

# *SerialGate*

SG-1160

User Guide

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## Revision History

| Revision Date | Version | Pages | Description  |
|---------------|---------|-------|--|
| Mar. 26. 2014 | 1.0     | All   | Initial release  |
| Apr. 04. 2015 | 1.1     | All   | Logo modification<br>Modify serial and network settings<br>Update SNMP |
| Jan. 25. 2016 | 1.2     | All   | Correcting errors in manual<br>Modbus Master Added                     |
| Nov. 13. 2018 | 1.3     | All   | Added option to change service port number                             |
| Apr. 21. 2020 | 1.4     | All   | Text modified and download guide added                                 |
| Dec. 10. 2020 | 1.5     | All   | IP Access Policy Added   |

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# Chapter 1. Introduction

This chapter is an introduction to SystemBase device server, the SerialGate series.

## About this document

This guide is designed for users of SerialGate, for setting configurations, status monitoring, firmware update, and other administration work related to the SerialGate.

## Who should read this document?

This guide is designed for SerialGate users and administrators. It is strongly recommended that anyone trying to apply, use, and maintain SerialGate to read this document. This guide deals with the hardware-level integration issues and software-level configuration tips. It will be a great starting point for any administrators who want to easily monitor and control SerialGate and its connected devices.

## Manual Contents

**Introduction** (Chapter 1) is a preface with general information and introductory notices.

**Getting Started** (Chapter 2) gives a brief introduction of SerialGate series, including features and applications.

**Hardware Descriptions** (Chapter 3) explains the layout and pin specifications with block diagram and drawings.

**Installation** (Chapter 4) helps you to connect SerialGate to serial and network environment. It ends up with first time boot-up and status check.

**Configuration from Web Browser** (Chapter 5) provides menu-by-menu guide for setting up the operation environment for SerialGate via web browser.

**Configuration via Telnet** (Chapter 6) provides a list of commands for setting up the operation environment for SerialGate via Telnet.

**Configuration using LCD** (Chapter 7) explains how to monitor status and working environment of device server.

**Application** (Chapter 8) provides a variety of application examples widely used in industries.

**Appendix** (Chapter 9) provides firmware update guides and technical specifications for detailed information.

### SerialGate Documents

The following table summarizes documents included in the SerialGate document set.

| Document Name                    | Description  |
|----------------------------------|--|
| User Guide                       | Integration, configuration, and management tasks are explained for the administrator |
| PortView User Manual             | Guide for SystemBase device server management application PortView                   |
| SGConfig User Manual             | Guide for SystemBase device server configuration application SGConfig                |
| Serial IP Redirector User Manual | Guide for Serial IP Redirector   |
| TestView User Manual             | User Manual for testing Com port Redirector , TCP Server/Client , UDP Server/Client  |

If you need brief information on SerialGate or device servers in general, please visit our company websites at <https://www.sysbas.com/en/>. You can view or download documents, the latest software and firmware updates related to SerialGate from sysbas.com. Available resources are as follows:

| Document Name          | Description   |
|------------------------|---|
| SerialGate Spec Sheet  | Specifications for SerialGate products  |
| SerialGate White Paper | An easy reading for anyone new to device server. Deals with background and technology Past, present, and future of device servers along with the overview of market environment |

All documents are updated promptly, so check for the recent document update. The contents in these documents are subject to change without any notice in advance.

### Technical Support

The customers can get a technical support from SystemBase by following methods:

Please visit our website <http://www.sysbas.com/> and go to 'Support' menu. There you can read FAQs and the customers can post an inquiries from the 'Technical Support' menu.

Lastly, you can call us at the customer center for immediate support. Our technical support team will kindly help you get over with the problem.

The number is +82-2-855-0501 (Extension number 1). Do not forget to dial the extension number after getting a welcome message.

The office hour is from 09:00 AM to 06:00 PM KST, Monday to Friday. We are closed on Saturday, Sunday and national holidays.

## Chapter 2. Getting Started

This chapter includes SerialGate overview, main and distinctive features, package contents for each product, and application fields.

### Overview

SerialGate provides network connectivity to various serial devices (security devices, communication peripherals, modems, data printing devices, industrial metering devices, etc.). SerialGate supports RS-232, RS-422, and RS-485 serial communication standards under various communication speed, meanwhile auto-sensing 100baseTX Fast Ethernet and 10baseT Ethernet connection.

### Features

Various features of SerialGate make it a universal yet distinctive device server solution. Here we present main features of SerialGate. Others will explicitly appear throughout this guide.

- Maximum 921.6Kbps serial communication speed
- RS-232/422/485
- 10/100Mbps Ethernet port
- Serial IP Redirector for better adaptability
- Extensive configuration and monitoring with PortView
- Firmware update via Web Browser and FTP
- Configuration using Web, Telnet, SNMP, and SGConfig
- SDK package which enables customizing program development

### Package Component

SerialGate package is composed of the following components. Make sure every component is included in your package. All packages include a product can be downloaded from SystemBase website([www.sysbas.com/en](http://www.sysbas.com/en) > product > download).

SerialGate device, 1 unit

Direct LAN Cable, 1 piece

Power Cable, 1 piece

**Class A Device**

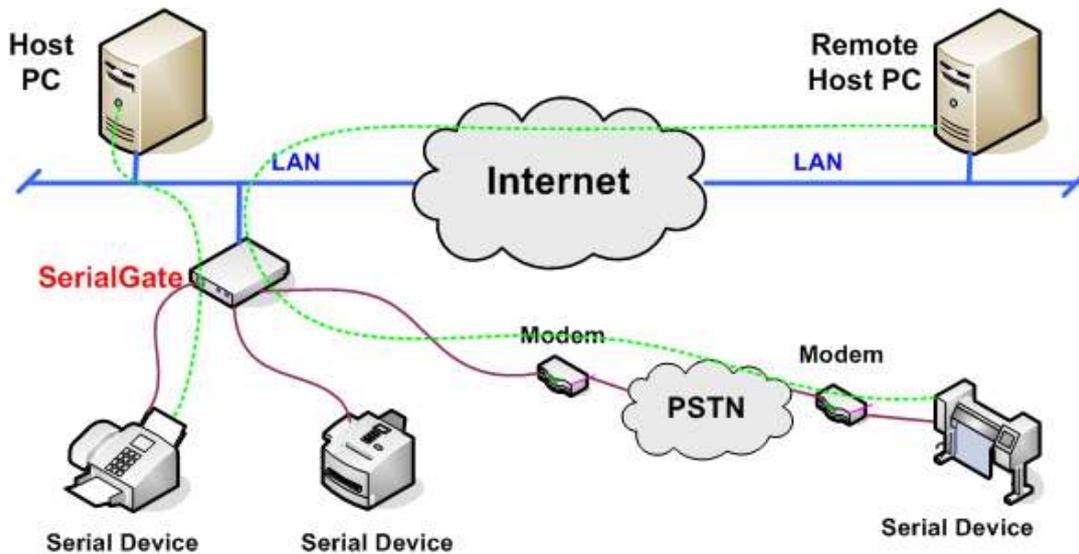
The distributor and the user must be aware that SerialGate series are a Class A device registered only for commercial or business environment. The SerialGate series are not a Class B device for residential or home use.

### Application

SerialGate can be used in many practical applications in various fields. Here we present some of them.

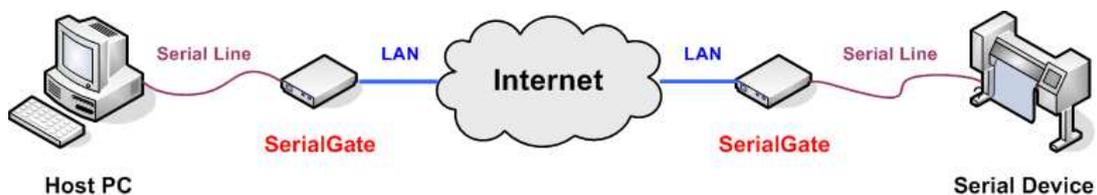
### Network Serial Communication

PC and SerialGate are connected to the network, and a user gets an access to a device connected to SerialGate on PC.



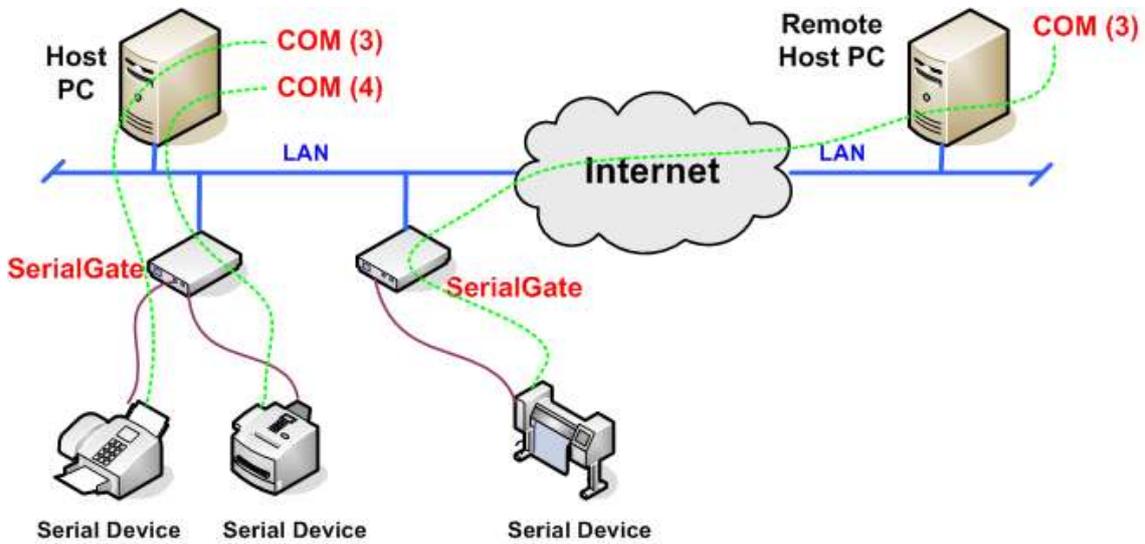
### Serial Communication Tunneling

SerialGate enables a connection not restricted to distance between PC and serial device. To enable this feature, a user should change its setting to TCP Server – TCP Client mode or UDP Server – UDP Client mode referring to Chapter 5 of this manual. In this case, only data can be transmitted while both data and control signal can be transmitted in Pair\_Master and Pair\_Slave mode.



### COM Port Redirection

With Serial IP Redirector, users can use serial port to connect to the SerialGate on the network as if there are serial ports in the PC. (Maximum Speed: 460.8 Kbps)



**Factory / Industrial Automation**

PLC, Robot arms, Human–Machine Interface, Warehouse rails  
Medical instruments, Inspection equipment controllers  
Alarming units

**Home Appliances / Electronic Devices**

Power controller, gaming machines  
Scales, Gas detection units, Water & pollution metering devices  
Data collection and distribution units

**Financial / Building Automation**

Card readers, Barcode scanners, Kiosks, Point–Of–Sale related devices  
Serial printers, Cash registers, Credit card authorization terminals  
Biometric detection units, Security devices

## Chapter 3. Hardware Description

This chapter provides hardware information including pin specification, dimensions and other hardware-related information.

### Exterior of SG-1160/ALL



- **Serial:** RJ-45 socket for serial ports (RS-232/422/485). A user can select protocol from the web manager using a web browser.
- **Power connector:** Use 100 ~ 245 VAC cable
- **Reset:** SerialGate reboots if this button is pressed for less than 3 seconds. If pressed for longer than 3 seconds, SerialGate will restore factory default settings.
- **LED:** Operation status of SerialGate. Next page describes the functions of each LED display status.
- **WAN:** Main network port used when connecting SerialGate to networking devices such as Ethernet card, hub, and router.

- **LAN:** This is a secondary network port operating in NAT mode. It allows connection to sub-network connected to SerialGate or in bridge mode, operates as a switch port.
- **SD / MMC:** SD memory card works for system log. Available up to 32 GB. (A SD memory card is not included in the package)
- **LCD:** Text LCD (16 characters x 2 lines); Configuration and monitoring purpose.
- **LCD Button:** Composed of 4 keys to control LCD. (Esc, Enter, Left, Right)

## LED / RESET

### <LED feature>

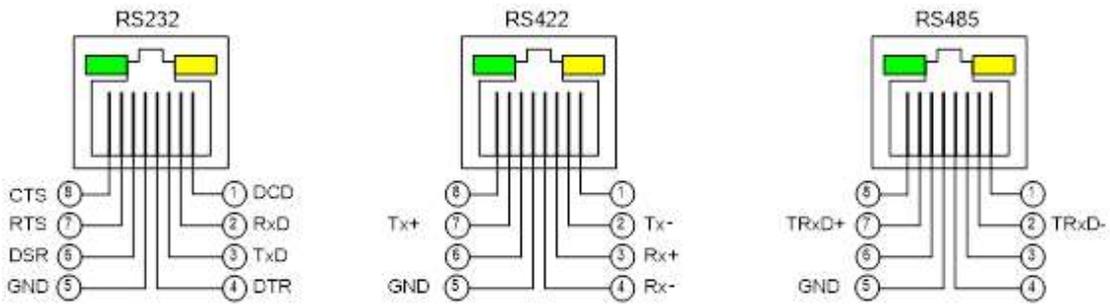
| LED                              | Status       | Meaning  |
|----------------------------------|--------------|--|
| PWR<br>(WHITE)                   | On           | Power supplied to the device   |
|                                  | Off          | No power supplied to the device  |
| Serial Tx                        | Green Blink  | Serial data transmitted  |
| Serial Rx                        | Orange Blink | Serial data received   |
| WAN/LAN<br>Front LED<br>(Orange) | On           | Connected to network (Rear LED: Orange)                                    |
|                                  | Off          | Disconnected to network (Rear LED: Orange)                                 |
|                                  | Blink        | LAN data being transmitted (Rear LED: Orange)                              |
| WAN/LAN<br>Front LED<br>(Green)  | On           | 100baseT connection detected and LAN data transferred<br>(Rear LED: Green) |
|                                  | Off          | 10baseT connection detected and LAN data transferred<br>(Rear LED: Green)  |

### < Reset button features >

| Operation                       | Result             |
|---------------------------------|--------------------|
| Pressed for less than 3 seconds | Restart SerialGate |

|  |  |
|--|--|
| <p>Pressed for more than 3 seconds</p> | <p>Restore factory default settings and reboot automatically</p> |
|--|--|

## Pin Specification



| Pin No. | RS-232 | RS-422 | RS-485 |
|---------|--------|--------|--------|
| 1       | DCD    | -      | -      |
| 2       | RxD    | Tx-    | TRxD-  |
| 3       | TxD    | Rx+    | -      |
| 4       | DTR    | Rx-    | -      |
| 5       | GND    | GND    | GND    |
| 6       | DSR    | -      | -      |
| 7       | RTS    | Tx+    | TRxD+  |
| 8       | CTS    | -      | -      |

## Chapter 4. How to Connect

This chapter explains how to install SerialGate. It deals with LAN and serial connection guides for SerialGate to operate together with the target serial device.

