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## PUSR USR-TCP232-410S

# PUSR USR-TCP232-410S Serial to Ethernet Adapter User Manual

Model: USR-TCP232-410S

## 1. INTRODUCTION

The PUSR USR-TCP232-410S is a dual serial server designed for transparent data transmission between serial devices (RS232/RS485) and an Ethernet network. It integrates a Cortex-M4 solution and a TCP/IP protocol stack, allowing both RS232 and RS485 ports to operate simultaneously. This device is suitable for industrial applications requiring reliable serial to Ethernet conversion.

### Key Features:

- Dual Serial Ports: One RS232 and one RS485 port, capable of simultaneous operation.
- ARM Cortex-M4 Core with integrated TCP/IP protocol stack.
- Ethernet Interface: Auto-MDI/MDIX, RJ45 port with 10/100Mbps.
- Multiple Work Modes: Supports TCP Server, TCP Client, UDP, UDP Server, and HTTPD Client.
- Modbus Gateway Functionality: Converts Modbus RTU to Modbus TCP and supports Multi-Host Modbus Polling.
- IoT Cloud Integration: Collects data in Modbus RTU/TCP and reports to IoT cloud platforms in JSON format via MQTT, TCP/UDP, or HTTP. Supports up to 128 data points.
- Data Transmission Encryption: SSL/TLS encryption for TCP client, HTTP client, and MQTT modes, with two-way certificate authentication.
- Virtual Serial Port: Provides corresponding software (USR-VCOM).
- Serial Baud Rate: Configurable from 600bps to 230.4Kbps, with various check bit options.
- Network Features: DHCP and DNS support.
- Configuration: Via built-in webpage or virtual COM software.
- Industrial Design: Power-line terminal, multiple indicator lights for debugging, built-in isolation transformer, 2KV electromagnetic isolation.
- Unique MAC Address: IEEE-bought global unique MAC address, user-definable.

- Firmware Upgrade: Supports network-based firmware upgrades.
- Keep-alive Function: Rapidly detects dead links.
- Security: Account and password support for page login and network settings.
- Websocket Support: One channel for bidirectional transparent transmission between webpage and serial.
- UDP Broadcast Function: Sends and receives data from all IPs in the network.

## 2. WHAT'S IN THE BOX

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Upon unpacking, please verify that all items listed below are present and in good condition:

- 1 x USR-TCP232-410S Dual Serial Device Server
- 1 x 5V 1A Power Supply
- 1 x Female to Female Serial Cable



Image: The USR-TCP232-410S device with its power supply and serial cable.

## 3. PRODUCT OVERVIEW

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Familiarize yourself with the device's ports and indicators.



Image: Front view of the USR-TCP232-410S showing the power, work, 232TX, 232RX, 485TX, 485RX indicators, and the RS232 and RS485 ports.



Image: Side view of the USR-TCP232-410S highlighting the DB9 RS232 serial port and the RS485 terminal block.



Image: Side view of the USR-TCP232-410S showing the RJ45 Ethernet port, DC power input, and the terminal block for DC 5-36V power input.

## 4. SETUP INSTRUCTIONS

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### 4.1. Hardware Connection

1. **Connect Power:** Connect the provided 5V 1A power supply to the DC power input jack on the device. Alternatively, use the terminal block for DC 5-36V power input. Ensure the power source matches the device's requirements.
2. **Connect Ethernet:** Connect an Ethernet cable from your network switch or router to the RJ45 Ethernet port on the USR-TCP232-410S. The Link/Data indicator light on the RJ45 port will illuminate upon successful connection.
3. **Connect Serial Device (RS232):** Use the provided female-to-female serial cable to connect your RS232 device to the DB9 port on the USR-TCP232-410S.



Image: The included female-to-female serial cable for RS232 connections.

4. **Connect Serial Device (RS485):** Connect your RS485 device to the A(+) and B(-) terminals on the RS485 terminal block. Ensure correct polarity.

## 4.2. Initial Network Configuration

The device typically comes with a default static IP address, often **192.168.0.7** or **192.168.0.6**. To access the web interface for configuration:

1. **Connect PC:** Ensure your PC is on the same network segment as the device. You may need to temporarily set your PC's IP address to be in the same subnet (e.g., 192.168.0.x, where x is not 6 or 7).
2. **Access Web Interface:** Open a web browser and enter the device's default IP address (e.g., <http://192.168.0.7>) into the address bar.
3. **Login:** The default username and password are often **admin / admin**.

4. **Configure Network Settings:** Once logged in, navigate to the network settings to configure the IP address, subnet mask, gateway, and DNS settings according to your network environment. You can choose between static IP or DHCP.
5. **Configure Serial Settings:** Adjust the serial port parameters (baud rate, data bits, stop bits, parity) to match your connected serial devices.

