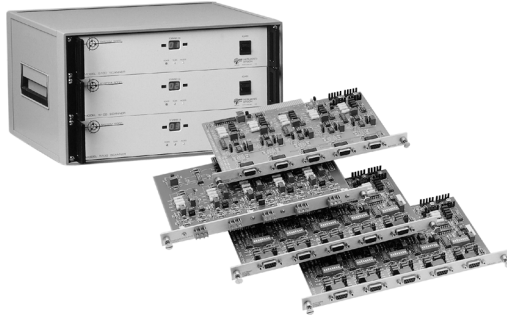


StrainSmart® Data Acquisition System



FEATURES

- From 5 to 1200 input channels - can be configured as needed at any time
- Inputs accepted from strain gages and strain-gage-based transducers (Model 5110A), thermocouples (Model 5120A), sensors with high-level voltage output (Model 5130B), and LVDT's (Model 5140A)
- Built-in bridge completion for 120-, 350-, and 1000-ohm strain gages
- Scanning and recording intervals as short as 0.02 seconds for up to 1200 inputs
- Stable, accurate, low-noise signal conditioning
- Available with PCI hardware Interface

DESCRIPTION

System 5000's Model 5100B Scanners acquire test data within 1 millisecond from up to 1200 channels at scan intervals as short as 0.02 seconds. This translates into more accurate test results, and the ability to capture data under static loading conditions immediately before failure.

Sensor connections are quickly made to the cards at the rear of each scanner in System 5000. Strain gage cards include built-in bridge completion for quarter and half bridges, and a constant voltage power supply for 0, 0.5, 1, 2, 5, and 10Vdc bridge excitation.

System 5000's instrumentation hardware is designed to incorporate all the features required for precision strain measurement under static loading conditions, while maintaining flexibility and ease of use. A system can be configured with as few as 5, and as many as 1200, sensors. Since each Model 5100B Scanner can function independently, your System 5000 components can easily be configured with StrainSmart software for each test requirement.

MODEL 5100B SCANNER SPECIFICATIONS



The Model 5100B Scanner is sized for standard 19-in (483-mm) instrumentation racks. Cabinets are available for various system configurations for bench-top or field use.

Since each Model 5100B Scanner can function independently, your System 5000 components can be easily configured for each test requirement. A 100-channel system, for example, can be used as five independent 20-channel systems simply by purchasing additional interface hardware installations.

INPUTS:

Accepts up to four cards (five channels per card and up to 20 channels per scanner).

A/D CONVERTER:

16-bit (15-bit plus sign) successive approximation converter. Usable resolution is typically 15 bits. 40 μ s total conversion time per reading.

SCAN RATE:

1ms per scan. Fifty complete scans per second typical usage. Concurrent scanning for all scanners. Input channels in each single scanner are scanned sequentially at 0.04-ms intervals and stored in random access memory within a 1-ms window.

DIGITAL OUTPUT: NO and NC relay contacts (500mA at 30Vdc into a resistive load).

OPERATIONAL ENVIRONMENT:

Temperature: -10° to +50°C
Humidity: Up to 90% RH, non-condensing

SIZE:

3.5 H x 19 W x 16 D in (89 x 483 x 381mm)

WEIGHT:

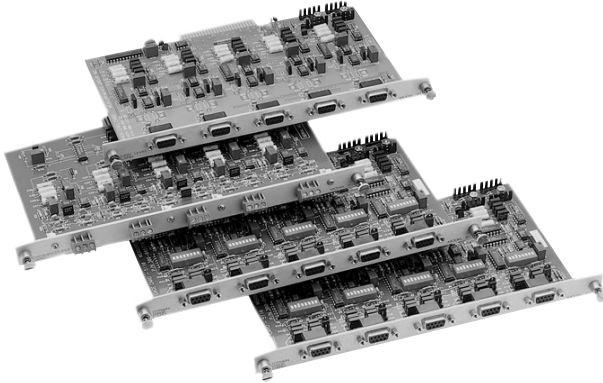
16lb (7.25kg)

POWER:

115 or 230Vac user-selectable;
 \pm 10% of setting; 50/60Hz; 140W max.

