LXI 18 GHz 12x12 Matrix With Loop-back 60-891-006

- 12x12 RF Matrix With Loop-back
- 18 GHz Bandwidth
- Compact 6U Form Factor
- Construction Permits Ease of Assembly/ Maintenance
- Compatible With Switch Path Manager for End to End Path Setting
- Relay Counting Available
- LXI Standard 1.5 Compliant
- IVI & Direct I/O Drivers
- 3 Year Warranty

Pickering Interfaces' 60-891-006 is a compact 50 Ω microwave switching matrix with added loop-back functionallity and a maximum bandwidth of 18 GHz.

It is ideal for constructing complex microwave switching systems for many applications. Connection is by high performance rear panel mounted N-type connectors.

The 60-891-006 matrix is constructed from interconnected microwave tree multiplexers which alllows the routing of any single input port to any single output port.

Controlling the Matrix

The 60-891-006 matrix is controlled through an LXI interface based on Ethernet 1000Base-T. This provides a quick and easy method of installing the unit and a simple way of controlling it from a remote location through its API or built in soft front panel. The ability to control the unit at a distance allows the testing of systems without the need for a physical presence.

Easy Repair

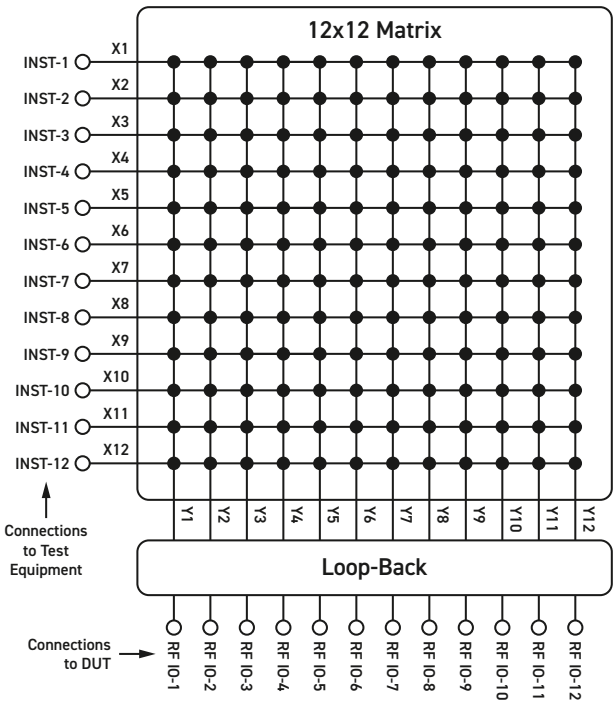
The construction of the 60-891-006 permits ease of assembly and maintenance. All the cabling required to create the switching configuration is contained within the unit for a neat solution in a small form-factor.

Other Microwave Switching Configurations

Pickering Interfaces is able to offer other microwave switching solutions, if you have a custom requirement for switching please contact your local Pickering Interfaces sales representative.

