SCM7B36
Isolated Potentiometer Input Modules

FEATURES

- INDUSTRY'S FIRST 7B POTENTIOMETER INPUT MODULE
- INTERFACES 100Ω TO 10KΩ POTENTIOMETERS
- HIGH LEVEL VOLTAGE OUTPUTS
- 1500VRMS TRANSFORMER ISOLATION
- ACCURACY, ±0.03% OF SPAN TYPICAL, ±0.1% MAX
- ANSI/IEEE C37.90.1-1989 TRANSIENT PROTECTION
- INPUT PROTECTED TO 120VAC CONTINUOUS
- CSA CERTIFIED, FM APPROVAL PENDING
- CE COMPLIANT

DESCRIPTION

Each SCM7B36 Potentiometer input module provides a single channel of resistance input which is filtered, isolated, amplified, and converted to a high level analog voltage output.

The SCM7B36 module interfaces to slidewires and potentiometers in both two or three wire configuration and incorporates a five-pole filtering approach to maximize both time and frequency response by taking advantage of both 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. In the 3-Wire configuration, lead resistance compensation is provided if the resistance of the "x" lead is closely equivalent to that of the "+" lead. Internal to the module, measurement error due to lead resistance is canceled.

In response to the low level current excitation, and after 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 then reconstructed and filtered for process control system output.

Six standard input resistance ranges are offered, from 100Ω to 10kΩ, with three output ranges available: 0-5V, 1-5V, and 0-10V. Modules accept a wide 14-35VDC power supply range (+24VDC nominal). Their compact packages (2.13" x 1.705" x 0.605" max.) save space and are ideal for high channel density applications. They are designed for easy DIN rail mounting using any of Dataforth's "-DIN" backpanels.

