

SCIM5B36

Potentiometer Input Modules

Description

SCIM5B36 Potentiometer input module provides a single channel of Potentiometer input which is filtered, isolated, amplified, and converted to a high level analog voltage output (Figure 1). This signal output is controlled by a logic switch which allows these modules to share common analog bus without the requirement of external multiplexers.

The SCIM5B modules are designed with a completely isolated output side circuitry which can be floated to more than $\pm 50V$ from Power Common, pin 16. No connection is required between I/O Common and Power Common for proper operation of the output switch. The output switch can be turned on continuously by simply shorting pins 22,19.

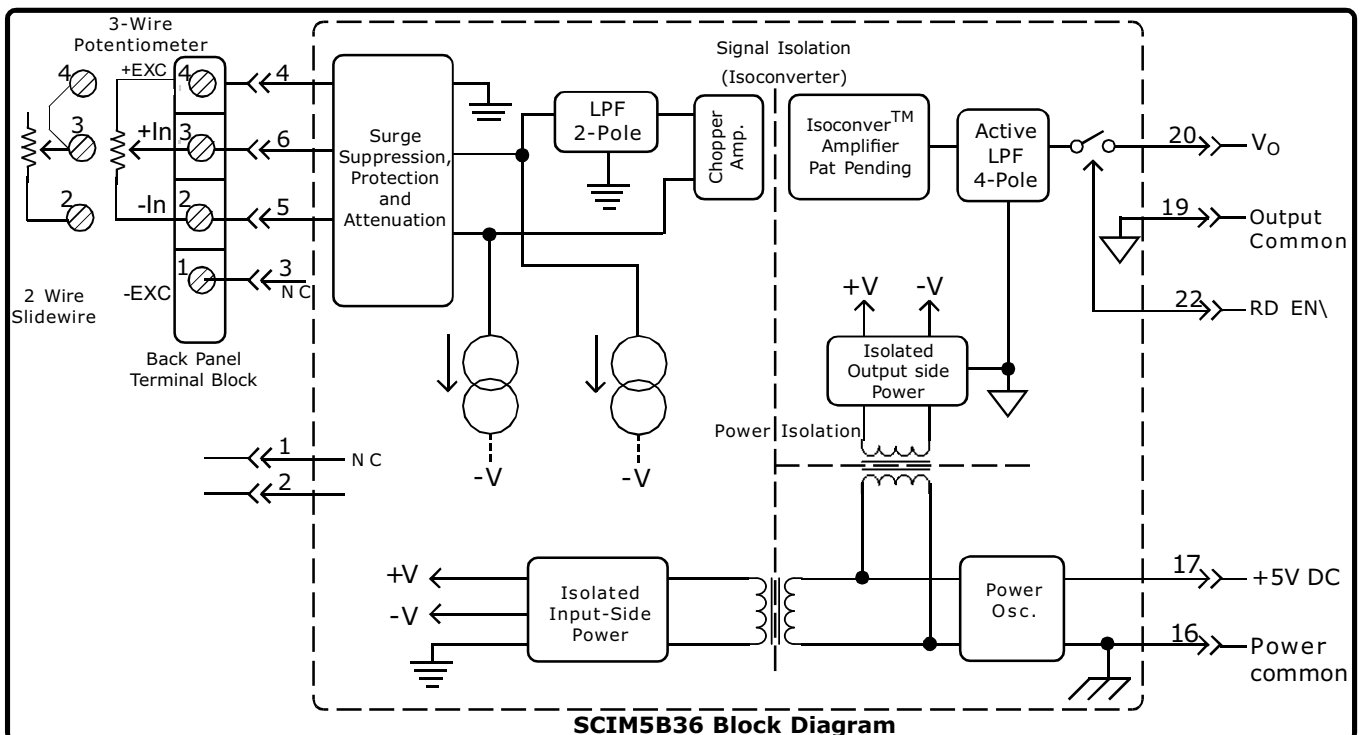
The Potentiometer excitation is provided from the module by a precision current source. By using a 3-wire potentiometer, this method allows cancellation of the effects of lead resistances. The excitation current available are very small (less than 1.0mA) which reduces self-heating of the potentiometer.

Signal filtering is accomplished with a six-pole filter which provides 95dB of normal-mode-rejection at 60Hz and 90dB at 50Hz. Two poles of this filter are on the input side of the isolation barrier and the other four are on the output side. After the initial field-side filtering the input signal is chopped by a proprietary converter circuit. Isolation is provided by transformer coupling which eliminates common mode spikes or surges. The module is powered from +5V DC, $\pm 5\%$

A special input protection circuitry on the SCIM5B36 module protects against accidental input voltages up to 250V AC.

