

SCM7B32/33

Isolated Process Current/Voltage Input Modules



Description

The SCM7B32 current input modules accept input signals in the 4-20mA or 0-20mA ranges from the field and provide a high-level output to the process control system (Figure 1). Current to voltage conversion occurs internal to the module, which is factory calibrated to ensure the highest accuracy.

SCM7B33 voltage input modules accept input signals in the +1V to +5V or 0 to +5V ranges from the field and provide a high-level output to the process control system. As an alternative, the SCM7B33 can be used with an external 250Ω resistor (Dataforth SCM7BXR1 or equivalent), to accept input signals in the 4-20mA or 0-20mA ranges. Using the external sense resistor allows the module to be removed without disrupting the current loop. All SCM7B33s are shipped with a SCM7BXR1 resistor.

These modules incorporate a five-pole filtering approach to maximize both time and frequency response by taking advantage of both Thomson (Bessel) and Butterworth characteristics. One pole of the filter is on the field side of the isolation barrier; four are on the process control system side.

After the initial field-side filtering (conversion-SCM7B32 only), the input signal is chopped by a proprietary chopper circuit and transferred across the transformer isolation barrier, suppressing transmission of common mode spikes and surges. The signal is then reconstructed and filtered for process control system output.

Modules accept a wide 14 - 35VDC power supply range (+24VDC nominal). Their compact packages (2.13"x1.705"x0.605" max) save space and are ideal for high channel density applications. They are designed for easy DIN rail mounting using any of the "DIN" backpanels.

► Features

- Accepts Current or Voltage Input
- Provides High-Level Voltage Outputs
- 1500Vrms Transformer Isolation
- Accuracy, $\pm 0.03\%$ of Span Typical, $\pm 0.1\%$ Max
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protected to 120Vrms Continuous
- Noise, 500μVp-p (5MHz), 300μVrms (100kHz)
- 105dB CMRR
- Easy DIN Rail Mounting
- CSA C/US Certified
- CE and ATEX Compliant

