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 (Figure below). The voltage output is logic switch controlled, which allows these modules to share a common analog bus without the requirement of external multiplexers.

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 module family is designed with a completely isolated computer-side circuit which can be floated to ±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

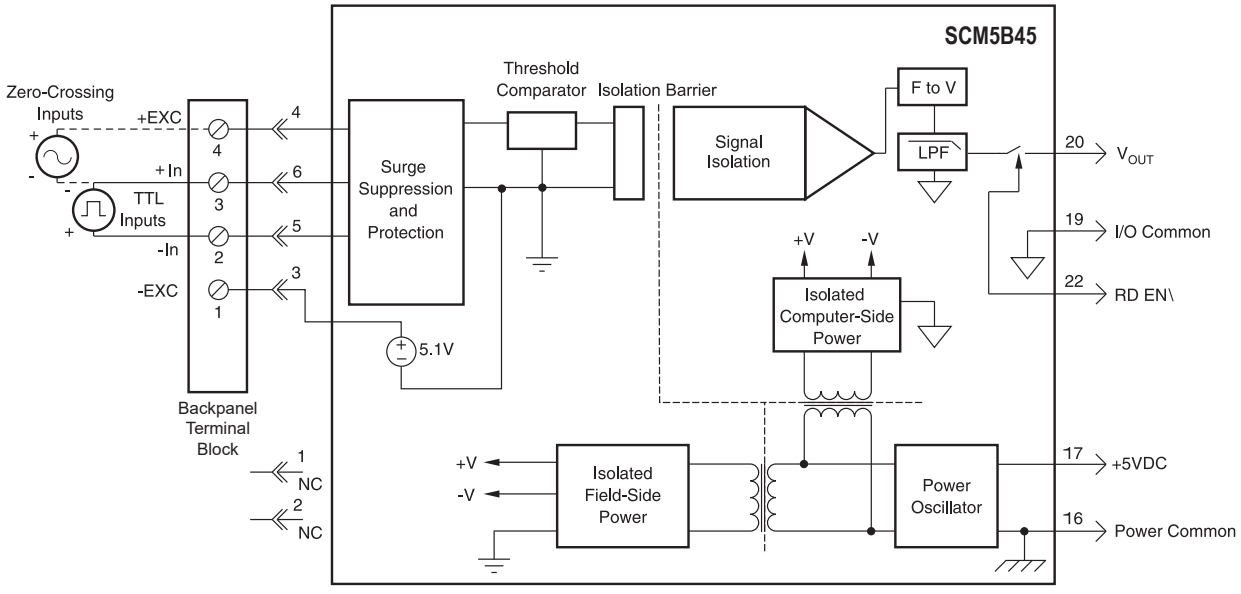
- Accepts Frequency Inputs of 0 to 100kHz
- Provides High-level Voltage Outputs
- TTL or Zero Crossing Signal Inputs
- 1500 Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- 120dB CMR
- Input Protected to 240VAC, Continuous
- ±0.05% Accuracy
- CSA C/US Certified
- CE and ATEX Compliant
- Manufactured per RoHS III Directive 2015/863
- Mix and Match SCM5B Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Heavy Equipment Power-line Voltage
- Reduces EMC Concerns and Electrical Noise in Measured Signals
- Convenient System Expansion and Repair
- Signal Filtering in Noisy Environments
- Simplifies Sensor Interface and Signal Conditioning Design
- Provides Isolation of External Sensors
- Breaks Ground Loops

APPLICATIONS

- Analog Signal Conditioning
- Analog Signal Isolation
- Analog Signal Filtering
- Industrial Process Control
- Test and Measurement
- System and Signal Monitoring



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SCM5B45 Block Diagram - For Module Dimensions and Pinouts, See Page 1-44

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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	6µs at C_{LOAD} = 0 to 2000pF
(to ±1mV of V_{OUT})	
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	2.28" x 2.26" x 0.60"
(h)x(w)x(d)	(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 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 SCM5B45-01D	0Hz to 500Hz	0V to +5V 0V to +10V	±20mV
SCM5B45-02 SCM5B45-02D	0Hz to 1kHz	0V to +5V 0V to +10V	±20mV
SCM5B45-03 SCM5B45-03D	0Hz to 3kHz	0V to +5V 0V to +10V	±20mV
SCM5B45-04 SCM5B45-04D	0Hz to 5kHz	0V to +5V 0V to +10V	±20mV
SCM5B45-05 SCM5B45-05D	0Hz to 10kHz	0V to +5V 0V to +10V	±20mV
SCM5B45-06 SCM5B45-06D	0Hz to 25kHz	0V to +5V 0V to +10V	±20mV
SCM5B45-07 SCM5B45-07D	0Hz to 50kHz	0V to +5V 0V to +10V	±20mV
SCM5B45-08 SCM5B45-08D	0Hz to 100kHz	0V to +5V 0V to +10V	±20mV
SCM5B45-21 SCM5B45-21D	0Hz to 500Hz	0V to +5V 0V to +10V	±400mV
SCM5B45-22 SCM5B45-22D	0Hz to 1kHz	0V to +5V 0V to +10V	±400mV
SCM5B45-23 SCM5B45-23D	0Hz to 3kHz	0V to +5V 0V to +10V	±400mV
SCM5B45-24 SCM5B45-24D	0Hz to 5kHz	0V to +5V 0V to +10V	±400mV
SCM5B45-25 SCM5B45-25D	0Hz to 10kHz	0V to +5V 0V to +10V	±400mV
SCM5B45-26 SCM5B45-26D	0Hz to 25kHz	0V to +5V 0V to +10V	±400mV
SCM5B45-27 SCM5B45-27D	0Hz to 50kHz	0V to +5V 0V to +10V	±400mV
SCM5B45-28 SCM5B45-28D	0Hz to 100kHz	0V to +5V 0V to +10V	±400mV

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