

# MGate™ 5109 Series

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



- > Supports Modbus master/slave and DNP3 master/outstation
- > Up to 31 Modbus serial slaves or DNP3 serial outstations
- > Up to 32 Modbus TCP slaves or DNP3 TCP/UDP outstations
- > Supports DNP 3.0 subset level 2
- > DNP3 master mode supports up to 26600 points
- > DNP3 master and outstation modes support time-synchronization
- > Complete diagnosis information for maintenance
- > Embedded Modbus and DNP3 serial traffic monitor
- > Redundant dual DC power inputs and relay output
- > microSD card for configuration backup and system log
- > -40 to 75°C wide operating temperature models available
- > Serial port with 2 kV built-in isolation protection
- > Built-in Ethernet cascading for easy wiring



### : Overview

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 for easily integrating Modbus TCP to Modbus RTU/ASCII networks or DNP3 TCP/UDP to DNP3 serial networks. The MGate

5109 also support 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 & 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 series 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.

### : Variety of Maintenance Functions

The MGate 5109 series gateway provides 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

**Protocols:** Modbus TCP client/server, DNP 3.0 TCP/UDP master/outstation

**Number of Ports:** 2 (1 IP, Ethernet cascade)

**Speed:** 10/100 Mbps, Auto MDI/MDIX

**Connector:** 8-pin RJ45

**Magnetic Isolation Protection:** 1.5 kV (built-in)

### Serial Interface

**Protocols:** Modbus RTU/ASCII Master/Slave

**Number of Ports:** 1

**Serial Standards:** RS-232/422/485, software selectable

**Connectors:** DB9 male

**RS-485 Data Direction Control:** ADDC® (automatic data direction control)

**Pull High/Low Resistor for RS-485:** 1 kΩ, 150 kΩ

**Terminator for RS-485:** 120 Ω

**Isolation:** 2 kV (built-in)

### Serial Communication Parameters

**Data Bits:** 7, 8

**Stop Bits:** 1, 2

**Parity:** None, Even, Odd, Space, Mark

**Flow Control:** RTS/CTS, RTS Toggle (RS-232 only)

**Baudrate:** 50 bps to 921.6 kbps

### Serial Signals

**RS-232:** TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

**RS-422:** Tx+, Tx-, Rx+, Rx-, GND

**RS-485-4w:** Tx+, Tx-, Rx+, Rx-, GND

**RS-485-2w:** Data+, Data-, GND

### Modbus

**Functions Supported:** 1, 2, 3, 4, 5, 6, 15, 16, 23

**Max. No. of Commands:** 100

**Max. No. of Connections:**

MGate as Modbus TCP Master: 32 slave connections

MGate as Modbus TCP slave: 16 master connections

### DNP3

**Max. No. of Connections:**

- Transparent mode:
  - 16 master connections or 32 outstation connections
- Agent mode:
  - MGate as DNP3 TCP/UDP master: 32 outstation connections
  - MGate as DNP3 TCP/UDP outstation: 1 master connection

### DNP3 Internal Database:

- For each outstation:
  - Binary Inputs: 256 points
  - Analog Inputs: 64 points
  - Counters: 64 points
  - Binary Outputs: 256 points
  - Analog Outputs: 64 points
- When the MGate 5109 is configured as a DNP3 outstation
  - Binary Inputs: 8192 points
  - Counters: 2048 points
  - Binary Outputs: 8192 points
  - Analog Outputs: 2048 points
  - Binary Input Events: 100
  - Analog Input Events: 100
  - Counter Events: 100

### Software

**Configuration Options:** Web Console, Serial Console Utility

**Configuration:** MXview, SNMP (v1, v2, v3), Private MIB

### Physical Characteristics

**Housing:** Metal, IP30

**Weight:** 507 g (1.12 lb)

**Dimensions:** 36 x 105 x 140 mm (1.42 x 4.14 x 5.51 in)

**Storage Card Slot:** 1 microSD (SDHC) card slot supports up to 32 GB

**Relay Alarm Circuit:** 3-pin circuit with current carrying capacity of 2 A @ 30 VDC

### Environmental Limits

**Operating Temperature:**

Standard Models: 0 to 60°C (32 to 140°F)

Wide Temp. Models: -40 to 75°C (-40 to 167°F)

**Storage Temperature:** -40 to 85°C (-40 to 185°F)

**Ambient Relative Humidity:** 5 to 95% (non-condensing)

**Vibration:** IEC 60068-2-6, IEC 60068-2-64

**Shock:** IEC 60068-2-27

**Drop:** IEC 60068-2-32

### Power Requirements

**Input Voltage:** 12 to 48 VDC

**Input Current:** 455 mA max., Class 2

**Power Connector:** Terminal block

### Standards and Certifications

**Safety:** UL 508, EN 60950-1

**Hazardous Location:** Class 1 Division 2, ATEX, IECEx

**EMC:** EN 55022/24

**EMI:** CISPR 22, FCC Part 15B Class B

**EMS:**

IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV

IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m

IEC 61000-4-4 EFT: Power: 4 kV; Signal: 2 kV

IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV

IEC 61000-4-6 CS: 150 kHz to 80 MHz: 10 V/m

IEC 61000-4-8 PFMF

### MTBF (mean time between failures)

**Time:** 859,422 hrs

**Standard:** Telcordia SR332

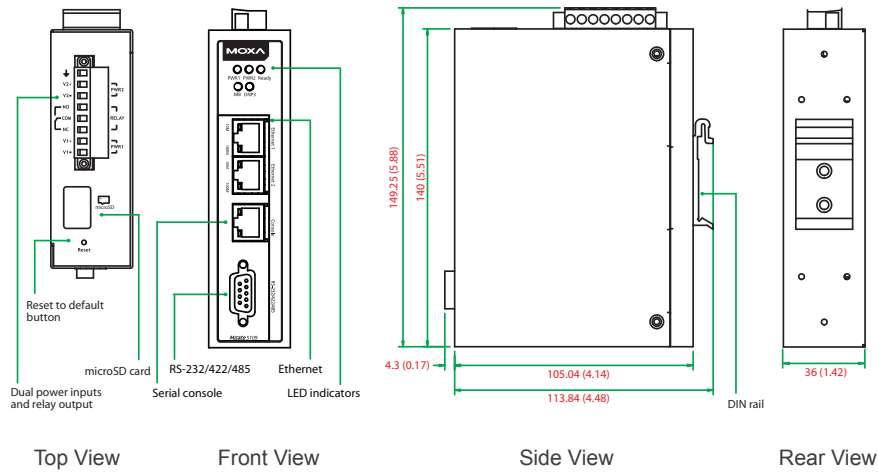
### Warranty

**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

## Dimensions

Unit: mm (inch)



## Ordering Information

### Available Models

**MGate 5109:** 1-port Modbus-to-DNP3 gateway, 0 to 60°C operating temperature

**MGate 5109-T:** 1-port Modbus-to-DNP3 gateway, -40 to 75°C operating temperature

### Optional Accessories (can be purchased separately)

**DR-4524:** 45W/2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input

**DR-75-24:** 75W/3.2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input

**DR-120-24:** 120W/5A DIN-rail 24 VDC power supply with 88 to 132 VAC/176 to 264 VAC input by switch

**WK-36-02:** Wall-mounting kit

**Mini DB9F-to-TB:** DB9-female-to-terminal-block adapter

### Package Checklist

- 1 MGate 5109 gateway
- 1 serial cable: DBL-RJ45F9-150
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card