MGate 5119 Series

1-port DNP3/IEC 101/IEC 104/Modbus-to-IEC 61850 gateways

Features and Benefits

- Supports IEC 61850 MMS server
- Supports DNP3 serial/TCP master
- Supports IEC 60870-5-101 master (balanced/unbalanced)
- Supports IEC 60870-5-104 client
- Supports Modbus RTU/ASCII/TCP master/client
- Embedded traffic monitoring/diagnostic information for easy troubleshooting
- Built-in Ethernet cascading for easy wiring
- -40 to 75°C operating temperature range
- Serial port with 2 kV isolation protection
- Supports IEC 61850 MMS and DNP3 TCP protocol encryption
- Security features based on IEC 62443/NERC CIP
- Compliant with IEC 61850-3 and IEEE 1613
- Built-in SCL file generator for easy configuration

Certifications

c(UL)us LISTED   CE   FC   IEC 61850-3 / IEEE 1613

Introduction

The MGate 5119 is an industrial Ethernet gateway with 2 Ethernet ports and 1 RS-232/422/485 serial port. To integrate Modbus, IEC 60870-5-101, and IEC 60870-5-104 devices with an IEC 61850 MMS network, use the MGate 5119 as a Modbus master/client, IEC 60870-5-101/104 master, and DNP3 serial/TCP master to collect and exchange data with IEC 61850 MMS systems.

Easy Configuration via SCL Generator

The MGate 5119 as an IEC 61850 MMS server, typically, requires the import of a SCL file generated by a 3rd party tool. This can be time-consuming and increase costs. To overcome this pain point, MGate 5119 has a built-in SCL generator, which can easily generate SCL files through the web console and make them available almost immediately saving configuration time and cost.

Easy Troubleshooting via Traffic Monitor

MGate 5119 Series gateways support Modbus RTU/ASCII/TCP, IEC 60870-5-101, IEC 60870-5-104, and IEC 61850 MMS Protocol Traffic Monitor for easy troubleshooting, especially during the installation stage. It is worth mentioning that traffic logs can be viewed in the popular troubleshooting tool, Wireshark. With this feature, you can easily analyze traffic to determine the root cause of a problem.

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) IEC 60870-5-104 Client IEC 61850 MMS Server DNP3 TCP Master
Configuration Options	Web Console (HTTP/HTTPS) Device Search Utility (DSU)
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	Even Mark None Odd Space
Stop Bits	1, 2
Flow Control	RTS Toggle (RS-232 only) 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

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

Industrial Protocols	Modbus RTU/ASCII Master IEC 60870-5-101 Master (Balanced/Unbalanced) DNP3 Serial Master

Modbus RTU/ASCII

Mode	Master
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Commands	128

Modbus TCP

Mode	Client (Master)
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Server Connections	32
Max. No. of Commands	128

IEC 60870-5-104

Mode	Client
Objects Supported	Single point Double point Step position Bit string of 32 bit Measured value (normalized) Measured value (scaled) Measured value (floating) Integrated totals
Max. No. of Server Connections	32
Max. No. of Information Objects	1200 points

IEC 60870-5-101

Mode	Master (Balanced/Unbalanced)
Objects Supported	Single point Double point Step position Bit string of 32 bit Measured value (normalized) Measured value (scaled) Measured value (floating) Integrated totals

Max. No. of Slave Connections	1 (Balanced), 31 (Unbalanced)
Max. No. of Information Objects	1200 points

DNP3 Serial

Mode	Master
Objects Supported	Binary inputs Analog inputs Counters Frozen counters Binary outputs Analog outputs
Max. No. of Outstation Connections	16
Max. No. of Objects	1200 points

DNP3 TCP

Mode	Master
Objects Supported	Binary inputs Analog inputs Counters Frozen counters Binary outputs Analog outputs
Max. No. of Outstation Connections	16
Max. No. of Objects	1200 points

IEC 61850

Mode	MMS Server
Max. No. of Client Connections	16
Max. No. of Datasets	99
Max. No. of Reports	99
Max. No. of Data Objects	1200 points

