MGate 5111 Series User Manual

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www.moxa.com/products

MGate 5111 Series User Manual

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1. Introduction

Welcome to the MGate 5111 gateway series that converts Modbus/PROFINET/EtherNet/IP to PROFIBUS slave protocols.

All the MGate 5111 gateways have dual DC power input for redundancy. Magnetic serial port isolation is also provided.

In this chapter, we give an introduction to the MGate 5111.

Overview

The MGate 5111 Series consists of industrial Ethernet gateways that convert between Modbus RTU/ASCII/TCP, EtherNet/IP, PROFINET and PROFIBUS protocols. All models are protected with a rugged metallic casing, are DIN-rail mountable, and offer built-in serial isolation. Modbus is one of the most widely used industrial communication protocol, and EtherNet/IP, PROFINET and PROFIBUS protocols are commonly seen in factory automation and process automation. The MGate 5111 gateways support both Modbus RTU/ASCII/TCP master or slave modes, so you can easily connect your Modbus device to PROFIBUS PLCs or DCSs, such as Siemens PLCs. For system integration, the MGate 5111 helps you connect EtherNet/IP PLC/SCADA, for example Rockwell Automation PLCs, to PROFIBUS PLC/DCS system, or between a new Siemens PLC system that supports PROFINET to an existing PROFIBUS system. The MGate 5111 gateways, designed for easy configuration and quick maintenance, provide a web console for remote maintenance, a wizard UI to help you set up the gateway quickly, and build-in comprehensive troubleshooting tools to reduce configuration time or system downtime. The rugged design is suitable for industrial applications such as factory automation, power, oil & gas, water and wastewater, and other process automation industries.

The MGate 5111 Series of gateways has LED indicators and supports Protocol Diagnose and Traffic Monitor for easy troubleshooting, especially during the installation stage. Communication issues could be caused by incorrect software parameters, such as slave ID and register address, or incorrect command configuration. With Protocol Diagnose and Traffic Monitor, you can check the captured data and easily identify the root cause. The MGate 5111 Series of gateways also supports status monitoring and fault protection. The status monitoring function notifies a PLC/DCS/SCADA system when a Modbus device gets disconnected or does not respond, in which case the process PLC/DCS gets the status of each end device and then issues an alarm to notify operators. The fault protection function executes actions to end devices with a pre-defined value set by the user when a PROFIBUS cable gets disconnected.

Windows-Based Utility and Web Console for Easy Setup

A Windows-based utility is provided to make it easy to search for and locate devices, assign IP addresses, import/export configuration files, and upgrade the MGate 5111's firmware. The utility automatically connects to all available MGate 5111 units on the local area network (LAN). A user-friendly web console is provided to configure the device from a web browser.

Package Checklist

All models in the MGate 5111 series are shipped with the following items:

Standard Accessories

- MGate 5111 gateway
- Quick installation guide (printed)
- Warranty card

Optional Accessories

- **Mini DB9F-to-TB Adapter:** DB9 female to terminal block adapter for RS-422/485 applications
- **WK-51-01:** wall-mounting kit, 51 mm wide

✏️ **NOTE**

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

Product Features

- Supports PROFIBUS DP V0 slave
- Supports Modbus RTU/ASCII/TCP client/master or server/slave
- Supports EtherNet/IP adapter or PROFINET IO device
- Built-in traffic monitoring/diagnostics/status monitoring and fault protection
- Built-in Ethernet cascading for easy wiring
- Redundant dual DC power inputs and relay output supported
- microSD card for configuration backup/duplication, and event log
- Serial port with 2 kV built-in isolation protection
- -40 to 75°C wide operating temperature models available
- Security features based on IEC-62443

2. Getting Started

This chapter provides basic instructions for installing the MGate 5111.

Connecting the Power

1. The unit can be powered by connecting a power source to the terminal block.
2. The power input range is from 12 to 48 VDC.

To remove the wire from the terminal block, use a flathead screwdriver to push the orange slot next to the terminal block hole, and then pull the wire out.

✏️ **NOTE**

The unit does not have an on/off switch. It automatically turns on when it receives power. The PWR LED on the front panel will glow to indicate that the unit is receiving power. There are two DC power inputs for redundancy.

Connecting PROFIBUS Devices

The unit's PROFIBUS port(s) are located on the front panel. Use a PROFIBUS cable to directly connect the unit to a PROFIBUS PLC or other PROFIBUS master.

For the PROFIBUS port pin assignments, please refer to the Pin Assignments section. This information can then be used to construct your own PROFIBUS cable.

Connecting Serial Devices

The unit's serial port(s) are located on the front panel. If you are connecting an RS-485 multidrop network with multiple devices, note the following:

- All devices that are connected to a single serial port must use the same protocol (i.e., either Modbus RTU or Modbus ASCII).

For serial port pin assignments, refer to the Pin Assignments section.

Connecting to a Host or the Network

Two 10/100 BaseT Ethernet ports are located on the gateway's front panel. These ports are used to connect the unit to a host or Ethernet network, as follows:

- For normal operation, use a standard straight-through Ethernet cable to connect the unit to your Modbus TCP, EtherNet/IP, or PROFINET network.
- For initial configuration or for troubleshooting purposes, you may connect the unit directly to a PC.

The unit's Link LED will light up to indicate a live Ethernet connection.

Installing the Software (Optional)

The Device Search Utility (DSU) can be downloaded from Moxa's website: www.moxa.com. The DSU can be used to connect the MGate with the PC. For additional details, refer to **Chapter 3:** Device Search Utility.

Wiring Requirements

> ⚠️ **ATTENTION**
>
> **Safety First!**
>
> Be sure to disconnect the power cord before installing and/or wiring your MGate 5111.
>
> **Wiring Caution!**
>
> Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum allowed current for each wire size.
>
> If the current goes over the allowed maximum, the wiring could overheat, causing serious damage to your equipment.
>
> **Temperature Caution!**
>
> Be careful when handling the MGate 5111. When plugged in, the MGate 5111's internal components generate heat, and consequently the board may be too hot to touch.

You should also observe the following common wiring rules:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the point of intersection.

> ✏️ **NOTE**
>
> Do not run signal or communication wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- When necessary, we strongly advise labeling wiring to all devices in the system.

LED Indicators

LED	Color	Description
PWR 1, PWR 2	Green	Power is on
	Off	Power is off
Ready	Green	Steady on: Power is on, and the unit is functioning normally Blinking: The unit is responding to the software's Locate function
	Red	Steady on: Power is on, and the unit is booting up Blinking: Indicates an IP conflict, or the DHCP or BOOTP server is not responding properly Flashing quickly: the microSD card failed
LAN	Green (Flashing only)	The Ethernet port is receiving or transmitting data **Modbus TCP Client:** Modbus communication in progress **Modbus TCP Server:** Modbus communication in progress **EtherNet/IP Adapter:** EtherNet/IP communication is exchanging data **PROFINET IO Device:** PROFINET communication is exchanging data
	Red (Flashing only)	A communication error occurred **Modbus TCP Client:** 1. Received an exception code or framing error (parity error, checksum error) 2. Command timeout (server/slave device is not responding) 3. TCP connection timeout **Modbus TCP Server:** 1. Received an invalid function code or framing error (parity error, checksum error) 2. Accessed invalid register address or coil address **EtherNet/IP Adapter:** The connection was refused due to incorrect configuration
	Off	No communication
MB*	Green (Flashing only)	Modbus is receiving or transmitting data
	Red (Flashing only)	A communication error occurred **Master Mode:** 1. Received an exception code or framing error (parity error, checksum error) 2. Command timeout (the server/slave device is not responding) **Slave Mode:** 1. Received an invalid function code or framing error (parity error, checksum error) 2. Accessed invalid register address or coil address
	Off	No communication
PBS	Green (Flashing only)	PROFIBUS is receiving or transmitting data
	Red (Steady)	An error in the Configuration or parameter data
	Off	PROFIBUS is offline or the slave ID is wrong.
Eth1, Eth2	Green	Indicates an 100 Mbps Ethernet connection
	Amber	Indicates a 10 Mbps Ethernet connection
	Off	The Ethernet cable is disconnected

*Only indicates serial communication status; for Modbus TCP status, please refer to LAN LED indicator.

