

MGate 5105-MB-EIP User's Manual

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www.moxa.com/product

MOXA[®]

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MGate 5105-MB-EIP User's Manual

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Introduction

Welcome to the MGate 5105-MB-EIP line of Modbus-to-EtherNet/IP gateways. All models perform easy protocol conversions between Modbus RTU/ASCII, Modbus TCP, and EtherNet/IP protocols.

This chapter is an introduction to the MGate 5105-MB-EIP and includes the following sections:

- **Overview**
- **Package Checklist**
- **Power Input and Relay Output Pinouts**
- **LED Indicators**
- **Dimensions**
- **Pin Assignments**
 - Modbus (Modbus RTU/ASCII) Pin Assignment
 - Console (RS-232) Pin Assignment
- **Mounting the Unit**
- **Specifications**
- **Reset Button**
- **Pull-high, Pull-low, and Terminator for RS-485**
- **microSD**
- **Configuration Methods**

Overview

The MGate 5105-MB-EIP is a line of protocol gateways that provides users with the following features:

- Gateway function to transfer data between Modbus RTU/ASCII, Modbus TCP and EtherNet/IP
- Support for both EtherNet/IP adapter and scanner
- Effortless configuration via web or Windows utility
- Complete packet analysis and diagnosis information for maintenance
- Redundant dual DC power inputs
- Built-in Ethernet cascading for easy wiring
- Power-off warning by relay output
- MicroSD card supported for configuration backup
- Web-based GUI for I/O data visualization
- -40 to 75°C wide operating temperature range models available

Package Checklist

All models of the MGate 5105-MB-EIP Series are shipped with the following items:

Standard Accessories:

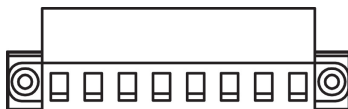
- 1 MGate 5105-MB-EIP Modbus-to-EtherNet/IP Gateway
- Documentation & software CD
- Quick installation guide (printed)
- Warranty card

Optional Accessories:

- DR-4524: 45W/2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input
- DR-75-24: 75W/3.2A DIN-rail 24 VDC power supply with universal 85 to 264 VAC input
- DR-120-24: 120W/5A DIN-rail 24 VDC power supply with 88 to 132 VAC/176 to 264 VAC input by switch
- WK-36-01: wall-mounting kit

NOTE Notify your sales representative if any of the above items is missing or damaged.

Power Input and Relay Output Pinouts

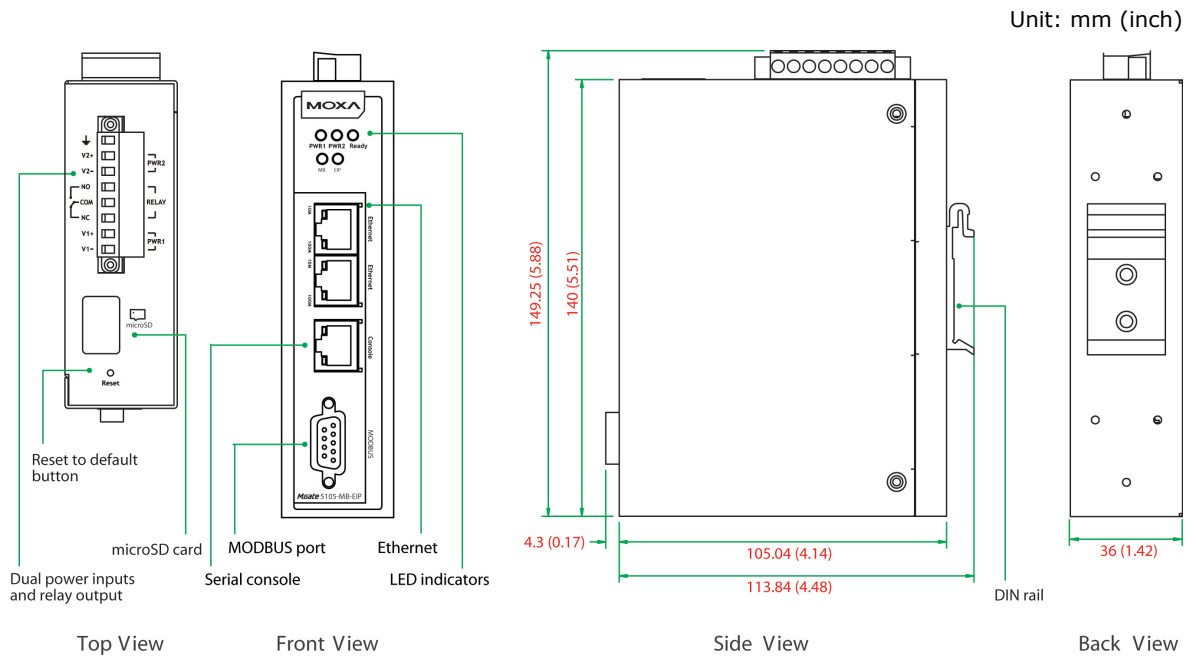


| | | | | | | | |
|-----------------|------------------|------------------|------|--------|------|------------------|------------------|
| | V2+ | V2- | | | | V1+ | V1- |
| Shielded Ground | DC Power Input 2 | DC Power Input 2 | N.O. | Common | N.C. | DC Power Input 1 | DC Power Input 1 |

LED Indicators

| LED | Color | Description |
|---------------------------------------|-------|--|
| Ready | Off | Power is off or a fault condition exists |
| | Green | Steady: Power is on, and the MGate is functioning normally |
| | | Blinking: The MGate has been located by MGate Manager's Location function |
| | Red | Steady: Power is on, and the MGate is booting up |
| | | Blinking slowly: Indicates an IP conflict, or the DHCP or BOOTP server is not responding properly |
| Flashing quickly: microSD card failed | | |
| EIP (Scanner) | Off | No I/O data is exchanged |
| | Green | Steady: I/O data is exchanged with all devices |
| | | Blinking: I/O data is exchanged with at least one device (not all configured devices can communicate with a gateway) |
| EIP (Adapter) | Off | No I/O data is exchanged |
| | Green | Steady: I/O data is exchanged with all devices |
| | | Blinking: I/O data is exchanged with at least one device (not all configured devices can communicate with a gateway) |
| MB | Off | No communication with Modbus RTU/ASCII device |
| | Green | Modbus RTU/ASCII communication progress |
| | Red | Communication error |
| | | When MGate 5105 acts as RTU/ASCII Master: <ol style="list-style-type: none"> 1. Slave device returned an error (exception) 2. Received frame error (parity error, checksum error) 3. Timeout (slave device no response) When MGate 5105 acts as RTU/ASCII Slave: <ol style="list-style-type: none"> 1. Received invalid function code 2. Master accessed invalid register address or coil addresses 3. Received frame error (parity error, checksum error) |

Dimensions

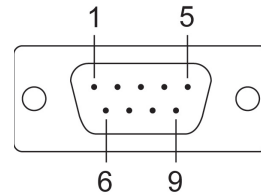


Pin Assignments

Modbus (Modbus RTU/ASCII) Pin Assignment

The MGate 5105-MB-EIP Series uses a DB9 serial port to connect to Modbus RTU/ASCII devices.

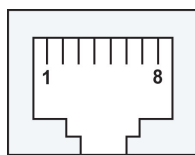
| Pin | RS-232 | RS-422, RS-485-4W | RS-485-2W |
|-----|--------|-------------------|-----------|
| 1 | DCD | TxD- | - |
| 2 | RxD | TxD+ | - |
| 3 | TXD | RxD+ | Data+ |
| 4 | DTR | RxD- | Data- |
| 5 | GND | GND | GND |
| 6 | DSR | - | - |
| 7 | RTS | - | - |
| 8 | CTS | - | - |
| 9 | - | - | - |



Console (RS-232) Pin Assignment

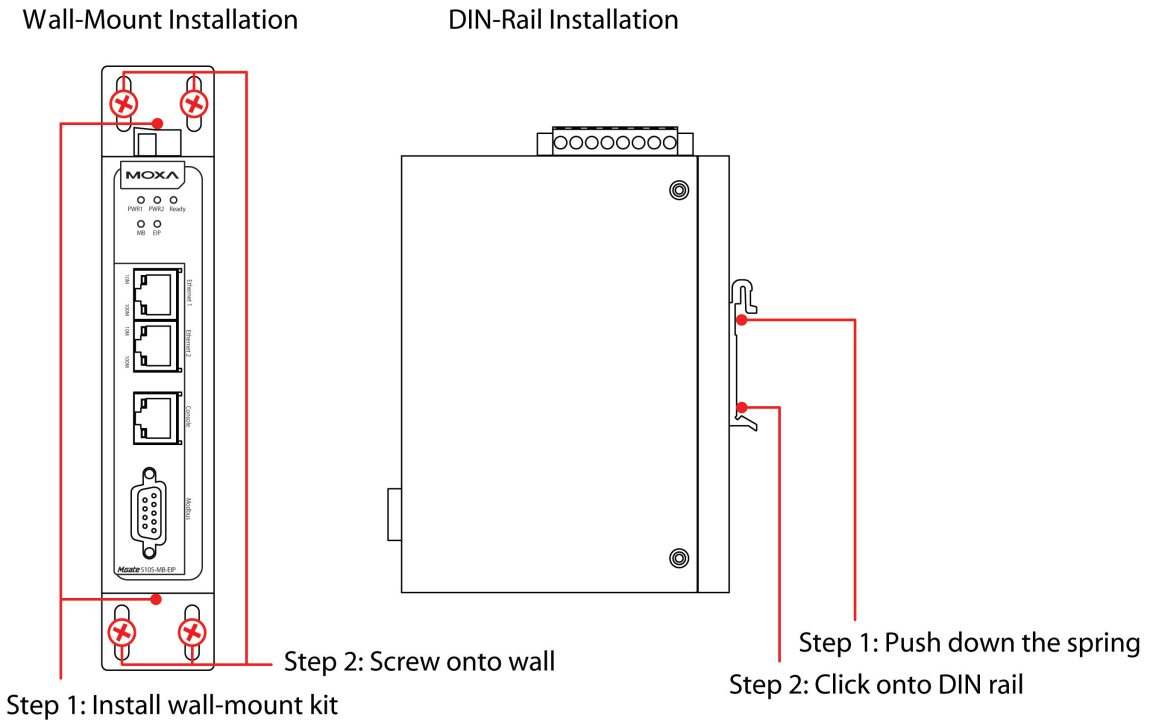
The MGate 5105-MB-EIP Series uses an RJ45 connector to connect to a PC for device configuration.

| Pin | RS-232 |
|-----|--------|
| 1 | DSR |
| 2 | RTS |
| 3 | GND |
| 4 | TXD |
| 5 | RXD |
| 6 | DCD |
| 7 | CTS |
| 8 | DTR |



Mounting the Unit

1. Connect the power adapter. Connect the 12–48 VDC power line or DIN-rail power supply to the MGate 5105-MB-EIP device’s terminal block.
2. Use a Modbus serial cable to connect the MGate to a Modbus slave device.
3. Use an Ethernet cable to connect the MGate to the EtherNet/IP controller.
4. The MGate 5105-MB-EIP is designed to be attached to a DIN rail or mounted on a wall. For DIN-rail mounting, push down the spring and properly attach it to the DIN rail until it “snaps” into place. For wall mounting, install the wall-mount kit (optional) first, and then screw the device onto the wall. The following figure illustrates the two mounting options:



Specifications

Ethernet Interface

Protocol: EtherNet/IP, Modbus TCP

Number of Ports: 2 (Ethernet cascade)

Speed: 10/100 Mbps, Auto MDI/MDIX

Connector: 8-pin RJ45

Magnetic Isolation Protection: 1.5 kV (built-in)

EtherNet/IP

Class: Adapter, Scanner

CIP Objects Supported: Identity, Message Router, Assembly, Connection Manager, TCP/IP interface, Ethernet link, Port

Max. Number of Connections:

MGate as Adapter: 16 connections for read-only, 1 connection for read/write

MGate as Scanner: 100 connections

Max. Total I/O Data Size:

Input: 2048 bytes (496 bytes per connection)

Output: 2048 bytes (496 bytes per connection)

Modbus

Functions Supported: 1, 2, 3, 4, 5, 6, 15, 16, 23

Max. Number of Commands: 100

Max. Number of Connections:

MGate as Modbus TCP Master: 32 connections

MGate as Modbus TCP Slave: 16 connections

Max. Total I/O Data Size:

Input: 2048 bytes

Output: 2048 bytes

Modbus Serial Interface

Protocol: Modbus RTU/ASCII

Number of Ports: 1

Serial Standards: RS-232/422/485, software selectable

Connectors: DB9 male

Isolation: 2 kV (built-in)

RS-485 Data Direction Control: ADDC® (automatic data direction control)

Pull High/Low Resistor for RS-485: 1 K Ω , 150 K Ω

Terminator for RS-485: 120 Ω

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, RTS Toggle

Baudrate: 50 bps to 921.6 Kbps

External Storage Drive

Interface: microSD

Standard: SDHC v2.0

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

Operation Modes: EtherNet/IP Adapter/Scanner, Modbus RTU/ASCII/TCP Master/Slave

Configuration Options: Web console, Windows utility, serial console

Utilities: MGate Manager for Windows 2000/XP/2003/Vista/Server 2008/7/8 (x86/x64), Windows Server 2008 R2/2012 (x64)

Physical Characteristics

Housing: Metal (IP30)

Weight: 507 g (1.12 lb)

Dimensions: 36 x 105 x 140 mm (1.42 x 4.13 x 5.51 in)

Storage Card Slot: 1 microSD (SDHC) card slot supports up to 32 GB

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

Environmental Limits

Operating Temperature:

Standard Models: 0 to 60°C (32 to 140°F)

Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Altitude: Up to 2000 m

Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Power Requirements

Input Voltage: 12 to 48 VDC

Power Connector: Terminal block

Power Consumption:

455 mA @ 12 VDC, 125 mA @ 48 VDC

Standards and Certifications

Safety: UL 508, EN 60950-1

EMC: CE, FCC

EMI: EN 55032 Class A, FCC Part 15 Subpart B Class A

EMS:

EN 55024,

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

IEC 61000-4-8 PFMF

Shock: IEC 60068-2-27

Freefall: IEC 60068-2-32

Vibration: IEC 60068-2-6

Reliability

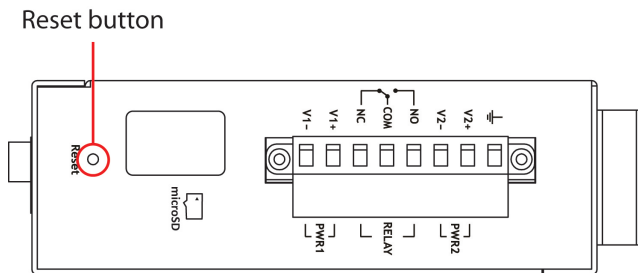
MTBF (mean time between failures): 859,422 hrs.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

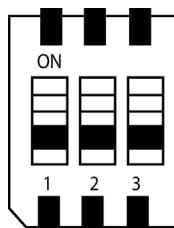
Reset Button



Restore the MGate to factory default settings by using a pointed object (such as a straightened paper clip) to hold the reset button down until the Ready LED stops blinking (approx. 5 seconds).

Pull-high, Pull-low, and Terminator for RS-485

Remove the MGate 5105-MB-EIP's top cover and you will find DIP switches to adjust each serial port's pull-high resistor, pull-low resistor, and terminator.



| SW | 1 | 2 | 3 |
|-----|--------------------|-------------------|------------|
| | Pull-high resistor | Pull-low resistor | Terminator |
| ON | 1 kΩ | 1 kΩ | 120 Ω |
| OFF | 150 kΩ* | 150 kΩ* | —* |

*Default

microSD

The MGate 5105-MG-EIP provides users with an easy way to backup, copy, replace, or deploy. The MGate is equipped with a microSD card slot. Users can plug in a microSD card to backup data, including the system configuration setting, GSD files, and system data log.

First time using the MGate gateway with a new microSD card

1. Format the microSD card as FAT file system through a PC.
2. Power off the MGate and insert the microSD card (ensure that the microSD card is empty).
3. Power on the MGate. The default settings will be copied to the microSD card.
4. Manually configure the MGate via MGate Manager or web console, and all the stored changes will copy to the microSD card for synchronization.

First time using the MGate with a microSD card containing a configuration file

1. Power off the MGate and insert the microSD card.
2. Power on the MGate.
3. The configuration file stored in the microSD card will automatically copy to the MGate.

Duplicating current configurations to another MGate gateway

1. Power off the MGate and insert a new microSD card.
2. Power on the MGate.
3. The configuration will be copied from MGate to microSD card.
4. Power off the MGate and insert the microSD card to the other MGate.
5. Power on the second MGate.
6. The configuration file stored in the microSD card will automatically copy to the MGate.

Malfunctioning MGate replacement

1. Replace the malfunctioning MGate with a new MGate.
2. Insert the microSD card into the new MGate.
3. Power on the MGate.
4. The configuration file stored on the microSD card will automatically copy to the MGate.

microSD card writing failure

The following circumstances may cause the microSD card to experience a writing failure:

1. The microSD card has less than 20 Mbytes of free space remaining.
2. The microSD card is write-protected.
3. The file system is corrupted.
4. The microSD card is damage.

The MGate will stop for the above events, accompanied by a flashing Ready LED and beeping alarm. When you replace the MGate gateway's microSD card, the microSD card will synchronize the configurations stored on the MGate gateway. Note that the replacement microSD card should not contain any configuration files on it; otherwise, the out-of-date configuration will copy to the MGate device.

