



## Product Overview

Mini-Circuits' ZTVX-n-18 series comprises a range of flexible, 2 by n switch matrices covering DC to 18 GHz, available in a compact 2U height, 19-inch rack-mountable chassis with all RF connections (SMA) accessible on the front panel. This system is available in a range of blocking switch matrix configurations from 2 x 8 to 2 x 16, ideal for expanding a standard 2 port VNA for a multi-port or multi-device test scenario:

- Parallel testing of multiple 2 port devices (eg: filter and amplifier production testing)
- Production testing of splitter/combiner or switch components with high port counts
- Testing of MIMO systems with high channel counts

The system can be controlled via USB or Ethernet (supporting both HTTP and Telnet network protocols). Full software support is provided, including our user-friendly GUI application for Windows and a full API with programming instructions for Windows and Linux environments (both 32-bit and 64-bit systems).

## Key Features

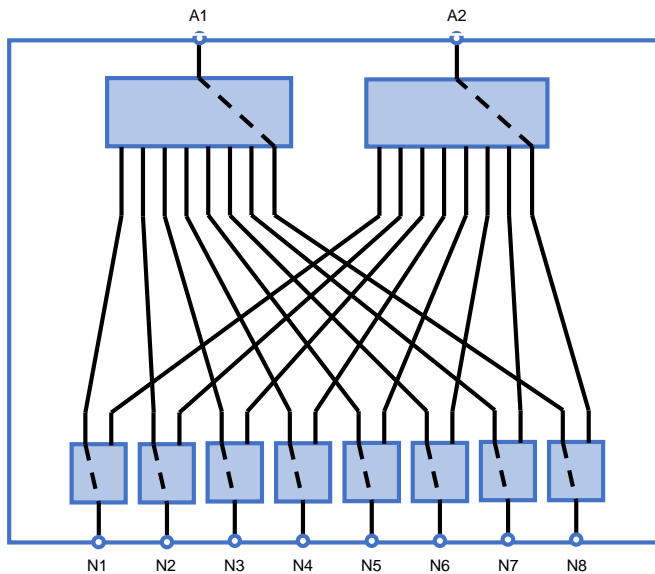
Feature	Advantages
High port counts	Bi-directional operation from 2 to multiple ports facilitates a wide range of switch applications
Compact package	The 2U height, rack-mountable chassis is easily located beneath a VNA or in a rack test environment.
Ethernet-TCP/IP (HTTP & Telnet)	Remote control from any Windows®, Mac®, or Linux® computer, or even a mobile device with a network connection and Ethernet-TCP/IP (HTTP or Telnet protocols) support. Using a VPN would allow remote control from anywhere in the world.
USB HID (Human Interface Device)	Local control via USB connection. Plug-and-Play, no driver required. Compatible with Windows® or Linux® operating systems using 32 and 64 bit architectures.
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.

Please contact [testsolutions@minicircuits.com](mailto:testsolutions@minicircuits.com) for support

## Catalog Configurations\*

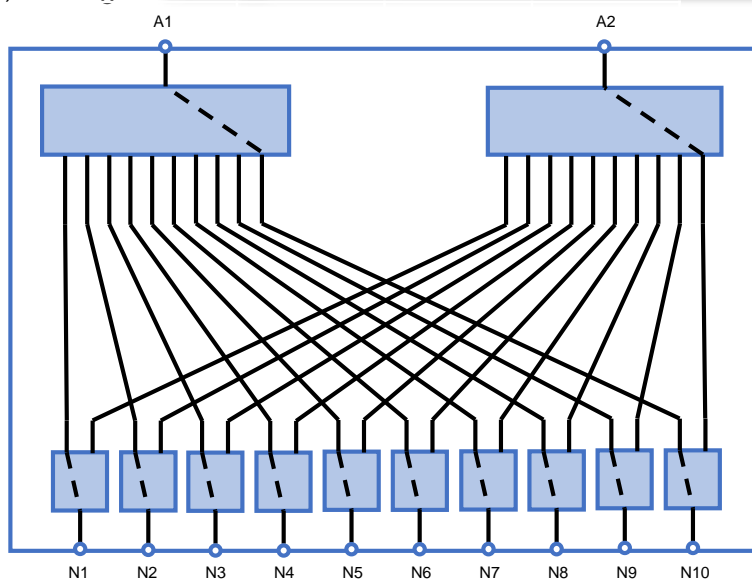
### ZTVX-8-18

- 2 x 8 switch matrix
- DC to 18 GHz
- SMA
- 19" rack chassis, 2U height



### ZTVX-10-18

- 2 x 10 switch matrix
- DC to 18 GHz
- SMA
- 19" rack chassis, 2U height

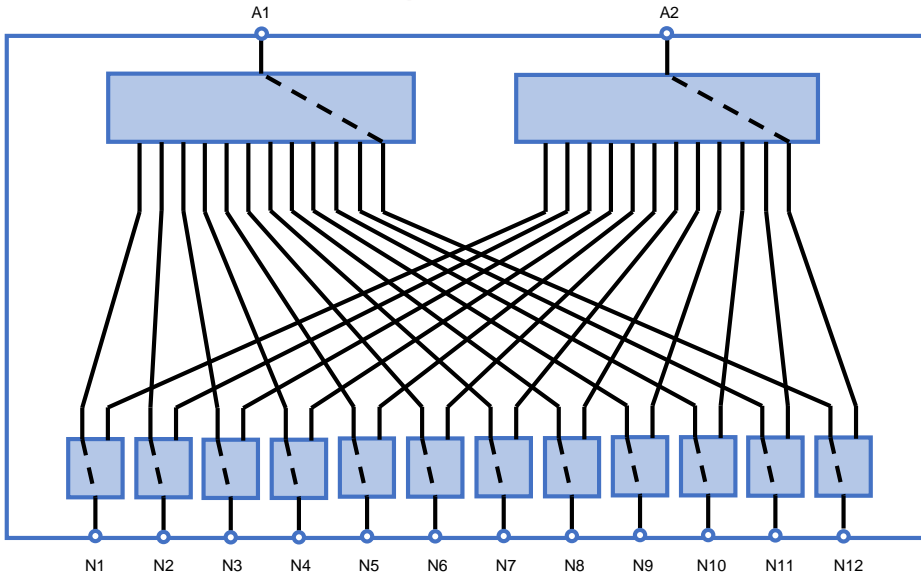
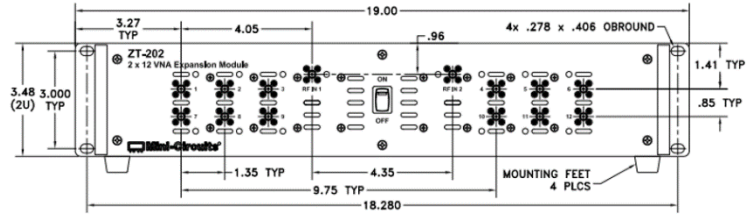


\*Note: Functional schematics are indicative of the switch matrix operation but are not precise wiring diagrams; the exact topology used may differ

