

Data Acquisition Product Guide

PC-Based Measurement Solutions

About Data Translation

Data Translation, founded in 1973 and headquartered in Marlboro, Mass., is a leading designer, manufacturer, and provider of data acquisition solutions for test and measurement. With expertise in the design of high-accuracy, high-quality hardware and application software, Data Translation partners with end users and OEMs to achieve their test and measurement goals. With more than thirty five years of experience, customers have come to rely on Data Translation for its world-class software, design proficiency, high-quality manufacturing, and customer service. Data Translation has a worldwide presence, with offices in the US and Europe and distribution in more than 40 countries.

Customer Support

Application engineers are available during normal business hours to discuss your requirements. Extensive information, including drivers, example code, a searchable Knowledge Base, and much more, is available 24 hours a day on our web site at www.datatranslation.com. You can also request complimentary support via email or fax at any time.

OEM Solutions

Data Translation's high quality OEM solutions are perfect for embedding into custom applications. When deciding on whether to design or buy a data acquisition module, many factors need to be considered:

- Buying an off-the-shelf data acquisition board is often the fastest way to market.
- Leveraging the knowledge and experience of the experts to provide customers with product quality, reliability, and performance that they expect.
- The "real cost" when building your own: design engineering, test engineering, quality, engineering, and production engineering.
- The "opportunity" cost involved in doing your own design. Engineering time is valuable and may be better spent on more targeted projects.

With on-site manufacturing in Marlboro, Mass., Data Translation has total control over the quality and delivery of their products. Fast turn-around and flexible scheduling and delivery are just a few of the benefits Data Translation can offer their OEM customers.

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Temperature



Voltage



Sound & Vibration



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Data Translation GmbH
Im Weilerlen 10
D-74321 Bietigheim-Bissingen
Germany

Sales: +49 (0) 7142-9531-0
Email: info@datatranslation.eu

USB DAQ

Data Translation offers a wide range of USB data acquisition (DAQ) modules for any application and budget.

- Up to 24-bit resolution
- From 2 – 48 analog input channels
- Up to 10 MS/s sampling
- From millivolts to ± 400 V input range
- Digital I/O, counter/timers, quadrature decoders, tachometer
- Analog output channels
- Isolation options including ISO-Channel technology
- Application software and drivers included



Low Cost USB DAQ Modules

Model	Analog Inputs	Resolution	Sample Rate	Digital I/O	Counter/Timers	Analog Outputs
DT9800 Series	16/8	12- or 16-bit	Up to 100 kHz	16	2	0 or 2
DT9810	8	10-bit	25 kHz	20	1	—
DT9812-2.5V	8	12-bit	50 kHz	16	1	2
DT9812-10V	8	12-bit	50 kHz	16	1	2
DT9813-10V	16	12-bit	50 kHz	8	1	2
DT9814-10V	24	12-bit	50 kHz	—	1	2
DT9816	6	16-bit	50 kHz	16	1	—
DT9816-A	6	16-bit	150 kHz	16	1	—
DT9816-S	6	16-bit	750 kHz	16	1	—
DT9817	—	—	—	28	1	—
DT9817-H	—	—	—	28	1	—
DT9817-R	—	—	—	16	1	—
DT9835	—	—	—	96	—	—
DT9853*	—	—	—	16	1	4
DT9854*	—	—	—	16	1	8

*0-20mA current output capability with -M version

Software Solutions for Test & Measurement

VIBpoint™ Framework — Ready-to-measure data collection and analysis software for sound and vibration applications.

quickDAQ™ — Ready-to-measure high performance .NET based data collection and analysis software application.

DT-Open Layers™ for .NET and DataAcq SDK — Programming environments for developing test and measurement applications.

Instrument Web Interface — Built-in interface allows access to your instrument from browser address bar. Web pages show information about your instrument on the network and provide access to instrument configuration, acquisition, display, and data recording settings.

Measure Foundry® — Drag and drop graphical environment for building powerful applications.

Measurement Applets — Ready-to-use applications developed in Measure Foundry.

MATLAB® and LabVIEW™ — All Data Translation products are supported under MATLAB®, LabVIEW™, and other third party software packages. See our website for more details.

