

# Keysight USB Modular Products and Systems



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## Manual Part Number

U2702-90001

## Edition

Edition 6, July 1, 2017

## Printed in:

Printed in Malaysia

## Published by:

Keysight Technologies  
Bayan Lepas Free Industrial Zone,  
11900 Penang, Malaysia

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## Safety Information

### CAUTION





A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

### WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

## Safety Symbols

The following symbols on the instrument and in the documentation indicate precautions which must be taken to maintain safe operation of the instrument.

 Direct current (DC)	 Alternating current (AC)
 Both direct and alternating current	 Caution, risk of danger (refer to this manual for specific Warning or Caution information)

## Safety Considerations

Read the information below before using this instrument. The descriptions and instructions in this manual apply to all the instruments in the Keysight modular product family. For more pertinent safety notes, please refer to the respective User's Guide of your modular product.






### WARNING

- Do not use this device if it is damaged. Before you use the device, inspect the casing. Look for cracks or missing plastic.
  - Do not operate the device around explosive gas, vapor, or wet environments.
  - Observe all markings on the device before establishing any connection.
  - Turn off the device and application system power before connecting to the I/O terminals.
  - When servicing the device, use only the specified replacement parts.
  - Do not operate the device with the cover removed or loosened.
  - Do not connect any terminal block or cables prior to performing the self-test procedure.
  - Use only the power adaptor provided by the manufacturer to avoid any unexpected hazards.
- 

### CAUTION

- Electrostatic discharge (ESD) can cause damage to the components in the device and accessories. Any cables or wires should be connected to the plug-in connectors first and covered with the cable casing prior to plugging it into the output connector to prevent ESD from occurring.
  - If the device is used in a manner not specified by the manufacturer, the device protection may be impaired.
  - Always use dry cloth to clean the device. Do not use ethyl alcohol or any other volatile liquid to clean the device.
  - Do not permit any blockage of the ventilation holes of the device.
-

## Regulatory Markings

	<p>The CE mark is a registered trademark of the European Community. This CE mark shows that the product complies with all the relevant European Legal Directives.</p>		<p>The RCM mark is a registered trademark of the Australian Communications and Media Authority.</p>
<p><b>ICES/NMB-001</b></p>	<p>ICES/NMB-001 indicates that this ISM device complies with the Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB-001 du Canada.</p>		<p>This instrument complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.</p>
	<p>The CSA mark is a registered trademark of the Canadian Standards Association.</p>		<p>This symbol indicates the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.</p>

## Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

This instrument complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.

### Product category:

With reference to the equipment types in the WEEE directive Annex 1, this instrument is classified as a “Monitoring and Control Instrument” product.

The affixed product label is as shown below.



Do not dispose in domestic household waste.

To return this unwanted instrument, contact your nearest Keysight Service Center, or visit <http://about.keysight.com/en/companyinfo/environment/takeback.shtml> for more information.

## Sales and Technical Support

To contact Keysight for sales and technical support, refer to the support links on the following Keysight websites:

- [www.keysight.com/find/usbscope](http://www.keysight.com/find/usbscope)  
(product-specific information and support, software and documentation updates)
- [www.keysight.com/find/assist](http://www.keysight.com/find/assist)  
(worldwide contact information for repair and service)



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## Overview of the USB Modular Products and Systems

The USB modular products and systems are a range of test and measurement instruments that offers you the choice and flexibility you need to create solutions that are able to expand and evolve with the changes of your test requirements.



**Figure 1-1** The USB modular products and systems family

### Summary of the standard features of a modular product

- Equipped with Hi-Speed USB 2.0 connectivity, capable of handling speeds of up to 480 MB/s
- Requires a PC to operate
- Bundled with the Keysight Measurement Manager software for immediate measurement start-up
- Supports the Keysight Open program and is compatible with a wide range of Application Development Environments (ADE)
- Operates as a standalone instrument or as a combined module when used with the Keysight U2781A USB modular products chassis (able to accommodate up to six individual modules)



## Standard purchase items

For the list of standard purchase items of each modular product, please refer to the respective User's Guides of your modular product. Verify the standard purchase items. If anything is missing or damaged, please contact the nearest Keysight Sales Office.

## Inspection and maintenance

### Initial inspection

When you receive your modular product, inspect the unit for any obvious damage that may occur during shipment. If any damaged is found, contact the nearest Keysight Sales Office immediately. Keep the original packaging in case the purchased modular product has to be returned to Keysight in the future.

### General maintenance

**NOTE**

Any repair that is not covered in your modular product manual should only be performed by qualified personnel.

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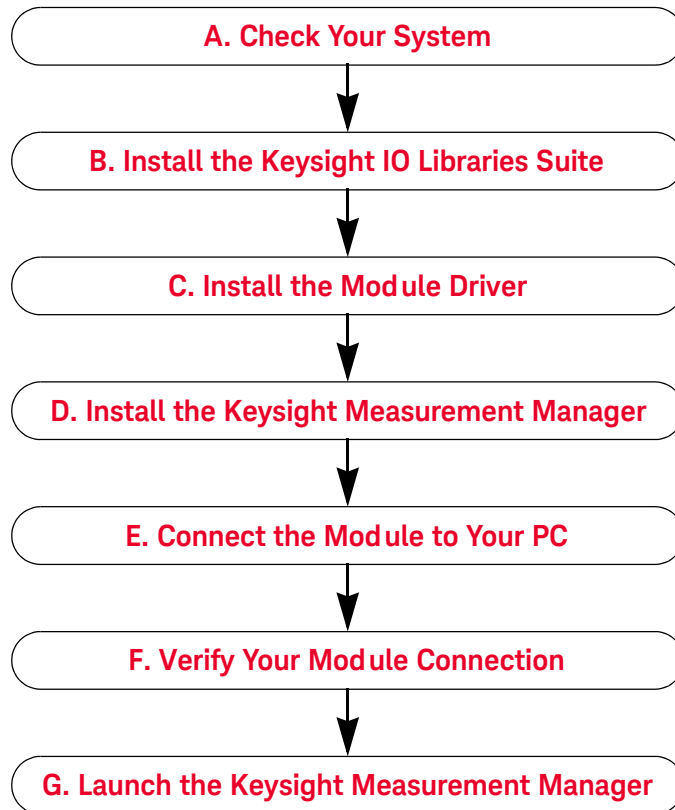
- 1 Power off your device, and remove the power cord and I/O cable from your device.
- 2 Remove your device from the bumper casing.
- 3 Shake off any dirt that may have accumulated on the device.
- 4 Wipe your device with a dry cloth, and install the bumper casing back in place.