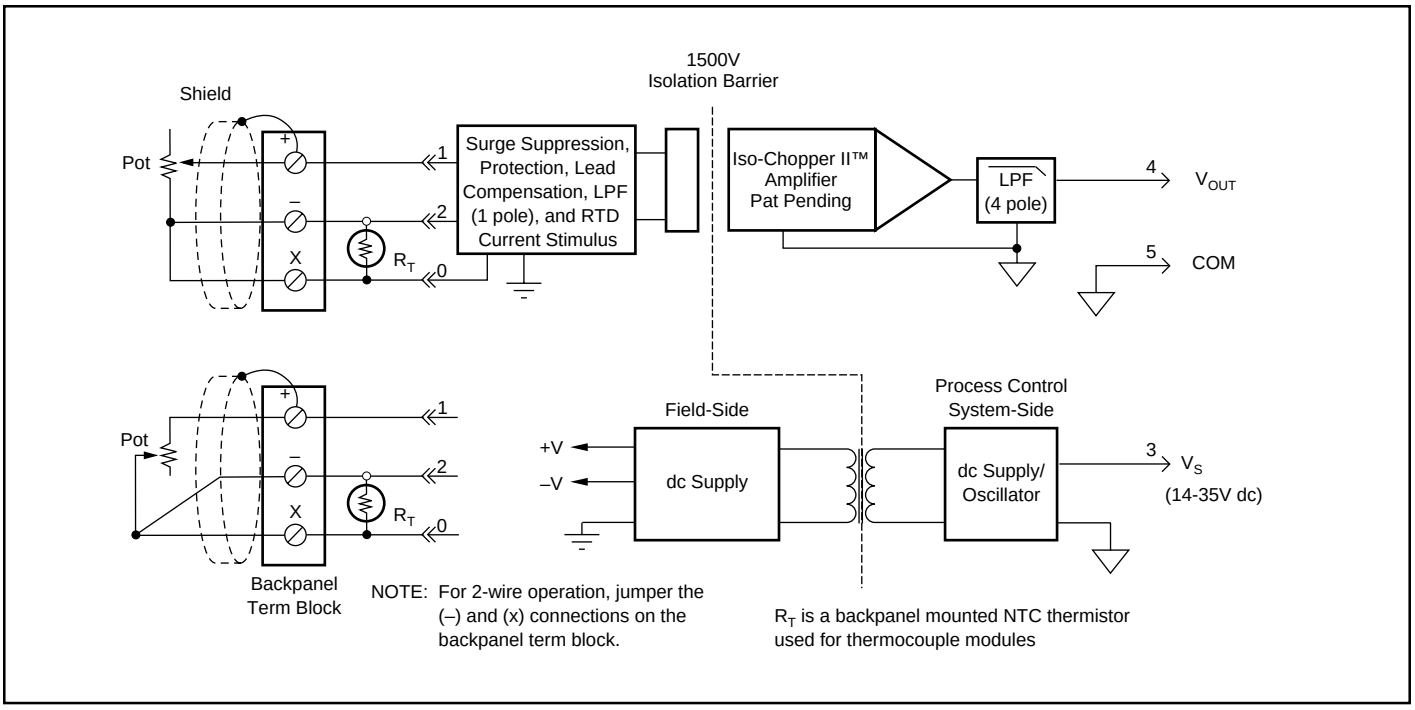

Fig 1: SCM7B36 Block Diagram

SPECIFICATIONS Typical at 25°C and +24VDC

Module	SCM7B36
Input Range	(See Ordering Information below)
Protection	
Continuous	120 Vrms max
Transient	ANSI/IEEE C37.90.1-1989
Sensor Excitation Current	65µA (10kΩ) to 260µA (100Ω)
Lead Resistance Effect (3-Wire)[1]	
	-01 thru -04 : ±0.005Ω/Ω
	-05 : ±0.02Ω/Ω
	-06 : ±0.04Ω/Ω
Output Range[2]	◆
(See Output Range below)	
Effective Available Power[2]	40 mW
Resistance	< 1Ω
Protection	Continuous Short-to-Ground
Voltage/Current Limit	±12 V, ±14 mA
CMV (Input to Output)	
Continuous	1500 Vrms
Transient	ANSI/IEEE C37.90.1-1989
CMRR (50 or 60Hz)	120 dB
Accuracy[3]	±0.03% Span typical, ±0.1% Span max
Nonlinearity [4]	±0.01% Span typical, ±0.02% Span max
Stability (-40°C to +85°C)	
Input Offset	±0.01Ω/°C
Output Offset	±30µV/°C
Gain	±60 ppm/°C
Noise Peak @ 5Mhz B/W	1 mV
RMS @ 10Hz to 100Khz B/W	250 µV
Peak @ 0.1Hz (10Hz B/W	1 µV
Frequency and Time Response	
Bandwidth, -3dB	3 Hz
NMR (50/60 Hz)	80/85dB
Step Response, 0 to 90%	250 ms
Supply Voltage	14-35 Vdc
Current[2]	12mA
Sensitivity	±0.0001%/% Vs
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 Temp. Range	-40°C to +85°C
Storage Temp. Range	-40˚C to +85°C
Relative Humidity	0 to 90% Noncondensing
Emmissions	EN50081-1, ISM Group 1, Class A (Radiated, Conducted)
Immunity	EN50082-1, ISM Group 1, Class A (ESD, RF, EFT)

NOTES
[1] Lead resistance effect is given for the condition of not having the NTC thermistor installed in the backpanel. As a general rule; as long as the lead resistance of the (+) lead matches the parallel combination of the thermistor and lead resistance in the (X) lead, the given specifications apply.
[2] 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 and accuracy specifications.
[3] Accuracy includes the effects of repeatability, hysteresis, and linearity, but does not include sensor accuracy.
[4] Nonlinearity is calculated using the best-fit straight line method.

ORDERING INFORMATION

MODEL	INPUT RANGE
SCM7B36-01	0 - 100Ω
SCM7B36-02	0 - 200Ω
SCM7B36-03	0 - 500Ω
SCM7B36-04	0 - 1KΩ
SCM7B36-05	0 - 5KΩ
SCM7B36-06	0 - 10KΩ

◆OUTPUT RANGES AVAILABLE

OUTPUT RANGE	PART NUMBER MODIFIER	EXAMPLE
+1 to +5V	(none)	SCM7B36-01
0 to +5V	A	SCM7B36-01A
0 to +10V	D	SCM7B36-01D