

Tektronix Bench Instruments PC Connectivity Installation Manual



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Tektronix

**Tektronix Bench Instruments
PC Connectivity
Installation Manual**

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

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Introduction

This document describes how to:

- Install National Instruments LabVIEW™ SignalExpress Tektronix Edition (Limited) software (referred to as SignalExpress in the rest of the document)
- Install the Step files needed by SignalExpress to communicate with a supported Tektronix instrument
- Connect and configure the instrument to your PC with a USB, GPIB, RS-232/USB, or Ethernet cable
- Remotely acquire measurements with SignalExpress

Install LabVIEW SignalExpress Software

SignalExpress Tektronix Edition (Limited) provides instrument control and measurement acquisition features without the added complication of programming. SignalExpress Tektronix Edition (Professional) also provides signal processing and advanced analysis features. The following table lists the features for each version of SignalExpress.

Feature	SignalExpress Professional	SignalExpress Limited
Visualization and Documentation		
Customizable graphing	✓	✓
Interactive cursors	✓	✓
Save signals to file	✓	✓
Print and export graphs	✓	✓
Drag & drop into Microsoft Excel, Word, WordPad	✓	✓
Signal Processing		
Software filters	✓	
Scalar and waveform math	✓	
Analog and digital conversion	✓	
Interactive signal comparisons	✓	
Load simulation data from PSPICE & Multisim	✓	
Time and Frequency Measurements		
Amplitude, level, timing & transition	✓	
Power spectrum & frequency response	✓	
Distortion measurements	✓	
Measurement Automation		
Limited data logging (one log per project)	✓	✓
Unlimited data logging	✓	
Test Automation & Parameter sweeping	✓	
Limit testing	✓	

NOTE. The first 30 days of SignalExpress Tektronix Edition (Limited) provides a trial version of NI LabVIEW SignalExpress Tektronix Edition (Professional). After 30 days, functionality reverts to SignalExpress Tektronix Edition (Limited). Contact Tektronix or a Tektronix Authorized Distributor to purchase a license for the Professional version.

System Requirements

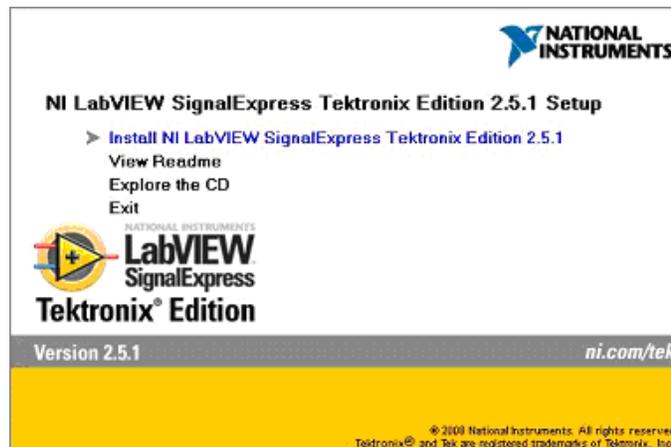
- 512 MB of memory
- Pentium 4 processor or equivalent (Pentium III or Celeron 600 MHz minimum)

Install SignalExpress

NOTE. *If you already have SignalExpress installed on your PC, and the required NI-VISA software (See page 12, Troubleshooting.), you do not need to install SignalExpress from the CD that came with your product. Go to Install the SignalExpress Step Files (See page 4.).*

To install SignalExpress:

1. Insert the SignalExpress CD into the CD or DVD drive on your PC to display the installation window.



2. Click **Install NI LabVIEW SignalExpress Tektronix Edition**.
3. Follow on-screen instructions to complete the installation.

NOTE. *The SignalExpress installation process automatically installs the National Instruments version of VISA drivers, replacing any current VISA drivers (such as TekVISA). Some TekVISA applications, such as TVC and Tek Toolbars, are not uninstalled, and continue to work with NI-VISA.*

This completes the SignalExpress software installation. Go to the next section to install the SignalExpress Step files.

