

USR-DR301 DIN-Rail RS232 Serial to Ethernet Converter User Manual

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1. PRODUCT OVERVIEW

The USR-DR301 is a DIN-Rail mounted RS232 Serial to Ethernet Converter. It facilitates transparent data transmission between RS232 serial devices and an Ethernet network. This device supports various operating modes, including TCP Client, TCP Server, UDP Client, UDP Server, and HTTP Client, making it suitable for industrial automation, power data networking, and other data acquisition applications.

DIN-rail RS232 Serial to Ethernet converter



Figure 1: USR-DR301 DIN-Rail RS232 Serial to Ethernet Converters. These devices are designed for industrial environments, offering robust RS232 to Ethernet connectivity with a compact form factor and DIN-rail mounting capability.

2. KEY FEATURES

- **RS232 Port:** Industrial-grade terminal type for reliable serial communication.
- **Modbus RTU to Modbus TCP:** Supports protocol conversion for industrial control systems.
- **Network Heartbeat Packet:** Maintains stable network connections by sending regular heartbeat packets.
- **Identity Heartbeat Packet:** Allows the device to send an identification packet (e.g., IMEI, ICCID, or user-editable) to the TCP server when operating as a TCP Client.
- **Compact Design:** Small form factor suitable for installations with limited space.
- **DIN-Rail Mounting:** Easy installation on standard DIN-rails.
- **Durable Construction:** Made from PC+ABS material for industrial environments.

3. TECHNICAL SPECIFICATIONS

Specification	Value
Model Number	USR-DR301
Interface	RS232 (Terminal Type), Ethernet (LAN)
Dimensions (L x W x H)	109.66mm x 28mm x 64.67mm (approx.)
Item Weight	7 ounces (approx. 198g)
Mounting	DIN-Rail
Material	PC+ABS
Power Input	DC 5-36V
Compatible Devices	Monitors, PCs, PLCs, Serial Devices



Figure 2: USR-DR301 Dimensions and Port Details. The image illustrates the compact size of the device and provides a clear view of its RS232 terminal block and Ethernet port.

4. SETUP AND INSTALLATION

4.1 Physical Installation

1. **Mounting:** Securely attach the USR-DR301 to a standard DIN-rail in your industrial enclosure.
2. **Power Connection:** Connect a DC 5-36V power supply to the power input terminals. Ensure correct polarity.
3. **RS232 Connection:** Connect your RS232 serial device to the RS232 terminal block on the converter. Refer to your serial device's documentation for pinout details.
4. **Ethernet Connection:** Connect an Ethernet cable from the LAN port of the USR-DR301 to your network switch or router.



Figure 3: Basic Connection Diagram. This illustration shows the fundamental connection path from an RS232 serial device, through the USR-DR301 converter, to an Ethernet network.

4.2 Network Configuration

The USR-DR301 requires network configuration to establish communication. This typically involves setting IP addresses, port numbers, and selecting the desired operating mode. Configuration is usually performed via dedicated software on a connected PC or through a web interface.



Figure 4: Modbus RTU to Modbus TCP Configuration. This diagram shows how configuration software on a computer interacts with the USR-DR301 to enable Modbus RTU to Modbus TCP protocol conversion for communication with a PLC. For detailed configuration steps, refer to the official USR product documentation or software user guide.

5. OPERATING MODES

The USR-DR301 supports several operating modes to accommodate various network communication requirements:

- **TCP Client:** The converter initiates a TCP connection to a configured destination IP address and port. It will continuously attempt to reconnect if the connection fails.
- **TCP Server:** The converter monitors a specified port and waits for incoming TCP client connections. Data from the serial device is transmitted to all successfully connected clients.
- **UDP Client:** The converter communicates only with the target interface of a specified target IP address, ensuring data transmission accuracy.
- **UDP Server:** The converter automatically transmits received data to the last device it communicated with. This mode is suitable for scenarios where multiple network devices need to communicate with the DR301.
- **HTTP Client:** The converter supports transmitting serial data to a specified server using HTTP (GET/POST) requests.

6. APPLICATIONS

The USR-DR301 is designed for a range of industrial and data communication applications:

6.1 Power Data Networking Transmission

Facilitates the conversion of terminal data from distribution boxes into network data for real-time communication and monitoring.



Figure 5: Power Data Networking Application. The image shows the USR-DR301 integrated into a system for transmitting power data over a network.

6.2 Unattended Weighing Systems

Enables remote control of devices like barrier gates via Ethernet, connecting serial weighing equipment to a central control system.



Figure 6: Unattended Weighing Application. This image depicts the USR-DR301 facilitating remote control of a barrier gate, typical in unattended weighing scenarios.

6.3 Traffic Signal Control

Used to connect and control multiple serial-based traffic signal lights over an Ethernet network from a central server.

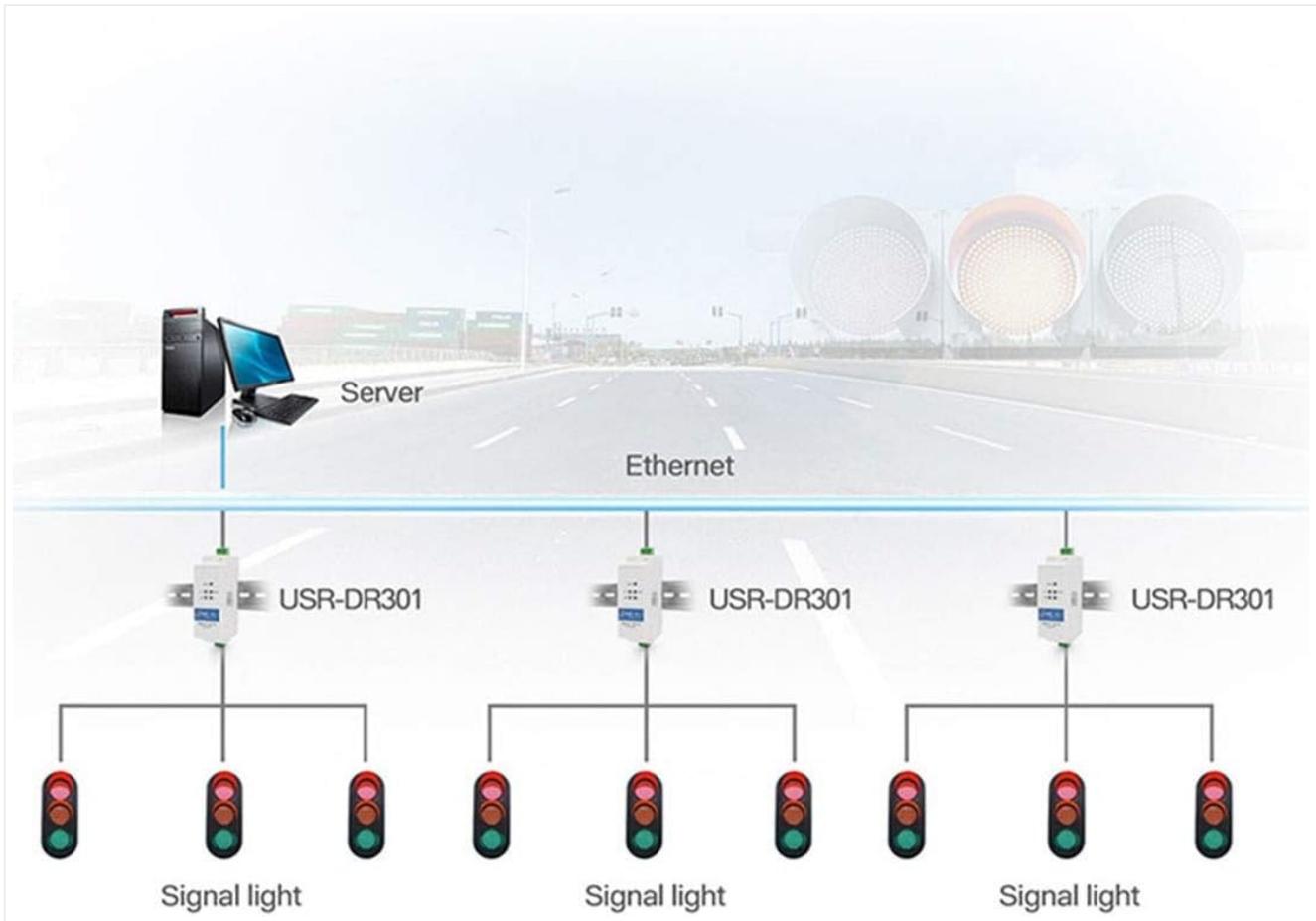


Figure 7: Traffic Signal Control Application. The diagram illustrates how multiple USR-DR301 units can connect various traffic signal lights to a central server via an Ethernet network for coordinated control.

7. TROUBLESHOOTING

This section provides basic troubleshooting steps for common issues. For more complex problems, refer to the official USR support resources.

- **No Power Indicator:**

- Verify the power supply is connected correctly and providing the specified DC 5-36V.
- Check power cable connections and ensure the power source is active.

- **No Network Connectivity:**

- Ensure the Ethernet cable is securely connected to both the USR-DR301 and the network device (switch/router).
- Check the network status indicators on the device and your network equipment.
- Verify IP address settings and subnet mask in the device's configuration.

- **No Serial Data Transmission:**

- Confirm the RS232 serial cable is correctly wired and connected to your serial device.

- Check serial port settings (baud rate, data bits, parity, stop bits) in the converter's configuration to match the serial device.
- Ensure the operating mode (TCP Client, TCP Server, etc.) is correctly configured for your application.
- **Modbus Communication Issues:**
 - Verify that the Modbus RTU and Modbus TCP settings are correctly configured, including slave IDs and register mappings.
 - Ensure the PLC or Modbus master is correctly configured to communicate with the converter.

8. MAINTENANCE

The USR-DR301 is designed for reliable operation with minimal maintenance. Follow these guidelines to ensure optimal performance:

- **Cleaning:** Keep the device clean and free from dust and debris. Use a soft, dry cloth for cleaning. Do not use liquid cleaners.
- **Environment:** Ensure the operating environment is within the specified temperature and humidity ranges. Avoid exposure to excessive moisture or extreme temperatures.
- **Firmware Updates:** Periodically check the manufacturer's website for firmware updates. Applying updates can improve performance, add features, or resolve known issues. Follow the provided instructions carefully during firmware updates.
- **Cable Integrity:** Regularly inspect all connected cables (power, RS232, Ethernet) for any signs of damage or wear. Replace damaged cables immediately.

9. WARRANTY AND SUPPORT

For technical support, warranty information, or to download the latest drivers and software, please visit the official USR website or contact their customer service department.

Manufacturer: PUSR

Model: USR-DR301

Refer to the product packaging or the official USR website for specific warranty terms and conditions.