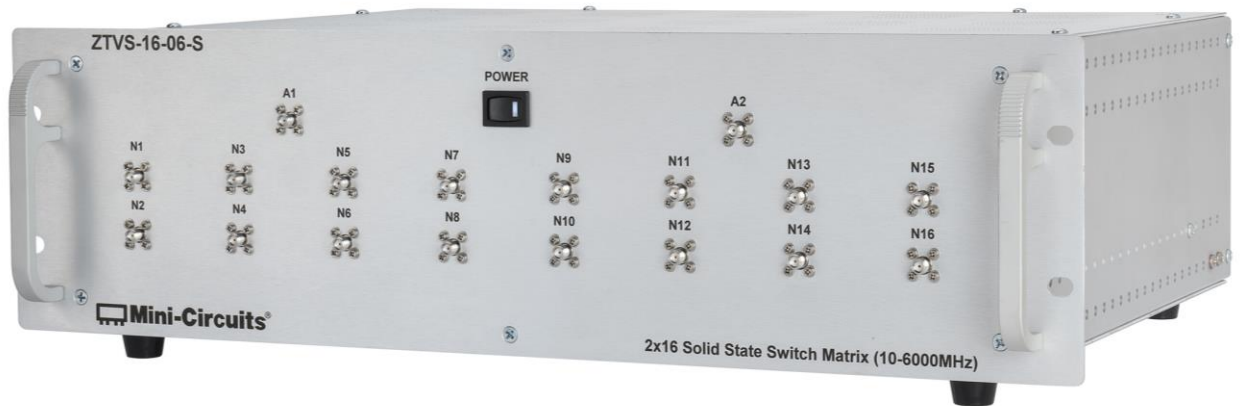


2 x 16 Blocking Switch Matrix

ZTVS-16-06-S

50Ω 10 to 6000 MHz Solid-State



Product Overview

Mini-Circuits' ZTVS-16-06 is a flexible, 2 by 16 blocking switch matrix covering 10 MHz to 6 GHz. The solid-state design combines fast switching times, high isolation and exceptional reliability. The compact 3U height, 19-inch rack-mountable chassis includes all RF connections (SMA) on the front panel. This system is ideal for expanding a standard 2 port VNA for multi-port or multi-device testing:

- Parallel testing of multiple 2 port devices such as filter or amplifier characterisation
- Production testing of splitter / combiner or switch components with high port counts
- Testing of MIMO systems with high channel counts

The system includes both USB and Ethernet control interfaces, providing a range of flexible control options. Software support is provided through our easy-to-use GUI application for remote control over a network, or local control through USB. ActiveX and .NET API objects (for Windows environments) and SSH / HTTP / Telnet support ensure compatibility with most common programming environments.

Key Features

Feature	Advantages
Solid-state switch design	Solid-state designs have no mechanical moving parts, offering faster switching times and better long-term reliability.
High port counts	Bi-directional operation from 2 to 16 ports facilitates a wide range of switch applications
Ethernet Control	Remote control from any computer or device with a network connection (SSH, HTTP or Telnet protocols).
Daisy-chain control stacking	Manage multiple switch matrices through a single software and control interface by daisy-chaining the systems.
Full software support	The user friendly Windows GUI (graphical user interface automation) allows manual control straight out of the box. A full API (application programming interface), programming examples and manuals are provided to allow automation in most programming environments.

