SECTION 7.3: ADDING NATIONAL INSTRUMENTS HARDWARE

Step: 1

In order to record data from a National Instruments device, you must first install NI-DAQmx software from the National Instruments website.

Note: This is a large download that may take a long time to install.

HTTP://FTP.NI.COM/SUPPORT/SOFTLIB/MULTIFUNC-

Note: If you have previously used National Instruments hardware, NI-DAQmx software may already be installed on your PC.

Step: 2

Plug in the NI USB device.

Step: 3

Open the NI-DAQmx software to set up a channel, as described in Section 7.3.1, or a task, as described in Section 7.3.2. Refer to the NI-DAQmx Help for complete information about channels and tasks.

Note:

A physical channel is a terminal or pin at which you can measure or generate an analog or digital signal.

A virtual channel maps a name to a physical channel and its settings, such as input terminal connections, the type of measurement or generation, and scaling information. In NI-DAQmx, virtual channels are integral to every measurement.

A task is one or more virtual channels with timing, triggering, and other properties. Conceptually, a task represents a measurement or generation to perform. You can set up and save configuration information in a task and use the task in an application.

SECTION 7.3.1: SETTING UP A NI-DAQ DIGITAL INPUT

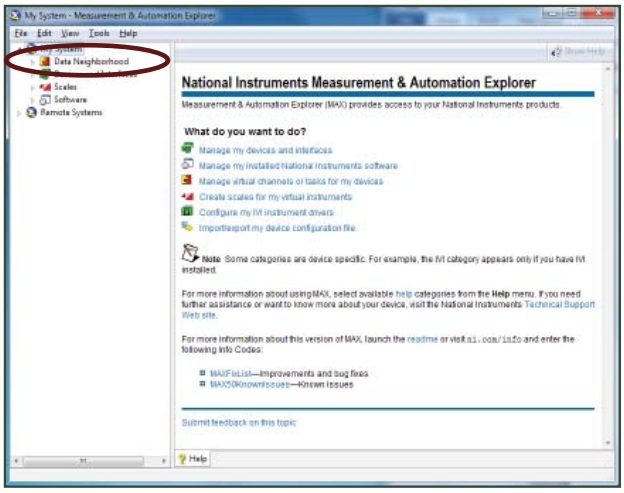
A physical channel is a terminal or pin at which you can measure or generate an analog or digital signal. A virtual channel maps a name to a physical channel and its settings, such as input terminal connections, the type of measurement or generation, and scaling information.

Step: 1

Open the NI-DAQmx software.

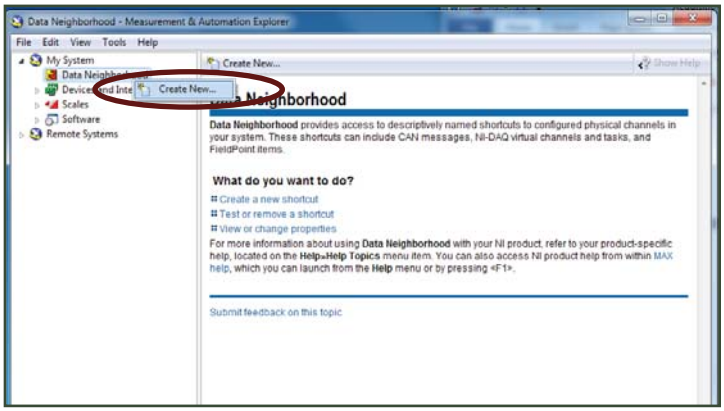
Step: 2

In the My System window, right-click on “Data Neighborhood.”



Step: 3

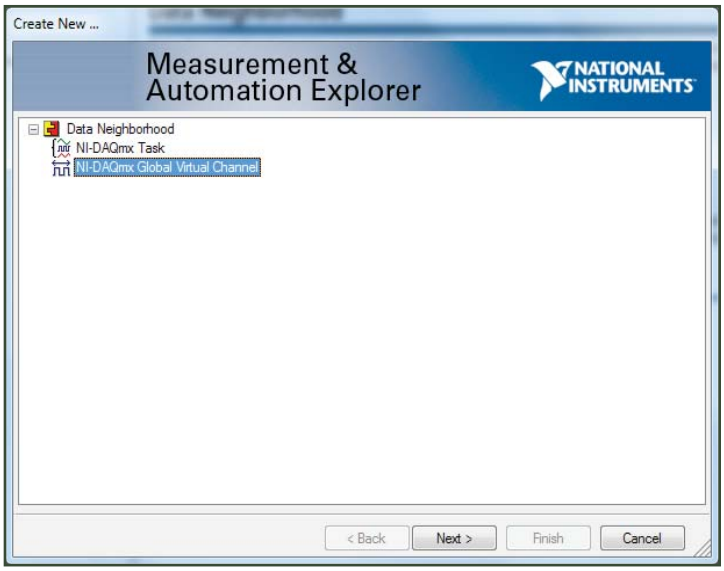
Select “Create New.”



