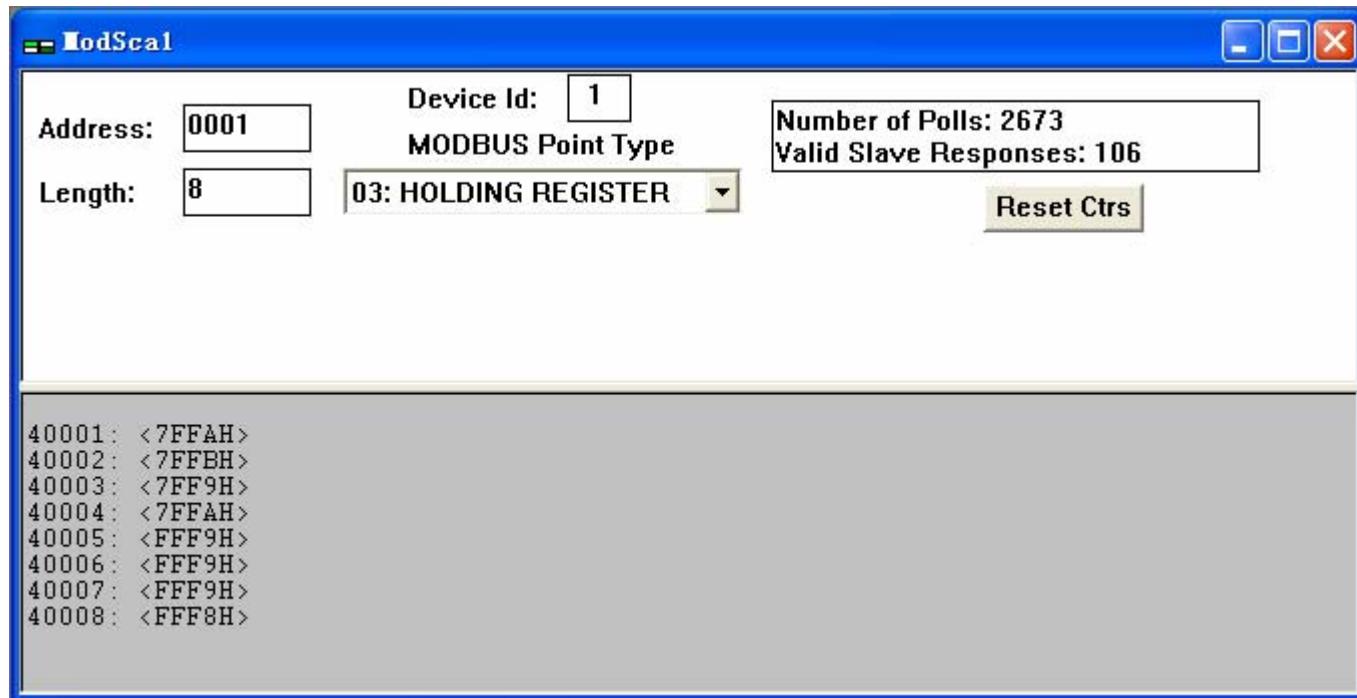


Figure 7 WJ102 using MODSCAN32 software read the existing device data

Operation and settings on the page

Input the default module IP on the browser, default: **192.168.0.7**, can open the module page (provided that the computer IP and module are in the same network segment, landing page need to be operated according to current module IP address), enter a user name and password, default: **admin**, click on “**landing**”. There is Chinese/English handover sign upper right corner.

