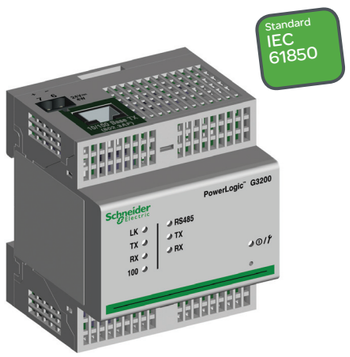
PowerLogic™ Ethernet Gateways

PowerLogic G3200 (ref. 59655)

Modbus-to-IEC 61850 Server

Installation Guide

63230-216-319A1 **12/2010**



Schneider Electric

SAFETY PRECAUTIONS

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Only qualified personnel should install this equipment. Such work should be performed only after reading this entire set of instructions.
- NEVER work alone.
- Turn off all power supplying this equipment before working on or inside it.
- Always use a properly rated voltage sensing device to confirm that all power is off.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume that all circuits are live until they have been completely de-energized, tested and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of backfeeding.
- Beware of potential hazards, wear personal protective equipment and carefully inspect the work area for tools and objects that may have been left inside the equipment.
- The successful operation of this equipment depends upon proper handling, installation, and operation. Neglecting fundamental installation requirements can lead to personal injury as well as damage to electrical equipment or other property.
- Handling this product requires relevant expertise in the field of protection of electrical networks. Only competent people who have this expertise are allowed to configure and set up this product.
- Before performing Dielectric (Hi-Pot) or Megger testing on any equipment in which the Ethernet interface is installed, disconnect all input and output wires to the Ethernet interface. High voltage testing can damage electronic components contained in the Ethernet interface.

Failure to follow these instructions will result in death or serious injury.

INTRODUCTION

Box Contents

- G3200 unit and connectors
- Installation guide

Additional Resources

Documentation:

PowerLogic G3200 Modbus-to-IEC61850 Server user's manual

To download it:

1. Go to www.schneider-electric.com
2. Type **G3200** in the **Search** field.
3. Select the **PowerLogic G3200** product range.
4. On the **PowerLogic G3200** product range page, click **Downloads**.
5. On the **Downloads** page, click **Tech.Publications**
6. Click on the User Guide or the Instruction Sheet you want to download.

Quick Start Checklist

1. Mount the unit.
2. Connect the power.
3. Configure the Ethernet communication settings via a web browser (using an Ethernet crossover cable) or via HyperTerminal (using a null modem cable, which is included in the TCSEAK0100 configuration kit [sold separately]).
4. Configure the serial port.
5. Wire the serial port.
6. Configure the IEC 61850 protocol (see PowerLogic G3200 user's manual).

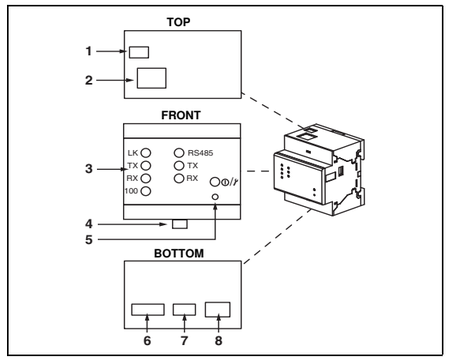
DESCRIPTION

1. 24 V DC control power terminal block connection
2. Ethernet 10/100BaseTx RJ45 connection
3. LEDs:

   Ethernet:
   - LK: Active link
   - TX: Transmitting data
   - RX: Receiving data
   - 100: Link speed. 100 Mb = ON, 10 Mb = OFF

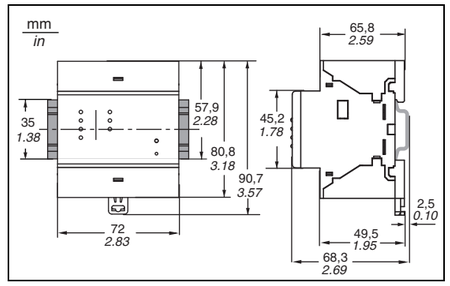
   Serial:
   - RS485: RS485 mode = ON, RS232 mode = OFF
   - TX: Transmitting data
   - RX: Receiving data

   Power/Status
4. DIN rail release
5. Reset button
6. RS485 terminal block connection
7. Dip switches
8. RS232 RJ45 connection

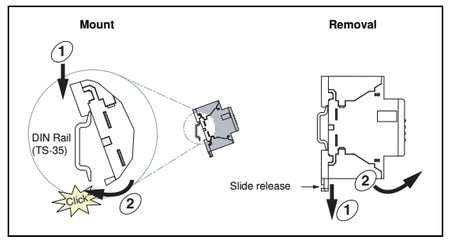


INSTALLATION

Dimensions



DIN Rail Mounting and Removal



Powering the G3200

The G3200 must be powered by a 24 V DC supply. The power supply terminal block requires wires with a cross section of 0.5 to 2.5 mm² (AWG 24-12). Also see the RS485 wiring drawings on page 2.

