

VIRTUALBENCH™ VERSION 2.1.1 RELEASE NOTES

These release notes discuss minimum system requirements, installation instructions, new features, and updated information to help you begin using VirtualBench Version 2.1.1

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VirtualBench Installation for Windows

You must install VirtualBench along with two other items:

- A National Instruments data acquisition (DAQ) device
- NI-DAQ driver software version 5.1 or later

Minimum System Requirements

To run VirtualBench you must have the following:

- Windows 95 or Windows NT 4.0 or higher
- Personal computer using at least a 33 MHz 486 or higher microprocessor with floating-point capability (National Instruments recommends a 66 MHz 486 or higher microprocessor with floating-point capability.)
- VGA resolution (or higher) video adapter
- Minimum of 16 MB of RAM
- 25 MB free hard disk space
- Microsoft-compatible mouse
- NI-DAQ 5.1 or later

You cannot use VirtualBench 2.1.1 in the following situations:

- You are using Windows 3.1.x.
- You are using an AT-DSP2200, AT-A2150, or EISA-A200 DAQ device in Windows 95/NT.

In these cases, you will have to install VirtualBench 2.0 located in the vbench20 folder on the VirtualBench 2.1.1 CD. NI-DAQ version 4.9 should be used with VirtualBench 2.0.

Installing VirtualBench from Compact Disk



Note

National Instruments recommends that you close other applications before you install VirtualBench.

To install VirtualBench from CD, perform the following steps:

1. Insert your VirtualBench Installation CD into your CD-ROM drive.
2. Wait several seconds. With most PCs, the AutoRun utility on the CD will automatically launch the VirtualBench Installation CD dialog box.

3. If the VirtualBench Installation CD dialog box does not appear, select **Run** from the **Start** menu and type `d:\setup` in the input box, where `d` is your CD-ROM drive. Click on **OK**.
4. Click on **Install VirtualBench** in the VirtualBench Installation CD dialog box.

Installing VirtualBench from Diskettes

VirtualBench 2.1.1 ships on CD only. You can make installation diskettes by performing the following steps:

1. Insert a formatted 1.44 MB diskette into your floppy disk drive.
2. Insert your VirtualBench CD into your CD-ROM drive.
3. Copy the entire contents of `d:\vbench211\disk1` to your floppy diskette, where `d` is your CD-ROM drive.
4. Repeat steps 1 through 3 for all `d:\vbench211\diskx` folders on the CD.
5. Insert diskette 1 into your floppy drive.
6. Select **Run** from the **Start** menu.
7. Enter `A:setup` or `B:setup` in the input box, depending on the pathname of your floppy disk drive. Click on **OK**.
8. Follow the instructions that appear in the dialog boxes.



Note

Do not rename the subdirectories `scope`, `dsa`, `logger`, `fg`, `dmm`, `arb`, `dio`, `aodc`, and `cal`. *VirtualBench must have this folder hierarchy to work correctly.*

What the Setup Program Installs

If you purchased the full VirtualBench suite, the setup program installs the VirtualBench engine and nine virtual instruments: the oscilloscope (Scope), dynamic signal analyzer (DSA), digital multimeter (DMM), function generator (FG), logger, arbitrary waveform generator (Arb), DC analog output controller (AODC), digital input/output controller (DIO), and device calibrator (CAL). Each instrument comes with online help.

If you did not purchase the full VirtualBench suite, the setup program installs the VirtualBench engine and the instruments you purchased in separate subdirectories. The VirtualBench toolbar enables only the buttons for the instruments you purchased. However, you can access online help for all the VirtualBench instruments.

Installing on a Network

Contact National Instruments for licensing information if you plan to run VirtualBench on a network.

Using Non-Plug and Play DAQ Devices in Windows 95

National Instruments DAQ devices that are not Plug and Play compatible require special instructions for installation. If you have trouble installing this type of DAQ device, refer to your NI-DAQ documentation for more information.

Using Plug and Play DAQ Devices in Windows 95

In some cases, Windows 95 classifies a National Instruments Plug and Play DAQ device (PCI, PCCard, and ISA PnP) as a generic card and installs it in the Device Manager under Other Devices. NI-DAQ does not recognize the device as a valid DAQ device in this case. This might occur if you installed the card in the computer before you installed NI-DAQ 5.0. Refer to your NI-DAQ documentation for more information on correcting this problem.

Using ISA Plug and Play DAQ Devices in Windows NT

If you plan to use ISA Plug and Play DAQ devices under Windows NT 4.0, you must install the Windows NT 4.0 ISA Plug and Play driver before you configure your device with the NI-DAQ Configuration Utility. VirtualBench does not install this driver by default. Refer to your NI-DAQ documentation for more information on installing the Windows NT 4.0 ISA Plug and Play driver.

