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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 250 Ω 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, ±0.03% of Span Typical, ±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

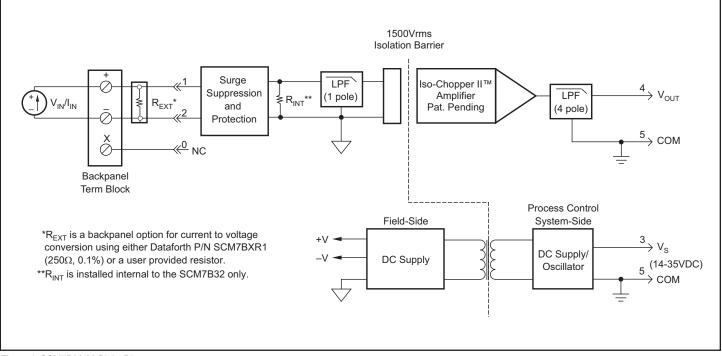


Figure 1: SCM7B32/33 Blok Diagram

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Specifications Typical* at 25°C and +24VDC

Module	SCM7B32	SCM7B33
Input Signal Range Bias Current Resistance Normal Power Off Overload Protection	4-20mA, 0-20mA N/A <100Ω <100Ω 30kΩ	+1 to +5V, 0 to +5V ±0.1nA 2MΩ 2MΩ 2MΩ
Continuous Transient	120Vrms max ANSI/IEEE C37.90.1	*
Output Signal Range ⁽¹⁾ Effective Available Power ⁽¹⁾ Resistance Protection	t 40mW <1Ω Continuous Short to Ground	† * *
Voltage/Current Limit	±12V, ±14mA	*
CMV (Input-to-Output) Continuous Transient CMRR (50 or 60Hz)	1500Vrms ANSI/IEEE C37.90.1 105dB	* * *
Accuracy ⁽²⁾	±0.03% Span typical, ±0.1% Span max	*
Linearity ⁽³⁾ Stability (–40°C to +85°C)	±0.01% Span typical, ±0.02% Span max	*
Gain Input Offset Output Offset Noise	±35ppm/°C N/A ⁽⁴⁾ ±0.003% Span/°C	* * *
Peak at 5MHz B/W RMS at 10Hz to 100kHz B/W Peak at 0.1Hz to 10Hz B/W	500μV 300μV 1μV RTI ⁽⁵⁾	* * *
Frequency and Time Response Bandwidth, –3dB NMR (–3dB at 100Hz) Step Response, 90% Span	100Hz 80dB per Decade above 100Hz 5ms	* * *
Supply Voltage Current ⁽¹⁾ Sensitivity	14 to 35VDC 12mA ±0.0001% % ₅	* * *
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 Storage Temperature Range Relative Humidity Emissions EN61000-6-4 Radiated, Conducted Immunity EN61000-6-2	-40°C to +85°C -40°C to +85°C 0 to 95% Noncondensing ISM, Group 1 Class A ISM, Group 1	* * * * *
RF ESD, EFT	Performance A ±0.5% Span Error 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

(i) experience is calculated by V_{out}/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.

(5) RTI = Referenced to Input.

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