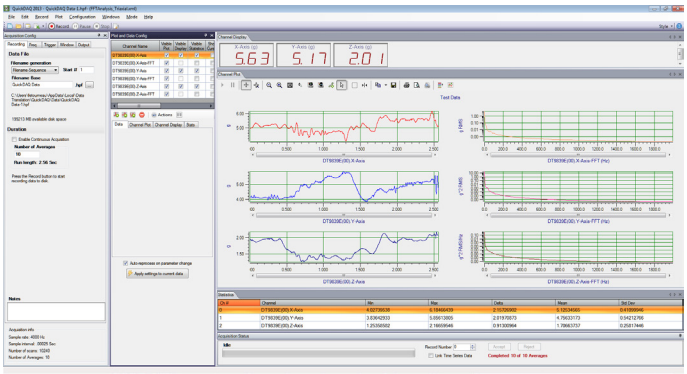
QuickDAQ

Ready-to-Measure Data Acquisition Software

(including Advanced FFT Analysis Functions for Powerful Measurement & Analysis)

QuickDAQ allows you to acquire and display measurement data from all Data Translation USB and Ethernet devices that support analog input streaming. Combine QuickDAQ with Data Translation hardware to acquire data, record data to disk, display the results in both a plot and digital display, and read a recorded data file.

Be productive right out of the box with this powerful data logging software. Two additional options can be purchased to add FFT analysis capabilities to the base package to provide the ultimate in measurement and analysis capabilities for sound and vibration and other applications. For further analysis, export the data to other applications like Microsoft Excel®.



QuickDAQ ready-to-measure application software, combined with Data Translation hardware, is a powerful data logger. Optional FFT Analysis functions can be purchased to extend the capabilities of the base package to provide powerful measurement and analysis capability for sound and vibration and other applications.

Feature	QuickDAQ		
	Base Version	FFT Analysis Option	Advanced FFT Analysis Option
Licensing	Free — No License Required	License Required	License Required
Acquire and display data in a plot or a digital display	✓	✓	✓
Log data to .hpf files and read recorded data files	✓	✓	✓
Generate output stimuli (fixed waveforms, swept sine waves, or noise signals)	✓	✓	✓
View statistics, including minimum, maximum, delta, and mean values	✓	✓	✓
Export time data to .csv or .txt file for further analysis in Microsoft Excel	✓	✓	✓
Perform single FFT operations (Auto Spectrum, Spectrum, Power Spectral Density)		✓	✓
View dynamic p erformance statistics (IBF, SNR, SINAD, SFDR, THD, ENOB)		✓	✓
Configure Hanning, Hamming, Bartlett, Blackman Harris, or Flat Top Response Windows		✓	✓
Configure Digital IIR (Bessel, Butterworth, Chebyshev) filters as low-pass, high-pass, band-pass, or band-stop		✓	✓
Configure reference and response channels			✓
Perform two-channel FFT operations (FRF, Cross-Spectrum, Cross Power Spectral Density, Coherence, Coherent Output Power)			✓
Configure Exponential Response Windows			✓
Configure Hanning, Hamming, Bartlett, Blackman Harris, Flat Top, Exponential, Force, or Cosine Taper Reference Windows			✓
Configure real, imaginary, and Nyquist display functions			✓
Save data to a .uff file			✓

QuickDAQ Base Version

The base version of QuickDAQ is free-of-charge and allows users to acquire and analyze data from all Data Translation USB and Ethernet devices, except the DT9841 Series, DT9817, DT9835, and DT9853/54. Using the base version of QuickDAQ, users can perform the following functions:

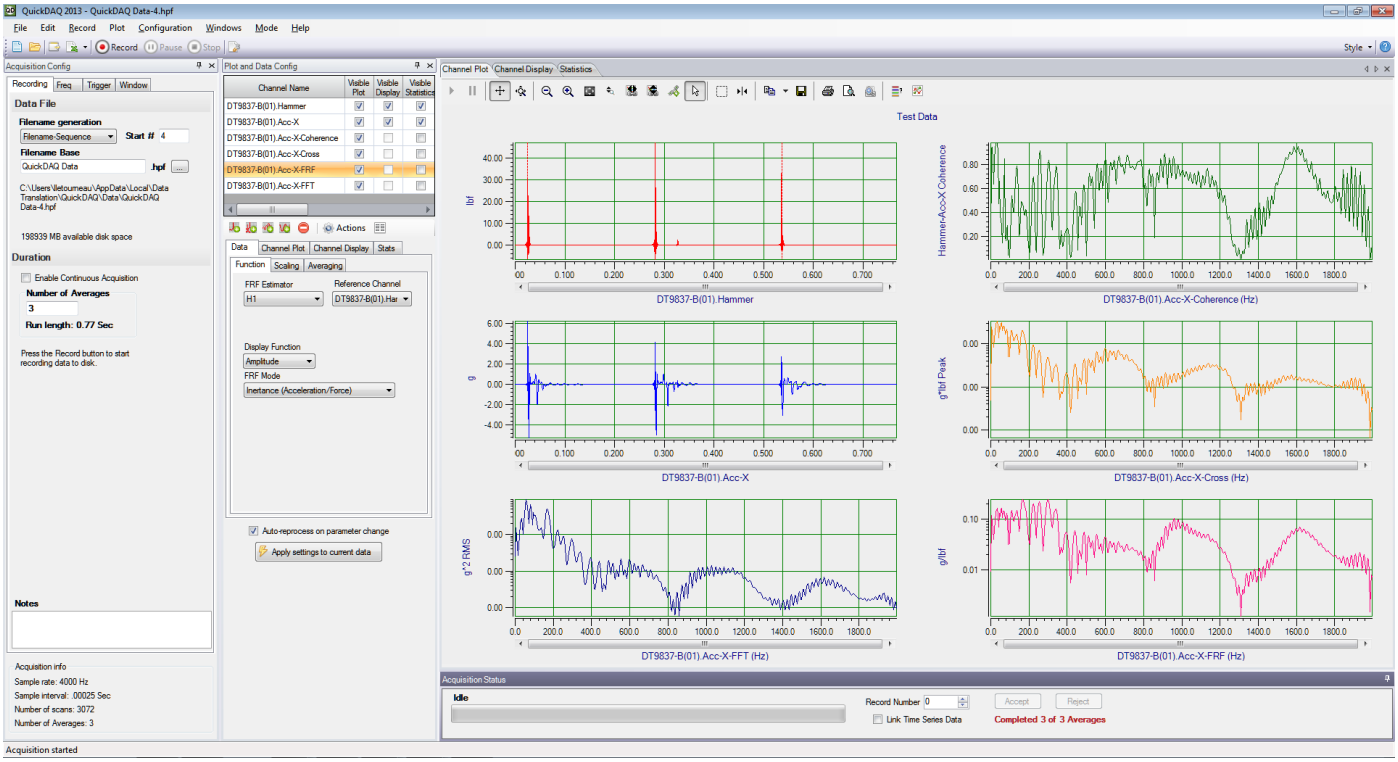
- Discover and select devices.
- Configure all connected input channel settings for the attached sensors.
- Load/save multiple hardware configurations.
- Generate output stimuli (fixed waveforms, swept sine waves, or noise signals).
- On each supported data acquisition device, acquire data from all channels supported in the input channel list.
- Choose to acquire data continuously or for a specified duration.
- Choose software or triggered acquisition.
- Log acquired data to disk in an .hpf file.
- Display acquired data during acquisition in either a digital display using the Channel Display window or as a waveform in the Channel Plot window.
- Choose linear or logarithmic scaling for the horizontal and vertical axes.
- View statistics about the acquired data, including the minimum, maximum, delta, and mean values and the standard deviation in the Statistics window.
- Export time data to a .csv or .txt file; you can open the recorded data in Microsoft Excel® for further analysis.
- Read a previously recorded .hpf data file.
- Customize many aspects of the acquisition, display, and recording functions as designed, including the acquisition duration, sampling frequency, trigger settings, filter type, and temperature units to use.

FFT & Advanced FFT Analysis Options

QuickDAQ with FFT Analysis and Advanced FFT Analysis options adds real-time analysis features to Data Translation modules. The add-ons feature tools to acquire continuous and triggered data, record data to disk, read a recorded data file, analyze the acquired data using single FFT and two-channel FFT functions, and produce a variety of output stimuli for modal analysis testing. 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.