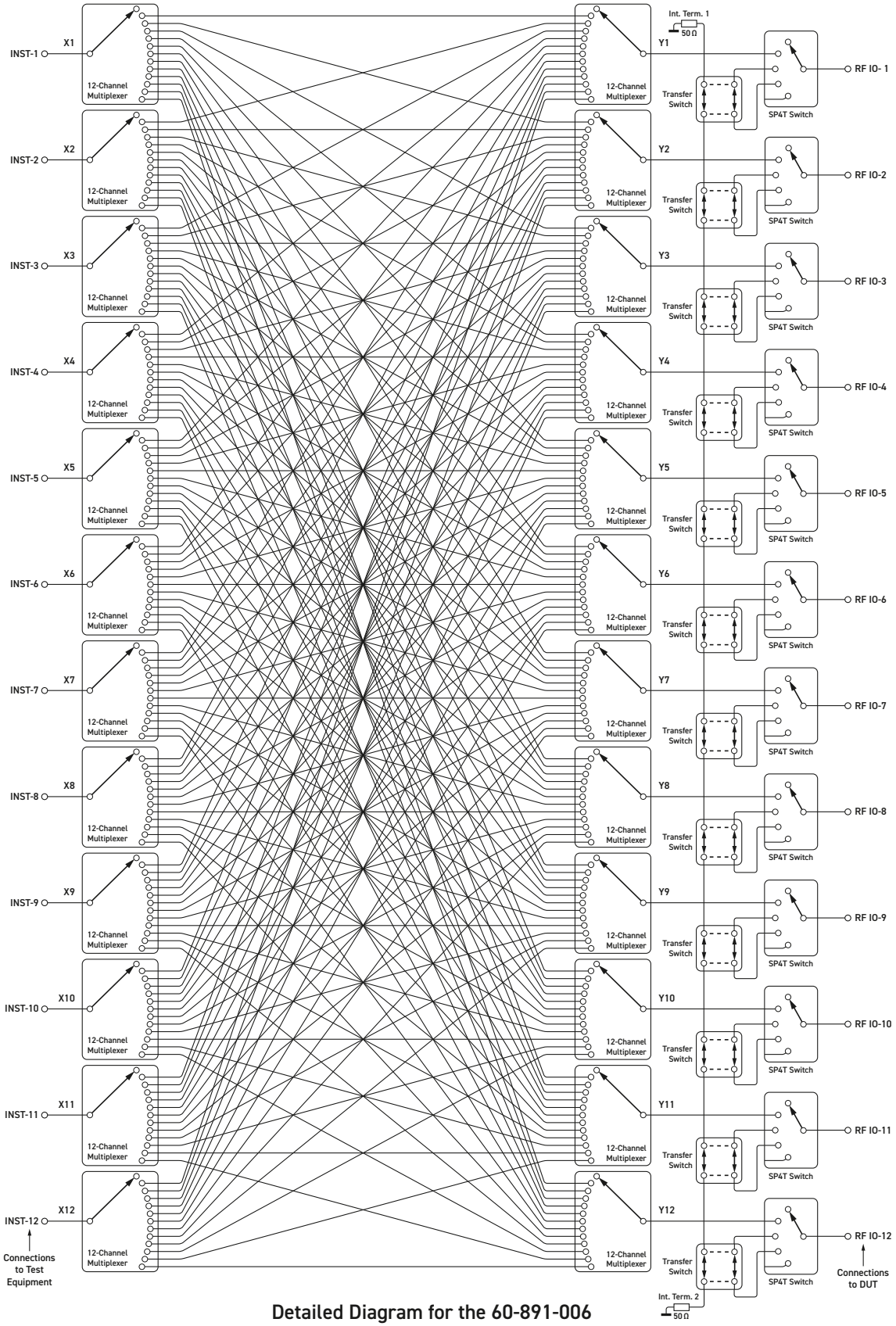
Switch Path Manager

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



Simplified Diagram for the 60-891-006 12x12 Microwave Matrix With Loop-back

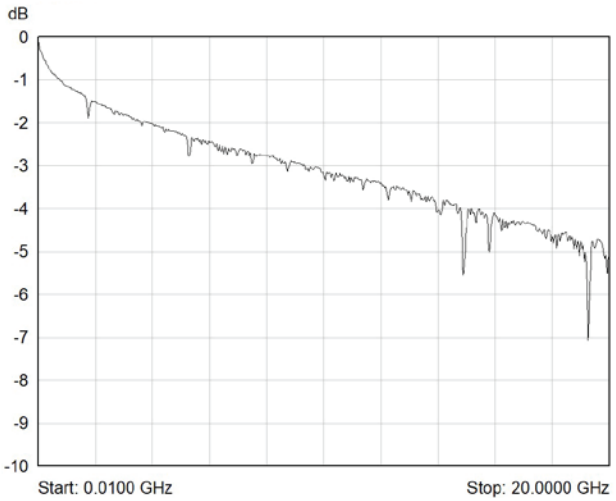
Issue 1.4 March 2024



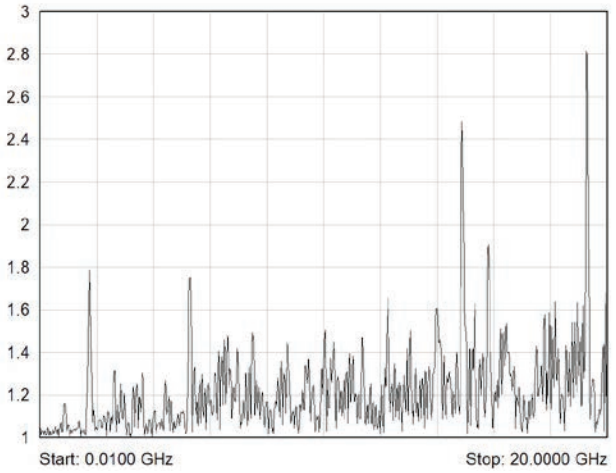
Detailed Diagram for the 60-891-006
12x12 Microwave Matrix With Loop-back