(1) Chinese/English Handover



(2) Current Status

中文 [logout](#)

firmware revision : v3008  WAYJUN <small>-Industrial Ethernet I/O-</small>	WJ102	help <ul style="list-style-type: none"> • Run time: run time means the minutes since latest reboot • TX/RX Count: TX/RX count give us a calculation of the total byte we have been received or send. 						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Current Status</th> <th style="width: 70%;">parameter</th> <th style="width: 15%;">help</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> Local IP Config TTL1 Web to Serial Misc Config Reboot </td> <td style="vertical-align: top;"> Module Name: WJ102-232/485-RJ45 Firmware Revision: 3008 Current IP Address: 192.168.0.7 MAC Address: d8-b0-4c-01-0d-71 Run Time: 0day: 0hour: 28min TX Count(ETH) : 0/ bytes RX Count(ETH) : 0/ bytes Conn Status(ETH) : LISTEN/ </td> <td style="vertical-align: top;"></td> </tr> </tbody> </table>			Current Status	parameter	help	Local IP Config TTL1 Web to Serial Misc Config Reboot	Module Name: WJ102-232/485-RJ45 Firmware Revision: 3008 Current IP Address: 192.168.0.7 MAC Address: d8-b0-4c-01-0d-71 Run Time: 0day: 0hour: 28min TX Count(ETH) : 0/ bytes RX Count(ETH) : 0/ bytes Conn Status(ETH) : LISTEN/	
Current Status	parameter	help						
Local IP Config TTL1 Web to Serial Misc Config Reboot	Module Name: WJ102-232/485-RJ45 Firmware Revision: 3008 Current IP Address: 192.168.0.7 MAC Address: d8-b0-4c-01-0d-71 Run Time: 0day: 0hour: 28min TX Count(ETH) : 0/ bytes RX Count(ETH) : 0/ bytes Conn Status(ETH) : LISTEN/							

(a)Module Name

Default: **WJ102-232/485-RJ45**, do not support to change module name.

(b) Firmware Version

Firmware version increments from V3000. Version can be seen in the upper left of the page.

(c) Current IP address

Module current IP address, the factory default: **192.168.0.7**

(d) MAC address

In the current state, which is being used to view the current MAC address, the factory MAC address is globally unique.

(e) Run time

Run time is the module cumulative run time from the last power-up, in minutes

(f) TX/RX count

It provides a rough network statistics, convenient debugging, in bytes

(g) Connection status

LISTEN / indicates that the network is connected.

(3) The local IP settings

中文 [logout](#)

firmware revision : v3008  WAYJUN <small>-Industrial Ethernet I/O-</small>	WJ102	help <ul style="list-style-type: none"> • IP type: StaticIP or DHCP • StaticIP Module's static ip • Submask usually 255.255.255.0 • Gateway Usually router's ip address 						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Current Status</th> <th style="width: 70%;">parameter</th> <th style="width: 15%;">help</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> Local IP Config TTL1 Web to Serial Misc Config Reboot </td> <td style="vertical-align: top;"> IP type: <input style="width: 150px; height: 20px; border: 1px solid #ccc; border-radius: 5px; padding: 2px 10px; margin-bottom: 10px;" type="button" value="Static IP"/> Static IP: <input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="0"/> . <input type="text" value="7"/> Submask: <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="0"/> Gateway: <input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="0"/> . <input type="text" value="1"/> <input style="margin-right: 10px;" type="button" value="Save"/> <input type="button" value="Cancel"/> </td> <td style="vertical-align: top;"></td> </tr> </tbody> </table>			Current Status	parameter	help	Local IP Config TTL1 Web to Serial Misc Config Reboot	IP type: <input style="width: 150px; height: 20px; border: 1px solid #ccc; border-radius: 5px; padding: 2px 10px; margin-bottom: 10px;" type="button" value="Static IP"/> Static IP: <input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="0"/> . <input type="text" value="7"/> Submask: <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="0"/> Gateway: <input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="0"/> . <input type="text" value="1"/> <input style="margin-right: 10px;" type="button" value="Save"/> <input type="button" value="Cancel"/>	
Current Status	parameter	help						
Local IP Config TTL1 Web to Serial Misc Config Reboot	IP type: <input style="width: 150px; height: 20px; border: 1px solid #ccc; border-radius: 5px; padding: 2px 10px; margin-bottom: 10px;" type="button" value="Static IP"/> Static IP: <input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="0"/> . <input type="text" value="7"/> Submask: <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="0"/> Gateway: <input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="0"/> . <input type="text" value="1"/> <input style="margin-right: 10px;" type="button" value="Save"/> <input type="button" value="Cancel"/>							

(a) Module IP address acquisition

There are two types: DHCP and Static IP address. Default configuration is Static IP address: **192.168.0.7**

DHCP enables network devices to obtain dynamic IP address, subnet mask, gateway, etc. After selecting DHCP, , take effect after restarting , the module will request IP address to the network DHCP host, the whole process takes about 5-15s, after you can search the module IP address by using search software.

