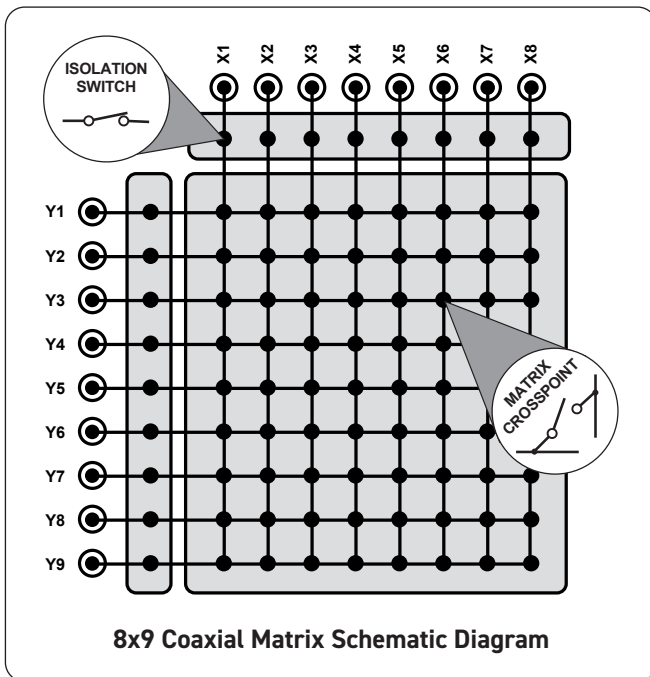


- 8x9 RF Coaxial Matrix
- Up to 500 MHz Bandwidth
- 50 Ω and 75 Ω Versions Available
- High Quality Ruthenium Reed Relays
- High Density SMB Front Panel Mounted Coaxial Connectors
- 75 Ω Version Suitable for Telecoms and High Quality Video Switching
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- Selected Builds Supported by *eBIRST™*
- 3 Year Warranty

The 40-725 is an 8x9 RF matrix module suitable for switching frequencies up to 500 MHz. Available in either 50 Ω or 75 Ω versions with SMB coaxial connectors, it is intended for the easy construction of high performance bidirectional matrix switching systems.

Automatic isolation switches are located on all X and Y connections (see diagram below). These can be used to disconnect the matrix from the external test fixture, maximizing isolation and RF performance.



### Matrix Operation

The 40-725 is a true 8x9 high density matrix, any combination of crosspoints may be selected. Only the signal is switched, all grounds are common.

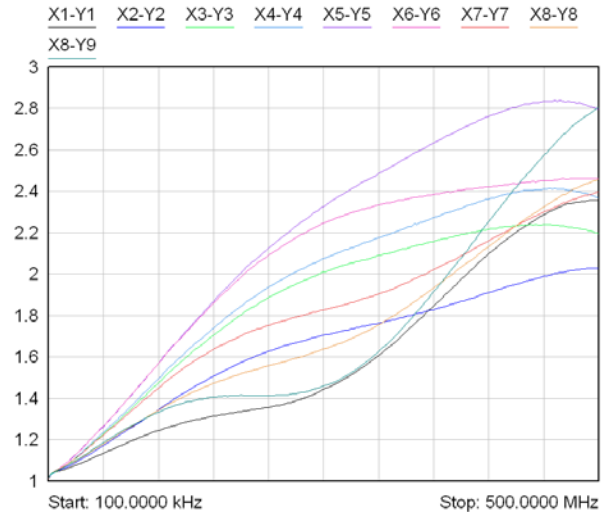
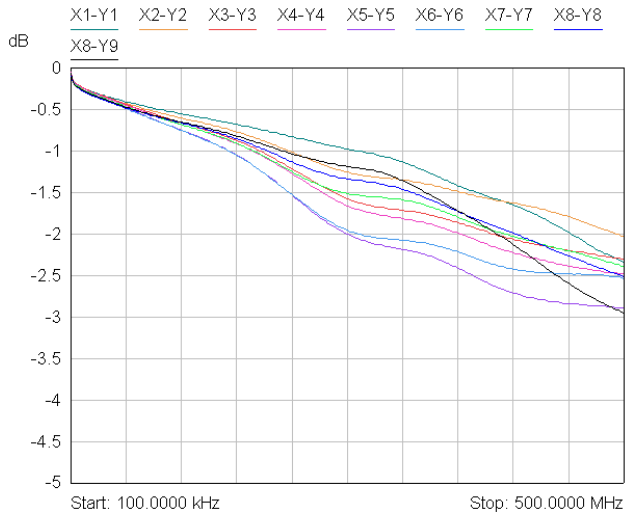
Other RF Matrix Modules in Pickering's PXI Range:	
40-726A	12x8 300 MHz, 50 Ω/75 Ω - Optional Y Loop-Thru
40-727	16x4 300 MHz, 50 Ω/75 Ω - Optional Y Loop-Thru
40-728	16x2 300 MHz, 50 Ω/75 Ω - Optional Y Loop-Thru
40-729	8x4 300 MHz, 50 Ω/75 Ω - Optional Y Loop-Thru
40-750	8x2 1.5 GHz, 50 Ω/75 Ω - Y Loop-Thru
40-872	single/dual 2x2 3 GHz, 50 Ω
40-832	single/dual 2x2 3 GHz, 75 Ω
45-720A	6U, 16x16 250 MHz, 50 Ω/75 Ω - Y Loop-Thru
Alternative LXI Ethernet Controlled RF Matrices:	
60-760	Single/Dual 24x8 25 MHz, 50 Ω
60-711	Single/Dual 24x8 25 MHz, 75 Ω
60-110	Scalable 24x8 to 104x16 200 MHz, 50 Ω

