

MGate MB3660 Series

8 and 16-port redundant Modbus gateways



Features and Benefits

- Supports Auto Device Routing for easy configuration
- Supports route by TCP port or IP address for flexible deployment
- Innovative Command Learning for improving system performance
- Supports agent mode for high performance through active and parallel polling of serial devices
- Supports Modbus serial master to Modbus serial slave communications
- 2 Ethernet ports with the same IP or dual IP addresses for network redundancy
- microSD card for configuration backup/duplication and event logs
- Accessed by up to 256 Modbus TCP clients
- Connects up to Modbus 128 TCP servers
- RJ45 serial interface (for “-J” models)
- Serial port with 2 kV isolation protection (for “-I” models)
- Dual VDC or VAC power inputs with wide power input range
- Embedded traffic monitoring/diagnostic information for easy troubleshooting
- Status monitoring and fault protection for easy maintenance

Certifications



Introduction

The MGate MB3660 (MB3660-8 and MB3660-16) gateways are redundant Modbus gateways that convert between the Modbus TCP and Modbus RTU/ASCII protocols. They can be accessed by up to 256 TCP master/client devices, or connect to 128 TCP slave/server devices. The MGate MB3660 isolation model provides 2 kV isolation protection suitable for power substation applications. The MGate MB3660 gateways are designed to easily integrate Modbus TCP and RTU/ASCII networks. The MGate MB3660 gateways offer features that make network integration easy, customizable, and compatible with almost any Modbus network.

For large-scale Modbus deployments, MGate MB3660 gateways can effectively connect a large number of Modbus nodes to the same network. The MB3660 Series can physically manage up to 248 serial slave nodes for 8-port models or 496 serial slave nodes for 16-port models (the Modbus standard only defines Modbus IDs from 1 to 247). Each RS-232/422/485 serial port can be configured individually for Modbus RTU or Modbus ASCII operation and for different baudrates, allowing both types of networks to be integrated with Modbus TCP through one Modbus gateway.

High Performance with Innovative Command Learning

The MGate MB3660 gateways support two communication modes: transparent mode and agent mode. For transparent mode, the gateway converts Modbus commands from Modbus TCP to Modbus RTU/ASCII, and vice versa, or from serial (master) to serial (slave). However, since only one Modbus protocol request-response action can be executed at any given time, each Modbus device has to wait its turn, resulting in poorer performance.

In order to provide better performance, the MGate MB3660 gateways are designed with an innovative Command Learning function, which can be activated with a single mouse click. Once activated, the gateway will learn and remember the Modbus commands it receives, and once a command has been learned, the gateway will act as though it were in agent mode, and actively send Modbus requests to the relevant Modbus devices. Since the data is saved in a different memory space that can be accessed by the SCADA system, the SCADA system can retrieve Modbus response data directly from the gateway's memory, instead of waiting for the data to pass through the Modbus devices, dramatically increasing communication performance.

Auto-Device Routing for Easy Configuration (Patented)

Moxa's Auto-Device Routing function helps eliminate many of the problems and inconveniences encountered by engineers who need to configure large numbers of Modbus devices. A single mouse click is all that's required to set up a slave ID routing table and configure Modbus gateways to

automatically detect Modbus requests from a supervisory control and data acquisition (SCADA) system. By removing the need to manually create the slave ID routing table, the Auto-Device Routing function saves engineers significant time and reduces cost.

Modbus Gateway with Power and Ethernet Redundancy

For a complicated Modbus system, redundancy is extremely important. The MGate MB3660 Modbus gateways support redundancy for both the power input and Ethernet connection. The MGate MB3660 gateways come with dual AC or DC power inputs built in for power redundancy, and have dual Ethernet ports (with different IPs) for network redundancy. To accommodate different types of applications, the dual Ethernet ports can be configured in one of two ways:

- Use the same IP for both Ethernet ports. In this case, the MGate MB3660 gateway will automatically switch to the backup LAN when the main LAN fails.
- Use different IP addresses for each of the two Ethernet ports. In this case, Modbus clients/masters can use both Ethernet ports to communicate with Modbus RTU/ASCII slave devices at the same time.

