PXI Ultra High Density Matrix 40-575A/576/577/578/579

- Highest Density Single-Slot 3U PXI 2 A 1-Pole Matrices With up to 448 Crosspoints
- 84x4, 64x6, 50x8, 36x12 & 28x16 Options
- Maximum Current 2 A Hot or Cold Switching
- Switch up to 300 VDC/250 VAC and up to 60 W Max Power
- Uses Gold-Plated Contact Electro-mechanical Relays
- Relay Cycle Counting Included for 40-575A
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- Supported by PXI or LXI Chassis
- Supported by *eBIRST* ™ Test Tool
- 3 Year Warranty

The 40-575A/576/577/578/579 are a range of high density matrix modules able to switch up to 2 A or 300 VDC/250 VAC. They are constructed using high quality electro-mechanical relays for high switching confidence.
The range is as follows:

- 40-575A-001 84x4, 1-Pole Matrix
- 40-576-001 64x6, 1-Pole Matrix
- 40-577-001 50x8, 1-Pole Matrix
- 40-578-001 36x12, 1-Pole Matrix
- 40-579-001 28x16, 1-Pole Matrix

The modules are designed for switching medium voltage and power signals. The user signal connection is via a robust 160-pin DIN 41612, 78-pin D-type or 50-pin D-Type connector that is fully supported by the wide range of Pickering Interfaces cable and connector accessories.

Supported by *eBIRST*

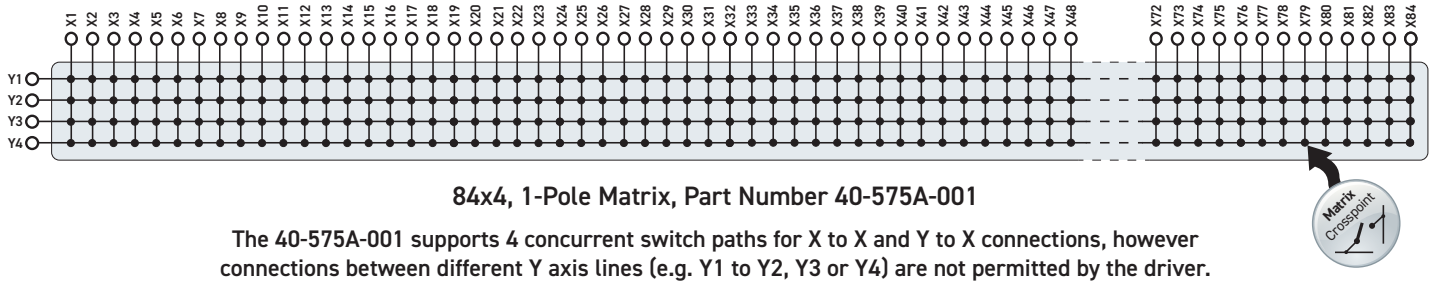
eBIRST switching system test tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.
For more information go to: pickeringtest.com/ebirst

Updated Product Information

The 40-575A has been introduced as a “form & fit” update to the 40-575, the changes are to provide an updated bus interface which will require the use of an updated software driver. Otherwise, the electrical performance is very similar and the pinout is identical.

Relay Cycle Counting

To aid with module “health” monitoring, the 40-575A is provided with a relay cycle counting cycle feature. The number of operations per contact are stored on the module and can be used to determine if a relay is approaching EOL. This information could allow system connections to be revised so that signals applied to heavily used contacts are swapped with lightly used contacts to prolong the working life of the relay(s).



84x4, 1-Pole Matrix, Part Number 40-575A-001

The 40-575A-001 supports 4 concurrent switch paths for X to X and Y to X connections, however connections between different Y axis lines (e.g. Y1 to Y2, Y3 or Y4) are not permitted by the driver.