When enabled with a purchased license key, the QuickDAQ FFT Analysis option includes all the features of the QuickDAQ Base version plus these features:

- The ability to switch between the Data Logger time-based interface and the FFT Analyzer block/average-based interface.
- Supports software, freerun, or triggered acquisition with accept and reject controls for impact testing applications.
- Allows users to perform single-channel FFT (Fast Fourier Transform) operations, including AutoSpectrum, Spectrum, and Power Spectral Density, on the acquired analog input data. Users can configure a number of parameters for the FFT, including the FFT size, windowing type, averaging type, integration type, and so on.
- Allows users to display frequency-domain data as amplitude or phase.
- Supports dB or linear scaling with RMS (root mean squared), peak, and peak-to-peak scaling options
- Supports linear or exponential averaging with RMS, vector, and peak hold averaging options.
- Supports windowed time channels.
- Supports the following response window types: Hanning, Hamming, Bartlett, Blackman, Blackman Harris, and Flat top.
- Supports the ability to lock the waveform output to the analysis frame time.
- Allows users to configure and view dynamic performance statistics, including the input below full-scale (IBF), total harmonic distortion (THD), spurious free dynamic range (SFDR), signal-to-noise and distortion ratio (SINAD), signal-to-noise ratio (SNR), and the effective number of bits (ENOB), for selected time-domain channels in the Statistics window.
- Configure Digital IIR (Bessel, Butterworth, Chebyshev) as low-pass, high-pass, band-pass, or band-stop



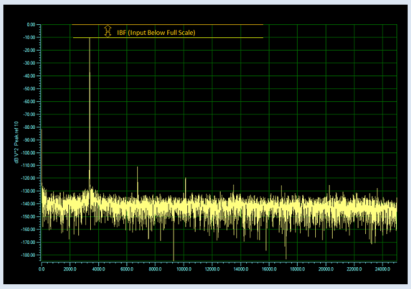
These features are available with the Advanced FFT Analysis Option:

- Allows users to designate a channel as a Reference or Response channel.
- Allows users to perform two-channel FFT analysis functions, 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.
- Supports the Exponential response window type.
- Supports the following reference window types: Hanning, Hamming, Bartlett, Blackman, Blackman Harris, FlatTop, Exponential, Force, and Cosine Taper windows.
- Supports real, imaginary, and Nyquist display functions.
- Allows users to save data in the .uff file format.

Dynamic Performance Functions Provided with the Advanced FFT Analysis Option:

Input Below Full Scale (IBF)

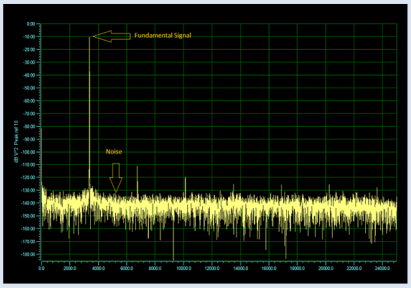
$$IBF = 20 \cdot \log_{10}\left(\frac{V_s}{V_f}\right)$$



This function returns a value in dB units representing the level of the main signal component relative to the full scale voltage of the channel.

Signal-to-Noise Ratio (SNR)

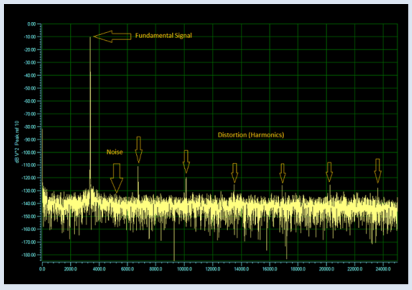
$$SNR = 20 \cdot \log_{10}\left(\frac{V_s}{V_n}\right)$$



This function returns a value in dB units representing the level of the main signal component relative to the total noise, (i.e. harmonics are not included).