Configuration Methods

MGate 5105-MB-EIP provides three ways to configure an MGate.

1. **MGate Manager (Windows utility)**

Use MGate Manager to configure the MGate through Ethernet, or check the MGate status. Refer to **Chapter 3** for details.

2. **Web console**

Use the web console to configure the MGate, or verify the MGate's status, by Ethernet. Use a web browser such as Microsoft Internet Explorer or Google Chrome to connect to the MGate, using HTTP/HTTPS protocol. In this case, the MGate IP address must be configured correctly. Refer to **Chapter 4** for details.

3. **Serial console**

Use the serial console to configure the MGate, or verify the MGate's status, through an RS-232 null modem (crossover) cable. Use a serial terminal emulation tool such as Moxa PComm Terminal Emulator or PuTTY to log in to the MGate serial console. Note that the serial console doesn't provide the interface for all parameters. Some parameters must be configured through MGate Manager or the web console. You must use a DP9-to-RJ45 cable to connect the serial console port on the MGate gateway's front panel to the serial port on the host. The serial console parameters are 115.2 kbps; parity: none; 8 data bits; and one stop bit.

Quick Configuration Guide

This chapter provides a quick overview of how to configure the MGate 5105-MB-EIP by web console. For more detailed information on how to configure the MGate 5105-MB-EIP, refer to Chapters 3 and 4.

The following topics are covered in this chapter:

- ❑ **Cable Connection**
- ❑ **Log in to the Web Console**
- ❑ **Quick Setup**
 - System Setting
 - Select Protocol
 - Role 1 and Role 2 of MGate 5105-MB-EIP
 - Finish
- ❑ **Network Settings**
- ❑ **Serial Settings**
- ❑ **Protocol Conversion**
- ❑ **EtherNet/IP Configuration**
- ❑ **Modbus RTU/ASCII Network**
- ❑ **Modbus TCP Configuration**
- ❑ **I/O Data Mapping**
- ❑ **Communication Analysis**
- ❑ **I/O Data View**

Cable Connection

The MGate gateway supports Modbus RTU/ASCII, Modbus TCP, and EtherNet/IP protocol. If the MGate gateway needs to communicate with Modbus RTU/ASCII devices, connect your Modbus device to the MGate gateway’s Modbus port. Regardless, at least one of your devices should be Modbus TCP or EtherNet/IP interface. Connect your Modbus TCP or EtherNet/IP device to the MGate gateway’s 10/100M Ethernet port as well. The MGate gateway will indicate a valid Ethernet connection in the following ways:

- The Ethernet LED will maintain a solid green color when connected to a 100 Mbps Ethernet network.
- The Ethernet LED will maintain a solid orange color when connected to a 10 Mbps Ethernet network.
- The Ethernet LED will flash when Ethernet packets are being transmitted or received

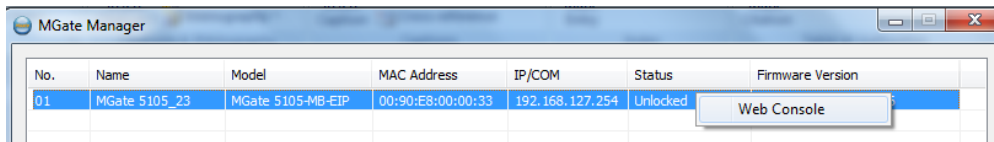
The gateway can be powered by connecting a power source to the terminal block by following the steps below:

1. Loosen or remove the screws on the terminal block.
2. Connect the 12–48 VDC power line to the terminal block. Confirm that the power source is off already.
3. Tighten the connections using the screws on the terminal block.
4. Turn on the power source.

NOTE Note that the gateway does not have an on/off switch. It automatically turns on when it receives power. The PWR LED on the top panel will glow to indicate that the unit is receiving power.

Log in to the Web Console

If you do not know the MGate gateway’s IP address when setting it up for the first time (default IP is 192.168.127.254), use an Ethernet cable to connect the host PC and MGate gateway directly. If the gateway and host PC are connected through the same Ethernet switch, make sure that there is no router between them. Then use MGate Manager to detect the MGate gateways on your network. When the MGate gateway appears on the MGate Manager device list, right-click on the selected MGate and configures it by web console.



On the first page of the web console, enter the **admin** for the default Account name and **moxa** for the default Password.

Account

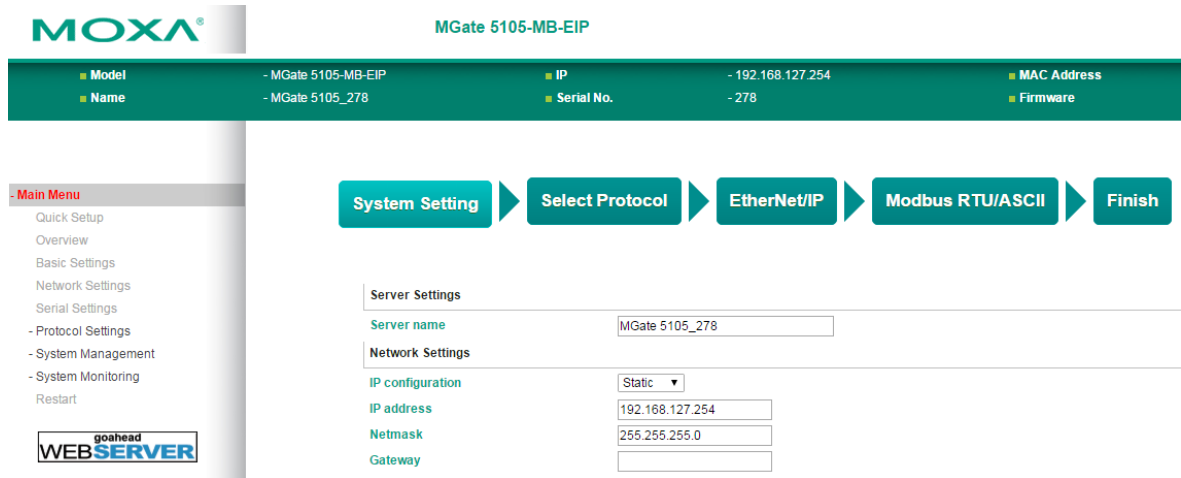
Password

Quick Setup

In most cases, users find it difficult to complete the MGate's configuration. Therefore, the MGate Series now provides Quick Setup, an illustrated guide especially designed to make the configuration easy. When you press **Quick Setup**, you will access the mode and start to configure. Only a few steps are needed.

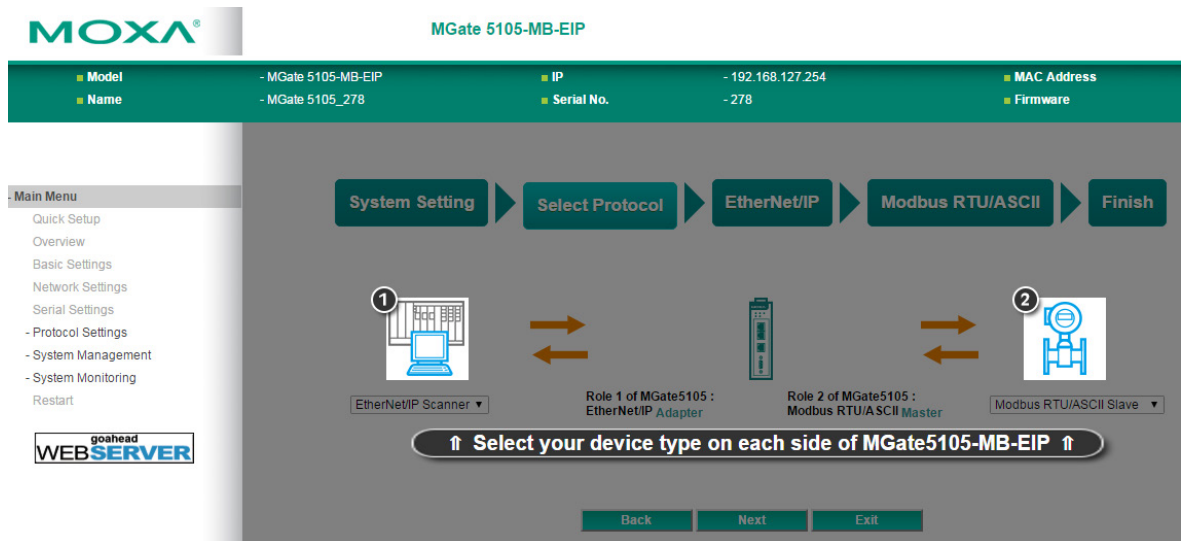
System Setting

First, configure the **Server Settings** to identify the units and **Network Settings** of MGate.



Select Protocol

Then, you should select your devices' protocols on each side. After selection, MGate will change its role to the correct one. For example, if the device is set as an EtherNet/IP Scanner, MGate will then automatically configure as an EtherNet/IP Adapter by itself.



Role 1 and Role 2 of MGate 5105-MB-EIP

After finishing Protocol Selection, Role 1 and Role 2 of MGate have been confirmed. You will need to configure the roles on each side by the following steps. Here is an example of Role 1 as an EtherNet/IP Adapter.

The screenshot shows the configuration interface for MGate 5105-MB-EIP. At the top, a green header bar displays the following information:

- Model: - MGate 5105-MB-EIP
- Name: - MGate 5105_278
- IP: - 192.168.127.254
- Serial No.: - 278
- MAC Address: (blank)
- Firmware: (blank)

The main menu on the left includes: Quick Setup, Overview, Basic Settings, Network Settings, Serial Settings, Protocol Settings, System Management, System Monitoring, and Restart. Below the menu is the 'goahead WEBSERVER' logo.

The central navigation bar shows the following steps: System Setting → Select Protocol → **EtherNet/IP** → Modbus RTU/ASCII → Finish.

The diagram below the navigation bar illustrates the roles:

- Your device: EtherNet/IP Scanner
- Role 1 of MGate5105: EtherNet/IP Adapter
- Role 2 of MGate5105: Modbus RTU/ASCII Master
- Your device: Modbus RTU/ASCII Slave

Below the diagram, the 'O → T Parameters' and 'O ← T Parameters' are listed:

| O → T Parameters | |
|------------------|--|
| Instance | 100 |
| Data size | Auto (auto calculate according to modbus command size) |

| O ← T Parameters | |
|------------------|--|
| Instance | 110 |
| Data size | Auto (auto calculate according to modbus command size) |

Here is an example of Role 2 as a Modbus RTU/ASCII.

The screenshot shows the configuration interface for MGate 5105-MB-EIP. At the top, a green header bar displays the following information:

- Model: - MGate 5105-MB-EIP
- Name: - MGate 5105_278
- IP: - 192.168.127.254
- Serial No.: - 278

The main menu on the left includes: Quick Setup, Overview, Basic Settings, Network Settings, Serial Settings, Protocol Settings, System Management, System Monitoring, and Restart. Below the menu is the 'goahead WEBSERVER' logo.

The central navigation bar shows the following steps: System Setting → Select Protocol → EtherNet/IP → **Modbus RTU/ASCII** → Finish.

The diagram below the navigation bar illustrates the roles:

- Your device: EtherNet/IP Scanner
- Role 1 of MGate5105: EtherNet/IP Adapter
- Role 2 of MGate5105: **Modbus RTU/ASCII Master**
- Your device: Modbus RTU/ASCII Slave

Below the diagram, the 'Modbus Mode' and 'Serial Parameter Settings' are shown:

Modbus Mode

Mode selection: Modbus RTU

| Baud rate | Parity | Data bit | Stop bit | Flow control | Interface | RTS on delay | RTS off delay |
|-----------|--------|----------|----------|--------------|-----------|--------------|---------------|
| 115200 | Even | 8 | 1 | None | RS-232 | 0 | 0 |

Modbus Commands

*press ctrl key to multi-select!

| Index | Name | Slave ID | Function | Address / Quantity |
|-------|------|----------|----------|--------------------|
| | | | | |

Finish

Once all the configurations are done, you can check if all parameters are correct on this page. Moreover, if you want to determine the data mapping status, you can click the **View I/O data mapping** to know more details. If all of them are correct, press **Save** to make parameters effective.

MOXA® MGate 5105-MB-EIP

| | | | |
|-------|---------------------|------------|-------------------|
| Model | - MGate 5105-MB-EIP | IP | - 192.168.127.254 |
| Name | - MGate 5105_278 | Serial No. | - 278 |

System Setting > Select Protocol > EtherNet/IP > Modbus RTU/ASCII > Finish

MGate name: MGate 5105_2
 MGate IP config: 192.168.127.254
 Netmask: 255.255.255.0
 Gateway:

Your device : EtherNet/IP Scanner ↔ Role 1 of MGate5105 : EtherNet/IP Adapter ↔ Role 2 of MGate5105 : Modbus RTU/ASCII Master ↔ Your device : Modbus RTU/ASCII Slave

| MGate Protocol1 Settings | | MGate Protocol2 Settings | |
|---------------------------|-------------------------------|--------------------------|------------------------|
| Protocol type | EtherNet/IP adapter | Protocol type | Modbus serial master |
| O ⇒ T (Output) Parameters | Instance : 100, data size : 0 | Mode | Modbus RTU |
| O ⇐ T (Input) Parameters | Instance : 110, data size : 0 | Serial parameter | 115200 Even,8,1 RS-232 |
| | | Total commands | 0 |

View I/O data mapping...

Back Save Exit

Network Settings

First, configure the **IP address** and **Netmask**. Contact your network administrator for the appropriate IP settings information.

MOXA® MGate 5105-MB-EIP

| | | | |
|-------|---------------------|------------|-------------------|
| Model | - MGate 5105-MB-EIP | IP | - 192.168.127.254 |
| Name | - MGate 5105_278 | Serial No. | - 278 |

Network Settings

Network Settings

IP configuration: Static

IP address: 192.168.127.254

Netmask: 255.255.255.0

Gateway: []

DNS server 1: []

DNS server 2: []

Submit

Serial Settings

Second, refer to the datasheet of your Modbus RTU/ASCII devices to configure **Serial parameters** for Modbus RTU/ASCII devices.

Protocol Conversion

The MGate 5105-MB-EIP supports Modbus RTU/ASCII, Modbus TCP, and EtherNet/IP protocols. On this page, the MGate fulfills a different role on each of its sides. Each role is determined by your devices' settings. Therefore, set the role of each of your devices correctly. EtherNet/IP Scanner/Adapter, Modbus TCP Client/Server, Modbus RTU/ASCII Master/Slave can be selected.

EtherNet/IP Configuration

If you select EtherNet/IP Scanner as your device, MGate 5105-MB-EIP will be configured as Ethernet/IP Adapter. In Adapter mode, you can choose **Automatic** configuration to automatically map O→T (Originator to Target) and T→O (Target to Originator) data sizes to Modbus data.

In Scanner mode, you must designate the parameters for each connection. Refer to your EtherNet/IP adapter’s datasheet to fill out O→T and T→O parameters.

NOTE A PLC may use Output and Input instead of O→T and T→O.

Modbus RTU/ASCII Network

As with EtherNet/IP setup, you should start by checking if you already have configured the serial parameters on **Serial Settings** page.

In RTU/ASCII Slave mode, the MGate gateway works as a Modbus slave device and waits for the incoming query from the Modbus master device. You only need to identify the Modbus Slave ID when in Slave mode.

The screenshot shows the 'Modbus RTU/ASCII Settings' page in Slave mode. At the top, a status bar displays: Model: MGate 5105-MB-EIP, Name: MGate 5105_278, IP: 192.168.127.254, Serial No.: 278, MAC Address: 00:90:E8:51:05:18, and Firmware: 1.2 Build 16032411. The main content area features a diagram with four components: 'Your device: EtherNet/IP Scanner', 'Role 1 of MGate5105: EtherNet/IP Adapter', 'Role 2 of MGate5105: Modbus RTU/ASCII Slave', and 'Your device: Modbus RTU/ASCII Master'. Below the diagram, the 'Role' is set to 'Slave' and the 'Mode' is 'RTU'. The 'Slave ID' is set to '2' (range 1-255). A 'Submit' button is at the bottom.

In RTU/ASCII Master mode, the MGate works as a Modbus master device and will send the Modbus request to the Modbus network actively.

The screenshot shows the 'Modbus RTU/ASCII Settings' page in Master mode. The status bar at the top is identical to the previous screenshot. The diagram shows 'Your device: EtherNet/IP Scanner' connected to 'Role 1 of MGate5105: EtherNet/IP Adapter', which is connected to 'Role 2 of MGate5105: Modbus RTU/ASCII Master', which is connected to 'Your device: Modbus RTU/ASCII Slave'. The 'Role' is set to 'Master' and the 'Mode' is 'RTU'. Under 'Master Settings', there are fields for: Initial delay (0 ms, range 0-30000), Max. retry (3, range 0-5), Response timeout (1000 ms, range 10-120000), Inter-frame delay (0 ms, range 10-500), and Inter-character timeout (0 ms, range 10-500). Below this is a 'Modbus Commands' table with columns: Index, Name, Slave ID, Function, Address / Quantity, Trigger, Poll Interval, and Endian Swap. A 'Submit' button is at the bottom.

Refer to your Modbus device’s datasheet to add Modbus commands.

Name
Slave ID
Function
Trigger
Poll interval (100 - 1200000 ms)
Endian swap
Read starting address (0 - 65535)
Read quantity

Modbus TCP Configuration

The MGate gateway also supports both Modbus TCP Master (i.e. Client) and Slave (i.e. Server) modes. In Slave mode, assign the Slave ID and confirm that the Modbus device on the remote side can send commands via the corresponding TCP port.