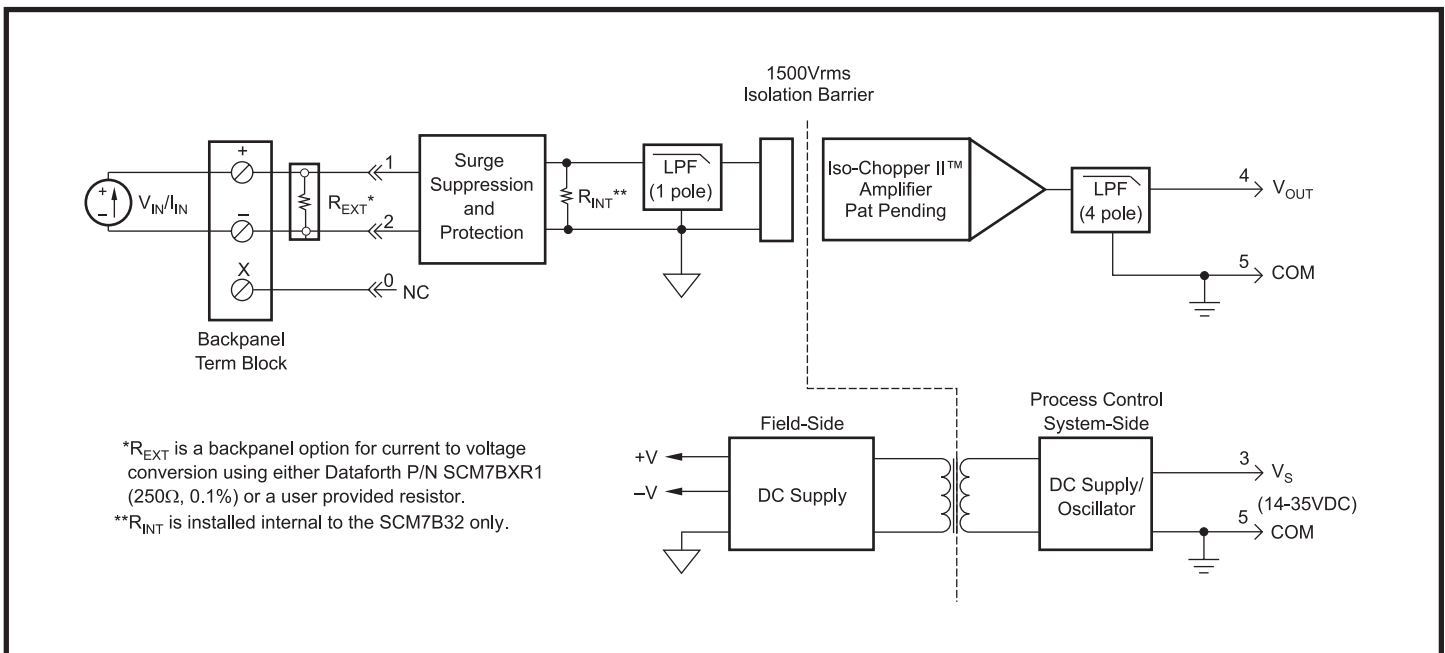


Figure 1: SCM7B32/33 Block Diagram

Specifications

Typical* at 25°C and +24VDC

Module	SCM7B32	SCM7B33
Input		
Signal Range	4-20mA, 0-20mA	+1 to +5V, 0 to +5V
Bias Current	N/A	±0.1nA
Resistance		
Normal	<100Ω	2MΩ
Power Off	<100Ω	2MΩ
Overload	30kΩ	2MΩ
Protection		
Continuous	120Vrms max	*
Transient	ANSI/IEEE C37.90.1	*
Output		
Signal Range ⁽¹⁾	†	†
Effective Available Power ⁽¹⁾	40mW	*
Resistance	<1Ω	*
Protection	Continuous Short-to-Ground	*
Voltage/Current Limit	±12V, ±14mA	*
CMV (Input-to-Output)		
Continuous	1500Vrms	*
Transient	ANSI/IEEE C37.90.1	*
CMRR (50 or 60Hz)	105dB	*
Accuracy ⁽²⁾	±0.03% Span typical, ±0.1% Span max	*
Linearity ⁽³⁾	±0.01% Span typical, ±0.02% Span max	*
Stability (–40°C to +85°C)		
Gain	±35ppm/°C	*
Input Offset	N/A ⁽⁴⁾	*
Output Offset	±0.003% Span/°C	*
Noise		
Peak at 5MHz B/W	500μV	*
RMS at 10Hz to 100kHz B/W	300μV	*
Peak at 0.1Hz to 10Hz B/W	1μV RTI	*
Frequency and Time Response		
Bandwidth, –3dB	100Hz	*
NMR (–3dB at 100Hz)	80dB per decade above 100Hz	*
Step Response, 90% Span	5ms	*
Supply Voltage	14 to 35VDC	*
Current ⁽¹⁾	12mA	*
Sensitivity	±0.0001%/°V _S	*
Mechanical Dimensions (h)(w)(d)	2.13" x 1.705" x 0.605" max 54.1mm x 43.3mm x 15.4mm max	*
Environmental		
Operating Temperature Range	–40°C to +85°C	*
Storage Temperature Range	–40°C to +85°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 ±0.5% Span Error	*
ESD, EFT	Performance B	*

NOTES:

* Contact factory or your local Dataforth sales office for maximum values.

† Specification same as preceding model

(1) Output Range and Supply Current specifications are based on minimum output load resistance. Minimum output load resistance is calculated by V_{OUT}^2/P_E , where P_E is the output Effective Available Power that guarantees output range, accuracy, and linearity specifications.

(2) Accuracy includes the effects of repeatability, hysteresis, and linearity.

For SCM7B33, does not include SCM7BXR1 accuracy.

(3) Linearity is calculated using the best-fit straight line method.

(4) Input offset term included in output offset specification.

Ordering Information

Model	Input Range
SCM7B32-01	4 to 20mA
SCM7B32-02	0 to 20mA
SCM7B33-01	+1 to +5V
SCM7B33-02	0 to +5V

†Output Ranges Available

Output Range	Part No. Suffix	Example
+1 to +5V	NONE	SCM7B32-01
0 to +5V	A	SCM7B32-01A
0 to +10V	D	SCM7B32-01D