USB DAQ

Low Cost

ECONseries
DT9810-DT9817

- 10-, 12-, 16-bit resolution
- Up to 24SE analog inputs
- Up to 750 kS/s sampling per channel
- Digital I/O modules
- Analog output modules
- Powered by USB
- Included software and drivers



Low Cost Digital I/O

DT9817

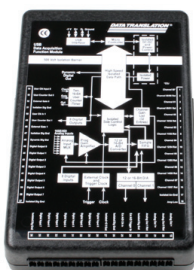
- 28 digital I/O lines
- DT9817-R fully isolated
- DT9817-H and -R ideal for switching relays (solid state or mechanical)
- Counter/Timer
- Included software and drivers



Low Cost Multifunction

DT9800 Series

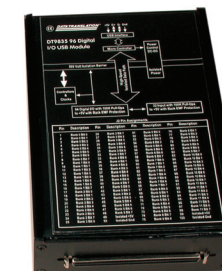
- $\pm 500V$ Isolation
- 16SE/8DI analog inputs
- 12- or 16-bit resolution
- Up to 100 kS/s sampling
- 16 digital I/O lines
- 2 counter/timers
- Optional 12- or 16-bit analog outputs
- Included software and drivers



High Channel Isolated Digital I/O

DT9835

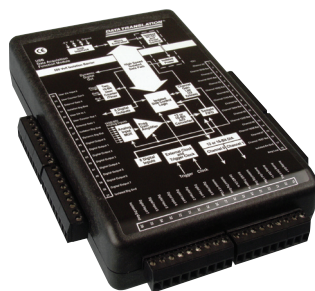
- $\pm 500V$ Isolation
- 96 digital I/O lines (32 as dedicated inputs)
- Capable of driving external solid state relay
- Included software and drivers



Low Cost Temperature

DT9805, DT9806

- $\pm 500V$ Isolation
- Cold junction compensation (CJC)
- 16SE/8DI analog inputs
- 16-bit resolution
- Up to 50 kS/s sampling
- 16 digital I/O lines
- 2 counter/timers
- Optional analog outputs
- Included software and drivers



Low Cost Analog Output

DT9853, DT9854

- 16-bit resolution
- Up to 8 analog outputs with 0-20mA current output capability
- 16 digital I/O lines
- Counter/Timer
- Powered by USB
- Included software and drivers



USB DAQ

High Performance USB DAQ Modules

Model	Analog Inputs	Resolution	Sample Rate	Digital I/O	Counter/Timers	Tachometer	Analog Outputs
DT9818	Up to 32	16-bit	150 kHz	16	2	—	2
DT9824	4	24-bit	4800 Hz/ch	16	—	—	—
DT9826	16	24-bit	41.6 kHz/ch	16	2	1	—
DT9834 Series	Up to 32	16-bit	500 kHz	32	5	—	0 or 4

High Performance Multifunction

DT9818

- $\pm 500V$ isolation
- Up to 32SE/16DI analog inputs
- 16-bit resolution
- 150 kS/s sampling
- 16 digital I/O lines
- 2 counter/timers
- OEM, BNC, or STP packaging
- Powered by USB
- Included software and drivers



High Performance Simultaneous

DT9826

- $\pm 500V$ isolation
- 16SE analog inputs
- Dedicated 24-bit resolution ADC per channel
- Up to 41.6 KS/s sampling per channel
- 16 digital I/O lines
- 2 counter/timers, 1 tachometer
- OEM or BNC packaging
- Powered by USB
- Included software and drivers



High Performance ISO-Channel™

DT9824

- $\pm 500V$ isolation ch-to-ch
- Dedicated 24-bit resolution per channel
- Input gains of 1,8,16, 32 with $\pm 10V$ range
- 16 digital I/O lines
- Temperature coefficient of $\pm 0.05\mu V/^\circ C$
- CMRR of greater than 150dB
- Included software and drivers



High Performance Multifunction

DT9834 Series

- $\pm 500V$ isolation
- Up to 32SE/16DI analog inputs
- 16-bit resolution
- 500 kS/s sampling
- Up to 32 digital I/O lines
- Up to 5 counter/timers
- OEM, BNC, or STP packaging
- Included software and drivers



USB DAQ

High Speed Simultaneous USB DAQ Modules

Model	Analog Inputs	Resolution	Sample Rate	Digital I/O	Counter/Timers	Quadrature Decoders	Analog Outputs
DT9832 Series	Up to 4	16-bit	Up to 2 MHz/ch	32	2	3	0 or 2
DT9836 Series	6 or 12	16-bit	Up to 800 kHz/ch	32	2	3	0, 2, or 4
DT9862	2	16-bit	10 MHz	32	2	3	0 or 2

