

# Modular Switching & Simulation...



...for Automated Test & Verification

# Design, Deploy & Sustain

Enhance your engineering team's effectiveness by working with the collaborative, creative and agile culture of Pickering.





# Let us help make the **DESIGN** phase of your test system project more efficient.

Defining an automated test system can be challenging. Your goal as a test system architect is to accelerate your design process using a flexible platform—and having a vendor with the expertise you need to help you get the job done on time and within budget. Pickering delivers the hardware (PXI, LXI, USB, PCI and turnkey switch & simulation platforms) and software tools you need to define test system switching and cabling. We can help accelerate the time to production readiness with these flexible platforms and years of expertise. There also may be times when you may need additional capabilities. Our **Partners** have unique skills and knowledge and can assist in the development of complete solutions to meet your needs.



# Once you have defined and architected your test system, you need to solve the challenges of **DEPLOYING** that system to production.

We provide resources to reduce test integration time and increase test throughput. These include chassis to host our switching and simulation modules, software applications such as signal routing, simulation tools and soft front panels, and cabling solutions. The benefit is you can focus on your product and let our tools augment your constrained engineering resources.





# The ability to **SUSTAIN** your test system once in production is critical.

A strategic test development strategy continues beyond the design and deployment phases. The ability to sustain the system once in production is critical in measuring the success of the development effort. To efficiently maintain your test system over the life of the products being tested, you need quality hardware and tools for diagnosis—maximizing uptime and lowering the total cost of ownership. We offer benefits to help in this phase, including products designed for maximum uptime, diagnostic test tools, and expert-level technical product support.



# Our collaborative, creative and agile culture can help your engineering team's effectiveness.

For over 30 years, Pickering has been helping test engineers design, deploy and sustain high-performance electronic test and verification systems. As a global specialist in high-quality modular signal switching and simulation, software and services for PXI, LXI, USB and PCI applications, we provide the engineering capabilities and worldwide resources you need to succeed. However, our philosophy of partnering with each customer helped build our company. That's why our tradition of hands-on, responsive customer service still drives each and every customer interaction.

Our core focus is high-density modular switching and simulation systems (with over 1,000 products in PXI alone) to meet your specifications. And, when our product range doesn't fit your application, we have the agility and expertise to develop a system to your specifications with little to no engineering cost. That's our specialty. At Pickering, we are focused solely on helping you design, deploy and sustain your automated test switching or simulation system.



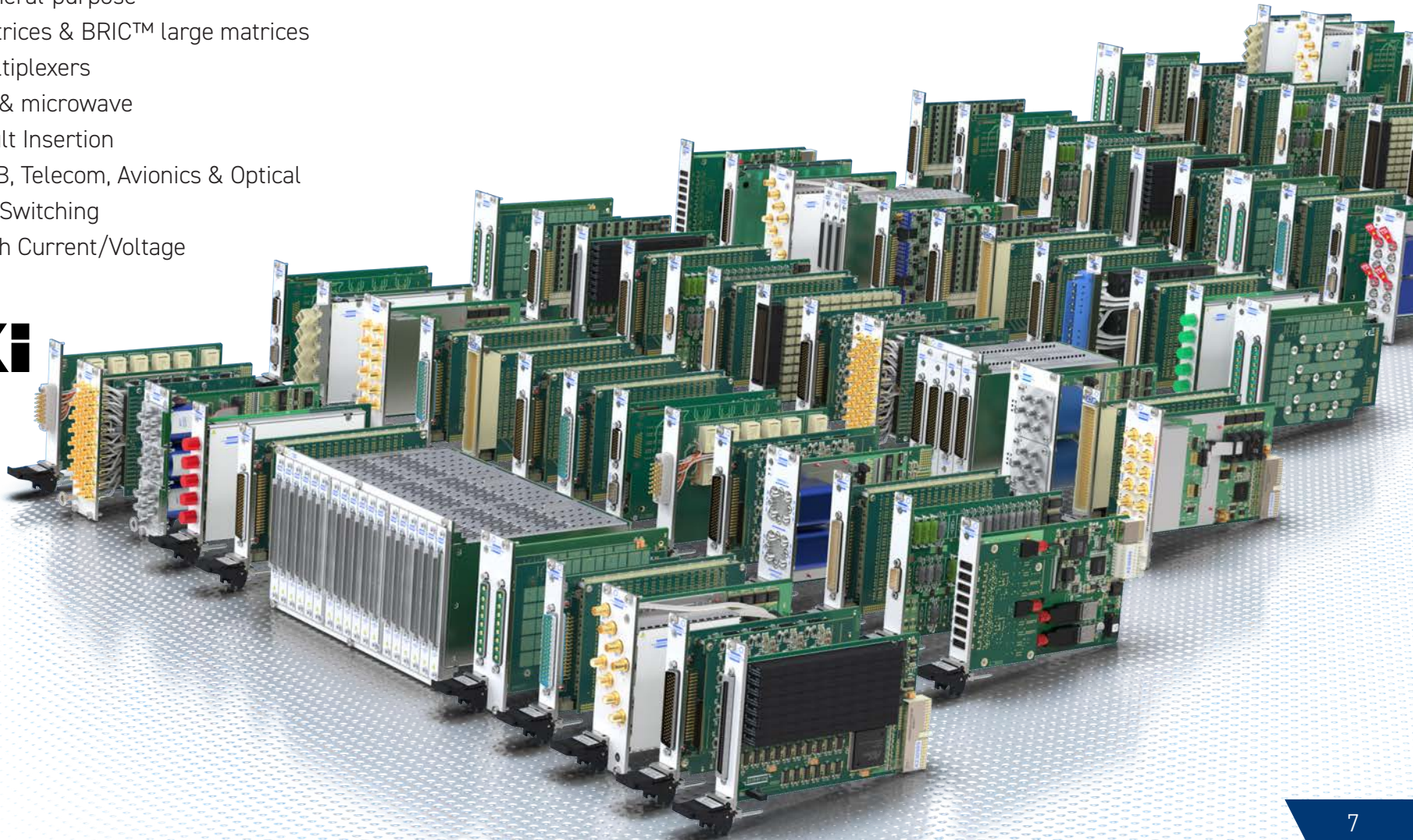


# The largest range of switching products available in **PXI** format.

As early adopters of the PXI standard, we have participated in the evolution of the standard with our membership in the PXI Systems Alliance. Our first PXI product was introduced in 1998; we now offer over 1000 switching modules in PXI, including:

- General-purpose
- Matrices & BRIC™ large matrices
- Multiplexers
- RF & microwave
- Fault Insertion
- USB, Telecom, Avionics & Optical
- 6U Switching
- High Current/Voltage

**PXI**



# PXI simulation modules for sensor simulation

Sensors are embedded in an array of applications, and there are a vast number of sensor types for measuring temperature, pressure, strain, position displacement, vibration, etc. Sensor simulators are used to test and validate controllers that rely on sensor inputs for correct operation. We have a large range of PXI sensor simulation choices and are continually offering more - these include:

- Programmable Resistors
- PT100, PT500 and PT1000 RTD Simulators
- Load Resistors up to 15W
- Strain Gauge Simulators
- Thermocouple Simulators
- LVDT, RVDT and Resolver Simulators
- Analog Output/Current Loop Simulators
- Battery Simulation
- Digital I/O



**PXI**



# Versatile interface and racking options

Our **PXI modules** 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

Our **PXIe modules** 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



# PCI switch and simulation cards

Instrumentation grade PCI switch and simulation cards can be cascaded to form larger switching networks.

