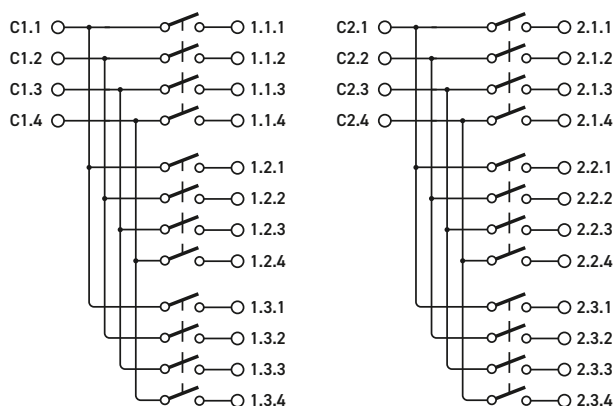


- Available as a PXI or PXIe Modules
- Wide Range of Switching Current Capability
- Minimum Current of 10  $\mu$ A With 2.5 A Maximum Current
- Switch up to 220 VDC/250 VAC
- Matrix & Multiplexer Options Available
- Loop-thru Functionality
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- PXI Versions Supported by PXI or LXI Chassis
- PXIe Versions Supported by PXI Hybrid or PXIe Chassis
- 3 Year Warranty

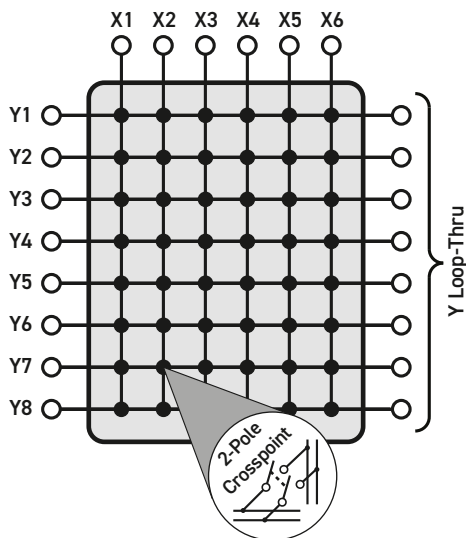
The 40-514 (PXI) and 42-514 (PXIe) are low density switching modules available in 6x8 or 6x4 2-pole matrix configurations or as a range of 1, 2 or 4-pole multiplexers. They are capable of switching a wide range of current, from 10  $\mu$ A to 2.5 A at 220 VDC/250 VAC. The current capability of the module permits the use of a single module type for both low and medium current test applications.

The module is in a 1-slot format and is constructed using quality electromechanical relays for high switching confidence.

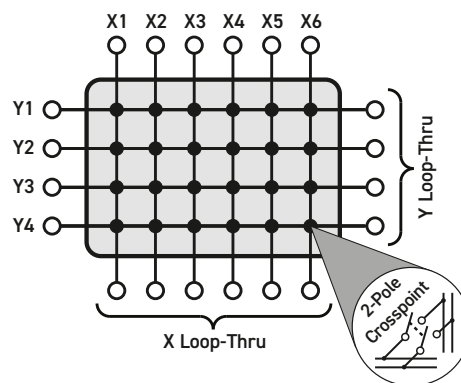
The 6x4 matrix versions are provided with loop-thru functionality on both the X and Y axis, and the 6x8 matrix has loop-thru on the Y axis only. Loop-thru aids with the construction of larger matrix switching systems.



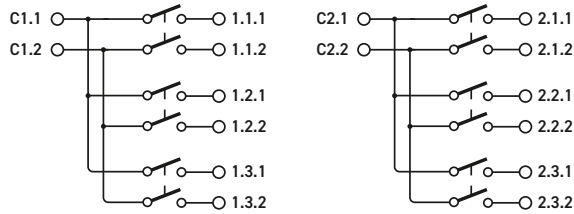
Dual 3-Channel 4-pole Multiplexer - Part No. 4x-514-101



