# Keysight U2781A USB Modular Instrument Chassis

Quick Start Guide

KEYSIGHT TECHNOLOGIES

NOTICE: This document contains references to Agilent Technologies. Agilent's former Test and Measurement business has become Keysight Technologies. For more information, go to **www.keysight.com.**

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**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

| | | | |
|---|---|---|---|
| | Protective conductor terminal | | Caution, risk of danger (Refer to U2781A User's Guide for more details) |
| | On (supply) | | Off (supply) |

# Safety Information

This U2781A complies with safety and EMC requirements.

Refer to Declaration of Conformity at http://www.keysight.com/go/conformity for the latest revision.

**WARNING**

- Do not use the device if it is damaged. Before you use the device, inspect the case. Look for cracks or missing plastic. Do not operate the device around explosive gas, vapor, dust, or wet environment.
- Do not apply more than the rated voltage (as marked on the device) between terminals, or between terminal and external ground.
- Always use the device with the cables provided.
- Observe all markings on the device before connecting to the device.
- Turn off the device and application system power before connecting to the I/O terminals.
- When servicing the device, use only specified replacement parts.
- Do not operate the device with the removable cover removed or loosened.
- Do not connect any cables and terminal block prior to performing self-test process.

**CAUTION**

- Do not load the output terminals above the specified current limits. Applying excessive voltage or overloading the device will cause irreversible damage to the circuitry.
- Applying excessive voltage or overloading the input terminal will damage the device permanently.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Do not permit any blockage on the ventilation holes.
- The instrument is designed for use in Overvoltage Category II and Pollution Degree 2.
- The input voltage range for the instrument is 100 to 240 VAC. Mains supply voltage fluctuations are not to exceed ±10% of the nominal supply voltage.

# Regulatory Markings

| | | | |
|---|---|---|---|
| CE<br>ISM 1-A | The CE mark shows that the product complies with all the relevant European legal Directives (if accompanied by a year, it signifies when the design was proven). | | The RCM mark is a registered trademark of the Australian Communications and Media Authority. |
| <br>C US | The CSA mark is a registered trademark of the Canadian Standards Association. A CSA mark with the indicators “C” and “US” means that the product is certified for both the U.S. and Canadian markets, to the applicable American and Canadian standards. | | This product complies with the WEEE Directive (2002/96/EC) marking equipment. The affixed product label indicates that you must not discard this electrical/ electronic product in domestic household waste. |
| | This symbol is a South Korean Class A EMC Declaration, with the product identification code “KCC-REM-ATI-WCDAQ”.<br>This is a Class A instrument suitable for professional use and in electromagnetic environment outside of the home.<br>A급 기기<br>(업무용 방송통신기자재)<br>이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다. | | 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. |
| **ICES/NMB-001** | This ISM device complies with the Canadian ICES-001. | | |

For further information on safety, refer to **Safety Information** in the *Keysight U2781A Modular Instrument Chassis User’s Guide*.

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# Introduction

Keysight U2781A USB modular instrument chassis fits into 4U rack mount flange kit with the ability to house up to six Keysight USB modular devices. It is a portable chassis with high performance added values. It targets a wide range of applications in both industrial and scientific environments. It helps you lower the costs of your test and accelerate your test system's integration and development.

This quick start guide provides an overview of the U2781A USB modular instrument chassis. This guide also includes the chassis specifications and step-by-step instructions on how to get started with the chassis.

