PXI/PXIe SP4T+SPDT RF Switch

- Available as a PXI or PXIe Module
- Up To 8 off SP4T & 4 off SPDT in a Single Module
- 1.8 GHz Switching (50 Ω SMB Version)
- 1.3 GHz Switching (75 Ω SMB Version)
- 1.3 GHz Switching (50 Ω Multiway Version)
- 1.3 GHz Switching (75 Ω Multiway Version)
- SMB and Multiway Connector Versions
- Low Cost, High Performance
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- PXI Versions Supported by PXI or LXI Chassis
- PXIe Versions Supported by PXI Hybrid or PXIe Chassis
- Supported by *eBIRST ™* Test Tools
- 3 Year Warranty

The 40-755A-9xx (PXI) and 42-755A-9xx (PXIe) are high density RF switches available in 50 Ω and 75 Ω variants with up to 8xSP4T & 4xSPDT switches in a single PXI module. They are available with two connector options; SMB that provides a frequency range of 1.8 GHz (50 Ω) / 1.3 GHz (75 Ω), or multiway which limits the bandwidth to 1.3 GHz but offers a high density solution occupying one PXI slot. The connectors used are fully supported by the range of Pickering Interfaces connection solutions.

The module offers low insertion loss and low VSWR through its usable frequency range and each switch has been designed to have path independent loss. The array of switches can be connected into alternative configurations through the use of external cabling.

The 4x-755A is supplied with drivers that allow the user to support the module in all popular PXI software environments. In addition, the PXI version of the module can be supported in all Pickering's LXI Modular Chassis, allowing the use of a PXI or LAN controlled switching solution with the same high levels of performance.

4x-755A RF Multiplexer Range:

- 8 off SP4T + 4 off SPDT, SMB Connectors, Dual Slot, 50 Ω (1.8 GHz) or 75 Ω (1.3 GHz)
- 8 off SP4T + 4 off SPDT, Multiway Connectors, Single Slot, 50 Ω (1.3 GHz) or 75 Ω (1.3 GHz)
- 4 off SP4T, + 2 off SPDT, Multiway Connector, Single Slot, 50 Ω (1.3 GHz) or 75 Ω (1.3 GHz)
- 3 off SP4T, + 1 off SPDT, SMB Connector, Single Slot, 50 Ω (1.8 GHz) or 75 Ω (1.3 GHz)

Supported by *eBIRST*

This product is supported by eBIRST test tools which simplify fault-finding by quickly testing the system and graphically identifying the faulty relay.
For more information go to: pickeringtest.com/ebirst
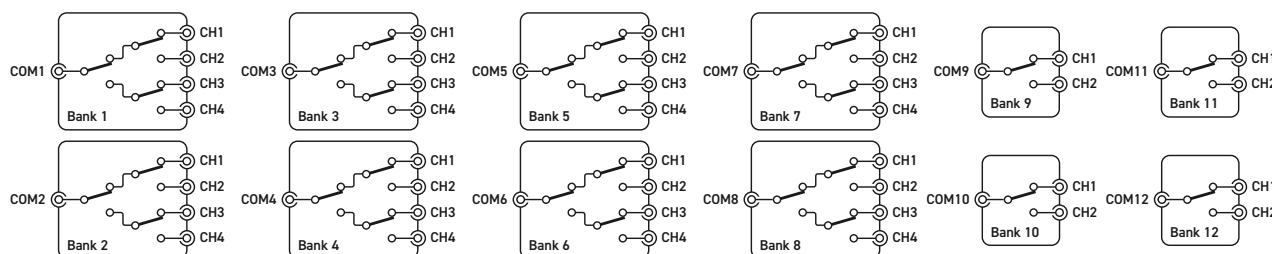
4x-755A-902/903 10 off SP4T + 4 off SPDT RF Switch Schematic Diagram (Default Switch Paths Shown)

