

DMM4020, DMM4040, and DMM4050 Connectivity Installation Manual



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Tektronix

**DMM4020, DMM4040, and DMM4050
Connectivity
Installation Manual**

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Contacting Tektronix

Tektronix, Inc.
14200 SW Karl Braun Drive
P.O. Box 500
Beaverton, OR 97077
USA

For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.

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Introduction to DMM Connectivity

You can connect the digital multimeter (DMM) to the USB port on your MS-Windows personal computer (PC) through the USB-to-Serial cable that comes standard with your DMM. The serial end of the cable attaches to the RS-232 port on the rear panel of the DMM, and the other end plugs into a USB port on the PC.

You can connect to a PC with IEEE-488 capability through the IEEE-488 port on the rear panel of the DMM4040 or DMM4050.

The USB port on the front panel is for USB memory devices, not for connecting to a remote PC.

USB-to-RS232 Serial Cable Installation

To use the cable, you need to install the USB-to-RS232 drivers on your PC. This allows the USB-to-RS232 cable to communicate between the DMM and the PC. To install the drivers, use the Documentation Browser CD, or plug in the USB-to-RS232 adapter and use your PC Wizard to locate and install the drivers.

After you install the drivers, you can select and set up an interface port through the Instrument Setup Key of the DMM. To set up the port, select “Port I/F” and “RS 232C” (highlighted when selected).

Installation Instructions for the USB-IR Optical Serial Cable

Revision: II

Version: v1.0.2176 for WinXP/2K

v1.09.06 for WinME/98

1. PC Requirements. To use the USB-IR serial cable, your Windows PC must meet the following requirements:

- a) Have an available USB port on the PC, or on a USB Hub connected to the PC.
- b) Your PC must be running one of the following versions of Windows:
 - Windows XP (Home or Professional)
 - Windows 2000
 - Windows ME
 - Windows 98 Second Edition (only the Second Edition of Windows 98 supports USB)

The USB-IR serial cable is not supported on Windows 95, Windows NT, or Windows 98 (original edition) operating systems, which do not support USB.

- c) To install the drivers for the cable on Windows XP or Windows 2000, you must be able to login to Windows with Administrator privileges.

2. Installing the USB-IR Cable Drivers.

- a) If your PC is running Windows XP or Windows 2000, log into an account with Administrator privileges.
- b) Plug the USB side of the USB-IR serial cable into an available USB port on your PC, or into a USB hub connected to your PC. Plug the serial side into the RS-232 port on the rear panel of your DMM.
- c) Windows will respond that it has "found new hardware", and the Windows Hardware Wizard dialog will appear.
- d) Follow the instructions from the wizard to install the new hardware.
- e) For a detailed installation guide, follow the "Installation Guides" link provided on the Documentation Browser CD.
- f) For automatic downloading of the latest driver from the Internet, allow Windows XP or Windows 2000 to search Microsoft Windows Update for updated software when asked.
To load the drivers from the Documentation Browser CD supplied with the cable, select "Specific Location" to install the drivers from the CD.
- g) The Hardware Wizard will find the FT232R USB UART driver and install the USB Serial Converter.
- h) Additionally, the Windows "found new hardware" wizard will run again to install the USB Serial Port.
- i) The Hardware Wizard will finish.

The USB-IR cable drivers have now been installed on the PC. On some systems, you may need to reboot the PC once following the driver installation before you can use the USB-IR cable.

3. Determining the USB-IR Cable's COM Port.

Once you have installed the USB-IR cable drivers and assigned a virtual COM port to your USB-IR cable, you can use this COM port to perform serial communications over your USB-IR cable.

To find out which COM port is associated with your cable, do the following:

- a) Ensure that you have attached the cable to the PC, or to a USB hub connected to your PC.
- b) Go to the Windows Control Panel. Open the "System" applet. This brings up the "System Properties" dialog box.