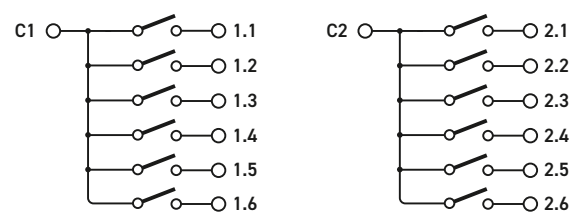
6x8 2-pole Matrix - Part No. 4x-514-001



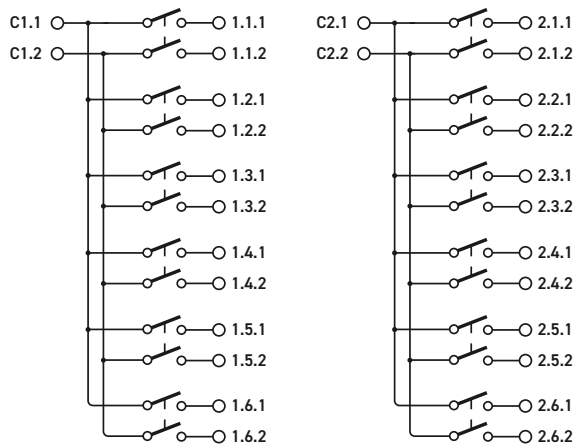
6x4 2-pole Matrix - Part No. 4x-514-002



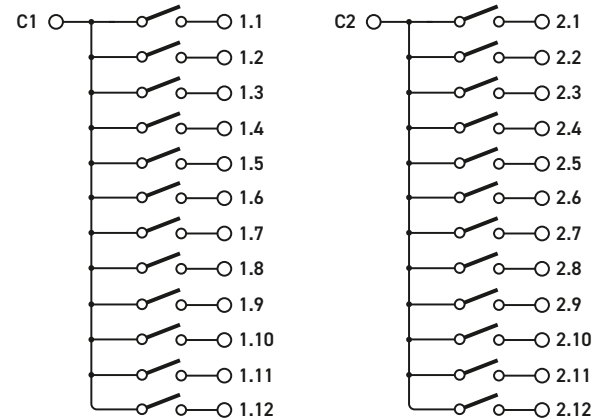
**Quad 3-Channel 2-pole Multiplexer**  
Part No. 4x-514-103



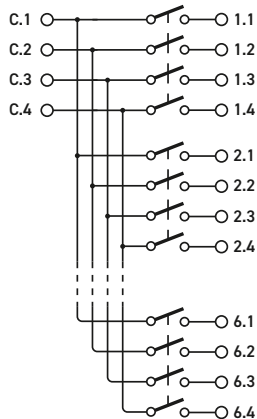
**Quad 6-Channel 1-pole Multiplexer**  
Part No. 4x-514-106



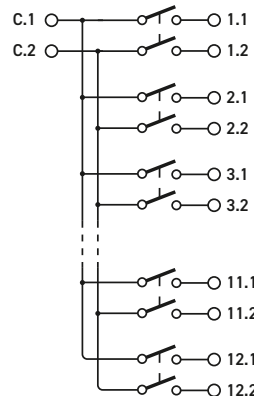
**Dual 6-Channel 2-pole Multiplexer**  
Part No. 4x-514-104



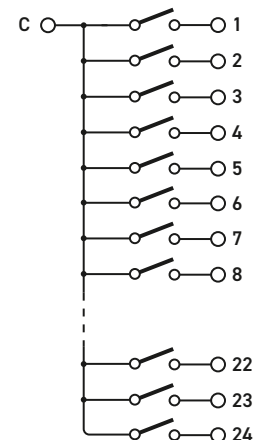
**Dual 12-Channel 1-pole Multiplexer**  
Part No. 4x-514-107



