SCIM5B34

Linearized 2- or 3- Wire RTD Input Modules

Description

SCIM5B34 RTD input module provides a single RTD input which is converted to DC value then filtered, isolated and converted to a standard level voltage output (Figure 1). This signal output is controlled by a logic-switch which enables these modules to share a common analog bus.No external multiplexers are required.

The SCIM5B modules are designed with a completely isolated output side circuitry which can be floated to more than ±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.

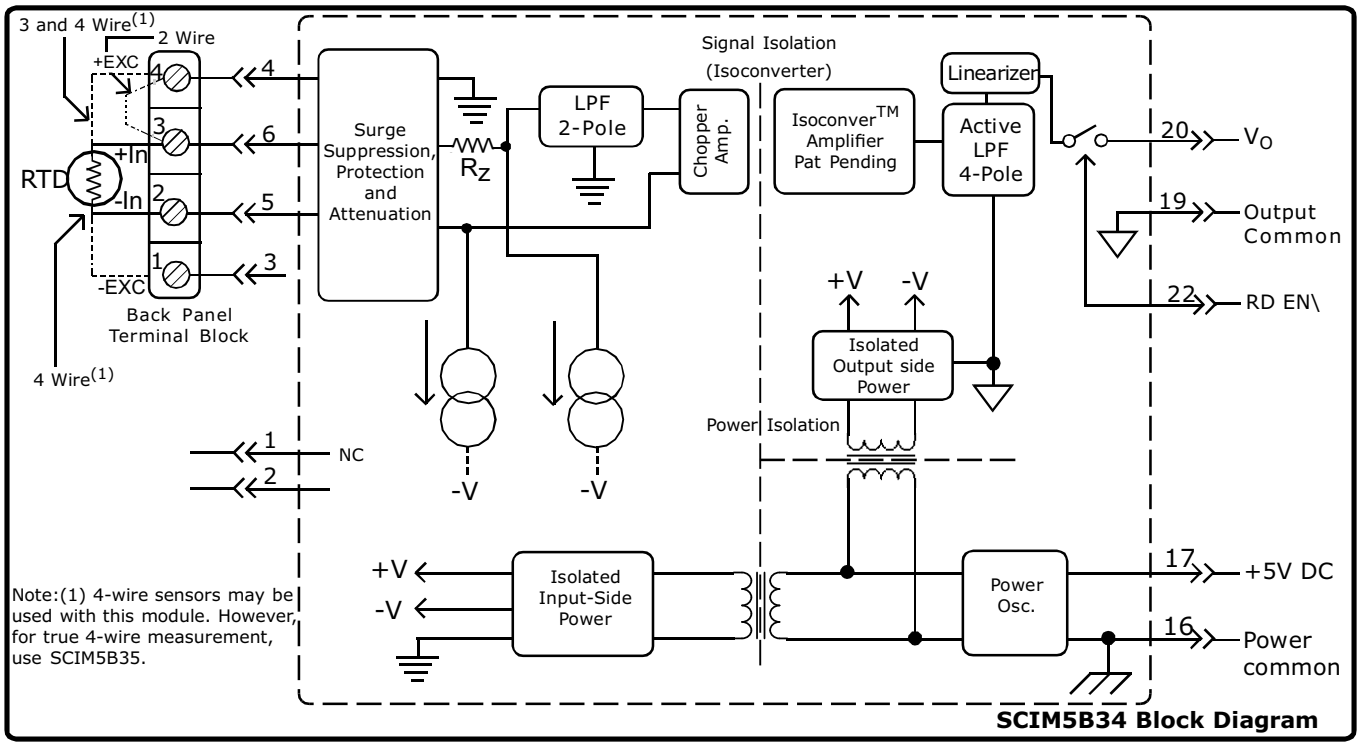
The RTD excitation is provided from the module by two matched current sources. By using a three-wire RTD, this method allows an equal current to flow in each RTD lead, which cancels the effects of lead resistances. The excitation currents are very small (0.25mA for 100W Pt and 120W Ni, and 1.0mA for 10Ω Cu) which reduces self-heating of the RTD.

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 the filter are on the input side of the isolation barrier and other two on the computer side. After the initial input-side filtering, the input signal is chopped by a proprietary converter circuit. Isolation is provided by transformer coupling, again using a propriety technique to suppress transmission of common mode spikes or surges. The module is powered from +5V DC, ±5%

A special input circuitry on SCIM5B34 module provides protection against accidental input voltages up to 250V AC.