Issue 1.1 November 2023

4x-755A-902 Specification - 50 Ω with Multiway Connectors

RF Specification - SP4T Switches

Impedance:	50 Ω
RF Frequency Range:	DC to 1.3 GHz
Insertion Loss:	<1 dB to 500 MHz (typical)
	<2 dB to 1 GHz (typical)
	<3.5 dB to 1.3 GHz (typical)
VSWR:	<1.5:1 to 500 MHz (typical)
	<2.4:1 to 1 GHz (typical)
	<4:1 to 1.3 GHz (typical)
Isolation:	>70 dB to 500 MHz (typical)
	>60 dB to 1 GHz (typical)
	>55 dB to 1.3 GHz (typical)
Crosstalk:	<-60 dB to 500 MHz (typical)
	<-55 dB to 1 GHz (typical)
	<-55 dB to 1.3 GHz (typical)
Maximum RF Power:	10 W at 1.3 GHz

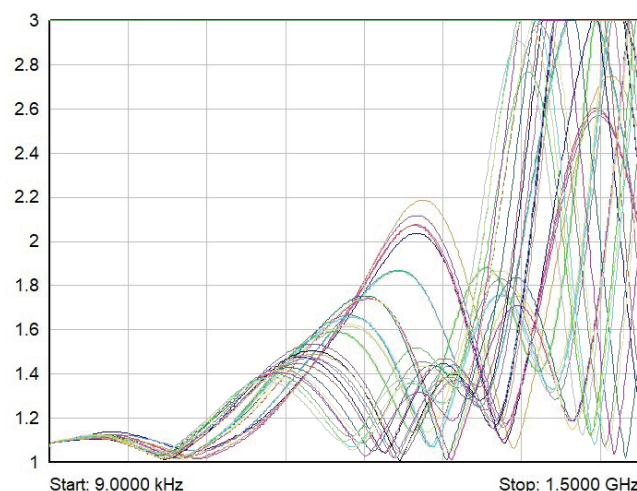### RF Specification - SPDT Switches

Impedance:	50 Ω
RF Frequency Range:	DC to 1.3 GHz
Insertion Loss:	<1 dB to 500 MHz (typical)
	<2 dB to 1 GHz (typical)
	<2.5 dB to 1.3 GHz (typical)
VSWR:	<1.3:1 to 500 MHz (typical)
	<1.8:1 to 1 GHz (typical)
	<3.1:1 to 1.3 GHz (typical)
Isolation:	>70 dB to 500 MHz (typical)
	>65 dB to 1 GHz (typical)
	>55 dB to 1.3 GHz (typical)
Crosstalk:	<-60 dB to 500 MHz (typical)
	<-55 dB to 1 GHz (typical)
	<-55 dB to 1.3 GHz (typical)
Maximum RF Power:	10 W at 1.3 GHz