### Connection Guide

In order to connect SerialGate to network, you need to use RJ45 Ethernet port. It supports both 10Mbps and 100Mbps Ethernet connection (auto-sensing). Since WAN/LAN port supports MDIX, it automatically detects any kind of cable. (Cross or direct LAN cable) Plug one end of a LAN cable to SerialGate and the other end to a hub, switch, or any other network device.

### Powering On for the First Time

First of all, please make sure that the power input you supply to the module is corresponding with the SerialGate model that you have. If an appropriate power input has been successfully supplied, SerialGate will power on and start booting.

Although there is no power LED to check the status, you can check by LEDs on the RJ45 Ethernet port. LED status operation is described in Chapter 3. Hardware Description.

An IP address is required to access web interface in SerialGate or telnet command-line configuration tool. By factory default, a static IP address is assigned to SerialGate. After the initial connection, you can either manually assign a different IP address or set SerialGate to automatically get an IP address from a DHCP server. While this depends on your network environment and policy, it is strongly recommended that a user assigns SerialGate with a unique static IP.

## Connecting to SerialGate

In order to view current settings or modify them, you need to make a Web or Telnet connection to SerialGate. IP address is required information to make a connection.

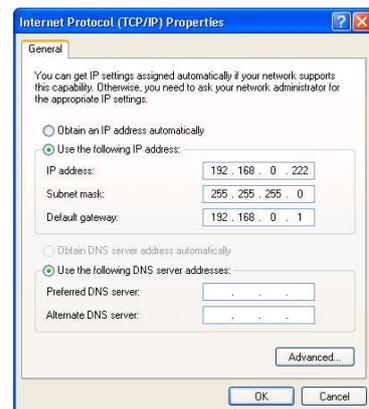
There are two ways you can know the current IP address of SerialGate.

If WAN port in SerialGate uses assigned IP address from DHCP server or is set to a fixed IP address, SerialGate supports the following options in case that a user does not know IP address.

1. A user can connect to the default LAN port with IP address: **10.10.1.1**
2. A user can search IP address pre-set to SerialGate using “Detector” application enclosed in the downloaded Utility and Documents and connect to SerialGate.

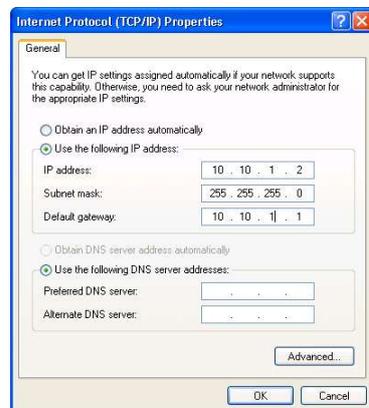
### WAN Default IP address: 192.168.0.223

The default IP address of SerialGate is set to 192.168.0.223. In order to connect with this address, you need to change network configurations so that your PC can connect to the IP 192.168.0.223. Please refer to an example to the right side, and note that values do not necessarily have to be identical to the example below.



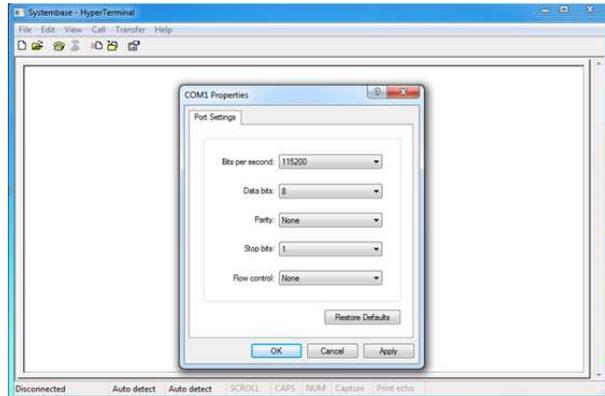
### LAN Default IP address: 10.10.1.1

The default IP address in SerialGate is 10.10.1.1. In order to connect to this address, the users need to configure network settings so that their PC can connect to the IP 10.10.1.1. Please refer to an example to the right side, and note that values don't necessarily have to be identical to the example.



### Serial Console Port

The SG-1160 supports console port. Connect to the console port from the PC with a serial cable. Run a utility such as HyperTerminal, with following settings: 115200 bps, None Parity, 8 Data bits, 1 Stop Bit. This will allow the users to connect to a device.



### Configuration

#### 1) Configuration via Web Browser

The users can easily configure SerialGate with web interface, accessible from most web browser. For more information, please refer to Chapter 5. Configuration from Web Browser.

#### 2) Configuration via Telnet

The users can configure SerialGate with commands after accessing SerialGate through Telnet. For more information, please refer to Chapter 6. Configuration via Telnet.

#### 3) Configuration via PortView

The users can use a Windows-based utility PortView from SystemBase to monitor SerialGate. For more information on using the utility for your administration purpose, please refer to PortView User Guide.

#### 4) Configuration with SGConfig

The users can use SGConfig to modify settings for the SerialGate. For more information, please refer to the SGConfig manual.

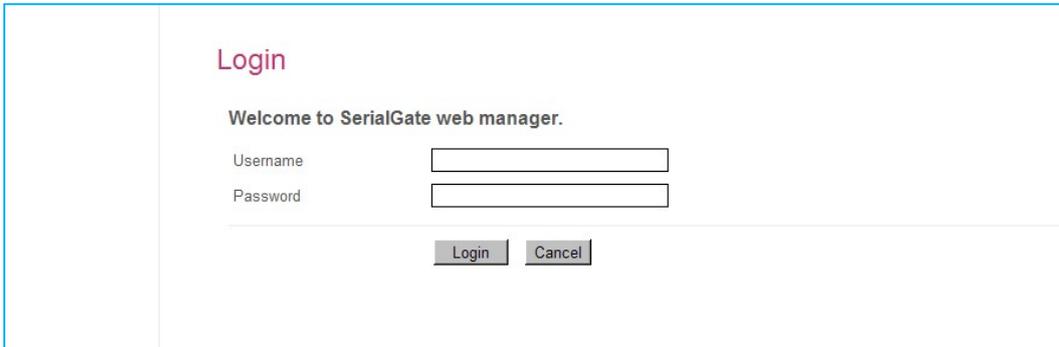
## Chapter 5. Configuration from Web Browser

### Connection

Open a web browser and enter the IP address of SerialGate to access the web manager. Once you are successfully connected, the following page will show up. You need to enter appropriate username and password to login. Please note that this username and password are used as authentication method for Telnet as well. This means if username or/and password has been modified from the web interface, modified values have to be entered to connect to Telnet, and vice versa.

Factory default username:        **serialgate**

Factory default password:        **99999999**



**Login**

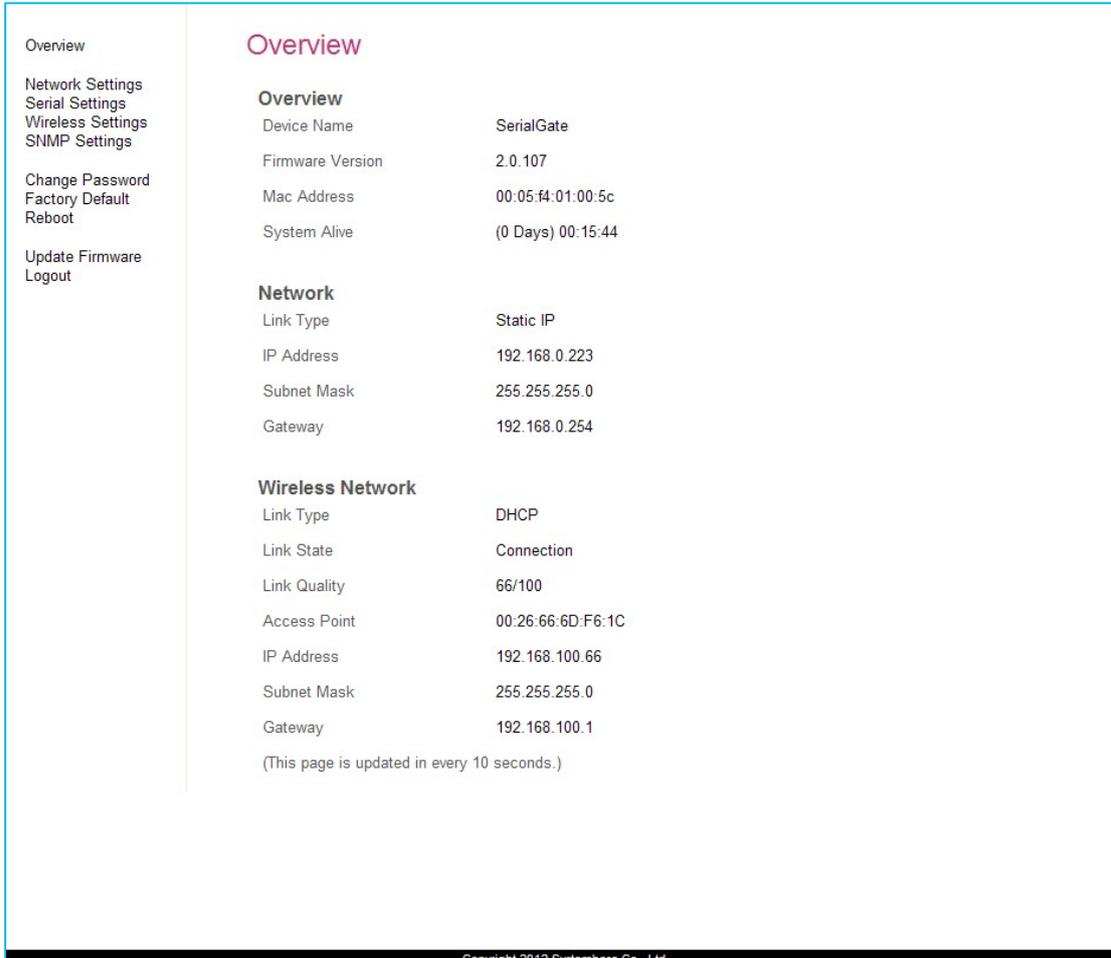
Welcome to SerialGate web manager.

Username

Password

## Setup Menu

If login process is successful, you will see a web manager's main page, showing summary of your device. On the left, you will see a setup menu, and you can navigate through these options.



The screenshot displays the web manager's main page. On the left is a navigation menu with the following items: Overview, Network Settings, Serial Settings, Wireless Settings, SNMP Settings, Change Password, Factory Default, Reboot, Update Firmware, and Logout. The main content area is titled "Overview" and contains three sections: "Overview", "Network", and "Wireless Network".

| Overview         |                   |
|------------------|-------------------|
| Device Name      | SerialGate        |
| Firmware Version | 2.0.107           |
| Mac Address      | 00:05:f4:01:00:5c |
| System Alive     | (0 Days) 00:15:44 |

| Network     |               |
|-------------|---------------|
| Link Type   | Static IP     |
| IP Address  | 192.168.0.223 |
| Subnet Mask | 255.255.255.0 |
| Gateway     | 192.168.0.254 |

| Wireless Network |                   |
|------------------|-------------------|
| Link Type        | DHCP              |
| Link State       | Connection        |
| Link Quality     | 66/100            |
| Access Point     | 00:26:66:6D:F6:1C |
| IP Address       | 192.168.100.66    |
| Subnet Mask      | 255.255.255.0     |
| Gateway          | 192.168.100.1     |

(This page is updated in every 10 seconds.)