The screenshot shows the 'Modbus TCP Settings' page for MGate 5105-MB-EIP. The role is set to 'Server'. The 'Server Settings' section includes:

- Unit ID: (1 - 255)
- TCP port:

Buttons for 'Submit' and 'Cancel' are visible at the bottom.

For Master mode, refer to your Modbus TCP device’s datasheet to specify the command one by one manually.

The screenshot shows the 'Modbus TCP Settings' page for MGate 5105-MB-EIP. The role is set to 'Client'. The 'Client Settings' section includes:

- Initial delay: (0 - 30000 ms)
- Max. retry: (0 - 5)
- Response timeout: (10 - 120000 ms)

Below the settings is a 'Modbus Commands' table with columns: Index, Name, Slave IP Address, Slave ID, Function, Address / Quantity, Trigger, Poll Interval, Endian Swap. Buttons for 'Add', 'Edit', 'Clone', 'Delete', and 'Move' are located above the table. A 'Submit' button is at the bottom.

I/O Data Mapping

The MGate provides an internal memory for data exchange between Modbus and EtherNet/IP protocols. After finishing the protocol settings, go to the I/O Data Mapping page and check if the data mapping is connected. In some cases, you may need to switch to manual arrangement to adjust the internal address for each command.

Moxa MGate 5105-MB-EIP www.moxa.com

Model: MGate 5105-MB-EIP | IP: 192.168.127.254 | MAC Address: 00-90-E8-51-05-18
 Name: MGate 5105_278 | Serial No.: 278 | Firmware: 1.2 Build 16032411

I/O Data Mapping

Data flow direction: EtherNet/IP Scanner --> Modbus RTU/ASCII Slave
 Mapping address arrangement: Automatic

Your device: EtherNet/IP Scanner | **Role 1 of MGate5105: EtherNet/IP Adapter** | **Role 2 of MGate5105: Modbus RTU/ASCII Master** | Your device: Modbus RTU/ASCII Slave

| Name | Internal Address | Data Size |
|---------------------|------------------|-----------|
| O → T instance #100 | 0 | 5 bytes |
| O → T instance #101 | 496 | N/A |
| O → T instance #102 | 992 | N/A |
| O → T instance #103 | 1488 | N/A |

| Name | Function | Internal Address | Quantity |
|----------|----------|------------------|----------|
| Command5 | 6 | 0 | 1 |
| Command6 | 6 | 2 | 3 |
| Command7 | 6 | 4 | 5 |

Submit

Communication Analysis

After finishing all configurations, use **Communication Analysis** to confirm that the settings are correct. Click **Start** and wait 10 seconds for the analysis report to appear and describe fail status details, warnings, and hints.

Moxa MGate 5105-MB-EIP

Model: MGate 5105-MB-EIP | IP: 192.168.127.254
 Name: MGate 5105_23 | Serial No.: 23

Communication Analysis

Analysis

- EtherNet/IP
- Modbus RTU/ASCII
- I/O data mapping

Start

Some **Diagnose** pages are provided to help check whether any Modbus and EtherNet/IP communication issues happened. (E.g., invalid response or timeout issue)

MGate 5105-MB-EIP

Model: - MGate 5105-MB-EIP IP: - 192.168.127.254 MAC Address: -
 Name: - MGate 5105_23 Serial No.: - 23 Firmware: -

EtherNet/IP Diagnose

Auto refresh

| Connection Parameters | |
|----------------------------------|-----|
| O → T instance (exclusive owner) | 100 |
| O → T instance (input only) | 120 |
| T → O instance | 110 |
| O → T data size | 0 |
| T → O data size | 40 |

| Overview | |
|-----------------------------------|---|
| Current TCP connections | 0 |
| Maximum TCP connections observed | 0 |
| Current I/O connections | 0 |
| Total TCP transmit packets | 0 |
| Total TCP receive packets | 0 |
| Total TCP receive invalid packets | 0 |
| Total UDP transmit packets | 0 |
| Total UDP receive packets | 0 |
| Total UDP receive invalid packets | 0 |

I/O Connection List

Connection Information

NOTE When the MGate gateway acts as an EtherNet/IP adapter, the O→T instance is 100 and T→O instance is 110. Your EtherNet/IP scanner (e.g. PLC, SCADA) needs to use these two instances to communicate with the MGate. For example, you should provide an Output (i.e., O→T) instance of 100 and an Input (i.e., T→O) instance of 110 for a Rockwell PLC, as shown below.

RSLogix 5000 - Demo [1769-L32E 18.12]*

Path: AB_ETHIP-1\192.168.32.110\BackplaneV0*

Module Properties: LocalENB (ETHERNET-MODULE 1.1)

Type: ETHERNET-MODULE Generic Ethernet Module
 Vendor: Allen-Bradley
 Parent: LocalENB
 Name: MGate_5105

Description:

Comm Format: Data - SINT

Address / Host Name
 IP Address: 192 . 168 . 33 . 10
 Host Name:

Connection Parameters

| | Assembly Instance: | Size: |
|----------------|--------------------|-----------|
| Input: | 110 | 1 (8-bit) |
| Output: | 100 | 1 (8-bit) |
| Configuration: | 1 | 0 (8-bit) |
| Status Input: | | |
| Status Output: | | |

Status: Offline

I/O Data View

I/O Data View is designed to check all I/O modules' exchanging data. Select data flow directions to obtain the correct data from Modbus or EtherNet/IP packets.

The screenshot shows the Moxa web interface for the MGate 5105-MB-EIP. At the top, the model name and IP address (192.168.127.254) are displayed. Below this, a navigation menu on the left lists various system settings, with 'I/O Data View' highlighted in red. The main content area is titled 'I/O Data View' and includes an 'Auto refresh' checkbox, a 'Data flow direction' dropdown menu set to 'Modbus RTU/ASCII --> EtherNet/IP', a 'Start address(Hex)' input field with '0', a 'Length' dropdown set to '128', and a 'Format' dropdown set to 'Hex'. Below these controls is a table showing data for internal addresses from 0000h to 0070h. Each row in the table contains 16 columns of data, all of which are currently '00'.

| Internal Address | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0A | 0B | 0C | 0D | 0E | 0F |
|------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 0000h | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| 0010h | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| 0020h | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| 0030h | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| 0040h | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| 0050h | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| 0060h | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| 0070h | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |

MGate Manager Configuration

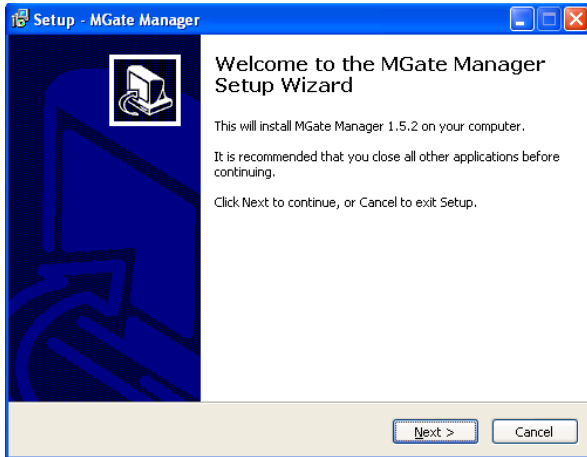
The following topics are covered in this chapter:

- ❑ **Installing the Software**
- ❑ **Starting MGate Manager**
- ❑ **Connecting to the Unit**
- ❑ **Modifying the Configuration**
 - Configure Device
 - Network Settings
 - Serial Settings
 - Protocol Settings
 - EtherNet/IP Settings
 - Modbus RTU/ASCII Settings
 - Modbus TCP Settings
 - I/O Data Mapping
 - System Settings
- ❑ **Load Default**
- ❑ **Upgrade Firmware**
- ❑ **Import/Export**
 - Export Function
 - Import Function
- ❑ **GSD Management**
- ❑ **Offline Configuration**

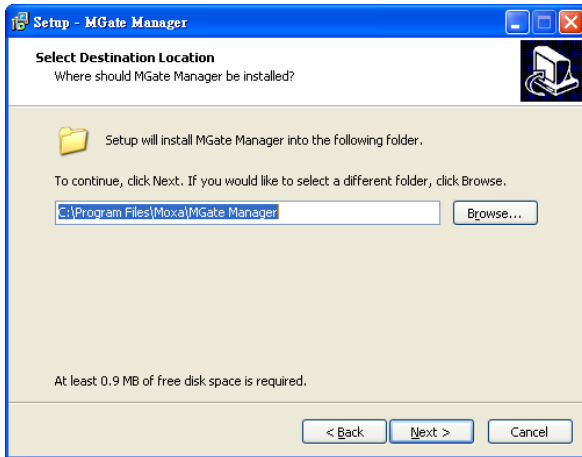
Installing the Software

The following instructions explain how to install MGate Manager, a utility for configuring and monitoring MGate 5105-MB-EIP gateways over the network.

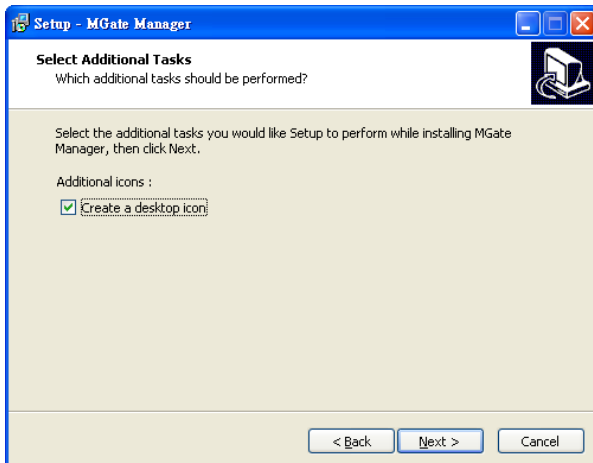
1. Insert the Document and Software CD into the CD-ROM drive. Locate and run the following setup program to begin the installation process:
 MGM_Setup_[Version]_Build_[DateTime].exe
 The latest version might be named MGM_Setup_Verx.x_Build_xxxxxxx.exe.
2. You will be greeted by a Welcome window. Click **Next** to continue.



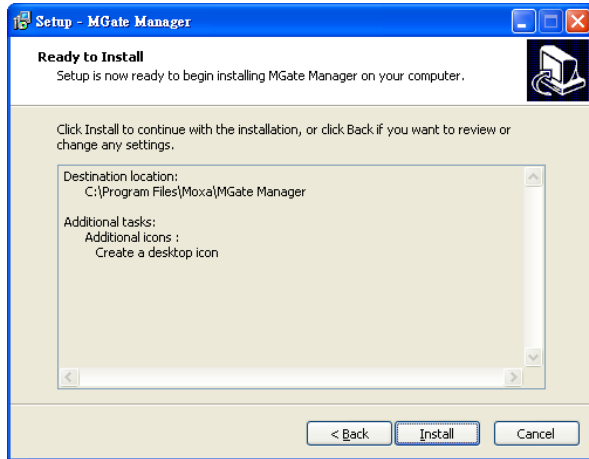
3. When the Select Destination Location window appears, click **Next** to continue. You may change the destination directory by first clicking on **Browse**.



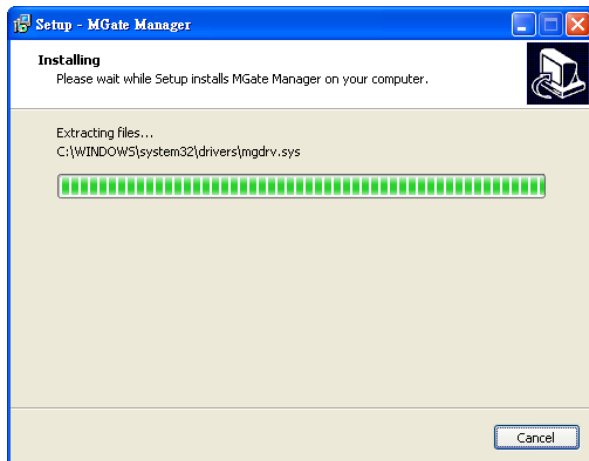
4. When the Select Additional Tasks window appears, click **Next** to continue. You may select **Create** a desktop icon if you would like a shortcut to MGate Manager on your desktop.



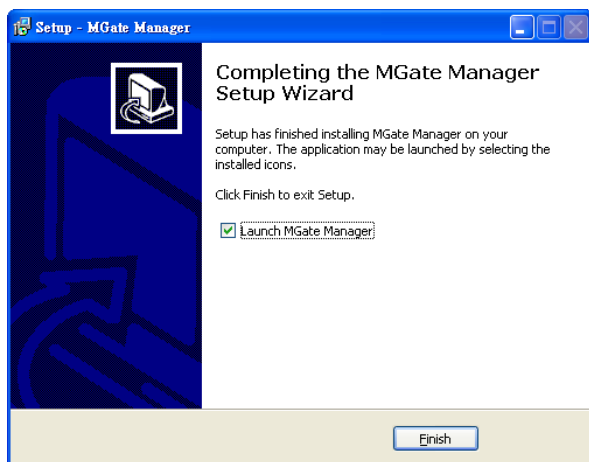
5. Click **Next** to start copying the software files.



6. A progress bar will appear. The procedure should take only a few seconds to complete.



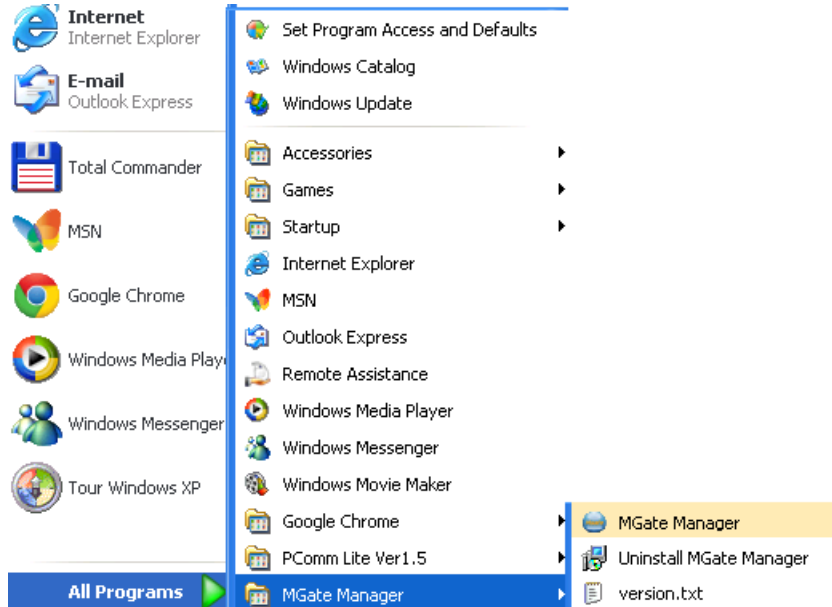
7. A message will indicate that MGate Manager is successfully installed. You may choose to run it immediately by selecting **Launch MGate Manager**.



8. You may also open **MGate Manager** through **Start → Programs → MGate Manager → MGate Manager**, as shown below.

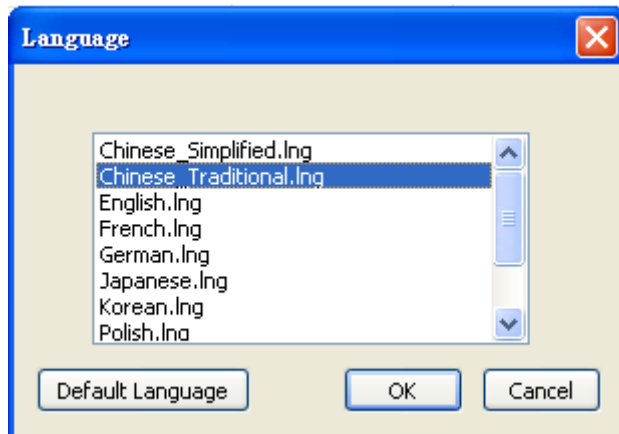
Starting MGate Manager

MGate Manager is a Windows-based utility that is used to configure the MGate 5105-MB-EIP. Before running MGate Manager, make sure that the MGate 5105-MB-EIP is connected to your PC. You may open MGate Manager from the Windows Start menu by clicking **Start → Programs → MGate Manager → MGate Manager**. The MGate Manager window should appear as shown below.



Changing the Language Settings

If you want to run MGate Manager in a different language, click **Language** to change the language setting. A dialog box showing the available languages should appear as shown below.



When you click **OK**, MGate Manager will immediately use your chosen language.



ATTENTION

Set your MGate Manager to **Default Language** before contacting Moxa Technical Support.

With support for multiple languages, MGate Manager is more user-friendly and accessible. However, if you need assistance from Moxa Technical Support, please change the language to **Default Language**. This will prevent any misunderstandings or confusion about MGate Manager menu items and commands while our engineers assist you.

The default language is English and will only be active for the current MGate Manager session. When you open MGate Manager again, the language will revert to your original setting.

Connecting to the Unit

Prior to configuration, MGate Manager must be connected to its unit. Two methods are available to establish a connection. Broadcast Search locates the MGate Series on the LAN. Search by IP attempts to connect to a specific unit by IP address, which is useful if the unit is located outside the LAN or can only be accessed by going through a router.

Broadcast Search

Broadcast Search is used for MGate Ethernet Gateways, such as the MGate 5000/MB3000/EIP3000 Series, which are discovered via Ethernet by using broadcast IP.

Specify by IP Address

Specify by IP Address is used for MGate Ethernet Gateways, such as the MGate 5000/MB3000/EIP300 Series, which are discovered via Ethernet by using a specific IP address. Click **Specify by IP Address** if you know the IP address of the unit and wish to connect to it directly.



