LXI Wideband Modular Matrix 65-100A

- Wide Bandwidth Modular Matrix
- 200MHz Bandwidth, Usable to 500MHz
- 50Ω Impedance
- Y8 or Y16 Solutions
- Scalable X to 104 Connections
- High Performance EMR Design
- Excellent Crosstalk Performance and Wide Bandwidth
- Self-test Facility to Check All Relays
- LXI Compliant Interface For Simple Ethernet Based Control
- 3 Year Warranty

The 65-110A provides a wideband modular matrix platform with bandwidth in excess of 200MHz and excellent crosstalk performance for applications requiring Y to X point to point connections.

Matrices are created by populating the 65-110A chassis with plugin modules that access the X and Y connections. The chassis is capable of supporting matrices with Y axis sizes of 8 or 16 and X axis size up to 104 in increments of 8. Users can specify as many or as few plugin modules as they require and can field upgrade the chassis to extend the matrix.

Y modules are available for an 8 or 16 Y axis. The Y modules either allow only point to point Y to X connections or allow multiple Y to an X connection. When multiple Y to X connection is used the system bandwidth is decreased.

When plugin modules are remove or added, the chassis control system identifies and configures the matrix as a single entity. The matrix can be manually controlled via a soft front panel available from the chassis' internal web server or it can be controlled through the LXI compliant Ethernet interface.

Pickering's Range of LXI RF & Microwave Matrices

Bandwidth	Impedance	Configurations	Model No.
25MHz	75Ω	Single or Dual 24x8	**60-711**
50MHz	50Ω	Single or Dual 24x8	**60-760**
500MHz	50Ω	24x8 up to 104x8 or 16x16 up to 104x16	**65-110A**
2.4GHz	50Ω	16x16 up to 32x16	**60-770**
2.4GHz	50Ω	8x8 up to 32x8	**60-771**
2.4GHz	50Ω	8x4 up to 32x4	**60-772**
20GHz	50Ω	3x3 up to 4x4	**60-750**

Also, refer to the LXI Product Guide for information on the entire range of LXI solutions - available as a download from pickeringtest.com

The 65-110A has low crosstalk and good VSWR performance over its entire operating frequency range, making it ideal for applications where high quality data acquisition is required on dynamic signals. It is particularly useful for applications where signal levels between channels varies significantly, making the application sensitive to crosstalk performance.

The 65-110A includes a self test that checks the functionality of all paths through the matrix while the user connections are still attached but without signals. The self test is initiated via the web interface without the use of an external application program and results are displayed graphically on the web interface.

Cooling for the chassis is provided by rear fans and front air intakes ensuring no wasted space when it is rack mounted. The cooling system is adaptive, minimizing acoustic noise when used in quiet laboratory environments. Unused chassis slots are filled using supplied blanking pieces to ensure correct air flow.

The control interface is fully compliant with the 1.5 LXI Device Standard 2011, providing simple control of the chassis over any distance using a robust connection interface.

Configuring the Matrix

To select the parts that you need to create a matrix simply:

- Specify a 65-110A-001 LXI Wideband Modular Chassis and a 65-110-801 Wideband Baseboard.
- For x8 matrices add a 65-101-101 Y1-Y8 module for Y to X systems or 65-110-103 for multi-Y systems.
- For x16 matrices add a 65-110-101 Y1 Y8 module and a 65-110-102 Y9 Y16 module for Y to X systems. For multi-Y systems add a 65-110-103 Y1 Y8 module and a 65-110-104 Y9 Y16 module.
- Add 65-110-201 (for Y by 8) or 65-110-202 (for Y by 16) Matrix Modules to make up the X dimension of the matrix – simply divide the X size by 8 and round up to the next integer to find the number required.