SECTION 7.3.1: SETTING UP A NI-DAQ DIGITAL INPUT

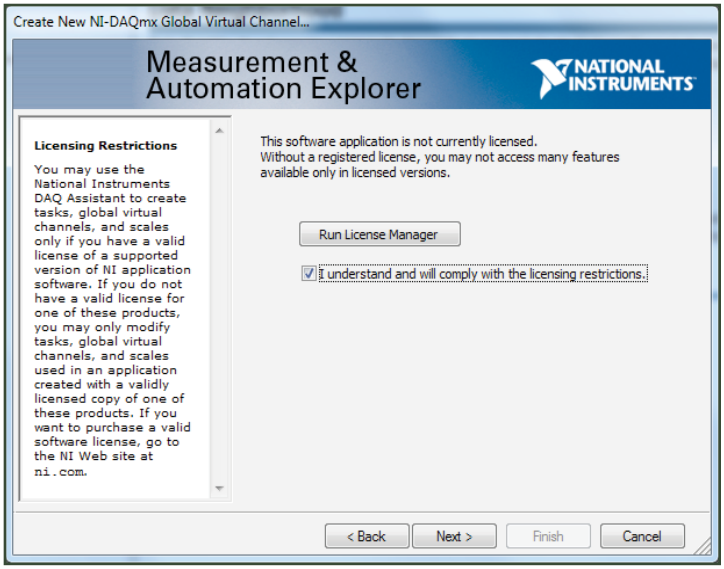
Step: 4

In the Measurement and Automation Explorer window, select “NI-DAQ Global Virtual Channel.” Click “Next.”



Step: 5

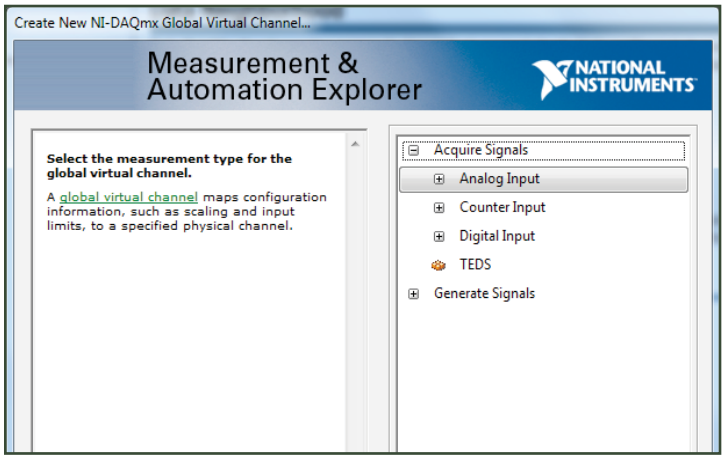
After reviewing the Licensing Restrictions, check the “I understand and will comply with the licensing restrictions” box and click “Next.”



SECTION 7.3.1: SETTING UP A NI-DAQ DIGITAL INPUT

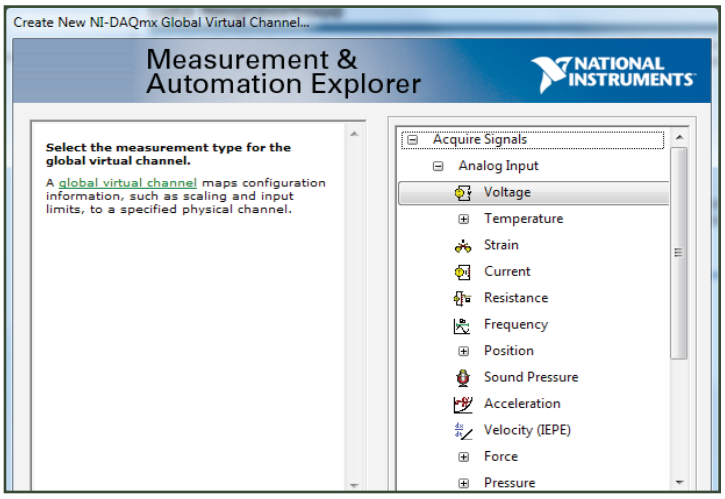
Step: 6

Click the expansion box (+) connected to Analog Input to expand the channel options.



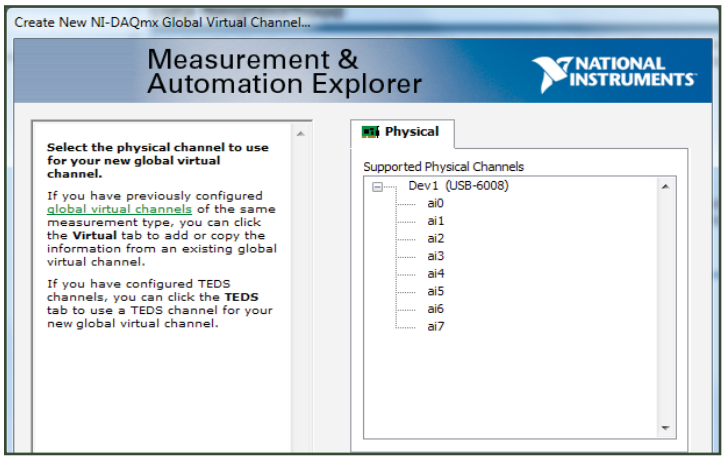
Step: 7

Select “Voltage” from the list of Analog Inputs.



