NATIONAL INSTRUMENTS™

GETTING STARTED USING NATIONAL INSTRUMENTS IVI™ WITH LABVIEW™ OR LABWINDOWS/CVI™

This document describes how to install, configure, and use the IVI drivers and tools available from National Instruments. All of these drivers and tools are based on the IVI Foundation's currently released and approved IVI specifications. You can download the specifications from www.ivifoundation.org. Some specifications are not yet complete, and, as a result, these tools are not fully compliant.

The following sections describe how to use IVI drivers in a simple application in LabVIEW or LabWindows/CVI. After reading this section, you will be able to:

- Run a simple example application that makes calls to an IVI class driver.
- Use the IVI category in Measurement and Automation Explorer (MAX) to configure your instrumentation system.

You can use MAX to swap instruments without recompiling or relinking the application source code.

The NI Web site contains examples, class drivers, and IVI-C specific drivers for use with other IVI classes. You can download these resources from ni.com/idnet/. The instructions in this user guide tell how to use the IviDMM class driver with the hp34401a and fl45 specific drivers; however, you can use these instructions as a guideline for using other examples and drivers.

Note To use these instructions, you do not need to have the actual instruments as IVI drivers can be run in simulation mode.

If you are unfamiliar with the architecture of IVI-C class drivers, refer to the *IVI-3.1: Driver Architecture Specification* available at www.ivifoundation.org for an overview.

Installing the Software

Complete the following steps to install the IVI software on your system. You can find all of the following components on `ni.com`.

1. Install the IVI Engine from `digital.ni.com/softlib.nsf/current/`.

2. Install NI-VISA 2.01 from `digital.ni.com/softlib.nsf/current/`.

3. Install the Basic IVI Class drivers from `digital.ni.com/softlib.nsf/current/`.

4. Choose two IVI-C specific drivers to use in the examples. *These two drivers must be from the same class.* Install the two drivers you have chosen from `zone.ni.com/idnet`.

5. Restart the computer after installing the software.

Installing the Examples

Complete one of the following sections to install the IVI class examples.

LabVIEW Users

Complete the following steps to install the IVI class examples in LabVIEW:

1. To download the LabVIEW IVI class driver examples library (`iviclass.llb`), go to `zone.ni.com/libraries/`, then click **Instrument Drivers»Instrument Driver and IVI Resource Library»IVI»LabVIEW IVI Class Sample Programs**.

2. Save the examples to the `\\Program Files\National Instruments\LabVIEW\examples\instr` directory on the computer.

LabWindows/CVI Users

Complete the following steps to install the IVI class examples in LabWindows/CVI:

1. To download the LabWindows/CVI IVI class examples folder (`iviclass`), go to `zone.ni.com/libraries/`, then click **Instrument Drivers»Instrument Driver and IVI Resource Library»IVI»LabWindows/CVI IVI Class Sample Programs**.

2. Save the examples to the `\\MeasurementStudio\cvi\samples` directory on the computer.

Configuring an IVI System in Measurement & Automation Explorer

Complete the following steps to configure your IVI system in MAX:

1. Launch MAX.

✎ **Note** If you cannot see the IVI Instruments folder, press <F5> to refresh MAX.

2. Expand **IVI Instruments**.
3. Right-click **Logical Names** and select **Insert**.
4. Type the logical name and description in the corresponding fields as shown.

5. Click **Next**.
6. Select the **Use an Existing Virtual Instrument** option button.
7. Select **hp34401a** in the virtual instrument drop-down menu.
8. Click **Next**.
9. After reviewing the **New Logical Name Summary**, click **Finish**.

