

SCM5B48

Accelerometer Input Module



Description

The SCM5B48 provides excitation to piezoelectric sensors with built-in microelectronic amplifiers, commonly known as ICP®* or IEPE* or LIVM* sensors. The module provides a constant current excitation to the sensor, then isolates, filters, and amplifies the sensor output, yielding a high-level analog voltage output (Figure 1). The excitation current, signal gain, and filter high-pass and low-pass cutoff frequencies are field-configurable through a set of slide switches.

Six poles of signal filtering in the SCM5B48 module result in greater than 100dB of normal-mode rejection for signal frequencies above the cutoff frequency. One pole of filtering is on the field side of the isolation barrier for anti-aliasing purposes and the remaining five-pole programmable Bessel filter is located on the system side. High-pass filtering is achieved through a second order passive filter, located on the field side. If desired, the output switch can be turned on continuously by simply connecting pin 22, the Read-Enable pin, to I/O Common, pin 19.

The SCM5B48 offers the option of setting the constant current source for sensor excitation to common values of 4mA or 9mA with a compliance voltage of 24VDC. Programmable gains of 1, 10 and 100 are selectable and the module offers a $\pm 10V$ output. The required supply level is +5VDC, $\pm 5\%$.

To ensure protection of expensive data acquisition equipment, the SCM5B48 module signal inputs and sensor excitation outputs are protected against accidental connection of voltages up to 240Vrms.

*ICP is a registered trademark of PCB Group Inc.

*IEPE is Integrated Electronic Piezo-Electric

*LIVM is Low Impedance Voltage Mode

Features

- Interfaces to ICP®* or IEPE* or LIVM* Sensors
- $\pm 5V$ or $\pm 10V$ Output Range
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protection to 240Vrms Continuous
- 1, 10, and 100 Programmable Gain
- 2.5, 5, 10, and 20kHz Programmable LP Filter
- 0.2 and 10Hz Programmable HP Filter
- 4mA or 9mA Programmable Current Excitation
- 100dB CMR
- $\pm 0.2\%$ Accuracy
- $\pm 0.01\%$ Linearity
- Low Drift with Ambient Temperature
- $-40^{\circ}C$ to $+85^{\circ}C$ Operating Temperature Range
- CSA C/US Certified
- CE Compliant
- ATEX Compliance Pending
- Mix and Match SCM5B Types on Backpanel

