SCIM7B34/34N

Isolated Linearized 2- or 3-Wire Input Modules

Description

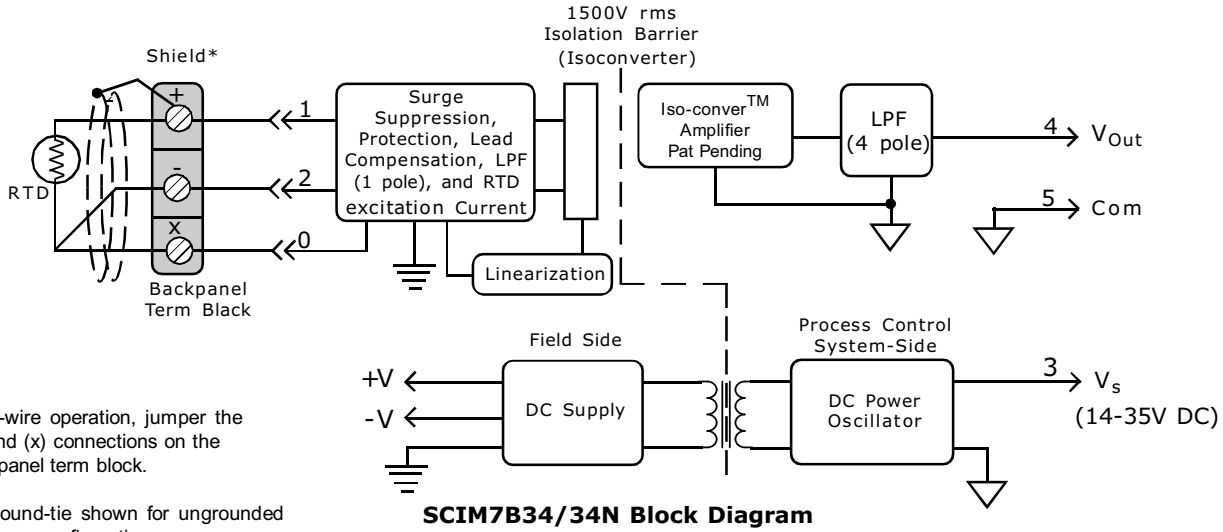
SCIM7B34/34N RTD input modules is a single channel RTD input which if filtered, isolated, amplified, and converted to standard-level voltage output. A five pole filter is provided with signal filtering which provides up to 85dB NMR at 50/60Hz
In response to rhe low level current excitation signal the input RTD signal is chopped by a proprietary converter circuit after initial filter stage, isolation is provided by transformer coupling which eliminates common mode spikes and surges.The signal is then reconstructed and filtered for process control system output.

Linearization is achieved by creating a non-linear transfer function through the module itself. This function is configured at the factory and is designed to be equal and opposite to the specific RTD non-linearity. Lead compensation is achieved by matching to current path thus canceling the effects of lead resistance.

These modules accepts a wide 14 - 35VDC power supply range (+24VDC nominal).The mechanical (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 nay of the "DIN" backpanels.

Features

- Interfaces to 100Ω, platinum or 120Ω, Nickel RTDS
- Works on 250µA RTD excitation current
- Linearizes RTD Signal response
- Standard Output of either 0 to 10V/+10V, 0 to 5V, 1 to 5V.
- 1.5KV Isolation
- Accuracy ±0.05% to ±0.15% of span typical
- Nonconformity, ±0.025% to ±0.07% of Span typical
- ANSI/IEEE C37.90.1 Transient Protection
- 120V rms Continuous Protected on Input
- Noise, 500µV Peak (5MHz), 250mV rms (100KHz)
- 120dB CMR
- 85dB NMR,
- Easy DIN Rail Mounting
- CSA , FM , CE and ATEX Compliant



Note: for 2-wire operation, jumper the (-) and (x) connections on the backpanel term block.

* Shield ground-tie shown for ungrounded RTD sensor configuration.

