ESG 5107D Ethernet Serial Gateway

User Manual

Version 1.0

January 26, 2022

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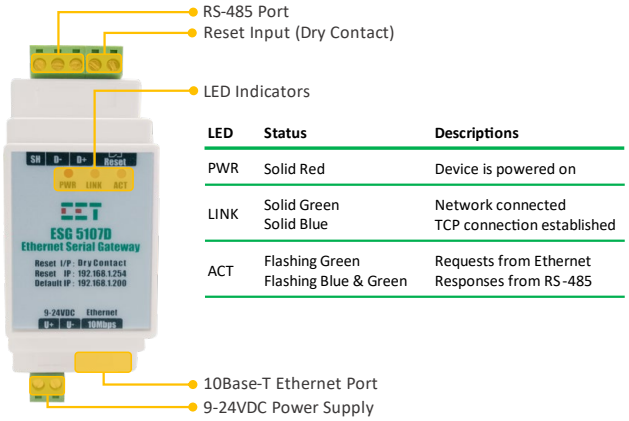
DANGER

This symbol indicates the presence of danger that may result in severe injury or death and permanent equipment damage if proper precautions are not taken during the installation, operation or maintenance of the device.

CAUTION

This symbol indicates the potential of personal injury or equipment damage if proper precautions are not taken during the installation, operation or maintenance of the device.

Overview



LED	Status	Descriptions
PWR	Solid Red	Device is powered on
LINK	Solid Green Solid Blue	Network connected TCP connection established
ACT	Flashing Green Flashing Blue & Green	Requests from Ethernet Responses from RS-485

Figure 1 Appearance

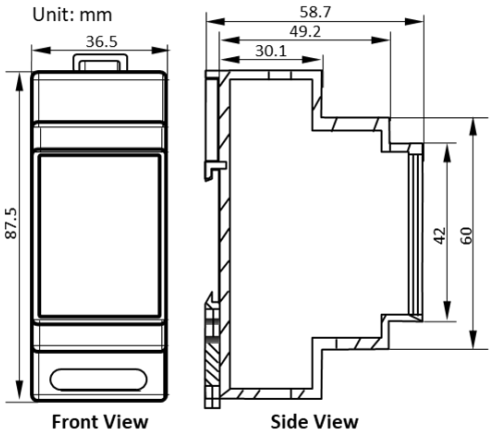


Figure 1 Dimensions

Mounting

- The ESG 5107D should be installed in a dry environment with no dust and kept away from heat, radiation and electrical noise source.
- Before installation, make sure the DIN rail is already in place.
- Move the installation clip at the back of the ESG 5107D downward to the “unlock” position.
- Mount the ESG 5107D on the DIN rail.
- Push the installation clip upward to the “lock” position to secure the ESG 5107D to the DIN rail.

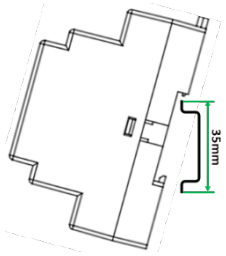


Figure 2 DIN Rail Mounting

Hardware Wiring

1. Ethernet (10Base-T)

The ESG 5107D comes with a 10Base-T Ethernet port with a RJ45 connector supporting auto MID/MIDX detection. The table below lists the meaning for each pin.

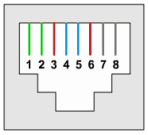
RJ45 Connector	Pin	Meaning
	1	Transmit Data+
	2	Transmit Data-
	3	Receive Data+
	4,5,7,8,	NC
	6	Receive Data-

Table 1 RJ45 Connector Pin Description for 10BaseT Applications

2. RS-485 Wiring

The ESG 5107D provides one standard RS-485 port and supports up to 32 devices on a RS-485 bus. The overall length of the RS-485 cable connecting all devices should not exceed 1200m.

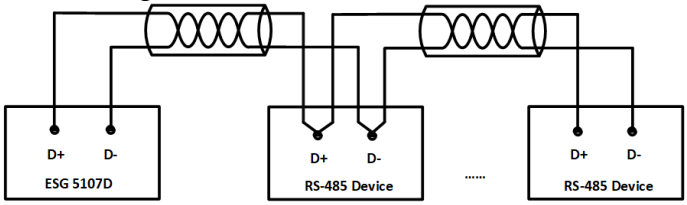


Figure 3 RS-485 Wiring

3. Reset Input

The ESG 5107D provides a “Dry Contact” Reset Input that allows the user to reset its webserver’s password to the factory default of **123456** and its IP address to **192.168.1.254** as printed on the Front Panel, respectively, by connecting together the two terminals of the Reset Input for 5s. The **LINK** indicator blinks once with green color as an acknowledgement that the reset signal has been triggered.