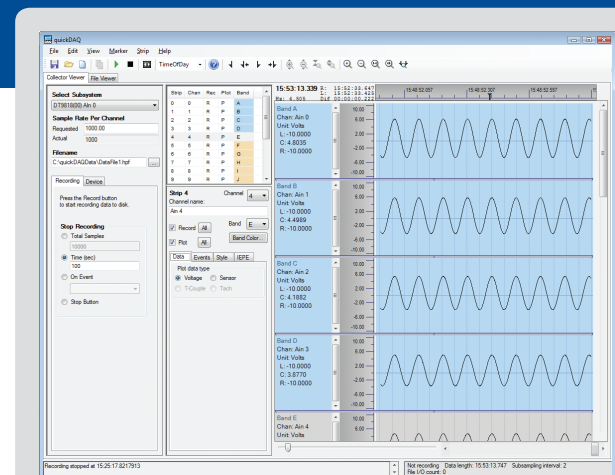
High Speed Simultaneous DT9832 Series, DT9836 Series

- ±500V isolation
- Up to 12SE simultaneous analog inputs
- 16-bit resolution
- Up to 2 MS/s sampling per channel
- 32 digital I/O lines
- 2 counter/timers
- 3 quadrature decoders
- Included software and drivers



High Speed Simultaneous DT9862

- ±500V isolation
- 2SE simultaneous analog inputs
- 16-bit resolution
- Up to 10 MS/s sampling
- 32 digital I/O lines
- 2 counter/timers
- 3 quadrature decoders
- Included software and drivers



quickDAQ

- Software ships with all Data Translation USB and PCI data acquisition hardware as a 14-day evaluation
- High performance, Ready-to-Measure Application for Data Acquisition
- Configure all input channel settings, such as: clock rate, sensor type, AC/DC coupling, input range, gain, counter and tachometer, etc.
- Acquire and display live signals for real-time visual analysis
- Acquire high speed signals simultaneously and directly to disk at full throughput of hardware
- Convert signals automatically to engineering units to support a variety of data acquisition applications
- Analyze data or save it to disk for later analysis
- Import data into other applications for advanced post-processing and analysis

USB DAQ

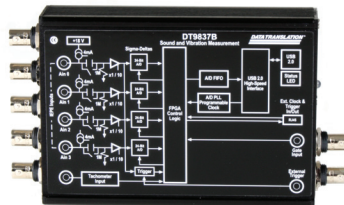
Sound & Vibration USB DAQ Modules

Model	Analog Inputs	Resolution	Sample Rate	Digital I/O	Counter/Timers	Tachometer	Analog Outputs
DT9837 Series	4	24-bit	Up to 105.4 kHz/ch	—	—	1	1
DT9841 Series	2 or 8	24-bit	100 kHz/ch	24	3	1	2
DT9842 Series	8	16-bit	100 kHz/ch	24	3	1	2 or 8

Sound & Vibration

DT9837 Series

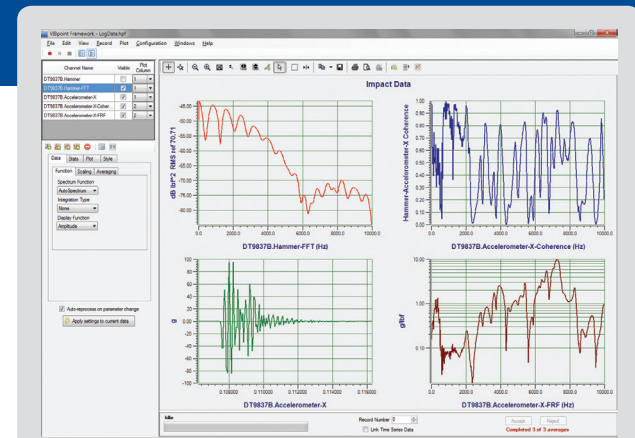
- 24-bit resolution
- IEPE or voltage inputs
- 4 analog inputs, Tacho input
- Up to 105.4 kS/s sampling
- Sync multiple modules for channel expansion
- OEM or BNC packaging
- Powered by USB
- Included software and drivers