Signal-to-Noise and Distortion Ratio (SINAD)

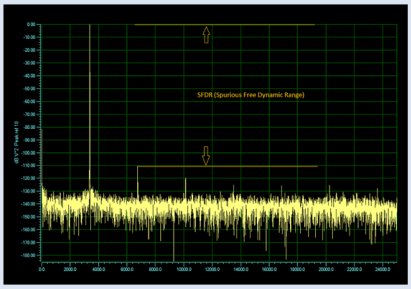
$$SINAD = 20 \cdot \log_{10}\left(\frac{V_s}{V_{n+d}}\right)$$



This function returns a value in dB units representing the level of the main signal component relative to the total noise, including harmonics.

Spurious Free Dynamic Range (SFDR)

$$SFDR = 20 \cdot \log_{10}\left(\frac{V_f}{V_a}\right)$$

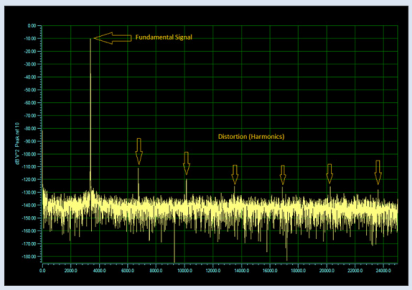


This function returns a value in dB units representing the level of the full scale range to the greatest noise or distortion component.

Total Harmonic Distortion (THD)

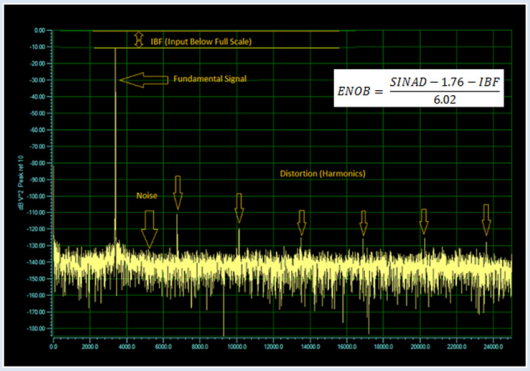
$$THD = 20 \cdot \log_{10}\left(\frac{\sqrt{{h_1}^2 + \cdots + {h_5}^2}}{V_s}\right)$$

$$THD = \left(\frac{\sqrt{{h_1}^2 + \cdots + {h_5}^2}}{V_s}\right) \cdot 100$$



This function returns a value in dB units and percent (%) representing the level of the harmonic distortion of the first 5 harmonics relative to the main signal component.

Effective Number of Bits (ENOB)



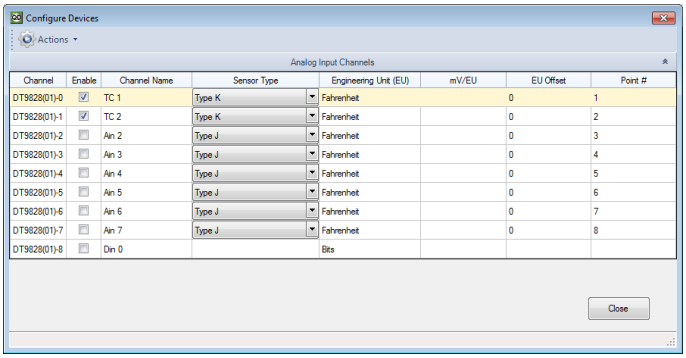
This function returns a value in bits representing the quality of a digitized signal. The input signal is typically sinusoidal and should be near full scale to properly characterize the AD and/or system.

Configuration Windows

The base version of QuickDAQ provides a Data Logger interface. The FFT Analysis and Advanced FFT Analysis options provide an additional FFT Analyzer interface; users of these options can switch between interfaces as needed.

Configure Devices

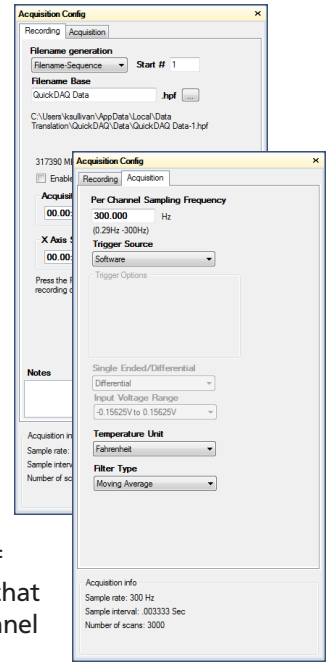
The elements of the Configure Devices window depend on the connected device. Selections may include: enable channels for acquisition, specify a meaningful name for each channel, select an input range (on devices that support multiple ranges), choose sensor type, engineering unit, AC/DC coupling and current source (for devices with IEPE support), etc.