**Single 6-Channel 4-pole Multiplexer**  
Part No. 4x-514-102



**Single 12-Channel 2-pole Multiplexer**  
Part No. 4x-514-105



**Single 24-Channel 1-pole Multiplexer**  
Part No. 4x-514-108

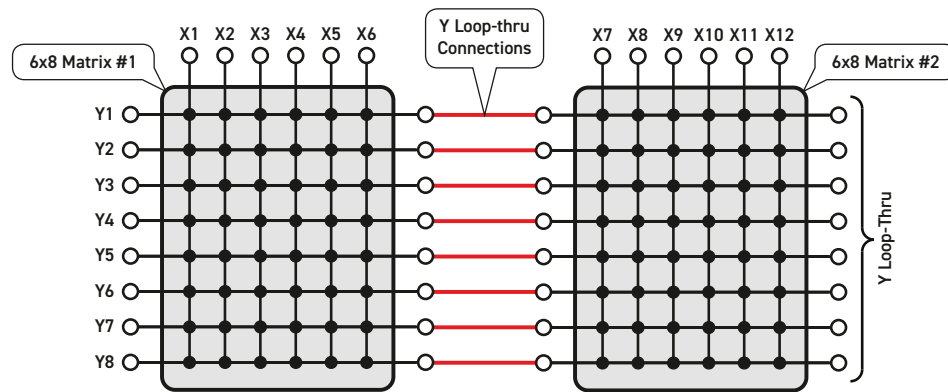


Diagram showing how two 4x-514-001 6x8 matrix modules can be interconnected using Y Loop-thru connections to create a 12x8 2-pole matrix.

