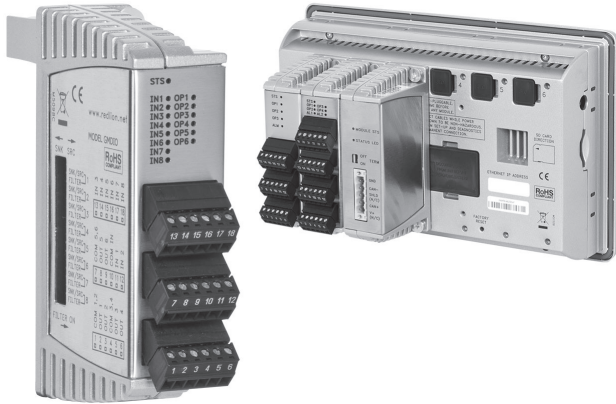


Model GMDIO - Graphite® Digital Module Installation Guide



- Adds I/O capability to the Graphite products
- Eight input, six output digital module
- Inputs isolated from outputs
- Inputs independently switch selectable for sink or source signals
- Inputs independently configurable for high or low active state
- Inputs independently switch selectable for high or low frequency signals
- Relay or NFET output models available

UL LISTED FOR USE IN HAZARDOUS LOCATIONS:
 IND.CONT. EQ. E317425 Class I, Division 2, Groups A, B, C, and D
 T4

For Model No. GMDIOS00 Only

UL US LISTED
 IND. CONT. EQ.
 E302106



UK CA **CE** **Ex** II 3 G Ex nA IIC T4 Gc
 -40°C ≤ T_{AMB} ≤ 75°C
 DEMKO 14 ATEX 1387X
 IECEx UL 15.0035X
 UL23UKEX2879X

For Model No. GMDIOS00 Only

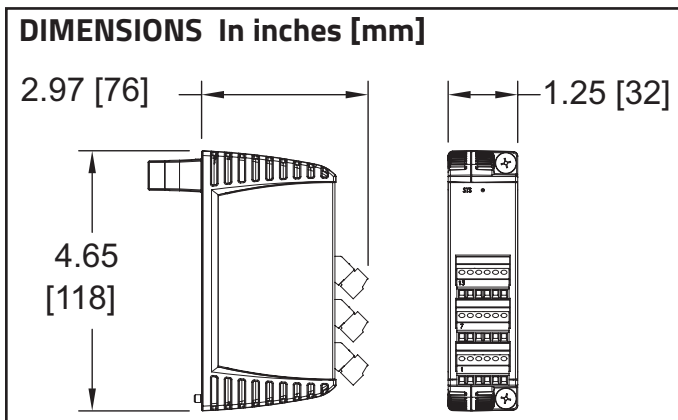
GENERAL DESCRIPTION

The Model GMDIO14 module is a digital I/O module designed for use with the Graphite products. This module offers eight inputs and six outputs that can be used to monitor contact or sensor inputs and actuate relays, solenoids, PLC inputs, etc.

The inputs accept standard DC inputs or contact closures, and are configured for Sink/Source signals via external switches. Additionally, each input has a switch selectable input filter that can be used to prevent contact bounce. Each input may also be software configured as a high-active or low-active input.

The module is available with relay or NFET outputs that are capable of switching up to one amp each (NFET DC only). For applications requiring large loads to be controlled, several DIN rail mount relays are available.

The module connects and communicates via proprietary USB connection to the various Graphite host devices. The Graphite host devices, equipped with serial ports as well as an 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 models for details.



Once programmed, the module will continue to operate/control independent of the Graphite host device as long as power is applied. Remove power from the host device before installing or replacing any modules.

CONFIGURATION

The Graphite is configured with Windows® compatible Crimson® 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 this document or on equipment must be observed to ensure personal safety and to prevent damage to either the device or equipment connected to it.

Do not use these products to replace proper safety interlocking. No software-based device (or any other solid-state device) should ever be designed to be responsible for the maintenance of personnel safety or consequential equipment not equipped with safeguards. Red Lion disclaims any responsibility for damages, either direct or consequential, that result from the use of this equipment in a manner not specified.

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

WARNING - EXPLOSION HAZARD - Do not disconnect equipment unless power has been switched off or area is known to be non-hazardous.

