

# EX1403

## 16-Channel Bridge and Strain Gauge Instrument



### Overview

The EX1403 Precision Bridge and Strain Gauge Instrument sets a new standard for strain and bridge measurements, delivering the highest performance measurements possible while controlling overall test hardware costs.

Sixteen channels of strain or voltage, independent 24-bit ADCs per channel, extensive software-selectable filtering, and independent signal conditioning paths deliver exceptional accuracy and reliability.

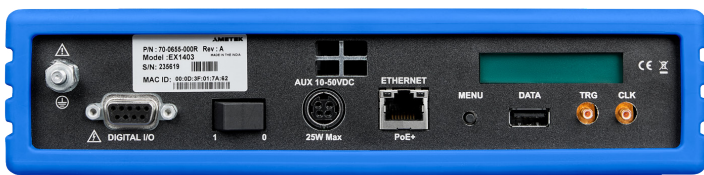
Built-in signal conditioning, programmable excitation, and selectable bridge completion, all integrated into the instrument and configurable on a per-channel basis, greatly simplify setup and configuration. With unmatched performance, accuracy and reliability, the EX1403 is the “go-to” solution for the most complex structural test applications worldwide.

A single system that can provide high-quality static or high-speed strain measurements:

- Airframe structural and fatigue test
- Rocket and satellite structural test
- Wind tunnel flight load test
- General purpose bridge measurements
- Load frame materials testing

### FEATURES

- 16-channel Strain, Bridge and Voltage Measurements
- 24-bit ADC per Channel
- 102.4 ksamples/second/channel Sample Rate
- Built-in Selectable Bridge Completion that supports 1/4 (120, 350, 1K and User defined), 1/2, and Full-Bridge Types
- Built-in Programmable Excitation
- TEDS Support
- RJ-45 Input Connectors
- Built-in Shunt Calibration
- LXI Ethernet Interface
- IEEE-1588 Synchronization
- Power over Ethernet (PoE) or 10–50 V DC input
- Built-in Parallel Data Streaming
- Full-featured Embedded Web Interface
- Compact 1U Half-rack Form Factor



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RELIABLE DATA FIRST TIME EVERY TIME

# EX1403 Isolated 16-Channel Bridge and Strain Gauge Instrument

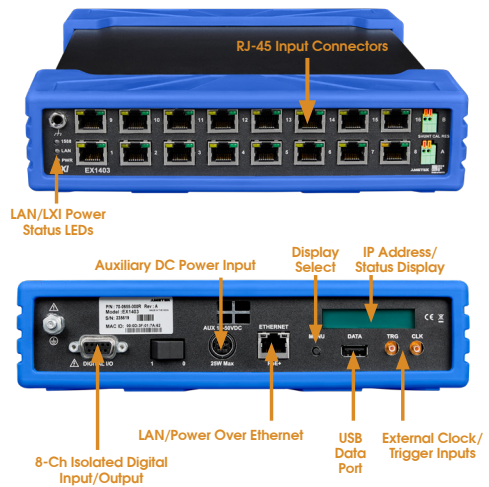
## General Specifications

Channels	16
Sample Rate	102.4 k samples per second
ADC	24-bit delta-sigma
Input Connector	RJ-45
Input Range	Voltage: $\pm 10\text{Vpk}$ , $\pm 1\text{Vpk}$ , $\pm 0.1\text{Vpk}$
	Strain $\frac{1}{4}$ bridge: $\pm 19.5\text{K}\mu\epsilon$ including imbalance for 10V Excitation, GF=2 STRAIN $\frac{1}{4}$ Bridge (including bridge imbalance), GF=2 $\pm 19\text{k}\mu$ @10V, $\pm 38\text{k}\mu$ @5V, $\pm 90\text{k}\mu$ @2V, $\pm 160\text{k}\mu$ @1V STRAIN FULL Bridge $\pm 5\text{k}\mu$ @10V, $\pm 10\text{k}\mu$ @5V, $\pm 25\text{k}\mu$ @2V, $\pm 50\text{k}\mu$ @1V, $\pm 100\text{k}\mu$ @0.5V
	2W/4W Resistance/RTD: 10k $\Omega$ , 2k $\Omega$ , 1k $\Omega$ , 200 $\Omega$ , 100 $\Omega$ , 20
Accuracy	Voltage: Typical (2 ): $\pm(0.03\% \text{ Rdn} + 0.01\% \text{ Rng})$ Maximum: $\pm(0.05\% \text{ Rdn} + 0.01\% \text{ Rng})$ Temperature Drift: $\pm(50\text{PPM}/^\circ\text{C} \text{ Rdn} + 5\text{PPM}/^\circ\text{C} \text{ Rng})$
	Strain $\frac{1}{4}$ Bridge: Typical (2 ): $\pm 0.05\% \text{ Rdn}$ Maximum: $\pm 0.1\% \text{ Rdn}$ Temperature Drift: $\pm(55\text{PPM}/^\circ\text{C} \text{ Rdn} + 4\mu / ^\circ\text{C})$
	Strain Full Bridge: Typical (2 ): $\pm 0.03\% \text{ Rdn}$ Maximum: $\pm 0.06\% \text{ Rdn}$ Temperature Drift: $\pm(55\text{PPM}/^\circ\text{C} \text{ Rdn} + 0.5\mu / ^\circ\text{C})$
	4-Wire Resistance/RTD: Typical (2 ): $\pm(0.08\% \text{ Rdn} + 0.02\% \text{ Rng})$ Maximum: $\pm(0.15\% \text{ Rdn} + 0.04\% \text{ Rng})$ Temperature Drift: $\pm(55\text{PPM}/^\circ\text{C} \text{ Rdn} + 0.5\mu / ^\circ\text{C})$
Input Coupling	DC
Input Impedance	10 M $\Omega$ Typical each input to ground
Common Mode Rejection, DC Coupling	-120dB Typical, <100Hz
	-100dB Typical, 100Hz - 1kHz
	-90dB Typical, 1kHz - 10kHz
Channel-to-Channel Crosstalk	Overdriving one channel does not affect performance of other channels
Input Protection	ESD: $\pm 12\text{V}$ Bidirectional TVS IEC61000-4-2, $\pm 30\text{kV}$ Contact, $\pm 30\text{kV}$ Air
Bridge Imbalance	Software nulling
Bridge Types	Full, Half ( $\frac{1}{2}$ ), Quarter ( $\frac{1}{4}$ )
1/4 Bridge Completion	Software Selectable: OFF, 120 $\Omega$ , 350 $\Omega$ , 1000 $\Omega$
1/2 Bridge Completion	10k-10k thin film RNET; Ratio Accuracy: 0.1%;
	Ratio Stability: 2 PPM/ $^\circ\text{C}$ ; Ratio drift: $\pm 20$ PPM/Year

## Ordering Information

Model	Configuration
70-0655-000R	EX1403, 16-channel Strain / Bridge Instrument
70-0626-900R	Rack Mount Kit
56-0739-120R	Power Supply, AC/DC, GS, PSE, 24V, 120W

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## Confidence

Manufacturing and test environments of today are dynamic, dictating minimal downtime of test systems in order to meet increasing product throughput demands. Ensuring that acquired data is reliable and that instrument calibration can be turned around quickly are keys to the success of any production team. VTI embeds intelligence into the EX1403 to facilitate maximum system "uptime" and increase manufacturing efficiency.

Built-in self-test can be invoked under software control prior to each critical test. A simple pass-fail result will be returned after completing system health diagnostics, including temperature and voltage level measurements of the on-board processor; this result can be used to prevent a test from running in the event of a failure.

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