

Moxa MGate MB3170

MOXA MGate MB3170 Advanced Modbus Gateway User Manual

MODEL: MGATE MB3170

1. Introduction

The Moxa MGate MB3170 is a 1-port advanced Modbus gateway designed to seamlessly convert between Modbus TCP/IP Ethernet networks and Modbus RTU/ASCII serial devices. This gateway acts as a critical bridge, enabling modern control systems to communicate effectively with a wide range of legacy industrial equipment. It integrates diverse Modbus devices into a unified communication infrastructure, enhancing flexibility, performance, and overall system resilience in industrial environments.

2. Product Overview

The MGate MB3170 offers robust features for reliable Modbus protocol conversion and network integration.

Key Features:

- Seamlessly converts between Modbus TCP, Modbus RTU, and Modbus ASCII protocols.
- Equipped with 1 software-selectable serial port (DB9 male for RS-232, terminal block for RS-422/485).
- Supports RS-232, RS-422, and 2-wire/4-wire RS-485 standards.
- Automatic Data Direction Control (ADDC) for RS-485 simplifies wiring and ensures reliable data transmission.
- Selectable 120-ohm termination and 1 k Ω /150 k Ω pull high/low resistors for RS-485.
- Wide baud rate support from 50 bps to 921.6 kbps.
- 15 kV ESD protection for all serial signals.
- 2 x 10/100BaseT(X) RJ45 Ethernet ports with auto MDI/MDI-X and built-in Ethernet cascading functionality.
- 1.5 kV magnetic isolation protection for Ethernet.
- Can operate simultaneously as Modbus TCP Client/Server and Modbus RTU/ASCII Master/Slave.
- Supports connecting up to 32 Modbus TCP clients/masters or to 32 Modbus TCP slaves/servers.
- Supports up to 31 or 62 Modbus RTU/ASCII slaves on the serial port.

Product Views:



Figure 2.1: Front view of the MGate MB3170 (right) alongside an MB3270I, highlighting the LED indicators (PWR1, PWR2, RDY, P1) and dual Ethernet ports.



Figure 2.2: Angled view of the MGate MB3170 (right) and MB3270I, illustrating the front panel with Ethernet ports and LEDs, and the bottom panel where the serial port (DB9) is located.

PWR1

PWR2

RDY

P1

MOXA



Ethernet 1



Ethernet 2

Mgate

MB3170

Figure 2.3: Detailed front view of a single MGate MB3170 unit, clearly showing the PWR1, PWR2, RDY, and P1 LEDs, along with Ethernet 1 and Ethernet 2 ports.





Figure 2.4: Side view of the MGate MB3170, illustrating the power input terminal block at the top and the integrated clip for DIN-rail mounting.

3. Setup and Installation

3.1 Physical Installation:

The MGate MB3170 is designed for industrial environments and typically mounts on a standard DIN-rail. Ensure adequate ventilation around the unit for optimal performance.

- Attach the gateway securely to a DIN-rail in a control cabinet or suitable enclosure.
- Maintain sufficient clearance around the device for heat dissipation and cable routing.

3.2 Wiring Connections:

Proper wiring is crucial for reliable operation. Refer to the pin assignments for each port type.

3.2.1 Power Input:

The MGate MB3170 supports redundant power inputs (PWR1 and PWR2) for enhanced reliability. Connect a 12-48 VDC power source to the terminal block at the top of the unit.

- Connect the positive (+) wire to the V+ terminal and the negative (-) wire to the V- terminal for each power input.
- Ensure proper grounding of the device.

3.2.2 Ethernet Ports:

The gateway features two 10/100BaseT(X) RJ45 Ethernet ports (Ethernet 1 and Ethernet 2) with auto MDI/MDI-X. These ports support daisy-chaining, reducing the need for external Ethernet switches.

- Connect standard Ethernet cables (Cat5e or better) from your network devices to the RJ45 ports.
- For cascading, connect Ethernet 2 of one gateway to Ethernet 1 of the next gateway.

3.2.3 Serial Port:

The single serial port is software-selectable for RS-232 (DB9 male connector) or RS-422/485 (terminal block). Configure the serial mode and parameters (baud rate, data bits, parity, stop bits) via the device's configuration interface.

- **RS-232:** Use a standard DB9 serial cable to connect to your RS-232 device.
- **RS-422/485:** Connect the A/B (Data+/Data-) and GND wires to the corresponding terminals on the removable terminal block.
- For RS-485, enable the 120-ohm termination resistor and pull high/low resistors as needed for network stability.
- Leverage Automatic Data Direction Control (ADDC) for RS-485 to simplify wiring and ensure proper data flow.

