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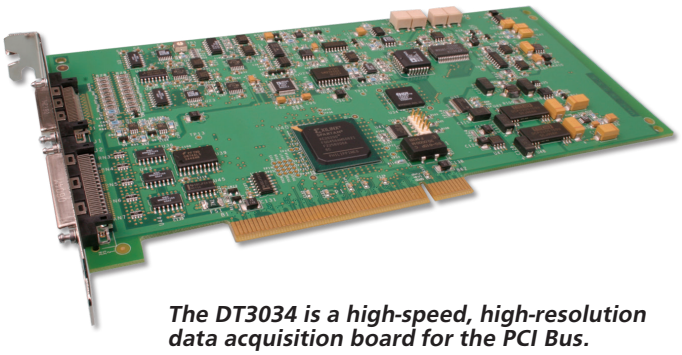
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DT3034

High-Speed, High-Accuracy DAQ Board for the PCI BUS

Overview

The DT3034 is a PCI-compatible, plug-in data acquisition board for high-speed, high accuracy, and high-channel-count applications. The DT3034 offer high speed, 16-bit measurements at up to 500 kS/s/ch, 2 simultaneous analog outputs with update rates of 500 kS/s/ch, 16 digital I/O lines and 4 counter/timers.



The DT3034 is a high-speed, high-resolution data acquisition board for the PCI Bus.

Key Features

- 500 kS/s/ch sample rate on up to 32 single-ended or 16 differential analog input channels with 16 bit resolution.
- 500 kS/s/ch update rate on two analog output channels with 16 bit resolution.
- ENOB rating of 14.2 bits with a Signal-to-Noise Ratio of 100 dB for the cleanest, most accurate signals available..
- Drive solid state relays over 16 digital I/O lines.
- Simultaneous subsystem operation at full speed without losing data.
- Flexible clocking and triggering for any application.
- Fully supported by DT-Open Layers for .NET Class Library for developing test and measurement application with Visual Basic .NET and C#.
- Fully RoHS-compliant lead-free design.

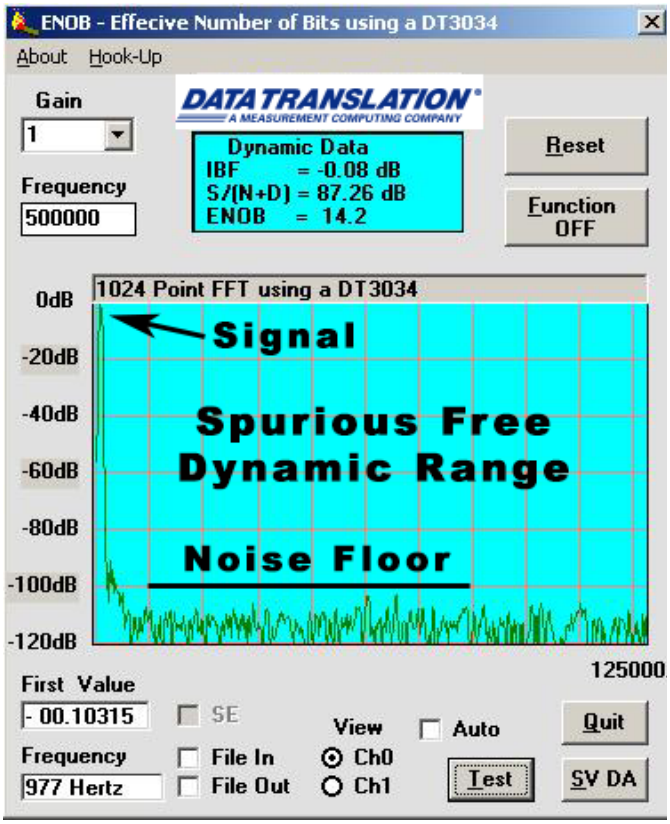
Supported Operating Systems

- Windows® 10/8/7/Vista®/XP 32/64-bit

Simultaneous Subsystem Operation

The DT3034 can run multiple subsystems simultaneously at full speed without losing data. A custom-designed PCI bus interface chip allows for high-speed, bus mastering data transfers to the PC. By setting aside a block of memory in the PC, the board performs bus-master data transfers without CPU intervention. You can trigger the analog inputs to run synchronously with the analog outputs using the analog threshold trigger or the digital trigger input that is dedicated to the DACs.