VirtualBench Requires Administrator Access in Windows NT

Under Windows NT 4.0, by default, only someone with administrator access to the system can run VirtualBench. Refer to your NI-DAQ documentation for information on how to allow other users to run VirtualBench from the system.

Printing in VirtualBench

VirtualBench instrument front panels print as bitmap images by default. If your printer supports postscript or color printing, you can modify lines in your `virtualbench.ini` file to use postscript or color printing when printing the VirtualBench front panel. The `virtualbench.ini` file is in your VirtualBench directory. After you change any information in your `virtualbench.ini` file, you must restart VirtualBench for the new

settings to take effect. You can edit your `virtualbench.ini` file with any word processing or text editing software such as Notepad.

Modify the following line in your `virtualbench.ini` file to enable postscript printing.

```
postScriptPrinting=True
```

If you enable postscript printing and your printer does not support it, your printout will consist of a single garbled line of postscript text.

Color and grayscale printing are disabled by default. To enable color or grayscale printing, modify the following line in your `virtualbench.ini` file:

```
colorPrinting=True
```

Disabling grayscale printing can conserve toner.



Note

To affect the printing options described above, you must modify the lines exactly as shown.



Caution

Do not modify any other existing lines in the `virtualbench.ini` file. Doing so will cause VirtualBench to operate incorrectly.

Important Notes for VirtualBench-Logger

Using other Windows Applications while Logging Data to Disk

You might lose logged data without warning if you run Windows applications while logging data to disk. The data losses show up as inconsistencies in the logged time stamps. To protect the integrity of data logging, close all other applications while using VirtualBench-Logger.

Version 2.1.1 Documentation Additions

Click on the button in the top right corner of the graphics display to expand the graphics display to fill the entire VirtualBench-Scope window. Click on the button again to reduce the graphics display size and regain access to the front panel controls.

Important Notes for VirtualBench-Scope

Using Equivalent Time Sampling with the VirtualBench-Scope and E-Series Devices

With Equivalent Time Sampling (ETS) you can achieve up to a 20Msample/second equivalent sampling rate with certain E-series devices, and up to a 1Gsample/second equivalent sampling rate on DAQScope 5102 devices. ETS requires that you view a repetitive or periodic signal.

ETS works with all DAQScope and E-series devices that also support analog hardware triggering. These include: AT-5102, PCI-5102, DAQCard-5102, AT-MIO-16E-1, AT-MIO-16E-2, AT-MIO-64E-3, NEC-MIO-16E-4, NEC-AI-16E-4, PCI-MIO-16E-1, PCI-MIO-16E-4, PCI-MIO-16XE-10, AT-MIO-16XE-10, AT-AI-16XE-10, VXI-MIO-64E-1, and VXI-MIO-64XE-10.

If you use ETS on E-series devices, the following restrictions apply:

- Only one channel is supported.
- The horizontal trigger position is ignored. The trigger position is on the left edge of the screen.

Using an Attenuation Probe with VirtualBench-Scope

When using a probe, enter the attenuation factor in the VirtualBench-Scope Channel Settings dialog box under the **Analog** tab. Each channel can have a different attenuation factor.

Version 2.1.1 Documentation Additions

The following are Version 2.1.1 VirtualBench-Scope features that are not documented in the online help or *Getting Started with VirtualBench*:

- The VirtualBench-Scope has enhanced math channel capabilities. You can create new channels derived from standard mathematical functions and operators. You can use any of the existing channel names as the variables in the equation. Review the pop-up help description for the Expression control for detailed information on the syntax and available functions. The Expression control is on the **Math** tab of the VirtualBench-Scope Channel Settings dialog box.
- The measurement displays indicate when the incoming signal is being clipped or when there is not enough data being acquired to make valid frequency or period measurements. These conditions are indicated when **+Over**, **-Over**, **±Over**, or **?** appears in the display in place of the usual numeric information.

- You can select a subset of the data on the graph that the VirtualBench-Scope will use to make the measurements. Click on the **Select** button on the VirtualBench-Scope front panel, and a portion of the graph turns green. To increase or decrease the width of this selection area, click on and drag the right and left edges of the selection band. When in select mode, the measurements displayed are derived only from the data within the selection area.
- Click on the button in the top right corner of the graphics display to expand the graphics display to fill the entire VirtualBench-Scope window. Click on the button again to reduce the graphics display size and regain access to the front panel controls.
- The VirtualBench-Scope remembers the size and position of its window when it is closed.

Important Notes for VirtualBench-DMM

Using the DAQCard-4050 with VirtualBench-DMM

When using the DAQCard-4050, you do not require an external current source to measure resistance.