Install a SignalExpress Step File

SignalExpress uses Step files to communicate with a supported Tektronix instrument or series of instruments.

To install the SignalExpress Step files for an instrument:

1. Insert the **Documentation and Connectivity Software** CD that came with your instrument into your computer CD or DVD drive to start the documentation browser software.

NOTE. *If the browser software does not start automatically, go to the root directory of the CD and double-click **launch.exe**.*

2. Select your language.
3. Click **Connectivity (SignalExpress™) > SignalExpress LabVIEW Step Installation Directory and Files** in the browser main menu.
4. Double-click the file that supports your instrument. For example, to load the Step files for a Tektronix FCA3000 Series instrument, double-click **Tek_FCA_MCA3000_3100.exe**. Follow the on-screen instructions.

This completes the SignalExpress Step file installation. Go to the next section to connect the instrument to the PC.

Connect the Instrument to the PC

NOTE. *Not all communication interfaces (USB, GPIB, RS-232/USB, or Ethernet) are available on all instruments. See the instrument user manual for information on available interfaces.*

You can attach multiple communication cables to the instrument at the same time. However, the instrument can only communicate using one interface at a time (USB, GPIB, RS-232/USB, or Ethernet).

This manual describes how to connect your PC to an instrument using any of the following cables:

- USB (See page 5.)
- GPIB (See page 5.)
- RS-232/USB (See page 6.)
- Ethernet (See page 8.)

USB Cable

1. See the instrument user documentation to locate the Type B USB port and enable the USB port for remote communication (if required).
2. Power off the instrument.
3. Insert the Type B, device-side connector into the USB device port on the back of the instrument.

NOTE. *Some Tektronix instruments include a host-side, Type A connector port on the front panel. This port is only for connecting USB memory devices and will not work for PC communication.*

4. Insert the Type A, host-side connector to the USB port on the PC.
5. Power on the instrument. The PC may run the Found New Hardware Wizard. Follow on-screen instructions.

This completes the USB cable install procedure. Go to the *Run SignalExpress* section to verify communication with the instrument. (See page 9.)

GPIB Cable

1. See the instrument user documentation to locate the GPIB connector, enable the GPIB port for remote communication (if required), and set GPIB parameters.
2. Connect a GPIB cable between the rear panel of the instrument and the GPIB board connector on the PC.

This completes the GPIB cable install procedure. Go to the *Run SignalExpress* section to verify communication with the instrument. (See page 9.)

RS-232/USB Cable

Connects the RS-232 port on the instrument to the USB port on the PC. You may need to install USB serial converter and port drivers.

Install Drivers

1. Insert the USB end of the RS-232/USB cable into a USB port on the PC. The PC will run the Found New Hardware Wizard.

NOTE. *If the Found New Hardware Wizard does not run, the drivers are probably already installed on your PC.*

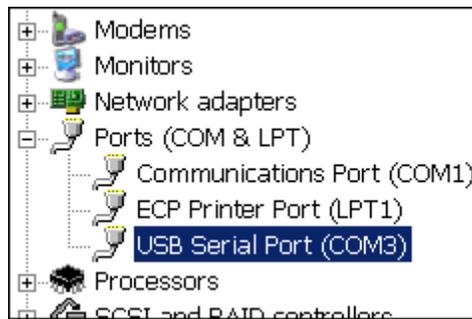
2. Install the USB Serial Converter driver files:
 - If you have Internet access, select **Yes, this time only** and click **Next**. Follow the on-screen instructions to install the software automatically.
 - If you do not have Internet access, select **No, not this time** and click **Next**. Follow the on-screen instructions to install from a specific location (the **Documentation and Connectivity Software** CD that came with your instrument).
3. The Found New Hardware Wizard will next install the USB Serial Port drivers (if required). Repeat step 2 to install the drivers.