(b) Computer IP address

The module IP address itself, users may modify the module IP address according need, take effect after restarting

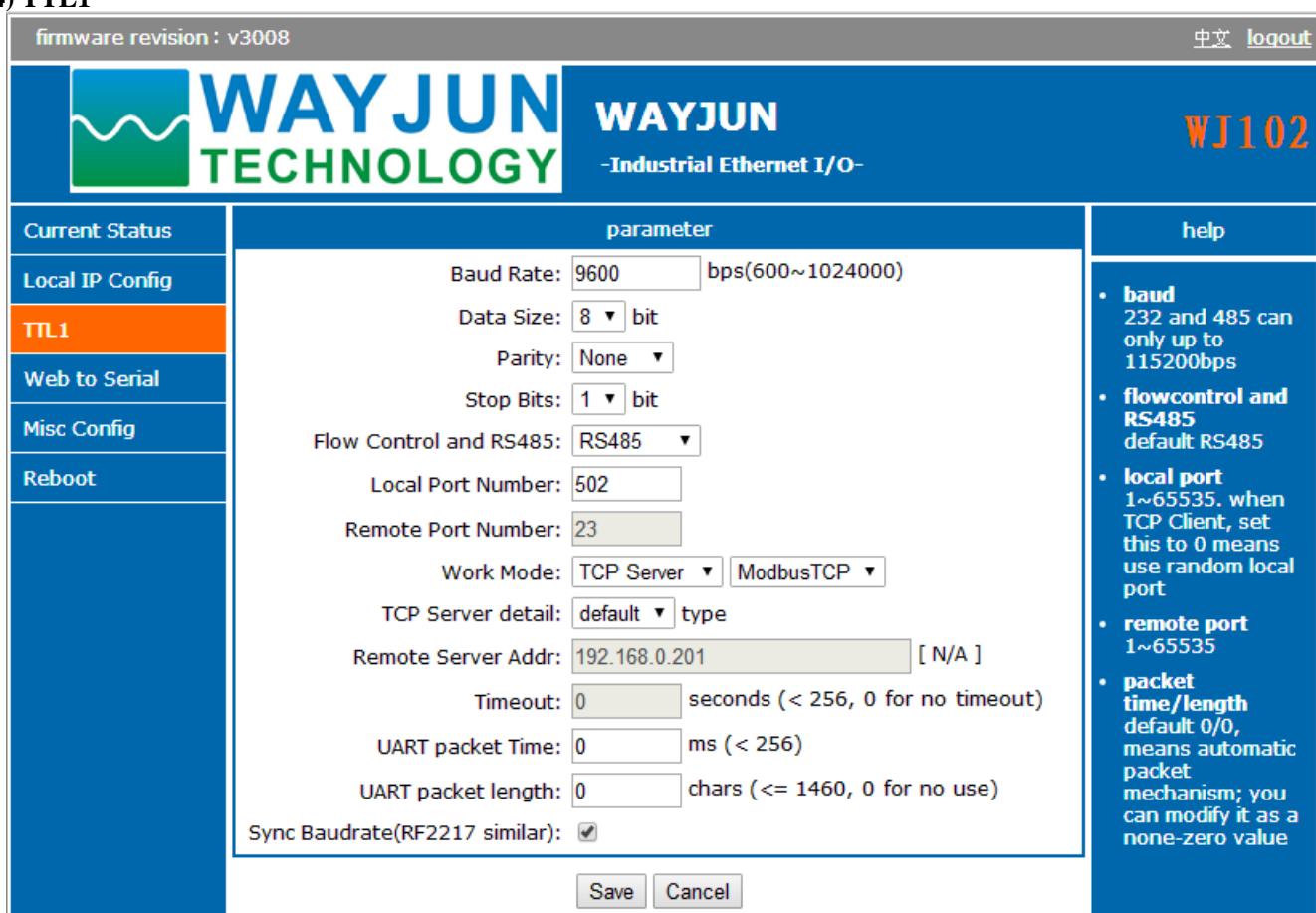
(c) Subnet Mask:

To subnet range (typically **255.255.255.0**), where you can modify, take effect after restarting.

