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LXI SHORTFORM CATALOG INTRODUCTION

The last few years have seen an incredible growth in the availability and acceptance of products based on the LXI Standard. With more than 1080 products from 20 manufacturers (at March 09) available and hundreds of millions of dollars in shipments, LXI is well on its way to being the dominant test and measurement control interface.

Pickering Interfaces are Strategic Members of the LXI Consortium and committed to establishing LXI controlled switching products as the mostly commonly used standard for control. Pickering together with Agilent Technologies was the first company to introduce LXI enabled products in December 2005 and we have continued to innovate in LXI products ever since.

LXI systems are simple to set up and manage through familiar web based interfaces using industry standard web browsers and simple Ethernet interconnection.

We offer two distinct product ranges, the first based on dedicated devices that perform well defined switch functions and a second range that uses a 7 or 18 slot modular chassis to host Pickering Interfaces' broad range of over 500 PXI switching modules through an LXI compliant interface.

A wide range of high density matrices are available with up 4096 crosspoints and a wide range of X and Y axis sizes, housed in a 1U "Pizza Box" unit.

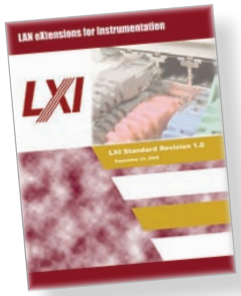
Pickering's LXI Modular Chassis allows modules from Pickering's extensive range of over 500 3U PXI switching products to be controlled in an LXI environment, with a choice of 7 or 18 slot chassis.

The range of dedicated LXI switch systems are perfect for building up larger scale switching solutions. The mechanical and electrical freedom of LXI supports switching functions which are not easily implemented in modular standards because of the high chassis, module, interconnection and configuring costs they imply. We offer a range of matrix and multiplexer solutions which have high relay density and low cost per relay. This catalog shows you the broad range of LXI Switching available as of the date of publication. We encourage you to go to: www.pickeringtest.com/lxi to see what's new.

Our LXI modular switching chassis provides a perfect solution where users require diverse switching functions that can be well supported by a modular system, but with the ease of use of an LXI control environment.

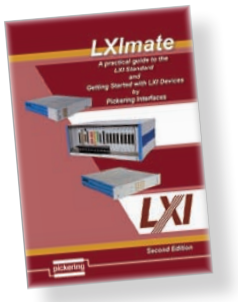
Our range of switching solutions continues to expand as we add both dedicated LXI solutions and PXI modules to our product range. If you don't see what you need, call us, we might have what you want in development or we may be able to create a new solution for your application.

LXI is the new standard for Ethernet control of instrumentation. It is the natural successor to GPIB (IEEE-488) incorporating LAN connectivity, full web browser support, IVI drivers and advanced triggering capability.



Pickering Interfaces is a Board level member of the LXI Consortium (www.lxistandard.org) and together with Agilent Technologies was the first company to release a fully compliant LXI device. Pickering is developing a large range of products conforming to the LXI standard and is constantly introducing new products in response to specific user demand. For further information go to www.pickeringtest.com/lxi

Pickering Interfaces has published a book, LXImate, which provides an easy to read overview of the LXI Standard. To order your free copy simply go to www.pickeringtest.com/lximate and request your copy.



CONTENTS

SWITCHING PRODUCTS

MODULAR PRODUCTS

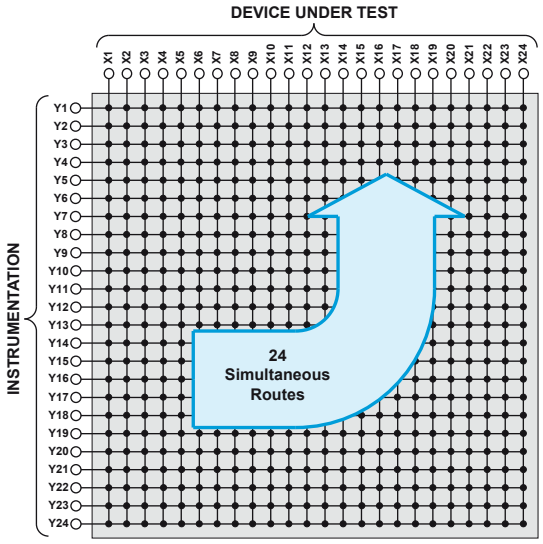
INTRODUCTION

Low frequency matrices find many uses in ATE systems since they provide complete flexibility for connecting test equipment and the unit under test together. For low frequency applications a matrix is implemented as a crosspoint switch, a configuration that minimizes the number of relays needed to implement a matrix. In some cases the matrix may include isolation relays or loop-thru systems that provide an improvement in the matrix bandwidth or residual path resistance.

The LXI standard has allowed Pickering Interfaces to design a number of large scale matrices that are difficult and expensive to implement as modular products, and the range of products is continually expanding.

Matrices are typically used in one of two ways:

- UUT on one axis (usually X) and test equipment on another axis (usually Y)
- UUT and test equipment on the same axis (X) and the number of concurrent connections being limited by the Y axis.

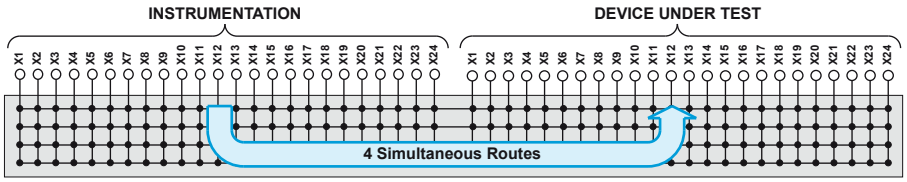


The first method results in the highest performance by most criteria but usually has the highest cost since both the X and Y axis can be large. It is also harder to scale an application to meet expanding demands since both the X and the Y axis need to increase in size.

The second method requires at least two relays to be closed to make a connection. This usually results in the lowest cost and is easiest to scale by adding more X axis connections providing that the number of concurrent connections required does not increase.

◀ **Using a 24x24 matrix to route signals between the test equipment and the UUT - 576 crosspoints are required**

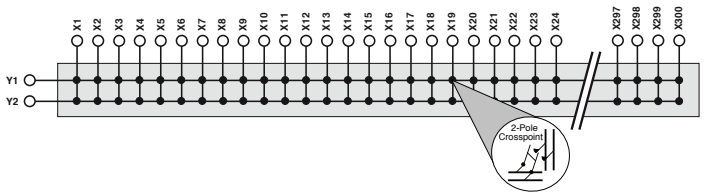
▼ **Using a 4x48 matrix to route signals between the test equipment and the UUT - 192 crosspoints are required**



Module Configuration	Maximum Size	Minimum Size	Voltage	Current	Product Code
2-Pole High Voltage Matrix	300x2	100x2	1000V	1A	**60-310**
	Triple 75x4	Single 75x4	750V	2A carry	**60-311**
Low EMF Matrix	1-Pole 56x33	1-Pole 14x33	150Vdc/100Vac	1A	**60-510**
			200Vdc/170Vac	1A	**60-511**
High Density Expandable Matrix	1-Pole 512x8	1-Pole 128x8	300Vdc/250Vac	2A	**60-550**
	1-Pole 512x4	1-Pole 128x4			**60-551**
	1-Pole 64x64	1-Pole 16x64			**60-552**
	1-Pole 256x16	1-Pole 64x16			**60-554**
	2-Pole 512x8	2-Pole 192x8			**60-555**
	2-Pole 512x4	2-Pole 192x4			**60-556**
High Power Matrix	Dual 32x4	Single 16x16	30Vdc/250Vac	10A	**60-600**

60-310 High Voltage Matrix

- 2-Pole 300 x 2 Matrix
- Voltage Rating of 1000Vdc
- Maximum Carry Current of 1A
- High Quality Reed Relays With Rhodium Contacts
- Easily Cascaded to Create Larger Matrix
- 2U Rack Mountable Enclosure



The 60-310 is designed for high voltage applications including circuit board isolation testing, relay testing, semiconductor breakdown monitoring and cable harness insulation testing.

The matrix is constructed using high quality Rhodium contact reed relays specifically designed for high voltage switching.

Switching Specification

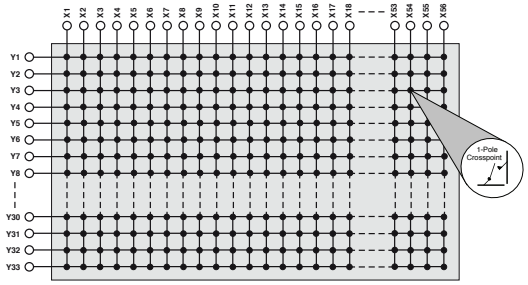
Switch Type:	Rhodium Reed
Max Cold Switching Voltage: Max Hot Switching Voltage:	1000Vdc 500Vdc
Max Hot Switching Power:	10W
Max Carry Current:	1A
On Path Resistance: Off Path Resistance:	<1.5Ω $>10^9\Omega$

Product Order Codes

2-Pole 100x2 High Voltage Matrix	60-310-102
2-Pole 200x2 High Voltage Matrix	60-310-202
2-Pole 300x2 High Voltage Matrix	60-310-302

60-510 Low EMF Matrix

- Single Pole 56 x 33 Matrix
- Low Thermal Offset
- Excellent Low Level Switching Characteristics
- Switch up to 150V DC/100V AC
- Maximum Carry Current of 1A
- 2U Rack Mountable Enclosure



The 60-510 is a high density matrix with excellent thermal stability and substantially reduced thermal EMF when compared to a conventional switching matrix.

Typical applications include signal routing in ATE, selecting thermocouple inputs, switching amplifier gain circuits and high accuracy DC microvolt measurements.

Switching Specification

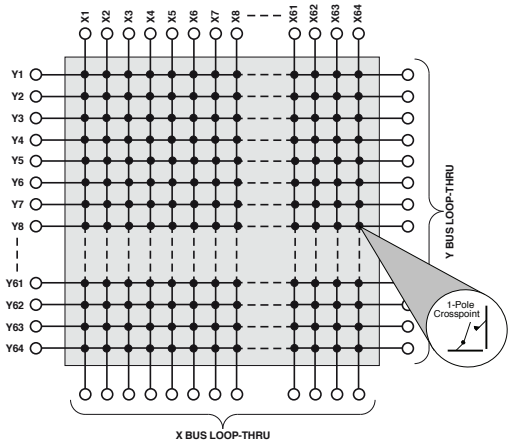
Switch Type:	Ruthenium Reed
Max Standoff Voltage:	150Vdc/100Vac
Max Power: Max Switch Current: Max Carry Current:	10W 0.5A 1A
Path Resistance, On: Path Resistance, Off:	<1.0Ω $>10^9\Omega$
Thermal EMF:	<2.5µV typical <5µV maximum

Product Order Codes

1-Pole 56x33 Low Thermal EMF Matrix	60-510-001
1-Pole 42x33 Low Thermal EMF Matrix	60-510-002
1-Pole 28x33 Low Thermal EMF Matrix	60-510-003
1-Pole 14x33 Low Thermal EMF Matrix	60-510-004

60-550/551/552/554 High Density Expandable Matrix

- Single Pole High Density Matrix
- Wide Range of Single Matrix Sizes
- Dual Matrix Sizes From 8x64 to 32x64
- Easily Expanded to Larger Matrix Sizes
- Version Available With Dual Analog Bus
- Switch up to 300Vdc/250Vac
- Maximum Switch Current of 2A
- 1U Rack Mountable Enclosure

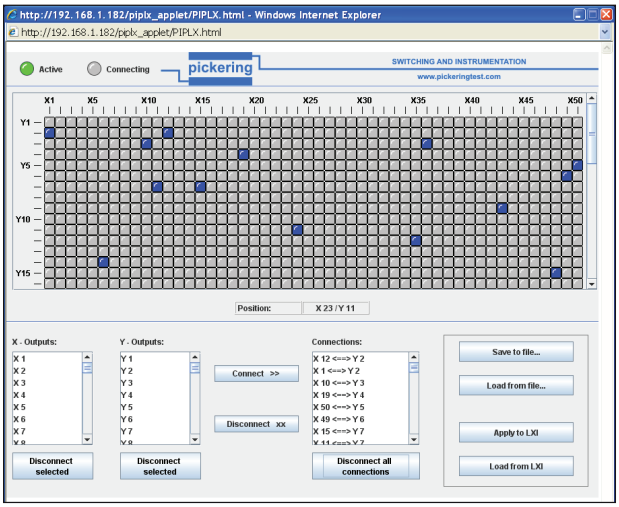


60-552-007 64x64 High Density Matrix With Loop-Thru on X & Y axes

These are high density single pole matrix modules with a maximum size of 4096 crosspoints and are suitable for signal routing in large ATE systems. They can be expanded further to produce larger matrix sizes, for instance, two 64x64 units can be linked to create a 128x64 matrix. Expansion of the 60-552 is made easy by the inclusion of front panel Loop-Thru connectors for daisy-chaining the X or Y bus. The 60-554 includes Loop-Thru connections on the Y bus only.

The 60-550/551 range has the feature of being able to route Y signals to one of two internal buses. This increases versatility and allows the matrix to be dynamically re-configured under software control.

Additionally, the 60-552 can be supplied in dual matrix formats. In these configurations the chassis contains two identical matrices which can be controlled separately.



Soft Front Panel For The High Density Matrix

Product Order Codes

LXI 128x8 EMR Matrix, Dual Y bus	60-550-002
LXI 192x8 EMR Matrix, Dual Y bus	60-550-003
LXI 256x8 EMR Matrix, Dual Y bus	60-550-004
LXI 320x8 EMR Matrix, Dual Y bus	60-550-005
LXI 384x8 EMR Matrix, Dual Y bus	60-550-006
LXI 448x8 EMR Matrix, Dual Y bus	60-550-007
LXI 512x8 EMR Matrix, Dual Y bus	60-550-008
LXI 128x4 EMR Matrix, Dual Y bus	60-551-002
LXI 192x4 EMR Matrix, Dual Y bus	60-551-003
LXI 256x4 EMR Matrix, Dual Y bus	60-551-004
LXI 320x4 EMR Matrix, Dual Y bus	60-551-005
LXI 384x4 EMR Matrix, Dual Y bus	60-551-006
LXI 448x4 EMR Matrix, Dual Y bus	60-551-007
LXI 512x4 EMR Matrix, Dual Y bus	60-551-008
LXI Single 16x64 Matrix, X & Y loop-thru	60-552-001
LXI Single 24x64 Matrix, X & Y loop-thru	60-552-002
LXI Single 32x64 Matrix, X & Y loop-thru	60-552-003
LXI Single 40x64 Matrix, X & Y loop-thru	60-552-004
LXI Single 48x64 Matrix, X & Y loop-thru	60-552-005
LXI Single 56x64 Matrix, X & Y loop-thru	60-552-006
LXI Single 64x64 Matrix, X & Y loop-thru	60-552-007
LXI Dual 8x64 Matrix, X & Y loop-thru	60-552-008
LXI Dual 16x64 Matrix, X & Y loop-thru	60-552-009
LXI Dual 24x64 Matrix, X & Y loop-thru	60-552-010
LXI Dual 32x64 Matrix, X & Y loop-thru	60-552-011
LXI 64x16 EMR Matrix, Y loop-thru	60-554-002
LXI 96x16 EMR Matrix, Y loop-thru	60-554-003
LXI 128x16 EMR Matrix, Y loop-thru	60-554-004
LXI 160x16 EMR Matrix, Y loop-thru	60-554-005
LXI 192x16 EMR Matrix, Y loop-thru	60-554-006
LXI 224x16 EMR Matrix, Y loop-thru	60-554-007
LXI 256x16 EMR Matrix, Y loop-thru	60-554-008

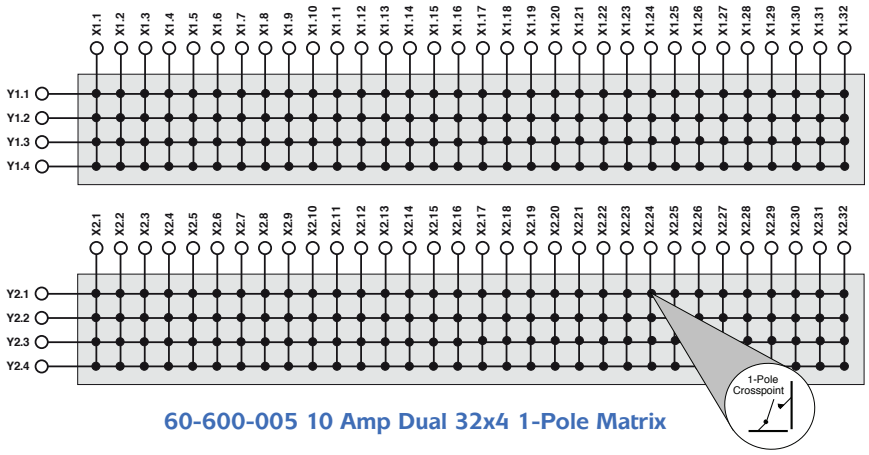
Switching Specification

Switch Type	Electro-mechanical
Max Switch Voltage:	300Vdc/250Vac
Max Power (single crosspoint):	60W
Max Switch Current:	2A
Max Carry Current:	2A
Path Resistance - On:	<1.5Ω
Path Resistance - Off:	>10^9Ω
Minimum Voltage:	100µV
Operate/Release Time:	<6ms

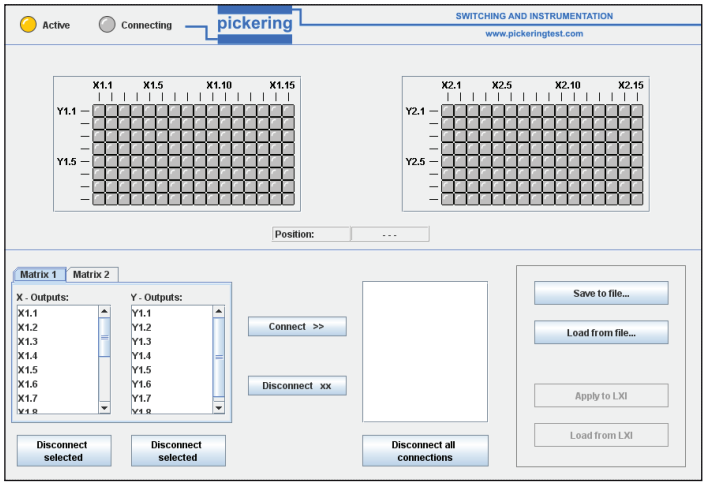
60-600 High Power Matrix

- Single Pole Power Matrix
- Available in a Variety of Sizes
- Single and Dual Matrix Configurations
- 10A Current Rating
- Switch up to 30Vdc or 250Vac
- Uses Electro-Mechanical Power Relays
- 1U Rack Mountable Enclosure

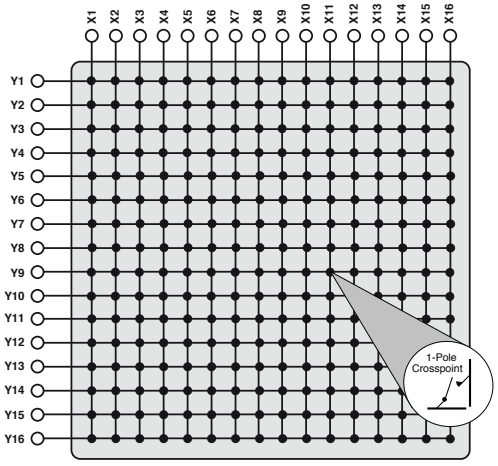
The 60-600 is a high power single pole Matrix Module suitable for power signal routing in large ATE systems. It is available with a selection of X and Y sizes as well as partially populated configurations. Connections to the X and Y buses are via 8-way power D-type type connectors.



60-600-005 10 Amp Dual 32x4 1-Pole Matrix



Soft Front Panel For The High Power Matrix



60-600-001 10 Amp Single 16x16 1-Pole Matrix

Switching Specification

Switch Type	Electro-mechanical
Nominal Switching Capacity:	10A @ 250Vac 10A @ 30Vdc
Max Switching Power:	2500VA, 300W
Max Switching Voltage:	250Vac, 30Vdc
Max Standoff Voltage:	400Vdc
Max Switching Current:	10A
Path Resistance, On:	<150mΩ
Path Resistance, Off:	>10^9Ω
Operate/Release Time:	<10ms

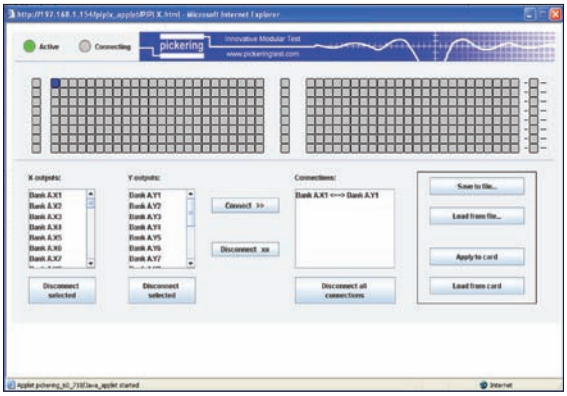
Product Order Codes

LXI 10A 1-Pole Matrix, Single 16x16	60-600-001
LXI 10A 1-Pole Matrix, Single 32x8	60-600-002
LXI 10A 1-Pole Matrix, Single 64x4	60-600-003
LXI 10A 1-Pole Matrix, Dual 16x8	60-600-004
LXI 10A 1-Pole Matrix, Dual 32x4	60-600-005

INTRODUCTION

Pickering Interfaces offers an expanding range of High Frequency and Microwave matrices. Each matrix is designed to have a controlled transmission line impedance and architecture developed to maximize the bandwidth of the product. HF matrices are designed with crosspoint switch systems interlinked with isolation relays and loop-thru connections to minimize stub loading of the matrix.

The mechanical and electrical freedom of LXI allows Pickering Interfaces to design HF and Microwave matrices to suit most applications. Although they can be used to switch DC or low frequency AC signals, users should consider the more cost effective LF Matrices if the application is restricted to low frequencies. All HF and Microwave matrices are designed to switch low level signals without contact resistance degradation that can be seen on higher power matrices since they use precious metal contacts and have sealed enclosures. To preserve their RF performance they are designed for applications where connection is from one axis (e.g. Y) to the other axis (X axis) and all performance figures use this connection method when testing.