The RS-232/USB cable driver install is completed. You may need to reboot the PC before you use the RS-232/USB cable. Go to the next section to identify the PC COM port assigned to the RS-232/USB cable.

Determining the RS-232 COM Port

To find out which COM port is associated with your RS-232/USB cable, do the following:

1. Connect the RS-232/USB cable to your PC.
2. On the PC, click **Start > Settings > Control Panel > System**.
3. Select the **Hardware** tab and click the **Device Manager** button.
4. Look for the **Ports (COM & LPT)** item and click the + symbol. The COM port associated with the RS-232/USB cable is listed as **USB Serial Port (COMn)**, where n is the COM port number.



5. Record the instrument USB serial COM port number for use with the SignalExpress software.

This completes the RS-232/USB cable install procedure. Go to the *Run SignalExpress* section to verify communication with the instrument. (See page 9.)

Ethernet Cable

1. See your instrument documentation to determine the network parameters to set for your instrument. Work with your network administrator to obtain the required network and instrument parameters. Typical network parameters include:
 - Instrument IP address
 - Gateway IP address
 - Subnet Mask
 - HTTP Port
 - DHCP/BOOTP
 - Domain Name
 - DNS IP Address

NOTE. *If your network DHCP/BOOTP server assigns dynamic IP addresses, then the value in the Instrument IP Address field may be different each time you power on the instrument. This is not an issue if you are using the network to send hard copy from an instrument to a network printer. However, if you need to remotely access the instrument, have the network administrator assign a static IP address to your instrument. A static IP Address makes it easier to identify a specific instrument on the network.*

NOTE. *The Domain Name and DNS IP Address are not required for network communication except for printer communications.*

2. Enter the required network parameters into your instrument. See your instrument documentation for how to access and enter network parameters.
3. Connect your instrument to a network port using a CAT5 10BaseT Ethernet cable with RJ-45 connectors.
4. If available, use a PC network IP address testing program to locate (“ping”) your instrument on the network. If you do not have a network testing program, have your system administrator verify that the instrument is connected to the network.

This completes the Ethernet cable install procedure. Go to the *Run SignalExpress* section to verify communication with the instrument. (See page 9.)

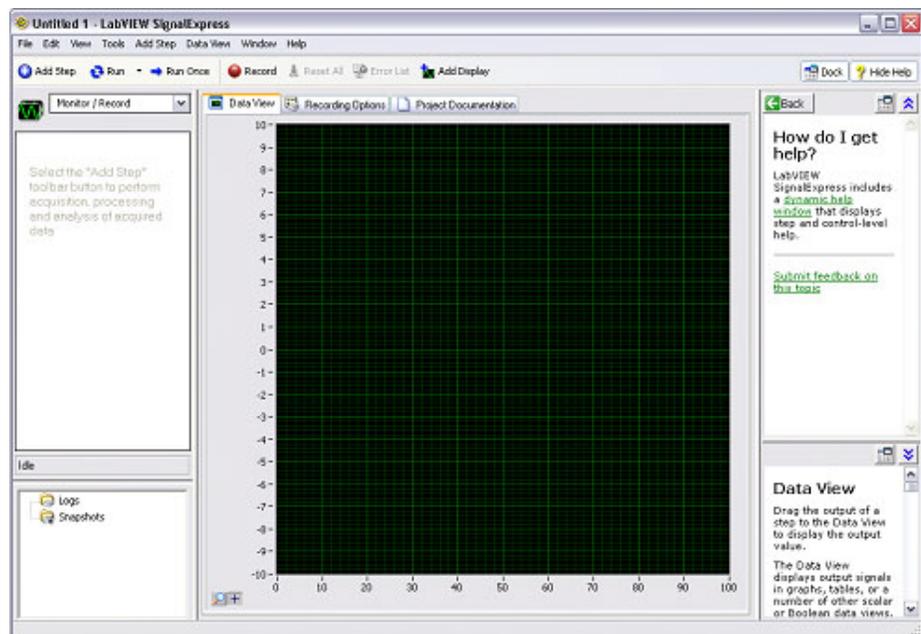
Run SignalExpress

Do the following to connect and control your instrument using SignalExpress:

1. Power off the instrument.
2. Connect the instrument to the PC with an appropriate cable. (See page 4.)

NOTE. You can attach multiple communication cables to the instrument at the same time. However, the instrument can only communicate using one interface at a time (USB, GPIB, RS-232/USB, or Ethernet).