(d) Gateway address:

The only way to access the external network (generally filled router's IP address).

(4) TTL1



The screenshot shows the configuration interface for the TTL1 module. The top bar includes 'firmware revision : v3008', '中文' (Chinese), and 'logout'. The main header features the WAYJUN logo and 'WJ102'. On the left, a vertical menu lists 'Current Status', 'Local IP Config', 'TTL1' (which is highlighted in orange), 'Web to Serial', 'Misc Config', and 'Reboot'. The central panel is titled 'parameter' and contains the following fields:

- Baud Rate: 9600 bps (600~1024000)
- Data Size: 8 bit
- Parity: None
- Stop Bits: 1 bit
- Flow Control and RS485: RS485
- Local Port Number: 502
- Remote Port Number: 23
- Work Mode: TCP Server (selected) / ModbusTCP (disabled)
- TCP Server detail: default type
- Remote Server Addr: 192.168.0.201 [N/A]
- Timeout: 0 seconds (< 256, 0 for no timeout)
- UART packet Time: 0 ms (< 256)
- UART packet length: 0 chars (<= 1460, 0 for no use)
- Sync Baudrate(RF2217 similar):

At the bottom are 'Save' and 'Cancel' buttons. To the right, a 'help' section provides detailed explanations for various parameters:

- baud**: 232 and 485 can only up to 115200bps
- flowcontrol and RS485**: default RS485
- local port**: 1~65535. when TCP Client, set this to 0 means use random local port
- remote port**: 1~65535
- packet time/length**: default 0/0, means automatic packet mechanism; you can modify it as a none-zero value

(a) The serial port parameters

Please according to the serial baud rate of connecting decive to set

(b) RS485 transceiver control

The default value, without modification

(c) The local port and remote port

Local port: MODBUS TCP protocol, please modify it to 502, other common serial communication, please modify it according to the need

Remote port: MODBUS TCP protocol no need to set, please modify it according to the need

(d) Work mode

For setting communications work mode, please select TCP Server mode and MODBUS TCP mode when MODBUS TCP communication. If the module restores the factory settings, this will become None, you need to modify it to MODBUS TCP mode.

(e) The remote server address

It is the remote server IP address.

(f) Timeout

<256, 0: no timeout.

(5) WJ102 Webpage to the serial

firmware revision : v3008

中文 logout



WAYJUN
TECHNOLOGY

WAYJUN
-Industrial Ethernet I/O-

WJ102

Current Status	parameter	help
Local IP Config	websocket connection: 0	<ul style="list-style-type: none">web to serial This page use websocket to transmit data between webpage and uart, it is recommended to use the Google Chrome browser or IE10 browser for testing
TTL1	Receive hex data	
Web to Serial		
Misc Config		
Reboot		

websocket connection: 0

Receive hex data

send ascii data send hex data clear

(a) WJ102 Webpage to the serial port

Since the webpage using **websocket** to achieve real-time data acquisition, it is recommended to use the **Google Chrome** browser or **IE10** browser for testing. After the success of connection, it can achieve two-way data transceiver between the module serial and the module webpage.