Specifications

Ethernet Interface	
10/100BaseT(X) Ports (RJ45 connector)	2 IP addresses Auto MDI/MDI-X connection

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

Security Functions	
Authentication	Local database RADIUS
Encryption	HTTPS, AES-128, AES-256, SHA-256
Security Protocols	SNMPv3 HTTPS (TLS 1.2)

Serial Interface	
Console Port	RS-232 (TxD, RxD, GND), 8-pin RJ45 (115200, n, 8, 1)
No. of Ports	MGate MB3660-8 Series: 8 MGate MB3660-16 Series: 16
Serial Standards	RS-232/422/485 (software selectable)
Connector	MGate MB3660-8/16: DB9 male MGate MB3660-8/16-J: RJ45
Baudrate	50 bps to 921.6 kbps
Data Bits	7, 8
Parity	None, Even, Odd, Space, Mark
Stop Bits	1, 2
Flow Control	RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)
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 (I models)
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, Modbus RTU/ASCII Slave
Configuration Options	Serial Console
Modbus RTU/ASCII	
Mode	Master, Slave
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Commands	256 per serial port
Memory Size	65535 bytes
Modbus TCP	
Mode	Client (Master), Server (Slave)
Max. No. of Client Connections	256
Max. No. of Server Connections	128
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Commands	256
Memory Size	65535 bytes
Modbus (Transparent)	
Max. No. of Client Connections	256
Max. No. of Server Connections	128
Power Parameters	
Input Voltage	All models: Redundant dual inputs AC models: 100 to 240 VAC (50/60 Hz) DC models: 20 to 60 VDC (1.5 kV isolation)
No. of Power Inputs	2
Power Connector	Terminal block (for DC models)
Power Consumption	MGate MB3660-8-2AC: 109 mA @ 110 VAC MGate MB3660I-8-2AC: 310 mA @ 110 VAC MGate MB3660-8-J-2AC: 235 mA @ 110 VAC MGate MB3660-8-2DC: 312 mA @ 24 VDC MGate MB3660-16-2AC: 141 mA @ 110 VAC MGate MB3660I-16-2AC: 310 mA @ 110 VAC MGate MB3660-16-J-2AC: 235 mA @ 110 VAC MGate MB3660-16-2DC: 494 mA @ 24 VDC

Relays

Contact Current Rating	Resistive load: 2 A @ 30 VDC
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Physical Characteristics

Housing	Metal
IP Rating	IP30
Dimensions (with ears)	480 x 45 x 198 mm (18.90 x 1.77 x 7.80 in)
Dimensions (without ears)	440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)
Weight	MGate MB3660-8-2AC: 2731 g (6.02 lb) MGate MB3660-8-2DC: 2684 g (5.92 lb) MGate MB3660-8-J-2AC: 2600 g (5.73 lb) MGate MB3660-16-2AC: 2830 g (6.24 lb) MGate MB3660-16-2DC: 2780 g (6.13 lb) MGate MB3660-16-J-2AC: 2670 g (5.89 lb) MGate MB3660I-8-2AC: 2753 g (6.07 lb) MGate MB3660I-16-2AC: 2820 g (6.22 lb)

Environmental Limits

Operating Temperature	0 to 60°C (32 to 140°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	MGate MB3660-8-2AC/16-2AC/8-2DC/16-2DC: IEC 62368-1, UL 62368-1 MGate MB3660I-8-2AC/16-2AC: IEC 62368-1, UL 62368-1 MGate MB3660-8-J-2AC/16-J-2AC: UL 60950-1
EMI	CISPR 32, FCC Part 15B Class A
EMC	EN 55032/35
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Freefall	IEC 60068-2-31
Shock	IEC 60068-2-27
Vibration	IEC 60068-2-6, IEC 60068-2-64

MTBF

Time	MGate MB3660-8-2AC: 721,988 hrs MGate MB3660-8-2DC: 711,978 hrs MGate MB3660-8-J-2AC: 616,505 hrs MGate MB3660-16-2AC: 495,416 hrs MGate MB3660-16-2DC: 490,684 hrs MGate MB3660-16-J-2AC: 437,337 hrs MGate MB3660I-8-2AC: 429,807 hrs MGate MB3660I-16-2AC: 256,208 hrs
Standards	Telcordia SR332