Additionally, the analog input subsystem can be run concurrently with the analog output subsystem for gap-free simultaneous stimulus and response.



This graph shows the outstanding quality of the DT3034 when switching channels at full scale, for all error sources with ENOB (Effective Number Of Bits) rating of 14.2 bits and an SFDR (Spurious Free Dynamic Range) of 100 dB. Since this is the worst case, most users in normal conditions would get even better ENOB ratings. Note: Signal-to-Noise ratio plus Distortion (as a sum of all peaks) is 87 dB.

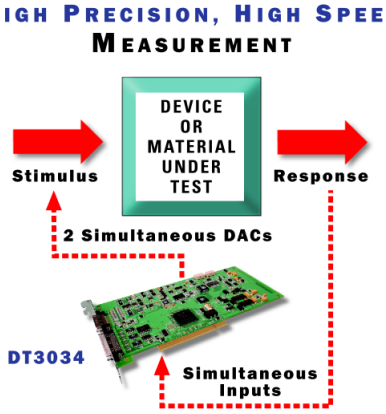
Features Summary						
A/D Channels @ Throughput	Analog I/O Resolution	D/A Channels @ Throughput	DIO	CT	Output FIFO	Applications
16/32 ch @ 500 kS/s	16-bit	2 ch @ 500 kS/s/ch	16	4	4K	Semiconductor testing, device characterization, automotive testing, scientific analysis.

Analog Inputs

The 16-bit resolution DT3034 board features 32 single-ended or 16 differential inputs at a maximum sample rate of 500 kS/s. The board has software-selectable unipolar or bipolar operation and gain settings of 1, 2, 4 or 8 that accommodate input ranges of 0-10 V, 0-5 V, 0-2.5 V, 0-1.25 V, +/-10 V, +/-5 V, +/- 2.5 V, +/-1.25 V. An amp low connection allows single-ended inputs to be referenced to a common point other then ground, thus providing 32 pseudo-differential inputs. Hands-off operation lets you calibrate the analog input subsystem through software.

Channel Gain List

The 1024-location channel-gain list gives the flexibility to sample non-sequential channels and channels with different gains. A single value can be acquired from any channel or a number of samples can be acquired from multiple channels. A multi-channel acquisition is performed by loading the channel gain list and cycling through it continuously or until a specific number of samples are acquired.



Subsystems can be run simultaneously for gap-free stimulus and response.

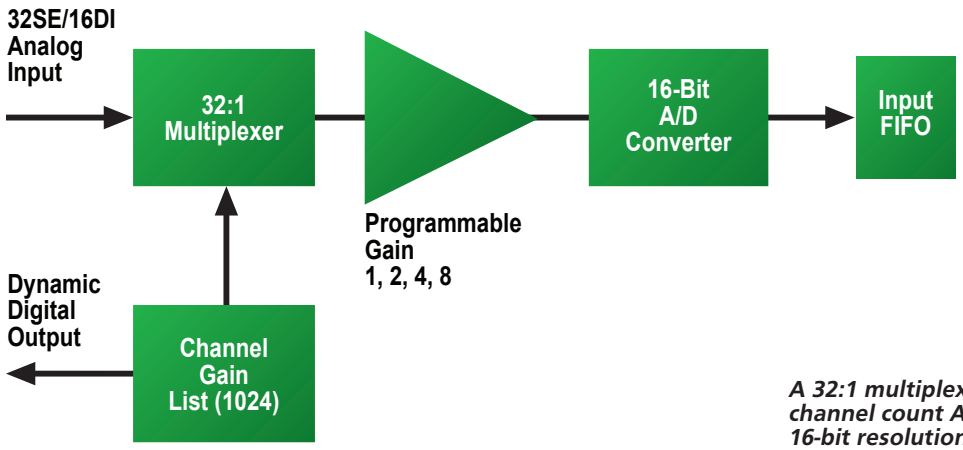
Triggered Scan Mode

The triggered scan mode capability of the DT3034 allows scanning through a list of channels at high speed with a programmed interval between scans, emulating a simultaneous sample and hold function. An internal or external clock can be used to pace the acquisition. In addition, the channel-gain list can be cycled through up to 256 times per trigger in the re-trigger mode, acquiring a waveform of data per channel for each trigger, up to 256 kS per trigger.