### Supported by *eBIRST*

The 50 Ω version of the 40-725 is supported by *eBIRST* switching system test tools. These simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.

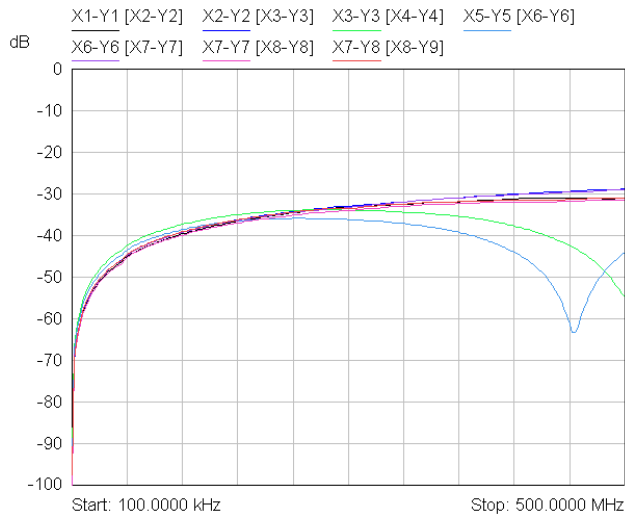
For more information go to: [pickeringtest.com/ebirst](http://pickeringtest.com/ebirst)