For advanced configuration or if the web interface is inaccessible, use the provided USR-VCOM virtual serial port software or other configuration tools available from the manufacturer's website.

## 5. OPERATING MODES

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The USR-TCP232-410S supports various operating modes to suit different application requirements:

- **TCP Client Mode:** The device initiates a connection to a specified TCP server. Data from the serial port is sent to the server, and data from the server is sent to the serial port.
- **TCP Server Mode:** The device listens for incoming TCP connections. Multiple clients can connect, and data is transparently transmitted between the serial port and the connected clients.
- **UDP Mode:** Data is transmitted using the UDP protocol. This mode is connectionless and suitable for applications where speed is prioritized over guaranteed delivery.
- **UDP Server Mode:** The device listens for UDP packets on a specified port.
- **HTTPD Client Mode:** Allows the device to send serial data to a web server via HTTP requests.
- **Modbus RTU to Modbus TCP:** This mode enables seamless integration of Modbus RTU serial devices into a Modbus TCP/IP network. The device acts as a gateway, converting RTU frames to TCP frames and vice-versa. It also supports multi-host Modbus polling.
- **MQTT/TCP/UDP/HTTP for IoT Cloud:** The device can collect data from Modbus RTU/TCP and report it to IoT cloud platforms in JSON format using MQTT, TCP/UDP, or HTTP protocols. This includes support for up to 128 data points and data decoding/computation to reduce server load.
- **SSL/TLS Encryption:** For secure data transmission, the device supports SSL/TLS encryption in TCP client, HTTP client, and MQTT operation modes, including two-way certificate authentication.

## 6. MAINTENANCE

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### 6.1. Restoring Default Settings

If you encounter configuration issues or wish to revert to factory settings, press and hold the "Reload" button on the device for approximately 5-10 seconds until the indicators flash, then release. This will restore the device to its default IP address and settings.

### 6.2. Firmware Upgrade

The device supports firmware upgrades via the network. Refer to the manufacturer's official website for the latest firmware versions and detailed upgrade instructions. Regular firmware updates can improve performance, add features, and address security vulnerabilities.

### 6.3. Keep-Alive Function

The built-in keep-alive function helps maintain stable network connections by periodically sending small packets to rapidly detect and re-establish dead links, ensuring continuous data flow.

## 7. TROUBLESHOOTING

- **Cannot Access Web Interface:**

- Verify the device is powered on and the Ethernet cable is securely connected.
- Ensure your PC's IP address is in the same subnet as the device's default IP (e.g., 192.168.0.x).
- Try pinging the device's default IP (192.168.0.7 or 192.168.0.6).
- If still unsuccessful, perform a factory reset using the "Reload" button.
- Check firewall settings on your PC that might block access to the device's IP.

- **No Data Transmission:**

- Check serial port connections (RS232/RS485) for correct wiring and polarity.
- Verify that the serial parameters (baud rate, data bits, stop bits, parity) on the device match those of your serial equipment.
- Confirm the network settings (IP, port, work mode) are correctly configured for your application.
- Check the TX/RX indicator lights on the device to see if serial data is being received or transmitted.

- **Intermittent Connection:**

- Ensure stable power supply within the specified voltage range (DC 5-36V).
- Check Ethernet cable quality and connections.
- Verify network stability and ensure no IP conflicts exist.
- Consider updating the device firmware.

## 8. SPECIFICATIONS

Feature	Description
Model	USR-TCP232-410S
CPU	Cortex-M4, 120MHz
Serial Ports	1 x RS232 (DB9), 1 x RS485 (Terminal Block)
Ethernet Port	1 x RJ45, 10/100Mbps, Auto-MDI/MDIX
Data Transfer Rate	100 Megabits Per Second (Ethernet)
Serial Baud Rate	600bps to 230.4Kbps
Serial Check Bit	None, Odd, Even, Mark, Space
Power Input	DC 5-36V (via DC jack or terminal block)
Power Consumption	< 1W
Working Temperature	-40°C to 85°C
Item Weight	0.2 Grams
Housing Material	Metal

## 9. WARRANTY INFORMATION

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Specific warranty details are typically provided at the point of purchase or on the manufacturer's official website. Please refer to your purchase documentation or the PUSR official website for the most accurate and up-to-date warranty information regarding the USR-TCP232-410S device.

## 10. TECHNICAL SUPPORT

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For technical assistance, additional documentation, software downloads (such as USR-VCOM), or firmware updates, please visit the official PUSR website. You may also find FAQs and community forums that can help resolve common issues.

**Manufacturer:** PUSR

**Model Number:** USR-TCP232-410S