4. Operating Instructions

4.1 Initial Configuration:

The MGate MB3170 is typically configured via a web-based interface or Moxa's provided utility software. Refer to the product's detailed software manual for specific instructions.

- Assign an IP address to the gateway that is compatible with your network.
- Configure the serial port parameters (baud rate, data format, flow control) to match your serial Modbus devices.
- Set up the Modbus operating modes (e.g., Modbus TCP Master to Modbus RTU Slave, or Modbus RTU Master to Modbus TCP Slave).

4.2 Modbus Operation Modes:

The gateway supports various Modbus communication scenarios:

- **Modbus TCP Client (Master) to Modbus RTU/ASCII Slave:** Allows an Ethernet-based Modbus TCP master to communicate with serial Modbus RTU/ASCII slave devices connected to the gateway's serial port.
- **Modbus RTU/ASCII Master to Modbus TCP Server (Slave):** Enables a serial Modbus RTU/ASCII master to communicate with Modbus TCP server devices on the Ethernet network.
- The gateway can operate in multiple roles simultaneously, providing flexible integration options.

5. Maintenance

Regular maintenance ensures the longevity and reliable operation of your MGate MB3170 gateway.

- **Cleaning:** Periodically clean the exterior of the unit with a soft, dry cloth. Do not use liquid or aerosol cleaners.
- **Connection Check:** Verify that all power, Ethernet, and serial connections are secure and free from damage.
- **Firmware Updates:** Check the Moxa website periodically for firmware updates. Applying updates can improve performance, add features, or address security vulnerabilities. Follow the provided instructions carefully when performing firmware upgrades.
- **Environmental Conditions:** Ensure the operating environment remains within the specified temperature and humidity ranges to prevent damage.

6. Troubleshooting

This section provides basic troubleshooting steps for common issues.

6.1 LED Indicators:

The LEDs on the front panel provide quick status information:

- **PWR1/PWR2:** Indicate power status for each redundant input. Should be ON when power is supplied.
- **RDY:** Indicates the system is ready. Should be ON when the device is operating normally.
- **P1:** Status indicator for the serial port. Blinks during data transmission/reception.
- **Ethernet Link/Activity LEDs:** Located on the RJ45 ports, indicate network link status and data activity.

6.2 Common Issues and Solutions:

- **No Power:**
 - Check power supply connections and voltage.
 - Ensure PWR1/PWR2 LEDs are illuminated.
- **No Network Connectivity:**
 - Verify Ethernet cable connections.
 - Check network device status (switch, router).
 - Confirm IP address configuration and subnet mask.
 - Ensure Ethernet Link/Activity LEDs are active.
- **Serial Communication Failure:**
 - Verify serial cable connections and pinouts.
 - Check serial port configuration (baud rate, data bits, parity, stop bits) matches the connected device.

- Ensure correct RS-232/422/485 mode selection.
- For RS-485, check termination and pull-up/down resistor settings.
- Observe the P1 LED for data activity.

• **Modbus Communication Errors:**

- Confirm Modbus ID/address settings on both master and slave devices.
- Verify Modbus function codes and data registers are correctly configured.
- Check for network latency or serial bus contention issues.

If issues persist, consult the detailed product manual available on the Moxa website or contact Moxa technical support.

7. Specifications

Category	Specification
Model	MGate MB3170
Protocol Support	Modbus TCP, Modbus RTU, Modbus ASCII
Ethernet Ports	2 x 10/100BaseT(X) RJ45 (Auto MDI/MDI-X, Cascading)
Ethernet Isolation	1.5 kV magnetic isolation
Serial Ports	1 x software-selectable (RS-232/422/485)
Serial Connector	DB9 male (RS-232), Terminal block (RS-422/485)
Serial Baud Rate	50 bps to 921.6 kbps
Serial Protection	15 kV ESD protection
RS-485 Features	ADDC, Selectable 120Ω termination, 1 kΩ/150 kΩ pull high/low resistors
Power Input	Redundant 12-48 VDC (via terminal block)
Operating Temperature	0 to 60°C (32 to 140°F)
Mounting	DIN-rail mounting

8. Warranty and Support

For detailed warranty information, technical support, and additional resources, please refer to the official Moxa website or contact your authorized Moxa distributor. Moxa provides comprehensive support and documentation for its products.

Moxa Official Website: www.moxa.com

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question