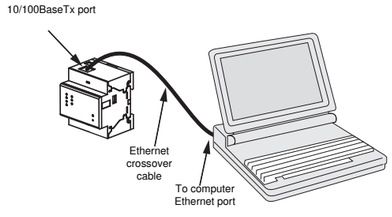
In order to ensure surge withstand protection and comply with the IEC61000-4-5 Level 4, it is recommended to use a Schneider Electric surge arrester PRI (ref. 16339) and to wire this equipment as described in the PowerLogic G3200 user's manual.

Ethernet Configuration

Before you begin, obtain a unique static IP address, subnet mask, and default gateway address from your network administrator. Use a web browser or HyperTerminal to configure the G3200 with the information obtained from your network administrator.

Ethernet Setup Using a Web Browser

1. Disconnect your computer from your network.
   NOTE: After disconnecting from your network, your computer should automatically use the default IP address 169.254.###.### (### = 0 to 255) and the default subnet mask 255.255.0.0. If the IP address is not automatically configured, contact your network administrator to set up a static IP address.
2. Connect an Ethernet crossover cable from the G3200 to the computer.
   NOTE: The Ethernet crossover cable is included in the TCSEAK0100 configuration kit (sold separately).



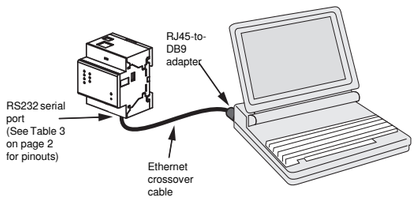
3. Start your web browser.
4. In the **URL** text box, type *169.254.0.10*, and then press Enter.
5. Type *Administrator* for your user name, type *G3200* for your password, and then click **OK**. User names and passwords are case sensitive.
6. Click **Setup**.
7. If the "Ethernet & TCP/IP" page does not open, click **Ethernet & TCP/IP** in the menu on the left side of the page.
8. Select the media type (see Table 1 for a description of each option).
9. Enter your IP address, subnet mask, and default gateway address assigned to your G3200 by your network administrator (see Table 1 for a description of each option), and then click **Apply**.
10. If you assigned a static IP address to your computer in step 1, you must restore your computer's original settings. Reconnect your computer to your network.

Table 1: G3200 Ethernet and TCP/IP Settings

Option	Description	Setting
Media Type	Used to define the physical Ethernet connection.	• 10T/100Tx Auto • 10BaseT-HD • 10BaseT-FD • 100BaseTX-HD • 100BaseTX-FD **Default:** 10T/100Tx Auto
IP Address	Used to enter the static IP address of the G3200. *NOTE: If you enter an IP address that is already in use, you are prompted to select a different IP address.*	0.0.0.0 to 255.255.255.255 **Default:** 169.254.0.10
Subnet Mask	Used to enter the Ethernet IP subnet mask address of your network.	0.0.0.0 to 255.255.255.255 **Default:** 255.255.0.0
Default Gateway	Used to enter the gateway (router) IP address used for wide area network (WAN) communications.	0.0.0.0 to 255.255.255.255 **Default:** 0.0.0.0

Ethernet Setup Using HyperTerminal

1. Attach an Ethernet crossover cable to the RJ45-to-DB9 adapter (see below).



NOTE: The RJ45-to-DB9 adapter and the Ethernet crossover cable are included in the TCSEAK0100 configuration kit (sold separately).

2. With Windows running, Click **Start** > **Run**, and then type *hypertrm*.
3. In the **Name** text box, type a name for the new connection (for example, *G3200 config*), and then click OK.
4. In the **Connect using** drop-down list box, select the computer COM port you will be using, and then click OK.
5. Set the COM properties as follows: Bits per second = 19200, Data bits = 8, Parity = None, Stop bits = 1, and Flow control = None.
6. Click OK.
7. Start the G3200 setup utility by doing the following:
   a. Cycle power or press the reset button on the G3200.
   b. While the green Power/Status LED blinks rapidly, press Enter on the computer keyboard to access the setup utility. See Table 2 for a description of the setup options.
   NOTE: The Power/Status LED stops blinking after 5 seconds.

