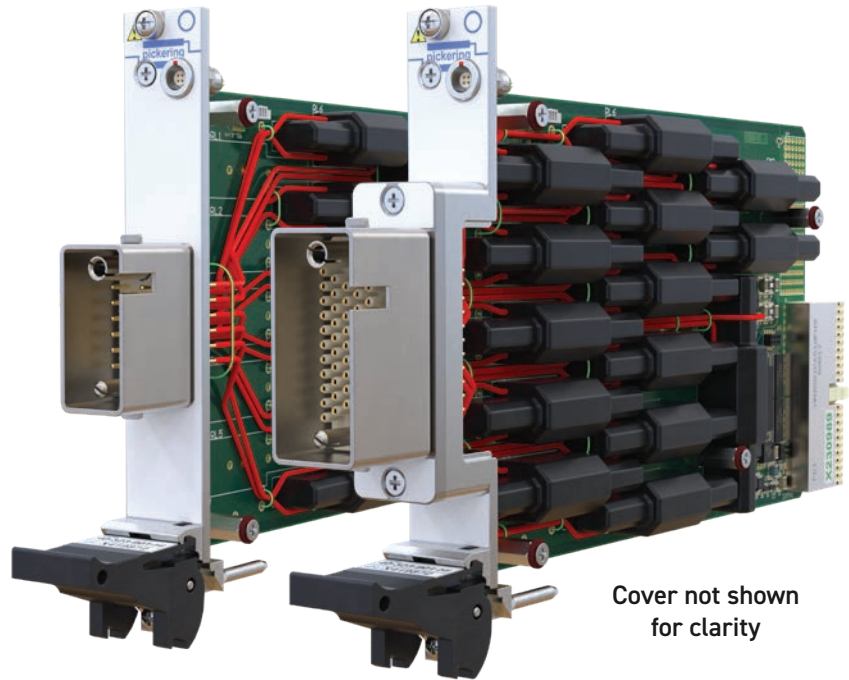


- Available as a PXI or PXIe Module
- 7 or 14 Relays Per Module
- Cold Switch up to 9 kVDC/9 kVAC Peak
- Hot Switch up to 7.5 kVDC/7.5 kVAC Peak
- 0.25 A Hot Switch Current
- Maximum Power 50 W
- Dry Reed Switch Contacts With RFI Suppression for Long Life
- Hardware Interlock Provided
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- PXI Version Supported by PXI or LXI Chassis
- 3 Year Warranty

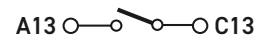
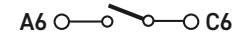
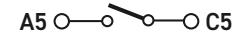


Cover not shown for clarity

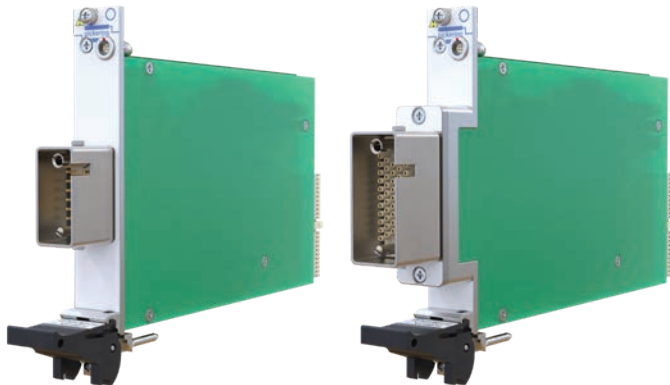
The 40-323 (PXI) and 42-323 (PXIe) are suitable for applications requiring high voltage power switching with high density. They have current handling up to 0.25 A, cold switching up to 9 kVDC/9 kVAC peak and hot switching up to 7.5 kVDC/7.5 kVAC peak. They are available with 7 or 14 separate single pole, single throw (SPST) relays. User connections are made via a Redel K or S series high voltage connector.

Applications include; circuit board isolation testing, relay testing, semiconductor breakdown monitoring and cable harness insulation testing.

A hardware interlock is provided on the front panel connector that prevents relay operation if a suitably wired mating connector is not fitted. This can, for example, be used to disable relay operation if the test system cabinet door is open.



40/42-323 High Voltage Power Relay  
- Available as 7 x SPST or 14 x SPST



40-323-900-HI & 40-323-901-HI PXI High Voltage Power Relay Modules with Covers

## Hardware Interlock

The 40/42-323 modules are fitted with a hardware interlock. The interlock, when activated, will return all relays to their default unpowered state (assuming the switches are fully functional) and also provide error notification via the software interface. The interlock feature can be daisy-chained between additional hardware interlock enabled modules for example to allow one signal to disable multiple cards. For further details please refer to the Hardware Interlock section within the user manual.