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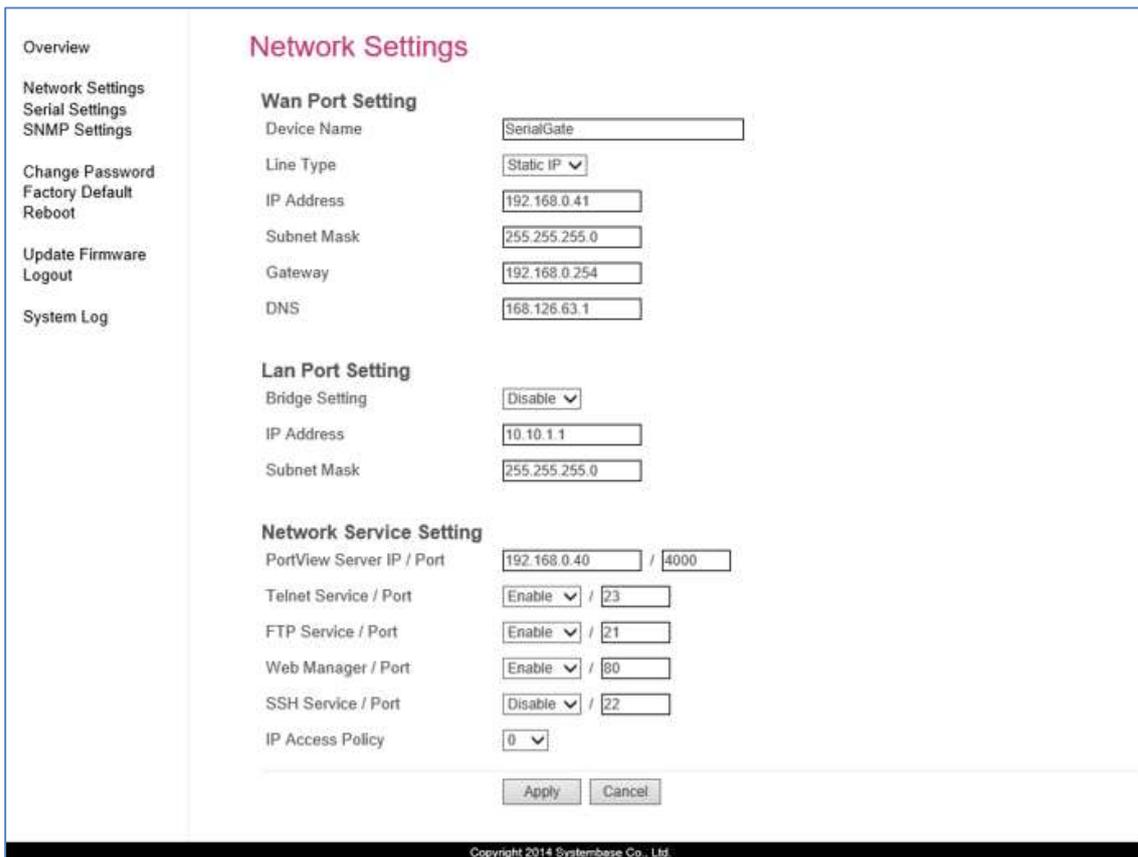
The followings are main features of Setup Menu.

| Menu              | Description   |
|-------------------|---|
| Summary           | Confirm basic information about SerialGate                        |
| Network Settings  | Configure network connection settings.                            |
| Serial Settings   | Configure detailed operation environment for serial communication |
| Wireless Settings | Set configurations related to Wi-Fi (Only for Wireless models)    |
| SNMP Settings     | Configure detailed operation environment for SNMP                 |
| Change Password   | Change ID and password for both Web connection and telnet         |
| Update Firmware   | Update the firmware in SerialGate                                 |
| Factory Default   | Restore all the factory default settings.                         |
| Save & Reboot     | Save the configurations and reboot SerialGate                     |
| System Log        | View system log of SerialGate (SG-1040/1080/1160)                 |

## Network Settings

In Network Settings, a user can configure general network environment and network management.

After changing values, you need to click **Apply** button. If you don't want to change, you need to click **Cancel** button. If you change the IP address, you must reconnect using the modified IP address.



The screenshot shows the 'Network Settings' page in a web browser. On the left is a navigation menu with options: Overview, Network Settings (selected), Serial Settings, SNMP Settings, Change Password, Factory Default, Reboot, Update Firmware, Logout, and System Log. The main content area is titled 'Network Settings' and is divided into three sections:

- Wan Port Setting:** Device Name (SerialGate), Line Type (Static IP), IP Address (192.168.0.41), Subnet Mask (255.255.255.0), Gateway (192.168.0.254), and DNS (168.126.63.1).
- Lan Port Setting:** Bridge Setting (Disable), IP Address (10.10.1.1), and Subnet Mask (255.255.255.0).
- Network Service Setting:** PortView Server IP / Port (192.168.0.40 / 4000), Telnet Service / Port (Enable / 23), FTP Service / Port (Enable / 21), Web Manager / Port (Enable / 80), SSH Service / Port (Disable / 22), and IP Access Policy (0).

At the bottom of the settings area are 'Apply' and 'Cancel' buttons. A footer at the very bottom of the page reads 'Copyright 2014 Systembase Co., Ltd.'

The followings are main features of WAN Configuration.

| Menu        | Default           | Description  |
|-------------|-------------------|--|
| Device Name | SerialGate        | Name of the current device   |
| Line Type   | Static IP         | How IP is obtained when network is connected.  |
| IP Address  | 192.168.0.22<br>3 | Current IP address SerialGate is assigned to.<br>(When line type is Static IP, manually enter an appropriate IP address. When line type is DHCP, current IP is displayed, but it is not editable.)                       |
| Subnet Mask | 255.255.255.<br>0 | Current subnet mask SerialGate is assigned to.<br>(When line type is Static IP, manually enter an appropriate subnet mask. When line type is DHCP, current subnet mask is displayed, but it is not editable.)            |
| Gateway     | 192.168.0.25<br>4 | Current default gateway SerialGate is assigned to<br>(When line type is Static IP, manually enter an appropriate default gateway. When line type is DHCP, current default gateway is displayed, but it is not editable.) |
| DNS         | 168.126.63.1      | Domain Name Service IP address   |

For SG-1160, the main features of LAN Configuration are as follows.

| Menu        | Default       | Description  |
|-------------|---------------|--|
| Bridge      | Disable       | Enable or Disable Bridge Mode                      |
| IP Address  | 10.10.1.1     | Set the current IP address (Bridge : disable only) |
| Subnet Mask | 255.255.255.0 | Set Subnet Mask address (Bridge : enable only)     |

When it is used in the bridge mode, LAN and WAN ports are not used as their original intention but will be connected to other SerialGate and form a network with daisy chain method.

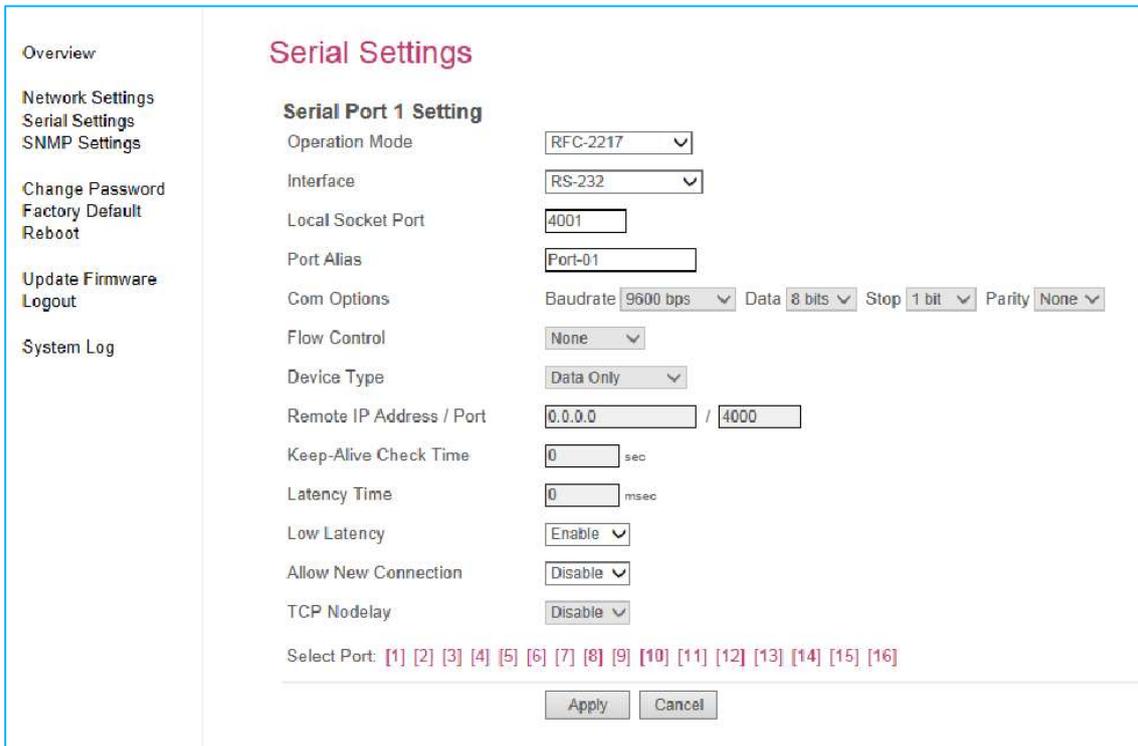
Main features for Network Service Configuration are as follows.

| Menu                     | Default           | Descriptions   |
|--------------------------|-------------------|--|
| PortView IP<br>/ Port    | 0.0.0.0 /<br>4000 | Set the IP address and the socket number of the PC where PortView is installed. For more information about PortView, please refer to the PortView User Manual. If IP is set to 0.0.0.0, this feature is disabled   |
| Telnet Service<br>/ Port | Enable<br>/ 23    | Enable or disable Telnet service and set the port number. To change the port number and apply it, you need to save and reboot. If disabled, you cannot connect to SerialGate via Telnet.   |
| FTP Service<br>/ Port    | Enable<br>/ 21    | Enable or disable FTP service and set the port number. To change the port number and apply it, you need to save and reboot. If disabled, you cannot connect to SerialGate via FTP.   |
| WEB Service<br>/ Port    | Enable<br>/ 80    | Enable or disable Web service and set the port number. To change the port number and apply it, you need to save and reboot. If disabled, you cannot connect to SerialGate via Web.   |
| SSH Service<br>/ Port    | Disable<br>/ 22   | Enable or disable Secure Shell service and set the port number. To change the port number and apply it, you need to save and reboot. If disabled, you cannot connect to SerialGate via SSH.  |
| IP Access Policy         | 0                 | Enable access control from the designated IP to SerialGate. Can be set to Accept or Deny the access to the Port which is set to Telnet, FTP, Web and SSH. If the IP is 0.0.0.0, the policy will not be applied.<br><br>(The parent policy is the top priority which takes precedence over the sub policy.) |

### Serial Settings

A user can set the communication and operation environment for the serial port.

After changing values, you need to click **Apply** button. If you don't want to change, you need to click **Cancel** button.



The screenshot shows the 'Serial Settings' configuration page. On the left is a navigation menu with options: Overview, Network Settings, Serial Settings (highlighted), SNMP Settings, Change Password, Factory Default, Reboot, Update Firmware, Logout, and System Log. The main content area is titled 'Serial Settings' and contains a 'Serial Port 1 Setting' section. The settings are as follows:

- Operation Mode: RFC-2217
- Interface: RS-232
- Local Socket Port: 4001
- Port Alias: Port-01
- Com Options: Baudrate 9600 bps, Data 8 bits, Stop 1 bit, Parity None
- Flow Control: None
- Device Type: Data Only
- Remote IP Address / Port: 0.0.0.0 / 4000
- Keep-Alive Check Time: 0 sec
- Latency Time: 0 msec
- Low Latency: Enable
- Allow New Connection: Disable
- TCP Nodelay: Disable

At the bottom, there is a 'Select Port' list with links [1] through [16], where [10] is highlighted. Below the list are 'Apply' and 'Cancel' buttons.

Serial settings for SerialGate are as follows.

| Menu           | Default  | Descriptions  |
|----------------|----------|---|
| Operation Mode | RFC-2217 | <p>Select the operation protocol that will be applied in the serial port.</p> <p><b>Disable</b><br/>Disable the serial port.</p> <p><b>RFC-2217</b><br/>Allows use of telnet protocol similar to COM Redirector. To use Serial/IP software in a PC, this protocol must be selected.<br/>(Maximum Speed: 460.8 Kbps)</p> <p><b>COM Redirector</b><br/>Use the serial port of SerialGate as a virtual COM port in Windows 2000/XP/2003/Vista/7/8/8.1</p> <p><b>Terminal</b><br/>Users can connect to serial console using SerialGate with this mode.<br/>With this mode, there is an option to set 'End of Line'.<br/>Following command is used to enter the serial console:<br/>telnet [SerialGate IP] [Local Socket Port]</p> <p><b>TCP Server</b><br/>SerialGate works as a socket server, waiting for the client connection on the network. Socket number for awaiting connections can be set in 'Local socket port' field. After socket connection, data between socket and serial port will be transmitted.</p> <p><b>TCP Client</b><br/>SerialGate acts as a socket client in this mode. It tries to connect to the server IP address and the socket number assigned when a certain server waits for connection on the network.<br/>All data between the socket and the serial port is transferred untouched after the socket connection is established.</p> <p><b>TCP Broadcast</b><br/>SerialGate works as a server, accepting up to 5 simultaneous connections from socket clients. Data transmitted from</p> |

| Menu | Default | Descriptions  |
|------|---------|---|
|      |         | <p>SerialGate is broadcast to each socket client.</p> <p><b>TCP Multiplex</b></p> <p>SerialGate works as a server, accepting up to 5 simultaneous connections from socket clients. The difference between TCP Broadcast and TCP Multiplex is that Multiplex allows each socket to communicate exclusively. That is, serial data in response are only transferred to the sender socket.</p> <p><b>UDP Server</b></p> <p>SerialGate works as a UDP server, waiting for UDP connection from the client on the network.</p> <p>Socket number for awaiting connections can be set in 'Local socket port' field.</p> <p>Once a UDP packet is received to the socket that waits for the connection, the data is transmitted to the serial port. The data input from the serial port is put into UDP packets, which eventually are sent to the client.</p> <p><b>UDP Client</b></p> <p>When the data is input to the serial port, UDP packets are sent using the preset IP address and the socket number of the server.</p> <p><b>Pair_Master/ Pair_Slave</b></p> <p>It extends a serial cable between DTE and DCE to network, and enables communication not limited to distance. Two devices are required for this feature and set one to Pair_Master and another to Pair_Slave. It can be used for serial communication tunneling.</p> <p><b>MODBUS RTU</b></p> <p>Connect MODBUS/RTU SLAVE using serial port so that the PC connected to the SerialGate with the Ethernet can be operate as MODBUS/TCP MASTER. By using this function, it will act as a media converter.</p> <p><b>MODBUS ASCII (Master)</b></p> <p>This mode is necessary when connecting MODBUS/TCP master to MODBUS/ASCII slave.</p> <p>Connect MODBUS/ASCII slave device to SerialGate.</p> <p>Connect LAN from SerialGate to MODBUS/TCP master to use</p> |

