

# ***Data Acquisition*** **Product Guide**

**VOLTAGE**



**TEMPERATURE**



**SOUND & VIBRATION,  
& STRAIN**



# 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.

### US/Canada

Data Translation Inc.  
100 Locke Drive  
Marlboro, MA 01752  
USA

Sales: 800-525-8528

Tel: 508-481-3700

Fax: 508-481-8620

Email: [info@datatranslation.com](mailto:info@datatranslation.com)

### Europe/Asia

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

Sales: +49 (0) 7142-9531-0

Email: [info@datatranslation.eu](mailto:info@datatranslation.eu)

## 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](http://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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## Low-Cost USB Bus-Powered Data Acquisition

| 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 Series | 8             | 12-bit        | Up to 100 kHz    | 16          | 1              | 2              |
| DT9813 Series | 16            | 12-bit        | Up to 100 kHz    | 8           | 1              | 2              |
| DT9814 Series | 24            | 12-bit        | Up to 100 kHz    | —           | 1              | 2              |
| DT9816 Series | 6             | 16-bit        | Up to 750 kHz/ch | 16          | 1              | —              |
| DT9817 Series | —             | —             | —                | Up to 28    | 1              | —              |
| DT9853*       | —             | —             | —                | 16          | 1              | 4              |
| DT9854*       | —             | —             | —                | 16          | 1              | 8              |

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

### Low Cost Multifunction

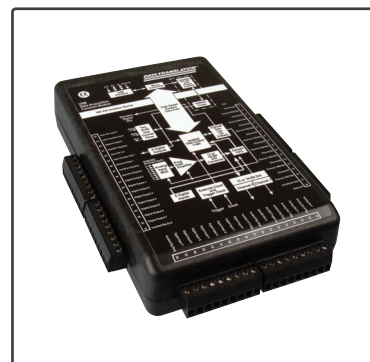
#### DT9800 Series

- $\pm 500V$  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
- Powered by USB
- Included software and drivers

### Low Cost Thermocouple, Voltage

#### 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
- Powered by USB
- Included software and drivers



### Low Cost

#### DT9810-DT9816

- 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
- Powered by USB
- Included software and drivers



### Low Cost Analog Output

#### DT9853, DT9854

- $\pm 300V$  Isolation
- 16-bit resolution
- Up to 8 analog outputs
- Output range:  $\pm 10V$ , 0-10V, 0-20mA current output capability
- 16 digital I/O lines
- Counter/Timer
- Powered by USB
- Included software and drivers



## High Performance USB Data Acquisition

| Model         | Analog Inputs | Resolution | Sample Rate      | Digital I/O | Counter/Timers | Quadrature Decoders | Analog Outputs | Power |
|---------------|---------------|------------|------------------|-------------|----------------|---------------------|----------------|-------|
| DT9818        | Up to 32      | 16-bit     | 150 kHz          | 16          | 2              | —                   | 2              | USB   |
| DT9824        | 4             | 24-bit     | 4800 Hz/ch       | 16          | —              | —                   | —              | USB   |
| DT9826        | 16            | 24-bit     | 41.6 kHz/ch      | 16          | 2              | —                   | —              | USB   |
| DT9832 Series | 2 or 4        | 16-bit     | Up to 2 MHz/ch   | 32          | 2              | 3                   | 0 or 2         | +5V   |
| DT9834 Series | Up to 32      | 16-bit     | 500 kHz          | 32          | 5              | —                   | 0 or 4         | +5V   |
| DT9836 Series | 6 or 12       | 16-bit     | Up to 800 kHz/ch | 32          | 2              | 3                   | 0, 2, or 4     | +5V   |
| DT9862        | 2             | 16-bit     | 10 MHz           | 32          | 2              | 3                   | 0 or 2         | +5V   |