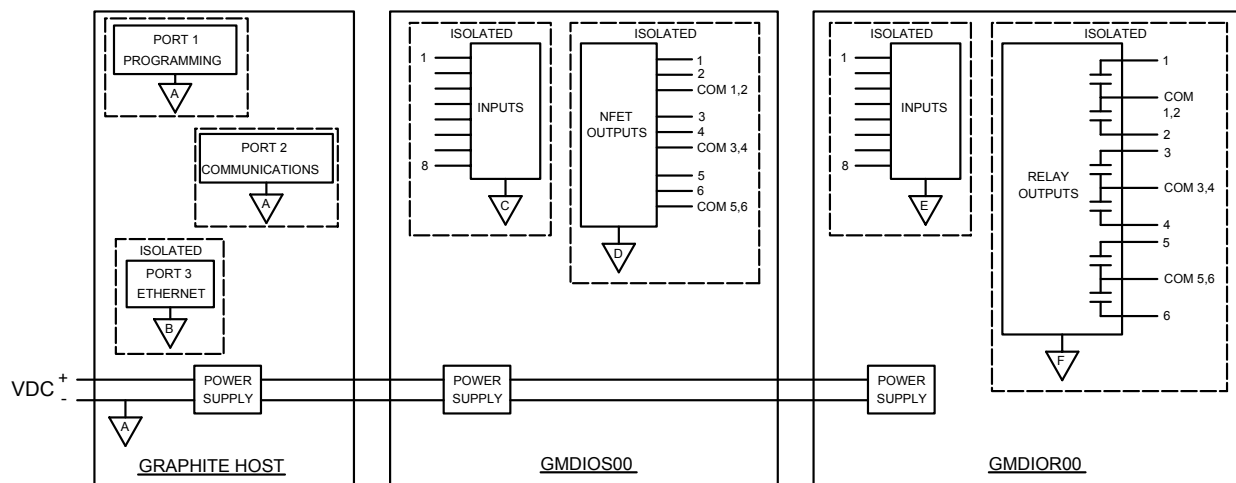
WARNING - EXPLOSION HAZARD - Substitution of components may impair suitability for Class I, Division 2

GENERAL SPECIFICATIONS

- POWER:** 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 data sheets for specific usage and power requirements.
GMDIO14 Max Power: 3.6 W
- LEDs:**
 STS - Status LED shows module condition.
 IN1-IN8 - LEDs are lit when associated input is active.
 OP1-OP6 - LEDs are lit when associated output is active.
- MEMORY:** Non-volatile memory retains all programmable parameters.
- INPUTS:** DIP switch selectable for sink or source
 Maximum voltage: +30 VDC, reverse polarity protected
 Off Voltage: < 1.2 Volts
 On Voltage: > 3.8 Volts
 Input Impedance: Source Mode 10K ohms; Sink Mode 20K ohms
 Input Frequency*:
 Filter switch on: 50 Hz
 Filter switch off: 300 Hz
 * Actual useable frequency limited by communication to external device.
- OUTPUTS:** Outputs available as FORM-A relay or Solid State NFET.
Form A Relay Output:
 Type: N.O.
 The following pairs of relays share the common terminal:
 1&2, 3&4, 5&6
 Current Rating by pair: 3 Amps @ 30 VDC / 125 VAC resistive
 1/10 HP @ 125 VAC
 Life Expectancy: 200,000 cycles at maximum load rating.
 (Decreasing load, increasing cycle time, and use of surge suppression such as RC snubbers increases life expectancy.)
Solid State Output:
 Type: Switched DC, N Channel open drain MOSFET
 All outputs share the same common
 Contact Rating: 1 ADC max
 VDS ON: < 0.2 V @ 1 A
 VDS MAX: 30 VDC
 Offstate Leakage Current: 0.5 mA max
- ISOLATION LEVEL:** 500 Vrms @ 50/60 Hz for 1 minute between the following:

- Inputs
 - Outputs
 - Graphite Host Power Supply Input
- COMMUNICATIONS:** Provided by the Graphite host device
 - ENVIRONMENTAL CONDITIONS:**
 Operating Temperature Range:
 GMDIOR00: -40 to 70 °C T_{AMB}
 GMDIOS00: -40 to 75 °C T_{AMB}
 Operating temperature is limited to lowest range among equipment used in your Graphite system. Consult the user manual or www.redlion.net/Optemp for further details.
 Storage Temperature Range: -40 to +85 °C T_{AMB}
 Shock to IEC 68-2-27: Operational 40 g (10 g, modules w/ relays)
 Operating and Storage Humidity: 85% max relative humidity, non-condensing
 Altitude: Up to 2000 meters
 - CERTIFICATIONS AND COMPLIANCES:**
CE Approved
 EN 61326-1 Immunity to Industrial Locations
 IEC/EN 61010-1
 RoHS Compliant
ATEX/UKEX Approved (GMDIOS00 only)
 II 3 G Ex nA IIC T4 Gc
 DEMKO 14 ATEX 1387X
 EN 60079-0, -11, -15, -31
 UL23UKEX2879X
IECEX Approved (GMDIOS00 only)
 Ex nA IIC T4 Gc
 IECEX UL 15.0035X
 IEC 60079-0, -11, -15, -31
India PESO Approved
 A/P/HQ/MH/104/7441 (P549599)
UL Listed: File #E302106
UL Hazardous: File #E317425 (GMDIOS00 only)
ABS Type Approval for Shipboard Applications
 - CONSTRUCTION:** Case body is all metal construction.
 - CONNECTIONS:** Removable wire clamp screw terminal blocks.
 Wire Gage: 28-16 AWG (0.32 mm - 1.29 mm) terminal gage wire
 Torque: 1.95-2.21 inch-lbs (0.22-0.25 N-m)
 - MOUNTING:** Screws to host
 - WEIGHT:** 8 oz (224 g)

Block Diagram



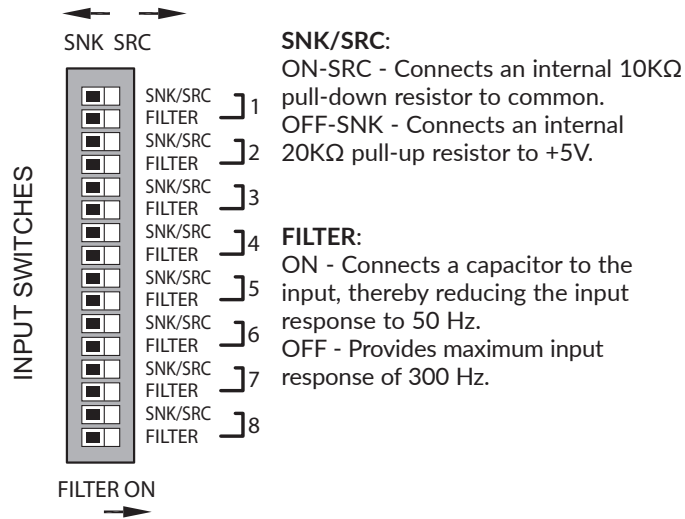
EMC INSTALLATION GUIDELINES

Visit <http://www.redlion.net/emi> for more information on EMI guidelines, Safety and CE issues as they relate to Red Lion products.

HARDWARE


Input Switches

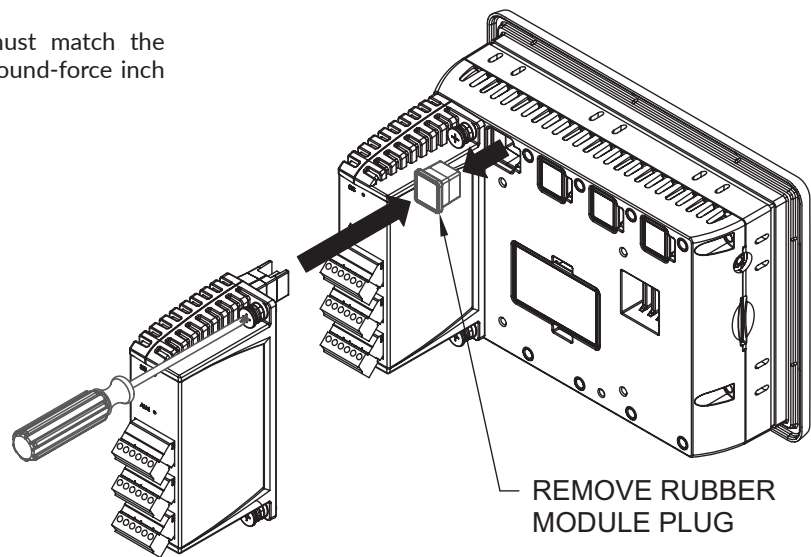
Each input is independently configurable for sinking or sourcing signals. A filter capacitor is also selectable for avoiding contact bounce.



