

# ULx for NI LabVIEW

## Software Quick Start

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# Software Quick Start

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

This Quick Start shows you how to create a LabVIEW application that graphs and logs data acquired from a MCC device. The procedures in this document assume that you are familiar with creating applications with NI LabVIEW.

## Hardware and Software Requirements

### Hardware

Most Measurement Computing Bluetooth, Ethernet/WEB, USB, PCI/PCIe, and Wireless devices are supported. Refer to our website for the software supported by each device.

### Software

- NI LabVIEW 10.0 or later
- MCC InstaCal installation, configuration, and test utility  
InstaCal is included with the MCC DAQ software bundle that ships with most Measurement Computing hardware.

### Operating systems

Windows 10/8/7/Vista®/XP 32/64-bit

## Install InstaCal and the ULx for NI LabVIEW software

Install InstaCal and the ULx for NI LabVIEW software from the MCC DAQ CD, or download the software from our website at [www.mccdaq.com/software.aspx](http://www.mccdaq.com/software.aspx).

ULx VIs are installed by default into C:\Program Files\National Instruments\LabVIEW <version>\vi.lib\ULx, where <version> is the LabVIEW version that is installed.

## Install and configure the hardware with InstaCal

You must configure MCC hardware with InstaCal before LabVIEW can recognize the device. Note that Measurement and Automation Explorer (MAX) is not used to configure MCC hardware for use in LabVIEW. Complete the following steps to install and configure your hardware:

1. Exit LabVIEW if it is running.
2. Install the MCC hardware that you want to use in LabVIEW.
3. Run InstaCal.

A **Plug and Play Board Detection** dialog box displays the device(s) detected on the system. Select the device to use in LabVIEW and click **OK**. The device is added to the InstaCal configuration file, and appears with a board number on the main InstaCal window. Use this number to select the hardware in LabVIEW. This procedure acquires data from the device installed as "Board# 0" in InstaCal.

4. Click the device and select **Install»Configure** to display the **Board Configuration** dialog box. Configure the hardware and click **OK** to close the dialog box and write device settings to the configuration file.
5. Connect a signal source to the MCC device so that it acquires signals from analog input channel 0.

Refer to the connector pinout in your hardware user's guide for the connector pinout.

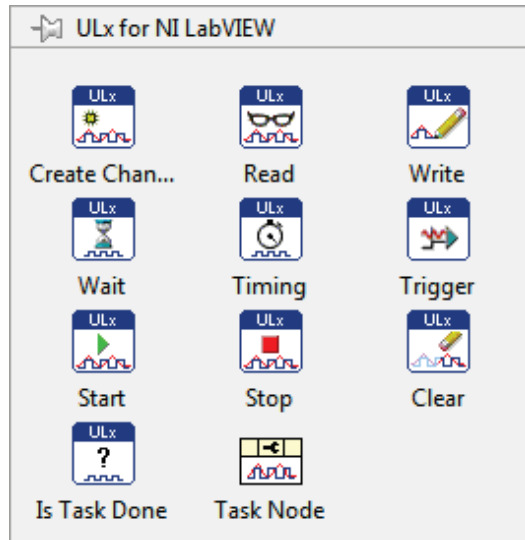
LabVIEW reads the InstaCal configuration file. If you need to change any device settings, make sure to close LabVIEW before configuring the device.

## Build the NI LabVIEW program

This procedure shows you how to create a program that acquires data from an MCC device, displays the data in a waveform, and saves the data to a file. The MCC USB-1608GX-2AO device was used for this exercise.

Complete the following steps to create the source code for the program:

1. Start LabVIEW and open a blank VI or empty project.
2. Display the block diagram window if it is not open.
3. Select **View»Functions Palette** to display the Functions palette.
4. Select **User Libraries»ULx for NI LabVIEW** to display the MCC ULx VIs.



