



U2972A CCFL Panel Test Solution

Operating Guide



Agilent Technologies

Notices

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Manual Part Number

U2972-90001

Edition

First Edition, June 20, 2008

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Santa Clara, CA 95052 USA

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Safety Notices

CAUTION














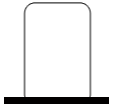


A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully 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)		Equipment protected throughout by double insulation or reinforced insulation
	Alternating current (AC)		Off (supply)
	Both direct and alternating current		On (supply)
	Three-phase alternating current		Caution, risk of electric shock
	Earth (ground) terminal		Caution, risk of danger (refer to this manual for specific Warning or Caution information)
	Protective conductor terminal		Caution, hot surface
	Frame or chassis terminal		Out position of a bi-stable push control
	Equipotentiality		In position of a bi-stable push control

General Safety Information

WARNING

- **Ground the equipment.** For Safety Class 1 equipment (equipment having a protective earth terminal), an uninterrupted safety earth ground must be provided from the mains power source to the product input wiring terminals or supplied power cable.
 - **DO NOT operate the product in an explosive atmosphere or in the presence of flammable gases or fumes.** For continued protection against fire, replace the line fuse(s) only with fuse(s) of the same voltage and current rating and type. DO NOT use repaired fuses or short-circuit fuse holders.
 - **Keep away from live circuits.** Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers or shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.
 - **DO NOT operate damaged equipment.** Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to Agilent for service and repair to ensure that safety features are maintained.
 - **DO NOT service or adjust alone.** Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.
 - **DO NOT substitute parts or modify equipment.** Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to Agilent for service and repair to ensure that safety features are maintained.
-

CAUTION

- Use the device with the cables provided.
 - Repair or service that is not covered in this manual should only be performed by qualified personnel.
-

Environmental Conditions

This instrument is designed for indoor use and in an area with low condensation. The table below shows the general environmental requirements for this instrument .



Environmental conditions	Requirements
Operating temperature	0 °C to 55 °C
Operating humidity	50% to 95% at 40 °C (non-condensing)
Storage temperature	−40 °C to 70 °C
Storage humidity	Up to 90% at 65 °C RH (non-condensing)

CAUTION

The U2972A CCFL panel test solution complies with the following safety and EMC requirements.

- IEC 61010-1:2001/EN 61010-1:2001 (2nd Edition)
- Canada: CAN/CSA-C22.2 No. 61010-1-04
- USA: ANSI/UL 61010-1:2004
- IEC 61326-2002/EN 61326:1997+A1:1998+A2:2001+A3:2003
- Canada: ICES-001:2004
- Australia/New Zealand: AS/NZS CISPR11:2004

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 C-tick mark is a registered trademark of the Spectrum Management Agency of Australia. This signifies compliance with the Australia EMC Framework regulations under the terms of the Radio Communication Act of 1992.</p>
<p>ICES/NMB-001</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/electronic product in domestic household waste.</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/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 shown as below.



Do not dispose in domestic household waste

To return this unwanted instrument, contact your nearest Agilent Technologies, or visit:

www.agilent.com/environment/product

for more information.



Agilent Technologies

DECLARATION OF CONFORMITY
According to EN ISO/IEC 17050-1:2004



Manufacturer's Name: Agilent Technologies Microwave Products (M) Sdn. Bhd
Manufacturer's Address: Bayan Lepas Free Industrial Zone,
11900, Bayan Lepas, Penang, Malaysia

Declares under sole responsibility that the product as originally delivered

Product Name: Agilent CCFL Panel Test Solution
Models Number: U2972A, U2907A
Product Options: This declaration covers all options of the above product(s)

complies with the essential requirements of the following applicable European Directives, and carries the CE marking accordingly:

Low Voltage Directive (2006/95/EC)
EMC Directive (2004/108/EC)

and conforms with the following product standards:

EMC	Standard	Limit
	IEC 61326:2002 / EN 61326:1997+A1:1998+A2:2001+A3:2003	
	CISPR 11:1990 / EN55011:1990	Class A Group 1
	IEC 61000-4-2:1995 / EN 61000-4-2:1995	4 kV CD, 8 kV AD
	IEC 61000-4-3:1995 / EN 61000-4-3:1996	3 V/m, 80-1000 MHz
	IEC 61000-4-4:1995 / EN 61000-4-4:1995	0.5 kV signal lines, 1 kV power lines
	IEC 61000-4-5:1995 / EN 61000-4-5:1995	0.5 kV line-line, 1 kV line-ground
	IEC 61000-4-6:1996 / EN 61000-4-6:1996	3 V, 0.15-80 MHz
	IEC 61000-4-11:1994 / EN 61000-4-11:1994	1 cycle / 100%

Canada: ICES-001:2004
Australia/New Zealand: AS/NZS CISPR11:2004

The product was tested in a typical configuration with Agilent Technologies test systems.

Safety IEC 61010-1:2001 / EN 61010-1:2001
Canada: CAN/CSA-C22.2 No. 61010-1-04
USA: ANSI/UL 61010-1:2004

This DoC applies to above-listed products placed on the EU market after:

2-June-2008

Date

Tay Eng Su

Quality Manager

For further information, please contact your local Agilent Technologies sales office, agent or distributor,
or Agilent Technologies Deutschland GmbH, Herrenberger Straße 130, 71034 Böblingen, Germany.

Template: A5971-5302-2, Rev. E

U2972A

DoC Revision 1.0

Product Regulations

EMC

IEC 61326-1:2002 / EN 61326-1:1997+A1:1998+A2:2001+A3:2003

CISPR 11:1990 / EN 55011:1990 – Group 1 Class A

IEC 61000-4-2:1995 / EN 61000-4-2:1995 (ESD 4kV CD, 8kV AD)

IEC 61000-4-3:1995 / EN 61000-4-3:1996 (3V/m, 80% AM)

IEC 61000-4-4:1995 / EN 61000-4-4:1995 (EFT 0.5kV line-line, 1kV line-earth)

IEC 61000-4-5:1995 / EN 61000-4-5:1995 (Surge 0.5kV line-line, 1kV line-earth)

IEC 61000-4-6:1996 / EN 61000-4-6:1996 (3V, 0.15–80 MHz, 80% AM, power line)

IEC 61000-4-11:1994 / EN 61000-4-11:1994 (Dips 1 cycle, 100%)

Canada: ICES-001:2004

Australia/New Zealand: AS/NZS CISPR11:2004

Performance Criteria

A

A

A

A

A

A

Safety IEC 61010-1:2001 / EN 61010-1:2001

Canada: CAN/CSA-C22.2 No. 61010-1-04

USA: ANSI/UL 61010-1:2004

Additional Information:

The product herewith complies with the essential requirements of the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC and carries the CE Marking accordingly (European Union).

¹Performance Criteria:

A Pass - Normal operation, no effect.

B Pass - Temporary degradation, self recoverable.

C Pass - Temporary degradation, operator intervention required.

D Fail - Not recoverable, component damage.

N/A – Not applicable

Notes:

Regulatory Information for Canada

ICES/NMB-001:2004

This ISM device complies with Canadian ICES-001.

Cet appareil ISM est conforme à la norme NMB-001 du Canada.

