



SCM5B45

Frequency Input Modules

Description

Each SCM5B45 frequency input module provides a single channel of frequency input which is isolated and converted to a high-level analog voltage output. This voltage output is logic switch controlled, which allows these modules to share a common analog bus without the requirement of external multiplexers (Figure 1).

The frequency input signal can be a TTL level signal or a zero-crossing signal. Terminal 3 on the field-side terminal block is the "common" or ground connection for input signals. A TTL signal is connected from terminal 2 to terminal 3, while a zero-crossing signal is connected from terminal 4 to terminal 3. Input circuitry for each of the signal types has hysteresis built in. An input signal must cross entirely through the hysteresis region in order to trigger the threshold comparator.

A 5.1V excitation is available for use with magnetic pick-up or contact-closure type sensors. The excitation is available on pin 1 and the excitation common is pin 3.

The SCM5B modules are designed with a completely isolated computer side circuit which can be floated to $\pm 50V$ from Power Common, pin 16. This complete isolation means that no connection is required between I/O Common and Power Common for proper operation of the output switch. 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.

A special circuit in the input stage of the module provides protection against accidental connection of power-line voltages up to 240VAC.

► Features

- Accepts Frequency Inputs of 0 to 100kHz
- Provides High-Level Voltage Outputs
- TTL or Zero Crossing Signal Inputs
- 1500 Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protected to 240VAC Continuous
- 120dB CMR
- $\pm 0.05\%$ Accuracy
- CSA C/US Certified
- CE and ATEX Compliant
- Mix and Match SCM5B Types on Backpanel