5. Click the pin icon to keep the ULx for NI LabVIEW palette visible while you select your VIs.

### Create an analog input voltage channel

1. Select the **Create Channel** icon and place the **ULx Create Virtual Channel VI** on the block diagram.
 

**Tip:** To show a text label on the block diagram, right-click on the VI and select **Visible Items»Label** from the shortcut menu.
2. Right-click the **physical channels** terminal and select **Create»Control**.
3. Add a control to the **minimal value** terminal.
4. Add a control to the **maximum value** terminal.

### Add a sample clock

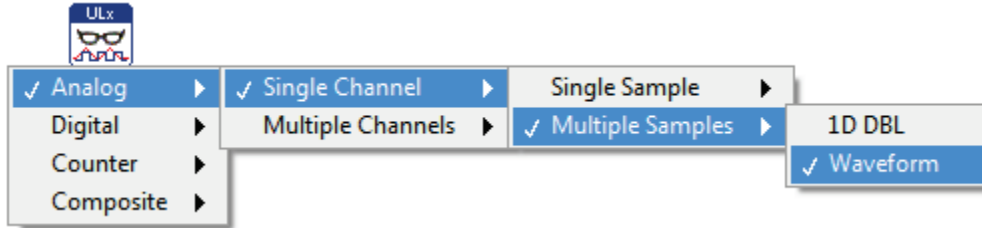
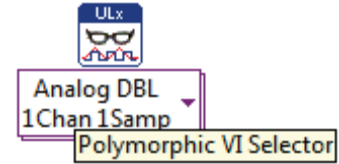
1. Select the **Timing** icon and place the **ULx Timing VI** on the block diagram.
2. Add a control to the **sample mode** terminal.
3. Add a control to the **samples per channel** terminal.
4. Add a control to the **rate** terminal.

### Specify when to start the acquisition

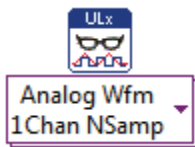
Select the **Start** icon and place the **ULx Start VI** on the block diagram.

## Acquire data

1. Select the **Read** icon and place the **ULx Read VI** on the block diagram.
2. Click the down arrow and use the Use the polymorphic VI selector to choose the **Analog Wfm 1Chan NSamp** instance. This VI instance reads multiple samples from one channel.



The icon updates with the name of the VI selected.