Specification - 18 GHz 12x12 Matrix

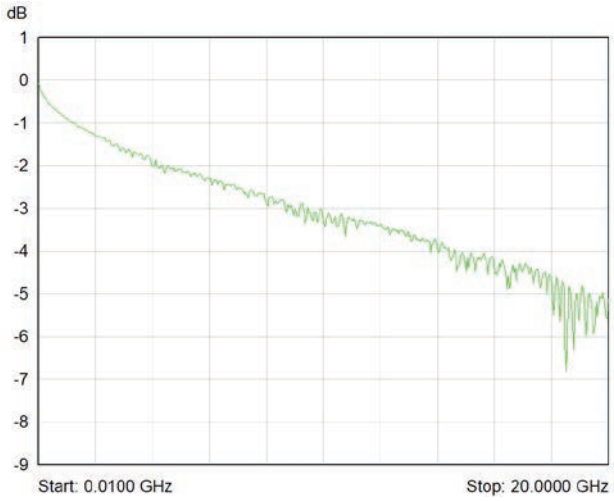
Configuration:	12x12 Microwave blocking matrix
Operate Time:	Typically 15 ms
Characteristic Impedance:	50 Ω
Connectors:	N-type
Bandwidth	DC to 18 GHz
Isolation:	>120 dB
Insertion Loss (typical):	7 dB - Input to RFIO RFIO (port X) to RFIO (port X+Y) 3 dB (Y = 1) 4.5 dB (2 <= Y <=5) 9.5 dB (6 <= Y <= 11)
VSWR (typical unless stated):	2.0:1 (typical) / 2.3:1 (max) – Input to RFIO RFIO (port X) to RFIO (port X+Y) 2.0:1 (Y = 1) 2.5:1 (2 <= Y <=5) 2.8:1 (6 <= Y <= 11)



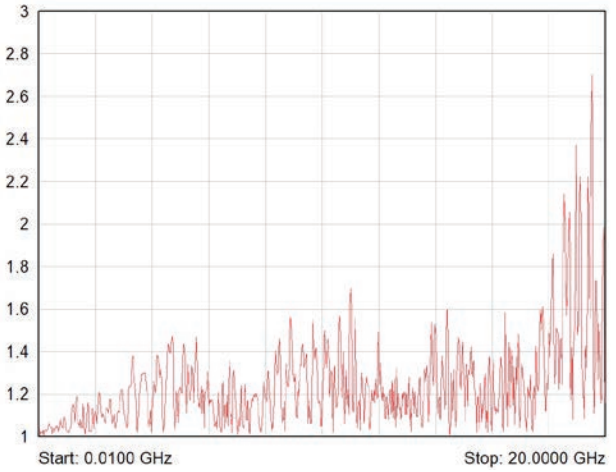
Typical Insertion Loss Plot for Loop-back Paths



Typical VSWR Plot for Loop-back Paths



Typical Insertion Loss Plot for Matrix Paths



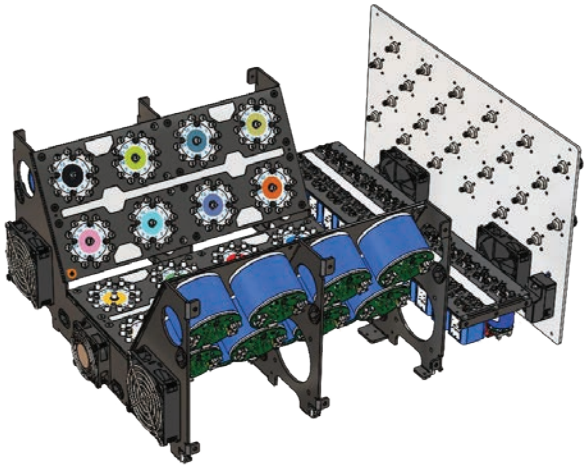
Typical VSWR Plot for Matrix Paths

Power Source

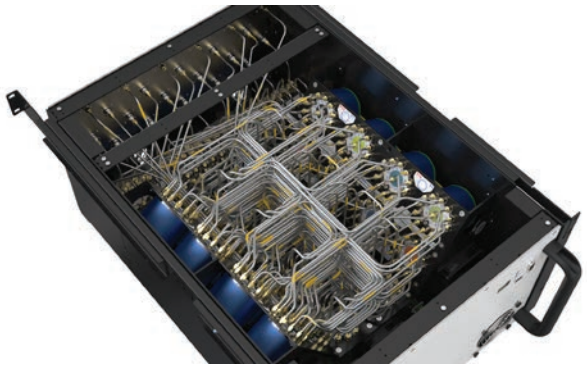
Universal AC mains supply, 90-120/200-240 V 50-60 Hz	
Power Inlet:	Male IEC connector
Power Rating:	100 VA maximum
Fuse Rating:	5 A, 250 V