Step: 8

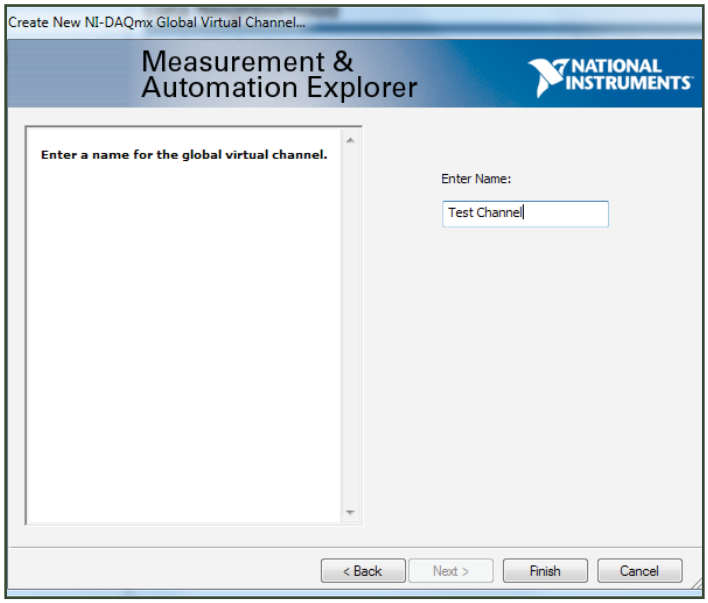
From the Supported Physical Channels list, select the channel you would like to use (e.g., ai0).



SECTION 7.3.1: SETTING UP A NI-DAQ DIGITAL INPUT

Step: 9

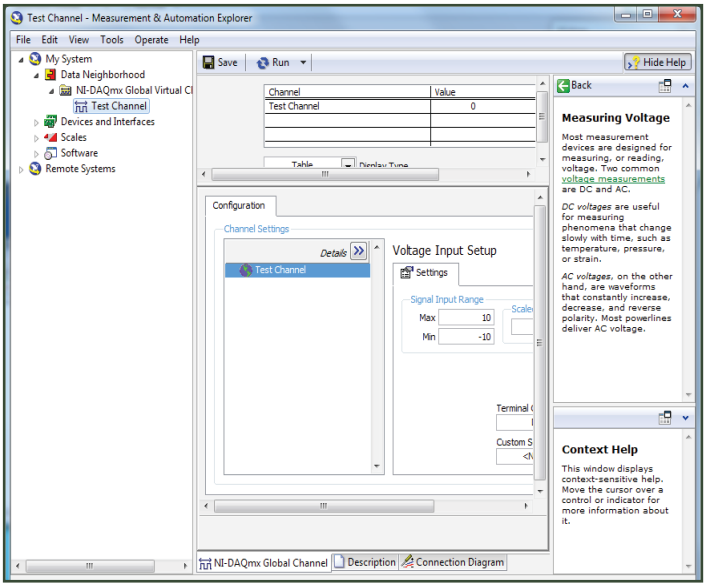
Enter a name for the channel into the text box, and then click “Finish.”



Step: 10

Make any necessary adjustments to the settings, and then click “Save.”

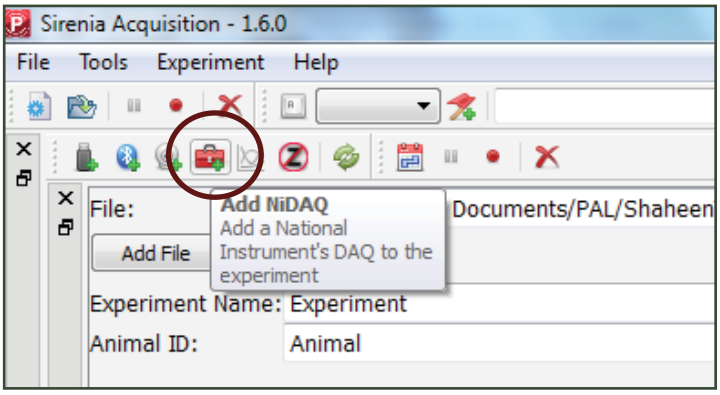
Note: Do NOT click “Run,” as this prevents Sirenia® from acquiring the channel.



SECTION 7.3.1: SETTING UP A NI-DAQ DIGITAL INPUT

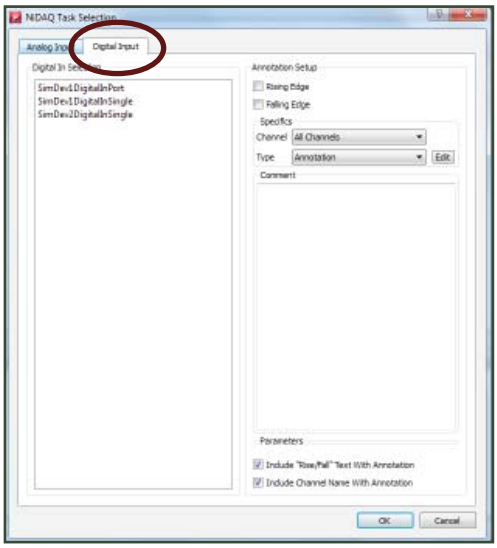
Step: 11

Open a New Experiment in Sirenia® Acquisition and click the NI-DAQ button on the Experiment Toolbar.



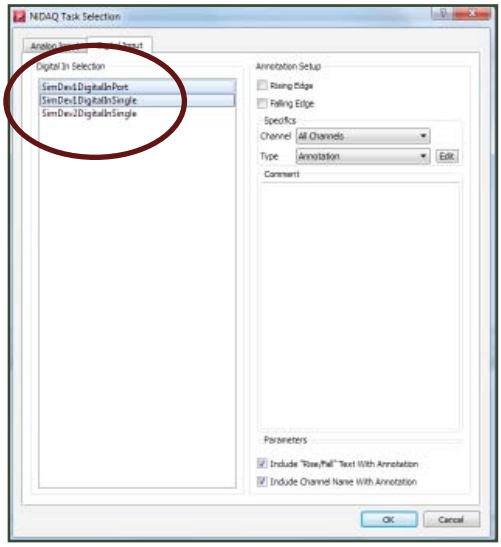
Step: 12

Click the Digital Input tab.



