LXI Microwave Matrix 60-750/751

- Versatile Microwave Matrix Switching Platform
- Versions Available up to Dual 4x4
- Loop-Thru Options For Easy Expansion
- Internally Terminated Versions
- Up to 20GHz Bandwidth
- Low Loss
- Equal Loss on Each 4x4 Matrix
- 50Ω Impedance
- Auxiliary Port For External Control of Relays
- Custom Versions Available on Request
- LXI Standard 1.4 Compliant
- 3 Year Warranty

The 60-750/751 is an LXI Microwave Switching platform controlled through an LXI compliant Ethernet connection. The matrix is available in a variety of configurations and frequencies up to 20GHz (60-751).

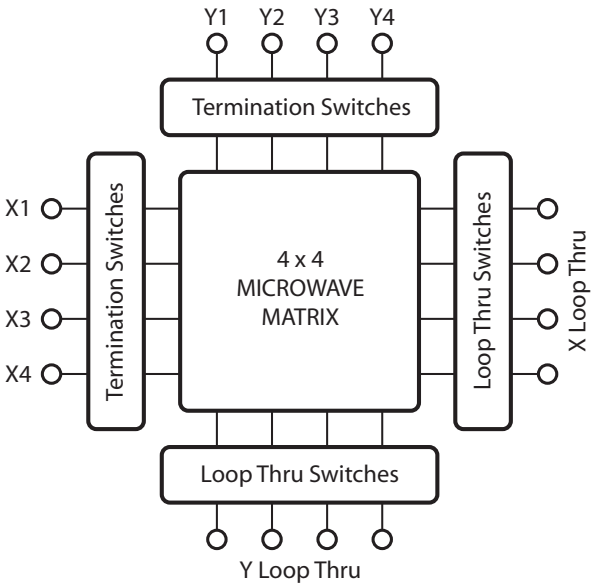
It is characterized for 50Ω applications, for 75Ω versions please consult your local sales representative.

The 60-750/751 is supplied in a 2U full rack width enclosure, providing a compact solution for rack mounted ATE systems or for use on the bench. The matrix is configured to the specified X-Y size with no extra cabling needed, saving the cost and time required creating matrices from individual components.

The 3x3 or 4x4 matrices are designed to have a nominally matched path loss no matter which path is selected. The matrices are non-blocking, allowing any input to be connected to any unused output. Optional Loop-Thru connections allow matrices to be easily combined to make larger arrays using external cabling.

The 60-750 can be supplied as dual or single 10GHz matrices, allowing users to select the most appropriate model for their application. Alternatively, the 60-750 can be supplied configured as a single 8x4 matrix with the two 4x4 matrices internally connected. The 60-751 can be supplied as a single 3x3 or 4x4 20GHz matrix. Models can be ordered with or without internal terminations for disconnected inputs.

For applications where extra microwave switches are required the 60-750/751 includes an auxiliary output that can be used to supply 12V power and control for 16 external switches.



Single 60-750/751 Non-Blocking 4x4 Matrix With Optional Loop-Thru and Internal Terminations