## Standard Purchase Items Checklist

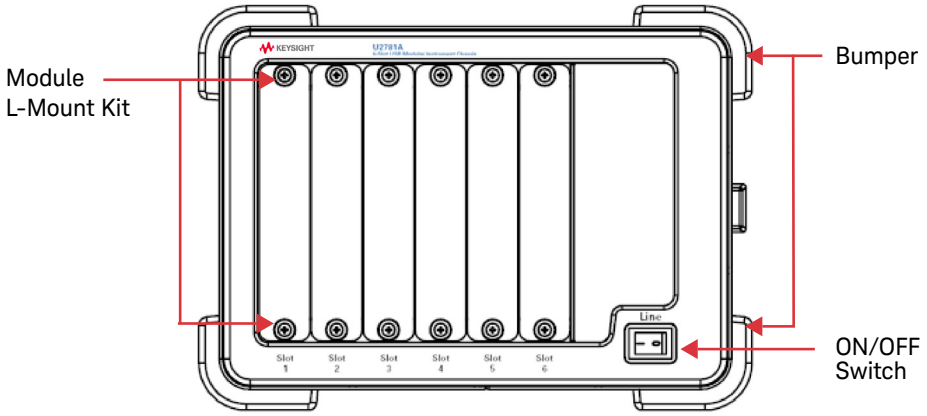
Verify that you have received the following items with the U2781A USB modular instrument chassis purchase. If anything is missing or damaged, please contact the nearest Keysight Sales Office.