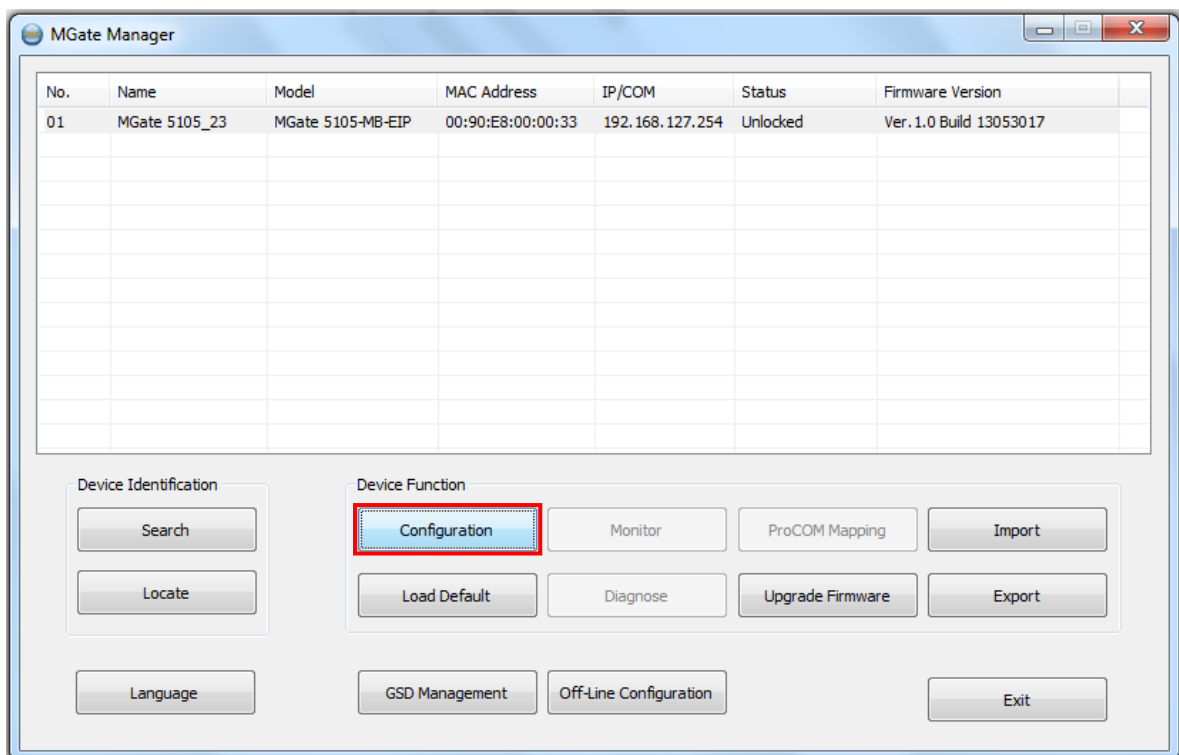
ATTENTION

If search by IP Address fails to locate the MGate 5000/MB3000/EIP3000 Series, the IP address that you entered might be incorrect. Try doing the search again and re-entering the IP address carefully.

Another possibility is that the MGate 5000/MB3000/EIP300 Series is located on the same LAN as your PC, but on a different subnet. In this case, you can modify your PC's IP address and/or netmask so that it is on the same subnet as the MGate 5000/MB3000/EIP300 Series. After your PC and the MGate 5000/MB3000/EIP300 Series are on the same subnet, MGate Manager should be able to find the unit.

Modifying the Configuration

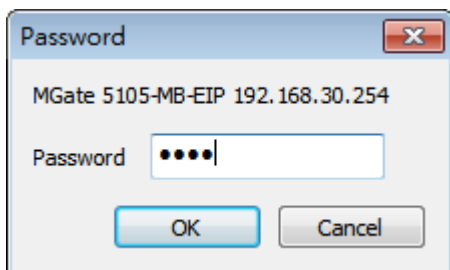
Once your unit is displayed in MGate Manager, select it by clicking on it. The Configuration button will become available. Click **Configuration** to open the configuration window.



Password Protection

For safety reasons, account/password protection is enabled by default so you must provide the correct password to unlock the device before configuring the device.

The default password is **moxa** in all lowercase letters.



Configure Device

On the first page, you can change the device name and time zone settings.

| | | | | |
|-----------------|--|--------|----------|-------------------|
| Basic | Network | Serial | Protocol | System |
| Server Settings | | | | |
| Server name | MGate 5105_23 | | | |
| Server location | | | | |
| Time Settings | | | | |
| Time zone | (GMT)Greenwich Mean Time: Dublin, Edinburgh, Lisbon, L | | | |
| Local time | <input type="checkbox"/> Modify | 2013 | / | 5 / 8 9 : 48 : 47 |
| Time server | | | | |

Server Setting

| Parameter | Value | Notes |
|-----------------|--------------------------|--|
| Server Name | (an alphanumeric string) | You can enter a name to help you identify the unit, such as the function, etc. |
| Server Location | (an alphanumeric string) | You can enter a name to help you identify the unit location. Such as "Cabinet A001." |

Time Settings

The MGate 5105-MB-EIP has a built-in Real-Time Clock for time calibration functions. Functions such as the log function can add real-time information to the message.



ATTENTION

First-time users should select the time zone first. The console will display the "real time" according to the time zone relative to GMT. If you would like to modify the real-time clock, select **Local time**. MGate's firmware will modify the GMT time according to the Time Zone.

| Parameter | Value | Notes |
|-------------|--|--|
| Time Zone | User selectable time zone | This field shows the currently selected time zone and allows you to select a different time zone. |
| Local Time | User adjustable time. (1900/1/1-2037/12/31) | |
| Time Server | IP or Domain address (e.g., 192.168.1.1 or time.stdtime.gov.tw) | This optional field specifies your time server's IP address or domain name if a time server is used on your network. The module supports SNTP (RFC-1769) for automatic time calibration. The MGate will request time information from the specified time server every 10 minutes. |



ATTENTION

When modifying the local time, select the time zone first. The time display will be updated to reflect the specified time zone.

Network Settings

The Network tab is where the unit's network settings are configured. You can modify the Name, Network Configuration, IP Address, Netmask, Default Gateway, and DNS.

Ethernet Settings

IP configuration: Static ▼

IP address: 192 . 168 . 30 . 254

Netmask: 255 . 255 . 255 . 0

Gateway: 0 . 0 . 0 . 0

DNS Server

DNS server 1: 0 . 0 . 0 . 0

DNS server 2: 0 . 0 . 0 . 0

Ethernet Settings

| Parameter | Value | Notes |
|------------------|---|--|
| IP Configuration | Static IP, DHCP, BOOTP | Select Static IP if you are using a fixed IP address. Select one of the other options if the IP address is set dynamically. |
| IP Address | 192.168.127.254 (or other 32-bit number) | The IP (Internet Protocol) address identifies the server on the TCP/IP network. |
| Netmask | 255.255.255.0 (or other 32-bit number) | This identifies the server as belonging to a Class A, B, or C network. |
| Gateway | 0.0.0.0 (or other 32-bit number) | This is the IP address of the router that provides network access outside the server's LAN. |

DNS Server

| Parameter | Value | Notes |
|--------------|-------------------------------------|---|
| DNS Server 1 | 0.0.0.0 (or other 32-bit number) | This is the IP address of the primary domain name server. |
| DNS Server 2 | 0.0.0.0 (or other 32-bit number) | This is the IP address of the secondary domain name server. |

Serial Settings

The MGate 5105-MB-EIP’s serial interface supports RS-232, 2-wire RS-485, 4-wire RS-485, and RS-422 interfaces. You must configure baudrate, parity, data bits, and stop bits before using the serial interface with Modbus RTS/ASCII protocol. Incorrect settings will result in communication failures.

Port 1

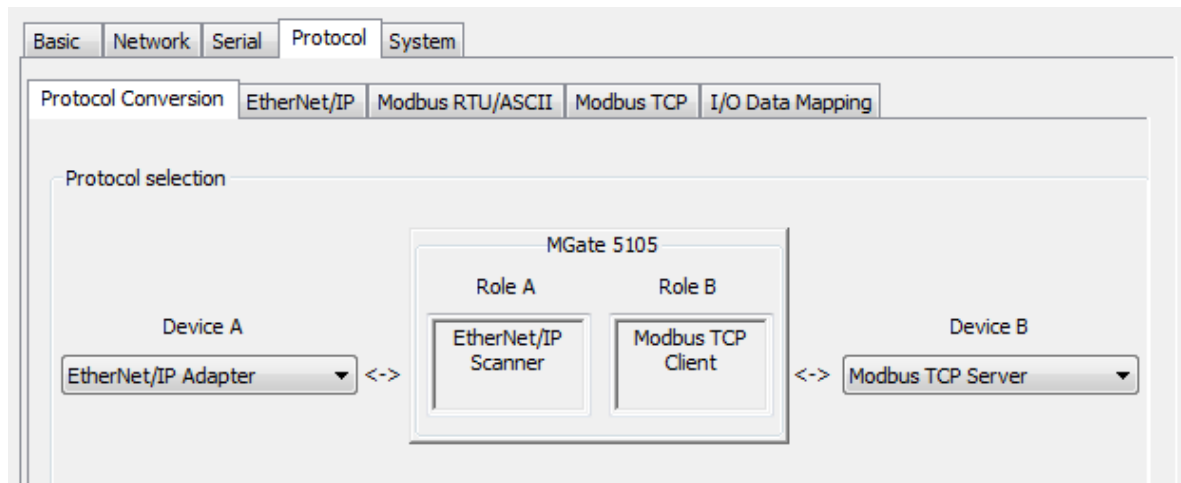
- Baud rate: 115200
- Parity: Even
- Data bit: 8
- Stop bit: 1
- Flow control: None
- FIFO: Enable
- Interface: RS232
- RTS on delay: 0
- RTS off delay: 0

Serial settings

| Parameter | Value | Notes |
|---------------|--|---|
| Baudrate | 50 bps to 921600 bps | |
| Parity | None, Odd, Even, Mark, Space | |
| Data bits | 8 | |
| Stop bits | 1, 2 | |
| Flow control | None, RTS/CTS, RTS Toggle | RTS Toggle will turn off RTS signals when there is no data to be sent. If there is data to be sent, RTS will turn on before data transmission and off after the transmission completes. |
| FIFO | Enable, Disable | The internal buffer of UART. Disabling FIFO can reduce the latency time when receiving data from serial communications, but this will also slow down the throughput. |
| Interface | RS-232, RS-422, RS-485 2 wire, RS-485 4 wire | |
| RTS on delay | 0-100 ms | Only available for RTS Toggle |
| RTS off delay | 0-100 ms | Only available for RTS Toggle |

Protocol Settings

The MGate gateway supports Modbus RTU/ASCII, Modbus TCP, and EtherNet/IP protocols. The possible combinations are listed in the following table.



Device A and Device B refer to the protocol of their own devices. MGate will then automatically configure to the corresponding role.

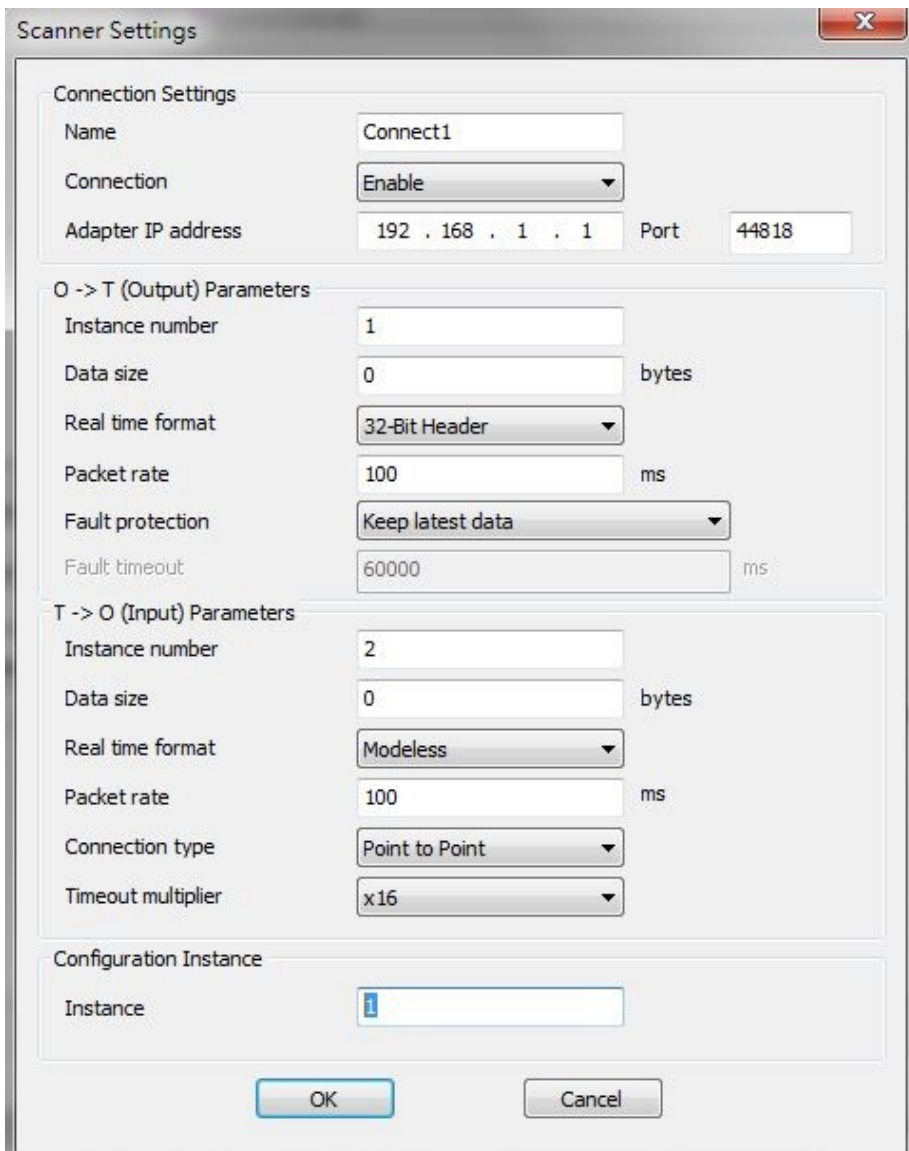
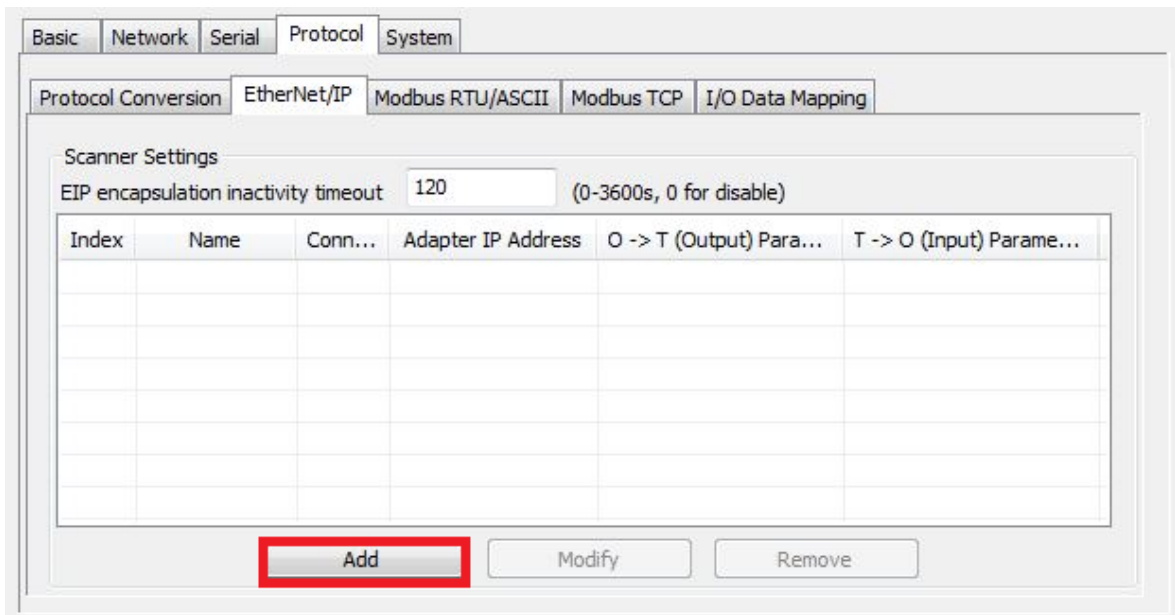
| | | Device A Protocol | | | |
|-------------------|-------------------------|---------------------|---------------------|-------------------|-------------------|
| | | EtherNet/IP Scanner | EtherNet/IP Adapter | Modbus TCP Client | Modbus TCP Server |
| Device B Protocol | Modbus RTU/ASCII Master | ✓ | ✓ | ✓ | ✓ |
| | Modbus RTU/ASCII Slave | ✓ | ✓ | ✓ | ✓ |
| | Modbus TCP Client | ✓ | ✓ | ✓ | ✓ |
| | Modbus TCP Server | ✓ | ✓ | ✓ | ✓ |

EtherNet/IP Settings

The MGate 5105-MB-EIP supports Adapter and Scanner modes for EtherNet/IP protocol. In Adapter mode, MGate supports up to four I/O connections as an EtherNet/IP adapter. All the parameters for each connection can be configured in the table.

| Parameter | Value | Notes |
|--------------------------------------|----------------------------------|---|
| EIP Encapsulation Inactivity Timeout | 0 to 3600, (0 for disable) | Unit: second If there is no data exchange in a period of time, the EtherNet/IP connection will be disconnected. |
| I/O data size configuration | Automatic, user-defined, disable | |
| O->T(Output) data size | 0 to 496 | Unit: byte O->T: Originator to Target |
| T->O(Input) data size | 0 to 496 | Unit: byte T->O: Target to Originator |
| Modbus TCP error action | Keep latest data, clear all to 0 | Keep latest data: keep sending the latest data received from Modbus TCP master to an EtherNet/IP scanner. Clear all to 0: clear MGate's input memory to zero and send all zero to the EtherNet/IP scanner. |
| Error Action timeout | 100 to 65535 | Unit: ms |

In Scanner mode, all EtherNet/IP connections will be shown in a table. For initial setup, click **Add** to create a new connection.



