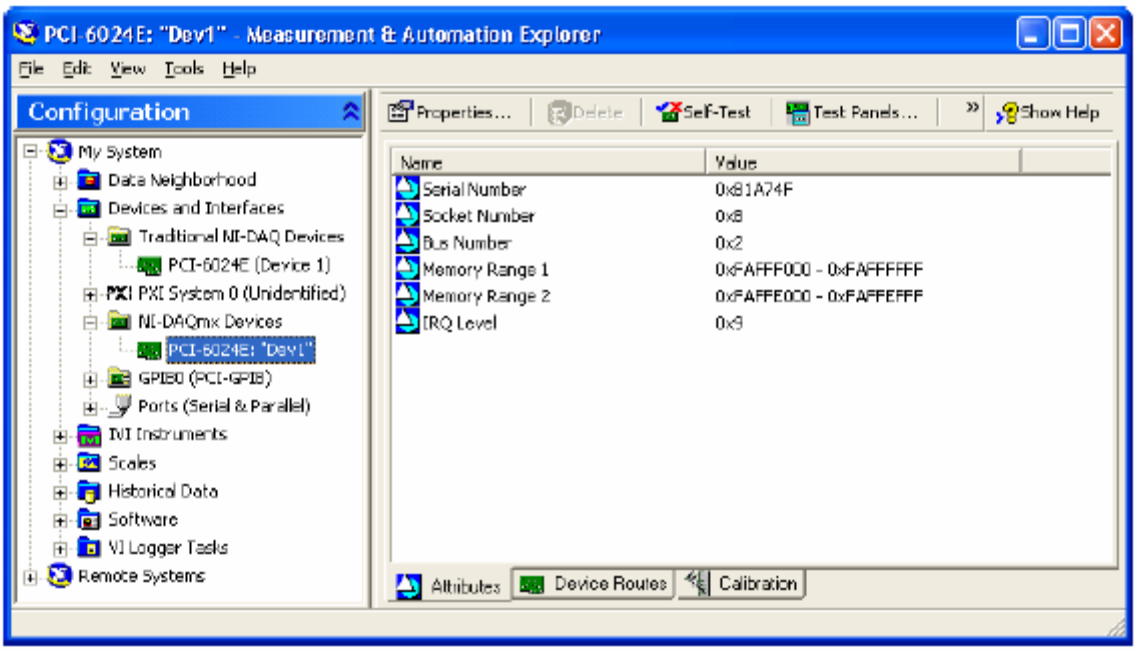
Exercise – 7: Measurement & Automation Explorer

Objective: **To use MAX to examine the current DAQ configuration and test the device interactively.**

Complete the following steps to examine the configuration for the DAQ device in the computer using MAX and use the test routines in MAX to confirm operation of the device.

Part A. Examining the DAQ Device Settings

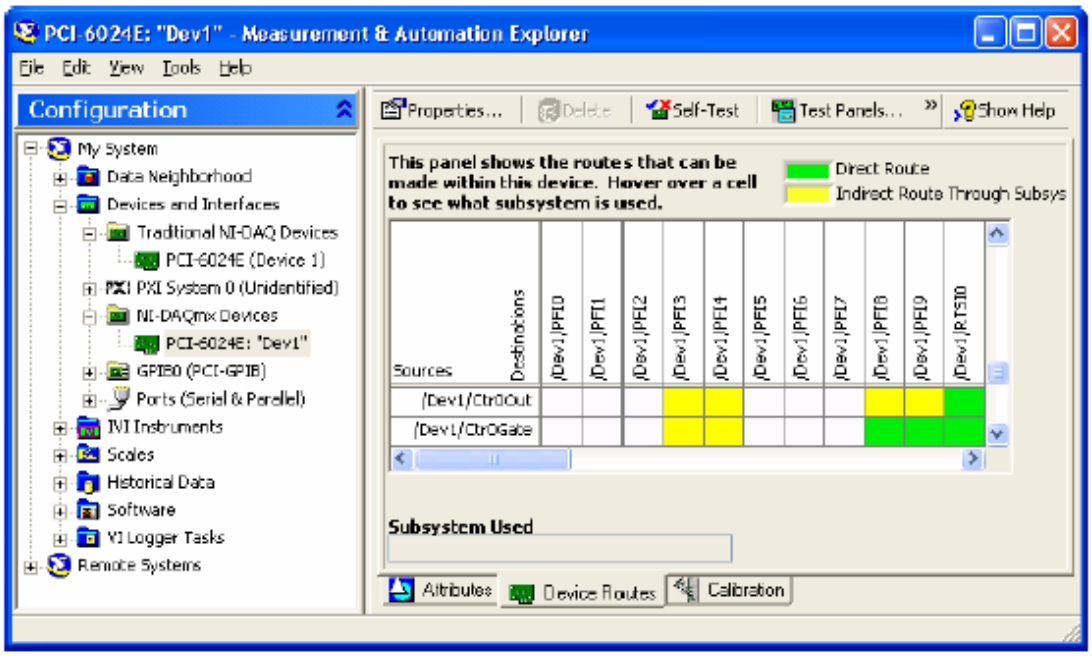
1. Launch MAX by double-clicking the icon on the desktop or by selecting **Tools»Measurement & Automation Explorer** in LabVIEW. The utility searches the computer for installed National Instruments hardware and displays the information.
2. Expand the **Devices and Interfaces** section to view the installed National Instruments devices. The following example shows the PCI-6024E and a PCI-GPIB device.



