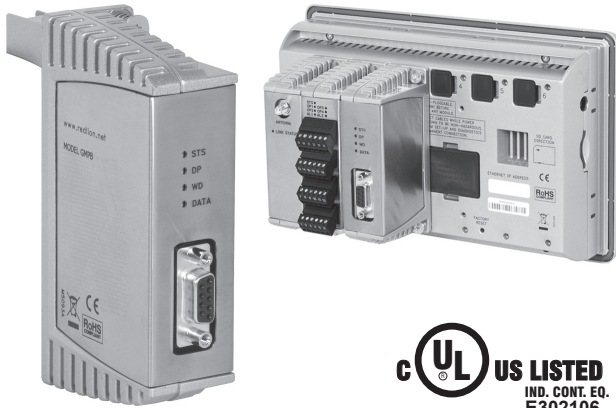
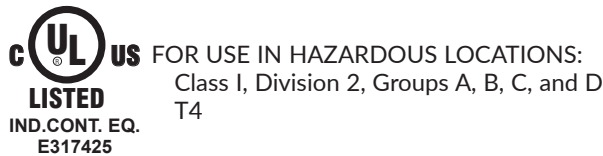


Model GMPB - Graphite® PROFIBUS-DP Module Installation Guide



- Connects Graphite products to PROFIBUS-DP network
- Configured using Crimson® software (version 3.0 or later)
- Standard 9-pin D-sub connector interface
- Operates from 9.6 Kbaud to 12 Mbaud with automatic baud rate detection
- Diagnostic LEDs indicate module status



GENERAL DESCRIPTION

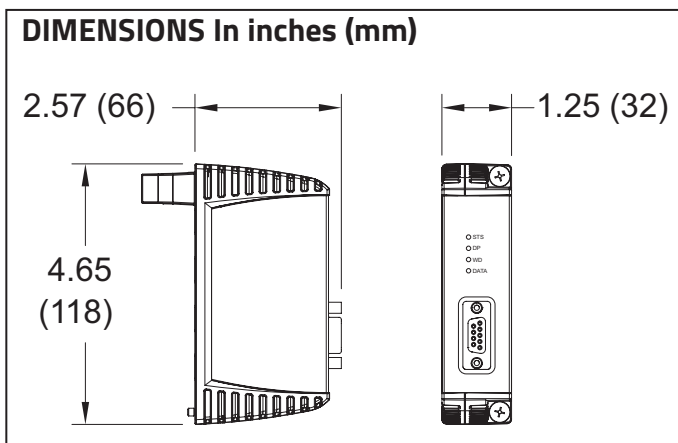
The Model GMPB adds PROFIBUS DP connectivity to any Graphite product. This allows a high speed exchange of blocks of data, at data rates up to 12 MBaud, between the Graphite host device and a Master PLC on a PROFIBUS network. The DP suffix refers to “Decentralized Periphery”, which is used to describe distributed I/O devices connected via a fast serial data link with a central controller.

The PROFIBUS-DP Network connects through a 9-pin D-subminiature female connector. Power for the module is provided by the Graphite host device. The PROFIBUS-DP Network is fully isolated from the Graphite host.

The modules connect and communicate via proprietary USB connection to the various Graphite host devices. Those devices, equipped with serial ports as well as Ethernet port(s), allow the system to share data with PCs, PLCs, and SCADA systems.

CONFIGURATION

The Graphite is configured with Windows® compatible Crimson 3 software. The software is an easy to use, graphical interface

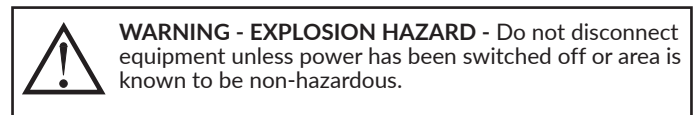
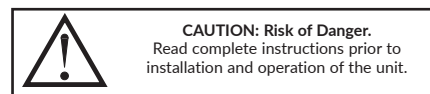


which provides a means of configuration and commissioning of new systems, as well as routine module re-calibration.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in 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.



ORDERING INFORMATION

DESCRIPTION	PART NUMBER
Graphite Module, PROFIBUS Interface	GMPBDP00

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

SPECIFICATIONS

1. 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.

GMPB Max Power: 2.6 W

2. LEDs:

- STS - Status LED shows module condition.
- DP - LED shows communications state.
- WD - LED shows communications state.
- DATA - LED shows data exchange.

3. COMMUNICATIONS:

PROFIBUS Port: FIELDBUS TYPE: PROFIBUS-DP per EN 50170.
 Baud Rates: 9.6 Kbaud to 12 Mbaud, auto baud rate detection.
 Station Address: software programmable in the range 1 to 125.
 Output Power: +5 VDC @ 90 mA max. on the D-Sub connector pins 5 (GND) and 6 (+5 V).
 Network Isolation: 500 Vrms @ 50/60 Hz for 1 minute between PROFIBUS-DP network and Graphite host.