Soft Front Panel Supplied With The 60-711 Dual 24x8 Video Matrix

Module Configuration	Maximum Size	Minimum Size	Impedance	Maximum Frequency	Product Code
Dual Video Matrix	Dual 24x8	Single 24x8	75Ω	25MHz	**60-711**
Dual HF Matrix	Dual 24x8	Single 24x8	50Ω	50MHz	**60-760**
Microwave Matrix	Dual 4x4	Single 3x3	50Ω	10GHz	**60-750**
	Single 4x4	Single 3x3		20GHz	**60-751**
1GHz RF Matrix	Single 32x16	Single 16x16	75Ω	1.5GHz	**60-730**
	Single 32x8	Single 8x8			**60-731**
	Single 32x4	Single 8x4			**60-732**
2.5GHz RF Matrix	Single 32x16	Single 16x16	50Ω	3GHz	**60-770**
	Single 32x8	Single 8x8			**60-771**
	Single 32x4	Single 8x4			**60-772**

60-711 Dual 24x8 Video Matrix

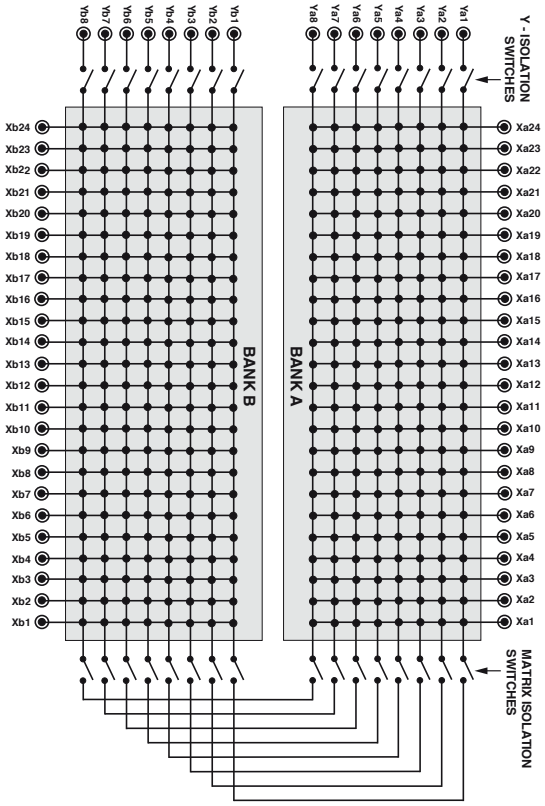
- Dual 24x8 Video Matrix
- Software Configurable As 48x8 Video Matrix
- Low Cost Single 24x8 Options
- 25MHz Bandwidth
- 75Ω Impedance Suitable for Video Switching
- High Density SMB or MCX Coaxial Connectors
- Also Available With BNC Connectors
- 1U Rack Mountable Enclosure (2U for BNC Version)

The 60-711 is a Dual 24x8 Video Matrix Module suitable for switching frequencies up to 25MHz. It has a characteristic impedance of 75Ω with the option of SMB, MCX or BNC connectors.

It is designed to provide a simple and scalable bidirectional matrix for video frequencies and is intended for the easy construction of high performance bidirectional matrix switching systems.

Software configuration allows the 60-711 to be set as a dual 24 by 8 matrix, a single 48 by 8 matrix and other configurations. All connections to the matrices are accessible from the front panel.

A flexible isolation switch arrangement permits the matrices to be configured so the matrix can be expanded with other modules while maximizing the bandwidth of the switching system.



General Matrix Switching Specification

Maximum Voltage: Maximum Power: Maximum Switch Current:	100Vdc 60W 1.4A
Characteristic Impedance:	75Ω
On Path Resistance: Off Path Resistance Thermal Offset:	<500mΩ $>10^8$Ω <50µV
Operate Time: Release Time:	<3ms <3ms

Product Order Codes

Single 24x8 Video Matrix 75Ω SMB	**60-711-001**
Dual 24x8 Video Matrix 75Ω SMB	**60-711-002**
Single 24x8 Video Matrix 75Ω MCX	**60-711-003**
Dual 24x8 Video Matrix 75Ω MCX	**60-711-004**
Dual 24x8 Video Matrix 50Ω SMB	**60-711-721**
Dual 24x8 Video Matrix 75Ω BNC	**60-711-901**

RF Specification - Single or Dual 24 x 8 Configuration

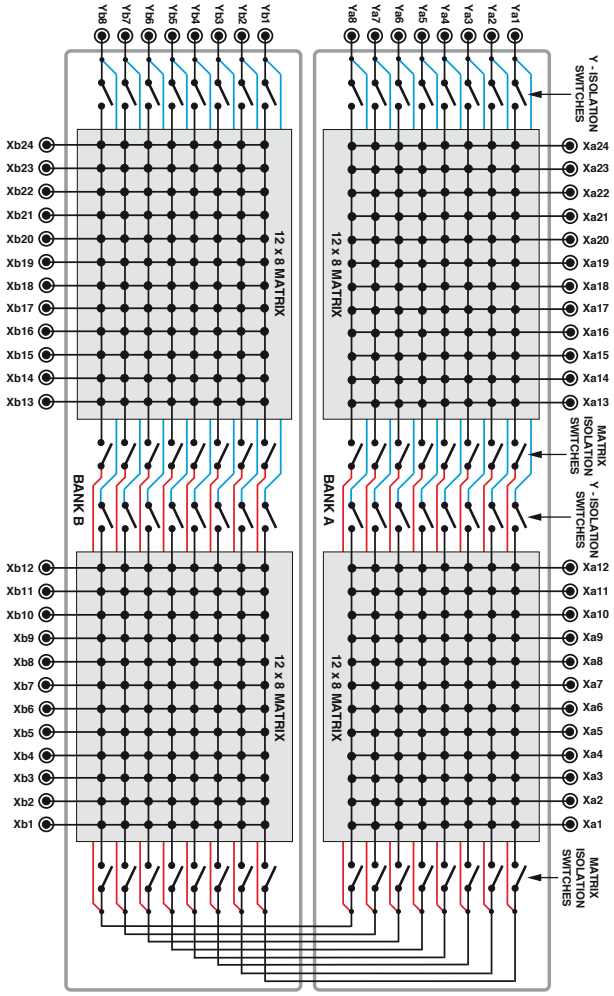
Insertion Loss:	<0.75dB @ 25MHz, 0.29dB typical
VSWR:	<2.0 @ 25MHz, 1.37 typical
Crosstalk (X-Y path, X terminated): (X-Y path, Y terminated):	 Better than 40dB @ 25MHz Better than 50dB @ 25MHz
Isolation:	Better than 55dB to 25MHz

RF Specification - Single 48 x 8 Configuration

Insertion Loss:	<1dB @ 25MHz, 0.55dB typical
VSWR:	<2.0 @ 25MHz, 1.6 typical
Crosstalk (X-Y path, X terminated): (X-Y path, Y terminated):	 Better than 40dB @ 25MHz Better than 50dB @ 25MHz
Isolation:	Better than 70dB to 25MHz

60-760 Dual 24x8 High Frequency Matrix

- Dual 24x8 High Frequency Matrix
- Software Configurable As 48x8 Matrix
- Low Cost Single 24x8 Options
- 50MHz Bandwidth, Useable to 100MHz
- High Density SMB Coaxial Connectors
- 50Ω Characteristic Impedance
- 1U Rack Mountable Enclosure

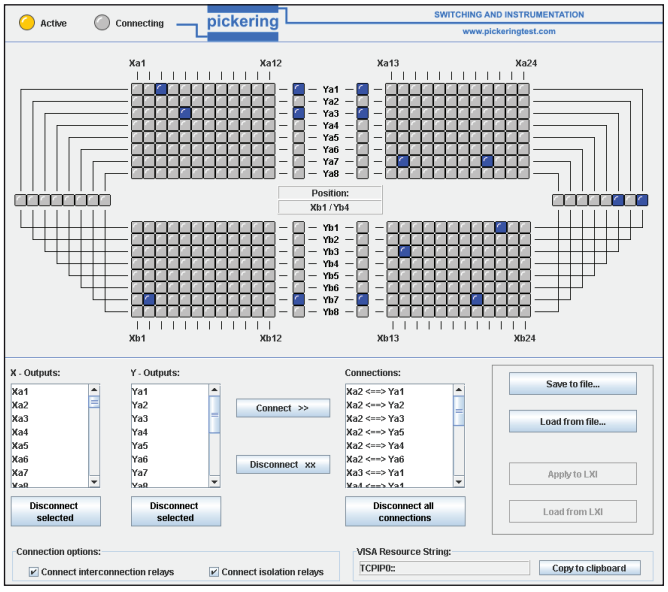


The 60-760 is a Dual 24 x 8 HF Matrix Module suitable for switching frequencies up to 50MHz. It has an impedance of 50Ω and uses front panel mounted SMB signal connectors.

It is designed to provide a simple and scalable bidirectional matrix for radio frequencies and is intended for the easy construction of high performance bidirectional matrix switching systems.

Software configuration allows the 60-760-002 to be set as a dual 24 by 8 matrix, a single 48 by 8 matrix and other configurations.

A flexible isolation switch arrangement permits the matrices to be expanded with other modules while maximizing the bandwidth of the switching system.



Soft Front Panel Supplied With The 60-760 Matrix

Specification

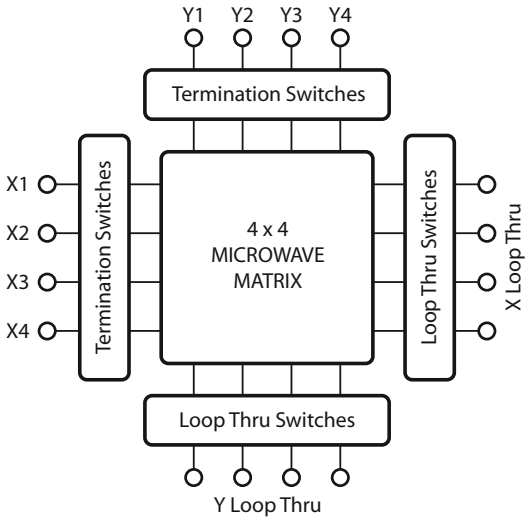
Inpedance:	50Ω
Frequency Range:	DC to 50MHz (useable to 100MHz)
Insertion Loss:	1dB typical at 50MHz 3dB typical at 100MHz
VSWR:	<1.8:1 typical at 50MHz
Crosstalk:	Better than 40dB at 50MHz
Isolation:	Better than 60dB at 50MHz
Operating Life:	$1x10^8$ for power less than 100mW $1x10^7$ at maximum power
Maximum HF Power:	10W at 50MHz
DC Rating:	100V max, 1A max, 30W
Operating Time:	<3ms

Product Order Codes

LXI Single 24 x 8 HF Matrix	**60-760-001**
LXI Dual 24 x 8 HF Matrix	**60-760-002**

60-750/751 Microwave Matrix

- Versatile Microwave Matrix Switching Platform
- Versions Available up to Dual 4 x 4
- Loop Thru Options For Easy Expansion
- Internally Terminated Versions
- Up to 20GHz Bandwidth
- Equal Loss on Each 4x4 Matrix
- 50Ω Impedance
- Auxiliary Port For External Control of Relays

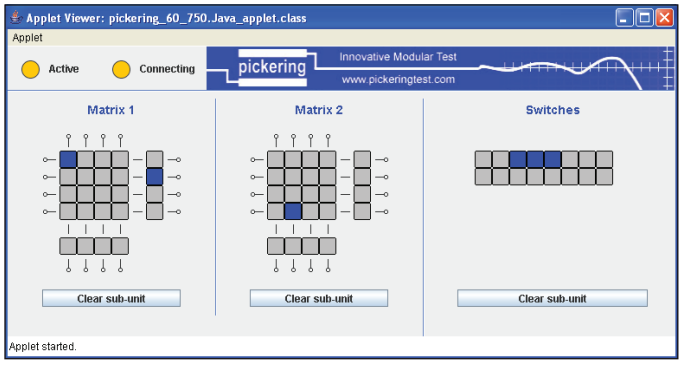


Single 4x4 Matrix With Optional Loop Thru and Termination

The 60-750/751 is a 2U full rack width unit, that provides a compact microwave switching solution for ATE systems. The matrix is fully configured to the specified dimensions with no extra cabling needed, saving users the cost and time of creating matrices from individual components.

The matrix is available in a variety of configurations and frequencies up to 20GHz (60-751). They are designed to have a nominally matched path loss no matter which path is selected. They have non blocking architecture, allowing any input to be connected to any unused output. Loop Thru connections allow matrices to be easily combined to make larger arrays and versions can be ordered with or without internal terminations for disconnected inputs.

For applications where extra microwave switches are required the 60-750/751 has an auxiliary output that can be used to control 16 external switches.



Soft Front Panel Supplied With The 60-750/751 Matrix

Specification

Inpedance:	50Ω
Frequency Range:	0 to 10GHz (60-750) 0 to 20GHz (60-751)
Insertion Loss:	3.6dB typical at 10GHz (60-750) 4.5dB typical at 20GHz (60-751)
VSWR:	<1.6:1 typical at 10GHz (60-750) <1.6:1 typical at 20GHz (60-751)
Crosstalk:	-85dB typical (60-750 & 60-751)
Isolation:	90dB typical (60-750 & 60-751)
Maximum HF Power:	100W at 3GHz (60-750 & 60-751) 60W at 10GHz (60-750) 30W at 20GHz (60-751) 1W for terminated versions
Max Voltage:	100Vdc
Max Switch Current:	1A
Operating Time:	15ms

Product Order Codes

Single 3x3 10GHz 50Ω Matrix:	**60-750-133**
Single 4x4 10GHz 50Ω Matrix:	**60-750-144**
Single 8x4 10GHz 50Ω Matrix:	**60-750-184**
Dual 3x3 10GHz 50Ω Matrix:	**60-750-233**
Dual 4x4 10GHz 50Ω Matrix:	**60-750-244**
Single 3x3 20GHz 50Ω Matrix:	**60-751-133**
Single 4x4 20GHz 50Ω Matrix:	**60-751-144**

Terminations and Loop Thru:
For versions with Loop Thru connections, add the suffix **-A**.
For versions with internal terminations, add the suffix **-B**.
For versions with Loop Thru and internal terminations, add the suffix **-C**.

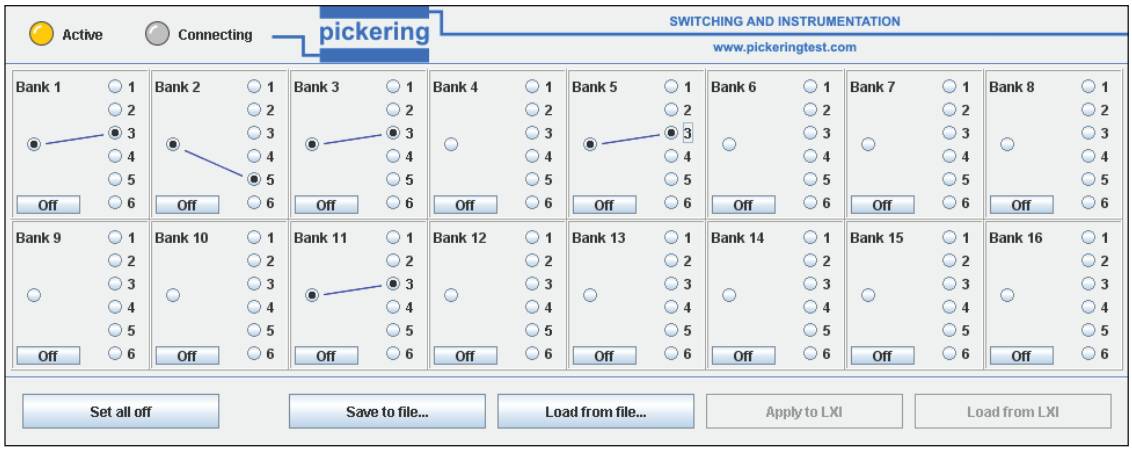
INTRODUCTION

The LXI range of RF and microwave multiplexers provide a less complex and less flexible solution for connecting RF test equipment to the UUT than matrix based configurations. They provide a connection from a common port to one of many ports.

To preserve their RF performance the multiplexers use either specially designed switches or use a tree structure to minimize the presence of stubs and other RF artifacts. RF performance is characterized when used as a N:1 or a 1:N multiplexer, RF performance between the N ports may not be possible or may have an unspecified performance.

The 60-800 and 60-820 offer the highest density microwave multiplexer configuration possible, packaging 16 multiplexers into a 2U high rack. In addition to ATE applications, the 60-721 offers an elegant and compact solution for monitoring applications where one item of test equipment needs to poll a number of channels. This can be in applications that test system performance to provide an early indication of failure.

Pickering Interfaces is continually expanding its range of multiplexer solutions, if you have other switching problems please contact your Pickering Interfaces sales representative.



Soft Front Panel for the 60-820 16-Bank 6 to 1 Microwave Multiplexer

Module Configuration	Maximum Size	Minimum Size	Impedance	Connector	Product Code
Video Multiplexer	72 Channel	24 Channel	75Ω	F-Type	**60-721**
High Isolation Multiplexer	Dual 12 Channel	Single 12 Channel	75Ω	F-Type	**60-722**
Microwave Multiplexer	16 x 6 Channel	4 x 6 Channel	50Ω	SMA	**60-800**
	16 x 6 Channel	4 x 6 Channel	75Ω	DIN 1.6/5.6	**60-820**

60-721 High Performance Video Multiplexer

- High Performance RF Multiplexer Suitable for Video Switching Applications
- 1GHz Bandwidth
- Available in 24, 48 or 72 Channel Versions
- 75Ω Characteristic Impedance
- Automatic Termination of Unused Inputs
- Low Loss, High Isolation
- LED Indicator On Every Channel
- Consistent Performance Across All Channels

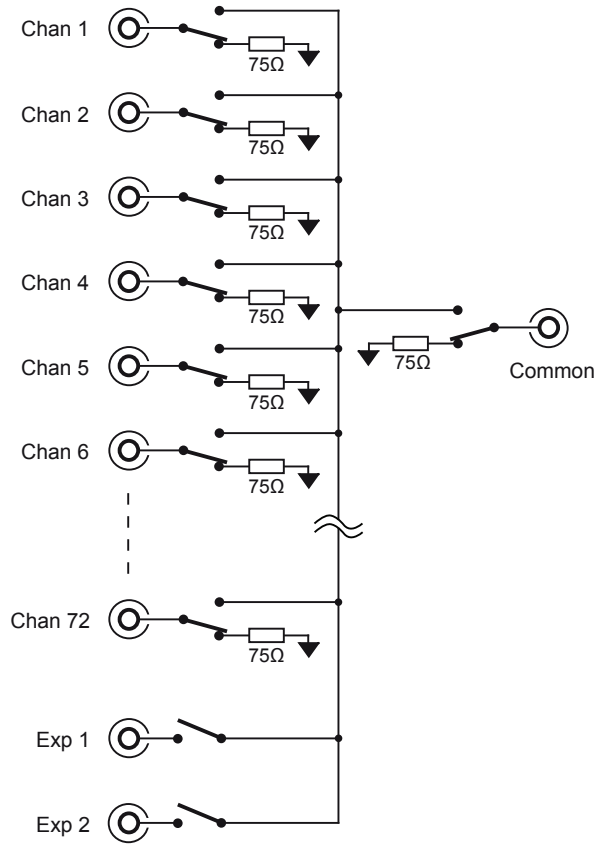
The 60-721 High Performance Video MUX is designed for the switching of RF signals in 75Ω systems at frequencies up to 1GHz. It is ideal for 75Ω monitoring applications that require a multiplexer to select one channel to be routed to measuring equipment.

Automatic 75Ω termination of the unused inputs ensures that un-selected signals are correctly terminated, minimizing the possibility of introducing unwanted responses into the monitored channel.

Front panel LED indicators adjacent to each multiplexer input connector provide an easy visual identification of active channels.

The high signal isolation and low crosstalk ensure that signal measurements on active channels are not disturbed by signals on un-selected channels and that the channels being monitored have a high degree of electrical separation. Careful attention to the design has ensured a smooth pass band response and insertion loss, which is consistent on each path, that can be easily calibrated out to provide traceable measurements.

The integrated design ensures a compact solution with no additional wiring required to assemble a large multiplexer.



Schematic Diagram for the 60-721 Multiplexer in 72 Channel Format

Product Order Codes

24 Channel 1GHz Video Multiplexer	**60-721-001**
48 Channel 1GHz Video Multiplexer	**60-721-002**
72 Channel 1GHz Video Multiplexer	**60-721-003**

Specification

Inpedance:	75Ω
Connectors:	F-Type
Frequency Range:	DC to 1GHz
Insertion Loss:	<3.5dB to 1GHz
VSWR selected channel: VSWR terminated channel:	<1.7:1 to 1GHz <1.5:1 to 1GHz
Isolation:	>65dB to 1GHz
Operating Life:	$2x10^7$ operations
Maximum Power:	0.5W
Operating Time:	5ms

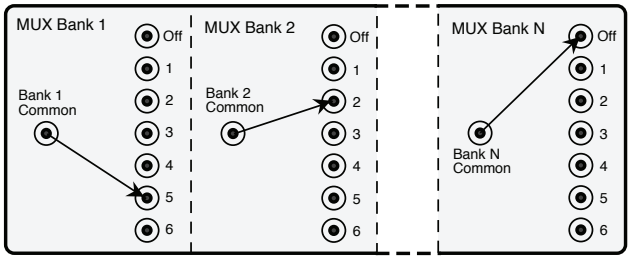
60-800/820 Microwave Multiplexer

- High Performance 6-Channel RF Multiplexers
- Available With 4, 8, 12 or 16 Multiplexer Banks
- 20GHz Bandwidth (60-800)
- 2.5GHz Bandwidth (60-820)
- 50Ω Characteristic Impedance (60-800)
- 75Ω Characteristic Impedance (60-820)
- Low Loss, High Isolation
- Compact 2U Form Factor

Pickering Interfaces' 60-800 Microwave Multiplexer is suitable for switching 50Ω signals up to 20GHz, and the 60-820 is suitable for 75Ω signals up to 2.5GHz. With the capability of supporting up to 16 banks of 6 channel multiplexers they are ideal for constructing complex microwave switching systems for many applications. Connection is by high performance front panel mounted SMA (60-800) or DIN1.6/5.6 (60-820) connectors.

The 60-800/820 multiplexers have an extremely high level of performance, offering low VSWR, very high isolation, low loss and high power handling. They are ideal for switching coaxial systems that require a high performance from the HF band to microwave frequencies.

