

DAQ Director Software

High-performance DAQ software operating under Windows NT

AC10

Features

- A prepackaged data acquisition system based on industry standards:
 - VXI hardware for data acquisition,
 - Windows® NT for the computer operating system,
 - Visual Basic® and Visual C++® for the data engines and the operator interfaces,
 - Access® for the configuration database, and
 - A VISA library and VXI*plug&play* drivers as the hardware/software "glue"
- Easy to set up and change the configuration
- Excellent configuration control with an unlimited number of user-defined configuration personalities
- No programming required to use the system as delivered
- Provides easy linking to data analysis packages such as DADiSP® and MATLAB®, as well as to the LabVIEW® visual programming environment.
- Supports high I/O throughput using VXI modules with multibuffer RAM memories.

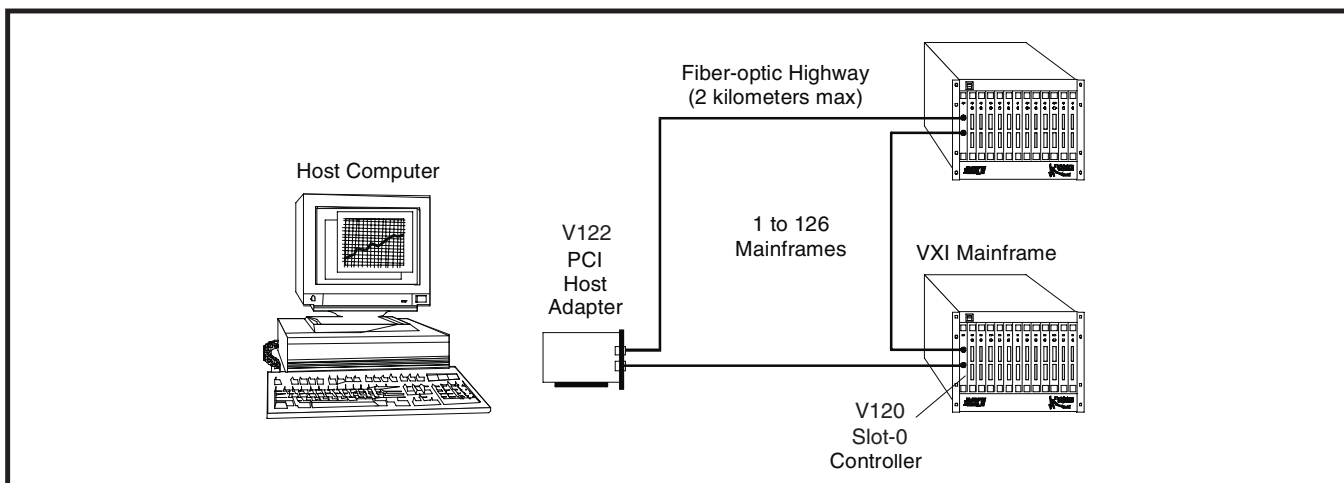
Applications

- Jet and rocket engine test cells
- Wind tunnel data acquisition and control
- Acoustic and vibration tests
- Nuclear accelerator control and monitoring
- High-performance test systems
- Applications requiring distributed I/O
- Applications requiring galvanic isolation between the host computer and the I/O chassis
- Applications where linkage with the LabVIEW visual programming environment is desirable