Embedded DSP

DT9841, DT9842

- $\pm 500V$ Isolation
- 16- and 24-bit resolution
- Up to 8 analog inputs
- Up to 100 kS/s sampling per channel
- 2-8 analog outputs
- 3 counter/timers
- OEM and Slick Box packaging
- Included software and drivers



VIBpoint™ Framework

- Software ships with all DT9837 Series and DT8837 hardware as a 14-day evaluation
- Discover and select available hardware: DT9837 Series and DT8837 modules
- Configure all input channel settings, such as: enable state, clock rate, AC/DC coupling, gain, counter and tachometer edges, etc.
- Load/Save hardware configurations
- Simultaneously acquire data from all selected channels on each device
- On each device, acquire data from all channels on one board, or across multiple boards in sync with Wired Trigger Bus (DT8837) or shared trigger/clock line (DT9837 Series)
- Acquisition mode: monitor acquired data without saving or record data to disk
- File Reader mode: view and analyze previously recorded data
- Perform single channel and two-channel FFT operations
- Display acquired data during acquisition
- Save data to disk, to comma or tab separated file, or open in Excel

For more information, see page 12.

USB DAQ

USB Modules with ISO-Channel™

See page 11 to learn more about ISO-Channel

Model	Analog Inputs	Input Range	Resolution	Sample Rate	Digital I/O
DT9824	4	$\pm 0.3125V, \pm 0.625V, \pm 1.25V, \pm 10V$	24-bit	4800 Hz/ch	16
DT9871	8-48	$\pm 75mV$	24-bit	10 Hz/ch	16
DT9872	8-48	$\pm 1.25V$	24-bit	10 Hz/ch	16
DT9873	8-48	$\pm 10V, \pm 100V, \pm 400V$	24-bit	10 Hz/ch	16
DT9874	8-48	$\pm 75mV, \pm 1.25V, \pm 10V, \pm 100V, \pm 400V$	24-bit	10 Hz/ch	16

High Performance ISO-Channel™

DT9824

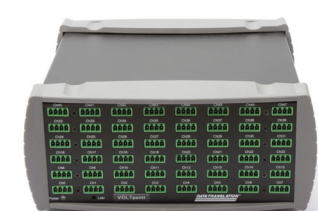
- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- Input gains of 1,8,16, 32 with $\pm 10V$ range
- 16 digital I/O lines
- Temperature coefficient of $\pm 0.05\mu V/^{\circ}C$
- CMRR of greater than 150dB
- Included software and drivers



ISO-Channel™ Voltage Instrument

DT9873

- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- Measure voltages up to $\pm 400V$
- 8 to 48 differential channels
- Sample up to 10Hz per channel
- Measurement Application included



VOLTpoint™

ISO-Channel™ Temperature Instrument

DT9871, DT9872

- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- Measure thermocouples, RTDs, or voltage
- 8 to 48 differential channels
- Sample up to 10Hz per channel
- B,E,J,K,N,R,S, and T thermocouples supported
 - Dedicated CJC (cold junction compensation) for each thermocouple channel
- Pt100, Pt500, Pt1000 Ω Platinum RTD types supported
- Measurement Application included



TEMPpoint™

ISO-Channel™ Temperature & Voltage Instrument

DT9874

- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- Measure thermocouples, RTDs, or voltage
- 8 to 48 differential channels
- Sample up to 10Hz per channel
- B,E,J,K,N,R,S, and T thermocouples supported
 - Dedicated CJC (cold junction compensation) for each thermocouple channel
- Pt100, Pt500, Pt1000 Ω Platinum RTD types supported
- Measure voltages up to $\pm 400V$
- Measurement Application included



MEASURpoint™

Ethernet DAQ



Ethernet Instruments with ISO-Channel™

See page 11 to learn more about ISO-Channel

Model	Analog Inputs	Input Range	Resolution	Sample Rate	Digital I/O
DT8824	4	$\pm 0.3125V$, $\pm 0.625V$, $\pm 1.25V$, $\pm 10V$	24-bit	4800Hz/ch	4
DT8837	4	$\pm 1V$, $\pm 10V$	24-bit	52.7 kHz/ch	4

ISO-Channel™ High Performance

DT8824

- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- Input gains of 1, 8, 16, 32 with $\pm 10V$
- 4 opto-isolated digital output lines; outputs are solid state relays that operate from $\pm 30V$ at currents up to 400mA (peak) AC or DC
- Temperature coefficient of $\pm 0.05\mu V/^\circ C$
- CMRR of greater than 150dB
- Ethernet (LXI Class C compliant)
- Sync multiple instruments with WTB
- Included software and drivers