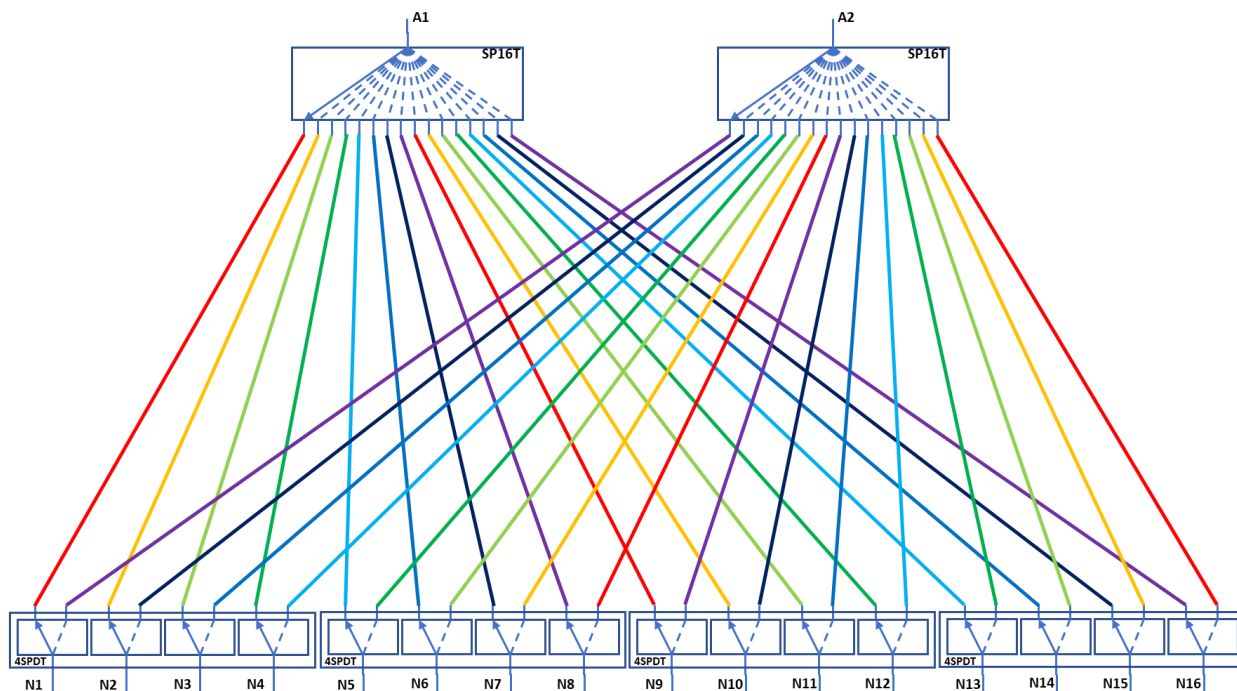
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Mechanical Specifications

Dimensions	19" (W) x 3U (H) x 13" (D)			
Case Drawing	99-01-3152			
Case Material	<ul style="list-style-type: none"> Aluminum (with protective coating to prevent corrosion) Reinforced cover to support VNA mounted on top of switch matrix 			
RF Connectors	Panel	Connector	Quantity	Port Labels
	Front	SMA female	2 16	A1 – A2 N1 – N16
Panel Items	Front Panel		Rear Panel	
Panel Marking	<ul style="list-style-type: none"> Model name 2 x 16 Solid-State Switch Matrix 10-6000 MHz 		<ul style="list-style-type: none"> CE EAC Serial number / date code / model name 	
Other Connectors			<ul style="list-style-type: none"> AC mains power input (IEC C14 inlet) USB type B socket RJ45 (LAN) socket 2 x D-Sub 9-pin (Serial In & Out) 	
Other	<ul style="list-style-type: none"> Power on / off switch with LED Carry handles 			
Power Supply	AC mains power input (90-260 V, 47-63 Hz)			
Fuse	2A, 250V rating			
Temperature	Operating: 0 to +50 °C			