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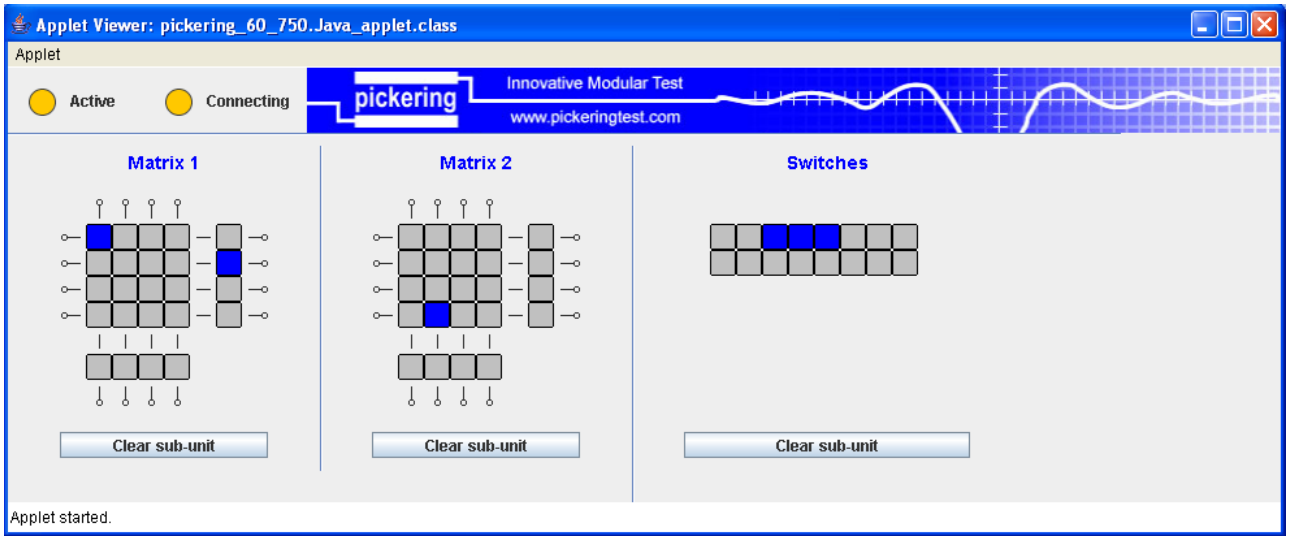
Control of the matrices could not be simpler. Communicate with the 60-750/751 via its Ethernet interface using any W3C compliant browser and run the soft front panel from a PC or a Mac. Alternatively use the programmatic interface based on Pickering Interfaces switch driver to control the 60-750/751 through DLLs or an IVI compliant driver.

The 60-750/751 is ideal for applications where a simple start up process is required and for applications requiring control at large distance.It is the first of a range of commercial and custom microwave switching products with the LXI control interface. For alternative configurations please contact your local sales office.