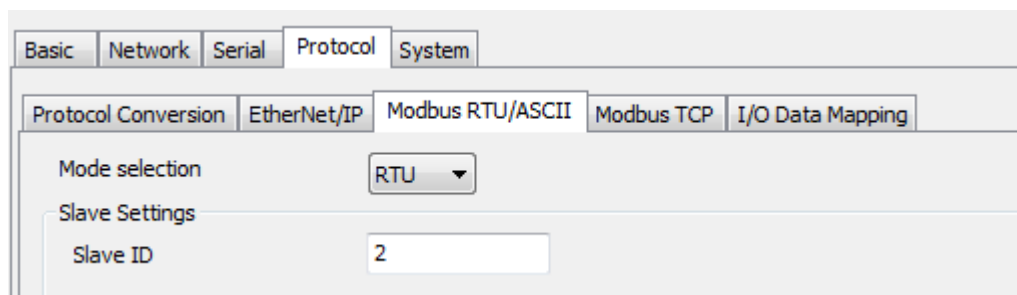
| Parameter | Value | Notes |
|-----------------------------|--|--|
| Name | Name | |
| Connection | Enable, Disable | Enable or Disable this connection. |
| Adapter IP address and Port | IP address Port: 1 to 65535 | Default EtherNet/IP port is 44818 |
| Instance number | 1 to 2147483647 | |
| Data size | O->T: 0 to 496 T->O: 0 to 496 | |
| Real-time formats | Modeless, 32-bit Header | Default O->T format is 32-bit Header. Default T->O format is modeless. |
| Packet rate | 0 to 3000 ms | Command polling interval time. |
| Fault Protection | Keep latest data, clear data to zero, user-defined value | For EtherNet/IP scanner mode, the opposite side refers to the Modbus side. Output of EtherNet/IP is sent from the Modbus side. Once the Modbus connection fails, the gateway will not be able to receive the Modbus command, but the gateway will continuously send output data to the EtherNet/IP adapter. To avoid problems in case the Modbus side fails, the MGate 5105 can be configured to react in one of three ways: keep latest data, clear data to zero, user-defined value. |
| Fault Timeout | 0 to 60000 ms | Defines the communication timeout for the Modbus side. |
| Connection type | Point to Point, Multicast | When using a Multicast connection, Target (i.e., EtherNet/IP Adapter) must reply to the Multicast IP address for the MGate to listen. |
| Timeout multiplier | x4, x8, x16, x32, x64, x128, x512 | Timeout value = packet rate x timeout multiplier (e.g., For packet rate = 100 ms and timeout multiplier = 16, the connection timeout = 1,600 ms). |

Modbus RTU/ASCII Settings

According to the Modbus RTU/ASCII settings, the MGate 5105-MB-EIP will act as a Modbus master or Modbus slave in order to communicate with your Modbus RTU/ASCII devices. For slave mode, the MGate acts as a slave and waits for the incoming connection from the Modbus master. In this mode, you only need to specify the slave ID for the MGate gateway. For master mode, the MGate works as a master and will try to send Modbus commands to the Modbus slave devices, so you will need to specify the slave device IDs and the relative Modbus commands.

Slave Mode Settings

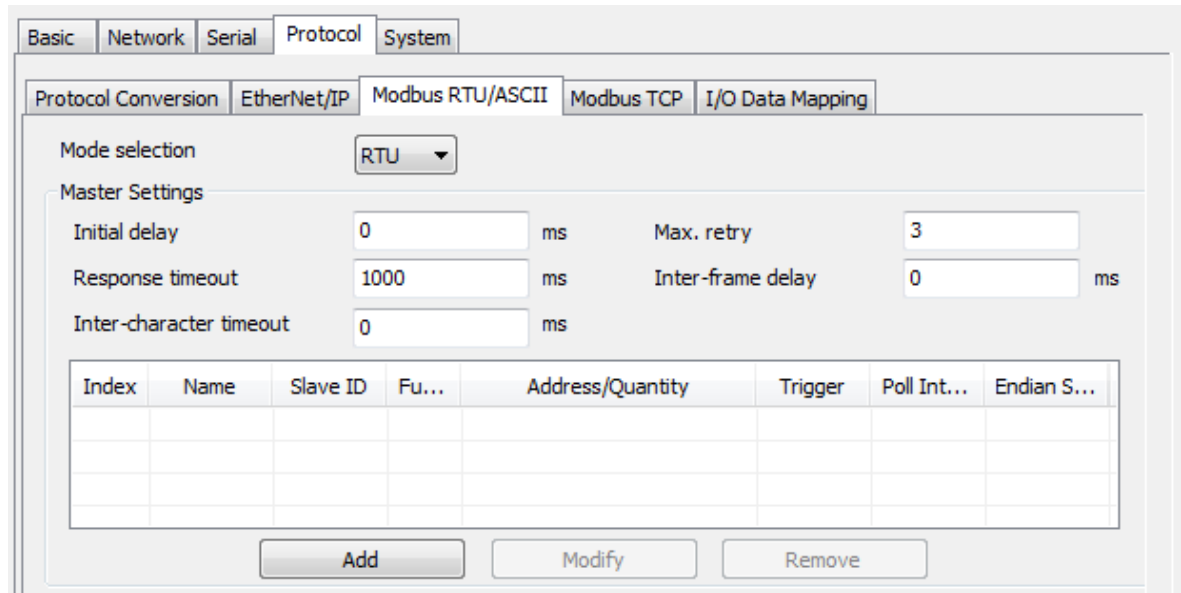
You will need to specify which Modbus protocols will run in slave mode. The MGate 5105-MB-EIP supports Modbus RTU and Modbus ASCII protocols in slave mode.



| Parameters | Value | Description |
|----------------|--------------------------|---|
| Mode selection | Slave RTU or Slave ASCII | The Modbus protocol. |
| Slave ID | 0 to 255 | The Modbus Slave ID that this slave module will accept. 0: Broadcasting 1-255: Device specific. |

Master Mode Settings

You will need to specify which Modbus protocols will run in master mode. The MGate 5105-MB-EIP supports Modbus RTU and Modbus ASCII protocols in master mode.



The MGate 5105-MB-EIP also provides several advanced settings for specific application requirements. The following settings are optional for most applications. It is suggested to use the default settings to test the MGate 5105-MB-EIP.

| Parameters | Description |
|---|---|
| Initial delay | Some Modbus slaves may take more time to boot up than other devices. In some environments, this may cause the entire system to suffer from repeated exceptions during the initial boot-up. You can force the MGate to wait after booting up before sending the first request with the Initial Delay setting. |
| Response timeout | According to the Modbus standard, the time it takes for a slave device to respond to a request is defined by the device manufacturer. Based on this response time, a master can be configured to wait a certain amount of time for a slave’s response. If no response is received within the specified time, the master will disregard the request and continue operation. This allows the Modbus system to continue operation even if a slave device is disconnected or faulty. On the MGate 5101-MB-EIP, the Response timeout field is used to configure how long the gateway will wait for a response from a Modbus ASCII or RTU slave. Please refer to your device manufacturer’s documentation to manually set the response time. |
| Inter-character timeout (only for Modbus RTU) | Use this function to determine the timeout interval between characters for Modbus devices that cannot receive Rx signals within an expected time interval. If the response is timed out, all received data will be discarded. The MGate 5105-MB-EIP will automatically determine the timeout interval if the timeout value is set to 0. |
| Max. retry | The number of times the master will retry the same request when the response times out. |
| Inter-frame delay (only for Modbus RTU) | The users can determine the time delay to transmit the data frame received from the slave device to the upstream. The MGate 5105-MB-EIP will automatically determine the time interval if it is set to 0. |

For master mode, you must identify which Modbus requests need to be sent to Modbus slave devices through serial interface. The data will be exchanged between slave devices and the MGate gateway’s internal memory. To do this, manually add all Modbus commands that will handle the data exchange. The **Add**, **Modify**, and **Remove** buttons support the Modbus command arrangement. When you click on the **Add** and **Modify** buttons, the following dialog box will be displayed.

Modify the Modbus command parameters to finish the configuration. You will need to configure each Modbus command through this dialog box.

| Parameters | Description |
|---------------|--|
| Name | Enter a name to help to identify the command, such as the location, function, etc. |
| Slave ID | The Modbus slave ID that this slave module will accept. 0: Broadcasting 1-255: Device specific |
| Function code | When a message is sent from a Client to a Server device, the function code field tells the server what kind of action to perform. We support the following function codes so far: 01: Read coils 02: Read discrete inputs 03: Read holding registers 04: Read input register 05: Write single coil 06: Write single register 15: Write multiple coils 16: Write multiple registers 23: Read/Write multiple registers |
| Trigger | Disable: The command is never sent Cyclic: The command is sent cyclically at the interval specified in the Poll Interval parameter Data change: The data area is polled for changes at the time interval defined by Poll Interval. A command is issued when a change in data is detected. |

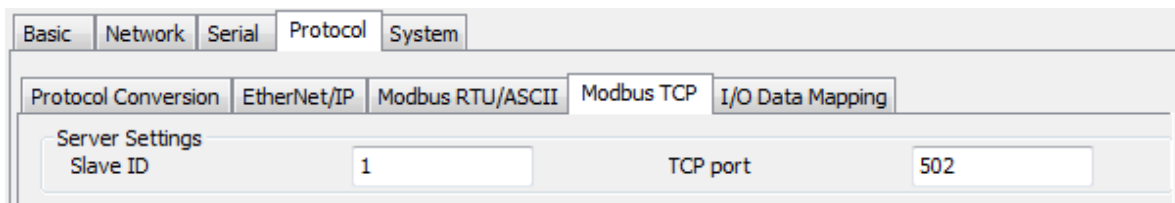
| Parameters | Description |
|------------------------|--|
| Poll interval | Polling intervals are in milliseconds. Since the module sends all requests in turns, the actual polling interval also depends on the number of requests in the queue and their parameters. The range is from 500 to 1,200,000 ms. |
| Endian swap | Data Byte Swapping None: Don't need to swap Byte: 0x0A, 0x0B, 0x0C, 0x0D becomes 0x0B, 0x0A, 0x0D, 0x0C. Word: 0x0A, 0x0B, 0x0C, 0x0D becomes 0x0C, 0x0D, 0x0A, 0x0B. ByteWord: 0x0A, 0x0B, 0x0C, 0x0D becomes 0x0D, 0x0C, 0x0B, 0x0A. There are two phases in changing ByteWord 1). 0x0A, 0x0B, 0x0C, 0x0D becomes 0x0B, 0x0A, 0x0D, 0x0C. 2). 0x0B, 0x0A, 0x0D, 0x0C becomes 0x0D, 0x0C, 0x0B, 0x0A. |
| Read starting address | Station Address. The range is from 0 to 65535 |
| Read quantity | Specifying how many quantities to write. There are two kinds of quantity units: 1 bit and 16 bits, which are associated with the function field. The range is from 1 to 125. |
| Write starting address | Station Address. The range is from 0 to 65535 |
| Write quantity | Specifying how many quantities to write. There are two kinds of quantity units: 1 bit and 16 bits, which are associated with the function field. The range is from 1 to 121. |
| Fault Protection | For Modbus RTU master mode, the opposite side refers to EtherNet/IP. Modbus Write command is sent from the EtherNet/IP side. Once EtherNet/IP connection fails, the gateway will not be able to receive the EtherNet/IP data, but the gateway will continuously send output data to Modbus RTU slave device. To avoid problems in case the EtherNet/IP side fails, MGate 5105 can be configured to react in one of three ways: keep latest data, clear data to zero, user-defined value. |
| Fault Timeout | Defines the communication timeout for the EtherNet/IP side. The range is from 0 to 60000 ms. |

Modbus TCP Settings

The MGate 5105-MB-EIP supports Modbus TCP function with slave and master mode. For slave mode, MGate works as a server and waits for incoming connection from Modbus TCP client. And for client mode, MGate works as a client and will try to build a TCP connection with a remote Modbus TCP slave device. In this mode, users have to specify the IP address of the remote device and the relative Modbus command.

Server Mode Settings

The MGate 5105-MB-EIP supports Modbus TCP server mode, which means the MGate will work as a server and wait for incoming connection requests. The default TCP listen port is 502. In this mode, the MGate will wait for incoming Modbus TCP requests and use the internal memory as the slave register to respond.



Modify the Slave ID settings to match the system requirements. The default TCP port for Modbus TCP is 502, so you may need to modify if there is a firewall in place.

| Parameters | Value | Description |
|------------|------------|-----------------------------------|
| Slave ID | 1 to 247 | The Modbus address of the MGate. |
| TCP Port | 1 to 65535 | The local TCP port for the MGate. |

Client Mode Settings

The MGate 5105-MB-EIP supports Modbus TCP client mode, which means the MGate will work as a client and send the Modbus command request to the slave device actively. You will need to configure each Modbus command manually. On this page, users can see all the commands listed in the table.

| Parameters | Value | Description |
|------------------|----------------|---|
| Initial Delay | 0 to 65535 ms | Some Modbus slaves may take more time to boot up than other devices. In some environments, this may cause the entire system to suffer from repeated exceptions during the initial boot-up. You can force the MGate to wait after booting up before sending the first request with the Initial Delay setting. |
| Response Timeout | 10 to 12000 ms | This is used to configure how long the MGate will wait for a response from a Modbus slave. |
| Max. retry | 0 to 99 | This is used to configure how many times the MGate will try to communicate with the Modbus slave. |

To add a new command or modify the existing one, click the **Add** button or **Modify** button and a new dialog box will appear. To remove Modbus commands, select the specific command and then click the **Remove** button.

To communicate with remote Modbus TCP slave devices, specify the Modbus command for each device. For each Modbus read/write command, specify the internal memory address for data exchange. For the read command, the information received from remote devices will be updated to the specified internal memory address. For the write command, the data in the specified internal memory address will be sent to the remote device. The data will be used to update the remote device register.

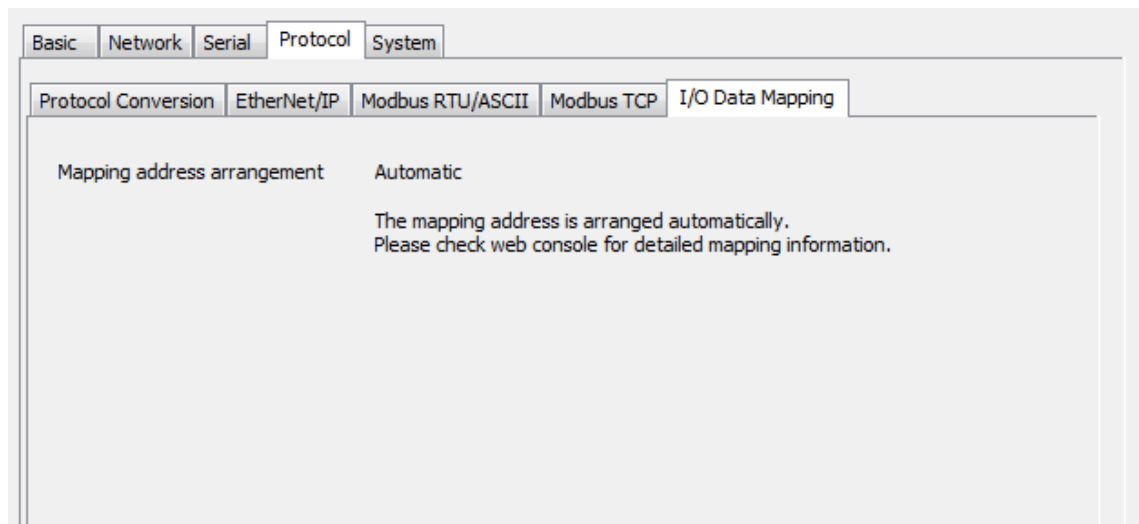
Each remote device may need more than one command for communication, so you will need to input all the commands manually.

| Parameters | Description |
|------------------|--|
| Name | Enter a name to help identify the command, such as the location, function, etc. |
| Slave IP address | The IP address of remote slave device. |
| Port | The TCP port number of remote slave devices. 0 to 65535 |
| Slave ID | The Modbus slave id that this slave module will accept. 0: Broadcasting 1–255: Device specific. |
| Function | When a message is sent from a Client to a Server device, the function code field tells the server what kind of action to perform. We support the following function codes so far: 01: Read coils 02: Read discrete inputs 03: Read holding registers 04: Read input register 05: Write single coil 06: Write single register 15: Write multiple coils 16: Write multiple registers 23: Read/Write multiple registers |
| Trigger | Disable: The command is never sent Cyclic: The command is sent cyclically at the interval specified in the Poll Interval parameter. Data change: The data area is polled for changes at the time interval defined by Poll Interval. A command is issued when a change in data is detected. |
| Poll interval | Polling intervals are in milliseconds. Since the module sends all requests in turns, the actual polling interval also depends on the number of requests in the queue and their parameters. The range is from 500 to 1,200,000 ms. |

| Parameters | Description |
|------------------------|---|
| Endian swap | Data Byte Swapping None: Don't need to swap Byte: 0x0A, 0x0B, 0x0C, 0x0D becomes 0x0D, 0x0C, 0x0B, 0x0A. Word: 0x0A, 0x0B, 0x0C, 0x0D becomes 0x0C, 0x0D, 0x0A, 0x0B. ByteWord: 0x0A, 0x0B, 0x0C, 0x0D becomes 0x0D, 0x0C, 0x0B, 0x0A. There are two phases in changing ByteWord: 1) 0x0A, 0x0B, 0x0C, 0x0D becomes 0x0B, 0x0A, 0x0D, 0x0C 2) 0x0B, 0x0A, 0x0D, 0x0C becomes 0x0D, 0x0C, 0x0B, 0x0A |
| Read starting address | Station Address. The range is from 0 to 65535 |
| Read quantity | Specifying how many quantities to write. There are two kinds of quantity units: bit and 16bits, which are associated with function field. The range is from 1 to 125. |
| Write starting address | Station Address. The range is from 0 to 65535 |
| Write quantity | Specifying how many quantities to write. There are two kinds of quantity units: bit and 16bits, which are associated with function field. The range is from 1 to 121. |
| Fault Protection | For Modbus TCP client mode, the opposite side refers to EtherNet/IP. Modbus Write command is sent from the EtherNet/IP side. If EtherNet/IP connection fails, the gateway will not be able to receive the EtherNet/IP data, but the gateway will continuously send output data to Modbus TCP server device. To avoid problems in case the EtherNet/IP side fails, MGate 5105 can be configured to react in one of three ways: keep latest data, clear data to zero, user-defined value. |
| Fault Timeout | Defines the communication timeout for the EtherNet/IP side. The range is from 0 to 60000 ms. |

I/O Data Mapping

To confirm or adjust the internal memory data mapping for both sides, use the web console.



