

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. 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 ±10V output. The required supply level is +5VDC, ±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.

► Features

- Interfaces to ICP®* or IEPE* or LIVM* Sensors
- ±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
- ±0.2% Accuracy
- ±0.01% Linearity
- Low Drift with Ambient Temperature
- -40°C to +85°C Operating Temperature Range
- CE Compliant, CSA and FM Approvals Pending
- Mix and Match Module Types on Backpanel

*ICP is a registered trademark of PCB Group Inc.

*IEPE is Integrated Electronic Piezo-Electric

*LIVM is Low Impedance Voltage Mode

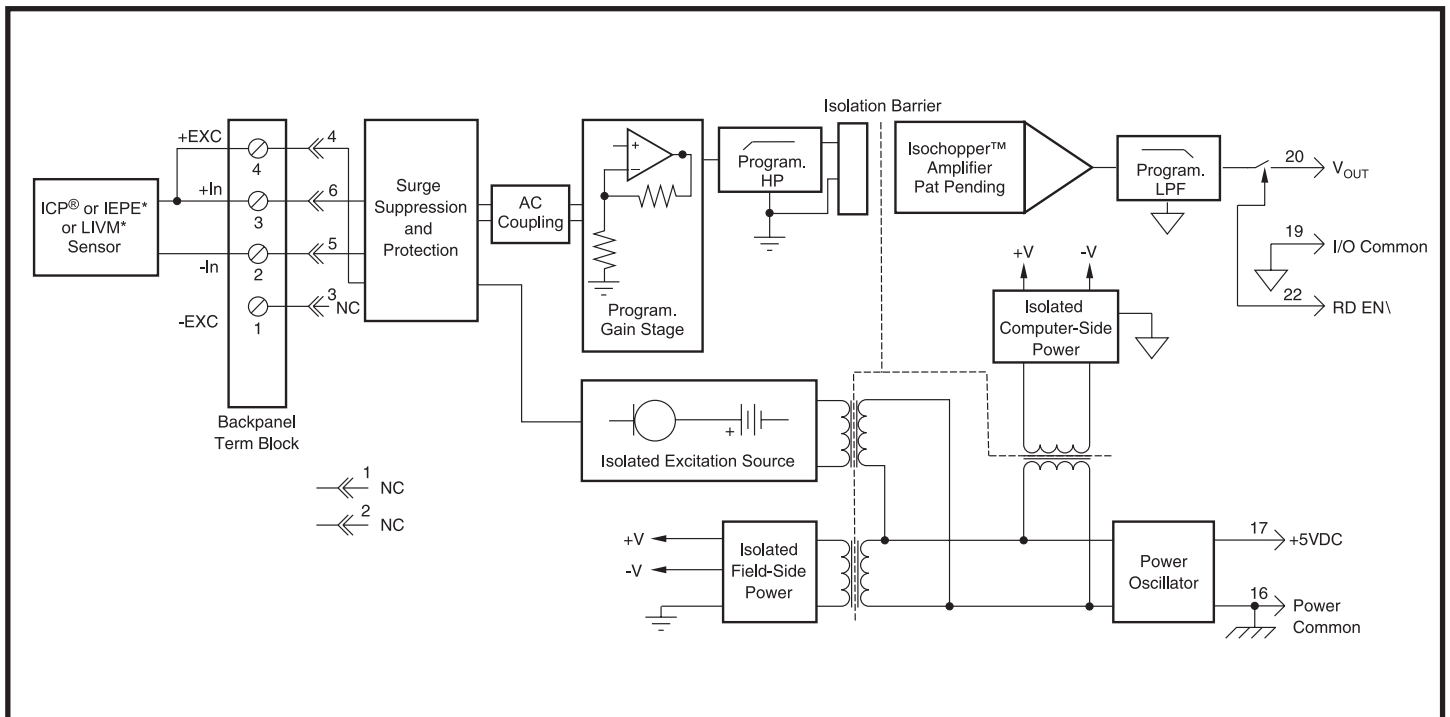


Figure 1: SCM5B48 Block Diagram

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

| Module | SCM5B48 |
|---------------------------------|--|
| Input Type | Accelerometer |
| Range ⁽¹⁾ | $\pm 10\text{V}$ |
| Protection | |
| Continuous | 240Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| Excitation | |
| Constant Current ⁽²⁾ | 4mA or 9mA, $\pm 10\%$ |
| Compliance Voltage | 24V $\pm 10\%$ |
| Protection | |
| Continuous | 240Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| Output Range | $\pm 10\text{V}$ |
| Resistance | 50 Ω |
| Protection | Continuous Short to Ground |
| Gain | |
