

# Keysight U2751A

## USB Modular Switch Matrix

The Keysight Technologies, Inc. U2751A USB modular switch matrix offers a high quality, low-cost switching solution for automated testing. It has 32 two-wire cross points organized in a four rows by eight columns (4 x 8) configuration enabling connection with any combination of rows and columns, including multiple channels at the same time.

Data Sheet



## Features

- 32 two-wire cross points in 4x8 configuration
- Minimal crosstalk at up to 45 MHz
- Bandwidth of 45 MHz without the terminal block
- Relay cycle counter
- Flexible connection configurations – capable of multiple closed channels simultaneously
- Hi-Speed USB 2.0 (480 Mbps)
- Bundled software – Keysight Measurement Manager (KMM)
- Command logger function
- Wide range of Application Development Environments (ADEs) compatibility
- Standalone and modular
- SCPI and IVI-COM supported
- USB 2.0 and USBTMC-USB488 standards



## Affordable, reliable and flexible switching solution

- Minimal crosstalk at up to 45 MHz for more accurate measurements
- Bandwidth of 45 MHz without terminal block allows you to perform high bandwidth measurements with minimum insertion loss
- Work in comfort and convenience with the bundled KMM software on your PC with quick and easy installation
- Flexible standalone or modular capability enables you to have lower startup cost
- SCPI and IVI-COM supported and a wide range of ADEs compatibility minimize your work time and increase software options
- Easy-to-use KMM software that includes the command logger function that helps you easily convert SCPI commands into snippets VEE, VB, C++ and C# code

## Flexible connection with minimal crosstalk

The U2751A offers the most flexible connection path between the device under test (DUT) and test equipment, allowing different instruments to be connected to multiple points on your DUT at the same time. In addition to this flexible connection path, the U2751A has minimal crosstalk which allows for better measurement accuracy with wider range of test applications

## Keysight U2922A 32-Channel Terminal Block

The U2922A terminal block is an optional accessory used with the U2751A. The U2922A, weighing approximately 100g with screw-type terminals offers a convenient and simple way of making connection to the switch matrix for prototyping applications or for an actual system deployment. It allows the user to configure a wide variety of routing options and matrix topologies.



Figure 1. U2922A with U2751A used as a standalone device



Figure 2. U2751A with U2922A used as a modular device

## Product outlook and dimensions

Front view



Rear view



Top view



## Product characteristics and general specifications

<b>Remote interface</b>	Hi-Speed USB 2.0 USBTMC-USB488 <sup>1</sup>
<b>Power consumption</b>	+12 VDC, 2 A maximum Installation Category II
<b>Operating environment</b>	Operating temperature from 0 °C to +50 °C Relative humidity at 20% to 85% RH (non-condensing) Altitude up to 2000 meters Pollution Degree 2 For indoor use only
<b>Storage compliance</b>	Storage temperature from -20 °C to 70 °C
<b>Safety compliance</b>	Certified with: IEC 61010-1:2001/EN 61010-1:2001 (2nd Edition) USA: ANSI/UL 61010-1:2004 Canada: CSA C22.2 No.61010-1:2004
<b>EMC compliance</b>	IEC 61326-1:2002/EN 61326-1:1997+A2:2001+A3:2003 Canada: ICES-001:2004 Australia/New Zealand: AS/NZS CISPR 11:2004
<b>Measurement compliance</b>	CAT II 300 V Over-voltage protection
<b>Shock and vibration</b>	Tested to IEC/EN 60068-2
<b>IO connector</b>	DSub 25 male
<b>Dimension (w × d × h)</b>	Module dimension: 120.00 mm × 183.00 mm × 44.00 mm (with bumpers) 105.00 mm × 175.00 mm × 25 mm (without bumpers)
<b>Weight</b>	480 g (with bumpers) 428 g (without bumpers)
<b>Warranty</b>	One year for U2751A Three months for standard shipped accessories

## Standard shipped accessories

- 12 V, 2 A AC/DC Power adapter
- Power cord
- Plug-in connectors and cable casing
- USB Standard-A to Mini-B interface cable
- L-Mount kit (used with modular product chassis)
- Keysight USB Modular Products Quick Start Guide
- Keysight Measurement Manager Quick Reference Card
- Keysight USB Modular Products Reference CD-ROM
- Keysight Automation-Ready CD-ROM (contains the Keysight IO Libraries Suite)
- Certificate of Calibration

## Optional accessories

- U2922A 32-channel terminal block
- USB secure 2-m cable

1. Compatible with Microsoft Windows operating systems only. Requires a direct USB connection to the PC so the appropriate driver can be installed in the USB modular instrument.

## Product specifications

Model	U2751A	
	Without U2922A terminal block	With U2922A terminal block
Channels/configuration	4 × 8, 2-wire	
Switch type	Armature latching	
<b>Input characteristics (per channel)</b>		
Max working voltage <sup>1</sup>		
– Standalone	42 VDC/35 Vrms	
– Modular (Used with U2781A)	180 VDC/180 Vrms	
Max transient voltage	300 Vrms	
Max current		
– Switch current	2 A	
– Carry current	2 A	
Power (W, VA) <sup>2</sup>	60 W, 62.5 VA	
Volt-Hertz limit	108	
<b>General specification</b>		
Thermal emf (differential)	< 3 $\mu$ V	
Initial closed channel resistance	< 1.5 $\Omega$	
DC isolation (ch-ch, ch-earth)	> 10 G $\Omega$	
<b>AC characteristics</b>		
Bandwidth <sup>3</sup>	45 MHz	30 MHz
Insertion loss		
– 100 kHz	0.2 dB	0.2 dB
– 1 MHz	0.3 dB	0.3 dB
– 10 MHz	< 2 dB	< 2 dB
– 45 MHz	< 3 dB	< 4.5 dB
Capacitance		
– HI-LO	55 pF	85 pF
– LO-Earth	35 pF	45 pF
Crosstalk at terminal block (ch-ch) <sup>3)</sup>		
– 300 kHz	–70 dB	
– 1 MHz	–60 dB	
– 20 MHz	–35 dB	
– 45 MHz	–30 dB	
<b>General characteristics</b>		
Relay life, typical		
– No load	100 M	
– 10 V, 100 mA	10 M	
– Related load	100 k	
Open/close time	4 ms/4 ms	