Step: 13

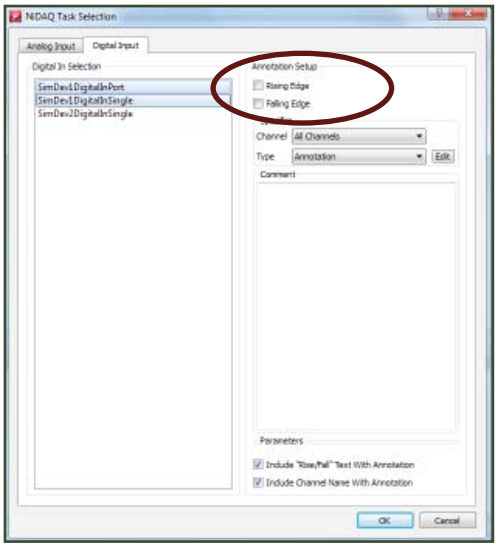
Click on each of the channels listed under 'Digital In Selection' from which you wish to read TTLs.



SECTION 7.3.1: SETTING UP A NI-DAQ DIGITAL INPUT

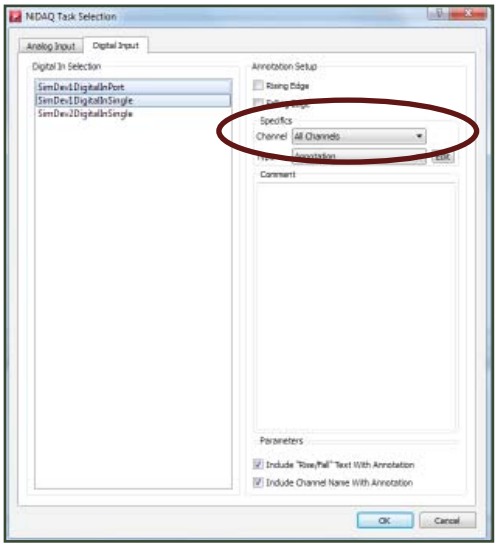
Step: 14

Under ‘Annotation Setup”, you must click at least on of the “Rising Edge” or “Falling Edge” options. This selects when a marker will be displayed.



Step: 15

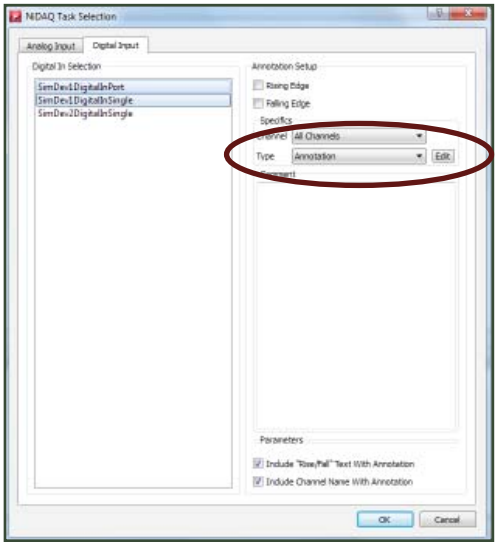
Under “Specifics,” select the channel you wish this marker to appear on. Leave as “All Channels” if you want it to show on all channels.



Step: 16

Select the type of marker you want the marker to save as. You can edit the available options by selecting the “Edit” button. The type helps to distinguish the markers.

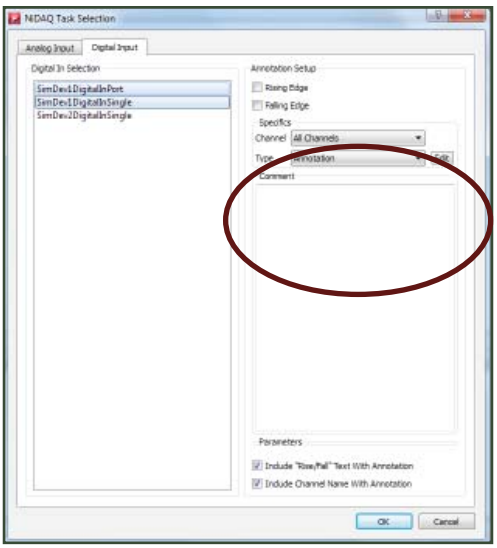
For example, you can select ‘Annotation’ or ‘Injection’ if you want to distinguish between these type of events. The markers can be set to be of a certain color based on their type.



SECTION 7.3.1: SETTING UP A NI-DAQ DIGITAL INPUT

Step: 17

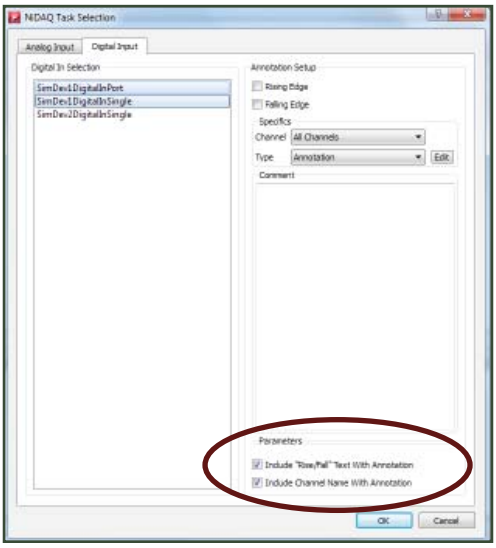
The “Comment” box is for adding any text you wish to display with the marker. This can be left blank.



