• High Density Reed Relay Matrix Module
• 44x4 Matrix
• 1-Pole, 2-Pole or Screened Versions
• 46x4 Matrix Option For 1-Pole Switching
• Large Matrices Built Using Multiple Modules
• Screened 50Ω Option with 50MHz Bandwidth
• Uses High Reliability Pickering Ruthenium Reed Relays For Maximum Performance
• Fast Operating Speed <500µs
• Switch up to 150V, 1.25A with 20W Max Power
• VISA, IVI & Kernel Drivers Supplied for Windows
• Supported by PXI or LXI Chassis
• Supported by eBIRST™
• 3 Year Warranty

The 40-523 and 40-524 high density matrix modules are part of our range PXI switching solutions. The configurations are as follows:
• 40-523-021 44x4 1-Pole Matrix
• 40-523-021-S 44x4 1-Pole Screened Matrix
• 40-523-022 44x4 2-Pole Matrix
• 40-524-021 46x4 1-Pole Matrix

The screened version is suitable for switching coaxial signals up to 50MHz.

Typical applications include signal routing in Functional ATE and data acquisition systems. These modules are constructed using high reliability sputtered ruthenium reed relays, offering 10^9 operations to give maximum switching confidence with long life and stable contact resistance.

Larger matrices may be constructed by daisy chaining the common signals from multiple modules. However, for applications that require a very large matrix, Pickering’s BRIC™ modules are best suited.

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
Relay Type
The 40-523/524 modules are fitted with ruthenium sputtered reed relays, these offer very long life with good low level switching performance and excellent contact resistance stability. Spare reed relays are built onto the circuit board to allow easy maintenance with minimum downtime.

All reed relays are manufactured by our sister company Pickering Electronics: [pickeringrelay.com](http://pickeringrelay.com)

Switching Specification

<table>
<thead>
<tr>
<th>Switch Type</th>
<th>Ruthenium Reed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Switch Voltage</td>
<td>150VDC/100VAC*</td>
</tr>
<tr>
<td>Max Power</td>
<td>20W</td>
</tr>
<tr>
<td>Max Switch Current</td>
<td>1.0A</td>
</tr>
<tr>
<td>Max Carry Current</td>
<td>1.25A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial Path Resistance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>On (Single Module)</td>
<td>&lt;1200mΩ (40-523)</td>
</tr>
<tr>
<td></td>
<td>&lt;1000mΩ (40-524)</td>
</tr>
<tr>
<td>Off (Single Module)</td>
<td>&gt;10Ω</td>
</tr>
<tr>
<td>Thermal Offset</td>
<td>&lt;5µV</td>
</tr>
</tbody>
</table>

| Operate Time           | <0.5ms, 0.25ms typical |
| Release Time           | <0.5ms, 0.25ms typical |

| Expected Life, low power load | 1x10⁹ operations |
| Expected Life, full power load | >5x10⁶ operations |

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

Power Requirements

<table>
<thead>
<tr>
<th>+3.3V</th>
<th>+5V</th>
<th>+12V</th>
<th>-12V</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>400mA (280mA typical)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).

3D models for all versions 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 96-pin male micro-D connector, for pin outs please refer to the operating manual.

Operating/Storage Conditions

**Operating Conditions**

<table>
<thead>
<tr>
<th>Operating Temperature</th>
<th>0°C to +55°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity</td>
<td>Up to 90% non-condensing</td>
</tr>
<tr>
<td>Altitude</td>
<td>5000m</td>
</tr>
</tbody>
</table>

**Storage and Transport Conditions**

<table>
<thead>
<tr>
<th>Storage Temperature</th>
<th>-20°C to +75°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity</td>
<td>Up to 90% non-condensing</td>
</tr>
<tr>
<td>Altitude</td>
<td>15000m</td>
</tr>
</tbody>
</table>

**PXI & CompactPCI Compliance**

The module is compliant with the PXI Specification 2.2. Local Bus, Trigger Bus and Star Trigger are not implemented.

Uses a 33MHz 32-bit backplane interface.

**Safety & CE Compliance**

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](http://pickeringtest.com/ebirst)

<table>
<thead>
<tr>
<th>Product</th>
<th>Test Tool</th>
<th>Adaptor</th>
<th>Termination</th>
</tr>
</thead>
</table>

**Spare Relay Kits**

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

<table>
<thead>
<tr>
<th>Product</th>
<th>Relay Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-523-021</td>
<td>91-100-003</td>
</tr>
<tr>
<td>40-523-021-S</td>
<td>91-100-011</td>
</tr>
<tr>
<td>40-523-022</td>
<td>91-100-008</td>
</tr>
<tr>
<td>40-524-021</td>
<td>91-100-030</td>
</tr>
</tbody>
</table>

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

**Mating Connectors & Cabling**

For connection accessories for the 40-523/524 modules please refer to the 90-016D 96-pin micro-D Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

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**Product Order Codes**

<table>
<thead>
<tr>
<th>44x4 Matrix Module, 1-Pole</th>
<th>40-523-021</th>
</tr>
</thead>
<tbody>
<tr>
<td>44x4 Matrix Module, 1-Pole Screened</td>
<td>40-523-021-S</td>
</tr>
<tr>
<td>44x4 Matrix Module, 2-Pole</td>
<td>40-523-022</td>
</tr>
<tr>
<td>46x4 Matrix Module, 1-Pole</td>
<td>40-524-021</td>
</tr>
</tbody>
</table>

**Product Customization**

Pickering PXI 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 reed relay types
- Mixture of reed 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.

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**Ordering Information**
Supporting Products & Software

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 1000+ PXI Switching & Simulation 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.

Connectors & Backshells Multiway Cable Assemblies RF Cable Assemblies 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. Visit pickeringtest.com/ctd to start your design.

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

Pickering Reed Relays
We are the only switch provider with in-house reed relay manufacturing capability via our sister company, Pickering Electronics. These instrument grade reed relays feature SoftCenter® technology, ensuring long service life and repeatable contact performance.
To learn more, please 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 a list of all supporting operating systems, please see: pickeringtest.com/os

The VISA driver is also compatible with Real-Time Operating Systems such as LabVIEW 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+)
- Keysight VEE
- Mathworks Matlab
- 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, please 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, please 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, please 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 a period of three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available for all our modules and systems with various levels to suit 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, please go to: pickeringtest.com/support

Available Product Resources

We have a large library of product resources including success stories, product and support videos, articles, as well as complete product catalogs and product reference maps to assist when looking for the switching, simulation and cable and connector solutions you need. We have also published handy reference books for the PXI and LXI standards.

To view, download or request any of our product resources, please visit: pickeringtest.com/resources