High-Speed Analog Outputs

The DT3034 features two high-speed, 16-bit analog outputs with a range of ±10 V. An internal or external source triggers the analog outputs. The analog outputs can be updated simultaneously at a rate of up to 500 kS/s/ch.

Repetitive waveforms can be loaded into the on-board FIFO and this data can be continuously cycled through. The 4K of board memory can be used for deglitched waveforms from 2 to 4096 samples. The DT3034 also features 20 kHz smoothing filters that are software-selectable for each DAC.

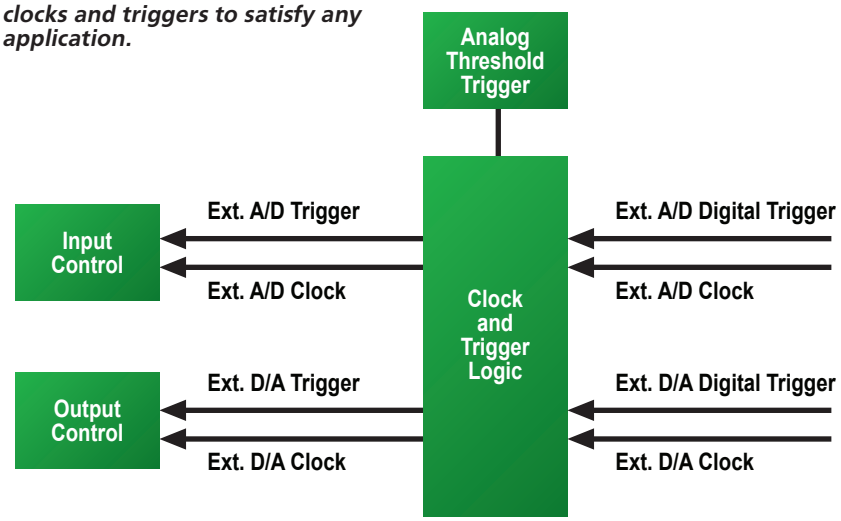


A 32:1 multiplexer provides high channel count A/D conversion at 16-bit resolution.

Flexible Triggering and Clocking Capabilities

The DT3034 provides flexibility in triggering, both in the trigger modes available and with events causing the trigger. Data can be acquired using post-trigger, pre-trigger and about-trigger modes. Post-trigger allows the user to acquire data after a hardware or software trigger. The pre-trigger mode enables acquisition up until a hardware trigger occurs. Data can be acquired both before and after a hardware trigger, using the about-trigger mode. Either an analog or digital signal can be used as the trigger source. The analog trigger can originate from a dedicated input pin or any of the analog input channels can be designated as the analog trigger input. The level of the analog input trigger can be from -10 V to +10 V.

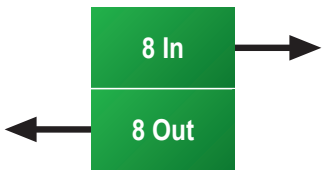
The DT3034 Series offers flexible clocks and triggers to satisfy any application.



The analog inputs and analog outputs can be paced using an internal or an external clock. Set the internal clock to acquire data from one sample per second up to 500 kS/s. If slower rates are needed, use an external source, or cascade two or more of the user counter/timers and connect the output to the external clock input.

The A/D sample clock and the A/D trigger signals are available on the user connector. Multiple boards or multiple instruments can be synchronized using these outputs.

