

# MGate™ MB3660 Series

## 8 and 16-port redundant Modbus gateways



- > 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 serial (Master) to serial (Slave) communications
- > 2 Ethernet ports with the same IP or dual IP addresses for network redundancy
- > SD card for configuration backup
- > Access by up to 256 TCP master/client devices, or connect to 128 TCP slave/server devices
- > Dual VDC or VAC power inputs with wide power input range
- > RJ45 serial interface (for “-J” models)
- > 2 kV isolation protection (for “-I” models)



### : Overview

The MGate MB3660 (MB3660-8 and MB3660-16) series 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 series isolation substation applications. The MGate MB3660 gateways are designed to easily integrate Modbus TCP and RTU/ASCII networks. The MGate MB3660 series 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 series 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.

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.

In order to provide better performance, the MGate MB3660 series gateways are designed with an innovative Command Learning function,

### : Auto-Device Routing for Easy Configuration (Patent Pending)

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 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:

1. 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.
2. 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

**Protocols:** Modbus TCP Client/Server  
**Number of Ports:** 2 (2 IP addresses)  
**Speed:** 10/100 Mbps, Auto MDI/MDIX  
**Connector:** RJ45 x 2

### Serial Interface

**Protocols:** Modbus RTU/ASCII Master/Slave  
**Number of Ports:**  
 MGate MB3660-8: 8  
 MGate MB3660I-8: 8  
 MGate MB3660-16: 16  
 MGate MB3660I-16: 16

**Serial Standards:** RS-232/422/485, software selectable  
**Connectors:** DB9 male, RJ45  
**RS-485 Data Direction Control:** ADDC® (automatic data direction control)  
**Isolation Protection:** 2 kV (for “-I” model)

### Serial Communication Parameters

**Data Bits:** 7, 8  
**Stop Bits:** 1, 2  
**Parity:** None, Even, Odd, Space, Mark  
**Flow Control:** RTS/CTS, DTR/DSR, RTS Toggle (RS-232 only)  
**Baudrate:** 50 bps to 921.6 Kbps

### Serial Signals

**RS-232:** TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND  
**RS-422:** Tx+, Tx-, Rx+, Rx-, GND  
**RS-485-4w:** Tx+, Tx-, Rx+, Rx-, GND  
**RS-485-2w:** Data+, Data-, GND

### Software

**Configuration Options:** Web console, Serial console, Telnet console  
**Utility:** Device Search Utility (DSU) for Windows 95, 98, ME, NT, 2000, Windows XP, Server 2003, Vista, Server 2008 (x86/x64), Windows Server 2008 R2, Windows 7/8/8.1/10 (x86/x64), Windows Server 2012 (x64), Windows 2012 R2  
**Network Protocols:** TCP/IP, UDP, HTTP, SMTP, NTP, DNS, DHCP Client, SNMPv1 (read only), ARP, Telnet, Radius

### Transparent Mode:

Master mode: 128 TCP slaves/servers  
 Slave mode: 256 TCP masters/clients

**Agent Mode:** 256 commands per serial port (Max. 4096 bytes)

### Physical Characteristics

**Fault Relay Circuit:** 3-pin circuit with current carrying capacity of 2 A @ 30 VDC

**External Storage Drive:** SD card for configuration backup

**Housing:** Metal, IP30

### Weight:

MGate MB3660-8-2AC: 2,731 g (6.02 lb)  
 MGate MB3660-8-2DC: 2,684 g (5.92 lb)  
 MGate MB3660I-8-2AC: 2,753 g (6.07 lb)  
 MGate MB3660-8-J-2AC: 2,600 g (5.73 lb)  
 MGate MB3660-16-2AC: 2,830 g (6.24 lb)

MGate MB3660-16-2DC: 2,780 g (6.13 lb)  
 MGate MB3660I-16-2AC: 2,820 g (6.22 lb)  
 MGate MB3660-16-J-2AC: 2,670 g (5.89 lb)

### Dimensions:

Without ears: 440 x 45 x 198 mm (17.32 x 1.77 x 7.80 in)  
 With ears: 480 x 45 x 198 mm (18.90 x 1.77 x 7.80 in)

