

8B40/41



Voltage Input Modules, 1kHz 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 8B40 or 8B41 module isolates, filters, and amplifies a voltage input signal and provides an analog voltage output.

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 1kHz. 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 8B40 and 8B41 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 optical 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
- 1kHz 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

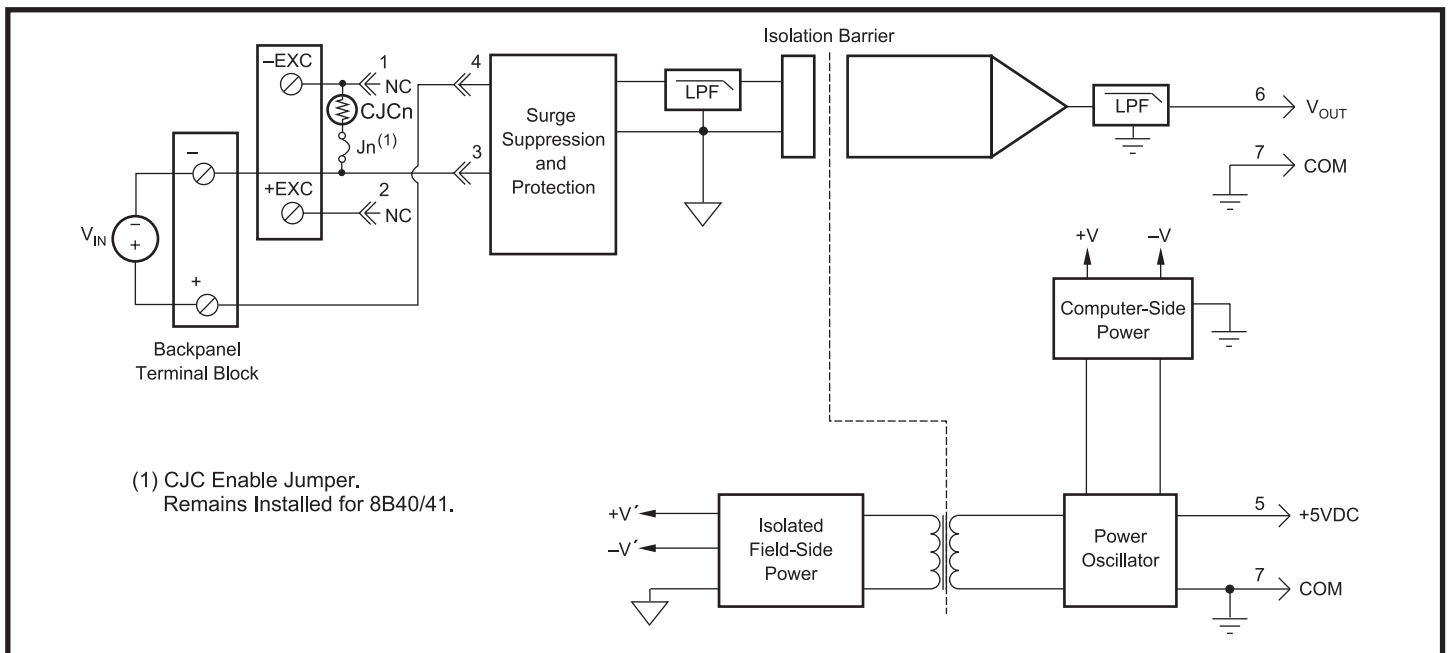


Figure 1: 8B40/41 Block Diagram

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

| Module | 8B40 | 8B41 |
|------------------------------------|---|-------------------------------------|
| Input Range | $\pm 10\text{mV}$ 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 | * |
| Transient | ANSI/IEEE C37.90.1 | * |
| CMV, Input to Output | 1500Vrms max | * |
| Transient, Input to Output | ANSI/IEEE C37.90.1 | * |
| CMR (50Hz or 60Hz) | 100dB | * |
| NMR (-3dB at 1kHz) | 100dB per decade above 1kHz | * |
| Accuracy ⁽²⁾ | $\pm 0.05\%$ Span | * |
| Linearity | $\pm 0.02\%$ Span | * |
| Stability | | |
| Offset | $\pm 10\text{ppm}/^\circ\text{C}$ | * |
| Gain | $\pm 50\text{ppm}/^\circ\text{C}$ | $\pm 75\text{ppm}/^\circ\text{C}$ |
| Noise | | |
| Output, 100kHz | 500 μVrms | * |
| Bandwidth, -3dB | 1kHz | * |
| Response Time, 90% Span | 550 μs | * |
| Output Range | See Ordering Information | * |
| Output Protection | Continuous Short to Ground | * |
| Transient | ANSI/IEEE C37.90.1 | * |
| Power Supply Voltage | +5VDC $\pm 5\%$ | * |
| Power Supply Current | 25mA | * |
| 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 8B40.

(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 |
|---------|------------------------------------|------------------------------|
| 8B40-01 | -10mV to $+10\text{mV}$ | -5V to $+5\text{V}$ |
| 8B40-02 | -50mV to $+50\text{mV}$ | -5V to $+5\text{V}$ |
| 8B40-03 | -100mV to $+100\text{mV}$ | -5V to $+5\text{V}$ |
| 8B41-01 | -1V to $+1\text{V}$ | -5V to $+5\text{V}$ |
| 8B41-02 | -5V to $+5\text{V}$ | -5V to $+5\text{V}$ |
| 8B41-03 | -10V to $+10\text{V}$ | -5V to $+5\text{V}$ |
| 8B41-04 | -1V to $+1\text{V}$ | 0V to $+5\text{V}$ |
| 8B41-05 | -5V to $+5\text{V}$ | 0V to $+5\text{V}$ |
| 8B41-06 | -10V to $+10\text{V}$ | 0V to $+5\text{V}$ |
| 8B41-07 | -20V to $+20\text{V}$ | -5V to $+5\text{V}$ |
| 8B41-08 | -20V to $+20\text{V}$ | 0V to $+5\text{V}$ |
| 8B41-09 | -40V to $+40\text{V}$ | -5V to $+5\text{V}$ |
| 8B41-10 | -40V to $+40\text{V}$ | 0V to $+5\text{V}$ |
| 8B41-12 | -60V to $+60\text{V}$ | -5V to $+5\text{V}$ |
| 8B41-13 | -60V to $+60\text{V}$ | 0V to $+5\text{V}$ |