

# Graphite™ Series Strain Gage Module

Red Lion Automation Series



## ▶▶▶ Strain Gage Module

The GMSG plug-in modules expand the functionality of our Graphite series HMI operator interface panels with PID control of load cells, pressure and torque transducers.

Expanding Graphite HMI functionality to include strain gage inputs is easy with GMSG plug-in modules. GMSG modules include full-featured single loop PID controllers designed to accept low level signals from a wide variety of bridge-type transducers. Optional second strain gage inputs are available to provide math capabilities between input channels for customized programs. Available with a user-selectable analog output and solid state or relay outputs, the GMSG module can perform virtually any combination of time-proportioning or linear output control operations.



### APPLICATIONS

- > Factory Automation
- > Manufacturing
- > Plastic Extrusion
- > Food Processing

### PRODUCT HIGHLIGHTS

- > Full PID Control Functionality
- > Load Cell, Pressure and Torque Bridge Inputs
- > Extended Operating Temperature
- > Multiple Output Options
- > Digital Rate, Batch Totalizer and Peak/Valley Recording

### FEATURES & BENEFITS

- > Dual Strain Gage Inputs (Model Dependent)
  - Monitor and control load cells, pressure and torque transducers
- > Three Solid-State or Three Relay Outputs
  - Easily control processes that include weight, pressure and tensioning
- > Up-To Seven Soft Alarms Can Trigger Discrete Outputs
  - Trigger outputs for precision operation
- > User Selectable Analog Output
  - Software defined (0-10 VDC, 0-20 mA, or 4-20 mA)
- > -40° to 70°C Operating Temperature
  - Reliably works in harsh environmental conditions
- > Control Modes Include:
  - On/Off, P, PI, or PID control

industrial

automation



# ▶▶▶ Strain Gage Module Specifications

## POWER

GMSG1 Max Power: 5.6 W (supplied by Graphite host device)

## COMMUNICATION PROPERTIES

| SELECTABLE INPUT RANGE | ACCURACY *18 TO 28°C 10 TO 75% RH | ACCURACY *0 TO 50°C 0 TO 85% RH | ACCURACY *-40 TO 70°C 0 TO 85% RH |
|------------------------|-----------------------------------|---------------------------------|-----------------------------------|
| ±20.000 mVDC           | 0.02% of reading +3 µV            | 0.07% of reading +4 µV          | 0.09% of reading +5 µV            |
| ±33.000 mVDC           | 0.02% of reading +5 µV            | 0.07% of reading +7 µV          | 0.09% of reading +9 µV            |
| ±200.00 mVDC           | 0.02% of reading +30 µV           | 0.07% of reading +40 µV         | 0.09% of reading +50 µV           |

\* After 20 minute warm-up. Accuracy includes the temperature coefficient.

Connection Type:

4-wire bridge (differential)

2-wire (single-ended)

Sample Time: 50 msec (20 readings per second)

Common Mode Range (with respect to input common): 0 to +5 VDC

Common Mode Rejection: > 100 dB, DC to 120 Hz

Temperature Coefficient (ratio metric): 20 ppm/°C max.

Step Response Time: 200 msec max. to within 99% of final process value

Input Impedance: 100 MΩ

Max Continuous Overload: 30 V

PV Range: -30,000 to 30,000

Effective Resolution: 16-bit

## BRIDGE EXCITATIONS

Software selectable:

5 VDC, ±2%, 65 mA max.

10 VDC, ±2%, 125 mA max. combined (excitation 1 plus excitation 2).

Temperature coefficient (ratio metric): 20 ppm/°C max.

Max. four 350Ω bridges per module.

## DISCRETE OUTPUTS

Available as (3) Solid State NFET, or (3) Form A relay.

Solid State Output:

Type: Switched DC, N Channel open drain MOSFET

Current Rating: 1 A max

VDS ON: 0.3 V @ 1 A

VDS MAX: 30 VDC

Offstate Leakage Current: 0.5 mA max

Form A Relay Output:

Type: N.O.

Current Rating: 3 Amps @ 125 VAC

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.)

## CONTROL MODES

Control: On/Off, P, PI, or PID

Output: Time proportioning or linear

Cycle Time: Programmable from 0.0 to 60.0 sec

Auto-Tune: When selected, sets proportional band, integral time, derivative time values, and output dampening time

Input Fault Response: Upscale

## ALARMS

Modes: Manual

Absolute High Acting Absolute Low Acting

Deviation High Acting Deviation Low Acting

Inside Band Acting Outside Band Acting

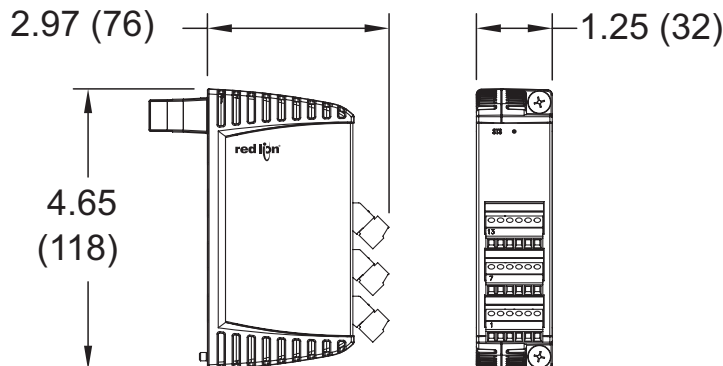
Reset Action: Programmable; automatic or latched

Standby Mode: Programmable; enable or disable

Hysteresis: Programmable

Input Fault Response: Upscale

## DIMENSIONS *In inches (mm)*



## ANALOG DC OUTPUT

Software programmable for 0-10 VDC, 0-20 mA, or 4-20 mA

Resolution:

Voltage: 500 µV

Current: 1 µA

Accuracy:

0.1% of full scale (18° to 28°C)

0.2% of full scale (-40° to 70°C)

Update Time: 0.0 to 60.0 sec

Compliance (for current output only): 500 Ω max.

Minimum load (voltage output only): 10 KΩ min.

Output is software selectable for either 10 V or 20 mA. The output range may be field calibrated to yield approximate 10% overrange and a small underrange (negative) signal.

## CERTIFICATIONS AND COMPLIANCES

CE Approved

EN 61326-1 to Industrial Locations

IEC/EN 61010-1

RoHS Compliant

## ENVIRONMENTAL

Operating Temperature Range: -40° to +70°C

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

## ORDERING GUIDE

| PART NUMBER | DESCRIPTION                                                                                  |
|-------------|----------------------------------------------------------------------------------------------|
| GMSG10R0    | Graphite Module, Single Loop, One Strain Gage Input, Relay Outputs, and Analog Output        |
| GMSG10S0    | Graphite Module, Single Loop, One Strain Gage Input, Solid State Outputs, and Analog Output  |
| GMSG11R0    | Graphite Module, Single Loop, Two Strain Gage Inputs, Relay Outputs, and Analog Output       |
| GMSG11S0    | Graphite Module, Single Loop, Two Strain Gage Inputs, Solid State Outputs, and Analog Output |



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