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

Rear View Of The 60-750/751 Matrix Showing Power And LAN Connections

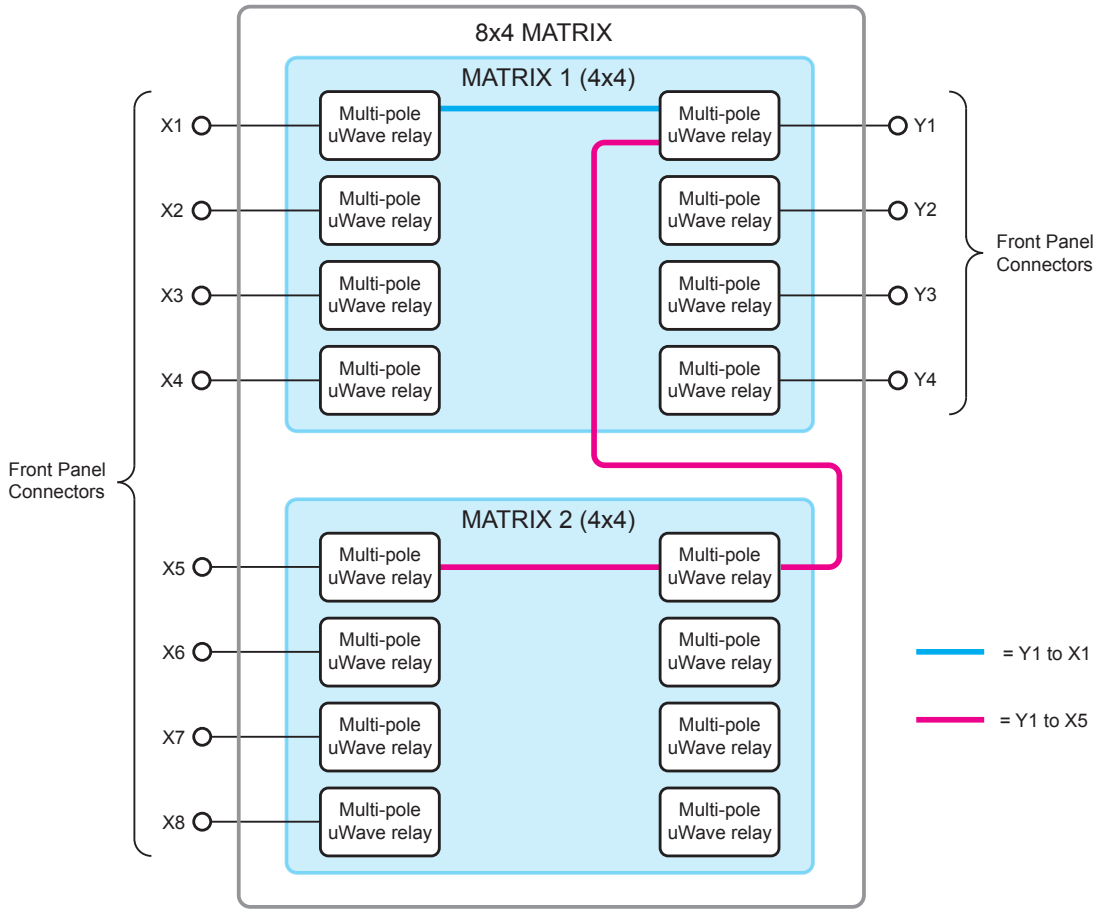


Diagram Illustrating The Two Path Lengths Used In 8x4 Matrices

General Matrix Information

Connectors:	Front panel SMA, alternatives available on request.
Operating Time:	<18ms (limited by switches)
Maximum Voltage:	100VDC*
Maximum Switch Current:	1A
Path Resistance:	On: <500m Off: >10^{10} (unterminated)
Expected Life:	Low power: >5 million per position Max power: 0.3 million

* For full voltage rating, signal sources to be switched must be fully isolated from mains supply and safety earth.

Power Source

Universal AC mains supply, 90-120V to 200-240V, 50-60Hz	
Power Inlet on Rear Panel:	Male IEC connector
Fuse Rating:	5A, 250V

LAN Interface

Compliant to LXI Standard 1.4, the 60-750/751 has a 1000Base-T Ethernet Interface via a standard RJ-45 connector mounted on the rear panel*.

***Note:** Legacy units may not have 1000Base-T support.

LXI Status Indicators

Front panel mounted LEDs:

- Power
- Ready
- Error
- LAN
- Active

Cooling

Fan assisted cooling, side air intakes and rear exhaust.

Mechanical Characteristics

Supplied with front panel ears to enable rack mounting on a shelf or other rear support mechanism.

Dimensions: 2U full rack width, 500mm deep.

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

Auxiliary Control

Type: Relay operated interface that can be used to operate 16 external switches, outputs fully floating to support common ground or common power configurations. Each output can switch up to 2A and 100V, maximum power 10W.

Power Connection: +12V protected by resettable fuse with 1.2A to 2.5A trip current (operating temperature dependent)

Connector: 37-pin female D-type

Matrix Specification

Extensive typical performance information is provided in the operating manual which can be downloaded from the Pickering Interfaces web site.

10GHz Version (60-750)

Characteristic Impedance:	50
Maximum Power:	100W to 3GHz 60W to 12GHz Terminated versions limited to 1W on all frequencies.
Typical Isolation:	-90dB
Typical Crosstalk	-85dB

10GHz Single 4x4 and 3x3 Matrix

	Frequency			
	2.5GHz	5GHz	7.5GHz	10GHz
Insertion Loss	1.3dB	2.3dB	2.9dB	3.6dB
VSWR	1:1.12	1:1.2	1:1.35	1:1.6

10GHz Dual 4x4 and 3x3 Matrix

	Frequency			
	2.5GHz	5GHz	7.5GHz	10GHz
Insertion Loss	1.3dB	2.3dB	2.9dB	3.6dB
VSWR	1:1.12	1:1.2	1:1.35	1:1.6

10GHz 8x4 Matrix

	Frequency			
	2.5GHz	5GHz	7.5GHz	10GHz
Insertion Loss Y to X1, X2, X3 or X4	1.3dB	2.3dB	2.9dB	3.6dB
VSWR Y to X1, X2, X3 or X4	1:1.12	1:1.2	1:1.35	1:1.6
Insertion Loss Y to X5, X6, X7 or X8	1.8dB	3.2dB	4.1dB	5.0dB
VSWR Y to X5, X6, X7 or X8	1:1.2	1:1.3	1:1.5	1:1.8

20GHz Version (60-751)

Characteristic Impedance:	50Ω
Maximum Power:	100W to 3GHz 60W to 10GHz 30W to 20GHz Terminated versions limited to 1W on all frequencies.
Typical Isolation:	-60dB
Typical Crosstalk	-90dB

20GHz Single 4x4 and 3x3 Matrix

	Frequency			
	5GHz	10GHz	15GHz	20GHz
Insertion Loss	1.5dB	3dB	4dB	4.5dB
VSWR	1:1.2	1:1.3	1:1.4	1:1.6

Product Order Codes

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

4x4 20GHz Matrix with Loop Thru & internal termination	**60-751-144-C**

Product Customization

Pickering LXI units are designed and manufactured on our own flexible manufacturing lines, giving complete product control and enabling simple customization to meet very specific requirements.