| Menu              | Default  | Descriptions   |
|-------------------|----------|--|
|                   |          | <p>SerialGate as media converter.</p> <p>SerialGate supports up to 32 MODBUS / ASCII slave connections and supports up to 16 connections per one serial port.</p> <p><b>MODBUS RTU (Master)</b></p> <p>This mode is necessary when connecting MODBUS/TCP master to MODBUS/MASTER slave.</p> <p>Connect MODBUS/ASCII slave device to SerialGate.</p> <p>Connect LAN from SerialGate to MODBUS/TCP master to use SerialGate as media converter.</p> <p>SerialGate supports up to 32 MODBUS / MASTER slave connections and supports up to 16 connections per one serial port.</p> <p><b>User Application</b></p> <p>A user can run own customized program. In order to run it, a user needs to ask for application development environment to SystemBase.</p> |
| Interface         | RS232,   | <p>In SG-1160 model, it is selectable between RS-232, RS-422, RS-485(No-Echo) and RS-485(Echo). Default value is RS-232.</p> <p>In SG-1160/ALL model, it is selectable between RS-232, RS-422, RS-485 (No-Echo) and RS-485 (Echo). Default value is RS-232 and termination can be configured.</p>  |
| Local Socket Port | 4001     | Set the socket number for the port. TCP server and UDP server operation mode makes use of this port for awaiting network socket connections.   |
| Port Alias        | Port1    | Name each port for convenience. 16 Characters at maximum.  |
| Baud Rate         | 9600 bps | Set communication speed<br>(Options: 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600 bps)   |
| Data Bits         | 8        | Set the number of bits in each character size.<br>(Options: 5, 6, 7, 8)  |
| Stop Bits         | 1        | Set the number of stop bits.<br>(Options: 1, 2)  |
| Parity            | None     | Set parity bit check scheme.<br>(Options: None, Odd, Even)   |

| Menu                     | Default        | Descriptions  |
|--------------------------|----------------|---|
| Flow Control             | None           | Set the flow control scheme.<br>(Options: None, Xon/Xoff, RTS/CTS)  |
| Device Type              | DataOnly       | Set the signal line checking method for the device to be connected to the given serial port.<br>If the mode is set to Data Only, TxD, RxD, and GND signal lines are used in inter-device communication.<br>If the mode is set to Modem Signals, all modem signals except RI (Ring Indicator) are asserted, tested, and used in communication.<br>(Options: Data Only, Modem Signals)  |
| Remote IP Address / Port | 0.0.0.0 / 4000 | If the Operation Mode is in TCP Client or UDP Client or Pair_Master mode, set the IP address and the socket number to connect to.   |
| Keepalive Check Time     | 30             | When set to '1', network status is check with given time period after socket connection is established.<br>Socket connection will be reset when there is any network issue. (When set to '0', this feature is disabled. When enabled, setting range is from 0 to 32767.)<br>If the value is set to '0', the socket connection is not reset.   |
| Latency Time             | 0              | This needs to be set when consecutive data from the given serial port needs to be transmitted to socket at once.<br>For example, if 100 bytes of character string are to be transmitted from the serial device to a server through SerialGate, bypass is set to 0 for the latency time. Although it provides immediate sending through SerialGate, the server could be received a lot parts of divided packets.<br>If the latency time is not 0, SerialGate will wait for the time and check new data. If there is new data, SerialGate repeatedly wait for the time. Otherwise, SerialGate will transfer the buffered data, but it could not run in real time. |

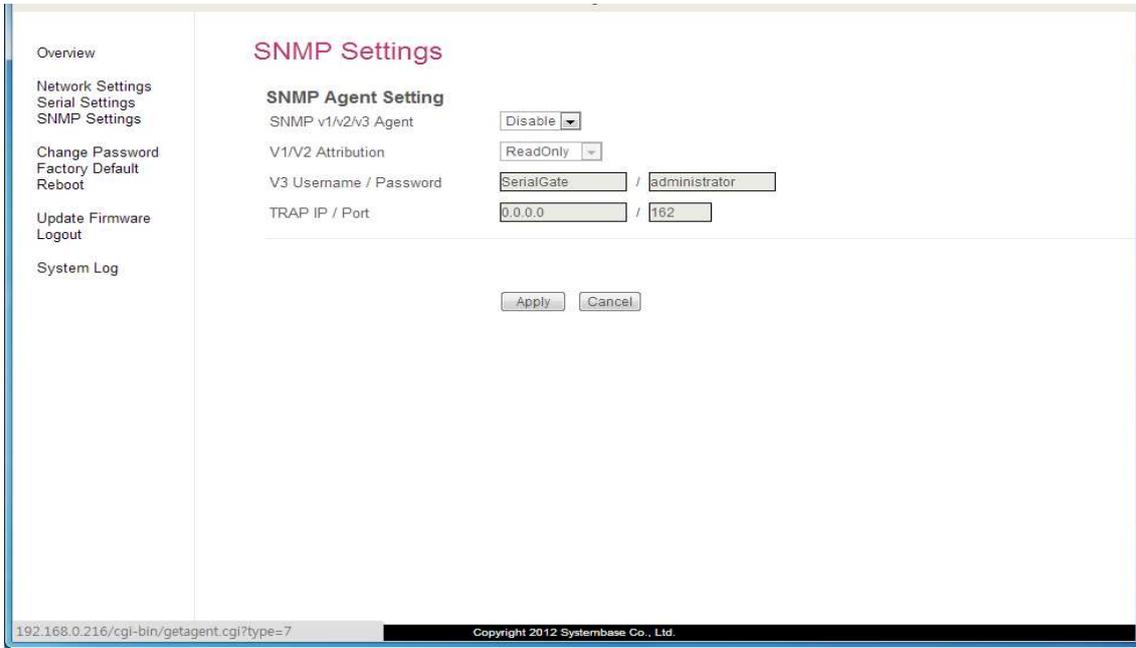
| Menu                  | Default | Descriptions   |
|-----------------------|---------|--|
| Maximum Response Time | 0       | When operating with TCP Multiplex mode, the SerialGate sends a data to the device and waits given amount of time. When there are no reply within the given time, it will send the next data to the device. If the value is set to zero, it will not wait for the reply but send the next available data right away when received.  |
| Low Latency           | Enable  | Send the data received from the Ethernet to the serial port as soon as possible. When enabled, it takes less time to send the serial data, but will increase the load of the system. When disabled, the load of the system decreases, but will take more time to send the serial data. If it is required to send the data to the serial device with less delay, enable this feature. When sending large amount of data, disable this feature.  |
| Allow New Connection  | Disable | When using TCP server mode, this feature allows new connection when enabled. While communicating, if new connection request arrives, the SerialGate will disconnect the current connection and permit the new connection.  |
| TCP Nodelay           | Disable | When communicating with TCP, this feature will allow whether to send the data at once using the Ethernet port.<br>If it is disabled, data received from TCP will be sent after they are gathered. It is recommended when using high speed data transmission or packet transmission.<br>If it is enabled, data received from TCP will be sent immediately, allowing less delay in Ethernet and serial communication.<br>However, it is not optimized for high speed communication or packet transmission. |
| Port Login            | Disable | User/Password can be set in TCP Server, TCP Broadcast, TCP Multiplex mode.<br>When 'Port Login' is enabled, 'User/Password' can be modified.   |
| User                  | none    | User/Password can be set in TCP Server, TCP Broadcast, TCP Multiplex mode.<br>When 'Port Login' is enabled, 'User' can be modified.  |
| Password              | none    | User/Password can be set in TCP Server, TCP Broadcast, TCP Multiplex mode.<br>When 'Port Login' is enabled, 'Password' can be modified.  |

| Menu                | Default     | Descriptions  |
|---------------------|-------------|---|
| End of line         | CR          | When operation mode is set to 'Terminal', this option appears.<br>CR or CR LF can be set here.  |
| Number of TCP Slave | 0           | Set the number of Modbus TCP Slave connected to the serial port.<br>In SerialGate it supports up to 32 Modbus TCP Slave connections and supports up to 16 Modbus TCP Slave connections per one serial port .<br>If the Operation mode MODBUS RTU / ASCII (Master) , this option appears . |
| Slave IP / Port     | 0.0.0.0 / 0 | Set the Modbus TCP Slave IP address and Port number.<br>"Number of TCP Slave" option appears if you have set the option to a value different than 1 .   |
| Slave ID Range      | 0 / 0       | Set the Modbus TCP slave device ID or the range of IDs<br>"Number of TCP Slave" option appears if you have set the option to a value different than 1 .<br>Ex.) 1-1 or 1-3  |

### SNMP Settings

A user can set the communication and operation environment for the SNMP Agent.

After changing values, you need to click **Apply** button. If you don't want to change, you need to click **Cancel** button.



| Menu                  | Default                   | Descriptions   |
|-----------------------|---------------------------|--|
| SNMP v1/v2/v3 Agent   | Disable                   | Enable or disable Simple Network Management Protocol (SNMP) support. (Options : Disable/Enable)  |
| V1/2 Attribution      | ReadOnly                  | SNMP V1/2 Attributes can read and write by SNMP Agent.<br>In order to read attributes only, change the feature to "ReadOnly".<br>In order to read and write attributes, change the feature to "ReadWrite". (Options : ReadOnly/ ReadWrite) |
| V3 Attribution        | ReadOnly                  | SNMP V3 Attributes can read and write by SNMP Agent.<br>In order to read attributes only, change the feature to "ReadOnly".<br>In order to read and write attributes, change the feature to "ReadWrite". (Options : ReadOnly/ ReadWrite)   |
| V3 Username/ Password | serialgate /administrator | Configure the Username and the password when use SNMP V3.<br>The Password is at least 8 character string   |

|               |                 |  |
|---------------|-----------------|--|
| TRAP IP/ Port | 0.0.0.0<br>/162 | Configure the server IP address and Port which receive the TRAP information. |
|---------------|-----------------|--|

### Change Password

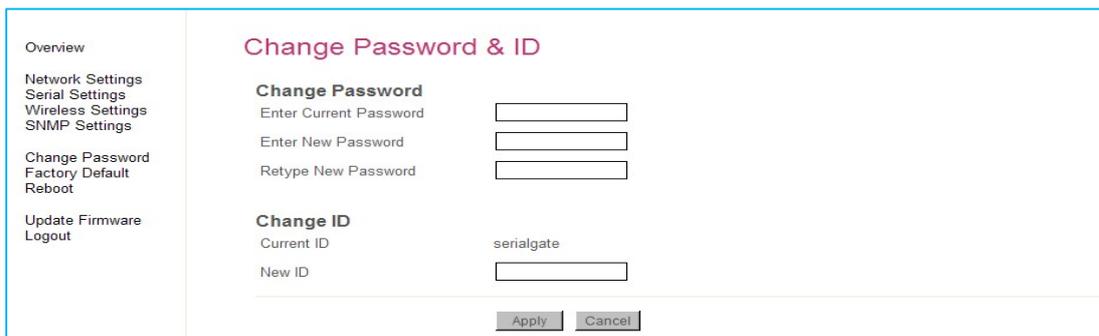
Change username and password for an access to Web and Telnet.

After changing values, you need to click **Apply** button. If you don't want to change, you need to click **Cancel** button.

In case that a user forgot password, press Reset button for less than 3 seconds to restore the settings back to factory default. However, please be aware that all other settings will be initialized and back to factory default.

**Default user id** : serialgate

**Default password** : 99999999



The screenshot shows the 'Change Password & ID' configuration page. On the left is a navigation menu with options: Overview, Network Settings, Serial Settings, Wireless Settings, SNMP Settings, Change Password, Factory Default, Reboot, Update Firmware, and Logout. The main content area is titled 'Change Password & ID' and contains two sections: 'Change Password' and 'Change ID'. The 'Change Password' section has three input fields: 'Enter Current Password', 'Enter New Password', and 'Retype New Password'. The 'Change ID' section has two input fields: 'Current ID' (pre-filled with 'serialgate') and 'New ID'. At the bottom of the form are 'Apply' and 'Cancel' buttons.



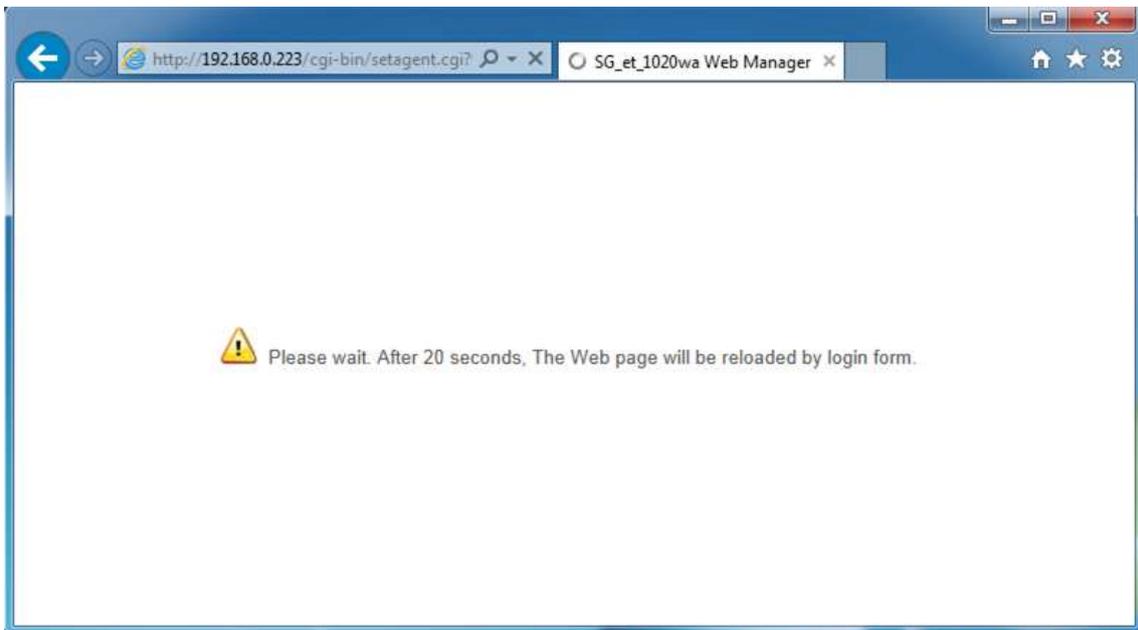
The screenshot shows the 'Success' confirmation page. The navigation menu is the same as in the previous screenshot. The main content area is titled 'Success' and contains a section 'New User Information'. It displays the following information: 'New ID : serialgate' and 'New PASSWORD : 1'. Below this information is a note: '(If you login next time, you must use this information.)'. At the bottom of the page, there is a small 'I' icon and a horizontal line.