HARDWARE INSTALLATION

The physical order of all installed modules must match the modules order in Crimson. Torque screws to 6.0 pound-force inch [96 ounce-force inch] (0.68 Nm).

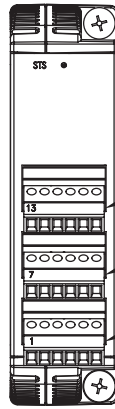
 **WARNING:** Disconnect all power to the unit before installing or removing modules.



WIRING

Wiring Connections

All conductors should meet voltage and current ratings for each terminal. Also, cabling should conform to appropriate standards of good installation, local codes and regulations and be suitably rated for the temperatures of the environment to which it is being installed. When wiring the module, use the numbers on the label to identify the position number with the proper function. Strip the wire, leaving approximately 1/4" (6 mm) of bare wire exposed. Insert the wire into the terminal, and tighten.



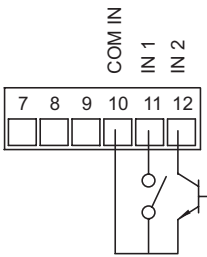
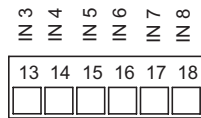
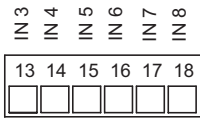
WARNING - EXPLOSION HAZARD - Do not connect or disconnect cables while power is applied unless area is know to be non-hazardous.

Terminals 13 to 18

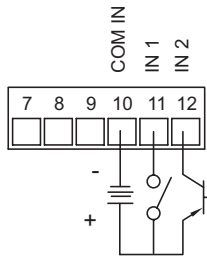
Terminals 7 to 12

Terminals 1 to 6

INPUT CONNECTIONS

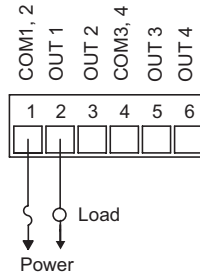
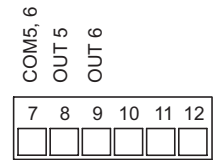
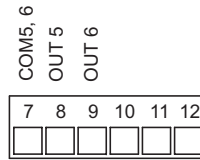


Sinking Input

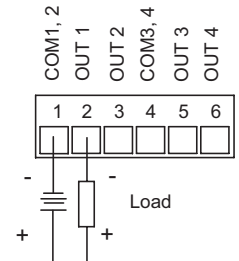


Sourcing Input

OUTPUT CONNECTIONS



Relay Version



Solid State NFET Version

LEDs

STS – Status LED

The Status LED is a green 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

LED	INDICATION
Off	Module is currently running the boot loader and/or being flash upgraded by Crimson.
Flashing Green	Module switching to configuration.
Green	Module performing normally.

Error States

LED	INDICATION
Flashing Green	Module is controlling properly, but has lost communication with the Host.

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.

CONFIGURATION

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

RED LION CONTROLS TECHNICAL SUPPORT

If for any reason you have trouble operating, connecting, or simply have questions concerning your new product, contact Red Lion's technical support.

Support: support.redlion.net

Website: www.redlion.net

Inside US: +1 (877) 432-9908

Outside US: +1 (717) 767-6511

Red Lion Controls, Inc.

35 Willow Springs Circle York, PA 17406

ORDERING INFORMATION

DESCRIPTION	PART NUMBER
Graphite Module, Digital I/O, 8 Inputs And 6 Relays Outputs ¹	GMDIOR00
Graphite Module, Digital I/O, 8 Inputs And 6 Solid State Outputs	GMDIOS00

A listing of the entire Graphite family of products and accessories can be found at www.redlion.net

¹ Module is not suitable for use in hazardous locations.

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(b) The Company shall not be liable for a breach of the warranty set forth in paragraph (a) if (i) the defect is a result of Customer's failure to store, install, commission or maintain the Product according to specifications; (ii) Customer alters or repairs such Product without the prior written consent of Company.

(c) Subject to paragraph (b), with respect to any such Product during the Warranty Period, Company shall, in its sole discretion, either (i) repair or replace the Product; or (ii) credit or refund the price of Product provided that, if Company so requests, Customer shall, at Company's expense, return such Product to Company.

(d) **THE REMEDIES SET FORTH IN PARAGRAPH (c) SHALL BE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDY AND COMPANY'S ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH IN PARAGRAPH (a).**

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