ISO-Channel™ Sound & Vibration

DT8837

- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- IEPE or voltage inputs
- 4 analog inputs, tachometer input
- 52.7 kS/s sampling per channel
- Ethernet (LXI) class-C compliant
- Sync multiple instruments with WTB
- Analog Output, 24 bit, 52.7 kS/s sampling
- Included software and drivers



Instrument Web Interface

- Built-in interface can be accessed by entering the IP address of your instrument module directly in your browser address bar
- Main web page shows information about your instrument on the network
- Web pages are provided for configuring the following aspects of your DT8824 instrument module:
 - Local Area Network (LAN) settings
 - Analog input channels
 - Clock frequency
 - Trigger settings
 - Buffer mode
- Use the Measurement & control web pages to perform the following functions
 - Start and stop acquisition on the analog input subsystem
 - View data in oscilloscope
 - Download measurements
 - Save data to disk
 - Control digital outputs

Ethernet Instruments with ISO-Channel™

See page 11 to learn more about ISO-Channel

Model	Analog Inputs	Input Range	Resolution	Sample Rate	Digital I/O
DT8871	8-48	±75mV	24-bit	10 Hz/ch	16
DT8872	8-48	±1.25V	24-bit	10 Hz/ch	16
DT8873	8-48	±10V, ±100V, ±400V	24-bit	10 Hz/ch	16
DT8874	8-48	±75mV, ±1.25V, ±10V, ±100V, ±400V	24-bit	10 Hz/ch	16

ISO-Channel™ Temperature Instrument**DT8871, DT8872**

- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- Measure thermocouples, RTDs, or voltage
- 8 to 48 differential channels
- Sample up to 10Hz per channel
- B,E,J,K,N,R,S, and T thermocouples supported
 - Dedicated CJC (cold junction compensation) for each thermocouple channel
- Pt100, Pt500, Pt1000 Ω Platinum RTD types supported
- Measurement Application included



TEMPpoint™

ISO-Channel™ Temperature & Voltage Instrument**DT8874**

- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- Measure thermocouples, RTDs, or voltage
- 8 to 48 differential channels
- Sample up to 10Hz per channel
- B,E,J,K,N,R,S, and T thermocouples supported
 - Dedicated CJC (cold junction compensation) for each thermocouple channel
- Pt100, Pt500, Pt1000 Ω Platinum RTD types supported
- Measure voltages up to ±400V
- Measurement Application included



MEASURpoint™

ISO-Channel™ Voltage Instrument**DT8873**

- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- Measure voltages up to ±400V
- 8 to 48 differential channels
- Sample up to 10Hz per channel
- Measurement Application included



VOLTpoint™

VIBpoint

VIBpoint for Sound & Vibration Analysis

Model	Analog Inputs	Resolution	Sample Rate	Digital I/O	Counter/ Timers	Tachometer	Analog Outputs
USB VIBpoint	16	24-bit	Up to 105 kHz	—	•	•	•
Ethernet VIBpoint	16*	24-bit	Up to 52.7 kHz	•	•	•	•

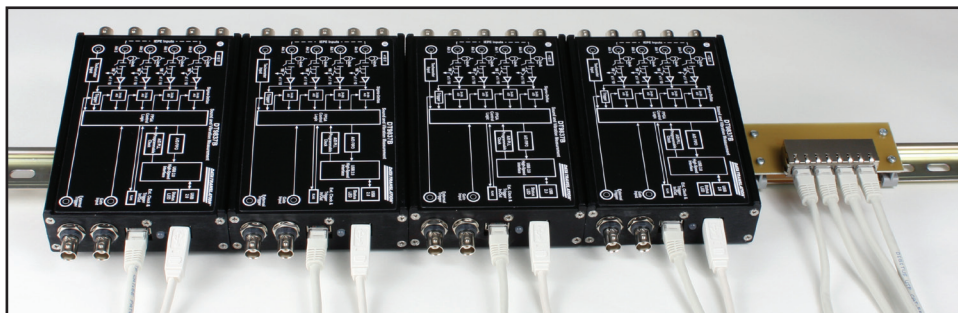
*ISO-Channel

VIBpoint™ is a series of precision measurement products for vibration data acquisition, analysis, and monitoring. The series includes USB and Ethernet (LXI compliant) options. The USB modules run on USB power, making them ideal for portable applications. All hardware is supported by the VIBpoint Framework Application software for vibration analysis.

