ULx for NI LabVIEW™
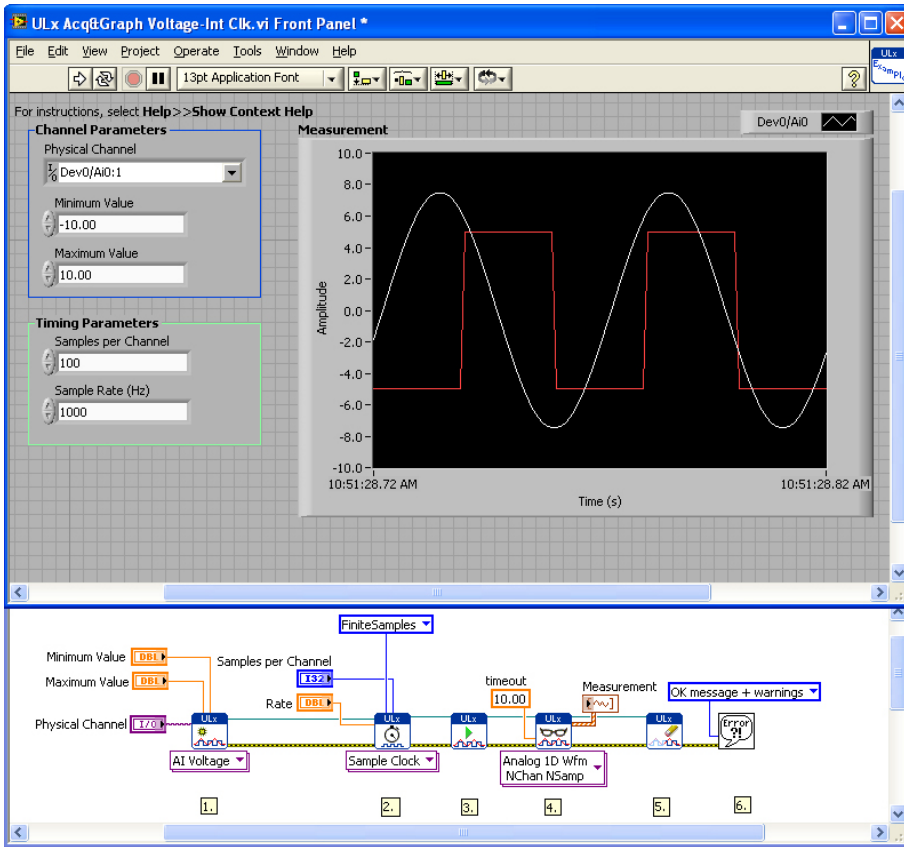
NI LabVIEW Driver for MCC DAQ Products

ULx for NI LabVIEW front panel (top) and block diagram (bottom)

Features

- **Comprehensive library of VIs and example programs**
- **Seamless operation with most MCC hardware products**
- **High-level VIs improve ease of use and speed development**
- **Polymorphic VIs reduce the number of VIs required**
- **Support for counter/timers, quadrature encoders, digital triggering, and synchronous DAQ operation**
- **NI LabVIEW waveform data type compatibility**
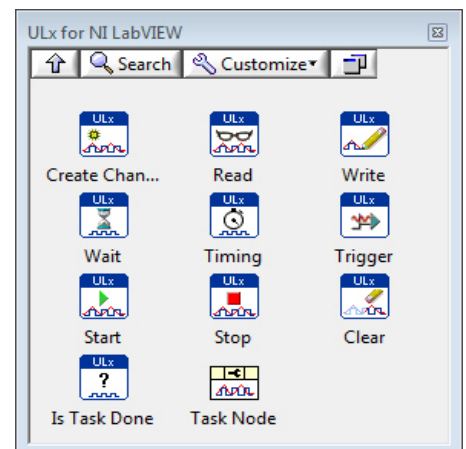- **Compatible with NI LabVIEW Version 2010 and later**

Supported Operating Systems

- **Windows 10/8/7/Vista®/XP 32/64-bit**

ULx VI Palette

Users select VIs from the ULx for NI LabVIEW palette within LabVIEW.

The ULx palette includes polymorphic VIs, which adapt to different data types. A polymorphic VI is a collection of VIs called instances. Each VI instance in the collection has similar input and output terminals, but accept or return different data types, such as waveforms, arrays, and scalar values.