Regulatory Information for Australia/New Zealand

This ISM device complies with Australian/New Zealand AS/NZS CISPR11:2004

 N10149

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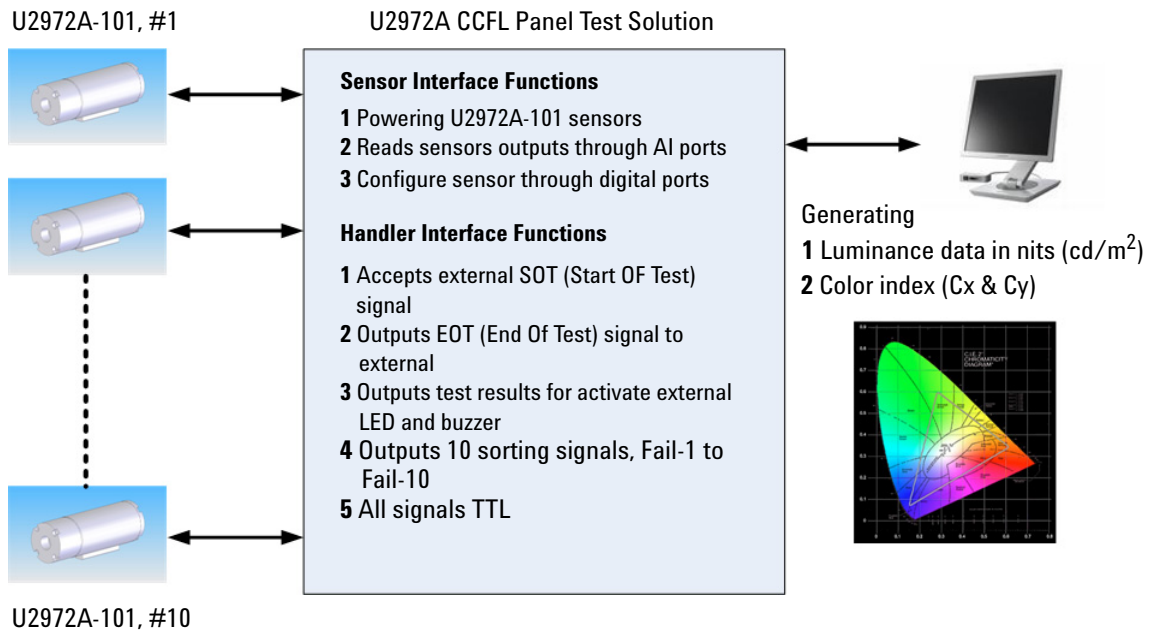
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Introduction

The U2972A cold cathode fluorescent light (CCFL) panel test solution is a measuring system consisting of a single to several measurement sensors, a data acquisition (DAQ) unit in a metallic enclosure, and cable accessories.

U2972A CCFL panel test solution platform

The CCFL panel test solution platform consists of an interface board and a DAQ unit in a metallic enclosure. The interface board receives signals from the measurement sensor and conveys it to the DAQ. The interface board also conveys the power to the measurement sensors. The interface board can support up to 10 measurement sensors and has an optional auto handler interface. The concept of the system configuration is shown in the drawing below.

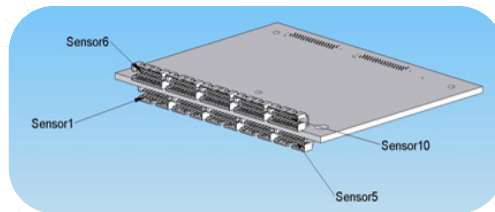


U2972A-101 Measurement sensors

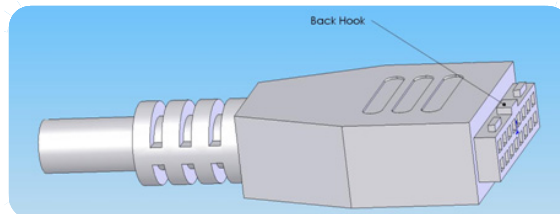
The Agilent U2972A-101 CCFL backlight luminance and white chromaticity measurement sensor is used to measure a light source on its luminance. The U2972A-101 is an aluminum circular shaped sensor. A non-detachable cable measures the luminance brightness in analog signals that are sent to the DAQ platform via a eight by two connector. At the bottom of the sensor, there are three screw holes than can be used for holding the sensor with a test jig. Two holes are M5 threaded while the other one is of camera screw ($\frac{1}{4}$ -20-UNC) type. See “[Product Outlook - CCFL Panel Test Solution Platform](#)” on page 5 for more details.

Sensor connection

The CCFL panel test solution back panel has 10 IDC ports for measurement sensors to be plugged in. The orientation and sensor port numbers is shown below.



The sensor’s “back hook” should face downwards when connecting to IDC ports 1 to 5 and upwards when connecting to IDC ports 6 to 10.



Standard Purchase Items

Verify that you have received the following items with the U2972A CCFL panel test solution purchase. If anything is missing or damaged, please contact the nearest Agilent Sales Office.

- ✓ U2972A CCFL panel test solution platform
- ✓ U2972A-101 CCFL backlight luminance and white chromaticity measurement sensor
- ✓ U2972A CCFL Panel Test Solution Operating Guide
- ✓ U2972A CCFL Panel Test Solution Product Reference CD-ROM
- ✓ Agilent Automation-Ready CD (contains IO Libraries Suite)
- ✓ USB cable (standard A to mini-B)
- ✓ Power cord
- ✓ 10-pin terminal blocks

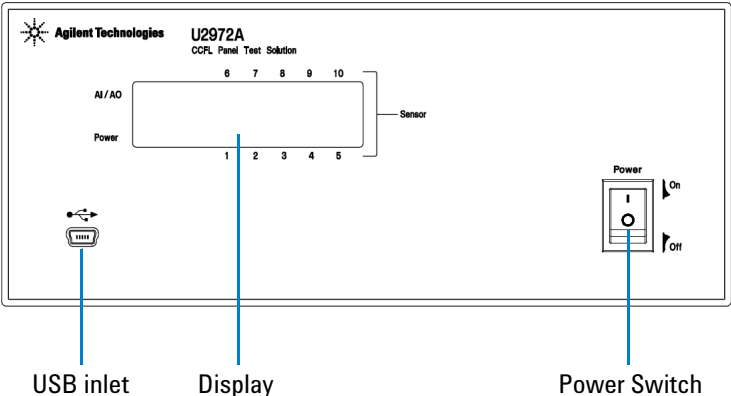
Optional accessories

1CM Rackmount Kit

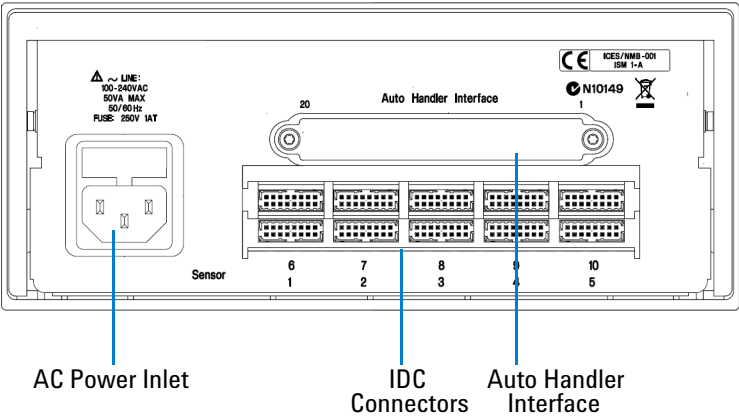
Product Outlook - CCFL Panel Test Solution Platform

