# MGate 5109 Series

*1-port Modbus RTU/ASCII/TCP-to-DNP3 serial/TCP/UDP gateways*

## Features and Benefits

- Supports Modbus RTU/ASCII/TCP master/client and slave/server
- Supports DNP3 serial/TCP/UDP master and outstation (Level 2)
- DNP3 master mode supports up to 26600 points
- Supports time-synchronization through DNP3
- Effortless configuration via web-based wizard
- Built-in Ethernet cascading for easy wiring
- Embedded traffic monitoring/diagnostic information for easy troubleshooting and cloud data transmission for cost evaluation and analysis
- microSD card for configuration backup/duplication and event logs
- Status monitoring and fault protection for easy maintenance
- Redundant dual DC power inputs and relay output
- -40 to 75°C wide operating temperature models available
- Serial port with 2 kV isolation protection

## Certifications

## Introduction

The MGate 5109 is an industrial Ethernet gateway for Modbus RTU/ASCII/TCP and DNP3 serial/TCP/UDP protocol conversion. All models are protected with a rugged metallic casing, are DIN-rail mountable, and offer built-in serial isolation. The MGate 5109 supports transparent mode to easily integrate Modbus TCP to Modbus RTU/ASCII networks or DNP3 TCP/UDP to DNP3 serial networks. The MGate 5109 also supports agent mode to exchange data between Modbus and DNP3 networks or to act as a data concentrator for multiple Modbus slaves or multiple DNP3 outstations. The rugged design is suitable for industrial applications such as power, oil and gas, and water and wastewater.

### Easy Configuration via Web Console

The MGate 5109 Series comes with an illustrated Quick Setup guide designed to make configuration easy. With Quick Setup, you can easily access protocol conversion modes and finish the configuration in a few steps. The MGate 5109 Series also supports Auto Detection for DNP3 serial outstations, allowing the MGate 5109 to automatically acquire all outstation objects when configured as a DNP3 master.

### Modbus and DNP3 Protocol Traffic Monitor

The MGate 5109 gateways support Modbus and DNP3 Protocol Traffic Monitor for easy troubleshooting, especially during the installation stage. Communication issues could be caused by incorrect software parameters, such as slave ID and register address, or incorrect command configuration. With Modbus/DNP3 Protocol Traffic Monitor, you can check the captured data and easily identify the root cause.

### A Variety of Maintenance Functions

The MGate 5109 gateways provide a web console and Telnet console for remote maintenance. Encryption communication functions, including HTTPS and SSH, are supported to provide better network security. In addition, firmware log functions are provided to record connection events and Modbus maintenance events. Users can review log data remotely through the web console.

## Specifications

### Ethernet Interface

| | |
|---|---|
| 10/100BaseT(X) Ports (RJ45 connector) | 2<br>Auto MDI/MDI-X connection |
| Magnetic Isolation Protection | 1.5 kV (built-in) |

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## Ethernet Software Features

| | |
|---|---|
| Industrial Protocols | Modbus TCP Client (Master)<br>Modbus TCP Server (Slave)<br>DNP3 TCP Master<br>DNP3 TCP Outstation |
| Configuration Options | Web Console (HTTP/HTTPS)<br>Device Search Utility (DSU)<br>Telnet Console |
| Management | ARP<br>DHCP Client<br>DNS<br>HTTP<br>HTTPS<br>SMTP<br>SNMP Trap<br>SNMPv1/v2c/v3<br>TCP/IP<br>Telnet<br>SSH<br>UDP<br>NTP Client |
| MIB | RFC1213, RFC1317 |
| Time Management | NTP Client |

## Security Functions

| | |
|---|---|
| Authentication | Local database |
| Encryption | HTTPS<br>AES-128<br>AES-256<br>SHA-256 |
| Security Protocols | SNMPv3<br>SNMPv2c Trap<br>HTTPS (TLS 1.3) |

## Serial Interface

| | |
|---|---|
| Console Port | RS-232 (TxD, RxD, GND), 8-pin RJ45 (115200, n, 8, 1) |
| No. of Ports | 1 |
| Connector | DB9 male |
| Serial Standards | RS-232/422/485 |
| Baudrate | 50 bps to 921.6 kbps |
| Data Bits | 7, 8 |
| Parity | None<br>Even<br>Odd<br>Space<br>Mark |
| Stop Bits | 1, 2 |
| Flow Control | RTS Toggle (RS-232 only)<br>RTS/CTS |
| RS-485 Data Direction Control | Automatic Data Direction Control (ADDC) |
| Pull High/Low Resistor for RS-485 | 1 kilo-ohm, 150 kilo-ohms |

