SCM7B40/41

Isolated Analog Voltage Input Modules, Wide Bandwidth

Description

Each SCM7B40/41 voltage input module accepts one channel of analog voltage input which is filtered, isolated, amplified, and converted to a high-level analog voltage for output to the process control system (Figure 1).

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, 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 thenreconstructed 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 Millivolt or Voltage Inputs
- Provides High-Level Voltage Outputs
- 10kHz Bandwidth
- 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, 2mVp-p (5MHz), 1mVrms (100kHz)
- Up to 110dB CMRR
- Easy DIN Rail Mounting
- CSA C/US Certified
- CE and ATEX Compliant

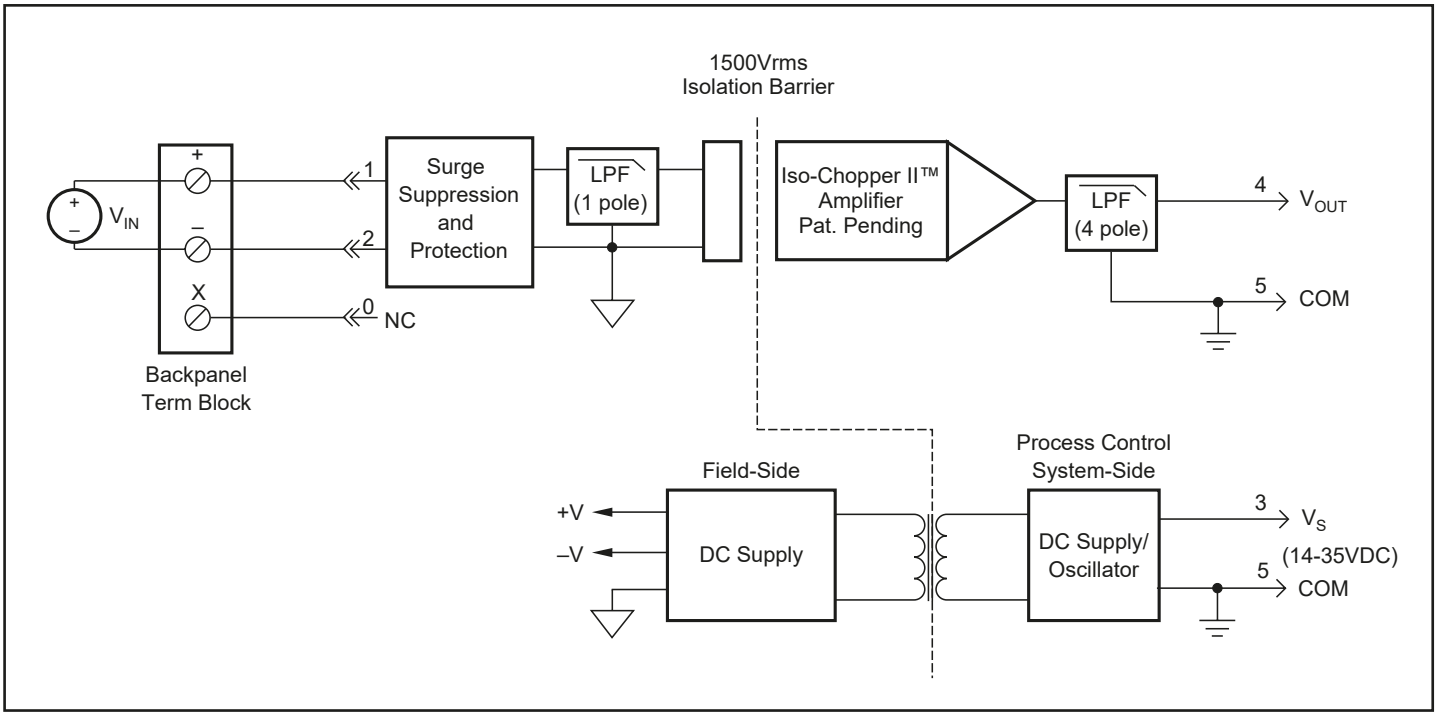

Figure 1: SCM7B40/41 Block Diagram

Specifications

Typical* at 25°C and +24VDC

Module	SCM7B40	SCM7B41
Input		
Signal Range	–1V to +1V	–10V to +40V
Bias Current	±1nA	±0.1nA
Resistance		
Normal	50MΩ	500kΩ min
Power Off	30kΩ min	500kΩ min
Overload	30kΩ min	500kΩ min
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)	110dB	110dB
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	±55ppm/°C
Input Offset	±0.5µV/°C	±5µV/°C
Zero Suppression	±0.005%(V_Z)(4)/°C	*
Output Offset	±0.002% Span/°C	*
Noise		
Peak at 5MHz B/W	2mV	*
RMS at 10Hz to 100kHz B/W	1mV	*
Peak at 0.1Hz to10Hz B/W	1µV RTI(5)	*
Frequency and Time Response		
Bandwidth, –3dB	10kHz	*
NMR	80dB per Decade above10kHz	*
Step Response, 90% Span	50µs	*
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.
(3) Linearity is calculated using the best-fit straight line method.
(4) V_Z is the nominal input voltage that results in a 0V output.
(5) RTI = Referenced to Input.

Ordering Information

Model	Input Range
SCM7B40-02	0 to +100mV
SCM7B40-03	0 to +1V
SCM7B40-07	±100mV
SCM7B40-08	±1V
SCM7B41-01	0 to +10V
SCM7B41-02	±5V
SCM7B41-03	10V
SCM7B41-04	0 to +5V
SCM7B41-05	0 to +20V
SCM7B41-06	0 to +40V

†Output Ranges Available

Output Range	Part No. Suffix	Example
+1 to +5V	NONE	SCM7B40-02
0 to +5V	A	SCM7B40-02A
0 to +10V	D	SCM7B40-02D