System

c) Open the Device Manager:

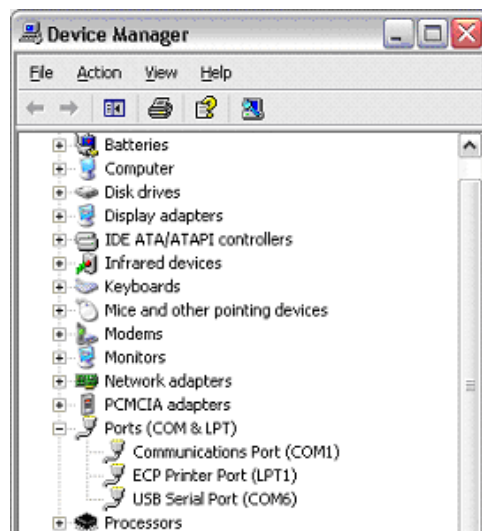
- On Windows 2000 and Windows XP, click on the "Hardware" tab of the "System Properties" dialog box. Then click on the "Device Manager" button.



- On Windows 98 SE and Windows ME, this is a tab named "Device Manager" on the "System Properties" dialog box.

d) On the "Device Manager" dialog box, look under the "Ports (COM & LPT)" tree.

The COM port associated with the USB-IR cable is listed there as "USB Serial Port (COM n)."



4. Changing the COM Port #.

Some programs require COM 1, COM 2, COM 3 or COM 4, and the USB-IR cable is sometimes installed as COM 5. To change the assigned COM port number, do the following:

a) Open the Device Manager by doing the following:

- On Windows 2000 and Windows XP, click on the "Hardware" tab of the "System Properties" dialog box. Then click on the "Device Manager" button.

- On Windows 98 SE and Windows ME, this is a tab named "Device Manager" on the "System Properties" dialog box.

b) On the "Device Manager" dialog box, look under the "Ports (COM & LPT)" tree.

c) Click on the "Port Settings" tab. Click on the "Advanced" button.

d) On the bottom left side, pull down the bar and select COM 1, COM 2, COM 3 or COM 4. NOTE: Choose one that does not say "in use" next to it. Click "OK."

e) Click "OK" again. Notice that the device will show up as being on the same COM port that it was before (i.e., COM 5), but will show up on the new port if you close the Device Manager and open it again.

f) Close the Device Manager. Your serial device should work properly.

5. Uninstalling the Driver.

When uninstalling the driver from Windows, always use the Add/Remove Programs utility as this uses the driver uninstaller program to remove files and registry entries to leave a clean system. Other methods may leave fragments of the driver, which may interfere with future installations.

LabVIEW SignalExpress Plug-In Installation

The Documentation Browser CD contains the National Instrument LabVIEW SignalExpress Plug-In files for the Tektronix DMM4020, DMM4040, and DMM4050 products. You can use the LabVIEW SignalExpress Tektronix Edition (TE) software to open the appropriate *.llb file and select the appropriate user VI.

With this capability, you can control and acquire the data from the instrument. Unlike other Tektronix products which offer plug and play, the Tektronix DMMs require you to install and setup the software. Once installed, the instrument setup, acquisition and control will perform similar to other Tektronix products that are supported by the LabVIEW SignalExpress TE software. (See page 11, *Proof of Concept*.)

You can access the LabVIEW SignalExpress TE online help for more information. To do so, select Help» Getting Started with» in the LabVIEW SignalExpress TE environment.

System Requirements

To run the LabVIEW SignalExpress TE software, National Instruments (NI) recommends that your system meet the following requirements:

- 512 MB of memory
- Pentium 4 processor or equivalent (Pentium III or Celeron 600 MHz minimum)

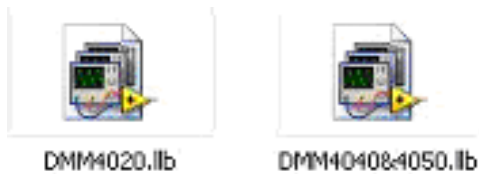
Installation Instructions

NI-VISA is automatically installed and is required for proper operation. If you have TekVISA software installed on your PC, you should be aware of the following:

- Installing the LabVIEW SignalExpress TE software will replace the TekVISA visa32.dll with the NI-VISA. However, some TekVISA applications, such as TVC and Tek Toolbars, are not uninstalled and will continue to work.

