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.
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**

Communication Interface 2

RJ45: RJ-45 network interface

Communication Interface 1

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:**

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

Note: same name PIN interior are connected
Power supply wiring diagram

<table>
<thead>
<tr>
<th>wiring</th>
<th>explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Power supply wiring diagram" /></td>
<td>Use PIN1, PIN2 screw terminals to connect the power supply. +8~32VDC Wide power supply range</td>
</tr>
</tbody>
</table>

RJ-45 wiring diagram

<table>
<thead>
<tr>
<th>wiring</th>
<th>explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="RJ-45 wiring diagram" /></td>
<td>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</td>
</tr>
</tbody>
</table>
### RS-232 wiring diagram

<table>
<thead>
<tr>
<th>Wiring</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| ![RS-232 Wiring Diagram](image) | 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

<table>
<thead>
<tr>
<th>Wiring</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| ![RS-485 Wiring Diagram](image) | 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

<table>
<thead>
<tr>
<th>Wiring</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| ![Restore Factory Settings](image) | 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.
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](image)

**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

(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
(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

(a) The serial port parameters

Please according to the serial baud rate of connecting device 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

(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
(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 cannot 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 cannot 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)
Warranty
Two years (but violate operating rules and requirements to create damage, clients need pay maintenance costs)

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