Dimensions

Unit = mm (inch)
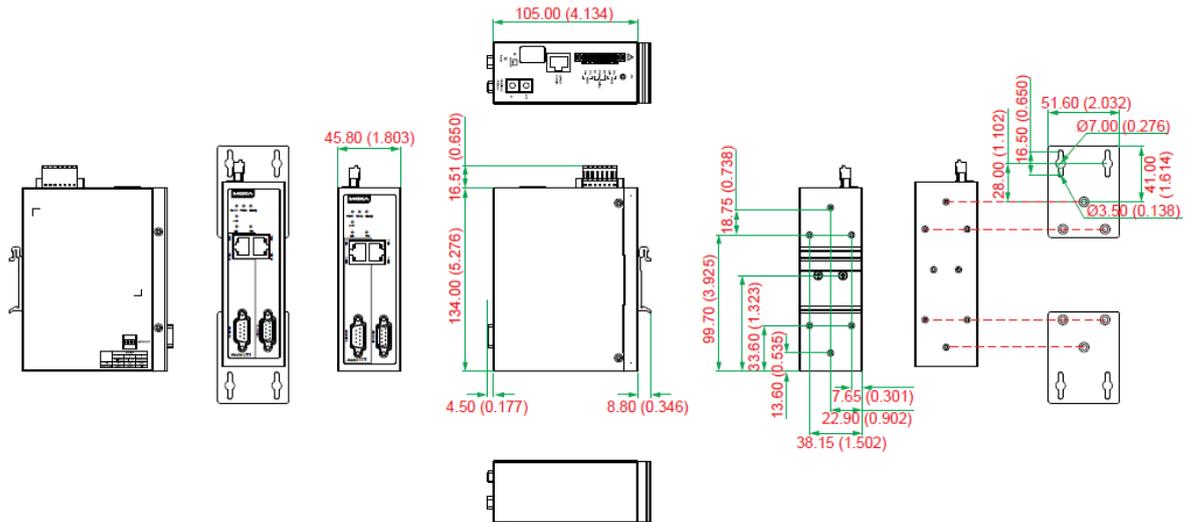
Pull Up/Down Resistors for RS-485 (Modbus)

In some critical environments, you may need to add termination resistors to prevent the reflection of serial signals. When using termination resistors, it is important to set the pull up/down resistors correctly so that the electrical signal is not corrupted. The MGate 5111 uses DIP switches to set the pull up/down resistor values for each serial port.

To add a 120 Ω termination resistor, set switch 3 on the port's assigned DIP switch to ON; set switch 3 to OFF (the default setting) to disable the termination resistor.

To set the pull up/down resistors to 150 KΩ, set switches 1 and 2 on the port's assigned DIP switch to OFF. This is the default setting.

To set the pull up/down resistors to 1 KΩ, set switches 1 and 2 on the port's assigned DIP switch to ON.

⚠️ **ATTENTION**

Do not use the 1 KΩ pull up/down setting on the MGate 5111 when using the RS-232 interface. Doing so will degrade the RS-232 signals and reduce the effective communication distance.
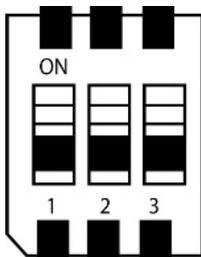

On the MGate 5111's left side panel, you will find DIP switches to adjust each serial port's pull-up resistor, pull-down resistor, and terminator.

| SW	MODBUS		
	1	2	3
	Pull-up resistor	Pull-down resistor	Terminator
ON	1 kΩ	1 kΩ	120 Ω
OFF	150 kΩ (default)	150 kΩ (default)	– (default)

Pin Assignments

The MGate 5111 uses DB9 serial ports to connect to Modbus RTU or ASCII devices. Each port supports three serial interfaces that is selected by software: RS-232, RS-422, and RS-485 (both 2 and 4-wire).

RJ45 (Ethernet, Console)
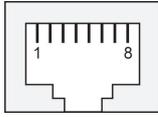
Pin	Ethernet	Console (RS-232)
1	Tx+	DSR
2	Tx-	RTS
3	Rx+	GND
4	–	TxD
5	–	RxD
6	Rx-	DCD
7	–	CTS
8	–	DTR

Male DB9 (Serial port)
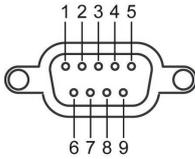
Pin	RS-232	RS-422/RS-485-4W	RS-485-2W
1	DCD	TxD-(A)	–
2	RxD	TxD+(B)	–
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5*	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	–	–	–

*Signal ground

PROFIBUS Port (Female DB9)
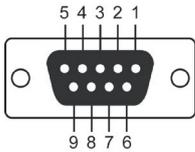
Pin	CAN
1	N.C.
2	N.C.
3	PROFIBUS D+
4	RTS
5	Signal common
6	5V
7	N.C.
8	PROFIBUS D-
9	N.C.

Power Input and Relay Output Pinouts
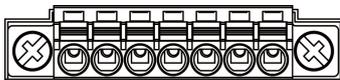
V2+	V2-	N.O.	Common	N.C.	V1+	V1-
DC Power Input 2	DC Power Input 2				DC Power Input 1	DC Power Input 1

Hardware Installation

The MGate 5111 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 mount the device to the wall. The following figure illustrates the two mounting options:
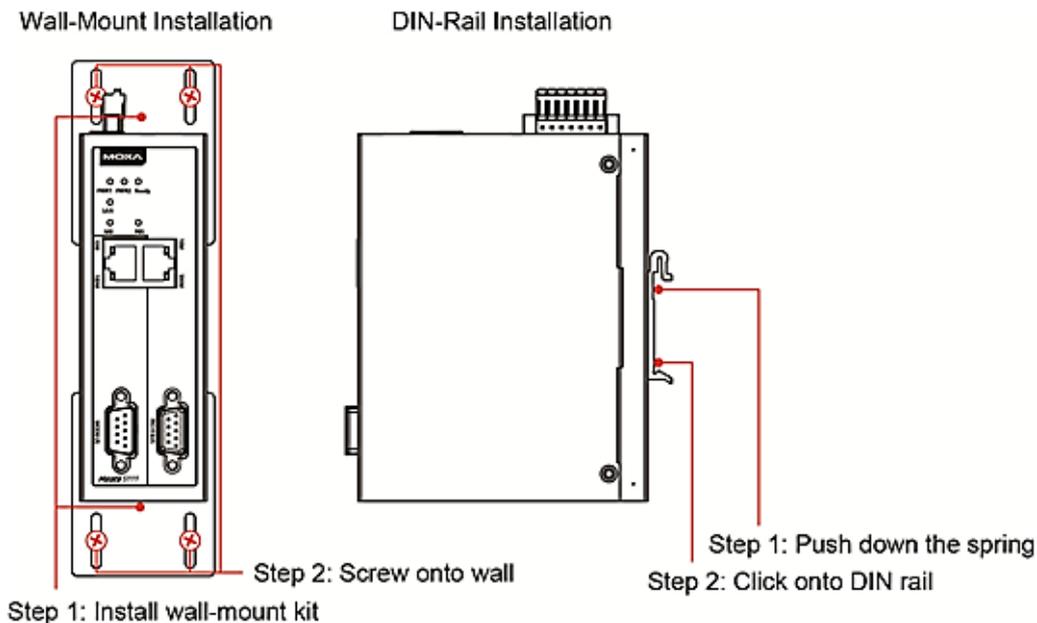
Specifications

✎ **NOTE**

The latest specifications for Moxa's products can be found at https://www.moxa.com.

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microSD Card

The MGate 5111 gateway series is equipped with a microSD card slot for easy configuration. The microSD card can be used to store an MGate's system configuration settings and the MGate's system log. In addition, a configuration stored on a microSD card can be uploaded automatically to an MGate.

✎ **NOTE**

Inserting a microSD card into an MGate's microSD slot results in one of two actions, depending on what kind of data is currently stored on the card:

1. If the microSD card contains a valid configuration file, the configuration will be automatically copied to the MGate.
2. If the microSD card does not contain a valid configuration file (e.g., if it's empty), the MGate's configuration will be copied to the microSD card.

Backing Up a Configuration

Use the following procedure to copy the configuration of an MGate gateway to a microSD card:

1. Use a PC to format the microSD card to support FAT file systems and delete all of the data on the card.
2. Power off the MGate and insert the microSD card (make sure the microSD card is empty).
3. Power on the MGate. The current settings will be copied to the microSD card.
4. If you modify the MGate's configuration using the Web Console while the microSD card is installed in the gateway, your configuration changes will be automatically saved to the microSD card when you save the configuration.

Configuring an MGate (Mass deployment/Replacement)

Use the following procedure to copy the configuration stored on a microSD card to an MGate gateway for mass deployment or to replace a faulty unit:

1. Power off the MGate device (often a new device) and insert the microSD card.
2. Power on the MGate device.
3. The configuration file stored on the microSD card will be copied automatically to the MGate gateway.

microSD card Write Failure

The following events will cause the microSD card to experience a write failure.

1. The microSD card has less than 20 MB of free space.
2. The MGate configuration file is read-only.
3. The microSD card's file system is corrupted.
4. The microSD card is damaged.

The MGate gateway will halt the write action if any of the above conditions exists. The MGate's Ready LED will flash and the beeper will sound to inform the user of the write failure. If you are replacing the microSD card, the microSD card will be synchronized with the configurations stored on the MGate device. Note that the microSD card should not contain any configuration files; otherwise, the configuration will be copied from the microSD card to the MGate device.

⚠️ **WARNING**

If your intention is to back up the configuration of an MGate gateway, it is best practice to **only insert an empty microSD card** into the microSD slot. If the card contains a valid configuration file, that configuration will automatically (without warning) overwrite the MGate's current configuration.

Quick Setup

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 five steps are needed.