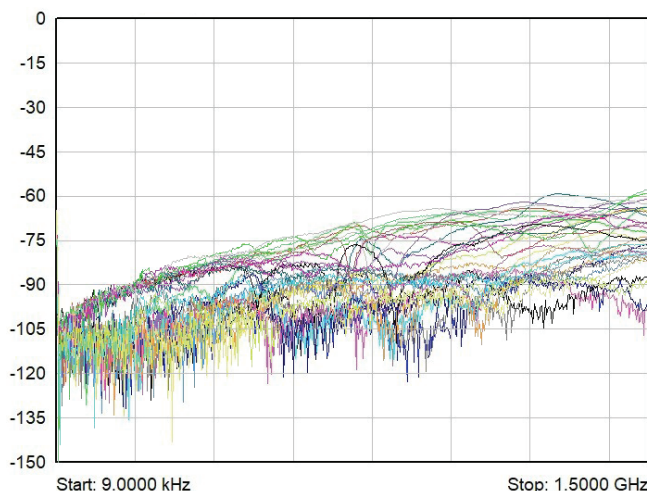### Other Switching Specification

Max Hot Switch Voltage:	200 VDC or AC peak
Max Hot Switch Current:	1 A
Max Cold Switch Current:	1 A
Max Hot Switch Power:	10 W
Operating Time:	3 ms typical
Life Expectancy:	10 million operations at <100 mW
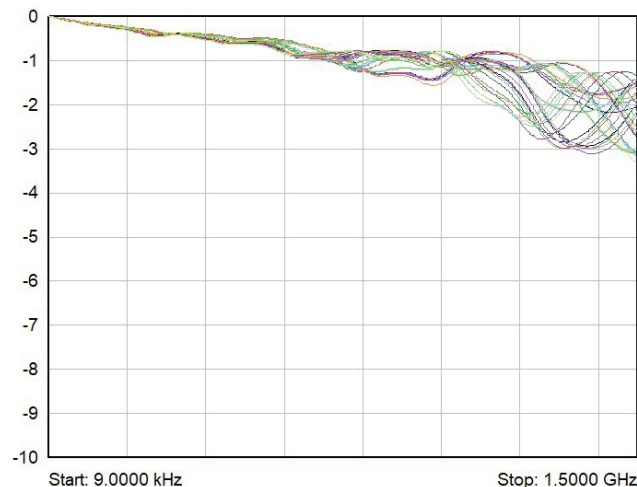
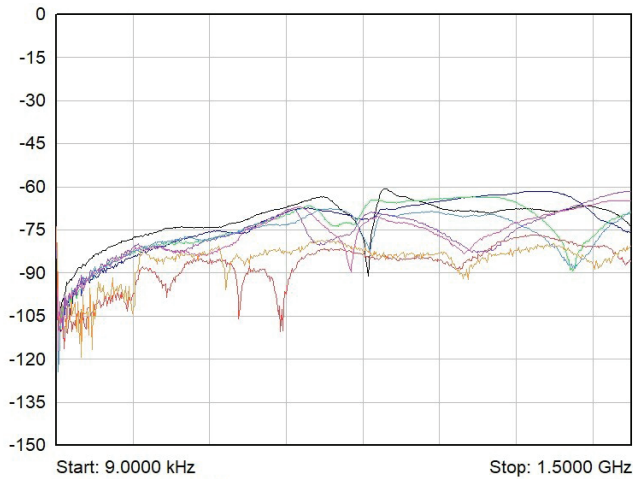SP4T Switches - Typical insertion loss plot (dB)

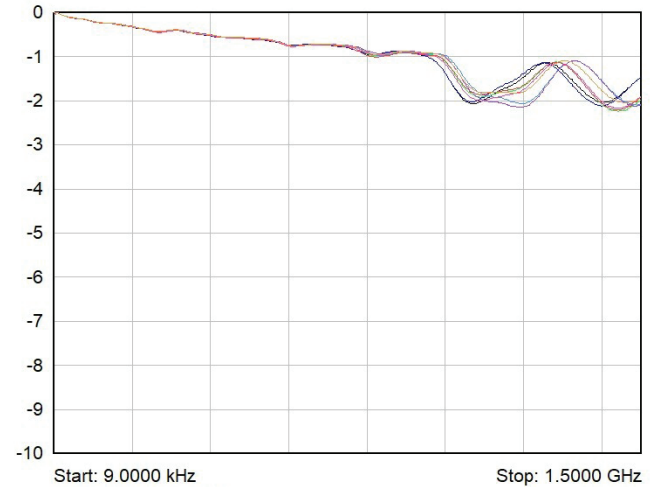SP4T Switches - Typical VSWR plot

SP4T Switches - Typical channel to common isolation plot (dB)