## Installation and Configuration

Follow the step-by-step instructions shown in the following flowchart to get started with the preparation and installation of your modular product.

**NOTE**

You need to install the IVI-COM driver if you are going to use your USB modular product with the Keysight VEE Pro, NI LabVIEW, or Microsoft® Visual Studio® software.



**Figure 1-2** Installation and configuration flowchart

## A. Check Your System

Prior to any installation and configuration, please ensure that your PC meets the following minimum system requirements.

Requirement	Windows® XP operating systems	Windows Vista® operating systems	Windows 7 operating systems
<b>Operating system</b>	Windows XP Service Pack 3 (or later) <sup>[a]</sup>	Windows Vista (32-bit) Service Pack 1 and 2 <sup>[b]</sup>	Windows 7 (32-bit and 64-bit) <sup>[c][d]</sup>
<b>Processor speed</b>	600 MHz or higher required, 800 MHz recommended	1 GHz 32-bit (x86)	3 GHz 32-bit (x86)
<b>Memory</b>	256 MB minimum (1 GB or greater recommended)	1 GB minimum	2 GB minimum
<b>Hard-disk space</b>	1.5 GB minimum	1.5 GB minimum	1.5 GB minimum
<b>Video</b>	Super VGA (800 × 600) 256 colors or more	Support for DirectX® 9 graphics with 128 MB graphics memory recommended <sup>[e]</sup>	Support for DirectX 9 graphics with 128 MB graphics memory recommended <sup>[e]</sup>
<b>CD-ROM drive or DVD-ROM drive</b> <sup>[f]</sup>	Required	Required	Required
<b>Browser</b>	Microsoft Internet Explorer® 5.01 or greater	Microsoft Internet Explorer 7 or greater	Microsoft Internet Explorer 7 or greater

[a] Supported Windows XP editions – Home or Professional

[b] Supported Windows Vista (32-bit) editions – Home Basic, Home Premium, Business, or Ultimate

[c] Supported Windows 7 (32-bit and 64-bit) editions – Home Basic, Home Premium, Professional, Enterprise, or Ultimate

[d] Keysight Measurement Manger for Windows 7 64-bit support is a 32-bit application running on a WOW64 (Windows-on-Windows 64-bit) emulator.

[e] Super VGA graphics is supported for Windows Vista and Windows 7.

[f] The type of media provided with the product determines whether a CD-ROM drive or DVD-ROM drive is required.

Software requirements	Availability
<b>Keysight IO Libraries Suite 15.5</b>	Available on the <i>Keysight Automation-Ready CD-ROM</i>
<b>Keysight T&amp;M Toolkit Runtime version 2.1</b>	Bundled with the Keysight Measurement Manager software application installer
<b>Keysight T&amp;M Toolkit Redistributable Package 2.1 patch</b>	Bundled with the Keysight Measurement Manager software application installer
<b>Microsoft .NET Framework version 2.0</b>	Bundled with the Keysight Measurement Manager software application installer

## B. Install the Keysight IO Libraries Suite

If you have the Keysight IO Libraries Suite 15.5 or higher installed on your PC, you may proceed to **“C. Install the Module Driver”** on page 28. If not, please perform this procedure to install the Keysight IO Libraries Suite.

### NOTE

You must have Administrator privileges to install the Keysight IO Libraries Suite Connection Expert.

---

- 1 Verify that your PC meets the minimum system requirements. (See **“A. Check Your System”** on page 19.) Close all other applications on your PC, and ready the *Keysight Automation-Ready CD-ROM*.
- 2 If you are upgrading to the latest version of the Keysight IO Libraries Suite from a previous version of the Keysight IO Libraries Suite, you must first remove the instruments and interfaces listed below before you upgrade your software.  
This step is necessary in order for these devices to obtain the correct drivers to work with the Keysight IO Libraries Suite.
  - a Disconnect any USB instruments from your PC.
  - b Disconnect any Keysight 82357 USB/GPIB interface converters from your PC.
  - c Disconnect any Keysight E8491 IEEE 1394 PC Link to VXI interfaces from your PC.
- 3 Close all other applications on your PC.

### NOTE

- If you install a PCI card in your computer at the same time you install the Keysight IO Libraries Suite, a possible conflict can occur. The **“New Hardware Found”** dialog for the PCI card must be closed before continuing the installation. Otherwise the Keysight IO Libraries Suite installation will stop until the PCI card installation is complete.
  - If you have NI software installed (such as NI MAX, etc.), then all NI services must be stopped prior to installing the Keysight IO Libraries Suite.
-

- 4 Insert the *Keysight Automation-Ready CD-ROM* with the Keysight IO Libraries Suite into the CD-ROM drive of your PC. Wait a few seconds for the auto-run window to appear.



If the auto-run window does not appear automatically,

- Click **Start > Run...**
- Type `<drive>:autorun\auto.exe`, where `<drive>` is your CD-ROM drive letter.

**NOTE**

**Every Keysight IO Libraries Suite installation is a “Full installation”**

In past versions of the Keysight IO Libraries Suite, an option to install Keysight IO Libraries Suite as either as a Full version or a Runtime version was provided. Beginning with the Keysight IO Libraries Suite 14.0, the installation process provides a Full installation for all users (i.e., there is no longer a Runtime installation option). This means that every installation now includes the development components of the Keysight IO Libraries Suite software, which allow you to develop your own I/O programs. If you wish to minimize the size of the installed software, select Custom installation; when you get to the Select Features dialog, do not select the manuals and the sample programs.

- 5 When the installation start-up window appears, click the “Click here to install now” button once, and wait for the InstallShield Wizard to appear.

**NOTE**

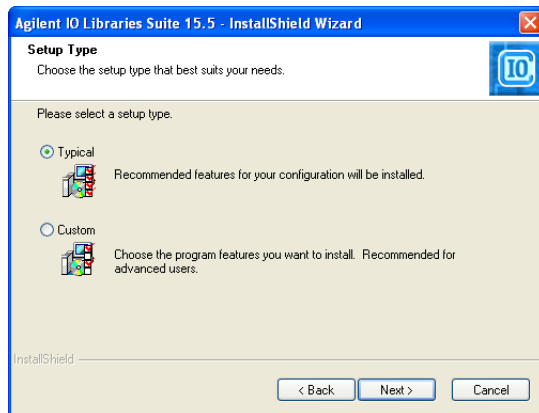
You also have the opportunity to watch a two-minute video how easy it is to install, set-up, and configure your interfaces and instruments using the Keysight IO Libraries Suite 15.