LAN Interface

Compliant to LXI Standard 1.5, the 60-891-006 has a 1000Base-T Ethernet Interface via a standard RJ-45 connector mounted on the rear panel with an LCD display showing the unit's IP address.



60-891-006 12x12 Microwave Matrix with covers removed and without internal cabling showing positions of relays



60-891-006 12x12 Microwave Matrix with top cover removed showing internal cabling

Mechanical Characteristics

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

Dimensions: 6U high, full 19" rack width, 24" deep.

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

LXI Status Indicators

Front panel mounted LEDs:

- Power
- Ready
- Error
- LAN
- Active

Connectors

Signals via rear panel N-type connectors.

Cooling

Cooling assisted by internal fans. Air is drawn in via front panel intakes and expelled through vents in the rear panel below the signal connectors.

Operating/Storage Conditions

Operating Temperature:	0 °C to +55 °C
Humidity:	Up to 90% non-condensing
Altitude:	5000 m
Storage/Transport Temperature:	-20 °C to +75 °C
Humidity:	Up to 90% non-condensing
Altitude:	15000 m

Safety & CE Compliance

All modules are fully CE compliant and meet applicable EU directives:

Low-voltage safety EN61010-1:2010,
EMC Immunity EN61326-1:2013,
Emissions EN55011:2009+A1:2010.

Product Order Codes

LXI 12x12 Microwave Matrix with Loop-back, 50 Ω, 18 GHz	60-891-006
Accessories	
RF Service Kit, SMA (supplied with unit)*	63-8xx-901

* See user manual for details.

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.

Support Products

Mating Connectors & Cabling

For connection accessories for the 60-891-006 unit 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 our website.

Further LXI RF Switching Solutions from Pickering Interfaces

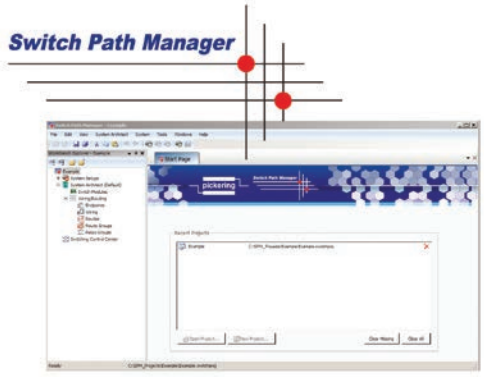
60-750/751 LXI Microwave Matrix. Bandwidth up to 20 GHz and is available in sizes from Single 3x3 up to Dual 4x4 with Loop-Thru and termination options.

60-721 A LXI 72-Channel High Performance Video Multiplexer with a 1 GHz bandwidth.

60-801/802 LXI Microwave Multiplexer, up to 40 GHz bandwidth and support for up to 16 banks of 6 or 4 way multiplexers.

Pickering Switch Path Manager™ – Signal Routing Software

- Manages Complex Switching Systems
- Reduces Switching Software Development Effort
- Provides Automated or Pre-defined Signal Routing
- Provides Static or Dynamic Routing
- Signal Isolation and Endpoint Protection Technology
- Manual Control Capability

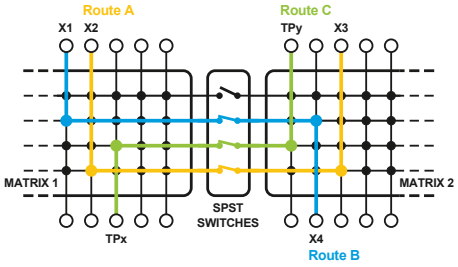


Signal Routing Made Simple

Switch Path Manager, simplifies the routing of signals through switching systems and speeds up the development of switching system software. It supports Pickering Interfaces switching products and the interconnection between these products. Third-party products can be supported on request.

Once a switching system model has been created, signal routing can be performed by simply defining the endpoints that are required to be connected together. The ability to automate signal routing results in simple and effective switching system management, safe and fast. The short circuit detection feature avoids unwanted shorts between routes.