The new logical name (myDMM) appears under **Logical Names** as shown.
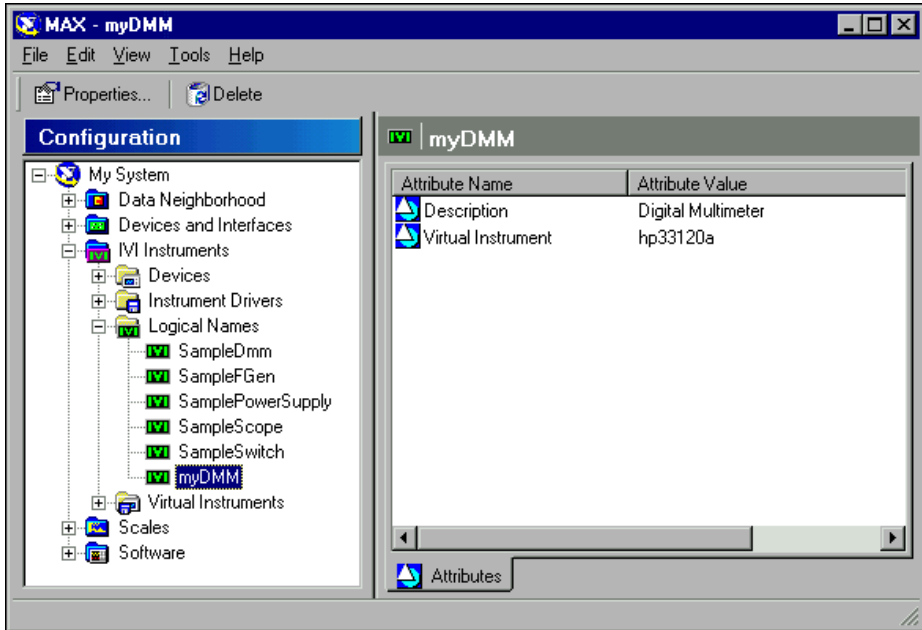
10. Right-click **myDMM** and select **Properties**.

11. Click **Properties** next to hp34401 to view **Virtual Instrument Properties-hp34401**.

12. After reviewing the information on the **Virtual Instruments** tab, click the **Inherent Attributes** tab.

13. If you do not have the actual instrument connected to your system, make sure that the **Simulate** checkbox is selected, otherwise, deselect it.

14. If simulating, make sure that **Output Data Simulation** is set to **Specific Driver** as shown because the Basic IVI Class Drivers do not support advanced class simulation drivers.
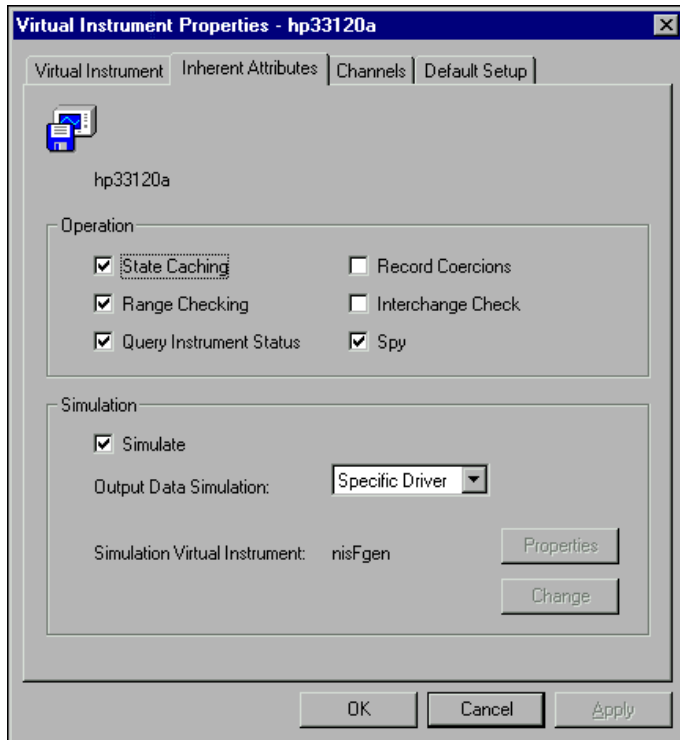
15. Click **OK** twice.
16. Exit MAX.