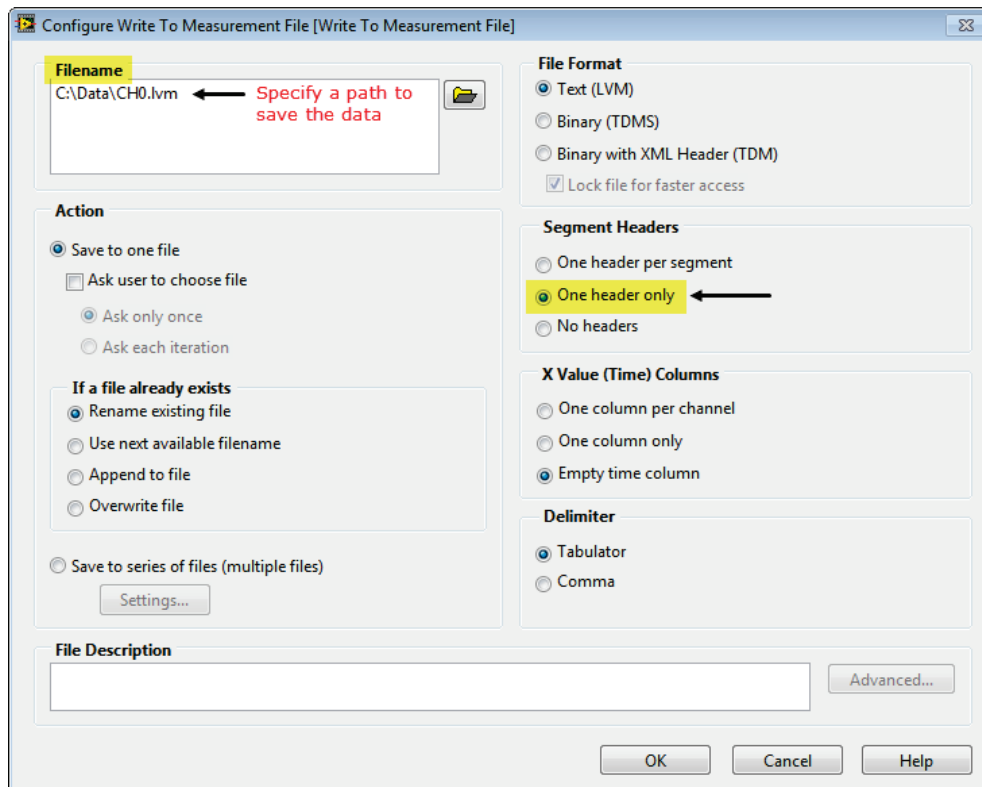


## Display the data

From the front panel, select **Express»Graph Indicators»Graph** and place a **Waveform Graph** on the block diagram.

## Write the data to a file

Select **Functions»Programming»File I/O»Write Meas File** to add a **Write to Measurement File Express VI** on the block diagram. The **Configure Write to Measurement File** dialog box opens:



Configure the following options on the dialog box:

1. In the **File Name** text box, enter a path to save the data, or browse to the destination path.
2. Select the **One header only** option button in the **Segment Headers** area; this option saves the data in a table with one header.

When you run the program, the data is saved to a LabVIEW measurement data file (\*.lvm). An \*.lvm file is a tab-delimited ASCII text file that you can open with a spreadsheet application or text editor.

## Clear the task

Select **ULx for NI LabVIEW»Clear** and place the VI on the block diagram. This VI releases resources that are reserved for the task.

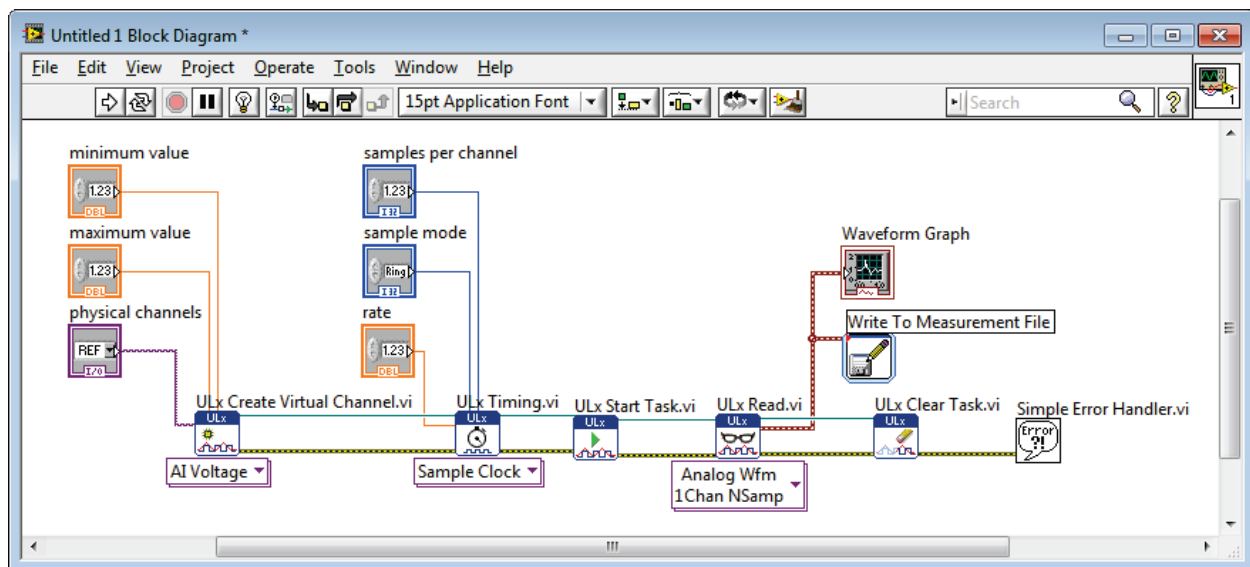
## Add error notification

Select **Functions»Programming»Dialog & User Interface»Simple Error** and place the VI on the block diagram.