### Environmental Limits

**Operating Temperature:** 0 to 60°C (32 to 140°F)  
**Storage Temperature:** -40 to 85°C (-40 to 185°F)  
**Ambient Relative Humidity:** 5 to 95% (non-condensing)  
**Vibration:** IEC 60068-2-6, IEC 60068-2-64  
**Shock:** IEC 60068-2-27  
**Drop:** IEC 60068-2-31

### Power Requirements

#### Input Voltage:

For DC models: Dual 20 to 60 VDC (1.5 kV isolation)  
 For AC models: Dual 100 to 240 VAC, 47 to 63 Hz

#### Input Current:

MGate MB3660-8-2AC: 144 mA @ 110 VAC, 101 mA @ 220 VAC  
 MGate MB3660-8-2DC: 312 mA @ 24 VDC, 156 mA @ 48 VDC  
 MGate MB3660I-8-2AC: 244 mA @ 110 VAC, 159 mA @ 220 VAC  
 MGate MB3660-8-J-2AC: 111 mA @ 110 VAC, 81 mA @ 220 VAC  
 MGate MB3660-16-2AC: 178 mA @ 110 VAC, 120 mA @ 220 VAC  
 MGate MB3660-16-2DC: 390 mA @ 24 VDC, 195 mA @ 48 VDC  
 MGate MB3660-16-J-2AC: 133 mA @ 110 VAC, 92 mA @ 220 VAC  
 MGate MB3660I-16-2AC: 351 mA @ 110 VAC, 221 mA @ 220 VAC  
**Power Connector:** Terminal block (for DC models)

### Standards and Certifications

**Safety:** UL 60950-1, EN 60950-1 (LVD)

**EMC:** EN 55032/24

**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 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: 150 kHz to 80 MHz: 10V/m  
 IEC 61000-4-8 PFMF

### MTBF (mean time between failures)

#### Time:

MGate MB3660-8-2AC: 716,647 hrs  
 MGate MB3660-8-2DC: 706,783 hrs  
 MGate MB3660I-8-2AC: 224,851 hrs  
 MGate MB3660-8-J-2AC: 616,505 hrs  
 MGate MB3660-16-2AC: 487,416 hrs  
 MGate MB3660-16-2DC: 482,835 hrs  
 MGate MB3660I-16-2AC: 114,595 hrs  
 MGate MB3660-16-J-2AC: 437,337 hrs  
**Standard:** Telcordia SR332