- 6 If the IVI Shared Components and IVI VISA COM Standard Components are not already installed on your PC, the Keysight IO Libraries Suite will install them in the default location.

**NOTE**

The IVI Shared Components and IVI VISA COM Standard Components are installed in default folders. However, if you need to install the IVI Components in a unique location refer to “Custom Installation of IVI Shared Components” in the *Keysight IO Libraries Suite Connectivity Guide*.

- 7 When the InstallShield Wizard appears, click **Next >** to begin the Keysight IO Libraries Suite software installation.
- 8 Read the License Agreement(s). If you accept the terms, click the radio button labeled “I accept the terms of the license agreement”, and then click **Next >** to continue.
- 9 When the InstallShield Wizard Setup Type dialog appears, as shown, select **Typical** or **Custom**, then click **Next >**.

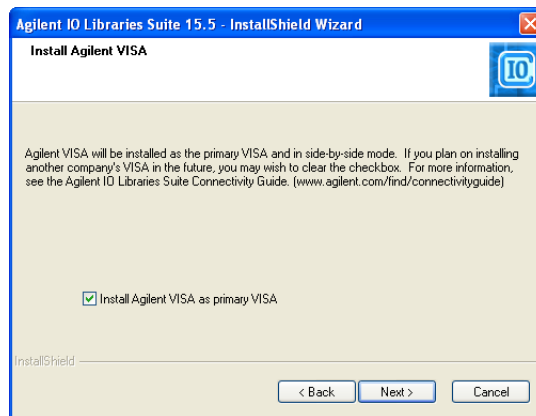


The Typical setup installs the recommended features for your configuration in standard locations on your PC. In a Typical setup, if another vendor's VISA software is already installed on this PC, Keysight VISA is installed as secondary. If no other vendor's VISA software is found on this PC, Keysight VISA is installed as primary. (See also "Using Keysight VISA in Side-by-Side Mode" in the *Keysight IO Libraries Suite Connectivity Guide*.)

**NOTE**

- If you accept the "Typical Installation", click **Next >** and proceed to **step 13**.
- If you chose the "Custom Installation" radio button, click **Next >** and proceed with **step 10** below.

**10** If you chose the Custom setup *and* you do not have another vendor's VISA implementation installed on your PC, then you will see the dialog below, which asks whether you want to install Keysight VISA as the primary VISA.



If you have another vendor's VISA installed, you will see a similar dialog, but the check box will not be selected, indicating that the default is to install Keysight VISA as secondary.

For details on this topic, see "Using Keysight VISA in Side-by-Side Mode" in the *Keysight IO Libraries Suite Connectivity Guide*.



11 If you chose a Custom setup, the next dialog shows the location of the:

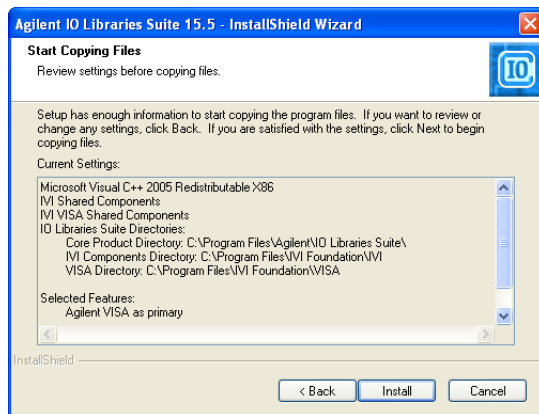
- Keysight IO Libraries Suite destination folder
- Keysight VISA destination folder, and
- IVI components destination folder

The VISA and IVI destinations are greyed out. They are for information only. In order to change them, you must follow the instructions in “Custom Install the IVI Shared Components” in the *Keysight IO Libraries Suite Connectivity Guide*.


12 If you chose a Custom setup, you will now see the Select Features dialog.


- a Click on any feature in the list to see the feature description and the space requirements for the selected set of features. It is recommended that you install the manuals and sample programs if you plan to program with the Keysight IO Libraries Suite; however, you may omit them to save space.
- b Select the check box for each feature to be installed. Clear the check box for each feature to omit. When you are done selecting features, click **Next >**.

13 The Start Copying Files dialog appears; click **Install** to begin copying files.



If the Microsoft .NET Framework version 2.0 has not previously been installed on your PC, Keysight IO Libraries Suite will install them; this may take up to ten minutes. The Microsoft .NET Framework provides necessary infrastructure for the Keysight IO Libraries Suite utilities, as well as for .NET programming tools and many other applications. You will only need to install the .NET Framework once, even if you remove and reinstall or upgrade your Keysight IO Libraries Suite.

- 14** After the files have been copied, you may see a dialog asking you to restart your PC. This occurs only if you have certain I/O hardware configurations. If you choose not to reboot at this time, you should reboot before running Connection Expert.
- 15** When the InstallShield Wizard Completed dialog appears indicating that Keysight IO Libraries Suite was successfully installed:
  - a** Click **Finish** to close the window.
  - b** Or click on one of the product/solution links for information on other Keysight solutions.
- 16** Click the IO control icon () in lower right Windows Notification area to run Keysight IO Libraries Suite.
- 17** If you are installing Keysight IO Libraries Suite along with another instrument, interface, or software package such as Keysight VEE, there may be another CD with additional software (drivers, sample programs, and so on). If you want to install this additional software,
  - Insert the CD into the CD-ROM drive on your PC.
  - Follow the instructions that came with the CD or the hardware or software product.
- 18** Re-connect any USB instruments or E8491 IEEE-1394 FireWire to VXI interfaces that you may have disconnected in [step 2](#). Install any new hardware.
- 19** If Connection Expert is already running, click **Refresh All** to identify any hardware you have just installed or re-connected.

- 20** If Connection Expert is not already running, run it now to verify your I/O configuration: In the Windows Notification area, click the IO icon () , and then click **Keysight Connection Expert**.
- a** Locate your interfaces and instruments in the Explorer Pane. Click on them to see their properties (displayed in the right-hand pane). Observe their state, also displayed in the right-hand pane: if communication to the interface or instrument has been successfully established, it will be in the Verified state, which is denoted by a green check mark.
  - b** Change the default I/O configuration (if necessary) by clicking **Change Properties...** in the property pane of the interface or instrument you wish to configure.

**NOTE**

If you plan to program your GPIB instruments using the Keysight 488 API, or to run NI-488.2-compatible programs with Keysight interface hardware (such as GPIB cards), you may need to enable the Keysight 488 library. To do this, click **Tools > Keysight 488...**, then select the check box labeled “Enable Keysight GPIB cards for 488 programs”.