System Settings

This configuration tab includes several system level settings, such as security, alarm, and information log. Most of these settings are optional.

Accessible IP Settings

These settings are used to restrict access to the module by IP address. Only IP addresses on the list will be allowed access to the device. You may add a specific address or range of addresses by using a combination of an IP address and a netmask, as follows:

To allow access to a specific IP address

Enter the IP address in the corresponding field; enter 255.255.255.255 for the netmask.

To allow access to hosts on a specific subnet

For both the IP address and netmask, use 0 for the last digit (e.g., "192.168.1.0" and "255.255.255.0").

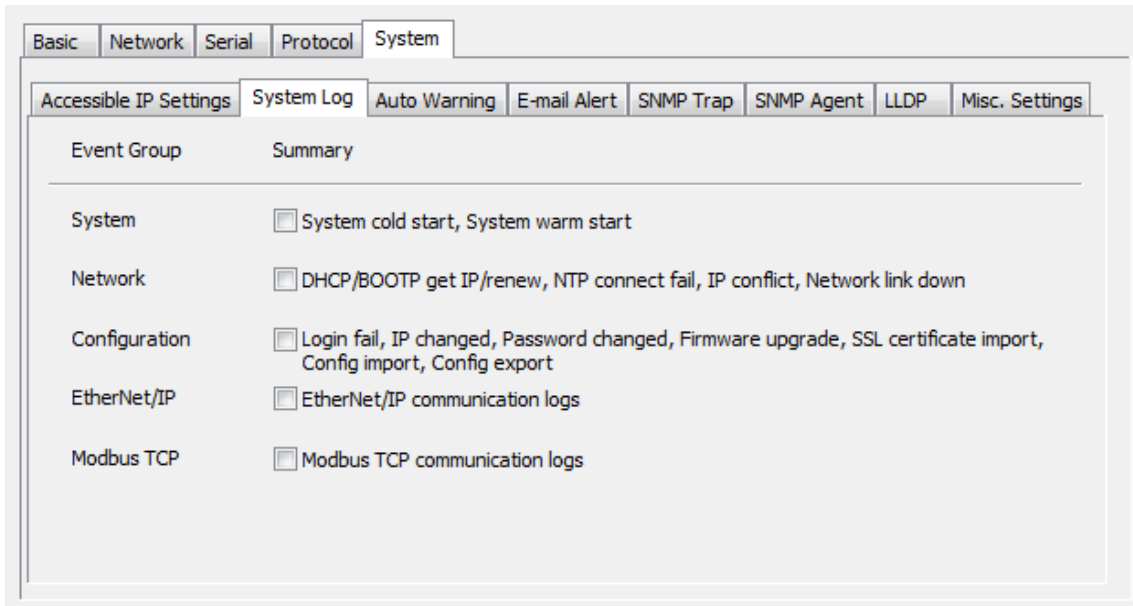
To allow access to all IP addresses

Make sure that **Enable** the accessible IP list is not checked.

Additional configuration examples are shown in the following table:

| Desired IP Range | IP Address Field | Netmask Field |
|--------------------------------|------------------|-----------------|
| Any host | Disable | Enable |
| 192.168.1.120 | 192.168.1.120 | 255.255.255.255 |
| 192.168.1.1 to 192.168.1.254 | 192.168.1.0 | 255.255.255.0 |
| 192.168.1.1 to 192.168.255.254 | 192.168.0.0 | 255.255.0.0 |
| 192.168.1.1 to 192.168.1.126 | 192.168.1.0 | 255.255.255.128 |
| 192.168.1.129 to 192.168.1.254 | 192.168.1.128 | 255.255.255.128 |

System Log Settings



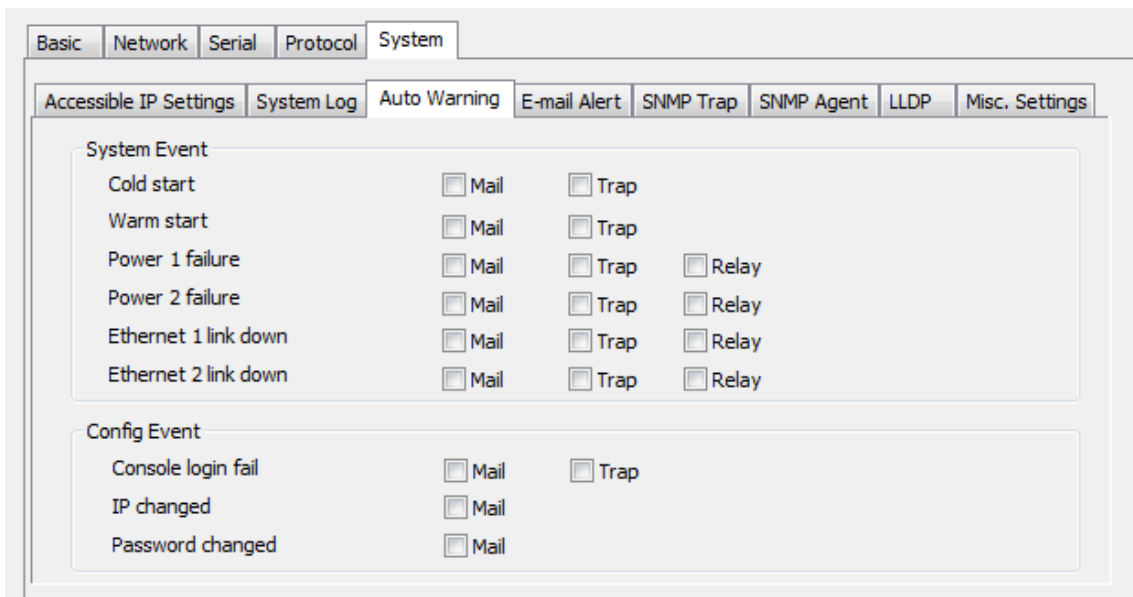
These settings enable the MGate firmware to record important events for future verification. The recorded information can only be displayed in the web console.

The available information that can be recorded includes the following events:

| Parameters | Event |
|---------------|---|
| System | System Cold Start, System Warm Start |
| Network | DHCP/BOOTP Get IP/Renew, NTP Connect Fail, IP Conflict, Network Link Down |
| Configuration | Login Fail, IP Changed, Password Changed, Firmware Upgrade, SSL Certificate Import, Configuration Import/Export |
| EtherNet/IP | EtherNet/IP Communication logs |
| Modbus TCP | Modbus TCP Communication logs |

Users can view the recorded information from the web console or text mode console.

Auto Warning Settings



Auto Warning is triggered by different events. When a checked trigger condition occurs, the MGate can send e-mail alters, SNMP Trap messages, or open/close the circuit of the relay output and trigger the Fault LED to start blinking. To enable an e-mail alert, configure the e-mail address on the **E-mail Alert** page. Likewise, to enable SNMP Trap alerts, configure SNMP trap server on the SNMP Trap page.

E-mail Alert Settings

| Parameters | Description |
|--------------------------|--|
| Mail server | The mail server’s domain name or IP address. |
| User name | This field is for your mail server’s user name, if required. |
| Password | This field is for your mail server’s password, if required. |
| From e-mail address | This is the e-mail address from which automatic e-mail warnings will be sent. |
| To e-mail address 1 to 4 | This is the e-mail address or addresses to which the automatic e-mail warnings will be sent. |

SNMP Trap Settings

| Parameters | Description |
|---------------------|--|
| SNMP trap server IP | Use this field to indicate the IP address to use for receiving SNMP traps. |
| Trap version | Use this field to select the SNMP trap version. |
| Trap community | Use this field to designate the SNMP trap community. |

SNMP Agent Settings

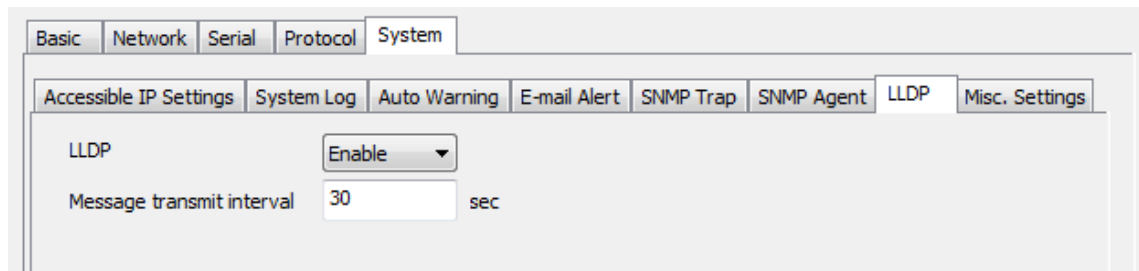
| Parameters | Description |
|------------------------|---|
| SNMP | To enable the SNMP Agent function, select the Enable option, and enter a community name (e.g., public). |
| Contact name | The optional SNMP contact information usually includes an emergency contact name and telephone number. |
| Read community string | This is a text password mechanism that is used to weakly authenticate queries to agents of managed network devices. |
| Write community string | This is a text password mechanism that is used to weakly authenticate changes to agents of managed network devices. |
| SNMP agent version | The MGate 5105-MB-EIP supports SNMP V1, V2c, and V3. |

Read-only and Read/write access control

The following fields allow you to define user names, passwords, and authentication parameters for two levels of access: read-only and read/write. The name of the field will indicate which level of access it refers to. For example, **Read-only** authentication mode allows you to configure the authentication mode for read-only access, whereas **Read/write** authentication mode allows you to configure the authentication mode for read/write access. For each level of access, you may configure the following:

| Parameters | Description |
|---------------------|---|
| User name | Use this optional field to identify the user name for the specified level of access. |
| Authentication mode | Use this field to select MD5 or SHA as the method of password encryption for the specified level of access, or to disable authentication. |
| Privacy mode | Use this field to enable or disable DES_CBC data encryption for the specified level of access. |
| Password | Use this field to set the password for the specified level of access. |
| Privacy | Use this field to define the encryption key for the specified level of access. |

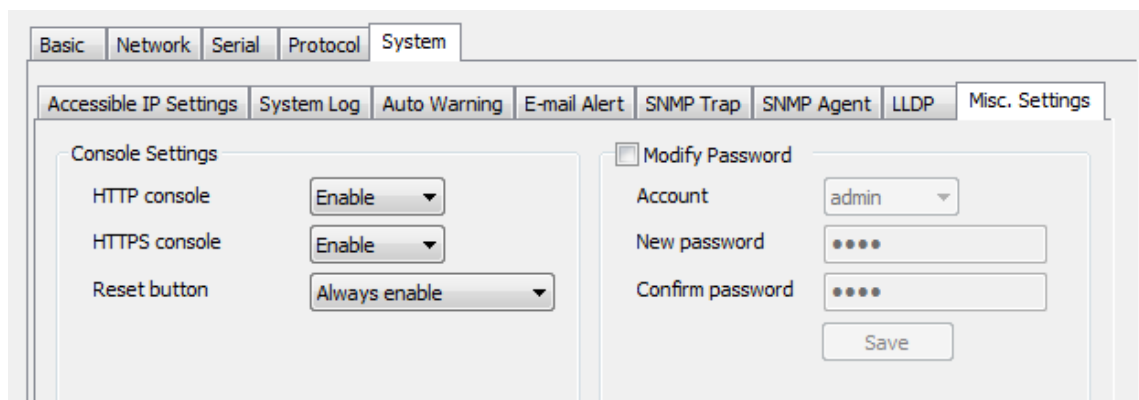
LLDP Settings



| Parameters | Description |
|---------------------------|---|
| Message transmit interval | Default is 30 seconds. The allowable range is between 5 and 32,768 seconds. |

Misc. Settings

This page includes console settings, password and relay output.



Console Settings

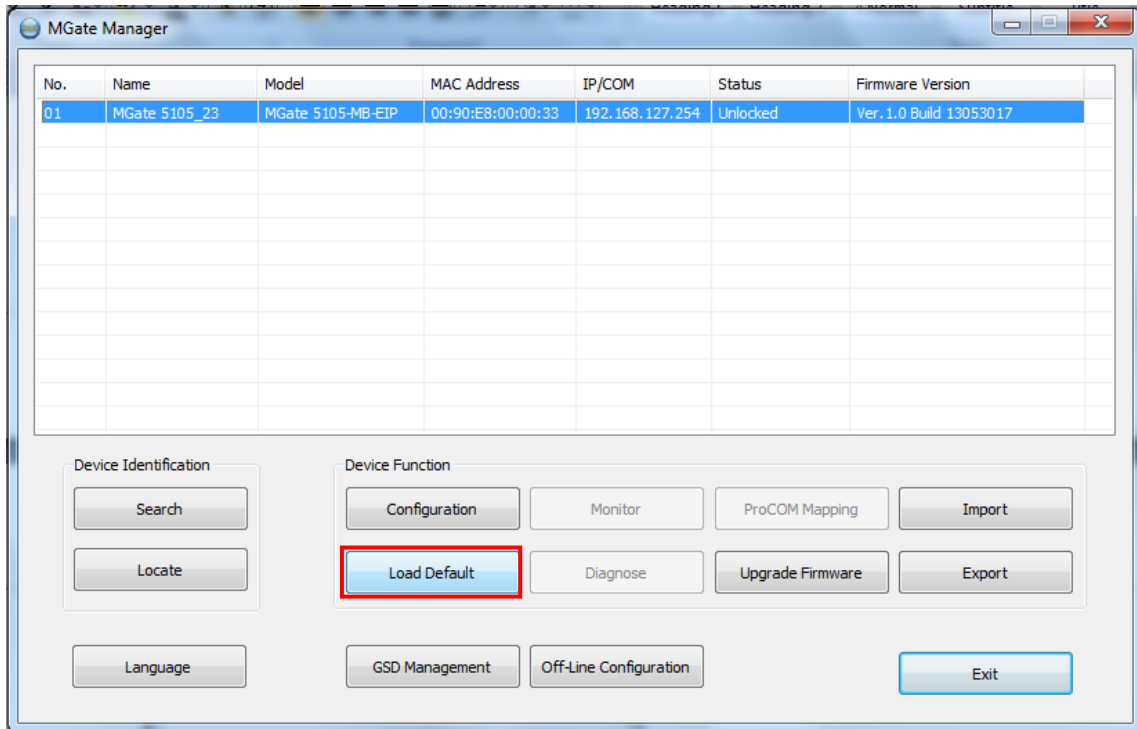
| Parameters | Value | Description |
|----------------------|-------------------------------------|---|
| HTTP/HTTPS | Enable/Disable | This setting is to enable/disable the web console. For security issues, users can only enable the HTTPS or just disable all settings. |
| Reset button protect | Disable after 60 sec, Always enable | MGate provides the reset button to clear password or load factory default settings. But for security issues, users can disable this function. In disabled mode, MGate will still enable this function within 60 seconds after boot-up, just in case users really need to reset this function. |

Modify Password

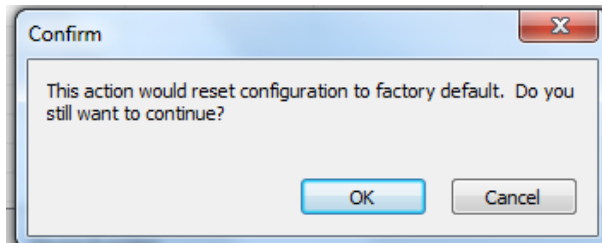
| Parameters | Value | Description |
|------------|-------------|--|
| Account | admin, user | Users can modify the password for different accounts. Now MGate provide two different level accounts. One is admin . Admin can access and modify all the settings through console. Another one is user . This account only can view the setting and can't change anything. |

Load Default

To clear all the settings on the unit, use the **Load Default** button to reset the unit to its initial factory default values.



Click **Load Default** and review the confirmation message. If you are sure you would like to reset the configuration to factory defaults, click the **OK** button. If not, click **Cancel**.