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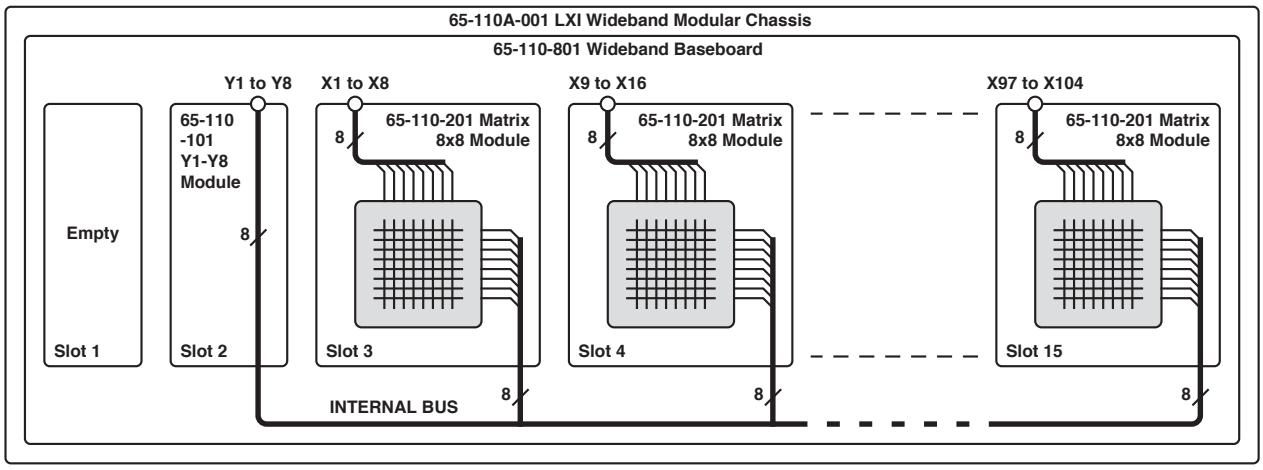
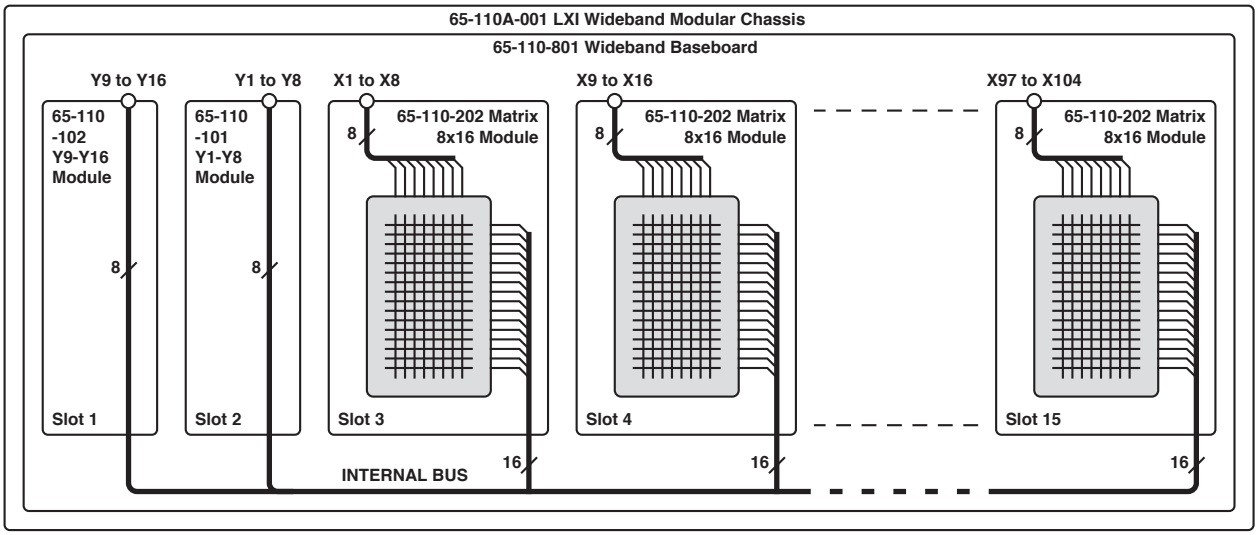
Example Configurations for Y to X Point to Point Systems

64x8 Matrix Matrix that permits 8 concurrent point to point connections to be made between Y and X.	1 off 65-110A-001 LXI Wideband Modular Chassis 1 off 65-110-801 Baseboard 1 off 65-110-101 Y1 Y8 Module 8 off 65-110-201 Matrix 8x8 Modules	**104x8 Matrix** Matrix that permits 8 concurrent point to point connections to be made between Y and X.	1 off 65-110A-001 LXI Wideband Modular Chassis 1 off 65-110-801 Baseboard 1 off 65-110-101 Y1 Y8 Module 13 off 65-110-201 Matrix 8x8 Modules