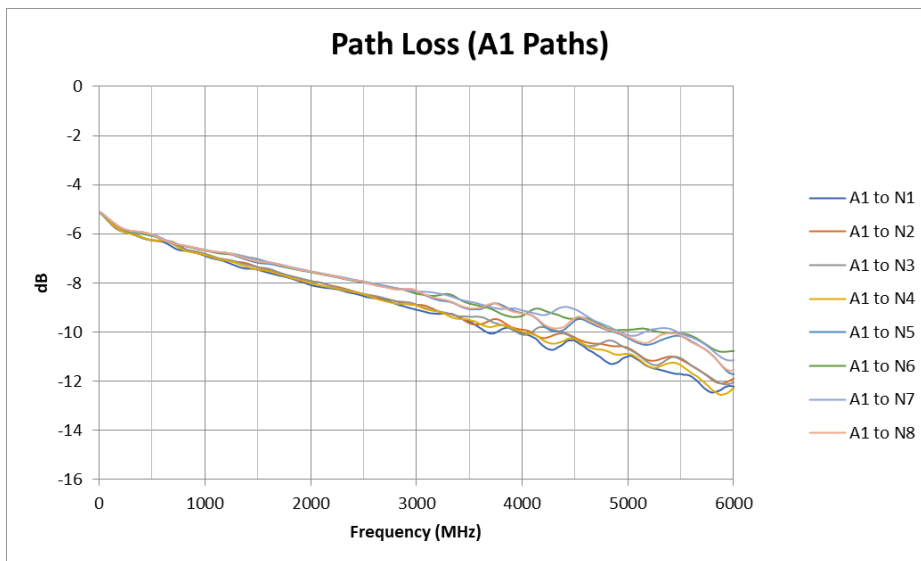
Block Diagram



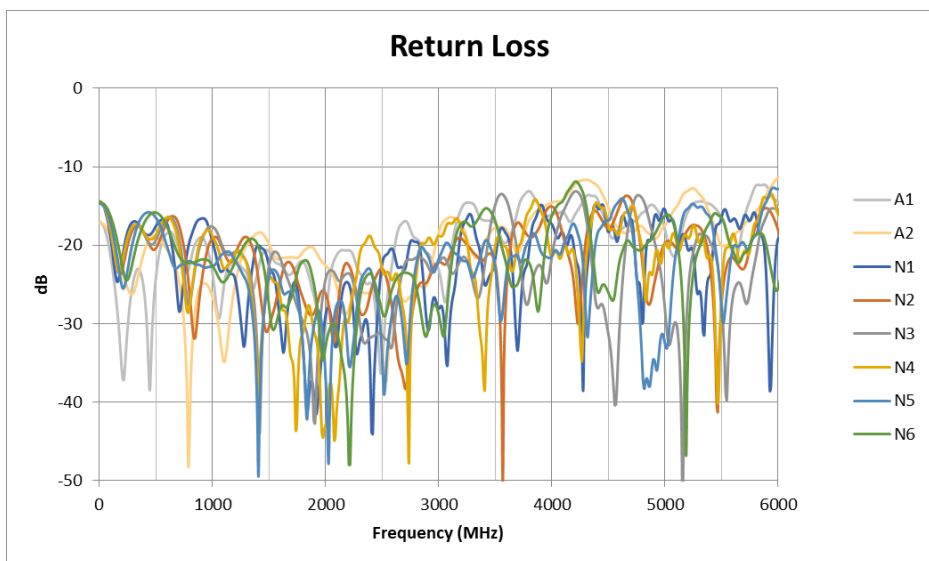