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| | |
|---|---|
| Terminator for RS-485 | 120 ohms |
| Isolation | 2 kV (built-in) |

### Serial Signals

| | |
|---|---|
| RS-232 | TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND |
| RS-422 | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-2w | Data+, Data-, GND |
| RS-485-4w | Tx+, Tx-, Rx+, Rx-, GND |

### Serial Software Features

| | |
|---|---|
| Configuration Options | Serial Console |
| Industrial Protocols | Modbus RTU/ASCII Master<br>Modbus RTU/ASCII Slave<br>DNP3 Serial Master<br>DNP3 Serial Outstation |

### Modbus RTU/ASCII

| | |
|---|---|
| Mode | Master, Slave |
| Functions Supported | 1, 2, 3, 4, 5, 6, 15, 16, 23 |
| Max. No. of Commands | 100 |

### Modbus TCP

| | |
|---|---|
| Functions Supported | 1, 2, 3, 4, 5, 6, 15, 16, 23 |
| Mode | Client (Master), Server (Slave) |
| Max. No. of Client Connections | 16 |
| Max. No. of Server Connections | 32 |
| Max. No. of Commands | 100 |

### DNP3 (Transparent)

| | |
|---|---|
| Max. No. of Master Connections | 16 |
| Max. No. of Outstation Connections | 32 |

### DNP3 Serial

| | |
|---|---|
| Mode | Master, Outstation |
| Max. No. of Master Connections | 1 |
| Max. No. of Outstation Connections | 31 |
| Internal Outstation Database | Binary Inputs: 8192 points<br>Analog Inputs: 2048 points<br>Counters: 2048 points<br>Binary Outputs: 8192 points<br>Analog Outputs: 2048 points<br>Binary Input Events: 1024<br>Analog Input Events: 1024<br>Counter Events: 1024 |

## DNP3 TCP/UDP

| | |
|---|---|
| Mode | Master, Outstation |
| Max. No. of Master Connections | 1 |
| Max. No. of Outstation Connections | 32 |
| Internal Master Database (MGate as DNP3 Master) | Binary Inputs: 8192 points (256 points per outstation)<br>Binary Outputs: 8192 points (256 points per outstation)<br>Analog Inputs: 2048 points (64 points per outstation)<br>Analog Outputs: 2048 points (64 points per outstation)<br>Counters: 2048 points (64 points per outstation) |
| Internal Outstation Database | Binary Inputs: 8192 points<br>Analog Inputs: 2048 points<br>Counters: 2048 points<br>Binary Outputs: 8192 points<br>Analog Outputs: 2048 points<br>Binary Input Events: 1024<br>Analog Input Events: 1024<br>Counter Events: 1024 |

## Memory

| | |
|---|---|
| microSD Slot | Up to 32 GB (SD 2.0 compatible) |

## Power Parameters

| | |
|---|---|
| Input Voltage | 12 to 48 VDC |
| Input Current | 455 mA @ 12 VDC |
| Power Connector | Screw-fastened Euroblock terminal |

## Relays

| | |
|---|---|
| Contact Current Rating | Resistive load: 2 A @ 30 VDC |

## Physical Characteristics

| | |
|---|---|
| Housing | Metal |
| IP Rating | IP30 |
| Dimensions | 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in) |
| Weight | 507 g (1.12 lb) |

## Environmental Limits

| | |
|---|---|
| Operating Temperature | MGate 5109: 0 to 60°C (32 to 140°F)<br>MGate 5109-T: -40 to 75°C (-40 to 167°F) |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F) |
| Ambient Relative Humidity | 5 to 95% (non-condensing) |

## Standards and Certifications

| | |
|---|---|
| EMC | EN 55032/35 |
| EMI | CISPR 32, FCC Part 15B Class B |
| EMS | IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV<br>IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m<br>IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV<br>IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV<br>IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m; Signal: 10 V/m<br>IEC 61000-4-8 PFMF |
| Safety | EN 62368-1 |

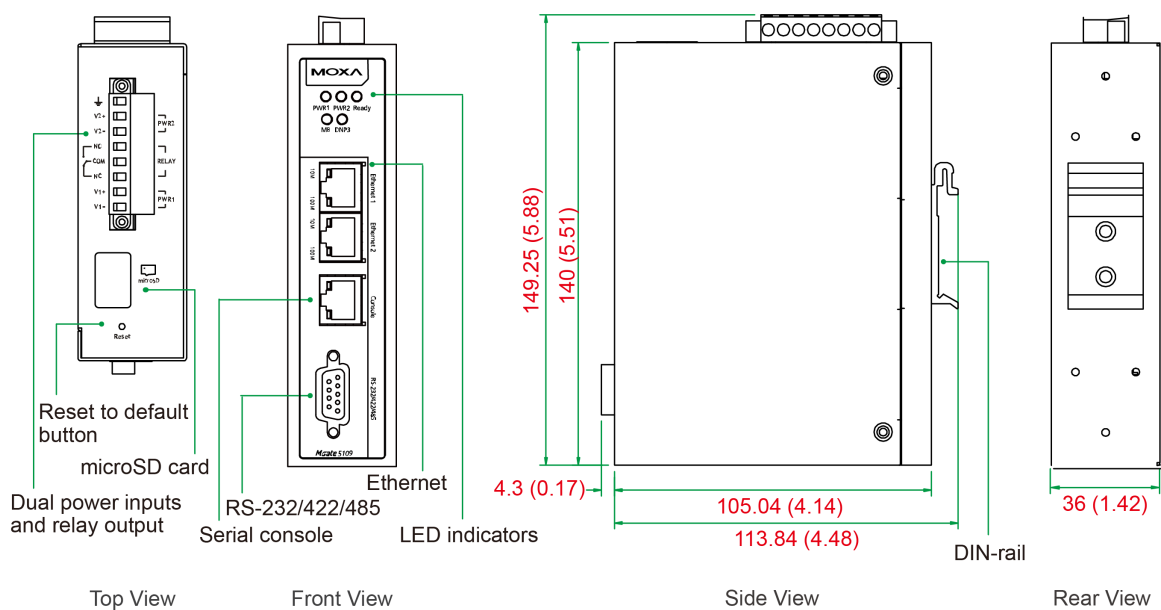| | UL 508 |
|---|---|
| Hazardous Locations | ATEX<br>Class I Division 2<br>IECEx |
| Freefall | IEC 60068-2-32 |
| Shock | IEC 60068-2-27 |
| Vibration | IEC 60068-2-6<br>IEC 60068-2-64 |

**MTBF**

| | |
|---|---|
| Time | 888,926 hrs |
| Standards | Telcordia SR332 |

**Warranty**

| | |
|---|---|
| Warranty Period | 5 years |
| Details | See www.moxa.com/warranty |

**Package Contents**

| | |
|---|---|
| Device | 1 x MGate 5109 Series gateway |
| Cable | 1 x RJ45-to-DB9 console cable |
| Installation Kit | 1 x DIN-rail kit |
| Documentation | 1 x quick installation guide<br>1 x warranty card |

## Dimensions

Unit: mm (inch)



Top View — Reset to default button, microSD card, Dual power inputs and relay output

Front View — Serial console, RS-232/422/485, Ethernet, LED indicators

Side View — 149.25 (5.88), 140 (5.51), 4.3 (0.17), 105.04 (4.14), 113.84 (4.48), DIN-rail

Rear View — 36 (1.42)

## Ordering Information

| Model Name | Operating Temp. |
| --- | --- |
| MGate 5109 | 0 to 60°C |
| MGate 5109-T | -40 to 75°C |

## Accessories (sold separately)

### Cables

| | |
| --- | --- |
| CBL-F9M9-150 | DB9 female to DB9 male serial cable, 1.5 m |
| CBL-F9M9-20 | DB9 female to DB9 male serial cable, 20 cm |
| CBL-RJ45F9-150 | 8-pin RJ45 to DB9 female serial cable, 1.5m |
| CBL-RJ45SF9-150 | 8-pin RJ45 to DB9 female serial cable with shielding, 1.5m |

### Connectors

| | |
| --- | --- |
| Mini DB9F-to-TB | DB9 female to terminal block connector |

### Power Cords

| | |
| --- | --- |
| CBL-PJTB-10 | Non-locking barrel plug to bare-wire cable |

### Mounting Kits

| | |
| --- | --- |
| DK-25-01 | DIN-rail mounting kit, 2 screws |
| WK-36-02 | DIN-rail/wall-mounting kit, 2 plates, 6 screws |

www.moxa.com