

Keysight U2802A 31-Channel Thermocouple Input Device

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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

	Direct current		Alternating current
	Both direct and alternating current		Three-phase alternating current
	Earth (ground) terminal		Protective conductor terminal
	Frame or chassis terminal		Equipotentiality
	On (Supply)		Off (Supply)
	Equipment protected throughout by double insulation or reinforced insulation		Caution, risk of electric shock
	Caution, hot surface		Caution, risk of danger (See note.)
	In position of a bi-stable push control		Out position of a bi-stable push control

Safety Information

This 31-channel thermocouple input device is safety-certified in compliance with:

- IEC 61326:2002 / EN 61326:1997+A1:1998+A2:2001+A3:2003
- CISPR 11: 1990/EN55011:1990 [Radiated emission]
- CANADA: ICES-001: 2004
- Australia/New Zealand: AS/NZS CISPR11:2004

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 or dust.
 - Do not apply more than the rated voltage 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.
 - Use only the power adapter supplied by the manufacturer to avoid any unexpected hazards.
-

CAUTION

- Do not load the input and output terminals above the specified operating limits. Input terminals should not exceed ± 10 V with respect to the module ground.
 - 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 device is used in a manner not specified by the manufacturer, the protection provided by the device may be impaired.
 - The U2802A can only be used with U2355A or U2356A DAQs and used with the SCSI cables provided.
 - 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

	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 directive.	ICES/NMB-001	ICES/NMB-001 indicates that this ISM device complies with Canadian ICES-001.
	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.		The UL Mark is a registered trademark of Underwriters Laboratories Inc. UL listing mark with the indicators "C" and "US" indicates the product compliance with both Canadian and U.S. requirements.
	The RCM mark is a registered trademark of the Australian Communications and Media Authority.		This product complies with the (2002/96/EC) marking equipment. The affixed product label indicates that you must not discard this electrical/electronic product in domestic household waste.

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Introduction to Keysight U2802A

The Keysight U2802A 31-Channel Thermocouple Input is a thermocouple input device that functions to convert low input voltage signal ($< \pm 100$ mV) from a thermocouple into an output voltage range suitable for data acquisition (DAQ) device (± 10 V).

Keysight U2802A thermocouple is to be used in conjunction with the U2355A and U2356A model DAQ to enable a wide range of sensor input measurements.

It works as a standalone device attached to a single DAQ. The U2802A thermocouple device is connected to the modular DAQ via SCSI cables. Keysight U2802A accepts eight standard thermocouple types defined in the NIST ITS-90 Thermocouple Database, which are Type B, E, J, K, N, R, S and T.

It is ideal for a broad variety of temperature and voltage measurement applications in education, industrial and scientific environments. The U2802A comes with an on-board EEPROM features. Hence, it allows user to store calibration data in volatile memory. Therefore, the U2802A is robust, cost-effective, and user friendly device.

This quick start guide provides an overview of the U2802A 31-channel thermocouple input device. The step-by-step instructions to install the hardware driver and Keysight Measurement Manager application software are covered in this guide to help you get started.

Standard Purchase Items Checklist

Inspect and verify that you have all the following items upon standard purchase of U2802A 31-channel thermocouple input device. If there are missing items, contact the nearest Keysight Sales Office.

- ✓ Keysight U2802A 31-channel thermocouple input device
- ✓ Power supply splitter
- ✓ Two 68-pin SCSI cables (1 m)
- ✓ One J-type thermocouple
- ✓ Quick Start Guide
- ✓ Product Reference CD-ROM
- ✓ Keysight Automation-Ready CD (contains the Keysight IO Libraries Suite)
- ✓ Certificate of Calibration

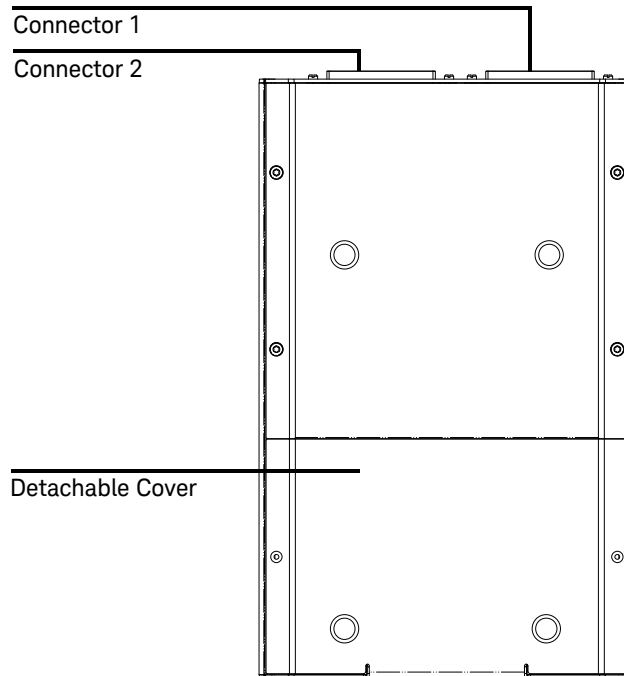
WARNING

Use only the power adaptor provided by manufacturer to avoid unexpected hazard.