- c** If you would like to test your connections manually, select your instrument, and then right-click and choose **Send Commands To This Instrument**.

**NOTE**

If you encounter problems while installing the Keysight IO Libraries Suite, see the “Installation Troubleshooting” section in the *Keysight IO Libraries Suite Connectivity Guide*.

**Vista Installation with UAC Disabled**

If you experience problems installing Keysight IO Libraries Suite on a system with the Windows Vista operating system, you may have the User Account Control (UAC) enabled. Typically, you may get an error message stating that a directory name is invalid. UAC must be disabled prior to installing Keysight IO Libraries Suite.

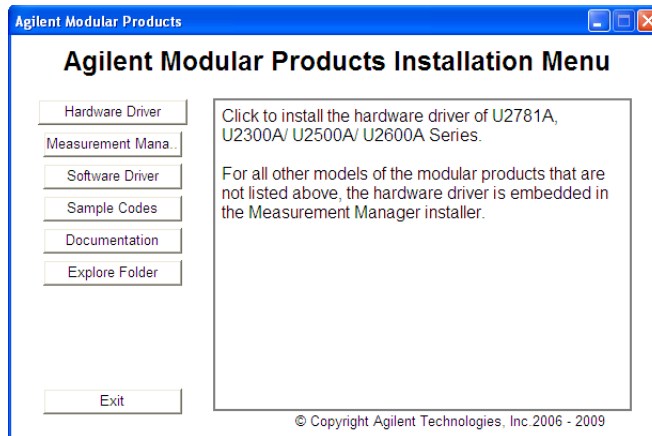
If possible, you should always use the current version of the Keysight IO Libraries Suite. This version supports the newest interfaces and operating systems, and has the most advanced features. For more information on the Keysight IO Libraries Suite, go to [www.keysight.com/find/iosuite](http://www.keysight.com/find/iosuite).

## C. Install the Module Driver

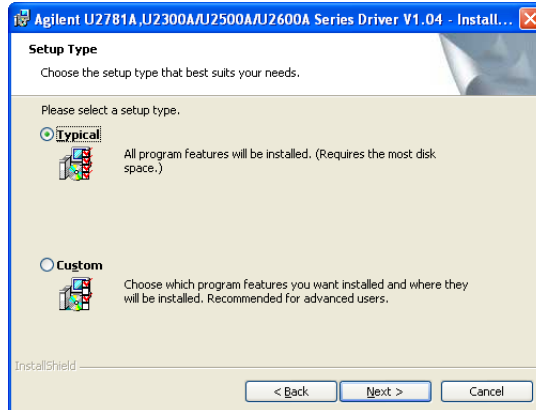
### NOTE

- Ensure that your modular product is disconnected from your PC before installing the driver.
  - Verify that the Keysight IO Libraries Suite version 15.5 or higher is installed before proceeding. See “**B. Install the Keysight IO Libraries Suite**” on page 21 for more information on the Keysight IO Libraries Suite installation procedure.
- 

- 1 Verify that your PC meets the minimum system requirements. (See “**A. Check Your System**” on page 19.) Close all other applications on your PC, and ready the *Keysight USB Modular Products and Systems Product Reference DVD-ROM*.
- 2 Insert the *Keysight USB Modular Products and Systems Product Reference DVD-ROM* with into the DVD-ROM drive of your PC. Wait a few seconds for the auto-run window to appear.  
If the auto-run window does not appear automatically,
  - Click **Start > Run...**
  - Type `<drive>:\Autorun.exe`, where `<Drive>` is your DVD-ROM drive letter.
- 3 When the installation start-up window appears, click the “Hardware Driver” button once, and wait for the InstallShield Wizard to appear.



- 4 When the InstallShield Wizard appears, click **Next >** to begin the module driver(s) installation.
- 5 Read the License Agreement(s). If you accept the terms, click the radio button labeled “I accept the terms of the license agreement”, and then click **Next >** to continue.
- 6 Read the Readme Information carefully. Ensure that all USB modular product devices are disconnected from your PC. Click **Next >** to continue.
- 7 When the InstallShield Wizard Setup Type dialog appears, as shown, select **Typical** or **Custom**, and then click **Next >**.

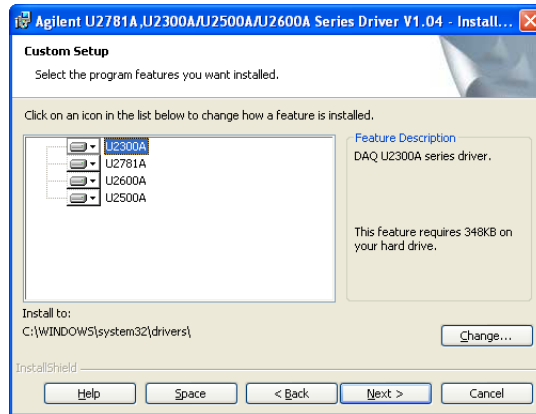


The Typical setup installs the recommended features for your configuration in standard locations on your PC.

**NOTE**

- If you accept the “Typical Installation”, click **Next** and proceed to **step 9**.
- If you chose the “Custom Installation” radio button, click **Next** and proceed with **step 8** below.

- 8 If you chose a Custom setup, you will now see the Custom Setup dialog.
  - a Click on any feature in the list to see the feature description and the space requirements for the selected set of features.
  - b Clear each feature to omit by selecting “This feature will not be available” option. When you are done selecting features, click **Next >**.



- 9 The Ready to Install the Program dialog appears; click **Install** to begin copying files.
- 10 When the InstallShield Wizard Completed dialog appears indicating that the module driver(s) was successfully installed, click **Finish** to close the window.

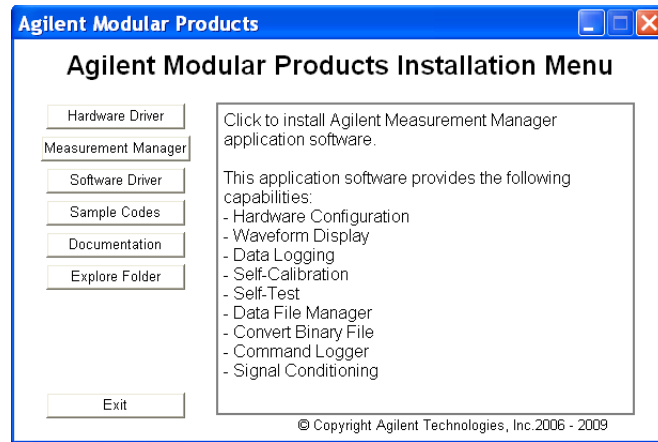
## D. Install the Keysight Measurement Manager

**NOTE**

Verify that the Keysight IO Libraries Suite version 15.5 or higher is installed before proceeding. See “**B. Install the Keysight IO Libraries Suite**” on page 21 for more information on the Keysight IO Libraries Suite installation procedure.