## 40-725-511 (50 Ω SMB) Performance Plots

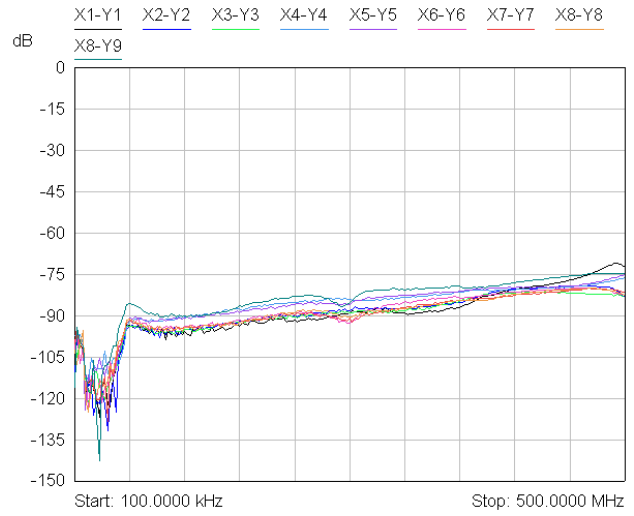


**40-725-511 (50 Ω Version) Insertion Loss Plot to 500 MHz**

**40-725-511 (50 Ω Version) VSWR Plot to 500 MHz**

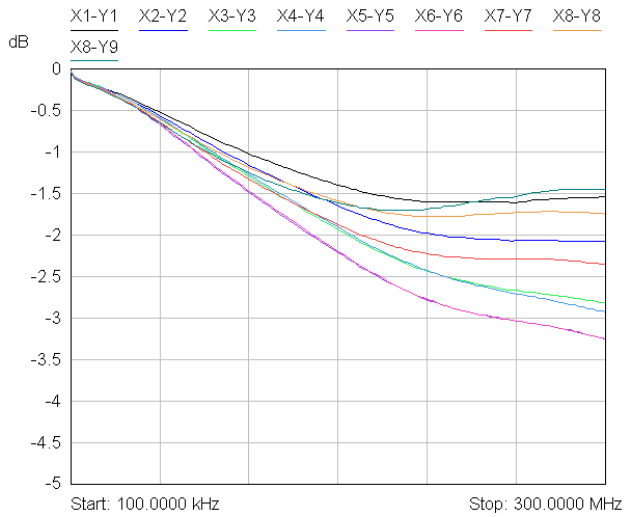


**40-725-511 (50 Ω Version) Crosstalk Plot to 500 MHz**

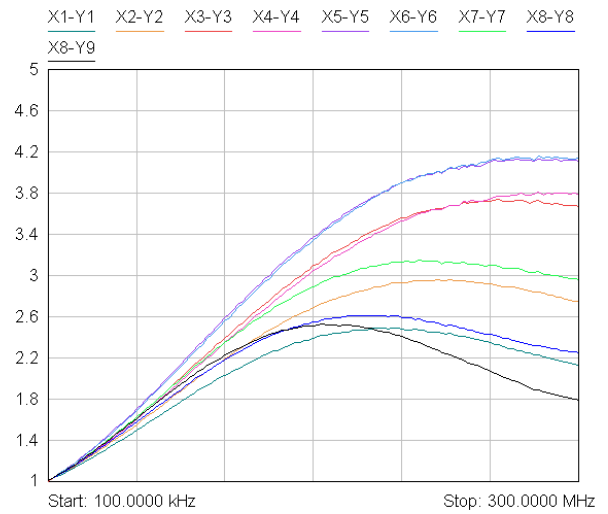


**40-725-511 (50 Ω Version) Isolation Plot to 500 MHz**

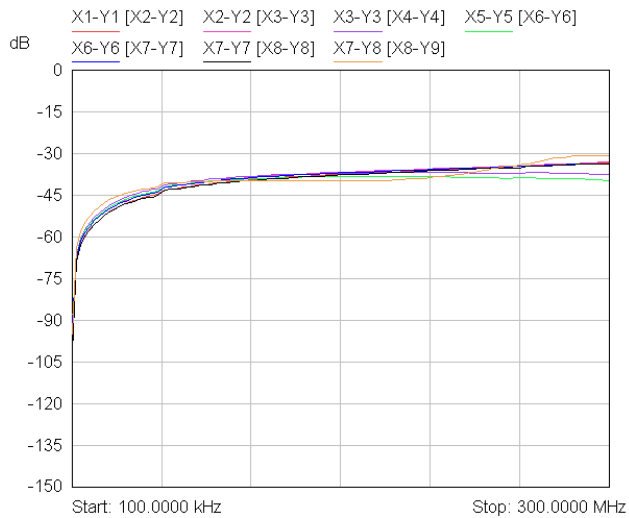
## 40-725-751 (75 Ω SMB) Performance Plots



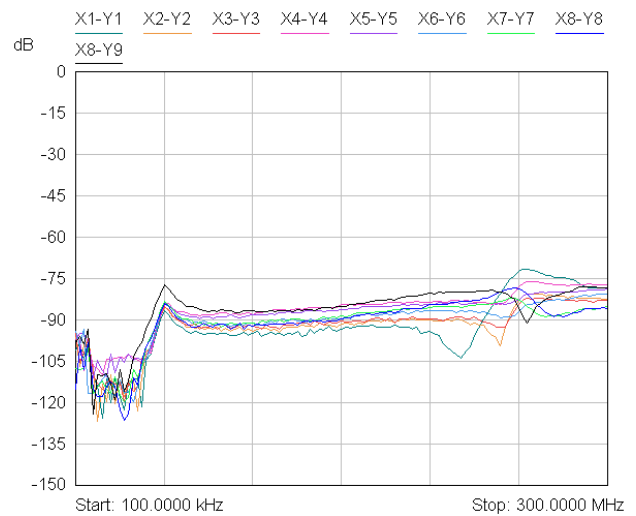
**40-725-751 (75 Ω Version) Insertion Loss Plot to 300 MHz**



**40-725-751 (75 Ω Version) VSWR Plot to 300 MHz**



**40-725-751 (75 Ω Version) Crosstalk Plot to 300 MHz**



**40-725-751 (75 Ω Version) Isolation Plot to 300 MHz**

## Relay Type

The 40-725 matrix is fitted with ruthenium sputtered reed relays, these offer very stable switch contact resistance with expected life of  $10^9$  operations when switching typical RF signals. Spare reed relays are built onto the circuit board to allow easy maintenance with minimum downtime.

All reed relays are manufactured by our sister company Pickering Electronics: [pickeringrelay.com](http://pickeringrelay.com)

## General Switching Specification

Maximum Voltage:	100 VDC
Maximum Power:	10 W
Maximum Switch Current:	0.5 A
Maximum Carry Current:	0.5 A
Characteristic Impedance:	50 $\Omega$ or 75 $\Omega$
Initial On Path Resistance:	<1000 m $\Omega$
Off Path Resistance:	> $10^8 \Omega$
Thermal Offset:	<30 $\mu$ V
Expected Life (Low Power):	$1 \times 10^9$ operations
Expected Life (Max Power):	> $5 \times 10^6$ operations
Operate Time:	<1 ms, 0.5 ms typical