The Multiplexer occupies just 2U of valuable rack space, providing a space saving solution for systems requiring high performance multiplexers in the construction of microwave switching systems. The multiplexers can be user connected to create customized switching systems which include both multiplexer and matrix arrangements.



Schematic Diagram for the 60-800/820 Microwave Multiplexer - up to 16 Multiplexer Modules can be supported

Product Order Codes

LXI Microwave Multiplexer, 50Ω	
6 to 1 MUX, 20GHz, SMA 4-Banks	**60-800-004**
6 to 1 MUX, 20GHz, SMA 8-Banks	**60-800-008**
6 to 1 MUX, 20GHz, SMA 12-Banks	**60-800-012**
6 to 1 MUX, 20GHz, SMA 16-Banks	**60-800-016**
LXI Microwave Multiplexer, 75Ω	
6 to 1 MUX, 2.5GHz DIN1.6/5.6 4-Banks	**60-820-004**
6 to 1 MUX, 2.5GHz DIN1.6/5.6 8-Banks	**60-820-008**
6 to 1 MUX, 2.5GHz DIN1.6/5.6 12-Banks	**60-820-012**
6 to 1 MUX, 2.5GHz DIN1.6/5.6 16-Banks	**60-820-016**

Versions with other bank counts, alternative connector types and different frequency ranges can be made to order, please contact sale office.

Specification

Inpedance:	50Ω (60-800) 75Ω (60-820)
Frequency Range:	DC to 20GHz (60-800) DC to 2.5GHz (60-820)
Connectors	SMA (60-800) DIN1.6/5.6 (60-820)
Insertion Loss:	>0.5dB to 20GHz (60-800) >0.3dB to 2.5GHz (60-820)
VSWR:	<1.5:1 to 20GHz (60-800) <1.3:1 to 2.5GHz (60-820)
Isolation:	>60dB to 20GHz (60-800) >70dB to 2.5GHz (60-820)
Maximum HF Power:	30W to 20GHz (60-800) 240W to 2.5GHz (60-820)
DC Rating:	100V max, 1A max
Operating Time:	15ms

INTRODUCTION

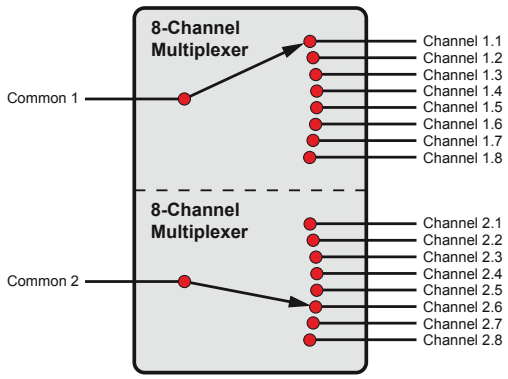
LXI is an ideal platform for supporting Optical switching systems. The use of Ethernet control makes it easy to provide optical switching within the network that is easy to control via a programmatic or web based interface.

Optical switching can be offered for single or multi-mode fibers. The current range is focussed on multiplexer arrangements, but matrix based solutions can be offered, contact your Pickering Interfaces sales representative with your requirements.

Module Configuration	Module Size	Fiber Type	Connector Type	Product Code
Fiber Multiplexer	Single or Dual 8-Channel Single 16-Channel	Single Mode	FC/APC, SC/PC, LC	**60-850**
		Multi Mode	SC	**60-851**

60-850/851 Fiber Optic Multiplexer

- High Performance Optical Multiplexer
- Single/Dual 8 Channel or 16 Channel Versions
- Loop-Thru Option For Easy MUX Expansion
- MEMS Based Actuation
- Long Life and Fast Operation
- Single-Mode or Multi-Mode Fiber Support
- Compact 1U Form Factor



The 60-850 and 60-851 are LXI conformant fiber optic multiplexers that ensure fast and reliable switching of single-mode or multi-mode optical signals. The 60-850/851 is available with a variety of connector options and in a variety of multiplexer arrangements.

Multiplexer configurations offered are single 8 channel MUX, dual 8 channel MUX and a single 16 channel MUX. Each configuration can be supplied with FC/APC, SC/PC, LC or SC connector types – allowing users to select exactly the model that fits their connection standard. A Loop-Thru option is also available allowing easy multiplexer expansion.

All configurations use a MEMS based mirror system that ensures fast switching, long operating life and repeatable insertion loss and isolation characteristics.

Product Order Codes

Single 8 Channel Fiber Multiplexer	
FC/APC, Single-Mode	**60-850-011**
SC/PC, Single-Mode	**60-850-211**
LC, Single-Mode	**60-850-411**
SC, Multi-Mode	**60-851-211**
Dual 8 Channel Fiber Multiplexer	
FC/APC, Single-Mode	**60-850-012**
SC/PC, Single-Mode	**60-850-212**
LC, Single-Mode	**60-850-412**
SC, Multi-Mode	**60-851-212**
Single 16 Channel Fiber Multiplexer	
FC/APC, Single-Mode	**60-850-013**
FC/PC, Single-Mode	**60-850-113**
LC, Single-Mode	**60-850-413**
SC, Multi-Mode	**60-851-213**

Specification

Wavelength:	1240 - 1640nm single mode 700 - 1700nm multi mode
Internal Fiber Type:	SM 9/125 single mode MM 62.5/125 multimode
Insertion Loss:	1dB typ (8-channel) 1.5dB typ (16-channel)
Return Loss:	60dB min (APC version) 55dB min (other versions)
Maximum Switching Time:	1ms
Cycle Rate:	500/sec

INTRODUCTION

Pickering Interfaces provides a range of products to support other functions in a system.

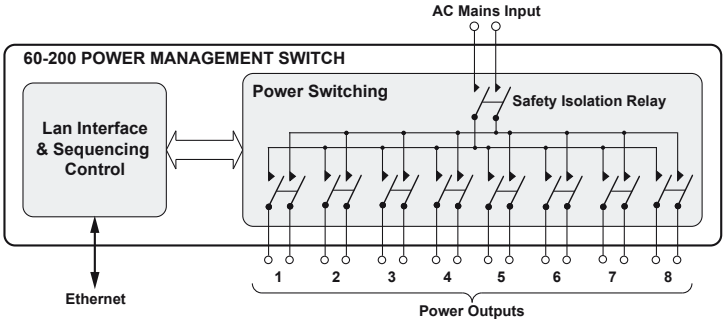
The 60-200 provides an elegant solution for controlling the power on/off switches of other LXI Devices - or non LXI Devices. The 60-200 can control the AC power supply for up to 8 devices, allowing the power to each device to be turned on or off individually, or initiating a controlled power down or power up sequence in an ATE system. The sequences can be timed accurately to reduce inrush currents and ensure that order sensitive systems (such as PXI) are correctly sequenced.

Pickering Interfaces also manufactures adaptors and accessories for the LXI Wired Trigger Bus. They are designed to help debug a WTB system or provide conversion of signals to or from the WTB to products that do not support the WTB. LXI approved WTB cable assemblies and terminators are available to interconnect LXI Class A products together or to connect Class C products that support the WTB.

Name	Description	Product Code
Power Management Switch	Remote power switching of up to 8 devices	**60-200**
Wired Trigger Bus Probe	For monitoring the 8 WTB signals	**60-981**
Wired Trigger Bus Adapter	Converts the 8 WTB signals into Low Voltage TTL	**60-982**
Wired Trigger Bus Terminator	For terminating the end of a WTB cable	**60-983**
Wired Trigger Bus Extender	Interconnects two WTB cables for greater reach	**60-984**
Wired Trigger Bus Cables	WTB compliant cables with lengths from 0.3m to 20m	**60-985**
Wired Trigger Bus Scope Adapter	Allows all 8 WTB signals to be displayed on an Agilent DSO	**60-990**

60-200 Power Management Switch

- Provides Controlled Start Up Of Test Systems
- Supports Up To 8 Instruments
- Settable Timing Interval And Sequence
- Permits Remote Re-booting Of Systems
- Local or Remote Sequence Start/Stop
- Provides Emergency Stop Facility

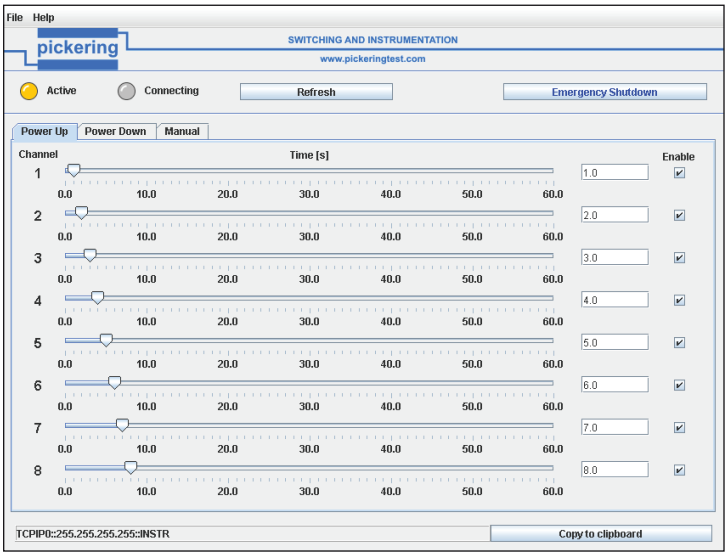


Functional Diagram for the 60-200 LXI Power Management Switch

The 60-200 provides a means of remotely controlling the power status of up to 8 instruments. Each outlet can be timed to be switched on with a specified sequence and timing delay. The delay can be staggered to ensure that systems like PXI that are order dependent can be switched on and off in an orderly fashion. Remote control can be used to re-boot systems that are present in other buildings.

For systems not requiring remote control the 60-200 will operate without a LAN connection being present. The on/off sequence will follow the stored instructions and is activated using the front panel “Sequence Start/Stop” push button.

An emergency stop facility is also included that disables all power outlets. This can be initiated by the front panel Stop button, or via a remotely mounted switch connected to the socket on the front panel.



Soft Front Panel for the 60-200 LXI Power Management Switch

Power Outlets on the rear panel of the 60-200 Power Management Switch

Specification

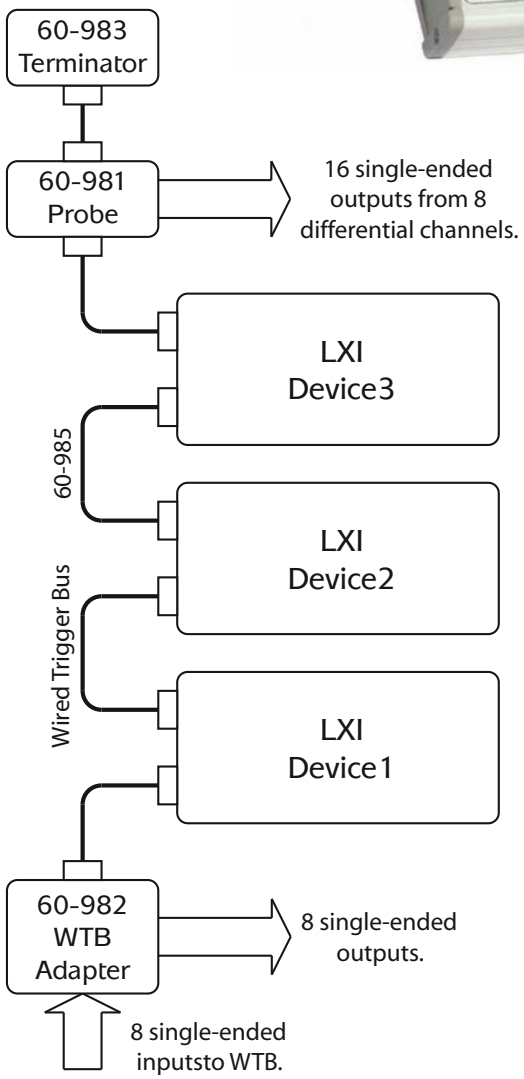
No. of power outlets:	8, female IEC connectors
Power inlet rating:	10A
Power outlet rating:	6A max per chan, 10A max total
Timing:	Delay of 0 to 60 seconds for each channel
On/Off initiation:	Remotely over LAN or manually via front panel button
Emergency shutdown:	Front panel stop button or via remote connection

Product Order Codes

LXI Remote AC Power Management Switch	**60-200-001**

60-900 LXI WTB Accessories

- A Range of Support Products For WTB
- Bus Probe in Thru and Terminated Versions
- Adapter in Thru and Terminated Versions
- Bus Terminator Module
- Cable Extender Module
- Adapter for Agilent Oscilloscopes
- Wide Range of WTB Cables



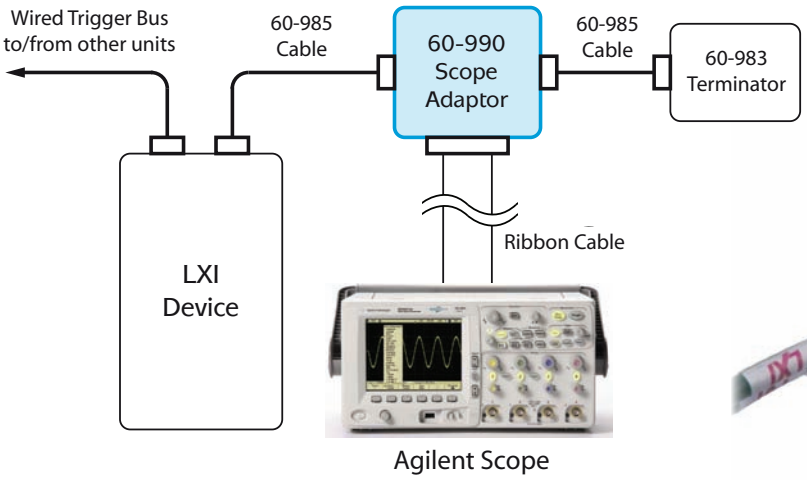
Example diagram showing the 60-981 Probe, the 60-982 Adapter, the 60-983 Terminator and 60-985 cabling in use

The 60-981 LXI Wired Trigger Probe provides a simple way of monitoring the LXI Wired Trigger Bus activity. It provides a through line active probe that can be used to non-intrusively monitor the waveforms of the M-LVDS drivers on all 8 channels. Each channel has two single ended outputs from the differential pair that can be subtracted by an oscilloscope to display each driver output and the differential signal.

The 60-982 WTB Adapter provides an effective method of translating trigger signals from bench instruments to the LXI Wired Trigger Bus signalling standard. The 60-982 converts M-LVDS signals on the WTB to Low Voltage TTL signals and converts Low Voltage TTL signals to M-LVDS. All 8 channels of the LXI WTB are supported. The 60-982 is available in thru-line or internally terminated versions.

Termination of the WTB is important to maintain it's transmission line characteristics. The 60-983 WTB Terminator can be attached via a WTB cable to the last WTB connector in a daisy chain of LXI devices to ensure correct bus operation. It is available in 100Ω, 90.6Ω and 109.8Ω versions.

The 60-894 provides an easy method of joining two LXI WTB bus cables together to extend the length. It is an ideal solution for cable extension where users need to experiment with different cabling solutions without having to totally replace the cables in the system.



Functional Diagram showing an example of the 60-990 LXI WTB Scope Adaptor in use

The 60-990 Adaptor With Cabling Attached

The 60-985 series of LXI cables conform with the LXI WTB cable specification. They terminate in a 25 way Micro D connector at each end and use low loss silver plated cable incorporating 8 differential pairs each with separate shields.

The 60-990 WTB Adaptor provides a simple way of monitoring the logical state of all 8 LXI WTB channels on a single oscilloscope display. It is ideal for debugging of LXI test systems that support the Wired Trigger Bus.

The 60-990 is easy to use, simply connect the adapter to a compatible Agilent scope using the Agilent ribbon cable and connect the WTB cables to the adapter. Power for the adapter is provided by the Agilent scope, so no other connections are needed. Using the logic analyzer mode on the scope the logical state of all 8 channels can be shown on one display.

The scope adapter is suitable for use with Agilent mixed signal oscilloscopes with 16 channel logic analyser capability, including MSO6000A, DSO6000L opt MSO and MSO8000 series.

Product Order Codes

LXI Wired Trigger Bus Probe, Thru, DC coupled	**60-981-001**
LXI Wired Trigger Bus Probe, Terminated	**60-981-002**
LXI WTB Adaptor, Thru Line	**60-982-001**
LXI WTB Adaptor, Terminated	**60-982-002**
LXI Wired Trigger Bus Terminator, 100Ω	**60-983-001**
LXI Wired Trigger Bus Terminator, 90.6Ω	**60-983-002**
LXI Wired Trigger Bus Terminator, 109.8Ω	**60-983-003**
LXI Wired Trigger Bus Extender	**60-984-001**
LXI WTB 0.3m Cable Assembly	**60-985-003**
LXI WTB 0.5m Cable Assembly	**60-985-005**
LXI WTB 1m Cable Assembly	**60-985-010**
LXI WTB 2m Cable Assembly	**60-985-020**
LXI WTB 3m Cable Assembly	**60-985-030**
LXI WTB 5m Cable Assembly	**60-985-050**
LXI WTB 10m Cable Assembly	**60-985-100**
LXI WTB 20m Cable Assembly	**60-985-200**
LXI Wired Trigger Bus Adaptor for Agilent MSO Scopes	**60-990-001**

The 60-983 WTB Terminator

INTRODUCTION

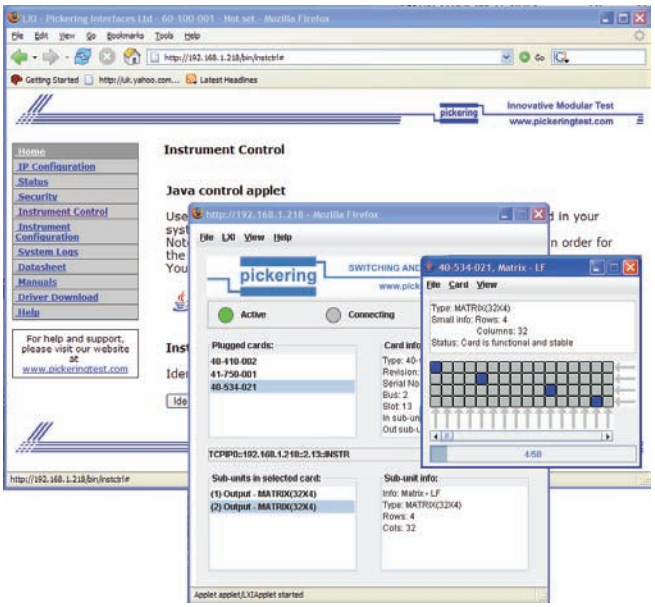
For applications requiring diverse switching functions but preferring an LXI interface, look no further than Pickering Interfaces' LXI modular platform.

The chassis can support all of the 3U PXI switching functions available from Pickering Interfaces – the largest range of PXI switching solutions available from any vendor. Optical, RF and low frequency switching can be mixed together in the same 4U chassis for bench top or ATE use. The chassis provides support for each module from a single IP address, and can provide a Java based soft front panel for any of the modules fitted.

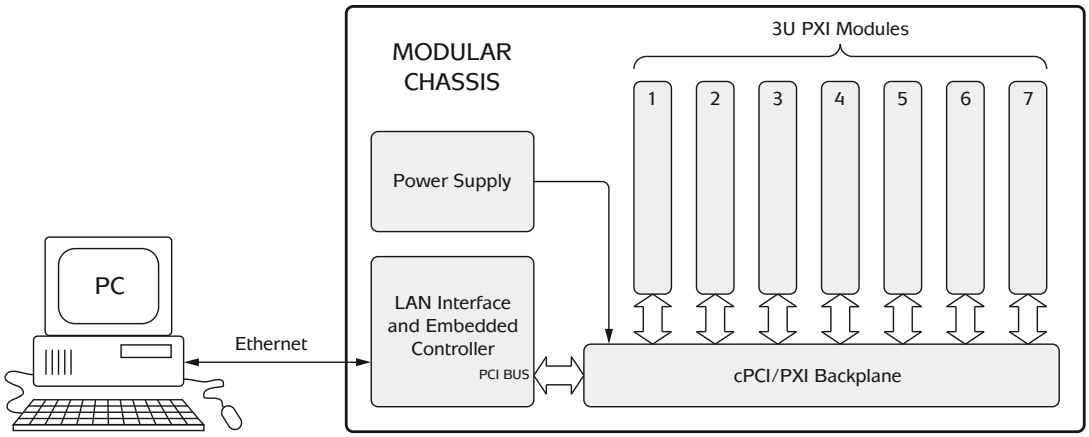
An industry standard web browser can be used to explore the chassis configuration and download the SFP (no need for SFP installation for each module), and the chassis can be controlled at almost any distance through the use of Ethernet connectivity.

The Pickering Interfaces modular products are the perfect solution for high diversity switching systems.

60-103 18-Slot LXI Modular Chassis



The Graphical Interface Included With the LXI Modular Chassis Allows Manual Control of PXI Modules Over an Ethernet Connection



Block Diagram for the Pickering Interfaces' 8-Slot LXI Modular Chassis

60-102 7-Slot LXI Modular Chassis - Front

- **The 60-102 and 60-103** are high power LXI Modular Chassis capable of supporting thermal loads up to 40W per slot. With a high capacity power supply, the 60-102 and 60-103 can support any of the PXI modules listed in this short form catalog.

60-103 18-Slot LXI Modular Chassis - Front

60-102 7-Slot LXI Modular Chassis - Rear

60-103 18-Slot LXI Modular Chassis - Rear

60-100A 7-Slot Low Power LXI Modular Chassis

- **The 60-100A is** a low power 7-slot LXI Modular Chassis which is perfect for supporting PXI modules that dissipate less than 25W per slot. With a low noise power supply, the 60-100A provides an excellent solution for applications requiring the lowest level of signal noise.

Module Selection Guide

A large variety of 3U PXI switching modules are available from Pickering Interfaces that can be supported by the LXI Modular Switching Chassis. The following information provides a convenient way of selecting, from the large number of modules available, the product most suited for your application. From the tables below select the short form data sheet that best describes your requirements. Full data sheets are available for each module from our web site. Please note that some overlap exists between module complexity (relay count), so for some applications it is worth checking short form data sheets that cover higher or lower complexity modules.