After the MGate Manager resets completely, MGate Manager will automatically execute a Broadcast Search for all MGate units on the LAN. Your MGate should reappear in the list of units.

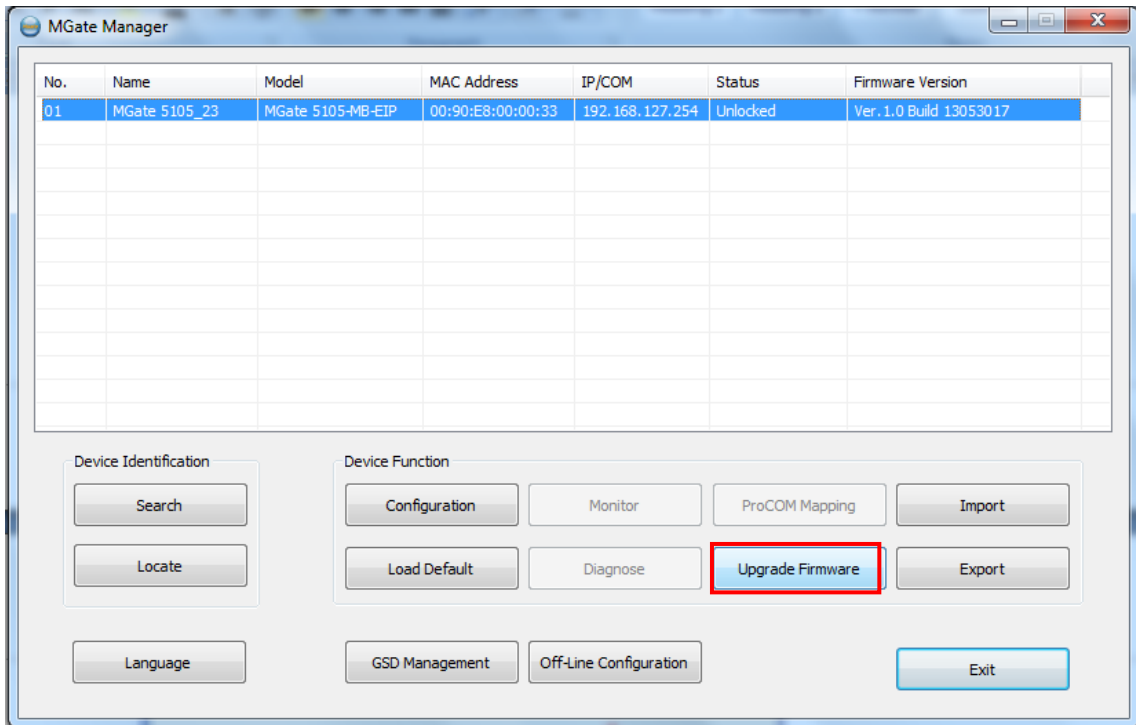


ATTENTION

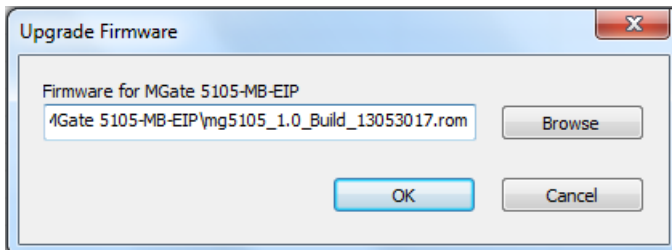
Load Default will completely reset the configuration of the unit, and all of the parameters you have saved will be discarded. Do not use this function unless you are sure you want to completely reset your unit.

Upgrade Firmware

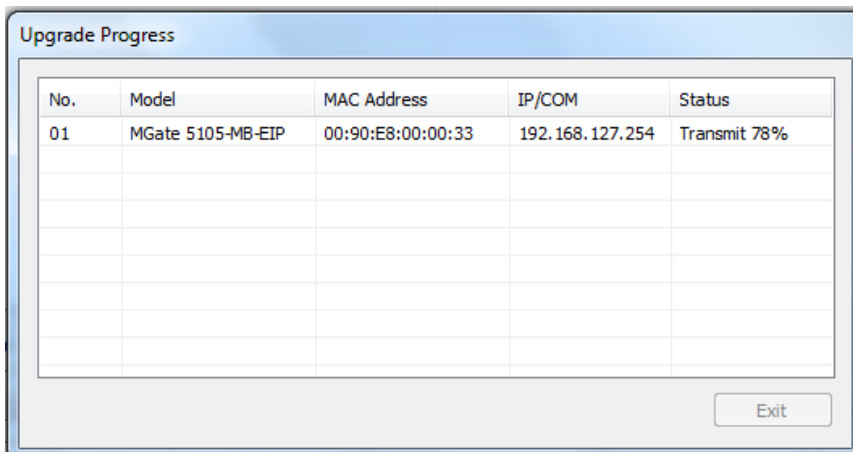
Firmware updates for the MGate 5105-MB-EIP are located at www.moxa.com. After you have downloaded the new firmware onto your PC, you can use MGate Manager to write it onto your MGate 5105-MB-EIP. Select the desired unit from the list in MGate Manager and click **Upgrade Firmware** to begin the process.



The dialog boxes will guide you through the process. You will need to browse your PC for the firmware file. Make sure it matches your model.



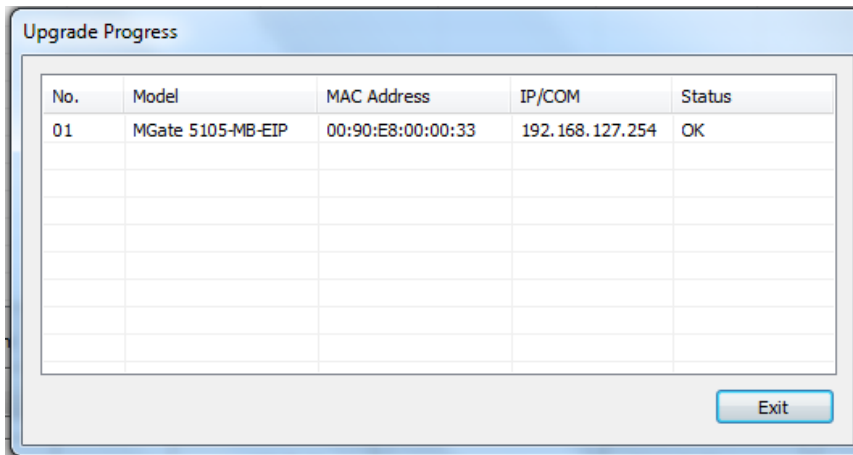
As the firmware is written to the unit, progress is displayed in the window.



**ATTENTION**

DO NOT turn off the MGate power before the firmware upgrade process is completed. The MGate will be erasing the old firmware to make room for the new firmware to flash memory. If you power off the MGate and terminate the progress, the flash memory will contain corrupted firmware and the MGate will fail to boot. If this happens, call Moxa RMA services.

Once the firmware has been successfully written onto the unit, click **Exit** to close the Upgrade Firmware window. MGate Manager will automatically execute a Broadcast Search for all MGate units on the LAN. Your MGate should reappear in the list of units.



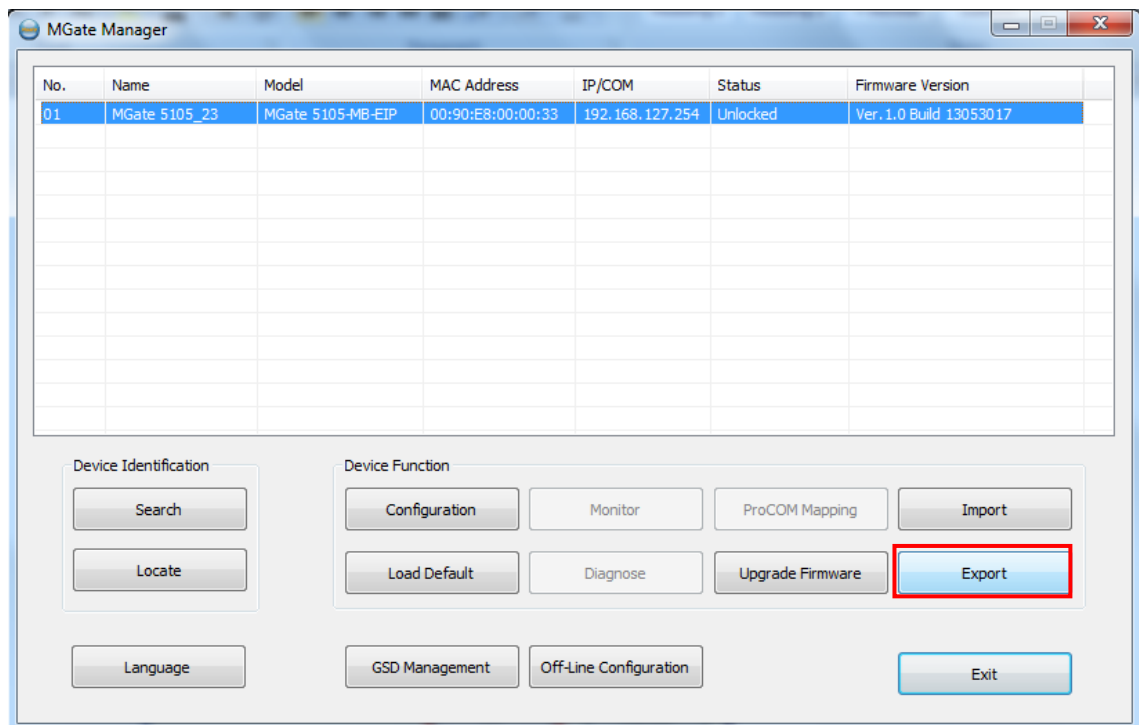
Import/Export

There are three main reasons for using the Import and Export functions.

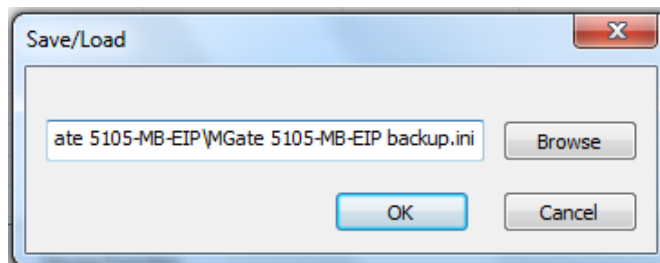
- **Applying the same configuration to multiple units**
The Import/Export configuration function is a convenient way to apply the same settings to units located in different sites. You can export the configuration as a file and then import the configuration file onto other units at any time.
- **Backing up configurations for system recovery**
The export function allows you to export configuration files that can be imported onto other gateways to restore malfunctioning systems within minutes.
- **Troubleshooting**
Exported configuration files can help administrators to identify system problems that provide useful information for Moxa's Technical Service Team when maintenance visits are requested.

Export Function

The export function saves all the configuration settings and parameters of the MGate 5105-MB-EIP in a *.ini file. To begin, click the **Export** button.



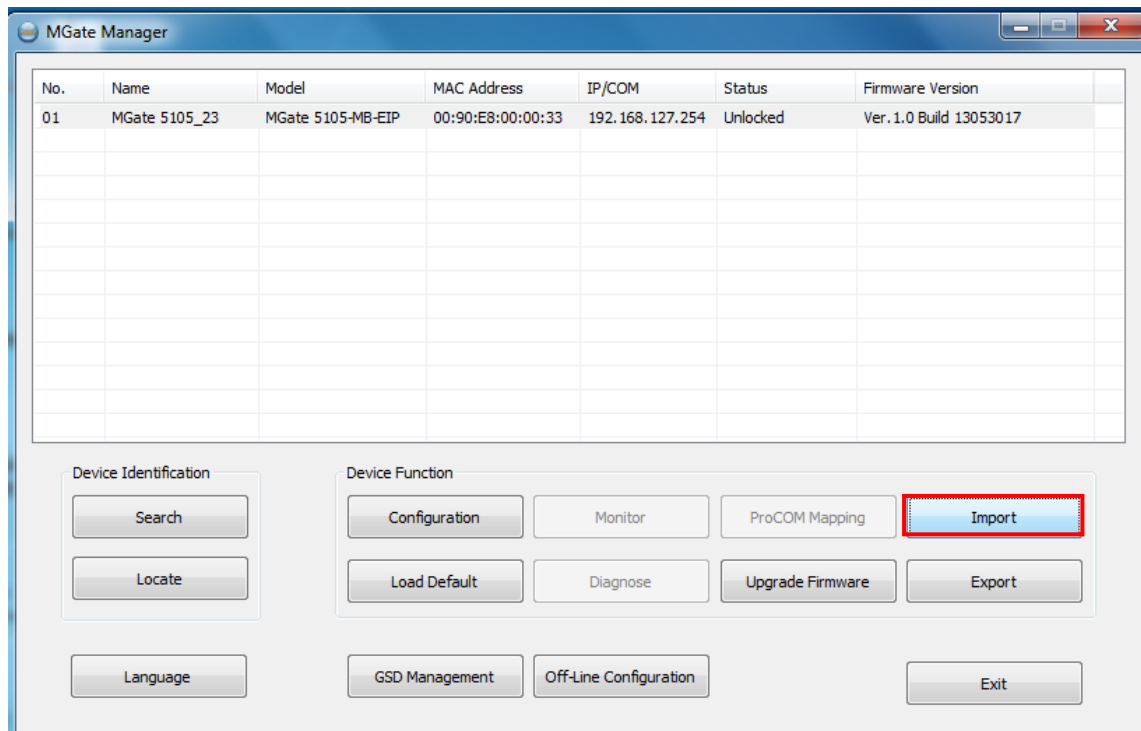
Enter a file name and use the **Browse** button to save the file to a specific path. Then, click the **OK** button.



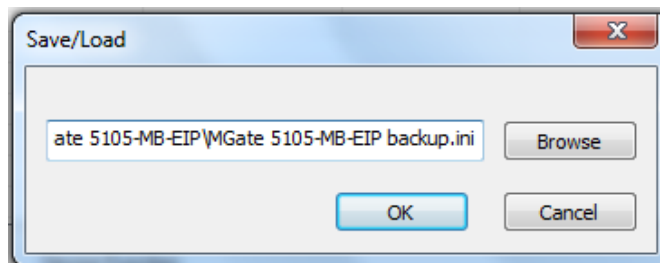
If you export the configuration file successfully, a confirmation message will pop up and the configuration file will be saved as a *.ini file

Import Function

Once the file is saved, it can be imported into your target unit to duplicate the same settings. Select the target unit first and click the **Import** button to import.



Select the file you want to import, and then click the **OK** button



Wait for the MGate Manager to finish configuring the target device. If you import the configuration file successfully, a confirmation message will pop up. After closing the message dialog, the MGate Manager will automatically execute a Broadcast Search for all MGate units on the LAN. Your MGate should reappear in the list of units.



ATTENTION

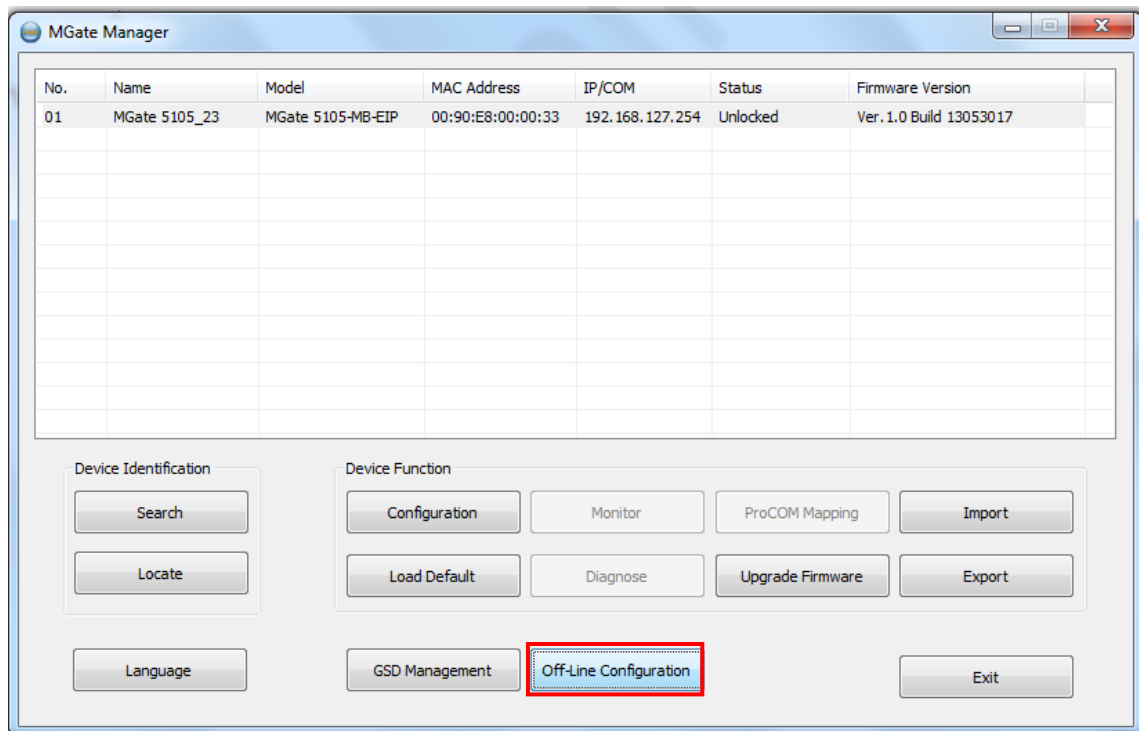
DO NOT turn off the MGate power before the firmware upgrade process is completed. The MGate will be erasing the old firmware to make room for the new firmware to flash memory. If you power off the MGate and terminate the process, all settings will disappear and the MGate gateway will revert to factory defaults. If this happens, import the settings from the file again.