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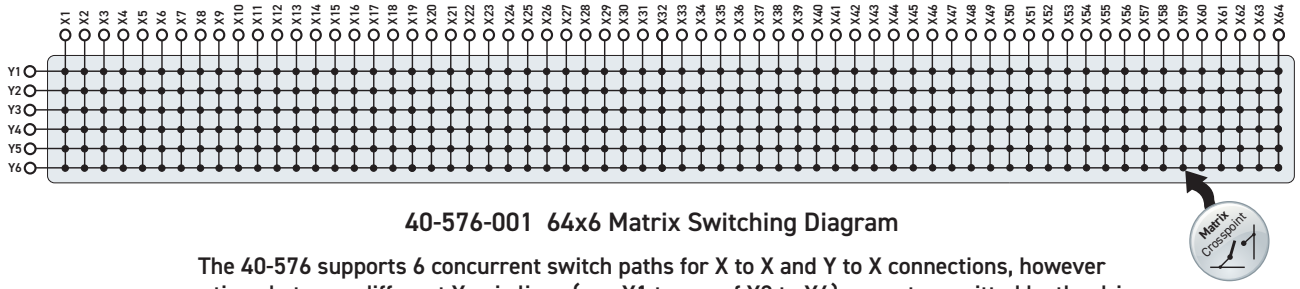
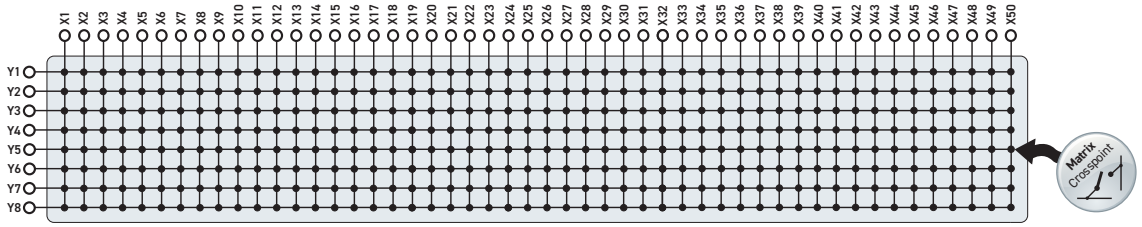


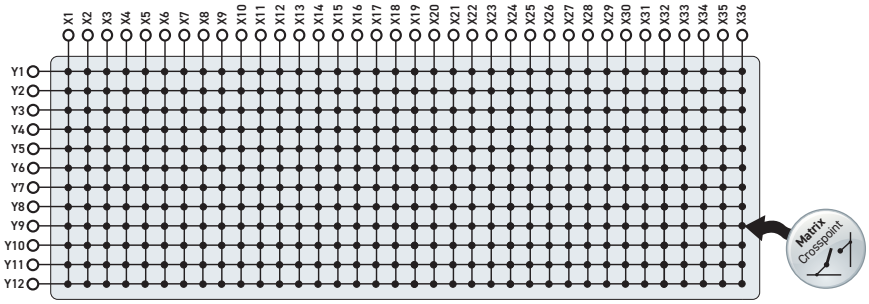
40-576-001 64x6 Matrix Switching Diagram

The 40-576 supports 6 concurrent switch paths for X to X and Y to X connections, however connections between different Y axis lines (e.g. Y1 to any of Y2 to Y6) are not permitted by the driver.



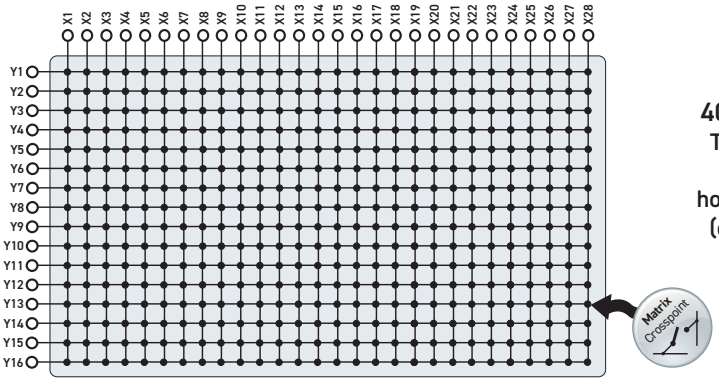
40-577-001 50x8 Matrix Switching Diagram

The 40-577 supports 8 concurrent switch paths for X to X and Y to X connections, however connections between different Y axis lines (e.g. Y1 to any of Y2 to Y8) are not permitted by the driver.