Product overview

Front view

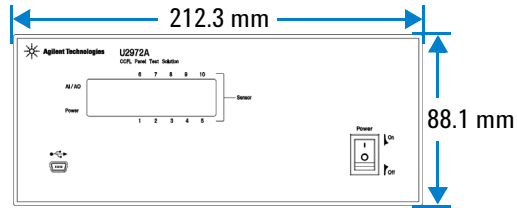


Rear view

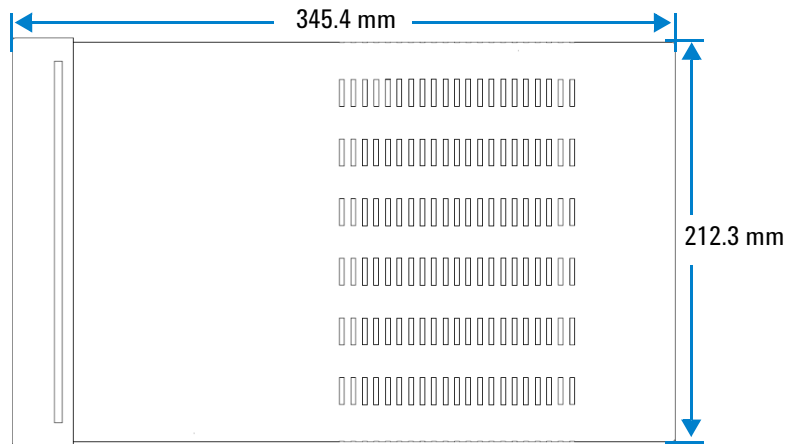


Product dimensions

Front view

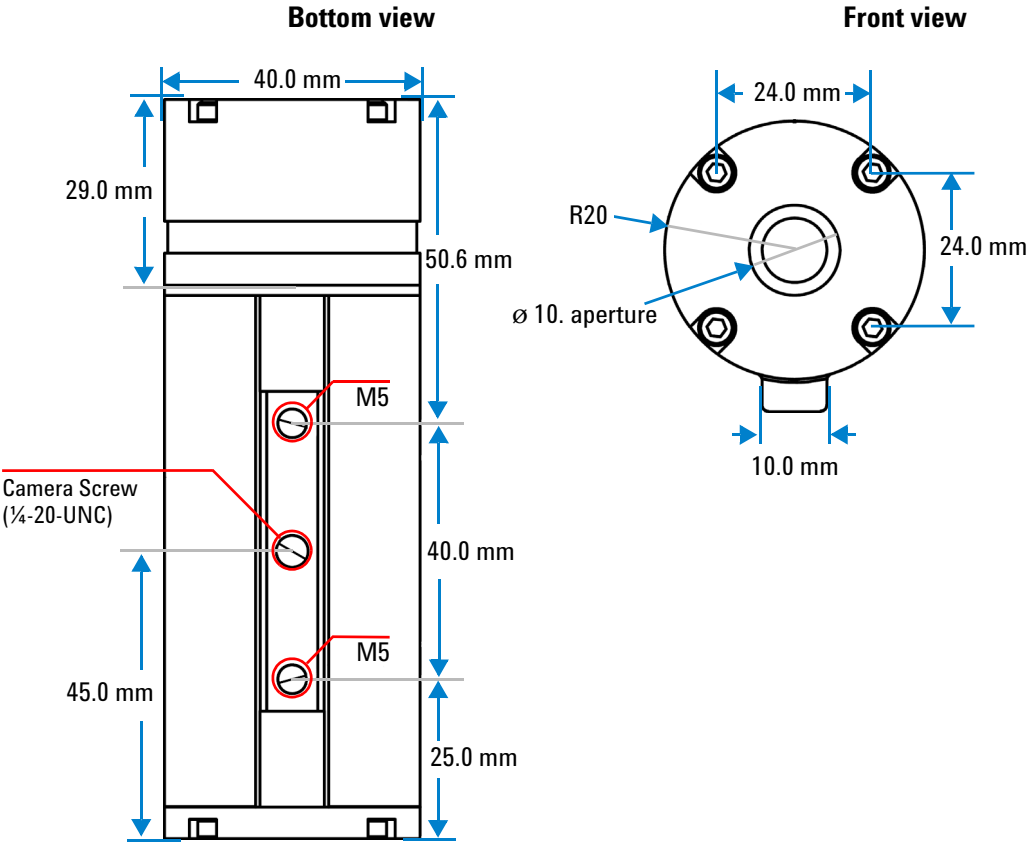


Top view

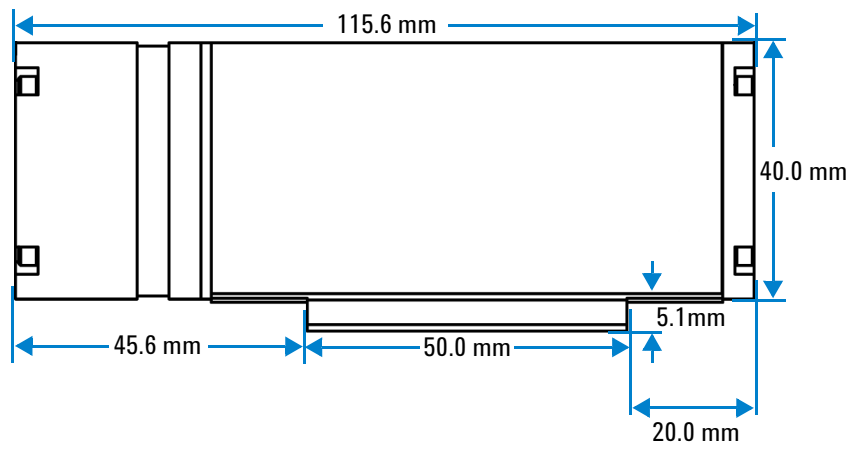


Product Outlook - Measurement Sensor

Product dimensions



Side view

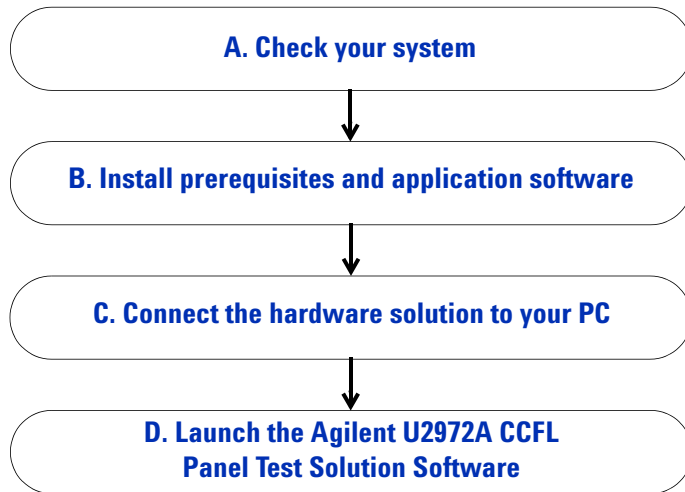


NOTE

The sensor dimensional tolerance is ± 0.5 mm.

Installation Guide

Follow the step-by-step instructions shown in the following flowchart to get started with the preparation and installation of your U2972A CCFL panel test solution.



A. Check your system

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

Hardware requirements

Hardware required	Specification (minimum)
Processor	1.6 GHz Pentium® IV or higher required
Operating System	Windows® XP Professional or Home Edition (Service Pack 1 or later), or Windows® 2000 Professional (Service Pack 4 or later)
Video	Super VGA 1024×768
Browser	Microsoft® Internet Explorer 5.01 or higher (6.0 or higher recommended)
Available RAM	512 MB or higher (1.0 GB or higher recommended)
Hard Disk Space	1.0 GB

Software requirements

Software required	Version (minimum)
Agilent IO Libraries Suite	Version 15.0 ^[1] or higher
Agilent U2300A/U2500A/U2600A/U2700A Series Driver	Version 1.03 ^[2]
Agilent VEE Pro Runtime	Version 8.51 ^[3]
Microsoft® .NET Framework	Version 1.1 and 2.0 ^[3]

NOTE

Agilent IO Libraries Suite 15.0 is required if your PC is running on Microsoft® Windows Vista™ 32-bit operating system.

[1] Available on Agilent Automation-Ready CD.

[2] Available on Agilent U2972A CCFL Panel Test Solution CD-ROM.

[3] Bundled with Agilent U2972A CCFL Panel Test Solution Software installer.

B. Install prerequisites and application software

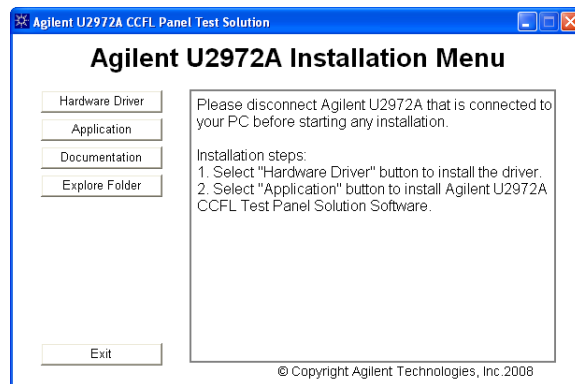
There are two options you may choose from to install the prerequisites and Agilent U2972A CCFL Panel Test Solution Software. You may choose to install from the provided Product Reference CD-ROM or obtain the installation software from Agilent's web site to install the application software.

NOTE

Prior to installing the prerequisites and Agilent U2972A CCFL Panel Test Solution Software, ensure that your PC meets the minimum system requirements for installation and operation processes.

Installing the application software from CD

- 1 Disconnect any instrument that is connected to your PC and close all other applications on your PC.
- 2 Insert the *Product Reference CD-ROM* into your CD-ROM drive.



- 3 If the installation menu does not appear after a few seconds, go to **Start > Run** and type `<drive>:\Application\setup.exe` where `<drive>` is your CD-ROM drive location.
- 4 Click **Hardware Driver** on the Agilent U2972A Installation Menu to install the Agilent U2300A/U2500A/U2600A/U2700A Series Driver before you begin to install the CCFL Panel Test Solution Software.