Our PCI switch and simulation cards are built using the same basic technology as our PXI range utilizing the same software drivers, soft front-panels and control electronics. These PCI cards will plug into any PCI based computer and are supplied with software drivers for Windows and comprehensive support for NI Switch Executive and LabVIEW.



**PCI**  
CONVENTIONAL™



# LXI switching solutions

LXI is the power of Ethernet and the Web applied to Test & Measurement instruments, offering you new possibilities in test systems—local, remote, distributed and time-aware. Our LXI switching solutions include:

- Low frequency (LF) high-density matrices
- Scalable LF, high voltage and RF switching
- RF & microwave switching
- Optical switches
- Turnkey microwave switch subsystems



# Software

- Software Drivers and Application Software Packages
- Diagnostic Test Tools for Switching Systems
- Switch Path Manager Signal Routing Software
- Sequence Manager Software
- PXI & LXI Simulation Tools

In test system development, the best hardware is only usable if its software control environment is robust and easy to use. If you are a test system developer, you must look at both the hardware and software aspects of your vendors. With seamless software driver installation and support of all popular programming languages, our flexible drivers use a common interface that has evolved to support our growing range of products and the latest operating systems.

In addition to software drivers, we offer diagnostic test tools for many of our switching products in the form of **BIRST** and **eBIRST**. Our **Switch Path Manager (SPM)** simplifies signal routing for our products and speeds up software development. We also offer **Sequence Manager** on our LXI products allowing the user to set predefined switch/simulation operations to simplify and speed up repetitive tasks. Our **PXI and LXI Simulation Tools** will enable you to develop and test system software independent from application hardware.



[Learn more...](#)



# Cables and connectors

Take advantage of our in-house cable manufacturing, from simple mating connectors to complex cable assemblies and terminal blocks. We have standard cables already designed for all of our products. Every accessory is designed to ensure you have a trouble-free experience connecting our products to your test system.

If you need a custom cable, you can design your own using our **Cable Design Tool**, or we can design one for you and deliver as little as one to many.

Learn more at [pickeringtest.com/cdt](https://pickeringtest.com/cdt)



# Custom designed and turnkey switch solutions

At Pickering, we have considerable **in-house experience creating custom switch and simulation solutions—including customer-defined turnkey systems**. We work with your design and test engineers to develop solutions that address your requirements and meet industry needs. Because of our in-house manufacturing capabilities, we can deliver new designs in a timely and cost-effective manner and replicate the design exactly as your business grows. Or work with one of our many Partners for a custom solution.

## Turnkey

### Microwave MUX Switch for MRI Automated Test Equipment

*"We are very happy with the result. This was a complex challenge, but now we have a better system that is 100% compatible with our established working practices, and Pickering delivered it on time and on budget."*

**Harrie van den Oever**  
Electrical Engineer at Philips





# Support

## Free First-Line Customer Support

Our experienced technical staff can address any hardware or software problems you may encounter. **We have multiple offices worldwide** and provide access to support engineers with many years of experience in functional test, and we are committed to responding in a timely fashion.

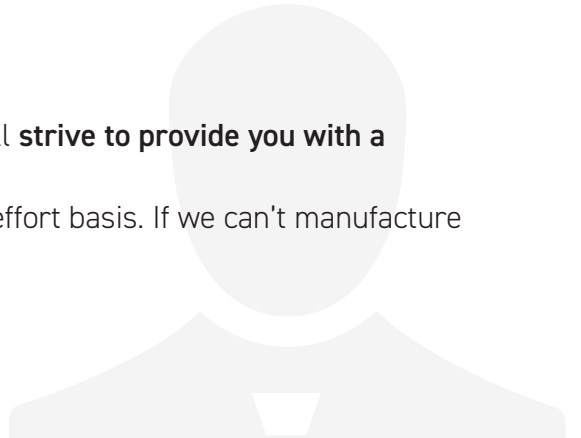
Also, our **website provides easy access to customer support, software drivers and packages and our Support Knowledgebase.**

## Guaranteed Long-Term Support and Low Obsolescence

You expect your test systems to last at least as long as the products you are testing. We understand this need and pride ourselves on the fact that all of our critical components, software and cabling designs, as well as our manufacturing processes, are carried out in-house. These capabilities enable us to provide our customers with guaranteed long-term support and low obsolescence.

We strive to support our customer's needs long-term by:

- Support the products you purchase from us typically **15–20 years** from delivery date.
- Continually update our product line, so even if a product happens to become obsolete, we will **strive to provide you with a functional equivalent** to replace it.
- Manufacturing older revision products to special order for compatibility purposes on a best-effort basis. If we can't manufacture the identical product—we will **strive to offer you a functionally equivalent alternative.**
- Products repaired via our **cost-effective** RMA (Return Materials Authorization) service.
- Service and repair all of our products, even if discontinued, on a best effort basis.



# Applications

## Communications

With the deployment of 5G worldwide, we are on the verge of hundreds, if not thousands, of new products that will want to share data. Connected Vehicles, Telemetry for first responders, and even robotic surgery! These applications call for new product designs and, with that, new test systems. Pickering has the only 67 GHz switching in PXI and LXI switching and simulation products for other parts of your product. We have a highly flexible engineering team that designs new switching, simulation, and custom cabling to help you design, deploy, and sustain your test systems worldwide.



## Industrial

The Fourth Industrial Revolution, also known as Industry 4.0, is changing how we build and test electronic products. Increased use of robotics and newer communications protocols (but still relying on old standards like 20 mA current loop) for large-scale machine-to-machine communication (M2M) add new opportunities and challenges to assembly automation companies. Pickering has worked with industrial automation companies for many years. We have developed high voltage, high current, microwave switching, and simulation modules for system automation. Let us show you how we can help design, deploy, and sustain your testing solutions.





# Applications

## Space

Human-crewed space stations, new communication satellites, heading back to the moon and even visiting Mars are just a taste of what is to come. But designing for space applications means simulating environments that are out of this world... but very important when testing for known good and bad situations. We are the only PXI manufacturer that can economically and effectively simulate hundreds of RTDs used in satellites. We have switching, simulation and cabling so you can build your test system in record time. Our support policy of supplying products for 15 or more years means you can be confident that your testers will be sustained in the future.



## Aerospace

Aviation is rapidly evolving to embrace alternative fuels and electrification to reduce its carbon footprint. So new technology is being developed to manage the changes... and it all needs to be tested. Only Pickering can address the switching and simulation required to tackle this challenge. From LVDT/RVDT/Resolver simulation to battery simulators and switching up to 9,000 volts, chances are we have your solution. If not, our highly flexible engineering team can design new switching, simulation, and cabling to help you design, deploy, and sustain your test systems worldwide.

# Applications

## Defense

As the Military branches of countries worldwide move toward a more technology-driven defense strategy—drones, lasers, satellite surveillance, secure communications and more—the need to test and diagnose these systems in the labs and on the battlefields is more crucial than ever. PXI and LXI are well-recognized standards for test systems at prime contractors and in the military. We have more choices for switching and simulation than all of the PXI and LXI vendors combined. Our policy of supporting products for 15 or more years means you can be confident that your testers will be sustained far in the future.



## Medical

If your company designs and builds medical instrumentation—be it for blood analysis, EKGs, heart monitors, and dozens of other categories of instrumentation—two critical aspects of your test strategy should be accuracy and repeatability. Our reed relay-based families of switching and simulation in PXI and LXI feature sealed relay contacts, ensuring accurate low-resistance connections and repeatable switching up to  $10^9$  operations. With more choices than any other vendor, Pickering should be your switching and simulation vendor of choice.

