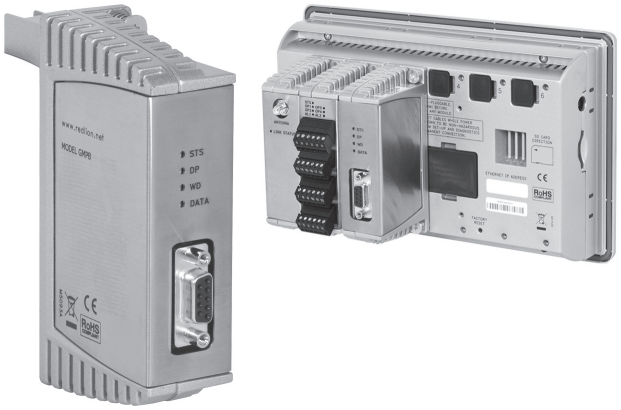
Install - GMPB-F
Drawing No. LP0961
Revised 11/2023

# 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

c UL us LISTED
IND. CONT. EQ.
E302106

c UL us LISTED
IND.CONT. EQ.
E317425

FOR USE IN HAZARDOUS LOCATIONS:
Class I, Division 2, Groups A, B, C, and D
T4

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

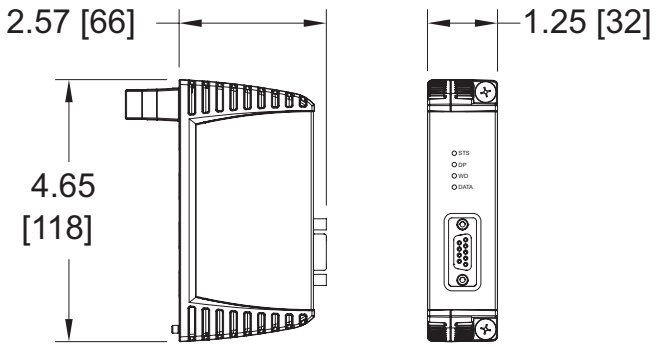
## GENERAL DESCRIPTION

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.

## DIMENSIONS In inches [mm]




## 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 as well as 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 consistent with these specifications.

**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

## 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 50 170.
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 TAMB, 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 TAMB
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/UKEX Approved**
Ⓔx II 3 G Ex nA IIC T4 Gc
DEMKO 14 ATEX 1387X
EN 60079-0, -11, -15, -31
UL23UKEX2879X
**IECEx Approved**
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
**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)

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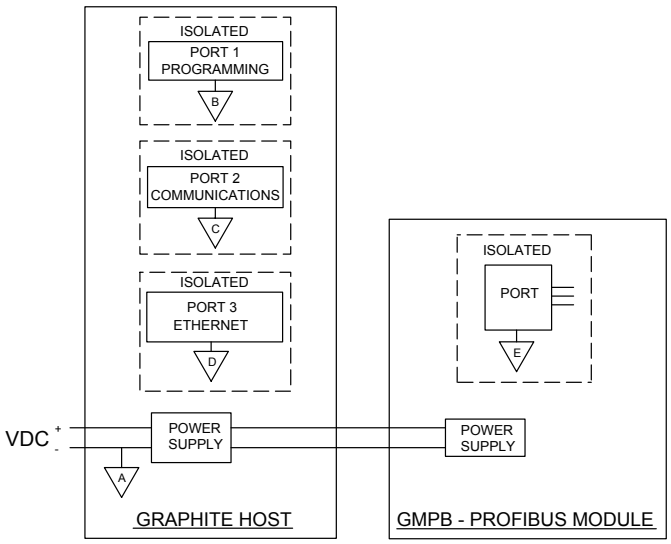
**Block Diagram for GMPB**

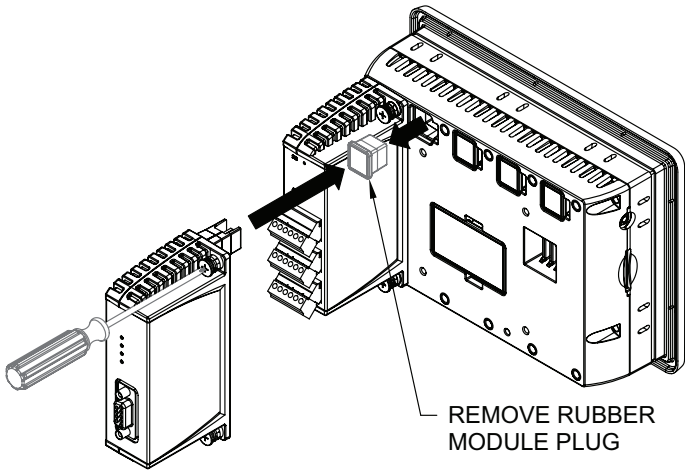



## EMC INSTALLATION GUIDELINES

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

## HARDWARE 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).



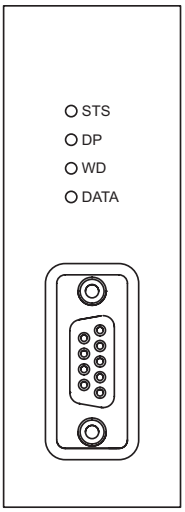

**WARNING:** Disconnect all power to the unit before installing or removing modules.

# 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

| 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. |

## 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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