General Purpose Relays

These modules provide an array of relays with no specific configuration enabling users to configure them to match their specific application. They can provide the lowest cost solution for functional test applications where there is a low likelihood of changes in the system

Short Form Data Sheet	Configurations Covered	Max Relay Count (up to)	Max Current or Voltage	Page
Low Density General Purpose Relay Modules	• SPST, SPDT, DPST	32	1.2A/150V	26
High Density General Purpose Relay Modules	• SPST, SPDT, DPST, DPDT	100	1A/150V	27
General Purpose Medium Power Relay Modules	• SPST, SPDT, DPST, DPDT	80	5A/300V	28
General Purpose High Power Relay Modules	• SPST, SPDT, DPST	12	40A/14V or 10A/250V	29

High Voltage Switch Modules

These modules are suitable for applications that require the routing of high voltage signals such as the insulation testing of PCBs and cables. They are available as an array of uncommitted relays or as a multiplexer.

Short Form Data Sheet	Configurations Covered	Max Relay Count (up to)	Max Current or Voltage	Page
High Voltage Switch Modules	• SPST • Multiplexer	24	1000V/4A	30

Matrix Modules

A matrix is an array of relays, typically arranged as a crosspoint switch, where a number of input terminals can be connected to a number of output terminals. Applications include the switching of signals between test equipment and the devices under test as part of an automatic test system

Short Form Data Sheet	Configurations Covered	Max Relay Count (up to)	Max Current or Voltage	Page
Low Density Matrix Modules	• Matrix	96	2A/300V	31
Medium Density Matrix Modules	• Matrix	184	2A/300V	32
High Density Matrix Modules	• Matrix	528	1A/150V	33
Power Matrix Modules	• Matrix	80	30A/40V or 5A/250V	34
Large Matrix Modules	• Matrix	4416	1.2A/150V	35
2 Amp Large Matrix	• Matrix	1540	2A/300V	38

Fault Insertion Switches

These are switching modules specifically designed for testing the fault tolerance of safety critical systems. The fault insertion switch topology allows short circuits, open circuits or external faults to be inserted into the system under test. The fault insertion matrix also allows faults to be inserted in series with the signal path.

Short Form Data Sheet	Configurations Covered	Max Relay Count (up to)	Max Current or Voltage	Page
Fault Insertion Matrix Modules	• Fault Insertion Matrix	2384	10A/250V	39
Fault Insertion Switch Modules	• Fault Insertion Switch	200	30A/40V or 10A/200V	40

MUX Modules

Multiplexers allow a single terminal to be connected to one of a number of other terminals. They are generally used for signal routing in ATE systems or for signal selection in acquisition systems.

Short Form Data Sheet	Configurations Covered	Max Relay Count (up to)	Max Current or Voltage	Page
Low Density MUX Modules	• Multiplexer • Low Thermal Switch MUX	48 to 1 MUX	1.2A/150V	42
High Density MUX Modules	• Multiplexer	198 to 1 MUX	2A/300V	43
Power MUX Modules	• Multiplexer	64 to 1 MUX	30A/40V or 10A/250V	44
Solid State MUX Modules	• Multiplexer	160 to 1 MUX	250mA/40V	45

RF and Microwave Switches

These are available in uncommitted relay, multiplexer or matrix formats. RF modules have bandwidths up to 3GHz and are suitable for routing high frequency signals in ATE systems or for video or telecoms switching. Microwave modules up to 65GHz and are suitable for very low loss applications such as routing signals to antenna systems.

Short Form Data Sheet	Configurations Covered	Max Relay Count (up to)	Max Frequency	Page
RF Switching Modules	• Uncommitted • Multiplexer • Matrix	96	3GHz	46
Microwave Switching Modules	• Uncommitted • Multiplexer • Matrix	36 i/p MUX	65GHz	48

Optical Switches

These use high performance MEMS technology for optical switching. Multiplexer or insert/bypass switch configurations are available and the wide selection of connector types means these modules will find application in many fiber switching and optical communications test systems.

Short Form Data Sheet	Configurations Covered	Max Relay Count (up to)	Max Current or Voltage	Page
Optical Switching Modules	• Multiplexer • Insert/bypass Switch	8 to 1 MUX	—	49

Telecoms Differential Switching

Tributary switches are designed for the testing of SONET/SDH transmission multiplexers and consist of relays for daisy-chaining signals between tributary channels and multiplexers for selecting one channel to be routed to test equipment. The Datacoms MUX is a configurable 2-pole multiplexer suitable for the routing of high speed serial data such as RS232 or USB.

Short Form Data Sheet	Configurations Covered	Max Relay Count (up to)	Max Current or Voltage	Page
Telecoms/Differential Switching Modules	• Daisy chain Tributary switch • Datacoms MUX • Ethernet or USB switching	16 channel 2 pole switch or 36 to 1 MUX	1A/100V	50

ARINC 608A Switching

These switching modules support the requirements of the ARINC 608A specification and are are suitable for signal routing in avionics test systems.

Short Form Data Sheet	Configurations Covered	Max Relay Count (up to)	Max Current or Voltage	Page
ARINC 608A Switching Modules	• Resource Distributor • Bus Matrix Inputs • Source Switching	2 x 16 channel 2 pole Resource Distributor & 2 x 32 input 4 pole Bus Matrix	2A/300V	51

Utility Modules

This category of PXI modules include those which are not purely a switching function. They include Programmable Resistors, Precision Programmable Resistors, Automotive Switch Simulators and Digital I/O Modules

Short Form Data Sheet	Configurations Covered	Max Number of Channels	Max Range	Page
Programmable Resistor Modules	• Selectable Resistor • Programmable Resistor • Potentiometer	48 selectable resistors, 18 programmable resistors, or 9 potentiometers	0Ω to 16MΩ	52
Precision Programmable Resistor Modules	• Precision Programmable • RTD Simulator • Strain Gauge Simulator	18 precision resistors, 18 RTD channels, or 6 strain gauge channels	3Ω to 1.5MΩ	53
Digital I/O and Switch Simulator Modules	• TTL Inputs & Outputs • Open Collector Outputs	32 TTL inputs, 32 TTL or O/C outputs	—	54
	• Relay Driver	64 outputs		
	• Programmable Threshold Inputs • High-Side or Low-Side Output Drivers	32 Inputs, 32 Outputs (set to source or sink current)		
	• Dirty Contact Simulator	32 switch simulators		

Attenuators

These modules are useful for applications where the level of a test signal is higher than the voltage input requirements of an instrumentation or test system. The programmable attenuator module allows the reduction of RF signals in steps of 1dB.

Short Form Data Sheet	Configurations Covered	Frequency Range	Max Gain or Attenuation	Page
Attenuator Modules	• RF Attenuator	3GHz	63dB attenuation	55

Power Supplies

Programmable power supply modules provide voltage outputs isolated from the chassis backplane and are available in fixed or variable configurations. Battery Simulator modules are designed for the testing of portable equipment such as mobile phones and can source or sink current to emulate a battery supply or a battery under charge.

Short Form Data Sheet	Configurations Covered	Voltage Range	Max Current	Page
Power Supply Modules	• Fixed Power Supply	3.3V to 15V	4A	56
	• Variable Power Supply	0 to 48V	2A	
	• Battery Simulator	0 to 6V	2.8A Source, 0.5A Sink	

Low Density General Purpose Reed Relays

- 16, 24 or 32 Reed Relays Per Module
- SPST, DPST, SPDT and Shielded Configurations
- Ruthenium Reed Relays Suitable For Low Level Signals
- Uses High Reliability Pickering Reed Relays For Maximum Performance
- Fast Operating Speed 250µs Typical
- Switch up to 150Volts, 1.25A with 20W Max Power
- 96-Pin Front Panel Connector
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis

40-110 General Purpose Reed Relay Module

Pickering Interfaces range of low density general purpose reed relay modules provide a cost effective solution for applications where high density relays are not required. All these modules use a 96 pin male connector that is supported by a comprehensive range of cable and connector accessories, ensuring they can be quickly integrated into the user's test system with a minimum of effort.

The relays are not committed to a particular configuration and are available in changeover and normally open configurations. Modules are available that use shielded reed relays to minimize crosstalk and maximize bandwidth.

The use of sputtered ruthenium reed relays allows the modules to be used for low and medium level switching with minimal level dependent characteristics. This provides enhanced reliability for low level switching compared to electromechanical or rhodium reed relays.

Configuration	Description	Max Switch Voltage	Max Power	Hot Switch Current	Cold Switch Current	Order Code
x16	Single Pole, Double Throw	150Vdc 100Vac	3W	0.25A	1A	40-110-021
x32						40-110-121
x16	Single Pole, Single Throw (normally open)		20W	1A	1.2A	40-115-021
x32						40-115-121
x16	Double Pole, Single Throw (normally open)					40-115-022
x24						40-115-122
x16	Shielded, Single Pole, Double Throw		3W	0.25A	1A	40-120-021
x16	Shielded, Single Pole, Single Throw (normally open)		20W	1A	1.2A	40-125-021
x24						40-125-121

High Density General Purpose Relays

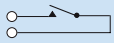
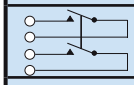
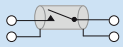
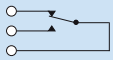
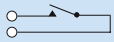
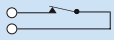
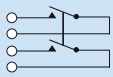
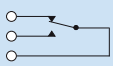
- Up to 100 Relays Per Module
- SPST, DPST, SPDT and Shielded Configurations
- Ruthenium Reed Relays Suitable For Maximum Signal Performance
- Electromechanical Relays For Higher Power Applications
- 200-Pin Front Panel Connector
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis

40-148 High Density General Purpose Relay Module

Pickering Interfaces range of high density general purpose relay modules provide an ideal solution for applications requiring dense arrays of uncommitted relays. The range includes both electromechanical and reed relay solutions in a variety of configurations.

All reed relay versions use high quality sputtered ruthenium relays that exhibit excellent contact performance under low and medium level switching conditions. For general purpose applications that also require higher power handling, the range of electromechanical relays provides an ideal solution.

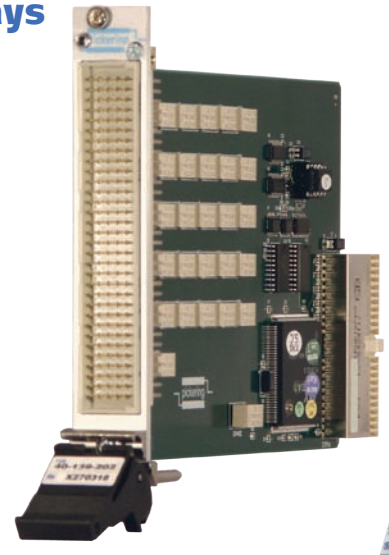
All these modules use a 200 way connector that is supported by a comprehensive range of cable and connector accessories ensuring they can be quickly integrated into the user's test system with a minimum of effort.

Configuration		Description	Max Switch Voltage	Max Power	Hot Switch Current	Cold Switch Current	Order Code
	x50	SPST Reed (normally open)	150Vdc 100Vac	20W	1A	1A	40-140A-021
	x75						40-140A-121
	x100						40-140A-221
	x50	DPST Reed (normally open)					40-141-022
	x50	Shielded SPST Reed (normally open)					40-142-021
	x48	SPDT Reed		3W	0.25A		40-143-121
	x64						40-143-221
	x50	SPST Electro-mechanical (normally open)		60W 62.5VA	1A		40-145-001
	x75						40-145-101
	x100						40-145-201
	x50	SPST Electro-mechanical (normally closed)					40-145-001-NC
	x75						40-145-101-NC
	x100						40-145-201-NC
	x25	DPST Electro-mechanical (n.o.)					40-146-002
	x50						40-146-202
	x32	SPDT Electro-mechanical					40-148-001
	x48						40-148-101
	x64						40-148-201

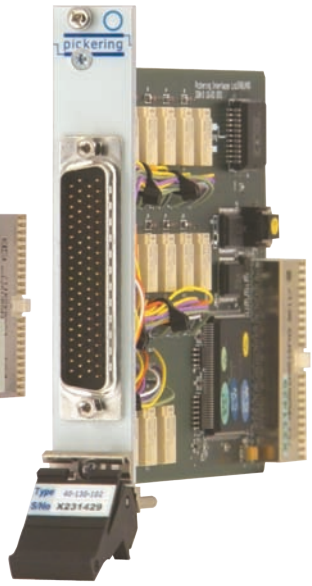
PXI MODULES SUITABLE FOR FITTING INTO AN LXI SWITCHING CHASSIS

General Purpose Medium Power Relays

- Reed Relay Solutions up to 2.5A
- Electromechanical Relays up to 5A
- SPST, DPST and DPDT Versions
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis



40-139 High Density 2 Amp Relay Module



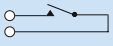
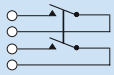
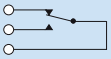
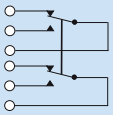
40-130 DPDT Relay Module

This range of Pickering Interfaces relay modules offers higher current ratings in a single 3U slot. Relays are available in SPST, DPST and DPDT configurations. The relay solutions have been carefully chosen to ensure a long service life. All connectors used are fully supported by the range of Pickering Interfaces cable and connector accessories to simplify system integration.

Reed relay versions use high quality sputtered ruthenium relays that exhibit excellent contact performance under low and medium level switching conditions.

For general purpose applications that also require higher power handling, the range of electromechanical relays provides an ideal solution.

The table below show the available relay count for each module. The 40-138 has a versatile cell-based architecture with 13 cells. Each cell can be configured as either SPST, DPST, SPDT or DPDT relays - the table shows the maximum allowable of one particular type. This gives the user a mixed contact configuration to suit a specific application, see the full data sheet for further information.

Relay Configuration & Switch Count per Module				Relay Type	Max Power	Max Switch Voltage	Cold Switch Current	Basic Order Code ‡
								
SPST normally open	DPST normally open	SPDT	DPDT					
–	–	–	8 or 13	EMR	60W	220Vdc	2A	**40-130**
–	–	16 or 26	–	EMR	60W	300Vdc	2A	**40-131**
16 or 26	16 or 19	–	–	EMR	60W	300Vdc	2A	**40-132**
16 or 25	–	–	–	Reed	40W	200Vdc	2A	**40-136**
32	12, 16 or 19	–	–	Reed	40W	200Vdc	2.5A	
16	–	–	–	EMR	90W	250Vac	5A	**40-137**
32 or 39	–	–	–	EMR	90W	250Vac	2A	
80 †	40 †	52 †	26 †	EMR	60W	300Vdc	2A	**40-138**
80	40	52	26	EMR	60W	300Vdc	2A	**40-139**

† The switch counts shown for the 40-138 are the maximum for a module populated with one switch configuration. This module can be ordered with custom combinations of SPST, DPST, SPDT and DPDT. See the full data sheet for details.

‡ For the full order codes for each variant, please refer to the data sheet.

General Purpose High Power Relays

- Electro-Mechanical Relays With Current Ratings to 40A
- Solid State Relays With Current Ratings to 30A
- SPST, DPST and SPDT Versions
- High Capacity Connectors
- Kernel and IVI Support For LXI Environments

Pickering's high power switching modules provide a range of high current handling relays suited for high power applications. Each module uses a connector that has been carefully suited for the intended application and is fully supported by Pickering Interfaces range of cable and connector accessories.

Lower current versions require one 3U PXI slot, but the highest current versions occupy two slots. The modules can be used to switch heavy AC or DC loads, and the highest current versions are particularly suitable for automotive test. High power switches are also available in multiplexer and matrix configurations.

40-160 General Purpose 10xDPST Power Relay Module

40-170 General Purpose High Power Relay Module

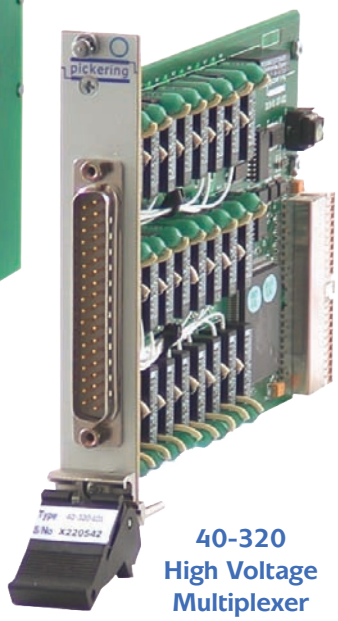
Configuration		Description	Relay Type	Max Switch Voltage	Cold Switch Current	Module Width	Front Panel Connector	Order Code
	x8	DPST	Electro-mechanical Power Relay	125Vdc 250Vac	5A	1 Slot	37-way D	40-150-002
	x12						50-way D	40-151-002
	x8	SPDT		35Vdc 250Vac			37-way D	40-155-001
	x16						50-way D	40-156-001
	x10	SPST		125Vdc 250Vac	10A		10-way MS-M	40-160-001
	x10	DPST			8A		2 x 10-way MS-M	40-160-002
	x2	SPST	Electro-mechanical High Power Relay	30Vdc 270Vac	30A	2 Slot	High Power 8-way D-type	40-170-001
	x2	DPST			20A			40-170-002
	x6	SPST	Solid State Relay	200V ac/dc	10A			40-182-001
				40V ac/dc	30A			40-183-001
	x2	SPST	Electro-mechanical Automotive Power Relay	14Vdc	40A			40-180-001
	x4							40-180-101
	x2			28Vdc	20A			40-180-011
	x4							40-180-111
	x2	SPDT		14Vdc	40A			40-181-001
				28Vdc	20A			40-181-011

PXI MODULES SUITABLE FOR FITTING INTO AN LXI SWITCHING CHASSIS

High Voltage Switching

- Hot Switching Up To 750Vdc or 750Vac peak
- Cold Switching Up To 1000Vdc or 1000Vac peak
- Reed Relay Versions For Long Operational Life
- Electro-Mechanical Relay Versions For Hot or Cold Current Switching Up To 4A
- High Voltage D-Type Connector
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis

40-330 High Voltage Relay Module



40-320 High Voltage Multiplexer Module

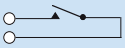
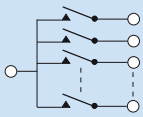
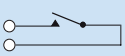
The 40-310/320 high voltage range of switching modules provides solutions for uncommitted relay and multiplexer applications that need to switch voltages up to 1000V. They are suited for hot or cold switching applications up to 10W and 0.5A with a rating of 13mA at their maximum operating voltage. The 40-330 uncommitted relay module can switch up to 1000V and also has a hot or cold switching current rating of 4A.

The 40-310/320 modules use 37-way D-Type high voltage connector, and the 40-330 modules uses a 50-way D-Type high voltage connector. These are fully supported by Pickering Interfaces cable and connector accessory range.

The design ensures the modules can withstand high common mode voltages and a protective safety cover is used to shield the switching components.

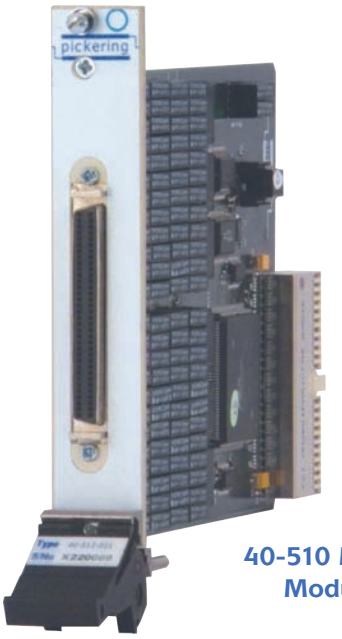
For more detailed information on each module please refer to the full data sheet or visit our web sit at:

www.pickeringtest.com

Configuration		Description	Relay Type	Maximum Cold Switching Voltage	Maximum Hot Switching Voltage	Maximum Power	Cold Switch Current	Order Code
	x8	SPST (normally open)	High Voltage Rhodium Reed	1000Vdc 1000Vac peak	750Vdc 750Vac peak	10W	0.5A	40-310-001
	x16							40-310-101
		12-Channel Multiplexer						40-320-001
		24-Channel Multiplexer						40-320-101
	x24	SPST (normally open)	Electro-mechanical		110Vdc 250Vac	120W 1000VA	4A	40-330-001

Low Density Matrices

- Ruthenium Reed Relay Versions For Maximum Signal Performance
- Electro-Mechanical Relay Versions For Current Handling up to 2 Amps
- Single and Dual Matrix Configurations
- 50Ω, 50MHz Screened Reed Versions
- Expansion Capability Across Multiple Cards
- Fast Operating Speed <500µs for Reed Versions, <3ms for Electromechanical Versions
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis



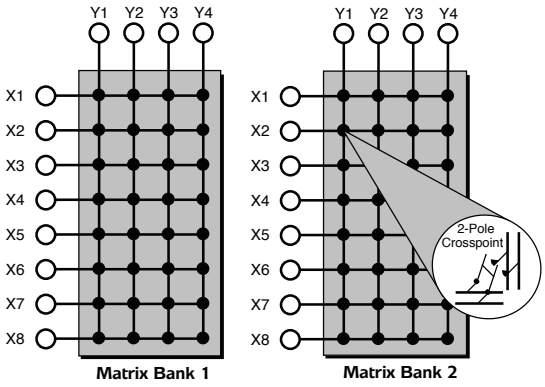
40-510 Matrix Module

Pickering Interfaces offers a comprehensive range of low density matrix modules that use either ruthenium reed relays or electromechanical relays. They are a cost effective solution for applications that require relatively small matrices in the PXI format.

The matrices can be expanded by connecting together multiple modules, but Pickering recommend that users look at the higher density modules that involve less user configuration.

All the reed relay versions use high quality sputtered ruthenium relays that exhibit excellent contact performance under low and medium level switching conditions. For general purpose applications that also require higher power handling, the range of electromechanical relays provides an ideal solution.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.



Example Matrix Configuration:
Dual 8 x 4 with 2-pole contacts (40-515)

Matrix Configuration	Number of Poles	Front Panel Connector	Relay Type	Max Switch Voltage	Max Power	Cold Switch Current	Order Code
Single 12 x 4	1-Pole	68-pin Micro-D	Sputtered Ruthenium Reed (screened reed option available for 1-pole matrices)	150Vdc 100Vac	20W	1.2A	40-510-021 †
	2-Pole						40-510-022
Dual 12 x 4	1-Pole						40-511-021 †
	2-Pole						40-511-022
Single 12 x 8	1-Pole						40-512-021 †
	2-Pole						40-512-022
Single 24 x 4	1-Pole						40-513-021 †
	2-Pole						40-513-022
Dual 8 x 4	2-Pole	50-way D-type	Electro-Mechanical	300Vdc 250Vac	60W 62.5VA	2A	40-515-002
Single 8 x 8							40-516-002
Single 16 x 4							40-517-002

† To order the screened reed relay version of a 1-pole matrix, please add **-S** suffix

PXI MODULES SUITABLE FOR FITTING INTO AN LXI SWITCHING CHASSIS

Medium Density Matrices

- Ruthenium Reed Relay Versions For Maximum Signal Performance
- Single and Dual Matrix Configurations
- 50Ω, 50MHz Screened Reed Versions
- Expansion Capability Across Multiple Cards
- Fast Operating Speed <500µs
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis

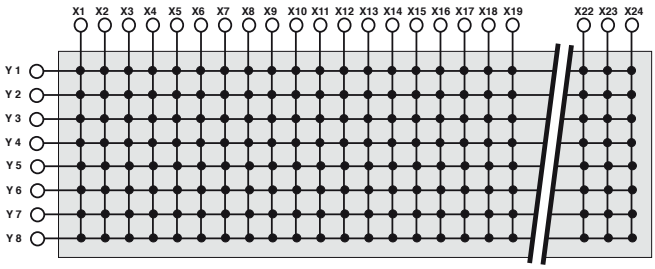
40-523 Matrix Module

Pickering Interfaces offers a comprehensive range of medium density matrix modules that use ruthenium reed relays. They are a cost effective solution for applications that require mid range matrices in the PXI format.