ULx for NI LabVIEW VI palette

Overview

The ULx for NI LabVIEW is a library of virtual instruments (VIs) used with Measurement Computing Corporation (MCC) devices to develop acquisition and control applications in National Instruments LabVIEW.

The ULx library contains high level task objects. Each task object owns a low level DAQ object that controls data acquisition for a specific device sub function such as analog input, analog output, digital input, digital output, etc. The ULx VIs interface with the MCC Universal Library (UL) software via transparent function calls.

ULx for NI LabVIEW is included with the free MCC DAQ Software bundle (CD/download).

High-Level VIs

High-level VIs merge operations into single, easier-to-use VIs that improve application development compared to previous drivers.

The VIs internally manage DAQ device variations such as data rate, input ranges, and data packet sizes, and can easily be migrated from one DAQ device to another.

Intelligent Error Handling

ULx for NI LabVIEW provides error descriptions and recommendations on how to resolve them, speeding development time.

Auto Detection of Supported UL Functions

ULx for NI LabVIEW automatically detects supported UL functions for each device, significantly reducing programming errors and reducing the need to refer to UL documentation.

ULx for NI LabVIEW™

NI LabVIEW Driver for MCC DAQ Products

Performing Data Acquisition Tasks

Users create a separate task to perform each data acquisition operation, such as analog input, digital output, and so on. A task can contain one or more virtual channels with timing, triggering, and other properties. Each task is associated with one hardware device.

All channels in a task must be of the same I/O type, such as analog input or counter output. A task can include channels of different measurement types, such as an analog input temperature channel and an analog input voltage channel.

Some MCC hardware devices support *composite* (synchronous) tasks, which can include combinations of any supported input operations OR any supported output operations, but cannot include input and output operations in one task.

Synchronous DAQ Operation

The ULx for NI LabVIEW library supports synchronous input or output on MCC hardware that can synchronously acquire analog, digital, temperature, and counter input using the same hardware pacer.

ULx also supports synchronous output on MCC hardware that can synchronously generate analog and digital output using the same hardware pacer.
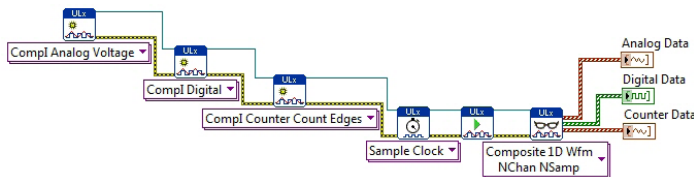
ULx composite input and output VIs support synchronous DAQ operation

Some examples of MCC hardware that support synchronous tasks are the USB-CTR Series, USB-2500 Series, USB-1602HS Series, USB-1604HS Series, and USB-1616HS Series.

Waveform Data Type

The ULx for NI LabVIEW library supports the use of the LabVIEW waveform data type to represent the analog and digital waveforms users can acquire or generate. ULx uses the *dt* component of the waveform input – the time in seconds between samples – to determine the sample clock rate.

Counter Input and Timer Output

The ULx for NI LabVIEW library supports several types of counter input and timer output channels for different types of counter measurements and generations. Most counters have three I/O lines: gate, input (clock), and output.

- A gate input controls when counting starts or stops.
- An input signal is the timebase for a measurement or the signal to count. A count register – the number of bits in the counter – increments or decrements the number of edges to count.
- An output signal can output a single pulse or a pulse train (series of pulses).

All counter types are supported, including encoders. Some MCC hardware devices have timer output channels which are independent of the counter channels.

Digital Pattern Triggering

The ULx for NI LabVIEW library supports digital pattern triggering. Users can configure a task to start an acquisition when a digital pattern is matched. The pattern to detect and the trigger sensitivity – the way in which the trigger event is detected – are user-configurable.

Example Programs

ULx for NI LabVIEW includes example programs that demonstrate how to perform data acquisition tasks in LabVIEW. Each program can be modified to suit specific application needs.

Requirements

Hardware

- Most Measurement Computing Bluetooth, Ethernet/WEB, USB, PCI/PCIe, and Wireless devices are supported

Software

- NI LabVIEW 10.0 and later