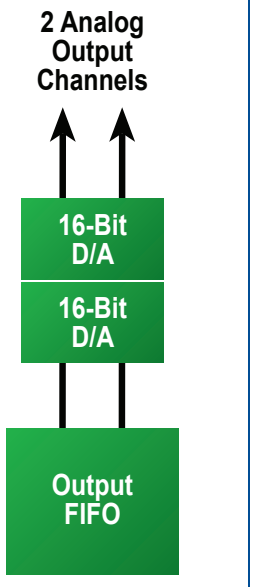
Digital I/O



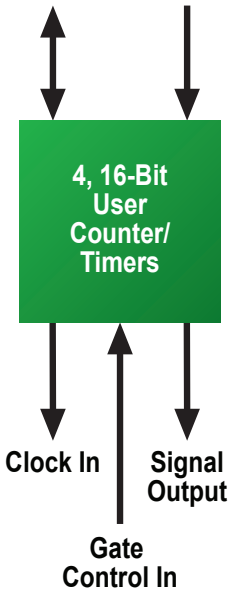
16 DIO lines can be programmed in banks of 8 for input or output.

This board also features 16 digital I/O lines. They can be programmed in two banks of eight for input or output. Read the status of the digital inputs at high speeds by including the digital inputs as a channel in the analog channel gain list. This dynamic digital input feature allows you to "time stamp" the digital inputs in relation to the analog inputs. In this mode, all digital input lines are read as one word. The digital outputs have sufficient current capability to drive external solid state relay modules (sink 24 mA and source 15 mA).

The series also includes two dedicated dynamic digital outputs. You can program these outputs to change state as a specified analog input is read, thereby triggering or synchronizing external circuitry or other data acquisition boards.



Two, deglitched, 16-bit D/A converters for pure waveform generation.



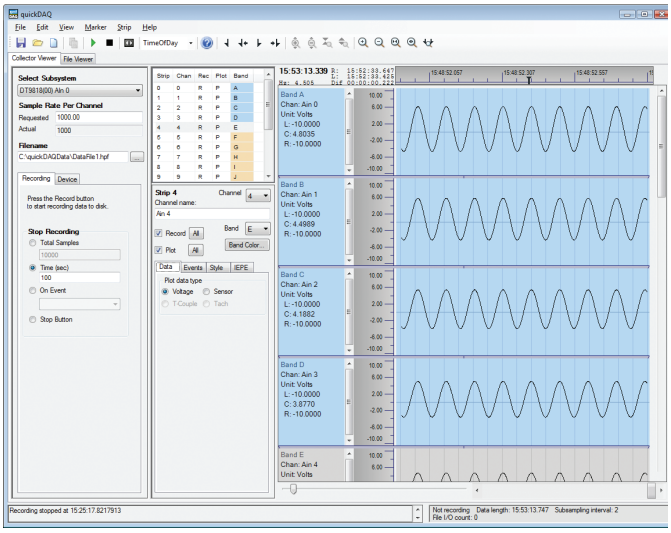
Dedicated counter/timers on every board.

QuickDAQ

QuickDAQ allows you to acquire and display from all Data Translation data acquisition 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. Data can be exported to other applications like Microsoft Excel® and The Mathworks MATLAB® for more advanced analysis. Two additional options can be purchased to add FFT analysis capabilities to the base package.

Key Features

- **QuickDAQ Base Package (Free)**
  - Ready-to-measure application software
  - Configure, acquire, log, display, and analyze your data
  - Customize many aspects of the acquisition, display, and recording functions to suit your needs
- **FFT Analysis Option (License Required)**
  - Includes all the features of the QuickDAQ Base Package
  - Perform single-channel FFT operations including:
    - ◊ Auto Spectrum
    - ◊ Spectrum
    - ◊ Power Spectral Density
  - Configure and view dynamic performance statistics
- Supports Hanning, Hamming, Bartlett, Blackman, Blackman Harris, and Flat Top response windows
- **Advanced FFT Analysis Option (License Required)**
  - Includes all the features of the QuickDAQ Base Package and FFT Analysis Package
  - Perform 2-channel FFT operations including:
    - ◊ FRF
    - ◊ Cross-Spectrum
    - ◊ Cross Power Spectral Density
    - ◊ Coherence
    - ◊ Coherent Output Power
  - Supports real, imaginary, and Nyquist display functions
  - Additional FFT analysis functions supported: Exponential, Force, Cosiner Taper
  - Save data to .uff file format



QuickDAQ acquires analog data from all devices supported by DT-Open Layers for .NET software at high speed, plots it during acquisition, analyzes it, and/or saves it to disk for later analysis.