3. Power on the instrument. The SignalExpress software may automatically run when you power on the instrument if the PC recognizes that an instrument is connected.
4. Run the SignalExpress software on the PC if it does not start automatically.

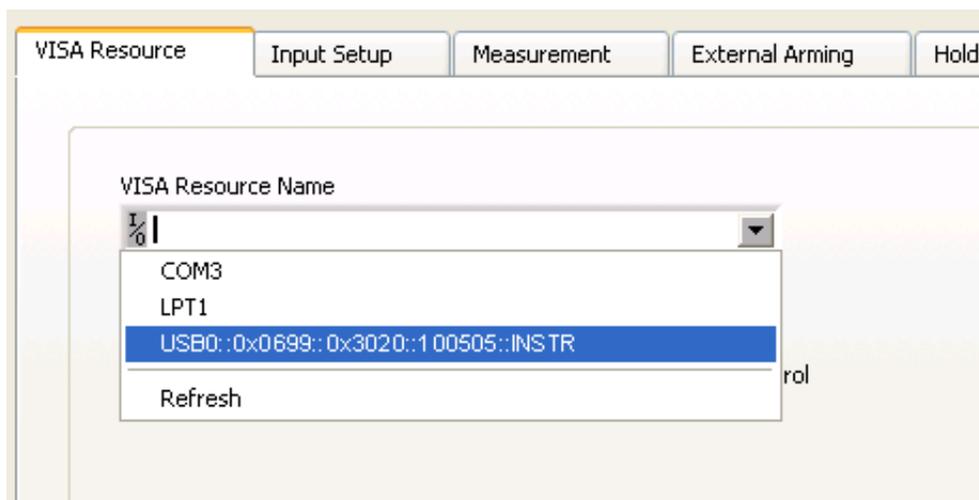


5. Add the Step that supports your instrument: click **Add Step > Tektronix > Acquire Signals** (for measurement instruments) or **Add Step > Tektronix > Generate Signals** (for signal source instruments) and select the Step that supports your instrument. SignalExpress loads the selected Step and displays the Visa Resource tab.

NOTE. *SignalExpress includes several Tektronix instrument Steps. If an instrument is not in the Acquire Signals or Generate Signals menu, please check that you have installed the required Step files. (See page 4, Install a SignalExpress Step File.)*

If the Tektronix instrument is not in the Acquire Signals or Generate Signals menu after installing the Step files, please contact your nearest Tektronix Customer Support center for help.

6. In the **VISA Resource** tab, click the instrument or resource name drop-down list and select the instrument that is connected to the PC. The following figure shows the FCA/MCA3000 Step VISA Resource tab with a USB-connected MCA3020 instrument (Tektronix manufacturer ID number 0699, instrument identifier 3020, and instrument serial number 100505).



For network-connected instruments, the VISA Resource list shows the IP Address of instruments connected to the network, instead of instrument-generated identifier text. Select the IP address assigned to the instrument to which you want access. (See page 8, *Ethernet Cable*.)