Running an IviDmm Class Example in LabVIEW or LabWindows/CVI
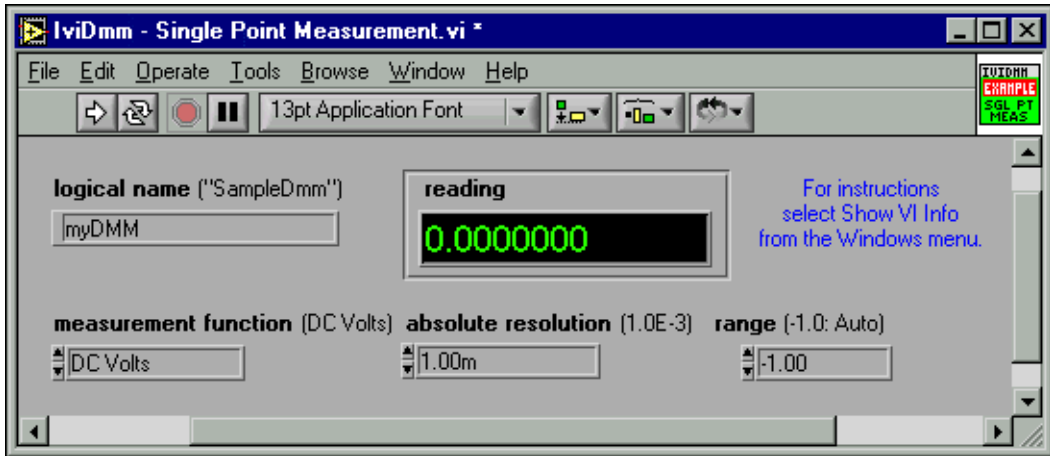
Complete one of the following sections to run an IviDMM Class example.

LabVIEW Users

To run an IviDMM Class example in LabVIEW, complete the following steps:

1. Launch LabVIEW and click **Open VI**.

2. Navigate to \Program Files\National Instruments\ LabVIEW\examples\instr and double-click iviclass.llb.

3. Double-click IviDmm-Single Point Measurement.vi.

4. Change the **logical name** to myDMM on the front panel of this VI as shown.

5. Run the example.

6. Change the configuration settings on the front panel and run the example again.

✎ **Note** If you receive an error message after you change the configuration, the configuration settings probably do not match those of HP 34401A DMM.

7. Leave the example open and go to *Interchanging the HP 34401A DMM with the Fluke 45 DMM*.

If you are interested in knowing which IVI class driver calls are made in this example, press <Ctrl-E> to view the block diagram.

LabWindows/CVI Users

To run an IviDMM Class example in LabWindows/CVI, complete the following steps:

1. Launch CVI.

2. Select **File»Open»Project**.

3. Navigate to \MeasurementStudio\cvi\samples\iviclass and double-click ividmm.prj.
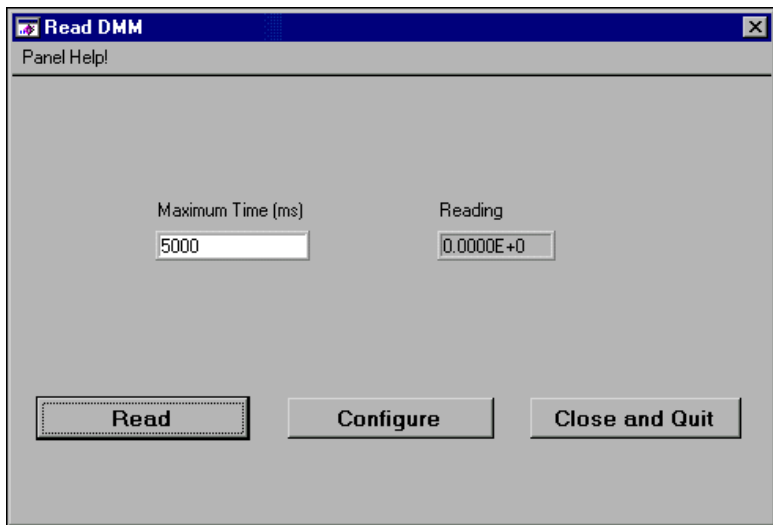
4. Select **Run»Debug ividmm.exe**.