| Programmable ⁽²⁾ | 1, 10, 100 |
| CMR (50/60Hz) | 100dB |
| Accuracy ⁽³⁾ | $\pm 0.2\%$ Span |
| Linearity | $\pm 0.01\%$ Span |
| Stability | |
| Offset | $\pm 25\text{ppm}/^{\circ}\text{C}$ |
| Gain | $\pm 100\text{ppm}/^{\circ}\text{C}$ |
| Output Noise, Gain=1, BW=20kHz | 200 μVrms |
| Low Pass Filter | |
| Type | Bessel |
| Programmable ⁽²⁾ | 2.5kHz, 5kHz, 10kHz, 20kHz |
| High Pass Filter | |
| Programmable ⁽²⁾ | DC, 0.2Hz, 10Hz |
| CMV (Input to Output) | |
| Continuous | 1500Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| NMR | 100db per Decade above cutoff frequency |
| Supply Voltage | +5VDC $\pm 5\%$ |
| Current | 140mA (9mA excitation) 100mA (4mA excitation) |
| Mechanical Dimensions (h)(w)(d) | 2.28" x 2.26" x 0.6" (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 $^{\circ}\text{C}$ |

NOTES:

- (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.

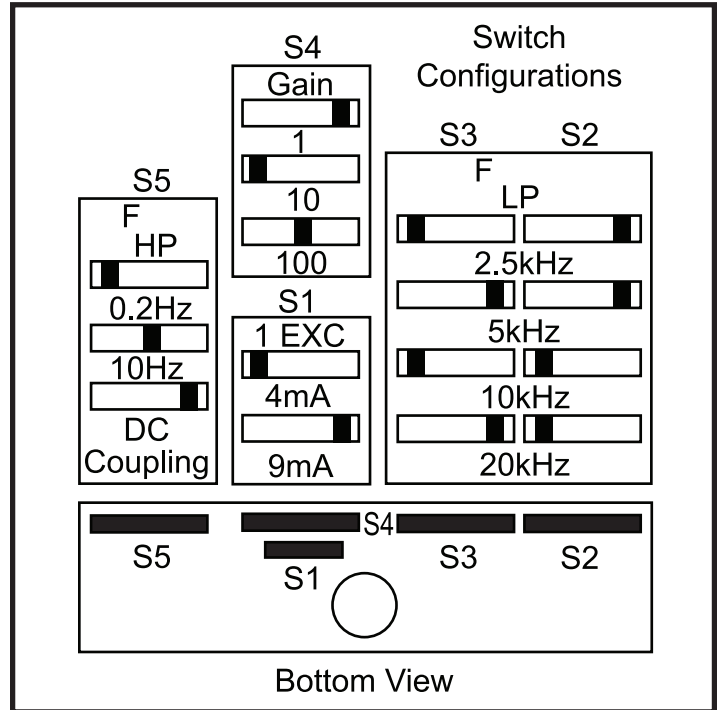


Figure 2: SCM5B48 Side Label

SCM5B

Ordering Information

| Model | Input Range | Output Range | Bandwidth | Mechanical Format | Isolation Voltage (Vrms) |
|------------|----------------------------|------------------|--------------------------------|-----------------------|--------------------------|
| SCM5B48-01 | $\pm 10\text{V max}^{(1)}$ | $\pm 10\text{V}$ | 2.5kHz to 20kHz ⁽²⁾ | Modular plug-in board | 1500 |