65-110A Configured as a 104x8 matrix using 65-110A-001 LXI Wideband Modular Chassis, 65-110-801 Wideband Baseboard, 65-110-101 Y Module and 65-110-201 Matrix 8x8 Modules

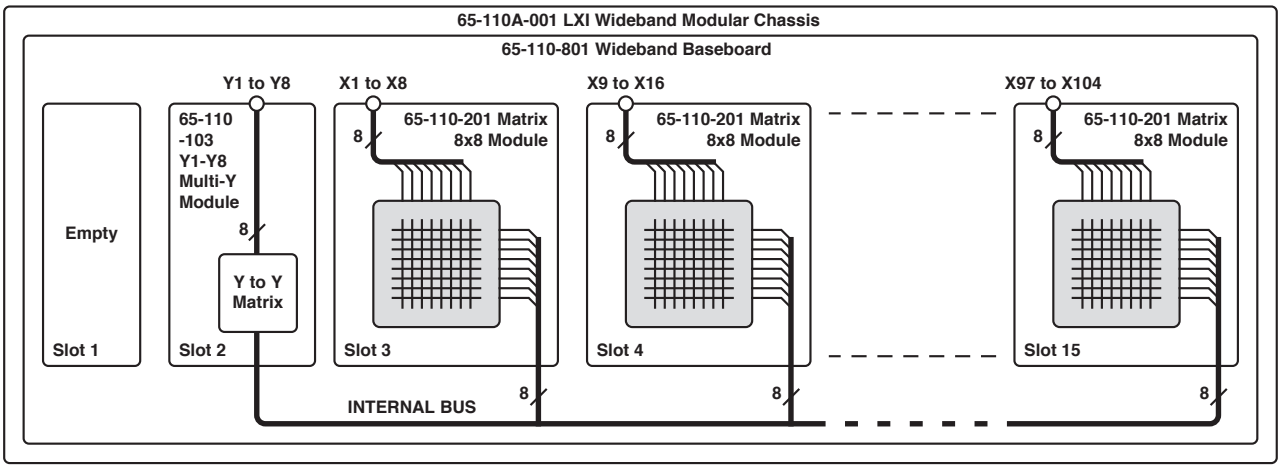
64x16 Matrix Matrix that permits 16 concurrent point to point connections to be made between Y and X.	1 off 65-110A-001 LXI Wideband Modular Chassis 1 off 65-110-801 Baseboard 1 off 65-110-101 Y1 Y8 Module 1 off 65-110-102 Y9 Y16 Module 8 off 65-110-202 Matrix 8x16 Modules	**104x16 Matrix** Matrix that permits 16 concurrent point to point connections to be made between Y and X.	1 off 65-110A-001 LXI Wideband Modular Chassis 1 off 65-110-801 Baseboard 1 off 65-110-101 Y1 Y8 Module 1 off 65-110-102 Y9 Y16 Module 13 off 65-110-202 Matrix 8x16 Modules



65-110A Configured as a 104x16 matrix using 65-110A-001 LXI Wideband Modular Chassis, 65-110-801 Wideband Baseboard, 65-110-101 and 65-110-102 Y Modules and 65-110-202 Matrix 8x16 Modules