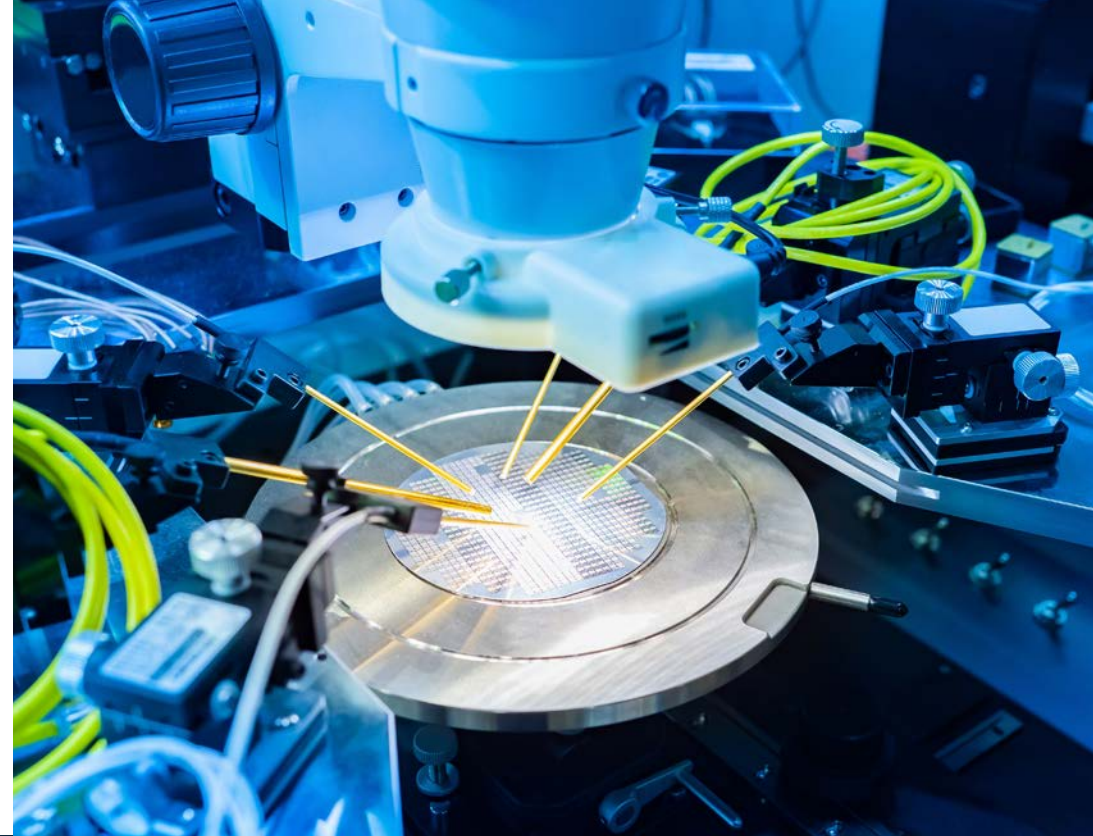




# Applications

## Semiconductor

Semiconductors are in virtually everything, from appliances to automobiles and aircraft. All these semiconductor devices will need to be tested at the lowest possible cost. That is why semiconductor manufacturers are looking at more testing at the wafer level to weed out defects before the devices are mounted in a package and the wire bonding process is completed. Our PXI and LXI switching solutions have been used in various levels of semiconductor test, including package and wafer-level test, shorts/opens, capacitance, I-V test for transient charge trapping, Single Charge Pulse Trapping (SPCT) and Wafer Acceptance Test (WAT).



## Automotive

Electronic complexity in automobiles has increased rapidly, making testing these electronic sub-assemblies challenging. At Pickering, we understand these challenges—since 1988, we have been designing and manufacturing switching systems and sensor simulation for automotive test applications. These applications range from simple body controllers, ABS brake modules, dashboard testing, transmission control, airbag squibs, engine management units, automotive networks and BMS testing to active safety and infotainment systems.

# Pickering Partner Program

## Why Work with a Pickering Partner?

Our primary focus is to offer you switching and simulation products and services to streamline the development and deployment of your electronic test and verification systems. To equip your specific test needs, there are times when you may need additional capabilities such as fixturing, integration consultancy, software development and other complementary services. Our partners have unique skills, services and expertise and can assist in the development of complete solutions to meet your exact needs.

## Why Become a Pickering Partner?

As a Pickering Partner, you will receive sales, marketing and technical resources that will help you to grow your business, bring new solutions to market and support our mutual customers.



### FIND A PARTNER

Our worldwide network of partners offers a variety of services from integration to consulting.



### BECOME A PARTNER

We offer valuable partnering options to help you grow your business and bring new solutions to market.



### ALREADY A PARTNER?

Take advantage of our Partner Portal for program and marketing resources, training material & more.



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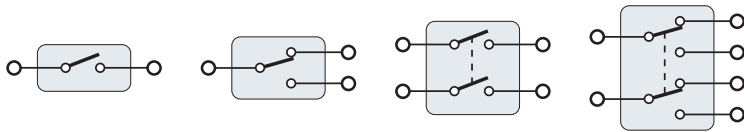
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# General Purpose Switches

Our general purpose relay modules offer reliable switching in a variety of configurations. They consist of multiple independent relays in single-pole single-throw (SPST), single-pole double-throw (SPDT), double-pole single-throw (DPST) and double-pole double-throw (DPDT) formats.

This range of switches includes low and high-density modules in PXI and PXIe formats and PCI cards. They come in various relay types, including Ruthenium reed and electro-mechanical (EMR)—offering you the performance you need for your application.



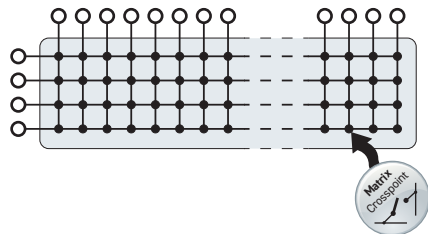
- SPST, SPDT, DPST & DPDT switching configurations
- PXI, PXIe & PCI versions
- High density modules with up to **100** relays
- Medium power modules with up to 2.5 A current handling
- Ruthenium reed & electro-mechanical relay versions
- PXI versions supported by PXI or LXI chassis
- Selected modules are supported by eBIRST Test Tools





# Low Density & Medium Density Matrices

Low-density matrix modules are a cost-effective solution for applications that require relatively small matrices in PXI, PXIe or PCI format. The range of medium-density matrix modules is suitable for applications that require mid-range matrices. Selected modules are supported by our Diagnostic Test Tools providing a quick and simple way of finding relay failures. These matrices are expandable by connecting multiple modules; however, we recommend that users look at the higher-density switch matrix modules that involve less configuration for larger matrices.