### High Performance Multifunction

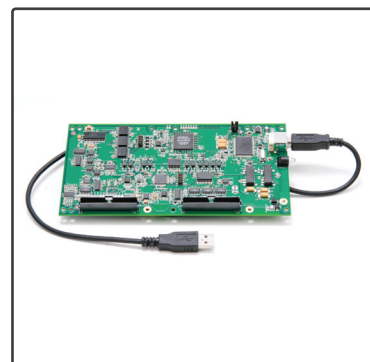
#### DT9818

- $\pm 500V$  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 ISO-Channel™

#### DT9824

- $\pm 500V$  isolation ch-to-ch and to earth ground
- Dedicated 24-bit resolution ADC/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
- Ethernet module available (DT8824)



### High Resolution Simultaneous

#### DT9826

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

### High Speed Simultaneous

#### DT9832 Series, DT9836 Series

- $\pm 500V$  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 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

### High Speed Simultaneous

#### DT9862

- $\pm 500V$  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





## Sound, Vibration, and Strain Data Acquisition for USB and Ethernet

| Model         | Analog Inputs | Resolution | Sample Rate        | Digital I/O | Counter/Timers | Tachometer | Analog Outputs |
|---------------|---------------|------------|--------------------|-------------|----------------|------------|----------------|
| DT8837        | 4             | 24-bit     | 52.7 kHz/ch        | 4           | 2              | 1          | 1              |
| DT9837 Series | 4             | 24-bit     | Up to 105.4 kHz/ch | —           | Up to 2        | 1          | 1              |
| DT9838        | 4             | 24-bit     | 52.7 kHz/ch        | —           | —              | 1          | —              |
| DT9841 Series | 2 or 8        | 24-bit     | 100 kHz/ch         | Up to 24    | 3              | 1          | 2              |
| DT9842 Series | 8             | 16-bit     | 100 kHz/ch         | 24          | 3              | 1          | 2 or 8         |

### ISO-Channel™ Sound & Vibration

#### DT8837

- $\pm 500V$  Isolation ch-to-ch and to earth ground
- 24-bit resolution, Delta-Sigma ADC/ch
- 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

### Portable Strain- and Bridge-Based DAQ

#### DT9838 Series

- 24-bit resolution, Delta-Sigma ADC/ch
- Strain- and bridge-based or voltage inputs
- 4 analog inputs, tachometer input
- Up to 52.7k S/s sampling per channel
- Sync multiple modules for channel expansion
- OEM or metal enclosure with RJ50 connectors
- Powered by USB
- Included software and drivers

### Portable Sound, Vibration & Acoustics

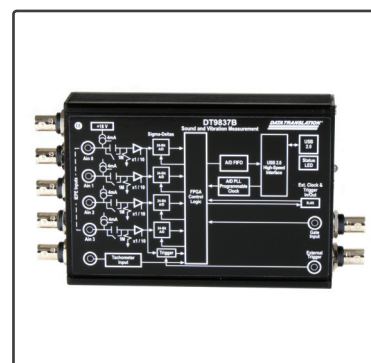
#### DT9837 Series

- 24-bit resolution, Delta-Sigma ADC/ch
- IEPE or voltage inputs
- 4 analog inputs, tachometer input
- Up to 105.4 kS/s sampling per channel
- 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