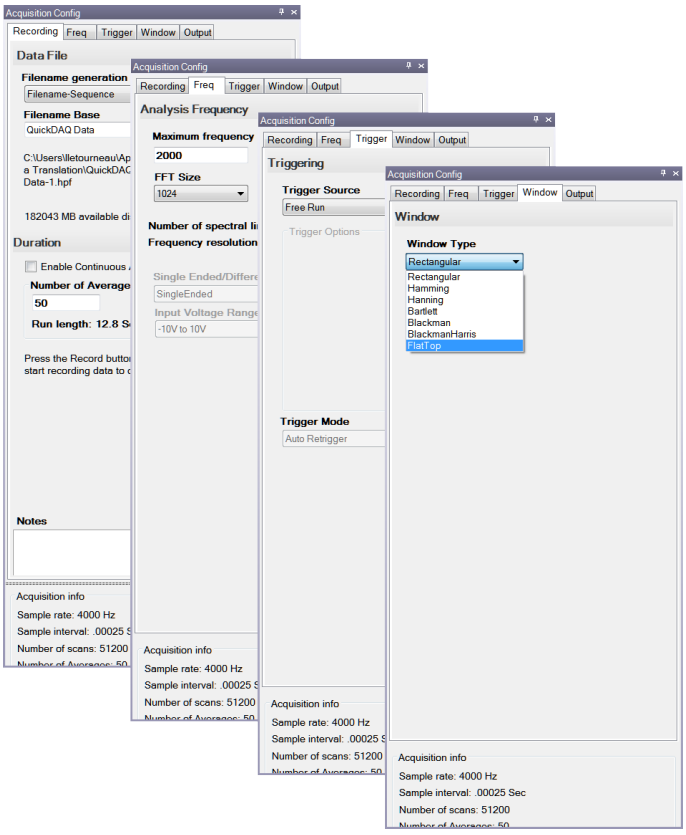
Additional Configuration and Calibration wizard is included to perform Shunt Calibration and Offset Nulling for strain gage or bridge-based sensors.

Recording tab allows users to set up the name for the data file, and enable or disable continuous acquisition. In the Data Logger interface, users can also specify the acquisition duration and x-axis span. In the FFT Analyzer interface, users can also specify how many records to acquire, process, and average.

Acquisition tab (in the Data Logger interface only) allows users to set up the parameters that apply to the analog input subsystem, including the per channel sampling frequency of the device, the trigger source that starts the acquisition, the channel configuration (single-ended or differential), input voltage range, the temperature units to use when converting voltage data to temperature, and/or the filter type.



Configuration windows of the Data Logger interface.



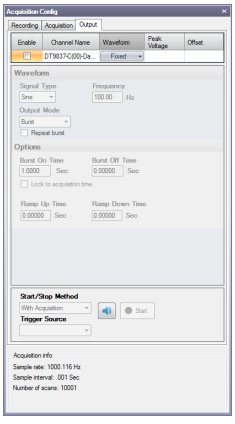
Configuration windows of the FFT Analyzer interface.

Freq Tab (in the FFT Analyzer interface only) allows users to set up the maximum frequency to be analyzed, the FFT size, and other parameters that apply to the analog input subsystem, such as the channel configuration (single-ended or differential), input voltage range, temperature units to use when converting voltage data to temperature, and/or the filter type.

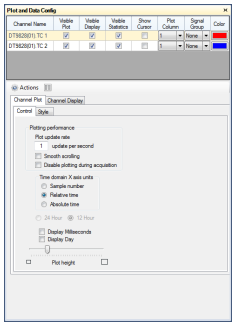
Trigger Tab (in the FFT Analyzer interface only) allows users to specify the trigger source that starts acquisition and the trigger mode.

Window tab (in the FFT Analyzer interface only) allows users to specify a windowing function to apply to the FFT channel to reduce spectral leakage errors.