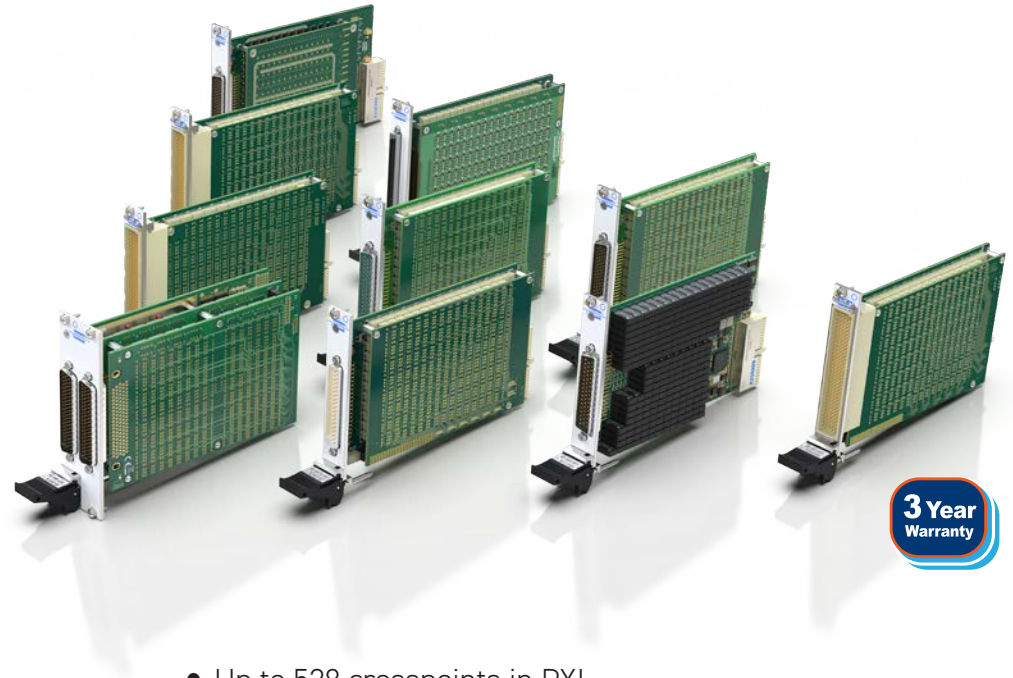
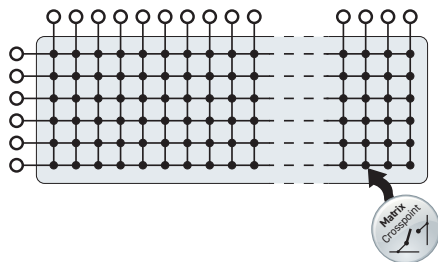


- High density single-slot matrices with up to **256 crosspoints**
- PXI, PXIe & PCI configurations
- Single & dual pole configuration
- Use reed or electro-mechanical relays
- Pickering instrumentation-grade Ruthenium reed relays for maximum low-level signal performance
- Maximum current 2A hot or cold switching
- Fast operating speed <500µs for reed versions, <3 ms for electro-mechanical versions
- Expansion capability across multiple cards
- PXI versions supported by PXI or LXI chassis
- Supported by BIRST & eBIRST Test Tools

# High Density Matrices

Our range of high-density matrix modules is a cost-effective solution for applications that require large matrices in the PXI, PXIe and LXI formats. The ability to expand to larger matrices is possible by connecting multiple modules. Reed relay versions use high-quality sputtered ruthenium reeds that exhibit excellent contact performance under low and medium-level switching conditions. Solid state relay versions are available for high speed and long life, and electro-mechanical versions for current handling up to 2 A.

Selected modules are supported by our Diagnostic Test Tools providing a quick and simple way of finding relay failures.

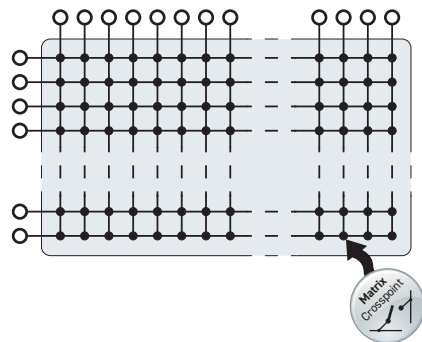


- Up to 528 crosspoints in PXI
- Up to 4096 crosspoints in LXI
- Scalable LXI switching platform with plug-in matrix modules also available
- Ruthenium reed, electro-mechanical & solid state versions available
- Single & dual matrix configurations
- Partially populated configurations available
- Expansion capability across multiple cards
- PXI versions supported by PXI or LXI chassis
- Selected modules are supported by BIRST & eBIRST Diagnostic Test Tools



# High Density PXI BRIC Matrices

With our BRIC large PXI matrix modules, high-density packaging and integrated backplanes enable a large PXI matrix to be implemented with no user configuration or special matrix expansion kits. These matrices use thru-hole mechanical relays (not surface mount) and can be serviced using standard de-soldering tools, simplifying repair and reducing downtime. Their integrated design ensures high matrix performance with high signal bandwidth and fewer system implementation errors.

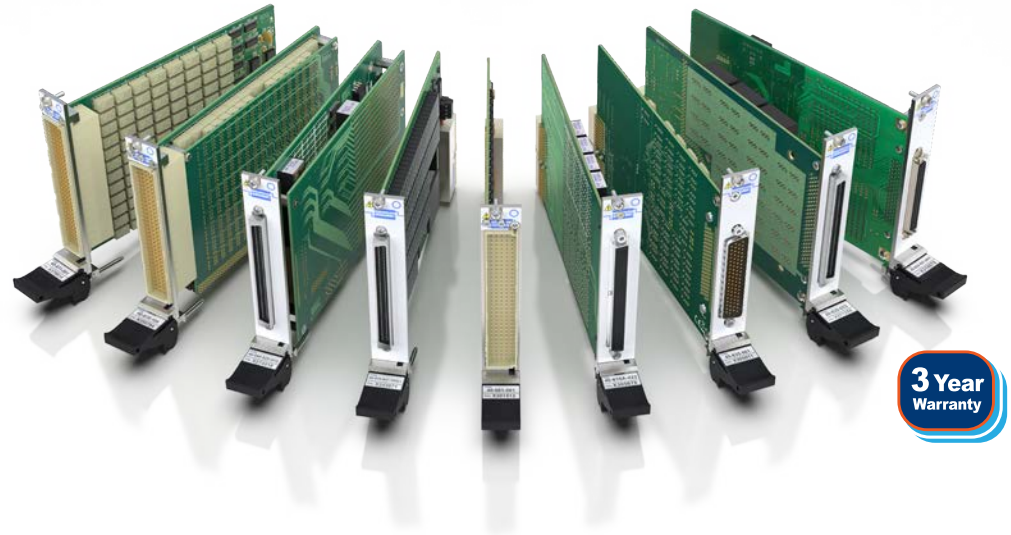
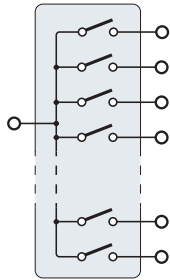


- Highest crosspoint density—up to 9216 crosspoints
- Up to 1 A & 2 A scalable matrices
- Ruthenium reed, electro-mechanical & solid state versions available
- Integrated PXI matrix modules with built-in analog bus
- Available as 2, 4, 8 and 12-Slot 3U PXI modules
- High bandwidth - up to 35 MHz
- Wide range of fully configured Y bus architectures
- Supported by PXI or LXI chassis
- Supported by BIRST & eBIRST Diagnostic Test Tools

# Multiplexers

Our range of low-density multiplexer modules is ideal for applications requiring a lower number of channels and poles. They are based on high-quality ruthenium reed or electro-mechanical relays, and the range includes a low thermal offset multiplexer.

The modules provide compact switching solutions with differing combinations of channel counts and poles.



