

# U2751A USB Modular Switch Matrix

## Introduction

The Keysight 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 four rows by eight columns (4x8) configuration enabling connection with any combination of rows and columns, including multiple channels at the same time. It also features a relay cycle counter.



## Features

- 32 two-wire crosspoints 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 — BenchVue USB Modular Switch Matrix App
- 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
- Control, automate, and simplify with Keysight BenchVue software
- Compatible with a wide range of Keysight Development Environments (KDEs)



### Awards and Accolades

Keysight U2700A series USB Modular Instruments won Design News' Golden Mousetrap Award in the 2009 Best Products Category. Design News' Awards Program highlights engineering innovation and product design creativity and honors the best designs of the past year.

## Affordable, Reliable, and Flexible Switching Solution

- Minimal crosstalk at up to 45 MHz for more accurate measurements
- The 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 BenchVue software on your PC with quick and easy installation
- The flexible standalone or modular capability enables you to have a lower startup cost
- SCPI and IVI-COM supported, and a wide range of ADEs compatibility minimize your work time and increase software options

## Flexible Connection with Minimal Crosstalk



The U2751A offers you the most flexible connection path between your device under test (DUT) and your 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 that allows you to have more accurate measurements with a wider range of test applications.

## U2922A 32-Channel Terminal Block



The U2922A terminal block is an optional accessory to be used with the U2751A. The U2922A, which weighs approximately 100 g with screw-type terminals, offers you a convenient and simple way of making the connection to the switch matrix for prototyping applications or 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

## Control, Automate and Simplify with BenchVue— No Programming Needed

Keysight BenchVue software for the PC eliminates many of the issues around bench testing. By making it simple to connect, control instruments, and automate test sequences, you can quickly move past the test development phase and access results faster than ever before with just a few clicks. Dedicated instrument apps allow you to quickly configure the most commonly used measurements and setups for each instrument family. Rapidly build custom test sequences with the integrated Test Flow app to automate and visualize test results without the need for instrument programming. BenchVue supports hundreds of Keysight instrument types and models, all from one easy-to-use application. Control, Automate, Simplify with BenchVue.

## Product Outlook and Dimensions

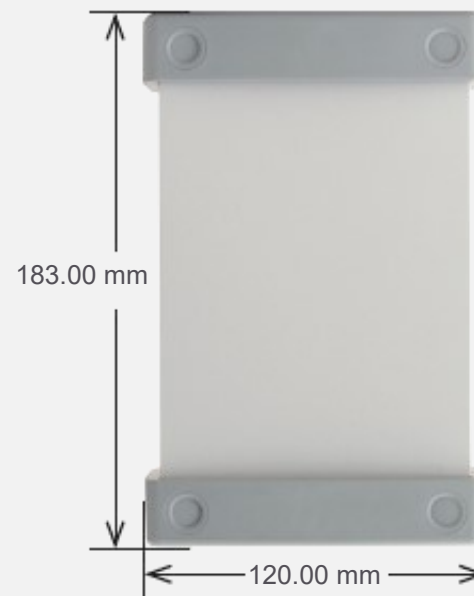
Front view



Rear view



Top view



## Optional accessories

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



Figure 3. Implement a variety of test topologies with the U2922A terminal block.