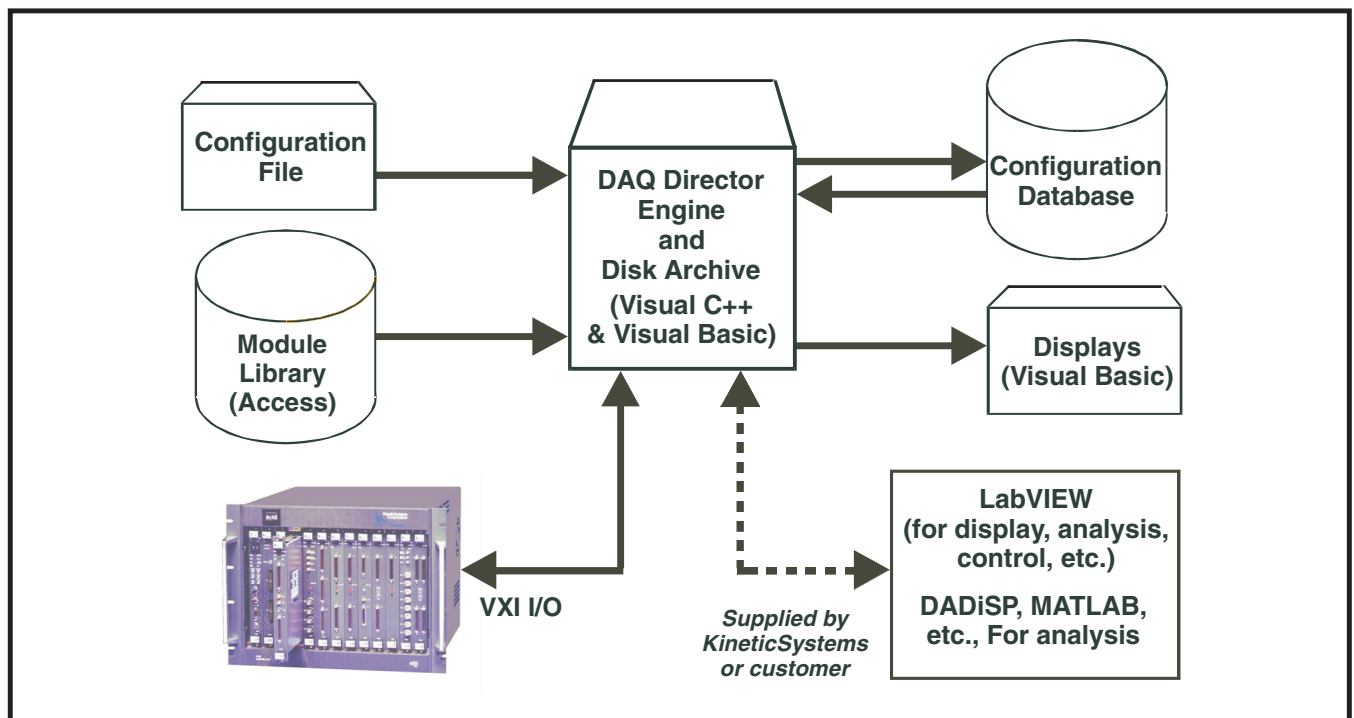
General Description

The DAQ Director™ is prepackaged data acquisition software that runs under the popular Windows NT software operating system and uses VXI hardware to acquire the data. It allows you to configure a system and to acquire, display and archive the acquired data easily and without any programming. DAQ Director can be coupled to popular data analysis packages, such as DADiSP or MATLAB, or with the LabVIEW visual programming environment. There is absolutely no programming required for you to use a DAQ Director-based system as delivered. With the additional purchase of the full LabVIEW development package, you can create a custom system by using the graphical LabVIEW programming tools. Also, our programming staff can create a custom system for you. In addition to using LabVIEW, we can provide custom systems that use other languages such as LabWindows/CVI® or Visual Basic® for display and analysis.

Typical Configuration—A typical configuration includes a host computer with the Windows NT Operating System, a FOXI highway subsystem with a V122 PCI Host Adapter and one or more V120 Slot-0 controllers, one or more VXI mainframes, and the appropriate data acquisition and signal conditioning modules. The system hardware is shown in the following figure.