Step: 18

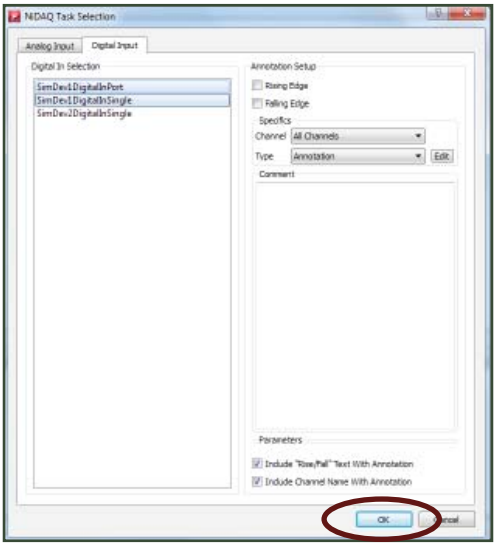
Check the “Include Rise/Fall” Text with Annotation is you want the comment for the marker to include the text of Rise or Fall depending on the changes of the TTL. If you include set a marker on both a rising and falling TTL, then this will help to distinguish between the event.

Checking the “Include Channel Name With Annotation” box adds the channel name to the comment section of the marker which is helpful if you have selected multiple channels.



Step: 19

Click “OK” to continue.



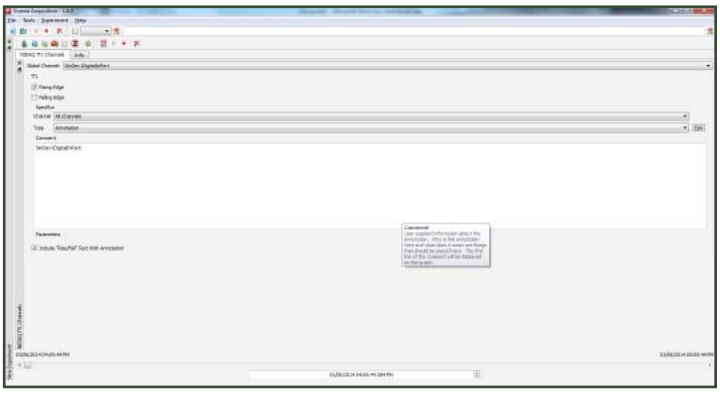
SECTION 7.3.1: SETTING UP A NI-DAQ DIGITAL INPUT

Step: 20

The NI-DAQ controls appear in a new tab titled “NIDAQ TTL Channels.”

The drop-down box at the top allows you to select different channels. This tab allows you to edit the settings of each channel separately. You can change all the information displayed such as the comment, when to display a marker, etc.

Note: The markers will not display unless the software is recording. After all devices are added, click the record button to view markers.



SECTION 7.3.2: SETTING UP A NI-DAQ ANALOG INPUT

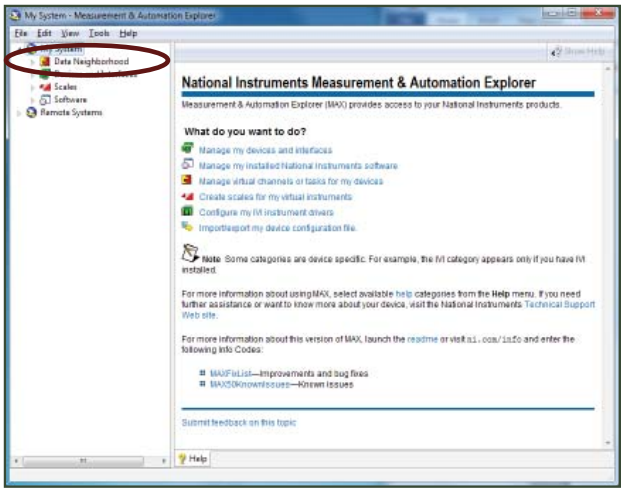
A task is one or more virtual channels with timing, triggering, and other properties. Conceptually, a task represents a measurement or generation to perform. You can set up and save configuration information in a task and use the task in an application.

Step: 1

Open the NI-DAQmx software.

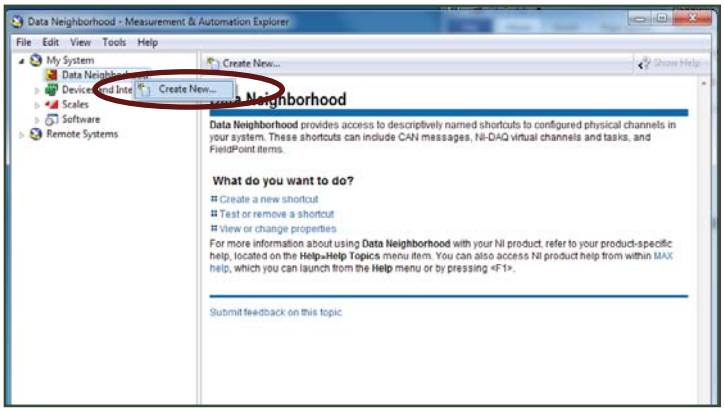
Step: 2

In the My System window, right-click on “Data Neighborhood.”