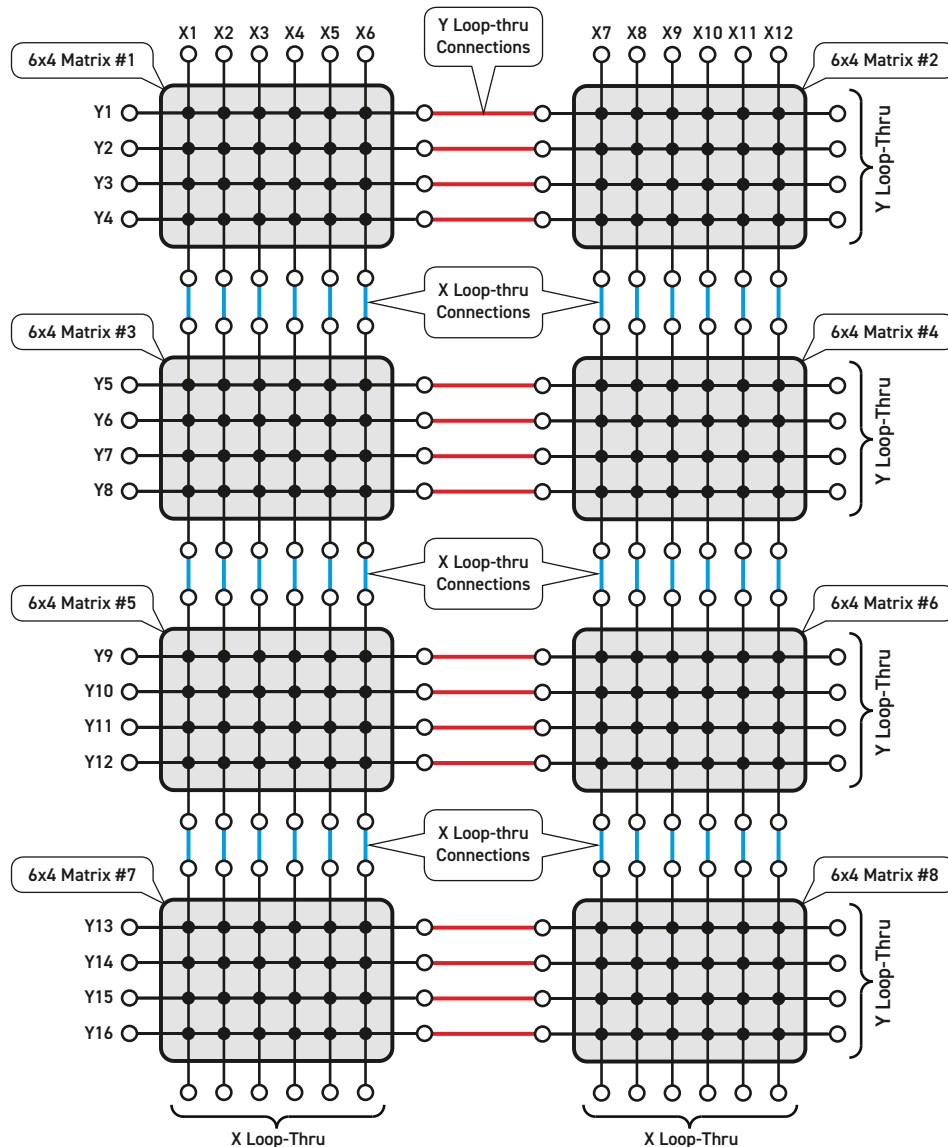


Diagram showing how eight 4x-514-002 6x4 matrix modules can be interconnected using X & Y Loop-thru connections to create a 12x16 2-pole matrix.

## Switching Specifications

Switch Type:	Electro-mechanical
Contact Type:	Gold Plated Silver
Max Switch Voltage:	220V DC/250 VAC*
Max Power:	62.5 VA, 60 W
Max Switch Current:	2.0 A
Max Continuous Carry Current:	2.5 A
Minimum Current:	10 $\mu$ A
Initial Path Resistance	
On (Single Module):	250 m $\Omega$ (X-Y connection)
Off (Single Module):	>10 <sup>9</sup> $\Omega$
Minimum Voltage:	10 mV
Thermal Offset:	5 $\mu$ V (typical)
Operate Time:	4 ms
Expected Life (operations)	>1x10 <sup>8</sup>

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

## RF Specification

Bandwidth -3 dB (typical):	30 MHz (4x-514-002)
	60 MHz (4x-514-101)
Crosstalk (typical):	10 kHz -55dB
	100 kHz -55dB
	1 MHz -50dB
	10 MHz -30dB
Isolation (typical):	10 kHz 60dB
	100 kHz 60dB
	1 MHz 50dB
	10 MHz 30dB

## Power Requirements - 40-514

	+3.3 V	+5 V	+12 V	-12 V
40-514-002	150 mA (typical)	760 mA (typical)	0	0
40-514-101	160 mA (typical)	140 mA (typical)	0	0

## Power Requirements - 42-514

	+3.3 V	+12 V
42-514-002	390 mA (typical)	380 mA (typical)
42-514-101	400 mA (typical)	70 mA (typical)

## Mechanical Characteristics

40-514 - 1 slot 3U PXI (CompactPCI card).

42-514 - 1 slot 3U PXIe, compatible with PXIe hybrid slot.

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

Module weight: 205 g (40-514-002)  
180 g (40-514-101)

## Connectors

40-514 - PXI bus via 32-bit P1/J1 backplane connector.

42-514 - PXIe bus via XJ3 and XJ4 backplane connectors.

Matrix versions - signals via front panel mounted 50-pin male D-type connector.

Multiplexer versions - signals via front panel mounted 37-pin male D-type connector.

For pin outs please refer to the operating manual.

## PXI & CompactPCI Compliance - 40-514

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 - 42-514

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

## 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 Wide Current Range Modules	
6x8 Matrix, 2-pole, Y Loop-thru	40-514-001
6x4 Matrix, 2-pole, X & Y Loop-thru	40-514-002
Dual 3-Channel Multiplexer, 4-Pole	40-514-101
Single 6-Channel Multiplexer, 4-Pole	40-514-102
Quad 3-Channel Multiplexer, 2-Pole	40-514-103
Dual 6-Channel Multiplexer, 2-Pole	40-514-104
Single 12-Channel Multiplexer, 2-Pole	40-514-105
Quad 6-Channel Multiplexer, 1-Pole	40-514-106
Dual 12-Channel Multiplexer, 1-Pole	40-514-107
Single 24-Channel Multiplexer, 1-Pole	40-514-108
PXIe Wide Current Range Modules	
6x8 Matrix, 2-pole, Y Loop-thru	42-514-001
6x4 Matrix, 2-pole, X & Y Loop-thru	42-514-002
Dual 3-Channel Multiplexer, 4-Pole	42-514-101
Single 6-Channel Multiplexer, 4-Pole	42-514-102
Quad 3-Channel Multiplexer, 2-Pole	42-514-103
Dual 6-Channel Multiplexer, 2-Pole	42-514-104
Single 12-Channel Multiplexer, 2-Pole	42-514-105
Quad 6-Channel Multiplexer, 1-Pole	42-514-106
Dual 12-Channel Multiplexer, 1-Pole	42-514-107
Single 24-Channel Multiplexer, 1-Pole	42-514-108

## Support Products

### 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
4x-514-xxx	91-100-124

For further assistance, please contact the Pickering sales office.

