D2K-LVIEW

LabVIEW® Interfaces for DAQ-2000 Series

Windows 98/NT/2000/XP

User's Guide

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Manual Rev. 1.30: August 15, 2002

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How to Use This Manual

This manual is designed to help you use the D2K-LVIEW, the LabVIEW driver for DAQ-2000 series data acquisition cards. For the installation and driver handling information, please refer to *ADLINK PCI/CompactPCI DAQ Cards Software Installation Guide*. For the detail description of D2K-LVIEW VIs, please refer to D2K-LVIEW PDF file format Function Reference. This manual is organized as follows:

✍✍ **Chapter 1, "Introduction to D2K-LVIEW" describes how to program your application by using D2K-LVIEW.**

✍✍ **Chapter 2, "D2K-LVIEW Overview" briefly describes each VI and provides the programming guide.**

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1

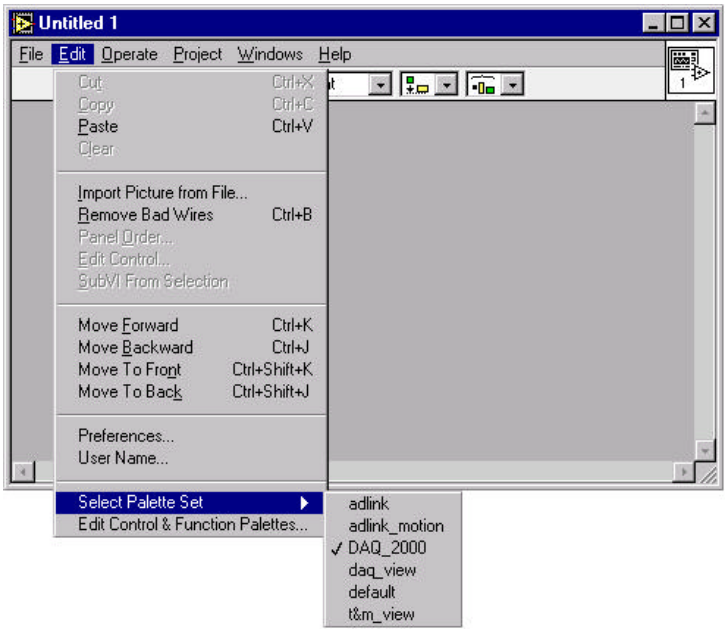
Introduction to D2K-LVIEW

1.1 Using D2K-LVIEW VIs in LabVIEW

To use D2K-LVIEW VIs, you may switch the palette to the ***DAQ_2000*** view.

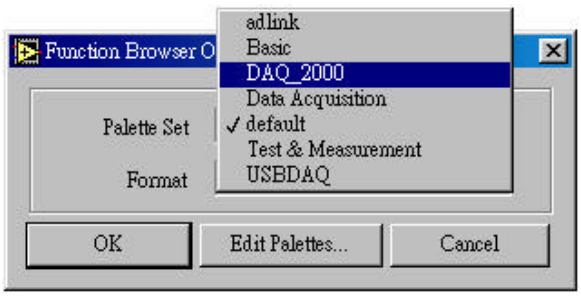
LabVIEW 4 / LabVIEW 5

Select **Select Palette Set** command in the **Edit** menu from panel or block diagram in LabVIEW. Then select the ***DAQ_2000*** view from the menu setup ring.



LabVIEW 6

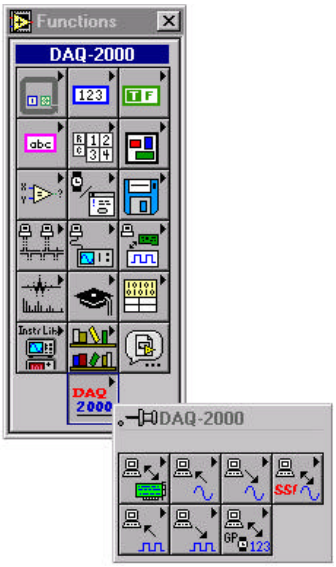
Click the **Options** button in the **Controls** or **Functions** palette toolbar to display the **Function Browser Options** dialog box. Select ***DAQ_2000*** view from the **Palette Set** pull-down menu. Click OK. The **Functions** palettes change to the ***DAQ_2000*** view.



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Then you can find D2K-LVIEW VIs in **DAQ2000** icon on the **Functions** palette..





