MGate MB3170-G2/MB3270-G2/MB3470-G2 Series

1, 2, 4-port advanced Modbus gateways

Features and Benefits

- Supports high-performing and low-latency agent mode to actively poll Modbus devices and cache data
- Supports proprietary Modbus and Modbus extensions for various devices
- Supports Auto Device Routing for easy configuration
- Supports route by TCP port or IP address for different system architectures
- Connects up to 32 Modbus TCP clients (MGate can queue 32 Modbus requests for each Modbus client connected)
- Supports Modbus serial client to Modbus serial server communications
- Ethernet cascading or dual subnet for flexible network system design
- 10/100BaseTX (RJ45) or 100BaseFX (single mode or multi-mode with SC/ST connector or SFP option)
- Modbus communication test tools independant of external software
- Intuitive Modbus diagnostics and traffic monitoring for easy troubleshooting
- Serial port with 2 kV isolation protection (for -I models)
- Supports redundant dual DC power inputs and 1 relay output
- Compliance with IEC 62443-4-2 Security Level 2 requirements
- -40 to 75°C wide operating temperature range (-T models)

Certifications

Introduction

The MGate MB3170-G2, MB3270-G2, and MB3470-G2 are new-generation Modbus gateways that convert between Modbus TCP, RTU, ASCII, and even proprietary or extended Modbus serial protocols. These MGate gateways transparently convert protocols, actively poll connected devices, and cache data in memory. These capabilities make it possible for SCADA systems to retrieve Modbus data directly from the gateway instead of waiting for all Modbus devices to respond, greatly increasing communication performance.

Moxa has developed the MGate Series using the IEC 62443-4-1 secure development life-cycle process ensuring secure connections and management of these gateways within industrial networks.

In addition, the user experience is enhanced by versatile installation options that accommodate diverse mounting and wiring requirements, a rugged design suitable for harsh environments, and easy-to-use configuration and troubleshooting tools for quick maintenance.

Hight-performance Modbus Conversion

MGate MB3170-G2/MB3270-G2/MB3470-G2 gateways operate in either transparent (direct protocol conversion) or agent (polling and caching) mode. Transparent mode converts protocols on a per-request basis. But for larger Modbus systems or when lower latency is needed, agent mode greatly enhances SCADA communication by directly accessing the gateway's cache.

Flexible Modbus Conversion for Various Systems

Supporting dual subnet network configuration, the MGate seamlessly integrates Modbus TCP with Modbus RTU/ASCII without disrupting existing systems. With multiple serial port models, the MGate simultaneously converts between Modbus serial and Modbus TCP, as well as serial-to-serial and TCP-to-TCP. Even with legacy serial, or COM port-based software, the MGate's Real COM mode enables communication through Ethernet TCP with no software adjustments. Beyond standard Modbus RTU and ASCII, the MGate also converts proprietary and extended Modbus serial protocols, eliminating the need for custom development or additional equipment and ensuring near-universal Modbus system compatibility. The MGate-G2 is capable of simultaneous conversion from proprietary serial and Modbus serial to Modbus TCP.

Intuitive Configuration and Minimal Maintenance

Downtime during maintenance can be costly. System alerts often require contacting vendors, prolonging troubleshooting due to information gathering and consultations. MGate-G2 gateways streamline this process by providing comprehensive troubleshooting information for rapid issue identification. One-click diagnostics gather all necessary data for technical support, empowering users to efficiently resolve issues and drastically reduce downtime.