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- 1 If you have performed the module driver installation in “**C. Install the Module Driver**” on page 28 and the Keysight Modular Products Installation Menu is still open, you may proceed to **step 4**. Otherwise, proceed to the next step.
- 2 Verify that your PC meets the minimum system requirements. (See “**A. Check Your System**” on page 19.) Close all other applications on your PC, and ready the *Keysight USB Modular Products and Systems Product Reference DVD-ROM*.
- 3 Insert the *Keysight USB Modular Products and Systems Product Reference DVD-ROM* into the DVD-ROM drive of your PC. Wait a few seconds for the auto-run window to appear.  
If the auto-run window does not appear automatically,
  - Click **Start > Run...**
  - Type **<drive>:\Autorun.exe**, where **<drive>** is your DVD-ROM drive letter.
- 4 When the installation start-up window appears, click the “Measurement Manager” button once, and wait for the InstallShield Wizard to appear.



**NOTE**

Disconnect all modular products from your PC before you proceed.

- 5 If you do not have any of the prerequisites installed, the InstallShield Wizard Software Prerequisite dialog will appear. Click **OK** to begin the installation of the listed missing prerequisites.  
Follow the on-screen instructions to install the listed missing prerequisites. Once the above installation has completed, installation of the Measurement Manager software will proceed as normal.
- 6 When the InstallShield Wizard appears, click **Next >** to begin the Measurement Manager installation.
- 7 Read the License Agreement(s). If you accept the terms, click the radio button labeled “I accept the terms of the license agreement”, and then click **Next >** to continue.
- 8 Fill in the Customer Information Form accordingly, and click **Next**.
- 9 Click **Next** to install to the specified folder, or click **Change** to install to a different folder.
- 10 The Ready to Install the Program dialog appears; click **Install** to begin copying files.



- 11 When the InstallShield Wizard Completed dialog appears indicating that the module driver(s) was successfully installed, click **Finish** to close the window. A shortcut to this software will be created on your desktop.

**NOTE****Licensed Materials Usage**

Using the licensed materials indicates your acceptance of the license terms. If you do not agree to all of these terms, you may return any unopened licensed material for a full refund. If the licensed materials are bundled or pre-loaded with another product, you may return the entire unused product for a full refund.

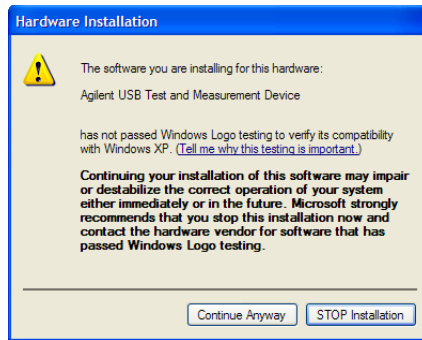
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## E. Connect the Module to Your PC

### NOTE

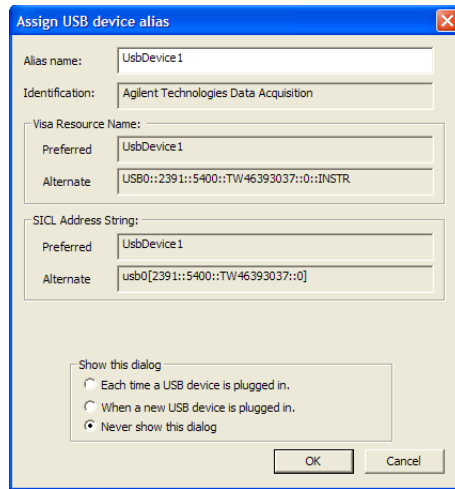
- Ensure that the Measurement Manager is installed before proceeding. See “D. Install the Keysight Measurement Manager” on page 31 for more information on the Measurement Manager installation procedure.
  - The figures shown below are for illustration purposes only and may appear different on your PC depending on your PC’s operating system and the type of modular product(s) connected.
- 

- 1 After all the software and driver installations have completed, connect the power cord to the AC/DC power adaptor. The AC/DC power adaptor requirements are 100 to 240 VAC, 50/60 Hz, with an output voltage of +12 VDC.
- 2 Insert the DC output plug from the AC/DC power adaptor to the power jack on the rear panel of the modular product.
- 3 Connect the modular product to any USB port on your PC with the bundled USB cable.
- 4 Your PC will automatically detect the connected unit, and the Found New Hardware Wizard window will appear. Select the “Yes, this time only” radio button, and click **Next** to proceed.
- 5 Select Install the software automatically (Recommended) and click **Next**.
- 6 A warning message will appear on the Hardware Installation window. Read the warning carefully, and click **Continue Anyway** to proceed with the installation of the modular product.

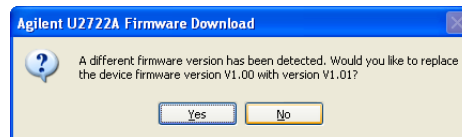
**NOTE**

If you do not wish to receive similar warning messages in the future, follow the instructions below:

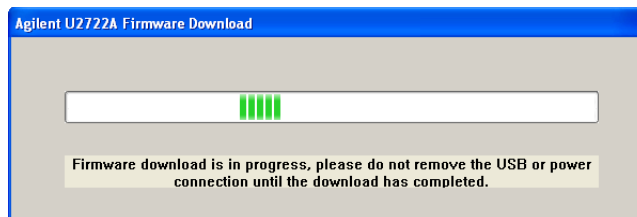
- 1 Click **Start** > **Control Panel**, and double-click the **System** icon.
  - 2 Select the **Hardware** tab, and click **Driver Signing** on the Drivers panel. The Driver Signing Options dialog will appear.
  - 3 Select the “Ignore” radio button to disable the warning message.
- 
- 7 When the Found New Hardware Wizard Completed dialog appears indicating that the device software was successfully installed, click **Finish** to close the window.
  - 8 The Assign USB device alias window will appear. Each time the modular product is plugged in, this dialog will appear. To disable this dialog, select the “Never show this dialog” option in the Show this dialog panel, and click **OK**.