Memory

No. of Data Points Supported	1,200 points
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 120 x 150 mm (1.42 x 4.72 x 5.91 in)
Weight	517 g (1.14 lb)

Environmental Limits

Operating Temperature	-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 A
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 4 kV IEC 61000-4-6 CS: 10 V/m IEC 61000-4-8 PFMF: 100 A/m
Safety	IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
Freefall	IEC 60068-2-32
Shock	IEC 60068-2-27 IEC 61850-3 Edition 2.0
Power Substation	IEEE 1613 IEC 61850-3
Vibration	IEC 60068-2-6 IEC 60068-2-64 IEC 61850-3 Edition 2.0

MTBF

Time	1,180,203 hrs
Standards	Telcordia SR332

Warranty

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

Package Contents

Device	1 x MGate 5119 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)
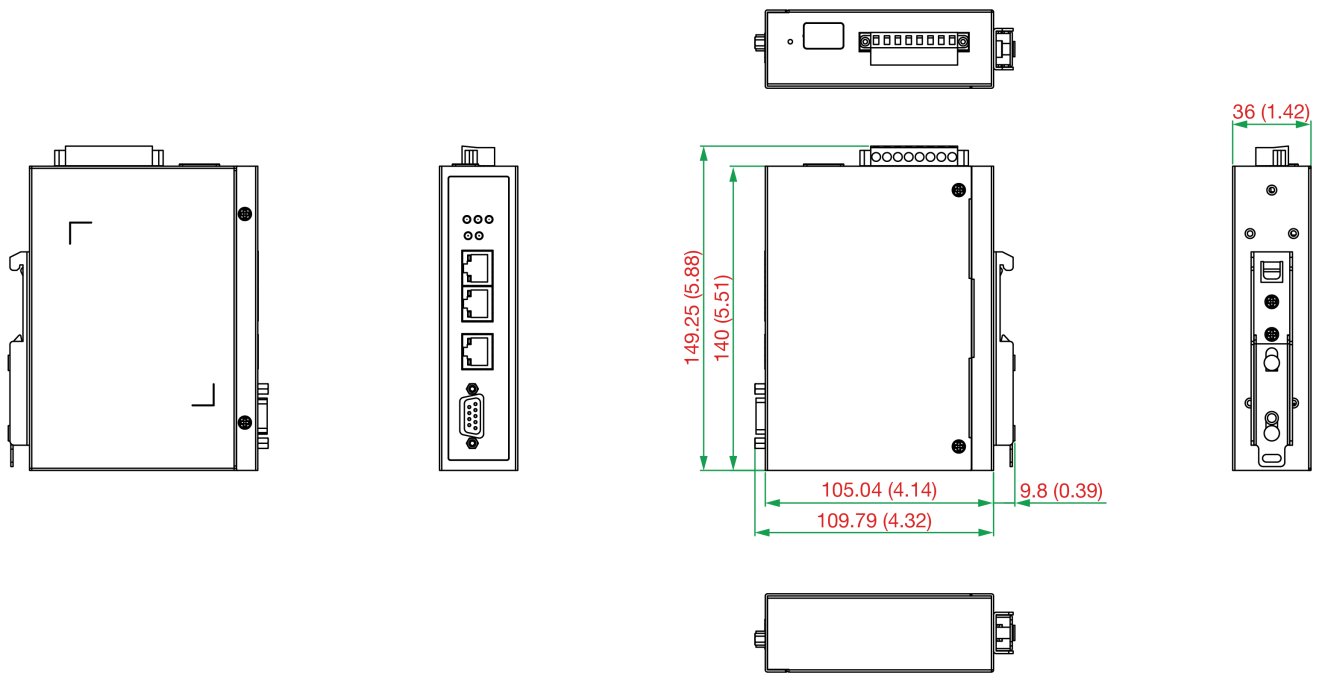
Ordering Information

Model Name	Operating Temperature
MGate 5119-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

WK-36-02	DIN-rail/wall-mounting kit, 2 plates, 6 screws