Specifications

Ethernet Interface

10/100BaseT(X) Ports (RJ45 connector)	2 (Ethernet cascade or dual subnet configured by software) Auto MDI/MDI-X connection
Magnetic Isolation Protection	1.5 kV (built-in)
Optical Fiber	

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 µm 800 MHz x km	G.652
Typical Distance		4 km	5 km	40 km
Wavelength	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.
Note: Compute the “typical distance” of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

Ethernet Software Features

Industrial Protocols	Modbus TCP Client Modbus TCP Server
Configuration Options	Web Console (HTTP/HTTPS) Device Search Utility (DSU) MCC Tool Windows Driver Manager Utility MXview One Software MXconfig Software
Management	ARP DHCP Client DNS HTTPS ICMP IPv4/IPv6 SMTP SMTPS SNMPv1/v2c/v3 SNTP TCP/IP UDP

MIB	MIB-II RFC1213, RFC1317
Time Management	SNTP Client

Security Functions

Authentication	Local database
Encryption	AES-128 AES-256 ECC-256 ECC-384 ECC-521 HMAC RSA-1024 RSA-2048 RSA-3072 RSA-4096 SHA-256 SHA-384
Security Protocols	SNMPv3 HTTPS (TLS 1.2)

Serial Interface

No. of Ports	MGate MB3170-G2 models: 1 MGate MB3270-G2 models: 2 MGate MB3470-G2 models: 4
Connector	MGate MB3170-G2/MB3270-G2/MB3470-G2 models: 1/2/4 x DB9 male MGate MB3270-TB-G2/MB3470-TB-G2 models: 2/4 x 5-pin spring type terminal block
Serial Standards	RS-232/422/485 (software-selectable)
Baudrate	50 bps to 921.6 kbps
Data Bits	7, 8
Parity	None Even Odd Space Mark
Stop Bits	1, 2
Flow Control	DTR/DSR RTS Toggle (RS-232 only) RTS/CTS
Pull High/Low Resistor for RS-485	1 kilo-ohm, 150 kilo-ohms (software selectable)
Terminator for RS-485	120 ohms (software selectable)
Isolation	I models: 2 kV
RS-485 Data Direction Control	ADDC (automatic data direction control)

Serial Signals

RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND or TxD, RxD, GND (for -TB models)
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 Client Modbus RTU/ASCII Server (supported in Agent mode) Proprietary Modbus Serial Client

Modbus (Transparent)

Max. No. of Client Connections	32
Max. No. of Server Connections	32

Modbus RTU/ASCII (Agent)

Mode	Client (Master) Server (Slave) Proprietary Serial (client)
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Commands	128/serial port
No. of Tags	MGate MB3170–G2 models: 150 MGate MB3270–G2 models: 300 MGate MB3470–G2 models: 600
Total Tag Size	MGate MB3170–G2 models: 2048 Bytes MGate MB3270–G2 models: 3072 Bytes MGate MB3470–G2 models: 4096 Bytes

Modbus TCP (Agent)

Mode	Client (Master) Server (Slave)
Max. No. of Client Connections	32
Max. No. of Server Connections	32
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Commands	128
No. of Tags	MGate MB3170–G2 models: 150 MGate MB3270–G2 models: 300 MGate MB3470–G2 models: 600
Total Tag Size	MGate MB3170–G2 models: 2048 Bytes MGate MB3270–G2 models: 3072 Bytes MGate MB3470–G2 models: 4096 Bytes

Power Parameters

Input Voltage	12 to 48 VDC
Input Current	MGate MB3170-G2/MB3270-G2 models: 452 mA @ 12 VDC MGate MB3470-G2 models: 583 mA @ 12 VDC
Power Connector	8-pin terminal block

Relays

Contact Current Rating	Resistive load: 1 A @ 30 VDC

Physical Characteristics

Housing	Metal
IP Rating	IP30
Dimensions (with ears)	MGate MB170-G2/MB3270-G2 models: 25 x 89 x 132 mm (0.98 x 3.50 x 5.19 in) MGate MB3470-G2 models: 42 x 89 x 132 mm (1.65 x 3.50 x 5.19 in)
Dimensions (without DIN-rail mouting kit)	MGate MB170-G2/MB3270-G2 models: 25 x 89 x 129 mm (0.98 x 3.50 x 5.08 in) MGate MB3470-G2 models: 42 x 89 x 129 mm (1.65 x 3.50 x 5.08 in)
Weight	MGate MB3170-G2 models: 338 g (0.75 lb) MGate MB3270-G2 modelss: 393 g (0.87 lb) MGate MB3470-G2 Series: 444 g (0.98 lb)