Step: 3

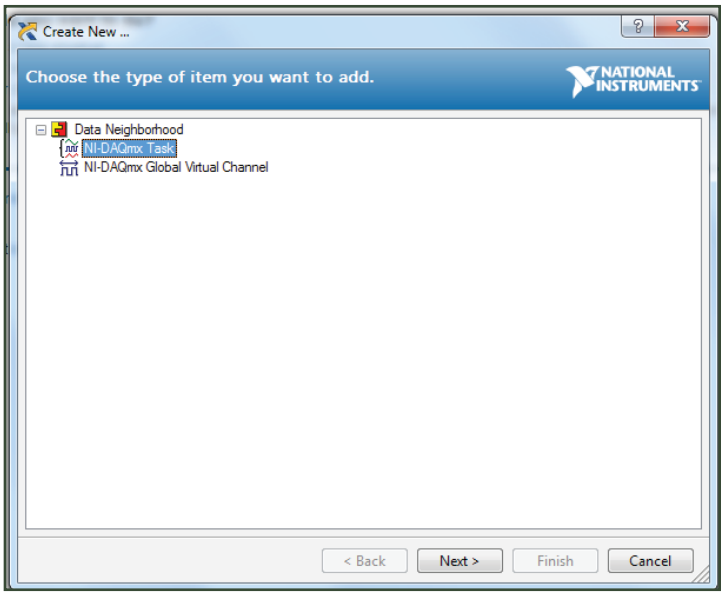
Select “Create New.”



SECTION 7.3.2: SETTING UP A NI-DAQ ANALOG INPUT

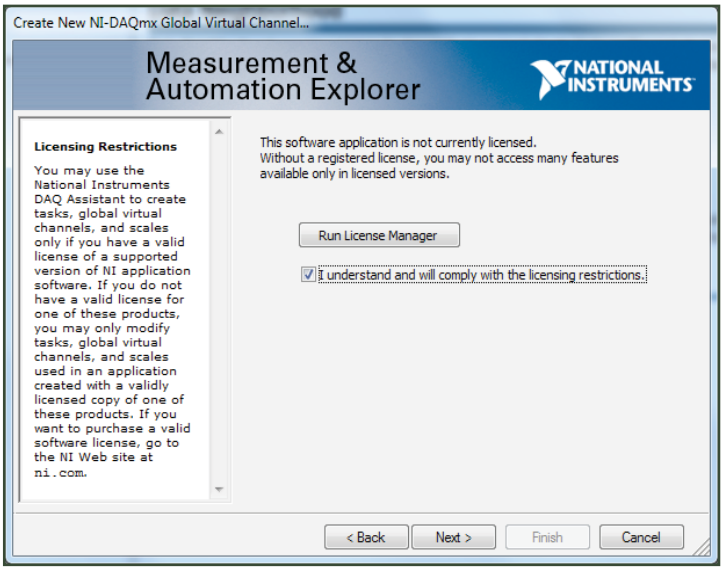
Step: 4

In the Measurement and Automation Explorer window, select “NI-DAQ Task.” Click “Next.”



Step: 5

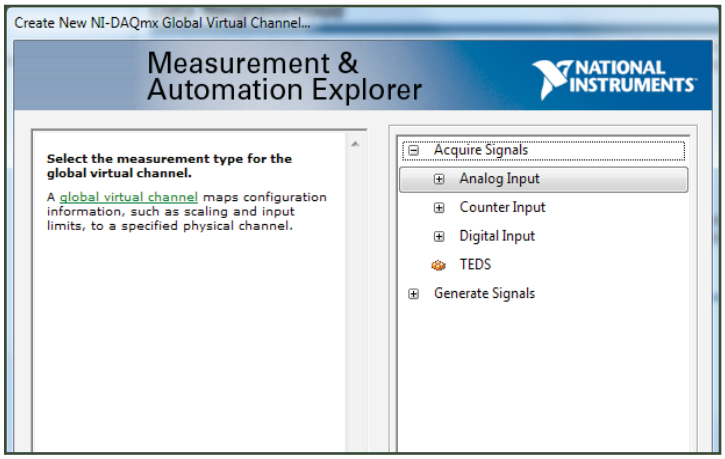
After reviewing the Licensing Restrictions, check the “I understand and will comply with the licensing restrictions” box and click “Next.”



SECTION 7.3.2: SETTING UP A NI-DAQ ANALOG INPUT

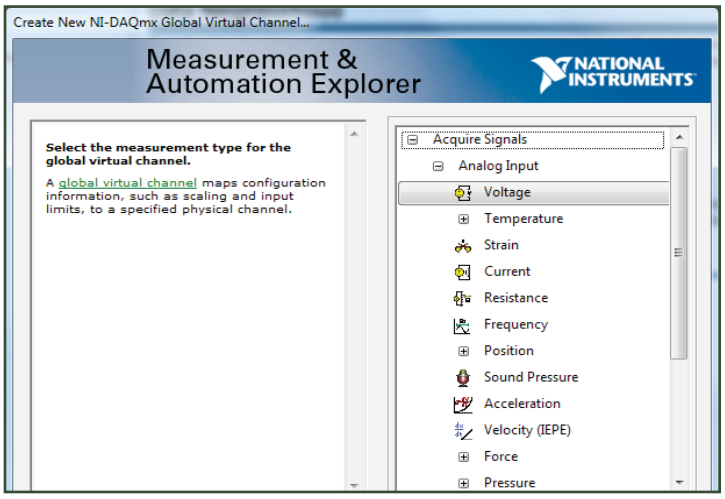
Step: 6

Click the expansion box (+) connected to Analog Input to expand the channel options.