## Temperature and Voltage Data Acquisition with ISO-Channel™ for USB and Ethernet

| Ethernet Model | USB Model | Analog Inputs | Resolution | Input Range                        | Isolation (Ch-to-Ch) | Sample Rate | Digital I/O | Sensor Type                |
|----------------|-----------|---------------|------------|------------------------------------|----------------------|-------------|-------------|----------------------------|
| DT8871         | DT9871    | 8-48          | 24-bit     | ±75mV                              | ±500V                | 10 Hz/ch    | 16          | Thermocouple, Voltage      |
| DT8872         | DT9872    | 8-48          | 24-bit     | ±1.25V                             | ±500V                | 10 Hz/ch    | 16          | RTD, Voltage               |
| DT8873         | DT9873    | 8-48          | 24-bit     | ±10V, ±100V, ±400V                 | ±500V                | 10 Hz/ch    | 16          | Voltage                    |
| DT8874         | DT9874    | 8-48          | 24-bit     | ±75mV, ±1.25V, ±10V, ±100V, ±400V  | ±500V                | 10 Hz/ch    | 16          | Thermocouple, RTD, Voltage |
| DT8875         | —         | 8-40          | 24-bit     | ±75mV, ±1.25V, ±10V, ±100V, ±400V  | ±1400V               | 10 Hz/ch    | 16          | Thermocouple, RTD, Voltage |
| DT8876         | —         | 4-20          | 24-bit     | ±75mV, ±100mV, ±1.0V, ±1.25V, ±10V | ±3500V               | 10 Hz/ch    | 16          | Thermocouple, RTD, Voltage |

### ISO-Channel™ Thermocouple, RTD, Voltage Measurement Instruments

#### DT8871, DT8872, DT8874, DT9871, DT9872, DT9874

- ±500V isolation ch-to-ch and to earth ground
- 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
- Pt100, Pt500, Pt1000 Ω Platinum RTD types supported
- MEASURpoint Framework included
- Rugged 2U, half-rack enclosure

MEASURpoint™  
TEMPpoint™



### ISO-Channel™ High Voltage Measurements

#### DT8873, DT9873

- ±500V isolation ch-to-ch and to earth ground
- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- Measure voltages up to ±400 V
- 8 to 48 differential channels
- Sample up to 10Hz per channel
- MEASURpoint Framework included
- Rugged 2U, half-rack enclosure

VOLTpoint™

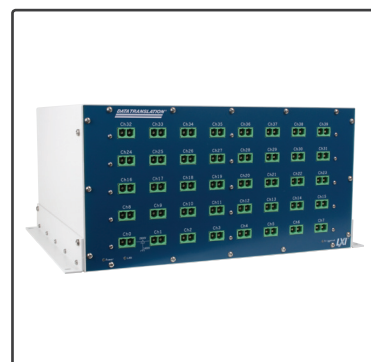


### ISO-Channel™ Thermocouple, RTD, Voltage Measurement Instruments

#### DT8875, DT8876

- ±1400V or ±3500V isolation ch-to-ch and to earth ground
- Dedicated 24-bit resolution, Delta-Sigma A/D converter per channel
- Measure thermocouples, RTDs, or voltage
- Up to 40 differential channels
- Sample up to 10Hz per channel
- B,E,J,K,N,R,S, and T thermocouples supported
- Pt100, Pt500, Pt1000 Ω Platinum RTD types supported
- Measure voltages up to ±400 V
- MEASURpoint Framework included
- Industrial 5U, 19-inch rack enclosure