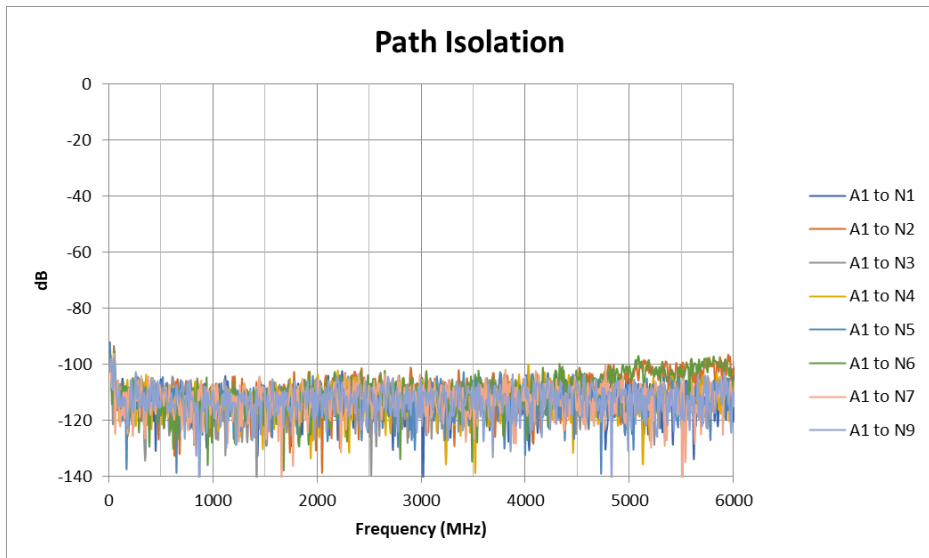
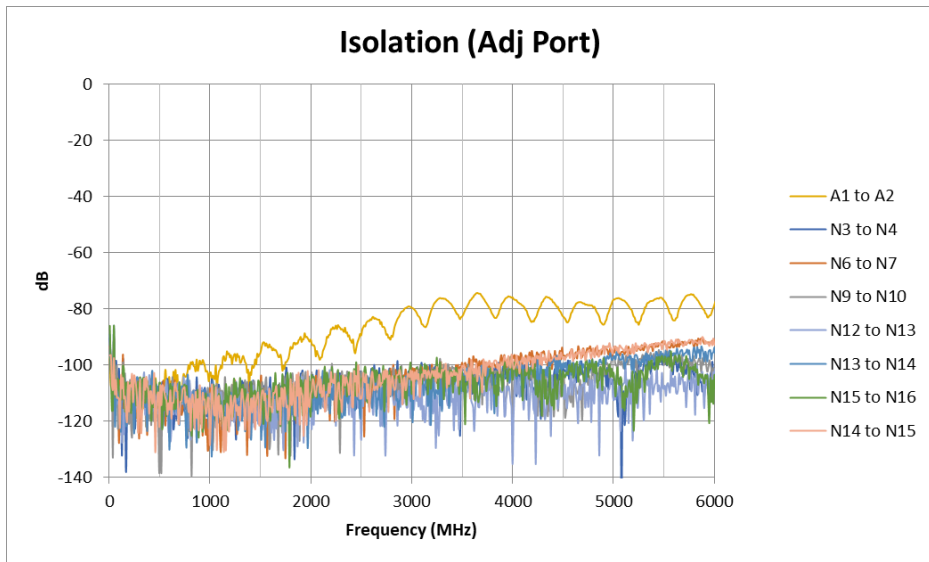
Electrical Specifications at 25°C

