

INTEGRATED DATA ACQUISITION SIGNAL CONDITIONING SYSTEMS

sentinel**EX**

RELIABLE DATA FIRST TIME EVERY TIME





Interoperability and Flexibility without Compromise

VTI delivers precision instrumentation for the world's most demanding test applications. Our solutions provide reliable data, first time, every time. VTI's mission critical data acquisition solutions are used to monitor and record data that characterizes the physical integrity and performance of aircraft, engines, large structures, and complex electronic systems. Knowing that we serve a wide range of applications, from critical infrastructure to flight safety and troop security, defines our ongoing commitment to product performance and quality.

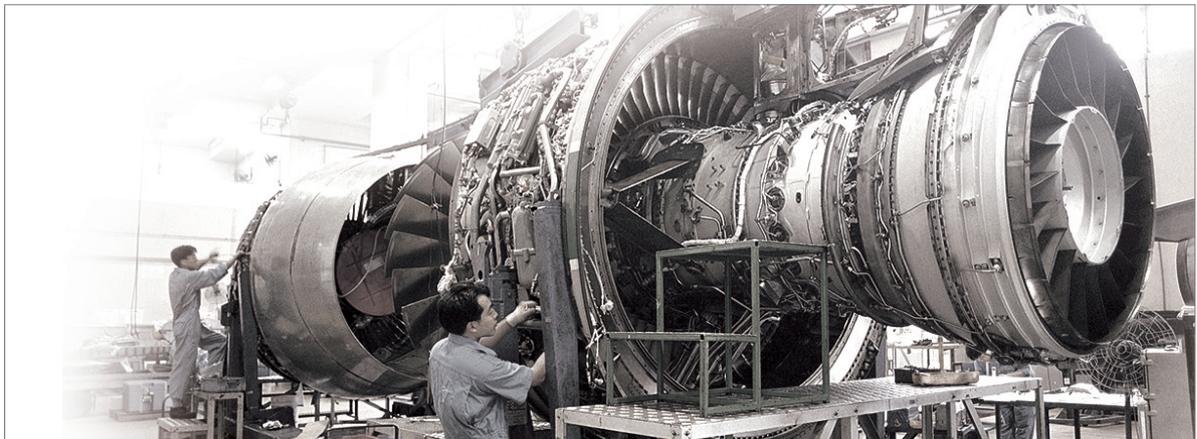
For over 20 years, we have developed and provided precision integrated data acquisition solutions. Our recently expanded sentinelEX Integrated Data Acquisition family builds upon this with solutions capable of delivering complete corporate-wide coverage spanning a broad range of applications and measurement types.

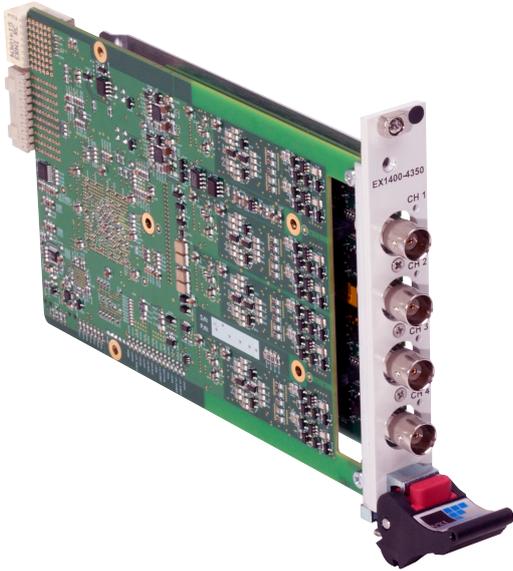
- Personalized hardware configurability and customization
- Unmatched signal integrity and measurement performance
- Speeds ranging from dynamic, high-speed to steady state
- Applications ranging from several channels to thousands of channels
- Complete application space coverage regardless of the type of measurement or transducer

Platform Independent Solutions

The sentinelEX product family delivers complete application space coverage with solutions designed to meet your challenging, and changing, data acquisition requirements. Solution set interoperability ensures that test system investments are maximized by using hardware that can be tailored to meet unique requirements, and by leveraging a common software application programming interface (API).