## Product Characteristics and General Specifications

Specifications	
Remote Interface	<ul style="list-style-type: none"> <li>• Hi-Speed USB 2.0 <sup>2</sup></li> <li>• USBTMC-USB488 <sup>1</sup></li> </ul>
Power Consumption	<ul style="list-style-type: none"> <li>• +12 VDC, 2 A maximum</li> <li>• Installation Category II</li> </ul>
Operating Environment	<ul style="list-style-type: none"> <li>• Operating temperature from 0 °C to +50 °C</li> <li>• Relative humidity at 20% to 85% RH (non-condensing)</li> <li>• Altitude up to 2000 meters</li> <li>• Pollution Degree 2</li> <li>• For indoor use only</li> </ul>
Storage Compliance	Storage temperature from –20 °C to 70 °C
Safety and EMC Compliance	Refer to Declaration of Conformity for the latest revisions of regulatory compliance at: <a href="http://www.keysight.com/go/conformity">www.keysight.com/go/conformity</a>
Measurement Compliance	CAT II 300 V Over-voltage protection
Shock and Vibration	Tested to IEC/EN 60068-2
IO Connector	DSub 25 male
Dimension (W × D × H)	Module dimension: <ul style="list-style-type: none"> <li>• 120.00 mm × 183.00 mm × 44.00 mm (with bumpers)</li> <li>• 105.00 mm × 175.00 mm × 25 mm (without bumpers)</li> </ul>
Weight	<ul style="list-style-type: none"> <li>• 480 g (with bumpers)</li> <li>• 428 g (without bumpers)</li> </ul>
Notes: <ol style="list-style-type: none"> <li>1. Compatible with Microsoft Windows operating systems only.</li> <li>2. If remote connections are necessary, an E5813A USB/LAN hub can be used. Please go to the product's user guide for more information.</li> </ol>	

## Product Specifications

Model	U2751A	
	Without U2922A terminal block	With U2922A terminal block
Channels/configuration	4 × 8, 2-wire	
Switch type	Armature latching	
Input characteristics (per channel)		
Max working voltage <sup>1</sup> <ul style="list-style-type: none"><li>Standalone</li><li>Modular (Used with U2781A)</li></ul>	<ul style="list-style-type: none"><li>42 VDC/35 Vrms</li><li>180 VDC/180 Vrms</li></ul>	
Max transient voltage	300 Vrms	
Max current <ul style="list-style-type: none"><li>Switch current</li><li>Carry current</li></ul>	<ul style="list-style-type: none"><li>2 A</li><li>2 A</li></ul>	
Power (W, VA) <sup>2</sup>	60 W, 62.5 VA	
Volt-Hertz limit	108	
General specification		
Thermal emf (differential)	< 3 μV	
Initial closed channel resistance	< 1.5 Ω	
DC isolation (ch-ch, ch-earth)	> 10 GΩ	
AC characteristics		
Bandwidth <sup>3</sup>	45 MHz	30 MHz
Insertion loss <ul style="list-style-type: none"><li>100 kHz</li><li>1 MHz</li><li>10 MHz</li><li>45 MHz</li></ul>	<ul style="list-style-type: none"><li>0.2 dB</li><li>0.3 dB</li><li>&lt; 2 dB</li><li>&lt; 3 dB</li></ul>	<ul style="list-style-type: none"><li>0.2 dB</li><li>0.3 dB</li><li>&lt; 2 dB</li><li>&lt; 4.5 dB</li></ul>
Capacitance <ul style="list-style-type: none"><li>HI-LO</li><li>LO-Earth</li></ul>	<ul style="list-style-type: none"><li>55 pF</li><li>35 pF</li></ul>	<ul style="list-style-type: none"><li>85 pF</li><li>45 pF</li></ul>

Model	U2751A	
	Without U2922A terminal block	With U2922A terminal block
Crosstalk at terminal block (ch-ch) <sup>3</sup> <ul style="list-style-type: none"> <li>• 300 kHz</li> <li>• 1 MHz</li> <li>• 20 MHz</li> <li>• 45 MHz</li> </ul>		<ul style="list-style-type: none"> <li>• 70 dB</li> <li>• 60 dB</li> <li>• 35 dB</li> <li>• 30 dB</li> </ul>
<b>General characteristics</b>		
Relay life, typical <ul style="list-style-type: none"> <li>• No-load</li> <li>• 10 V, 100 mA</li> <li>• Related load</li> </ul>		<ul style="list-style-type: none"> <li>• 100 M</li> <li>• 10 M</li> <li>• 100 k</li> </ul>
Open/close time		4 ms/4 ms
Notes: <ol style="list-style-type: none"> <li>1. DC or AC rms, channel-to-channel or channel-to-earth.</li> <li>2. Limited to 6 W channel resistance power loss per module.</li> <li>3. 3 50 Ω source, 50 Ω load, differential measurements verified with a 4-port network analyzer (Sdd21).</li> </ol>		

## USB Modular Switch Matrix App within BenchVue

BenchVue software for the PC makes it simple to connect, control, capture, and view multiple Keysight instruments simultaneously with no additional programming. You can derive answers faster than ever by easily viewing, logging, and exporting measurement data and screen images with a few clicks from a single environment.