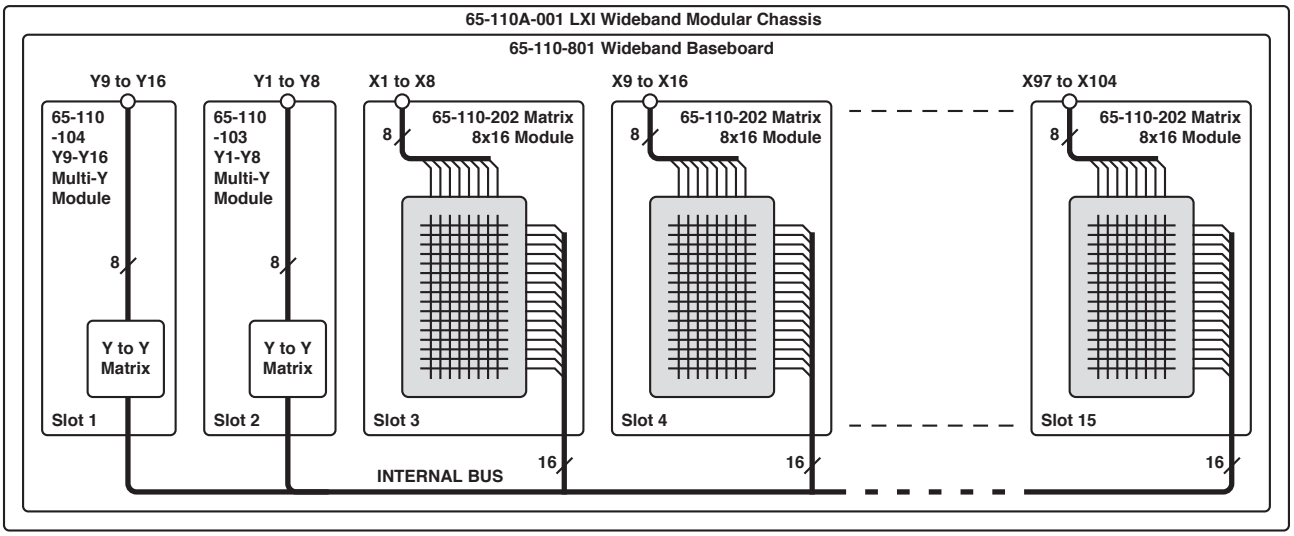
Example Configurations for Multi-Y to X Systems

64x8 Matrix Matrix that permits point to point Y to X connections including multiple Y to X connections.	1 off 65-110A-001 LXI Wideband Modular Chassis 1 off 65-110-801 Wideband Baseboard 1 off 65-110-103 Y1 Y8 Multi-Y Module 8 off 65-110-201 Matrix 8x8 Modules	**104x8 Matrix** Matrix that permits point to point Y to X connections including multiple Y to X connections.	1 off 65-110A-001 LXI Wideband Modular Chassis 1 off 65-110-801 Wideband Baseboard 1 off 65-110-103 Y1 Y8 Multi-Y Module 13 off 65-110-201 Matrix 8x8 Modules