Parameter	Conditions	Min	Typ	Max	Units
Frequency		10	-	6000	MHz
Path Loss	10 – 3000 MHz	-	9.0	10.5	dB
	3000 – 6000 MHz	-	12.0	14.0	
Adjacent Port Isolation (Between A Ports)	10 – 3000 MHz	75	90	-	dB
	3000 – 6000 MHz	60	75	-	
Adjacent Port Isolation (Between N Ports)	10 – 3000 MHz	80	100	-	dB
	3000 – 6000 MHz	80	95	-	
Path Isolation (Inactive Paths)	A _x to N _y when disconnected	80	100	-	dB
Return Loss	10 – 3000 MHz	-	18	-	dB
	3000 – 6000 MHz	-	13	-	
Input Power		-	-	+23	dBm

Typical Performance Data



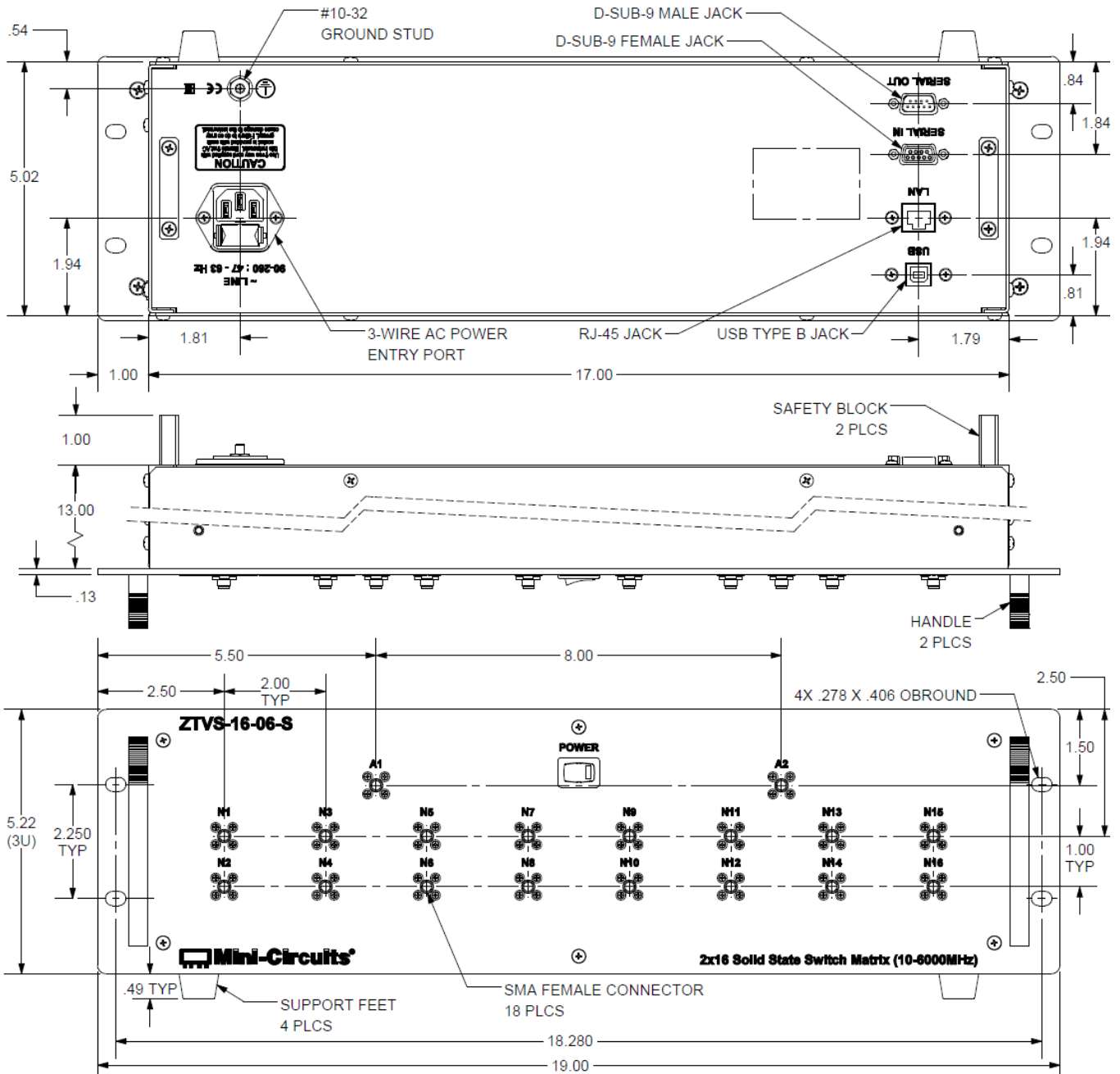
Typical Performance Data



2 x 16 Blocking Switch Matrix

ZTVS-16-06-S

Outline Drawing



Software Specifications

- Please contact testsolutions@minicircuits.com for support

Ethernet Control	Supported Protocols	TCP / IP, SSH, HTTP, Telnet, DHCP, UDP
	Max Data Rate	100 Mbps (100Base-T Full Duplex)
USB Control	Supported Protocols	HID - High Speed
	Min Communication Time	400 μ s typ
Software Support	<ul style="list-style-type: none"> • Mini-Circuits' Universal GUI for USB & LAN control (Windows only) • ASCII / SCPI command syntax for LAN programming (all OS) • ActiveX / .Net DLL APIs for USB programming (Windows only) • Interrupt codes for direct USB programming (all OS) • Full programming instructions and examples for a wide range of languages 	
Downloads	Software & Documentation	https://www.minicircuits.com/softwaredownload/ztvx.html