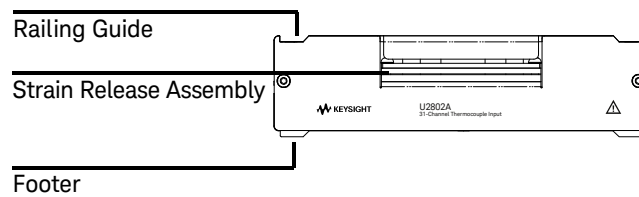
Product Overview

Product Outlook

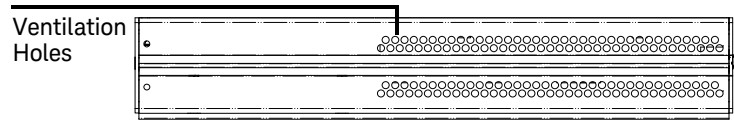
Top View



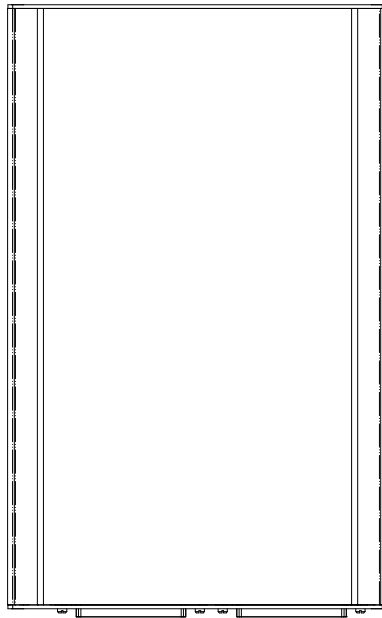
Front View



Side View



Bottom View



General Specifications

POWER CONSUMPTION

- ±12 VDC, 750 mA maximum

OPERATING ENVIRONMENT

- Operating temperature from 0 °C to 55 °C
- Relative humidity at 50% to 85% RH (non-condensing)
- Altitude up to 2000 meters

STORAGE COMPLIANCE

- -40 °C to 70 °C

SAFETY COMPLIANCE

Certified with:

- IEC 61010-1:2001/EN 61010-1:2001 (2nd Edition)

EMC COMPLIANCE

- IEC 61326-1:2002 / EN 61326-1:1997+A1:1998+A2:2001+A3:2003
- CISPR 11:1990/EN55011:1990 – Group 1, Class A
- CANADA: ICES-001: 2004
- Australia/New Zealand: AS/NZS CISPR11:2004

SHOCK & VIBRATION

- Tested to IEC/EN 60068-2

IO CONNECTOR

- 2 x 68-pin female SCSI connector
- 2 x 34-pin screw terminal block
- 1 x 24 pin screw terminal block

DIMENSIONS (WxDxH)

- 159.7 mm x 254.2 mm x 40.5 mm

WEIGHT

- 1.036 KG

WARRANTY

- Three years
-

Installations and Configurations

The U2802A is used in conjunction with the U2355A and U2356A DAQ. If you are using the U2300A Series 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 U2300A Series with the Keysight Measurement Manager software, and use the DAQ devices with Keysight VEE, LabVIEW or Microsoft Visual Studio only, you can skip steps E and I in the following flowchart.
 - You need to install IVI-COM driver before using the U2300A Series with Keysight VEE, LabVIEW or Microsoft Visual Studio.
 - If you have installed and currently using the U2300A Series, you may skip the initial steps and proceed to step H for U2802A Thermocouple Input installation in the following flowchart. Make sure Keysight Measurement Manager version 1.4 and above is installed before you proceed.
-

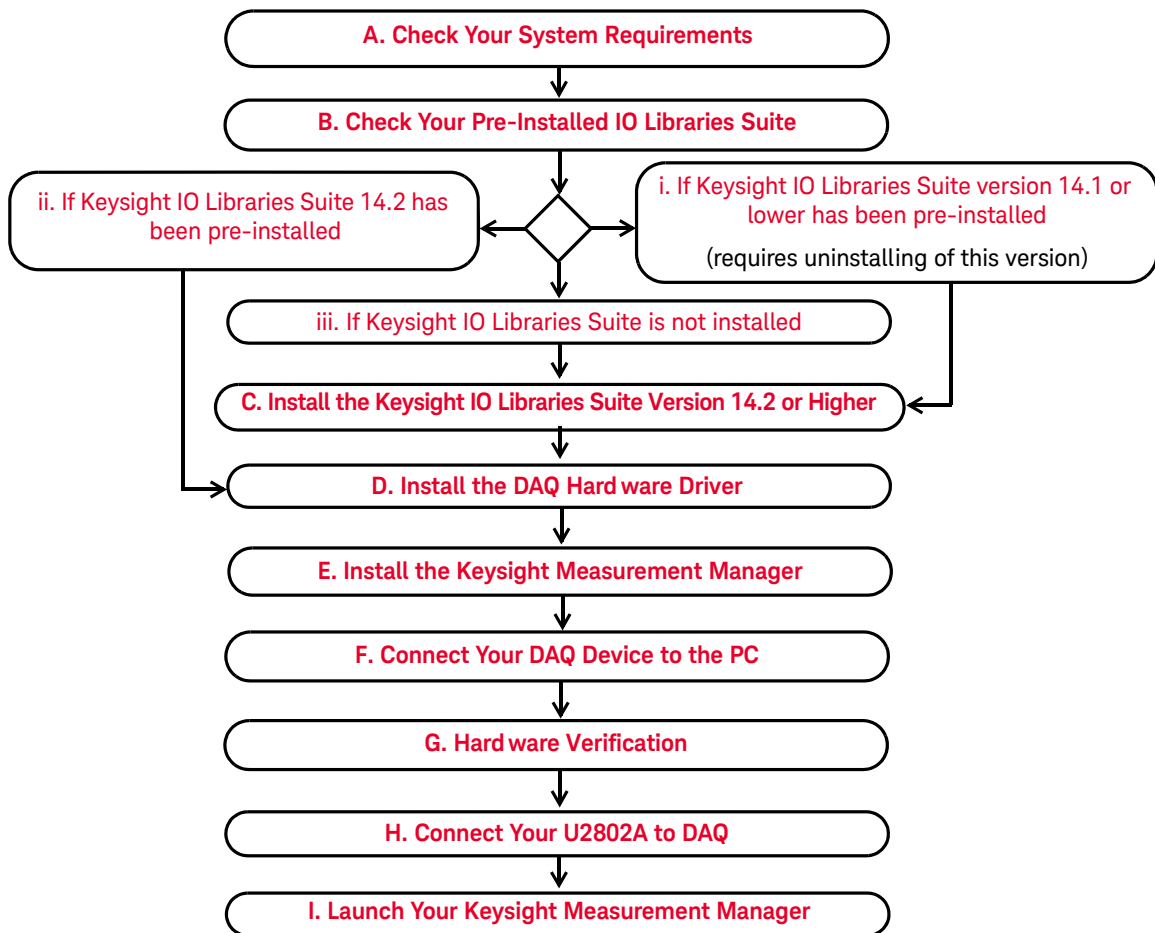


Figure 1-1 U2802A installation flowchart

A. Check Your System Requirements

Before installing the Keysight Measurement Manager software and 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: Windows XP Professional or Home Edition (Service Pack 1 or later), Windows 2000 Professional (Service Pack 4 or later)

Browser Microsoft Internet Explorer 5.01 or higher

Available RAM 512 MB or higher is recommended

Hard disk space 1 GB

Pre-requisite Keysight IO Libraries Suite 14.2^[1] or higher, Keysight T&M Toolkit 2.1 Runtime version^[2], Keysight T&M Toolkit Redistributable Package 2.1 patch^[2], Microsoft .NET Framework version 1.1 and 2.0^[2]

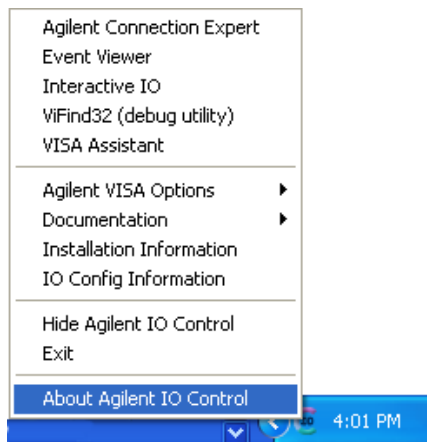
[1] Available in Keysight Automation-Ready CD.

[2] Bundled with Keysight Measurement Manager application software installer.

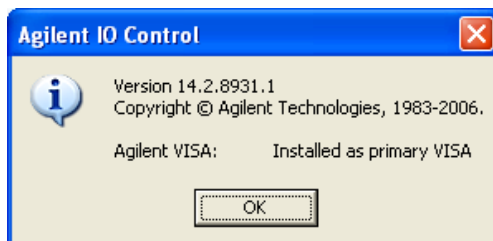
B. Check Your Pre-Installed IO Libraries Suite

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 indicate 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 uninstall the IO Libraries Suite.

- 1 To perform uninstallation, 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 **C. 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 C and proceed to **D. Install the DAQ 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 **C. Install the Keysight IO Libraries Suite Version 14.2 or Higher**.

C. Install the Keysight IO Libraries Suite Version 14.2 or Higher

The Keysight IO Libraries Suite 14.2 is available in the *Keysight Automation-Ready CD* that comes with the standard purchase of Keysight U2300A Series USB Multifunction Data Acquisition Devices or U2802A 31-Channel Thermocouple Input.

NOTE

- If you do not have the *Keysight Automation-Ready CD*, obtain the Keysight IO Libraries Suite 14.2 or higher at <http://www.keysight.com/find/iolib>.
- Ensure that you do not have any USB DAQ device connected to your PC during installation of the Keysight IO Libraries Suite.

- 1 Disconnect any USB DAQ device that is connected to your PC and close all other applications on your PC.
- 2 Insert the *Keysight Automation-Ready CD* into your CD-ROM drive, and follow the instructions on your screen.
- 3 If the installation does not start automatically, go to **Start > Run** (on the Windows start menu) and type `<drive>:\autorun\auto.exe` where **drive** is your CD-ROM drive.
- 4 If you obtain the Keysight IO Libraries Suite from the web, save the self-extracting zip file (*.exe) to any location on your hard disk.
- 5 Double-click the installation file to launch the installation.
- 6 Follow the instructions on your screen to proceed with the installation.
- 7 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>.

D. Install the DAQ Hardware Driver

NOTE

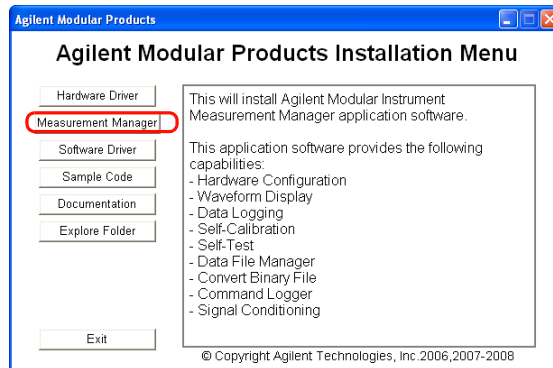
Refer to *Keysight U2300A Series USB Multifunction Data Acquisition Devices User's Guide* for DAQ hardware driver installation procedure.

E. Install the Keysight Measurement Manager

NOTE

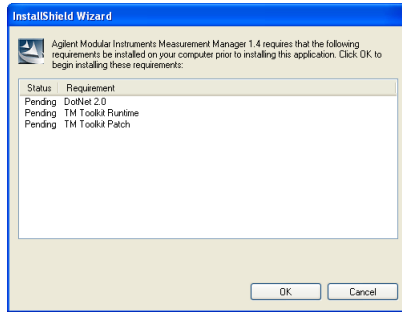
Make sure Keysight Measurement Manager version 1.4 and above is installed before U2802A is used.

- 1 Verify that you have the hardware driver installed. If not, close all other applications on your PC and insert the *Product Reference CD-ROM* into your CD-ROM drive.
- 2 Click **Measurement Manager** on the Keysight Modular Products Installation Menu to begin the installation.

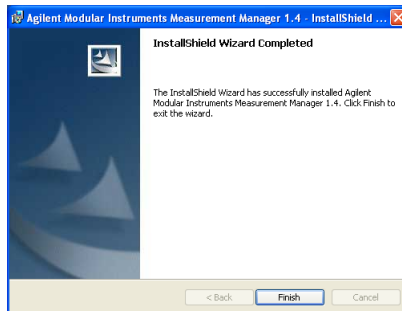


- 3 If the installation menu does not appear after a few seconds, go to **Start > Run** and type `<drive>:\Application\Modular Instruments Measurement Manager\setup.exe`, where `drive` is your CD-ROM drive.
- 4 Click **OK** to begin installation.

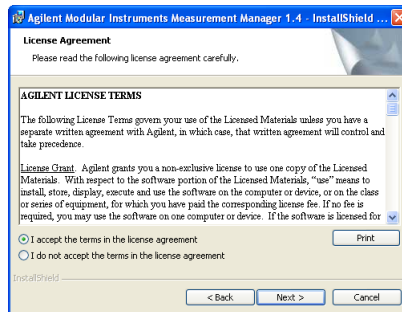
- 5 If you do not have the Keysight T&M Toolkit 2.1 Runtime version and/or Microsoft .NET Framework version 1.1 and 2.0 installed, the InstallShield Wizard software pre-requisite will appear as shown below.



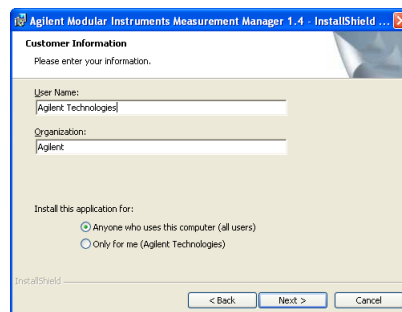
- 6 Click **OK** to begin installation of the listed missing software.
- 7 Once the above installation is completed, installation of the Keysight Measurement Manager software will proceed as normal
- 8 The Keysight Measurement Manager InstallShield Wizard dialog box will appear as shown below. Click **Next** to begin.



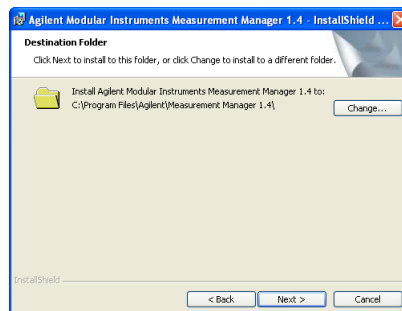
- 9 Read the License Agreement and select **I accept the terms in the License Agreement** to proceed. You may click **Print** to print a hardcopy of the Keysight License Terms for reference. Click **Next** to proceed.



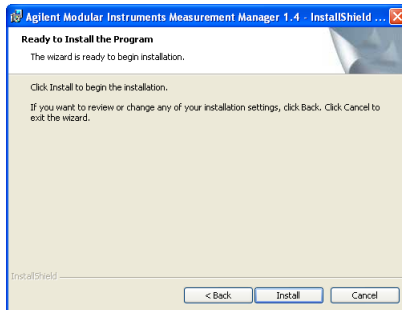
- 10 Fill in the Customer Information form, as shown below, accordingly and click **Next**.



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



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



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



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

NOTE

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F. Connect Your DAQ Device to the PC

NOTE

Refer to *Keysight U2300A Series USB Multifunction Data Acquisition Devices User's Guide* for “Connect Your DAQ Device to PC” procedure.

The bundled power supply splitter in U2802A is used to allow powering both the U2802 and U2355/56A DAQ with a single DC power adapter which has been supplied with the DAQ.

G. Hardware Verification

NOTE

Refer to *Keysight U2300A Series USB Multifunction Data Acquisition Devices User's Guide* for “Hardware Verification” procedure.

H. Connect Your U2802A to DAQ

- 1 Connect U2802A to U2355/56A DAQ using two 68-pin SCSI cables.
- 2 Connect 12V DC power supply to the power jack on the rear panel of the U2802A and the U2355/56A DAQ with the bundled power supply splitter.
- 3 Power on U2355A or U2356A DAQ.

I. Launch Your Keysight Measurement Manager

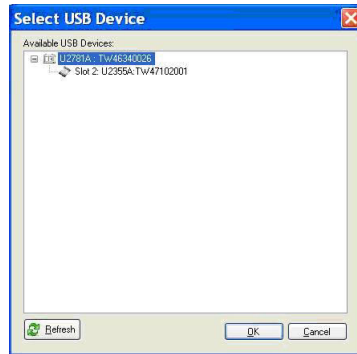
NOTE

- The Keysight IO Control will launch automatically when you start your PC.
 - Launching Keysight Measurement Manager without Keysight IO Control running will cause Keysight Measurement Manager to fail from detecting or establishing any connection with the USB DAQ device connected to your PC.
 - To run Keysight IO Control, go to **Start > All Programs > Keysight IO Libraries Suite > Utilities > IO Control**.
-

- 1 Double-click the Keysight Measurement Manager software icon on your desktop or go to **Start > All Programs > Keysight > Measurement Manager > Keysight 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 and shows the connected DAQ devices. To start the application, select a DAQ device and click **OK** to establish the connection.



NOTE

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



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

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