

EX1400 SERIES

ADVANCED, FULL-FEATURED, PRECISION DATA ACQUISITION

The VTI Instruments EX1400 Product family features an advanced, full-featured data acquisition series designed to acquire precision data from temperature, strain, and voltage sensors. It is designed to provide the highest level of performance and ease of use for any data acquisition application.



EX1401

**16-CHANNEL ISOLATED
THERMOCOUPLE AND VOLTAGE
MEASUREMENT INSTRUMENT**

FEATURES

- > Typical accuracies of $\pm 0.20^{\circ}\text{C}$
- > 16-channel isolated universal thermocouple/voltage inputs
- > 20K samples/second/channel sample rate
- > 24-bit ADC per channel
- > 1000 V channel-channel isolation
- > 500 V channel-ground isolation



EX1402

**16-CHANNEL ISOLATED HIGH
VOLTAGE MEASUREMENT
INSTRUMENT**

FEATURES

- > 24-bit SAR ADC per Channel
- > 128k samples/second/channel sample rate
- > 1000V channel-channel isolation
- > 500V channel-ground isolation
- > Input voltage ranges peak: $\pm 420\text{V}/\pm 10\text{V}/\pm 1\text{V}$
- > 3-Pin screw terminal input connector



EX1403A

**16-CHANNEL BRIDGE
AND STRAIN GAUGE
MEASUREMENT INSTRUMENT**

FEATURES

- > 24-bit, delta-sigma ADC, simultaneous sampling
- > Programmable Sample Rate up to 128kSPS
- > Full, Half & Quarter Bridge with 120 Ω , 350 Ω & 1k Ω bridge completion
- > 2-Wire & 4-Wire Ohms/RTD
- > Bridge Zero Balancing
- > Strain Lead Wire Calibration
- > Shunt Calibration: 50k Ω , 100k Ω & External provided by User
- > TEDS Support

OTHER COMMON FEATURES INCLUDE:

- > Data logger acquisition mode
- > Built-in parallel data streaming
- > Full-featured embedded web interface
- > LXI Ethernet interface
- > 8-bit bank isolated digital I/O
- > Compact 1U half-rack form factor
- > IEEE-1588 synchronization
- > Power over Ethernet+ (PoE+)
- > Built-In-Self-Test (BIST)
- > Driver support: IVI, Linux, Labview, driverless REST interface

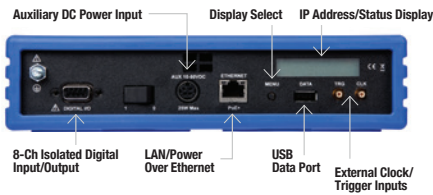
APPLICATIONS:

EX1401: Battery and fuel cell test / Thermal data acquisition / Gas turbine test / HALT/HASS / In-vehicle automotive test / Electric motor test / Wind tunnel evaluation / Rocket motor reliability / Health monitoring

EX1402: Battery and fuel cell test / Data acquisition / Gas turbine test / HALT/HASS / Health monitoring

EX1403A: Airframe structural and fatigue test / Rocket and satellite structural test / Wind tunnel flight load test / General purpose bridge measurements / Load frame materials testing

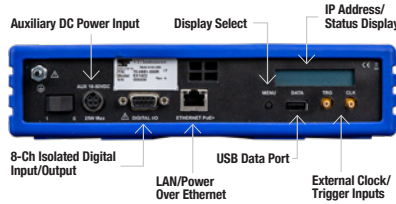
EX1401



EX1401 GENERAL SPECIFICATIONS

ADC	24-bit Sigma Delta	
Acquisition Speed	20Ksa/S	
Digital IO Channels	8	
Measurement Type	Thermocouples, $\pm 10V$	
Ranges	0.01V, 0.1V, 1V, 10V	
Transducers	All TC types	
Input Type	Differential	
Input Connector Type	Mini TC	
Isolation	500V to Ground, 1000V channel-to-channel	
Filtering Options	Digital programmable	
Resolution	$\pm 0.01 V$	1.7 μV
	$\pm 0.1 V$	150 nV
	$\pm 1.0 V$	13.5 nV
	$\pm 10.0 V$	1.7 nV
	Thermocouple	< 0.001 °C
Power Requirements	10VDC-50VDC, 12 W typical, 15 W max	
PoE+	12 W typical, 15 W max	
Accuracy - Typical	$\pm 0.01 V$ Range	$\pm (0.050\% + 5\mu V)$ Max: $\pm (0.145\% + 9\mu V)$
	$\pm 0.1 V$ Range	$\pm (0.020\% + 7\mu V)$ Max: $\pm (0.035\% + 15\mu V)$
	$\pm 1.0 V$ Range	$\pm (0.020\% + 40\mu V)$ Max: $\pm (0.030\% + 50\mu V)$
	$\pm 10.0 V$ Range	$\pm (0.020\% + 400\mu V)$ Max: $\pm (0.030\% + 500\mu V)$
	TC Type J, K, T, E, N	$\pm (0.020\% + 0.2^\circ C)$ Max: $\pm (0.040\% + 0.4^\circ C)$
	TC Type S, R	$\pm (0.020\% + 0.6^\circ C)$ Max: $\pm (0.040\% + 1.3^\circ C)$
	TC Type B	$\pm (0.020\% + 0.9^\circ C)$ Max: $\pm (0.040\% + 1.8^\circ C)$
Interface	Ethernet LXI	
Clock Sync	External 10MHz clock, and IEEE-1588 PTP-V2	
Data Logging	Stream over Ethernet and / or Stream to USB	
Onboard Memory	256Mb	

