

System 8000

StrainSmart® Data Acquisition System

8 Software-Selectable Input Channels



Features

- Eight software-selectable input channels
- Up to 16 scanners can be used concurrently
- Supported inputs include:
 - Strain gage (quarter-, half-, and full-bridges)
 - Strain-gage-based transducer
 - High-level voltage signal
 - Thermocouples
- RJ45 input connectors for each input channel
- Scanning rates:
 - 1000, 500, 200, 100, and 10 samples/second
- Compact size and ruggedized enclosure
- Ethernet network architecture
- Optional self-calibration functionality available

Datasheet is available on our website at:
<http://www.vishaypg.com/doc?11272>

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 - Strain gage (quarter-, half-, and full-bridges)
 - Strain-gage-based transducer
 - High-level voltage signal
 - Thermocouples
- RJ45 input connectors for each input channel
- Scanning rates are 1000, 500, 200, 100, and 10 samples/second
- Compact size and ruggedized enclosure
- Ethernet network architecture
- Optional self-calibration functionality available

DESCRIPTION

System 8000 from Micro-Measurements is a versatile, precision data acquisition instrument system intended for static and dynamic test and measurement applications. The system includes a scanner with 8 channels of data acquisition. A 10' crossover Ethernet cable is also included. The scanners may be used separately or up to 16 scanners can be used concurrently for a maximum of 128 channels.

Each channel can be configured, via software, to accept signals from strain gages or strain-gage-based transducers, thermocouples, or high level voltage sensors. Strain gage channels accept full-, half-, or quarter-bridge configurations and have the required bridge completion components for 120-, 350-, and 1000-ohm bridges. Each scanner operates independently; multiple scanners are not synchronized.

The data is processed in a modern 24-bit digital signal processor and filtering is performed using Finite Impulse Response (FIR), multi-stage filters. This provides excellent noise rejection and stability and unsurpassed measurement accuracy.

The Model 8000-8-SM Scanner communicates with a host personal computer (PC) via an Ethernet connection. Micro-Measurements StrainSmart® software is optimal for configuring, controlling, and acquiring data from the System 8000. A Programmer's Reference Kit provides documentation, programming examples, and instrument drivers to assist with custom software development.

SUPPORTED SENSORS

Each channel can be defined, via software, to be one of the following sensor types:

- Strain gage (quarter-, half-, and full-bridges)
- Strain-gage-based transducer
- High-level voltage signal
- Thermocouples



SAMPLING

All channels in each scanner are sampled simultaneously. Each channel's 24-bit analog-to-digital converter oversamples data at a rate of 128k samples/second, and provides high quality, low noise data (without the need for signal averaging) at rates up to 1000 samples/second/channel.

SCANNING RATES

The system provides numerous scan rates and Finite Impulse Response (FIR) filters are automatically selected to provide suitable filtering at each rate to avoid aliasing. Sampling rates for the Model 8000-8-SM are 1000, 500, 200, 100, and 10 samples/second.

COMPACT, RUGGEDIZED ENCLOSURE

The Model 8000-8-SM has 8 channels in a 1U (1.72 inch) height enclosure. The aluminum-alloy enclosure provides superior strength and durability. A rack mount kit is also available.

RJ45 INPUT CONNECTORS

Each channel input connector is an 8-pin TIA/EIA RJ45.

RELAY OUTPUT

A relay output is provided to control external hardware.

ETHERNET NETWORK ARCHITECTURE

The system communicates over an IEEE-802.3u 100Base-TX or an IEEE-802.3 10Base-T Ethernet Network. The firmware uses separate command and data ports and employs a reliable TCP-based protocol to prevent data loss.

DC OPERATION

Model 8000 operates on 10-32 VDC power. This can be from the included power supply or by using a separate AC-to-DC converter or DC supply such as a battery.

MODEL 8000-8-SM POWER SOURCE

The Model 8000 is a DC-powered instrument. The system accommodates DC input voltages from 10 to 32 volts. The included power supply provides the required AC-to-DC conversion and up to 30 watts of power to the system. An alternate DC power source can be used provided that it supplies enough power to meet the

system and excitation power requirements. The total system power requirements are highly dependent upon the power requirements of the bridge excitation circuitry. At a minimum, the instrument requires approximately 17 watts of power. A fully loaded instrument employing the maximum excitation current requires up to 26 watts of power.

ENCLOSURE

The Model 8000-8-SM enclosure is constructed of aluminum alloy. The enclosure is designed to provide superior strength, durability, and to minimize RF emissions and susceptibility.

A123 SYSTEM VOLTAGE CALIBRATION CARD (OPTIONAL)



The Micro-Measurements A123 System Voltage Calibration (VCAL) Card is available as an accessory and provides the ability to perform a system-level calibration of the entire measurement circuit without the need to return the system to the manufacturer or metrology lab. The gain and offset of each channel can be calibrated. The A123 is calibrated at the factory to NIST-traceable standards and does not need to be present in the system during normal operation. A benefit of the system under calibration is the ability to calibrate the system under the actual operating conditions, thereby minimizing errors due to environmental conditions.

SPECIFICATIONS – GENERAL

All specifications are nominal or typical at +23°C unless noted. Performance may be degraded in the presence of high-level electromagnetic fields. For CE compliance, Micro-Measurements recommends that all cables be limited to 30 meters in length.

Environmental

- Temperature: 0° to +50°C
- Humidity: Up to 90%, non-condensing

Enclosure

- Material: A356-T6 aluminum casting
- Dimensions (all dimensions are nominal): 1.72 H (1.96 with feet) x 11.0 W x 10.18 D (10.55 including power connector) inches (43.68 x 279.4 x 258.66 mm)
- Configurations: Bench-top, stackable, rack-mountable.

Weight

3.85 lbs (1.75 kg)

Power

Input: 10-32 VDC, 5A max.

Fuse:

5A Fast-acting blade terminal. (Littelfuse FUN MINI® PN 125.6785.4502 or equivalent)

Power Switch:

Rocker switch with green LED to indicate power on.

Relay

Quantity: One

Configuration: NO and NC, 500 mA relay contact

Communication

Ethernet interface: IEEE 802.3 10Base-T, 802.3u 100Base-TX, half- and full-duplex, auto-detect. RJ45 connection, green LINK/ACT LED

A123 Voltage Calibration Card

Accuracy:

±100 ppm repeatability, typical

±250 ppm repeatability, maximum

Drift:

1.9 ppm/°C ±0.6 µV/°C typical

9.4 ppm/°C ±2.1 µV/°C maximum

Resolution: 150 µV nominal

Voltage Range: ±5V

ANALOG CHANNELS

Channels

Eight, differential inputs

A/D Converter

Quantity: Eight (one per channel)

Architecture: Delta-Sigma (ΔΣ)

Resolution: 24 bits

Oversampling Rate: 128k samples/second/channel (max)

Data Rates 1000, 500, 200, 100, or 10 samples/second/channel

Analog Anti-Alias Filter

Type: Low-pass

Frequency: 500 Hz @ -3 dB

Number of Poles: One

Topology: Lowpass RC

Processor

Type: 32-bit floating point Digital Signal Processor

300 MHz operating frequency

RAM

Type: SDRAM

Size: 32 MB

Flash

Type: Serial NOR

Size: 1MB (user)

Revision: 09-Jan-2015

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