### Update Firmware

Firmware is an application embedded in Flash memory of SerialGate. Set the location of the firmware file to update, using the **Browse...** button. The selected firmware will be transferred to SerialGate when you click **Update**.



After updating is complete, SerialGate will be automatically restarted to operate with the new firmware. Your browser will be reloaded with the login page.

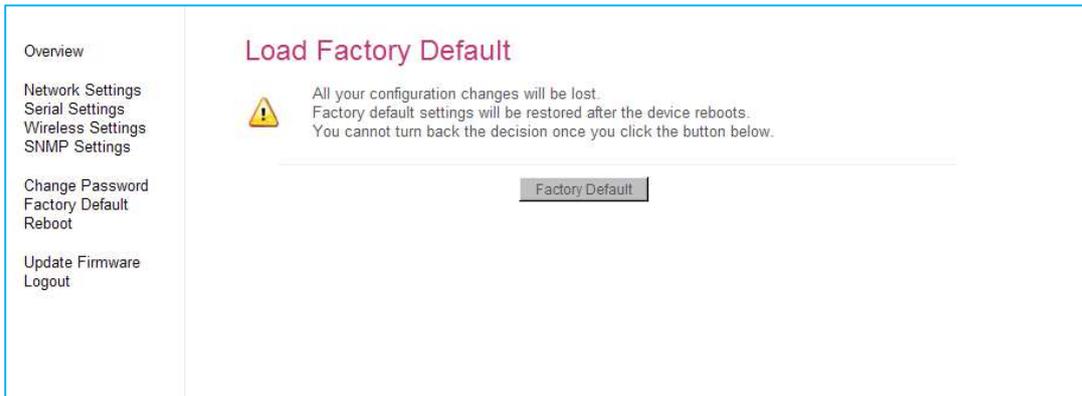


### Factory Default

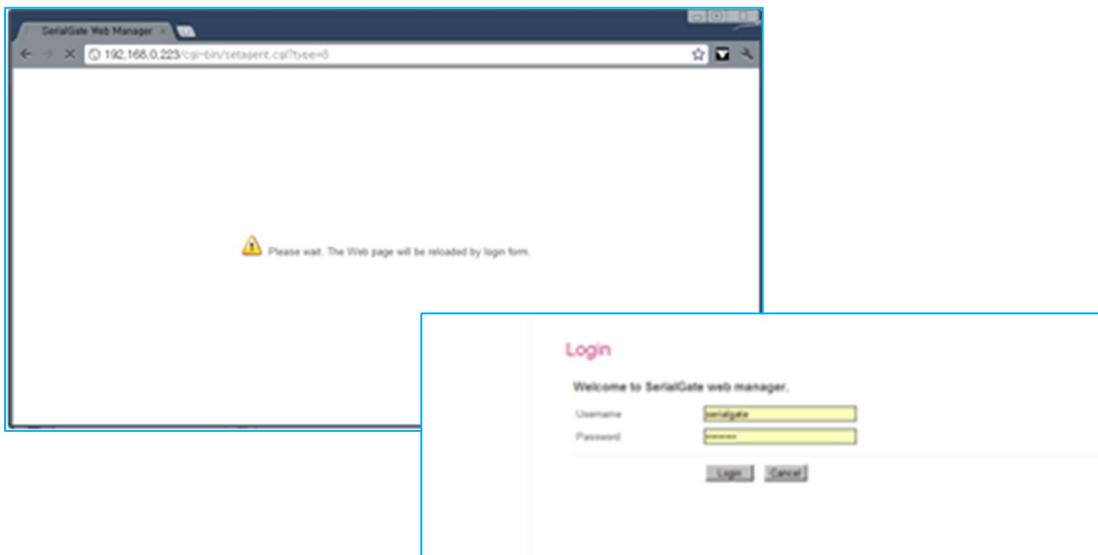
Restore all the configurable parameters to the factory default values. Clicking the 'Factory Default'

button will delete all current settings and restore settings to the initial status, and SerialGate will automatically reboot.

Default WAN IP Address 192.168.0.223, Default LAN IP Address 10.10.1.1

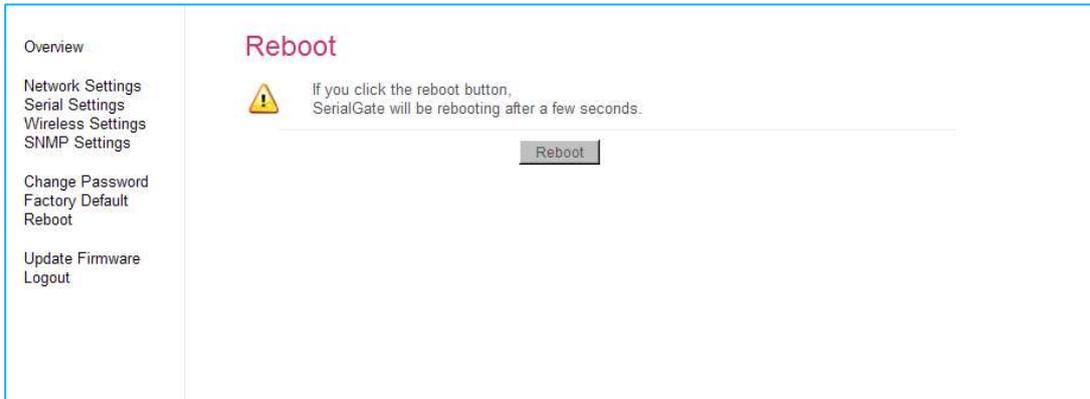


If “Factory Default” process is completed, it shows the IP address, username and password as below, and restarts the device.



## Reboot

This menu provides the reboot function when connected by a web browser.



After reboot, your browser is reloaded on the login page.

## System Log

This feature is about system log information. It records the time of the system startup and shutdown, ending time of each port connection, configuration and others.

This feature is only available in **SG-1160** with Secure Digital (SD) card or Multi Media card (MMC) slot in it or **SG-204x/208x/216x** models where there is a microSD card slot in the device.

If the button/coin cell battery is not in the built-in RTC power supply, the default time will be displayed as YYYY-MM-DD HH:MM:SS or "2000-01-01 00:00:00".

Otherwise, if the battery is installed, previous time stored will be shown.

```

C:W>telnet 192.168.0.223
SerialGate Login : serialgate
Password :99999999
# rtc 2010 7 8 15 0 0 ← Set Current time (Year, Month, Date, Hour,
minute, second)
Thu Jul 8 15:00:00 MDT 2010
Thu Jul 8 15:00:00 MDT 2010
# date ← setting time
Thu Jul 8 15:00:05 MDT 2010 ← Shows time elapsed
# reboot

```

## Chapter 6. Configuration via Telnet

### Connection

Open your telnet client program and enter the IP address of SerialGate to connect. You need to enter appropriate username and password to login. Please note that this username and password is used as authentication method for Web as well. This means if username or/and password has been modified from the telnet interface, modified values have to be entered to connect to web, and vice versa.

Factory default username : serialgate  
Factory default password : 99999999

**[def]** commands – you can configure settings of SerialGate.

**[def help]** commands – you can view the use of the **def** command.

After changing values, you can see modified values with **set view** commands. These values are not in effect unless you issue a **def save** command. Changes will be discarded if you do not save current settings.

### View Commands

Commands related to View are as follows.

| Command             | Description                           |
|---------------------|---------------------------------------|
| def view            | Show all information about SerialGate |
| def view wan        | Show WAN network settings             |
| def view management | Show managing items settings          |
| def view serial     | Show serial port settings             |
| def help            | Show command list and help            |

### Network Commands

Commands related to configuration of general network environment and network management are as follows.

| Command                          | Default               | Description   |
|----------------------------------|-----------------------|---|
| def mac<br><MAC Address>         | 00:05:f4:00:20:5<br>7 | Modify MAC address  |
| def line<br>[ip/dhcp]            | Static IP             | How IP is obtained when network is connected.   |
| def ip<br><IP Address>           | 192.168.0.223         | Display the current IP address<br>If line type is Static IP, manually enter an appropriate IP address.<br>If line type is DHCP, it is not editable. Instead, current IP address is shown.                             |
| def mask<br><Subnet mask>        | 255.255.255.0         | Display the current subnet mask address<br>If line type is Static IP, manually enter an appropriate subnet mask address.<br>If line type is DHCP, it is not editable. Instead, current subnet mask address is shown   |
| def gateway<br><Gateway address> | 192.168.0.1           | Display the current Gateway address<br>If the connection type is the static IP, manually enter an appropriate Gateway address.<br>If line type is DHCP, it is not editable. Instead, current Gateway address is shown |

|                                   |              |  |
|-----------------------------------|--------------|--|
| def dns<br><IP Address>           | 168.126.63.1 | Set IP address of Domain Name Service  |
| def portviewip<br><IP address>    | 0.0.0.0      | Configures IP of PC which PortView is installed<br>If IP is set to 0.0.0.0, PortView feature is disabled.<br>(Please refer to PortView User Manual in SerialGate Utility and Documents CD for detailed information.) |
| def portviewport<br><Port number> | 4000         | Set the socket number of a PC which PortView is installed.   |
| def ftp<br>[enable/ disable]      | Enable       | Enable or disable FTP service.<br>If disabled, you cannot connect to SerialGate via FTP.   |
| def ftp port<br><Port number>     | 21           | Set the port number of FTP Server. To change the port number and apply it, you need to save and reboot.  |
| def telnet<br>[enable/ disable]   | Enable       | Enable or disable Telnet service.<br>If disabled, you cannot connect to SerialGate via Telnet.   |
| def telnet port<br><Port number>  | 23           | Set the port number of Telnet Server. To change the port number and apply it, you need to save and reboot.   |
| def web<br>[enable/ disable]      | Enable       | Enable or disable Web service.<br>If disabled, you cannot connect to SerialGate via Web.   |
| def web port<br><Port number>     | 80           | Set the port number of WEB Server. To change the port number and apply it, you need to save and reboot.  |
| def ssh<br>[enable/ disable]      | Disable      | Enable or disable SSH service.<br>If enabled, you can connect to SerialGate via SSH.   |
| def ssh port<br><Port number>     | 22           | Set the port number of SSH Server. To change the port number and apply it, you need to save and reboot.  |
| def name<br>[SerialGate name]     | Product Name | Set the name of SerialGate. (Max 32 bytes)   |
| def snmp<br>[enable/ disable]     | Disable      | Enable or disable SNMP (Simple Network Management Protocol)<br>– MIB-II (RFC 1213): System, Interface, IP, ICMP, TCP, UDP<br>– MIB-I (RFC 1317): Serial Interface  |
| def v1readwrite                   | Disable      | SNMP V1/2 Attributes can read and write by SNMP  |

|  |            |   |
|--|------------|---|
| [enable, disable]                        |            | Agent. In order to read attributes only, change the feature to "ReadOnly."<br>In order to read and write attributes change the feature to "ReadWrite."<br>(Options : ReadOnly/ ReadWrite)   |
| def v3readwrite<br>[enable, disable]     | Disable    | SNMP V3 Attributes can read and write by SNMP Agent.<br>In order to read attributes only change the feature to "ReadOnly."<br>In order to read and write attributes change the feature to "ReadWrite."<br>(Options : ReadOnly/ ReadWrite) |
| def v3username<br>[string]               | serialgate | Configure the Username to use SNMP V3.  |
| def v3password<br>[string]               | none       | Configure the password to use SNMP V3.  |
| def trapip<br>[address]                  | 0.0.0.0    | Configure the server IP address which transmits the TRAP information.   |
| def trapoprt<br>[Socket No.]             | 162        | Configure the server Port which transmits the TRAP information.   |
| def acc [0~15]<br>policy                 | 0          | Set the number of policies to which the IP Access policy applies.   |
| def acc [1~15] ip<br>[IP Address]        | 0.0.0.0    | Set the IP address to which the IP Access policy applies.<br>0.0.0.0: IP not applied<br>ex) To block 192.168.0.100<br>def acc 1 ip 192.168.0.100  |
| def acc [1~15]<br>range [IP<br>Address]  | 0.0.0.0    | Set the IP address range to which the IP Access policy applies.<br>0.0.0.0: IP not applied<br>ex) To block 192.168.0.100~192.168.1.102<br>def acc 1 ip 192.168.0.100<br>def acc 1 range 192.168.1.102                                     |
| def acc [1~15]<br>state<br>[accept/deny] | deny       | Accept or deny the access by IP Access Policy.<br>accept: allow, deny:block   |

|                                |   |   |
|--------------------------------|---|---|
| def acc [1~15]<br>telnet [0/1] | 0 | Apply the IP Access Policy to the Telnet port.<br>0: not apply, 1:apply |
| def acc [1~15]<br>ftp [0/1]    | 0 | Apply the IP Access Policy to the ftp port.<br>0: not apply, 1:apply    |
| def acc [1~15]<br>web [0/1]    | 0 | Apply the IP Access Policy to the web port.<br>0: not apply, 1:apply    |
| def acc [1~15]<br>ssh [0/1]    | 0 | Apply the IP Access Policy to the ssh port.<br>0: not apply, 1:apply    |

### Serial Commands

You can set the communication and operation environment for serial port. Please refer to **Chapter 5** for details of each option.

| Commands   | Default | Description  |
|--|---------|--|
| def port x protocol<br>[disable,<br>com_redirect,<br>rfc2217<br>terminal<br>tcp_server,<br>Tcp_client,<br>tcp_broadcast,<br>Tcp_multiplex,<br>udp_server,<br>udp_client,<br>pair_master,<br>pair_slave,<br>modbus_ascii,<br>modbus_rtu,<br>master_ascii,<br>master_rtu,<br>user] | rfc2217 | Select the operation protocol to be used in serial port.   |
| def port x interface<br>[rs232,<br>rs422,<br>rs485ne,  | RS232,  | Configure interface of serial port.<br>It is not available for RS232 model.<br>Combo model can choose from RS-422, RS-485-No-Echo and RS-485-Echo. |

| Commands  | Default | Description   |
|---|---------|---|
| rs485e]   |         | SG-1160/ALL can choose from RS-232, RS-422 and RS-485.  |
| def port x socket<br><port number>  | 4001    | Set the socket number for the port. Com_redirect, TCP Server, TCP Multiplex, TCP Broadcast, UDP Server, Pair_Slave modes make use of this port for awaiting network socket connections. |
| def port x name<br><name>   | Port 1  | Name each port for convenience. 16 Characters at maximum  |
| def port x speed<br>[150/300/600/1200<br>/2400/4800/9600/1<br>9200/38400/57600<br>/115200/230400/4<br>60800/921600] | 9600bps | Set communication speed.  |
| def port x data<br>[5 / 6 / 7 / 8]  | 8       | Set the number of bits in each character size.  |
| def port x stop<br>[1 / 2]  | 1       | Set the number of stop bits.  |
| def port x parity<br>[none/odd/even]  | none    | Set parity bit check scheme.  |
| def port x flow<br>[none/xon/rts]   | none    | Set the flow control scheme.  |
| def port x signal<br>[data/modem]   | data    | Set the signal line checking method for the device to be connected to the given serial port.  |
| def port x remote<br><IP address>   | 0.0.0.0 | Set IP address of the server to be connected in TCP Client, UDP Client, Pair_Master mode.   |
| def port 1<br>remoteport<br><socket number>   | 4000    | Set the socket number to connect to when the Operation Mode is set to TCP Client or UDP Client or Pair_Master mode.   |
| def port x keepalive<br><0 ~ 65535>   | 30      | When set to '1', network status is check with given time period after socket connection is established.   |
| def port x latency<br><msec>  | 0       | This needs to be set when consecutive data from the given serial port needs to be transmitted to socket at once.  |

| Commands  | Default | Description  |
|---|---------|--|
| def port x login<br><Enable/Disable>                          | Disable | When the Operation Mode is set to TCP Server, ask for the username and password when the client tries to connect.  |
| def port x loginname<br><username>                            | None    | When the Operation Mode is set to TCP Server, ask for the username (Maximum 16 characters)   |
| def port x loginpass<br><password>                            | None    | When the Operation Mode is set as TCP Server, ask for the password (Maximum 16 characters)   |
| def port x termination<br><Enable/Disable>                    | Disable | Set termination for each port.   |
| def port x nodelay<br><enable/disable>                        | disable | Set the TCP no_delay option for each port.   |
| def port x slaveno<br><0 ~ 16>                                | 0       | Set the number of Modbus TCP Slave connected to the serial port.<br>SerialGate supports up to 32 Modbus TCP slave connections and supports up to 16 Modbus TCP slave connections per one serial port . |
| def port x slaveip<br><slave number><br><slave ip number>     | 0.0.0.0 | Set Modbus TCP IP address corresponding to the < slave number>   |
| def port x slaveport<br><slave number><br><slave port number> | 0       | Set Modbus TCP port number corresponding to the < slave number>  |
| def port x slaveid<br><slave number><br><start id> <end id>   | 0       | Set the Modbus TCP slave device ID or the range of IDs corresponding to the <slave number >  |

#### Username/Password Commands

Configure username and password for Web/Telnet/FTP.

| Commands                   | Default    | Descriptions   |
|----------------------------|------------|--|
| def username<br><username> | serialgate | Set username to use in Web, Telnet, or FTP.<br>16 characters at maximum. |

|                            |          |  |
|----------------------------|----------|--|
| def password<br><password> | 99999999 | Set password to use in Web, Telnet, or FTP.<br>16 characters at maximum. |
|----------------------------|----------|--|

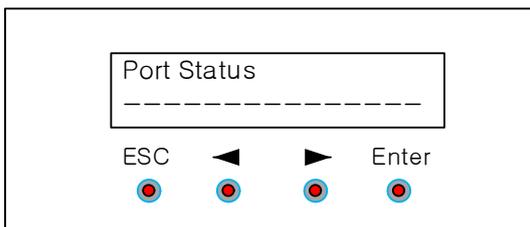
#### System Commands

| Commands    | Descriptions   |
|-------------|--|
| def default | Restore all settings to factory default. Requires reboot for changes to take effect. |
| def apply   | Save and apply changed settings.   |
| Reboot      | Reboots SerialGate.  |

## Chapter 7. Configuration via LCD

Through the LCD on the front panel, the users can modify operation of each interface and configuration. By default, the LCD displays communication status of each port, and by operating the keys next to the LCD, the interface can be tested.

### LCD and Key Operation



The LCD screen can display 16 characters with 2 lines. Four buttons are there to configure the operating environment.

The function of each key is as follows.

| Key   | Function 1   | Function 2   |
|-------|--|--|
| ESC   | Go to the main menu.                                   |  |
| Enter | Select the current value, and then go to the next menu |  |
|       | Previous menu/item                                     | If the variable is numeric, it increases the value<br>Ex.) 192.168.0.111 → 192.168.1.111 |
|       | Next menu/item   | If the variable is numeric, move to the next space<br>Ex.) 192.168.0.111 → 192.168.0.111 |

## Main Menu

Default screen of the LCD displays the status of each port.

Press ESC to go back to the main menu screen.

Main menu items are as follows.

- Network Setup** : Change the network configuration of the device server.
- Port Setup** : Change the operating environment setting for each port.
- Status** : Check the connection status of the port or display the version information.
- System** : Perform firmware upgrade or reset, do factory default reset.
- Verification** : Verify each HW interface in the device server.

## Network Setup

Change the network configuration of the device server.

In order to select the Network Setup, press '**ESC**' located left of the LCD panel until '**Main Menu**' shows, and when the '**Main Menu**' is displayed, press '<<' or '>>' until you see '**Network Setup**'.

Then, press '**Enter**' to change the details.

Press '**ESC**' at any time to go back to the top menu and it will ask if the user wants to save the change to the Flash memory if there were any changes.

For more details about each menu, please refer to "Chapter 5. Configuration via Web" and "Chapter 6. Configuration via Telnet."

Menu and selectable options are as follows.

| Menu             | Option                    | Default           | Description   |
|------------------|---------------------------|-------------------|---|
| Network line     | Static IP,<br>DCHP Client | Static IP         | <<, >> : Select option<br>Enter : Save the current option, and go to the next menu.   |
| IP Address       |                           | 192.168.0.22<br>3 | <<: Increase the value of the cursor position.<br>>>: Move cursor to the next space.<br>Enter : Save the current option, and go to the next menu. |
| Subnet Mask      |                           | 255.255.255.<br>0 |   |
| Gateway          |                           | 192.168.0.25<br>4 |   |
| FTP Service      | Enable, Disable           | Enable            | <<, >> : Select option<br>Enter : Save the current option, and go to the next menu.   |
| Telnet Service   | Enable, Disable           | Enable            |   |
| SSH Service      | Enable, Disable           | Disable           |   |
| WEB Service      | Enable, Disable           | Enable            |   |
| PortView Address |                           | 0.0.0.0           | <<: Increase the value of the cursor position.<br>>>: Move cursor to the next space.<br>Enter : Save the current option, and go to the next menu. |

### Port Setup

This changes the operating environment settings for each ports.

In order to select the Port Setup, press '**ESC**' located left of the LCD panel until '**Main Menu**' shows, and when '**Main Menu**' is displayed, press '<<' or '>>' until you see '**Port Setup**'. Then, press '**Enter**' to change the details.

Press '**ESC**' at any time to go back to the top menu and it will ask if a user wants to save the change to the Flash memory in there were any changes.

For more details about each menu, please refer to "Chapter 5. Configuration from Web Browser" and "Chapter 6. Configuration via Telnet."

Menu and selectable options are as follows.

| Menu        | Option   | Default            | Description  |
|-------------|--|--------------------|--|
| Protocol    | Disable<br>Com_redirector<br>RFC-2217<br>TCP_Server<br>TCP_Client<br>TCP_Broadcast<br>TCP_Multiplex<br>UDP_Server<br>UDP_Client<br>Pair_Master<br>Pair_Slave | RFC-2217           | <<, >> : Select option<br>Enter: Save the current option, and go to the next menu.   |
| Socket No.  | 4001 ~ 4016  | 4000 + Port number | <<: Increase the value of the cursor position.<br>>>: Move cursor to the next space.<br>Enter: Save the current option, and go to the next menu. |
| Interface   | RS232,<br>RS422<br>RS485 (NE)<br>RS485(E)  | RS232              | <<, >>: Select option<br>Enter: Save the current option, and go to the next menu.  |
| Device Type | Data Only,<br>Modem  | Data Only          |  |
| BaudRate    | 150 ~ 921600<br>bps  | 9600               |  |

|              |                 |         |  |
|--------------|-----------------|---------|--|
| Parity       | None, Odd, Even | None    |  |
| Data Bits    | 5 ~ 8           | 8       |  |
| Stop Bits    | 1, 2            | 1       |  |
| Latency_time | 0 ~ 65535       | 0       | <<: Increase the value of the cursor position.                                     |
| Keepalive    | 0 ~ 65535       | 0       | >>: Move cursor to the next space.   |
| Remote IP    |                 | 0.0.0.0 | Enter: Save the current option, and go to the next menu.                           |
| Remote Port  |                 | 4000    |  |
| Termination  | Enable, Disable | Disable | <<, >> : Select option<br>Enter: Save the current option, and go to the next menu. |

### Status

Check the connection status of the port and device server's version information.

In order to select Status, press '**ESC**' on the panel until '**Main Menu**' comes up, and if '**Main Menu**' is displayed, press '<<' or '>>' until you see '**Status**'. Then, press '**Enter**' to change the details.

Press '**ESC**' at any time to moves to the top menu.

| Menu        | Display | Description   |
|-------------|---------|---|
| Version     | 2.3.xxx | Firmware Version  |
| Port Status | -----   | If serial port is in communication, the port number is displayed on the corresponding space. Since it only shows one digit, it will display 0 ~ 6 for port 10 ~ 16. |

## System

Update device server firmware, initialize the system or command port reset.

In order to select System, press '**ESC**' on the panel until '**Main Menu**' comes up, and if '**Main Menu**' is displayed, press '<<' or '>>' until you see '**System**'. Then, press '**Enter**' to change the details.

At any time '**ESC**' is selected, it moves to the top menu.

| Menu            | Option     | Default | Description  |
|-----------------|------------|---------|--|
| Port Reset      | Cancel Yes | Cancel  | <<, >> : Select option.  |
| Factory Default |            |         | Enter: If <b>Cancel</b> is selected, it moves to the next menu. If <b>Yes</b> is selected, that action is performed. |
| Reboot System   |            |         |  |

### Port Reset

If 'yes' is selected in Port Reset, LCD displays the port number from 1 to 16 as below, and the cursor is at the first one.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | o | r | t | R | e | s | e | t |   |   |   |   |   |   |   |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |

Move the cursor to the port to be reset using '<<', '>>' keys and press 'Enter'. Then, the corresponding port will be reset.

### Factory Default

'Cancel' and 'Yes' are selectable with '<<', '>>' keys. If a user selects 'Yes' and then 'Enter', configuration resets to the factory default.

### Reboot System

'Cancel' and 'Yes' are selectable with '<<', '>>' keys. If a user selects 'Yes' and then 'Enter', it prints out 'Now Rebooting' message and reboots the device server.

## Verification

It verifies each interface HW of a device server.

In order to select System, press '**ESC**' on the panel until '**Main Menu**' comes up, and if the '**Main Menu**' is displayed, press '<<' or '>>' until you see '**Verification**'. Then, press '**Enter**' to change the details.

Press the 'ESC' at any time to move to the top menu.

(\*) When a user performs this test, all the programs running in the device server stops. Therefore, the user must restart the device server after the test.

| Menu             | Option     | Default | Description   |
|------------------|------------|---------|---|
| RS232(Loopback)  | Cancel Yes | Cancel  | <<, >>: Select option.<br>Enter: If Cancel selected, go to the next menu.<br>If <b>Yes</b> is selected, that action is performed. |
| RS232(Signal)    |            |         |   |
| RS422(Loopback)  |            |         |   |
| RS485(Loopback)  |            |         |   |
| Testing WAN Port |            |         |   |
| Testing LAN Port |            |         |   |
| Testing MMC      |            |         |   |
| Testing Reset    |            |         |   |
| Testing Console  |            |         |   |
| Testing RTC      |            |         |   |

**RS232 (Loopback)**

Change all the serial ports of a device server to RS-232, and conduct a Loopback test.

RS-232 Loopback connector must be connected to all the serial ports for the test.

If a user selects 'yes' option, it starts Loopback test and prints out the result on LCD.

```

T e s t I n g ( R S 2 3 2 )
O O O O O O O O O O O O O O O O
```

If there is nothing wrong, it displays 'O'; otherwise 'X'.

**RS232 (Signal)**

Change all the serial ports of a device server to RS-232, and conduct a serial signal test.  
RS-232 loopback connector must be connected to all the serial ports for the test. Please use the loopback connector with the full signal line.

If a user selects 'yes' option, it starts serial signal test and prints out the result on LCD.

```
T e s t I n g ( S I g n a l )
O O O O O O O O O O O O O O O O
```

If there is nothing wrong, it displays 'O'; otherwise 'X'.

**RS422 (Loopback)**

Change all the serial ports of a device server to RS-422, and conduct a loopback test.  
RS-422 loopback connector must be connected to all the serial ports for the test.

If a user selects 'yes' option, it starts loopback test and prints out the result on LCD.

```
T e s t I n g ( R S 4 2 2 )
O O O O O O O O O O O O O O O O
```

If there is nothing wrong, it displays 'O'; otherwise 'X'.

**RS485 (Loopback)**

Change all the serial ports of a device server to RS-485, and conduct a loopback test.  
No additional loopback connector is required for RS-485 since RS-485 supports self-loopback.

If a user selects 'yes' option, it starts loopback test and prints out the result on LCD.

```
T e s t I n g ( R S 4 8 5 )
O O O O O O O O O O O O O O O O
```

If there is nothing wrong, it displays 'O'; otherwise 'X'.

### Testing WAN Port

Test WAN port in a device server.

For the test, WAN port must be connected to network, and there should be a PC with the IP address, '192.168.0.1' for the Ping test on network.

If a user selects 'yes' option, it tries Ping to '192.168.0.1', and prints out the result on LCD.

|                             |
|-----------------------------|
| T e s t i n g W A N P o r t |
| OK !                        |

If there is nothing wrong, it shows 'OK !'; otherwise 'Failed !'.

### Testing LAN Port

Test LAN port of a device server.

For the test, LAN port must be connected to network, and there should be a PC with the IP address, '192.168.0.1' for the Ping test on network.

If a user selects 'yes' option, it tries Ping to '192.168.0.1', and prints out the result on LCD.

|                             |
|-----------------------------|
| T e s t i n g L A N P o r t |
| OK !                        |

If there is nothing wrong, it shows 'OK !'; otherwise 'Failed !'.

### Testing MMC

It tests whether memory card of a device server can read and write.

For the test, SD card must be inserted to the device server.

If a user selects 'yes' option, it reads and writes the data on SD card, and prints out the result on LCD.

|                     |
|---------------------|
| T e s t i n g M M C |
| OK !                |

If there is nothing wrong, it shows 'OK !'; otherwise 'Failed !'.

**Testing Reset**

It tests whether 'Reset' button of a device server works.

If a user selects 'yes' option, it waits for 'Reset' key to be pressed for approximately 6 seconds.

If 'Reset' is pressed or 6 seconds passed, it shows the result on LCD.

|  |
|--|
| <p>T e s t i n g R e s e t</p> <p>OK !</p> |
|--|

If there is nothing wrong, it shows 'OK !'; otherwise 'Failed !'.

**Testing Console**

It tests whether console port of a device server works.

For the test, DB9 Loopback connector should be conned to all the console ports.

If a user selects 'yes' option, it starts Loopback test, and prints out the result on LCD.

|  |
|--|
| <p>T e s t i n g C o n s o l e</p> <p>OK !</p> |
|--|

If there is nothing wrong, it shows 'OK !'; otherwise 'Failed !'.

**Testing RTC**

It tests RTC interface working as a clock for the device.

If a user selects 'yes' option, it sets time up on RTC and prints out the result on LCD.

After the test, a user should reset the time and date.

|   |
|---|
| <p>T e s t i n g R T C</p> <p>O K !</p> |
|---|

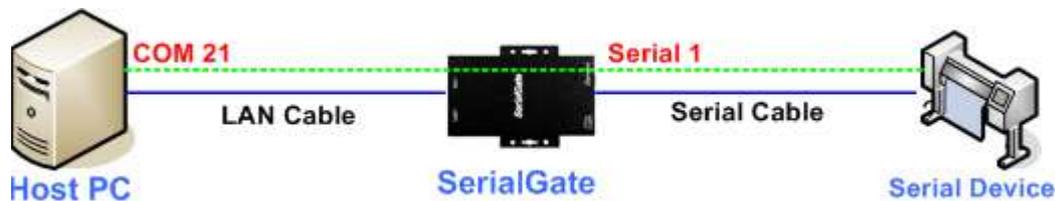
If there is nothing wrong, it shows 'OK !'; otherwise 'Failed !'.

## Chapter 8. Application

SerialGate can be used in many practical applications in various fields.

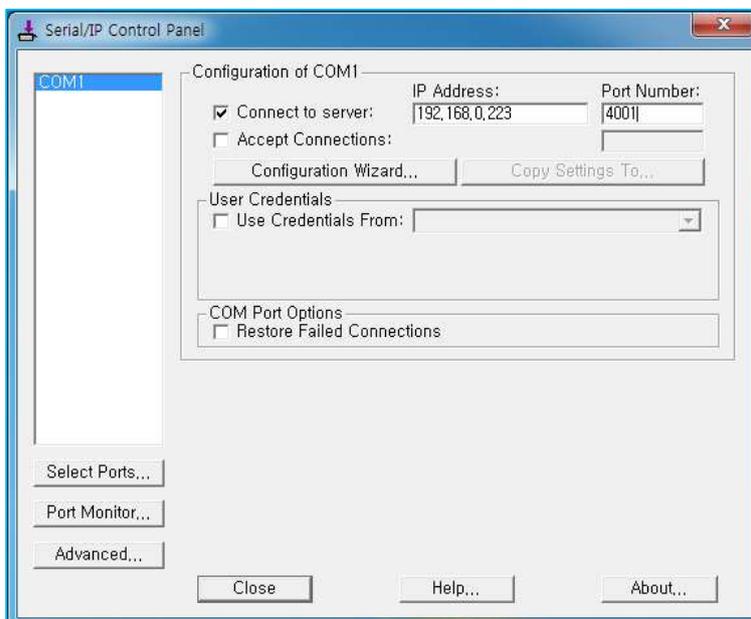
### Serial IP Redirector

With Serial IP Redirector, a user can use a serial port connected to SerialGate on the network as if it is a serial port in the PC. Maximum speed: 460.8Kbps

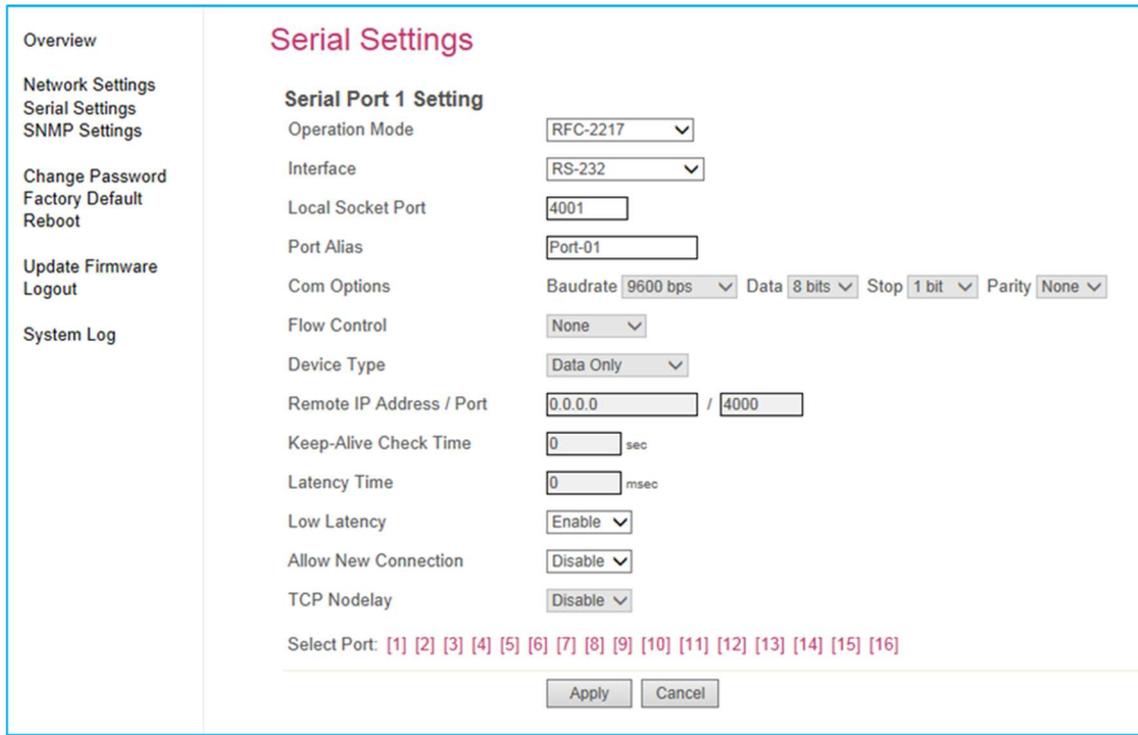


Install Serial IP Redirector and set the following steps. (For installation, please refer to Serial IP Redirector manual enclosed in CD.

In the picture below, IP address of SerialGate is 192.168.0.223, and the first serial port is being used. A user can open Com1 and use serial device connected to SerialGate.



In order to correspond to the Redirector setting of PC, change the setting in the first serial port of SerialGate as follows.



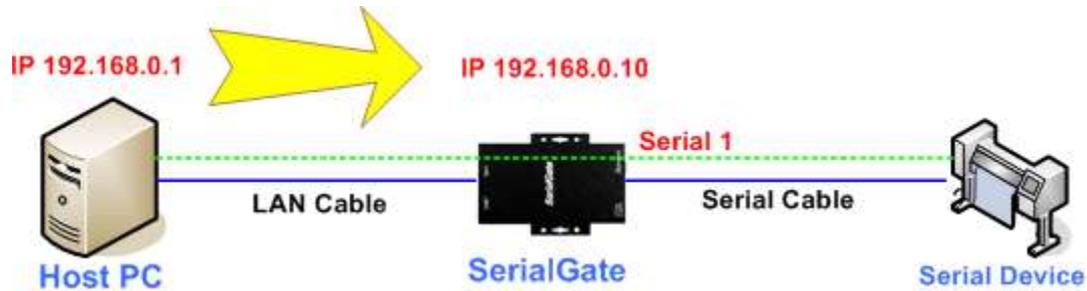
The screenshot shows the 'Serial Settings' configuration page. On the left is a navigation menu with options: Overview, Network Settings, Serial Settings, SNMP Settings, Change Password, Factory Default, Reboot, Update Firmware, Logout, and System Log. The main content area is titled 'Serial Settings' and contains a 'Serial Port 1 Setting' section. The settings are as follows:

| Setting                  | Value   |
|--------------------------|---|
| Operation Mode           | RFC-2217  |
| Interface                | RS-232  |
| Local Socket Port        | 4001  |
| Port Alias               | Port-01   |
| Com Options              | Baudrate: 9600 bps, Data: 8 bits, Stop: 1 bit, Parity: None |
| Flow Control             | None  |
| Device Type              | Data Only   |
| Remote IP Address / Port | 0.0.0.0 / 4000  |
| Keep-Alive Check Time    | 0 sec   |
| Latency Time             | 0 msec  |
| Low Latency              | Enable  |
| Allow New Connection     | Disable   |
| TCP Nodelay              | Disable   |

At the bottom of the settings area, there is a 'Select Port:' label followed by a list of port numbers: [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16]. Below this list are 'Apply' and 'Cancel' buttons.

**TCP\_Server (TCP/IP connection from PC to SerialGate)**

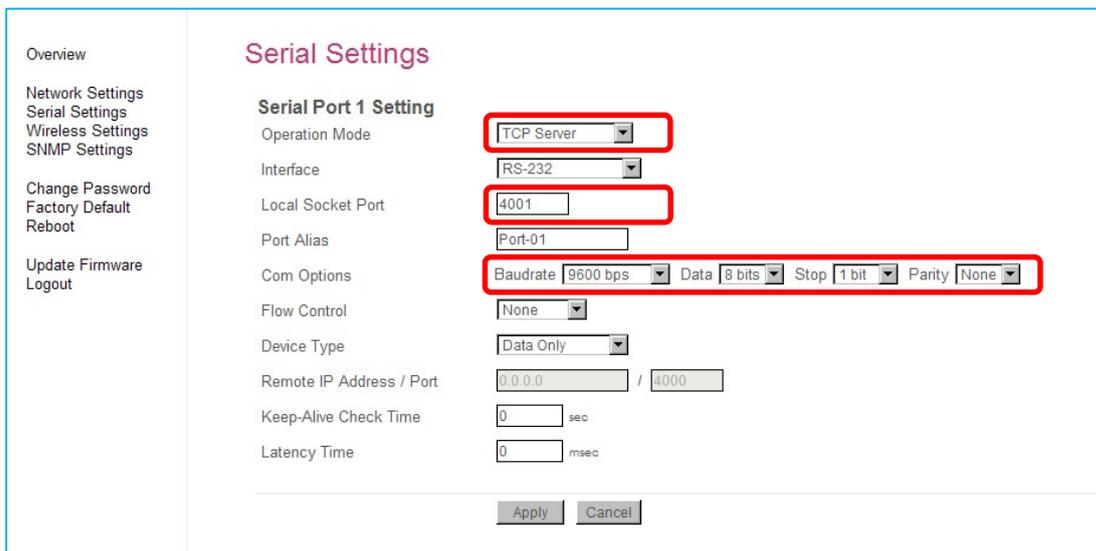
From the socket program in the PC, connect the first serial port of SerialGate with a socket.



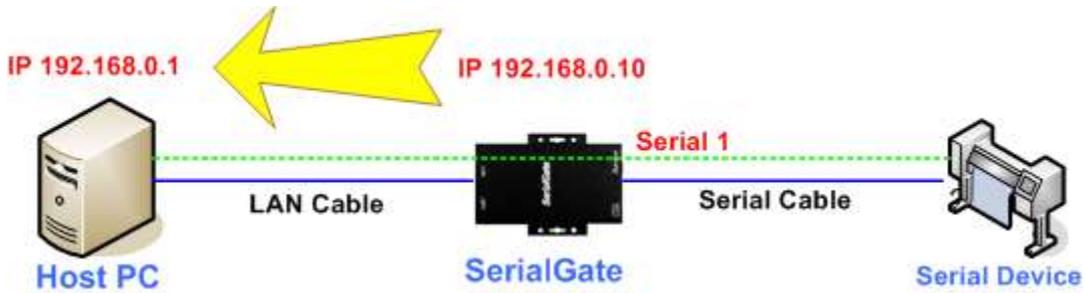
Since socket number for the first port of SerialGate is 4001 by default, try to connect to SerialGate IP address and 4001 socket number when connecting from a PC.

As shown below, change the operation mode to TCP\_Server and check the socket number waiting for connection.

Check the communication speed of a serial device to be connected to the serial port, and set it to Com Specification.



**TCP\_Client (TCP/IP Connection: SerialGate to PC)**



Since it is a connection from SerialGate to a PC, change the operation mode to TCP\_Client and register IP address and socket number of the PC that you want to connect.

Check the communication speed of the serial device connected to the serial port in the SerialGate, and set it in the “Com Options”.

Overview

Network Settings

Serial Settings

Wireless Settings

SNMP Settings

Change Password

Factory Default

Reboot

Update Firmware

Logout

### Serial Settings

**Serial Port 1 Setting**

Operation Mode: TCP Client

Interface: RS-232

Local Socket Port: 4001

Port Alias: Port-01

Com Options: Baudrate 9600 bps Data 8 bits Stop 1 bit Parity None

Flow Control: None

Device Type: Data Only

Remote IP Address / Port: 192.168.0.97 / 4000

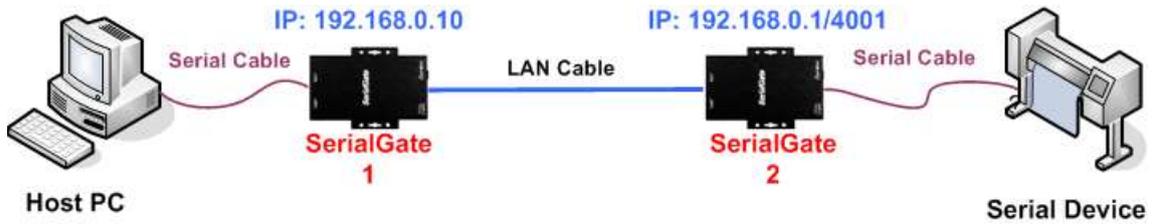
Keep-Alive Check Time: 0 sec

Latency Time: 0 msec

Apply
Cancel

**Pairing (Serial Line to Serial Line)**

This is mainly used when the cable length between the PC and a serial device is short so a user needs to extend the communication distance. This approach consists of two SerialGates connected in pair.



**Setting for SerialGate 1**

In order to perform master features, change operation mode to Pari\_Master. Check the communication speed of a PC and set it in “Com Options”, and also register the target SerialGate IP address and port number in Remote IP/Port.

Overview

Network Settings

Serial Settings

Wireless Settings

SNMP Settings

Change Password

Factory Default

Reboot

Update Firmware

Logout

### Serial Settings

**Serial Port 1 Setting**

Operation Mode: Pair Master

Interface: RS-232

Local Socket Port: 4001

Port Alias: Port-01

Com Options: Baudrate 9600 bps Data 8 bits Stop 1 bit Parity None

Flow Control: None

Device Type: Data Only

Remote IP Address / Port: 192.168.0.97 / 4000

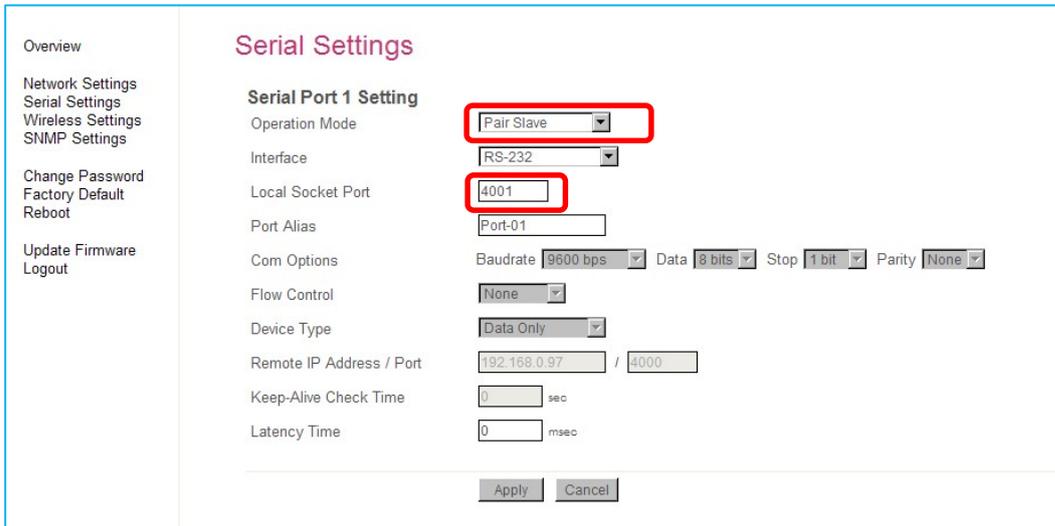
Keep-Alive Check Time: 0 sec

Latency Time: 0 msec

Apply
Cancel

### Setting for SerialGate 2

In order to wait for master connection, set the operation mode to Pari\_Slave and register the socket number to be connected in local socket port.



The screenshot shows the 'Serial Settings' configuration page. On the left is a navigation menu with options: Overview, Network Settings, Serial Settings, Wireless Settings, SNMP Settings, Change Password, Factory Default, Reboot, Update Firmware, and Logout. The main content area is titled 'Serial Settings' and contains a 'Serial Port 1 Setting' section. The 'Operation Mode' dropdown is set to 'Pari Slave' and is circled in red. The 'Local Socket Port' text input is set to '4001' and is also circled in red. Other settings include: Interface (RS-232), Port Alias (Port-01), Com Options (Baudrate: 9600 bps, Data: 8 bits, Stop: 1 bit, Parity: None), Flow Control (None), Device Type (Data Only), Remote IP Address / Port (192.168.0.97 / 4000), Keep-Alive Check Time (0 sec), and Latency Time (0 msec). 'Apply' and 'Cancel' buttons are at the bottom.

## Chapter 9. Appendix

### Troubleshooting

This section describes procedures for troubleshooting problems you may encounter with SerialGate.

#### Troubleshooting Installation Problems

If you cannot access the connected serial device via SerialGate, first check the network connection and cabling.

- Check the physical cabling to ensure all cables are plugged in (Ethernet and DB-9 serial cable)
- If the appropriate LEDs are not illuminated, then there is probably a bad 10baseT or 100baseTX cable, or the hub port is bad. If possible, try a different cable and hub port, or try connecting a different device to the cable.
- Verify that you are using the correct values for both IP Address and Port Number.
- If you are using a hub, verify that the hub port is operating correctly by trying SerialGate on a different port.

#### Troubleshooting Network Configuration Problems

- If you are using TCP/IP, make sure that your computer and SerialGate are on the same IP segment or can reach each other with a PING command from the host. The IP address you assign to SerialGate must be on the same logical network as your host computers (e.g., if your computer has an IP address of 192.189.207.3 and the subnet mask of 255.255.255.0, SerialGate should have an IP address of 192.189.207.x, where x is an integer between 1 and 254), or you must properly configure your router address to work with SerialGate.
- If your Device Server is set to Auto or DHCP for obtaining an IP Address, it is possible that the IP address of SerialGate can change. Either configure your DHCP server to give SerialGate a permanent lease, or configure SerialGate to be on a STATIC IP address

outside the scope of the DHCP addresses.

- The problem may be the result of mismatched or duplicate IP addresses. Verify that the IP address is correctly loaded into SerialGate (via the displayed or printed configuration information or through the remote console), and make sure that no other nodes on the network have this address (duplicate addresses are the biggest cause of TCP/IP connectivity problems). If the IP address is not correct, then check whether the loading procedure was properly executed.
- Also verify that the host computer and SerialGate are using the same subnet masks (for example, if SerialGate has a subnet mask of 255.255.255.0, the host must have the same subnet mask) or that the router is properly configured to pass data between the two devices.
- If the wrong IP address is loaded, check your network for DHCP server, and make sure that the server is not set up to load wrong IP addresses into SerialGate.

#### **Troubleshooting Windows Problems**

- If you are having trouble accessing the connected serial device through Windows, ensure you can ping SerialGate using the command PING x.x.x.x, where x.x.x.x is the IP address of SerialGate. If you cannot ping SerialGate, you will not be able to access the serial device.

### Firmware Update using FTP

A user can upload firmware using web browser, FTP, and etc.

- 1) Connect to SerialGate with FTP, using correct username and password. (Default: serialgate, 99999999)
- 2) Issue a command 'bi' for binary file transfer mode. Optionally use 'hash' to see the data transfer mark.
- 3) Issue 'put' command to upload the firmware file.
- 4) After getting a 'Transfer complete' message, issue a command 'bye' to disconnect. Now we are ready to update the firmware.

```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985–2001 Microsoft Corp.

C:\Documents and Settings\Wxxx>ftp 192.168.0.223

Connected to 192.168.0.223
220 Operation successful
User(192.168.0.223:(none)): serialgate ← Default
Password:99999999 ← Default
ftp>bi
ftp>ha
ftp>put c:\Wsg.bin ←choose the firmware and upload
200 Operation successful
150 Ok to send data
#####
#####
#####
#####
226 Operation successful
ftp: 2214352 bytes sent in 0.86Seconds 2577.83bytes/sec.
ftp>bye
```

- 5) Connect to SerialGate via Telnet, using correct username and password. (Default: eddy, 99999999)
- 6) After the login, you are already at the default directory where the firmware resides. Update can start right away.
- 7) Issue a command **ls** to make sure firmware files are both successfully uploaded.

- 8) Use 'upgrade' command to write this file into the flash memory in SerialGate. The upgrade application automatically detects whether the given firmware is a kernel or a file system.
- 9) Usage: Upgrade <firmware name> (Filename is case-sensitive.)
- 10) Make sure 'Flash Write OK' and 'Flash Verify OK' messages are displayed.
- 11) Enter 'reboot' to restart SerialGate. Now SerialGate will run with the new firmware.

```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Wxxx>telnet 192.168.0.223
SerialGate login: serialgate ← Default
Password: 99999999 ← Default
# upgrade sg.bin ←upgrade to the firmware uploaded to FTP
Version info: 2.0.109
Erase = 2214352 Bytes (34 blocks), info.erasesize = 65536
Erasing...
2214352 (2214352 bytes)
Flash Write OK

Verifying .....
Flash Verify OK
Total 20 second(s) was taken
Update Complete
# reboot
```

## Product Specification

### Communication

|                        |                              |
|------------------------|------------------------------|
| Ethernet Port          | 2 ports of 10/100Mbps RJ-45  |
| Assigning IP Address   | Static, Dynamic              |
| Number of Serial Ports | 16 Ports (RS-232/RS-422/485) |
| Serial Speed           | Maximum 921.6kbps            |

### Hardware

|                        |                                 |
|------------------------|---------------------------------|
| Process                | 400MHz                          |
| Flash Memory           | 8MByte                          |
| SDRAM                  | 32MByte                         |
| Power                  | AC : 100 ~ 245 VAC              |
| Size                   | 430(W) x 193(L) x 45(H)mm       |
| Weight                 | 2,480g                          |
| Operation Temperature  | 0 ~ 50 °C                       |
| Serial Port Signal     | TX, RX, DTR, DSR, CTS, RTS, DCD |
| Humidity               | Max 95% R.H                     |
| LED                    | Power ,Serial ,Ready, Link      |
| Serial Port Protection | ± 15kV ESD Protection           |
| SD/MMC CARD            | SD Support (Maximum 32GB)       |

### Reset Button

| Feature         | Action                     | Result                       |
|-----------------|----------------------------|------------------------------|
| Warm Booting    | Press for less than 3 sec. | SerialGate reboots           |
| Factory Default | Press for more than 3 sec. | Restores the default setting |

## Software

---

|                 |  |
|-----------------|--|
| Protocol        | TCP, UDP, Telnet, ICMP, DHCP, TFTP, HTTP, SNMP 1/2/3, SSH, SSL, Modbus TCP RTU/ASCII |
| Management Tool | PortView, SNMP, TestView   |
| Configuration   | Telnet, Web, SSH, SGConfig   |

## Ordering Information

---

|               |  |
|---------------|--|
| SG-1010/RS232 | 1 x Serial Port, RS-232 only                       |
| SG-1010/Combo | 1 x Serial Port, RS-422/485 selectable             |
| SG-1010/ALL   | 1 x Serial Port, RS-232/422/485 selectable         |
| SG-1010W/ALL  | 1 x Serial Port, RS-232/422/485 selectable, WiFi   |
| SG-1020/RS232 | 2 x Serial Ports, RS-232 only                      |
| SG-1020/Combo | 2 x Serial Ports, RS-422/485 selectable            |
| SG-1020/ALL   | 2 x Serial Ports, RS-232/422/485 selectable        |
| SG-1020W/ALL  | 2 x Serial Ports, RS-232/422/485 selectable , WiFi |
| SG-1040/RS232 | 4 x Serial Ports, RS-232 only                      |
| SG-1040/Combo | 4 x Serial Ports, RS-422/485 selectable            |
| SG-1080/RS232 | 8 x Serial Ports, RS-232 only                      |
| SG-1080/Combo | 8 x Serial Ports, RS-422/485 selectable            |
| SG-1160/ALL   | 16 x Serial Ports, RS-232/422/485 selectable       |