StrainSmart® Data Acquisition System

SENSOR CARD SPECIFICATIONS



Strain gages, strain-gage-based transducers, thermocouples, LVDT's, potentiometers and other transducers can be intermixed in multiples of 5 by choosing the appropriate sensor card.

MODEL 5110A STRAIN GAGE CARD

CHANNELS: Five per card.

INPUTS:

Strain Gages:

120Ω, 350Ω, 1000Ω quarter bridges; 60Ω to 5000Ω half and full bridges.

Jumper-selectable completion resistors (0.02% ± 3ppm/°C typ).

Measurement Range:

Normal range mode: ±16 380με

High range mode: ±163 800με

Low range mode: ±1638με

Resolution:

Normal range mode: 1με

High range mode: 10με

Low range mode: 0.1με

Strain Gage Based Transducers:

60Ω to 5000Ω impedance

Measurement Range:

Normal range mode: ±8mV/V

High range mode: ±80mV/V

Low range mode: ±0.8mV/V

Resolution:

Normal range mode: 0.5μV/V

High range mode: 5.0μV/V

Low range mode: 0.05μV/V

Input Impedance:

220MΩ each input.

Input Protection: ±40V

Source Current: ±25nA max.

Input Connector: Nine-pin D-sub style.

AMPLIFIER:

Zero Temperature Stability:

±1.2μV/°C RTI, ±100μV/°C RTO, after 30-minute warm-up.

Gain Accuracy & Stability:

±0.1% at +23°C; ±100ppm/°C

Common-Mode Voltage:

±10V

Common-Mode Rejection (dc to 5Hz):

100dB typical

System Noise (Normal Mode Operation):

±2με typical (±4ADC counts)

System Coarse Balance Range:

±100% of measurement range (typically ±16 383με)

CALIBRATION:

Two shunt calibration points are available on each channel. Switch-selectable.

Calibration switches, A and B, are software selectable.

EXCITATION:

0.0, 0.5, 1.0, 2.0, 5.0, and 10.0Vdc.

Software-programmable.

Accuracy:

±5mV typical

Current:

250mA max. (50mA per channel).

Over-current protected.

Load Regulation:

<0.05% of full scale for a load variation of 10% to 100% of full load

Temperature Stability:

Better than ±0.005%/°C

FILTER:

Type:

Four-pole Butterworth

Cutoff Frequency (-3dB):

5HZ

StrainSmart® Data Acquisition System

MODEL 5120A THERMOCOUPLE CARD**CHANNELS:** Five per card.**INPUTS:**

Thermocouple types J, K, T, E, R, S, and B.
Built-in electronic cold-junction compensation.
Software-selectable
Open sensor detection

Input Impedance: 22M Ω each input.**Input Protection:** $\pm 40V$ **Source Current:** $\pm 0.5nA$ typical; $\pm 5nA$ max**INPUT CONNECTOR:**

Removable three-position screw terminal

AMPLIFIER:**Zero Temperature Stability:** $\pm 1.2\mu V/^{\circ}C$ RTI, $\pm 100\mu V/^{\circ}C$ RTO, after 30-minute warm-up.**Gain Accuracy & Stability:**0.1% $\pm 100ppm/^{\circ}C$ **Common-Mode Rejection (dc to 5Hz):**

100dB typical

Common-Mode Voltage: $\pm 10V$ **System Noise (Normal Mode Operation):** $\pm 10\mu V$ typical ($\pm 4ADC$ counts)**MEASUREMENT RANGE:** $\pm 81.9mV$ **RESOLUTION:** $2.5\mu V$ **FILTER:****Type:**