Customization can include:

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

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

Operating/Storage Conditions

Operating Conditions

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

Storage and Transport Conditions

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

Safety & CE Compliance

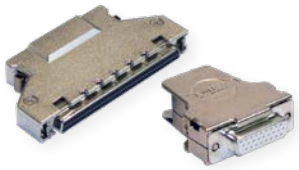
All products are fully CE compliant and meet applicable EU directives: Low-voltage safety EN61010-1:2010, EMC Immunity EN61326-1:2013, Emissions EN55011:2009+A1:2010.

Mating Connectors & Cabling

For connection accessories for the 60-750/751 please refer to the 90-011D RF Cable Assemblies data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

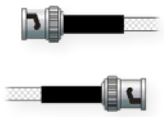
Connectivity Solutions

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



Connectors & Backshells

Multiway Cable Assemblies



RF Cable Assemblies

Connector Blocks

We also offer customized cabling and have a free online **Cable Design Tool** that can be used to create custom cable solutions for many applications.
Visit: pickeringtest.com/cdt to start your design.

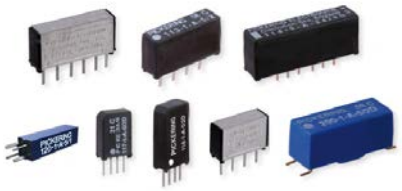
Mass Interconnect

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

Pickering Reed Relays

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

To learn more, please go to: pickeringrelay.com



Programming

All LXI devices are supplied with built-in software drivers, web pages for configuration and soft front panels as required by the LXI specification. A variety of drivers are provided (C, .NET, IVI, SOAP) which are compatible with all Microsoft supported versions of Windows and popular older versions. For a list of all supporting operating systems, please see: pickeringtest.com/os

The drivers may be used in many commonly used programming environments and applications including:

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

As well as various open source environments such as:

- **Sharp Develop**
- **Dev-C++**

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

Signal Routing Software

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

To learn more, please go to: pickeringtest.com/spm

Diagnostic Relay Test Tools

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

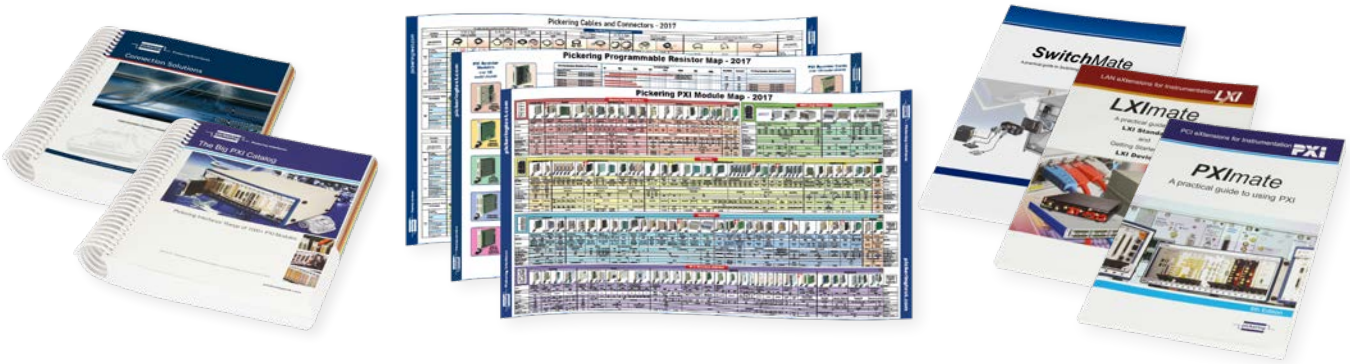
To learn more, please go to: pickeringtest.com/ebirst

Three Year Warranty

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

Available Product Resources

We have a large library of product resources including success stories, product and support videos, articles, as well as complete product catalogs and product reference maps to assist when looking for the switching, simulation and cable and connector solutions you need. We have also published handy reference books on Switching Technology and for the PXI and LXI standards.



To view, download or request any of our product resources, please visit: pickeringtest.com/resources