- High density configurations with up to 198 channels
- Between 1 & 20 separate banks available
- Pole Count from 1 up to 32
- High density versions available in PXI, PXIe & PCI format
- Reed, electro-mechanical or solid state relays
- Switching up to 300 VDC/250 VAC
- High density electro-mechanical relay versions switch up to 2 A
- PXI versions supported by PXI or LXI chassis
- Selected modules are supported by eBIRST Test Tools



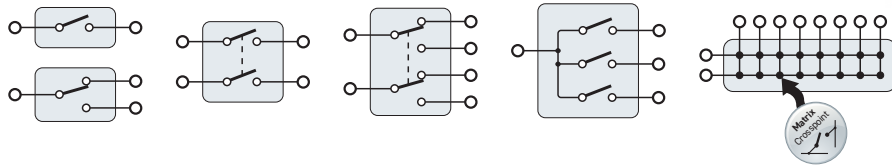


# High Power Switches

These high-power switch modules provide higher current and power ratings than the high-density versions. These modules are designed to switch AC or DC loads or to control large relay or solenoid systems.

As well as PXI & PXIe, these matrices are available in LXI format and our scalable LXI chassis and plug-in platform.

Solid state high power switches are suitable for automotive and aerospace test applications with a maximum current of 40 A.



- PXI, PXIe and LXI Configurations
- SPST, SPDT, DPST & DPDT general purpose switches as well as matrix & multiplexer configurations
- Electro-mechanical and solid state relay versions
- Current ratings up to 40 A
- Switching up to 400 V (cold switching)
- Expansion capability across multiple modules
- PXI versions supported by PXI or LXI chassis
- Selected modules are supported by eBIRST Test Tools

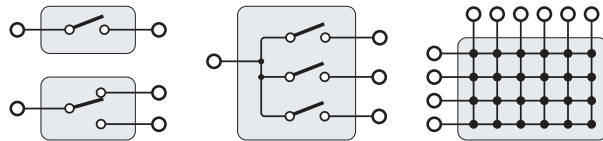


# High Voltage Switches

These high-voltage relay switching modules provide solutions for uncommitted relay, matrix and multiplexer applications that need to switch voltages up to 9 kV. The design of these relay modules ensures they can withstand high common mode voltages, and a protective safety cover is used to shield the switching components.

Typical applications are automotive, aerospace and power cell testing.

All modules use high-voltage connectors, which are fully supported by our cable and connector accessories.



- PXI, PXIe & LXI versions
- Hot switching up to 7.5 kVDC or 7.5 kVAC peak
- Cold switching up to 9 kVDC or 9 kVAC peak
- Uncommitted relay, matrix & multiplexer configurations available
- Reed versions use high-performance Pickering tungsten reed relays
- Electro-mechanical relay versions for hot or cold current switching up to 5 A
- High voltage front panel connector
- PXI versions supported by PXI or LXI chassis
- Selected modules are supported by eBIRST Test Tools

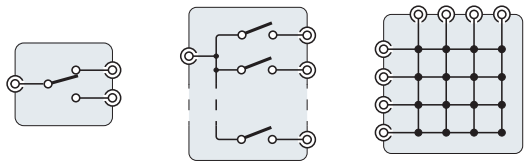


# RF Switches

Our RF switching modules can provide economic switching for frequencies up to 8 GHz with an impedance of 50  $\Omega$ . The range includes SPDT switches, matrices and multiplexers with a choice of signal connectors.

Versions are available with 75  $\Omega$  impedance suitable for telecoms and high-quality video switching.

Please look at our microwave switching modules for higher frequency applications requiring high-performance levels.

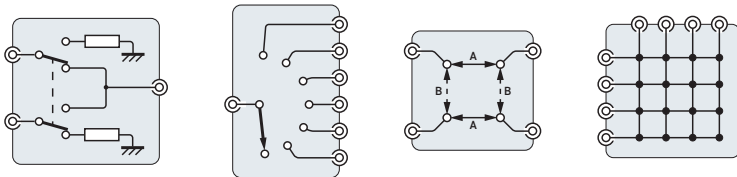


- Available in PXI, PXIe & LXI formats
- General-purpose relay, matrix & multiplexer configurations
- Available in 50  $\Omega$  & 75  $\Omega$  impedance versions
- Signal bandwidths up to 8 GHz
- Wide range of signal connector options including SMB, SMA & MCX
- PXI versions supported by PXI or LXI chassis

# Microwave Switches

Our microwave switch modules vary from simple multiplexer and switch configurations to large multiplexers and matrices. Most products are characterized for 50  $\Omega$  operation; however certain 75  $\Omega$  versions are supplied as standard or custom products. Remote PXI or PXIe versions occupy a single slot with switches mounted separately from the host chassis and controlled via a cable.

Our flexible LXI microwave switch platform and turnkey LXI microwave switch subsystems offer a customization service allowing you to specify an LXI microwave switching solution to exactly meet your needs.



- High performance switching with low insertion loss & very high isolation
- Available in PXI, PXIe & LXI formats
- Relay, multiplexer, transfer switch & matrix configurations
- Most modules include LED indication of active switch
- Latching & failsafe versions
- Available with 50  $\Omega$  & 75  $\Omega$  impedance
- Terminated & unterminated versions
- Signal bandwidths up to 67 GHz
- Range of signal connectors including SMA, N-type, & 1.6/5.6
- PXI/PXIe panel mounted & chassis space saving remote mounted versions
- PXI versions supported by PXI or LXI chassis

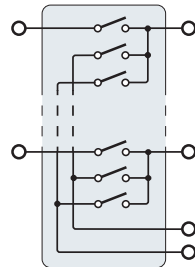


# Fault Insertion Switches

Our fault insertion switch modules feature a breakout arrangement that allows faults to be attached to sensor lines; this includes breaking a connection or adding a defect—all of which can simulate connectivity problems in a system.

Modules are available with single signal paths and series switches with switches to connect to one or more fault buses. Versions are also available with pairs of signals with series switches, shorting switches between the signal pairs and switches to connect either signal to an external fault input.

Fault insertion modules are also available with differential signals and controlled transmission line impedance suitable for fault testing serial interfaces such as Ethernet.



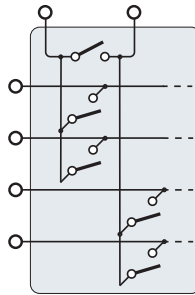
- Fault insertion switches for a wide range of testing applications
- Choice of channel counts & switch configurations
- PXI format with selected modules available in PXIe
- Modular Breakout System (MBoS) available for Hardware-in-the-Loop simulation applications
- Electro-mechanical relay versions for current handling between 1 A & 20 A
- Solid state relay versions for current handling up to 40 A
- Differential switching versions available for fault insertion on serial interfaces
- PXI versions supported by PXI or LXI chassis
- Selected modules are supported by eBIRST Test Tools



# Fault Insertion Matrices

Our fault insertion matrices, designed for large-scale fault insertion applications, feature a breakout arrangement that allows faults to be attached to sensor lines via the Y-axis. This includes breaking a connection or adding a series defect—all of which can simulate connectivity problems in a system.

Versions are available with two or three-pin breakout connections. Three-pin breakout allows the connection to be swapped for a “bad” sensor simulation. Using a programmable matrix for fault insertion ensures testing is fast to perform and can be reproduced on subsequent test cycles in the event of corrective action or a system upgrade.



