

MODEL GMJ1939 - GRAPHITE™ SERIES J1939 MODULE



- CONFIGURED USING CRIMSON SOFTWARE (VERSION 3.0 OR LATER)
- DIGITALLY ISOLATED J1939 PORT CAPABLE OF COMMUNICATING WITH ANY J1939 DEVICE
- POWERED AND CONFIGURED FROM GRAPHITE HOST DEVICE
- BUILT-IN TERMINATION RESISTOR SELECTABLE THROUGH A SWITCH
- CAN BE USED IN CONJUNCTION WITH ANY GRAPHITE MODULES



GENERAL DESCRIPTION

The model GMJ1939 is a J1939 communication module designed for use with the Graphite series. The module provides the Graphite host device a J1939 communications port. It is built with digital isolation to protect the Graphite host device from the J1939 bus and vice versa. It provides the ability to communicate to any J1939 device. The GMJ1939 module has a termination resistor built-in, and is selectable through a switch. The connector is pluggable for easy removal of the GMJ1939 module from the J1939 bus, without disturbing communications with other devices on the bus.

The modules connect and communicate via proprietary USB connection to the various Graphite devices. The Graphite devices, equipped with serial ports as well as Ethernet port(s), allows the system to share data with PCs, PLCs and SCADA systems. The maximum number of modules varies for each Graphite device, see specific model for details. Remove power from the host device before installing or replacing any modules.

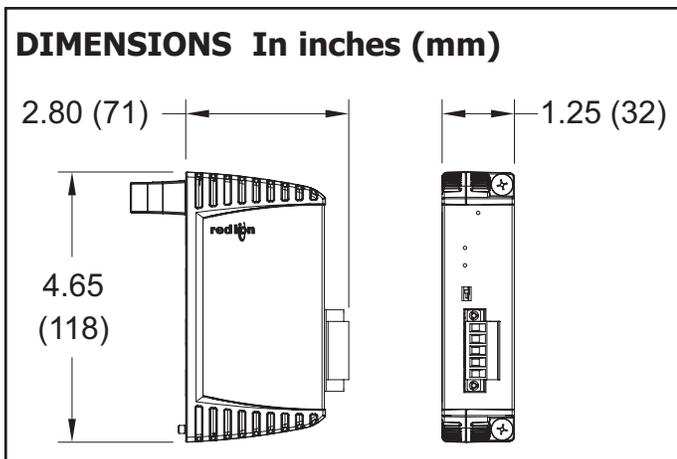
CONFIGURATION

The Graphite Series is configured with Windows® compatible Crimson 3 software. The software is an easy to use, graphical interface which provides a means of configuration and commissioning of new systems, as well as routine module re-calibration.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the module to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the module. An independent and redundant temperature limit indicator with alarm outputs is strongly recommended.



 CAUTION: Risk of Danger. Read complete instructions prior to installation and operation of the unit.	 CAUTION: Risk of electric shock.
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SPECIFICATIONS

1. POWER REQUIREMENTS:

Power will be supplied by the Graphite host device. Some modules, depending on usage may consume high levels of power. This may limit the total number of modules that can be installed on a single Graphite host. Check the Graphite module and Graphite host installation guides for specific usage and power requirements.

GMJ1939 Max Power: 1.2 W

2. COMMUNICATIONS:

J1939 Port: The J1939 port has format and baud rates that are software programmable up to 250K baud and is digitally isolated. 124 ohm, 1W termination is provided through a switch. This port may be configured for various J1939 protocols.

Isolation from GMJ1939 Communication ports to Graphite host device: 1000 VDC for 1 minute.

3. ENVIRONMENTAL CONDITIONS:

Operating Temperature Range: -40 to +75 °C; limited to host

Storage Temperature Range: -40 to +85 °C

Operating and Storage Humidity: 85% max relative humidity, non-condensing, from 0 to +50 °C

Altitude: Up to 2000 meters

4. CERTIFICATIONS AND COMPLIANCES:

CE Approved

EN 61326-1 to Industrial Locations

IEC/EN 61010-1

RoHS Compliant

5. **CONSTRUCTION:** Case body is aluminum and stainless steel. For indoor use only. Installation Category II, Pollution Degree 2.

6. **CONNECTIONS:** Removable wire clamp screw terminal block.

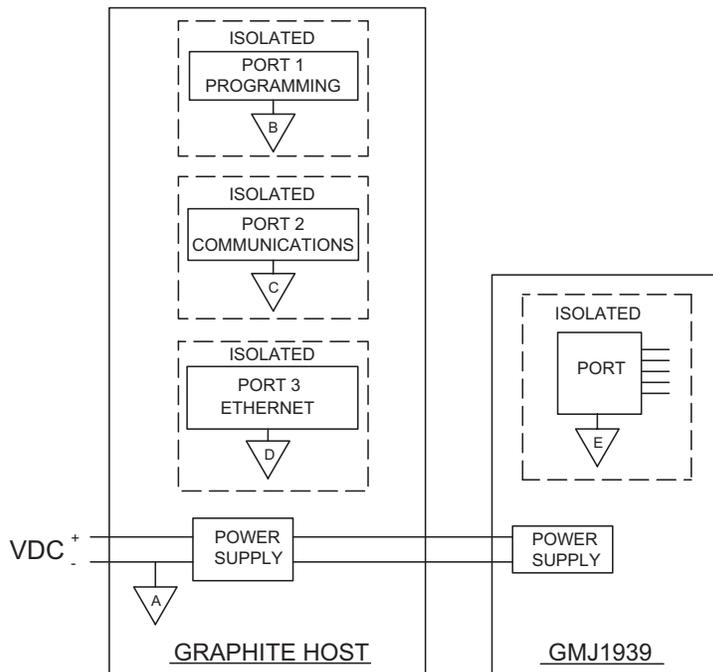
Wire Gage: 28-14 AWG terminal gage wire.

Torque 6.0 lbf-inch (96 oz-inch)

7. **MOUNTING:** Screws to host.

8. **WEIGHT:** 6.9 oz (196 g)

BLOCK DIAGRAM FOR GMJ1939



EMC INSTALLATION GUIDELINES

Although Red Lion Controls Products are designed with a high degree of immunity to Electromagnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, source or coupling method into a unit may be different for various installations. Cable length, routing, and shield termination are very important and can mean the difference between a successful or troublesome installation. Listed are some EMI guidelines for a successful installation in an industrial environment.

1. A unit should be mounted in a metal enclosure, which is properly connected to protective earth.
2. Use shielded cables for all Signal and Control inputs. The shield connection should be made as short as possible. The connection point for the shield depends somewhat upon the application. Listed below are the recommended methods of connecting the shield, in order of their effectiveness.
 - a. Connect the shield to earth ground (protective earth) at one end where the unit is mounted.
 - b. Connect the shield to earth ground at both ends of the cable, usually when the noise source frequency is over 1 MHz.
3. Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors, feeding motors, solenoids, SCR controls, and

heaters, etc. The cables should be run through metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter. Also, Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.

4. Long cable runs are more susceptible to EMI pickup than short cable runs.
5. In extremely high EMI environments, the use of external EMI suppression devices such as Ferrite Suppression Cores for signal and control cables is effective. The following EMI suppression devices (or equivalent) are recommended:

Fair-Rite part number 0443167251 (RLC part number FCOR0000)

Line Filters for input power cables:

Schaffner # FN2010-1/07 (Red Lion Controls # LFIL0000)

6. To protect relay contacts that control inductive loads and to minimize radiated and conducted noise (EMI), some type of contact protection network is normally installed across the load, the contacts or both. The most effective location is across the load.
 - a. Using a snubber, which is a resistor-capacitor (RC) network or metal oxide varistor (MOV) across an AC inductive load is very effective at reducing EMI and increasing relay contact life.
 - b. If a DC inductive load (such as a DC relay coil) is controlled by a transistor

switch, care must be taken not to exceed the breakdown voltage of the transistor when the load is switched. One of the most effective ways is to place a diode across the inductive load. Most RLC products with solid state outputs have internal zener diode protection. However external diode protection at the load is always a good design practice to limit EMI. Although the use of a snubber or varistor could be used.
 RLC part numbers: Snubber: SNUB0000
 Varistor: ILS11500 or ILS23000

7. Care should be taken when connecting input and output devices to the instrument. When a separate input and output common is provided, they

should not be mixed. Therefore a sensor common should NOT be connected to an output common. This would cause EMI on the sensitive input common, which could affect the instrument's operation.

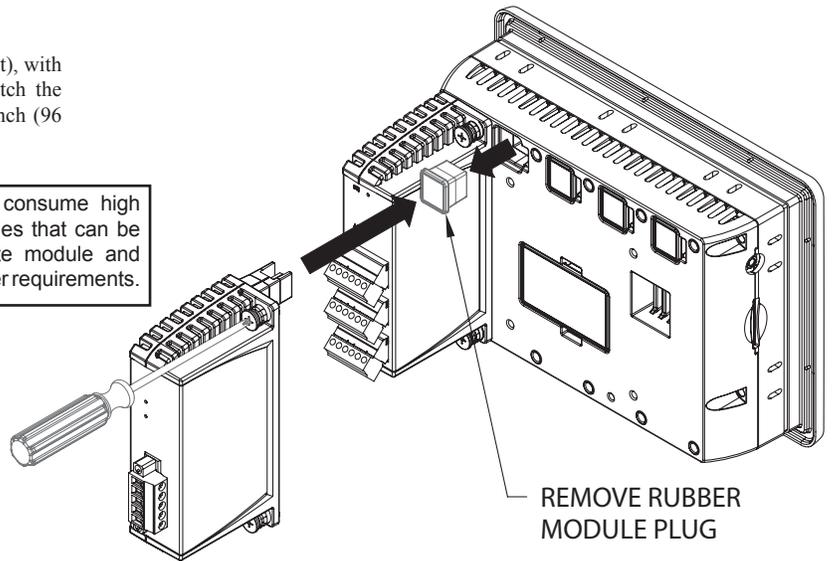
Visit RLC's web site at <http://www.redlion.net/Support/InstallationConsiderations.html> for more information on EMI guidelines, Safety and CE issues as they relate to Red Lion Controls products.

HARDWARE INSTALLATION

Modules must be installed beginning with slot 1 (left-most slot), with no empty slots between the modules, and the order must match the modules order in Crimson. Torque screws to 6.0 pound-force inch (96 ounce-force inch)

CAUTION: Some modules, depending on usage, may consume high levels of power. This may limit the total number of modules that can be installed on a single Graphite host. Check the Graphite module and Graphite host installation guides for specific usage and power requirements.

WARNING: Disconnect all power to the unit before installing or removing modules.



COMMUNICATING WITH THE GMJ1939 MODULE

CONFIGURATION

Programming is done via Crimson® software, a Windows® compatible configuration interface. Please see the Crimson manual for more information.

J1939 PORT PROTOCOLS

The GMJ1939 module has one J1939 port. This port may be configured for various J1939 protocols.

GMJ1939 PORT PIN OUTS

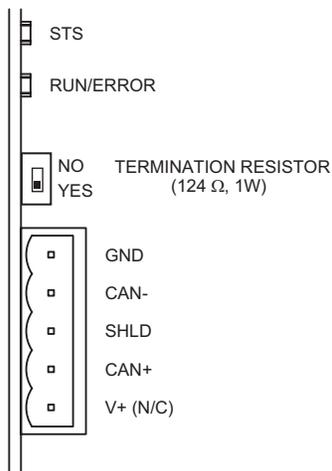
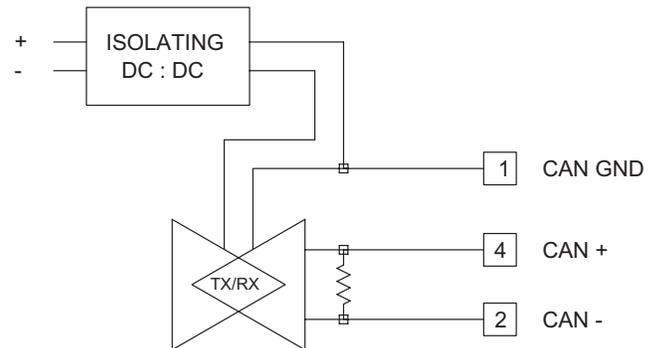


Figure 3

TERMINATION RESISTOR

An onboard termination resistor is selectable through a switch. The termination resistor is rated for 124Ω at 1W. If a different termination resistance is desired, slide the switch for no termination resistor. At this point you will be required to connect your own termination resistor between positions 2 and 4 of the five position connector.



CAN GND

Position 1 of the pluggable connector provides a CAN ground connection. This terminal is isolated from the Graphite host device.

CAN-

Position 2 of the pluggable connector provides the CAN- bus line (active low). This terminal is isolated from the Graphite host device.

SHLD (CAN SHIELD)

Position 3 of the pluggable connector is provided for shield connections. This position is available to tie shield wires to earth ground. The SHLD position is connected through a series RC network to CHASSIS as noted in specification J1939-11. The SHLD connection is internally tied to the Graphite host device enclosure.

CAN+

Position 4 of the pluggable connector provides the CAN+ bus line (active high). This terminal is isolated from the Graphite host device.

V+ (OPTIONAL 24 VDC)

Position 5 of the pluggable connector is provided for optional 24 VDC connections. This position is available only to tie 24 VDC wires together. The GMJ1939 module neither provides 24 VDC power nor uses 24 VDC power through this connection. The V+ position is not connected to any circuitry internal to the GMJ1939 module or Graphite Host device.

LEDS

STS – STATUS LED

The Status LED is a green/red LED that provides information regarding the state of the module. This includes indication of the various stages of the start-up routine (power-up), as well as any errors that may occur.

Startup Routine

Flashing Red	Module is currently running the boot loader and/or being flash upgraded by Crimson.
Green	Module performing normally.

Error States

Flashing Green	Module has lost communication with the Host.
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RUN/ERROR LED

Green	GMJ1939 module established communication with other J1939 devices (RUN) and is communicating normally.
Red	GMJ1939 module failed to establish communications with other J1939 devices (ERROR).

FIRMWARE UPGRADE

The module's firmware is stored in flash memory so that software/hardware conflicts are avoided, and so features can be added in the future.

During a download, Crimson compares its own library of firmware files with those stored in the module. If they do not match, Crimson will download the necessary firmware.

ORDERING INFORMATION

TYPE	DESCRIPTION	PART NUMBER
Operator Interface Panels	Graphite 7" Color Touch Screen, Indoor, 24 VDC Powered	G07C0000
	Graphite 7" Color Touch Screen, Indoor/Outdoor, 24 VDC Powered	G07S0000
	Graphite 9" Color Touch Screen, Indoor, 24 VDC Powered	G09C0000
	Graphite 9" Color Touch Screen, Indoor, 24 VDC Powered, Additional Ethernet Port	G09C1000
	Graphite 10" Color Touch Screen, Indoor, 24 VDC Powered	G10C0000
	Graphite 10" Color Touch Screen, Indoor, 24 VDC Powered, Additional Ethernet Port	G10C1000
	Graphite 10" High Resolution Display, Color Touch Screen, Indoor, 24 VDC Powered	G10R0000
	Graphite 10" High Resolution Display, Color Touch Screen, Indoor, 24 VDC Powered, Additional Ethernet Port	G10R1000
	Graphite 10" Color Touch Screen, Indoor/Outdoor, 24 VDC Powered	G10S0000
	Graphite 10" Color Touch Screen, Indoor/Outdoor, 24 VDC Powered, Additional Ethernet Port	G10S1000
	Graphite 12" Color Touch Screen, Indoor, 24 VDC Powered	G12C0000
	Graphite 12" Color Touch Screen, Indoor, 24 VDC Powered, Additional Ethernet And Serial Port	G12C1100
	Graphite 15" Color Touch Screen, Indoor, 24 VDC Powered	G15C0000
	Graphite 15" Color Touch Screen, Indoor, 24 VDC Powered, Additional Ethernet And Serial Port	G15C1100
Input Modules	Graphite Module, J1939 Interface	GMJ19390

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