Output tab allows users to set up the parameters that apply to the analog output subsystem. Define the type of waveform to output (fixed, sweep, or noise), and all the parameters that apply to that waveform type, including the signal or noise type, sweep mode, whether the signal is output continuously or as a burst, the frequency of the output signal, whether to ramp up or down, and how to start the operation. This tab is only available if the connected device supports analog output operations.



Plot and Data Config window allows users to select which channels you want to plot and specify the appearance of the display area.

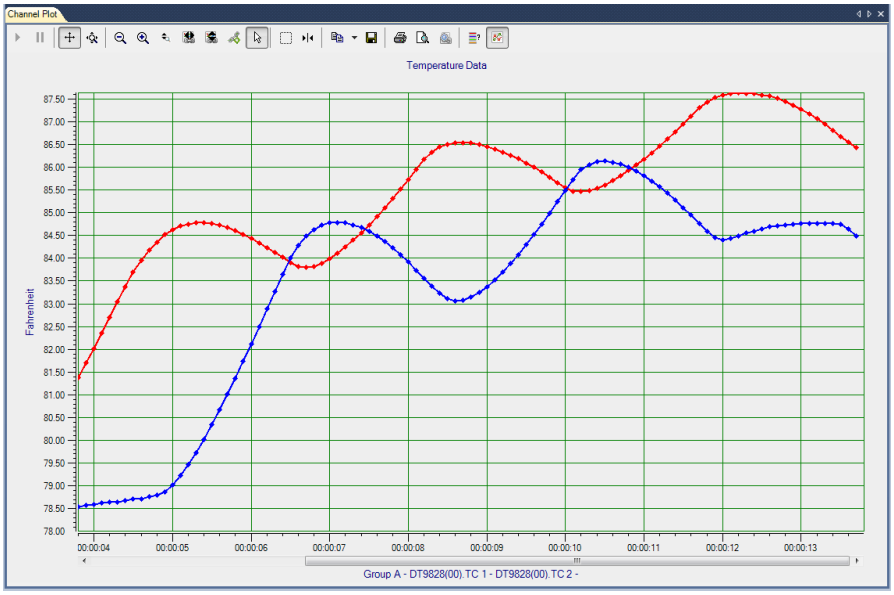


Display Windows

You can display the data as a plot or digital display. You can also view statistics about the acquired data.

Channel Plot

During acquisition, the results are plotted in the Channel Plot window in real time. In file-reader mode, the results are read from the file and plotted in the Channel Plot window.

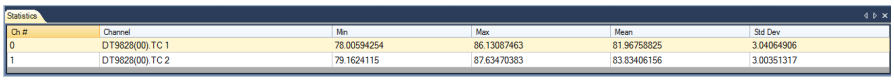


Channel Display

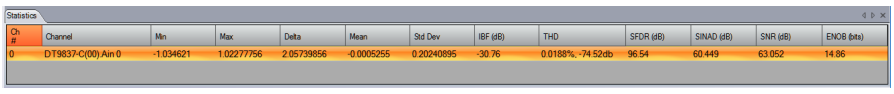
During acquisition, the newest value for each enabled channel is displayed in the Channel Display window in real time. The Channel Display window allows you to view data from your device in a digital display.

Statistics

During acquisition, the statistics are displayed in the Statistics window in real time. The Data Logger interface shows the minimum, maximum, and mean values of the data, along with the standard deviation for each enabled channel.



The FFT Analyzer interface also allows users to view dynamic performance statistics, including input below full-scale (IBF), total harmonic distortion (THD), spurious free dynamic range (SFDR), signal-to-noise ratio (SNR), and the effective number of bits (ENOB).



Ordering Summary

- **QuickDAQ Base Package** — Available as a free download from our website.
- **QuickDAQ FFT Analysis Option** (license required) — SP8072-KEY
- **QuickDAQ Advanced FFT Analysis Option** (license required) — SP8073-KEY
- **Upgrade QuickDAQ FFT Analysis Option to Advanced FFT Analysis Option** (license required) — SP8073-UPG. For those who previously purchased the FFT Analysis Option.

Copyright © 2014 Data Translation, Inc. All rights reserved. All trademarks are the property of their respective holders.
Prices, availability, and specifications are subject to change without notice.