The matrices can be expanded by connecting together multiple modules, but Pickering recommend that users look at the higher density modules that involve less user configuration.

All versions use high quality sputtered ruthenium reed relays that exhibit excellent contact performance under low and medium level switching conditions.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.



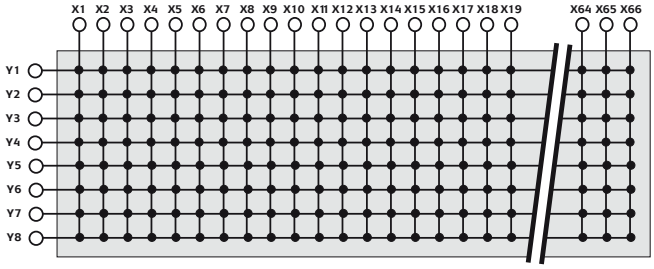
Example Matrix Configuration:
Single 24 x 8 with 1 pole contacts (40-521)

Matrix Configuration	Number of Poles	Front Panel Connector	Relay Type	Max Switch Voltage	Max Power	Cold Switch Current	Order Code
Single 16 x 8	2-Pole	78-way D-type	Electro-Mechanical	300Vdc 250Vac	60W 62.5VA	2A	40-518-002
Single 32 x 4							40-519-002
Single 24 x 8	1-Pole	96-pin Micro-D	Sputtered Ruthenium Reed (screened reed option available for 1-pole matrices)	150Vdc 100Vac	10W	1.0A	40-521-021†
	2-Pole						40-521-022
Dual 12 x 8	1-Pole				20W	1.2A	40-522-021†
	2-Pole						40-522-022
Single 44 x 4	1-Pole						40-523-021†
	2-Pole						40-523-022
Single 46 x 4	1-Pole						40-524-021

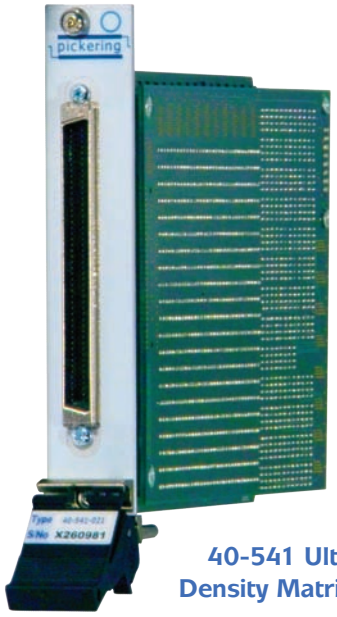
† To order the screened reed relay version of a 1-pole matrix, please add **-S** suffix

High Density Matrices

- Ruthenium Reed Versions for Maximum Signal Performance
- Solid State Version for High Speed & Long Life
- Single and Dual Matrix Configurations
- Partially Populated Configurations Available
- 50Ω, 50MHz Screened Reed Versions
- Expansion Capability Across Multiple Cards
- Fast Operating Speed <500µs
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis



Single 66 x 8 with 1 pole contacts (40-541-021)



40-541 Ultra High Density Matrix Module

Pickering Interfaces offers a comprehensive range of high density matrix modules that use ruthenium reed relays. They are a cost effective solution for applications that require high density matrices in the PXI format. Expansion to even larger matrices is possible by connecting together multiple modules.

All high density matrices are available in partially populated configurations giving a cost effective solution for specific applications. Please consult the sales office for details.

Reed relay versions use high quality sputtered ruthenium reeds that exhibit excellent contact performance under low and medium level switching conditions.

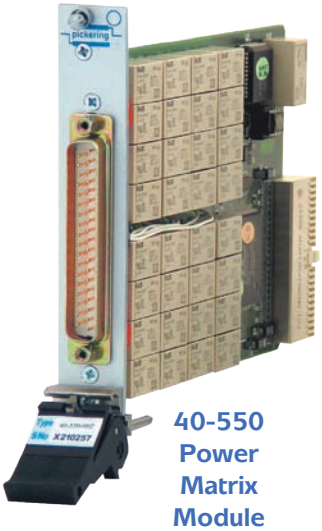
All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.

Matrix Configuration	Number of Poles	Front Panel Connector	Relay Type	Max Switch Voltage	Max Power	Cold Switch Current	Order Code
Single 64 x 4	1-Pole	78-pin D	Solid State	±60V	—	1.5A surge	40-500-001
Single 32 x 8	1-Pole	96-pin Micro-D	Sputtered Ruthenium Reed	150Vdc 100Vac	20W	1.0A	40-530-021‡
Single 32 x 8	2-Pole	96-pin Micro-D	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	1.0A	40-531-021†
Single 32 x 8	2-Pole	96-pin Micro-D	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	1.0A	40-531-022
Dual 16 x 8	1-Pole	96-pin Micro-D	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	1.0A	40-532-021†
Dual 16 x 8	2-Pole	96-pin Micro-D	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	1.0A	40-532-022
Single 64 x 4	1-Pole	200-pin	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-533A-021†
Single 64 x 4	2-Pole	200-pin	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-533A-022
Dual 32 x 4	1-Pole	200-pin	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-534A-021†
Dual 32 x 4	2-Pole	200-pin	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-534A-022
Single 92 x 4	1-Pole	96-pin Micro-D	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-535-021
Dual 44 x 4	1-Pole	96-pin Micro-D	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-536-021
Single 44 x 8	1-Pole	96-pin Micro-D	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-537-021†
Single 55 x 8	1-Pole	96-pin Micro-D	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-538-021†
Single 132 x 4	1-Pole	200-pin	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-540-021
Single 66 x 8	1-Pole	96-pin	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-541-021
Single 33 x 16	1-Pole	68-pin	Sputtered Ruthenium Reed	150Vdc 100Vac	10W	0.5A	40-542-021
Single 33 x 8	2-Pole	96-pin	Electromechanical	150Vdc 100Vac	60W	1.0A	40-581-002

† The 1-pole versions of these matrices can be ordered with screened reed relays fitted, please add **-S** suffix
‡ The 40-530-021 is a lower cost alternative to the 40-531-021 with a higher switch current and the same connector pin-out

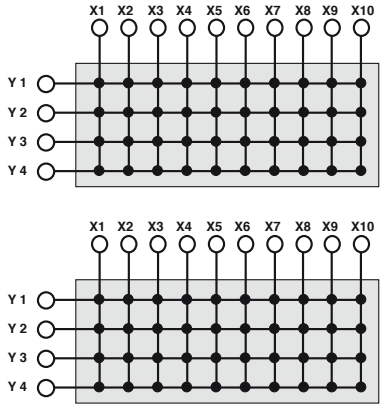
Power Matrix Modules

- Electro-Mechanical Relays With Current Ratings of 2A and 5A and Switching Up To 250Vac
- Solid State Relays With Current Ratings of 10A and 30A and Switching Up To 200V ac/dc
- Single and Dual Matrix Configurations
- 1 or 2 Pole Switching Configurations
- Expansion Capability Across Multiple Cards
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis



40-550 Power Matrix Module

40-554-001 30A Solid State Matrix



Example Matrix Configuration: Dual 10 x 4 (40-546)

These power matrix modules provide matrices with higher current and power ratings than the high density versions. They are designed for the switching of AC or DC loads or for controlling large relay or solenoid systems. The electro-mechanical relay based versions have ratings from 2A to 5A, occupy a single slot and are ideal for power applications. Solid state versions have ratings of 10A and 30A, occupy two PXI slots and are suitable for automotive test applications.

Each module uses connectors supported by the Pickering cable accessory range and relays have been carefully selected to ensure long service life under demanding load conditions.

For more information on these modules please refer to the individual data sheets or visit our web site at:
www.pickeringtest.com

Matrix Configuration	Number of Poles	Front Panel Connector	Relay Type	Max Switch Voltage	Maximum Current	Order Code
Single 10 x 4	1-Pole	37-way D-type	Electro-Mechanical	110Vdc 250Vac	2A	40-545-001
Dual 10 x 4						40-546-001
Single 10 x 8						40-547-001
Single 20 x 4						40-548-001
Single 8 x 4	2-Pole			35Vdc 250Vac	5A	40-550-002
		2 x 20-way MSN				40-550-902
Single 6 x 2	1-Pole	8-way Power D-type	Solid State High Power	200V ac/dc	10A	† 40-553-001
				40V ac/dc	30A	40-554-001

† When fitted into a 60-100A, use 25W/slot rating

Large Matrices

- Integrated PXI Matrix Modules With Built In Analog Bus
- Fully Scalable Matrix Solution
- Partially Populated Configurations Available
- High Reliability Instrument Grade Reed Relay Versions
- Solid State Versions
- Low Cost Of System Integration
- Wide Range of Fully Configured Y Bus Architectures
- Ratings up to 150 Volts, 1 Amp and 20W
- High Bandwidth - up to 40MHz
- Kernel and IVI Support For LXI Environments

Pickering Interfaces range of Large Matrix Modules offers integrated solutions for matrix assemblies. The use of high density packaging and integrated backplanes enables a large matrix to be implemented with no user configuration or special matrix expansion kits. Fault diagnosis can be carried out through the use of the 90-100 MXT tool and the matrices can be serviced using standard de-soldering tools.

All reed relay matrices use high quality sputtered ruthenium relays that exhibit excellent contact performance under low and medium level switching conditions.

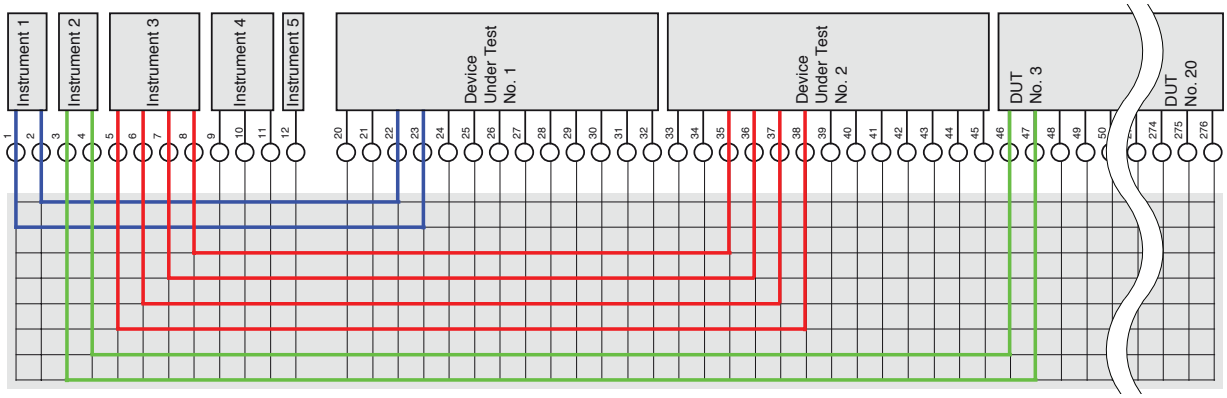
The modules are ideal for applications requiring a large matrix, they are programmed as a single matrix entity, saving user integration and software investment. The integrated design ensures high matrix performance with high signal bandwidth and fewer system implementation errors.

Large matrices with 8 Y connections are also available in solid state versions. These exhibit high switching speed with a very long service life and are suitable for low current applications such as data acquisition.

The 40-560 BRIC range is available in mechanical sizes occupying 2, 4 or 8 slots. Versions are available with 3 different electrical characteristics and with 1 pole, 2 pole and 1 pole screened architectures.

Any large matrix is available in partially populated configurations giving a cost effective solution for specific applications. Please consult the sales office for details.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.



Schematic diagram showing a 276 x 8 BRIC Matrix being used to parallel test multiple DUTs. The BRIC Matrix allows tremendous test system flexibility.

PXI MODULES SUITABLE FOR FITTING INTO AN LXI SWITCHING CHASSIS

LARGE MATRIX MODULES WITH 4 Y CONNECTIONS

Minimum X Size	Maximum X Size	Matrix Configuration (all relays are ruthenium reed)	Maximum Switch Voltage	Maximum Power	Cold Switch Current	Number of Slots	Order Code †
184	276	single pole	150Vdc 100Vac	10W	0.5A	2	40-560-221
	552					4	40-560-021
	1104					8	40-560-121
88	132	single pole		20W	1.2A	2	40-562-221
		two pole					40-562-222
		screened single pole					40-562-221-S
	264	single pole				4	40-562-021
		two pole					40-562-022
		screened single pole					40-562-021-S
	528	single pole				8	40-562-121
		two pole					40-562-122
		screened single pole					40-562-121-S

† For the full order codes and all the available matrix sizes for each variant please refer to the data sheet

LARGE MATRIX MODULES WITH 8 Y CONNECTIONS

Minimum X Size	Maximum X Size	Matrix Configuration (all relays are ruthenium reed)	Maximum Switch Voltage	Maximum Power	Cold Switch Current	Number of Slots	Order Code †
92	138	single pole	150Vdc 100Vac	10W	0.5A	2	40-560-221
		dual analog bus (8-wire)					40-560-221-M
	276	single pole				4	40-560-021
		dual analog bus (8-wire)					40-560-021-M
	552	single pole				8	40-560-121
		dual analog bus (8-wire)					40-560-121-M
60	90	single pole				2	40-561-221
		two pole					40-561-222
		screened single pole					40-561-221-S
	180	single pole				4	40-561-021
		two pole					40-561-022
		screened single pole					40-561-021-S
	360	single pole				8	40-561-121
		two pole					40-561-122
		screened single pole					40-561-121-S
44	66	single pole		20W	1.2A	2	40-562-221
		two pole					40-562-222
		screened single pole					40-562-221-S
	132	single pole				4	40-562-021
		two pole					40-562-022
		screened single pole					40-562-021-S
	264	single pole				8	40-562-121
		two pole					40-562-122
		screened single pole					40-562-121-S

† For the full order codes and all the available matrix sizes for each variant please refer to the data sheet

LARGE MATRIX MODULES WITH 16 Y CONNECTIONS

Minimum X Size	Maximum X Size	Matrix Configuration (all relays are ruthenium reed)	Maximum Switch Voltage	Maximum Power	Cold Switch Current	Number of Slots	Order Code †
46	69	single pole	150Vdc 100Vac	10W	0.5A	2	40-560-221
	138					4	40-560-021
	276					8	40-560-121
30	45	single pole				2	40-561-221
		two pole					40-561-222
		screened single pole					40-561-221-S
	90	single pole				4	40-561-021
		two pole					40-561-022
		screened single pole					40-561-021-S
	180	single pole				8	40-561-121
		two pole					40-561-122
		screened single pole					40-561-121-S
22	33	single pole		20W	1.2A	2	40-562-221
		two pole					40-562-222
		screened single pole					40-562-221-S
	66	single pole				4	40-562-021
		two pole					40-562-022
		screened single pole					40-562-021-S
	132	single pole				8	40-562-121
		two pole					40-562-122
		screened single pole					40-562-121-S

† For the full order codes and all the available matrix sizes for each variant please refer to the data sheet

LARGE MATRIX MODULES WITH 32 Y CONNECTIONS

Minimum X Size	Maximum X Size	Matrix Configuration (all relays are ruthenium reed)	Maximum Switch Voltage	Maximum Power	Cold Switch Current	Number of Slots	Order Code †
10	15	single pole	150Vdc 100Vac	20W	1.2A	2	40-562-221
	30					4	40-562-021
	60					8	40-562-121

† For the full order codes and all the available matrix sizes for each variant please refer to the data sheet

SOLID STATE LARGE MATRIX MODULES WITH 8 Y CONNECTIONS

Minimum X Size	Maximum X Size	Matrix Configuration (all relays are solid state)	Maximum Switch Voltage	Max Carry Current	Max Surge Current	Number of Slots	Order Code †
64	96	single pole	40V	0.25A	0.75A for 100ms	2	40-563-221
	192					4	40-563-021
	384					8	40-563-121

† For the full order codes and all the available matrix sizes for each variant please refer to the data sheet

2 Amp Large Matrices

- Integrated Large Size Matrices
- Require No User Configuration
- Pickering BRIC™ Modules Offer a Scalable Solution With Upgrade Paths
- 2-Pole Electro-Mechanical Relays With Current Handling of 2 Amps
- Wide Range of Matrix Sizes with 4 or 8 Y Connections
- Partially Populated Configurations Available
- Fast Operating Speed of <3ms
- Kernel and IVI Support For LXI Environments

40-565 BRIC8 2 Amp
2-Pole Matrix Module

Pickering Interfaces range of Large Matrix Modules offers integrated solutions for large matrix assemblies. The use of high density packaging and integrated backplanes enables a large matrix to be implemented with no user configuration or special matrix expansion kits. The high density approach used ensures the matrix has a large bandwidth and low through path resistance. Fault diagnosis can be carried out through the use of the 90-100 MXT tool and the matrices can be serviced using standard de-soldering tools.

This range of large matrices feature 2-pole switching and current handling up to 2A using electromechanical relays.

Any large matrix is available in partially populated configurations giving a cost effective solution for specific applications. Please consult the sales office for details.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.

40-566 BRIC8 2 Amp
2-Pole Matrix Module

Y Size	Minimum X Size	Maximum X Size	Matrix Configuration	Maximum Switch Voltage	Maximum Power	Cold Switch Current	Number of Slots	Order Code †
4	55	165	two pole (electro-mechanical relay)	300Vdc 250Vac	60W	2A	4	40-566
		385					8	
8	24	96					4	40-565
		192					8	

† For the full order codes and all the available matrix sizes for each variant please refer to the data sheet

Fault Insertion Matrices

- Designed For Fault Insertion Applications
- Breakout Connections For Wiring to Sensors
- Pickering BRIC™ Architecture Provides Scalable Matrix Size
- Wide Range of Matrix Sizes
- Partially Populated Configurations Available
- Ruthenium Reed Relays For Maximum Signal Performance
- Electro-Mechanical Relay Versions For Current Handling up to 10 Amps
- Kernel and IVI Support For LXI Environments

40-592 BRIC8 FIBO Matrix Module

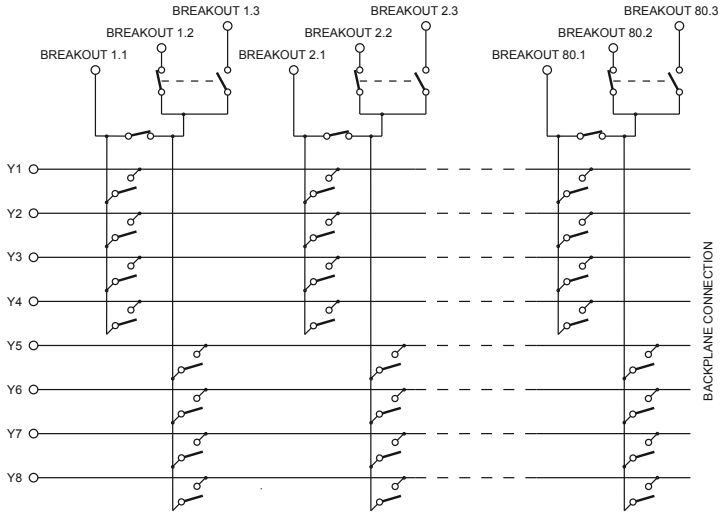
The Fault Insertion matrices are designed specifically for safety critical applications where the response of a control system is required to be evaluated when sensor connections behave in unexpected ways. This is particularly important in safety critical applications, such as automotive and aeronautical systems, where unexpected controller behavior could result in loss of life or substantial asset loss.

All these matrices feature a breakout arrangement that allows faults to be attached to the sensor lines via the Y axis. This includes the breaking of a connection or the adding of a series defect – all of which can simulate connectivity problems in the system. The three pin breakout versions allow the connection to be swapped for a "bad" sensor simulation.

The use of a programmable matrix for fault insertion ensures testing is fast to perform and can be reproduced on subsequent test cycles in the event of corrective action or a system upgrade.

All reed relay matrices use high quality sputtered ruthenium relays that exhibit excellent contact performance under low and medium level switching conditions. For applications that require fault insertion in power circuits and current handling up to 10A, Pickering's matrices based on electromechanical relays provide an ideal solution.

The matrix design is based on Pickering's proven BRIC architecture that allows the matrix size required for an application to be selected from the many versions available. Also, any FIBO matrix is available in partially populated configurations giving a cost effective solution for specific applications. Please consult the sales office for details.



Connectors used are fully supported by Pickering's accessory range of cables.

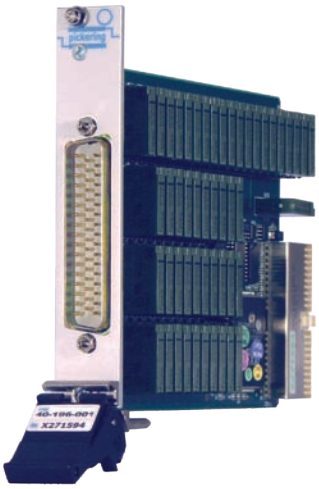
Minimum Matrix Size	Maximum Matrix Size	Matrix Configuration	Relay Type	Maximum Switch Voltage	Max Power	Cold Switch Current	Number of Slots	Order Code
31 x 8	124 x 8	2-Pin Breakout	Sputtered Ruthenium Reed	150Vdc 100Vac	20W	1.2A	4	**40-592-021-2P**
	248 x 8						8	**40-592-121-2P**
20 x 8	80 x 8	3-Pin Breakout					4	**40-592-021-3P**
	160 x 8						8	**40-592-122-3P**
6 x 8	30 x 8		Electro-mechanical	125Vdc 250Vac	300W †	10A †		**40-595-101-3P**

† The power and current figures shown are for the matrix crosspoints, the breakout contacts are rated at 240W and 8A.