Features

- 100Ω Platinum, 10Ω Copper, or 120Ω Nickel RTD Input
- Linearizes RTD Signal
- Standard Output of either 0 to 10V/+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
- CSA , CE and ATEX Compliant
- Mixes and Matches with all SCIM5B Types on Backpanel



SCIM5B34 Block Diagram

Specifications

Typical at T_A=+25°C and +5V Power supply

Module	SCIM5B34
Input	
Range Limits	-200°C to +850°C (100Ω Pt) -80°C to 320°C (120Ω Ni) -100°C to 260°C (10Ω Cu)
Resistance	
Normal	50MΩ
Power off	40KΩ
Overload	40KΩ
Protection	
Continuous	250V rms max
Transient	ANSI/IEEE C37.90.1
Sensor Excitation Current	
100Ω Pt, 120Ω Ni	0.25mA
10W Cu	1.0mA
Lead Resistance Effect	
100Ω Pt, 120Ω Ni	±0.02°C / Ω (1)
10Ω Cu	±0.2°C / Ω (1)
CMV, Input to Output	
Continuous	1500Vrms max
Transient	ANSI/IEEE C37.90.1
CMR (50 or 60Hz)	160dB
NMR	95dB at 60Hz, 90dB at 50Hz
Accuracy	See Ordering Information
Conformity Error (3)	±0.025% Span
Stability	
Input Offset	±0.01°C/°C
Output Offset	±20uV/°C
Gain	±35ppm / °C
Noise	
Input, 0.1 to 10Hz	0.2uV rms
Output, 100KHz	200uV rms
Bandwidth - 3dB	4Hz
Response Time, 90% Span	200mS
Output	
Range	See Ordering Information
Resistance	50Ω
Protection	Continuous Short to Ground
Selection Time (to +1mV of V_{OUT})	6uS at C_{load} =0 to 2000pF
Current Limit	+8mA
Output Enable Control	
Max Logic "0"	+0.8V
Min Logic "1"	+2.4V
Max Logic "1"	+36V
Input Current "0,1"	0.5µA
Open input Response	Downscale
Open Input Detection Time	3s
Power supply voltage	+5V DC ±5%
Power supply Current	30mA
Power supply Sensitivity	
100Ω Pt, 120w Ni	0.2°C / V
10Ω Cu	0.5°C / V
Mechanical Dimensions (H) (W) (D)	2.28" x 2.26" x 0.60" (58mm x 57mm x 15mm)
Environmental	
Operating Temp.Range	-40°C to +85°C
ATEX Group II, Cat, 3	-20°C to +40°C
Storage Temp. 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 Susceptability	Performance A ±0.5% Span Error
ESD,EFT,surge,voltage dips	Performance B

Notes:
(1). "Ω" refers to the resistance in one lead.
(2). Includes conformity, hysteresis and repeatability.
(3). Conformity error is ±0.05% Span for SCIM5B34N-01

Ordering Information

Model	Input Range	Output Ranges (DC)	Accuracy (2)
100Ω Pt **			
SCIM5B34-01	-100°C +100°C (-148°F to +212°F	1,2,3,4,8	±0.12°C
SCIM5B34-02	0°C to +100°C (+32°F to +212°F	1,2,3,4,8	±0.06°C
SCIM5B34-03	0°C to +200°C (+32°F to +392°F	1,2,3,4,8	±0.12°C
SCIM5B34-04	0°C +600°C (+32°F to +1112°F)	1,2,3,4,8	±0.36°C
SCIM5B34-05	-100°C +200°C (+148°F to +392°F)	1,2,3,4,8	±0.18°C
10Ω Cu **			
SCIM5B34C-01	0°C +120°C (10Ω at 0°C) (+32°F to +248°F)	1,2,3,4,8	±0.23°C
SCIM5B34C-02	0°C +120°C (10Ω at 25°C) (+32°F to +248°F)	1,2,3,4,8	±0.23°C
SCIM5B34C-03	0°C +160°C (10Ω at 0°C) (+32°F to +320°F)	1,2,3,4,8	±0.32°C
120Ω Ni **			
SCIM5B34N-01	0°C +300°C (+32°F to +572°F)	1,2,3,4,8	±0.23°C

** RTD Standards

Type	Alpha Coefficient	DIN	JIS
100Ω Pt 120Ω Ni 10Ω CU	0.00385 0.00672 0.004274	DIN 43760	JIS C 1604-1989

Output Ranges Available

Output Range	Part No. Suffix	Example
1.-5V to +5V	Z	SCIM5B34-01Z
2.-10V to +10V	X	SCIM5B34-01X
3. 0V to +5V	C	SCIM5B34-01C
4. 0V to +10V	E	SCIM5B34-01E
8. 1V to +5V	Y	SCIM5B34-01Y