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



Switch Path Manager
Signal Routing Example

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. These accessories are detailed in Connector Accessories data sheets, where a complete list and documentation can be found for each accessory.

Connectors & Backshells

Multi-way Cable Assemblies

RF Cable Assemblies

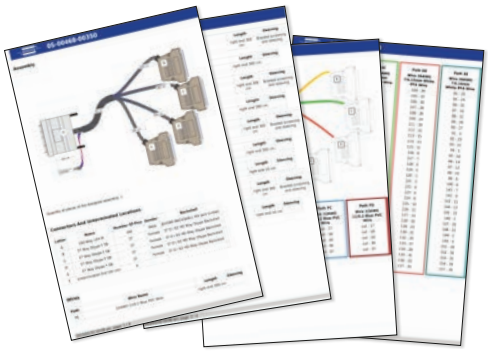
Breakouts

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.

- Fully supported on modern browsers and tablet operating systems.
- Built-in tutorials and videos allow you to get quickly up to speed.
- Store cable assemblies in the Cloud and develop over time.
- Each cable design has a downloadable PDF documentation file detailing all specifications

Start designing your custom cabling, go to pickeringtest.com/cdt



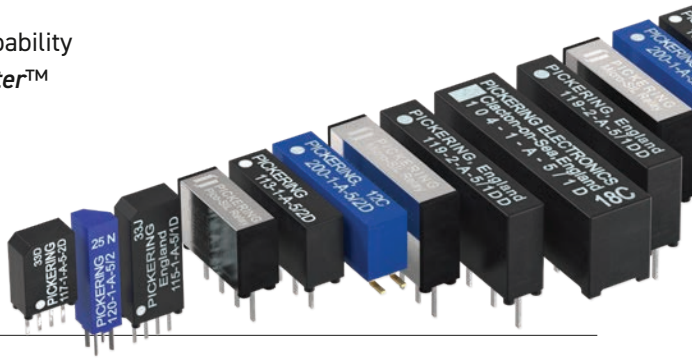
Mass Interconnect

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

Pickering Reed Relays

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

To learn more go to pickeringrelay.com



Programming

Pickering provide kernel, IVI and VISA (NI & Keysight) drivers which are compatible with all Microsoft supported versions of Windows and popular older versions.

For more information go to pickeringtest.com/os

The VISA driver support is provided for LabVIEW Real Time Operating Systems (Pharlap and Linux-RT). For other RTOS support contact Pickering. These drivers may be used with a variety of programming environments and applications including:

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

Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help you develop test routines with ease.

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

Signal Routing Software

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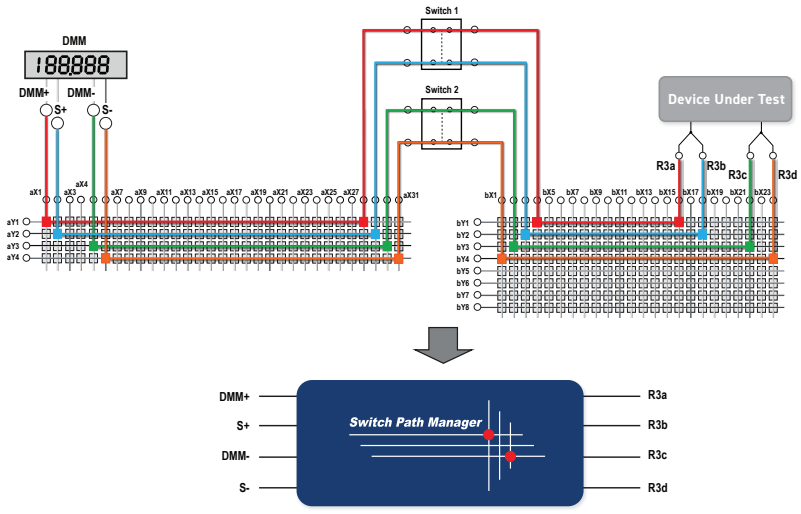

Diagnostic Relay Test Tools

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 go to pickeringtest.com/ebirst

Three Year Warranty & Guaranteed Long-Term Support

All standard products manufactured by Pickering Interfaces are warranted against defective materials and workmanship for three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available with various levels for 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 go to pickeringtest.com/support

Available Product Resources

We have a library of resources including success stories, product and support videos, articles and white papers as well as application-specific brochures to assist you. We have also published reference books on switching technology and the PXI and LXI standards.

To view, download or request any of our product resources go to pickeringtest.com/resources