4. ENVIRONMENTAL CONDITIONS:

Operating Temperature Range: -40 to +75°C T_{AMB}, or 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}
 Operating and Storage Humidity: 85% max relative humidity, non-condensing.
 Altitude: Up to 2000 meters

5. CERTIFICATIONS AND COMPLIANCES:

- CE Approved**
 EN 61326-1 Immunity to Industrial Locations
 IEC/EN 61010-1
 RoHS Compliant
- ATEX Approved**

II 3 G Ex nA IIC T4 Gc
 DEMKO 14 ATEX 1387X
 EN 60079-0, -15

IECEX Approved
 Ex nA IIC T4 Gc
 IECEX UL 15.0035X
 IEC 60079-0, -15

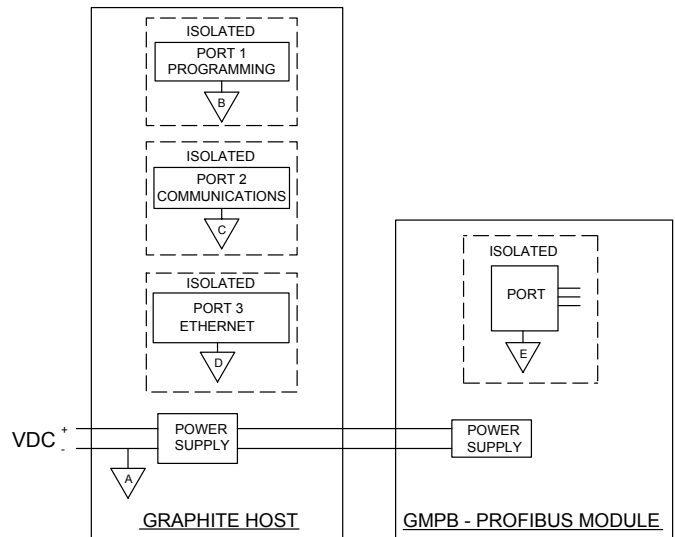
UKEX Approved
 UL22UKEX2574X

UL Listed: File #E302106
UL Hazardous: File #E317425

ABS Type Approval for Shipboard Applications

- 6. CONSTRUCTION:** Case body is all metal construction.
- 7. CONNECTIONS:** Pluggable DB9F connector.
- 8. MOUNTING:** Screws to host.
- 9. WEIGHT:** 8 oz (224 g)

Block Diagram for GMPB



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 (Red Lion #FCOR0000)
 Line Filters for input power cables:
 Schaffner # FN2010-1/07 (Red Lion #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 Red Lion 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.
 Red Lion 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

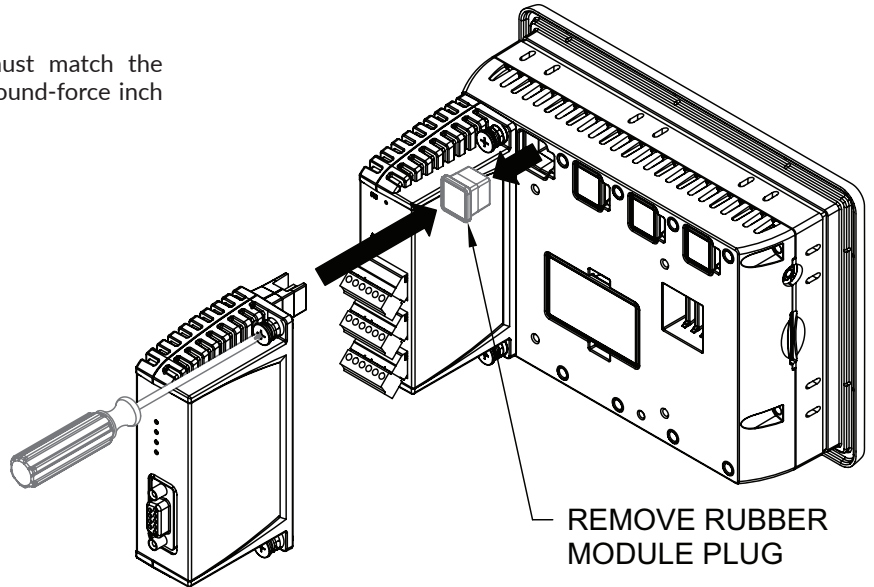
sensor common should NOT be connected to an output common. This would cause EMI on the sensitive input common, which could affect the instrument's operation.

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

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.

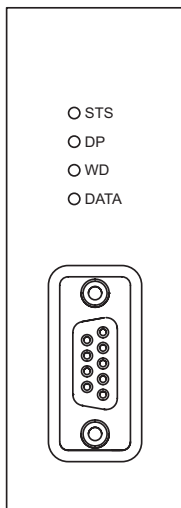


COMMUNICATING WITH THE GMPB MODULE

CONFIGURATION

Programming is done via Crimson 3 software, a Windows® compatible configuration interface. Please see the Crimson manual for more information.

LEDs



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

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

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

Flashing Green	Module is running, but has lost communication with the Host.
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COMMUNICATION LEDs

The module has 3 LEDs that provide communications state information.

DP (RED)	WD (GREEN)	DATA (RED)	DESCRIPTION
SLOW ALTERNATING FLASH	SLOW ALTERNATING FLASH	OFF	Baud Search
ON	OFF	OFF	Baud Control
FAST FLASH	SLOW FLASH	OFF	Waiting for Parameter Telegram
SLOW FLASH	FAST FLASH	OFF	Waiting for Configuration Telegram
OFF	OFF	ON	Data Exchange

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.

GSD FILE

The GSD file and associated bitmap are part of the Crimson installation, and can also be downloaded from the Red Lion website.

DATA TAGS

PROFIBUS data blocks have no concept or knowledge of data type or structure – they are described by a size in bytes. Crimson's Tag based approach to data allows for data of mixed types, bytes, 16-bit words and 32-bit words, to be mapped into a single data block.

A PROFIBUS master exchanges data with slaves as separate input and output blocks. Data transfer direction is described with respect to the PROFIBUS Network such that input data is transferred to the network, or written by the Graphite, and output data is transferred from the network, or read by the Graphite.

Data Tags are mapped to either an Input Block and are Write only, or an Output Block and are Read Only. The Access must be selected to reflect this.

The Data Offset is the byte address of the Data Tag within the Data Block.

The Data Type is the actual size in bytes of the data that will be mapped into the Data Block.

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

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(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.

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