SCM9B-5000

4-channel Sensor-to-computer Modules

DESCRIPTION

The SCM9B-5000 4-channel Sensor-to-computer Modules are a family of complete solutions designed for data acquisition systems based on personal computers and other processor-based equipment with standard serial I/O ports. The modules convert four analog input signals to engineering units and transmit in ASCII format to any host with standard RS-485 or RS-232C ports. These modules can measure temperature, voltage, and current. The modules provide direct connection to a wide variety of sensors and perform all signal conditioning, scaling, linearization, and conversion to engineering units.

Each channel of the SCM9B-5000 Series can be independently programmed by the user for zero, span, and filter, to scale linear input signals such as millivolts and milliamps to desired engineering units such as pounds or percent of full scale.

The SCM9B-5000 modules are easy to use. With these modules, anyone familiar with a personal computer can construct a data acquisition system. This modular approach to data acquisition is extremely flexible, easy to use, and cost effective. Data is acquired on a per channel basis so you only buy as many channels as you need. The modules can be mixed and matched to fit the application. They can be placed remote from the host and from each other.

The modules contain no pots or switches to be set. Features such as address, data rate, parity, echo, and scaling are selectable using simple commands over the communications port—without requiring access to the module. The selections are stored in nonvolatile EEPROM which maintains data even after power is removed.

The 5000 series is completely hardware- and software-compatible with the 1000, 2000, 3000 and 4000 series and may be mixed in any combination.

All modules are supplied with removable screw-terminal connectors and captive mounting hardware. The connectors allow system expansion, reconfiguration or repair without disturbing field wiring.

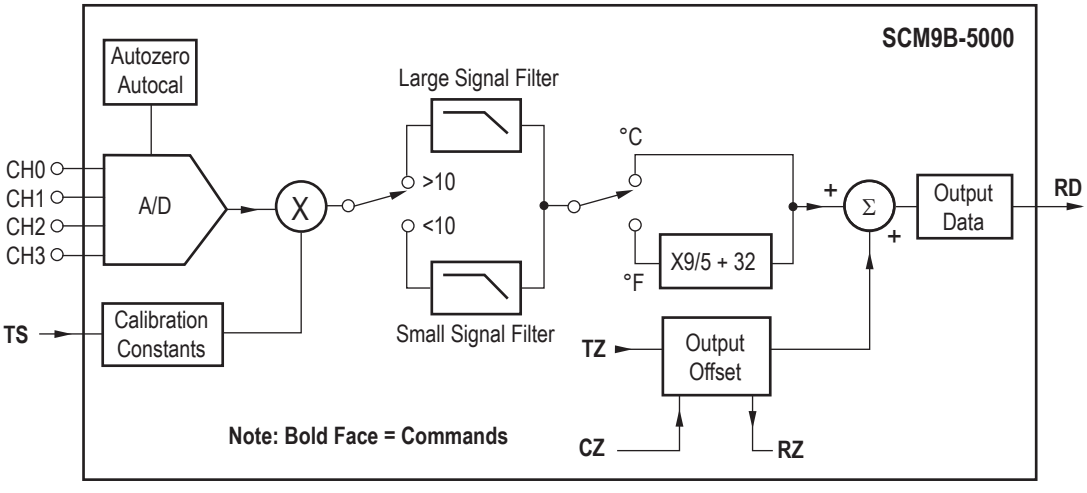
Although software is not required, utility software (S1000) is available.

FEATURES

- Four Analog Input Channels
- Complete Sensor to RS-485 or RS-232 Interface
- ASCII Format Command/ Response Protocol
- 500Vrms Analog Input Isolation
- 15-bit Measurement Resolution
- Continuous Self-calibration; No Adjustments of Any Kind
- Programmable Digital Filter
- Requires +10V to +30VDC Unregulated Supply
- Transient Suppression on RS-485 Communications Lines
- Screw Terminal Plug Connectors Supplied
- Mix and Match with Single-channel Units on Same Backpanel
- CE Compliant

APPLICATIONS

- Process Monitoring and Control
- Remote Data Logging to any Host Computer
- Product Testing
- Direct Connection to Modems



SCM9B-5000 Block Diagram - For Module Dimensions and Pinouts, See Page 5-26

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Specifications Typical at +25°C and nominal power supply unless otherwise noted.