The Digits of Precision setting in the VirtualBench-DMM Settings dialog box determines measurement accuracy. A larger value gives greater precision but slower measurement performance.

Choose the power line frequency to use in the area that you are making your measurements with the Power Line Frequency control in the VirtualBench-DMM Settings dialog box. VirtualBench-DMM uses this selection to best reduce measurement inaccuracies due to line noise and interference from sources such as nearby AC-powered equipment and overhead lighting.

Version 2.1.1 Documentation Additions

The VirtualBench-DMM has a Trend Viewer window. You can select this display from the **Window** menu of the VirtualBench-DMM front panel. This viewer allows you to visualize the data you collect with the VirtualBench-DMM over time. The Trend Viewer window graphics display has scroll, zoom, and print capabilities.

Frequently Asked Questions

I can't find anything about a topic in *Getting Started with VirtualBench*.

Getting Started with VirtualBench covers only the basics of how to operate each instrument. Please consult the online help for detailed information on all the VirtualBench instrument features.

Can I run VirtualBench without a data acquisition device installed?

No, VirtualBench does not load if you do not have NI-DAQ installed on your computer. If you have NI-DAQ installed but do not have a device configured, the VirtualBench toolbar loads properly, but the instrument buttons are not enabled.

How do I create a data file that can be output with the VirtualBench-FG or VirtualBench-Arb?

VirtualBench-FG and VirtualBench-Arb can read data from ASCII text files. Any file will work that has delimited data arranged in columns.

How do I change the trigger level and position on VirtualBench-Scope?

VirtualBench-Scope uses a cursor on the graph to select a trigger level and position. Move the green crosshair cursor to select the trigger event location. If the cursor is not visible, click on the **Auto Setup** button at the bottom of the VirtualBench-Scope window to bring the cursor to the center.

Why do I only have a few milliseconds of data when I choose Save Waveforms on the VirtualBench-Scope?

Save Waveforms saves only the data currently present on the screen. If you want to stream data to disk, you must use the VirtualBench-Logger.

Can I run multiple VirtualBench instruments on the same device?

You can access two instruments that perform different types of I/O using the same data acquisition device. For example, you can use the VirtualBench-Scope and the VirtualBench-FG with the same hardware because one performs analog input and the other analog output. You cannot load two instruments that perform the same function with the same hardware, such as the VirtualBench-Scope and the VirtualBench-DSA. The instruments might appear to run simultaneously, but the data results are not reliable and you might cause an operating system failure.

Can I edit the VirtualBench LabVIEW source code to customize the instruments?

No, National Instruments does not supply source code for VirtualBench.

The VirtualBench-Logger cannot log data at the rate I specified. How can I change the settings to achieve the logging rate I want?

If you cannot decrease the sample rate or the number of channels you acquire, you can try the following:

- Decrease the display window size.
- Decrease the number of channels displayed on the graph while logging.

Why can't the VirtualBench-Logger log data at the maximum rate of my device?

The VirtualBench-Logger does not log at high speeds for the following reasons:

- The VirtualBench-Logger acquires data, converts the data based upon the transducer settings, and converts the data to ASCII format before writing it to the file. These conversions take away from the time available for logging.
- The VirtualBench-Logger must check each data point to determine whether the point should be logged based upon dead-banding and logging settings. This checking process takes longer as the sample rate and number of channels increase.
- The graphics display maintains a buffer of the display data. Larger sample rates and numbers of channels result in a larger buffer. Therefore, VirtualBench-Logger requires more time to manage the displaying of this data.

So, how fast can I expect to log data using the VirtualBench-Logger?

There is no absolute answer to this question. The rate is very system dependent. The following benchmark measurements are estimates of how fast you can log on different systems using a 1 second display window (all using Windows 95):

- 80486, Syex, 20 MB of RAM, IDE hard drive
 - 125 Hz on a single channel
 - 60 Hz per channel (16 channels)
- Pentium 90, Dell Dimension XPSP90, 32 MB of RAM, IDE hard drive
 - 250 Hz on a single channel
 - 100 Hz per channel (16 channels)
- Pentium 266 Dell Dimension XPSD266, 64 MB of RAM, IDE hard drive with Ultra DMA
 - 1500 Hz on a single channel
 - 850 Hz per channel (16 channels)

I set up the buffer size on the VirtualBench-Scope to 200 k. While acquiring several channels, my machine became very sluggish, and I had to restart. Why?

For buffer sizes greater than 100 k, National Instruments recommends you have a minimum of 32 MB of RAM. The more channels you acquire, the more pronounced this problem becomes.

I set up the frame size on the VirtualBench-DSA to 2048. My machine then became very sluggish, and I had to restart. Why?

For frame size greater than 1024, National Instruments recommends that you have a minimum of 32 MB of RAM.