- ✔ Power cord
- ✔ USB extension cable

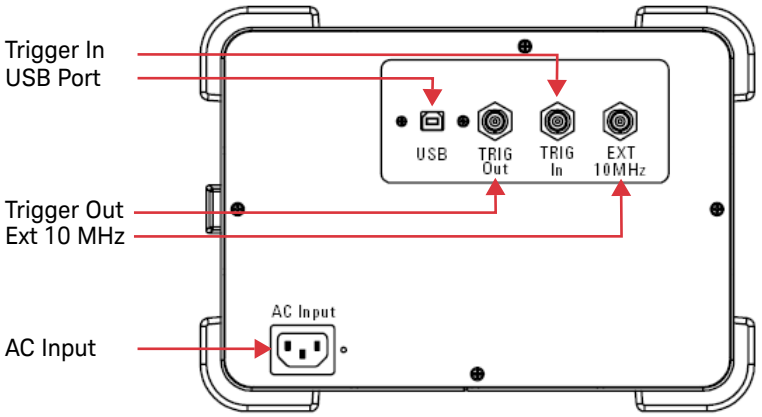
# Product at a Glance

## Product outlook

### Front view




### Rear view



# Product General Specifications

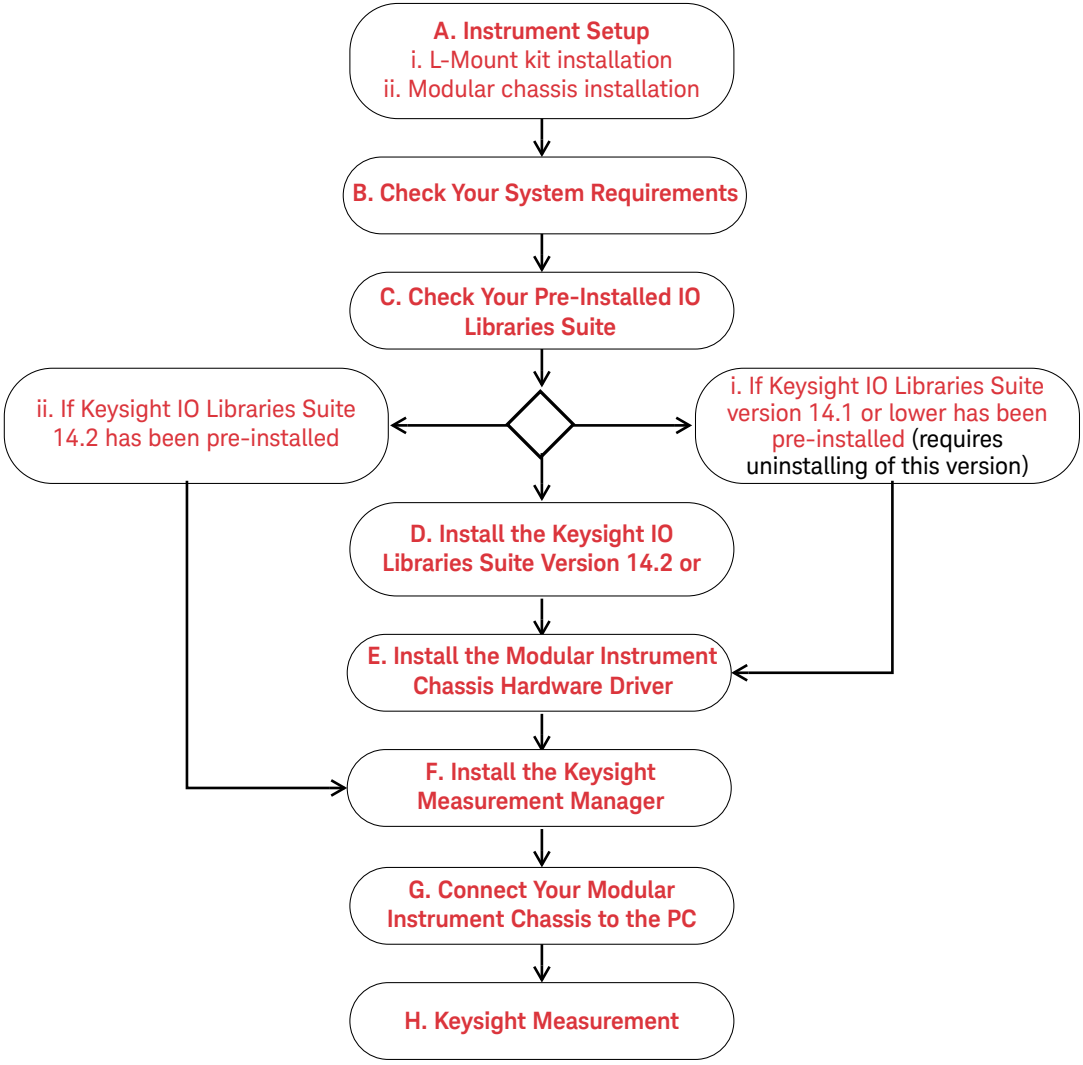
| | |
|---|---|
| **REMOTE INTERFACE** | – Hi-Speed USB 2.0<br>– USBTMC Class Device |
| **OPERATING ENVIRONMENT** | – Operating temperature from 0 °C to +55 °C<br>– Relative humidity at 15% to 85% RH (non-condensing)<br>– Altitude up to 2000 meters<br>– Pollution Degree 2<br>– For indoor use only |
| **STORAGE COMPLIANCE** | –20 °C to 70 °C |
| **SAFETY COMPLIANCE** | Certified with:<br>– IEC 61010-1:2001/EN 61010-1:2001 (2nd Edition)<br>– USA: UL61010-1: 2004<br>– Canada: CSA C22.2 No.61010-1:2004 |
| **EMC COMPLIANCE** | – IEC/EN 61326-1 1998<br>– CISPR 11: 1990/EN55011:1991, Class A, Group 1<br>– CANADA: ICES-001: 1998<br>– Australia/New Zealand: AS/NZS 2064.1 |
| **ACOUSTIC EMISSION** | – Sound pressure level: 45.5 dB(A)<br>– Sound power level: 56.6 dB(A) |
| **SHOCK & VIBRATION** | Tested to IEC/EN 60068-2 |
| **DIMENSION (W×D×H)** | 270.00 mm x 271.20 mm x 197.00 mm |
| **WEIGHT** | – 3.7 kg (without any modules slotted in)<br>– 6.0 kg (with maximum six modules slotted in) |
| **WARRANTY** | Three years |

# Installations and Configurations

If you are using the U2781A USB modular instrument chassis with the Keysight Measurement Manager, follow the step-by-step instructions as shown in the following flowchart.

**NOTE**

- If you do not wish to specifically use the U2781A USB modular instrument chassis with the Keysight Measurement Manager software, and use the DAQ devices with Keysight VEE, LabVIEW, or Microsoft Visual Studio only, you can skip steps F and H in the following flowchart.
- You need to install IVI-COM driver before using the U2781A Series with Keysight VEE, LabVIEW or Microsoft Visual Studio.