Features

- Potentiometers up to 10,000 Ω Input
- Standard Output of either 0 to 10V/ $\pm 10V$, 0 to 5V, 1 to 5V
- 1.5KV Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- 250V AC Continuous Protected on Input
- 160dB CMR
- 95dB NMR at 60Hz, 90dB at 50Hz
- $\pm 0.03\%$ Accuracy
- $\pm 0.005\%$ Linearity
- CSA , CE and ATEX Compliant
- Mixes and Matches with all SCIM5B Types on Backpanel



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

Module	SCIM5B36
Input	
Range	0 to 10K Ω
Resistance	
Normal	50M Ω
Power off	40K Ω
Overload	40K Ω
Protection	
Continuous	250V rms max
Transient	ANSI/IEEE C37.90.1
Sensor Excitation Current	0.25mA; 100 Ω , 500 Ω , 1K Ω sensor 0.10mA; 10K Ω sensor
Lead Resistance Effect	$\pm 0.01\Omega / \Omega$; 100 Ω , 500 Ω , 1K Ω sensor $\pm 0.02\Omega / \Omega$; 10K Ω sensor
CMV input to output	
Continuous	1500V rms max
Transient	ANSI/IEEE C37.90.1
CMR (50 or 60Hz)	160dB
NMR	95dB at 60Hz, 90dB at 50Hz
Accuracy ⁽¹⁾	$\pm 0.03\%$ Span
Nonlinearity	$\pm 0.005\%$ Span
Stability	
Input offset	$\pm 0.004\Omega / ^{\circ}\text{C}$; 100 Ω , 500 Ω , 1K Ω sensor $\pm 0.010\Omega / ^{\circ}\text{C}$; 10K Ω sensor
Output offset	$\pm 20\mu\text{V} / ^{\circ}\text{C}$
Gain	$\pm 50\text{ppm}$ of reading / $^{\circ}\text{C}$
Noise	
Input, 0.1 to 10Hz	0.2 μV rms
Output, 100KHz	200 μV rms
Bandwidth - 3dB	4Hz
Response Time, 90% Span	200mS
Output	
Range	See Ordering Information
Resistance	50 Ω
Protection	Continuous Short to Ground
Selection Time (to $\pm 1\text{mV}$ of V_{OUT})	6 μs at $C_{\text{load}}=0$ to 2000pF
Current Limit	+8mA
Output Enable Control	
Max Logic "0"	+0.8V
Min Logic "1"	+2.4V
Max Logic "1"	+3.6V
Input Current "0,1"	0.5 μA
Open input Response	Downscale
Open Input Detection Time	3s
Power supply voltage	+5V DC $\pm 5\%$
Power supply Current	30mA
Power supply Sensitivity	$\pm 2\mu\text{V} / \%$ RTI ⁽²⁾
Mechanical Dimensions (H) (W) (D)	2.28" x 2.26" x 0.60" (58mm x 57mm x 15mm)
Environmental	
Operating Temp. Range	-40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$
ATEX Group II, Cat, 3	-20 $^{\circ}\text{C}$ to +40 $^{\circ}\text{C}$
Storage Temp. Range	-40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$
Relative Humidity	0 to 95% Noncondensing
Emissions EN61000-6-4 Radiated, Conducted	ISM, Group 1 Class A
Immunity EN61000-6-2 RF Susceptibility	ISM, Group 1
ESD, EFT, surge, voltage dips	Performance A $\pm 0.5\%$ Span Error Performance B

Ordering Information

Model	Input Range (rms)	Output Range (DC)
SCIM5B36-01	0 to 100 Ω	1,2,3,4,8
SCIM5B36-02	0 to 500 Ω	1,2,3,4,8
SCIM5B36-03	0 to 1K Ω	1,2,3,4,8
SCIM5B36-04	0 to 10K Ω	1,2,3,4,8

Output Ranges Available

Output Range	Part No. Suffix	Example
1. -5V to +5V	Z	SCIM5B36-01Z
2. -10V to +10V	X	SCIM5B36-01X
3. 0V to +5V	NONE	SCIM5B36-01
4. 0V to +10V	D	SCIM5B36-01D
8. 1V to +5V	Y	SCIM5B36-01Y

Notes:

- (1). Includes nonlinearity, hysteresis and repeatability
(2). Referenced to input.