Environmental Limits

Operating Temperature	Standard models : -10 to 60°C (14 to 140°F) Wide temp. models: -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 61000-6-2/-6-4
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 2 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV IEC 61000-4-5 Surge: Power: 2 kV, Signal: 1 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF IEC 61000-4-11
Hazardous Locations	ATEX Class I Division 2 IECEx Note: Certification processes are underway; expected completion by the end of June 2026.
Maritime	DNV Note: Certification process is underway; expected completion by the end of June 2026
Safety	EN 62368-1 UL 62368-1
Vibration	IEC 60068-2-6
Package Drop Test	ISTA 1A

MTBF

Time	MGate MB3170-G2 models: 3,238,923 hrs MGate MB3170I-G2 models: 3,156,544 hrs MGate MB3170-S/M-SC-G2/M-ST-G2 models: 2,889,487 hrs MGate MB3170-SFP-G2 models: 3,109,327 hrs MGate MB3270-TB-G2 models: 2,943,248 hrs MGate MB3270-G2 models: 2,931,934 hrs MGate MB3270I-TB-G2 models: 2,809,979 hrs MGate MB3270I-G2 models: 2,799,662 hrs MGate MB3470-TB-G2 models: 2,377,791 hrs MGate MB3470-G2 models: 2,363,042 hrs MGate MB3470I-TB-G2 models: 2,208,607 hrs MGate MB3470I-G2 models: 2,195,874 hrs
Standards	Telcordia Standard SR-332

Warranty

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

Package Contents

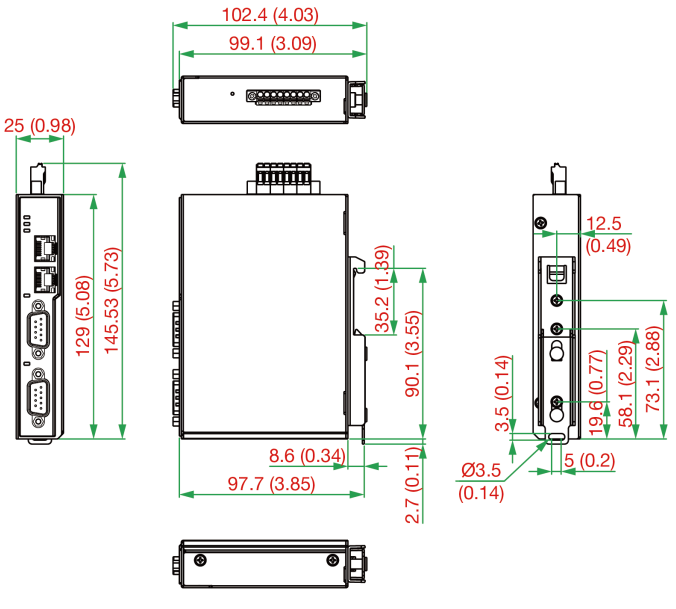
Device	1 x MGate MB3170-G2/MB3270-G2/MB3470-G2 Series gateway
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