A. Instrument Setup
i. L-Mount kit installation
ii. Modular chassis installation
B. Check Your System Requirements
C. Check Your Pre-Installed IO Libraries Suite
ii. If Keysight IO Libraries Suite 14.2 has been pre-installed
i. If Keysight IO Libraries Suite version 14.1 or lower has been pre-installed (requires uninstalling of this version)
D. Install the Keysight IO Libraries Suite Version 14.2 or
E. Install the Modular Instrument Chassis Hardware Driver
F. Install the Keysight Measurement Manager
G. Connect Your Modular Instrument Chassis to the PC
H. Keysight Measurement

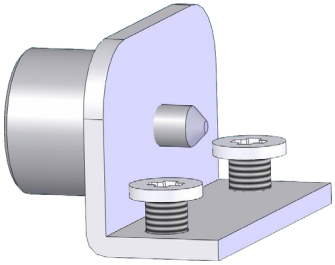
## i. L-Mount kit installation

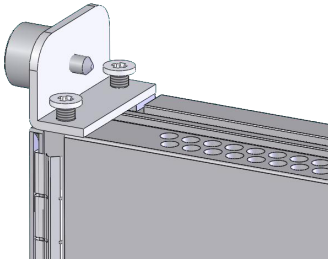
In order to slot in any modular devices (U2300A, U2500A, U2600A, U2700A Series) into the U2781A USB modular instrument chassis, you need to fix the L-Mount kit on both sides of any modular devices. The L-Mount kit is provided when you purchase the modular devices.

Follow the two simple step-by-step instructions to install the L-Mount kit to the modular devices. Proceed to **ii. Modular chassis installation** to learn how to slot a modular device into the chassis.

**Step 1**

**Use the L-Mount kit that is provided with the modular device**



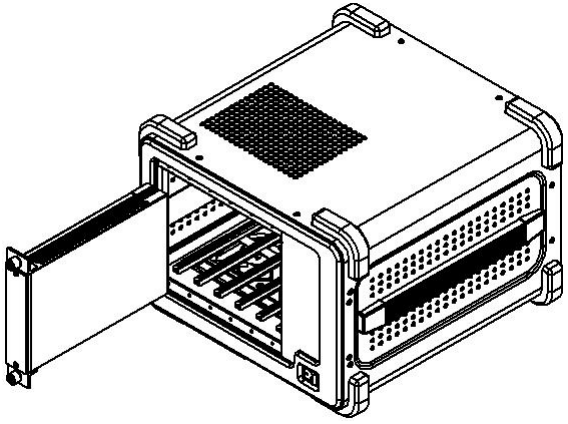


**Step 2**

**Tighten the L-Mount kit on both sides of the USB modular device**

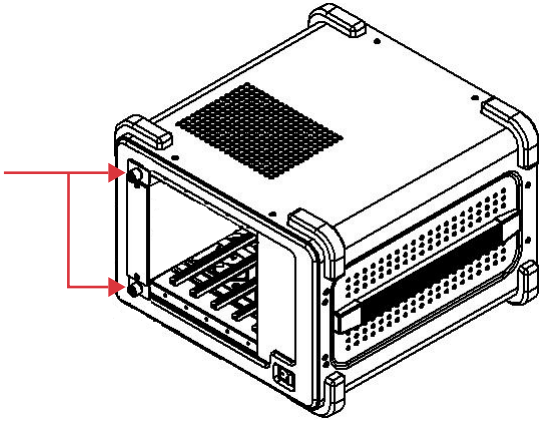
## ii. Modular chassis installation

The figures below shows the procedure of installing the USB modular devices into the U2781A modular instrument chassis.



**Slot in the modular device into the modular chassis. Make sure that the 55-pin backplane connector is at the bottom.**

**Secure both the thumb screws onto the modular chassis.**



## B. Check Your System Requirements

Before installing the Keysight Measurement Manager software and the DAQ hardware driver, make sure your PC meets the following minimum system requirements for installation and data acquisition.

| | |
|---|---|
| **Processor** | 1.6 GHz Pentium® IV or higher |
| **Operating system** | One of the following Microsoft® Windows® versions:<br>– Windows® XP Professional or Home Edition, Service Pack 1 or later<br>– Windows® 2000 Professional, Service Pack 4 or later |
| **Browser** | Microsoft® Internet Explorer 5.01 or higher |
| **Available RAM** | 512 MB or higher recommended |
| **Hard disk space** | 1 GB |
| **Pre-requisite** | Keysight IO Libraries Suite 14.2 or higher, Keysight T&M Toolkit 2.1 Runtime version, Keysight T&M Toolkit Redistributable Package 2.1 patch, Microsoft® .NET Framework version 1.1 and 2.0 |

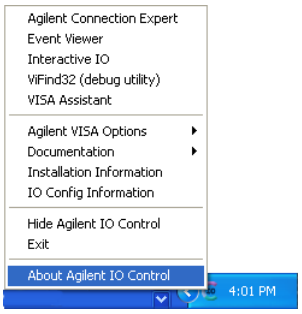
**NOTE**

- The Keysight T&M Toolkit 2.1 Runtime, and Microsoft® .NET Framework 1.1 and 2.0 are bundled with the Keysight Measurement Manager software installer.
- If you do not have Keysight T&M Toolkit 2.1 Runtime, or Microsoft® .NET Framework 1.1 and 2.0 installed in your PC, launching the Keysight Measurement Manager software installation, as instructed in **F. Install the Keysight Measurement Manager**, will prompt for installation of these tools.

## C. Check Your Pre-Installed IO Libraries Suite

To check the version of your pre-installed IO Libraries Suite follow the instructions below.

1 Right-click IO Control icon on your taskbar notification area and the context menu will appear as shown below. Select **About Keysight IO Control**.




2 Keysight IO Control window will appear and the version of installed IO Libraries Suite will be displayed as shown below.

**NOTE**

If the Keysight IO Control icon is not visible on the taskbar notification area it may indicates that,

- you do not have the Keysight IO Libraries installed, or
- you have hidden the Keysight IO Control icon from the taskbar notification area.

To activate the icon, go to **Start** › **All Programs** › **Keysight IO Libraries Suite** › **Utilities** › **IO Control**. You will now see the Keysight IO Control icon appear on your taskbar notification area.

### i. If Keysight IO Libraries Suite version 14.1 or lower has been pre-installed

If you have Keysight IO Libraries Suite version 14.1 or lower installed on your PC, you are required to uninstalling the IO Libraries Suite.

1. To uninstall, go to **Start > Control Panel > Add or Remove Programs**. The Add or Remove Programs window will appear select Keysight IO Libraries Suite 14.1 or lower version.
2. Click **Change/Remove** and select **Remove** when the instructions on the screen prompted to proceed uninstalling the IO Libraries Suite version 14.1 or lower from your PC.
3. Proceed to **D. Install the Keysight IO Libraries Suite Version 14.2 or Higher**.

### ii. If Keysight IO Libraries Suite 14.2 has been pre-installed

If you have the IO Libraries Suite 14.2 pre-installed on your PC, skip Step D and proceed to **E. Install the Modular Instrument Chassis Hardware Driver**.

### iii. If Keysight IO Libraries Suite is not installed

If you do not have IO Libraries Suite installed on your PC, go to **D. Install the Keysight IO Libraries Suite Version 14.2 or Higher**.

## D. Install the Keysight IO Libraries Suite Version 14.2 or Higher

This section describes how to install the Keysight IO Libraries Suite on your PC. The Keysight IO Libraries Suite is a collection of libraries and utilities that gives you the ability to use your instruments from instrument control software. You should install the Keysight IO Libraries Suite as your first step before installing the hardware because it installs the necessary software and drivers to control your instruments.

If possible, always use the most recent version of the Keysight IO Libraries Suite. This version supports the newest interfaces and operating systems, and has the most advanced features.

**NOTE**

- **Verify that your PC meets the minimum system requirements. Refer to the IO Libraries Web page at www.keysight.com/find/iosuite or the IO Libraries Suite Readme**
- **Ensure that you do not have any USB module connected to your PC during installation of the Keysight IO Libraries Suite.**

1. Disconnect any USB module that is connected to your PC and close all other applications on your PC.
2. Download and install the IO Libraries software from www.keysight.com/find/iosuite. Save the self-extracting zip file (*.exe) to any location on your hard disk.
3. Double-click the installation file to launch the installation.
4. Follow the instructions on your screen to proceed with the installation.
5. After the installation is completed, you will see the IO Control icon on the Windows taskbar notification area as shown below.

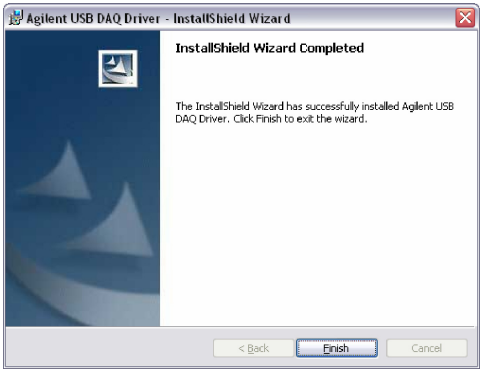
**NOTE** For detailed installation instructions, refer to the *Keysight IO Libraries Suite Getting Started Guide* at http://www.keysight.com/find/iolib.

## E. Install the Modular Instrument Chassis Hardware Driver

1. Verify that your PC meets the minimum system requirements as stated in **B. Check Your System Requirements**.
2. Download and install the hardware driver from https://www.keysight.com/us/en/support/U2781A/usb-modular-product-chassis.html#drivers.
3. The installer will automatically launch the Keysight Modular Products Installation Menu. Select **Hardware Driver** to begin the hardware driver installation.
4. The Keysight USB DAQ Driver dialog box will appear as shown below. Click **Next** to proceed. This will install the chassis and DAQ drivers.

5 Click **Install** to begin installation.

6 Click **Finish** when the installation has completed.

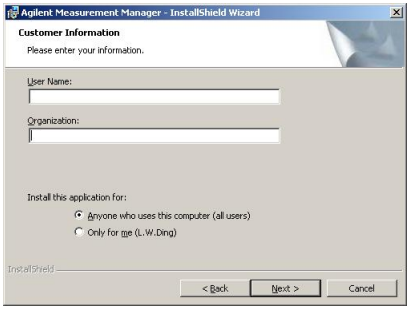


## F. Install the Keysight Measurement Manager

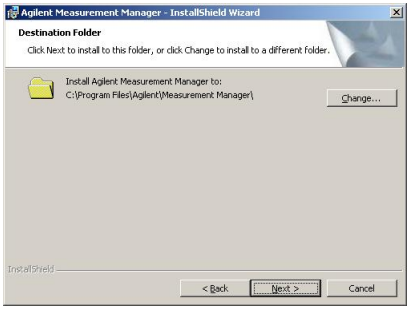
1. If you have done **E. Install the Modular Instrument Chassis Hardware Driver**, proceed to Step 2.
2. Download and install the Keysight Measurement Manager from https://www.keysight.com/us/en/support/U2781A/usb-modular-product-chassis.html#drivers.
3. If you do not have the Keysight T&M Toolkit 2.1 Runtime version and/or Microsoft .NET Framework version 1.1 and 2.0 installed, click to download installer package with software prerequisites.
4. The Keysight Measurement Manager InstallShield Wizard dialog box will appear as shown below. Click **Next** to begin.

5. Read the License Agreement and select **I accept the terms in the License Agreement** to proceed. You may click **Print** to print a hardcopy of the Keysight License Terms for reference. Click **Next** to proceed.

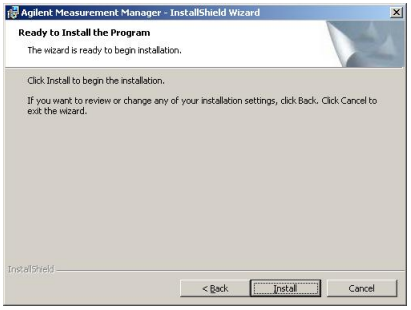
6 Fill in the Customer Information form, as shown below, accordingly and click **Next**.



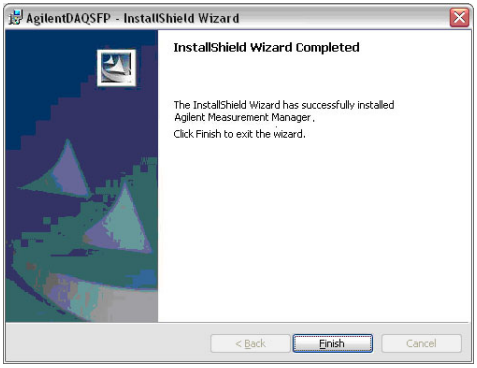

7 Click **Next** to install to the folder specified or click **Change** to install to a different folder.




8 Click **Install** to begin the installation of Keysight Measurement Manager.



**9** Click **Finish** when the installation has completed.




**10** A shortcut to this software will be created on your desktop.

**NOTE** 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 MATERIALS 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.

## G. Connect Your Modular Instrument Chassis to the PC

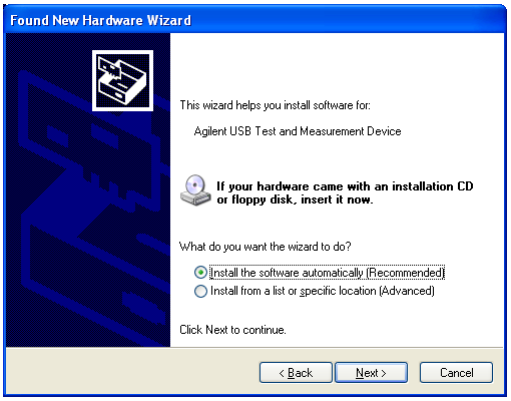
**1** After all installations have successfully completed, connect the power cord to the AC input of the chassis device you have set up in Step A. Instrument Setup. The AC input requirement is 110 V/240 VAC, 50/60 Hz.

**2** Connect the modular instrument chassis to any USB ports on your PC with the bundled USB cable.

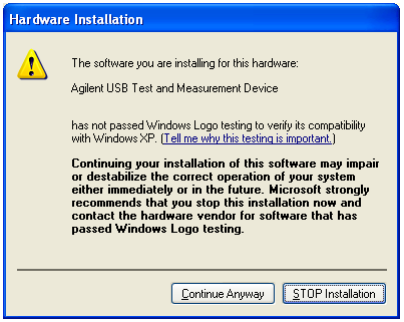
3 Your PC will automatically detect the connected chassis and the Found New Hardware Wizard window will appear as shown below.

4 Select **Yes, this time only** and click **Next** to proceed.

5 Select **Install the software automatically (Recommended)** and click **Next**.



6 A warning message will appear in the Hardware Installation window, as shown below. Click **Continue Anyway** to proceed with the installation of the driver.

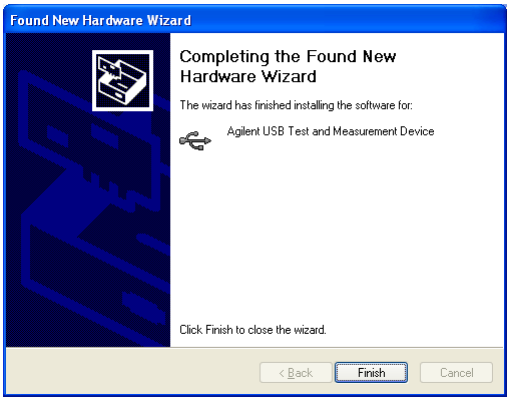



**NOTE**

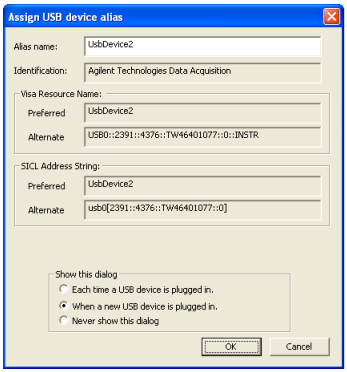
If you do not wish the receive similar warning message in future, follow the instructions below.

- Go to **Start** > **Control Panel** and double-click System.
- Select Hardware tab, on the Drivers panel click **Driver Signing** and the Driver Signing Options dialog box will appear.
- Select **Ignore** to disable the warning message.

7 Click **Finish** when the installation has completed.




8 When the installation has completed, the Assign USB device alias window will appear as shown below. Each time a USB device is plugged in, this dialog will be shown. To configure or disable this dialog, select an options in the Show this dialog panel and click **OK**.




9 The modular instrument chassis is now ready for usage.

**NOTE**

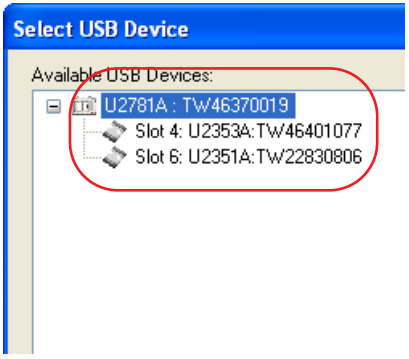
- Before proceeding, you may verify your connected modular instrument chassis using Keysight Connection Expert.
- For more information on hardware verification, refer to **H. Hardware Verification** in *Keysight U2781A USB Modular Instrument Chassis User's Guide*.

## H. Keysight Measurement Manager

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

2 The Keysight Measurement Manager welcome screen will appear as shown below.

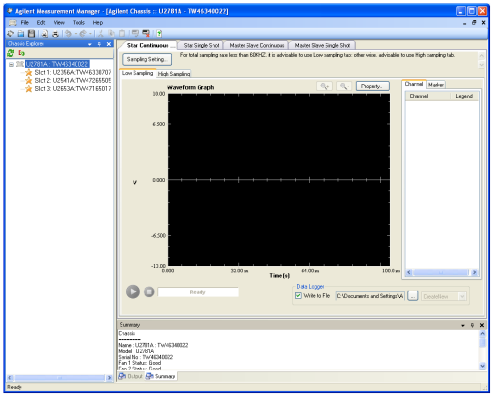
3 The Select USB Device dialog box will appear. It will show all USB modules that are connected to your PC as shown below.




4 If an empty chassis is connected to your PC, slot in at least one USB module into your chassis and click **Refresh**.

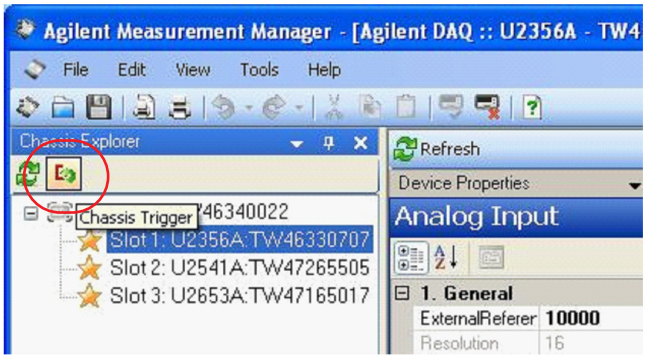
5 To start the application, click **OK** to establish the connection.

6 The Keysight Measurement Manager window will appear as shown in the following figure. On the chassis Explorer panel, you will see a list of devices that are connected to your PC.



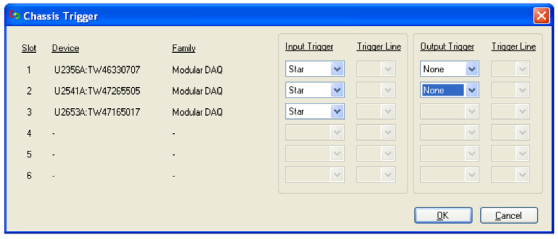
## Trigger mode configuration

The chassis default trigger setting is set to Star Trigger for all U2300A, U2500A, U2600A, and U2700A Series devices upon connection. To configure the trigger mode, click on the Chassis Trigger in the Chassis Explorer and a pop-up menu will appear as shown below. Select the desired trigger mode—Star Trigger[1], Master or Slave[2], and None when no trigger is required.




[1] U2781A offers star trigger bus that aims to provide high performance synchronization features that can be configured via Keysight Measurement Manager.

[2] Master/Slave trigger mode allows one of the modules to be set as the trigger source (Master), while other modules are configured to listen to the trigger bus for the trigger signal (Slave).




**NOTE** For more information on how to use Keysight Measurement Manager, refer to *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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