- High-density fault matrix solution for large scale fault insertion applications
- Two or three pin breakout connections for wiring to sensors
- PXI BRIC architecture provides scalable matrix size
- Wide range of matrix sizes & partially populated configurations available
- Ruthenium reed relays for maximum signal performance
- Electro-mechanical relays for current handling up to 10 A
- Occupies 4 or 8 3U PXI Slots
- Supported by PXI or LXI chassis

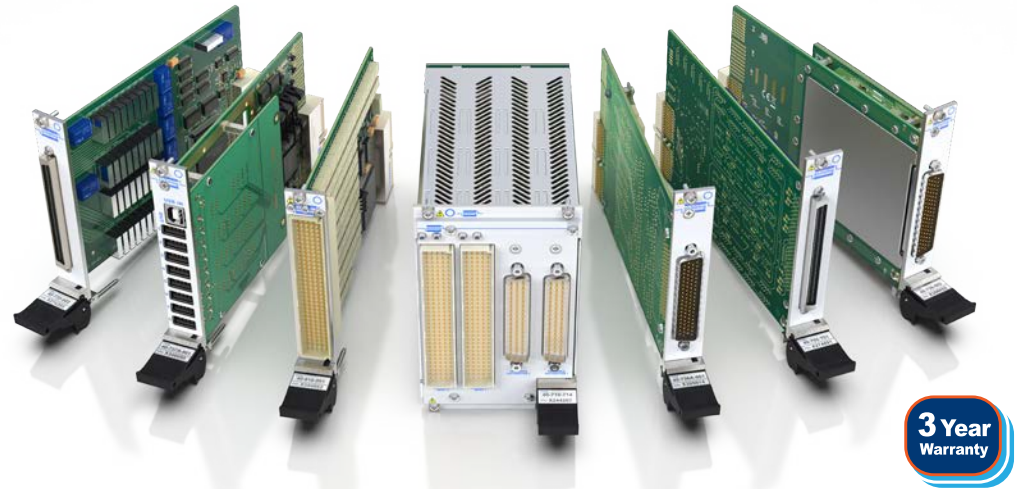


# USB, Communications, Avionics & Optical Switching

Our communication switches are designed to switch signals such as RS232, USB, CAN Bus, Ethernet, and Gigabit Ethernet. The range includes tributary switches designed for SONET/SDH multiplexer applications in 75  $\Omega$  or 120  $\Omega$  differential systems.

ARINC 608A switching modules are suitable for avionics applications. They can be fitted with a combination of Resource Distributor and Bus Matrix Input daughter cards, giving a high level of integration and reducing the cost and complexity of cabling.

Our optical switching modules include high-performance multiplexers, matrices and insert/bypass switches. MEMS (Micro-Electro-Mechanical Systems) switch technology offers higher performance and longer operational life than conventional prism-based optical switching.



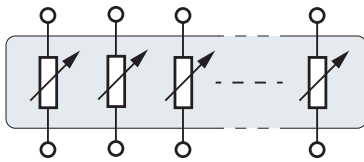
- Telecoms switching (PXI & PXIe)
  - Differential multiplexer for switching serial data
  - For signals carried on differential pairs
  - Versions suitable for USB and Ethernet
  - Tributary switches for telecoms test applications
- ARINC 608A switching (PXI)
  - Resource Distribution and Bus Matrix Input modules
  - Choice of configurations
  - 2 A switch current, 300 VDC/250 VAC maximum voltage
- Optical switching (PXI, PXIe & LXI)
  - Range of multiplexers, matrices & insert/bypass switches
  - MEMS switching technology
  - Single & multi-mode versions
  - Wide range of connector types
- PXI versions supported by PXI or LXI chassis



# Programmable Resistors

Programmable resistor modules are ideal for medical, aerospace and automotive applications as part of our Sensor Simulation family. They are designed to simulate resistive sensors and variable resistors when testing devices such as engine controllers.

The modules are available in different ranges of resistance, density and precision to suit many applications. The module types include; selectable resistors, standard resistors, precision resistors, RTD simulators, strain gauge simulators and load resistors.



- Programmable resistor & potentiometers suitable for sensor emulation applications
- PXI & PCI formats with selected modules available in PXIe
- Selectable modules with user defined fixed resistors
- Standard modules with resolution to 0.25  $\Omega$  & Resistance Ranges from 1  $\Omega$  to 16 M $\Omega$
- Precision modules with resolution to 2 m $\Omega$  & Resistance Ranges from 1  $\Omega$  to 85.3 M $\Omega$
- High precision versions for **RTD & Strain Gauge** simulation
- Load resistors with power handling to 15 W
- PXI versions supported by PXI or LXI Chassis



# Sensor Simulation

As electronic devices get more intelligent, they require many sensors to provide data for decision-making and initiating the appropriate action. When it comes to New Product Introduction (NPI) and manufacturing test, it can be challenging to use the actual sensors used with the device. These are better simulated in test, making the test system smaller, faster, and more accurate.

For sensor simulation and programmable resistors, we offer a range of simulation modules for specific applications, including thermocouple, LVDT, current loop, strain gauge and switch simulation. We also provide modules suitable for other functions in a simulation and test system; these include waveform generator, amplifier and attenuator modules.



- Thermocouple simulators with 32, 24, 16 or 8 channels
- LVDT/RVDT/Resolver simulator with 4 or 5/6 wire emulation
- Analog Output/Current Loop simulators suitable for emulating 4-20 mA current loops of industrial transceivers
- Strain Gauge simulators for strain/pressure transducer emulation with Wheatstone bridge configuration
- Waveform Generator with sine, square and triangle functions up to 10 MHz with 48-bit resolution
- Amplifiers with 5 channels, gain up to 20x and 1 MHz bandwidth
- High Voltage attenuator with 5 or 10 channels, attenuation of up to 160x and  $\pm 600$  V maximum
- RF Attenuators with up to 6 channels up to 63 dB attenuation and 3 or 6 GHz bandwidth
- PXI versions supported by PXI or LXI chassis

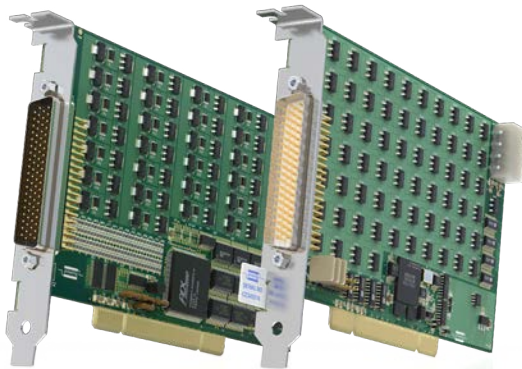


# Digital I/O & Prototyping

Digital I/O modules are suitable for operating external devices or interfacing with external logic. The output drivers are available as TTL for interacting with external logic or with output channels for operating external devices with voltages to 60 VDC and current to 2 A

They are available with programmable input thresholds allowing the user to test the voltage of incoming signals' high and low states. They also have output channels that can be used as high-side drivers for sourcing current or low-side drivers for sinking current.

Our PXI prototyping modules are available with or without digital I/O and allow users to construct their circuitry. The breadboard module without digital I/O has no PXI interface but has access to fused power supplies from the PXI backplane and is available in 1 or 2-slot formats with either a blank front panel or fitted with one of a selection of connectors.



- Digital I/O modules (PXI & PCI)
  - Up to 32 inputs & 32 outputs
  - TTL or open collector outputs
  - High side or low side drive versions
  - Programmable threshold options
  - Optically isolated versions
- Prototyping modules (PXI)
  - With or without 32 channels of digital I/O
  - I/O option with TTL or open collector outputs
  - 65 cm<sup>2</sup> of prototyping area
  - Low cost option with no interface circuitry
  - One or two PXI slot width
  - Choice of connector types or blank front panel
- PXI versions supported by PXI or LXI chassis

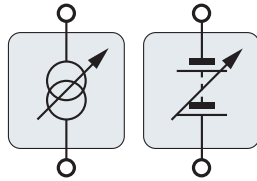


# Power Supply & Battery Simulation

Our programmable power supplies provide voltage outputs that are fully adjustable under software control. Dual power supplies can supply up to 60 W and are ideal for applications where a self-contained test system with a high power supply power capability is required in a PXI format.