Installation Procedure

1. Copy the *.llb file to a folder that you specify on the local drive on your PC.

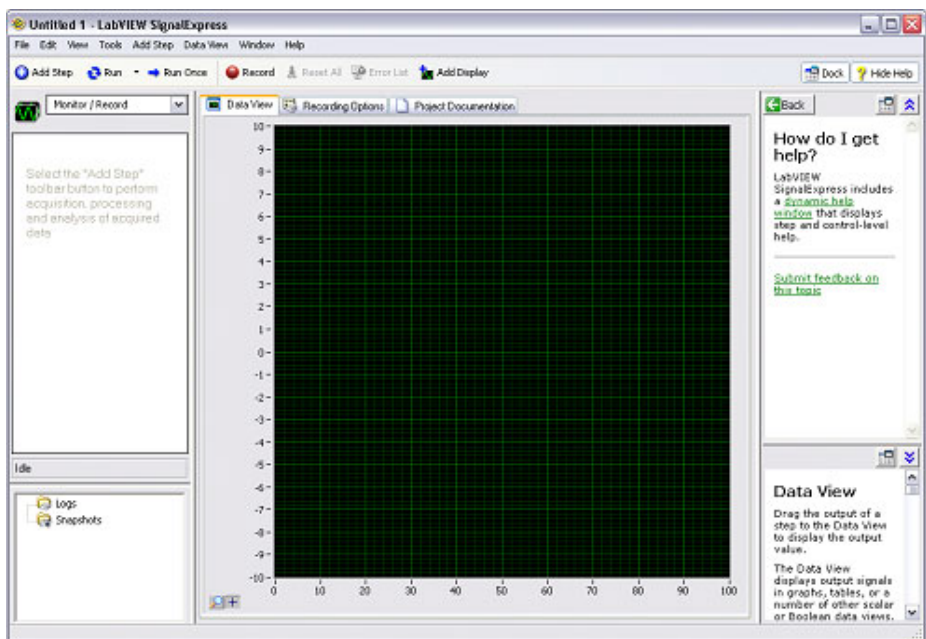


NOTE. For development, you can modify the *.llb file through the NI LabVIEW software, version 8.2 or later.

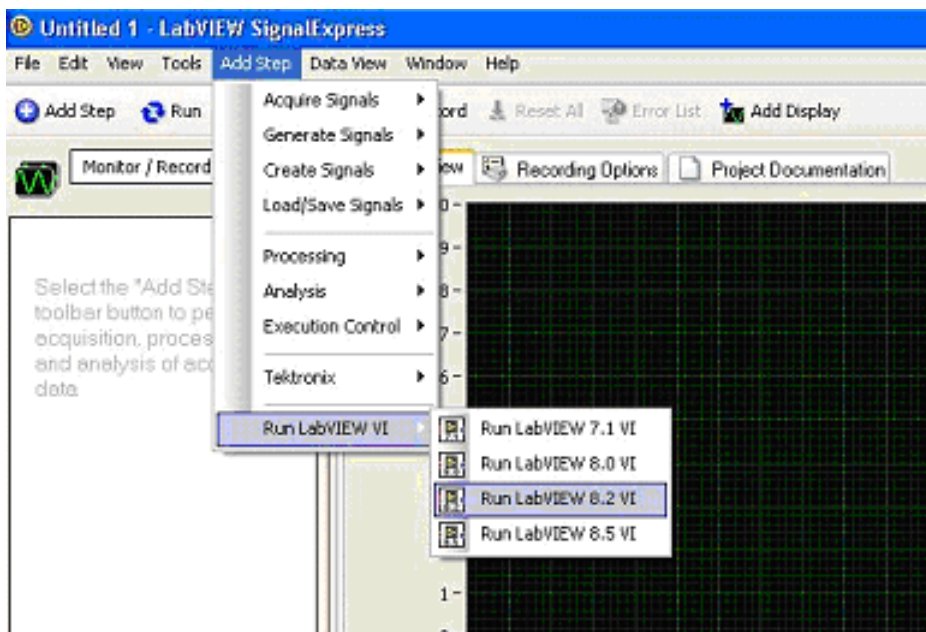
2. Install the NI LabVIEW SignalExpress TE software on your PC. This can be accomplished with the CD provided or web download from Tektronix.com. Note that this will take several minutes to install.