- Visualize multiple measurements simultaneously
- Easily log data, screenshots, and system state
- Rapidly prototype custom test sequences
- Recall past states of your USB Modular to replicate results
- Export measurement data in the desired format fast
- Quickly access manuals, drivers, FAQs, and videos

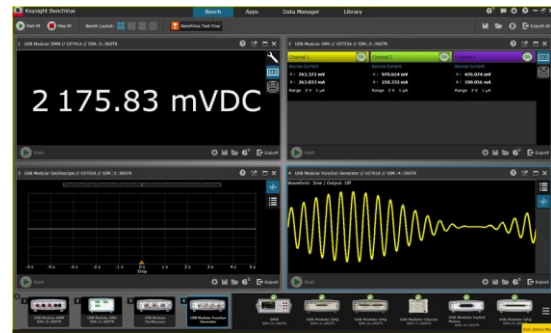


Figure 7. View measurements across USB DAQ, modular, and bench instruments all on one BenchVue interface.

The USB Modular Switch Matrix App within BenchVue allows you to quickly configure and control the U2751A Switch Matrix across its 32 cross points and visualize the number of times each relay is used.

Get started with BenchVue, downloadable at no cost at [www.keysight.com/find/benchvue](http://www.keysight.com/find/benchvue).

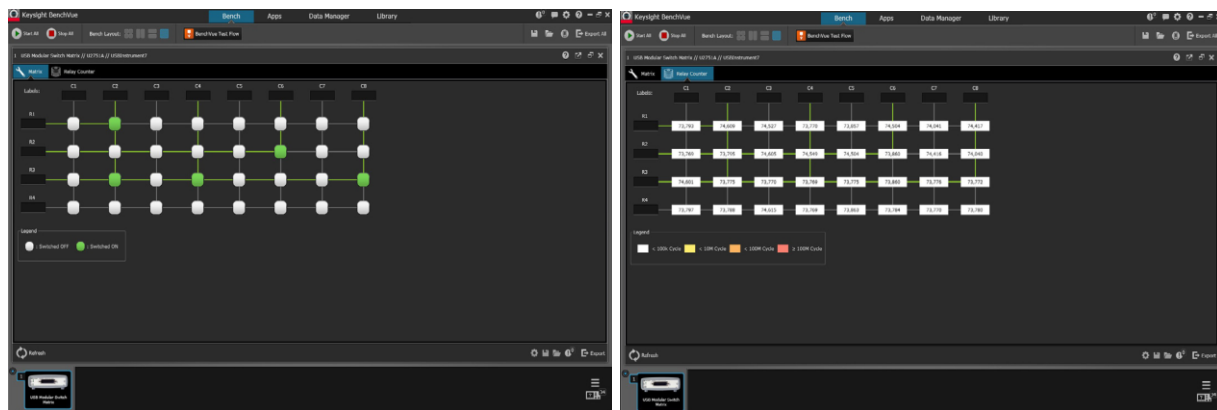


Figure 8. Configure and monitor your switch matrix easily on BenchVue's modern interface.



## 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 enable 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 the stimulus
- Easy customization with Arbitrary Waveform Editor
- Internal modulation capability simplifies the 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

## Web Resources

Learn more about U2751A at: [www.keysight.com/find/U2751A](http://www.keysight.com/find/U2751A)

Learn more at: [www.keysight.com](http://www.keysight.com)

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