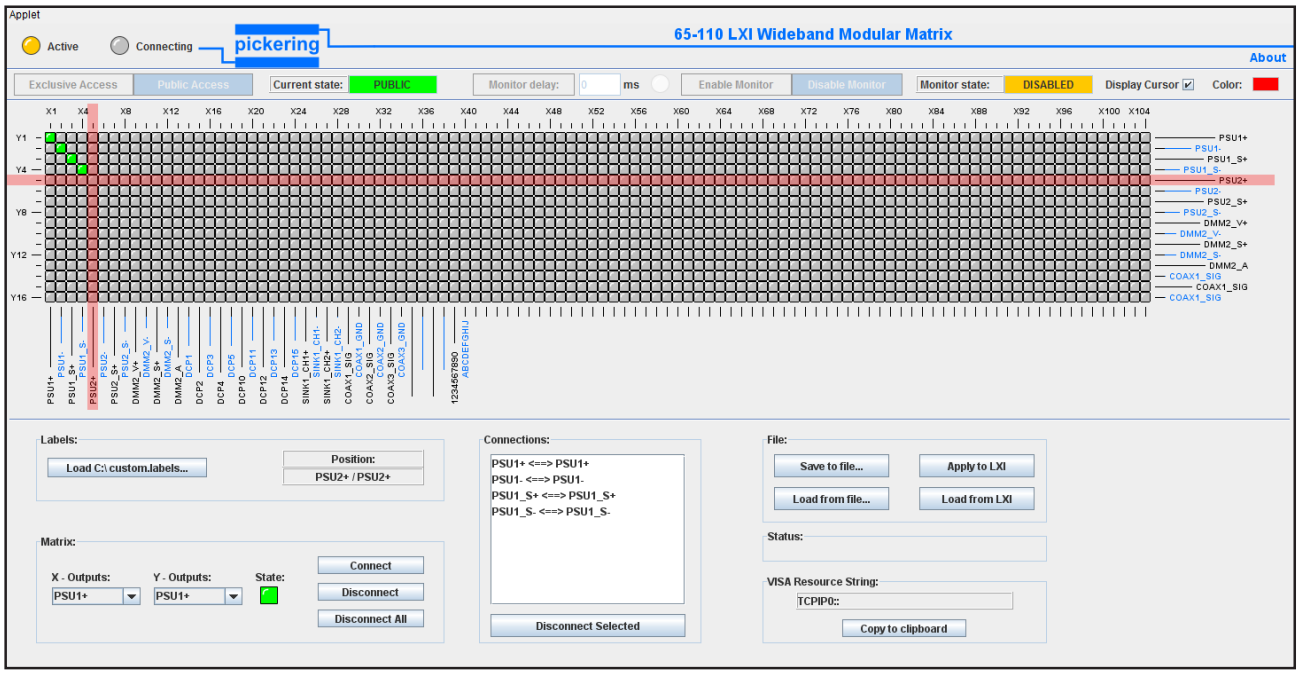


65-110A Configured as a 104x8 matrix using 65-110A-001 LXI Wideband Modular Chassis, 65-110-801 Wideband Baseboard, 65-110-103 Multi-Y Module and 65-110-201 Matrix 8x8 Modules

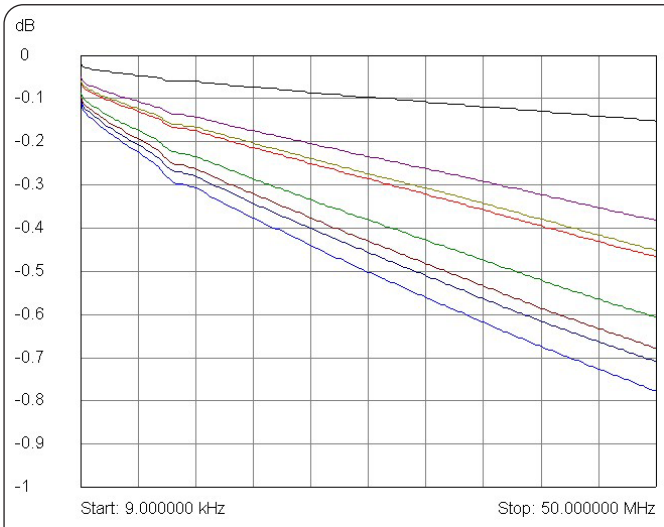
64x16 Matrix Matrix that permits point to point Y to X connections including multiple Y to X connections.	1 off 65-110A-001 LXI Wideband Modular Chassis 1 off 65-110-801 Wideband Baseboard 1 off 65-110-103 Y1 Y8 Multi-Y Module 1 off 65-110-104 Y9 Y16 Multi-Y Module 8 off 65-110-202 Matrix 8x16 Modules	**104x16 Matrix** Matrix that permits point to point Y to X connections including multiple Y to X connections.	1 off 65-110A-001 LXI Wideband Modular Chassis 1 off 65-110-801 Wideband Baseboard 1 off 65-110-103 Y1 Y8 Multi-Y Module 1 off 65-110-104 Y9 Y16 Multi-Y Module 13 off 65-110-202 Matrix 8x16 Modules



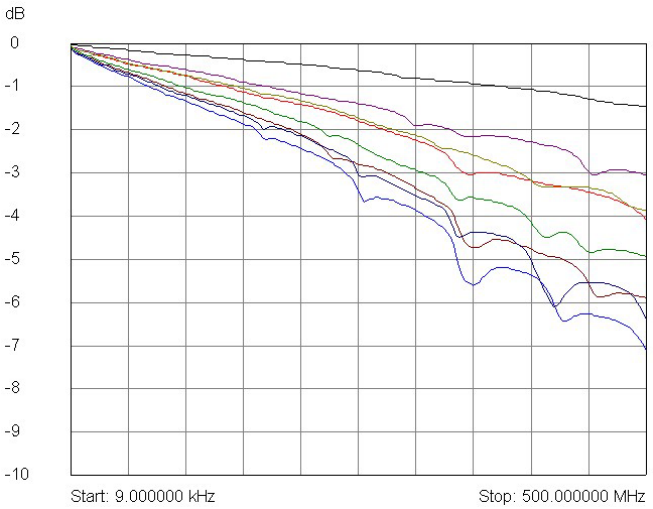
65-110A Configured as a 104x16 matrix using 65-110A-001 LXI Wideband Modular Chassis, 65-110-801 Wideband Baseboard, 65-110-103 and 65-110-104 Multi-Y Modules and 65-110-202 Matrix 8x16 Modules