GSD Management

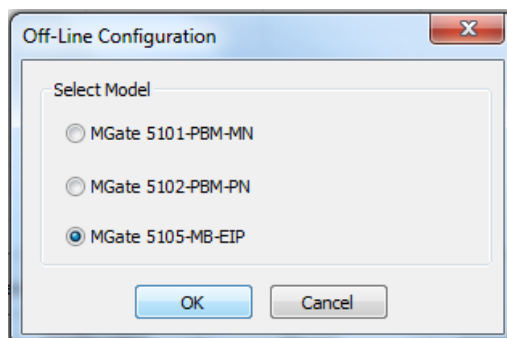
GSD Management is designed for PROFIBUS gateways (e.g., the MGate 5102-PBM-PN), so it cannot be used for the MGate 5105-MB-EIP.

Offline Configuration

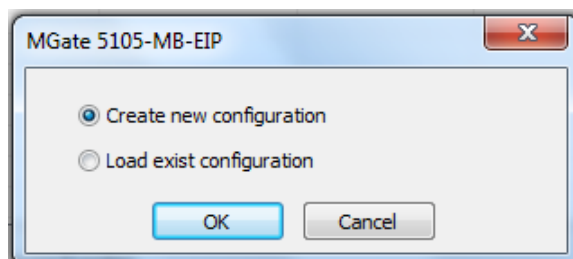
Create or modify the configuration file manually through MGate Manager by first generating the configuration file with the **Export** function. The file generated by this function can also be used for the **Import** function. To use this function, click the **Off-Line Configuration** button to load the configuration window.



Select your MGate model in the dialog box and click **OK** to proceed to the next step.



Choose either **Create new configuration** or **Load exist configuration** to edit the configuration.



For more details, refer to **Chapter 3: Modifying the Configuration** above. When all configuration settings are finished, click **OK** to save the updates to the configuration file.

4

Web Console Configuration and Troubleshooting

The following topics are covered in this chapter:

- ❑ **Overview**
- ❑ **Common Settings**
- ❑ **Protocol Settings**
- ❑ **System Management**
- ❑ **System Monitoring**

Overview

The MGate 5105-MB-EIP supports configuration and troubleshooting by web console. This chapter will focus only on the settings that can be configured by web console. These include monitoring and troubleshooting functions, such as how to check I/O data transmission, troubleshoot configurations, run diagnostics, etc. More detailed information about other configuration settings can be found in Chapter 3.

To connect to the MGate web console, open a web browser and enter the MGate gateway’s IP address.

http://<MGate IP address>

or

https://<MGate IP address>

On the first page, specify the account type and enter the password. Only two types of accounts are supported: admin and user. The **admin** account can modify all the settings, whereas the **user** account only can view settings and cannot modify any configurations. The default password is **moxa**.

All available configuration items are listed in left panel tree. Click on an item to view detailed options in the panel area on the right. To activate changes, click the **Submit** button before leaving the current page. If necessary, the MGate gateway will restart to activate the settings.

| | | | | | |
|-------|---------------------|------------|-------------------|-------------|----------------------|
| Model | - MGate 5105-MB-EIP | IP | - 192.168.127.254 | MAC Address | - 00:90:E8:00:00:33 |
| Name | - MGate 5105_23 | Serial No. | - 23 | Firmware | - 1.0 Build 13053017 |

| Welcome to MGate 5105-MB-EIP | |
|------------------------------|--------------------|
| Model name | MGate 5105-MB-EIP |
| Serial No. | 23 |
| Firmware version | 1.0 Build 13053017 |
| Ethernet IP address | 192.168.127.254 |
| Ethernet MAC address | 00:90:E8:00:00:33 |
| Up time | 0 days 07h 27m 27s |
| Power 1 | On |
| Power 2 | Off |
| microSD | Not Detected |

Common Settings

Refer to the appropriate reference section in **Chapter 3: MGate Manager Configuration** of this user’s manual for each MGate Manager settings page.

| MGate Manager Settings Page | Reference Section in Chapter 3 |
|---|--|
| Basic Settings | See Configure Device section |
| Network Settings | See Network Settings section |
| Serial Settings | See Serial Settings section |
| Protocol Settings - Protocol Conversion | See Protocol Conversion section |
| Protocol Settings - EtherNet/IP | See EtherNet/IP Settings section |
| Protocol Settings - Modbus RTU/ASCII | See Modbus RTU/ASCII Settings section |
| Protocol Settings - Modbus TCP | See Modbus TCP Settings section |
| System Management – Accessible IP List | See Accessible IP Settings section |
| System Management – System Log Settings | See Log Settings section |
| System Management – Auto Warning Settings | See Auto Warning section |
| System Management – E-mail Alert | See E-mail Alert section |
| System Management – SNMP Trap | See SNMP Trap section |
| System Management – SNMP Agent | See SNMP Agent section |
| System Management – LLDP Settings | See LLDP Settings section |
| System Management – Misc. Settings | See Misc. Settings section |
| System Management – Maintenance - Firmware Upgrade | See Upgrade Firmware section |
| System Management – Maintenance - Configuration Import/Export | See Import/Export section |
| System Management – Maintenance - Load Factory Default | See Load Default section |

In addition to the common settings above, the following functions mentioned in this chapter are only available in the web console.

Protocol Settings

Protocol Settings – I/O Data Mapping

Here, you could click left on EtherNet/IP I/O connection that will show what Modbus commands are included in the table on the right.

The screenshot shows the MGate 5105-MB-EIP web console interface. At the top, the device name and IP address are displayed. The main content area is titled "I/O Data Mapping" and shows a diagram of data flow between "Your device: EtherNet/IP Scanner" and "Your device: Modbus RTU/ASCII Slave". Below the diagram, there are two tables listing command mappings.

| Name | Internal Address | Data Size |
|---------------------|------------------|-------------|
| O → T Instance #100 | 0 | 5 bytes |
| O → T Instance #101 | 496 | N/A 0 bytes |
| O → T Instance #102 | 992 | N/A 0 bytes |
| O → T Instance #103 | 1488 | N/A 0 bytes |

| Name | Function | Internal Address | Quantity |
|----------|----------|------------------|-----------|
| Command5 | 6 | 0 | 1 2 bytes |
| Command6 | 6 | 2 | 3 2 bytes |
| Command7 | 6 | 4 | 5 2 bytes |

System Management

System Management – Maintenance – Ping

This network testing function is available only in the web console. The MGate gateway will send an ICMP packet through the network to a specified host, and the result can be viewed in the web console immediately.

- Serial Settings
- Protocol Settings
- System Management
 - Accessible IP List
 - System Log Settings
 - Auto Warning Settings
 - E-mail Alert
 - SNMP Trap
 - SNMP Agent
 - LLDP Settings
- Misc. Settings
- Maintenance
 - Ping**
 - Firmware Upgrade
 - Configuration Import/Export
 - Load Factory Default
- Certificate
- System Monitoring
- Restart

Ping Test

Ping Destination

Destination

[Activate](#)

System Management – Certificate

Use this function to load the Ethernet SSL certificate. Select or browse for the certificate file in the **Select SSL certificate/key file** field. This function is only available in the web console.

- Main Menu
- Overview
- Basic Settings
- Network Settings
- Serial Settings
- Protocol Settings
- System Management
 - Accessible IP List
 - System Log Settings
 - Auto Warning Settings
 - E-mail Alert
 - SNMP Trap
 - SNMP Agent
 - LLDP Settings
- Misc. Settings
- Maintenance
- Certificate**
- System Monitoring
- Restart

Certificate

SSL Certificate

| | |
|------------------|-----------------------------|
| Issued to | 192.168.127.254 |
| Issued by | 192.168.127.254 |
| Valid | from 2013/5/21 to 2023/5/19 |

Select SSL certificate file [Browse...](#) [Import](#)

Delete SSL certificate file [Delete](#)

System Monitoring

System Monitoring – System Status – Network Connections

Go to **Network Connections** under **System Status** to view network connection information.

- Main Menu

- Overview
- Basic Settings
- Network Settings
- Serial Settings
- Protocol Settings
- System Management
- System Monitoring
 - System Status
 - Network Connections**
 - System Log
 - Relay State
 - LLDP Table
- Protocol Status
- Communication Analysis
- Restart

Network Connections

Auto refresh

| Protocol | Recv-Q | Send-Q | Local Address | Foreign Address | State |
|----------|--------|--------|--------------------|--------------------|-------------|
| TCP | 0 | 0 | *:4900 | *:0 | LISTEN |
| TCP | 0 | 0 | *:80 | *:0 | LISTEN |
| TCP | 0 | 0 | *:44818 | *:0 | LISTEN |
| TCP | 0 | 0 | *:443 | *:0 | LISTEN |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1920 | TIME_WAIT |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1928 | TIME_WAIT |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1930 | TIME_WAIT |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1923 | TIME_WAIT |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1913 | TIME_WAIT |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1911 | TIME_WAIT |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1910 | TIME_WAIT |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1906 | TIME_WAIT |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1921 | TIME_WAIT |
| TCP | 0 | 1362 | 192.168.127.254:80 | 169.254.9.171:1935 | ESTABLISHED |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1931 | TIME_WAIT |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1915 | TIME_WAIT |
| TCP | 0 | 0 | 192.168.127.254:80 | 169.254.9.171:1933 | TIME_WAIT |

System Monitoring – System Status – System Log

- Main Menu

- Overview
- Basic Settings
- Network Settings
- Serial Settings
- Protocol Settings
- System Management
- System Monitoring
 - System Status
 - Network Connections
 - System Log**
 - Relay State
 - LLDP Table
- Protocol Status
- Communication Analysis
- Restart

System Log

System Log

2013/06/02 14:48:34 [Config] Firmware upgrade

2013/06/02 14:48:43 [System] System warm start

2013/06/02 14:48:43 [Network] Ethernet port 1 link down

Clear log
Refresh

System Monitoring – System Status – Relay Status

The MGate gateway includes a built-in relay circuit that is triggered in the event of a power failure or if the Ethernet link is down. You can view the relay status on this page.

- Main Menu

- Overview
- Basic Settings
- Network Settings
- Serial Settings
- Protocol Settings
- System Management
- System Monitoring
 - System Status
 - Network Connections
 - System Log
 - Relay State**
 - LLDP Table
- Protocol Status

Relay State

Auto refresh

| | | |
|-----------------------|-----|-------------------|
| Power input 1 failure | N/A | Acknowledge Event |
| Power input 2 failure | N/A | Acknowledge Event |
| Ethernet 1 link down | N/A | Acknowledge Event |
| Ethernet 2 link down | N/A | Acknowledge Event |

System Monitoring – System Status – LLDP Tables

You can see LLDP related information, including Port, Neighbor ID, Neighbor Port, Neighbor Port Description, and Neighbor System.

System Monitoring – Protocol Status – I/O Data View

This page displays the internal memory information for input and output data transfers. View updated values for communication verification here. This function is only available in the web console and text-mode console.

System Monitoring – Protocol Status – Diagnose

The MGate provides status information for EtherNet/IP, Modbus RUB/ASCII, and Modbus TCP troubleshooting. Verify data or packet counters to make sure the communications are running smoothly.

- Main Menu
 - Overview
 - Basic Settings
 - Network Settings
 - Serial Settings
 - Protocol Settings
 - System Management
 - System Monitoring
 - System Status
 - Protocol Status
 - I/O Data View
 - EtherNet/IP Diagnose
 - Modbus RTU/ASCII Diagnose
 - Modbus TCP Diagnose
 - Modbus RTU/ASCII Traffic
 - Communication Analysis
 - Restart

Modbus RTU/ASCII Diagnose

Auto refresh

| Category | Item | Value |
|-------------|---------------------------|------------|
| Modbus | | |
| | Mode | RTU Master |
| | Sent request | 3294 |
| | Received valid response | 3294 |
| | Received invalid response | 0 |
| | Received CRC/LRC Error | 0 |
| | Received exception | 0 |
| | Timeout | 0 |
| Serial Port | | |
| | Port number | 1 |
| | Break | 0 |
| | Frame error | 0 |
| | Parity error | 0 |
| | Overrun error | 0 |

- Network Settings
- Serial Settings
- Protocol Settings
 - Protocol Conversion
 - EtherNet/IP
 - Modbus RTU/ASCII
 - Modbus TCP
 - I/O Data Mapping
- System Management
- System Monitoring
 - System Status
 - Protocol Status
- I/O Data View
 - EtherNet/IP Diagnose
 - Modbus RTU/ASCII Diagnose
 - Modbus TCP Diagnose
 - Modbus RTU/ASCII Traffic
- Communication Analysis
- Restart

Modbus TCP Diagnose

Auto refresh

| Category | Item | Value |
|-------------|---------------------------|--------|
| Modbus | | |
| | Mode | Master |
| | Number of connection | 0 |
| | Sent request | 0 |
| | Received valid response | 0 |
| | Received invalid response | 0 |
| | Received exception | 0 |
| | Timeout | 0 |
| Connections | | |

System Monitoring – Protocol Status – Modbus RTU/ASCII Traffic

For troubleshooting or management purposes, you can monitor the Modbus RTU/ASCII data passing through the MGate 5105-MB-EIP on the network. Rather than simply echoing the data, MGate Manager presents the data in an intelligent, easy-to-understand format with clearly designated fields, including source, type, destination, contents, and more. Events can be filtered in different ways, and the complete log can be saved to a file for later analysis.

- Network Settings
- Serial Settings
- Protocol Settings
 - Protocol Conversion
 - EtherNet/IP
 - Modbus RTU/ASCII
 - Modbus TCP
 - I/O Data Mapping
- System Management
- System Monitoring
 - System Status
 - Protocol Status
- I/O Data View
 - EtherNet/IP Diagnose
 - Modbus RTU/ASCII Diagnose
 - Modbus TCP Diagnose
 - Modbus RTU/ASCII Traffic
- Communication Analysis
- Restart

Modbus RTU/ASCII Traffic

Auto scroll

Start Stop Export Capturing ...

| No. | Time | Send/Receive | Slave ID | Function Code | Data |
|-----|--------|--------------|----------|---------------|--|
| 40 | 10.278 | Receive | 1 | 3 | 01 03 14 00 00 1B 4A 00 00 1B 33 00 00 1B 55 00 00 1B 42 AB CD FF FF CF 10 |
| 41 | 10.278 | Send | 1 | 3 | 01 03 00 00 00 0A C5 CD |
| 42 | 10.326 | Receive | 1 | 3 | 01 03 14 AB CD 67 89 00 00 00 00 1B 3F 00 00 1B 30 00 00 1B 51 00 00 58 70 |
| 43 | 10.348 | Send | 1 | 3 | 01 03 00 0A 00 0A E5 CF |
| 44 | 10.396 | Receive | 1 | 3 | 01 03 14 00 00 1B 4C 00 00 1B 37 00 00 1B 55 00 00 1B 44 AB CD FF FF 80 53 |
| 45 | 11.278 | Send | 1 | 3 | 01 03 00 00 00 0A C5 CD |
| 46 | 11.326 | Receive | 1 | 3 | 01 03 14 AB CD 67 89 00 00 00 00 1B 41 00 00 1B 32 00 00 1B 53 00 00 44 59 |
| 47 | 11.348 | Send | 1 | 3 | 01 03 00 0A 00 0A E5 CF |
| 48 | 11.396 | Receive | 1 | 3 | 01 03 14 00 00 1B 4E 00 00 1B 39 00 00 1B 57 00 00 1B 46 AB CD FF FF 57 1D |
| 49 | 12.278 | Send | 1 | 3 | 01 03 00 00 00 0A C5 CD |
| 50 | 12.326 | Receive | 1 | 3 | 01 03 14 AB CD 67 89 00 00 00 00 1B 43 00 00 1B 34 00 00 1B 55 00 00 C9 E0 |
| 51 | 12.348 | Send | 1 | 3 | 01 03 00 0A 00 0A E5 CF |
| 52 | 12.396 | Receive | 1 | 3 | 01 03 14 00 00 1B 50 00 00 1B 3B 00 00 1B 59 00 00 1B 48 AB CD FF FF 1C 58 |
| 53 | 13.278 | Send | 1 | 3 | 01 03 00 00 00 0A C5 CD |
| 54 | 13.326 | Receive | 1 | 3 | 01 03 14 AB CD 67 89 00 00 00 00 1B 45 00 00 1B 36 00 00 1B 57 00 00 55 68 |

System Monitoring –Communication Analysis

After finishing all configurations, you can use **Communication Analysis** to confirm whether the settings are correct. Click **Start** and wait for 10 seconds, and an analysis report will appear with detailed fail statuses, warnings, and hints.

- System Log Settings
- Auto Warning Settings
- E-mail Alert
- SNMP Trap
- SNMP Agent
- LLDP Settings
- Misc. Settings
- Maintenance
- Certificate
- System Monitoring
- System Status
- Protocol Status
 - I/O Data View
 - EtherNet/IP Diagnose
 - Modbus RTU/ASCII Diagnos
 - Modbus TCP Diagnose
 - Modbus RTU/ASCII Traffic
- Communication Analysis
- Restart

Communication Analysis

EtherNet/IP

1. Check adapter's connection status: Fail
 - Reason: No connection request from the scanner.
 - Hint: Invalid adapter's IP setting on scanner device.

Modbus RTU/ASCII

1. Checking modubs status: OK

I/O data mapping

1. Check I/O data mapping: OK

Finish