

1-port MQTT-supported Modbus RTU/ASCII/TCP-to-EtherNet/IP gateways



Features and Benefits

- Connects fieldbus data to cloud through generic MQTT
- Supports MQTT connection with built-in device SDKs to Azure/Alibaba Cloud
- Protocol conversion between Modbus and EtherNet/IP
- Supports EtherNet/IP Scanner/Adapter
- Supports Modbus RTU/ASCII/TCP master/client and slave/server
- Supports MQTT connection with TLS and certificate in JSON and Raw data format
- 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, and data buffering when cloud connection is lost
- -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 5105-MB-EIP is an industrial Ethernet gateway for Modbus RTU/ASCII/TCP and EtherNet/IP network communications with IIoT applications, based on MQTT or third-party cloud services, such as Azure and Alibaba Cloud. To integrate existing Modbus devices onto an EtherNet/IP network, use the MGate 5105-MB-EIP as a Modbus master or slave to collect data and exchange data with EtherNet/IP devices. The latest exchange data will be stored in the gateway as well. The gateway converts stored Modbus data into EtherNet/IP packets so the EtherNet/IP scanner can control or monitor Modbus devices. The MQTT standard with supported cloud solutions on the MGate 5105-MB-EIP leverages advanced security, configuration, and diagnostics to troubleshoot technologies to deliver scalable and extensible solutions that are suitable for remote monitoring applications such as energy management and assets management.

Configuration Backup via microSD Card

The MGate 5105-MB-EIP is equipped with a microSD card slot. A microSD card can be used to back up both the system configuration and system log, and can be used to conveniently copy the same configuration to several MGate 5105-MP-EIP units. The configuration file stored in the microSD card will be copied to the MGate itself when the system is rebooted.

Effortless Configuration and Troubleshooting via Web Console

The MGate 5105-MB-EIP also provides a web console to make configuration easy without having to install an extra utility. Simply log in as an administrator to access all settings, or as a general user with read-only permission. Besides configuring basic protocol settings, you can use the web console to monitor I/O data values and transfers. In particular, I/O Data Mapping shows data addresses for both protocols in the gateway's memory, and I/O Data View allows you to track data values for online nodes. Moreover, diagnostics and communication analysis for each protocol can also provide helpful information for troubleshooting.

Redundant Power Inputs

The MGate 5105-MB-EIP has dual power inputs for greater reliability. The power inputs allow simultaneous connection to 2 live DC power sources, so that continuous operation is provided even if one power source fails. The higher level of reliability makes these advanced Modbus-to-EtherNet/IP gateways ideal for demanding industrial applications.

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), EtherNet/IP Scanner, EtherNet/IP Adapter, MQTT
Configuration Options	Web Console (HTTP/HTTPS), Device Search Utility (DSU), MGate Manager, 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

Modbus RTU/ASCII	
Mode	Master, Slave
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Commands	100
Input Data Size	2048 bytes
Output Data Size	2048 bytes

Modbus TCP	
Mode	Client (Master), Server (Slave)
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Client Connections	16
Max. No. of Server Connections	32
Max. No. of Commands	100
Input Data Size	2048 bytes
Output Data Size	2048 bytes

EtherNet/IP	
Mode	Scanner, Adapter
CIP Objects Supported	Identity, Message Router, Assembly, Connection Manager, TCP/IP interface, Ethernet link, Port
Max. No. of Scanner Connections	16 (for read-only), 1 (for read/write)
Max. No. of Adapter Connections	100
Input Data Size	496 bytes
Output Data Size	496 bytes

MQTT	
Mode	Publisher/Subscriber of MQTT, Azure IoT Hub Device, Alibaba IoT Platform Device
Version Supported	v3.1.1
QoS Level	QoS 0,1,2
Secure Transmission	TLS (1.0, 1.1, 1.2) encryption with user's root CA, Client certificate, Private key
Max. No. of Data Tag	300 data tags
Max. No. of Message	20 messages
MQTT General Features	Keep Alive, Retain Message, Last Will Message, Clean Session

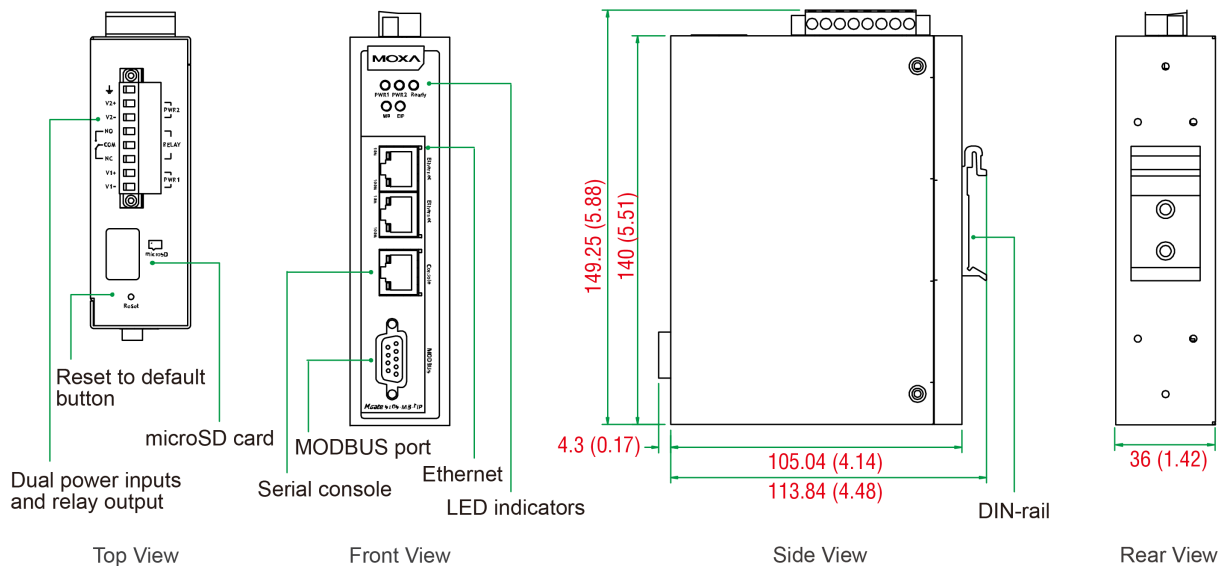
Memory	
microSD Slot	Up to 32 GB (SD 2.0 compatible; Data buffering up to 2 GB)
Power Parameters	
Input Voltage	12 to 48 VDC
Input Current	455 mA @ 12 VDC
Power Connector	Screw-fastened Euroblock terminal
Relays	
Contact Current Rating	Resistive load: 2 A @ 30 VDC
Physical Characteristics	
Housing	Metal
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 5105-MB-EIP: 0 to 60°C (32 to 140°F) MGate 5105-MB-EIP-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	859,422 hrs
Standards	Telcordia SR332
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x MGate 5105-MB-EIP 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 5105-MB-EIP	0 to 60°C
MGate 5105-MB-EIP-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
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DIN-Rail Mounting Kits

DK-25-01	DIN-rail mounting kit, 2 screws
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Wall-Mounting Kits

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

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