5. In the **Initialize DMM** panel, type your logical name (myDMM) in the **Logical Name** field, as shown, and click **Initialize**.
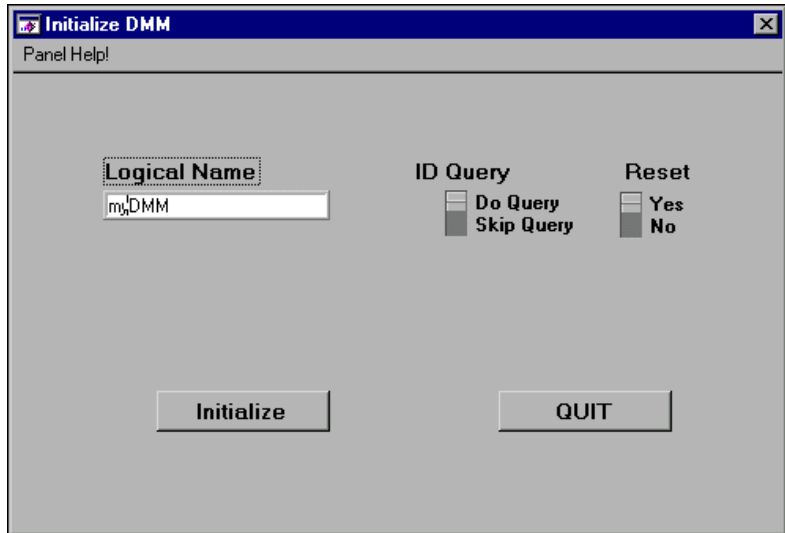
6. In the **Configure DMM** panel, click **Configure**.
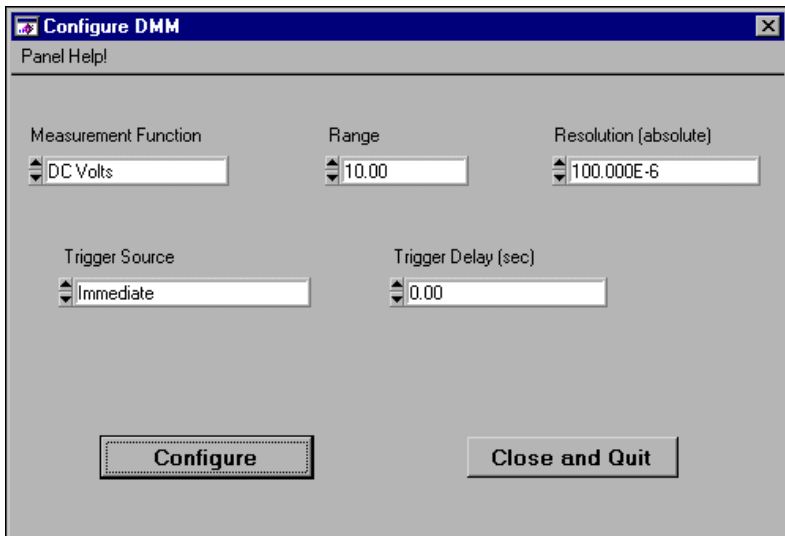
7. In the **Read DMM** panel, click **Read**.

8. To take multiple readings, click **Read** repeatedly.

9. To change the configuration settings of the DMM, return to the **Configure DMM** panel by clicking **Configure**.

Note If you receive an error message after you change the configuration, the configuration settings probably do not match those of HP 34401A DMM.

10. Click **Close and Quit**.

If you are interested in knowing which IVI class driver calls are made in this example, select **File»Open»Source (*.c)** to view the source code of the example.

# Interchanging the HP 34401A DMM with the Fluke 45 DMM

To interchange the HP 34401A DMM with the Fluke 45 DMM, complete the following steps:

1. Launch MAX.

2. Expand **IVI Instruments**.

3. Expand **Logical Names**.

4. Right-click **myDMM** and select **Properties**.

5. To replace the existing virtual instrument with a new instrument, click **Change** in the **myDMM Properties** dialog box.

6. In the **Change Virtual Instrument** dialog box, select **fl45** from the **Use an Existing Virtual Instrument** drop-down menu to associate it with the logical name as shown below.
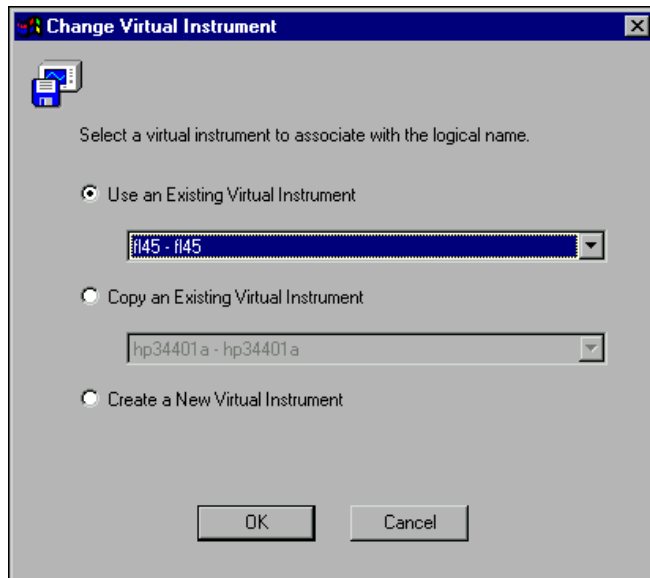
7. Click **OK**.

   Now the logical name (myDMM) points to a new virtual instrument.
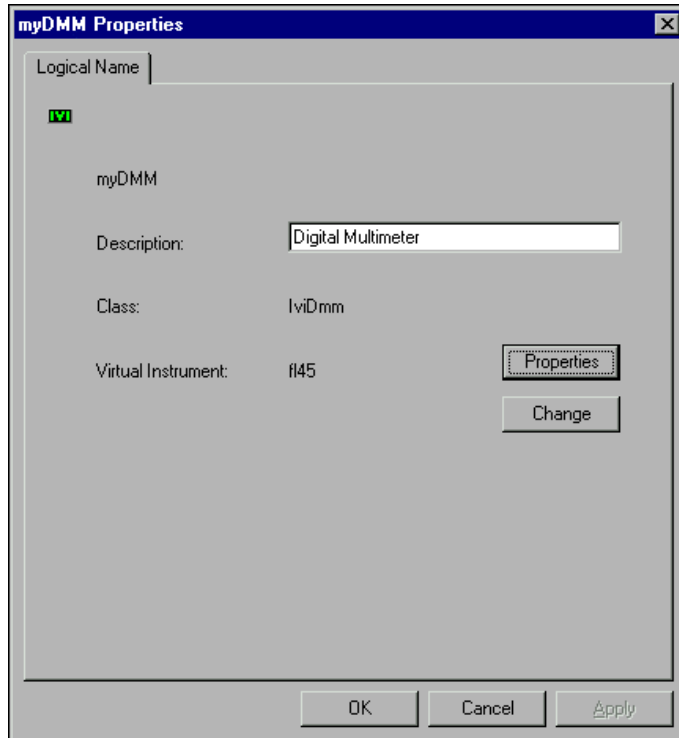
8. In the **myDMM Properties** dialog box, click **Properties** and review the information on the **Virtual Instrument** tab.

9. If simulating, click the **Inherent Attributes** tab and select **Specific Driver** in the **Output Data Simulation** drop-down menu.

10. Click **OK**.

11. Click **Apply**.

12. Exit MAX.

You are now ready to run the example program using the same logical name but a different instrument.

13. To verify instrument interchange, repeat the instructions *Running an IviDmm Class Example in LabVIEW or LabWindows/CVI*. The example program or project should still be open.

✎ **Note** If the actual instruments are connected to your system, you can run the same examples with simulation turned off. Refer to *Configuring an IVI System in Measurement & Automation Explorer* for information on how to disable simulation in MAX.

You have successfully completed all sections and learned how to configure an IVI system in MAX, run a sample program in the simulation mode, and interchanged instruments.