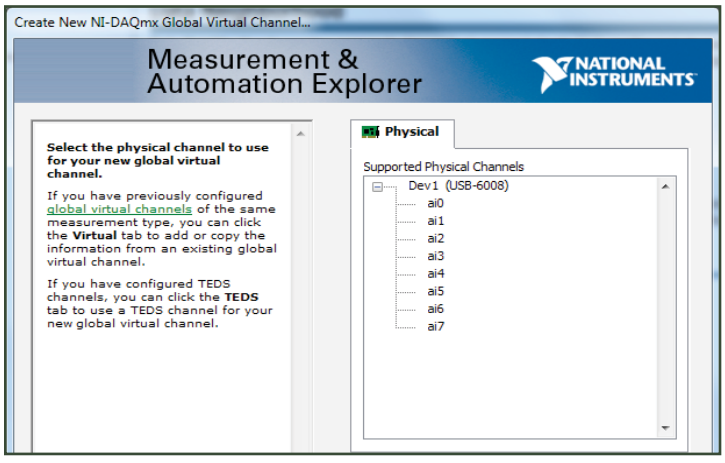
Step: 7

Select “Voltage” from the list of Analog Inputs.



Step: 8

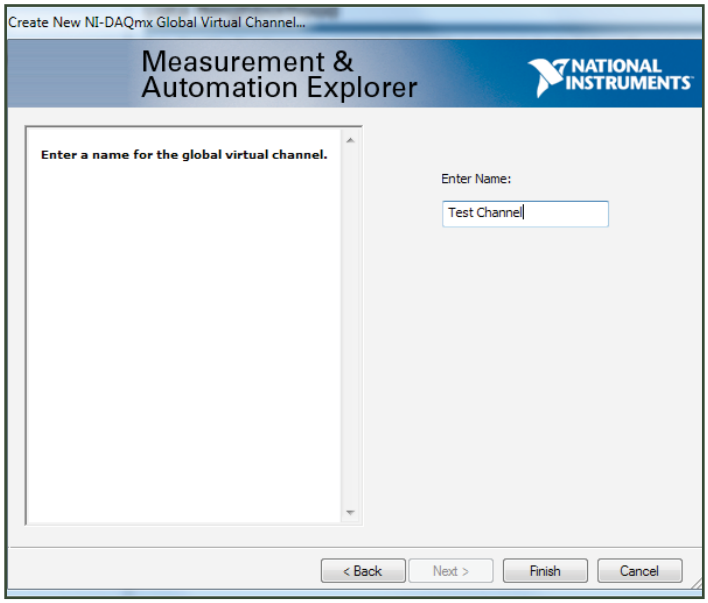
From the Supported Physical Channels list, select the channel you would like to use (e.g., ai0).



SECTION 7.3.2: SETTING UP A NI-DAQ ANALOG INPUT

Step: 9

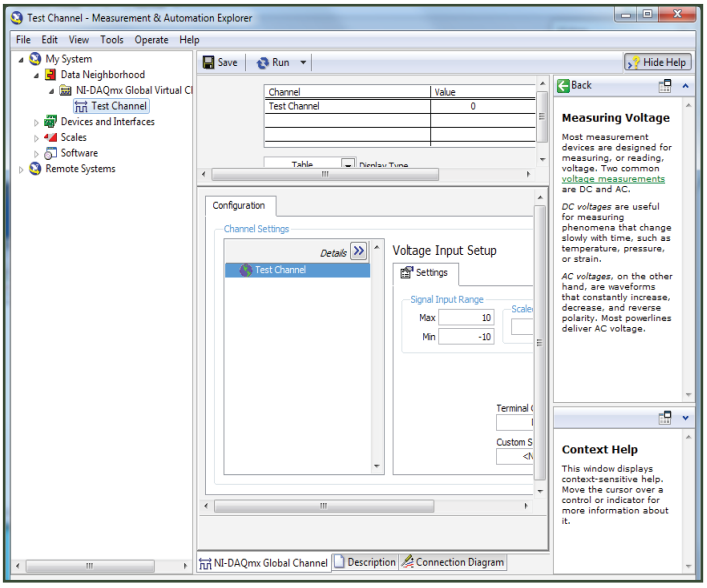
Enter a name for the task into the text box, and then click “Finish.”



Step: 10

Make any necessary adjustments to the settings, and then click “Save.”

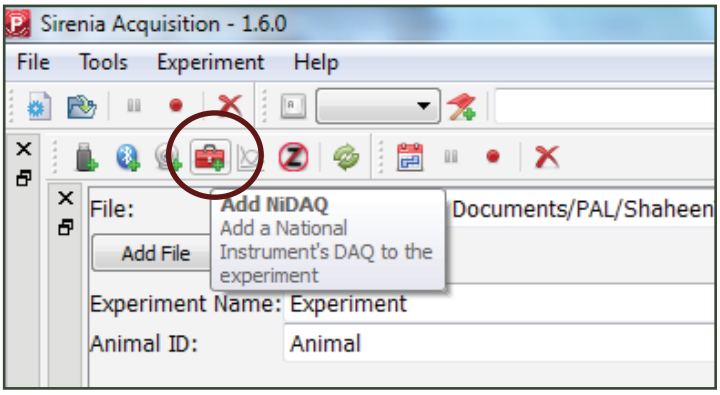
Note: Do NOT click “Run,” as this prevents Sirenia® from acquiring the task.



