

Daq Data Acquisition Devices		
Category	Device	Description
Primary Data Acquisition Device	DaqLab/2001 DaqLab/2005	Ethernet-Based Laboratory Data Acquisition 16-bit, 200 kHz devices with Ethernet connectivity. Each can serve as host to an internal analog and/or digital DBK card. Each has a built-in AC-to-DC power circuit and can be plugged directly into a standard AC outlet.
	DaqScan/2001 DaqScan/2002 DaqScan/2004 DaqScan/2005	Ethernet-Based Data Acquisition System Components 16-bit, 200 kHz devices with Ethernet connectivity. Each has a built-in AC-to-DC power circuit and can be plugged directly into a standard AC outlet. For rack mount applications.
	DaqBook/2001 DaqBook/2005 DaqBook/2020	Portable Data Acquisition 16-bit, 200 kHz devices with Ethernet connectivity. Make use of an external power supply, 10 to 30 VDC input.
	DaqOEM/2001 DaqOEM/2005	Portable Data Acquisition, 16-bit, 200 kHz boards. DaqOEMs are single-board components for systems. Each board has Ethernet connectivity. These boards reside external to the host PC.
	DaqBook/100 Series DaqBook/200 Series	Portable Data Acquisition 12-bit: DaqBook/100, /112, /120 16-bit: DaqBook/200, /216, /260
	DaqBook/2000A DaqBook/2000E DaqBook/2000X	Portable Data Acquisition 16-bit, 200 kHz devices with Ethernet connectivity, though only the DaqBook/2000E provides for a direct Ethernet connection. These devices include a 100-pin P4 connector. Each makes use of an external AC-to-DC power supply.
	DaqBoard/2000 Series	Plug-In Boards for PCI Bus-Slots 16-bit, 200 kHz. Six boards identified as /2000 through /2005
	DaqBoard/2000c Series	Plug-In Boards for Compact-PCI Bus-Slots 16-bit, 200 kHz. Six boards identified as /2000c through /2005c
	DaqBoard (ISA types)*	Plug-In Boards for ISA Bus-Slots 12-bit: DaqBoard/100A, /112A 16-bit: DaqBoard/200A, /216A, /2000
	Daq PC-Card*	Plug-In PCMCIA Card 12-bit: Daq/112B 16-bit: Daq/216B
DBK Option Cards and Modules*	Analog Signal Conditioning	Cards and DBK modules used to condition Analog Signals DBK/ 4, 7, 8, 9, 12, 13, 15, 17, 18, 19, 42, 43A, 44, 45, 50, 51, 52, 53, 54, 55, 65, 80, 81, 82, 83, 84, 85, 90, 100, 207, 207/CJC
	Analog Output	Cards used to modify Analog Output Signals DBK/ 2, 5
	Digital I/O and Control	Cards and DBK modules used to condition Digital I/O DBK/ 20, 21, 23, 24, 25, 208, 210
	Expansion Connections	Cards and DBK modules used to expand the acquisition system. DBK/ 1, 10, 11A, 35, 40, 41, 60, 200, 201, 202, 203, 204, 205, 206, 209
	Power Supply	DBKs: 30A, 32A, 33, 34
Software	Included Software	DaqView, Post Data Acquisition Analysis Program (actual application not specified), Visual Basic extensions, Application Programming Interface (API)
	Optional Software	DaqViewXL, DASyLab

* The list of DBK cards and modules continues to grow. For information regarding new and upcoming products consult our website, your sales representative, or contact the factory directly.

Using DBK Cards and Modules for Signal Conditioning

The DBK signal-conditioning cards and modules are designed for use with DaqLab, DaqScan, DaqBook, LogBook, and various data acquisition boards, i.e., ISA, PCI, and compact-PCI types. The DBKs perform best when used with an acquisition device that can dynamically select channel, gain, and range. DBK cards and modules with dynamic channel and gain/range selection allow for high channel-to-channel scan rates with a variety of transducers.

Note: Only *passive* DBKs, such as the DBK1 BNC module, the DBK11A screw terminal card, and the DBK40 BNC analog interface, can be used with Daq PC-Cards.

DBK output signals can be bipolar, e.g., -5 to +5 V, or unipolar, e.g., 0 to 10 V. The user can select a range of relevant values to correspond to the lowest signal (e.g., -5 or 0 V) and the highest signal (e.g., 5 or 10 V) signal. This type of range selection guarantees the highest resolution in 12-bit or 16-bit conversion.

DBK modules share the same footprint as the DaqBook and a typical notebook PCs; allowing for convenient stacking. The majority of these modules have their own power supply; however, several options exist for packaging and powering the DBKs.



Reference Note:

DBK options are detailed in the *DBK Option Cards and Modules User's Manual* (p/n 457-0905). As a part of product support, this manual is automatically loaded onto your hard drive during software installation. The default location is the Programs directory, which can be accessed through the Windows Desktop.

Daq Software

The Daq devices have software options capable of handling most applications. Three types of software are available:

- ready-to-use graphical programs, e.g., DaqView, DaqViewXL, and post acquisition data analysis programs such as eZ-PostView
- drivers for third-party, icon-driven software such as DASyLab and LabView
- various language drivers to aid custom programming using API

Ready-to-use programs are convenient for fill-in-the-blank applications that do not require programming for basic data acquisition and display:

- DaqView is a Windows-based program for basic set-up and data acquisition. DaqView lets you select desired channels, gains, transducer types (including thermocouples), and a host of other parameters with a click of a PC's mouse. DaqView lets you stream data to disk and display data in numerical or graphical formats. PostView is a post-acquisition waveform-display program within DaqView.
- DaqViewXL allows you to interface directly with Microsoft Excel to enhance data handling and display. Within Excel you have a full-featured Daq control panel and all the data display capabilities of Excel.
- A post acquisition data analysis programs, e.g., eZ-PostView, typically allows you to view and edit post-acquisition data.
- The Daq Configuration control panel allows for interface configuration, testing, and troubleshooting.