- 5 Click **Application** on the Agilent U2972A Installation Menu to begin the CCFL Panel Test Solution Software installation.
- 6 Click **OK** to begin the installation.
- 7 If you do not have any of the prerequisites installed, the InstallShield Wizard software prerequisite will appear.
- 8 Click **OK** to begin the installation of the listed missing prerequisites.
- 9 Once the above installation has completed, installation of the CCFL Panel Test Solution Software will proceed as normal.
- 10 The Agilent U2972A CCFL Panel Test Solution InstallShield Wizard dialog will appear. Click **Next** to begin.
- 11 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 Agilent License Terms for your reference. Click **Next** to proceed.
- 12 Fill in the Customer Information Form accordingly, and click **Next**.
- 13 Click **Next** to install to the specified folder or click **Change** to install to a different folder.
- 14 Click **Install** to begin the installation of the CCFL Panel Test Solution Software.
- 15 Click **Finish** when the installation has completed.
- 16 A shortcut to this software will be created to your desktop as shown below.



Agilent
U2972A CCFL
Panel Test
Solution
Software

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 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.

Downloading the application software from the Web

- 1 Go to <http://www.agilent.com/find/U2972A>, and download the Agilent U2972A CCFL Panel Test Solution Software.
- 2 Save the file to any location on your hard disk.
- 3 Disconnect any instrument that is connected to your PC and close all other applications on your PC.
- 4 Double-click the saved installation file to begin installation.
- 5 If you do not have any of the prerequisites installed, the **InstallShield Wizard** software prerequisite will appear.
- 6 Click **OK** to begin the installation of the listed missing prerequisites.
- 7 Once the above installation has completed, installation of the CCFL Panel Test Solution Software will proceed as normal.
- 8 Follow the instructions on your screen to begin the installation.
- 9 Click **Finish** once the installation has completed.

C. Connect the hardware solution to your PC

Basic setup

- 1 Connect the power cord to the U2972A AC inlet terminal.
- 2 Connect the U2972A USB port to your PC USB port.
- 3 Connect the U2972A-101 measurement sensor(s) to any of the U2972A sensor terminals. The U2972A system allows connection of up to 10 measurement sensors at the same time.
- 4 Power-on the U2972A. The power LED will light up at the front panel and the sensor LED indicator will flicker if a sensor is connected to the terminal.

NOTE

Refer to “[Hardware Troubleshooting](#)” on page 47 for more information on LED indicator status.

Auto handler setup

- 1 Power-off the U2972A.
- 2 Remove the cover of the auto handler interface.

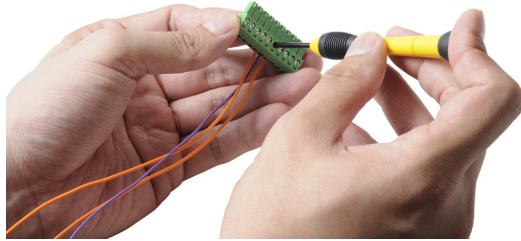


WARNING

To avoid ESD damage to the CCFL panel test solution, users are highly recommended to comply with the following cautions:

- Users are required to discharge themselves to any large metal object (e.g. shelf, desk, etc.) prior to operating the CCFL panel test solution.
 - Operate the CCFL panel test solution under an ESD protected workstation, with the minimum requirements of using a wrist strap (connected to ground) and an ESD pad. The wrist strap can be grounded by connecting it to the power supply ground and/or circuit board ground.
-

- 3 Connect the external devices/control cables to the 10-pin terminal block interface as desired. Refer to [Table 1](#) for terminal block pin configuration.



- 4 Connect the 10-pin terminal block to the auto handler interface as shown below.



- 5 Your auto handler interface is now ready for use.

NOTE

Refer to the *Agilent U2972A CCFL Panel Test Solution Software Help File* for more information on auto handler measurement options.

Table 1 Pin configuration for auto handler interface

Position	Function
1	SOT-EXT, signal from external trigger to declare "Start of Test".
2	EOT-EXT, signal from external trigger to declare the "End of Test".
3	LED-pass, signal to activate external LED
4	LED-fail, signal to activate external LED
5	Buzzer, signal to activate external buzzer
6	Fail-1, active low
7	Fail-2, active low
8	Fail-3, active low
9	Fail-4, active low
10	Fail-5, active low
11	Fail-6, active low
12	Fail-7, active low
13	Fail-8, active low
14	Fail-9, active low
15	Fail-10, active low
16	User-defined, internal wired to DIO-504(0)
17	User-defined, internal wired to DIO-504(1)
18	User-defined, internal wired to DIO-504(2)
19	User-defined, internal wired to DIO-504(3)
20	EXT-GND, External ground

D. Launch the Agilent U2972A CCFL Panel Test Solution Software

NOTE

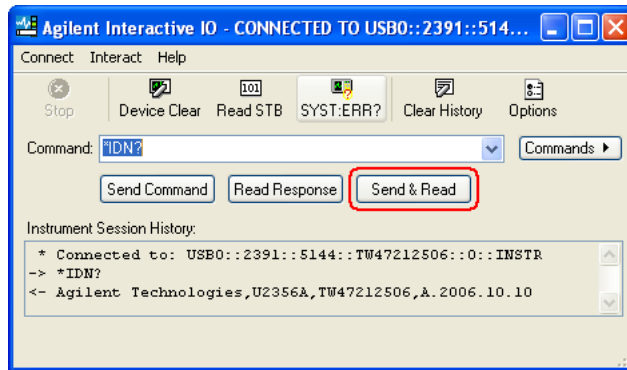
Before you proceed, ensure that your system meets the minimum system requirements.

- 1 Before attempting to start-up your Agilent U2972A CCFL Panel Test Solution Software, it is recommended to follow the step-by-steps instructions below.
- 2 Plug in your instrument via the supported USB socket.
- 3 Go to **Start > All Programs > Agilent IO Libraries Suite > Agilent Connection Expert** to launch the Connection Expert.
- 4 The detected U2972A will be visible on the **Instrument I/O on this PC** explorer pane. Right-click on the U2972A instrument on the explorer pane.
- 5 A context menu will appear as shown below. **Select Send Commands To This Instrument.**



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

A sample of a typical instrument's response is shown below. The Agilent U2356A DAQ device is displayed because the U2972A platform houses the U2356A DAQ device.



- 7 If the Connection Expert can successfully communicate with the U2972A, this indicates that the instrument has been installed correctly.

NOTE

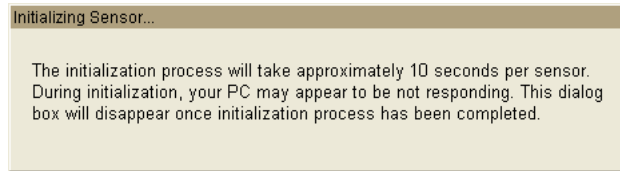
- The IO Control will launch automatically when you start your PC.
- Launching the VEE without the IO Control running will cause failure of the VEE to detect or establish any connection with the U2972A connected to your PC.
- To run the IO Control, go to **Start > All Programs > Agilent IO Libraries Suite > Utilities > IO Control**.

- 8 Double-click CCFL Panel Test Solution Software software icon on your desktop or go to **Start > All Programs > Agilent U2972A CCFL Panel Test Solution > Agilent U2972A CCFL Panel Test Solution Software** to launch the software.
- 9 The CCFL Panel Test Solution Software will automatically find your connected U2972A platform.

NOTE

If you have more than one U2972A platform connected to your computer, the CCFL Panel Test Solution Software will prompt you to select either the **VISA Alias** or **VISA Address** of your desired U2972A platform.

- 10** A dialog box will appear while the measurement sensor's initialization process take place.



- 11** Once the measurement sensor's initialization has been completed, the dialog box will disappear.



- 12** Select **Configuration** to select your connected measurement sensors and to set your measurement conditions.
- 13** Select **Measurement** to start acquiring measurements with the Agilent U2972A CCFL Panel Test Solution.
- 14** Select **Auto Handler** for auto handling options. For more information, see “[Auto handler setup](#)” on page 14.

15 Select **Help** to launch the *Agilent U2972A CCFL Panel Test Solution Software Help File* or **About** to learn more about the CCFL Panel Test Solution Software.

16 Click **Exit** to leave the program.

NOTE

Refer to the *Agilent U2972A CCFL Panel Test Solution Software Help File* for more information.

Application Programming Interface (API)

The following API functions enables you to develop your own application software. It is compatible with the following programming environment:

- Agilent VEE 8.0 or higher
- Microsoft® Visual Studio.NET, C/C++
- Microsoft® Visual Basic 6
- LabVIEW

The API file is accessible via the Start Program menu.

- 1 Go to **Start > All Programs > Agilent U2972A CCFL Panel Test Solution**.
- 2 Select **U2972A Application Programming Interface (API)**.

NOTE

All functions will return a status code unless otherwise stated. See “[Status Codes](#)” on page 42” for a list of all status codes.

Function Name	U297X_iGetVersion
Description	To obtain DLL version
Input	lpiMajorVersion Pointer for the major version value lpiMinorVersion Pointer for the minor version value
Output	Void

Function Name	U297X_hConnect
Description	Connect to specified DAQ device
Input	lpszResourceName Pointer for DAQ Resource Name
	lpiRetCode Pointer for return status code
Output	Returns session handler of DAQ resource in long format, otherwise returns NULL if there is no connected DAQ device
Function Name	U297X_iDisconnect
Description	Disconnect from specified DAQ device
Input	hInfo Pointer to Session Handler for DAQ device
Output	Status code
Function Name	U297X_iPing
Description	Obtains current state of attached sensors
Input	hInfo Pointer to Session Handler for DAQ device
	lpwState Pointer to slot flag if status code is "U297X_SUCCESS"
Output	Status code

Function Name	U297X_iInit
Description	Performs initialization to sensors with DAQ environment
Input	hInfo Pointer to Session Handler for DAQ device lpwState Pointer to slot flag if status code is "U297X_SUCCESS"
Output	Status code

NOTE

lpwSlotFlag used in U297X_ilnit API indicates the states of sensors currently installed, represented in WORD format. The position of each bit corresponds to the specific sensor position.

- Bit-0: 1/0 indicates Sensor 1 is installed/not installed
- Bit-1: 1/0 indicates Sensor 2 is installed/not installed
-
- Bit-9: 1/0 indicates Sensor 10 is installed/not installed

Function Name	U297X_iConfig
Description	Configures specified DAQ device by slot ID flag
Input	hInfo Pointer to Session Handler for DAQ device wSlotFlag Specifies the slot ID flag (bit-0 is Slot 1, bit-9 is Slot 10) lpszTrigMode Specifies the trigger mode (see “Pin configuration for auto handler interface” on page 16)
Output	Status code

NOTE

wSlotFlag used in other API (such as U297X_iConfig) represents bitwise the combination of sensors selected to perform measurements, in WORD format. The position of each bit corresponds to the specific sensor position.

- Bit-0: 1/0 represents Sensor 1 is selected/not selected.
- Bit-1: 1/0 represents Sensor 2 is selected/not selected.

...

- Bit-9: 1/0 represents Sensor 10 is selected/not selected.

If the selected sensor does not exist (not installed), the corresponding error code will be returned.

Function Name	U297X_iConfigByList
Description	Configures specified DAQ device by slot ID list
Input	<p>hInfo Pointer to Session Handler for DAQ device</p> <p>lpszSlotList Specifies the slot ID list (separated by commas)</p> <p>lpszTrigMode Specifies the trigger mode (see “Pin configuration for auto handler interface” on page 16)</p>
Output	Status code

NOTE

SlotList used in API indicates the states (selected/not selected) of sensors currently installed, which is represented by ASCII strings.

- Sensor 1 to 10 can be represented by ASCII strings from "1" to "10"
- The separator is "," example: 1,3,5
- The sequence can be randomly specified (and can be repeated)

Function Name	U297X_iRead
Description	Retrieves the data read by specified DAQ device
Input	<p>hInfo</p> <p>Pointer to Session Handler for DAQ device</p> <p>lpfDataArray</p> <p>Pointer to Double array for data reading</p> <p>nSizeOfArray</p> <p>Specifies the array size (should be triple of attached sensors, one for luminance, two for color coordinates)</p> <p>nTimeout</p> <p>Specifies time-out duration (in ms) value</p>
Output	Status code
Function Name	U297X_iFetch
Description	Retrieves the data fetched from specified DAQ device
Input	<p>hInfo</p> <p>Pointer to Session Handler for DAQ device</p> <p>lpfDataArray</p> <p>Pointer to Double array for data reading</p> <p>nSizeOfArray</p> <p>Specifies the array size (should be triple of attached sensors, one for luminance, two for color coordinates)</p>
Output	Status code

Function Name	U297X_iMeasure
Description	Retrieves the data measured by specified DAQ device
Input	<p>hInfo Pointer to Session Handler for DAQ device</p> <p>wSlotFlag Specifies the slot ID flag (bit-0 is Slot 1, bit-9 is Slot 10)</p> <p>lpszTrigMode Specifies the trigger mode (see “Pin configuration for auto handler interface” on page 16)</p> <p>lpfDataArray Pointer to Double array for data reading</p> <p>nSizeOfArray Specifies the array size (should be triple of attached sensors, one for luminance, two for color coordinates)</p> <p>nTimeout Specifies time-out duration (in ms) value</p>
Output	Status code

Function Name	U297X_iMeasureByList
Description	Retrieves the data measured by specified DAQ device by slot ID list
Input	<p>hInfo Pointer to Session Handler for DAQ device</p> <p>lpszSlotList Specifies the slot ID list (separated by commas)</p> <p>lpszTrigMode Specifies the trigger mode (see “Pin configuration for auto handler interface” on page 16)</p> <p>lpfdataArray Pointer to Double array for data reading</p> <p>nSizeOfArray Specifies the array size (should be triple of attached sensors, one for luminance, two for color coordinates)</p> <p>nTimeout Specifies time-out duration (in ms) value</p>
Output	Status code

Function Name	U297X_iStart
Description	Starts sampling
Input	<p>hInfo Pointer to Session Handler for DAQ device</p>
Output	Status code

Function Name	U297X_iStop
Description	Stops sampling
Input	<p>hInfo Pointer to Session Handler for DAQ device</p>
Output	Status code

Function Name	U297X_iIsComplete
Description	Checks if sampling process has completed
Input	hInfo Pointer to Session Handler for DAQ device
Output	<ul style="list-style-type: none"> • U297X_COMPLETE If sampling is complete and without any errors • U297X_SUCCESS If sampling is incomplete • Status code of error
Function Name	U297X_iEndOfTest
Description	Stops test and sets test result
Input	hInfo Pointer to Session Handler for DAQ device bPass Specifies pass or fail bTestResult Test result to set (FALSE TRUE = Fail Pass)
Output	Status code
Function Name	U297X_iGetSensorState
Description	Returns current state of attached sensors (U297X_iInit must be called before using this function)
Input	hInfo Pointer to Session Handler for DAQ device lpwState Saves returned state if status code is "U297X_SUCCESS"
Output	Status code

Function Name	U297X_iSetIOTimeout
Description	Set I/O time-out duration (for default value see DEFAULT_TIMEOUT_IO)
Input	hInfo Pointer to Session Handler for DAQ device nDuration Sets the new time-out duration value (ms)
Output	Status code
Function Name	U297X_iSlotFlagToList
Description	Converts slot flag string to slot list
Input	wSlotFlag Saves slot flag lpszSlotList Saves returned slot list string
Output	Status code
Function Name	U297X_iSlotListToFlag
Description	Converts slot list string to slot flag
Input	lpszSlotList Specifies the slot ID list (separated by commas) wSlotFlag Saves slot flag
Output	Status code

Function Name	U297X_iGetSensorSerialNo
Description	Retrieves the serial number of specified sensor
Input	<p>hInfo Pointer to Session Handler for DAQ device</p> <p>nSlotID Specifies list of slot ID for sensors (possible id = 1, 2, 3, ..., 10)</p> <p>lpszBuf Buffer to save returned data</p>
Output	Status code

Function Name	U297X_iGetSensorCaliDate
Format	yyyy/mm/dd
Description	Retrieve the calibration date of specified sensor
Input	<p>hInfo Pointer to Session Handler for DAQ device</p> <p>nSlotID Specifies list of slot ID for sensors (possible id = 1, 2, 3, ..., 10)</p> <p>lpszData Save returned data</p>
Output	Status code

Function Name	U297X_iGetSensorCaliTime
Description	Retrieves the number of seconds elapsed since midnight (00:00:00) of last calibration of specified sensor
Input	<p>hInfo Pointer to Session Handler for DAQ device</p> <p>nSlotID Specifies list of slot ID for sensors (possible id = 1, 2, 3, ..., 10)</p> <p>lpSzData Save returned data</p>
Output	Status code

Function Name	U297X_iSetBinData
Description	Sets output BIN (binary) data
Input	<p>hInfo Pointer to Session Handler for DAQ device</p> <p>nData Specifies BIN data to be output (only low 4-bit are useful)</p>
Output	Status code

Programming Samples

U297X.DLL recommended sequence instructions

1 Copy the U297X.DLL to your \Windows\System32 directory.

2 Recommended steps to use the API:

a U297X_iGetVersion Acquire the DLL version

b U297X_hConnect Connect to DAQ

```
if (m_hDAQ = U297X_hConnect(m_strDAQName, &rc))
{
    m_bConnect = TRUE;
    rc = U297X_iIdentify(m_hDAQ, buf, MAX_PATH);
    if (rc == U297X_SUCCESS)
    {
        vSetColorSystem(TRUE);
    }
}
```

c U297X_iIdentify Query to verify the DAQ model (optional)

d U297X_iInit Get the state of sensors currently installed

(In case of any sensor failure, the API will return an error code. To proceed, please remove the failed sensor first.)

```

BOOL CLUX230TestProgramDlg::bDoInit ()
{
    int rc;
    BOOL ret = FALSE;
    WORD w, ww;
    UpdateData(TRUE);
    m_iNoOfSensor = 0;
    rc = U297X_iPing(m_hDAQ, &ww);
    vResetElapsedTime();
    if (rc == U297X_SUCCESS)
    {
        rc = U297X_iInit(m_hDAQ, &w);
    }
    vShowElapsedTime ();
    if (rc == U297X_SUCCESS)
    {
        CString off;
        off.LoadString(IDS_OFF);
        if (w & 0x0001 || ww & 0x0001)
        {
            m_strSensor1State = strGetStatus(1);
            m_iNoOfSensor++;
        }
        else
        {
            m_strSensor1State = off;
        }
        if (w & 0x0002 || ww & 0x0002)
        {
            m_strSensor2State = strGetStatus(2);
            m_iNoOfSensor++;
        }
        else
        {
            m_strSensor2State = off;
        }
        if (w & 0x0004 || ww & 0x0004)
        {
            m_strSensor3State = strGetStatus(3);
            m_iNoOfSensor++;
        }
        else
        {
            m_strSensor3State = off;
        }
    }
}

```

```

if (w & 0x0008 || ww & 0x0008)
{
    m_strSensor4State = strGetStatus(4);
    m_iNoOfSensor++;
}
else
{
    m_strSensor4State = off;
}
if (w & 0x0010 || ww & 0x0010)
{
    m_strSensor5State = strGetStatus(5);
    m_iNoOfSensor++;
}
else
{
    m_strSensor5State = off;
}
if (w & 0x0020 || ww & 0x0020)
{
    m_strSensor6State = strGetStatus(6);
    m_iNoOfSensor++;
}
else
{
    m_strSensor6State = off;
}
if (w & 0x0040 || ww & 0x0040)
{
    m_strSensor7State = strGetStatus(7);
    m_iNoOfSensor++;
}
else
{
    m_strSensor7State = off;
}
if (w & 0x0080 || ww & 0x0080)
{
    m_strSensor8State = strGetStatus(8);
    m_iNoOfSensor++;
}
else
{
    m_strSensor8State = off;
}

```

```

if (w & 0x0100 || ww & 0x0100)
{
    m_strSensor9State = strGetStatus(9);
    m_iNoOfSensor++;
}
else
{
    m_strSensor9State = off;
}
if (w & 0x0200 || ww & 0x0200)
{
    m_strSensor10State = strGetStatus(10);
    m_iNoOfSensor++;
}
else
{
    m_strSensor10State = off;
}
m_wSensorState = w;
if (w == ww)
{
    ret = TRUE;
}
}
m_strRetCode.Format("%d", rc);
UpdateData(FALSE);
return(ret);
} // end CLUX230TestProgramDlg::bDoInit

```

e U297X_iConfig>Select Select sensors for measurement

```

int rc;
CString mode;
int cur_sel;
cur_sel = m_ctrlComboTrigger.GetCurSel();
m_ctrlComboTrigger.GetLBText(cur_sel, mode);
// rc = U297X_iConfigByList(m_hDAQ,
    "1,2,1,2,1,2,1,2,1,2", mode);
rc = U297X_iConfig(m_hDAQ, m_wSensorState, mode);
UpdateData(TRUE);
m_strRetCode.Format("%d", rc);
UpdateData(FALSE);

```

f U297X_iRead Perform measurements and retrieve result

g Repeat [step f](#) for continual measurements.

h U297X_iDisconnect Disconnects DAQ

i The program now ends.

```
U297X_iDisconnect(m_hDAQ);
```

3 Calling the U297X_iMeasure function is equal to executing the following functions:

```
U297X_iConfig
U297X_iRead
U297X_iMeasure:

int rc;
double fdata[30];
memset(fdata, 0, sizeof(double) * 30);
rc = U297X_iMeasure(m_hDAQ, m_wSensorState,
TRIG_MODE_NONE, fdata, 30, 1000);
// rc = U297X_iMeasureByList(m_hDAQ,
"1,2,1,2,1,2,1,2,1,2", TRIG_MODE_NONE, fdata, 30,
1000);
if (rc == U297X_SUCCESS)
{
    bShowData(fdata, 30); //See bShowData example
    below
    // do EOT if set as EXTD mode
    if (m_ctrlComboTrigger.GetCurSel() == 1)
    {
        rc = iDoEOT();
    }
}
UpdateData(TRUE);
m_strRetCode.Format("%d", rc);
UpdateData(FALSE);
```

4 lpwSlotFlag used in U297X_iInit API indicates the states of sensors currently installed, represented in WORD format. The position of each bit corresponds to the specific sensor position.

- Bit-0: 1/0 indicates Sensor 1 is installed/not installed
- Bit-1: 1/0 indicates Sensor 2 is installed/not installed
-
- Bit-9: 1/0 indicates Sensor 10 is installed/not installed

5 wSlotFlag used in other API (such as U297X_iConfig) represents bitwise the combination of sensors selected to perform

measurements, in WORD format. The position of each bit corresponds to the specific sensor position.

- Bit-0: 1/0 represents Sensor 1 is selected/not selected.
- Bit-1: 1/0 represents Sensor 2 is selected/not selected.
- ...
- Bit-9: 1/0 represents Sensor 10 is selected/not selected.

If the selected sensor does not exist (not installed), the corresponding error code will be returned.

- 6** SlotList used in API indicates the states (selected/not selected) of sensors currently installed, which is represented by ASCII strings.
 - Sensor 1 to 10 can be represented by ASCII strings from "1" to "10"
 - The separator is "," example: 1,3,5
 - The sequence can be randomly specified (and can be repeated)
- 7** Among the parameters required by U297X_iMeasure and U297X_iRead functions:
 - `lpfdataArray` is mainly used to return the data (Lv, Cx, and Cy) that have been read. The data sequence for each sensor is shown below.

Example Reading of Data (m_wSensorState is lpwSlotFlag mentioned above):

```
BOOL CLUX230TestProgramDlg::bShowData
(double*lpfdataArray, UINT nSizeOfArray)
{
    int idx;
    idx = 0;
    UpdateData(TRUE);
    if (m_wSensorState & 0x0001)
    {
        m_strSensor1Lux.Format("%.1f",
            lpfdataArray[idx++]);
        m_strSensor1Cx.Format("%.4f",
            lpfdataArray[idx++]);
        m_strSensor1Cy.Format("%.4f",
            lpfdataArray[idx++]);
    }

    if (m_wSensorState & 0x0002)
    {
        m_strSensor2Lux.Format("%.1f",
            lpfdataArray[idx++]);
        m_strSensor2Cx.Format("%.4f",
            lpfdataArray[idx++]);
        m_strSensor2Cy.Format("%.4f",
            lpfdataArray[idx++]);
    }

    if (m_wSensorState & 0x0004)
    {
        m_strSensor3Lux.Format("%.1f",
            lpfdataArray[idx++]);
        m_strSensor3Cx.Format("%.4f",
            lpfdataArray[idx++]);
        m_strSensor3Cy.Format("%.4f",
            lpfdataArray[idx++]);
    }
}
```



```

if (m_wSensorState & 0x0008)
{
    m_strSensor4Lux.Format("%.1f",
        lpfdataArray[idx++]);
    m_strSensor4Cx.Format("%.4f",
        lpfdataArray[idx++]);
    m_strSensor4Cy.Format("%.4f",
        lpfdataArray[idx++]);
}

if (m_wSensorState & 0x0010)
{
    m_strSensor5Lux.Format("%.1f",
        lpfdataArray[idx++]);
    m_strSensor5Cx.Format("%.4f",
        lpfdataArray[idx++]);
    m_strSensor5Cy.Format("%.4f",
        lpfdataArray[idx++]);
}

if (m_wSensorState & 0x0020)
{
    m_strSensor6Lux.Format("%.1f",
        lpfdataArray[idx++]);
    m_strSensor6Cx.Format("%.4f",
        lpfdataArray[idx++]);
    m_strSensor6Cy.Format("%.4f",
        lpfdataArray[idx++]);
}

if (m_wSensorState & 0x0040)
{
    m_strSensor7Lux.Format("%.1f",
        lpfdataArray[idx++]);
    m_strSensor7Cx.Format("%.4f",
        lpfdataArray[idx++]);
    m_strSensor7Cy.Format("%.4f",
        lpfdataArray[idx++]);
}

if (m_wSensorState & 0x0080)
{
    m_strSensor8Lux.Format("%.1f",
        lpfdataArray[idx++]);
    m_strSensor8Cx.Format("%.4f",
        lpfdataArray[idx++]);
    m_strSensor8Cy.Format("%.4f",
        lpfdataArray[idx++]);
}