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D2K-LVIEW Overview

2.1 D2K-LVIEW Programming

The Chapter *D2K-DASK Application Hints* of *D2K-DASK User's Guide* provides the programming schemes showing the function flow of that D2K-DASK performs analog I/O and digital I/O. Please refer to it for the information of D2K-LVIEW programming.

2.2 D2K-LVIEW VI Overview

This section briefly describes each VI in D2K-LVIEW. All applications developed with D2K-LVIEW are compatible across Windows 98, Windows NT, and Windows 2000.

You can find the detailed description of each VI by the following ways:

1. Select **Show Help** command of **Help** menu in LabVIEW. When you put the mouse cursor on D2K-LVIEW VI, LabVIEW will show the description of the VI.
2. PDF manual files in <Install Dir>\Manual directory.

D2K-LVIEW VIs are grouped to the following classes:

- **General Configuration Function Group**
- **Analog Input Function Group**
  - Analog Input Configuration functions
  - One-Shot Analog Input functions
  - Continuous Analog Input functions
  - Asynchronous Analog Input Monitoring functions
- **Analog Output Function Group**
  - Analog Output Configuration functions
  - One-Shot Analog Output functions
  - Continuous Analog Output functions
  - Asynchronous Analog Output Monitoring functions
  - Group Analog Output functions
- **Digital Input Function Group**
  - Digital Input Configuration functions
  - One-Shot Digital Input functions
- **Digital Output Function Group**
  - Digital Output Configuration functions
  - One-Shot Digital Output functions
- **General Timer/Counter Function Group**
- **DIO Function Group**
  - Digital Input/Output Configuration function
- **SSI Function Group**

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✍✍ **Calibration Function Group**

2.1.1 General Configuration Function Group

Use these functions to initialize and configure data acquisition cards.

Initial VIs (DAQ2010 Initial, …)

Initializes the hardware and software states of a DAQ-2000 series data acquisition card. Initial VI must be called before any other D2K-LVIEW VI can be called for that card.

Release Card Tells D2K-DASK driver that this card is not used currently and can be released. This would make room for new card to initialize.

2.1.2 Analog Input Function Group

Analog Input Configuration VIs

D2K AI CH Config Informs D2K-DASK library of the AI range selected for the specified analog input channel of DAQ-2000 device. You must call this function before calling function to perform analog input operation.

D2K AI Config Informs D2K-DASK library of trigger source, trigger mode, input mode and trigger properties for the analog input operation of DAQ-2000 device. You must call this function before calling function to perform continuous analog input operation of DAQ-2000 device.

D2K AIO Config Informs D2K-DASK library of the Timer Source and the Analog Trigger setting for the DAQ-2000 device with card ID CardNumber. You must call this function, if using the external timer source or the analog trigger mode of AI/AO is performed.

D2K AI Mux Scan Setup **S**tores *numChans*, *chans*, and *gain_refGnd* in the Channel-Gain Queue for a scanned data acquisition operation.

One-Shot Analog Input VIs

D2K AI Read Channel Performs a software triggered A/D conversion (analog input) on an analog input channel and returns the value converted (unscaled).

D2K AI Simu Read Channel Performs a software triggered A/D conversion (analog input) on analog input channels and returns the values converted (unscaled). This function is only available for Simultaneous AD card (e.q. DAQ-2010).

D2K AI Read Mux Scan Returns readings for all analog input channels selected by *D2K_AI_MuxScanSetup*. This function is only available for Multiplexed AD card (e.q. DAQ-2205).

D2K AI Scan read Channels Performs software triggered A/D conversions (analog input) on analog input channels and returns the values converted (unscaled). This function is only available for Multiplexed AD card (e.q. DAQ-2205).

D2K AI Read Channel Volt Performs a software triggered A/D conversion (analog input) on an analog input channel and returns the value scaled to a voltage in units of volts.

D2K AI Volt Scale Converts the result from a *D2K AI Read Channel* call to the actual input voltage.

Continuous Analog Input VIs

D2K AI Cont Read Channel Performs continuous A/D conversions on the specified analog input channel at a rate as close to the rate you specified.

D2K AI Cont Scan Channels Performs continuous A/D conversions on the specified *continuous* analog input channels at a rate as close to the rate you specified. This function is only available for those cards that support auto-scan functionality.

D2K AI Cont Read Multiple Channels

Performs continuous A/D conversions on the specified analog input channels at a rate as close to the rate you specified. This function is only available for those cards that support auto-scan functionality.