- 9 For modules other than the U2300A Series, U2500A Series, U2600A Series, and the U2781A, the system will perform a firmware version check on your connected module.
- a If the module firmware version is the same as the installed version on the PC, a firmware download will not be performed. The modular product is now ready for use.
  - b If the module firmware version differs from the installed version on the PC, the following message box will appear. The model number and firmware versions shown on the message box may vary depending on the module connected to your PC.



- c Click **Yes** to begin the firmware download. The following message box will appear indicating that the download is in progress. The model number shown on the message box may vary depending on the module connected to your PC.

**CAUTION**

Do not remove the USB and power connection until the firmware download has been completed. Interrupting the firmware download process may result in a device failure.

---


- 10 Your modular product is ready for use once the firmware download and upgrade has been completed.

## F. Verify Your Module Connection

### NOTE

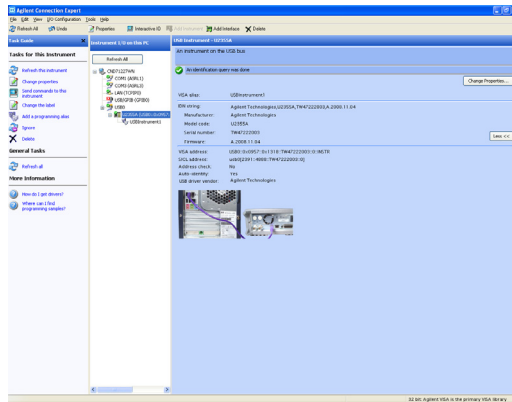
The figures shown below are for illustration purposes only and may appear different on your PC depending on your PC's operating system and the type of modular product(s) connected.

The Connection Expert is one of the utilities in the Keysight IO Libraries Suite. The Connection Expert configures the connected instrument(s) and enables communication. It is able to automatically detect any modular product plugged into the PC.

- 1 Apply power to the PC and to the installed modular product(s).
- 2 If the Connection Expert is already running, click **Refresh All** to identify any hardware you have just installed or re-connected.
- 3 If the Connection Expert is not already running, run it now to verify your I/O configuration(s): In the Windows Notification area, click the IO icon () , and then click **Keysight Connection Expert**.

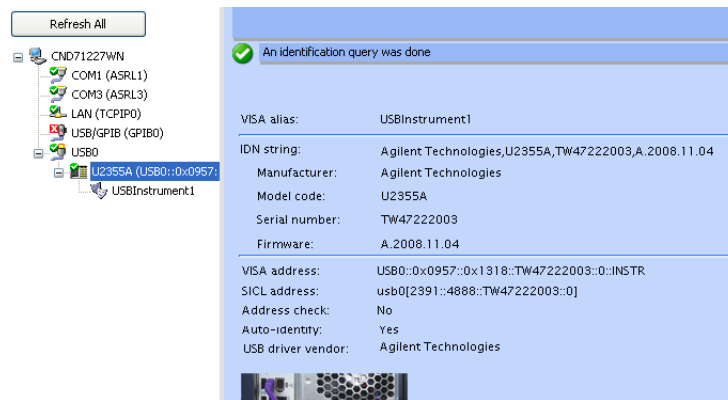


- 4 When the main screen appears, you will see a map of the system connections in the Instrument I/O on this PC pane (also called the “Explorer Pane”).



- The detected modular product will be visible on the Instrument IO the Explorer Pane.

When you select a particular instrument in the Explorer Pane, you will see the parameters of the instrument in the Properties Pane on the right – such as the model number of the product, serial number, VISA address, GPIB address, and firmware revisions.



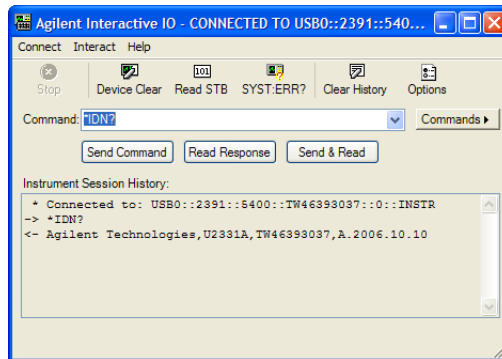
The green check mark icon at the top signifies that a listener check and identification (\*IDN) query were performed automatically.

- 6 We will use the Interactive IO to quickly verify the connectivity to your instrument. The Interactive IO is a software utility that allows you to interact with an instrument by sending commands to the instrument and seeing the instrument's responses.

To start the Interactive IO from within Connection Expert, click **Tools > Interactive IO** from the Connection Expert menu bar, or right-click on the modular product in the Explorer Pane. A context menu will appear. Select **Send Commands To This Instrument**.



- 7 The Interactive IO dialog will appear. Click **Send & Read** to send the \*IDN? default command. The instrument response should appear in the Instrument Session History panel.



- 8 If the Connection Expert can successfully communicate with your modular product, this indicates that the instrument is installed correctly.



## G. Launch the Keysight Measurement Manager

**NOTE**

**The IO Control will launch automatically when you start your PC**

Launching the Measurement Manager without running the IO Control will cause failure in communicating with any USB modular product connected to your PC. To run the IO Control, go to **Start > All Programs > Keysight IO Libraries Suite > Utilities > IO Control**.

---

**NOTE**

The figures shown below are for illustration purposes only and may appear different on your PC depending on your PC's operating system and the type of modular product(s) connected.

---

- 1 Double-click the Measurement Manager software icon on your desktop or go to **Start > All Programs > Keysight > Modular Products > Keysight Measurement Manager** to launch the software.
- 2 The Measurement Manager welcome screen will appear.



- 3 The Select USB Device dialog will appear displaying the connected modular product. To start the application, select the modular product and click **OK** to establish a connection. The model number shown on the Available USB Devices pane may vary depending on the module(s) connected to your PC.

## 1 Keysight USB Modular Products and Systems

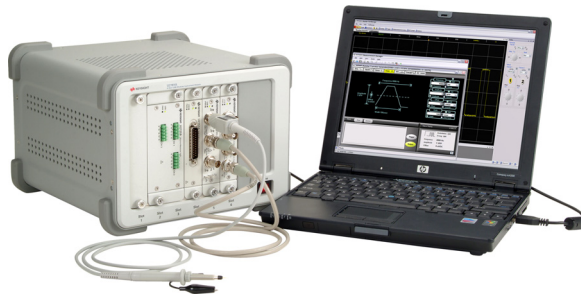
- 
- 
- 
- 4 The Measurement Manager will launch the appropriate measurement application depending on the USB modular product selected. See the *Keysight Measurement Manager Help File* for further information pertaining to your modular product application software.



