DI-5B38-100 Programmable Strain Gage Signal Conditioner

FEATURES

- Interfaces to 120Ω Through 10KΩ Strain Gages
- Full, Half, or Quarter Bridge Input
- Pin Compatible with all other DI-5B Modules
- High Performance RISC Processor Based
- Windows Based Setup Program
- Remote Programmable Features:
  - Modules Identified by Unique Address
  - Configure using RS-232 Connection to Module Pin 21
  - Balance, UP +/-100% Span with 16-bit Resolution
  - Gain, 5 TO 2500 with 12-bit Resolution
  - Voltage Output, ±0.5V TO ±5V
  - Inverted or Non-inverted Output
  - Four Internal Precision Shunt Calibration Resistors
- ±0.08% Accuracy
- ±0.02% Linearity

DESCRIPTION

Each DI-5B38-100 programmable strain gage input module provides a single channel of strain gage input which is filtered, amplified, and converted to a high level voltage output. The modules are easily configured using a Windows based spreadsheet style setup program, which accepts user inputs and communicates to the modules using a standard RS-232 serial port. Standard communications ports 1-4 can be used and the baud rate is fixed at 4800. Each module has a unique serial number stored in EEPROM that is used for addressing up to 64 modules in a system. However, the serial number is user programmable and can be set as an alpha-numeric label. Eight and 16-channel back panels are available which have the communication circuitry for interfacing to the modules and multi-dropping multiple back panels. Once configured, the module(s) may be used in the same back panel or removed and used in any standard "5B" back panel.

The DI-5B38-100 can interface to transducers with a nominal resistance of 120Ω to 10KΩ. Input configurations of full bridge, half-bridge or quarter bridge can be accommodated by selecting or de-selecting the internal precision bridge completion resistors. Strain gage excitation is provided from the module by a stable 5V source.

SPECIFICATIONS

Typical at T_A = +25ºC and +5V Power

	DI-5B38-100
Input Range	±2mV to ±100mV
Input Bias Current	±0.5nA
Input Resistance Normal Power Off Overload	 50MΩ 20kΩ 20kΩ
Signal Input Protection (Continuous)	40V max
Excitation	5V
Half-Bridge Voltage Level	2.5V
Internal Shunt Calibration Resistors	20kΩ, 40kΩ, 80kΩ, 200kΩ
Output Range	±0.5V to ±5.0V
Output Protection	Continuous Short to Ground
CMV, Input to Output or Input to Power	±7.5 (Non-isolated)
CMR (50Hz or 60Hz)	55dB
Accuracy*	±0.08% Span
Nonlinearity	±0.02% Span
Adjustability Zero (Balance) Gain	 Up to 100% Span, 16-bit resolution 5 to 2500, 12-bit resolution
Stability Input Offset Output Offset Gain	 ±1μV/°C ±20ppm/°C ±55ppm/°C
Output Noise, 100kHz Bandwidth	350mVrms
Bandwidth, -3dB	5kHz
NMR	20dB/decade above 5kHz
Response Time, 90% Span	70μs
Power Supply Voltage Current	 5VDC ± 5% 90mA No Exc. Load, 220ma Full Exc. Load
Environmental Operating Temp. Storage Temp. Relative Humidity	 -40°C to +85°C -40°C to +85°C 0 to 95% Noncondensing
Mechanical Dimensions	2.28" × 2.26" × 0.60" (58mm × 57mm × 15mm)
Configuration	Windows Based, Spreadsheet Style
Hardware Configuration	EEPROM, 40 years with power off
Serial Number	Alpha-Numeric, stored in EEPROM
Communications Port Baud Rate	RS-232 to module pin 21 1-4 4800
Max. Channel Count	64 in groups of 8

*Includes excitation error, nonlinearity, hysteresis and repeatability.

DESCRIPTION (continued from page 1)

The key feature of the DI-5B38-100 module is the remote programmable balance and gain. The "Balance" command can be used to offset bridge imbalances and to provide pedestal offsets up to ±100% span with 16-bit resolution. The "Gain" command can be used to program the module gain over the wide range from 5 to 2500 with 12-bit resolution. One of four precision internal shunt calibration resistors with values of 20KΩ, 40KΩ, 80KΩ and 200KΩ can be selected to simulate a full scale condition for setting module gain. Additionally, an external calibration resistor can be selected.

Voltage output can be programmed to values between ±0.5V and ±5.0V in 0.5V steps. It can also be programmed to be inverting or non-inverting. Signal filtering is accomplished with a 5kHz bandwidth single-pole filter to optimize step response.

When configuring the modules, a Windows spreadsheet-like software interface is used to enter the configuration parameters on a channel-by-channel basis. A secondary spreadsheet is used to list module serial numbers for channels 1-64. Modules 1-64 are divided into 8 groups of 8 for localized programmability. Any commands sent to the modules can be addressed to individual modules, groups of 8 modules, or to all 64 modules. Among other things, this allows simultaneous balancing or setting gain for signal conditioners in specific locations. All setup information is stored in non-volatile memory on the module, allowing the modules to be programmed and installed at a later time. Setup information can also be saved to a file so modules can be easily returned to their original configuration or new modules can be programmed to match previously programmed modules.

Ordering Information

Model Number	Input Range	Output Range
DI-5B38-100	±2mV to ±100mV	±0.5V to ±5.0V

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