DAQ Director System Configuration



The DAQ Director basic system configuration is shown above. It contains the following elements:

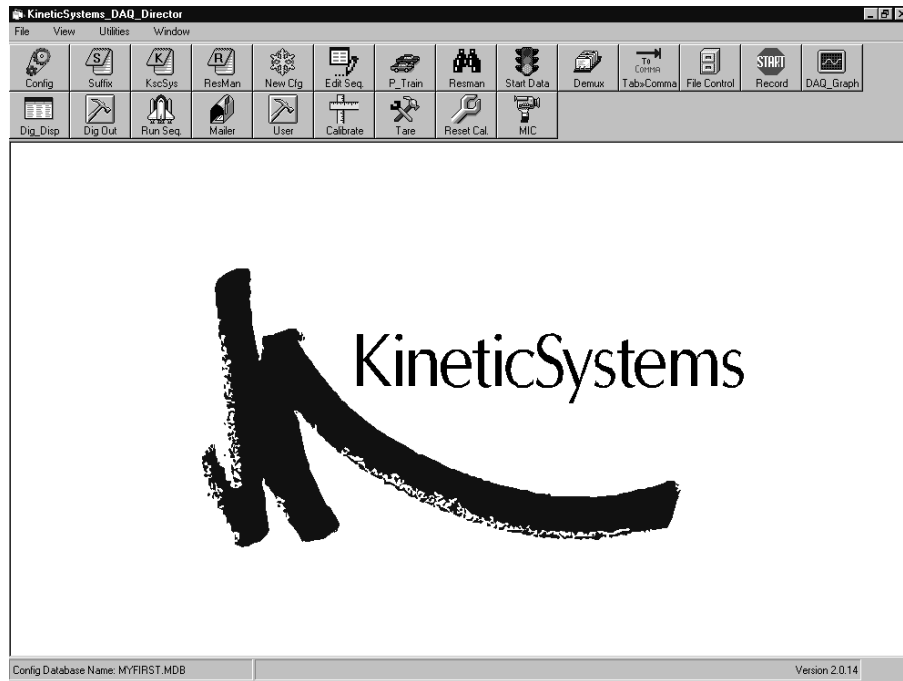
- One or more *VXI mainframes* that are connected to the system via the FOXI interface. The data acquisition modules reside in the VXI mainframe(s).
- The *Configuration File* is used to store rudimentary information such as file names and paths.
- The *Module Library* is an Access database that is supplied with the system. It contains the information needed to create a Configuration Database and includes default properties.
- The heart of the system is The *DAQ Director Engine and Disk Archive*. It controls most of the DAQ Director functions. This portion of DAQ Director was created using the Visual C++ and Visual Basic software languages.
- The *Configuration Database* contains the information required to initialize and operate all of the modules in the VXI mainframe(s). It also can contain application-specific parameters, such as engineering-unit assignments, transducer identification and calibration history.
- DAQ Director contains several *display utilities*. These include DAQGraph, a versatile graphing utility, and the Digital Display Utility. The display utilities were written in Visual Basic.
- DAQ Director can store data in a format that can be used by software analysis tools such as *DADiSP* and *MATLAB* as well as the data analysis and display modules in *LabVIEW*. Additionally, DAQ Director can be linked to LabVIEW in real time.

The Module Library—Following are a portion of the Module Library database records for the V207 500,000 Sample/s ADC module. The first six fields and the first eight records are shown here:

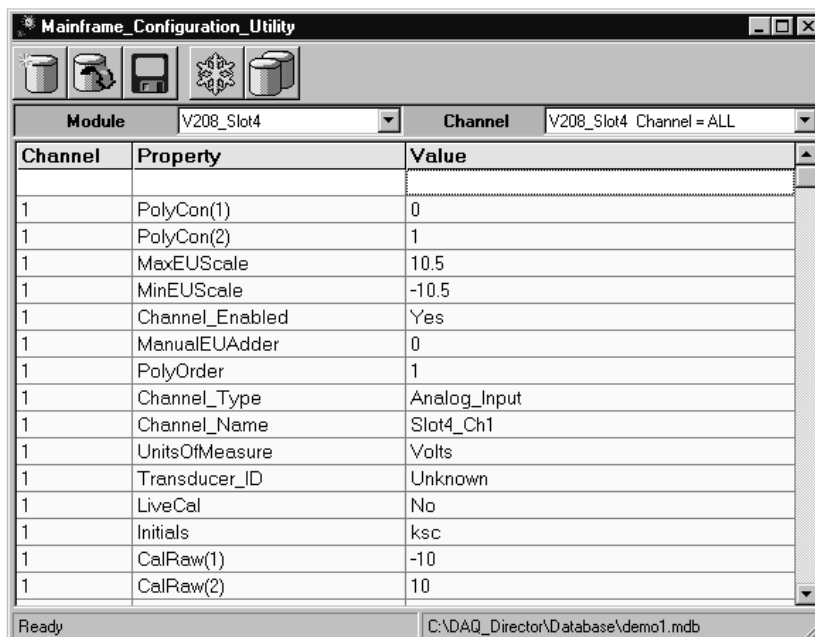
Property	Global	DefaultValue	PropertyType	Option_1	Option_2
SamplesPerChannel	Yes	100	1	unused	unused
TTL_Trigger_Line	Yes	Line 1	2	Line 0	Line 1
ModuleEnabled	Yes	Yes	2	Yes	No
PostTriggerSamples	Yes	0	1	unused	unused
Sample_Clock_Source	Yes	Internal	2	Internal	TTL_Trigger_Line 0
Clock_Setting	Yes	50000 Hz	2	100 Hz	200 Hz
External_Clock_Rate	Yes	0	1	unused	unused
Number_Of_Buffers	Yes	1	1	unused	unused

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The DAQ Director Main Window—Running the DAQ Director application opens its main window. DAQ Director features are accessed by using the 23 selection buttons found on the toolbar in this window, as shown below. The window wallpaper can be customized for your application.



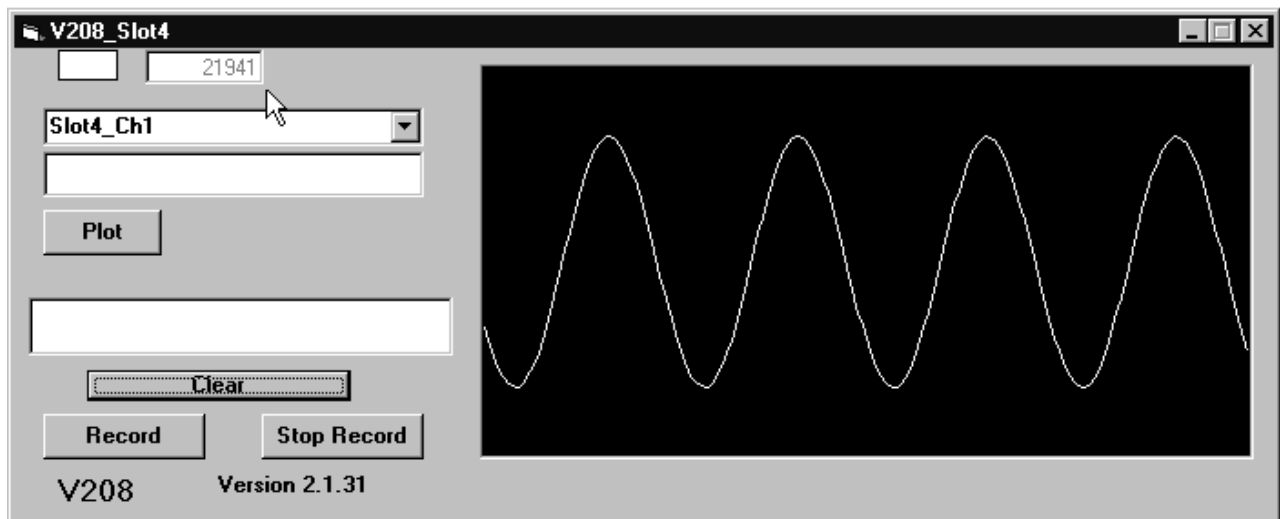
The Mainframe Configuration Utility—DAQ Director includes a simplified interface to the Configuration Database, the *Mainframe_Configuration_Utility*. When you request a new Configuration Database, a pull-down menu includes only those modules that are currently in your system. Data fields in the Configuration Database Utility window are either read-only or editable. The read-only fields are for information only and cannot be changed by the user. The editable fields either have an unlimited choice of valid entries, such as Channel_Name, or a limited number of valid choices, such as Clock_Setting. If the number of choices is limited, you are presented with a pull-down selector, which contains all the valid choices. There is no limit to the number of Configuration Databases that you can create. This allows the DAQ Director to have unique configurations for various test applications. This also aids in configuration control. The Configuration Database is archived along with the test data to give a traceable record of the test setup. A typical Mainframe Configuration Utility window is shown below.



The DAQ Director Control Panel—Associated with each module in the mainframe is a DAQ Director Data Engine—an executable to control that module for data acquisition or control. When you click the *Start Data Engine* button on the DAQ Director main toolbar, a DAQ Director *Control Panel* window opens and starts the data engine. The Control Panel example below shows *V208_Slot4 Running* and the indicator in the V208_Slot4 button turns green. The data engine is now running. If more than one module were present, their data engines would be activated in sequence.



The Data Engine—A typical Data Engine window is shown in the figure below. Data engine windows associated with analog-to-digital converter modules contain buttons to start and stop recording to disk as well as a button to display a quick graph to check on system operation. The data engine windows are normally minimized during system operation.



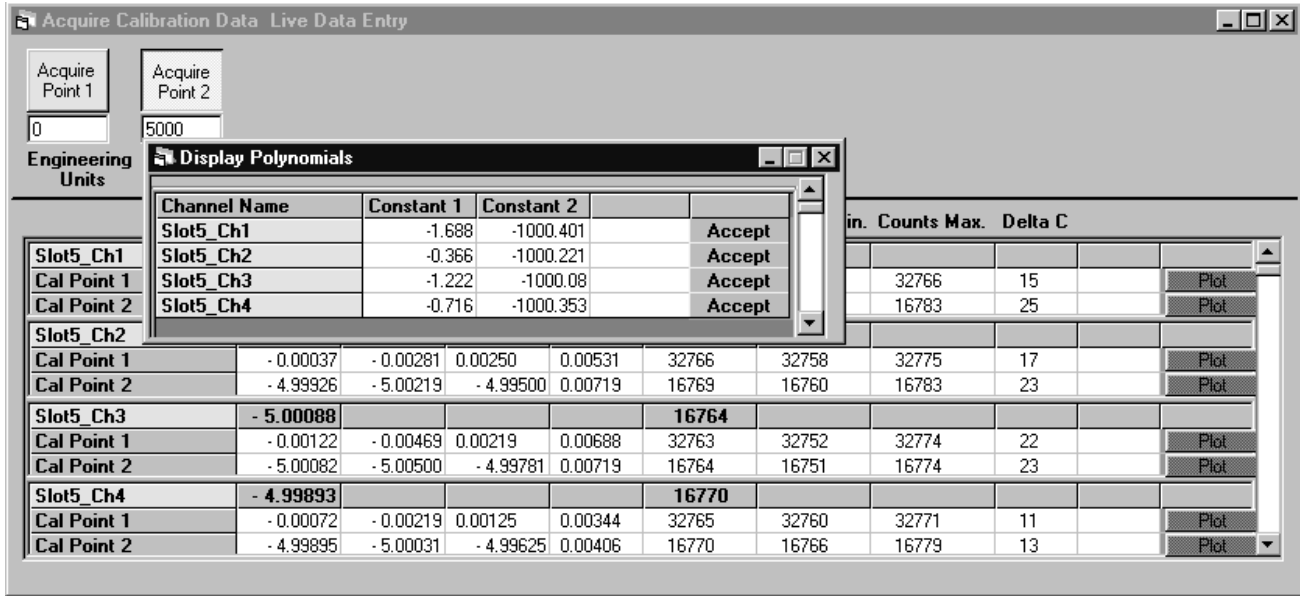
Continuous and Transient Data Collection—DAQ Director supports two types of data collection when used with the V200, V207 or V208 data acquisition modules from KineticSystems, continuous and transient. With other modules that do not support transient capture, such as the V213, only continuous data acquisition is provided.

With continuous data acquisition, data is acquired as long as the data engine for that module is running. The data can be viewed in graphical or digital form. Clicking the Record Data button causes the data to also be recorded to disk. With the V200, disk recording throughput can be as high as 6.3 megabytes per second with a fast disk drive.

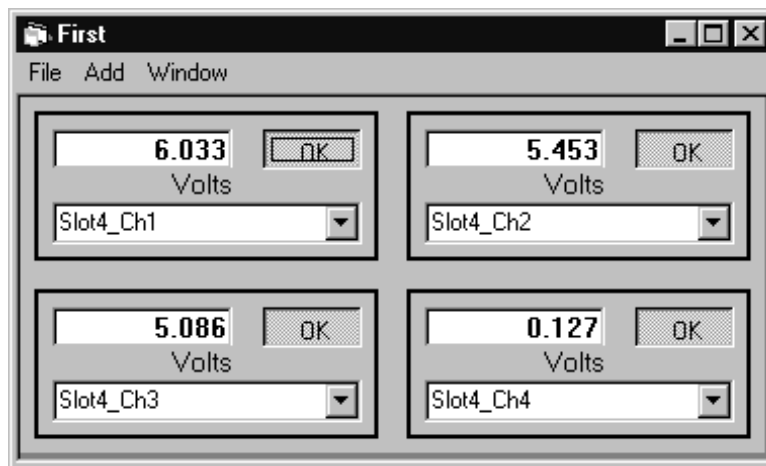
It is often desirable to base the acquisition of data on an external event. With transient data capture, you can set the total number of samples to be captured and the number of samples to be captured after the event—thereby also setting the number of samples before the event. The memory on the module acts as a circular buffer, and data is being recorded to this on-board buffer. The event, such as a crash sled hitting a barrier, for example, causes the module to continue recording for the preset post-trigger samples, and recording stops. DAQ Director then transfers the data to disk.

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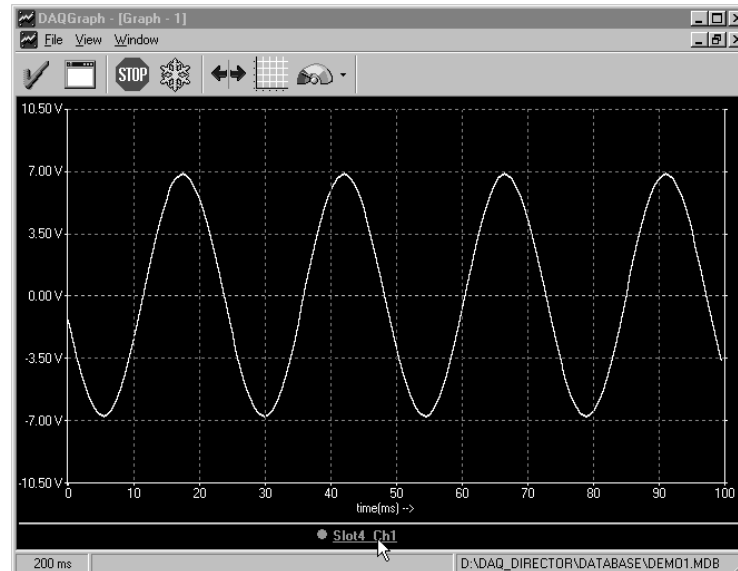
Calibration—Most KineticSystems VXI data acquisition modules include facilities for internal calibration of the entire signal conditioning and digitizing path. The Configuration Database for each of these modules can be set to automatically perform the internal calibration sequence when the data engine is run. Additionally, DAQ Director contains a rich set of routines to facilitate end-to-end calibration, including the sensor. This can be performed using live data and applying a stimulus to a transducer, or it can be accomplished by text data entry, using calibration information from a sensor calibration certificate. The figure below shows two DAQ Director windows—the main live calibration window and the window used to accept live data values.