```

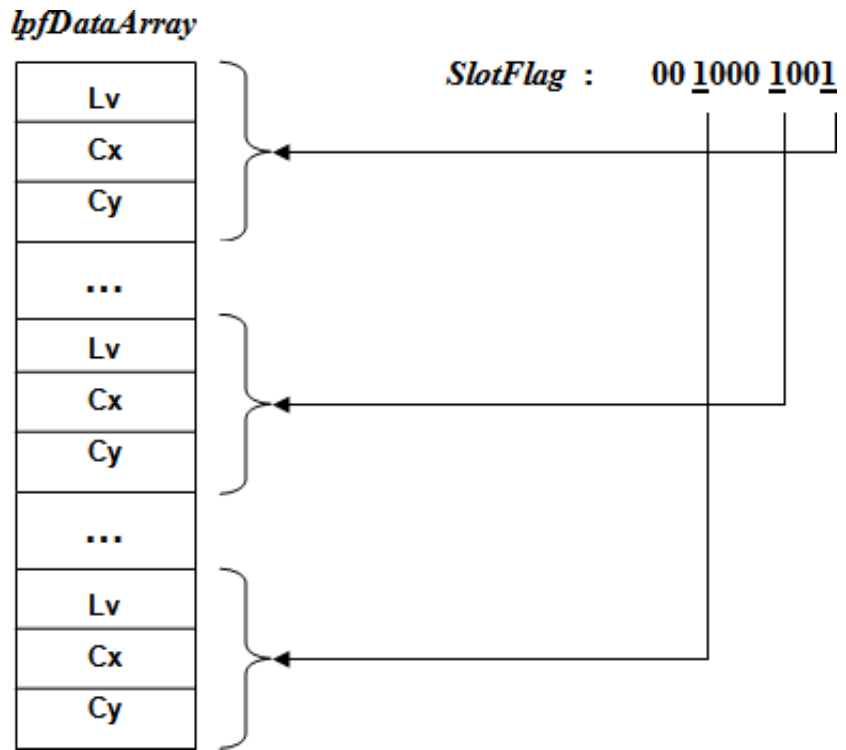
```

if (m_wSensorState & 0x0100)
{
    m_strSensor9Lux.Format("%.1f",
        lpfdataArray[idx++]);
    m_strSensor9Cx.Format("%.4f",
        lpfdataArray[idx++]);
    m_strSensor9Cy.Format("%.4f",
        lpfdataArray[idx++]);
}

if (m_wSensorState & 0x0200)
{
    m_strSensor10Lux.Format("%.1f",
        lpfdataArray[idx++]);
    m_strSensor10Cx.Format("%.4f",
        lpfdataArray[idx++]);
    m_strSensor10Cy.Format("%.4f",
        lpfdataArray[idx++]);
}

UpdateData(FALSE);
return(TRUE);
} // end CLUX230TestProgramDlg::bShowData

```



- The sensors are arranged in the order specified in [step 4](#) and [step 5](#).
- `nSizeOfArray` indicates the array size of `lpfdataArray`, where the number of array size is triple the size of the attached sensors (one for luminance, two for color coordinates).

Status Codes

Table 2 List of status codes

Error	Function Name	Description
2	U297X_MAJOR_VERSION	Returns major version of DLL
50	U297X_MINOR_VERSION	Returns minor version of DLL
10	NUM_OF_SENSOR	Maximum number of sensors installed
0	U297X_SUCCESS	Successful operation
100	U297X_COMPLETE	Sampling has been completed
-1	U297X_ERR_CREATE_THREAD	Working thread cannot be created
-2	U297X_ERR_RESOURCE_NAME	Invalid resource name
-3	U297X_ERR_OPEN_DEFAULT_RM	Hardware cannot be initialized
-5	U297X_ERR_LOCK_SESSION	Session cannot be locked
-6	U297X_ERR_NOT_CONNECTED	DAQ is not connected yet
-7	U297X_ERR_DAQ_MODEL	Incorrect DAQ model
-8	U297X_ERR_NOT_INIT	DAQ not initialized yet
-9	U297X_ERR_NO_SENSOR_ATTACHED	No sensors found
-10	U297X_ERR_NOT_CONFIG	DAQ not configured yet
-20	U297X_ERR_HANDLE	Invalid DAQ information handle
-21	U297X_ERR_SLOT_ID	Invalid slot ID
-22	U297X_ERR_NOT_EXIST	Specified sensor does not exist
-23	U297X_ERR_TRIG_MODE	Incorrect trigger mode
-24	U297X_INVALID_ARGUMENT	Invalid parameter set
-30	U297X_ERR_SERVICE_TYPE	Unknown service type
-31	U297X_ERR_NO_DATA	No available data
-40	U297X_ERR_WRITE	VISA vPrintf error
-41	U297X_ERR_READ	VISA vScanf error

Table 2 List of status codes

Error	Function Name	Description
-42	U297X_ERR_IO	VISA I/O time-out
-43	U297X_ERR_TIMEOUT_IFB	Interface board time-out
-44	U297X_ERR_TIMEOUT_DATA	Wait for data time-out
-45	U297X_ERR_BUFFER_SIZE	Insufficient buffer size
-46	U297X_ERR_TIMEOUT_TRIGGER	Trigger time-out
-47	U297X_ERR_BIN_DATA	Invalid BIN data
-48	U297X_ERR_DAO_DATA	Incorrect DAQ data
-101	U297X_ERR_INDEX	Invalid sensor index
-102	U297X_ERR_BUFFER	Invalid input buffer address
-103	U297X_ERR_DATA_SIZE	Invalid data size
-106	U297X_ERR_DATA_FORMAT	Incorrect packet data
3000	DEFAULT_TIMEOUT_IO	Default I/O time-out duration
3000	DEFAULT_TIMEOUT_DATA	Default data time-out duration

Error Messages

Table 3 List of Error Codes

Error	Function Name	Troubleshoot	Solution
-1	U297X_ERR_CREATE_THREAD	A working thread cannot be created while calling U297X_ilnit()	Restart software
-2	U297X_ERR_RESOURCE_NAME	The supplied resource name to U297X_hConnect() function is invalid	Verify that the hardware's VISA address or VISA alias is correct
-3	U297X_ERR_OPEN_DEFAULT_RM	Resource manager failed to open while calling U297X_ilnit()	Verify that the hardware's VISA address or VISA alias is properly installed
-5	U297X_ERR_LOCK_SESSION	Cannot lock session	Check to make sure if DAQ is locked by another program
-6	U297X_ERR_NOT_CONNECTED	U297X_hConnect() function must be called prior to calling this function	Follow the recommended sequence for using the DLL
-7	U297X_ERR_DAQ_MODEL	Wrong resource name specified for the U2972A	Use Agilent Connection Expert to determine the correct resource name
-8	U297X_ERR_NOT_INIT	U297X_ilnit() function must be called prior to calling this function	Follow the recommended sequence for using the DLL
-9	U297X_ERR_NO_SENSOR_ATTACHED	No sensor module detected at the sensor slot ID	Ensure that the sensor's LED indicator is flickering and retry. If error persists, the calibration data might be corrupted.
-10	U297X_ERR_NOT_CONFIG	U297X_iConfig() function must be called prior to calling this function	Follow the recommended sequence for using the DLL
-20	U297X_ERR_HANDLE	The specified information handle is invalid	The information handle is unique to each session, ensure that the correct information handle is used
-21	U297X_ERR_SLOT_ID	The specified slot ID is invalid	Slot ID must be from 1 to 10

