Generating a Signal: Step by Step Procedure

Use the exercise solution from the Taking a Measurement module to acquire the signal being output on the analog output pins of your USB DAQ device.

1. Connect the USB DAQ device to your PC
2. Connect Analog Output 0 (ao0) to Analog Input 0 (ai0)
   a. You can locate the device pinouts for a DAQ device by searching for your device online at ni.com
   b. The user guide and specifications contain this diagram
   c. Right-click your device in Measurement & Automation Explorer (MAX) configuration software and select Device Pinouts
3. Create a new VI in LabVIEW
   a. Open LabVIEW and select File >> New VI
4. Place a DAQ Assistant on the block diagram
   a. Right-click on the block diagram and select Express >> Output >> DAQ Assistant
   b. Place the DAQ Assistant on the block diagram by left-clicking
5. Configure DAQ Assistant type
   a. Select Generate Signals >> Analog Output >> Voltage
   b. Select Dev1 (or the name of your device if not Dev1)
   c. Select ao0
6. Configure generation settings
   a. Select Continuous Samples for Generation Mode
   b. Enter 100 for the Samples to Write
   c. Ensure the Use Waveform Timing checkbox is checked
   d. Select OK to apply these settings
   e. Select Yes when prompted to automatically create a While Loop
7. Place a Simulate SignalExpress VI on the block diagram
   a. Expand the While Loop to approximately double its original size
   b. Right-click the block diagram and select Express >> Input >> Simulate Signal
   c. Left-click to place the Simulate SignalExpress VI to the left of the DAQ Assistant
8. Configure simulate signal settings
   a. Select Triangle for the Signal Type
   b. Select OK to configure the Express VI
9. Wire the Triangle output to the Signals input of the DAQ Assistant
10. Create the stop condition to include when the **Stop** button is pressed or an error is detected
   a. Unwire the **Conditional Terminal** from the **Stopped** output terminal of the analog output DAQ Assistant
   b. Right-click the block diagram and select **Programming >> Boolean >> Or**
   c. Wire the output from the Stop button control to the bottom input of the Or Boolean function
   d. Right-click the block diagram and select **Programming >> Cluster, Class, & Variant >> Unbundle by Name** and place this to the right of the analog output DAQ Assistant
   e. Wire the **Error Out** output terminal of the analog output DAQ Assistant to the input of the Unbundle by Name function and ensure **Status** is selected to be **unbundled**
   f. Wire the output of the Unbundle by Name function to the top input of the Or function
   g. Wire the output of the Or function to the input of the **Conditional Terminal**

11. Run the VI to observe the signal being output on the waveform graph

You can convert your DAQ Assistant Express VIs into low-level NI-DAQmx functions by right-clicking the DAQ Assistant and selecting **Generate NI-DAQmx Code**. The low-level NI-DAQmx API exposes more functionality and customization options for programming.