Analog
- Four-channel analog input
- Maximum CMV, input to output at 60Hz: 500Vrms
- Leakage I, input to output at 115Vrms, 60Hz: <2µArms
- 15-bit measurement resolution
- 8 conversions per second
- Common-mode rejection: 100dB at 50/60Hz
- Autozero and autocalibration—no adjustment pots

Digital
- 8-bit CMOS microcomputer
- Digital scaling, linearization and calibration
- Nonvolatile memory eliminates pots and switches
- Small and large signal digital filtering with user selectable time constants

Communications
- Communications in ASCII via RS-232C, RS-485 ports
- Selectable data rates: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600,115200bps
- NRZ asynchronous data format; 1 start bit, 7 data bits, 1 parity bit, and 1 stop bit
- Parity: odd, even, none
- User-selectable channel address
- ASCII format command/response protocol
- Up to 3721 multidrop modules per host serial port
- Communications distance up to 4,000 feet (RS-485)
- Transient suppression on RS-485 communications lines
- Communications error checking via checksum
- Scan up to 250 channels per second
- All communications setups stored in EEPROM

Power
- Requirements: Unregulated +10V to +30VDC, 0.75W (max)
- Protected against power supply reversals

Environmental
- Temperature Range: Operating –25°C to +70°C
  Storage –25°C to +85°C
- Relative Humidity:0 to 95% Noncondensing

Mechanical
- Dimensions: See Dimension drawing
- Case: ABS with captive mounting hardware
- Connectors: Screw terminal barrier plug (supplied)
  Replace with Phoenix MSTB 1.5/10ST 5.08 or equivalent

5100 Voltage Inputs
- Voltages: ±100mV, ±1V, ±5V, ±10V, ±100VDC
- Resolution: 0.01% of FS (4 digits)
- Accuracy: ±0.02% of FS (max)
- Zero drift: ±1 count max (autozero)
- Span tempco: ±50ppm/°C (max)
- Input burnout protection to 250VAC
- Input impedance: ≤±1V input = 100MΩ (min)
  ≥±5V input = 1MΩ (min)

5200 Current Input
- Current: 4-20mADC
- Resolution: 0.04% of FS
- Accuracy: 0.04% of FS
- Zero drift: ±1 count max (autozero)
- Span tempco: ±50ppm/°C (max)
- Voltage drop: 1.0V (max)

5300 Thermocouple Inputs
- Thermocouple types: J, K, T, E (factory set)
- Ranges: J = –200°C to +760°C
  T = –200°C to +400°C
  K = –150°C to +1250°C
  E = –100°C to +1000°C
- Resolution: ±1°
- Overall Accuracy (error from all sources) from 0 to +40°C ambient: ±1.0°C
- Input impedance: 100MΩ (min)
- Lead resistance effect: <20µV per 350Ω
- Open thermocouple and overrange indication
- Input burnout protection to 250VAC
- User-selectable °C or °F
- Automatic cold junction compensation and linearization.

5450 Thermistor Inputs
- Thermistor types: 2252Ω at 25°C
- Range: 0°C to +100°C
- Resolution: 0.01°C or F
- Accuracy: ±0.1°C
- Input protection to 30VDC
- User selectable °C or °F

Specifications are subject to change without notice.

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Ordering Information – SCM9B-5100 Voltage Inputs

Part Number	Input Range	Output Range	Bandwidth	Mechanical Format
SCM9B-5111	±100mV	RS-232C	Programmable	Plug-In or Hockey Puck
SCM9B-5112	±100mV	RS-485	Programmable	Plug-In or Hockey Puck
SCM9B-5121	±1V	RS-232C	Programmable	Plug-In or Hockey Puck
SCM9B-5122	±1V	RS-485	Programmable	Plug-In or Hockey Puck
SCM9B-5131	±5V	RS-232C	Programmable	Plug-In or Hockey Puck
SCM9B-5132	±5V	RS-485	Programmable	Plug-In or Hockey Puck
SCM9B-5141	±10V	RS-232C	Programmable	Plug-In or Hockey Puck
SCM9B-5142	±10V	RS-485	Programmable	Plug-In or Hockey Puck
SCM9B-5151	±100V	RS-232C	Programmable	Plug-In or Hockey Puck
SCM9B-5152	±100V	RS-485	Programmable	Plug-In or Hockey Puck

Ordering Information – SCM9B-5200 Current Inputs

Part Number	Input Range	Output Range	Bandwidth
SCM9B-5251	4-20mA	RS-232C	Plug-In or Hockey Puck
SCM9B-5252	4-20mA	RS-485	Plug-In or Hockey Puck

Ordering Information – 5300 Thermocouple Inputs

Part Number	Thermocouple Type	Output Range	Input Temperature Range	Mechanical Format
SCM9B-5312	J	RS-485	–200°C to 760°C	Plug-In or Hockey Puck
SCM9B-5321	K	RS-232C	–150°C to 1250°C	Plug-In or Hockey Puck
SCM9B-5322	K	RS-485	–150°C to 1250°C	Plug-In or Hockey Puck
SCM9B-5332	T	RS-485	–200°C to 760°C	Plug-In or Hockey Puck

Ordering Information – 5400-Thermistor

Part Number	Type	Output Range	Input Range	Resolution	Mechanical Format
SCM9B-5451	2252Ω at 25°C	RS-232C	0°C to 100°C	0.01°C or °F	Plug-In or Hockey Puck
SCM9B-5452	2252Ω at 25°C	RS-485	0°C to 100°C	0.01°C or °F	Plug-In or Hockey Puck

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