Table 2: G3200 Setup Utility Options

Option	Description	Setting
1	Used to select the language for the current HyperTerminal session.	English, French, Spanish, **Default:** English
2	Used to enter the static IP address of the G3200. *NOTE: If you enter an IP address that is already in use, you are prompted to select a different IP address.*	0.0.0.0 to 255.255.255.255 **Default:** 169.254.0.10
3	Used to enter the subnet mask of your network.	0.0.0.0 to 255.255.255.255 **Default:** 255.255.0.0
4	Used to enter the default gateway (router) IP address used for wide area network (WAN) communications.	0.0.0.0 to 255.255.255.255 **Default:** 0.0.0.0
5	Used to define the physical Ethernet connection.	• 10T/100Tx Auto • 10BaseT-HD • 10BaseT-FD • 100BaseTx-HD • 100BaseTx-FD **Default:** 10T/100Tx Auto
6	Saves the settings and exits the setup utility.	—

Serial Configuration

1. Start a web browser.
2. In the **Address** text box, type the IP address assigned to your G3200, then press Enter.
3. Type *Administrator* for your user name, type *G3200* for your password, then click **OK**.
4. Click **Serial Port**.
5. Select the physical interface, baud rate, and parity for the serial COM port.

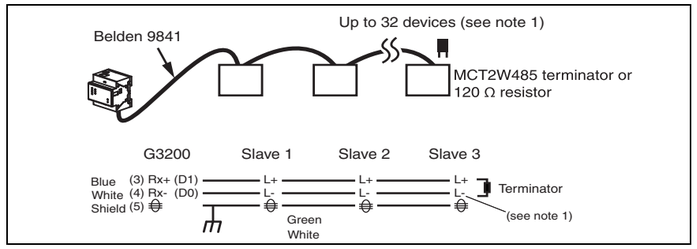
NOTE: Attached serial devices must have the same baud rate, parity, and wiring mode (2-wire or 4-wire) settings.

Parameter	Options	Default Setting
Physical Interface	RS485 4-wire, RS485 2-wire	RS485 2-wire
Baud Rate	9600, 19200, 38400	19200
Parity	Even, Odd	Even
Response Timeout	0.1 to 2 seconds	0.2 seconds

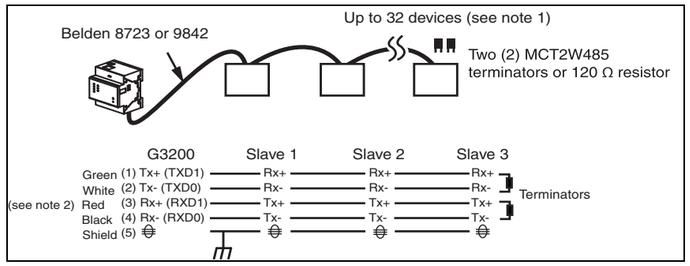
6. Click **Apply** to save the changes.

RS485 Wiring

2-wire Network



4-wire Network



Notes:
1. For more information about the maximum number of daisy chained devices, refer to the PowerLogic G3200 user's manual.
2. In the above graphic, indicated colors apply to the Belden 8723 cable only. For the Belden 9842 cable, the following color combinations are used: Blue/White (Tx+), White/Blue (Tx-), Orange/White (Rx+), and White/Orange (Rx-).

Table 4: Daisy Chain Maximum Distances

Baud Rate	Maximum Distance for 1–16 Devices	Maximum Distance for 17–32 Devices
9600	3048 m (10,000 ft.)	1219 m (4,000 ft.)
19200	1524 m (5,000 ft.)	762 m (2,500 ft.)
38400	1524 m (5,000 ft.)	457 m (1,500 ft.)

NOTE: This table is to be used only as a guide.

Connection Characteristics

The RS485 terminal block requires wires with a cross section of 0.5 to 2.5 mm^2 (AWG 24-12).

RS485 Biasing and Termination

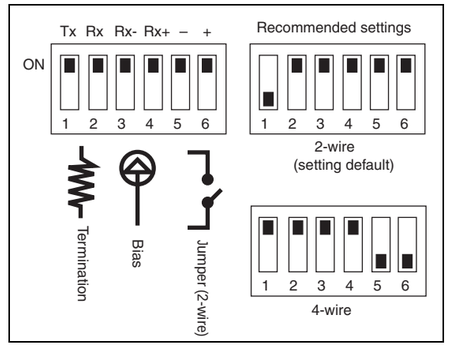


Table 5: RS485 DIP Switch Settings

Network Termination	SW1	SW2	SW3	SW4	SW5	SW6
2-wire network	OFF	ON				
4-wire network	ON	ON				
Network Bias						
at 0 V			ON			
at 5 V				ON		
Network Type						
2-wire network					ON	ON
4-wire network					OFF	OFF

RS232 Serial Port

The RS232 port is used to configure the G3200 network parameters. The G3200 RS232 port is wired as a data terminal equipment (DTE) device and uses a standard RJ45 connector.