(6) Advanced Settings

firmware revision : v3008	中文 logout	
 WAYJUN -Industrial Ethernet I/O-		
Current Status Local IP Config TTL1 Web to Serial Misc Config Reboot	<p style="text-align: center;">parameter</p> <p>Module name: WJ102-232/485-RJ45</p> <p>Reserved: <input type="text" value="6432"/></p> <p>Webserver port: <input type="text" value="80"/></p> <p>Module id(use for indentify module): <input type="text" value="1"/> (1~65535)</p> <p>Module id type: <input type="text" value="0"/> (0/1/2/3)</p> <p>MAC address: <input type="text" value="d8-b0-4c-01-0d-71"/></p> <p>User name: <input type="text" value="admin"/></p> <p>Pass word: <input type="text" value="admin"/></p> <p>Buffer data before connected: <input checked="" type="checkbox"/></p> <p>Reset timeout: <input type="text" value="0"/> second</p> <p style="text-align: center;"><input type="button" value="Save"/> <input type="button" value="Cancel"/></p>	help <ul style="list-style-type: none"> • module name max length is 15 char • Web port default 80 • ID and ID type we could use it for D2D • Mac address user could modify this MAC address • Buffer data default not checked, buffer data before tcp connection established • reset timeout default 0, 0-60 mean no timeout, >60 mean when there is no data received during this time, the device will restart

(a) Module Name

Module name defaults **WJ102-232/485-RJ45**, that is the factory name. It does not support to change module name.

(b) Webpage Port

Module contains built-in web server, the same as the conventional web server, both use port 80 pages, but this module provides the port modification function, after modification, can be accessed built-in web through other ports.

(c) ID and ID type

The default value, without modification

(d) MAC address

Users can modify the module MAC address as according to need

(e) User name and password

The user name and password are both default "**admin**", the length must be less than 6. After modifying , the restart to take effect.

(f) Buffer data

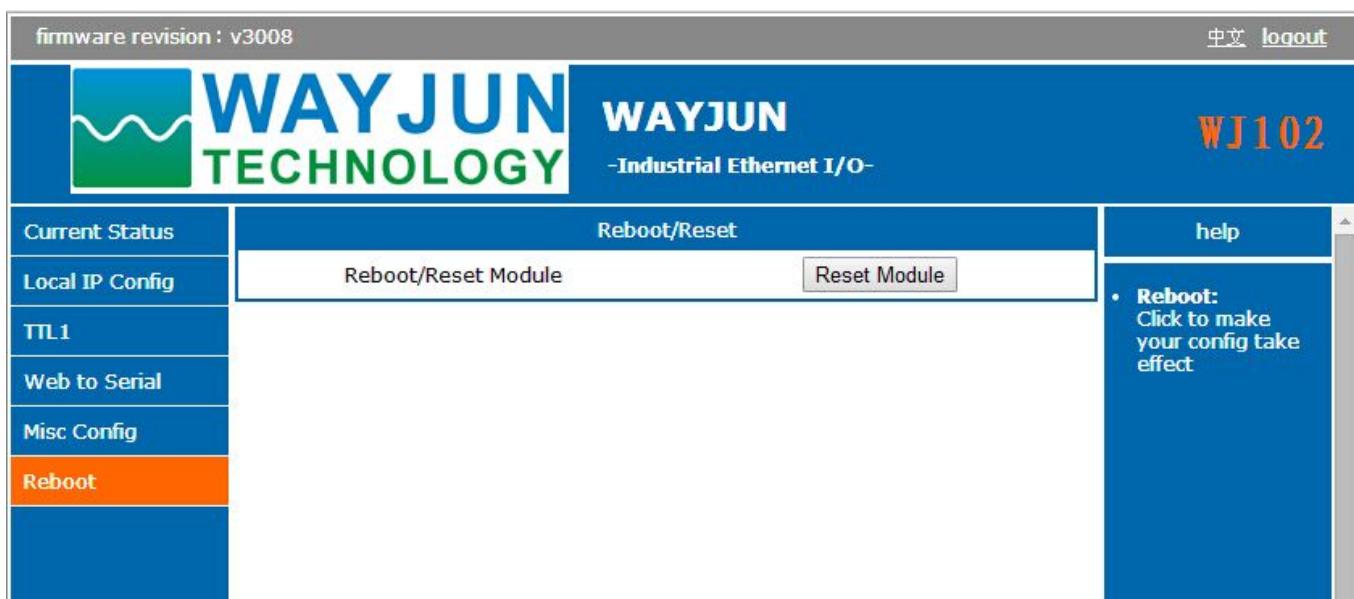
The default value, without modification

(g) Reset timeout

Default 0, 0~60 means no timeout,

> = 60, mean when there is no data received during this time, the device will restart

(7) Module Management



(a) Restart Module

Restart module to make your configuration take effect

FAQ about WJ102

1>> Across the network Segment problems

If the communication PC and device IP are not a network segment, and it is in a straight line, or under a sub-router, then they are unable to communicate simply.