SECTION 7.3.2: SETTING UP A NI-DAQ ANALOG INPUT

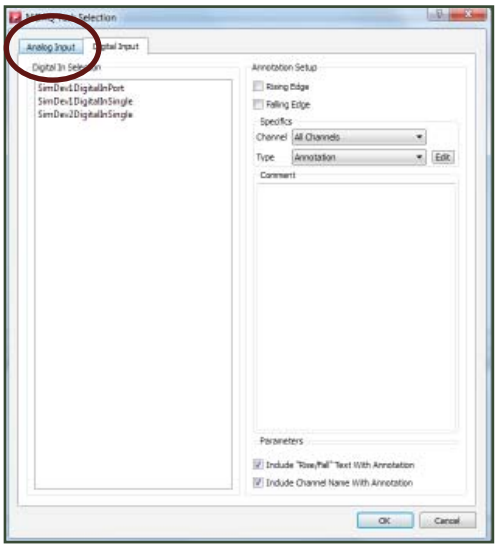
Step: 11

Open a New Experiment in Sirenia® Acquisition and click the NI-DAQ button on the Experiment Toolbar.



Step: 12

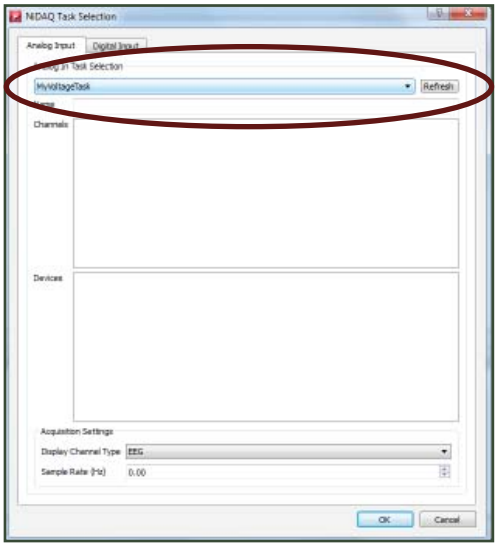
Click the Analog Input tab.



Step: 13

Select the task you configured from the drop-down box.

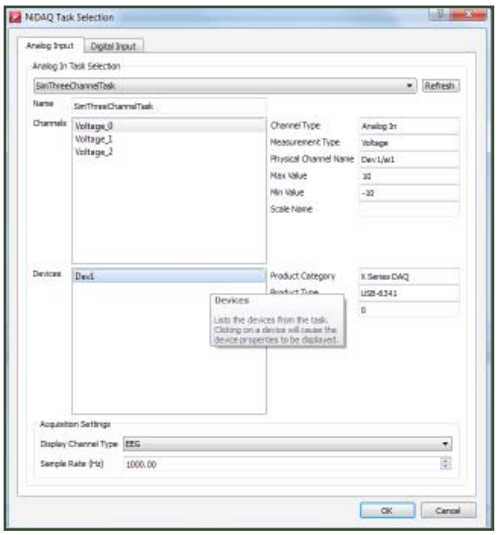
Note: If it is not listed, click the “Refresh” button.



SECTION 7.3.2: SETTING UP A NI-DAQ ANALOG INPUT

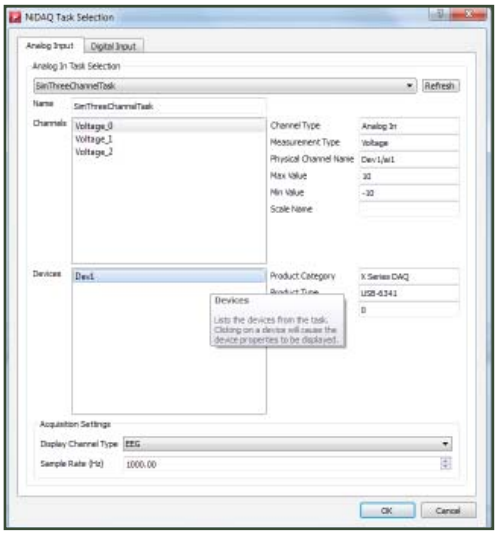
Step: 14

The channels and devices will be shown for the selected task. You can click on them to show information about each. The channel names cannot be changed in Sirenia. They can be changed using the MAX software from National Instruments.



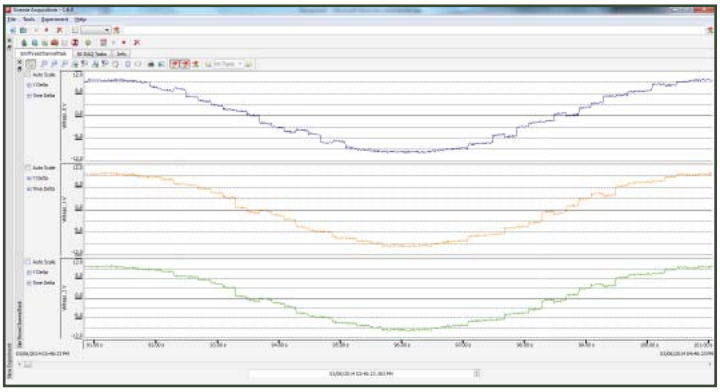
Step: 15

Under ‘Acquisition Settings’, select how you want the channel to be displayed in Sirenia (either as EEG, EMG, or BIO). Select the sample rate you wish to record the data as. Then click OK to start displaying the data from the channels.



Step: 16

Two tabs will be created for the experiment tab. One tab is named the same as the selected task. This shows the channels currently being acquired.



SECTION 7.3.2: SETTING UP A NI-DAQ ANALOG INPUT

Step: 17

The second tab, called NI-DAQ Tasks, displays information about the selected tasks.