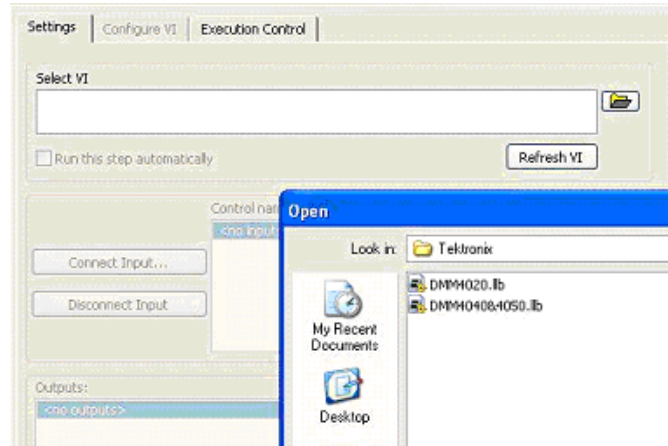
3. After installing the software, run the LabVIEW SignalExpress TE software. The PC displays the LabVIEW SignalExpress main menu.



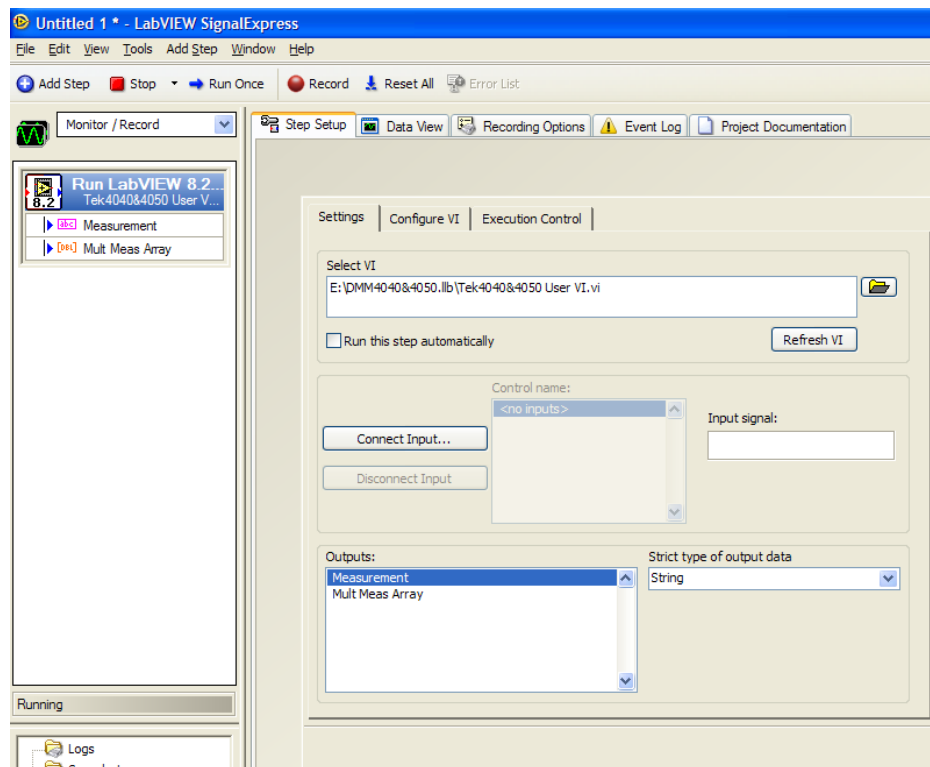
4. In the LabVIEW SignalExpress main menu, click the “Add Step” menu, select Run LabVIEW VI, and then select Run LabVIEW 8.2 VI.