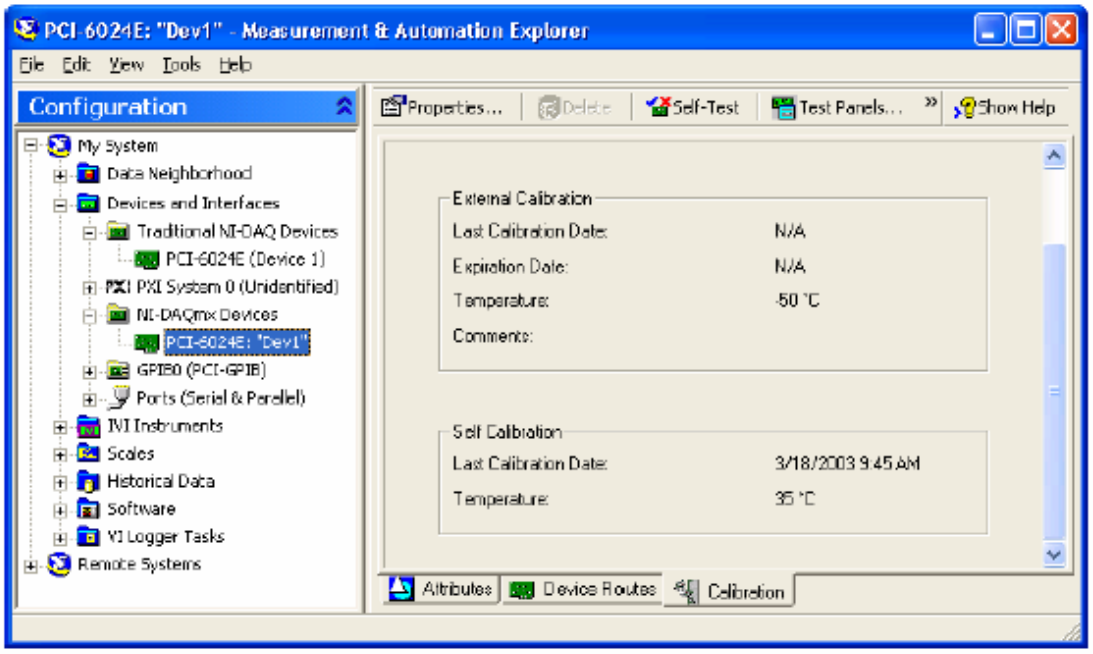
MAX displays the National Instruments hardware and software in the computer. The device number appears in quotes following the device name. The Data Acquisition VIs use this device number to determine which device performs DAQ operations. MAX also displays the attributes of the device such as the system resources that are being used by the device.

Note You might have a different device installed, and some of the options shown might be different. Click the **Show Help/Hide Help** button in the top right corner of MAX to hide the online help and show the DAQ device information.

3. The **Device Routes** tab provides detailed information about the internal signals that can be routed to other destinations on the device. This is a powerful resource that gives you a visual representation of the signals that are available to provide timing and synchronization with components that are on the device and other external devices.



4. The **Calibration** tab provides information about the last time the device was calibrated both internally and externally.



5. Right-click the NI-DAQmx device in the configuration tree and select **Self Calibrate** to calibrate the DAQ device using a precision voltage reference source and update the built-in calibration constants. Once the device has been calibrated, the **Self Calibration** information updates in the **Calibration** tab.

Part B. Testing the DAQ Device Components

6. Click the **Self-Test** button to test the device. This tests the system resources assigned to the device. The device should pass the test because it is already configured.
7. Click the **Test Panels** button to test the individual functions of the DAQ device, such as analog input and output. The **Test Panels** dialog box appears.
   a. Use the **Analog Input** tab to test the various analog input channels on the DAQ device. Channel Dev1/ai0 is connected to the temperature sensor on the DAQ Signal Accessory. Click the **Start** button to acquire data from analog input channel 0. Place your finger on the sensor to see the voltage rise. You also can move the **Noise** switch to **On** on the DAQ Signal Accessory to see the signal change in this tab. When you are finished click the **Stop** button.

   b. Click the **Analog Output** tab to set up a single voltage or sine wave on one of the DAQ device analog output channels.

      Change the **Output Mode** to **Sinewave Generation** and click the **Start Sine Generator** button. LabVIEW generates a continuous sine wave on analog output channel 0.

   c. On the external DAQ Signal Accessory box, wire Analog Out Ch0 to Analog In Ch1.
   d. Click the **Analog Input** tab and change the channel to Dev1/ai1. Click the **Start** button to acquire data from analog input channel 1. LabVIEW displays the sine wave from analog output channel 0.
   e. Click the **Digital I/O** tab to test the digital lines on the DAQ device.
   f. Set lines 0 through 3 as output and toggle the **Logic Level** checkboxes. As you toggle the boxes, the LEDs on the DAQ signal accessory turn on or off. The LEDs use negative logic.
   g. Click the **Close** button to close the **Test Panel** and return to MAX.
8. Click the **Counter I/O** tab to determine if the DAQ device counter/timers are functioning properly. To verify counter/timer operation, change the **Counter Mode** tab to **Edge Counting** and click the **Start** button. The **Counter Value** increments rapidly. Click **Stop** to stop the counter test.
9. Close MAX by selecting **File»Exit**.