## Catalog Configurations\*

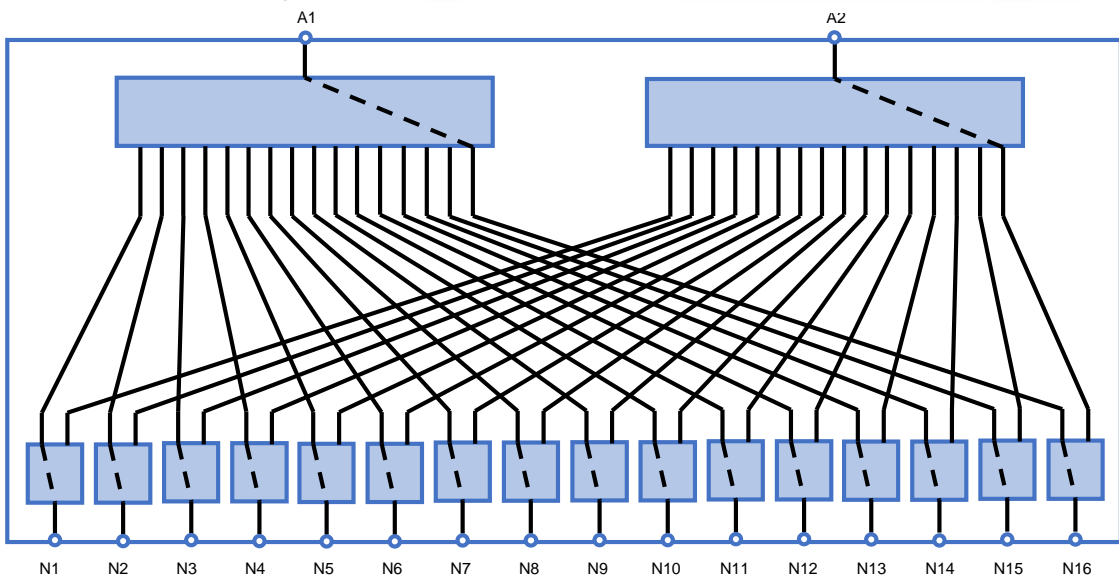
### ZTVX-12-18

- 2 x 12 switch matrix
- DC to 18 GHz
- SMA
- 19" rack chassis, 2U height



### ZTVX-16-18

- 2 x 16 switch matrix
- DC to 18 GHz
- SMA
- 19" rack chassis, 2U height



\*Note: Functional schematics are indicative of the switch matrix operation but are not precise wiring diagrams; the exact topology used may differ

**Mechanical Specifications**

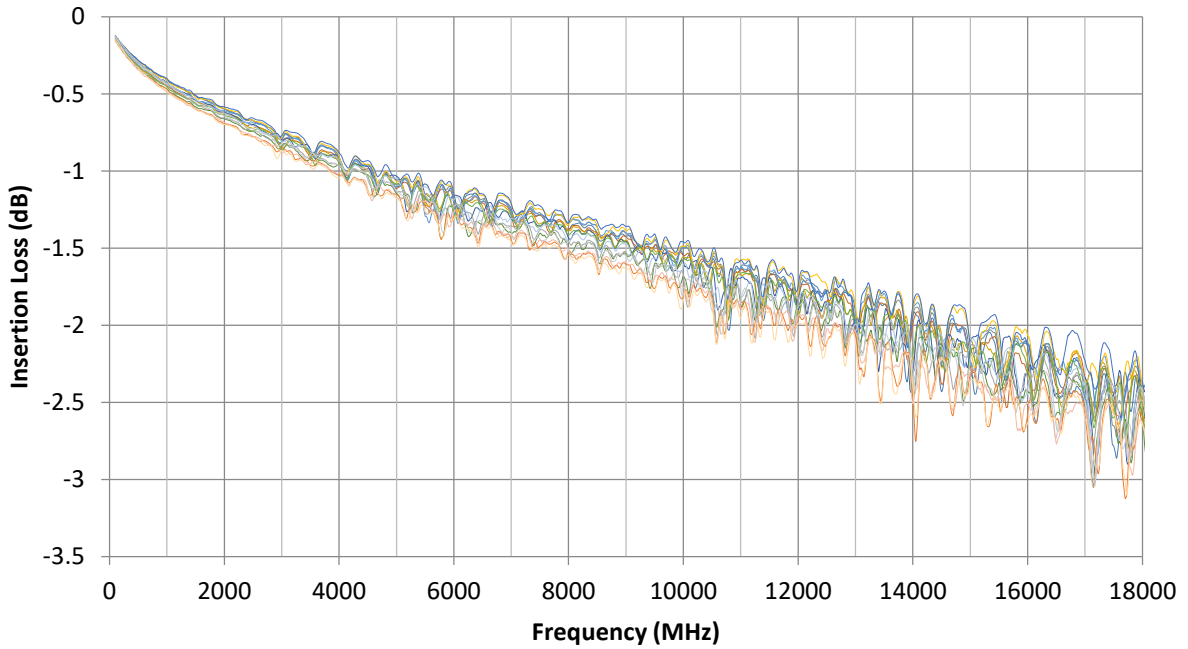
<b>Dimensions</b>	19" (W) x 2U (H) x 20" (D)
<b>Case Material</b>	Aluminum (with protective coatings to prevent corrosion)
<b>Feet</b>	Non-slip feet (removable)
<b>RF Connectors</b>	SMA female
<b>Top Panel</b>	Reinforced cover to support VNA mounted on top of switch matrix
<b>Front panel</b>	a) All RF ports (SMA female) b) LED switch path position indicators c) ON/OFF switch with indicator light d) Carry handles
<b>Rear panel</b>	a) AC mains power supply input (IEC C14 inlet) b) USB & RJ45 control connections c) Label with date code/serial number/MCL part# for traceability
<b>Control Interface</b>	a) USB and Ethernet TCP/IP supporting HTTP and TELNET protocols
<b>Power supply</b>	a) AC mains power supply (90-260 V, 47-63 Hz) b) 2A, 250V fuse rating
<b>Operating temp</b>	0° to +50° C

**Typical Electrical Performance**

Parameter	Value	Comments
<b>Port Counts</b>	2	A ports
	8 to 16	N ports
<b>Operating Frequency</b>	DC to 18 GHz	
<b>Insertion Loss</b>	1.0 dB typ	@ 3 GHz
	1.5 dB typ	@ 8 GHz
	2.5 dB typ	@ 18 GHz
<b>Return Loss</b>	20 dB typ	@ 3 GHz
	12 dB typ	@ 18 GHz
<b>Isolation</b>	90 dB typ	
<b>Input Power</b>	+30 dBm max	

## Typical Performance Data

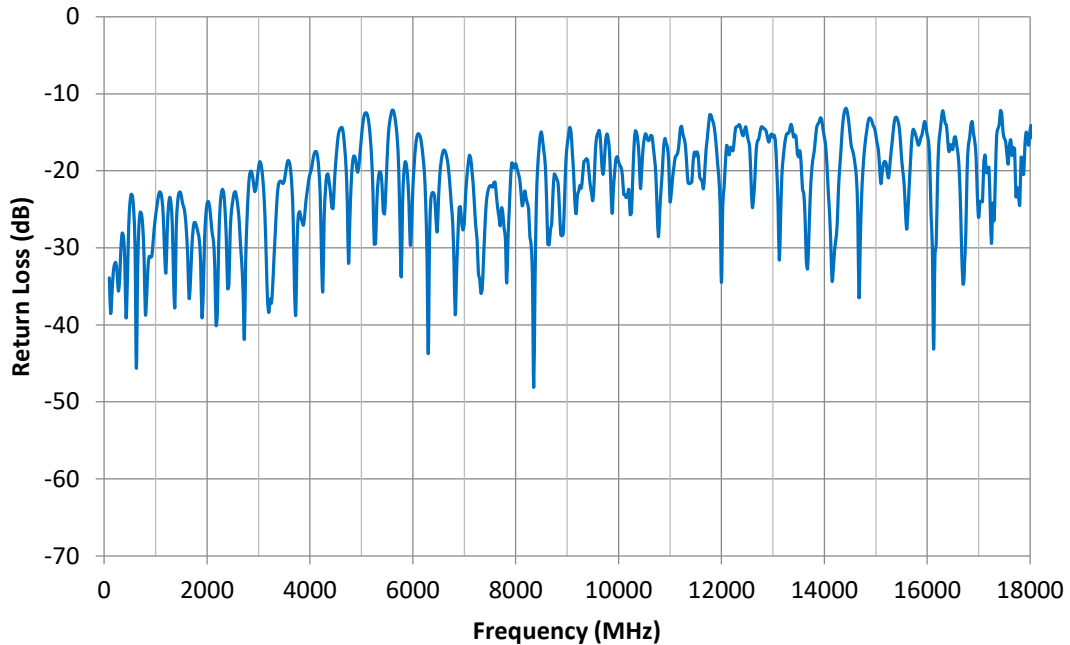
### Insertion Loss (All Paths from Port A1)



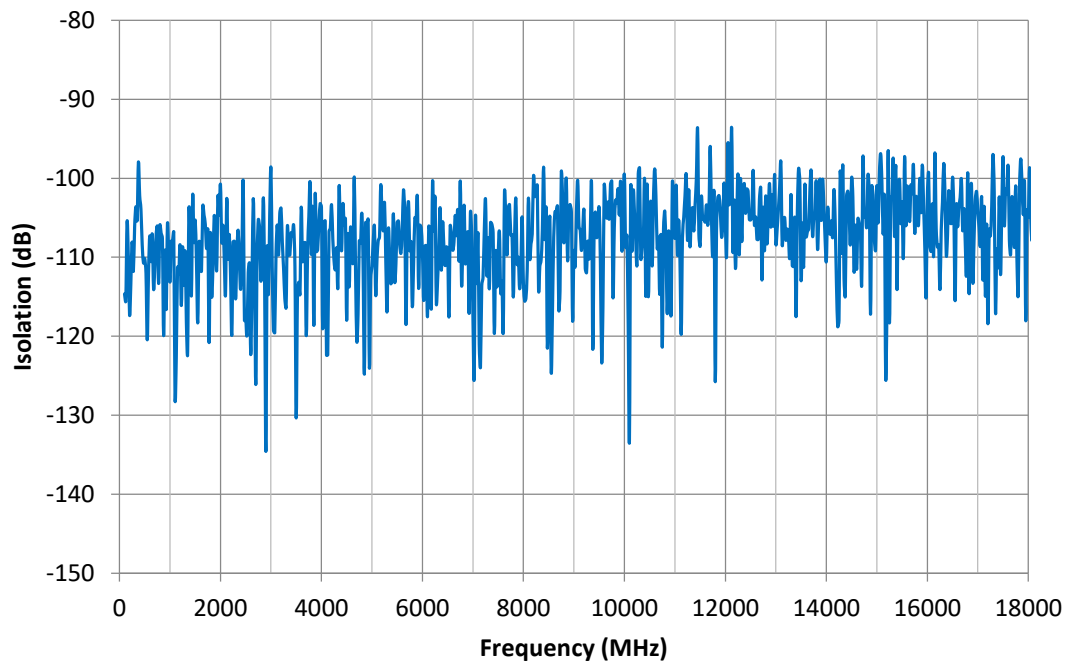
- A1 to N1    — A1 to N2    — A1 to N3    — A1 to N4    — A1 to N5    — A1 to N6
- A1 to N7    — A1 to N8    — A1 to N9    — A1 to N10    — A1 to N11    — A1 to N12
- A1 to N13    — A1 to N14    — A1 to N15    — A1 to N16

## Typical Performance Data

### Return Loss



### Isolation



## Software Specifications

### Software & Documentation Download:

- Mini-Circuits' full software and support package including user guide, Windows GUI, DLL files, programming manual and examples are available for download from:  
<https://www.minicircuits.com/softwaredownload/ztvx.html>
- Please contact [testsolutions@minicircuits.com](mailto:testsolutions@minicircuits.com) for support

### Minimum System Requirements:

Parameter	Requirements	
Interface	USB HID & Ethernet (HTTP & Telnet)	
System Requirements	GUI	Windows 98 or later
	USB API DLL	Windows 98 or later and programming environment with ActiveX or .NET support
	USB Direct Programming	Linux; Windows 98 or later
	Ethernet	Windows, Linux or Mac computer with a network port and Ethernet TCP / IP support
Hardware	Pentium II or later with 256 MB RAM	

### Application Programming Interface (API)

#### Ethernet Support:

- Simple ASCII / SCPI command set for attenuator control
- Communication via HTTP or Telnet
- Supported by most common programming environments

#### USB Support (Windows):

- ActiveX COM DLL file for creation of 32-bit programs
- .NET library DLL file for creation of 32 / 64-bit programs
- Supported by most common programming environments (refer to application note [AN-49-001](#) for summary of supported environments)

#### USB Support (Linux):

- Direct USB programming using a series of USB interrupt codes

Full programming instructions and examples available for a wide range of programming environments / languages.

## 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

The screenshot displays the Mini-Circuits ZTVX GUI. The interface is divided into several functional areas:

- Set Path:** Includes 'From' and 'To' dropdowns (A1 to N5), 'Show Command', 'Save to Quick Set Button', and 'SEND' buttons.
- Main Control:** Features 'Model Name' (ZTVX), 'Serial Number' (Demo Mode), 'Protocol', 'IP', and 'Password' fields. It also has 'Firmware Upgrade' and 'Ethernet Config' buttons, and a 'Connection Status' indicator set to 'Demo Mode'.
- Quick-Set Buttons:** A grid of buttons for setting paths (A1 -> N1 to N16), a 'Query A1 Path' button, and 'EMPTY' buttons. Includes 'Modify Buttons', 'Load Config', and 'Clear All' options.
- Manual Commands:** Fields for 'Switch Commands', 'Switch States' (containing ':PATH:A1?'), 'Switch Counters', and 'Additional Commands'. Includes a 'Command' input field and a 'SEND' button.
- Command History:** A scrollable log showing recent SCPI commands and their successful results in demo mode.
- Switch Status:** A table showing the status of 10 switches.
- Connection Status:** A section for monitoring the connection of A1 and A2 matrices.
- Temperature / Fans Status:** A table showing the status of the device's temperature and fans.

Switch	State	Count
1	0	325
2	1	179
6	0	470
7	0	461
8	1	430
9	1	254
10	0	479

Parameter	Status
Temperature	Normal
Fan1 operation	OK
Fan2 operation	OK
Fans state	OFF