1. DC or AC rms, channel-to-channel or channel-to-earth.

2. Limited to 6 W channel resistance power loss per module.

3. 50  $\Omega$  source, 50  $\Omega$  load, differential measurements verified with a 4-port network analyzer (Sdd21).

## Keysight Measurement Manager

The Keysight Measurement Manager (KMM) is an application data viewer software that comes with the standard purchase of the U2700A Series USB modular instruments. This software is designed to help you perform quick device configuration, data logging and data acquisition using the products.

Supported features found in the U2751A modular switch matrix:

- Command logger
- Self-test
- Option to save the current instrument configuration to a file

## Keysight Measurement Manager prerequisites

Prior to installing the Keysight Measurement Manager software, ensure that your PC meets the following minimum system requirements for installation and operation.

Requirement	Windows XP operating systems	Windows Vista operating systems	Windows 7 operating systems
Operating system	Windows XP Service Pack 3 (or later) <sup>1</sup>	Windows Vista (32-bit) Service Pack 1 and 2 <sup>2</sup>	Windows 7 (32-bit and 64-bit) <sup>3,4</sup>
Processor speed	600 MHz or higher required, 800 MHz recommended	1 GHz 32-bit (x86)	3 GHz 32-bit (x86)
Memory	256 MB minimum (1 GB or greater recommended)	1 GB minimum	2 GB minimum
Hard-disk space	1.5 GB minimum	1.5 GB minimum	1.5 GB minimum
Video	Super VGA (800 × 600) 256 colors or more	Support for DirectX 9 graphics with 128 MB graphics memory recommended <sup>5</sup>	Support for DirectX 9 graphics with 128 MB graphics memory recommended <sup>5</sup>
CD-ROM drive or DVD-ROM drive <sup>6</sup>	Required	Required	Required
Browser	Microsoft Internet Explorer 5.01 or greater	Microsoft Internet Explorer 7 or greater	Microsoft Internet Explorer 7 or greater

1. Supported Windows XP editions — Home or Professional
2. Supported Windows Vista (32-bit) editions — Home Basic, Home Premium, Business, or Ultimate
3. Supported Windows 7 (32-bit and 64-bit) editions — Home Basic, Home Premium, Professional, Enterprise, or Ultimate
4. Keysight Measurement Manager for Windows 7 64-bit support is a 32-bit application running on a WOW64 (Windows-on-Windows 64-bit) emulator.
5. Super VGA graphics is supported for Windows Vista and Windows 7.
6. The type of media provided with the product determines whether a CD-ROM drive or DVD-ROM drive is required.

### Software requirements

Keysight IO Libraries Suite 15.1 and above<sup>1</sup>

Keysight T&M Toolkit Runtime version 2.1<sup>2</sup>

Keysight T&M Toolkit Redistributable Package 2.1 patch<sup>2</sup>

Microsoft .NET Framework version 2.0<sup>2</sup>

1. Available on the Keysight Automation-Ready CD-ROM
2. Bundled with Keysight Measurement Manager software application installer

## Other products in the Keysight USB Modular Test Instruments Family



### U2722A/U2723A USB Modular Source Measure Unit

Features:

- Three-channel SMU with four-quadrant source/measure operation
- High measurement sensitivity of 100 pA with 16-bit resolution for all voltage and current ranges
- 0.1% basic accuracy
- Embedded test scripts (for U2723A)

For more information: [www.keysight.com/find/U2722A](http://www.keysight.com/find/U2722A)  
[www.keysight.com/find/U2723A](http://www.keysight.com/find/U2723A)



### U2741A USB Modular Digital Multimeter (DMM)

Features:

- Fast reading speed (up to 100 Sa/s)
- Wide range of basic measurement functions, including frequency and temperature measurements

For more information: [www.keysight.com/find/U2741A](http://www.keysight.com/find/U2741A)



### U2701A/U2702A USB Modular Oscilloscope

Features:

- High sampling rate up to 500 MSa/s, enabling accurate measurement analysis
- Up to 32 MB large memory
- Fast fourier transfer (FFT) and waveform math functions enables easy waveform calculation

For more information: [www.keysight.com/find/usbscope](http://www.keysight.com/find/usbscope)



### U2761A USB Modular Function/Arbitrary Waveform Generator

Features:

- Direct digital synthesis (DDS) waveform generator
- Pulse generator that can generate pulse signal as stimulus
- Easy customization with Arbitrary Waveform Editor
- Internal modulation capability simplifies test setup

For more information: [www.keysight.com/find/U2761A](http://www.keysight.com/find/U2761A)



### U2781A USB Modular Product Chassis

Features:

- Expansion of channels for each modular product
- Multiple instrument synchronization
- Internal and external 10 MHz reference clock
- High-speed USB 2.0
- SSI/Star trigger bus synchronization between external trigger source and modules

For more information: [www.keysight.com/find/U2781A](http://www.keysight.com/find/U2781A)

## Ordering information

Model	Description
U2751A	USB modular switch matrix

## Optional accessories

Model	Description
U2922A-201	32-channel terminal block
U2921A-101	USB secure cable 2 m



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