

8B38



Strain Gage Input Modules, Wide and Narrow Bandwidth

Description

8B modules are 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 gage input signal and provides an analog voltage output.

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 Gages
- 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
- CE Compliant
- UL Listing Pending
- Mix and Match Module Types on Backpanel

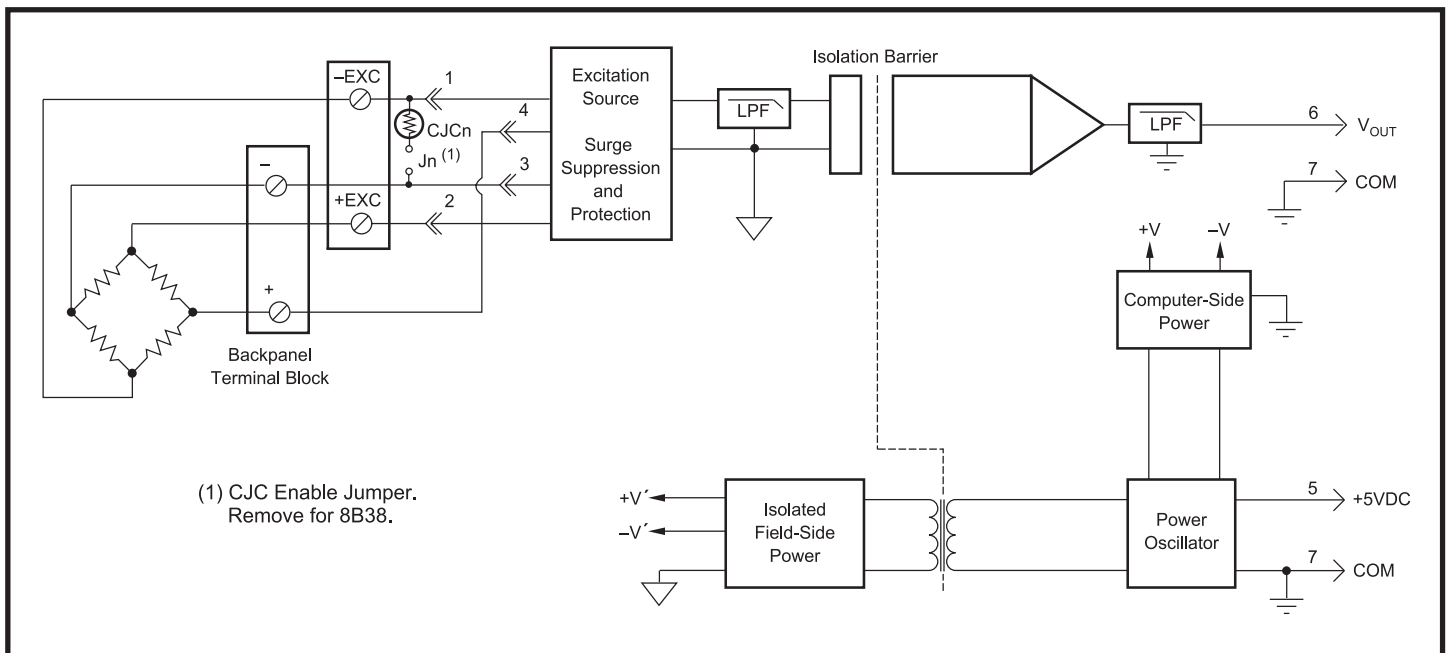


Figure 1: 8B38 Block Diagram

Specifications Typical at $T_A = +25^\circ\text{C}$ and +5V power

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

NOTES:

* Same specification as 8B38-0x.

(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	Bandwidth	Input Range	Exc.	Sens.	Output Range
8B38-01	8kHz	-10mV to $+10\text{mV}$	+3.333V	3mV/V	-5V to $+5\text{V}$
8B38-02	8kHz	-30mV to $+30\text{mV}$	+10.0V	3mV/V	-5V to $+5\text{V}$
8B38-05	8kHz	-20mV to $+20\text{mV}$	+10.0V	2mV/V	-5V to $+5\text{V}$
8B38-31	3Hz	-10mV to $+10\text{mV}$	+3.333V	3mV/V	-5V to $+5\text{V}$
8B38-32	3Hz	-30mV to $+30\text{mV}$	+10.0V	3mV/V	-5V to $+5\text{V}$
8B38-35	3Hz	-20mV to $+20\text{mV}$	+10.0V	2mV/V	-5V to $+5\text{V}$