## Wire the VIs together

1. Connect a wire between the **task out** terminal on one VI to the **task in** terminal on the adjacent VI.
2. Connect a wire between the **error out** terminal on one VI to the **error in** terminal on the adjacent VI.
3. Connect a wire between the Waveform Graph to the **data** terminal on the ULx Read.vi.
4. Connect a wire between the **signals** terminal on the Write to Measurement File VI to the **data** terminal on the ULx Read VI.

The completed block diagram is shown here:

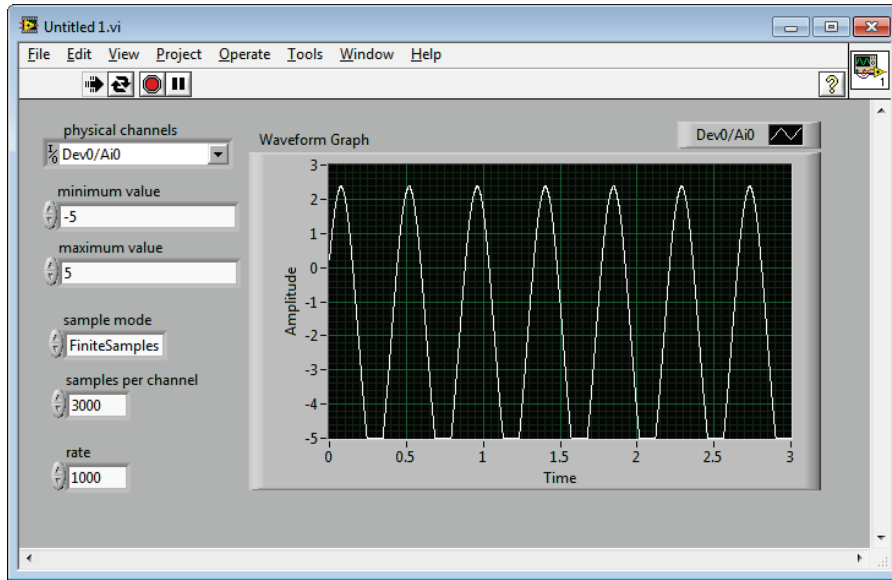


## Run the VI

After creating the source code for the program, display the front panel and configure the user interface. Complete the following steps:

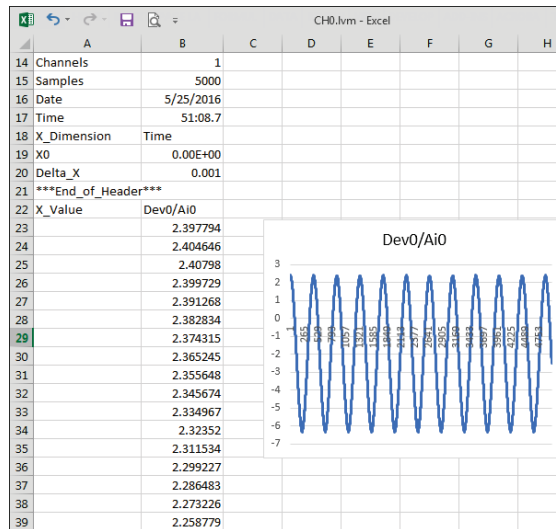
1. Click the **physical channels** arrow and select **Dev0/Ai0** to acquire data from channel 0 on device 0. The device number is associated with the device installed in InstaCal as "Board# 0".
2. Set the voltage range, sample mode, samples per channel, and rate to values supported by your hardware. The front panel shown below is configured with values supported by the USB-1608GX-2AO.
3. Click the **Run** button on the toolbar to run the VI.

Waveform data displays on the front panel, and the data is written to the file specified in the [Write the data to a file](#) procedure on page 6. Data acquired from the USB-1608 is shown below.



## View logged data

You can use a spreadsheet application such as Microsoft Excel or a text editor to open the data file. The following image shows the data file opened and charted in Excel:



## Help File

To learn more about MCC ULx VIs, select **ULx for NI LabVIEW Help** from the LabVIEW **Help** menu.



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