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
- 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
- Security features based on IEC 62443

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 Auto MDI/MDI-X connection
Magnetic Isolation Protection	1.5 kV (built-in)

Ethernet Software Features

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

Security Functions

Authentication	Local database
Encryption	HTTPS, AES-128, AES-256, SHA-256
Security Protocols	SNMPv3 SNMPv2c Trap 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, Even, Odd, Space, Mark
Stop Bits	1, 2
Flow Control	RTS Toggle (RS-232 only), RTS/CTS
RS-485 Data Direction Control	ADDC® (automatic data direction control)
Pull High/Low Resistor for RS-485	1 kilo-ohm, 150 kilo-ohms
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, Modbus RTU/ASCII Slave, DNP3 Serial Master, 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 Master Database (each Master)	Binary Inputs: 8192 points Analog Inputs: 2048 points Counters: 2048 points Binary Outputs: 8192 points Analog Outputs: 2048 points
Internal Outstation Database	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

DNP3 TCP/UDP

Mode	Master, Outstation
Max. No. of Master Connections	1
Max. No. of Outstation Connections	32
Internal Master Database (each Master)	Binary Inputs: 8192 points Analog Inputs: 2048 points Counters: 2048 points Binary Outputs: 8192 points Analog Outputs: 2048 points
Internal Outstation Database	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

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) 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

Safety	EN 60950-1, UL 508
EMC	EN 55032/24
EMI	CISPR 32, 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; Signal: 10 V/m IEC 61000-4-8 PFMF
Hazardous Locations	ATEX, Class I Division 2, IECEx
Freefall	IEC 60068-2-32
Shock	IEC 60068-2-27
Vibration	IEC 60068-2-6, IEC 60068-2-64

MTBF

Time	888,926 hrs
Standards	Telcordia SR332

Warranty

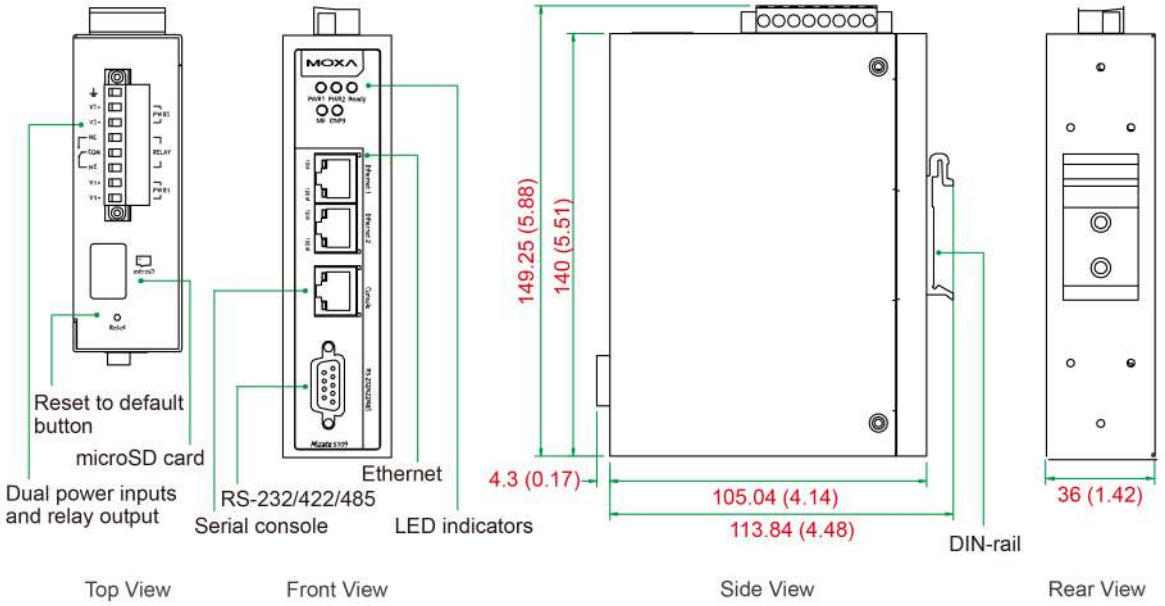
Warranty Period	5 years
Details	See www.moxa.com/warranty

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 1 x warranty card

Dimensions

Unit: mm (inch)



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

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