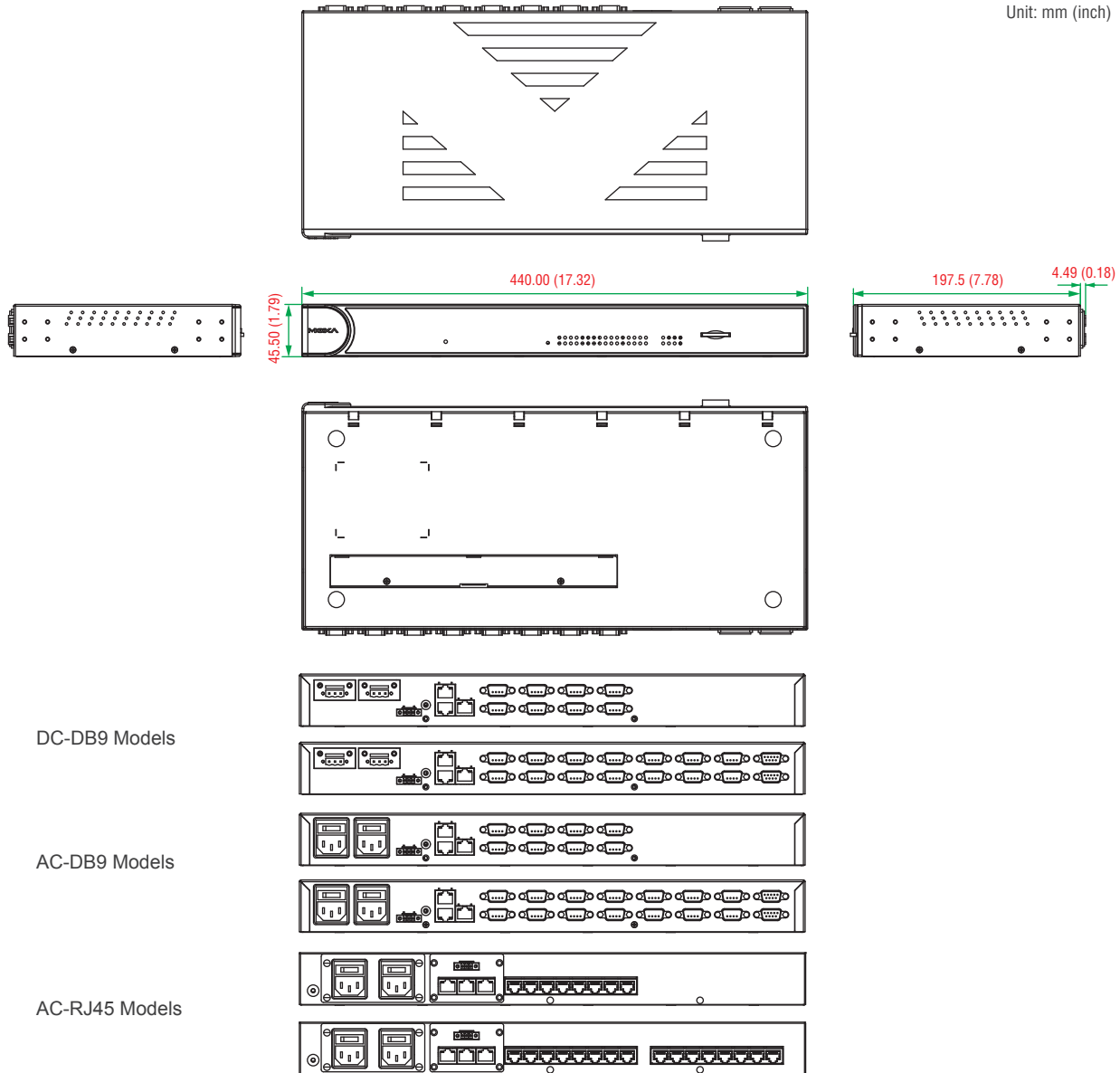
### Warranty

**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

## Dimensions

Unit: mm (inch)



## Ordering Information

### Available Models

**MGate MB3660-8-2AC:** Modbus gateway with dual LANs, dual AC power inputs, 8 RS-232/422/485 ports, 0 to 60°C operating temperature

**MGate MB3660-8-2DC:** Modbus gateway with dual LANs, dual DC power inputs, 8 RS-232/422/485 ports, 0 to 60°C operating temperature

**MGate MB3660I-8-2AC:** Modbus gateway with dual LANs, dual AC power inputs, 8 RS-232/422/485 ports, 2 kV isolation, 0 to 60°C operating temperature

**MGate MB3660-8-J-2AC:** Modbus gateway with dual LANs, dual AC power inputs, 8 RS-232/422/485 ports, RJ45 serial interface, 0 to 60°C operating temperature

**MGate MB3660-16-2AC:** Modbus gateway with dual LANs, dual AC power inputs, 16 RS-232/422/485 ports, 0 to 60°C operating temperature

**MGate MB3660-16-2DC:** Modbus gateway with dual LANs, dual DC power inputs, 16 RS-232/422/485 ports, 0 to 60°C operating temperature

**MGate MB3660I-16-2AC:** Modbus gateway with dual LANs, dual AC power inputs, 16 RS-232/422/485 ports, 2 kV isolation, 0 to 60°C operating temperature

**MGate MB3660-16-J-2AC:** Modbus gateway with dual LANs, dual AC power inputs, 16 RS-232/422/485 ports, RJ45 serial interface, 0 to 60°C operating temperature

### Optional Accessories (can be purchased separately)

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

### Package Checklist

- 1 MGate MB3660-8 or MB3660-16 Modbus gateway
- 1 serial cable: CBL-RJ45F9-150
- 2 L-shaped brackets for wall mounting
- 2 power cords (suitable for your region)
- Documentation and software CD
- Quick installation guide
- Warranty card