Step 1: System Setting

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

Step 2: Select Protocol

Then, you have to select the protocols used on your devices that are connected through the MGate. After selection, the MGate will automatically change its role to the correct one. For example, if the device is set as a Modbus TCP Server, the MGate will then automatically configure as a Modbus TCP Client by itself. Regarding protocol configuration, please refer to chapter 4.
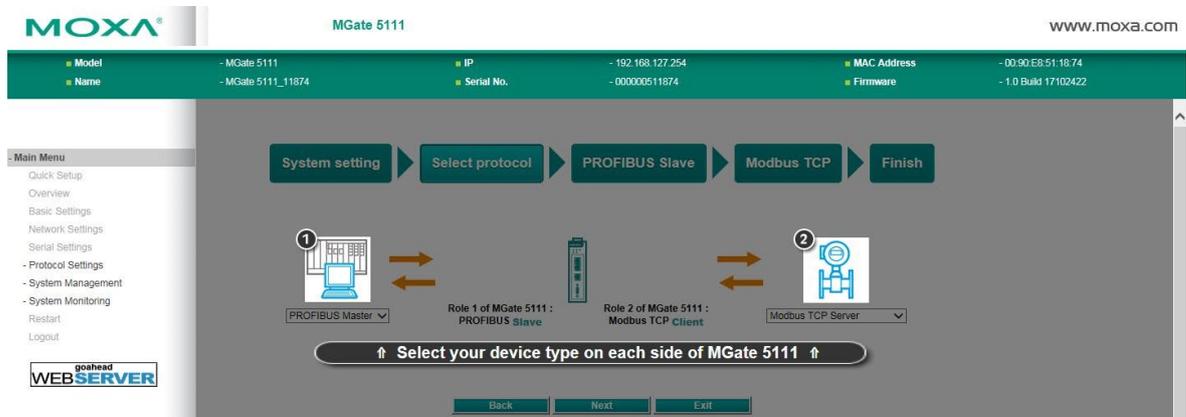
Example of Role 1 and Role 2:

After finishing the device protocol selection, Role 1 and Role 2 of the MGate will be set accordingly. You will need to configure the details on each side with the following steps. Here is an example of Role 1 as a PROFIBUS Master, and Role 2 as a Modbus TCP Server device.
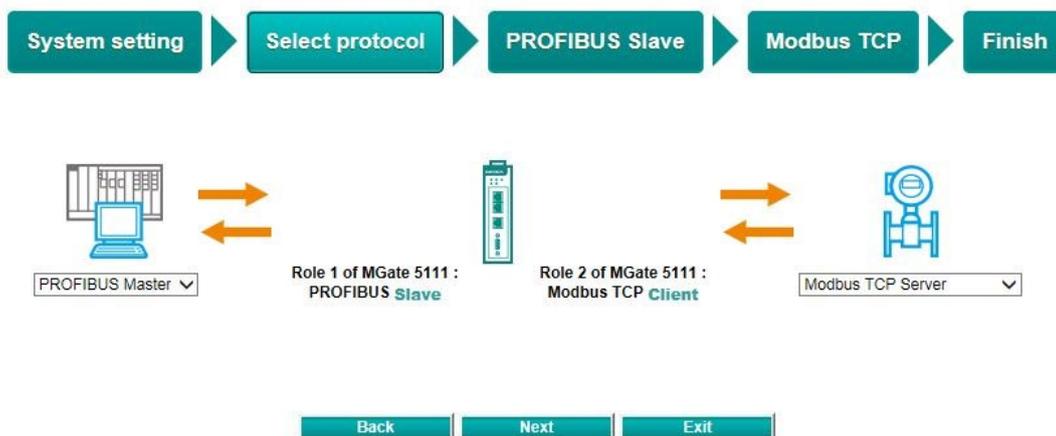
Step 3: PROFIBUS Slave Settings

For details, please refer to Protocol Settings.

Step 4: Modbus TCP Settings

For details, please refer to **Protocol Settings**.

Modbus Commands

*press ctrl key to multi-select!   ⊕ Add   ✎ Edit   ⧉ Clone   🗑 Delete   ↕ Move

Index	Name	Slave IP Address	Slave ID	Function	Address / Quantity

Back Next Exit

Name	Command1	
Slave IP address	0.0.0.0	Port 502
Unit ID	1	
Function	01 - Read Coils	
Read starting address	0	(0 - 65535)
Read quantity	10	

OK Cancel

Modbus Commands

*press ctrl key to multi-select!   ⊕ Add   ✎ Edit   ⧉ Clone   🗑 Delete   ↕ Move

Index	Name	Slave IP Address	Slave ID	Function	Address / Quantity

Back Next Exit

Step 5: Finish

Once all the configurations are done, you can check if all parameters are correct on this webpage. 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 the settings effective.

| System setting | Select protocol | PROFIBUS Slave | Modbus TCP | Finish |

MGate name	MGate 5111
MGate IP config	192.168.127.254
Netmask	255.255.255.0
Gateway	--

Your device :
PROFIBUS **Master**

Role1 of MGate 5111 :
PROFIBUS **Slave**

Role2 of MGate 5111 :
Modbus TCP **Client**

Your device :
Modbus TCP **Server**

MGate Protocol1 Settings

Protocol type	PROFIBUS Slave
Input size	2
Output size	1

MGate Protocol2 Settings

Protocol type	Modbus TCP client
Total commands	3

Back   Save   Exit

3. Device Search Utility

Installing the Software

The following instructions explain how to install the Device Search Utility (**DSU**), a utility for configuring and monitoring MGate 5111 units over a network.

1. Locate and run the following setup program to begin the installation process:

   dsu_setup_[*Version*]**_Build_**[*DateTime*]**.exe**

   The latest version might be named **dsu_setup_Ver2.0_Build_xxxxxxxx.exe**, for example:
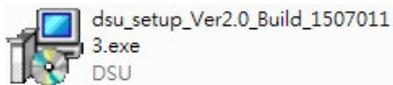
2. You will be greeted by the Welcome window. Click **Next** to continue.

3. When the **Select Destination Location** window appears, click **Next** to continue. You may change the destination directory by clicking on **Browse....**
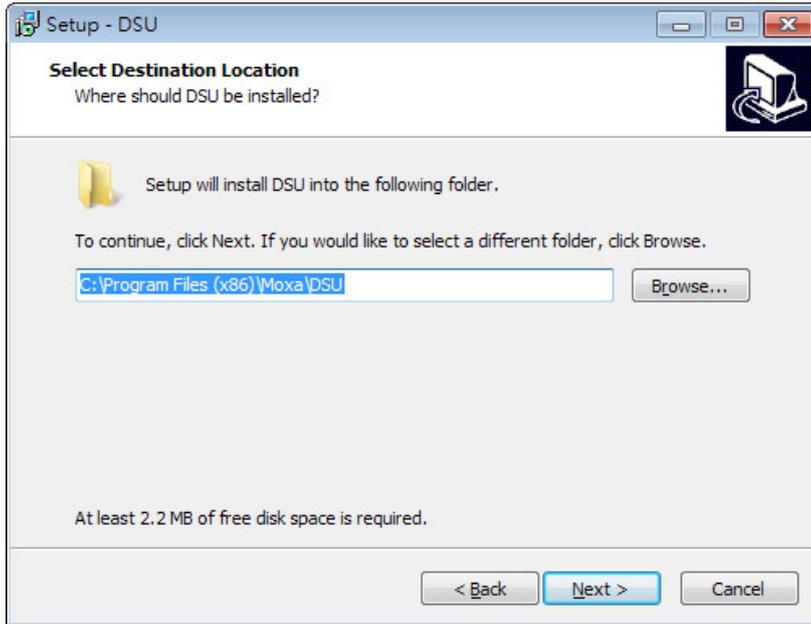
4. When the **Select Additional Tasks** window appears, click **Next** to continue. You may select **Create a desktop icon** if you would like a shortcut to the DSU on your desktop.
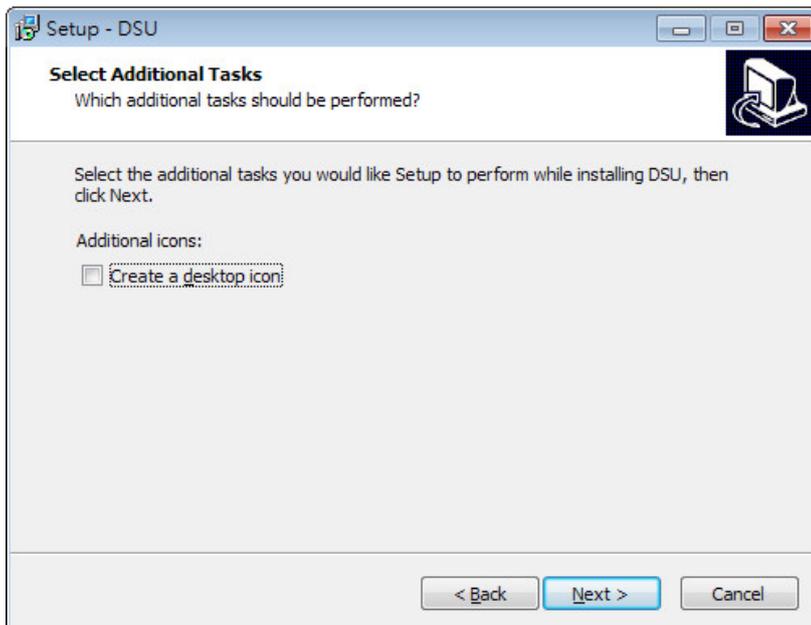
5. Click **Install** to start copying the software files.
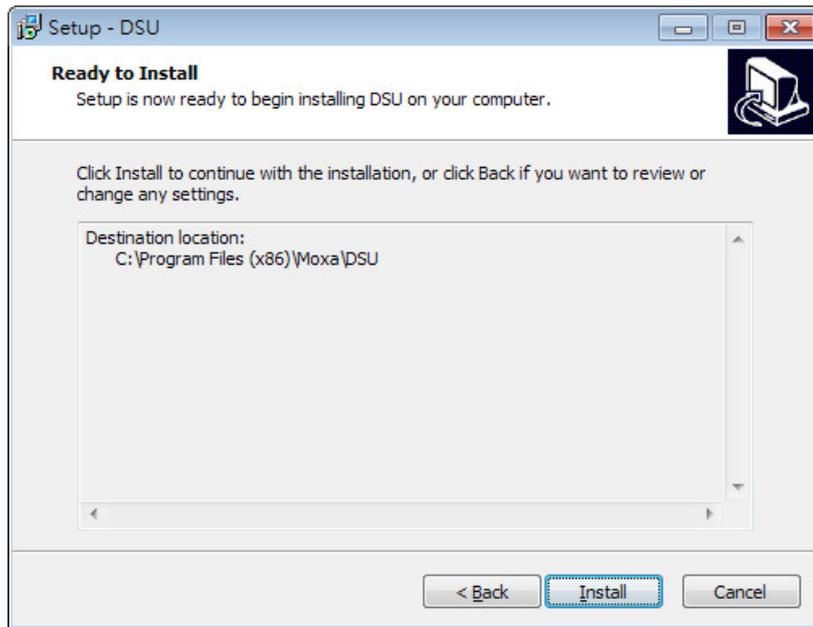
6. A progress bar will appear. The procedure should take only a few seconds to complete.
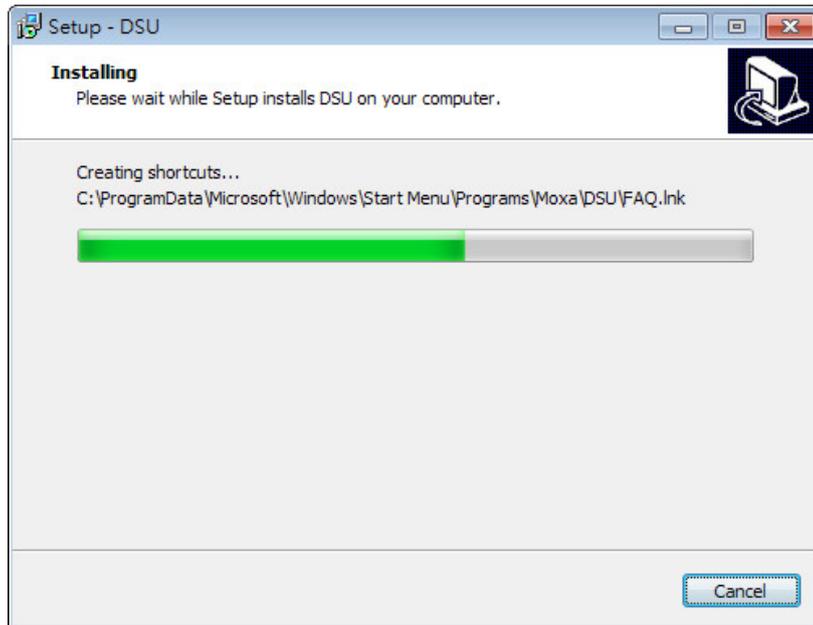
7. A message will indicate that the DSU is successfully installed. You may choose to run it immediately by selecting **Launch DSU.**
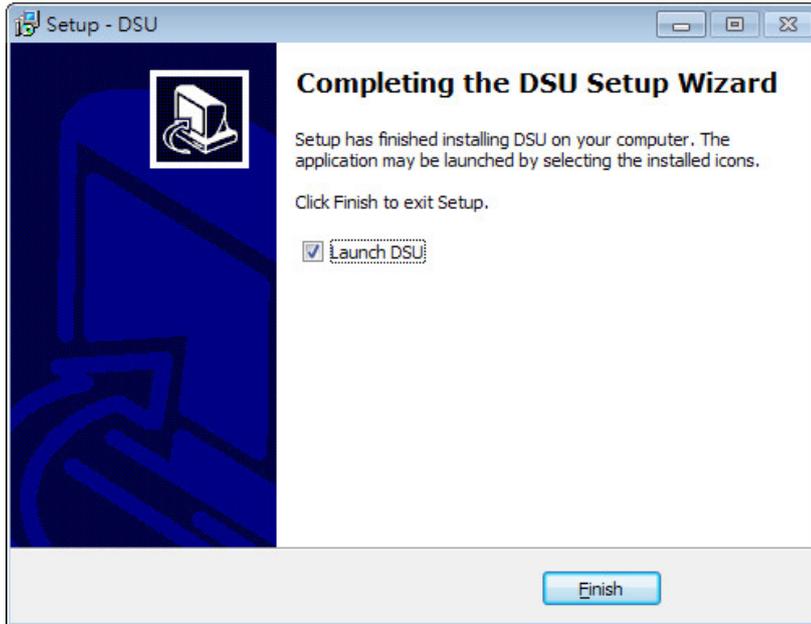
8. You may also open the DSU through **Start > Programs > MOXA > DSU**, as shown below.
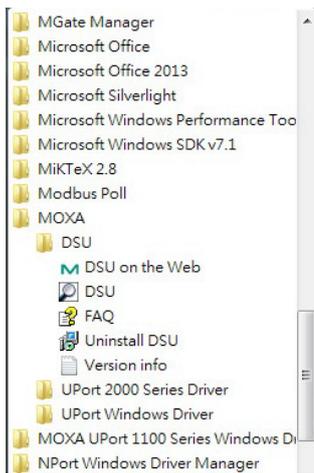
Starting the Device Search Utility (DSU)

The DSU is a Windows-based utility that is used to configure the MGate 5111 Series.

Before running the DSU, make sure that your PC and the MGate 5111 are connected to the same network. Alternatively, the MGate 5111 Series may be connected directly to the PC for configuration purposes. Refer to Chapter 2 for more details.

You may open the DSU from the Windows Start menu by clicking **Start > Programs > MOXA > DSU.** The DSU window should appear as shown below.
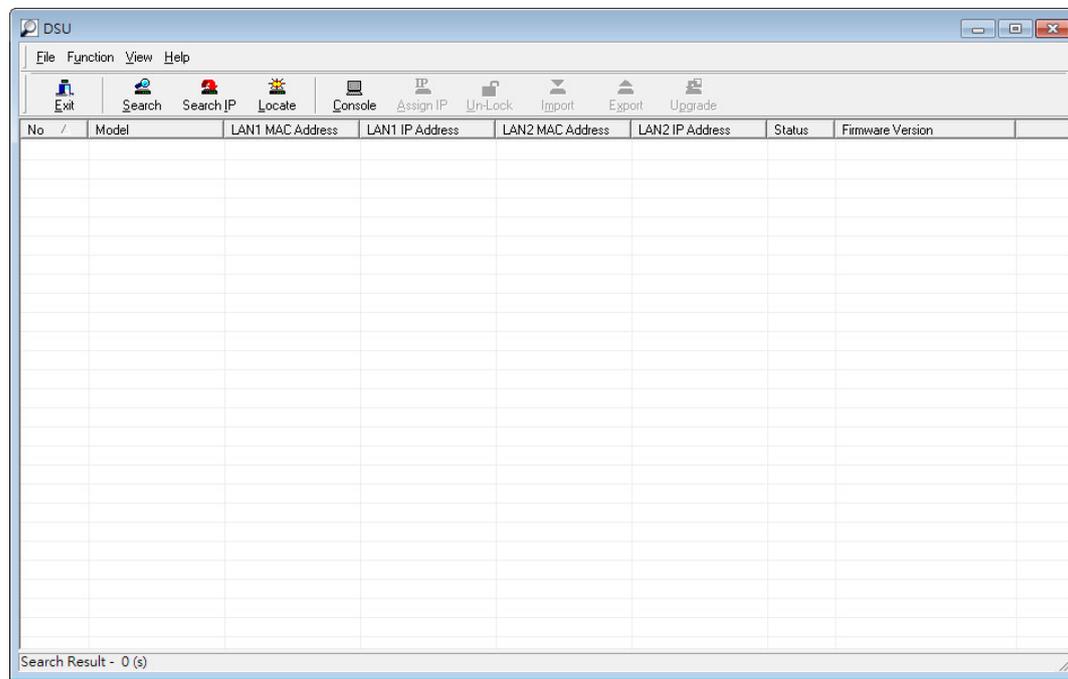
The DSU needs to connect to the unit before the unit can be configured. There are two methods to connect to the unit. **Broadcast Search** is used to find all MGate 5111 units on the LAN. **Search IP** attempts to connect to a specific unit by IP address, which is useful if the unit is located outside the LAN or can only be accessed by going through a router.

Broadcast Search

Click **Search** and a new Search window will pop up.
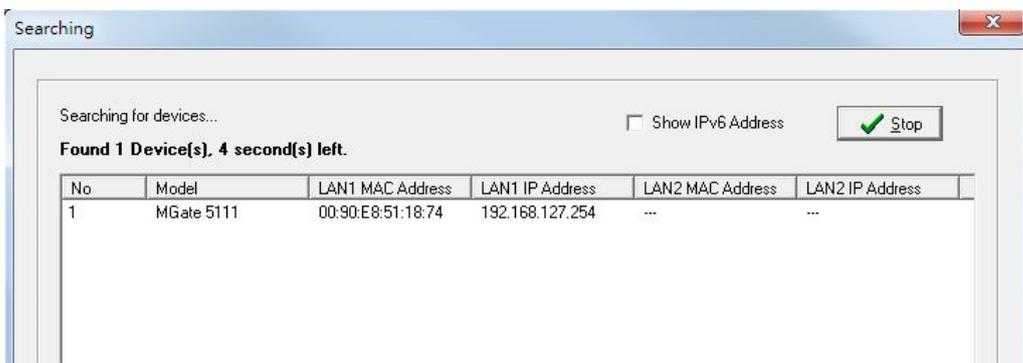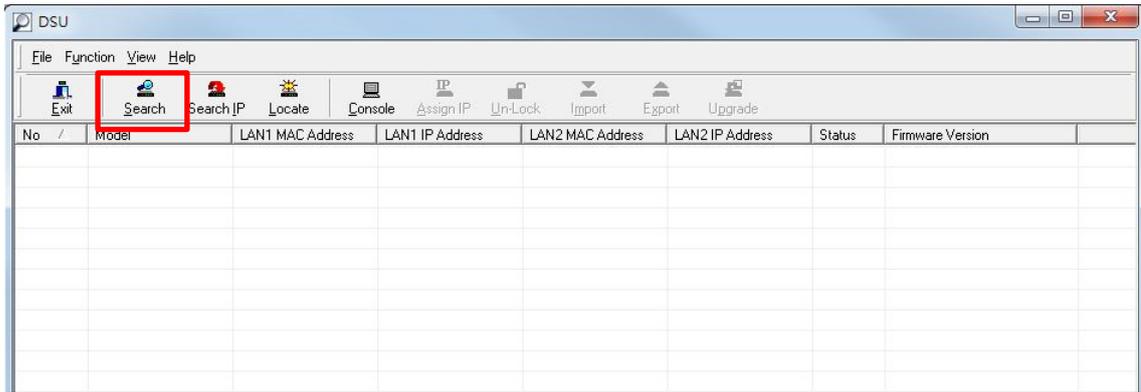
When the search is complete, every MGate 5111 found on the LAN will appear in the DSU window. The MAC address, IP address, and firmware version of each unit will be shown. Select the one you would like to configure.
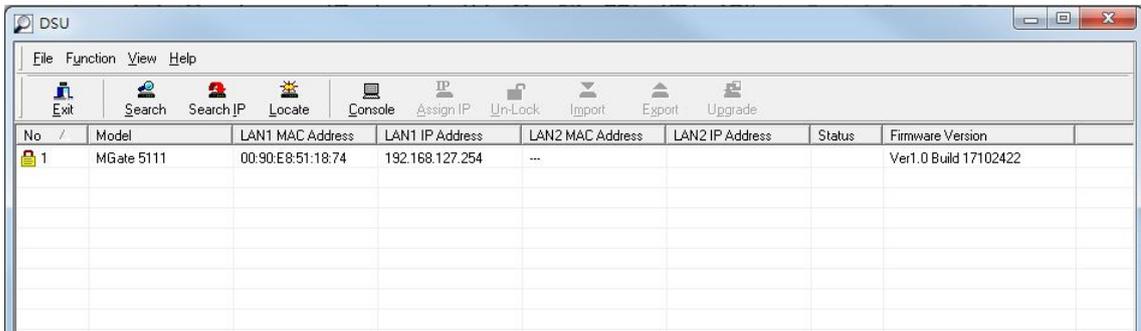
Search IP

Click **Search IP** if you know the IP address of the unit and wish to connect to it directly.

Enter the unit's IP address and click **OK**.
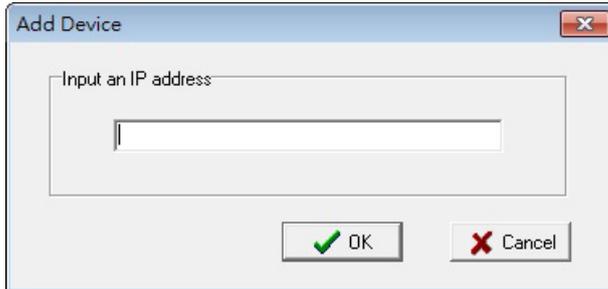
If the search is successful, the unit will be listed in the DSU window. Right click the unit to open a pop-up list of possible actions, or double click a unit to open the web console.
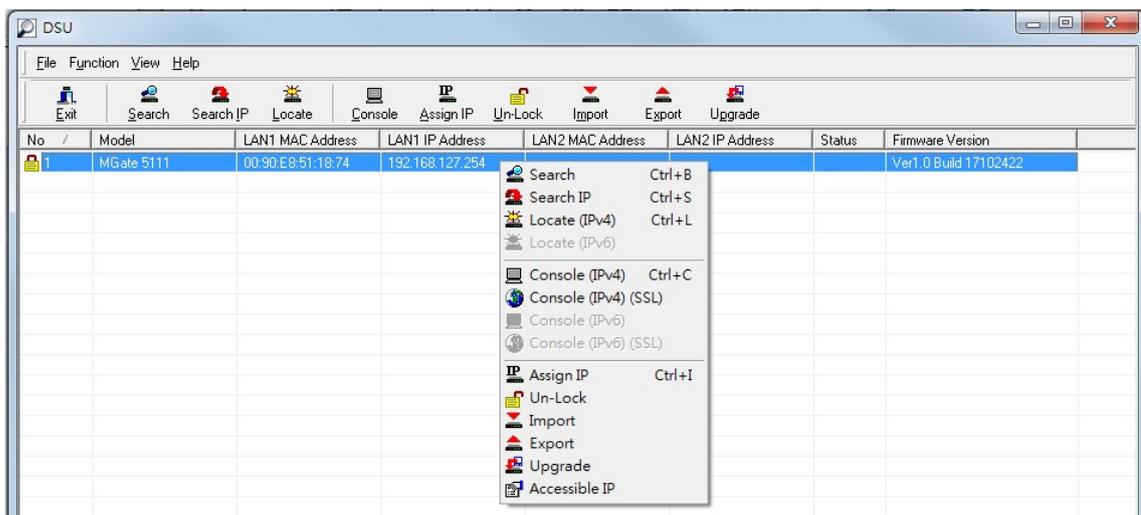
⚠️ **ATTENTION**

If Search IP fails to locate the MGate 5111, the IP address that you entered might be incorrect. Retry the search and reenter the IP address carefully.

Another possibility is that the MGate 5111 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 5111. When your PC and the MGate 5111 are on the same subnet, the DSU should be able to find the unit.

Locate

The **Locate** function will cause the unit to beep, so you can determine which unit is the target.

Assign IP

The **Assign IP** function allows you to change the unit's IP addresses.
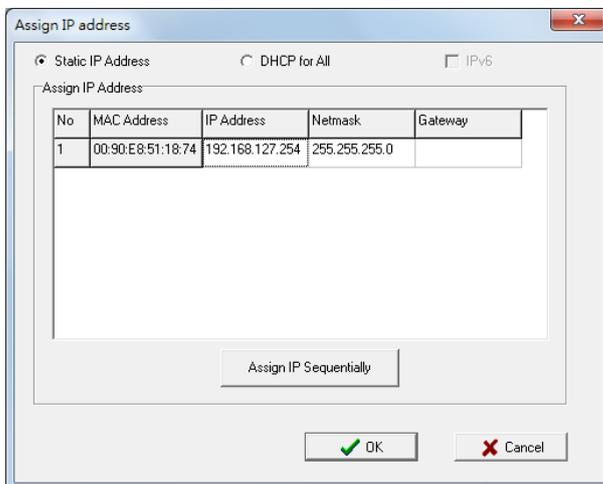
Unlock

Use the **Un-Lock** function to execute Import, Export, and Upgrade actions. The default account and password are **admin** and **moxa**.
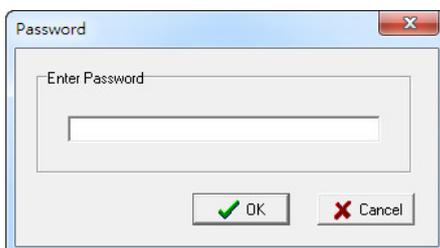
Import/Export

To **Import** or **Export** the configuration file, click the icons to import the configuration file from a laptop, or export the currently used unit's configuration file to a laptop.

Upgrading the Firmware

You can obtain the latest firmware for the MGate 5111 from www.moxa.com. After downloading the new firmware file to your PC, you can use the DSU to write it to your MGate 5111. Select the desired unit from the DSU list and then click **Upgrade** to begin the process.

4. Web Console Configuration

The MGate 5111 provides a web console for easy configuration through a web browser such as Microsoft Internet Explorer or Google Chrome.

Overview

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

http://<MGate IP address>

The default IP address is 192.168.127.254. If you are unable to log in to the unit, you can use the DSU to first search for the unit. Refer to the Device Search Utility.

When the login page pops up, enter the account name and password. The default Account name and Password are admin and moxa, respectively.

Once logged in to the web console, you will see the previous login record. If the login record is not as what you accessed previously, please change the password immediately.

The welcome page shows information relevant to the MGate 5111.

Basic Settings

Server Settings and **Time Settings** are shown on the **Basic Settings** page. Click **Submit** to save the current changes to the unit and click **Restart** once all the settings have been changed. The unit will reboot immediately to use the new settings.

Server Setting

Parameter	Value	Description
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 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	Description
Time Zone	User's selectable time zone	This field shows the currently selected time zone and allows you to select a different time zone.
Local Time	User's 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**

If the dispersion of the time server is higher than the client (MGate), the client will not accept NTP messages from the time server. MGate's dispersion is 1 second. You must configure your time server with a dispersion value lower than 1 sec for the NTP process to complete.

Network Settings

You can modify the **IP Configuration**, **IP Address**, **Netmask**, **Gateway**, and **DNS**.

Parameter	Value	Description
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 another 32-bit number)	The IP (Internet Protocol) address identifies the server on the TCP/IP network
Netmask	255.255.255.0 (or another 32-bit number)	Identifies the server as belonging to a Class A, B, or C network.
Gateway	0.0.0.0 (or another 32-bit number)	The IP address of the router that provides network access outside the server's LAN.
DNS Server 1	0.0.0.0 (or another 32-bit number)	This is the IP address of the primary domain name server.
DNS Server 2	0.0.0.0 (or another 32-bit number)	This is the IP address of the secondary domain name server.

Serial Settings

The **Serial** tab is where each serial port's communication parameters are configured. You can configure **Baudrate**, **Parity**, **Stop Bit**, **Flow Control**, **FIFO**, **Interface**, **RTS on delay**, and **RTS off delay**.

Parameter	Value
Baudrate	Supports standard baudrates (bps): 50/75/110/134/150/300/600/1200/1800/2400/4800/7200/9600/19200/38400/57600/115200/ 230.4k/460.8k/921.6k
Parity	None, Odd, Even, Space, Mark
Stop Bits	1, 2
Flow Control	None, RTS/CTS, RTS Toggle
UART FIFO	Enable, Disable
Interface	RS-232
	RS-422
	RS-485, 2W
	RS-485, 4W
RTS On Delay	0 to 100 ms
RTS Off Delay	0 to 100 ms

RTS Delay

The **RTS Toggle** function is used for **RS-232** mode only. This flow-control mechanism is achieved by toggling the RTS pin in the transmission direction. When activated, data will be sent after the RTS pin is toggled **ON** for the specified time interval. After the data transmission is finished, the RTS pin will toggle **OFF** for the specified time interval.

Protocol Settings

The MGate 5111 supports PROFIBUS, Modbus RTU/ASCII, Modbus TCP, EtherNet/IP and PROFINET protocols. Each role is determined by your device's settings. **Modbus TCP (Client/Server), Modbus RTU/ASCII (Master/Slave), EtherNet/IP (Adapter),** and **PROFINET (IO Device)** can be selected.

The setting of each protocol is described as follows:

1. PROFIBUS Slave

:- PROFIBUS Slave Settings

Your device : PROFIBUS Master	Role 1 of MGate 5111 : PROFIBUS Slave	Role 2 of MGate 5111 : Modbus TCP Client	Your device : Modbus TCP Server	

Slave Settings

Slave address	3	(Slave address less than 99 could only be set by the rotary switch)

PROFIBUS I/O Table

⊕ Add   ✎ Edit   ⧉ Clone   🗑 Delete   ↕ Move

Index	Name	I/O Module	CID
1	Module1	Output:1 byte	0x20
2	Module2	Input:1 byte	0x10
3	Module3	Input:1 byte(status)	0x10

Submit

Slave Settings

Parameter	Value	Default	Description
Slave address	PROFIBUS address 0~99 (addresses 100 to 125 supported by SW)	Depends on the rotary switch	Before any communication, you must assign a slave ID to the PROFIBUS slave. If you would like to assign an address between 0-99, you need to change the rotary switch to the desired address. If you would like to assign an address which is over 99, you must set it via web console.

PROFIBUS I/O Table

PROFIBUS I/O Table			
Index	Name	I/O Module	CID
1	Module1	Output:1 byte	0x20
2	Module2	Input:1 byte	0x10
3	Module3	Input:1 byte(status)	0x10

Submit

Name	Module4	
I/O type	Output ∨	
Data type	Byte ∨	
Data length	1	(1 - 64)

OK   Cancel

Parameter	Description
Name	Enter a name to help identify the module, such as the location, function, etc.
I/O Type	Input: Used to map into input memory Output: Used to map into output memory Input (status): Used to retrieve status of Modbus TCP servers or Modbus RTU/ASCII slaves. Please refer to the Status Monitoring section.
Data Type	The data type for this I/O module
Data Length	The data length for this I/O module. The range is from 1 to 64.

2. Modbus TCP Client (Master) Settings

Modbus TCP Settings

Your device :
PROFIBUS Master

Role 1 of MGate 5111 :
PROFIBUS Slave

Role 2 of MGate 5111 :
Modbus TCP Client

Your device :
Modbus TCP Server

Role	Client

Client Settings

Initial delay	0	(0 - 30000 ms)
Max. retry	3	(0 - 5)
Response timeout	1000	(10 - 120000 ms)

Modbus Commands

Index	Name	Slave IP Address	Slave ID	Function	Address / Quantity	Trigger	Poll Interval	Endian Swap
1	Command1	192.168.127.1 : 502	1	1	Read address 0, Quantity 10	Cyclic	1000	None
2	Command2	192.168.127.2 : 502	1	3	Read address 0, Quantity 10	Cyclic	1000	None
3	Command3	192.168.127.3 : 502	1	16	Write address 100, Quantity 2	Data Change	N/A	None

Client Settings

Parameter	Value	Default	Description
Initial delay	0 - 30000 ms	0	Some Modbus servers/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. After booting up, you can force the MGate to wait before sending the first request with the Initial Delay setting.
Max. retry	0 - 5	3	This is used to configure how many times the MGate will try to communicate with the Modbus server/slave.
Response timeout	10 - 120000 ms	1000	According to the Modbus standard, the time it takes for a server/slave device to respond to a request is defined by the device manufacturer. Based on this response time, the client/master can be configured to wait a certain amount of time for a server/slave's response. If no response is received within the specified time, the client/master will disregard the request and continue operation. This allows the Modbus system to continue the operation even if a server/slave device is disconnected or faulty. On the MGate 5111, the Response timeout field is used to configure how long the gateway will wait for a response from a Modbus server/slave. Please refer to your device manufacturer's documentation to manually set the response timeout

Add Modbus Commands

Parameter	Value	Default	Description
Name	(an alphanumeric string)	Command1	Max. 32 characters
Slave IP address	0.0.0.0 - 255.255.255.255	0.0.0.0	The IP address of a remote server/slave device.
Port	1 - 65535	502	The TCP port number of a remote server/slave device.
Slave ID	1 - 255	1	The Modbus slave ID
Function	1 – Read Coils 2 – Read Discrete Inputs 3 – Read Holding Registers 4 – Read Input Registers 5 – Write Single Coil 6 – Write Single Register 15 – Write Multiple Coils 16 – Write Multiple Registers 23 – Read/Write Multiple Registers		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.

Parameter	Value	Default	Description
Trigger	Cyclic Data Change Disable		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	100 - 1200000 ms	1000	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 100 to 1,200,000 ms.
Endian swap	None Byte Word Byte and Word	None	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.
Read starting address	0 - 65535	0	Modbus register address.
Read quantity		10	Specifying how many quantities to read.
Write starting address	0 - 65535	0	Modbus register address.
Write quantity		1	Specifying how many quantities to write.
Fault protection	Keep latest data Clear all data bits to 0 Set to user defined value		If the opposite side connection fails, the gateway will not be able to receive data, but the gateway will continuously send output data to the Modbus TCP server device. To avoid problems in case the opposite side fails, the MGate 5111 can be configured to react in one of three ways: keep latest data, clear data to zero, user-defined value.
Fault value		00 00	The value for Set to user defined value.
Fault timeout	1 - 86400 s	3600	Defines the communication timeout for the opposite side.

3. Modbus TCP Server (Slave) Settings

:•Modbus TCP Settings

Role	Server

Server Settings

Unit ID	1	(1 - 255)
TCP port	502	

Submit

Server Settings

Parameter	Value	Default	Description
Unit ID	1 - 255	1	The Modbus slave ID that this server/slave module will accept.
TCP port	1 - 65535	502	The TCP port number.

4.Modbus RTU/ASCII (Master) Settings

:•Modbus RTU/ASCII Settings

Role	Master
Mode	RTU

Master Settings

Initial delay	0	(0 - 30000 ms)
Max. retry	3	(0 - 5)
Response timeout	1000	(10 - 120000 ms)
Inter-frame delay	0	(10 - 500 ms, 0: default)
Inter-character timeout	0	(10 - 500 ms, 0: default)

Modbus Commands

⊕ Add   ✎ Edit   🗐 Clone   🗑 Delete   ↕ Move

Index	Name	Slave ID	Function	Address / Quantity	Trigger	Poll Interval	Endian Swap

Submit

Master Settings

Parameter	Value	Default	Description
Initial delay	0 - 30000 ms	0	Some Modbus servers/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. After booting up, you can force the MGate to wait before sending the first request with the Initial Delay setting.
Max. retry	0 - 5	3	The number of times the client/master will retry the same request when the response times out.

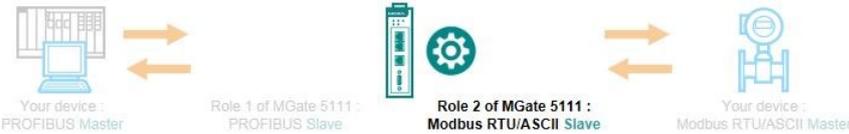| Parameter	Value	Default	Description
Response timeout	10 - 120000 ms	1000	According to the Modbus standard, the time it takes for a server/slave device to respond to a request is defined by the device manufacturer. Based on this response time, a client/master can be configured to wait a certain amount of time for a server/slave's response. If no response is received within the specified time, the client/master will disregard the request and continue operation. This allows the Modbus system to continue operations even if a server/slave device is disconnected or faulty. On the MGate 5111, the Response timeout field is used to configure how long the gateway will wait for a response from a Modbus ASCII or RTU server/slave. Please refer to your device manufacturer's documentation to manually set the response time.
Inter-frame delay (only for Modbus RTU)	10 - 500 ms	0	Defines the time interval between an RTU response and the next RTU request. When the baudrate is lower than 19200 bps, the default value is 0, which is 3.5 character time. When the baudrate is larger than 19200 bps, the MGate uses a predefined fixed value that is not user-configurable. This function solves the issue that some devices can't handle the RTU requests that quickly, so the MGate opens to user-defined values. How to calculate Modbus character time? E.g., if the baudrate is 9600 bps, 1 character time is about 1 ms. In a serial frame (11 bits, including start bit, data, parity bit, and stop bit), 9600 bps approximately equals to 960 characters/s, so transmitting 1 character needs about 1/960 = 1 ms.
Inter-character timeout (only for Modbus RTU)	10 - 500 ms	0	The time interval between characters in one frame. When the baudrate is lower than 19200 bps, the default value is 0, which is 1.5 character time. When the baudrate is larger than 19200 bps, the MGate uses a predefined fixed value that is not user-configurable. When the serial side of the MGate receives one character, and the next one comes after the "inter-character timeout" defined, the frame will be discarded because of timeout.
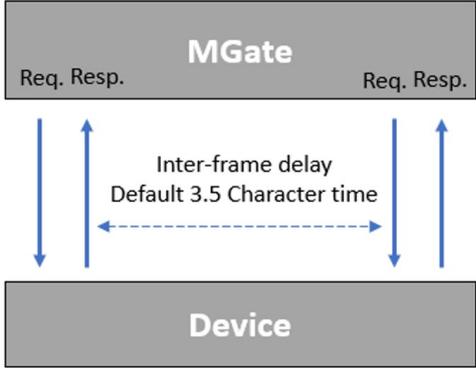
Add Modbus Commands

Please refer to 2. Modbus TCP Client (Master) Settings

5. Modbus RTU/ASCII (Slave) Settings

Slave Settings

Parameter	Value	Default	Description
Slave ID	1 - 255	2	The Modbus slave ID that this server/slave module will accept.

6. EtherNet/IP Adapter Setting

The MGate 5111 supports Adapter mode for EtherNet/IP protocol.

Adapter Mode:

You can select Automatic for I/O data size configuration to automatically map O→T (Originator to Target) and T→O (Target to Originator) data sizes.

7. PROFINET IO Device Setting

The MGate 5111 can play the role of the PROFINET IO device. All you have to set is the device name of the MGate.

I/O Data Mapping

You can verify the gateway's memory allocation on the **I/O Data Mapping** page. Select the Modbus data flow you want to see.

System Management

This configuration tab includes several system level settings. Most of these settings are optional.

Accessible IP Settings

:•Accessible IP List

☐ Enable the accessible IP list ("Disable" will allow all IP's connection)

Index	Active	IP	NetMask
1	☐		
2	☐		
3	☐		
4	☐		
5	☐		
6	☐		
7	☐		
8	☐		
9	☐		
10	☐		
11	☐		
12	☐		
13	☐		
14	☐		
15	☐		
16	☐		

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 IP address and 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
192.168.0.1 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

DoS Defense

To avoid a DoS attack, some configurations can be set accordingly. They include Null Scan, Xmas Scan, NMAP-Xmas Scan, SYN/FIN Scan, FIN Scan, NMAP-ID Scan, and SYN/RST Scan. The SYN-Flood and ICMP-Death can also be set on this page.

∷ DoS Defense

Configuration	
Null Scan	☐
Xmas Scan	☐
NMAP-Xmas Scan	☐
SYN/FIN Scan	☐
FIN Scan	☐
NMAP-ID Scan	☐
SYN/RST Scan	☐

SYN-Flood	
Enable	☐
Limit	4000 (pkt/s)

ICMP-Death	
Enable	☐
Limit	4000 (pkt/s)

System Log Settings

∷ System Log Settings

Event Group	Syslog	Local Log	Summary
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, Config import, Config export, Configuration change, Clear event log
PROFIBUS	☐	☐	PROFIBUS communication logs
Modbus TCP	☐	☐	Modbus TCP communication logs
EtherNet/IP	☐	☐	EtherNet/IP communication logs
PROFINET	☐	☐	PROFINET communication logs

Local Log Settings

☐ Enable log capacity warning at 0 (%)

Warning by: ☑ SNMP Trap ☑ Email

Event log oversize action : Overwrite The Oldest Event Log ⌄

Syslog Settings

Syslog server IP	
Syslog server port	514

[submit]

These settings enable the MGate firmware to record important events for future verification. The recorded

Information can only be displayed on the web console.

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

Event Group	Description
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
PROFIBUS	PROFIBUS communication logs
Modbus TCP	Modbus TCP Communication logs
EtherNet/IP	EtherNet/IP communication logs
PROFINET	PROFINET communication logs

Local Log Settings	Description
Enable log capacity warning (%)	When the log amount exceeds the warning percentage, it will trigger an event to SNMP Trap or Email.
Warning by	SNMP Trap Email
Event log oversize action	Overwrites the oldest event log Stops recording event log

Syslog Settings	Description
Syslog server IP	IP address of a server which will record the log data.
Syslog server port	514

Auto Warning Settings

Auto Warning is triggered by different events. When a checked trigger condition occurs, the MGate can send e-mail alerts, 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

E-Mail Alert

Mail Settings	
Mail server (SMTP)	
☐ My server requires authentication	
User name	
Password	
From e-mail address	
To e-mail address 1	
To e-mail address 2	
To e-mail address 3	
To e-mail address 4	

Submit

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

SNMP Trap

SNMP Trap	
SNMP trap server IP or domain name	
Trap version	◉ v1 ○ v2c
Trap community	public

Submit

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 5111 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 indicates 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
Username	Use this optional field to identify the username 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.
Password	Use this field to set the password for the specified level of access.
Privacy Mode	Use this field to enable or disable DES_CBC data encryption for the specified level of access
Privacy	Use this field to define the encryption key for the specified level of access.

LLDP Settings

The Link Layer Discovery Protocol (LLDP) standardizes the method that devices on a network use to periodically send information about their configuration and status. This self-identification method keeps all LLDP devices on a network informed of each other's status and configuration. You can use SNMP protocol to send the LLDP information on the network devices to Moxa's MXview to create auto network topology and for network visualization.

The MGate web interface lets you enable or disable LLDP, and set the LLDP transmit interval. In addition, you can go to **System Monitoring–System Status–LLDP Table** to view the MGate's neighbor-list, which is created based on the information reported by neighboring devices on the network.

Parameters	Description
Message Transmit Interval	The default time is 30 seconds. The allowable range is between 5 and 16,383 seconds.

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.

Misc. Settings

This page includes console settings, password, and relay output.

Console Settings

Console Settings

Configurations

HTTP console	Enable
HTTPS console	Enable
Telnet console	Enable
SSH console	Enable
Serial console	Enable
Reset button	Always enable
MOXA Command	Enable

Session Settings

Maximum Login User For HTTP+HTTPS	5	(1 ~ 10)
Auto Logout Setting	5	(0 ~ 1440 min, 0 for Disable)

Submit

Configuration	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.
Telnet/SSH	Enable/Disable	The MGate telnet/SSH function can be enabled or disabled.
Serial console	Enable/Disable	The MGate serial console function can be enabled or disabled.
Reset button protect	Disable after 60 sec, Always enable	The 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, the MGate will still enable this function within 60 seconds after boot-up, just in case users really need to reset this function.
MOXA command	Enable/Disable	The MGate can be searched by the Device Search Utility (DSU). If you have any security concerns, you can choose Disable to deny the DSU right to access.

Session Settings	Value	Description
Maximum Login User for HTTP+HTTPS	1 - 10	The number of users that can access the MGate at the same time.
Auto Logout Setting	0 - 1440 min.	Set the auto logout time period.

Notification Message

Users can input a message for Login or for Login authentication failure message.

Account Management

Parameters	Value	Description
Account	admin, user	Users can modify the password for different accounts. Now the MGate provides two different level accounts: admin and user . The admin account can access and modify all the settings through the web console. The user account can only view the setting and can't change anything.

Login Password Policy

⁞• Login Password Policy

Account Password Policy		
Minimum length	4	(4 ~ 16)
☐ Enable password complexity strength check		
☐ At least one digit(0~9)		
☐ Mixed upper and lower case letters(A~Z, a~z)		
☐ At least one special character: ~!@#$%^&*-_|;:,.<>[]{}()		
☐ Password lifetime	90	(90 ~ 180 days)

Account Login Failure Lockout		
☐ Enable		
Retry failure threshold	5	(1 ~ 10 time)
Lockout time	5	(1 ~ 60 min)

Submit

Account Password Policy	Value	Description
Minimum length	4-16	
Enable password complexity strength check		Select how the MGate checks the password's strength
Password lifetime	90-180 days	Set the password's lifetime period.