4. Power Supply

The ESG 5107D should be powered by a 9-24VDC power supply by connecting the positive and negative terminals of the power supply to the U+ and U- terminals of the ESG 5107D, respectively.

Caution should be exercised to not connect a power supply with a higher voltage than 24VDC to the ESG 5107D because doing so will damage the device beyond repair.

Typical Applications

Transparent Gateway*

The ESG 5107D allows one or more upstream Workstations (Masters) on an IP-based Ethernet LAN to directly connect to it via a TCP/IP connection for the transparent transfer of Modbus RTU packets inside the TCP/IP frames to and from downstream serial devices on a RS-485 network.

*The **Transparent Gateway** (or Transparent Transfer) in this document means **Modbus RTU over TCP/IP** communications and their terms may be used interchangeably.

Modbus TCP/RTU Gateway

The ESG 5107D translates the Modbus TCP requests from one or more Modbus TCP Masters on an Ethernet network to Modbus RTU packets and then forwards to downstream Modbus RTU devices on a RS-485 network and then translates the Modbus RTU responses from the RS-485 devices to Modbus TCP before transmitting them back to the Modbus Masters.

Device Configuration via Web Server

To access the ESG 5170D's Web Interface with default IP 192.168.1.200, please first configure the PC's IP Address as 192.168.1.xxx so that they are on the same subnet. Then enter http://192.168.1.200 on the web browser. When the login prompt appears, enter the **default Password**: **123456** and click **login**.

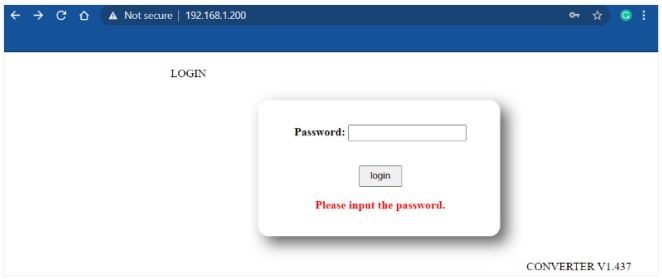


Figure 4 Logon Page of Web Server

The Web Interface of ESG 5107D appears after login. There are 6 menus – **Device Information**, **Network Settings**, **Serial Settings**, **Advanced Settings**, **Multi-Master Settings** and **Modify Web Password**.

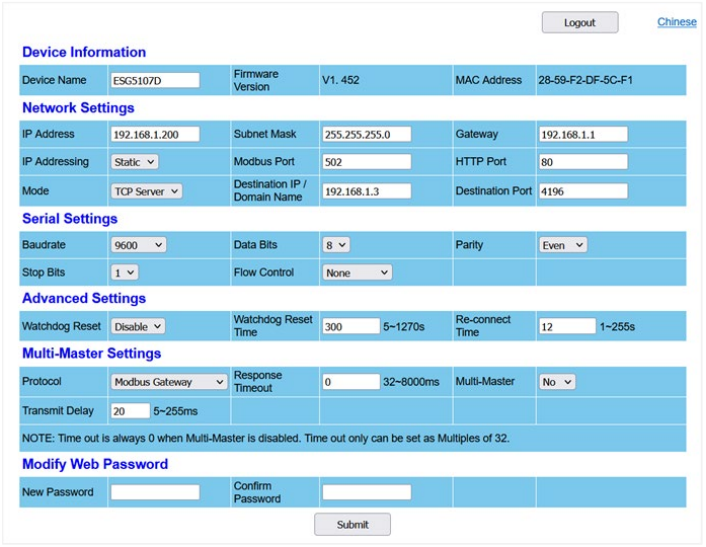


Figure 5 Web Interface of ESG 5107D

Please click **Submit** at the bottom of the Web Interface to save the changes. If the settings are saved successfully, the following page will appear, and the user should click **restart** to login again.

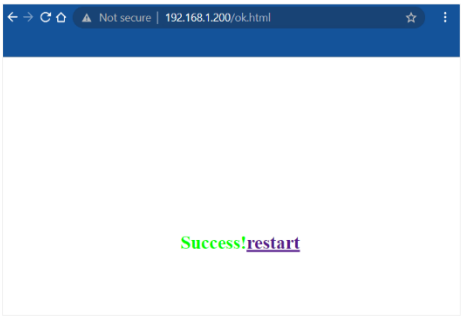


Figure 6 Settings Saved Succeed Page

The following sections provide a quick overview for these menus.