Other Software Options

The following software is available for free and provided on the Data Acquisition Omni CD:

- **Device Driver** –The device driver allows you to use the PCI DAQ board with any of the supported software packages or utilities.
- **DT-Open Layers® for .NET Class Library** – Use this class library if you want to use Visual C#® or Visual Basic® for .NET to develop application software using Visual Studio® 2003-2012; the class library complies with the DT-Open Layers standard.
- **DataAcq SDK** – Use the DataAcq SDK to use Visual Studio 6.0 and Microsoft® C or C++ to develop application software using Windows 10/8/7/Vista/XP 32/64-bit; the DataAcq SDK complies with the DT-Open Layers standard.
- **DAQ Adaptor for MATLAB** – Data Translation's DAQ Adaptor provides an interface between the MATLAB® Data Acquisition (DAQ) toolbox from The MathWorks™ and Data Translation's DT-Open Layers architecture.
- **LV-Link** – Data Translation's LV-Link is a library of VIs that enable LabVIEW™ programmers to access the data acquisition features of DT-Open Layers compliant USB and PCI devices.

User Counter/Timers

Four dedicated counter/times are available for counting events, creating a one-shot or frequency output, or measuring a frequency output. Cascade two counters internally through software or cascade more then two counters externally on the screw terminal accessory. Set the duty cycle, frequency, and output polarity of the output pulse from the user counter/timers.

User Connections

To maintain the accuracy of your measurements and preserve signal integrity, the analog and digital connections are separate. All analog input and output connections are brought out to a dedicated 50-pin connector on the backplate of the boards. The digital input and output connections are brought out to a dedicated 68-pin connector. The DT740 screw terminal panel is available to simplify connections. The EP307 and EP308 cables complete the system.

Cross-Series Compatibility

Virtually all Data Translation data acquisition boards and modules are compatible with the DT-Open Layers® Class Library. This means that if your application was developed with one of Data Translation's software products, you can easily upgrade to a new Data Translation board. Little or no reprogramming is needed.

User's Manual

Each DAQ board or module includes a comprehensive user's manual that provides getting started and reference information. The manual is provided in electronic (PDF) format on the Data Acquisition Omni CD, included with the module and also available online.

Technical Support

Application engineers are available by phone and email during normal business hours to discuss your application requirements. Extensive product information, including drivers, example code, pinouts, a searchable Knowledge Base, and much more, is available 24 hours a day on our web site at www.mccdaq.com/Support.aspx.

Ordering Summary

DT3034

- **DT3034** — High-speed PCI data acquisition board with 500 kS/s throughput

ACCESSORIES

- **DT740** — Screw Terminal Panel
- **DT3010 Cable Set** — includes both EP307 and
- EP308 cables
- **DT3010-3 Cable Set** — includes both EP307-3 and EP308-3 cables
- **EP307** — 1m, 50-pin shielded cable
- **EP307-3** — 3m, 50-pin shielded cable
- **EP308** — 1m, 68-pin shielded cable
- **EP308-3** — 3m, 68-pin shielded cable

FREE SOFTWARE

The following software is available as a free download from our website:

- **QuickDAQ**
- **LV-Link** – Access the power of Data Translation boards through LabVIEW™
- **DAQ Adaptor for MATLAB** – Access the analysis and visualization tools of MATLAB®.

OPTIONAL SOFTWARE

- **QuickDAQ FFT Analysis Option** (License Required)
- **QuickDAQ Advanced FFT Analysis Option** (License Required)

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