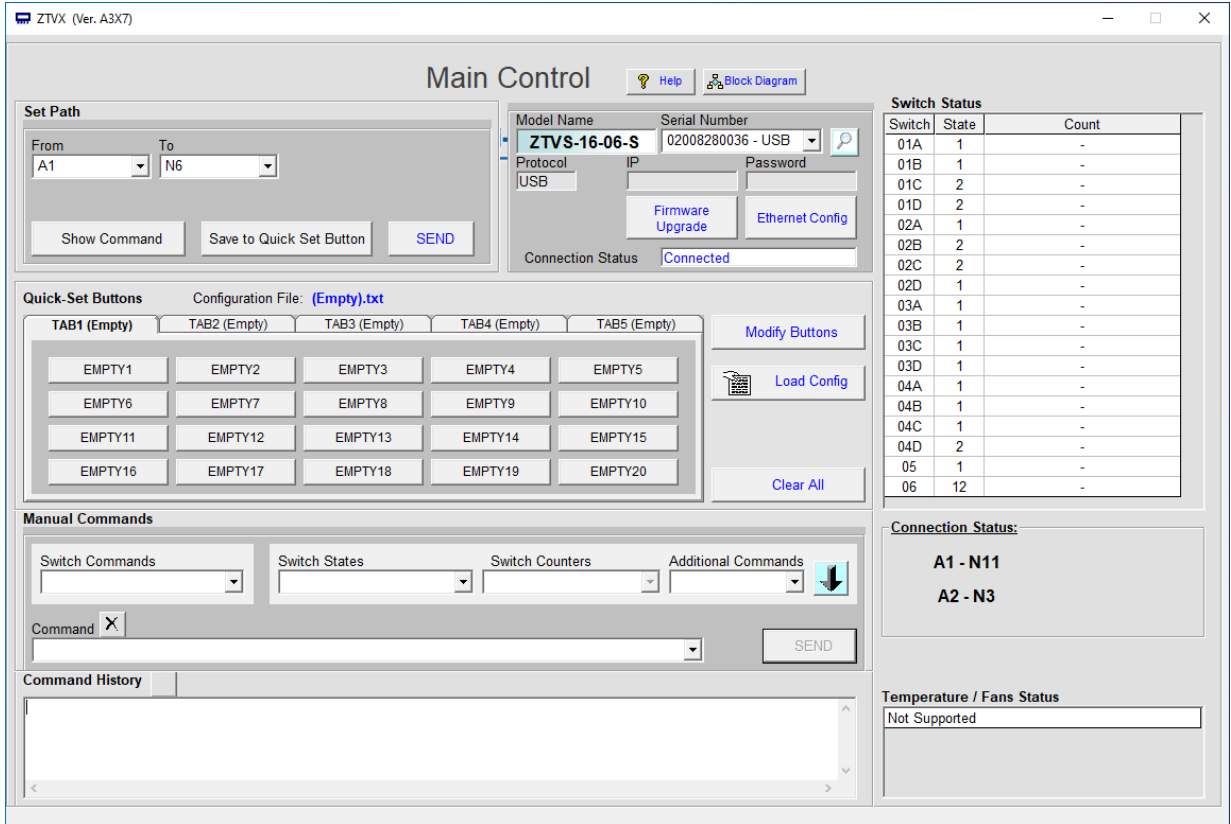
Programming Commands

- The key ASCII / SCPI commands for control of the system are summarized below
- These can be sent via the USB or Ethernet API
- Please refer to the programming manual for full details

Command / Query	Description
:MN?	Read model name
:SN?	Read serial number
:FIRMWARE?	Read firmware version
:PATH:a_port:n_port	Set the path between 2 switch ports: <ul style="list-style-type: none"> • a_port = "Input" port • n_port = "Output" port • Example: :PATH:A1:N8 (connect A1 to N8)
:PATH:input?	Check which "output" is connected to a specified input port

Graphical User Interface (GUI) for Windows - Key Features

- Connect via USB or Ethernet
- Run GUI in “demo mode” to evaluate software without a hardware connection
- View and set all switch paths
- Configure Ethernet settings
- Upgrade firmware
- Send SCPI commands
- View temperature & fan status



Daisy-Chain Control of Multiple Switch Matrices

Multiple switch matrix racks can be combined to form much larger systems by stacking the serial control interfaces. This allows large numbers of units to be managed through a single USB or Ethernet connection and software interface. All software commands are issued to the Master unit (the first unit in the chain) which will in turn control all Slave units as required. The process is:

- 1) Connect the Serial Out port of the first unit to the Serial In port of the next
- 2) Continue connecting additional units in the same manner, as required
- 3) Connect the AC power inputs for all units in the daisy-chain
- 4) Connect the control connection (USB or Ethernet) to the first unit in the chain; this becomes the Master unit
- 5) Each switch matrix within the chain can be individually controlled by issuing commands through the Master, to the unique address of each unit



Ordering Information

Please contact Mini-Circuits' Test Solutions department for price and availability:

testsolutions@minicircuits.com

Included Accessories

Model Name	Quantity	Description
CBL-3W-xx*	1	AC power cord (IEC C13 connector to local plug)
USB-CBL-AB-7+	1	USB cable (6.8 ft)
CBL-RJ45-MM-5+	1	Ethernet cable (5 ft)
HT-4-SMA	1	SMA Cable Wrench (4 in)

Cable Model	Region
CBL-3W-US	USA
CBL-3W-EU	Europe
CBL-3W-IL	Israel
CBL-3W-UK	UK
CBL-3W-AU	Australia / China

*Please specify one option on the purchase order, at no charge

Additional Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp