40-727/728/729
Expandable RF Coaxial Matrix

- 16x4, 16x2 and 8x4 RF Coaxial Matrices
- 300MHz Usable Bandwidth
- 50Ω and 75Ω Versions Available
- Easy To Use Loop Thru Option To Allow Unlimited X Axis Expansion
- High Density SMB and Multiway Connector Versions
- 75Ω Version Suitable for Telecoms and Video Switching
- VISA/IVI Drivers Supplied for Windows XP/Vista/7/8
- Supported by PXI or LXI Chassis
- 3 Year Warranty

40-727/728/729 are RF Matrix Modules suitable for switching frequencies to 300MHz. The modules are available in either 50Ω or 75Ω versions with a choice of coaxial connectors. The 40-727/728/729 are designed to provide a simple and scalable bidirectional matrix to RF frequencies. They are intended for the easy construction of high performance bidirectional matrix switching systems.

Isolation Switches are located on all coaxial connectors (refer to drawing), these disconnect the matrix from the external test fixture. This maximises isolation and RF performance.

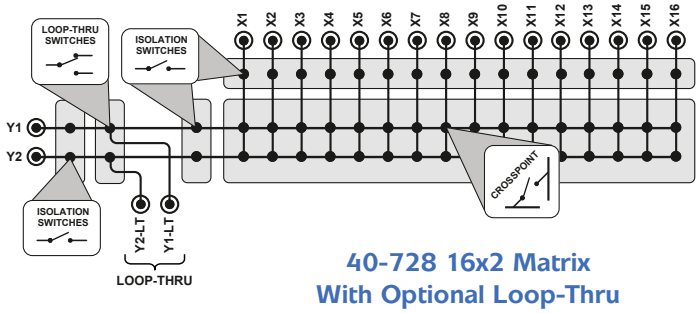
Matrix Operation

The 40-727/8/9 are high density matrices designed primarily to provide a Y to X connection to maximize matrix bandwidth. It can also support limited X to X connectivity as shown in the manual.

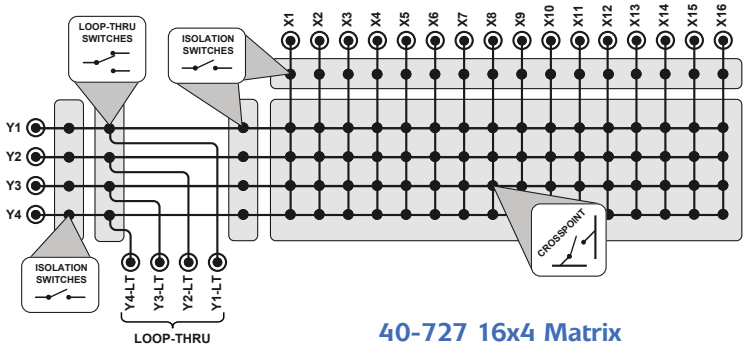
This module is based on the same construction as the popular 40-725 RF matrix module, but has increased capacity and optional built in loop thru on the Y axis to allowing easy expansion with a minimum loss of bandwidth.

Other RF Matrix Modules in Pickering's PXI Range:

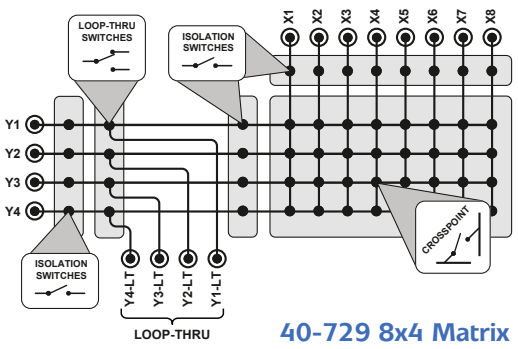
- **40-725** - 8x9 500MHz, 50Ω/75Ω
- **40-726A** - 12x8 300MHz, 50Ω/75Ω - Optional Y Loop-Thru
- **40-750** - 8x2 1.5GHz, 50Ω/75Ω - Y Loop-Thru
- **40-872** - single/dual 2x2 3GHz, 50Ω
- **40-832** - single/dual 2x2 3GHz, 75Ω
- **45-720A** - 6U, 16x16 250MHz, 50Ω/75Ω - Y Loop-Thru



40-728 16x2 Matrix
With Optional Loop-Thru



40-727 16x4 Matrix
With Optional Loop-Thru



40-729 8x4 Matrix
With Optional Loop-Thru

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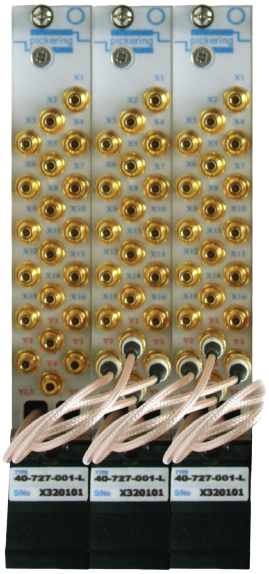
Option For Loop Thru on Y Axis

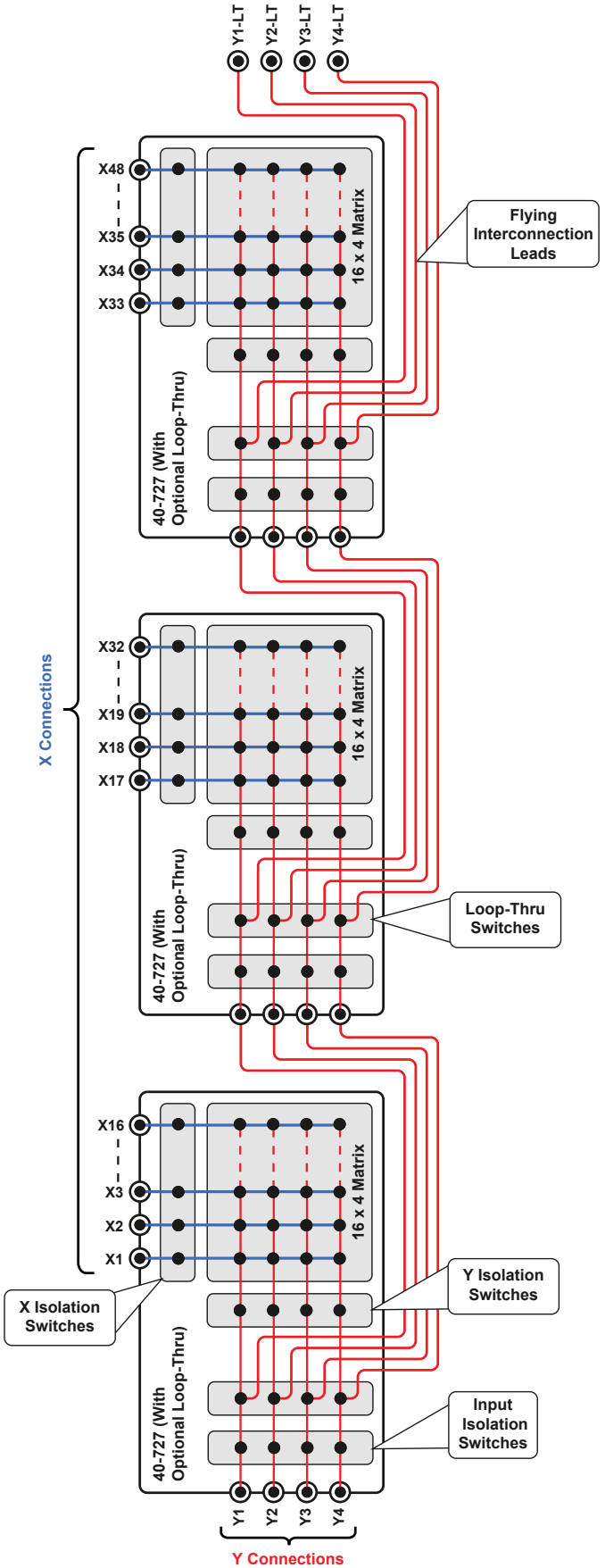
The easy to use loop thru option allows 40-727/728/729 modules to be cascaded to form larger matrices whilst minimizing impact on RF performance.

The Loop Thru Cables are already built into the SMB loop thru version, they pass thru a slot in front panel and are simply connected to the next matrix module in the chain. Multiway connector versions include pins for loop-thru on the front panel connector.

The loop thru system is designed to provide an extended connection from Y to X , it does not support an X to X connection where the X connections are in different modules.



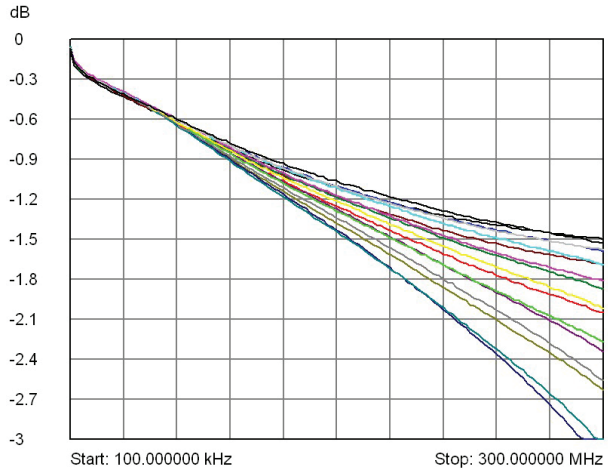
48x4 RF Matrix Created from 3-off 40-727-001-L
(Loop-Thru cables interconnect each 16x4 Matrix module)



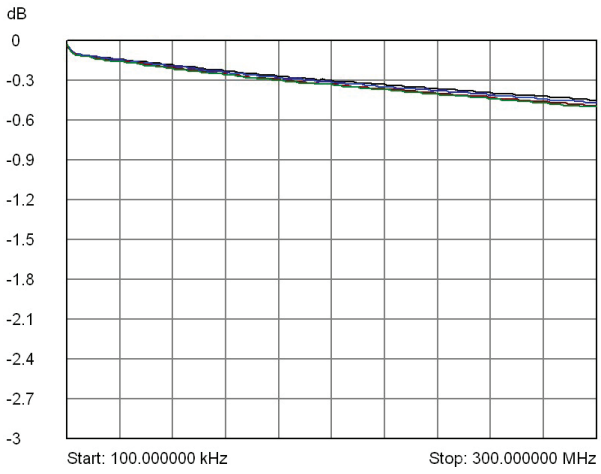
3 off 40-727-001-L 16x4 RF Matrix Modules Interconnected as a 48x4 Matrix

RF Performance Plots for 40-727 300MHz RF Matrix Module

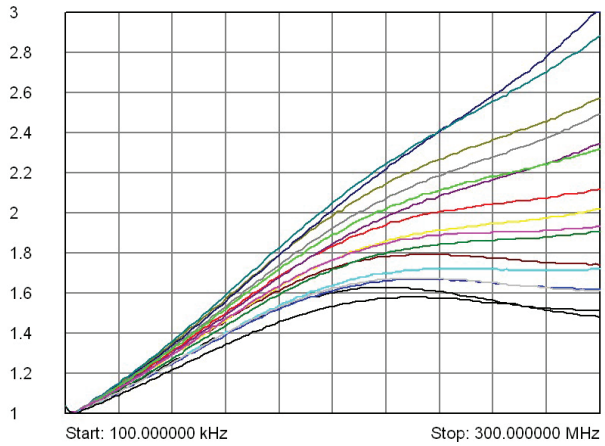
Typical curves are shown for matrix rows/columns with 1 crosspoint set. For optimum insertion loss and VSWR (reflection) performance ensure only one crosspoint is set in any one row/column. **Multiple crosspoints can be set on any one row or column but this will seriously degrade RF performance.** The performance is also dependent upon the area of the matrix where the crosspoint is set. Best performance is obtained at the corners (for example a X1-Y1 path), worse performance is obtained in the center (a X8-Y2 path). This is outlined in the Insertion Loss and VSWR plots below which also include the performance of a typical signal path between X4 and Y2. For more information on how performance is distributed throughout the matrix, please refer to the User Manual



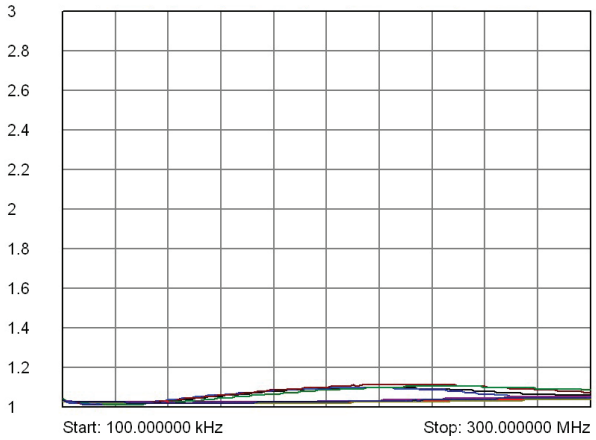
40-727 50Ω Insertion Loss For X to Y Signal Paths



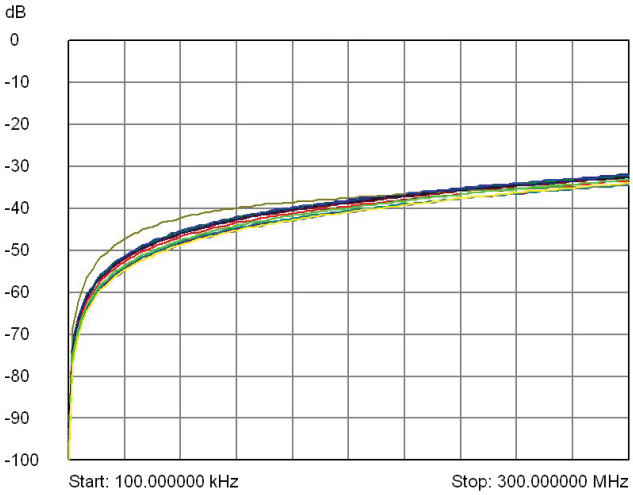
40-727 50Ω Insertion Loss For Y Loop-Thru Paths



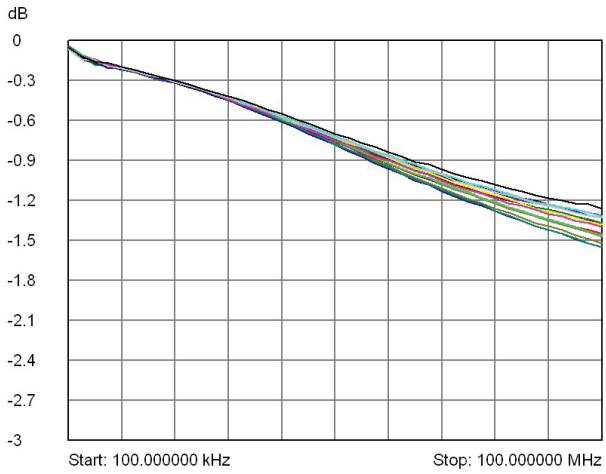
40-727 50Ω VSWR For X to Y Signal Paths



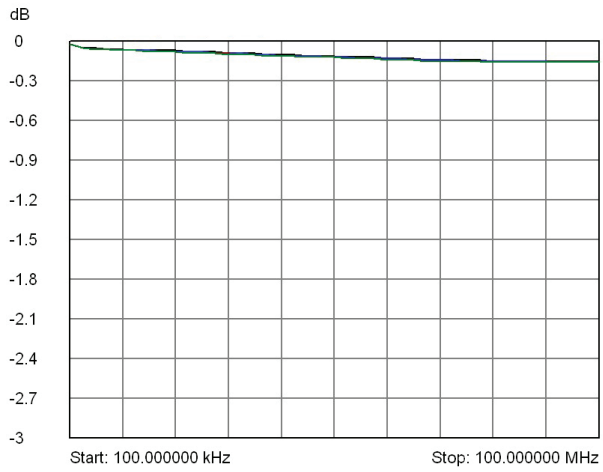
40-727 50Ω Loop-Thru Paths VSWR



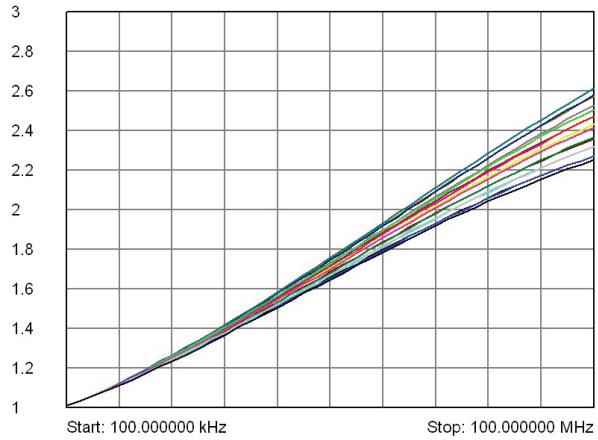
40-727 50Ω Crosstalk Between Signal Paths



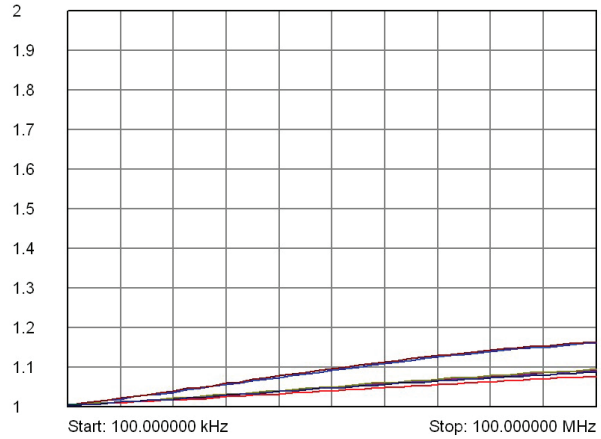
40-727 75Ω Insertion Loss For X to Y Signal Paths



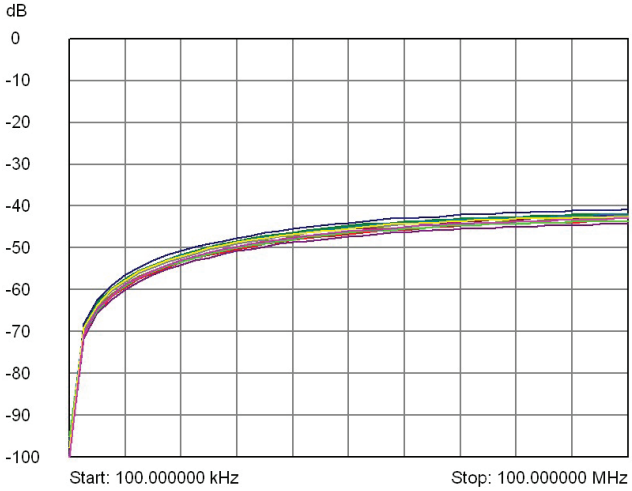
40-727 75Ω Insertion Loss For Y Loop-Thru Paths



40-727 75Ω VSWR For X to Y Signal Paths



40-727 75Ω Loop-Thru Paths VSWR



40-727 75Ω Crosstalk Between Signal Paths

General Matrix Switching Specification

Maximum Switch Voltage: Maximum Switch Current: Maximum Switch Power:	100V 0.5A 10W
Characteristic Impedance:	50Ω or 75Ω
On Path Resistance: Off Path Resistance:	<500mΩ $>10^8$Ω
Expected Life - Matrix: Expected Life - Loop-Thru:	$1x10^9$ operations $1x10^7$ operations
Operate Time: Release Time:	5ms typical 5ms typical

RF Specification

Maximum Frequency:	Usable to 300MHz, 50Ω Usable to 100MHz, 75Ω
Insertion Loss (typical): V.S.W.R. (typical): Crosstalk (typical): Isolation (typical):	<3dB for 50Ω at 300MHz† <3dB for 75Ω at 150MHz† <2.0 for 50Ω at 150MHz† <2.0 for 75Ω at 60MHz† >45dB at 50MHz Better than 70dB