PXI battery simulators are designed to simulate the power supplies of portable battery-powered equipment. These modules can source current to simulate a battery supply or sink current to simulate a battery under charge.

The 6-cell battery simulator version is ideal for emulating the battery stacks used for electric vehicles. Its high density and high isolation voltage barrier permit it to be used with many cells in series, enabling it to emulate a battery stack of up to 108 cells in a single PXI or LXI chassis.



- Fixed or programmable power supply modules
- Battery simulator modules capable of sinking or sourcing current
- Simulation of batteries in portable equipment
- Capable of simulating a battery under charge
- 6-channel battery simulator for emulating electric vehicle battery stacks
- Variable supplies can deliver up to 48 V per channel with 2 A maximum current
- Suitable for PXI or LXI modular chassis

# Chassis & Remote Controllers

We offer both PXI & PXIe chassis and PXI controllers that support all of our PXI switching and simulation modules as well as those from third parties. There is a choice of up to 19-slot 3U chassis with options to reduce acoustic noise. For high-performance PXI systems, our Gen 3 PXIe chassis provide performance and low-cost for a broad range of applications.

Our LXI chassis allow any of our 3U PXI switch modules and simulation modules to be controlled in an Ethernet environment. Our LXI/USB chassis, available in 2, 4, and 6-slot versions; these chassis allow most of our 1 or 2-slot PXI modules to be controlled via USB or Ethernet.

Our PXI remote controllers offer seamless connection between a PC's PCI or PCI Express interface and a PXI or PXIe chassis.



- PXI chassis with between 8 & 19 peripheral slots in half or full rack formats
- PXI Express chassis with 8 or 18 slots in half or full rack formats
- LXI chassis in half or full rack formats allowing 7 or 18 PXI modules to be controlled via Ethernet
- LXI/USB chassis with 2, 4 or 6 PXI slots under Ethernet or USB control
- Controller cards for connection between PCIe & PXI or PCIe & PXIe





# Cables & Connector Solutions

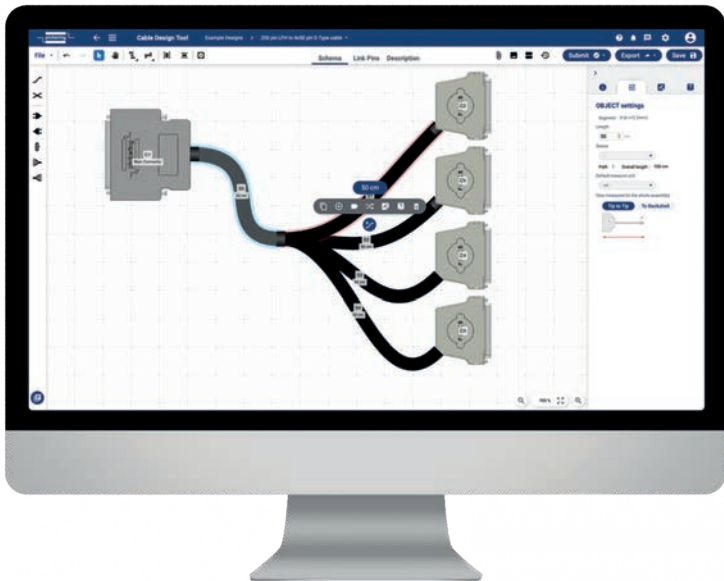
We provide a full range of supporting cables and connector solutions for all of our PXI modules, PCI cards and LXI Ethernet switching solutions. We offer everything from simple mating connectors to complex cable assemblies and terminal blocks.

Every accessory is designed to ensure you have a trouble-free experience in connecting our products to your test system. All parts are guaranteed to mechanically and electrically connect correctly.

We can also manufacture cable assemblies to special requirements. You can try our Cable Design Tool to create a custom cable assembly or contact your local sales representative.



- High density, high power & RF cables available
- Wide choice of cable lengths and connector gender
- Connector support for all Pickering's switching and simulation modules
- Male to male, male to female & female to female options
- Underminated cables for user's custom connection
- Connectors for user to construct their own cabling
- Solder & crimp connectors with or without backshells
- Connector blocks for discrete wire connection
- Custom cables available
- Cable Design Tool for users to specify their own cables



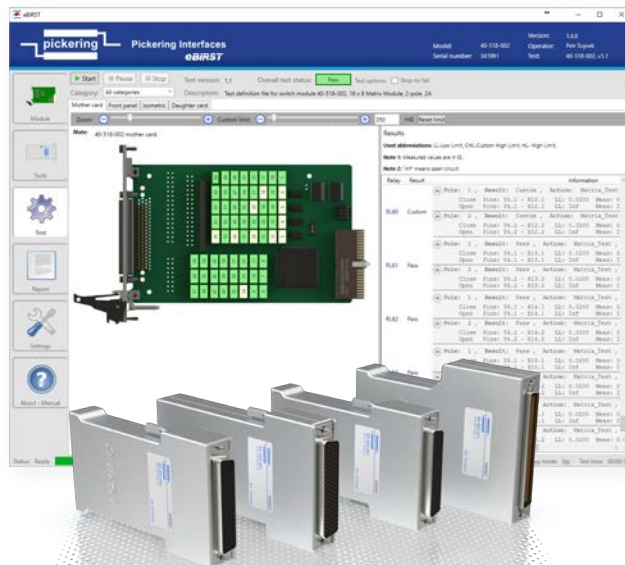
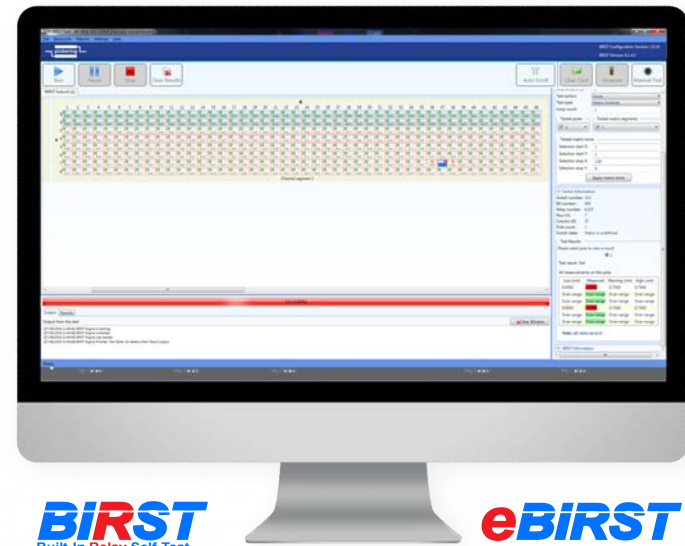
# Diagnostic Test Tools for Switching Systems

Verifying and diagnosing complex switching operations in a test system has always been an issue. Our diagnostic test tools provide a quick and simple way of finding relay failures within systems that use our PXI, LXI, or PCI switching products.

**BIRST™** - Built-in Relay Self-Test: Available on many of our matrix-switching products. BIRST requires no purchased external tools; it simply requires a free software installation on a Windows controller.

**eBIRST™** - Switching System Test Tools: Available for many of our switching products. eBIRST consists of an adaptor for the user connector and associated software.

These tools provide a means of quickly determining if a switching system has faults, identifying where the fault is located and allowing fast corrective action.