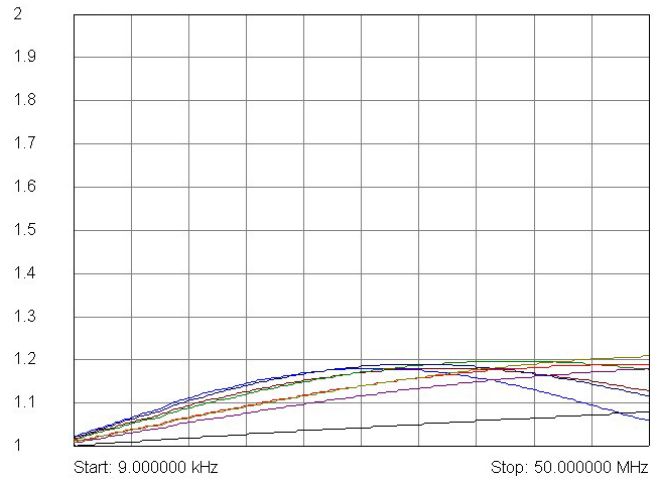
Example of the 65-110A Soft Front Panel



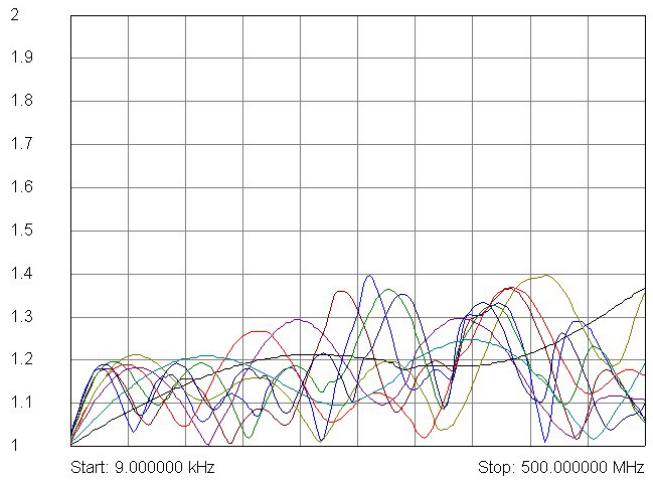
Typical Insertion Loss plot to 50MHz for a 104x16 matrix showing a selection of routes including shortest (Y8 to X8) and longest (Y9 to X104)



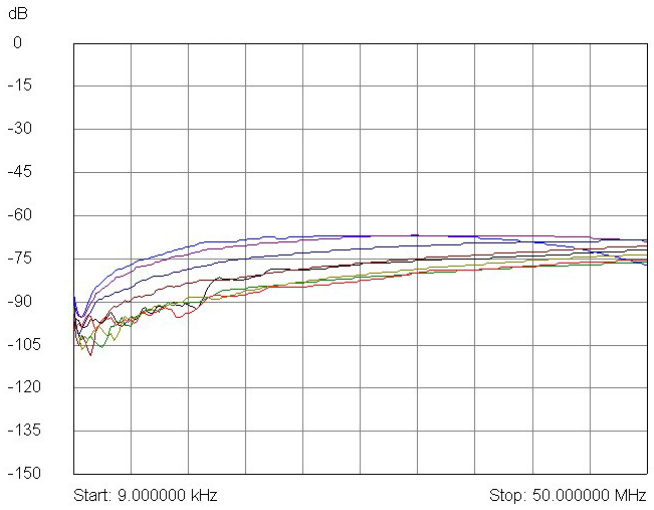
Typical Insertion Loss plot to 500MHz for a 104x16 matrix showing a selection of routes including shortest (Y8 to X8) and longest (Y9 to X104)