## RF Specification

Maximum Frequency - 50 $\Omega$ Version:	500 MHz
Maximum Frequency - 75 $\Omega$ Version:	250 MHz
Typical Rise Time:	800 ps †
Insertion Loss:	<3 dB †
V.S.W.R. - 50 $\Omega$ Version:	<3:1 to 500 MHz †
V.S.W.R. - 75 $\Omega$ Version:	<3:1 to 100 MHz †
Isolation:	>70 dB
Crosstalk - 50 $\Omega$ Version:	<40 dB at 50 MHz <25 dB at 500 MHz
Crosstalk - 75 $\Omega$ Version:	<40 dB at 50 MHz <30 dB at 250 MHz
40-725-721 Version:	
Insertion Loss to 200 MHz:	<3 dB typical
Insertion Loss to 400 MHz:	<4.5 dB typical

† RF Performance is entirely dependant upon the combination of crosspoints selected, the figures shown are for one selected crosspoint on any X or Y channel only, refer to graphs.

## Power Requirements

+3.3V	+5V	+12V	-12V
0	320 mA (typ 240 mA)	0	0

## Mechanical Characteristics

Single slot 3 U 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.  
X and Y Signals via 17 front panel mounted coaxial SMB connectors.

## Operating/Storage Conditions

### Operating Conditions

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

### Storage and Transport Conditions

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

## PXI & CompactPCI Compliance

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.

## 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.

## Product Order Codes

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<b>PXI 8x9 Coaxial Matrix:</b>	
<b>SMB Version, 50 <math>\Omega</math></b>	<b>40-725-511</b>
<b>SMB Version, 75 <math>\Omega</math></b>	<b>40-725-751</b>

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<b>Special Version of the 75 <math>\Omega</math> Coaxial Matrix, 75 <math>\Omega</math> Impedance (but using 50 <math>\Omega</math> SMB connectors)</b>	<b>40-725-721</b>
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## 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.

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.

## Support Products

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### **eBIRST Switching System Test Tool**

40-725-511 is supported by the *eBIRST* test tools which simplify the identification of failed relays, the required *eBIRST* tools are below. For more information go to:

[pickeringtest.com/ebirst](http://pickeringtest.com/ebirst)

<b>Product</b>	<b>Test Tool</b>	<b>Adaptor</b>
<b>40-725-511</b>	<b>93-005-001</b>	<b>93-005-202A</b>

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### **Spare Relay Kits**

Kits of replacement relays are available for the majority of Pickering's PXI switching products, simplifying servicing and reducing down-time.

<b>Product</b>	<b>Relay Kit</b>
<b>40-725</b>	<b>91-100-004</b>

For further assistance, please contact your local Pickering sales office.

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## Mating Connectors & Cabling

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For connection accessories for the 40-725 range please refer to the [90-011D](#) RF Cable Assemblies data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

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## Chassis Compatibility

This PXI module must be used in a suitable chassis. It is 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

## Chassis Selection Guide

### Standard PXI or hybrid PXIe Chassis from any Vendor:

- Mix our 1000+ PXI switching & simulation modules with any vendor's PXI 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 1000+ PXI Switching & Simulation 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

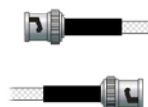
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed to mechanically and electrically mate to our modules.



Connectors & Backshells



Multiwire Cable Assemblies



RF Cable Assemblies



Connector Blocks

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. Visit: [pickeringtest.com/cdt](http://pickeringtest.com/cdt) to start your design.

## Mass Interconnect

We recommend the use of a mass interconnect solution when an Interchangeable Test Adapter (ITA) is required for a PXI or LXI based test system. Our modules are fully supported by both 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, please go to: [pickeringrelay.com](http://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 a list of all supporting operating systems, please see: [pickeringtest.com/os](http://pickeringtest.com/os)

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:

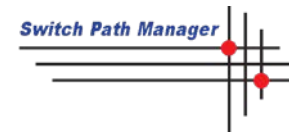
- **Pickering Interfaces Switch Path Manager**
- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Keysight** VEE and OpenTAP
- **Mathworks** Matlab
- **Marvin** ATEasy
- **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, please go to: [pickeringtest.com/software](http://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, please go to: [pickeringtest.com/spm](http://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, please go to: [pickeringtest.com/ebirst](http://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 a period of three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available for all our modules and systems with various levels to suit 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, please go to: [pickeringtest.com/support](http://pickeringtest.com/support)

## Available Product Resources

We have a large library of product resources including success stories, product and support videos, articles and white papers as well as application specific product brochures to assist when looking for the switching, simulation and connection solutions you need. We have also published handy reference books on Switching Technology and for the PXI and LXI standards.



To view, download or request any of our product resources, please visit: [pickeringtest.com/resources](http://pickeringtest.com/resources)