- Click the Open File icon from the dialog box, then select and open the appropriate *.llb file from the folder specified in step 1. You can use the DMM4020.llb file for a DMM4020 product, or the DMM4040&4050.llb file for a DMM4040 or a DMM4050.



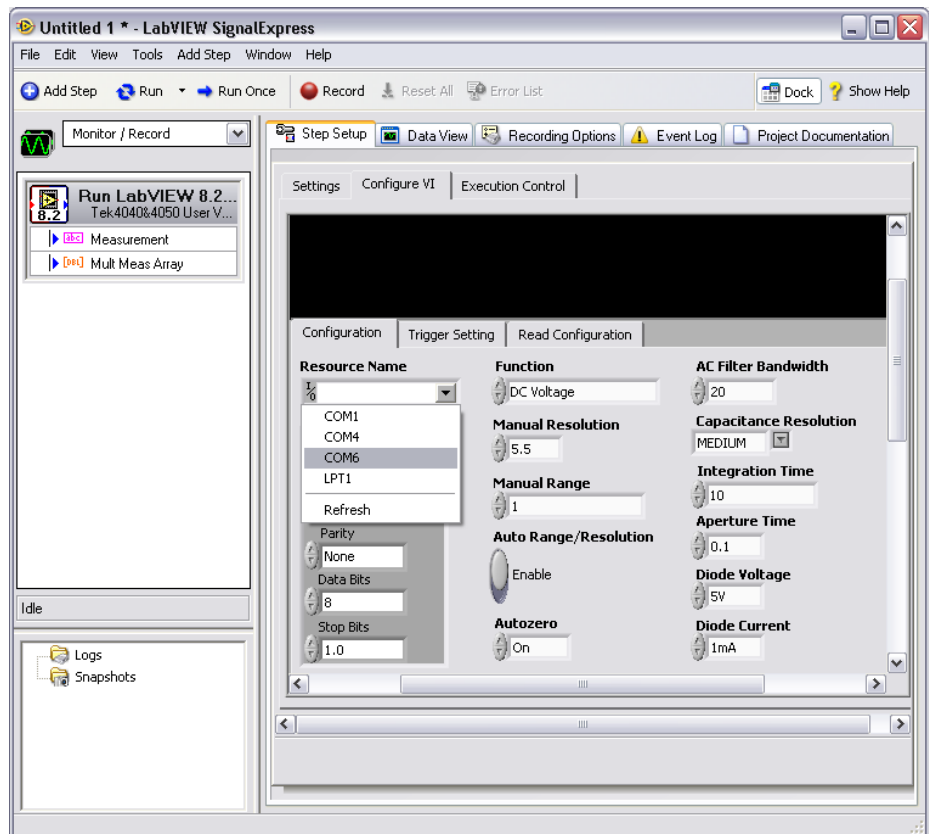
- Choose the appropriate user VI from the *.llb file: Tek4040&4050 User VI.vi or Tek4020 User VI.vi. LabVIEW 8.2 should appear in the upper left window (the project view pane).