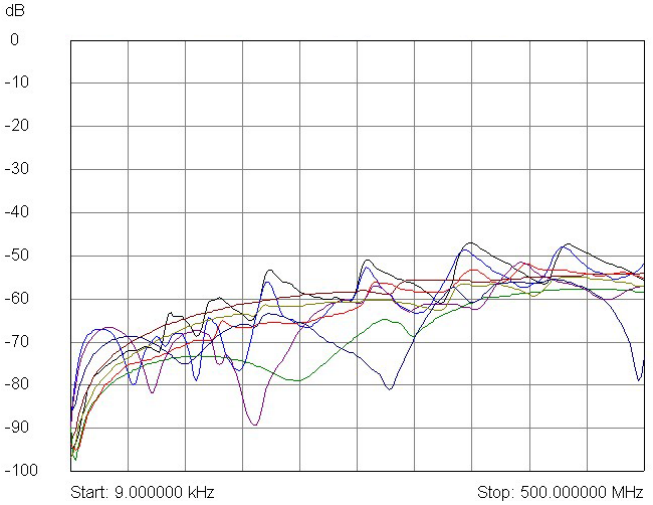
Typical VSWR plot to 50MHz for a 104x16 matrix showing a selection of routes including shortest (Y8 to X8) and longest (Y9 to X104)



Typical VSWR plot to 500MHz for a 104x16 matrix showing a selection of routes including shortest (Y8 to X8) and longest (Y9 to X104)



Typical Crosstalk plot to 50MHz for a 104x16 matrix between a selection of adjacent routes



Typical Crosstalk plot to 500MHz for a 104x16 matrix between a selection of adjacent routes

Matrix Specification

General:	Provides 8 or 16 concurrent Y to X point to point connections. Multi-Y versions allow an X to be connected to multiple Y. X to X connections are not supported.
Maximum Size:	104x16
Matrix Bandwidth:	>200MHz, usable to 500MHz for point to point Y to X connections or a multi-Y system where only point to point Y to X is set. For multi-Y to X connections see manual.
Matrix Crosstalk:	Typically better than 60dB at 30MHz on Y to X connection.
Maximum Recommended Carry Current:	0.07A
Input impedance:	Designed for 50Ω system, unused inputs can be terminated in open circuit or 50Ω, termination power 0.25W maximum.
Relay Type:	Electro-mechanical
Matrix Setting Time:	5ms
Matrix Path Resistance:	<3Ω (Y to X)

Mechanical Specification

Chassis Dimensions:	4U rack mountable full width, depth 500mm.
Number of Modules Supported:	15, 2 of which are Y plugin modules.
RF Connectors:	SMB connectors for all front panel connections.
Chassis Cooling:	Front air intakes through plugin module holes, temperature controlled speed adjustable fans.

Power Source

Universal AC mains supply, 90-120/200-240V 50-60Hz.

Power Inlet:	Male IEC connector
Power Rating:	100VA maximum
Fuse Rating:	(F) 5A 250V

LAN Interface

1000Base-T Ethernet Interface with a standard RJ-45 connector mounted on the rear panel. Compliant to LXI Standard 1.5

Self-Test

Built in self-test system checks path resistance of all installed modules and identifies any problem modules. Graphical output locates faulty relays and their location.

Power supply monitor provided and full system start up checks of controller.

Operating/Storage Conditions

Operating Conditions (operating with specified airflow)

Operating Temperature:	0°C to +55°C
Humidity:	10% to 95% non-condensing

Storage and Transport Conditions

Storage Temperature:	-20°C to +70°C
Humidity:	10% to 90% non-condensing

Safety, CE & RoHS 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.

The 65-110A chassis also complies with the European Restriction of Hazardous Substances directive (RoHS).

Product Order Codes

Specify which modules are required to build the matrix, Pickering Interfaces will supply the chassis with the modules installed if ordered at the same time. Plug-in modules can be ordered for chassis already supplied.
Users should choose either x8 or x16 Y axis size, the chassis is common to both configurations.
Note: Chassis and Baseboard must be ordered at the same time.