NOTE: An RJ45-to-DB9 adapter is included in the TCSEAK0100 configuration kit (sold separately) for use with an Ethernet crossover cable.

Table 3: RS232 Pin Assignments (EIA/TIA-561 for RJ45)

Pin Number	Description
Pin 1	Data Set Ready
Pin 2	Received Line Signal Detector (Data Carrier Detect)
Pin 3	Data Terminal Ready
Pin 4	Signal Ground
Pin 5	Received Data
Pin 6	Transmit Data
Pin 7	Clear To Send
Pin 8	Request To Send

SPECIFICATIONS

Control Power Input	
Operating Input Range	24 V DC (±10%) sourced by Class 2 rated power supply
Burden, maximum	4 W
Isolation	1.5 kV
Environmental	
Ambient Operating Temperature	–25°C to +70°C (-13°F to +158 °F)
Storage Temperature	–40°C to +85°C (-40°F to +185 °F)
Humidity Rating	5–95% Relative Humidity (non-condensing) at +55°C (+131°F)
Pollution Degree	Class 2
Physical	
Weight	170 g (6 oz.)
Dimensions	Height: 80.8 mm (3.18 in.) Width: 72 mm (2.83 in.) Depth: 65.8 mm (2.59 in.)
Enclosure	IP30
Regulatory/Standards Compliance for Electromagnetic Interference	
Emissions (radiated and conducted)	EN 55022 EN 55011 FCC Class A
Immunity for Industrial Environments:	EN 61000-6-2
Electrostatic Discharge	EN 61000-4-2
Radiated RF	EN 61000-4-3
Electrical Fast Transients	EN 61000-4-4
Surge	EN 61000-4-5
Conducted RF	EN 61000-4-6
Power Frequency Magnetic Field	EN 61000-4-8
Regulatory/Standards Compliance for Safety	
International (CB Scheme)	IEC 60950
USA	UL 508 UL 60950
Canada	cUL (complies with CSA C22.2, #60950)
Europe	EN 60950
Australia/New Zealand	AS/NZS 60950
Other Regulatory/Standards Compliance	
Europe	CE

MAINTENANCE AND TROUBLESHOOTING

Maintenance

The G3200 does not require maintenance, nor does it contain any user-serviceable parts. If the G3200 has a problem and you can not solve it with the diagnostic table that follows, contact your local sales representative for help. Do not open the G3200 enclosure as this will void the product warranty agreement.

Diagnostics

The Diagnostics pages provided by the G3200 display diagnostic data that may be helpful in troubleshooting network problems. These pages also contain information about your specific G3200, including the serial number, manufacturing date, and media access control (MAC) address. Clicking the Reset button on the Communication Statistics page clears all cumulative counters.

NOTE: These pages show accumulated readings since the G3200 was last activated. If power to the G3200 is lost, all values are reset to zero.

Troubleshooting

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- This equipment must be installed and serviced only by qualified personnel.
- Qualified persons performing diagnostics or troubleshooting that require electrical conductors to be energized must comply with and follow safe electrical work practices. For example, in the USA, see NFPA 70E.

Failure to follow these instructions will result in death or serious injury.

Problem	Possible Cause	Solution
Power/Status LED is not lit.	Source power is not applied or is not stable.	Apply power or check power source.
	LED is burned out.	Check to see if other LEDs operate properly.
Ethernet link LED is not lit.	Proper link is not established.	Make sure the proper cable is connected.
		Make sure the proper media type is selected in the G3200 Communications setup configuration.
Power/Status LED repeats a four blink-pause pattern	The IP address that the G3200 was assigned is being used by another network device.	Assign a new IP address to the G3200 or to the conflicting device. *NOTE: When a duplicate IP address is detected, the G3200 resets its specified IP address to the default IP address. When the G3200 detects the conflict no longer exists, it uses the specified IP address.*
Cannot browse the G3200.	Incorrect network configuration.	Verify that all IP parameters are correct.
		Verify that the G3200 receives requests (ping G3200 by going to DOS prompt and typing "ping" and the G3200 IP address, e.g., **ping 169.254.0.10**).
		Verify that all browser internet options connections settings are correct.
Forgot administrator password.		Call your local sales representative for assistance.

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