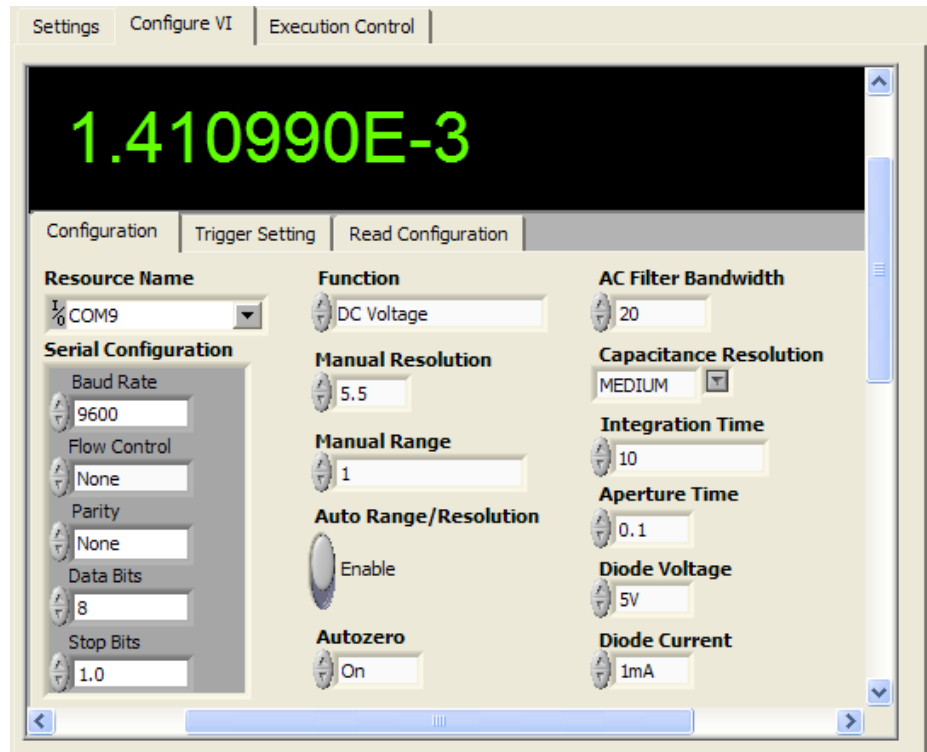
7. Connect the instrument to your PC, and install the hardware driver from the Documentation Browser CD or from the internet, if you have not already done so.

NOTE. The DMM4040 and DMM4050 products have two modes of RS-232 operation: *TERMINAL* and *COMPUTER*. The *COMPUTER* mode is used when the DMM is operated by a computer program. Select *COMPUTER* for use with the LabVIEW SignalExpress TE software.

8. Select the Configure VI tab (upper tab) and configure the Resource Name, Serial port and other parameters from the Configuration tab. From the Resource Name drop down list, select the COM# to match the initial setup of the USB-to-RS232 adapter. (Refer to the USB-to-RS232 Serial Cable Installation section.) This allows you to control the instrument and acquire the data from the DMM.



9. Select Run Once from the top menu to confirm data acquisition from the DMM.



NOTE. If the software does not run, be sure to recheck the setup in step 7.

Set Up a DMM Project File

LabVIEW SignalExpress requires setting up the DMM for each project (.seproj files) and is a step that appears in the upper left window (project view pane). Instead of going through the “Add Step” sequence, you can create a generic setup project file. Once saved, you can recall the generic project file and use it to create a new measurement project or add it to another project. Note that this requires you to save the new project under a new project name to avoid overwriting the generic project.

To set up the DMM once, follow these steps:

1. Start the LabVIEW SignalExpress software.
2. Perform the initial DMM step set up. (See page 5, *Installation Instructions*.)
3. Save the generic setup using Save project (user specified name).
4. Exit the LabVIEW SignalExpress software.