PXI MODULES SUITABLE FOR FITTING INTO AN LXI SWITCHING CHASSIS

Fault Insertion Switches

- Designed For Fault Insertion Applications
- Breakout Connections For Wiring to Sensors
- Choice of Channel Counts and Switch Configurations
- Solid State Relay Versions For Current Handling up to 30 Amps
- Kernel and IVI Support For LXI Environments



40-196 Avionics/ Automotive 5A Fault Insertion Switch

40-191 30A Fault Insertion Switch

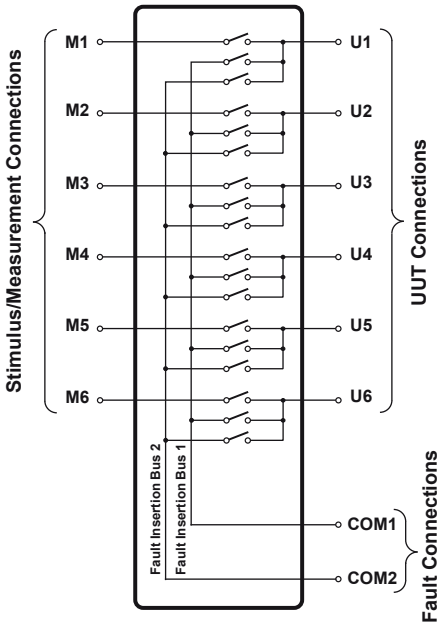
The Fault Insertion switches are designed specifically for safety critical applications where the response of a control system is required to be evaluated when sensor connections behave in unexpected ways.

These switch modules feature a breakout arrangement that allows faults to be attached to the sensor lines. This includes the breaking of a connection or the adding of defect – all of which can simulate connectivity problems in the system. Two switching topologies are available; The first has single signal paths with series switches and switches to connect to one or more fault buses. The second has pairs of signals with series switches, shorting switches between the signal pairs and switches to connect either signal to an external fault input.

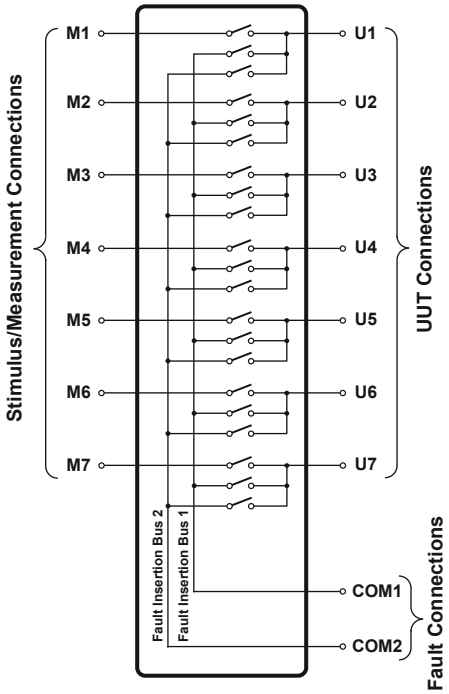
Fault insertion switches based on solid state relays can handle up to 30A. For applications that require fault insertion switching on a larger scale, Pickering's BRIC based fault insertion matrices provide an ideal solution.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.

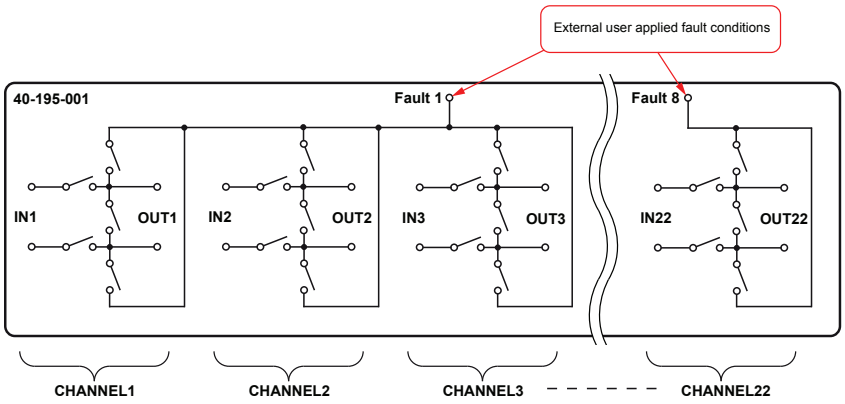
For more detailed information on each module please refer to the individual data sheets or visit our web site at: www.pickeringtest.com



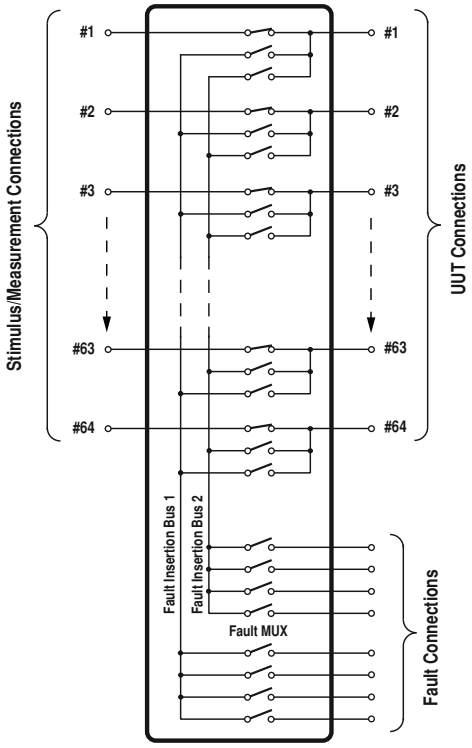
Schematic diagram for 6-channel Solid State Fault Insertion Switch. Available with one or two fault buses, the 40-191 can switch 30A and 40-192 can switch 10A.



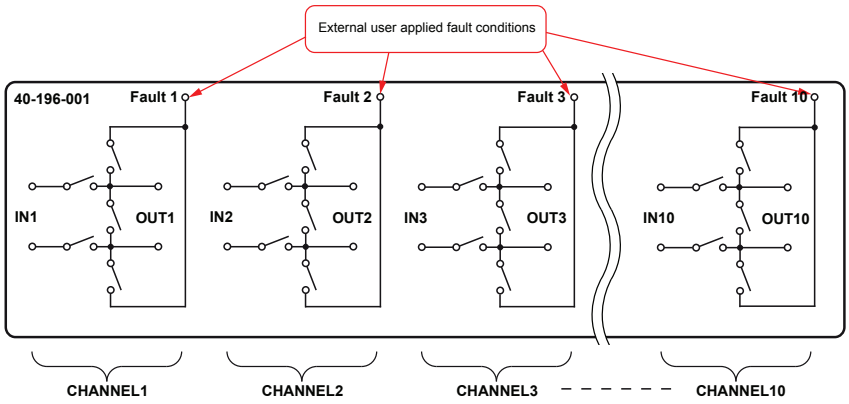
Schematic diagram for 7-channel Fault Insertion Switch with electro-mechanical relays available with one or two fault buses. The 40-193 can switch 20A max with 1A min, and the 40-194 can switch 20A with no minimum.



40-195 22-channel Fault Insertion Switch schematic diagram. There are 8 inputs that can be used to inject external fault conditions (one Fault input for every 3 switch channels, with channel 22 having its own Fault input). The 40-195 is also available in an 11-channel version with four fault inputs.



40-190 Fault Insertion Switch available with one or two fault buses, each with four switchable fault inputs



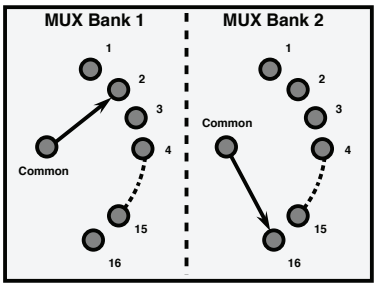
Schematic Diagram for 40-196 Fault Insertion Switch, available with 5 or 10 channel pairs each with a separate fault insertion input.

No. of Channels	Number of Fault Inputs	Front Panel Connector	Relay Type	Maximum Switch Voltage	Cold Switch Current	Order Code
6	2 buses, 2 inputs	2x 8-way D-type	Solid State	40V	30A	**40-191-002**
				200V	10A	**40-192-002**
7	1 or 2 buses, 1 or 2 inputs		Electro-Mechanical	16Vdc	20A max, 1A min.	**40-193**
					20A max, no min.	**40-194**
64	1 or 2 buses, 4 or 8 inputs	160-way		150Vdc 100Vac	2A	**40-190**
22 pairs	8	96-way Micro-D			1A	**40-195-001**
11 pairs	4					**40-195-101**
10 pairs	10	50-way D-type		110Vdc 100Vac	5A	**40-196-001**
5 pairs	5					**40-196-101**

Low Density Reed Relay Multiplexers

- Versatile Multiplexer Range With Single & Dual Operation
- Configurable Versions Can be Set With Different Bank Sizes and Pole Count
- Low Thermal EMF Version
- Screened 50Ω Option with 50MHz Bandwidth
- All Versions Use High Reliability Pickering Ruthenium Reed Relays
- Fast Operating Speed <500µs
- Switch up to 150Volts, 1.2A with 20W Max Power
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis

40-630 General Purpose Multiplexer Module



Example Multiplexer Configuration: Dual 1 to 16 (40-630)

The range of low density multiplexer solutions are ideal for applications requiring a lower number of channels and poles. All modules are based on high quality ruthenium reed relays that provide a very long service life and consistent contact operations at all rated switching levels.

The range includes a low thermal offset multiplexer that is suitable for connecting to thermocouples and other sensors that requires the use of contacts with low offset errors and consistent contact performance.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.

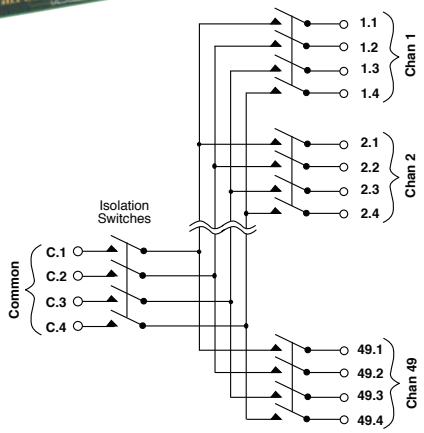
Multiplexer Configuration	Number of Poles	Relay Type	Max Switch Voltage	Maximum Power	Cold Switch Current	Front Panel Connector	Order Code †
Dual 16 to 1	2-Pole	Sputtered Ruthenium Reed	150Vdc 100Vac	20W	1.2A	68-way Micro-D	40-630-022
Dual 32 to 1	1-Pole						
Single 16 to 1	4-Pole						
Single 32 to 1	2-Pole						
Single 64 to 1	1-Pole						
Screened Dual 16 to 1		Screened Ruthenium Reed					40-630-021-S
Screened Single 32 to 1							
Dual 24 to 1		Sputtered Ruthenium Reed					40-632-021
Single 24 to 1	2-Pole						
Single 48 to 1	1-Pole						
Low thermal EMF Single 23 to 1	2-Pole	Low thermal Ruthenium Reed	100Vdc.		1.0A	96-way Micro-D	40-620-022

† For the full order number and configuration codes for each variant, please refer to the data sheet.

High Density Multiplexers

- Versatile Multiplexer Range With Channel Counts From 4 to 1, Up To 198 to 1
- Versions Available With Between 1 and 20 Separate Banks
- Pole Count From 1 Up To 32
- Reed Versions Use High Quality Sputtered Ruthenium Reed Relays
- Screened 50Ω Option with 50MHz Bandwidth
- Kernel and IVI Support For LXI Environments
- Software Configured Versatile Multiplexers
- Compatible With All LXI Modular Switching Chassis

40-675 Very High Density Multiplexer



40-670A Multiplexer in 49 Channel 4 pole Configuration (1 bank).

The range of High Density Multiplexers provide a compact array of MUX solutions with differing combinations of channel counts and poles. Most high density solutions include isolation relays that allows the MUX to be disconnected from the single input/output port, enabling the convenient interconnection of other channels.

The modules use high density connectors that are fully supported by the Pickering Interfaces range of connector and cable accessories.

Minimum/Maximum Multiplexer Configuration			Relay Type	Max Switch Voltage	Cold Switch Current	Order Code †
Channels	Banks	Poles				
16/128	1/8	1	Sputtered Ruthenium Reed	100Vdc	1.2A	40-610-022
8/64		2				
		1				40-610-021
		1 screened				40-610-021-S
8/160	1/20	1				40-615-022
4/80		2				
		1				40-615-021
		1 screened				40-615-021-S
5	16	1			1.0A	40-616-021
3	18					40-617-021
94	1			150Vdc	1.2A	40-640-022
47		2				
		1 screened				40-640-021-S
5/99	1	1/16		100Vdc	0.5A	40-670A-021
5/198		1/32				40-670A-022
5/99		1/16 screened				40-670A-021-S
5/198		1/32	Electro-mechanical	150Vdc	1.0A	40-675-002
16/128	1/8	1		300Vdc 250Vac	2.0A	40-612-002 ‡
4/64	1/16	2				40-613-002 ‡

† For the full order codes and all the available multiplexer sizes for each variant please refer to the data sheet.

‡ The 40-612/613 are versatile high density multiplexers which can be set to many different configurations under software control.

PXI MODULES SUITABLE FOR FITTING INTO AN LXI SWITCHING CHASSIS

Power Multiplexer Modules

- Versatile Multiplexer Range With Channel Counts From 3 to 1, Up To 64 to 1
- Versions Available With Between 1 and 8 Banks
- One or Two Pole Versions Available
- Electromechanical Relay Versions Capable of Switching Up To 10 Amps
- Solid State Relay Versions Capable of Switching Up To 30 Amps
- Power And Sense MUX Version Suitable For Power Distribution and Regulation Circuits
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis

40-656 38 Channel 2 Amp Multiplexer

40-667 30A Solid State Power Multiplexer

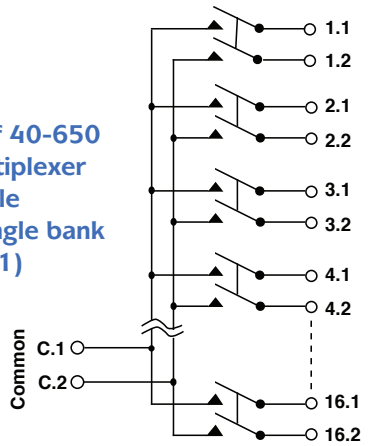
The power MUX range provides a selection of switching modules based on electromagnetic, reed and solid state relays capable of switching currents of up to 30A. Each module supports one or more multiplexer channels between one input/output terminal and a selection of output/input terminals. To reduce through path resistance most of these multiplexers do not include isolation relays.

Each module uses connectors supported by the Pickering cable accessory range and relays have been carefully selected to ensure long service life under demanding load conditions.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.

For more information on these modules please refer to the individual data sheets or visit our web site at: www.pickeringtest.com

Schematic of 40-650 Power Multiplexer Module (two pole single bank 16 to 1)



Multiplexer Configuration	Number of Poles	Relay Type	Max Switch Voltage	Cold Switch Current	Front Panel Connector	Order Code
Single 16 to 1	2-Pole	Electro-mechanical	35Vdc 250Vac	5A	37-way D-type	40-650-002
7 Bank 4 to 1			220Vdc 125Vac	2A	78-way D-type	40-655-002
Single 38 to 1						40-656-002
8 Bank 8 to 1	1-Pole		110Vdc 250Vac			40-657-001-8/8/1
4 Bank 16 to 1						40-657-001-4/16/1
2 Bank 32 to 1						40-657-001-2/32/1
Single 64 to 1						40-657-001-1/64/1
Single 18 to 1 with 18 to 1 sense MUX	2-Pole power and sense MUX	Ruthenium Reed	200Vdc 240Vac	2A		40-658-002
8 Bank 8 to 1	2-Pole	Electro-mechanical	300Vdc 250Vac	2A	160-way DIN 41612	40-659-102
Single 10 to 1	1-Pole		35Vdc 250Vac	10A	20-way MSM	40-660-001
	2-Pole			8A		40-660-002
Single 18 to 1	1-Pole			10A		40-665-001
Dual 3 to 1 or Single 6 to 1	1-Pole	Solid State High Power	200V ac/dc	10A	8-way Power D-type	40-666
			40V ac/dc	30A		40-667

Solid State Multiplexers

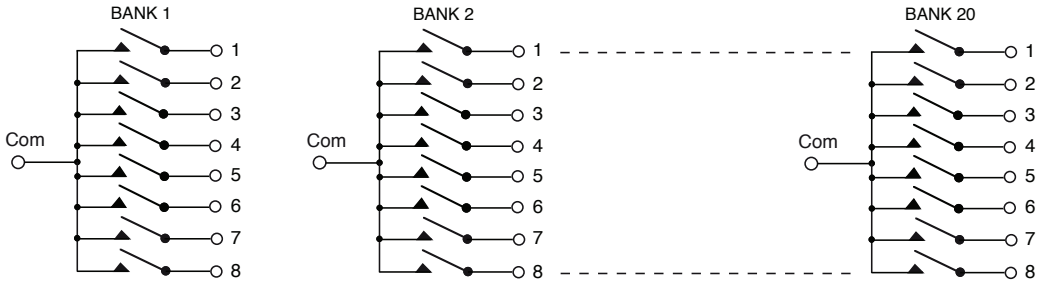
- Versatile Multiplexer Range With Channel Counts From 8 to 1, Up To 160 to 1
- Versions Available With Between 1 and 20 Separate Banks
- 1 or 2 Pole Configurations
- Solid State Switching Gives Fast Operation and Long Service Life
- Ideal For Low current and Low Voltage Applications
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis

40-682 Solid State Versatile Multiplexer Module

This range of high density multiplexers is based on solid state switching devices. They are suitable for applications that require fast operation and a long service life with frequent switch operation. They are ideal for routing low current, low voltage signals such as DMM measurements or data acquisition. Also, they have the advantages of no switch bounce and no wear out mechanism.

The range provides a compact array of multiplexer solutions with differing combinations of channel counts and poles. The 40-682 has a versatile software configurable architecture and is the solid state equivalent of the relay based 40-612.

The modules use high density connectors that are fully supported by the Pickering Interfaces range of connector and cable accessories.



Schematic of 40-680 Multiplexer Module
(20 bank 8 to 1 configuration)

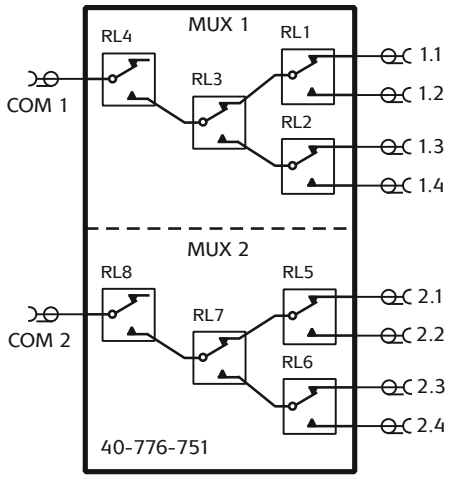
Maximum Multiplexer Channel Configuration			Minimum Multiplexer Channel Configuration			Max Switch Voltage	Max Current (Peak)	Order Code †
Channels	Banks	Poles	Channels	Banks	Poles			
160	1	1	8	20	1	±15V	20mA (40mA)	**40-680**
128	1	1	8	8	2	±40V	250mA (750mA)	**40-682 ‡**

† For the full order codes and all the available multiplexer sizes for each variant please refer to the data sheet.
‡ The 40-682 is a versatile high density multiplexer which can be set to many different configurations under software control.

RF Switches

- Comprehensive Range of RF Switch Modules Including Relays, Matrices and Multiplexers
- 50Ω and 75Ω Versions Available
- Bandwidths Up To 3000MHz
- Wide Range of Signal Connectors Including BNC, SMB, SMA, SMZ, 1.0/2.3, Mini SMB and MCX
- Power Handling Up To 15 Watts
- 75Ω Version Suitable for Telecoms and High Quality Video (HDTV) Switching
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis

40-874 Dual 8 to 1 RF Multiplexer Module



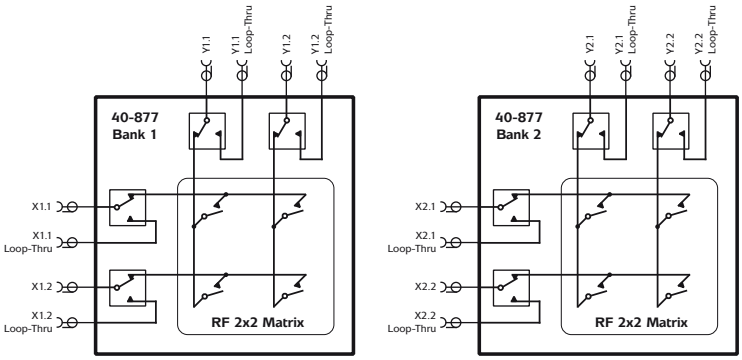
Schematic Diagram for the 40-776 Dual 4 to 1 RF Multiplexer Module

Pickering has a range RF switches capable of providing economic switching for frequencies up to 3.5GHz. For higher frequency applications, or applications requiring high performance levels, Pickering also offer a variety of microwave switching modules.

The modules offer a range of relay, multiplexer and matrix functions. Some matrices include the facility for externally cabled expansion by providing a loop-through facility.

The modules can be provided with a variety of output connectors to suit the application, they are also supported by a comprehensive range of cable and connector accessories.

40-870 Hex RF SPDT Switch Module



Schematic Diagram for the 40-877 Dual 2 x 2 Expandable Matrix with Loop-thru

RF RELAY MODULES

RF Switch Configuration	Maximum Frequency	Available 50Ω Connectors	Available 75Ω Connectors	Maximum Power	Order Code†
NEW Triple or Hex SPDT	3GHz	SMB, MCX	–	10W	**40-870**
	2.7GHz	–	SMB, MCX		**40-830**
4 x SPDT relays	2.5GHz	BNC, SMB, SMA	BNC, SMZ, 1.0/2.3, miniSMB	15W	**40-710**

RF MATRIX MODULES

RF Switch Configuration	Maximum Frequency	Available 50Ω Connectors	Available 75Ω Connectors	Maximum Power	Order Code†
NEW Single or Dual 2x2 Matrix with Loop-thru	3GHz	SMB, MCX	–	10W	**40-877**
	2.5GHz	–	SMB, MCX		**40-837**
8 x 2 Matrix	1.5GHz	SMA, SMB	–	10W	**40-750**
8 x 9 Matrix	500MHz	SMB	SMZ, 1.0/2.3, miniSMB	3W	**40-725**
12 x 8 Matrix	300MHz		miniSMB		**40-726A**

RF MULTIPLEXER MODULES

RF Switch Configuration	Maximum Frequency	Available 50Ω Connectors	Available 75Ω Connectors	Maximum Power	Order Code†
NEW Single, Dual or Quad 4 to 1 MUX	3GHz	SMB, MCX	–	10W	**40-872**
	3GHz	–	SMB, MCX		**40-832**
NEW Single, Dual or Quad 4 to 1 Terminated Com MUX	3GHz	SMB, MCX	–	2W terminated	**40-876**
NEW Single or Dual 8 to 1 MUX	3GHz	SMB, MCX	–	10W	**40-874**
	3GHz	–	SMB, MCX		**40-834**
NEW Single 16 to 1 MUX	3GHz	SMB, MCX	–		**40-875**
	3GHz	–	SMB, MCX		**40-835**
4 to 1 MUX with automatic termination	2GHz	SMB, SMA	SMZ, 1.0/2.3, miniSMB	2W terminated	**40-740**
4 to 1 MUX		BNC, SMB	BNC	15W	**40-745**
8 to 1 MUX		SMB, SMA	SMZ, 1.0/2.3, miniSMB		
Dual 4 to 1 MUX					**40-746**
16 to 1 MUX			1.0/2.3, miniSMB		**40-747**
Dual 8 to 1 MUX					**40-748**
Quad 4 to 1 MUX					**40-749**
4 to 1 MUX	3GHz		SMZ, 1.0/2.3, miniSMB		**40-770**
8 to 1 MUX					**40-775**
Dual 4 to 1 MUX					**40-776**
16 to 1 MUX	3GHz		1.0/2.3, miniSMB	10W	**40-777**
Dual 8 to 1 MUX	2GHz				**40-778**

† For the full specification and corresponding order codes for each variant, please refer to the data sheet

Microwave Switch Modules

- Comprehensive Range of Microwave Switch Modules Including Relays, Matrices and Multiplexers
- 50Ω and 75Ω Versions Available
- Bandwidths Up To 65GHz
- Range of Signal Connectors Including SMA, SMZ and Mini SMB
- Power Handling Up To 100 Watts
- Kernel and IVI Support For LXI Environments

40-786 Triple 6 Channel Microwave Multiplexer Module

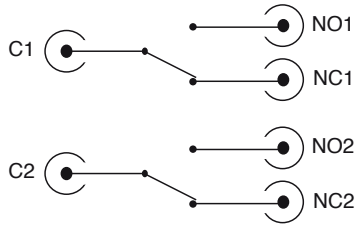
The Pickering Interfaces range of microwave modules provides high performance switching that features low insertion loss and very high isolation. The range varies from simple multiplexer and switch configurations to integrated matrices and large multiplexers.

Most products are characterized for 50Ω operation but some 75Ω versions are supplied either as standard products or as custom units. The 40-785 is also available in 20GHz terminated versions, and in remotely controlled versions. Remote versions occupy a single PXI slot with the microwave switches mounted separately from the host chassis, connection to the module is via a supplied control cable.

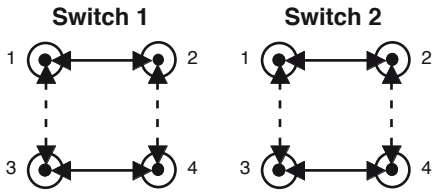
The modules use high quality RF connectors that are supported by a comprehensive range of cable and connector accessories.

For more information on these modules please refer to the individual data sheets or visit our web site at: www.pickeringtest.com

Schematic Diagram for the 40-780 2 x SPDT Microwave Relay Module



Schematic Diagram for the 40-782 2 x Microwave Transfer Switch Module



Microwave Switch Configuration		Maximum Frequency	Available 50Ω Connectors	Available 75Ω Connectors	Maximum Power		No. of Slots Used	Order Code†
					At Low Frequency	At Max Frequency		
SWITCH	1 x Changeover (SPDT)	65GHz	SMA, SMA-2.9, SMA-2.4, SMA-1.8	SMZ, mini SMB	100W	30W	1	40-780
	2 x Changeover (SPDT)							
	1 x Transfer Switch	18GHz	SMA	–			2	40-782
	2 x Transfer Switch							
MULTIPLEXER	Single 6 to 1 MUX	40GHz	SMA, SMA-2.9,	1.6/5.6	120W	50W	3	40-785 ‡
	Dual 6 to 1 MUX							
	Single 6 to 1 Terminated	26.5GHz		–	120W (1W term)	50W (1W term)	4	
	Dual 6 to 1 Terminated						6	
	Single 6 to 1 MUX	20GHz	SMA	–	100W	30W	2	40-786
	Dual 6 to 1 MUX							
	Triple 6 to 1 MUX							
	Configurable 36 i/p MUX	12GHz			80W	25W	10	40-789
MATRIX	3 x 3 Matrix	20GHz	SMA	–	100W	30W	10	40-787
	4 x 3 Matrix							
	4 x 4 Matrix							

† For the full specification and corresponding order codes for each variant, please refer to the data sheet

‡ The 40-785 is also available in versions that occupying a single PXI slot with remotely mounted microwave relays.

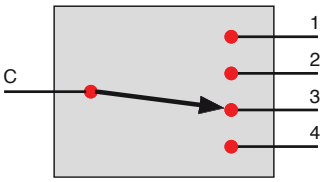
Optical Switching

- Comprehensive Range of Optical Multiplexers and Insert/Bypass Switches
- MEMS Switching Technology Offers High Reliability and Fast Operating Speed
- Single and Multi Mode Versions
- FC/APC, FC/PC, SC/PC, MU (mini SC) or LC Connectors (Single Mode Versions)
- SC or ST Connectors (Multi Mode Versions)
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis

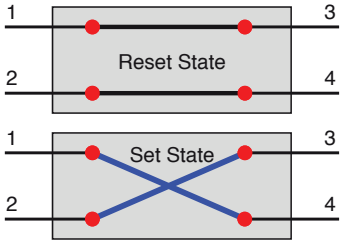
40-852
8-Channel Fiber Optic Multiplexer Module

40-860 Fiber Optic Insert/Bypass Switch Module

Schematic Diagram for Single 4 to 1 Multiplexer



Schematic Diagram for Insert/Bypass Switch



The Pickering Interfaces range of optical switching modules include high performance multiplexers and insert/bypass switches. MEMS (Micro Electro-Mechanical Systems) switch technology offers higher performance and longer operational life compared to conventional prism based optical switching.

All modules use high quality optical connectors that are supported by a comprehensive range of fiber and connector accessories.

Optical Switch Configuration	Switch Technology	Fiber/Wavelength Support	Connector Options	Order Code†
Single 4 to 1 Multiplexer	MEMS	Single Mode/1200 to 1600nm Multi Mode/700 to 1700nm	FC/APC, FC/PC, SC/PC, MU (mini SC), LC, SC, ST	40-850
Single 8 to 1 Multiplexer				40-852
Single 2 to 1 Multiplexer				40-855
Dual 2 to 1 Multiplexer				
Triple 2 to 1 Multiplexer		Single Mode/1200 to 1600nm	FC/APC, FC/PC, SC/PC, MU (mini SC), LC	
Quad 2 to 1 Multiplexer				
Single Insert/Bypass Switch		Single Mode/1200 to 1600nm Multi Mode/700 to 1700nm	FC/APC, FC/PC, SC/PC, MU (mini SC), LC, SC, ST	40-860
Dual Insert/Bypass Switch				
Triple Insert/Bypass Switch		Single Mode/1200 to 1600nm	FC/APC, FC/PC, SC/PC, MU (mini SC), LC	
Quad Insert/Bypass Switch				

† For the full specification and corresponding order codes for each variant, please refer to the data sheet

PXI MODULES SUITABLE FOR FITTING INTO AN LXI SWITCHING CHASSIS

Telecoms/Differential Switching

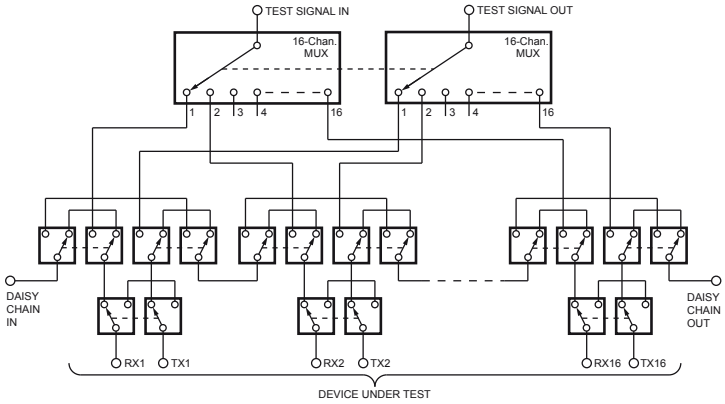
- A Range of Switching Modules Designed For Switching Signals Carried on Differential Pairs
- Daisy Chain Switching Modules Suitable For Testing SONET/SDH Transmission Multiplexers
- Daisy Chain Switching Modules Available in Unbalanced 75Ω and Balanced 120Ω Versions With 8 or 16 Channels
- Differential MUX For Switching Serial Data Communication Signals Such as USB and Ethernet
- Kernel and IVI Support For LXI Environments
- Compatible With All LXI Modular Switching Chassis

40-796 Daisy Chain Switching Module

40-736 Datacoms MUX

This range of modules is ideal for switching signals carried as differential signals where a controlled differential impedance is required. Applications include Telecoms signals and the switching of serial bus systems that use differential signalling.

The daisy chain switching modules 40-792/3/5/6, are specifically designed for production or verification testing of SONET/SDH transmission multiplexers switching 2MBit/s or 1.5MBIt/s data. Versions are available for 75Ω or 120Ω balanced systems with either 8 or 16 tributary channels. The modules incorporate switches that allow data to be fed sequentially through selected tributaries, and multiplexers enable test equipment to break into selected channels.

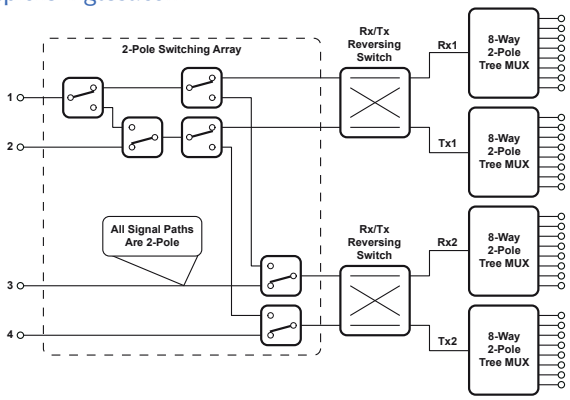


16 Channel Daisy Chain Switching Module 40-793

The 40-735 and 40-736 multiplexers are designed to switch signals carried by serial interfaces such as RS232 and USB. They can be configured to different multiplexer formats, each channel having two poles. The 40-736 has sufficient bandwidth to allow the switching of Gigabit Ethernet.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.

For more information on these modules please refer to the individual data sheets or visit our web site at:
www.pickeringtest.com



Configurable 2-Pole Datacoms Differential MUX 40-736

Card Configuration	Number of Channels	Impedance	Bandwidth	Maximum Current	Order Code
Daisy Chain Tributary Switch (1-pole)	8	75Ω	100MHz	1.0A	40-792-701
	16				40-793-701
Daisy Chain Tributary Switch Balanced (2-pole)	8	100/120Ω			40-795-922
	16				40-796-922
Configurable 2-pole Datacoms Differential MUX - Suitable for Ethernet or USB Switching	Single 36:1 or dual 18:1	90Ω	>200MHz	0.5A	40-735-912
	Single 32:1, dual 16:1 or quad 8:1	100Ω	450MHz	0.3A	40-736-001

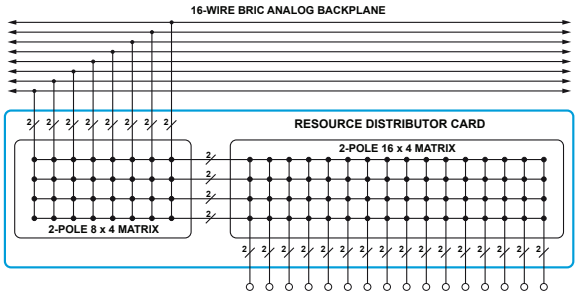
ARINC 608A Switching

- A Range of Switching Modules Designed For Routing Signals in Avionics Test Systems
- BRIC Based Resource Distributor & Bus Matrix Inputs Module With a Choice of Configurations
- Source Switching Module Has 12 x 4 to 1 Multiplexers and 44 SPST Relay Contacts Occupying a Single 3U PXI Slot
- Switch/Carry Current of 2A
- Maximum Switching Voltage 300Vdc/250Vac
- Kernel and IVI Support For LXI Environments

40-569 in BRIC4 Format fitted with 1 Resource Distributor and 2 Bus Matrix Cards

This range of switching modules is designed to support the requirements the of ARINC 608A specification and are primarily intended for the construction of avionics test systems.

The 40-569 is based on Pickering's proven BRIC format, and is available as a 4 slot module suitable for fitting to the 60-100A chassis. The module can be fitted with a combination of Resource Distributor and Bus Matrix Input daughter cards as required by the user. The maximum configuration is two Bus Matrix and two Resource Distributor cards fitted in the BRIC4 module. The daughter cards are inter-linked by the BRIC's 16-wire analog backplane giving a high level of integration. This reduces the cost and complexity of cabling that would be required in implementing an equivalent system using conventional switching modules.

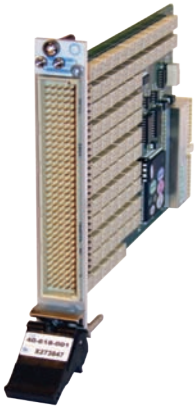


40-569 Resource Distributor Card

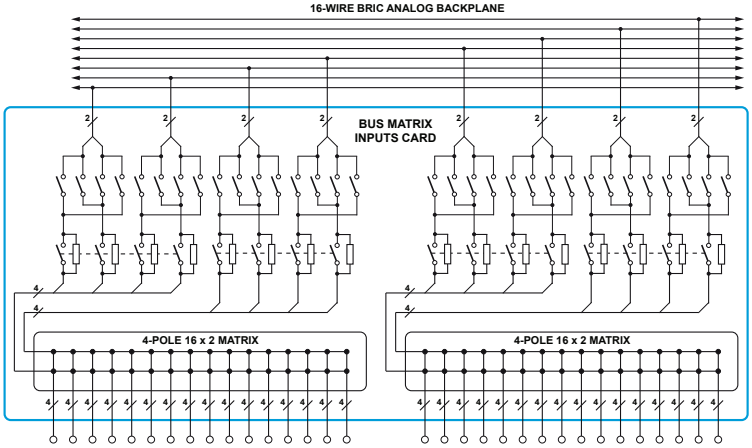
The 40-618 consists of twelve 4 to 1 multiplexers and 44 SPST uncommitted relays in a single PXI slot module and is suitable for Source Switching applications

All modules are based on high quality electro-mechanical relays with 2A switch/carry current and 250Vac/220Vdc voltage rating.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.



40-618 Source Switching Module



40-569 Bus Matrix Inputs Card

Card Configuration	Number of Channels per Card	Max Cards per Module	Slot Occupancy	Maximum Voltage	Maximum Current	Order Code †
Resource Distributor	16 off 2-pole inputs	7	4 or 8	300Vdc 250Vac	2A	40-569
Bus Matrix Input	2x16 off 4-pole inputs	2				
Source Switching	12 off 4-channel MUX & 44 off SPST relays	–	1			40-618

† For the full specification and corresponding order codes for each variant, please refer to the data sheet

PXI MODULES SUITABLE FOR FITTING INTO AN LXI SWITCHING CHASSIS

Programmable Resistors

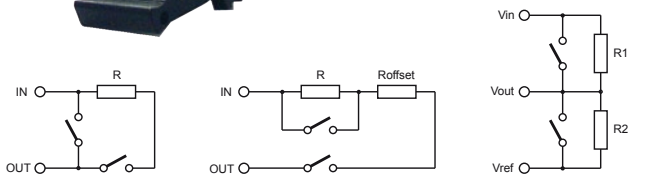
- Versatile Range of Resistor Modules Including Programmable Resistors and Potentiometers
- Fully Programmable Versions With Resolution of Up to 24-bit
- Resistance Range From 0 to 16MΩ
- Low Cost Fixed Value Selectable Resistor Versions With User Defined Values
- All Versions Use High Reliability Pickering Ruthenium Reed Relays
- Compatible With All LXI Modular Switching Chassis

40-280 Selectable Resistor Module

The range of programmable resistor modules includes fully programmable resistor and potentiometer modules for applications that require fine adjustment with a resolution of up to 24-bit. Also in the range are selectable resistor and potentiometer modules. These consist of fixed resistor values pre-defined by the user which can be switched in and out of circuit with reed relays.

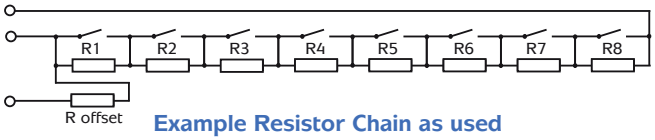
All modules are based on high quality ruthenium reed relays that provide a very long service life and consistent contact operations at all rated switching levels.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.



40-280 Single Resistor Card | 40-281 Dual Resistor Card | 40-282 Potential Divider

Fixed Value Resistor Configurations as used on Selectable Resistor Modules



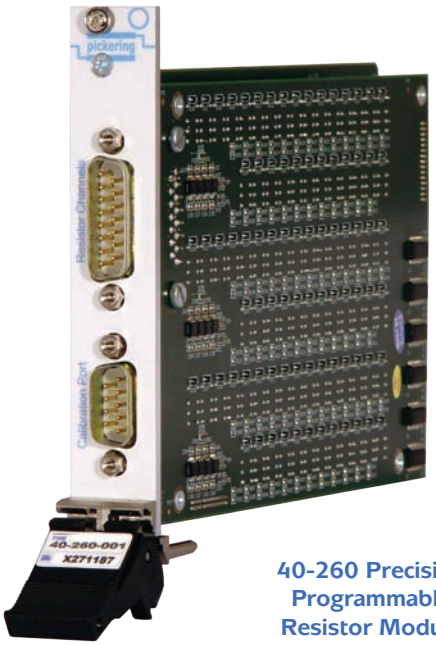
Example Resistor Chain as used on Programmable Resistor Modules (8-bit chain shown)

Resistor Card Configuration	No. of Channels	Resolution	Resistance Range ‡	Max Resistor Power	Front Panel Connector	Order Code †
Fixed Value Selectable Resistors	24 or 48	—	User Specified	0.5W	96-way Micro-D	40-280
Dual Selectable Resistors	12 or 24					40-281
Fixed Value Potential Dividers	12 or 24					40-282
Programmable Resistors	Dual	16-bit	0.5Ω to 32kΩ	1W	68-way Micro-D	40-290
Programmable Resistors + SPDT relays						
Programmable Resistors	Quad	8-bit	0.5Ω to 128Ω			40-291
Programmable Resistors + SPDT relays						
Programmable Resistors	10 or 18		0 to 255Ω	0.5W	37-way D-type	40-295
	5 or 10	12-bit	0 to 4kΩ			
		16-bit	0 to 65kΩ			
	3 or 6	24-bit	0 to 16MΩ			
Programmable Potentiometers	5 or 9	8-bit	0 to 255Ω			40-296
	2 or 4	12-bit	0 to 4kΩ			
		16-bit	0 to 65kΩ			
	1 or 3	24-bit	0 to 16MΩ			

‡ Most modules can be offered with alternative resistance range, for more information contact Pickering Interfaces
† For the full order number and configuration codes for each variant, please refer to the data sheet.

Precision Programmable Resistors

- Precision Variable Resistors With a Choice of Resistance Ranges
- Very High Accuracy and Stability
- Fine Setting Resolution
- Low Thermo-Electric EMF
- Simple Calibration With an External DMM
- Compatible With All LXI Modular Switching Chassis



40-260 Precision Programmable Resistor Module

This range of programmable resistor modules feature high setting resolution with excellent stability and accuracy through the use of innovative switching networks and software correction techniques. This also means all resistance values can be set - there are no missing values due to switch resistance or resistor tolerance.

They are ideal for simulation of sensors that require very fine adjustment and also have the capability of being set as open or short circuit to simulate faults in cabling systems. The range includes modules specifically designed for RTD and strain gauge simulation.

The modules incorporate a system for the calibration of each channel using a DMM connected to the Calibration Port on the front panel. Calibration can be performed with the UUT connected to the module and multiple modules can be cascaded and calibrated with a single DMM (this does not apply to the 40-297 which uses the same connector for the UUT and calibration).

The resistor channels and calibration port occupy separate connectors on the module's front panel. All connectors are supported by a comprehensive range of cable and connector accessories.

New versions of the precision resistor cards are being regularly introduced, please contact your local sales office for more details.

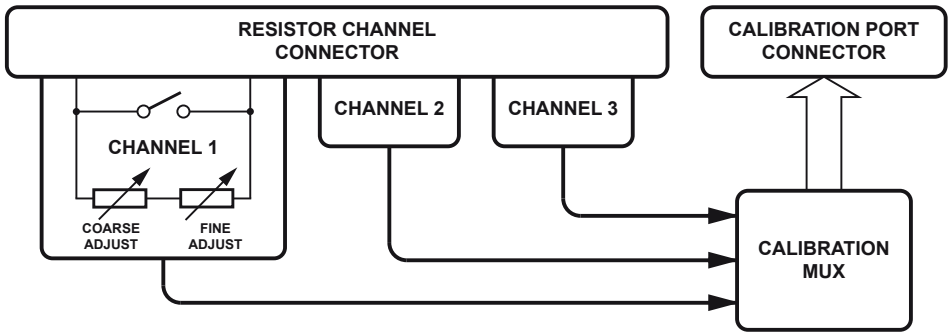


Diagram for 40-260 Three Channel Precision Programmable Resistor Modules

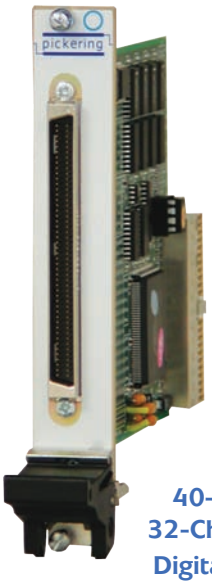
Resistor Card Type	No. of Channels	Resolution/Accuracy	Resistance Range ‡	Max Resistor Power	Order Code †
Precision Programmable	3	<10mΩ / 0.1%	90Ω to 8kΩ	100mW	40-260
	2	<2mΩ or <15mΩ/0.1%	1.5Ω-2.9kΩ or 10Ω-36kΩ		40-261
RTD Simulator	6 or 18	2mΩ / 0.1%	90Ω-250Ω or 900Ω-2.5kΩ		40-262
Strain Gauge Simulator	1 to 6	2mΩ / 0.03%	350Ω Bridge		40-265
High Density Precision Programmable	18	1Ω / 0.2%	1Ω to 230Ω	500mW	40-297-001
	9	0.25Ω / 0.2%	2Ω to 13.5kΩ		40-297-002
	6	0.125Ω / 0.2%	3Ω to 1.5MΩ		40-297-003

‡ Most modules can be offered with alternative resistance range, for more information contact Pickering Interfaces
† For the full order number and configuration codes for each variant, please refer to the data sheet.

