8B38

Strain Gauge Input Modules, Wide and Narrow Bandwidth

DESCRIPTION

The 8B38 module family is an optimal solution for monitoring real-world process signals and providing high-level signals to a data acquisition system. Each 8B38 module isolates, filters, and amplifies a full-bridge strain gauge input signal and provides an analog voltage output (Figure below).

The 8B38 can interface to transducers with a nominal resistance of 100Ω to 2kΩ. Bridge excitation is provided from the module with a stable 10.00V or 3.33V source. Full scale sensitivities of 2mV/V and 3mV/V are offered as standard.

Signal filtering is accomplished with a 5-pole filter optimized for time and frequency response which provides 100dB per decade of normal-mode rejection above the filter cutoff frequency. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other four are on the system side.

A special input circuit on the 8B38 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by transformer coupling to suppress transmission of common-mode spikes or surges. The module is powered from +5VDC, ±5%.

The modules are designed for installation in Class I, Division 2 hazardous locations and have a high level of immunity to environmental noise.

FEATURES

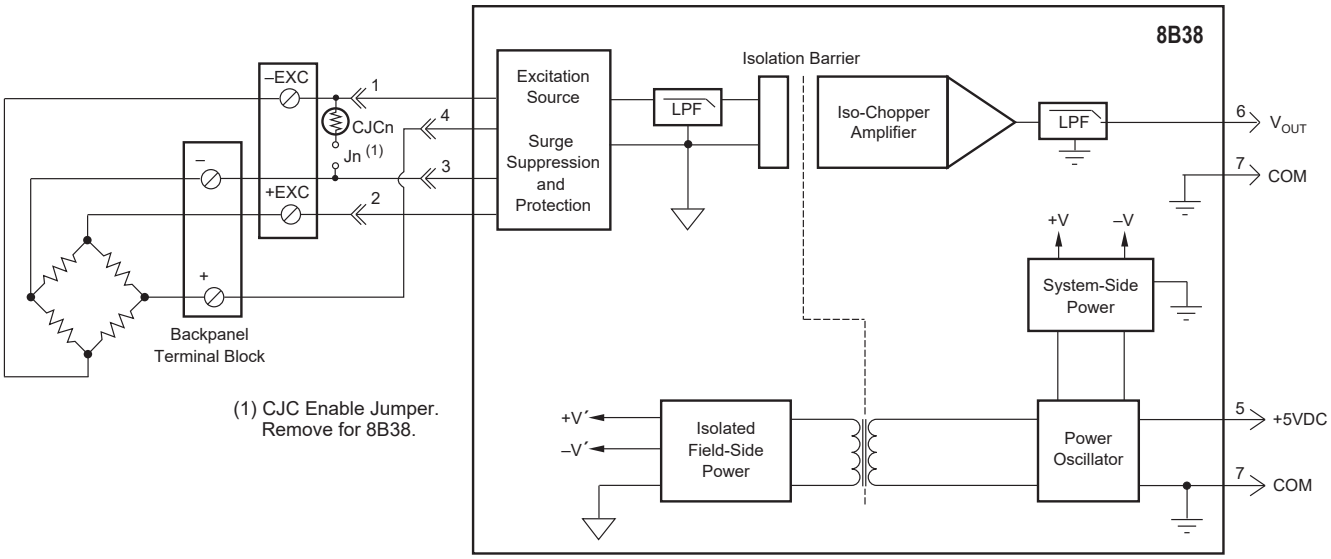
- Interfaces to 100Ω through 2kΩ Full-bridge Strain Gauges
- High-level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 100dB CMR
- 3Hz or 8kHz Signal Bandwidth
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- UL/cUL Listed
- CE Compliant
- ATEX Compliance Pending
- Manufactured per RoHS III Directive 2015/863
- Mix and Match Module Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Industrial Equipment Power-line Voltage
- Reduces Electrical Noise in Measured Signals
- Convenient System Expansion and Repair

APPLICATIONS

- Designed for Embedded Applications
  - PC/104 Embedded Solutions
  - Compact PCI Systems
  - VMEbus Systems
  - PXI Systems
- Designed for Industrial Plant Environments
- High-vibration Environments



(1) CJC Enable Jumper. Remove for 8B38.