D2K AI Cont Read Channel To File

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Performs continuous A/D conversions on the specified analog input channel at a rate as close to the rate you specified and saves the acquired data in a disk file.

D2K AI Cont Scan Channels To File

Performs continuous A/D conversions on the specified *continuous* analog input channels at a rate as close to the rate you specified and saves the acquired data in a disk file. This function is only available for those cards that support auto-scan functionality.

D2K AI Cont Read Multiple Channels To File

Performs continuous A/D conversions on the specified analog input channels at a rate as close to the rate you specified and saves the acquired data in a disk file. This function is only available for those cards that support auto-scan functionality.

D2K AI Cont Mux Scan This function initializes the Channel-Gain Queue to point to the start of the scan sequence as specified by *D2K_AI_MuxScanSetup* and starts a multiple-channel scanned data acquisition operation. This function is only available for ***Multiplexed AD card*** (e.g. DAQ-2205)

D2K AI Cont Mux Scan To File Initializes the Channel-Gain Queue to point to the start of the scan sequence as specified by *D2K_AI_MuxScanSetup*, starts a multiple-channel scanned data acquisition operation and saves the acquired data in a disk file.

D2K AI Cont VScale Converts the values of an array of acquired data from a continuous A/D conversion call to the actual input voltages.

D2K AI Cont Status Checks the current status of the continuous analog input operation.

D2K AI Cont Buffer Setup Set up the buffer for continuous analog input.

D2K AI Cont Buffer Reset Reset all the buffers set by function *D2K AI Cont Buffer Setup*.

D2K AI Initial Memory Allocated Gets the actual size of analog input memory that is available in the device driver.

Asynchronous Analog Input Monitoring/Configuration VIs

D2K AI Async Check Checks the current status of the asynchronous analog input operation.

D2K AI Async Clear Stops the asynchronous analog input operation.

D2K AI Async Double Buffer Mode

Enables or disables double buffer data acquisition mode.

D2K AI Async Double Buffer Half Ready

Checks whether the next half buffer of data in circular buffer is ready for transfer during an asynchronous double-buffered analog input operation.

D2K AI Async Double Buffer To File

Copies half of the data of circular buffer into a disk file.

2.1.3 Analog Output Function Group

Analog output Configuration VIs

D2K AO CH Config Informs D2K-DASK library of the reference voltage value selected for an analog output channel of DAQ-2000 Device. You must call this function before calling function to perform voltage output operation.

D2K AO Config Informs D2K-DASK library of trigger source, trigger mode, output mode and trigger properties for the analog output operation of DAQ-2000 device. You must call this function before calling function to perform continuous analog output operation of DAQ-2000 device.

D2K AIO Config Informs D2K-DASK library of the Timer Source and the Analog Trigger setting for the DAQ-2000 device with card ID CardNumber. You must call this function, if using the external timer source or the analog trigger mode of AI/AO is performed.

One-Shot Analog Output Functions

D2K AO Write Channel Writes a binary value to the specified analog output channel.

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D2K AO Simu Write Channel	Writes binary values to the specified analog output channels simultaneously. This function is only available for Simultaneous DA card.
D2K AO Write Channel Volt	Accepts a voltage value, scales it to the proper binary value and writes a binary value to the specified analog output channel.
D2K AO Volt Scale	Scales a voltage to a binary value.

Continuous Analog Output Functions

D2K AO Cont Write Channel	Performs continuous analog output on the specified analog output port at a rate as close to the rate you specified.
D2K AO Cont Write Multiple Channels	Performs continuous D/A conversions on the specified analog output channels at a rate as close to the rate you specified.
D2K AO Cont Status	Checks the current status of the continuous analog output operation.
D2K AO Cont Buffer Setup	This function set up the buffer for continuous analog output
D2K AO Cont Buffer Reset	This function reset all the buffers set by function *D2K AO Cont Buffer Setup* for continuous analog output
D2K AO Initial Memory Allocated	Gets the actual size of analog output DMA memory that is available in the device driver.

Asynchronous Analog Output Monitoring Functions

D2K AO Async Check	Checks the current status of the asynchronous analog output operation.
D2K AO Async Clear	Stops the asynchronous analog output operation.
D2K AO Async Double Buffer Mode	Enables or disables double buffer data acquisition mode.
D2K AO Async Double Buffer Half Ready	Checks whether the next half buffer of data in circular buffer is ready during an asynchronous double-buffered analog output operation.

Group Analog Output Functions (DAQ-2501/2502)

D2K AO Group FIFO Load	Loads a waveform buffer to on-board DA FIFOs
D2K AO Group Setup	Assigns one or more analog output channels to a waveform generation group.
D2K AO Group Update	Writes binary values to the specified group of analog output channels simultaneously.
D2K AO Group Update Volt	Accepts voltage values, scales them to the proper binary values and writes binary values to the specified group of analog output channels simultaneously.
D2K AO Group WFM Async Check	Checks the current status of the asynchronous analog output operation of a specified group.
D2K AO Group WFM Async Clear	Stops the asynchronous analog output operation of a specified group.
D2K AO Group WFM start	Performs continuous D/A conversions on the specified group of analog output channels at a rate as close to the rate you specified.
D2K AO Group WFM Stop Config	Informs D2K-DASK library of stop source and stop mode for the asynchronous analog output operation of a specified group.

2.1.4 Digital Input Function Group

One-Shot Digital Input VIs

D2K DI Read Line	Reads the digital logic state of the specified digital line in the specified port.
D2K DI Read Port	Reads digital data from the specified digital input port.

2.1.5 Digital Output Function Group

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One-Shot Digital Output VIs

D2K DO Write Line	Sets the specified digital output line in the specified digital output port to the specified state. This function is only available for those cards that support digital output read-back functionality.
D2K DO Write Port	Writes digital data to the specified digital output port.
D2K DO Read Line	Reads the specified digital output line in the specified digital output port.
D2K DO Read Port	Reads digital data from the specified digital output port.

2.1.6 General Timer/Counter Function Group

General-Purpose Timer/Counter VIs

D2K GCTR Setup	Controls the general-purpose counter to operate in the specified mode.
D2K GCTR Read	Reads the counter value of the general-purpose counter without disturbing the counting process.
D2K GCTR Control	Controls for the selected counter/timer by software
D2K GCTR Reset	Halts the specified general-purpose timer/counter operation and reload the initial value of the timer/counter.
D2K GCTR Status	Reads the counter value of the general-purpose counter without disturbing the counting process.

2.1.7 DIO Function Group

Digital Input/Output Configuration Functions

D2K DIO Port Config	This function is only used by the Digital I/O cards whose I/O port can be set as input port or output port. This function informs D2K-DASK library of the port direction selected for the digital input/output operation. You must call this function before calling functions to perform digital input/output operation.

2.1.8 SSI Function Group

D2K SSI Source Connect	Connects a device to the specified SSI bus trigger line.
D2K SSI Source Disconnect	Disconnects a device signal from the specified SSI bus trigger line.
D2K SSI Source Clear	Disconnects a device signal from the specified SSI bus trigger line

2.1.9 Calibration Function Group

D2K DB Auto Calibration ALL	Calibrates your DAQ-2000 device.
D2K EEPROM Calib Constant Update	Save new calibration constants to the specified *bank* of EEPROM
D2K Load Calib Data	Load calibration constants from the specified *bank* of EEPROM.
DAQ2005 Acquire AD Error	Acquires the offset and gain errors of the specified AI channel in the specified polarity mode.
DAQ2005 Acquire DA Error	Acquires the offset and gain errors of the specified DA channel in the specified polarity mode.
DAQ2006 Acquire AD Error	Acquires the offset and gain errors of the specified AI channel in the specified polarity mode.
DAQ2006 Acquire DA Error	Acquires the offset and gain errors of the specified DA channel in the specified polarity mode.
DAQ2010 Acquire AD Error	Acquires the offset and gain errors of the specified AI channel in the specified polarity mode.
DAQ2010 Acquire DA Error	Acquires the offset and gain errors of the specified DA channel in the specified polarity mode.

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DAQ2204 Acquire AD Error	Acquires the offset and gain errors of ADC.
DAQ2204 Acquire DA Error	Acquires the offset and gain errors of the specified DA channel in the specified polarity mode.
DAQ2205 Acquire AD Error	Acquires the offset and gain errors of ADC.
DAQ2205 Acquire DA Error	Acquires the offset and gain errors of the specified DA channel in the specified polarity mode.
DAQ2206 Acquire AD Error	Acquires the offset and gain errors of ADC.
DAQ2206 Acquire DA Error	Acquires the offset and gain errors of the specified DA channel in the specified polarity mode.
DAQ250X Acquire AD Error	Acquires the offset and gain errors of the specified DA channel in the specified polarity mode.
DAQ250X Acquire DA Error	Acquires the offset and gain errors of the specified DA channel in the specified polarity mode.

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