SCIM7B34/34N Block Diagram

Specifications

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

Module	SCIM7B34	SCIM7B34N
Input		
Signal Range	100Ω Pt RTD see Ordering information	120Ω Ni RTD *
Protection		
Continuous	120V rms max.	*
Transient	ANSI/IEEE C37.90.1	*
Sensor Excitation Current (1)	~250µA	*
Lead Resistance effect	±0.02°C/Ω max	*
Output		
Signal Range(2)	See Ordering Information	*
Effective available power(2)	40µΩ	*
Resistance	<1Ω	*
Protection	Continuous short to ground	*
Voltage/Current Limit	±12V, ±14µA	*
CMV (Input to Output)		
Continous	1500V rms	*
Transient	ANSI/IEEE C37.90.1	*
CMRR (50 or 60Hz)	160dB	*
Accuracy(3)	See Ordering Information	*
Nonlinearity(4)	See Ordering Information	*
Stability (-40°C to +85°C)		
Gain	±60ppm/°C	*
Input Offset	±1µV/°C	*
Zero Suppression	±0.002%(R_Z/R_{SPAN})(5)°C	*
Output Offset	±0.002% Span/°C	*
Noise		
Peak at 5MHz B/W	500µV	*
RMS at 10Hz to 100KHz B/W	250µV	*
Peak at 0.1Hz to 10Hz B/W	1µV RTI	*
Open Input Response		
'+' Lead	Upscale	*
'-' Lead	Non-deterministic	*
'x' Lead	Downscale	*
Open Input Detection Time	<5s	*
Frequency and Time Response		
Bandwidth, -3dB	3Hz	*
NMR (50/60Hz)	80/85dB	*
Step Response, 90% span	250ms	*
Power supply voltage	14 to 35V DC	*
Power supply Current(2)	12µA	*
Power supply Sensitivity	±0.0001%/%V_S	*
Mechanical Dimensions	2.13"x1.705"x0.605"max	*
(H) (W) (D)	(54.1x43.3x15.4mm)max	*
Environmental		
Operating Temp.Range	-40°C to +85°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	Performance A ±0.5% Span Error	*
ESD,EFT,Surge,Voltage Dips	Performance B	*

Ordering Information

Model	Input Range	Accuracy(2) Typical	Accuracy(2) Max	Nonlinearity(3) Typical	Nonlinearity(3) Max	Output Range
100Ω Pt**						
SCIM7B34-01	-100°C to +100°C (-148°F to +212°F)	±0.075% (0.15°C)	±0.15% (0.30°C)	±0.025% (0.05°C)	±0.05% (0.10°C)	1, 2, 3, 4, 5
SCIM7B34-02	0°C to +100°C (+32°F to +212°F)	±0.10% (0.10°C)	±0.2% (0.20°C)	±0.025% (0.025°C)	±0.05% (0.05°C)	1, 2, 3, 4, 5
SCIM7B34-03	0°C to +200°C (+32°F to +392°F)	±0.075% (0.15°C)	±0.15% (0.30°C)	±0.025% (0.05°C)	±0.05% (0.10°C)	1, 2, 3, 4, 5
SCIM7B34-04	0°C to +600°C (+32°F to +1112°F)	±0.05% (0.30°C)	±0.1% (0.60°C)	±0.025% (0.15°C)	±0.05% (0.30°C)	1, 2, 3, 4, 5
SCIM7B34-05	-50°C to +350°C (-58°F to +662°F)	±0.05% (0.20°C)	±0.1% (0.40°C)	±0.025% (0.1°C)	±0.05% (0.20°C)	1, 2, 3, 4, 5
120ΩNi**						
SCIM7B34N-01	0°C to +300°C (+32°F to +572°F)	±0.15% (0.45°C)	±0.3% (0.90°C)	±0.06% (0.18°C)	±0.12% (0.36°C)	1, 2, 3, 4, 5
SCIM7B34N-02	0°C to +200°C (+32°F to +392°F)	±0.15% (0.30°C)	±0.3% (0.60°C)	±0.07% (0.14°C)	±0.14% (0.28°C)	1, 2, 3, 4, 5

Output Ranges Available

Output Range	Part No. Suffix	Example
1. 1 to +5V	NONE	SCIM7B34-01
2. 0 to +5V	A	SCIM7B34-01A
3. 0 to +10V	D	SCIM7B34-01D
4. -5V to +5V	C	SCIM7B34-01C
5. -10V to +10V	B	SCIM7B34-01B

** RTD Standards

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

Note:

Specifications same as preceding model.

(1). Sensor excitation current is model dependent.

(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, accuracy, and conformity, specifications.

(3). Accuracy includes the effects of repeatability, hysteresis, and conformity.

(4). Nonlinearity is calculated using the best-fit straight line method.

(5). R_Z is the value of the RTD resistance at the lowest measurement point. R_{span} is the change in resistance over the measurement span.