Four-pole Butterworth

Cutoff Frequency (-3dB):

5HZ

MODEL 5130B HIGH-LEVEL INPUT CARD**CHANNELS:** Five per card.**INPUTS:** DC volts (differential)**Input Impedance:** 22M Ω each input.**Input Protection:** $\pm 40V$ **Source Current:** $\pm 0.5nA$ typical; $\pm 5nA$ max**INPUT CONNECTOR:** Nine-pin D-sub style**AMPLIFIER:****Zero Temperature Stability:** $\pm 1.2\mu V/^{\circ}C$ RTI, $\pm 100\mu V/^{\circ}C$ RTO, after 30-minute warm-up.**Gain Accuracy & Stability:**0.1% $\pm 100ppm/^{\circ}C$ **Common-Mode Rejection (dc to 5Hz):**

100dB typical

Common-Mode Voltage: $\pm 10V$ **System Noise (Normal Mode Operation):** $\pm 4ADC$ counts typical (0 to 15V excitation). $\pm 10ADC$ counts typical (20 to 30V excitation)**MEASUREMENT RANGES:** ± 1 , ± 2 , ± 5 , $\pm 10Vdc$ **RESOLUTION:** 30.5, 61, 152.5, 305 μV **EXCITATION:**

0, 0.5, 1.0, 2.0, 5.0, 10.0, 15.0, 20.0, 25.0 and 30.0Vdc

Accuracy: $\pm 10mV$ typical**Current:**

250mA max (50mA per channel) at 1 to 15V.

200mA max (40mA per channel) at 20V.

150mA max (30mA per channel) at 25 to 30V.

Over-current protected.

Max current limit selected by jumpers.

Load Regulation:

<0.05% of full scale for a load variation of 10% to 100% of full load

Temperature Stability:Better than $\pm 0.005\%/^{\circ}C$ **FILTER:****Type:**

Four-pole Butterworth

Cutoff Frequency (-3dB):

5HZ

MODEL 5140A LVDT INPUT CARD**CHANNELS:** Five per card.**INPUTS:** Three- to six-wire transducers**Input Impedance:** 10M Ω each input.**Input Protection:** $\pm 40V$ **Source Current:** $\pm 0.5nA$ typical; $\pm 5nA$ max**INPUT CONNECTOR:** Nine-pin D-sub style**AMPLIFIER:****Zero Temperature Stability:** $\pm 1.2\mu V/^{\circ}C$ RTI, $\pm 100\mu V/^{\circ}C$ RTO, after 30-minute warm-up.**Gain Accuracy:**

0.25% typical

Common-Mode Rejection (dc to 5Hz):

100dB typical

Common-Mode Voltage: $\pm 10V$ **System Noise (Normal Mode Operation):** $\pm 4ADC$ counts typical

StrainSmart® Data Acquisition System

MEASUREMENT RANGES: ± 0.5 , ± 1 , ± 2.5 , ± 5 Vrms

RESOLUTION: 15.25, 30.5, 76.2, 152.5 μ Vrms

CALIBRATION: Excitation sample

EXCITATION:

3.0 Vrms, 5000 Hz or 2500 Hz sine wave.
Software-selectable

Accuracy:

± 5 mVrms typical

Current:

± 250 mA max (± 50 mA per channel).
Over-current protected

Load Regulation:

$< 0.1\%$ of full scale for a load variation of 10% to 100% of full load

Temperature Stability:

Better than $\pm 0.05\%/^{\circ}\text{C}$

FILTER:

Type:

Four-pole Butterworth

Cutoff Frequency (-3dB):

5 Hz

Disclaimer

All product specifications and data are subject to change without notice.

Vishay Precision Group, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay Precision Group"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay Precision Group disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay Precision Group's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay Precision Group.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay Precision Group products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay Precision Group for any damages arising or resulting from such use or sale. Please contact authorized Vishay Precision Group personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.