MEASUREMENT SOLUTIONS							
	EMX Series	EX1000A EX1000A-TC	EX1016A EX1032A	EX1048A	EX10SC	EX1266	EX1629
Voltage	●	●	●		●	●	●
Voltage (> 15 V)	●				●	●	
Thermocouple	●	●	●	●	●	●	
RTD/Thermistor	●				●	●	
Bridge (Strain/Pressure)	●				●		●
Load/Force	●				●		●
Frequency/RPM	●				●	●	
Resistance	●				●	●	
Digital I/O	●	●	●	●		●	●
Analog Output	●					●	
Shock/Vibration/Acceleration	●						
Acoustics	●						
Deterministic Control	●						
Isolation	●				●		
RTD Stimulator						●	
Measurement Speed	Fast	Medium	Medium	Medium	Slow	Slow	Medium





EMX Series

Precision Reconfigurable Modular Instrumentation

The EMX series, VTI's latest addition to the sentinelEX product family, delivers unprecedented speed, measurement performance, and hardware customization. Advanced system-on-a-chip (SoC) hardware enhancement, coupled with open-platform software tools, allows unparalleled hardware optimization for real-time data manipulation.

Combining best-in-class noise immunity, unmatched excitation flexibility, aggressive anti-aliasing filters, and low distortion frequency performance with unsurpassed uptime through embedded self-test and self-calibration results in one common solution that delivers unsurpassed system level measurement confidence. Modular and scalable, the EMX series is easily customized to meet changing application needs, all within the common sentinelEX family framework.



EMX Series

Precision Reconfigurable Modular Instrumentation

DYNAMIC SIGNAL ANALYSIS/NVH

MODEL NAME	DESCRIPTION
EMX-4250 EMX-4250-8	204.8 kSa/s DSA instrument, 16 independent channels (EMX-4250) or 8 independent channels (EMX-4250-8), 24-bit, exceptional general purpose digitizer optimized for AC coupled transducers, advanced hardware system-on-a-chip (SoC) and FPGA personalization, compatible with ICP signal conditioning accessories, internal self-test/self-calibration.
EMX-4016 EMX-4008	16-channel (EMX-4016) and 8-channel (EMX-4008) breakout box provides BNC connectivity to transducers. For use with EMX-4250 and EMX-4250-8, respectively.
EMX-4350	625 kSa/s DSA instrument, 4 independent, differential channels, >98 dB distortion and 0.001 dB flatness, CMRR of -120 dB, <50 μ V DC measurement performance, aggressive anti-aliasing filters, programmable 2 mA to 20 mA excitation, 24-bit, advanced hardware system-on-a-chip (SoC) and FPGA personalization, internal self-test/self-calibration.
EMX-1434	192 kSa/s arbitrary waveform source, 4 independent channels, integrated tachometer, synchronized DSA source and rotational measurement capability, 4 channels DIO, internal self-test/self-calibration.

BRIDGE/TEMPERATURE/VOLTAGE

MODEL NAME	DESCRIPTION
EMX-5290	144 kSa/s strain and voltage instrument, 12 independent channels, 24-bit, internal bridge completion and shunt calibration, independent regulated bridge excitation, TEDS support, internal self-test/self-calibration.
EMX-1482 EMX-1482-16	32-channel (EMX-1482) or 16-channel (EMX-1482-16) precision thermocouple instruments, ± 0.2 °C accuracy, 500 Sa/s per channel, up to 8 precision CJC references, 300 V isolation, 24-bit delta-sigma ADCs, real-time open transducer detection, internal self-test/self-calibration. Use with terminal blocks EMX-1482-32TB (EMX-1482 only) or EMX-1482-16TB (EMX-1482-16 only) or breakout box VT1586A.
EMX-1482-32TB EMX-1482-16TB	32-channel (EMX-1482-32TB) and 16-channel (EMX-1482-16TB) front-plugin terminal blocks for EMX-1482 and EMX-1482-16, respectively. Screw-in terminal inputs and 8 high-precision thermistors built-in for CJC.
VT1586A	32-channel breakout box for EMX-1482 and EMX-1482-16, three on-board thermistors for CJC and RF filter option for high-frequency noise rejection.
EMX-1032 EMX-1016 EMX-1008	General purpose data acquisition module with 32-channel (EMX-1032), 16-channel (EMX-1016), or 8-Channel (EMX-1008) analog input, 16-channels DIO and 2 analog outputs. 200 kSa/s, 18-bit, ± 10 V and ± 5 V input ranges, internal self-test and self-calibration.
EMX-1016-RTD EMX-1008-RTD	16-channel (EMX-1016-RTD) and 8-channel (EMX-1008-RTD) RTD instrument, ± 0.01 °C accuracy, 18-bit ADC, programmable 30 μ A to 480 μ A excitation, internal self-test and self-calibration..