4x-755A-902 Specification - 50 Ω with Multiway Connectors - Continued
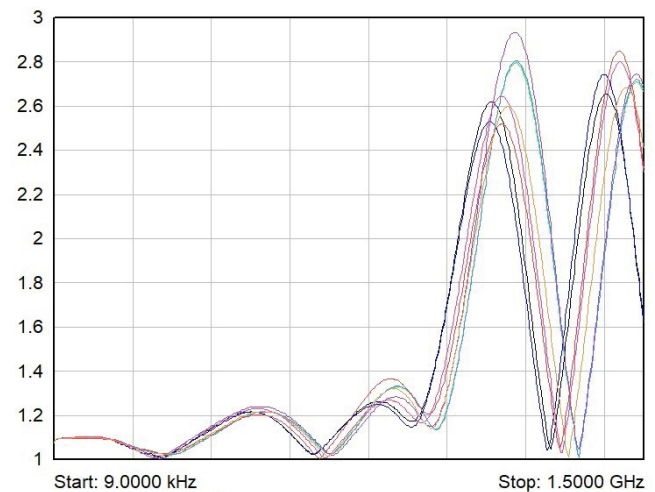

Typical bank to bank crosstalk plot (dB)
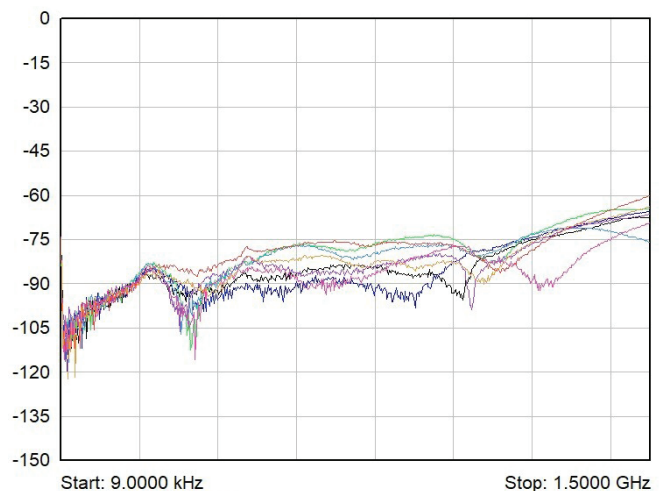

SPDT Switches - Typical insertion loss plot (dB)

**40-755A-902 8off SP4T + 4off SPDT RF Switch
with MS-M RF multiway connectors**

SPDT Switches - Typical VSWR plot

SPDT Switches - Typical channel to common isolation plot (dB)

Power Requirements - 40-755A-9xx

+3.3 V	+5 V	+12 V	-12 V
1 A	0.65 A	0	0

Power Requirements - 42-755A-9xx

+3.3 V	+12 V
0.4 A	0.1 A

Mechanical Characteristics

- 40-755A-902/912/913   Single slot 3U PXI (CompactPCI card)
- 40-755A-903   Dual slot 3U PXI (CompactPCI card)
- 40-755A-922/932/933   Single slot 3U PXI (CompactPCI card)
- 40-755A-923   Dual slot 3U PXI (CompactPCI card)
- 42-755A-902/912/913   Single slot 3U PXIe, compatible with PXIe hybrid slot
- 42-755A-903   Dual slot 3U PXIe, compatible with PXIe hybrid slot
- 42-755A-922/932/933   Single slot 3U PXIe, compatible with PXIe hybrid slot
- 42-755A-923   Dual slot 3U PXIe, compatible with PXIe hybrid slot

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

PXI & CompactPCI Compliance - 40-755A-9xx

The module is compliant with the PXI Specification 2.2. Local Bus, Trigger Bus and Star Trigger are not implemented. Uses a 33 MHz 32-bit backplane interface.

PXIe Compliance - 42-755A-9xx

The module is compliant with the PXIe Specification 1.0. Local Bus, Trigger Bus & Star Trigger are not implemented.

Connectors

40-755A - PXI bus via 32-bit P1/J1 backplane connector.

42-755A - PXIe bus via XJ3 and XJ4 backplane connectors.