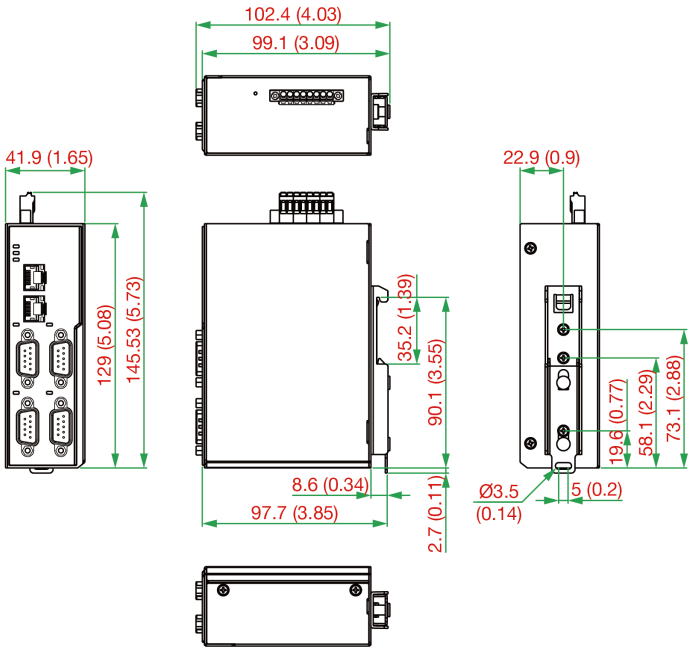
With Din Rail Mounting Kit

Unit: mm (inch)

MGate MB3170-G2/MB3270-G2 Series



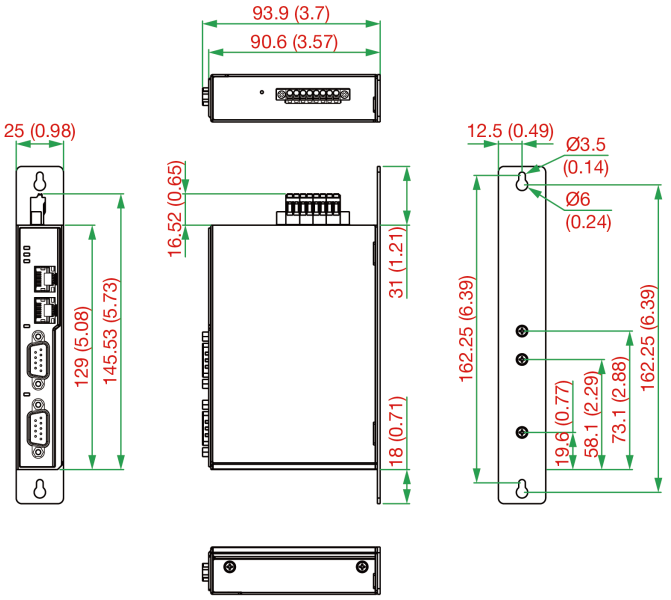
MGate MB3470-G2 Series



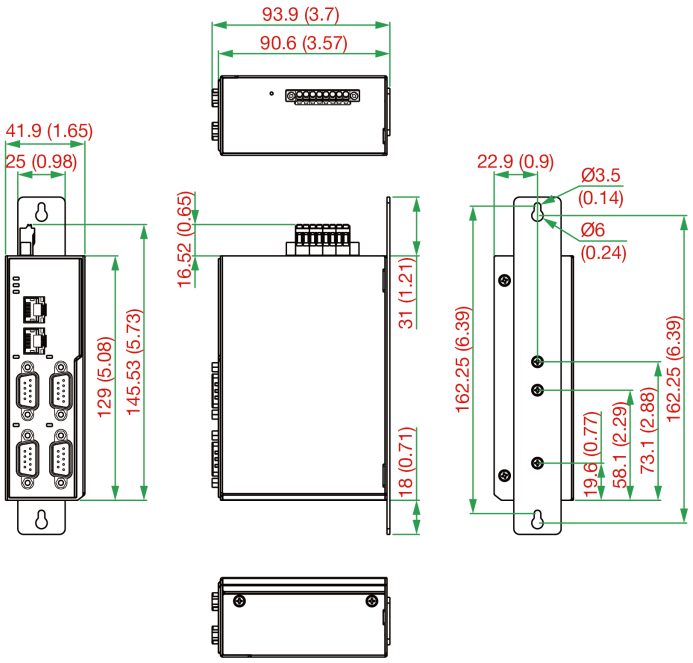
With Wall Mounting Kit

Unit: mm (inch)