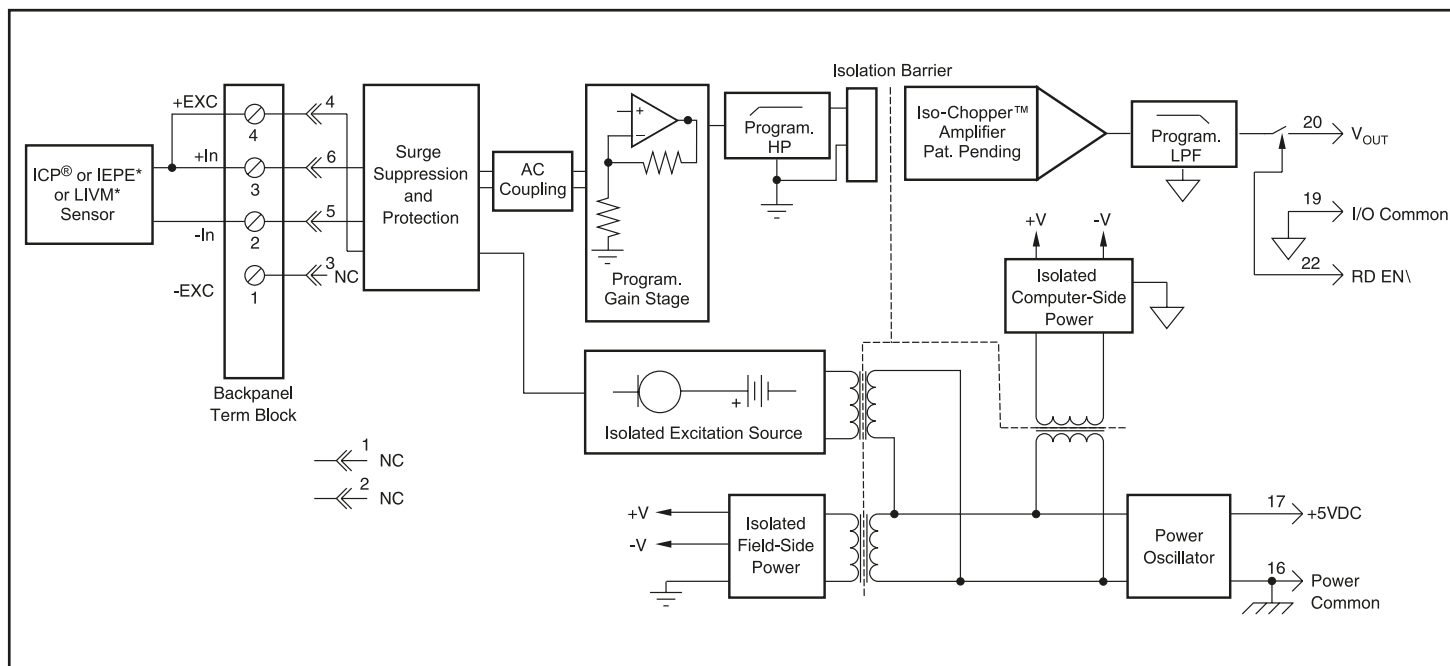


Figure 1: SCM5B48 Block Diagram

Specifications Typical* at $T_A = +25^{\circ}\text{C}$ and +5VDC power

Module	SCM5B48
Input Type Range ⁽¹⁾ Protection Continuous Transient	Accelerometer $\pm 10\text{V}$ 240Vrms max ANSI/IEEE C37.90.1
Excitation Constant Current ⁽²⁾ Compliance Voltage Protection Continuous Transient	4mA or 9mA, $\pm 10\%$ 24V $\pm 10\%$ 240Vrms max ANSI/IEEE C37.90.1
Output Range Resistance Protection	See Ordering Information 50 Ω Continuous Short to Ground
Gain Programmable ⁽²⁾	1, 10, 100
CMR (50/60Hz) Accuracy ⁽³⁾ Linearity Stability Offset Gain Output Noise, Gain \neq , BW=20kHz Low Pass Filter Type Programmable ⁽²⁾ High Pass Filter Programmable ⁽²⁾ CMV (Input to Output) Continuous Transient NMR	100dB $\pm 0.2\%$ Span $\pm 0.01\%$ Span $\pm 25\text{ppm}/^{\circ}\text{C}$ $\pm 100\text{ppm}/^{\circ}\text{C}$ 200 μVrms Bessel 2.5kHz, 5kHz, 10kHz, 20kHz DC, 0.2Hz, 10Hz 1500Vrms max ANSI/IEEE C37.90.1 100db per Decade above cutoff frequency
Power Supply Voltage Power Supply Current	+5VDC $\pm 5\%$ 110mA typical (9mA excitation) 70mA typical (4mA excitation)
Power Supply Sensitivity	$\pm 600\mu\text{V}/\%$ RTI ⁽⁴⁾
Mechanical Dimensions (h)(w)(d)	2.28" x 2.26" x 0.6" (58mm x 57mm x 15mm)
Environmental Operating Temperature Range Storage Temperature Range	-40°C to $+85^{\circ}\text{C}$ -40°C to $+85^{\circ}\text{C}$

NOTES:

*Contact factory or your local Dataforth sales office for maximum values.

(1) AC peak for AC coupling. For DC coupling input range (AC + DC): 0 to +10V.

(2) Programmable using slide switches on the bottom of the module.

(3) Includes linearity, repeatability and hysteresis.

(4) RTI = Referenced to input.

Ordering Information

Model	Input Range ⁽¹⁾	Output Range	Bandwidth
SCM5B48-01	-10V to +10V	-10V to +10V	2.5kHz to 20kHz ⁽²⁾
SCM5B48-02	-10V to +10V	-5V to +5V	2.5kHz to 20kHz ⁽²⁾

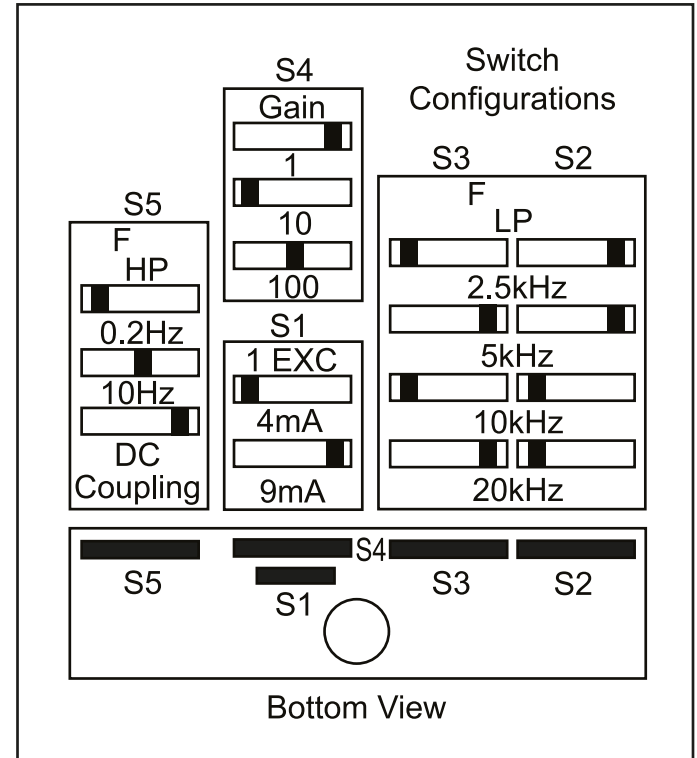


Figure 2: SCM5B48 Side Label