Each Daq system comes with an Application Programming Interface (API) via a subroutine library (DAQ) or an ActiveX/COM based library (DaqCOM). API-language drivers include: C/C++, and Visual Basic. The latest software is a 32-bit version API.



Reference Notes:

- The software document modules, *DaqView*, *DaqViewXL*, and *Post Acquisition Data Analysis User's Guide*, are not included as part of the hardcopy manual, but are available in PDF version. See the PDF Note, below.
- Programming topics are covered in the *Programmer's User Manual* (1008-0901). As a part of product support, this manual is automatically loaded onto your hard drive during software installation. The default location is the Programs directory, which can be accessed through the Windows Desktop.

PDF Note:

During software installation, Adobe® PDF versions of user manuals will automatically install onto your hard drive as a part of product support. The default location is in the **Programs** group, which can be accessed from the *Windows Desktop*. Refer to the PDF documentation for details regarding both hardware and software.

A copy of the Adobe Acrobat Reader® is included on your CD. The Reader provides a means of reading and printing the PDF documents. Note that hardcopy versions of the manuals can be ordered from the factory.



Device Overviews

Overview 2-1

Product Features 2-2

Overview

DaqLab/2001 and DaqLab/2005 are high-speed, multi-function, data acquisition devices for use with Ethernet PCs and Ethernet networks. Each unit connects directly to a PC's Ethernet port or network hub, and each features a 16-bit, 200-kHz A/D converter and digital calibration.

In addition, both units include an internal AC-to-DC power converter and 2 slots for the addition of optional DBK cards.



Reference Notes:

- Block diagrams are presented in chapter 3.
- Connectors and pinouts are discussed chapter 4.

I/O Comparison Matrix		
Feature	DaqLab/2001	DaqLab/2005
PC Interface	10/100BaseT Ethernet	10/100BaseT Ethernet
A/D Converter	16-bit/ 200 kHz	16-bit/ 200 kHz
Front-panel voltage inputs	8	8
Built-in expansion slots	2	2
Maximum analog channel capacity*	128	128
Analog outputs	4 channel, 16-bit/100 kHz	-----
Frequency inputs	4 channel, 16-bit/ 10 MHz	4 channel, 16-bit/ 10 MHz
Timer outputs	2 channel, 16-bit/ 1 MHz	2 channel, 16-bit/ 1 MHz
Digital I/O	30	30
Included data logging application	DaqView	DaqView
Included software support	Visual Basic, C/C++, ActiveX/COM, LabVIEW, MATLAB, DASyLab	Visual Basic, C/C++, ActiveX/COM, LabVIEW, MATLAB, DASyLab

*Up to 488 thermocouple channels can be measured with one DaqLab using DBK90 thermocouple options.
Measurement speed with DBK90 is 1msec/channel.

Synchronous Operation Matrix		
Operation	DaqLab/2001	DaqLab/2005
Synchronous Input		
Analog Main Unit Inputs	Yes	Yes
Analog Expansion Input	Yes	Yes
Counter Inputs	Yes	Yes
Digital Main Unit Inputs	Yes	Yes
Digital Expansion Inputs	Yes	Yes
Synchronous Output		
Analog D/A Waveform Output	Yes	No
Asynchronous IO		
Main Unit Digital I/O	Yes	Yes
Expansion Digital I/O	Yes	Yes
Timer Output (Pulse Generation)	Yes	Yes
Analog Output	Yes	No

Product Features

I/O Connections

All input and output signals are accessed via two 37-pin DSUB connectors [P1 and P2] on the rear panel and three removable screw terminal blocks on the front panel. When one or two DBK options are installed, signal lines will connect to them through openings in the upper region of the front panel. The DBK options connect to the DaqLab/2000 Series device through that unit's P1 and P2 connectors [P1 for analog, P2 for digital]. Chapter 4 includes connector descriptions and pinouts.



Reference Notes:

- Block diagrams are presented in chapter 3.
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General Features

- **TTL-level digital I/O lines.** There are 30 digital I/O lines. They are divided into three 8-bit ports on P2 and one 6-bit port on the front panel. The latter makes use of a removable screw terminal block.
- **Four 16-bit counters.** Each can accept frequency inputs up to 10 MHz. The counters can be cascaded into two 32-bit counters. Counter connection is via a removable screw terminal block on the front panel.
- **Two 16-bit timer outputs.** Each can generate square waves from 16 Hz to 1 MHz. Connection to the timer outputs is via a removable screw terminal block on the front panel.
- **Configuration through software only.** Device settings are made via software. There are no hardware settings to be made, for example, there are no device DIP switches to be set or jumpers to be positioned. However, note that DBK expansion options may require a small degree of manual set up. Refer to the *DBK Option Cards and Modules User's Manual* (457-0905) for details. A PDF version of the document is included on the installation CD.
- **Scan Sequencing.** Each DaqLab/2000 Series device has a scan sequencer that can select up to 16384 channel/range combinations. Scan rates are programmable on a per channel basis to 5 μ s/channel, 10 μ s/channel, or 1000 μ s/channel.

Note: Inputs to these devices can be measured at the 5 μ s/channel rate. However, some DBK expansion options require more settling time and can be measured at the slower rate of 10 μ s/channel or 1000 μ s/channel. All types of measurements can be mixed within the scan group.



Reference Note:

Chapter 8, *Taking Measurements*, includes information on additional product features. These include: triggering, synchronous I/O operations, and asynchronous I/O operations.