40-578-001 36x12 Matrix Switching Diagram

The 40-578 supports 12 concurrent switch paths for X to X and Y to X connections, however connections between different Y axis lines (e.g. Y1 to any of Y2 to Y12) are not permitted by the driver.

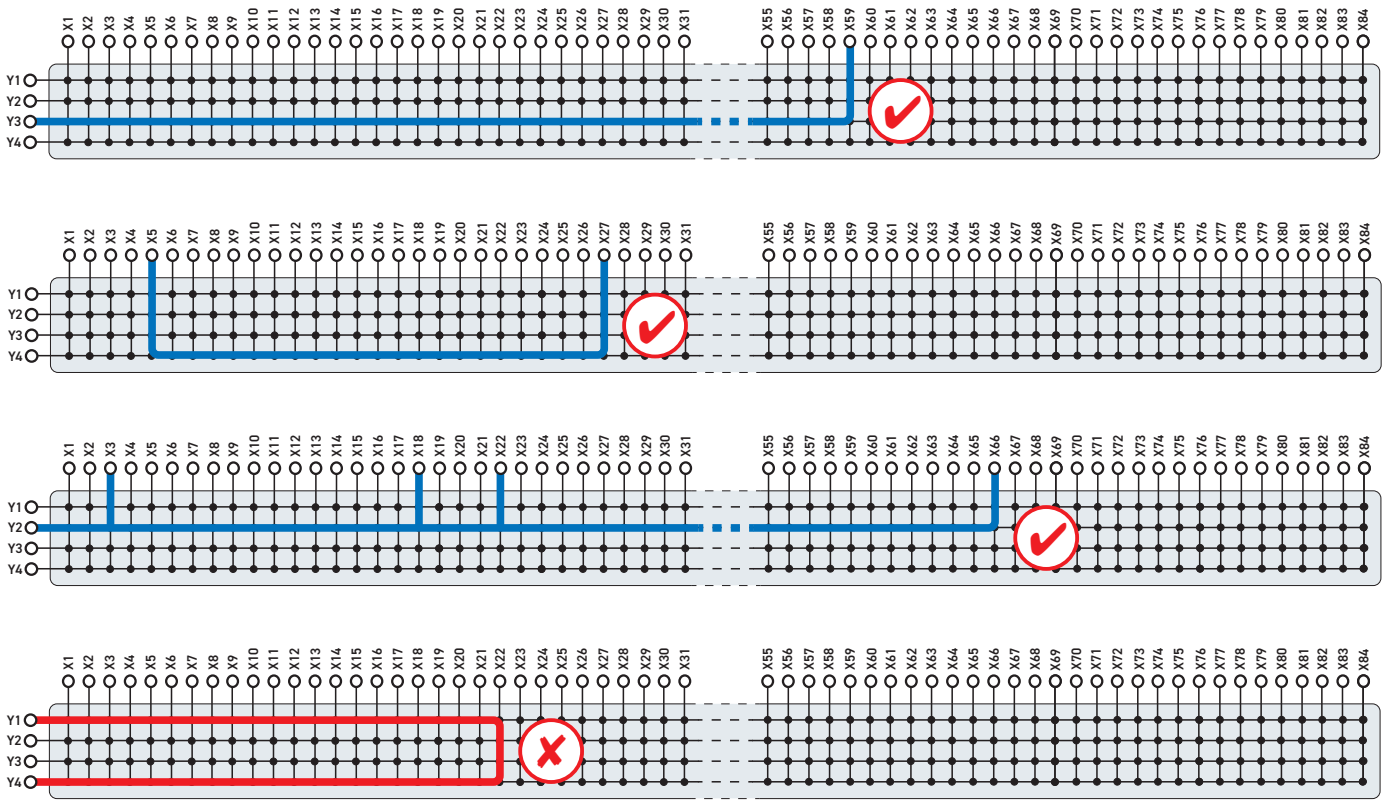


40-579-001 28x16 Matrix Switching Diagram

The 40-579 supports 14 concurrent switch paths for X to X or 16 concurrent Y to X connections, however connections between different Y axis lines (e.g. Y1 to any of Y2 to Y16) are not permitted by the driver.