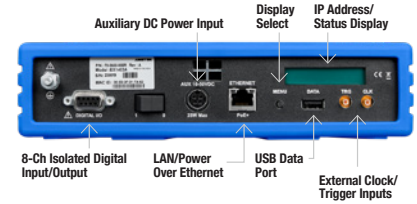
EX1402



EX1402 GENERAL SPECIFICATIONS

ADC	24-bit SAR	
Acquisition Speed	128Ksa/S	
Digital IO Channels	8	
Measurement Type	$\pm 420V$	
Ranges	1V, 10V, 420V	
Transducers	Voltage inputs	
Input Type	Differential	
Input Connector Type	3 Pin screw terminal block, 5mm pitch (0.197in) single row	
Isolation	500V to Ground, 1000V channel to channel	
Filtering Options	Digital programmable	
Resolution	$\pm 1V$	150 nV
	$\pm 10V$	1.7 μV
	$\pm 420V$	63 μV
Power Requirements	110VDC-50VDC, 12 W typical, 15 W max	
PoE+	12 W typical, 15 W max	
Accuracy - Typical	1V Range	$\pm [(0.03\%+9PPM/^\circ C)R_{dng} + 0.002\%R_{ng} + 2\mu V/^\circ C]$
	10V Range	$\pm [(0.03\%+10PPM/^\circ C)R_{dng} + 0.002\%R_{ng} + 5\mu V/^\circ C]$
	420V Range	$\pm [(0.05\%+25PPM/^\circ C)R_{dng} + 0.002\%R_{ng} + 66\mu V/^\circ C]$
Interface	Ethernet LXI	
Clock Sync	External 10MHz clock, and IEEE-1588 PTP-V2	
Data Logging	Stream over Ethernet and / or Stream to USB	
Onboard Memory	256Mb	

EX1403A



EX1403A GENERAL SPECIFICATIONS

ADC	24-bit Sigma Delta	
Acquisition Speed	128Ksa/S	
Digital IO Channels	8	
Measurement Type	Full, Half & Quarter Bridge with 120 Ω , 350 Ω & 1k Ω bridge completion, 2-Wire & 4-Wire Ω / RTD, 0-20K Ω	
Ranges	200 Ω , 2K Ω , 20K Ω	
Transducers	120 Ω , 350 Ω , 1K Ω , 1/4, 1/2 and full bridge strain gauges	
Input Type	Differential	
Input Connector Type	RJ45	
Isolation	No Channel to ground isolation, ESD protected to $\pm 10kV$	
Filtering Options	Digital programmable	
Resolution	0.1V	15 nV
	1V	150 nV
	10V	1.7 μV
	Strain 1/4 & 1/2 (40k $\mu\epsilon$ Vexc=5V GF=2)	0.005 $\mu\epsilon$
	200 Ω	30 $\mu\Omega$
	2K Ω	300 $\mu\Omega$
	20K Ω	3 m Ω
Power Requirements	10VDC-50VDC, 12 W typical, 15 W max	
PoE+	12 W typical, 15 W max	
Accuracy - Typical	0.1V Range	$\pm [(0.10\%+140PPM/^\circ C)R_{dng} + 9\mu V + 1\mu V/^\circ C]$
	1V Range	$\pm [(0.10\%+60PPM/^\circ C)R_{dng} + 53\mu V + 5\mu V/^\circ C]$
	10V Range	$\pm [(0.10\%+10PPM/^\circ C)R_{dng} + 442\mu V + 50\mu V/^\circ C]$
	1/4 Bridge 120 Ω	$\pm [(0.10\%+140PPM/^\circ C)R_{dng} + 15\mu\epsilon + 14\mu\epsilon/^\circ C]$
	1/2 & 1k Ω Bridge 350 Ω & 1k Ω	$\pm [(0.10\%+140PPM/^\circ C)R_{dng} + 15\mu\epsilon + 6\mu\epsilon/^\circ C]$
	2/4Wire-Ohms & RTD(Ω)	$\pm [(0.05\%+140PPM/^\circ C)R_{dng} + 0.01\%R_{ng}]$
Interface	Ethernet LXI	
Clock Sync	External 10MHz clock, and IEEE-1588 PTP-V2	
Data Logging	Stream over Ethernet and / or Stream to USB	
Onboard Memory	256Mb	