8B38 Block Diagram - For Module Dimensions and Pinouts, See Page 3-40

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Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	8B38-0x	8B38-3x
Input Range	±10mV to ±30mV	±10mV to ±30mV
Input Bias Current	±0.5nA	±0.5nA
Input Resistance		
Normal	50MΩ	50MΩ
Power Off	100kΩ	100kΩ
Overload	100kΩ	100kΩ
Input Protection		
Continuous(1)	240VAC	240VAC
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
Excitation Output (-x1)	+3.333V ±2mV	+3.333V ±2mV
Load Resistance	100Ω to 2kΩ	100Ω to 2kΩ
Excitation Output (-x2,-x5)	+10V ±5mV	+10V ±5mV
Load Resistance	300Ω to 2kΩ	300Ω to 2kΩ
Excitation Load Regulation	15ppm/mA	15ppm/mA
Excitation Stability	50ppm/°C	50ppm/°C
Excitation Protection	120VAC	120VAC
CMV, Input to Output	1500Vrms (max)	1500Vrms (max)
Transient, Input to Output	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	100dB	100dB
NMR	100dB per Decade Above 8kHz	70dB at 60Hz
Accuracy(2)	±0.05% Span	±0.05% Span
Linearity	±0.02% Span	±0.02% Span
Stability		
Offset	±25ppm/°C	±25ppm/°C
Gain	±100ppm/°C	±75ppm/°C
Noise		
Output, 100kHz	1500µVrms	200µVrms
Bandwidth, –3dB	8kHz	3Hz
Response Time, 90% Span	70µs	160ms
Output Range	±5V	±5V
Output Protection	Continuous Short-to-Ground	Continuous Short-to-Ground
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
Power Supply Voltage	+5VDC ±5%	+5VDC ±5%
Power Supply Current	110mA No Exc. Load 150mA Full Exc. Load	110mA No Exc. Load 150mA Full Exc. Load
Power Supply Sensitivity	±75ppm/%	±75ppm/%
Mechanical Dimensions (h)x(w)x(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental		
Operating Temperature Range	–40°C to +85°C	–40°C to +85°C
Storage Temperature Range	–40°C to +85°C	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1	ISM, Group 1
Radiated, Conducted	Class A	Class A
Immunity EN61000-6-2	ISM, Group 1	ISM, Group 1
RF	Performance A ±0.5% Span Error	Performance A ±0.5% Span Error
ESD, EFT	Performance B	Performance B

NOTES:
*Contact factory or your local Dataforth sales office for maximum values.
(1) 240VAC between +Input terminal and –Input, +EXC, or –EXC terminals.
120VAC between –Input and +EXC or –EXC terminals.
120VAC between +EXC and –EXC terminals.
(2) Includes linearity, hysteresis, and repeatability.

Ordering Information

Model	Band-width	Input Range	Exc.	Sens.	Output Range
8B38-01	8kHz	–10mV to +10mV	+3.333V	3mV/V	–5V to +5V
8B38-02	8kHz	–30mV to +30mV	+10.0V	3mV/V	–5V to +5V
8B38-05	8kHz	–20mV to +20mV	+10.0V	2mV/V	–5V to +5V
8B38-06	8kHz	–10mV to +10mV	+3.333V	3mV/V	0V to +5V
8B38-07	8kHz	–30mV to +30mV	+10.0V	3mV/V	0V to +5V
8B38-08	8kHz	–20mV to +20mV	+10.0V	2mV/V	0V to +5V
8B38-31	3Hz	–10mV to +10mV	+3.333V	3mV/V	–5V to +5V
8B38-32	3Hz	–30mV to +30mV	+10.0V	3mV/V	–5V to +5V
8B38-35	3Hz	–20mV to +20mV	+10.0V	2mV/V	–5V to +5V
8B38-36	3Hz	–10mV to +10mV	+3.333V	3mV/V	0V to +5V
8B38-37	3Hz	–30mV to +30mV	+10.0V	3mV/V	0V to +5V
8B38-38	3Hz	–20mV to +20mV	+10.0V	2mV/V	0V to +5V

Installation Notes

1) This Equipment is Suitable for Use in Class I, Division 2, Groups A, B,C, D, or Non-hazardous Locations Only.
2) WARNING - Explosion Hazard - Substitution of Any Components May Impair Suitability for Class I, Division 2.
3) WARNING - Explosion Hazard - Do Not Disconnect Equipment Unless Power Has Been Switched Off or the Area is Known to be Non-hazardous.

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