EMX Series

Precision Reconfigurable Modular Instrumentation

PYROSHOCK/HIGH-SPEED

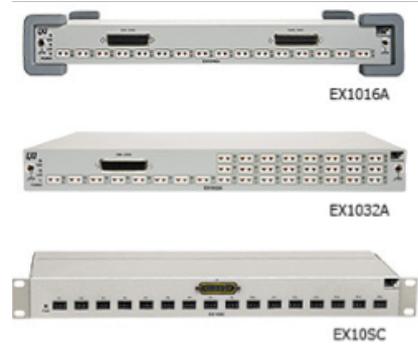
MODEL NAME	DESCRIPTION
EMX-6010 EMX-6010-4	10 MSa/s high-speed instrument, 8 (EMX-6010) or 4 (EMX-6010-4) independent channels, 16-bit, 1 MHz bandwidth, aggressive anti-aliasing filters > -80 dB per octave, 10x oversampling, extensive on-board signal processing capabilities, advanced hardware system-on-a-chip (SoC) and FPGA personalization, internal self-test/self calibration
EMX-6050 EMX-6050-4	10 MSa/s high-speed instrument, 8 (EMX-6050) or 4 (EMX-6050-4) independent channels, 16-bit, 5 MHz bandwidth, aggressive anti-aliasing filters, extensive on-board signal processing capabilities, advanced hardware system-on-a-chip (SoC) and FPGA personalization, internal self-test/self calibration.

INTEGRATED CHASSIS/CONTROLLERS

MODEL NAME	DESCRIPTION
EMX09	9-slot (1 hybrid slot) flexible 4U chassis, integrated Gigabit Ethernet LXI interface, smart panel display for health monitoring and control, IEEE 1588 distributed chassis/instrument synchronization, high-speed switched serial backplane.
EMX18	18-slot (8 hybrid slot) 4U chassis integrated Gigabit Ethernet LXI interface, multifunction power switch/diagnostic display, IEEE 1588 distributed chassis/instrument synchronization, high-speed switched serial backplane.

EX1000A EX1629 Series

High-Density Temperature, Strain, and Voltage Instrumentation



Ideally suited for high channel count temperature, bridge, and voltage measurements, the EX1000A/EX1629 series instruments deliver superior measurement accuracy and repeatability across a wide range of applications. Fully integrated independent signal conditioning paths, advanced cold-junction compensation (CJC), independent 24-bit A/D converters per channel, extensive software selectable filtering, and complete end-to-end self-calibration ensure reliable data first time, every time.

MODEL NAME	DESCRIPTION
EX1000A	1 kSa/s precision voltage (± 10 V) instrument, 48 channel, independent signal conditioning per channel, 1 U compact footprint, programmable low pass filter per channel, internal self-test/self-calibration.
EX1000A-TC	1 kSa/s precision thermocouple and voltage (± 10 V) instrument, 48 channel, independent selection of thermocouple or voltage on a per channel basis, independent signal conditioning per channel, ± 0.2 °C accuracy, independent programmable low pass filter per channel, internal self-test/self-calibration.
EX1016A	1 kSa/s precision thermocouple and voltage instrument, 16 thermocouple channels / 32 voltage channels (± 10 V), independent selection of thermocouple or voltage on a per channel basis, independent signal conditioning per channel, ± 0.2 °C accuracy, independent programmable low pass filter per channel, internal self-test/self-calibration.
EX1032A	1 kSa/s precision thermocouple and voltage instrument, 32 thermocouple channels / 16 voltage channels (± 10 V), independent selection of thermocouple or voltage on a per channel basis, independent signal conditioning per channel, ± 0.2 °C accuracy, independent programmable low pass filter per channel, internal self-test/self-calibration.
EX1048A	1 kSa/s precision thermocouple, 48 thermocouple channels, independent signal conditioning per channel, ± 0.2 °C accuracy, 1 U compact footprint, independent programmable low pass filter per channel, internal self-test/self-calibration.
EX10SC	Signal conditioning accessory, 16 channel, individually configurable for voltage, thermocouple, RTD, current, frequency, strain/bridge, thermistor, or pressure. Compatible with EX1000A, EX1016A, and EX1032A
EX1629	Precision strain/bridge and voltage instrument, samples up to 25 kSa/s, 48 independent channels, 24-bit ADC per channel, integrated TEDS, independent bipolar excitation, ± 15 V measurement range, extensive software selectable filtering, internal self-test/self-calibration.