Key features:

- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- IEPE or voltage inputs
- 16 analog inputs, Tachometer input
- Up to 105.4 kS/s sampling per channel
- USB powered and Ethernet (external power required) options
- Includes VIBpoint Framework Application and all accessories required for a total solution

VIBpoint™



ISO-Channel™

- Galvanic isolation methods to guarantee 1000V isolation between all input channels and ±500V to earth ground
- Common mode noise and ground loop problems are eliminated
- Increase reliability by implementing a 24-bit A/D converter per channel, all operating in parallel
- All solid-state ISO-Channel provides digital transfer of valuable sensor data with optical or transformer isolation
- Result is accuracy is preserved for all sensor inputs

Products Featuring ISO-Channel:

- | | | |
|----------|----------|----------|
| • DT8824 | • DT8873 | • DT9872 |
| • DT8837 | • DT8874 | • DT9873 |
| • DT8871 | • DT9824 | • DT9874 |
| • DT8872 | • DT9871 | |

MEASURpoint™

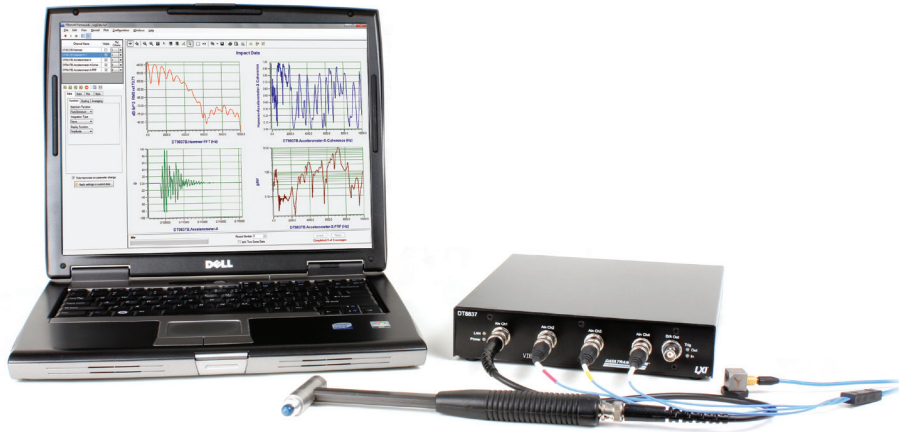
VIBpoint™

TEMPpoint™

VOLTpoint™

VIBpoint Framework

The VIBpoint Framework application adds real-time analysis features to DT9837 and DT8837 vibration test systems. The VIBpoint Framework Application provides continuous and re-triggered data acquisition, records data to disk, and analyzes the acquired data using single-channel and two-channel FFT functions. The software is navigated through a series of easy-to-use configuration windows, allowing flexible selection of the desired acquisition, processing, plotting and display parameters.



Acquire

- Discover and select supported devices
- Configure all input channel settings for the attached sensors, such as the enable state, IEPE settings, input range, tachometer edges, counter edges, and engineering units for the sensor
- Load/save multiple hardware configurations
- Simultaneously acquire data from all selected channels on each connected device
- Log acquired data to disk, file can be opened later for further processing

Analyze

- Perform single FFT (Fast Fourier Transforms) operations on the acquired analog input data, including Spectrum, Autospectrum, and Power Spectral Density
- Perform two-channel FFT operations, including: Frequency Response Functions (Inertance, Mobility, Compliance, Apparent Mass, Impedance, Dynamic Stiffness or custom FRF) with H1, H2, or H3 Estimator types, Cross-Spectrum, Cross Power Spectral Density, Coherence, and Coherent Output Power

- Frequency domain data can be displayed as Amplitude, Phase, or Nyquist Plot
- Configure and view statistics about the FFT data, including the frequency and dB value of the highest peaks
- Open recorded data in Excel for further analysis
- Time domain data can be displayed as acquired and/or after windowing
- Linear and Exponential Averaging Types are supported along with RMS (Real), Vector (Complex) and Peak Hold Averaging Modes