Example:

Device IP: 192.168.0.7

Subnet Mask: 255.255.255.0

PC's IP: 192.168.1.100

Subnet Mask: 255.255.255.0

Device IP is 192.168.0.7, then the result could not land equipment page on the PC, also can not ping it.

If you want them to be able to communicate, you need set to 255.255.0.0 about the subnet mask of device/PC and the router, so that we can login module pages.

2>> Device can ping but can not open the page

There may be several causes:

- 1) The device is set up static IP, but conflicts to the existing device network IP
- 2) HTTP server port was to be modified (default should be 80)
- 3) Other reasons

Workaround: Re-set up an unused IP to the device, restore factory settings or input the correct port when open the browser.

3>> every once in a while, dropped reconnection occurs

Every once in a while, dropped reconnection phenomena occur

Cause: The serial server has an IP address conflict with other device

4>> Communication is not normal, not on the network links, or can not search

Currently used computer firewall needs to be closed (in the windows firewall settings)

Three local ports, not conflict, that is, must be set to different values, the default 23, 26, 29

With illegal MAC address, such as all-FF MAC address, there maybe appear unable to connect the target IP address, or MAC address repeat.

Illegal IP address, such as a router and network are not in a network segment, you may not be able to access the Internet.

5>> Find hardware problems

Bad power adapter, or plug connection is undesirable

Power light is not on, the LAN light is not bright, that is no power supply or the hardware is broken

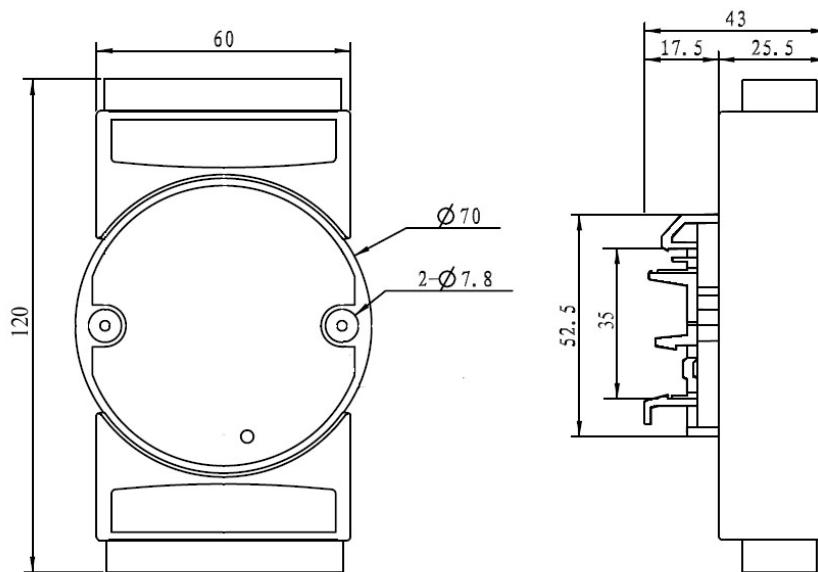
Cable or network port hardware issues, view the status of the network port lights

Network interface hardware problems, you can check the network port status, etc., green light should be the long bright, yellow light should be flashing, instead of the long light or long off, otherwise it is a hardware problem

Wrong password, if you forget the password, you can restore the factory configuration (switch to **init**, the device is on 10 seconds, then put on the switch to **normal**)

Size(unit:mm)

DIN35 Rail Mounted

**Warranty**

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

Copyright

Copyright © 2016 Shenzhen WAYJUN Industrial Automation

Specifications subject to change without notice.

Brand

In this manual, mentioned other trademarks and copyright belongs to their respective owners.

Version: V1.0