EX1200 Series

General Purpose Data Acquisition Instrumentation



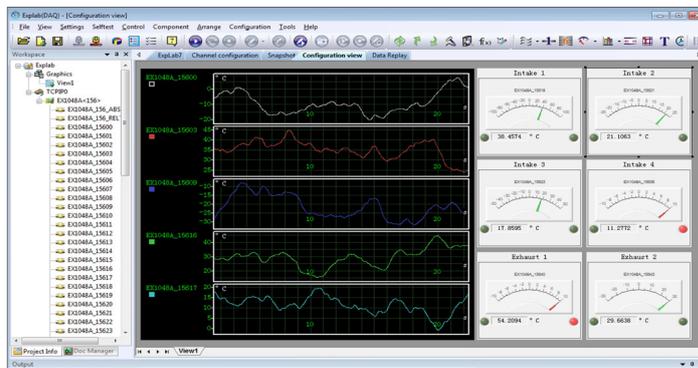
Optimized performance and scalability can be found in the EX1200 series precision switch, measure, and I/O instrument. This cost-effective solution is ideal for a wide range of common data acquisition signal types and transducer inputs, combining measurement accuracy with flexible configuration alternatives.

MODEL NAME	DESCRIPTION
EX1262	2-slot, 1U half-rack instrument with integrated 6.5 digit DMM, internal 300 V measurement bus, Ethernet interface, built-in webserver and LXI trigger bus.
EX1266A	6-slot, 1U instrument with integrated 6.5 digit DMM, internal 300 V measurement bus, Ethernet interface, built-in webserver and LXI trigger bus.
EX1268A	16-slot, 3U instrument with integrated 6.5 digit DMM, internal 300 V measurement bus, Ethernet interface, built-in webserver and LXI trigger bus.
EX1200-3048	48-channel, dual (1x24) 2-wire, 300 V / 2 A multiplexer. Unmatched performance for density - 60 W, 125 VA switching, 35 MHz bandwidth.
EX1200-3048S	48-channel, dual (1x24) 2-wire, 250 V, high-speed FET multiplexer, 250 V switching, infinite life and are ideal for applications that require high-speed switching over prolonged periods like battery tests and thermocouple and RTD switching.
EX1200-3072	72-channel, dual (1x36) 2-wire, 300 V / 2 A multiplexer. Best-in-class performance at this density - 60 W, 125 VA switching, 40 MHz bandwidth.
EX1200-3096	96-channel, dual (1x48) 2-wire, 100 V, 0.5 A multiplexer.
EX1200-7500	64-channel, time-stamped 8-bit 8-port DIO and relay driver (300 mA sink and upto +60 V) with 2.5 MHz clock rate. Large onboard memory (2 MB) and extensive synchronization and triggering.
EX1200-1538	8-channels of independent 1 MHz frequency / 32-bit counter inputs. 16 channels of isolated digital I/O, and 2 channels of isolated analog output (DAC) in a single instrument.
EX1200-3604	4-channel independent, isolated, 500 kSA/s, 16-bit current (20 mA) and voltage (+20 V) source with extensive triggering capability. Connect in series to achieve up to 160 mA or 160V output.
EX1200-3608	8-channel independent, isolated, 500 kSa/s, 16-bit current (20 mA) and voltage (+20 V) source with extensive triggering capability. Connect in series to achieve up to 160 mA or 160 V output.

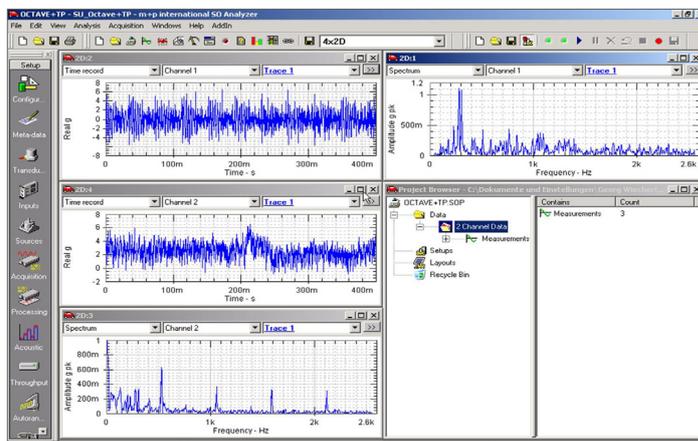
Software

Turn key Data Acquisition, NVH, and DSA Software Solutions

VTI's intuitive turn-key data acquisition software solutions offer broad application space coverage ranging from general purpose data logging to specialized applications such as acoustic analysis. These proven solutions can easily scale from tens to thousands of channels, address time and frequency domain requirements, display data in a variety of formats, monitor alarm conditions, and perform specialized analysis.