### Mating Connectors & Cabling

For connection accessories for the 4x-514 module please refer to the [90-005D](#) 50-pin and [90-007D](#) 37-pin D-type Connector Accessories data sheets where a complete list and documentation can be found for accessories.

### 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.



**PXIe Version of 6x8  
Wide Current Range Matrix  
- Part Number 42-514-001**



**PXI of 6x4 Wide  
Current Range Matrix  
- Part Number 40-514-002**



**PXI Dual 3-Channel 4-Pole  
Wide Current Range Multiplexer  
- Part Number 40-514-101**



## 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

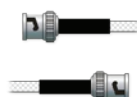
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with **1200+** products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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



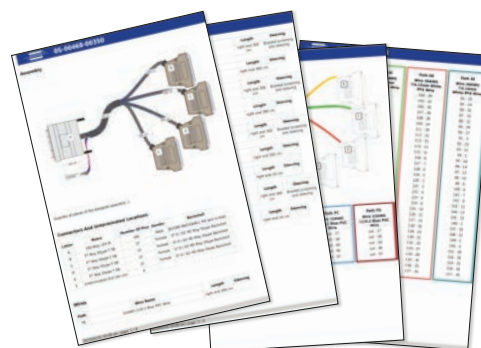
## Breakouts



## 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](http://pickeringtest.com/cdt)

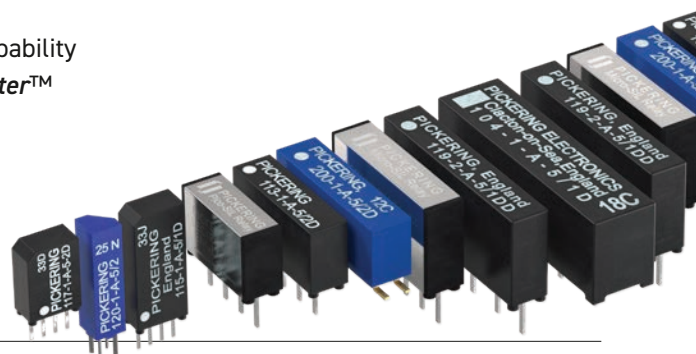
## Mass Interconnect

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](https://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](http://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

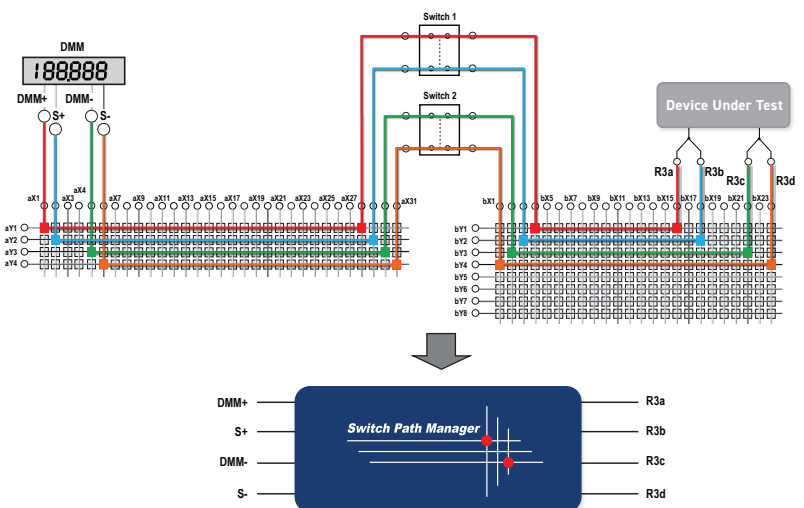
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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

To learn more about software drivers and development environments go to [pickeringtest.com/software](http://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](http://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](http://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](http://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](http://pickeringtest.com/resources)