Signals via front panel RF connectors:

- 4x-755A-912   1off high density male 26-pin MS-M RF multi-way connector
- 4x-755A-902   2off high density male 26-pin MS-M RF multi-way connector
- 4x-755A-913   18off SMB coaxial connectors
- 4x-755A-903   52off SMB coaxial connectors
- 4x-755A-932   1off high density male 26-pin MS-M RF multi-way connector
- 4x-755A-922   2off high density male 26-pin MS-M RF multi-way connector
- 4x-755A-933   18off SMB coaxial connectors
- 4x-755A-923   52off SMB coaxial connectors

For pin outs please refer to the operating manual.

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.

Operating/Storage Conditions

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

Product Order Codes

PXI SP4T + SPDT RF Switch, 50 Ω:

8off SP4T + 4off SPDT, 1.3 GHz Multiway	40-755A-902
4off SP4T + 2off SPDT, 1.3 GHz Multiway	40-755A-912
8off SP4T + 4off SPDT, 1.8 GHz SMB	40-755A-903
3off SP4T + 1off SPDT, 1.8 GHz SMB	40-755A-913

PXI SP4T + SPDT RF Switch, 75 Ω:

8off SP4T + 4off SPDT, 1.3 GHz Multiway	40-755A-922
4off SP4T + 2off SPDT, 1.3 GHz Multiway	40-755A-932
8off SP4T + 4off SPDT, 1.3 GHz SMB	40-755A-923
3off SP4T + 1off SPDT, 1.3 GHz SMB	40-755A-933

PXIe SP4T + SPDT RF Switch, 50 Ω:

8off SP4T + 4off SPDT, 1.3 GHz Multiway	42-755A-902
4off SP4T + 2off SPDT, 1.3 GHz Multiway	42-755A-912
8off SP4T + 4off SPDT, 1.8 GHz SMB	42-755A-903
3off SP4T + 1off SPDT, 1.8 GHz SMB	42-755A-913

PXIe SP4T + SPDT RF Switch, 75 Ω:

8off SP4T + 4off SPDT, 1.3 GHz Multiway	42-755A-922
4off SP4T + 2off SPDT, 1.3 GHz Multiway	42-755A-932
8off SP4T + 4off SPDT, 1.3 GHz SMB	42-755A-923
3off SP4T + 1off SPDT, 1.3 GHz SMB	42-755A-933

Product Customization

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

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

42-755A-902 8off SP4T + 4off SPDT RF Switch in PXIe Format

Support Products

eBIRST Switching System Test Tool

This product is supported by the *eBIRST* test tools which simplify the identification of failed relays, the required *eBIRST* tools are below. For more information go to: pickeringtest.com/ebirst

Product	Test Tool	Adaptor	Termination
4x-755A-903/913	93-002-001	93-002-202	93-002-101
4x-755A-902/912	93-006-001	93-006-255	93-006-101
4x-755A-923/933	93-002-001	93-002-202	93-002-101
4x-755A-922/932	93-006-001	93-006-255	93-006-101

Mating Connectors & Cabling

For connection accessories for the SMB version of the 4x-755A-9xx please refer to the 90-011D RF Cable Assemblies data sheet, or for the multiway MS-M connector version please refer to the 90-017D Cable Assemblies where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Pickering can supply cable assemblies for all its modules. The cable shown (MS-M RF to unterminated coax) is suitable for multiway connector versions of the 4x-755A-9xx.

Chassis Compatibility

The PXI versions of this module are compatible with the following chassis types:

- All chassis conforming to the 3U PXI and 3U Compact PCI (cPCI) specification
- Legacy and Hybrid Peripheral slots in a 3U PXI Express (PXIe) chassis
- Pickering Interfaces LXI or LXI/USB Modular Chassis

The PXIe versions of this module are compatible with the following chassis types:

- All chassis conforming to the 3U PXIe specification
- PXIe and Hybrid Peripheral slots in a 3U PXI Express (PXIe) chassis

Chassis Selection Guide

PXI and PXIe (with PXIe and/or Hybrid slots)
Chassis from any Vendor:

- Mix our 1000+ PXI/PXIe switching & simulation modules with any vendor's PXI/PXIe instrumentation
- Embedded or remote Windows PC control
- Real-time Operating System Support
- High data bandwidths, especially with PXI Express
- Integrated module timing and synchronization