Index	Channel number	Availability	Signal type	Sensor type	Voltage range	Unit	Filter	Integrit...	Reference_chan...
0	EX108A_15000	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
1	EX108A_156	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
2	EX108A_156_A45	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
3	EX108A_15601	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
4	EX108A_15604	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
5	EX108A_15605	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
6	EX108A_15606	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
7	EX108A_15607	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
8	EX108A_15608	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
9	EX108A_15609	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
10	EX108A_15610	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
11	EX108A_15611	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
12	EX108A_15612	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
13	EX108A_15613	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
14	EX108A_15614	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
15	EX108A_15615	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
16	EX108A_15616	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
17	EX108A_15617	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
18	EX108A_15618	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
19	EX108A_15619	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
20	EX108A_15620	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
21	EX108A_15621	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
22	EX108A_15622	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...
23	EX108A_15623	✓	Temperature	Thermocouple J	0.01 mV	°C	4 Hz	External CIC	...



EXLab

General Purpose Data Acquisition

MODEL NAME	DESCRIPTION
EXLab-Lite	General purpose, turn-key data acquisition software, support for up to 144 channels, automatic device discovery with intelligent configuration, support for multiple instrument types and configurations, extensive time domain displays and data viewing capabilities, and data logging.
EXLab-Standard	Extends EXLab-Lite capability with 384-channel support, real-time FFT displays, advanced data logging and triggering capabilities, and runtime alarms.
EXLab-Professional	Extends EXLab-Standard capability with 1000-channel support, post analysis functionality, advanced file management, and multiple client data publishing/display.
EXLab-Enterprise	Extends EXLab-Professional capability with unlimited channel support, remote monitoring and control, support for up to five (5) remote clients, and optional client support.
EXLab-Standard-Analysis	Post analysis data acquisition capability including data import / export, data visualization including waterfall, video, images, and scatter diagrams and well as analysis.
EXLab-Advanced-Analysis	Extends EXLab-Standard-Analysis capability with advanced data import/export capability, advanced filtering and analysis, and extended visualization and modeling features including chromatogram, 3D model and SRS diagrams, as well as optional MATLAB support.

VTIcoda

Large Scale Static Structural Test

MODEL NAME	DESCRIPTION
VTIcoda-Express	General purpose, turn-key data acquisition software with support for up to 96 channels, single client/server configuration, single instrument, automatic instrument identification, event logging, basic arithmetical operations, time domain displays, and data viewing capabilities.
VTIcoda-Pro	Extends VTIcoda -Express with support for up to 240 channels plus support for multiple instrument types, full alarm management, running average, circular buffer, calculated stress and strain.
VTIcoda-Expert	Extends VTIcoda -Pro with support for over 240 channels with support for predicted and real-time stress, predicted alarms, multi-station configuration, FFT display, advanced mathematical functions.

X-Modal III

Modal Analysis

MODEL NAME	DESCRIPTION
X-Modal III	Comprehensive open-source modal analysis software package supporting unlimited channels, extensive modal parameter estimation algorithms, flexible data management capability, based on MATLAB open programming environment.

SO Analyzer

Acoustic/Impact/Rotational/Shock/Modal

MODEL NAME	DESCRIPTION
VTI DSA Pro SO Analyzer	Real-time FFT acquisition, analysis and reporting with data import/export, support for up to 16 channels, time history recording, off-line post processing, calculated channels.
VTI DSA +16	Extends VTI DSA Pro SO Analyzer capability with additional 16 channel support (up to 240 channels).
VTI Acoustic	Extends VTI DSA Pro SO Analyzer capability with real-time acoustic analyzer (fractional octave filters).
VTI Impact ODS	Guided impact, Geom, and ODS.
VTI Pro Modal	Guided Impact, Geom, ODS & Advanced Modal analysis SDOF, MDOF, and MMV.
VTI MIMO	MIMO measurement and analysis including multiple source output.
VTI Rotate	Stepped sine on-line analysis wizard.
VTI Shock	Shock response post processing analysis.
VTI Intensity	Accoustic intensity measurement and analysis wizard.

VTI INSTRUMENTS

INTEGRATED DATA ACQUISITION SIGNAL CONDITIONING SYSTEMS

sentinel**EX**

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