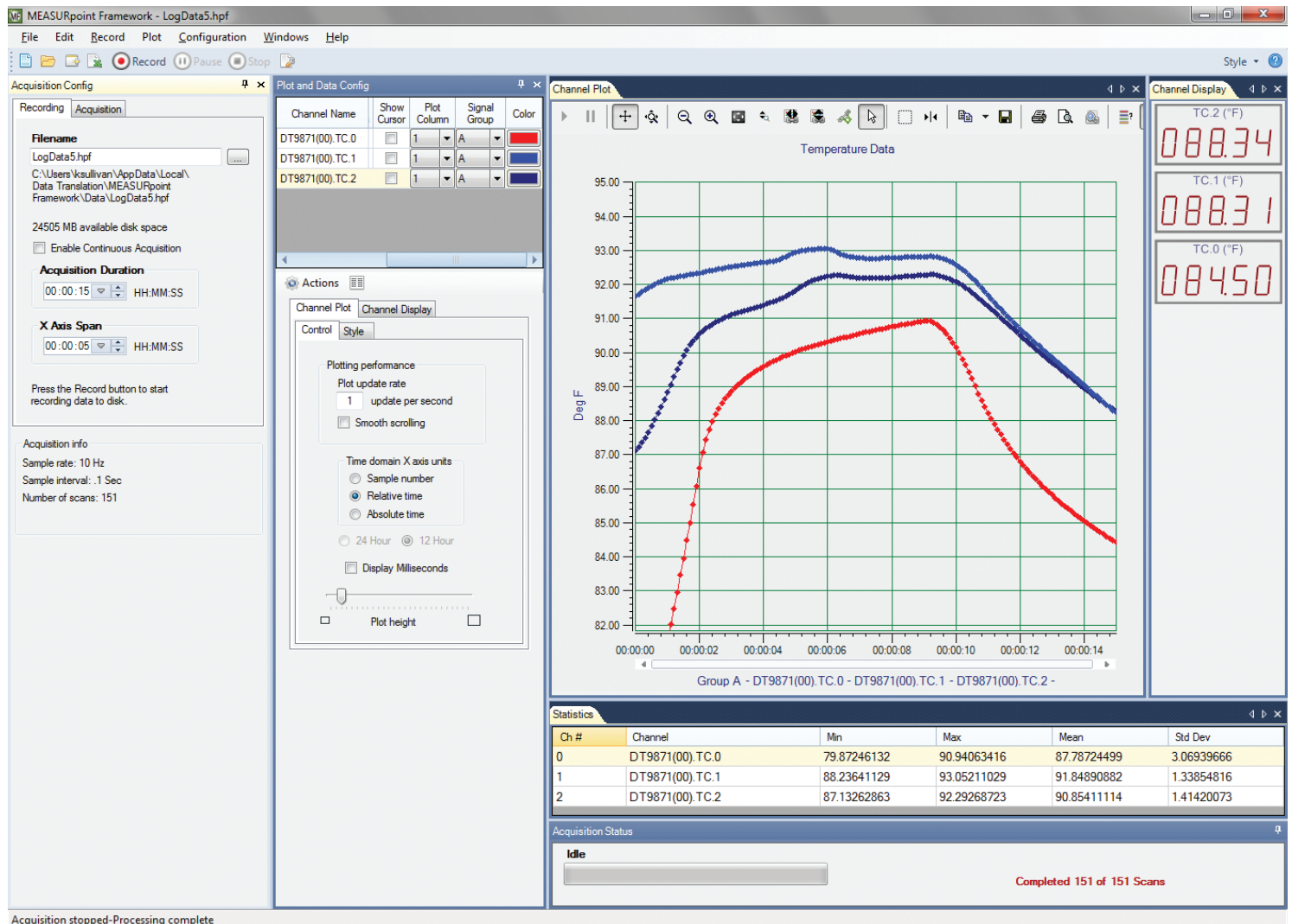
MEASURpoint™



## MEASURpoint Framework

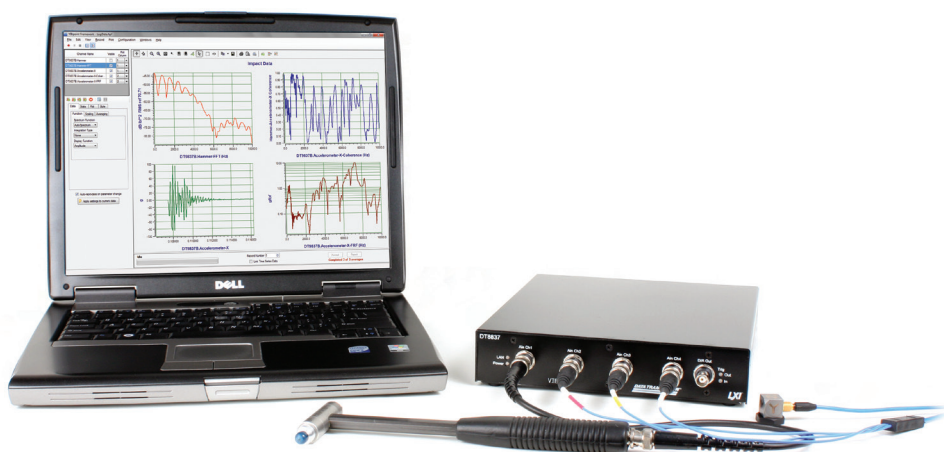
The MEASURpoint Framework application is included with all MEASURpoint, TEMPpoint, and VOLTpoint instruments. This ready-to-measure application allows you to acquire thermocouple, RTD, and/or voltage data from multiple instruments, record data to disk, display the results in both a plot and a digital display, and read a recorded data file.

- Discover and select instruments
- Configure all input channel settings for the attached sensors
- Load/save multiple hardware configurations
- On each device, acquire temperature and voltage data from all enabled channels simultaneously at up to 10Hz per channel
- Log acquired data to disk
- Display acquired data during acquisition in a digital display using the Channel Display window and/or as a waveform in the Channel Plot window
- View statistics about the acquired data, including the minimum, maximum, and mean values and the standard deviation in the Statistics window
- Open recorded data in Microsoft Excel® for further analysis
- Customize many aspects of the acquisition, display, and recording functions, including the acquisition duration, sampling frequency, trigger settings, filter type, and temperature units to use
- Fully configurable graphical user interface



## VIBpoint Framework

The VIBpoint Framework application adds real-time analysis features to DT9837 and DT8837 vibration and DT9838 strain measurement 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, strain measurement settings, 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

- 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.

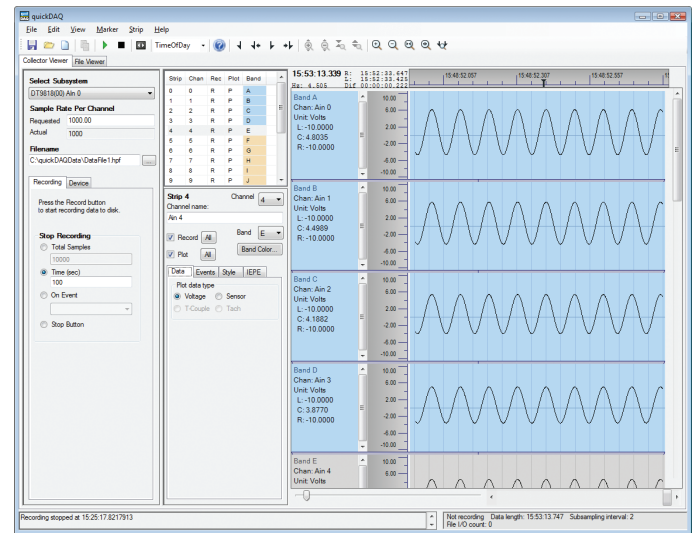
### Licensing

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.



## 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



## 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

## 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

## IVI-COM Driver

- This driver is provided to write application programs for MEASURpoint, TEMPpoint, VOLTpoint, DT8824, and DT8837 using an IVI-COM instrument interface. It can be used with programs written in Visual C#®, Visual Basic® for .NET, or C++ under Visual Studio® 2003/2005/2008/2010.

## 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, DT8824, 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.
- An IVI-COM driver with example Vis is provided with each DT Ethernet instrument for use with any development environment that supports COM programming, including LabVIEW

## Instrument Web Interface

- This built-in interface allows you to verify the operation of your MEASURpoint, TEMPpoint, VOLTpoint, DT8824, and DT8837 instrument and perform basic functions with Internet Explorer and no additional software. Using it, you can configure your instrument, control output signals, measure input signals, and save results to disk.

## SCPI Support for Ethernet Instruments

- Use VISA or network sockets to program and control MEASURpoint, TEMPpoint, VOLTpoint, DT8824, and DT8837 LXI instruments by sending SCPI commands. Comprehensive user manual and example programs provided.