Warranty

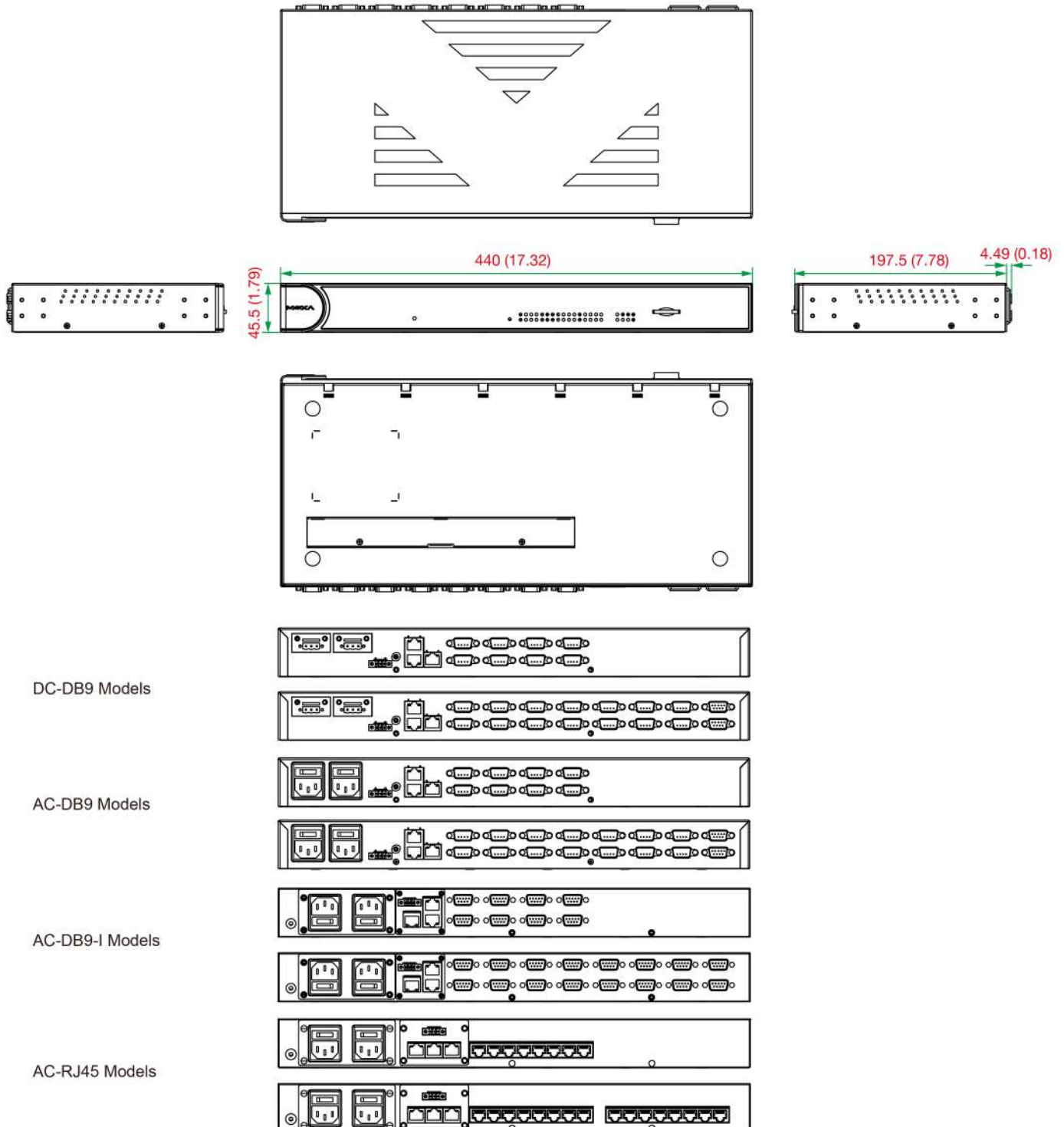
Warranty Period	5 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x MGate MB3660 Series gateway
Power Supply	1 x power cord, suitable for your region
Cable	1 x RJ45-to-DB9 console cable
Installation Kit	1 x wall-mounting kit
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	No. of Serial Ports	Serial Connector	Serial Isolation	Input Voltage
MGate MB3660-8-2DC	8	DB9 male	–	20-60 VDC (1.5 kV isolation)
MGate MB3660-16-2DC	16	DB9 male	–	20-60 VDC (1.5 kV isolation)
MGate MB3660-8-2AC	8	DB9 male	–	100-240 VAC (47-63 Hz)
MGate MB3660-16-2AC	16	DB9 male	–	100-240 VAC (47-63 Hz)
MGate MB3660I-8-2AC	8	DB9 male	2 kV	100-240 VAC (47-63 Hz)
MGate MB3660I-16-2AC	16	DB9 male	2 kV	100-240 VAC (47-63 Hz)
MGate MB3660-8-J-2AC	8	RJ45	–	100-240 VAC (47-63 Hz)
MGate MB3660-16-J-2AC	16	RJ45	–	100-240 VAC (47-63 Hz)

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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Power Cords

PWC-C13AU-3B-183	Power cord with Australian (AU) plug, 1.83 m
PWC-C13CN-3B-183	Power cord with three-prong China (CN) plug, 1.83 m
PWC-C13EU-3B-183	Power cord with Continental Europe (EU) plug, 1.83 m
PWC-C13JP-3B-183	Power cord with Japan (JP) plug, 7A/125V, 1.83 m
PWC-C13UK-3B-183	Power cord with United Kingdom (UK) plug, 1.83 m
PWC-C13US-3B-183	Power cord with United States (US) plug, 1.83 m
CBL-PJTB-10	Non-locking barrel plug to bare-wire cable

Mounting Kits

WK-45-01	Wall-mounting kit, 2 L-shaped plates, 6 screws, 45 x 57 x 2.5 mm
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