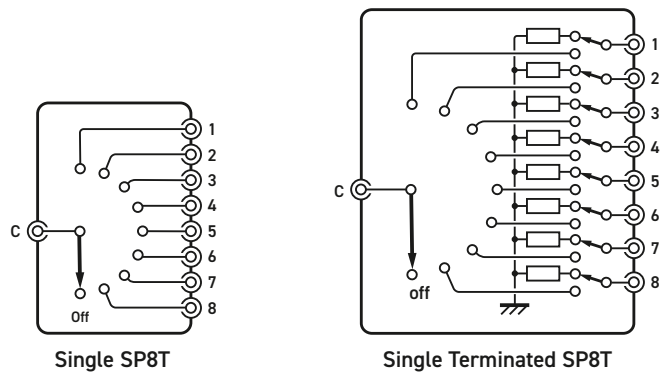


- Available as PXI or PXIe Modules
- SP8T, SP10T or SP12T Panel Mounted Multiplexer
- 1 or 2 Remote SP8T, SP10T or SP12T Multiplexers From Dual Slot Version
- 50 Ω Versions With 8-40 GHz Bandwidth
- 50 Ω Terminated and unterminated Versions
- Relay Cycle Counting Included
- LED Indication
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- PXI Version Supported by PXI or LXI Chassis
- 3 Year Warranty



The 40-788 (PXI) and 42-788 (PXIe) range of PXI microwave multiplexer modules are suitable for switching 50 Ω signals up to 40 GHz. Single SP8T options are available in addition to single or dual SP10T or SP12T configurations with relays mounted on the front panel. Remote versions are also available which can support one or two multiplexers in a dual slot module.

The remote multiplexer versions, as well as occupying less PXI panel space, allow the microwave relays to be placed closer to the UUT and RF test equipment. This can shorten the length of cables and improve system performance. Remote versions are supplied with 1.5 m interface cables.



**Microwave Multiplexer (Part No. 40/42-788)
in Single SP8T Format**

The panel mounted terminated and unterminated multiplexers occupy 4 slots (all single versions) or 6 slots (all dual versions).

The 40/42-788 range is suitable for constructing complex microwave switching networks and includes switching configurations to suit most applications. Connection is by high performance SMA, SMA 2.9 or N-type connectors.

These modules give you the highest RF and microwave switching performance available within a Pickering switching system. Although designed for microwave applications, they have many uses in the RF spectrum where extremely low insertion loss and ultra high isolation are critical.



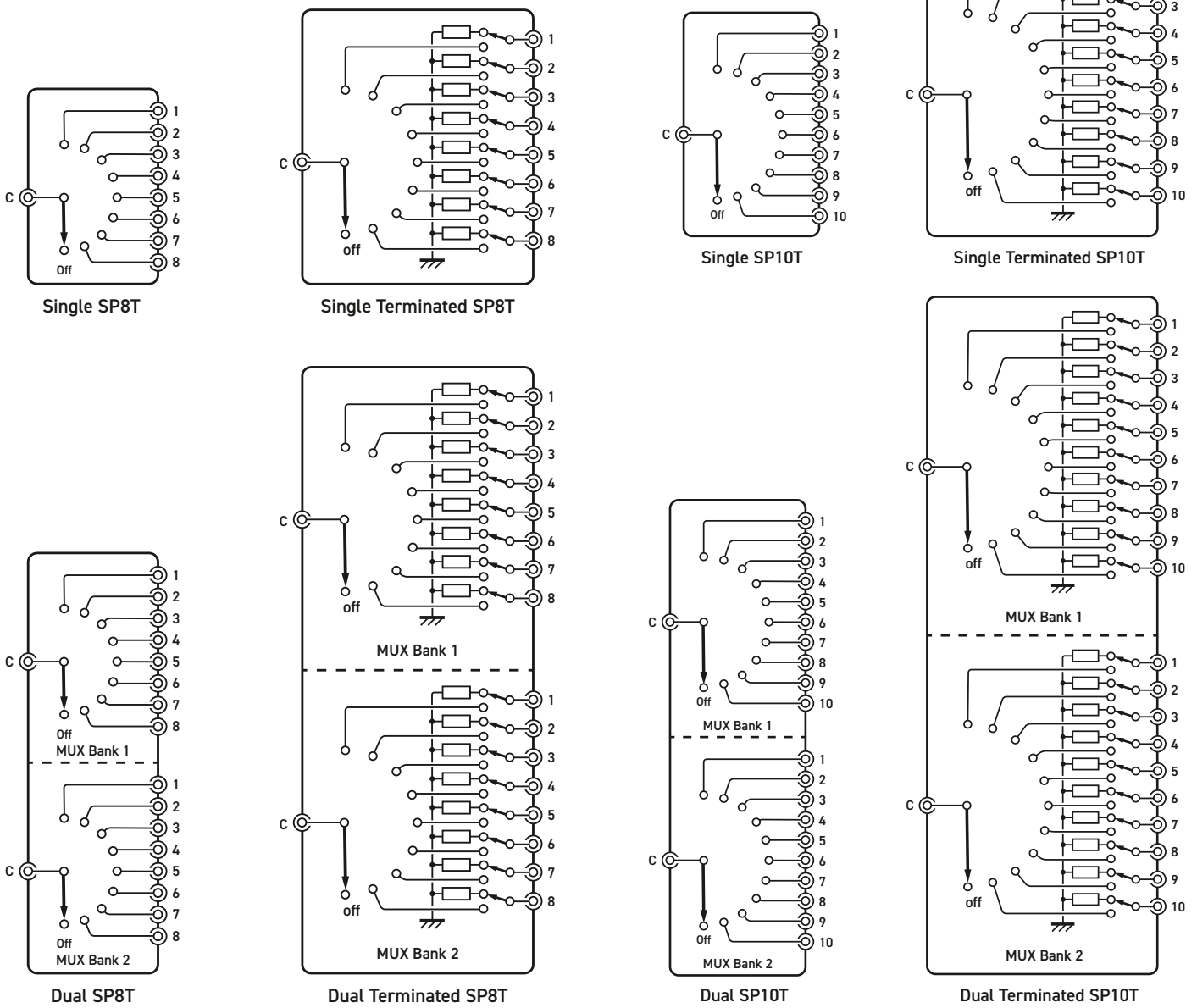
**Dual slot version
controls 1 or 2
remotely mounted
microwave
multiplexers via
interface cables**

Relay Cycle Counting

To aid with module "health" monitoring all versions are provided with a relay cycle counting feature. The number of operations per contact are stored on the module and can be used to determine if a relay is approaching EOL. This information could allow system connections to be revised so that signals applied to heavily used contacts are swapped with lightly used contacts to prolong the working life of the relay(s).

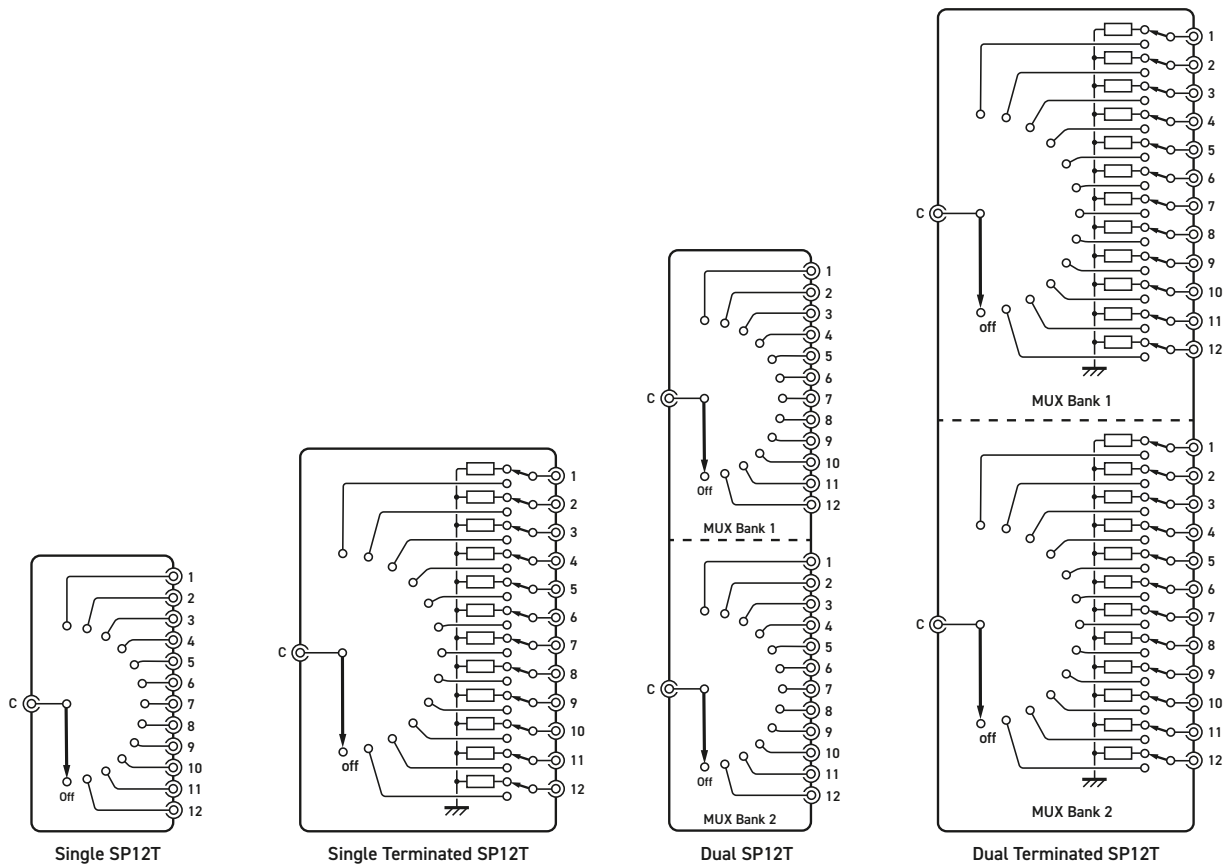
Larger Microwave Switching Systems

For applications requiring a larger payload than supported in the PXI/PXIe format please consider the Pickering LXI flexible (60-890) or turnkey (60-891) microwave ranges.



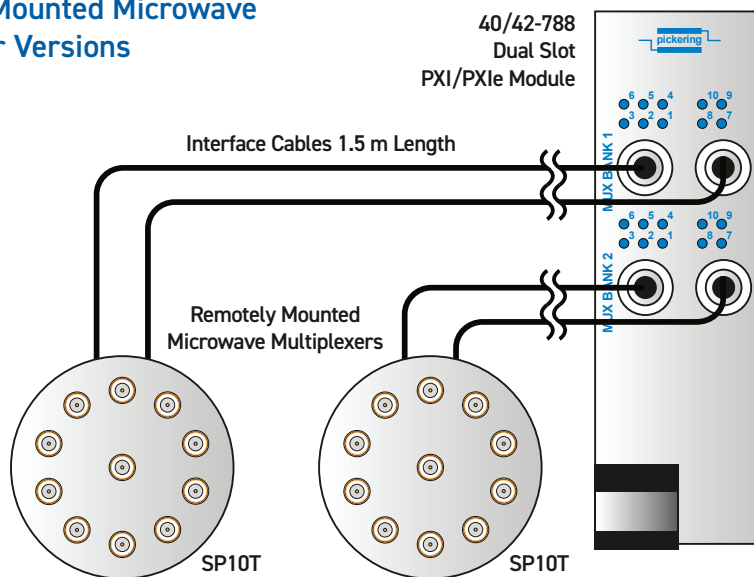
40/42-788 SP8T Multiplexer Range

40/42-788 SP10T Multiplexer Range



40/42-788 SP12T Multiplexer Range

Remotely Mounted Microwave Multiplexer Versions



Interconnection Between 40/42-788 Dual Slot Version and Remotely Mounted Microwave Multiplexers

General Multiplexer Information

Relay Manufacturer:	Radiall
Configuration:	SP8T, SP10T or SP12T Microwave MUX with 1 or 2 independent banks.
LED Indicators:	Multiplexers have blue LEDs to indicate a closed RF path.
Operate Time:	Typically 15 ms
Maximum Cold Switch Voltage:	100 V
Maximum Carry Current:	1 A

Specification - 18 GHz SP8T Versions

Characteristic Impedance:	50 Ω
Connectors:	SMA
Bandwidth	DC to 18 GHz
Isolation:	80 dB (0-3 GHz) 70 dB (3-8 GHz) 60 dB (8-12.4 GHz) 60 dB (12.4-18 GHz)
Insertion Loss:	0.2 dB (0-3 GHz) 0.3 dB (3-8 GHz) 0.4 dB (8-12.4 GHz) 0.5 dB (12.4-18 GHz)
VSWR:	1.2:1 (0-3 GHz) 1.3:1 (3-8 GHz) 1.4:1 (8-12.4 GHz) 1.5:1 (12.4-18 GHz)
Maximum RF Carry Power:	240 W (0-3 GHz) 150 W (3-8 GHz) 120 W (8-12.4 GHz) 100 W (12.4-18 GHz)
Termination Power Rating (terminated versions):	1 W per termination, 3 W total per multiplexer.
Expected Life (operations):	>3 million

Specification - 8 GHz SP8T, SP10T & SP12T Versions

Characteristic Impedance:	50 Ω
Connectors:	N-type
Bandwidth	DC to 8 GHz
Isolation:	80 dB (0-3 GHz) 70 dB (3-8 GHz)
Insertion Loss:	0.3 dB (0-3 GHz) 0.5 dB (3-8 GHz)
VSWR:	1.3:1 (0-3 GHz) 1.5:1 (0-3 GHz)
Maximum RF Carry Power:	400 W (0-3 GHz) 250 W (3-8 GHz)
Expected Life (operations):	>2 million

Specification - 18 GHz SP10T Versions

Characteristic Impedance:	50 Ω
Connectors:	SMA
Bandwidth	DC to 18 GHz
Isolation:	80 dB (0-3 GHz) 70 dB (3-8 GHz) 60 dB (8-12.4 GHz) 60 dB (12.4-16 GHz) 55 dB (16-18 GHz)
Insertion Loss:	0.2 dB (0-3 GHz) 0.3 dB (3-8 GHz) 0.4 dB (8-12.4 GHz) 0.5 dB (12.4-16 GHz) 0.7 dB (16-18 GHz)
VSWR:	1.2:1 (0-3 GHz) 1.3:1 (3-8 GHz) 1.4:1 (8-12.4 GHz) 1.5:1 (12.4-16 GHz) 1.7:1 (16-18 GHz)
Maximum RF Carry Power:	240 W (0-3 GHz) 150 W (3-8 GHz) 120 W (8-12.4 GHz) 110 W (12.4-16 GHz) 100 W (16-18 GHz)
Termination Power Rating (terminated versions):	1 W per termination, 3 W total per multiplexer.
Expected Life (operations):	>2 million

Specification - 18 GHz SP12T Versions

Characteristic Impedance:	50 Ω
Connectors:	SMA
Bandwidth	DC to 18 GHz
Isolation:	80 dB (0-3 GHz) 70 dB (3-8 GHz) 60 dB (8-12.4 GHz) 60 dB (12.4-16 GHz) 50 dB (16-18 GHz)
Insertion Loss:	0.2 dB (0-3 GHz) 0.4 dB (3-8 GHz) 0.6 dB (8-12.4 GHz) 0.7 dB (12.4-16 GHz) 0.8 dB (16-18 GHz)
VSWR:	1.2:1 (0-3 GHz) 1.4:1 (3-8 GHz) 1.6:1 (8-12.4 GHz) 1.7:1 (12.4-16 GHz) 1.8:1 (16-18 GHz)
Maximum RF Carry Power:	240 W (0-3 GHz) 150 W (3-8 GHz) 120 W (8-12.4 GHz) 110 W (12.4-16 GHz) 100 W (16-18 GHz)
Termination Power Rating (terminated versions):	1 W per termination, 3 W total per multiplexer.
Expected Life (operations):	>2 million

Specification - 22 GHz SP10T Versions

Characteristic Impedance:	50 Ω
Connectors:	SMA
Bandwidth	DC to 22 GHz
Isolation:	80 dB (0-3 GHz) 70 dB (3-8 GHz) 60 dB (8-12.4 GHz) 60 dB (12.4-16 GHz) 55 dB (16-18 GHz) 55 dB (18-22 GHz)
Insertion Loss:	0.2 dB (0-3 GHz) 0.3 dB (3-8 GHz) 0.4 dB (8-12.4 GHz) 0.5 dB (12.4-16 GHz) 0.7 dB (16-18 GHz) 0.8 dB (18-22 GHz)
VSWR:	1.2:1 (0-3 GHz) 1.3:1 (3-8 GHz) 1.4:1 (8-12.4 GHz) 1.5:1 (12.4-16 GHz) 1.7:1 (16-18 GHz) 1.8:1 (18-22 GHz)
Maximum RF Carry Power:	240 W (0-3 GHz) 150 W (3-8 GHz) 120 W (8-12.4 GHz) 110 W (12.4-16 GHz) 100 W (16-18 GHz) 90 W (18-22 GHz)
Termination Power Rating (terminated versions):	1 W per termination, 3 W total per multiplexer.
Expected Life (operations):	>2 million

Specification - 26.5 GHz SP8T Versions

Characteristic Impedance:	50 Ω
Connectors:	SMA
Bandwidth	DC to 26.5 GHz
Isolation:	80 dB (0-3 GHz) 70 dB (3-8 GHz) 60 dB (8-12.4 GHz) 60 dB (12.4-18 GHz) 60 dB (18-26.5 GHz)
Insertion Loss:	0.2 dB (0-3 GHz) 0.3 dB (3-8 GHz) 0.4 dB (8-12.4 GHz) 0.5 dB (12.4-18 GHz) 0.9 dB (18-26.5 GHz)
VSWR:	1.2:1 (0-3 GHz) 1.3:1 (3-8 GHz) 1.4:1 (8-12.4 GHz) 1.5:1 (12.4-18 GHz) 1.9:1 (18-26.5 GHz)
Maximum RF Carry Power:	240 W (0-3 GHz) 150 W (3-8 GHz) 120 W (8-12.4 GHz) 100 W (12.4-18 GHz) 40 W (18-26.5 GHz)
Termination Power Rating (terminated versions):	1 W per termination, 3 W total per multiplexer.
Expected Life (operations):	>3 million

Specification - 40 GHz SP8T Versions

Characteristic Impedance:	50 Ω
Connectors:	SMA 2.9
Bandwidth	DC to 40 GHz
Isolation:	80 dB (0-6 GHz) 70 dB (6-12.4 GHz) 70 dB (12.4-18 GHz) 70 dB (18-26.5 GHz) 70 dB (26.5-40 GHz)
Insertion Loss:	0.3 dB (0-6 GHz) 0.4 dB (6-12.4 GHz) 0.6 dB (12.4-18 GHz) 0.7 dB (18-26.5 GHz) 1.5 dB (26.5-40 GHz)
VSWR:	1.3:1 (0-6 GHz) 1.3:1 (6-12.4 GHz) 1.5:1 (12.4-18 GHz) 2.0:1 (18-26.5 GHz) 2.2:1 (26.5-40 GHz)
Maximum RF Carry Power:	40 W (0-6 GHz) 30 W (6-12.4 GHz) 25 W (12.4-18 GHz) 15 W (18-26.5 GHz) 5 W (26.5-40 GHz)
Termination Power Rating (terminated versions):	1 W per termination, 3 W total per multiplexer.
Expected Life (operations):	>2 million

Mechanical Characteristics

Front panel mounted multiplexers:

- 40-788 Single multiplexer versions
 - 4 slot 3U PXI (CompactPCI card)
- 40-788 Dual multiplexer versions
 - 6 slot 3U PXI (CompactPCI card)
- 42-788 Single multiplexer versions
 - 4 slot 3U PXIe, compatible with PXIe hybrid slot
- 42-788 Dual multiplexer versions
 - 6 slot 3U PXIe, compatible with PXIe hybrid slot

Remote mounted multiplexers:

- 40-788 Remote mounted versions
 - Dual slot 3U PXI (CompactPCI card)
- 42-788 Remote mounted versions
 - Dual slot 3U PXIe, compatible with PXIe hybrid slot

Remote mounted multiplexers are supplied with 1.5 m interface cables for each of the supplied microwave relays.

3D models for all versions in a variety of popular file formats are available on request.

Power Requirements - 40-788

+3.3 V	+5 V	+12 V	-12 V
0.13 A	0.01 A	0.75 A	0

Power Requirements - 42-788

+3.3 V	+12 V
0.36 A	0.95 A

Connectors

40-788 - PXI bus via 32-bit P1/J1 backplane connector.

42-788 - PXIe bus via XJ3 and XJ4 backplane connectors.

Signals via front panel mounted coaxial connectors:

- 8 GHz, 50 Ω versions - N-type
- 18 GHz, 50 Ω versions - SMA
- 22 GHz, 50 Ω versions - SMA
- 26.5 GHz, 50 Ω versions - SMA
- 40 GHz, 50 Ω versions - SMA 2.9

Operating/Storage Conditions

Operating Temperature:	0 °C to +55 °C
Humidity:	Up to 90 % non-condensing
Altitude:	5000 m
Storage/Transport Temperature:	-20 °C to +75 °C
Humidity:	Up to 90 % non-condensing
Altitude:	15000 m

Product Order Codes

4[A]-788-[B][C][D][E]

Interface 0 = PXI 2 = PXIe
Type 0 = SP8T 50 Ω 1 = SP10T 50 Ω, not N-type Panel Mounted 2 = SP12T 50 Ω, not N-type Panel Mounted
Frequency 1 = 8 GHz, N-type only 2 = 18 GHz, SMA 3 = 22 GHz, SMA, SP10T only 4 = 26.5 GHz, SMA, SP8T only 5 = 40 GHz, SMA 2.9, SP8T only

Options [Blank] = Panel Mount -T = Terminated & Panel Mount -E = Remote Mount -TE = Terminated & Remote Mount
Quantity 1 or 2* for Panel Mount 1 or 2 for Remote Mount

* Only applicable to SP10T or SP12T versions.

Example part numbers:

A PXI dual, SP10T 22 GHz, terminated, panel mounted module would require part number **40-788-132-T**

A PXIe single, SP8T 18 GHz, unterminated, remote mounted module would require part number **42-788-021-E**

Please refer to the user manual for all individually defined valid part numbers.

Connection Accessories

For a complete list of connection accessories and documentation for the 40/42-788 module please refer to our [RF connectors datasheet \(90-011D\)](#).

Warranty

This module carries a 3 year warranty. The warranty specifically applies to only the cold switching operations of the relay within the stated lifetime.

Accessories

Microwave relay bracket for remote mounting:

Bracket for SP8T unterminated or terminated, SMA 40-788-001-TE-MB

Bracket for SP10T unterminated or terminated, SMA 40-788-101-TE-MB

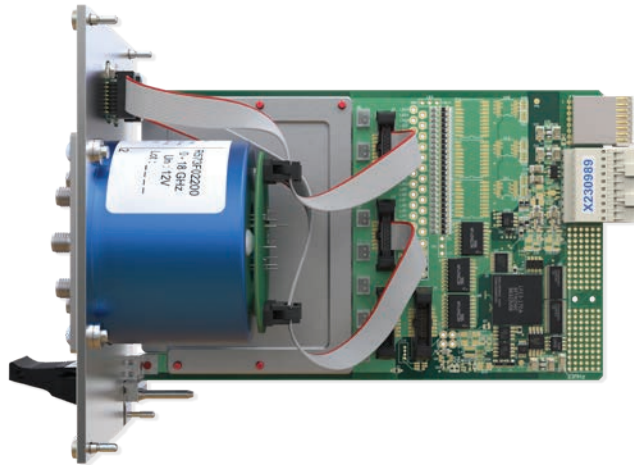
Bracket for SP12T unterminated or terminated, SMA 40-788-201-TE-MB

Bracket for SP8T unterminated, N-type 40-788-011-E-MB

Bracket for SP10T unterminated, N-type 40-788-111-E-MB

Bracket for SP12T unterminated, N-type 40-788-211-E-MB

Note: A single relay is mounted to each bracket, see user manual for details. To mount more than one relay, order multiples of the required part number.



Side View of the Microwave Multiplexer in PXIe Format

Product Customization

Pickering modules are designed and manufactured on our own flexible manufacturing lines, giving complete product control and enabling simple customization to meet very specific requirements. Customization can include:

- Alternative relay types
- Mixture of relay types
- Alternative number of relays
- Different performance specifications

All customized products are given a unique part number, fully documented and may be ordered at any time in the future. Please contact your local sales office to discuss.



42-788 PXIe Dual SP10T Microwave Multiplexer

PXI & CompactPCI Compliance - 40-788

The module is compliant with the PXI Specification 2.2. Local Bus, Trigger Bus and Star Trigger are not implemented.

Uses a 33 MHz 32-bit backplane interface.

PXIe Compliance - 42-788

The module is compliant with the PXIe Specification 1.0. Local Bus, Trigger Bus & Star Trigger are not implemented.

Safety & CE Compliance

All modules are fully CE compliant and meet applicable EU directives:

Low-voltage safety EN61010-1:2010,
EMC Immunity EN61326-1:2013,
Emissions EN55011:2009+A1:2010.

The 40/42-788 is part of a range of switching modules suitable for RF and microwave applications.

Pickering's Range of PXI & PXIe Microwave Switching Modules

Switch Type	Banks	Frequency Range	Model No.
SPDT Unterminated	1, 2, 3 or 4 Panel Mount, 1, 2 or 3 Remote Mount	2.5 GHz (75Ω) or 12.4 - 67 GHz (50Ω)	40/42-780B
SPDT Terminated	1 or 2 Panel Mount	18 - 50 GHz (50Ω)	40/42-781A
Transfer Switch	1 or 2 Panel Mount	18 - 50 GHz (50Ω)	40/42-782B
SP4T or SP6T Unterminated	1, 2 or 3 Panel Mount, 1, 2 or 3 Remote Mount	6 - 40 GHz (50Ω)	40/42-784B
SP4T or SP6T Terminated or Unterminated	1 or 2 Panel Mount, 1, 2 or 3 Remote Mount	2.5 GHz (75Ω) or 3 - 67 GHz (50Ω)	40/42-785C
SP8T, SP10T or SP12T Terminated or Unterminated	1 or 2 Panel Mount, 1 or 2 Remote Mount	8 - 40 GHz (50Ω)	40/42-788



40/42-780B

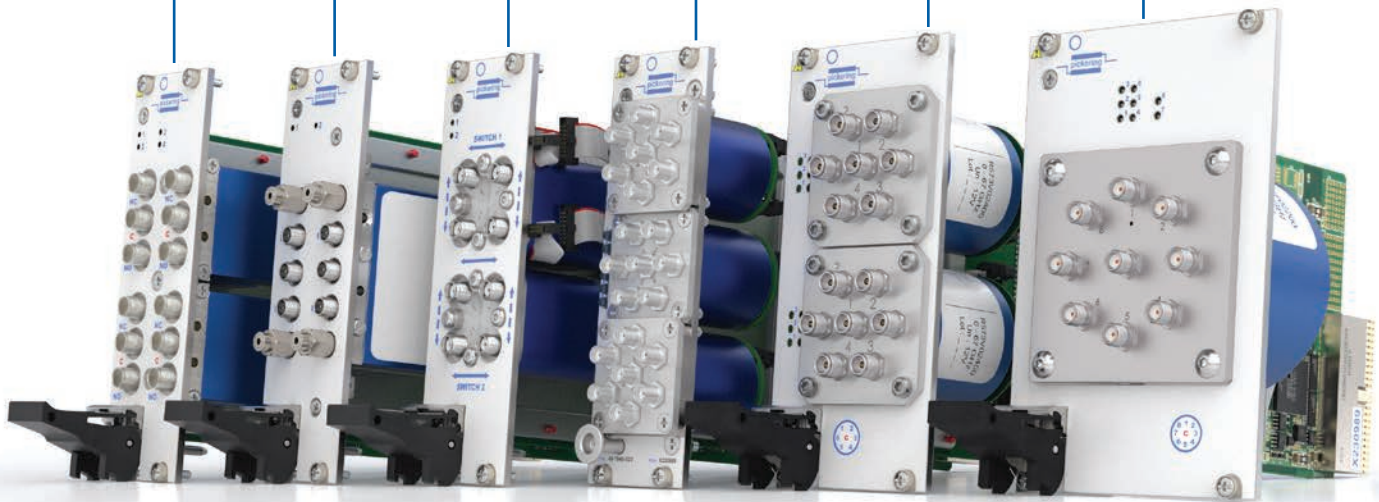
40/42-781A

40/42-782B

40/42-784B

40/42-785C

40/42-788



Chassis Compatibility

The PXI versions of this module are compatible with the following chassis types:

- All chassis conforming to the 3U PXI and 3U Compact PCI (cPCI) specification
- Legacy and Hybrid Peripheral slots in a 3U PXI Express (PXIe) chassis
- Pickering Interfaces LXI or LXI/USB Modular Chassis

The PXIe versions of this module are compatible with the following chassis types:

- All chassis conforming to the 3U PXIe specification
- PXIe and Hybrid Peripheral slots in a 3U PXI Express (PXIe) chassis

Chassis Selection Guide

PXI and PXIe (with PXIe and/or Hybrid slots) Chassis from any Vendor:

- Mix our 1000+ PXI/PXIe switching & simulation modules with any vendor's PXI/PXIe instrumentation
- Embedded or remote Windows PC control
- Real-time Operating System Support
- High data bandwidths, especially with PXI Express
- Integrated module timing and synchronization



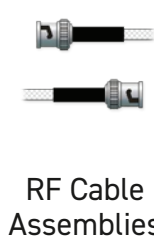
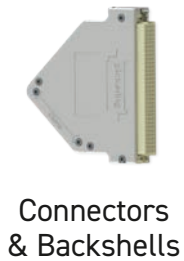
Pickering LXI or LXI/USB Modular Chassis Only accept our PXI Switching & Simulation Modules:

- Choose from 1000+ Pickering PXI Modules
- Ethernet or USB control enables remote operation
- Low-cost control from practically any controller
- LXI provides manual control via Web browsers
- Driverless software support
- Power sequencing immunity
- Ethernet provides chassis/controller voltage isolation
- Independence from Windows operating system



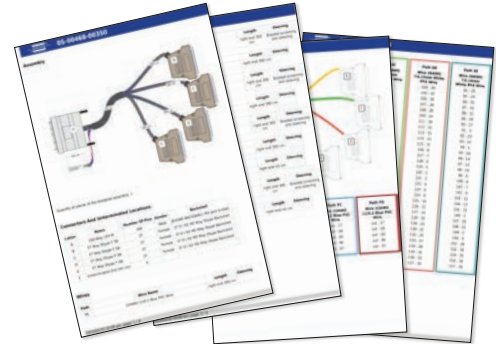
Connectivity Solutions

We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed to mechanically and electrically mate to our modules. These accessories are detailed in Connector Accessories data sheets, where a complete list and documentation can be found for each accessory.



We also offer customized cabling and have a free online **Cable Design Tool** that can be used to create custom cable solutions for many applications.

- Fully supported on modern browsers and tablet operating systems.
- Built-in tutorials and videos allow you to get quickly up to speed.
- Store cable assemblies in the Cloud and develop over time.
- Each cable design has a downloadable PDF documentation file detailing all specifications



Start designing your custom cabling, go to pickeringtest.com/cdt

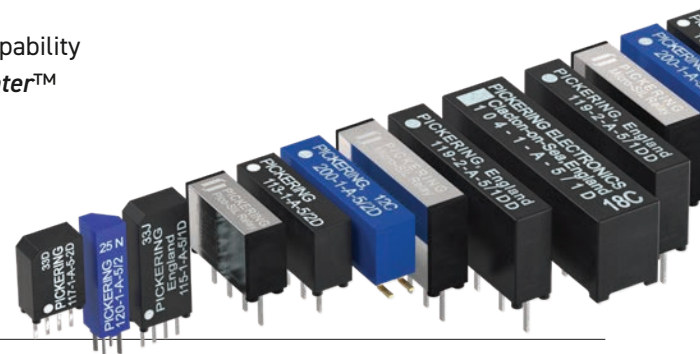
Mass Interconnect

We recommend the use of a mass interconnect solution when an Interchangeable Test Adapter (ITA) is required for PXI/LXI based test systems. Our modules are fully supported by Virginia Panel and MacPanel.

Pickering Reed Relays

We are the only switch provider with in-house reed relay manufacturing capability via our Relay Division. These instrument grade reed relays feature **SoftCenter™** technology, ensuring long service life and repeatable contact performance.

To learn more go to pickeringrelay.com



Programming

Pickering provide kernel, IVI and VISA (NI & Keysight) drivers which are compatible with all Microsoft supported versions of Windows and popular older versions.

For more information go to pickeringtest.com/os

The VISA driver support is provided for LabVIEW Real Time Operating Systems (Pharlap and Linux-RT). For other RTOS support contact Pickering. These drivers may be used with a variety of programming environments and applications including:

- **Pickering Interfaces Switch Path Manager**
- **National Instruments products** (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio products** (Visual Basic, Visual C++)
- **Programming Languages** C, C++, C#, Python
- **Keysight VEE and OpenTAP**
- **Mathworks MATLAB, Simulink**
- **Marvin ATEasy**
- **MTQ Testsolutions Tecap Test & Measurement Suite**

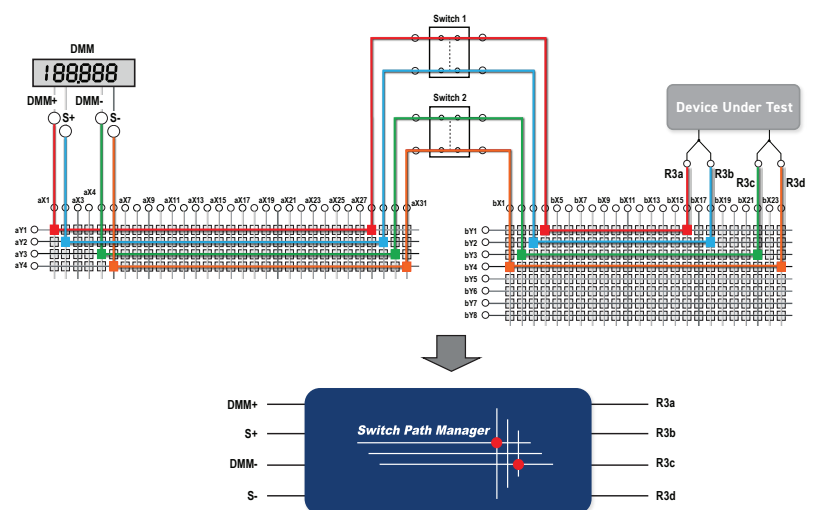
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help you develop test routines with ease.

To learn more about software drivers and development environments go to pickeringtest.com/software

Signal Routing Software

Our signal routing software, Switch Path Manager, automatically selects and energizes switch paths through Pickering switching systems. Signal routing is performed by simply defining test system endpoints to be connected together, greatly accelerating Test System software development.

To learn more go to pickeringtest.com/spm



Diagnostic Relay Test Tools

eBIRST Switching System Test Tools are designed specifically for our PXI, PCI or LXI products, these tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.

To learn more go to pickeringtest.com/ebirst



Three Year Warranty & Guaranteed Long-Term Support

All standard products manufactured by Pickering Interfaces are warranted against defective materials and workmanship for three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available with various levels for your requirements. Although we offer a 3-year warranty as standard, we also include guaranteed long-term support—with a history of supporting our products for typically 15-20 years.

To learn more go to pickeringtest.com/support

Available Product Resources

We have a library of resources including success stories, product and support videos, articles and white papers as well as application-specific brochures to assist you. We have also published reference books on switching technology and the PXI and LXI standards.

To view, download or request any of our product resources go to pickeringtest.com/resources