Pickering LXI or LXI/USB Modular Chassis
Only accept our PXI Switching & Simulation Modules:

- Choose from 1000+ Pickering PXI Modules
- Ethernet or USB control enables remote operation
- Low-cost control from practically any controller
- LXI provides manual control via Web browsers
- Driverless software support
- Power sequencing immunity
- Ethernet provides chassis/controller voltage isolation
- Independence from Windows operating system
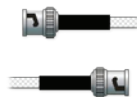
Connectivity Solutions

We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with **1200+** products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed to mechanically and electrically mate to our modules. These accessories are detailed in Connector Accessories data sheets, where a complete list and documentation can be found for each accessory.
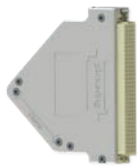
| Connectors & Backshells | Multi-way Cable Assemblies | RF Cable Assemblies | Breakouts | Connector Blocks |

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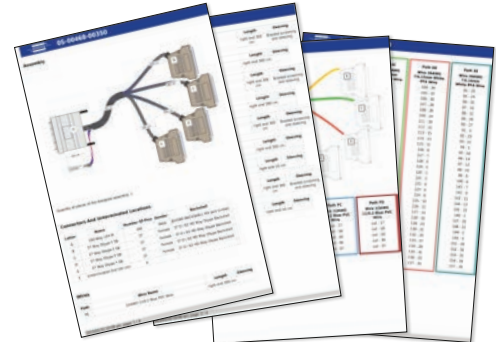
Start designing your custom cabling, go to pickeringtest.com/cdt

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
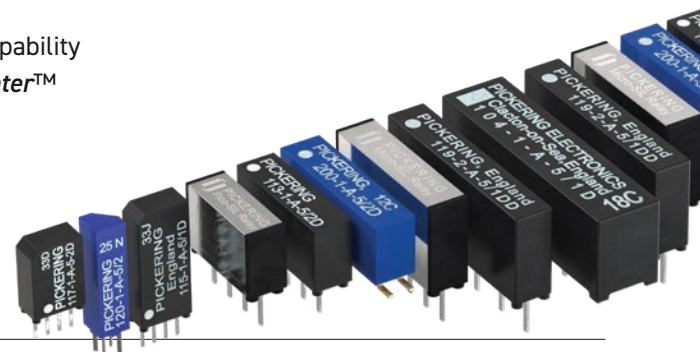
Programming

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

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 go to pickeringtest.com/spm
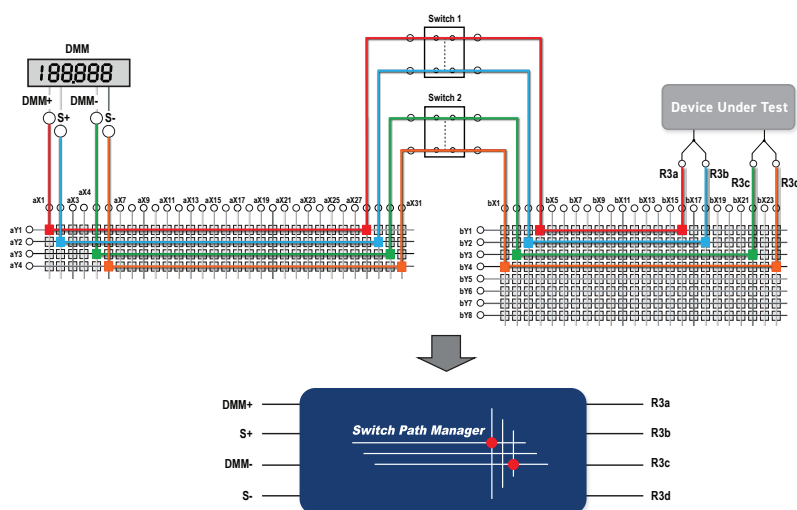
Diagnostic Relay Test Tools

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 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