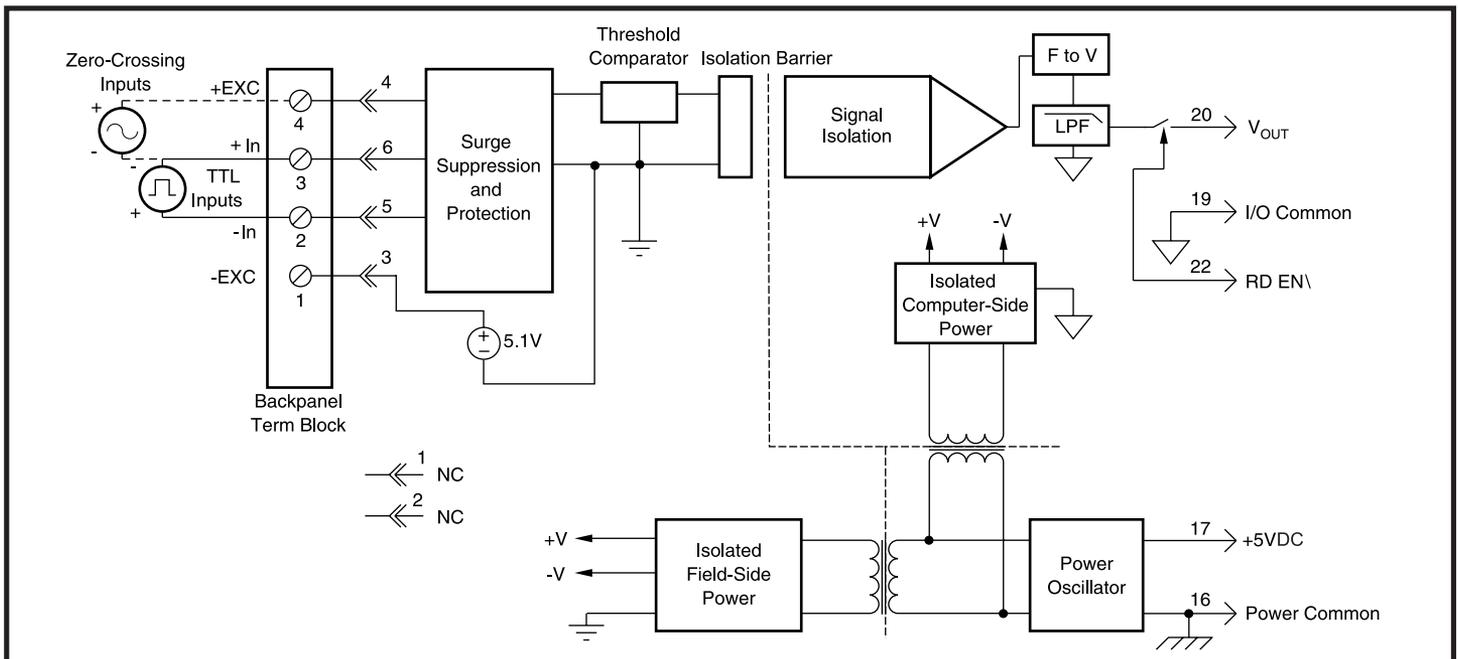


Figure 1: SCM5B45 Block Diagram

Specifications Typical* at T_A=+25°C and +5VDC power

| Module | SCM5B45 |
|--|---|
| Input Range | 0Hz to 100kHz |
| Input Threshold | Zero Crossing |
| Minimum Input | 60mVp-p |
| Maximum Input | 350Vp-p |
| Minimum Pulse Width | 4μs |
| TTL Input Low | 0.8V max |
| TTL Input High | 2.4V min |
| Input Hysteresis | |
| Zero Crossing | ±20mV (±400mV on -2x models) |
| TTL | 1.5V |
| Input Resistance | |
| Normal | 100kΩ |
| Power Off | 100kΩ |
| Overload | 100kΩ |
| Input Protection | |
| Continuous | 240Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| Excitation | +5.1V at 8mA max |
| CMV, Input to Output | |
| Continuous | 1500Vrms max |
| Transient | ANSI/IEEE C37.90.1 |
| CMR (50 or 60Hz) | 120dB |
| Accuracy ⁽¹⁾ | ±0.05% Span |
| Linearity | ±0.02% Span |
| Stability | |
| Offset | ±8ppm/°C |
| Gain | ±40ppm/°C |
| Noise | |
| Output Ripple | <10mVp-p at Input >2% span |
| Response Time (0 to 90%) | |
| SCM5B45-01, -02, -21, -22 | 300ms |
| SCM5B45-03, -23 | 170ms |
| SCM5B45-04, -05, -24, -25 | 90ms |
| SCM5B45-06, -07, -08, -26, -27, -28 | 20ms |
| Output Range | See Ordering Information |
| Output Resistance | 50Ω |
| Output Protection | Continuous Short to Ground |
| Output Selection Time (to ±1mV of V _{OUT}) | 6μs at C _{load} = 0 to 2000pF |
| Output 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 |
| Power Supply Voltage | +5VDC ±5% |
| Power Supply Current | 110mA |
| Power Supply Sensitivity | ±150μV/% RTO ⁽²⁾ |
| Mechanical Dimensions (h)(w)(d) | 2.28" x 2.26" x 0.60" (58mm x 57mm x 15mm) |
| Environmental | |
| Operating Temperature Range | -40°C to +85°C |
| Storage Temperature 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 | Performance B |

NOTES:

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

(1) Includes linearity, hysteresis and repeatability.

(2) RTO = Referenced to output.

Ordering Information

| Model | Input Range | Output Range [†] | Zero Crossing Hysteresis |
|------------|---------------|---------------------------|--------------------------|
| SCM5B45-01 | 0Hz to 500Hz | 3, 4 | ±20mV |
| SCM5B45-02 | 0Hz to 1kHz | 3, 4 | ±20mV |
| SCM5B45-03 | 0Hz to 3kHz | 3, 4 | ±20mV |
| SCM5B45-04 | 0Hz to 5kHz | 3, 4 | ±20mV |
| SCM5B45-05 | 0Hz to 10kHz | 3, 4 | ±20mV |
| SCM5B45-06 | 0Hz to 25kHz | 3, 4 | ±20mV |
| SCM5B45-07 | 0Hz to 50kHz | 3, 4 | ±20mV |
| SCM5B45-08 | 0Hz to 100kHz | 3, 4 | ±20mV |
| SCM5B45-21 | 0Hz to 500Hz | 3, 4 | ±400mV |
| SCM5B45-22 | 0Hz to 1kHz | 3, 4 | ±400mV |
| SCM5B45-23 | 0Hz to 3kHz | 3, 4 | ±400mV |
| SCM5B45-24 | 0Hz to 5kHz | 3, 4 | ±400mV |
| SCM5B45-25 | 0Hz to 10kHz | 3, 4 | ±400mV |
| SCM5B45-26 | 0Hz to 25kHz | 3, 4 | ±400mV |
| SCM5B45-27 | 0Hz to 50kHz | 3, 4 | ±400mV |
| SCM5B45-28 | 0Hz to 100kHz | 3, 4 | ±400mV |

†Output Ranges Available

| Output Range | Part No. Suffix | Example |
|---------------|-----------------|-------------|
| 3. 0V to +5V | NONE | SCM5B45-01 |
| 4. 0V to +10V | D | SCM5B45-01D |