1. Device Information

This menu provides the **Device Name**, **Firmware Version** and **MAC Address** for the device.

2. Network Settings

This menu allows users to configure the following Network parameters.

Parameters	Descriptions	Range/Default*
IP Address	Specify the device IP Address when **IP Addressing** is set to Static.	192.168.1.200*
Subnet Mask	The subnet mask splits the IP address into the host and network addresses, thereby defining which part of the IP address belongs to the device and which part belongs to the network.	255.255.255.0*
Gateway	Specify the IP address of the gateway.	192.168.1.1*
IP Addressing	Specify how the device retrieves its settings for IP Address, Subnet Mask and Gateway. DHCP – Network settings assigned by a DHCP Server. Static – Manual configuration.	Static*, DHCP
HTTP Port	Specify the IP Port for the web interface.	1-65535, 80*
Modbus Port	Specify the IP Port for the Modbus TCP connection. Please be informed that **502** should be used if the ESG 5107D is configured as a **Modbus Gateway**. The Reserved IP Port between 1 and 1023 should not be used if the ESG 5107D is configured as a **Transparent Gateway** for Modbus RTU over TCP/IP.	1024-65535, 502*
Mode	Only the **TCP Server** mode should be used.	TCP Server*, TCP Client, UDP, UDP Group
Destination IP/ Domain Name	Please disregard this setting in **TCP Server** mode.	192.168.1.3*
Destination Port	Please disregard this setting in **TCP Server** mode.	4196*

Table 2 Network Settings Parameters

3. Serial Settings

This menu allows users to configure the parameters for the RS-485 port. The settings of these parameters should be identical to those of the downstream RS-485 devices.

Parameters	Range/Default*
Baudrate	1200, 2400, 4800, 7200, 9600*, 14400, 19200, 28800, 38400, 57600, 76800, 115200
Data Bits	5, 6, 7, 8*
Parity	None, Odd, Even*, Mark, Space
Stop Bits	1*, 2
Flow Control	None*, CTS/RTS, DSR/DTR, XON/XOFF (Not used for RS-485 connection)

Table 3 Serial Settings Parameters

4. Advanced Settings

This menu doesn't apply to the **Modbus Gateway** or **Transparent Gateway** applications. It's recommended to keep the default settings for the **Advanced** parameters.

5. Multi-Master Settings

Modbus is a Master/Slave protocol that is not designed for simultaneous requests from multiple masters. The ESG 5107D supports Multi-Master applications (up to 10 Masters) by stacking ***Modbus TCP*** or ***Modbus RTU over***

TCP/IP requests and then transmitting them sequentially over the RS-485 bus while conforming to the Master/Slave protocol to avoid any communication conflicts.

Parameters	Definition	Range/Default*
Protocol	Specify the operation mode for the gateway.	Transparent Gateway, Modbus Gateway*
Response Timeout	To determine that a slave is non-responsive after the specified interval, which should be specified in multiples of 32.	32 to 8000 (ms), 0* (changes to 256 automatically if Multi-Master is enabled)
Multi-Master	To enable the Multi-Master mode.	Yes, No*
Transmit Delay	Specify the delay for the gateway to send the next request after the last response has been received or a timeout has happened.	5 to 255 (ms), 0* (changes to 20 automatically if Multi-Master is enabled)

Table 4 Multi-Master Settings Parameters

6. Modify Web Password

This menu allows users to change the password for the Web Interface. The password must be less than 9 characters long and consist of numbers, letters (case-sensitive) and ASCII special characters or a combination thereof.

Technical Specifications

Power Supply (U+, U-)	
Power Input	9-24VDC
Burden	< 3W
RS-485 Port (D+, D-, SH)	
Baudrate	1200/2400/4800/7200/9600/14400/ 19200/28800/38400/57600/76800/115200
10Base-T Ethernet Port	
Speed	10 Mbps
Connector	RJ45
Cable	CAT5, CAT5e with maximum 100m distance
Surge Protection	1.5kVrms
Reset Input	
Input Type	Dry Contact
Terminal Dimensions	
Power/RS-485/Reset Terminals	2.5mm x 2.8mm
Max. Wire Size	$1.5mm^2$
Max. Torque	5kgf.cm/M3 (4.3 lb-in)
Environmental Conditions	
Operating Temperature	-10 °C to 60 °C
Storage Temperature	-30 °C to 80 °C
Humidity	5% to 95% non-condensing
Mechanical Characteristics	
Unit Dimensions	36.5(W)x87.5(H)x58.7(D) mm
Mounting	DIN-Rail Mounting
Shipping Weight	TBD
Shipping Dimensions	TBD

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