

SCIM5B42

2-Wire Transmitter Interface Modules

Description

SCIM5B42 2-wire transmitter interface module provides a single channel which accepts a 4 to 20mA process current input and provides a standard +1 to +5V or +2 to +10V output signal (Figure 1). An isolated +20V DC regulated power supply is provided to power the current transmitter. This allows a 2-wire loop powered transmitter to be directly connected to the SCIM5B42 without requiring an external power supply. The regulated supply will provide a nominal +20VDC at loop current of 4mA to 20mA.

The SCIM5B42 will provide a 1500V isolation barrier for non-isolated 2-wire field transmitters. It can also be used when additional isolation is required between an isolated 2-wire transmitter and the input stage of the control room computer.

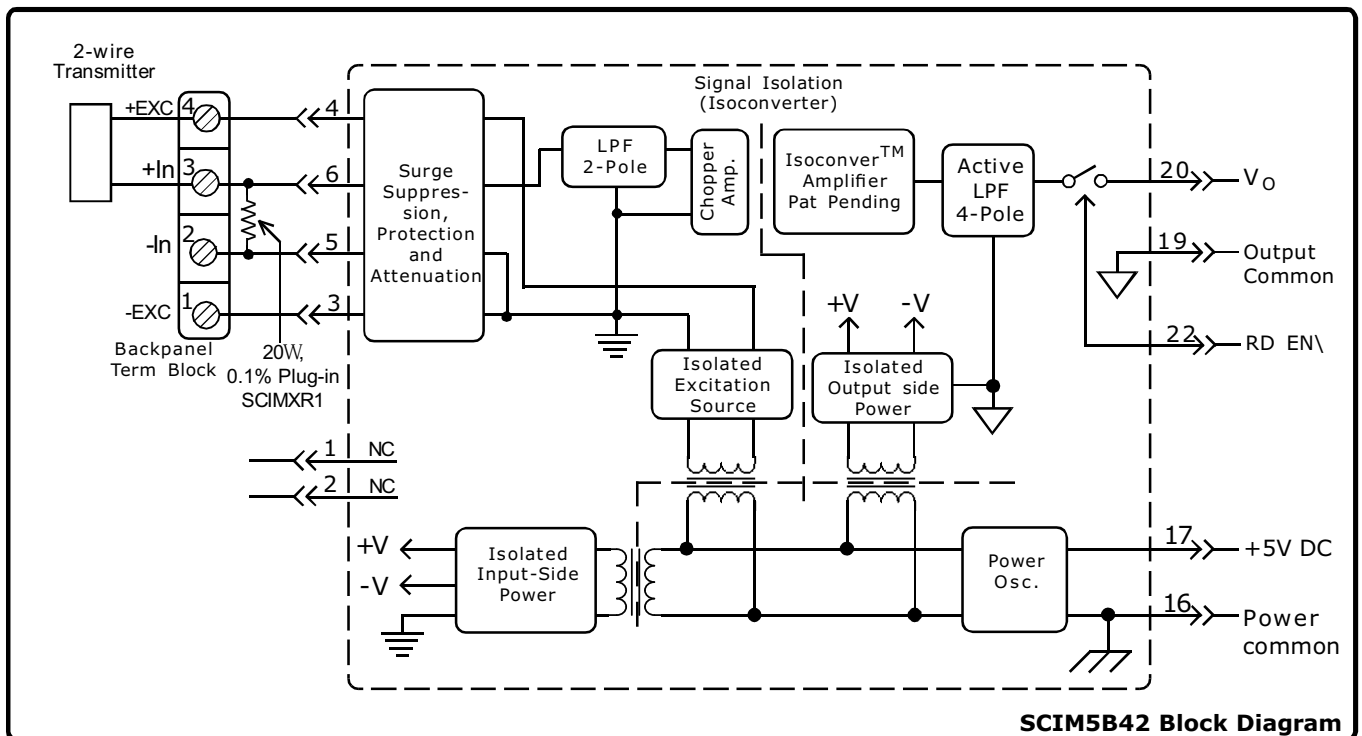
This signal output is controlled by a logic-switch which enables these modules to share a common analog bus. No external multiplexers are required.

The SCIM5B modules are designed with a completely isolated output side circuitry which can be floated to more than $\pm 50V$ 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.

A precision 20W current conversion resistor is supplied with the module. Sockets are provided on the SCIM5B01/02/03/04/05/06/07 backpanels to allow installation of this resistor. Extra resistors are available under part number SCIMXR1. All field inputs are fully protected from accidental connection of power-line voltages up to 250VAC. The module has a 3dB bandwidth of 100Hz. Signal filtering is accomplished with a six-pole filter, with two poles on the input side of the isolation barrier, and the other four on the outputs side.

Features

- Isolated +20V DC Current Loop supply
- Provides Isolation for non-Isolated 2-Wire Transmitters.
- Standard Output of either 0 to 10V/+10V, 0 to 5V, 1 to 5V
- 1.5KV Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protected to 250VAC Continuous
- 100dB CMR
- 100Hz Signal Bandwidth
- $\pm 0.03\%$ Accuracy
- $\pm 0.005\%$ Linearity
- CSA , FM , CE and ATEX Compliant
- Mixes and Matches with all SCIM5B Types on Backpanel



SCIM5B42 Block Diagram

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

Module	SCIM5B42
Input	
Range	4 to 20mA
Resistor Value	20.00 Ω
Accuracy	$\pm 0.1\%$
Stability	$\pm 10\text{ppm}/^{\circ}\text{C}$
Loop supply voltage	Nominal 20V at 4 to 20mA
Isolated Excitation Protection	
Continuous	250V rms max.
Transient	ANSI/IEEE C37.90.1
Input Protection	
Continuous	250V rms max.
Transient	ANSI/IEEE C37.90.1
CMV, Input to Output	
Continuous	1500V rms max
Transient	ANSI/IEEE C37.90.1
CMR (50 or 60Hz)	100dB
NMR (-3dB at 100Hz)	120dB per Decade Above 100Hz
Accuracy ⁽¹⁾	$\pm 0.03\%$ Span
Nonlinearity	$\pm 0.005\%$ Span
Stability	
Input Offset	$\pm 1\mu\text{V}/^{\circ}\text{C}$
Output Offset	$\pm 40\mu\text{V}/^{\circ}\text{C}$
Gain	$\pm 25\text{ppm}/^{\circ}\text{C}$ of Reading
Noise	
Input, 0.1 to 10KHz	10nA rms
Output, 100KHz	500 μV rms
Bandwidth, - 3dB	100Hz
Response Time, 10 to 90% Span	4ms
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"	+36V
Input Current "0.1"	0.5mA
Power supply voltage	+5V DC $\pm 5\%$
Power supply Current	180mA at Transmitter Load of 20mA 100mA at Transmitter Load of 4mA
Power supply Sensitivity	$\pm 10\mu\text{V}/\%$ 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 $^{\circ}\text{C}$
Storage Temp. Range	-40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$
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 $\pm 0.5\%$ Span Error
ESD,EFT,Surge,Voltage Dips	Performance B

Ordering Information

Model	Input Range	Output Range
SCIM5B42-01	4mA to 20mA	+1V to +5V
SCIM5B42-02	4mA to 20mA	+2V to +10V
SCIM5B42-03	4mA to 20mA	0V to +5V
SCIM5B42-04	4mA to 20mA	0V to +10V

Note:

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