Matrix Functionality

The 40-579 permits 14 concurrent X to X paths or 16 concurrent Y to X paths, the 40-575A, 40-576, 40-577 and 40-578 permit 4, 6, 8 and 12 concurrent X to X or X to Y paths respectively. As an example, the 40-575A is shown in the figure below; X to Y connections (e.g. X59 to Y3) and X to X connections (e.g. X5 to X27) are permitted, also any number of X connections can be connected to the Y axis (e.g. X3, X18, X22 & X66 to Y2). However, the driver prevents the connection of Y axis connections together (e.g. Y1 to Y4).



Allowable Signal Paths For The 40-575A Matrix

40-575A-001	40-576-001	40-577-001	40-578-001	40-579-001
84x4 Matrix	64x6 Matrix	50x8 Matrix	36x12 Matrix	28x16 Matrix

Switching Specification

Switch Type:	Electro-mechanical
Contact Type:	Palladium-Ruthenium, Gold Covered, Bifurcated
Max Switch Voltage:	300 VDC/250 VAC*
Max Power: Max Switch Current: Max Continuous Carry Current: Max Pulsed Carry Current Example (for single switch path):	62.5 VA, 60 W 2 A 2 A 6 A for 100 ms (up to 10 % duty cycle)
Max Continuous Total Switch Path Loading: †	16 W (Example allowed conditions – 11 channels at 2 A, please contact sales office for further advice)
Initial On Path Resistance: Off Path Resistance: Thermal Offset:	<0.35 Ω >10^9 Ω 10 µV (X to X connection)
Max Number of Simultaneously Closed Crosspoints:	84 (40-575A) 64 (40-576) 50 (40-577) 36 (40-578) 28 (40-579)
Operate Time:	6.5 ms
Expected Life (Operations) Very low power load: Low power load: Medium power load: Full power load:	 >1x10^8 >1.5x10^7 (0.1 A 20 VDC) >5x10^6 (1 A 30 VDC) >1x10^5 (2 A 30 VDC)

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

† Significantly higher total switch path loading is possible when using Pickering 40-922/923A PXI & 60-102B/103B LXI chassis', please contact sales office for details.

RF Specification

Bandwidth (-3 dB) typical	40-575A	10 MHz
	40-576	10 MHz
	40-577	10 MHz
	40-578	15 MHz
	40-579	15 MHz

		10 kHz	100 kHz	1 MHz	10 MHz
Crosstalk (typical)	40-575A	-60 dB	-55 dB	-35 dB	-20 dB
	40-576	-70 dB	-50 dB	-30 dB	-15 dB
	40-577	-75 dB	-60 dB	-40 dB	-20 dB
	40-578	-70 dB	-55 dB	-35 dB	-15 dB
	40-579	-70 dB	-50 dB	-35 dB	-15 dB
Isolation (typical)	40-575A	60 dB	60 dB	40 dB	25 dB
	40-576	60 dB	45 dB	30 dB	15 dB
	40-577	85 dB	70 dB	55 dB	40 dB
	40-578	70 dB	50 dB	35 dB	20 dB
	40-579	70 dB	55 dB	35 dB	20 dB

Power Requirements

	+3.3 V	+5 V	+12 V	-12 V
40-575A	140 mA	800 mA	0	0
40-576	140 mA	600 mA	0	0
40-577	140 mA	475 mA	0	0
40-578	140 mA	345 mA	0	0
40-579	140 mA	270 mA	0	0

Width and Dimensions

Single slot 3U PXI module (CompactPCI).
Module weight: 410 g.
3D models for these modules in a variety of popular file formats are available on request.

Connectors

PXI bus via 32-bit P1/J1 backplane connector.
Signals via front panel connectors:

- 40-575A 160-pin male DIN 41612
- 40-576/577 78-pin male D-type
- 40-578/579 50-pin male D-type

For pin outs please refer to the operating manual.