## USB USB Modular Products and Systems Chassis

The Keysight U2781A USB modular products chassis is a portable chassis that is able to house up to six USB modular devices. It is equipped with USB plug-and-play connectivity and is compliant to the USBTMC-USB488.2 standards <sup>[1]</sup>, allowing it to work seamlessly with the Measurement Manager software.

Purchasing a U2781A chassis enables you to add synchronization capability between modules via a star trigger bus. For more details on the U2781A chassis, refer to the *Keysight U2781A USB Modular Products Chassis User's Guide*.



**Figure 1-3** The U2781A chassis connected to a PC

### Chassis installation

The L-Mount kit is to be installed on your module. The following instructions describe the simple procedure of installing the L-Mount kit and your module into the U2781A chassis.

- 1 Unpack the L-Mount kit from the packaging.
- 2 Remove your module from the bumper casing.
- 3 Using a Phillips screwdriver, fasten the L-Mount kit to your module.

[1] Compatible with Microsoft Windows operating systems only.

- 4 Insert your module into the U2781A chassis with the 55-pin backplane connector positioned at the bottom of the module. See the [55-pin backplane connector pin configuration](#) for more information.
- 5 Once you have slotted in the module, tighten the screws on the L-Mount kit to secure the connection to the chassis.

### 55-pin backplane connector pin configuration

The 55-pin backplane connector is used when your module is slotted into the U2781A chassis. Refer to [Table 1-1](#) for the SSI connector pin descriptions.

GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	<b>F</b>
NC	NC	NC	NC	NC	NC	NC	NC	VBUS	GND	USB_D-	<b>E</b>
GND	TRIG3	GND	TRIG2	GND	TRIG1	GND	TRIG0	GND	GND	USB_D+	<b>D</b>
TRIG4	GND	TRIG5	GND	TRIG6	GND	TRIG7	GND	+12 V	+12 V	GND	<b>C</b>
nBPUB	CLK10M	GND	STAR_TRIG	GA2	GA1	GA0	NC	+12 V	+12 V	+12 V	<b>B</b>
NC	NC	NC	NC	NC	NC	NC	NC	+12 V	+12 V	+12 V	<b>A</b>
<b>11</b>	<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	

**Figure 1-4** 55-pin backplane connector pin configuration

**Table 1-1** SSI connector pin description

SSI timing signal	Functionality
GND	Ground
NC	Not connected
VBUS	USB bus power sensing input
USB_D+, USB_D-	USB differential pair
TRIG0 ~ TRIG7	Trigger bus
+12 V	+12 V power with 4 A current
nBPUB	USB backplane input detect
CLK10M	10 MHz clock source
STAR_TRIG	Star trigger
GA0, GA1, GA2	Geographical address pin

## Additional Information

### Windows 7

When installing the Keysight USB Modular Instrument driver on a computer running Windows 7, you may experience the following issues:

- Driver installation failure.
- Computer-to-hardware connection failure after a successful driver installation.

If these issues arise, refer to the steps below:

- 1** Compare the file size of the downloaded setup file with the file size as stated on the Web. If the size of the downloaded setup file is smaller, this may indicate that the setup file is corrupted. In this case, download the setup file again and cross-check the file size before proceeding with installation.
- 2** Ensure that you are logged into your computer with Administrator privileges.
- 3** Set the User Account Control (UAC) to the lowest security level to prevent the operating system from interfering with the installation program.
- 4** Ensure that your computer is running the latest version of IO Libraries Suite (version 16.2 or greater).
- 5** Reinstall the latest version of AMM with prerequisites (version 2.2.1.0 or greater).

If you are still unable to establish a successful connection after following the steps above, please contact your nearest Keysight Support toll-free number.

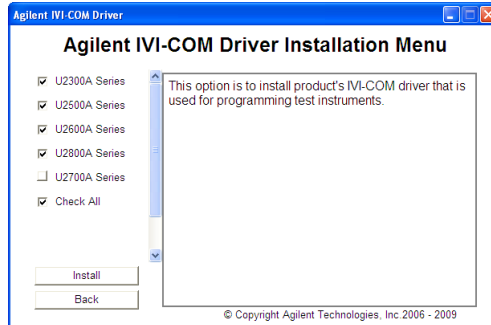
### Software drivers

Software components and applications for IVI-COM drivers and MATLAB DAQ Adaptors are provided with the *Keysight USB Modular Products and Systems Product Reference DVD-ROM*.

The IVI-COM drivers are used to program the test instruments in an IVI-COM environment, while the MATLAB DAQ Adaptor allows the data acquisition modular products (U2300A Series, U2500A Series, and U2600A Series) to be controlled in a MathWorks environment.

## To install the IVI-COM drivers

Select **Software Driver > IVI-COM** on the Keysight Modular Products Installation Menu, and select the check box for each product series to be installed. Clear the check box for each product series to omit.



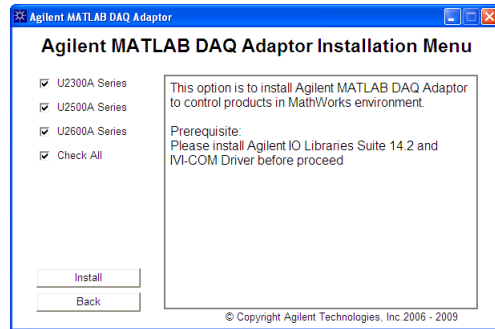
**Figure 1-5** Keysight IVI-COM Driver Installation Menu

### NOTE

- The IVI Shared Components must also be installed prior to installing the IVI-COM driver. Find the IVI Shared Components at the IVI website here: [www.ivifoundation.org](http://www.ivifoundation.org).
- If needed, the IVI-COM driver may also be downloaded from this site: [www.keysight.com/find/ivi-com](http://www.keysight.com/find/ivi-com).

## To install the MATLAB DAQ Adaptor

Select **Software Driver** > **MATLAB** on the Keysight Modular Products Installation Menu, and select the check box for each product series to be installed. Clear the check box for each product series to omit.