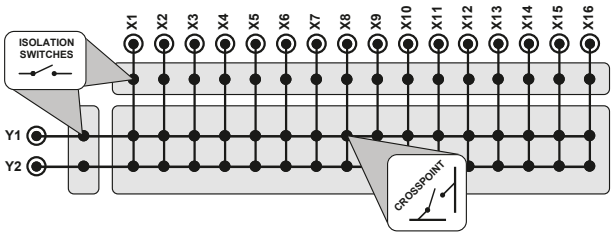
Loop Thru RF Specification

Insertion Loss: Isolation:	0.6dB typical at 300MHz >70dB
Operate Time: Release Time:	5ms typical 5ms typical

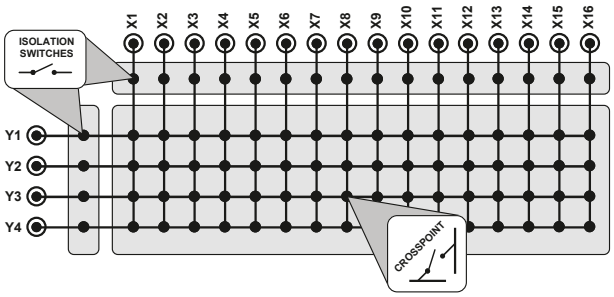
† Matrix RF Performance is entirely dependant upon the combination of crosspoints currently selected, these figures are for **one** selected crosspoint on any X or Y channel only, refer to graphs. For further assistance on getting maximum performance using the 40-727/728/729 please refer to the Operating Manual.

Mating Connectors & Cabling

For connection accessories for the SMB versions of the 40-727/728/729 range please refer to the **90-011D** RF Cable Assemblies data sheet or for multiway MS-M connector versions, please refer to the **90-017D** Cable Assemblies data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.



40-728 16x2 Matrix Without Loop-Thru



40-727 16x4 Matrix Without Loop-Thru

Power Requirements

+3.3V	+5V	+12V	-12V
100mA	500mA (typ 350mA)	0	0

Width and Dimensions

Single slot 3U PXI (CompactPCI card).

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

Connectors

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

40-727 SMB versions: X and Y Signals via 20 front panel mounted coaxial connectors (Y loop-thru via 4 flying leads).

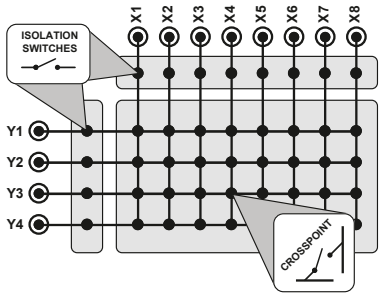
40-728 SMB versions: X and Y Signals via 18 front panel mounted coaxial connectors (Y loop-thru via 2 flying leads).

40-729 SMB versions: X and Y Signals via 12 front panel mounted coaxial connectors (Y loop-thru via 4 flying leads).

40-727/728/729 Multiway versions: X, Y and Y loop-thru signals via one 26-way high density MS-M RF multiway coaxial connector.

Product Order Codes

PXI 16x4 RF Coaxial Matrix	
SMB, 50Ω	**40-727-001**
SMB, 50Ω with loop-thru on Y axis	**40-727-001-L**
Multiway, 50Ω	**40-727-002**
Multiway, 50Ω with loop-thru on Y axis	**40-727-002-L**
SMB, 75Ω	**40-727-101**
SMB, 75Ω with loop-thru on Y axis	**40-727-101-L**
PXI 16x2 RF Coaxial Matrix	
SMB, 50Ω	**40-728-001**
SMB, 50Ω with loop-thru on Y axis	**40-728-001-L**
Multiway, 50Ω	**40-728-002**
Multiway, 50Ω with loop-thru on Y axis	**40-728-002-L**
SMB, 75Ω	**40-728-101**
SMB, 75Ω with loop-thru on Y axis	**40-728-101-L**
PXI 8x4 RF Coaxial Matrix	
SMB, 50Ω	**40-729-001**
SMB, 50Ω with loop-thru on Y axis	**40-729-001-L**
Multiway, 50Ω	**40-729-002**
Multiway, 50Ω with loop-thru on Y axis	**40-729-002-L**
SMB, 75Ω	**40-729-101**
SMB, 75Ω with loop-thru on Y axis	**40-729-101-L**



40-729 8x4 Matrix Without Loop-Thru

Programming

Pickering provide kernel, IVI and VISA (NI and Agilent) drivers which are compatible with 32/64-bit versions of Windows including XP, Vista, 7 and 8 operating systems. The VISA driver is also compatible with Real-Time Operating Systems such as LabVIEW RT. For other RTOS support contact Pickering.
These drivers may be used with a variety of programming environments and applications including:

- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Agilent** VEE
- **Mathworks** Matlab
- **Marvin** ATE Easy
- **MTQ Testsolutions** Tecap
- **Tecap Switching**

Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries.

Operating/Storage Conditions

Operating Conditions

Operating Temperature:	0°C to +55°C
Humidity:	Up to 90% non-condensing
Altitude:	5000m

Storage and Transport Conditions

Storage Temperature:	-20°C to +75°C
Humidity:	Up to 90% non-condensing
Altitude:	15000m

PXI & CompactPCI Compliance

The module is compliant with the PXI Specification 2.2. Local Bus, Trigger Bus and Star Trigger are not implemented.
Uses 33MHz 32-bit backplane interface.

Safety & CE Compliance

All modules are fully CE compliant and meet applicable EU directives: Low-voltage safety EN61010-1:2001, EMC Immunity EN61000-6-1:2001, Emissions EN55011:1998.

PXI & LXI Chassis Compatibility

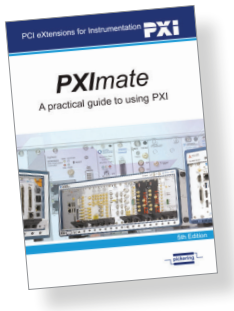
Compatible with all chassis conforming to the 3U PXI and 3U cPCI specification. Compatible with Legacy and Hybrid peripheral slots in a 3U PXI Express chassis.
Compatible with Pickering Interfaces LXI Modular Chassis. For information on driving your switching solution in an LXI environment refer to the LXI Product Catalog.

Latest Details

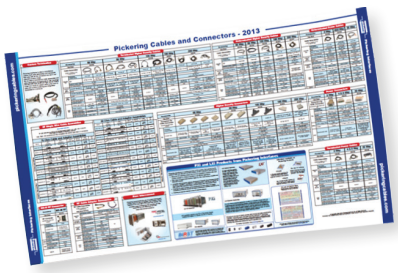
Please refer to our Web Site for Latest Product Details.
www.pickeringtest.com

Please refer to the 200 page Pickering Interfaces "**Connection Solutions**" catalog for the full list of connector/cabling options, including drawings, photos and specifications. Available in either print or as a download.
Alternatively our web site has dynamically linked connector/cabling options, including pricing, for all Pickering PXI modules.

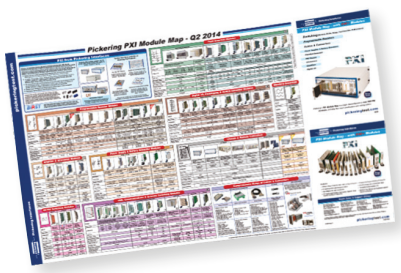
"**The Big PXI Catalog**" gives full details of Pickering's entire range of PXI switch modules, instrument modules and support products.
At over 500 pages, the Big PXI Catalog is available on request or can be downloaded from the Pickering website.



Ever wondered what PXI is all about?
Pickering Interfaces' "**PXImate**" explains the basics of PXI and provides useful data for engineers working on switch based test systems.
The PXImate is available free on request from the Pickering website.



The "**Cables & Connectors Map**" - outlines the cable and connector options available for all PXI Modules.



The "**PXI Module Map**" - a simple fold-out selection guide to all Pickering's 1000+ PXI Modules.