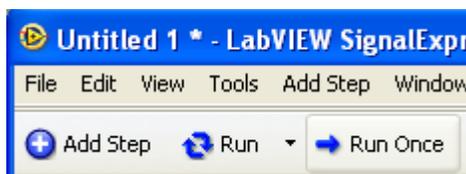
NOTE. *The Step Setup tabs and fields are different for each instrument.*

If you do not see the connected instrument listed, click **Refresh** in the list (or the **Autodetect** button if available) to update the list. If the instrument is still not listed, check the following:

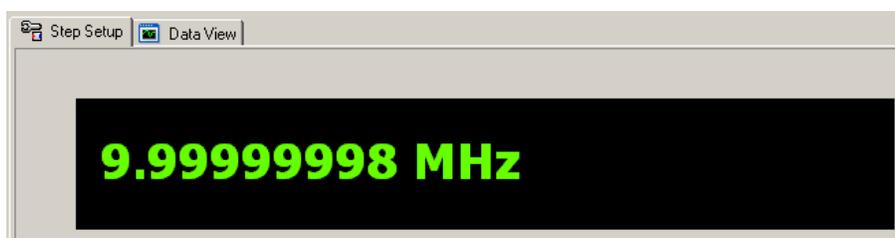
- The PC and instrument cables are fully seated in their connectors
- The instrument communication settings are correct
- The instrument is powered on
- The instrument is accessible on the network (“ping” the instrument IP address)

NOTE. *You cannot remotely access an instrument until the instrument is shown in the VISA Resource tab list.*

7. Click **Run Once** to set the instrument parameters and/or acquire a measurement value, depending on the connected instrument.



8. For signal acquire instruments, verify that SignalExpress acquired a measurement that matches the main readout of the instrument. The following figure shows the measurement from a Tektronix FCA3000 Series Timer/Counter/Analyzer.



For signal generate instruments, verify that SignalExpress set the instrument to the parameters specified in the Step Setup tab.

For more information on using the LabVIEW SignalExpress Tektronix Edition software, see the PDF manual *LabVIEW SignalExpress: Getting Started with LabVIEW SignalExpress*, and the file *NI LabVIEW SignalExpress Tektronix Edition Readme*, both of which are on the *NI LabVIEW SignalExpress* software CD.

In SignalExpress, click **Help > Getting Started with** to open the application online help.

Drivers

IVI-C and LabVIEW PnP Drivers

Controlling an instrument in a programming environment requires specific IVI-C or LabVIEW PnP drivers. Go to www.ni.com and enter **Tektronix drivers** in their search engine field to locate and download the IVI-C or LabVIEW PnP drivers for your instrument.

IVI-COM Drivers

Some Tektronix instruments also have IVI-COM drivers available to offer more programming flexibility. Go to www.tek.com/software and enter your instrument series in the search box to locate the IVI-COM driver.

Troubleshooting

If you have problems connecting or controlling the remote instrument from SignalExpress or a programming environment, do the following:

Check the NI-VISA File

1. Go to **C:\WINDOWS\system32** on your PC.
2. Locate and right-click on the **visa32.dll** file to open the Properties dialog box.
3. Click the **Version** tab and verify that the file version is **4.6** or later and the description is **NI-VISA Library**. If the VISA file on your system is not the NI-VISA version, go to the National Instruments Web site (www.ni.com) to download and install the latest version.

Uninstall and Reinstall the Step Files

1. Click **Start > Settings > Control Panel > Add or Remove Programs**.
2. Locate and select the step for your instrument.
3. Click **Remove**. Follow any on-screen instructions.
4. Reinstall the step. (See page 4, *Install a SignalExpress Step File*.)

Uninstall and Reinstall SignalExpress

1. Click **Start > Settings > Control Panel > Add or Remove Programs**.
2. Select **National Instruments IVI Specific Drivers**.
3. Select all items in the **Products** list (use standard Microsoft Windows operations to select multiple items).
4. Click **Remove**. Follow any on-screen instructions.

5. Select **National Instruments Software** in the Add or Remove Programs window.
6. Select all items in the **Products** list (use standard Microsoft Windows operations to select multiple items).
7. Click **Remove**. Follow any on-screen instructions.
8. Reinstall SignalExpress. (See page 2, *Install LabVIEW SignalExpress Software*.)

NOTE. *You may need to reinstall additional software or drivers for other NI products, such as GPIB cards.*

**Contact Tektronix
Customer Support**

Contact the Tektronix Customer Support center for assistance.