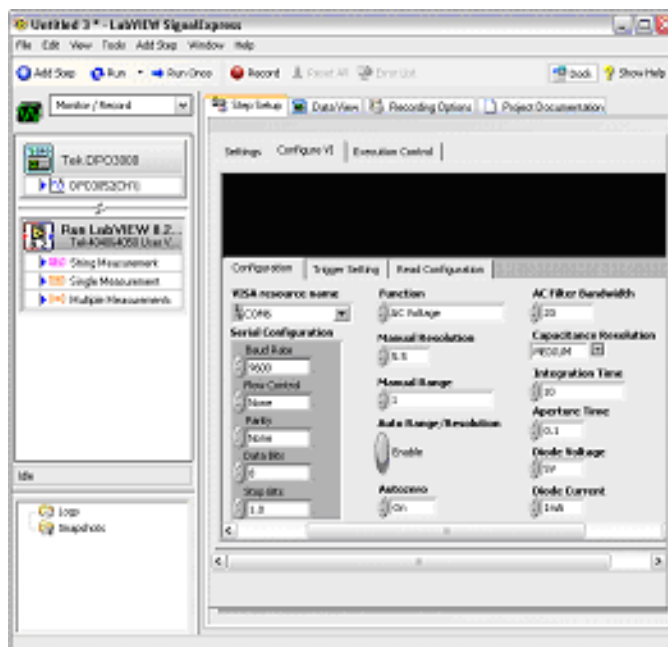
To reuse the generic DMM setup, follow these steps:

1. Start the LabVIEW SignalExpress software.
2. Recall the generic DMM set up through the Open Project or Recent Project selections using your specified generic name.
3. Save the new project under a new project name.
4. Begin to define the new project tasks.
5. End and save the new project with the finished setup.

Optionally, you can copy and past your generic DMM set up into a new or existing project. To do so, follow these steps:

1. Start the LabVIEW SignalExpress software.
2. Recall the generic DMM set up through the Open Project or Recent Project selections using your specified generic name.
3. Start a new or open up a previous project. You should have a second session of the LabVIEW SignalExpress software running.
4. Go to the generic DMM project, select Edit, and then select Copy Step.
5. Select the second session of LabVIEW SignalExpress running the new or recalled project.
6. Under the Edit menu, select Paste (before or after the step).
7. Close the previous generic DMM project.

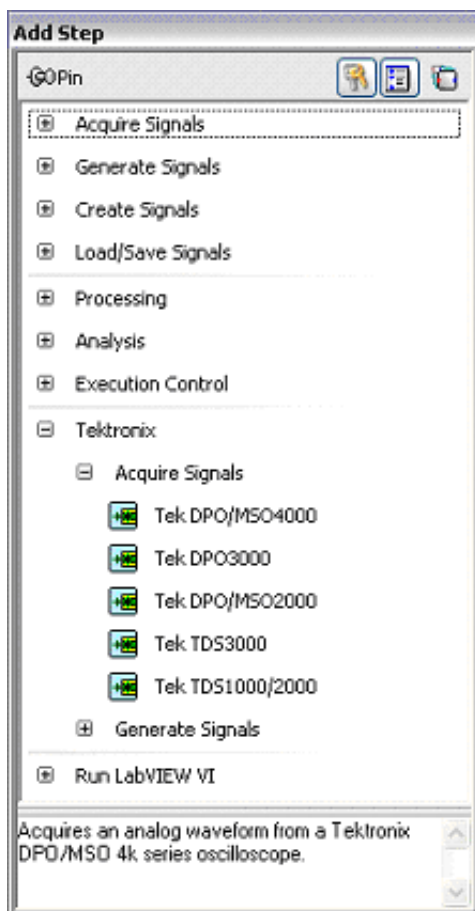
Here is an example of a generic DMM step copied to another project using a DPO3000 oscilloscope step.



Proof of Concept

The NI LabVIEW SignalExpress TE software is the standard measurement software for the DMM4000 series of digital multimeters. The initial release is a Proof of Concept software release that will provide full acquisition and control similar to other Tektronix instruments. This includes the integration of DMMs into any project you define and setup. The primary difference is support for DMMs can not offer plug and play, and will not be found under the Tektronix Add Step menu.

The DMM4000 series support is under the Run LabVIEW VI control.



For the DMM4000 series, adding a step is available under the Run LabVIEW VI control, and requires you to select LabVIEW 8.2. (See page 9, *Set Up a DMM Project File*.) A final release will include the DMM support under the Tektronix step, and be made available before the end of 2009.

NOTE. After 30 days, you will be required to update to the latest version. For the latest version of software, open a Web browser, access the www.tektronix.com/software web page, search for “SignalExpress” and then download the newer software.