**Figure 1-6** Keysight MATLAB DAQ Adaptor Installation Menu

### NOTE

In order to use these devices with MATLAB, you need to install the MATLAB and Keysight software components and applications, connect the DAQ modular product, and install the respective drivers. A MATLAB example is provided at:

- [www.keysight.com/find/matlab\\_u2300a](http://www.keysight.com/find/matlab_u2300a) for the U2300A Series DAQ
- [www.keysight.com/find/matlab\\_u2500a](http://www.keysight.com/find/matlab_u2500a) for the U2500A Series DAQ
- [www.keysight.com/find/matlab\\_u2600a](http://www.keysight.com/find/matlab_u2600a) for the U2600A Series DIO

### NOTE

- For more information on how to install the MATLAB DAQ Adaptor, see the respective product series' *Using the USB Multifunction Data Acquisition Devices with MATLAB Software Quick Start Guides*.
- You can install the MATLAB software directly from the MATLAB installation DVD-ROM or from the MathWorks website. If you do not already have the MATLAB or MATLAB's Data Acquisition Toolbox software, you can request a trial version at: [www.mathworks.com/keysight/daq/tryit.html](http://www.mathworks.com/keysight/daq/tryit.html)

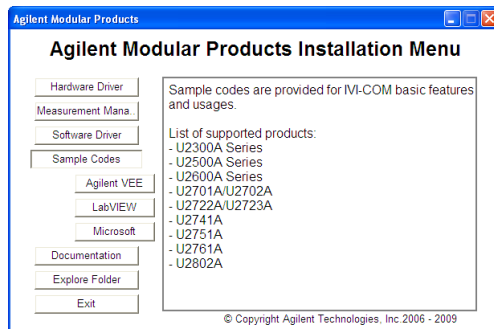


## Sample codes

Sample codes for the Keysight VEE, LabVIEW, and Microsoft (C#, C++, VB7, and VB6) software platforms are provided to help you get started with your modular product.

### To view the sample codes

Select **Sample Codes** on the Keysight Modular Products Installation Menu, and choose the preferred programming language type as shown in the following figure.

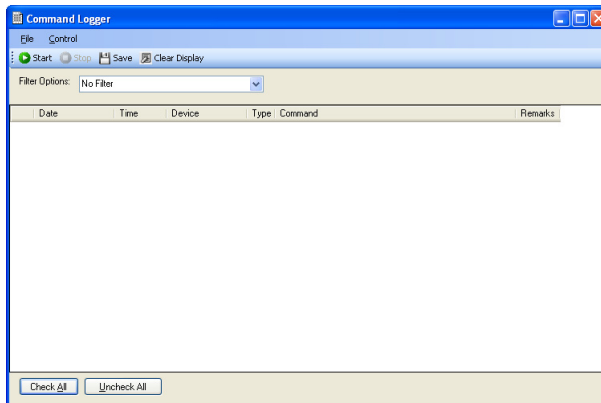
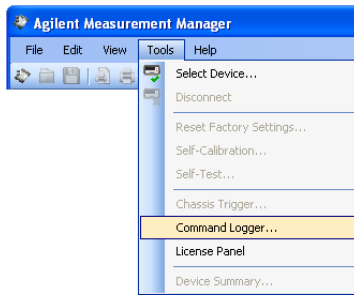


**Figure 1-7** Viewing the sample codes

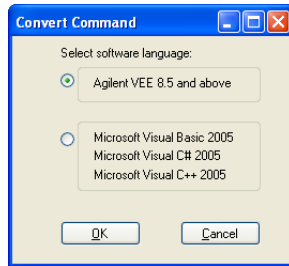
## Command logger and code converter

The Measurement Manager offers you quick and easy configuration and control without the need for programming work. To further simplify your work, you can use the provided Command Logger function that logs the configuration commands and easily convert them to snippets of Keysight VEE, Microsoft Visual Basic, Microsoft Visual C#, or Microsoft Visual C++ codes.

- To launch the Command Logger function: launch the Measurement Manager, and go to **Tools > Command Logger...**



- To convert the logged commands in to other languages: from the Command Logger window, click **File** > **Convert Command File**.

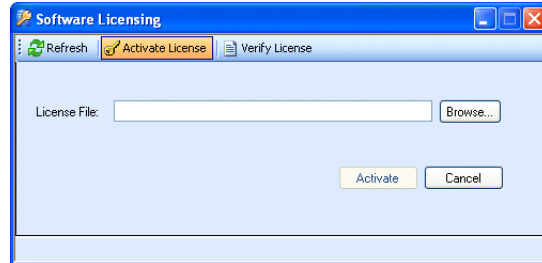
**NOTE**

For more information on how to use the Command Logger application, refer to the *Keysight Measurement Manager Help File*.

---

## Activate your device license

If you have purchased a with an Option, you are required to activate the device license before you can use its additional feature(s). You may activate the device license through the Software Licensing application in the Measurement Manager.

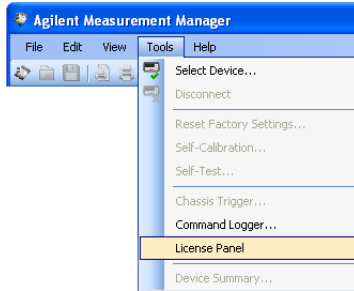


**Figure 1-8** Software Licensing application

### NOTE

- You do not need to perform this procedure if you have not purchased a modular product with an Option. Please refer to the respective User's Guide of your modular product to find out more about the Option(s) available with your modular product.
- If you do not wish to install the Measurement Manager, you will need to launch the Software Licensing stand-alone installer. Select **Software Licensing** on the Keysight Modular Products Installation Menu, and follow the instruction on-screen.

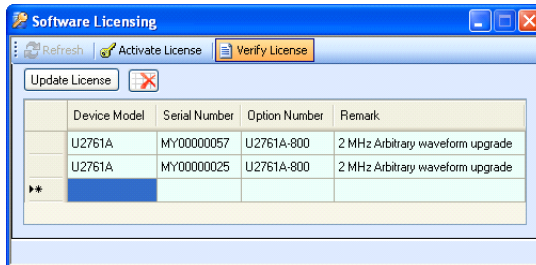
- To activate your device license, launch the Measurement Manager and go to **Tools > License Panel**.



**NOTE**

You will require a valid device license key (\*.lic). If you do not have a device license key, you will need to redeem your device license key at [www.keysight.com/find/softwarelicense](http://www.keysight.com/find/softwarelicense). Follow the on-screen instructions to redeem a valid license key for your device.

- To verify your device license(s) from the Software Licensing window, click **Verify License > Update License**.



**NOTE**

For more information on how to use the Software Licensing application, refer to the *Keysight Measurement Manager Help File*.

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This information is subject to change without notice. Always refer to the Keysight website for the latest revision.

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Edition 6, July 1, 2017

Printed in Malaysia



U2702-90001

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