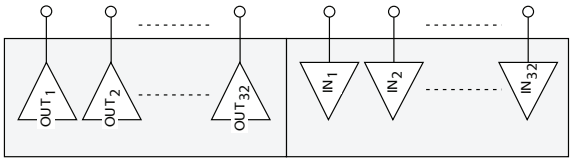
Digital I/O and Switch Simulators

- Versatile Range of Modules Incorporating Digital Input/Output Functions
- Versions With Optically Isolated Input/Output For Interfacing to Electrically Noisy Environments
- TTL Inputs and Outputs Suitable for Interfacing to External Logic
- Open Collector Transistor Output Versions Suitable for Driving Internal or External Relay Coils
- Version With Programmable Input Threshold and High-Side or Low-Side Drive Capability
- Switch Simulator Modules are Designed for Dirty Contact Emulation in Automotive Test Applications
- Compatible With All LXI Modular Switching Chassis

40-412 Digital I/O Module with Programmable Threshold



40-410 32-Channel Digital I/O Module



Digital I/O Module with 32-bit Input and 32-bit Output (40-410)

This range of Digital I/O Modules are suitable for operating external devices, or for interfacing with external logic. Two choices of output driver are available: TTL for interacting with external logic and Open Collector Transistor for operating external devices with voltages to 50V DC and currents to 500mA.

Optically isolated versions are intended for input-output functions in electrically noisy environments. All inputs and outputs share a common ground and have an isolation barrier of 500V DC. Power for the isolated input/output circuit can be supplied by the user or supplied by an optional on-board DC-DC converter.

A version of I/O module is available with programmable input threshold which allows the user to set the voltage of the high and low states of incoming signals. Additionally, its output channels can be used as high-side drivers which can source 0.4A or low-side drivers capable of sinking 0.5A.

Switch Simulator Modules are designed for automotive test applications. They can simulate contaminated contacts or current leakage conditions enabling the correct operation of I/O devices to be tested.

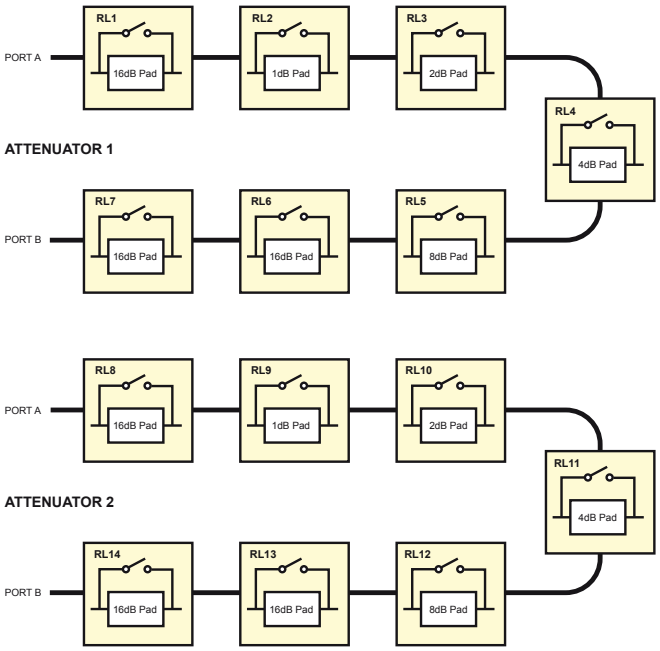
All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.

Card Configuration	Number of Channels		Front Panel Connector	Order Code
Digital Input/Output Module	32 TTL I/P	32 TTL O/P	96-way	40-410-001
		32 O/C O/P		40-410-002
Relay Driver	64 Output Channels		78-way	40-411-001
Digital Input/Output Module with Programmable Threshold	32 I/P, 0.3V to 50V threshold	32 high-side or low-side drivers		40-412-001
Optically Isolated Digital I/O Module With on board DC-DC converter	16 I/P	32 O/P	68-way	40-490-001
	16 TTL I/P			40-491-001
Optically Isolated Digital I/O Module No DC-DC converter	16 I/P			40-490-002
	16 TTL I/P			40-491-002
Automotive Switch Simulator	8, 16 or 32 channel		37-way	40-480†
Dual Automotive Switch Simulator	Single or dual 8 or 16 channel			40-485†

† For the full order codes for each variant, please refer to the data sheet.

Attenuator Modules

- Single and Dual High Frequency Attenuator Modules
- 3GHz Frequency Range
- Maximum Attenuation 63dB
- 1dB Attenuator Resolution
- Input and Output Connector Savers Easily Replaced if Damaged



41-180-022 Dual 3GHz Programmable Attenuator Module

41-180 Programmable Attenuator Module

It is not unusual for test systems to generate high voltage signals incompatible with the instrumentation capability in a PXI system. Pickering offers a solution for this problem. The 41-180 is an accurate DC to 3GHz programmable attenuator that has a 1dB step resolution, allowing it to adjust signal amplitudes for optimum measurement by other devices.

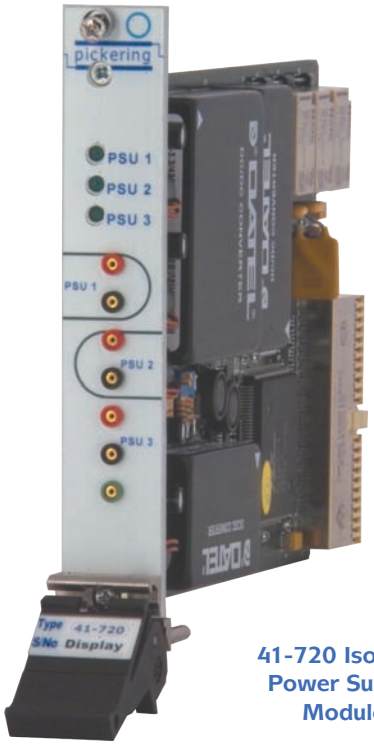
The connectors used by these modules are supported by a comprehensive range of cable and connector accessories.

For more information on these modules please refer to the individual data sheets or visit our web site at www.pickeringtest.com

Card Configuration	Channels	Frequency	Maximum Attenuation	Signal Connectors	Order Code
Programmable Attenuator	1	3GHz	63dB	SMA Sockets	41-180-021
	2				41-180-022

Power Supply Modules

- Range of Fixed or Variable Power Supply Modules
- Battery Simulator Module Capable of Sinking or Sourcing Current
- Fixed Supplies Have up to 4 User Specified Output Voltages
- Variable Supplies Can Deliver up to 48V Per Channel With 2A Maximum Current



41-720 Isolated Power Supply Module

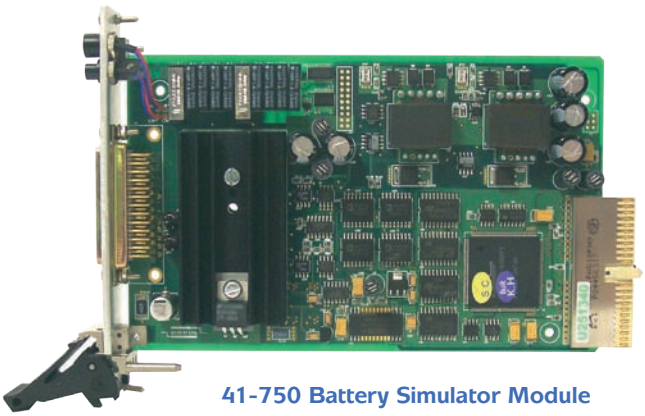
The 41-720 range of Fixed Power Supply modules provides the user with up to 4 separate voltage outputs isolated from the PXI backplane. Any combination of 3.3V, 5V, 12V or 15V can be specified with a maximum current capability of 4A for the 3.3V option. Software provides on/off control and status monitoring for each output.

Programmable Power Supplies provide voltage outputs which are fully adjustable under software control. The 40-735 delivers positive 10V and the 40-736 delivers negative 10V, both with a maximum current of 1A. The output voltage can either be derived from the PXI chassis supply or from an external source.

The 41-740/741 are dual Programmable Power Supplies and can deliver up to 48V at 2A. They are fed from an external AC mains, or DC 56V supply.

The 41-750 and 41-751Battery Simulator modules are designed to simulate the power supplies of portable battery powered equipment and is particularly suitable for cell phone testing. They can source current to simulate a battery supply or sink current to simulate a battery under charge.

All the connectors used by these modules are supported by a comprehensive range of cable and connector accessories.



41-750 Battery Simulator Module

Card Configuration	Channels	Input Voltage	Output Voltage	Max Current	Order Code
Isolated Power Supply	4 max	5V from PXI Backplane	Choice of 3.3V, 5V, 12V or 15V	4A (3.3V option)	**41-720**
+10 Volt Programmable Power Supply	2	+12V from PXI Backplane or external supply	Adjustable 0 to +10V	1A Per Channel	**41-735-001**
-10 Volt Programmable Power Supply	2	-12V from PXI Backplane or external supply	Adjustable 0 to -10V	1A Per Channel	**41-736-001**
Programmable Power Supply	2	+56V DC	Adjustable 0 to 48V	2A Per Channel	**41-740-001**
	2	90-260V AC			**41-742-001**
Battery Simulator Module	1	5V from PXI Backplane	Adjustable 0 to 6V	2.8A Source, 0.5A Sink	**41-750-001**
				1A Source, 0.25A Sink	**41-751-001**

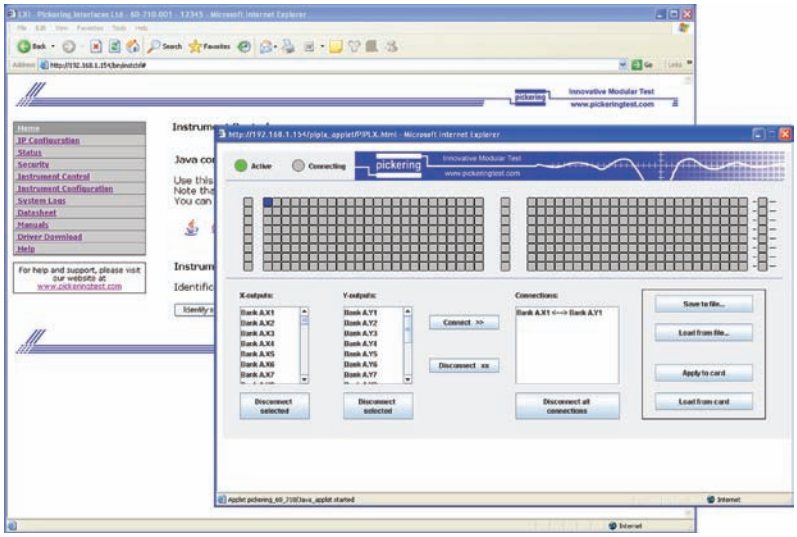
LXI Software Support - Overview

Before any programming of your LXI device can take place it has to be configured for operation on your network. The first task is to find the IP address of the device and establish remote communication. Pickering supply a number of “discovery” tools to simplify this operation. Once the IP address has been found the device’s homepage can be accessed using your web browser. From here the device can be configured and user manuals and drivers downloaded. A Java based soft front panel can also be accessed for graphical control of the device. For more information on setting up and communicating with your LXI device, refer to the Pickering “LXI Getting Started Guide”.

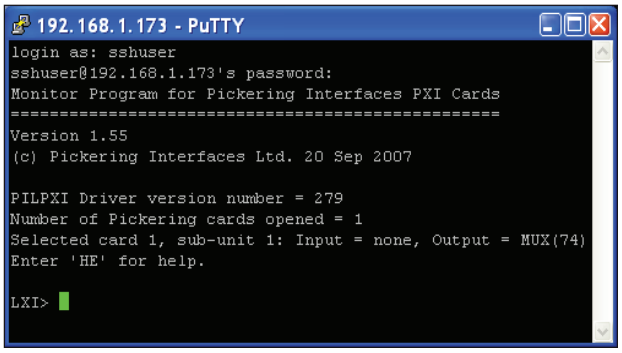
Software drivers are supplied for Microsoft Windows 2000/XP/Vista operating systems, with specific support for the following development environments:

- Microsoft Visual Basic
- Microsoft Visual C++
- National Instruments LabWindows/CVI
- National Instruments LabVIEW and LabVIEW RT

Windows drivers are supplied in the form of Dynamic Link Libraries, which should also be usable in any other development environment that supports them.



Setup of an LXI device can be carried out using the Instrument Homepage, and control of the device’s switching functions can be executed via the Soft Front Panel which is executed as a Java applet



With SSH running on the LXI device, control can be carried out via a command line interface

LXI Simulator

Pickering provide an LXI Simulator software application that may be configured to simulate any Pickering LXI product.

Using this product the user may create an LXI object that will behave exactly like the real product, but of course, without the hardware. This allows a developer to create and test software for a Pickering LXI target in advance of delivery of the hardware.

The principal drivers provided are:

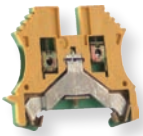
- **IVI Driver for Windows** The Pickering IVI-C driver is IVI-Switch class compliant and fully compatible with National Instruments Switch Executive, allowing control of all Pickering switch products from a single driver. The driver also includes some custom specific functions that permits the control of non-switch based products such as resistor cards. The driver may also be used from a variety of programming environments such as Visual C++, Visual Basic, LabVIEW and LabWindows/CVI. A further, general purpose, IVI-COM custom driver is also available.
- **Direct I/O Driver** is most commonly used in general-purpose programming environments such as Visual C++ and Visual Basic and can usually be adapted to work from other programming environments. Wrappers for LabWindows/CVI, LabVIEW and Agilent VEE are provided in the installation package. This driver is also available for popular Linux distributions on request. A version of this driver is available with LabVIEW RT support
- **SOAP** interface is provided with all Pickering LXI units. This permits the unit to be controlled from any programming environment capable of handling SOAP, including Perl and .NET.
- **LabVIEW and LabWindows/CVI** files & libraries are provided, allowing the LXI device to be controlled from these environments. For LabVIEW RT a separate Direct I/O driver is required.
- **SSH Interface** is provided with all Pickering LXI units. This service allows command line control of the unit, or programmatic control when used with external software (not provided).
- **Native .NET Driver** The Pickering .NET driver offers a versatile interface that may be used from any .NET programming environment such as Visual C++, Visual C# and Visual Basic.

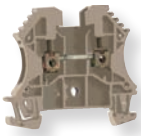
Installation information and details of the available drivers can be found in the documentation supplied with the unit.

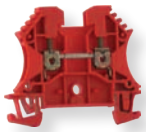
CABLING & CONNECTOR SYSTEMS

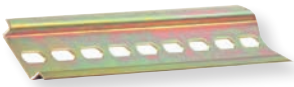
Pickering Interfaces understands that just providing the switching and instrumentation modules is not enough, users need to be provided with fast and effective ways of connecting their investment to the device under test.

The modules in the Pickering Interfaces PXI, PCI and LXI system are fully supported by a comprehensive range of connector and cable accessories. The accessories are detailed in the 56 page Interconnection Solutions Catalog available in paper or downloadable format. The catalog is cross referenced to all Pickering system 40 PXI modules and PCI modules as well as PXI modules supported by the 60-100 series LXI chassis, making it easy for the user to find the perfect accessories to compliment their chosen module.



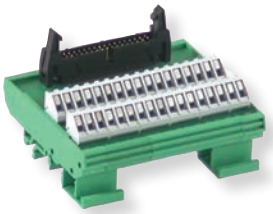


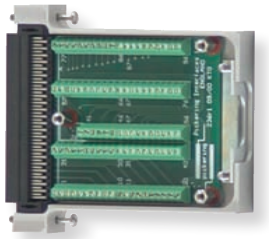




- **Connectors & Prototyping Cables For Pickering PXI and LXI Modules.**
  Pickering can supply mating multi-way connectors for any PXI module in the range from 4-way power connectors up to 200-way high density types. This allows the user to construct their own prototype cable assemblies to suit specific applications. Alternatively, cableforms can be supplied with a multi-way connector on one end and un-terminated wires on the other. This removes a large amount of the work required by the user when prototype cabling is required

- **Cable assemblies For Pickering Interfaces PXI and LXI**
  Pickering Interfaces offers a wide range of standard and custom cable assemblies that support all our switching and instrumentation products. Every module we manufacture is fully supported by cables and accessories, allowing users to procure their cables and modules from one source to ensure connector compatibility. Our manufacturing plant in the Czech Republic can manufacture high quality cable assemblies in small or medium volumes on fast turn around times. We support both simple and complex connectors (200 way).





- **Connector Blocks & Breakouts For Pickering PXI and LXI Modules**
  Breakout Boxes provides an electrical connection between a module's multi-way connector and a set of screw terminals. They are mounted on the front panel of the module and allow the user to easily attach discrete wires to what would otherwise be a difficult to terminate connector. Most Pickering PXI modules have a good selection of Connector Blocks and Breakouts available.

- **Fuse Holders and Terminals For PXI and LXI**
  We also offer a range of DIN rail mounted Terminals and accessories. These provide an easy means of building your test system as they enable discrete wires from cableforms to be interconnected between PXI modules and the devices under test. The range also includes DIN rail mounted fuse holders to provide overload protection for your test system.

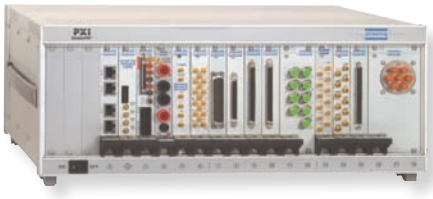
- **Custom Connectors & Cabling**
  If a particular connector and cable configuration cannot be found in the Interconnection Solutions Catalog, Pickering can make custom cableforms to special order. This service further reduces the work that the user requires to build a test system that exactly meets their requirements. Please contact Pickering sales office to discuss your application.

OTHER SWITCHING SYSTEMS FROM PICKERING INTERFACES

PXI Switch, Instrument & Systems – SYSTEM 40

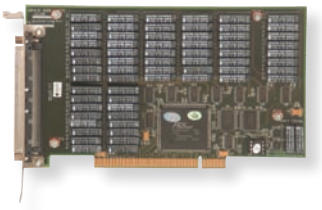
Pickering have a full range of competitively priced 3U & 6U PXI (CompactPCI) Switch Modules, including Relay, Digital I/O, Matrix, Multiplexer, RF, Microwave, Optical and Telecom, our 3U PXI matrix modules offer up to 4400 crosspoints per module.

Pickering PXI Instruments include Arbs, Amplifiers, Digitizers, Automotive Serial Protocol Communications, 5½, 6½ & 7½ DMMs, Power Supplies, RF Power Meters, RF Attenuators, Programmable Resistor/Potentiometers, Avionics Bus Analyzers, Breadboards & Digital I/O. We are continually adding to our PXI range (over 500 models), so if the product you require is not listed please ask.



PCI Switch Modules – SYSTEM 50

Pickering Interfaces have a range of competitively priced PCI switch Modules, including General Purpose Reed Relay, Matrix, Multiplexer, RF & Programmable Resistor. Pickering Interfaces PCI Modules share the same software environment as our extensive PXI range.

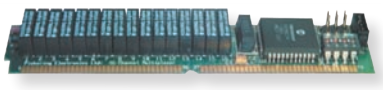


VXI Switching System Modules – SYSTEM 30

Pickering Interfaces have a range of high density VXI switching modules, System 30, containing up to 2340 relays per module. These are C sized modules with a SCPI message based interface, VXI Plug/Play & IVI Drivers, offering up to 10 times density advantage over competing VXI switching products.

SIM Relay Cards – SYSTEM 1000

Pickering Interfaces also offer range of uncommitted relays, matrices and multiplexers based on 72-pin SIM modules. These enable the user build custom switching systems that can be located inside test fixtures and close to the unit under test. Control is via an RS232 or I^2C interface.



IEEE-488.2 & RS-232 Controlled Switching Systems – SYSTEM 10/20

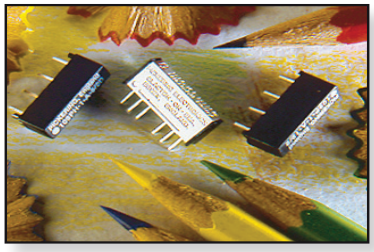
Pickering Interfaces' System 10 and System 20 Programmable Relay Switching Systems now offer the most comprehensive range of switching modules currently available. Our switching systems will switch from nanoVolts to 7.5 kilo Volts, DC to 26.5GHz and pico Amps to 30Amps. Models are programmable using a wide range of interfaces: IEEE 488, Ethernet, USB or RS-232.

Custom Switching Solutions

Pickering Interfaces are able to meet your exact custom switching needs. With extensive experience in PXI, PCI, VXI, IEEE-488, and Ethernet architectures, we can develop a switching solution that matches your exact needs. For further information please visit the Custom Design area of the "Sales" section of our web site or call your local Pickering Sales office.

"A Switching Module Is Only As Good As The Relays Used"

Ruthenium Sputtered Reed Relays offer maximum performance, are hermetically sealed and offer a very stable, long life relay contact (>10^9 operations) with fast operate time. Alternative cheaper types such as electro-mechanical armature relays or non-instrumentation grade reed relays (Rhodium plated) don't offer the consistent contact resistance, long life, fast switching speed and low level switching capability of an instrumentation reed relay. All reed relays used in our switch modules are manufactured by our sister company Pickering Electronics. www.pickeringrelay.com.



Switch On to Pickering

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www.pickeringtest.com

Please visit our web-site for additional world-wide contact details.

Mar 2009

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