65-110A LXI Wideband Modular LXI Chassis

LXI Wideband Modular Chassis	**65-110A-001**
LXI Wideband Baseboard	**65-110-801**

65-110A LXI Wideband Modular Chassis Y Plugin Module (order both when using a x16 configuration)

Y1 Y8 Module	**65-110-101**
Y9 Y16 Module	**65-110-102**

65-110A LXI Wideband Modular Chassis Multi-Y Plugin Module (order both when using a x16 configuration)

Y1 Y8 Module	**65-110-103**
Y9 Y16 Module	**65-110-104**

65-110 LXI Wideband Modular Chassis X Plugin Module (order as required of one type up to 13 modules per chassis)

Matrix 8x8 Module	**65-110-201**
Matrix 8x16 Module	**65-110-202**

Example Ordering Configurations for Y to X Point to Point Matrices

64x8 RF Matrix:

1 x 65-110A-001	LXI Wideband Modular Chassis
1 x 65-110-801	Wideband Baseboard
1 x 65-110-101	Y1 Y8 Module
8 x 65-110-201	Matrix 8x8 Module

104x16 RF Matrix:

1 x 65-110A-001	LXI Wideband Modular Chassis
1 x 65-110-801	Wideband Baseboard
1 x 65-110-101	Y1 Y8 Module
1 x 65-110-102	Y9 Y16 Module
13 x 65-110-202	Matrix 8x16 Module

Please contact the Pickering sales office for assistance in configuring your LXI Wideband Modular Matrix.

Overall Matrix Size	Plugin Modules Required			
	Y1 Y8 Module 65-110-101 or 65-110-103 (multi-Y only)	Y9 Y16 Module 65-110-102 or 65-110-104 (multi-Y only	8x8 Matrix Module 65-110-201	8x16 Matrix Module 65-110-202
24x8	1	—	3	—
32x8	1	—	4	—
40x8	1	—	5	—
48x8	1	—	6	—
56x8	1	—	7	—
64x8	1	—	8	—
72x8	1	—	9	—
80x8	1	—	10	—
88x8	1	—	11	—
96x8	1	—	12	—
104x8	1	—	13	—
16x16	1	1	—	2
24x16	1	1	—	3
32x16	1	1	—	4
40x16	1	1	—	5
48x16	1	1	—	6
56x16	1	1	—	7
64x16	1	1	—	8
72x16	1	1	—	9
80x16	1	1	—	10
88x16	1	1	—	11
96x16	1	1	—	12
104x16	1	1	—	13

Support Products

Mating Connectors & Cabling

For connection accessories for the 65-110A range please refer to the 90-011D RF Cable Assemblies data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

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.

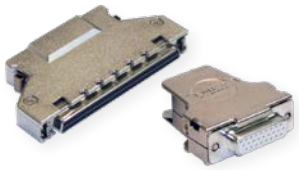
Customization can include:

- 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.

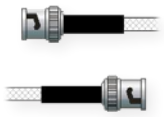
Connectivity Solutions

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.

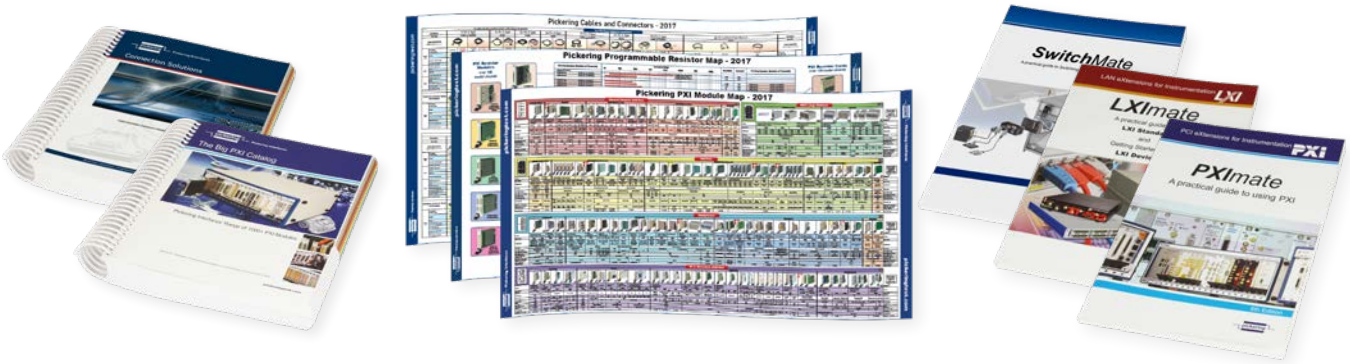
To learn more, please go to: pickeringtest.com/ebirst

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