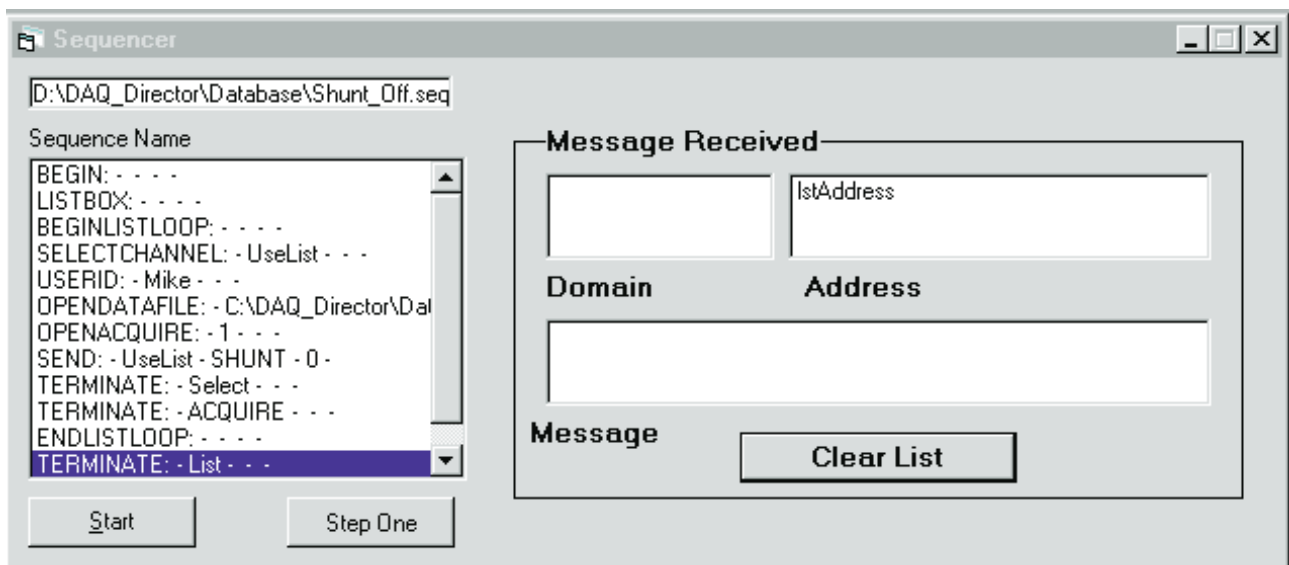
Data Display—DAQ Director contains a variety of utilities to represent acquired data and present it to you. For example, the Data Engine itself provides the instantaneous value of the raw data in counts as well as a quick-graph capability to provide you with a check on the results. Digital displays can be attached to the real-time data from a number of channels. These displays, as shown in the following figure, can represent ADC counts or engineering units, as set up in the Configuration Database. You can select the number of these displays that are active.



The data can be displayed in graphical form by the DAQGraph utility as it is acquired. This graphical display includes a rich set of features, such as scaling in the x and y direction, vertical panning, a cursor for accurate timing measurements of the waveform, and the ability to create multiple graphs. A typical DAQGraph display window is shown on the following page.



Automating Your Test—DAQ Director provides the facility to allow you to create and edit operation sequences. These can range from several steps to the automation of a complete test program. This information can be saved in a sequence file, which you can recall as needed. You can create user buttons, which can assert any DAQ Director function or execute a test sequence. The following figure shows the DAQ Director sequencer containing a list for automating bridge shunt calibration.



Ordering Information

Model AC10-0100 DAQ Director Software for Windows NT

Related Products

Model AA21 LabVIEW - VXI Development System (required for custom LabVIEW graphical programming)

Model V122 FOXI PCI Host Adapter

Model V120 FOXI VXI Slot-0 Controller

Model V195 13-slot, C-size, VXI Mainframe

Model Vxxx Data acquisition modules, as required

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