

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
- > IEC 62443-4-2 compliant



: 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 DNP3 TCP master connections or 32 DNP3 TCP 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
 - Analog Inputs: 2048 points
 - Counters: 2048 points
 - Binary Outputs: 8192 points
 - Analog Outputs: 2048 points
 - Binary Input Events: 1024
 - Analog Input Events: 1024
 - Counter Events: 1024

Software

Configuration Options: Web Console, Serial Console

Utility: Device Search Utility (DSU) for Windows 95, 98, ME, NT, 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1/10 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2

Configuration: MXconfig, MXview, SNMP (v1, v2c, 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

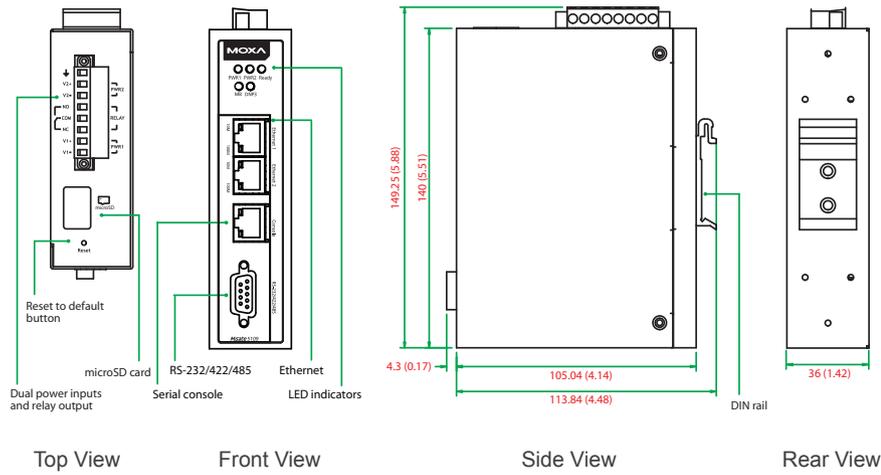
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

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