Table 3 List of Error Codes

Error	Function Name	Troubleshoot	Solution
-22	U297X_ERR_NOT_EXIST	The specified slot ID has no sensor module attached	Power-off hardware, ensure that a sensor module is connected to the specified slot ID and that its LED indicator is flickering when hardware is powered-on
-23	U297X_ERR_TRIG_MODE	Only two trigger modes are supported - NONE or EXTD	Refer to the trigger mode enum
-24	U297X_INVALID_ARGUMENT	Call API with improper argument	Check argument and correct it
-30	U297X_ERR_SERVICE_TYPE	Internal error	Restart software
-31	U297X_ERR_NO_DATA	Data is not ready while calling U297X_iFetch()	Call again to get data or calibrate the system by calling U297X_iConfig() function
-40	U297X_ERR_WRITE	Error while call vPrintf	Restart software and IO library
-41	U297X_ERR_READ	Error while call vPrintf	Restart software and IO library
-42	U297X_ERR_IO	Instrument returns error, hardware is not responding or disconnected	Restart hardware, contact Agilent if error persists
-43	U297X_ERR_TIMEOUT_IFB	Instrument returns error, hardware is not responding or disconnected	Restart hardware, contact Agilent if error persists
-44	U297X_ERR_TIMEOUT_DATA	Instrument returns error, hardware is not responding or disconnected	Restart hardware, contact Agilent if error persists
-45	U297X_ERR_BUFFER_SIZE	The allocated buffer size is insufficient to store the result	Ensure that the double (real64) array size is at least three times the total slots used
-46	U297X_ERR_TIMEOUT_TRIGGER	No external trigger pulse detected since system was armed	Trigger the system within 10 seconds, or configure a longer time-out period
-48	U297X_ERR_DAQ_DATA	Data corrupted during communication, BIN block returns error	Restart hardware, contact Agilent if error persists
-101	U297X_ERR_INDEX	Incorrect sensor index	Check and correct sensor index, valid sensor index is from 1 to 10

Table 3 List of Error Codes

Error	Function Name	Troubleshoot	Solution
-102	U297X_ERR_BUFFER	Insufficient software resources	Restart software, restart hardware and CPU if error persists
-103	U297X_ERR_DATA_SIZE	Insufficient software resources	Restart software, restart hardware and CPU if error persists
-106	U297X_ERR_DATA_FORMAT	Read incorrect data from DAQ	Restart software, if still same then replace DAQ
-120	U297X_ERR_CRC	Error while loading calibration	Remove faulty sensor and restart

Hardware Troubleshooting

Table 4 Hardware troubleshooting guide

Problem	Possible Cause	Solution
Power "LED" does not light up	<ul style="list-style-type: none">• No power supplied to the platform.• Faulty fuse.	<ul style="list-style-type: none">• Ensure power cord is firmly connected to the platform.• Replace faulty fuse with same rating fuse.
Measurement sensor "LED" does not light up	<ul style="list-style-type: none">• Measurement sensor not connected properly.	<ul style="list-style-type: none">• Ensure measurement sensor cable is firmly connected to the platform's sensor terminal.
Measurement sensor "LED" does not flicker	<ul style="list-style-type: none">• Measurement sensor not initiated properly.• Error in system.	<ul style="list-style-type: none">• Power-off the platform. Disconnect the measurement sensor cable and reconnect. Power-on the platform.
Cannot detect U2972A device	<ul style="list-style-type: none">• USB cable is not connected properly.• Installation of driver is not successful.	<ul style="list-style-type: none">• Ensure USB cable is firmly connected to the USB terminals (platform and PC).• Refer to the Installation Guide.

NOTE

If the measurement sensor LED light up and flickers, the system is operating as normal.

Product Specifications

Table 5 General characteristics of the U2972A CCFL panel test solution

General Characteristics	
Remote interface	<ul style="list-style-type: none">• Hi-Speed USB 2.0• USBTMC 488.2 Class Device
Power supply	100 VAC to 240 VAC, 50/60 Hz, 50 VA
Operating environment	<ul style="list-style-type: none">• Temperature: 0 °C to 55 °C• Humidity: 50% to 95% at 40 °C (non-condensing)• Altitude up to 2000 meters• Pollution degree 2• For indoor use only
Storage compliance	<ul style="list-style-type: none">• Temperature: -40 °C to 70 °C• Humidity: Up to 90% at 65 °C RH (non-condensing)
Safety compliance	<ul style="list-style-type: none">• IEC 61010-1:2001/EN61010-1:2001 (2nd Edition)• Canada: CAN/CSA-C22.2 No. 61010-1-04• USA: ANSI/UL 61010-1:2004
EMC compliance	<ul style="list-style-type: none">• IEC 61326-1:2002/EN 61326-1:1997+A1:1998+A2:2001+A3:2003• Canada: ICES-001:2004• Australia/New Zealand: AS/NZS CISPR11:2004
Shock and vibration	Tested on IEC/EN 60068-2
Warranty	One year

Table 6 Electrical characteristics of the U2972A CCFL panel test solution

Description	Data
DC power consumption	12 VDC ($\pm 10\%$), average 40 mA/sensor
Sensor signal voltage range	0 V to 4 V maximum
Measurement Time (typ.)	250 ms

Table 7 Mechanical characteristics of the U2972A CCFL panel test solution

Description	Data
Sensor housing	Extrude aluminum, black powder coating
Signal cable	<ul style="list-style-type: none">• 2 m multi-wire cable with 8 x 2 connector
Dimensions (mm)	<ul style="list-style-type: none">• Platform (WxDxH): 212.3 x 345.4 x 88.1• Sensor (D, L)[†]: 40.0, 115.5
Typical Weight (kg)	<ul style="list-style-type: none">• Sensor: 0.28• Platform: 2.55

[†] The dimensional tolerance of the dimensions are ± 0.5 mm.

Table 8 Optical characteristics of the U2972A CCFL panel test solution

Description	Data
Sensing wavelength	380 nm to 680 nm
Sensing area	60 mm diameter (at 100 mm distance with <1% variation)
Sensing distance	90 mm to 110 mm
Luminance sensing range	500 nits to 6000 nits (cd/m ²)
Luminance accuracy	± 6%
Sensor repeatability	± 1%
Sensor to sensor deviation	± 4%
Color response range [†]	0.25 to 0.45
Color accuracy	<ul style="list-style-type: none">• 500 nits to 2000 nits, ± 0.007• 2000 nits to 6000 nits, ± 0.005
Dark current-voltage	<ul style="list-style-type: none">• 5 mV maximum• 3 mV typical

[†] Based on CIE 1937 chromaticity diagram

Table 9 Auto handler interface characteristics of the U2972A CCFL panel test solution

Name	Description	Data
SOT	Start Of Test — An external trigger-in signal to declare the beginning of test.	Digital TTL level trigger signal, input signal
EOT	End Of Test — A signal to declare that the test has been completed.	Digital 3.3 V level output signal
PASS	A signal to declare the test result.	Digital 3.3 V level output signal
LED	<ul style="list-style-type: none">• Signal to drive an external LED for visual indication of PASS/FAIL.• The LED signal remains unchanged until the next test result become available.	Digital 3.3 V level output signal
BUZZER	A signal to drive an external buzzer, activated momentarily.	Digital 3.3 V level output signal
BIN1 ~ BIN4	BIN sort data <ul style="list-style-type: none">• 0001=BIN1• 0010=BIN2• 0100=BIN3• 1000=BIN4	Digital 3.3 V level output signal
GROUND	DAQ ground level	Non-isolated ground

Maintenance

No cleaning is required for this product. If you wish to remove dust from the platform, use a dry cloth.

To clean the lens of the measurement sensor, use the IPA solution with a non-fabric swab.



NOTE

Always ensure that the sensor is covered with the provided sensor cap when not in use.

Ordering Info

Table 10 U2972A CCFL panel test solution ordering options

1	Ordering Options	Description
	U2907A	U2972A-101 CCFL backlight luminance and white chromaticity measurement sensor

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Contact us

To obtain service, warranty or technical assistance, contact us at the following phone or fax numbers:

United States:

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Printed in Malaysia
First Edition, June 20, 2008

U2972-90001



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