

8B50/51

Voltage Input Modules, 20kHz 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 8B50 or 8B51 module isolates, filters, and amplifies a voltage input signal and provides an analog voltage output (Figure 1).

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 20kHz. 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 8B50 and 8B51 modules 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

- Accepts Millivolt and Voltage Level Signals
- High-Level Voltage Outputs
- 1500Vrms Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240VAC Continuous
- 100dB CMR
- 20kHz Signal Bandwidth
- ±0.05% Accuracy
- ±0.02% Linearity
- Low Drift with Ambient Temperature
- C-UL-US Listed
- CE Compliant
- ATEX Compliance Pending
- Mix and Match Module Types on Backpanel

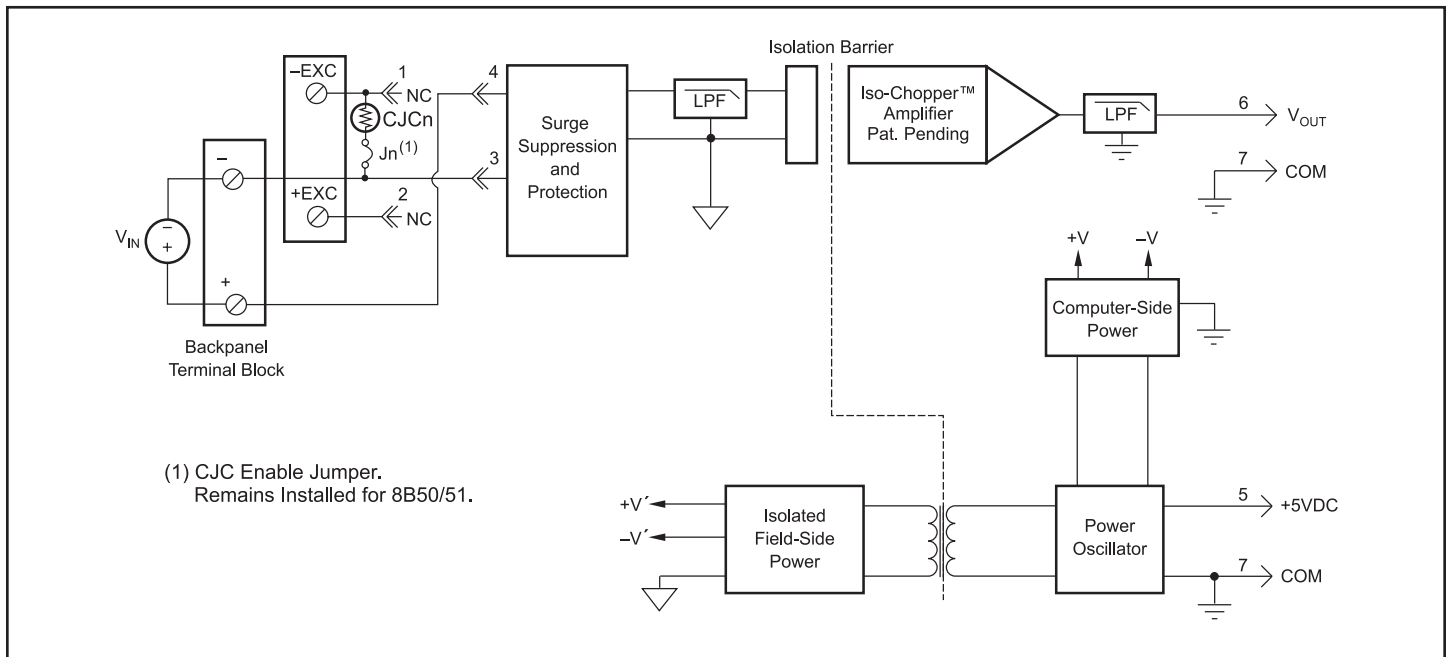


Figure 1: 8B50/51 Block Diagram

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

Module	8B50	8B51
Input Range	$\pm 20\text{mV}$ to $\pm 100\text{mV}$	$\pm 1\text{V}$ to $\pm 60\text{V}$
Input Bias Current	$\pm 0.5\text{nA}$	$\pm 0.05\text{nA}$
Input Resistance		
Normal	50M Ω	500k Ω (minimum)
Power Off	100k Ω	500k Ω (minimum)
Overload	100k Ω	500k Ω (minimum)
Input Protection		
Continuous ⁽¹⁾	240VAC	240VAC
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
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 (-3dB at 20kHz)	100dB per Decade above 20kHz	100dB per Decade above 20kHz
Accuracy ⁽²⁾	$\pm 0.05\%$ Span	$\pm 0.05\%$ Span
Linearity	$\pm 0.02\%$ Span	$\pm 0.02\%$ Span
Stability		
Offset	$\pm 10\text{ppm}/^\circ\text{C}$	$\pm 10\text{ppm}/^\circ\text{C}$
Gain	$\pm 50\text{ppm}/^\circ\text{C}$	$\pm 75\text{ppm}/^\circ\text{C}$
Noise		
Output, 100kHz	500 μVrms	500 μVrms
Bandwidth, -3dB	20kHz (15kHz, 50-01)	20kHz (15kHz, 50-01)
Rise Time, 10 to 90% Span	25 μs	25 μs
Output Range	See Ordering Information	See Ordering Information
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 $\pm 5\%$	+5VDC $\pm 5\%$
Power Supply Current	25mA	25mA
Power Supply Sensitivity	$\pm 75\text{ppm}/\%$	$\pm 75\text{ppm}/\%$
Mechanical Dimensions (h)(w)(d)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)	1.11" x 1.65" x 0.40" (28.1mm x 41.9mm x 10.2mm)
Environmental		
Operating Temp. Range	-40°C to +85°C	-40°C to +85°C
Storage Temp. 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 $\pm 0.5\%$ Span Error	Performance A $\pm 0.5\%$ 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	Input Range	Output Range
8B50-01	-20mV to +20mV	-5V to +5V
8B50-02	-50mV to +50mV	-5V to +5V
8B50-03	-100mV to +100mV	-5V to +5V
8B50-04	-20mV to +20mV	0 to +5V
8B50-05	-50mV to +50mV	0 to +5V
8B50-06	-100mV to +100mV	0 to +5V
8B51-01	-1V to +1V	-5V to +5V
8B51-02	-5V to +5V	-5V to +5V
8B51-03	-10V to +10V	-5V to +5V
8B51-04	-1V to +1V	0V to +5V
8B51-05	-5V to +5V	0V to +5V
8B51-06	-10V to +10V	0V to +5V
8B51-07	-20V to +20V	-5V to +5V
8B51-08	-20V to +20V	0V to +5V
8B51-09	-40V to +40V	-5V to +5V
8B51-10	-40V to +40V	0V to +5V
8B51-12	-60V to +60V	-5V to +5V
8B51-13	-60V to +60V	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.