Display

- Customize many aspects of the signal display to suit your needs, including row/column configuration, colors, fonts, custom header annotation, signal overlay etc.
- Display acquired and processed data in real-time during acquisition.
- Any processing parameters can be changed post-acquisition and the results are immediately calculated and displayed
- Export data as comma or tab delimited text, and export display window to a variety of graphics file formats

Modes of Operation

The VIBpoint Framework application offers two operating modes:

- Acquisition mode – Acquire analog input, tachometer, and/or counter data. This mode requires use of at least one of the supported Data Translation data acquisition devices. In this mode, monitor acquired data without logging it to disk, or record the acquired data to disk.
- File reader mode – View a previously recorded data file. In this mode, analyze the data, repeatedly, using different single function or two-channel FFT functions, as desired.

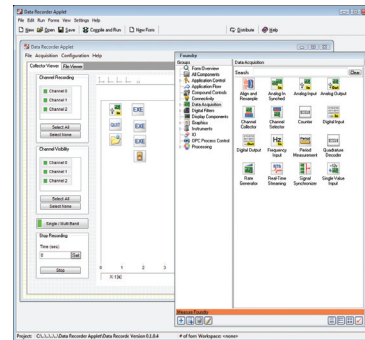
Licensing

The VIBpoint Framework application is available as a 14-day trial version. Once you start the software, you have 14 consecutive calendar days in which to try the features of the application. When the 14-day trial period has elapsed, you must purchase a license key from Data Translation to continue using the VIBpoint Framework application.

DAQ Software

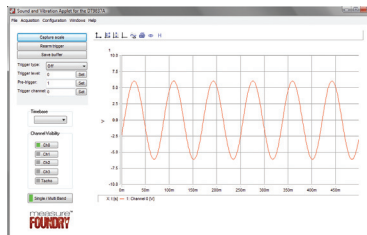
Measure Foundry®

- Visual, drag-and-drop software development environment
- Supports all IVI-COM drivers over interfaces including GPIB and LXI
- Melting Pot (offering math operations and functions) and VISA script components for custom code
- Evaluation copy included with all hardware



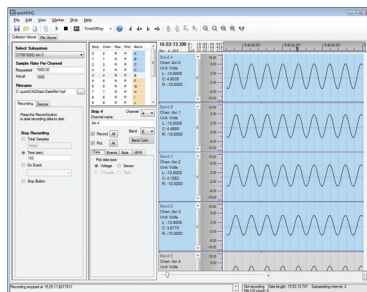
Measurement Applets

- Small applications, developed with Measure Foundry®, that can be modified or combined to provide a specific solution
- Included with Measure Foundry®



quickDAQ

- Easy to use, no programming
- Acquire data from all devices supported by DT-Open Layers® for .NET at high speed
- Plots data during acquisition, analyzes it, and/or saves it to disk for later analysis



Quick Data Acq

- Easy to use, no programming
- Acquire data from all devices supported by DT-Open Layers® for .NET
- Verify key hardware features, display data on the screen, and save data to disk

DT-Open Layers® for .NET

- Native .NET® class library for developing test and measurement applications in Microsoft Visual Studio®
- Any language that conforms to the Common Language Specification (CLS) can be used, including: Visual Basic® .NET, Visual C#®, Visual C++® .NET with managed extensions, and Visual J#® .NET
- Includes DT-Display for .NET, a control for plotting data to a Windows form. It provides a powerful and user-friendly interface for rendering data.

DataAcq SDK

- Programmer's DLL (Dynamic Linked Library) intended for use with non .NET languages, such as ANSI C, Visual C++ 6.0, and Visual Basic 6.0
- Includes DTx-EZ, a visual programming tool for Microsoft Visual Basic and Visual C++. Enable a quick and easy development of test and measurement applications

MATLAB®

- The DAQ Adaptor for MATLAB® provides an interface between the MATLAB® Data Acquisition Toolbox from The MathWorks® and Data Translation hardware. Support for all DT-Open Layers® compatible hardware.
- Using the MATLAB® Instrument Control Toolbox from The MathWorks®, you can access all the functions of Data Translation's Ethernet (LXI) measurement instruments, including: TEMPpoint, VOLTpoint, MEASURpoint, and the DT8837.

LabVIEW™

- LV-Link provides an interface between National Instrument's LabVIEW™ and Data Translation hardware. Support for all DT-Open Layers® compatible hardware.