Product Order Codes

Ultra High Density Matrix:	
84x4, 1-Pole (2 A, 60 W)	40-575A-001
64x6, 1-Pole (2 A, 60 W)	40-576-001
50x8, 1-Pole (2 A, 60 W)	40-577-001
36x12, 1-Pole (2 A, 60 W)	40-578-001
28x16, 1-Pole (2 A, 60 W)	40-579-001

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.

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.

PXI & CompactPCI Compliance

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

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

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
40-575A	93-002-001	93-002-410
40-576/577	93-006-001	Not Required
40-578/579	93-005-001	Not Required

Spare Relay Kits

Kits of replacement relays are available for the majority of Pickering's PXI switching products, simplifying servicing and reducing down-time.

Product	Relay Kit
40-575A/576/577/579/579	91-100-001

For further assistance, please contact your local Pickering sales office.

Mating Connectors & Cabling

For connection accessories for the 40-575A/576/577/578/579 modules please refer to the 90-001D 160-pin DIN 41612, 90-006D 78-pin D-type and 90-005D 50-pin D-type Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Chassis Compatibility

This PXI module must be used in a suitable chassis. It is 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

Chassis Selection Guide

Standard PXI or hybrid PXIe Chassis From Any Vendor:

- Mix our 1000+ PXI switching & simulation modules with any vendor's PXI 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

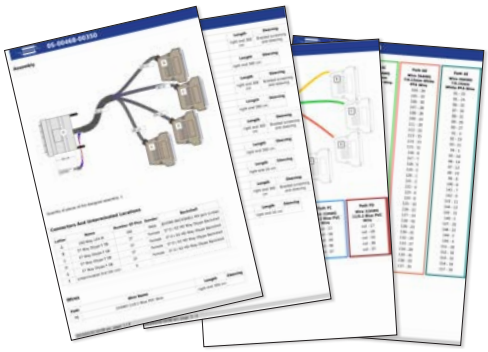
Breakouts

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



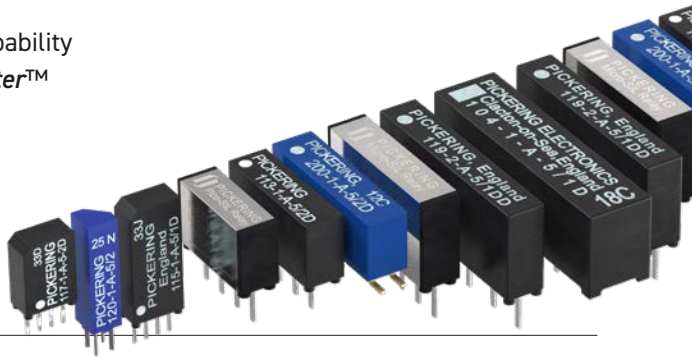
Mass Interconnect

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

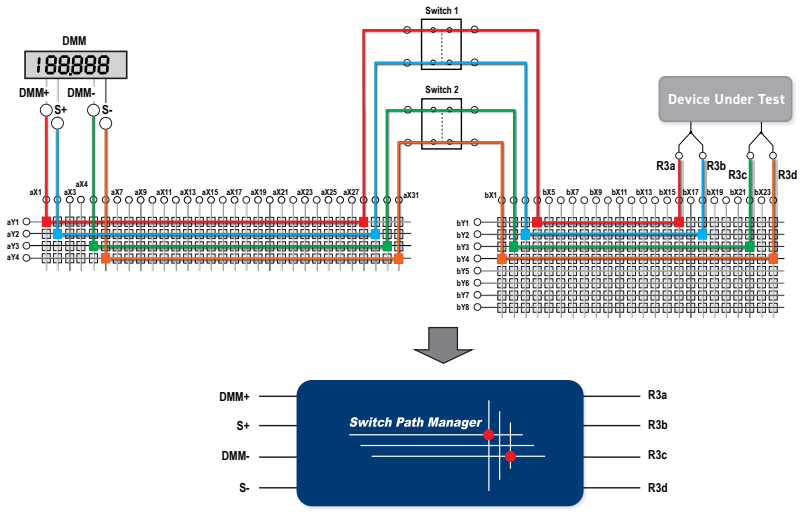
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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