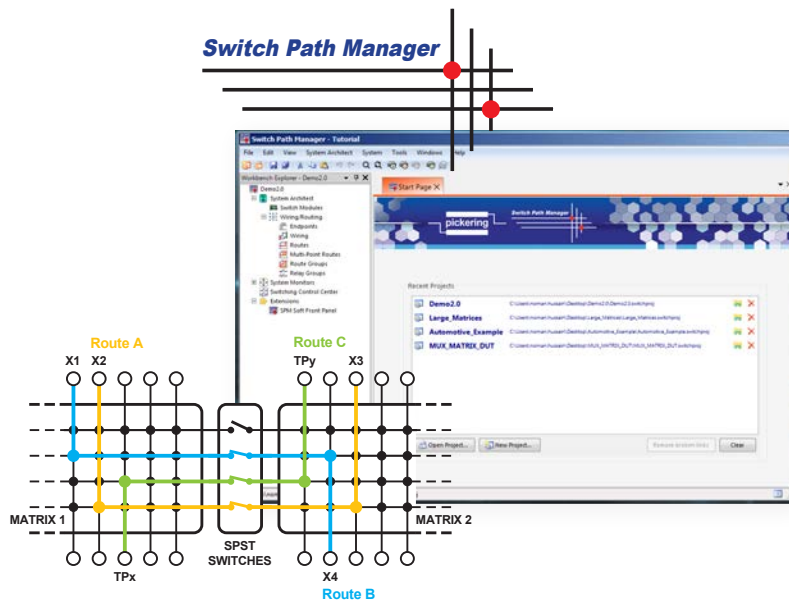
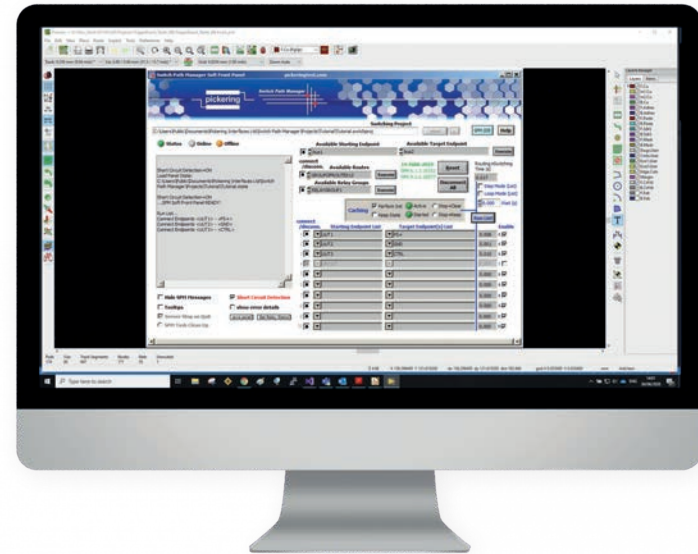


- BIRST locates faults on our matrix products—requires no external instrumentation
- eBIRST used on many of our switching products—requires external adaptor—gives 100% coverage
- Quickly determine if your switching system has faults
- Detection of welded, open circuit or high resistance relays
- Identify where that fault is located at relay level and allow you to take fast corrective action
- Save repair costs
- Minimize downtime of the switching system



# Signal Routing Software

Our signal routing software, Switch Path Manager (SPM), simplifies signal routing through switching systems and speeds up the development of switching system software. SPM supports our switching modules and the interconnection between them. Once a switching system model has been created, simply defining the endpoints required to be connected can perform signal routing—the ability to automate signal routing results in effective and easy switching system management—safely and quickly. SPM is available in a full version and a lower-cost lite version. For information, please look at the SPM resources available on our website.



- Manages complex switching systems and reduces switching software development effort
- Provides automated or pre-defined signal routing and static or dynamic routing
- Signal isolation & endpoint protection technology
- Manual control capability
- Supports PXI, LXI & PCI systems
- Modules pack for all Pickering switch modules
- APIs available for C, .NET, Python, LabWindows™/CVI and LabVIEW™
- Windows 32-bit or 64-bit compatible
- Free software upgrades & lifetime support, no software subscription required

# Pickering Interfaces

Pickering Interfaces was formed in 1988 and is headquartered in Clacton-on-Sea, United Kingdom. We have two manufacturing facilities—in the UK and the Czech Republic. We also have direct sales and support offices throughout Asia, Europe and North America. Our employees share a customer-centric approach and are dedicated to quickly getting our products functioning at their peak and into our customers' hands.



Today, we offer modular signal switching, simulation, software and services to streamline the development and deployment of high-performance electronic test and verification systems. We provide the most extensive range of switching and simulation solutions in the industry for PXI, LXI, USB and PCI applications. To support our switching and simulation solutions, we also offer application software and software drivers along with a full range of supporting connectivity and cabling solutions.



The Pickering Group of companies has been in switching technology since 1968 when our reed relay division, Pickering Electronics, introduced its first reed relays. It comprises Pickering Electronics, Pickering Interfaces—the switching and simulation division and Pickering Connect—the connection division. Together we deliver high-quality switching and simulation products and a full range of standard and custom cable and connector solutions.



# Pickering Interfaces Timeline



**1998**

Became an early innovator in PXI, launching our first System 40 switching products.

First PXI programmable resistors introduced - the start of a wide range of modules for simulation.

Joins PXI Systems Alliance.

**1988**

Pickering Interfaces formed as a sister company to Pickering Electronics designing and manufacturing modular GPIB (System 10) switching systems.



**PXI**



**2000**

First PCI switching products (System 50) launched.

Swedish office opened.



**2004**

Manufacturing cabling and connectivity solutions begins.

PXI power supply and instrumentation modules introduced.

Second USA office opened on East coast.



**2006**

French office opened.



**1990**

GPIB 6U switching systems (System 20) launched featuring higher performance, built-in self test and reduced cost per switch.

**VXI**



**1999**

First USA office opened.



**2001**

New larger manufacturing facility opened.

German office opened.



**2002**

BRIC ultra-high density PXI switch modules introduced using custom designed 117 reed relays. With over 4000 relays per module - the highest density in any test platform.

**2003**

First PXI RF switching modules launched.



**LXI**



**2005**

First LXI compliant products (System 60) introduced.

Joins the LXI Consortium.

Pickering Interfaces sro established in Trinec, Czech Republic.



**2009**

Built-In Relay Self-Test (BIRST) introduced to the PXI product line.

**BIRST**  
Built-In Relay Self-Test



**2014**

Now offering over 1000 modules in its PXI range.

**2016**

Switch Path Manager signal routing software introduced.

2-Slot LXI/USB modular chassis introduced (60-104).

Switch Path Manager



**2018**

PXI Switching Module (model 45-542) selected for USAF A-10 aircraft ground support.

6-Slot LXI/USB modular chassis introduced (60-106).



**2021**

New custom designed 3500m² building opens in Bystrice, Czech Republic.

200+ modules now available in PXIe format.



**2013**

Wideband modular LXI matrix (model 65-110) chosen by CERN for Collider Signal Monitoring.



**2015**

Support office opened in Beijing China.

eBIRST switching system test tools introduced for PXI, LXI and PCI ranges.

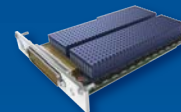


**eBIRST**

**2017**

Ultra-high density 1 Amp matrices introduced in LXI format.

4-Slot LXI/USB modular chassis introduced (60-105).



**2019**

Won 2019 UK Queen's Award for outstanding short-term growth in overseas sales.

Ultra-high density 1 Amp matrices introduced in PXI format.



**2020**

Partner Program begins.

8 & 18-Slot PXIe chassis introduced (41-924 & 42-925).

New Turnkey LXI microwave switch & signal routing subsystem service.





## Direct Sales & Support Offices

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