Account Login Failure Lockout	Value	Description
Retry failure threshold	1-10 time	
Lockout time	1-60 min	

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.

⁞• Ping Test

Ping Destination	
Destination	

Activate

Firmware Upgrade

Firmware updates for the MGate 5111 are located at www.moxa.com. After you have downloaded the new firmware onto your PC, you can use the web console to write it onto your MGate 5111. Select the desired unit from the list in the web console and click **Upgrade Firmware** to begin the process.

> ⚠ **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.

Configuration 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.

Load Factory Default

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

Load Factory Default

Click on **Submit** to reset all settings, including the console password, to the factory default values. To leave the IP address, netmask and gateway settings unchanged, make sure that **Keep IP settings** is enabled.

Reset to Factory Default

☐ **Keep IP settings**

Submit

⚠ **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.

System Monitoring

System Status

Network Connections

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

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	*:502	*:0	LISTEN
TCP	0	0	*:22	*:0	LISTEN
TCP	0	0	*:23	*:0	LISTEN
TCP	0	0	*:443	*:0	LISTEN
TCP	0	0	192.168.127.254:80	192.168.127.222:5980	ESTABLISHED
UDP	0	0	*:161	*:0	
UDP	0	0	*:4800	*:0	

System Log

Go to **System Log** under **System Status** to view network connection information.

System Log

System Log

Export   Clear log   Refresh

Relay State

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.

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

LLDP Table

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

LLDP Table

Port	Neighbor ID	Neighbor Port	Neighbor Port Description	Neighbor System
sw0	ks-hsu01	port-001		KS-HSU01

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.

I/O Data View

☐ Auto refresh

Data flow direction [PROFIBUS Master --> Modbus TCP Server ▾]   Start address(Hex) [0]   Length [128 ▾]   Format [Hex ▾]

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

Diagnose

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

PROFIBUS Slave Diagnose

:•PROFIBUS Slave Diagnose

☑ Auto refresh

Category	Item	Value
PROFIBUS		
	State	Wait Parameterization
	Baudrate	Not Found
	Address	3
	Output	1 bytes
	Input	2 bytes
	Illegal I/O Config	0
	Restart Data Exchange	0

Modbus RTU/ASCII Diagnose (Master)

:•Modbus RTU/ASCII Diagnose

☑ Auto refresh

Category	Item	Value
Modbus		
	Mode	RTU Master
	Sent request	0
	Received valid response	0
	Received invalid response	0
	Received CRC/LRC Error	0
	Received exception	0
	Timeout	0
Serial Port		
	Port is not opened.	

Modbus RTU/ASCII Diagnose (Slave)

:•Modbus RTU/ASCII Diagnose

☑ Auto refresh

Category	Item	Value
Modbus		
	Mode	RTU Slave
	Slave ID	2
	Received valid request	0
	Received invalid request	0
	Received CRC/LRC error	0
	Sent response	0
	Sent exception	0
Serial Port		
	Port number	1
	Break	0
	Frame error	0
	Parity error	0
	Overrun error	0

Modbus TCP Diagnose (Client/Master)

∴ 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		

Modbus TCP Diagnose (Slave/Server)

∴ Modbus TCP Diagnose

☑ Auto refresh

Category	Item	Value
Modbus		
	Mode	Slave
	Number of connection	0
	Received valid request	0
	Received invalid request	0
	Sent response	0
	Sent exceptions	0
Connections		

PROFINET Diagnose

∴ PROFINET Diagnose

☑ Auto refresh   Refresh

Category	Item	Value
PLC Status		
	Connected PLC MAC Address	N/A
	PLC Operation Mode	STOP
Parameters		
	Sender clock (packet interval)	0 ms
	Device name	
I/O Slot		

EtherNet/IP Diagnose

EtherNet/IP Diagnose

☑ Auto refresh

Overview		I/O Connection List
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	

Connection1 Parameters		Connection Information
O ➜ T instance (exclusive owner)	100	
O ➜ T instance (input only)	120	
T ➜ O instance	110	
O ➜ T data size	1	
T ➜ O data size	1	

Traffic

Modbus RTU/ASCII Traffic

For troubleshooting or management purposes, you can monitor the Modbus RTU/ASCII data passing through the MGate 5111 on the network. Rather than simply echoing the data, the web console 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.

Modbus RTU/ASCII Traffic

☐ Auto scroll

Start	Stop	Export	Ready to capture.

No.	Time	Send/Receive	Slave ID	Function Code	Data
1	0.450	MGate -> Port 1 device	1	3	01 03 00 00 00 0A C5 CD
2	0.510	MGate <- Port 1 device	1	3	01 03 14 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 A3 67
3	1.465	MGate -> Port 1 device	1	3	01 03 00 00 00 0A C5 CD
4	1.525	MGate <- Port 1 device	1	3	01 03 14 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 A3 67
5	2.475	MGate -> Port 1 device	1	3	01 03 00 00 00 0A C5 CD
6	2.535	MGate <- Port 1 device	1	3	01 03 14 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 A3 67
7	3.490	MGate -> Port 1 device	1	3	01 03 00 00 00 0A C5 CD
8	3.550	MGate <- Port 1 device	1	3	01 03 14 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 A3 67
9	4.505	MGate -> Port 1 device	1	3	01 03 00 00 00 0A C5 CD
10	4.565	MGate <- Port 1 device	1	3	01 03 14 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 A3 67
11	5.520	MGate -> Port 1 device	1	3	01 03 00 00 00 0A C5 CD
12	5.580	MGate <- Port 1 device	1	3	01 03 14 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 A3 67

Fault Protection and Status Monitoring

Fault Protection

The Fault Protection function sends a predefined setting to field devices to prevent incorrect actions when the upstream connection is lost. The MGate 5111 supports a Fault Protection function when selecting Modbus RTU/ASCII master mode or Modbus TCP Client mode. You can configure the criteria used to determine what to do when the write command is no longer received from the master side. For example, when a cable comes loose accidentally, the most up-to-date write command from the master side will not be received by the gateway. Hence, the slave device will use the latest command from the gateway, which is now out-of-date, creating an inconsistency between the master and slave devices. To avoid this problem, the MGate 5111 supports options to determine which actions should be taken when the master's side is disconnected from the gateway.

Options	Description
Keep latest data	The gateway will write the same data to the slave device.
Clear data to zero	The gateway will write zero values to the slave device.
User-define value	A user-defined value will be written to the slave device.

Status Monitoring

The **Status Monitoring** function provides status information of field devices when the MGate is being used as a Modbus RTU/ASCII master or Modbus TCP client. If a slave device fails or a cable comes loose, generally the gateway won't be able to receive up-to-date data from the slave device. The out-of-date data will be stored in the gateway's memory and will be retrieved by the master device (e.g., PLC), which will not be aware that the slave device is not providing up-to-date data.

The MGate 5111 allocates one bit of the gateway's specified memory address to indicate the status of each Modbus command as being normal or abnormal. If a command has run successfully, the status value will continuously be 1. On the contrary, if a command has failed, the status will be set to 0. In this case, the master device will be aware of the failure status of the slave device. Add PROFIBUS status input module in PROFIBUS Slave Setting page. Max. modbus command is 128, so you can add 16 bytes input module to indicate all Modbus command status.

Name	MB Devices Status
I/O type	Intput (status)
Data type	Byte
Data length	16 (1 - 64)

OK   Cancel

Restart

All changes will be activated by clicking the **Submit** button first and then restarting the gateway. If a lot of settings need to be changed, you can click **Submit** for each setting and then click **Restart** to activate all the changes.

Restart

!!! Warning !!!

Clicking "Submit" will disconnect Ethernet connections and reboot the system.

Submit

Logout

For safety reasons, remember to log out of the web utility to prevent people who do not have the proper authorization from accessing the gateway.

MXview

The Moxa MXview network management software gives you a convenient graphical representation of your Ethernet network and allows you to configure, monitor, and diagnose Moxa networking devices. MXview provides an integrated management platform that can manage Moxa MGate series products as well as Ethernet switches and wireless APs, and SNMP-enabled and ICMP-enabled devices installed on subnets. MXview includes an integrated MIB complier that supports any third-party MIB. It also allows you to monitor third-party OIDs and Traps. Network and Trap components that have been located by MXview can be managed via web browsers from both local and remote sites—anytime, anywhere.

MXconfig

Moxa's MXconfig is a comprehensive Windows-based utility that is used to install, configure, and maintain multiple Moxa devices in industrial networks. This suite of useful tools helps users set the IP addresses of multiple devices with one click, configure the redundant protocols and VLAN settings, modify multiple network configurations of multiple Moxa devices, upload firmware to multiple devices, export/import configuration files, copy configuration settings across devices, easily link to web and telnet consoles, and test device connectivity. MXconfig gives device installers and control engineers a powerful and easy way to mass configure devices, and effectively reduces the setup and maintenance cost.

For more detailed information regarding MXview and MXConfig, download the user's manual from Moxa's website at http://www.moxa.com.