MGate MB3170-G2/MB3270-G2 Series



MGate MB3470-G2 Series



Ordering Information

Model Name	Ethernet	No. of Serial Ports	Serial Connector	Serial Isolation	Operating Temperature
MGate MB3170-G2	2 x RJ45	1	DB9	–	-10 to 60°C
MGate MB3170-G2-T	2xRJ45	1	DB9	–	-40 to 75°C
MGate MB3170-M-SC-G2	1 x RJ45 1 x Multi-mode SC Fiber	1	DB9	–	-10 to 60°C
MGate MB3170-M-SC-G2-T	1 x RJ45 1 x Multi-mode SC Fiber	1	DB9	–	-40 to 75°C
MGate MB3170-M-ST-G2	1 x RJ45 1 x Multi-mode ST Fiber	1	DB9	–	-10 to 60°C
MGate MB3170-M-ST-G2-T	1 x RJ45 1 x Multi-mode ST Fiber	1	DB9	–	-40 to 75°C
MGate MB3170-S-SC-G2	1 x RJ45 1 x Single-mode SC Fiber	1	DB9	–	-10 to 60°C
MGate MB3170-S-SC-G2-T	1 x RJ45 1 x Single-mode SC Fiber	1	DB9	–	-40 to 75°C
MGate MB3170-SFP-G2	1 x RJ45 1 x SFP Slot	1	DB9	–	-10 to 60°C
MGate MB3170-SFP-G2-T	1 x RJ45 1 x SFP Slot	1	DB9	–	-40 to 75°C
MGate MB3170I-G2	2 x RJ45	1	DB9	2 kV	-10 to 60°C
MGate MB3170I-G2-T	2 x RJ45	1	DB9	2 kV	-40 to 75°C
MGate MB3270-G2	2 x RJ45	2	DB9	–	-10 to 60°C
MGate MB3270-G2-T	2 x RJ45	2	DB9	–	-40 to 75°C
MGate MB3270-TB-G2	2 x RJ45	2	5-pin Terminal Block	–	-10 to 60°C
MGate MB3270-TB-G2-T	2 x RJ45	2	5-pin Terminal Block	–	-40 to 75°C

Model Name	Ethernet	No. of Serial Ports	Serial Connector	Serial Isolation	Operating Temperature
MGate MB3270I-G2	2 x RJ45	2	DB9	2 kV	-10 to 60°C
MGate MB3270I-G2-T	2 x RJ45	2	DB9	2 kV	-40 to 75°C
MGate MB3270I-TB-G2	2 x RJ45	2	5-pin Terminal Block	2 kV	-10 to 60°C
MGate MB3270I-TB-G2-T	2 x RJ45	2	5-pin Terminal Block	2 kV	-40 to 75°C
MGate MB3470-G2	2 x RJ45	4	DB9	–	-10 to 60°C
MGate MB3470-G2-T	2 x RJ45	4	DB9	–	-40 to 75°C
MGate MB3470-TB-G2	2 x RJ45	4	5-pin Terminal Block	–	-10 to 60°C
MGate MB3470-TB-G2-T	2 x RJ45	4	5-pin Terminal Block	–	-40 to 75°C
MGate MB3470I-G2	2 x RJ45	4	DB9	2 kV	-10 to 60°C
MGate MB3470I-G2-T	2 x RJ45	4	DB9	2 kV	-40 to 75°C
MGate MB3470I-TB-G2	2 x RJ45	4	5-pin Terminal Block	2 kV	-10 to 60°C
MGate MB3470I-TB-G2-T	2 x RJ45	4	5-pin Terminal Block	2 kV	-40 to 75°C

Accessories (sold separately)

SFP Modules

SFP-1FELLC-T	SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature
SFP-1FESLC-T	SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1FEMLC-T	SFP module with 1 100Base multi-mode, LC connector for 2/4 km transmission, -40 to 85°C operating temperature

Mounting Kits

DK-89-01	DIN-rail mounting kit with 1 plate (89 x 19 x 9 mm), 3 M3 x 5 mm screws
WK-178-01	Wall-mounting kit with 1 plate (178 x 25 x 1.5 mm), 3 M3 x 5 mm screws

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

Connectors

Mini DB9F-to-TB	DB9 female to terminal block connector

Power Cords

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