## Overview of “Hot” & “Cold” Switching Techniques

### “Hot” Switching

This is when the load is switched with the high voltage source applied. Hot switching may generate considerable RFI, both within the switching module and on interconnecting wiring. Care must be taken to suppress or shield all cabling.

Note that any precaution which adds extra capacitance to a cable should be taken with great care, even a very small capacitance at high voltages can cause very large inrush current through the module resulting in possible switch weld and excessive RFI.

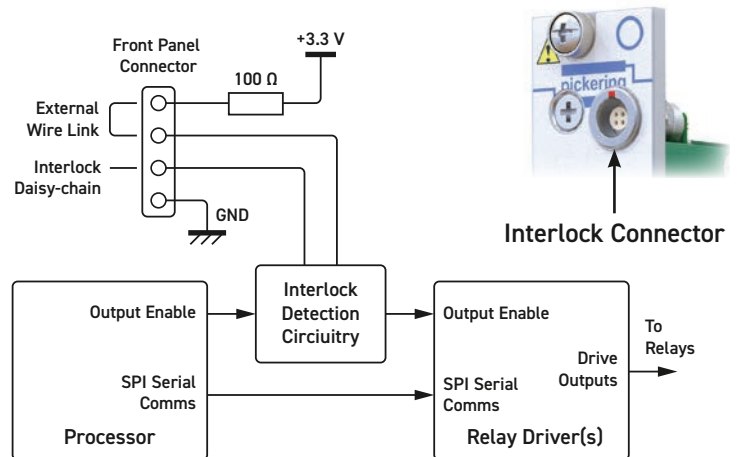
The 40/42-323 includes extensive built-in suppression circuits that minimize RFI and surge problems.

## RFI Suppression

The 40/42-323 module includes RFI suppression that extends relay contact life in hot switching applications and controls surges caused by high voltage transients in cold switching applications. The suppressors also ensure the module's safe operation when connected to a high voltage source via cable assemblies that might otherwise generate additional transients or RFI problems.

The suppression components result in reduced bandwidth and slightly higher path resistance compared to standard designs (please refer to the switching specification table).

Please note, it is good practice to keep high voltage switching modules away from more sensitive units to minimize crosstalk.



Interlock Signal Routing Diagram for 40/42-323

### “Cold” Switching – The Preferred Option for Reliability & Long Life

With cold switching, the relay is operated before the high voltage source is applied. In this case the maximum carry current is much greater, also there will be much less stress on the reed relays, resulting in improved reliability and life.

Most high voltage sources include a soft start facility which reduces the likelihood of generating RFI or temporary over-voltage.

High voltage switching modules are often used for isolation testing applications (e.g. cable, transformer or semiconductor isolation tests), in these cases, cold switching is nearly always the preferred option to reduce the risk of high voltage transients that may cause premature breakdown.

## Relay Type

The 40/42-323 is fitted with high quality tungsten reed relays specifically designed for very high voltage switching and are manufactured by our Relay Division:

[pickeringrelay.com](http://pickeringrelay.com)

## High Voltage Switching Specification

Switch Type:	Tungsten Reed
Max Hot Switch Voltage:	7.5 kVDC/7.5 kVAC peak*
Max Cold Switch Voltage:	9 kVDC/9 kVAC peak*
Max Power:	50 W
Max Hot Switch Current:	0.25 A
Max Cold Switch Current:	0.25 A
Initial On Path Resistance:	<2.3 Ω
Off Path Resistance:	>1x10 <sup>12</sup> Ω
Thermal Offset:	<85 μV
Operate Time:	7 ms typical
Expected Life:	>1x10 <sup>7</sup> operations

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

## RF Specification

Bandwidth (-3 dB):	1.4 MHz (typical)
VSWR (1.5:1):	340 kHz (typical)
Crosstalk (typical):	10 kHz: -70 dB
	100 kHz: -70 dB
	1 MHz: -60 dB
	4 MHz: -45 dB
Isolation (typical):	10 kHz: 60 dB
	100 kHz: 70 dB
	1 MHz: 50 dB
	4 MHz: 40 dB

## Power Requirements - 40-323

+3.3V	+5V	+12V	-12V
0.2 A	0	0.8 A	0

## Power Requirements - 42-323

+3.3V	+12V
0.2 A	0.8 A

## Mechanical Characteristics

40-323 - Single slot 3U PXI (CompactPCI card).

42-323 - Single slot 3U PXIe, compatible with PXIe hybrid slot.

Module weight: 430 g

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

## Connectors

40-323 - PXI bus via 32-bit P1/J1 backplane connector.

42-323 - PXIe bus via XJ3 and XJ4 backplane connectors.

Signals via front panel connectors:

- 40/42-323-900-HI - Redel K series high voltage, 22-pin
- 40/42-323-901-HI - Redel S series high voltage, 51-pin
- Interlock: 1 x 4-pin female 00 series (mating half supplied with module, to be wired by end user).

For pin outs please refer to the operating manual.

## PXI & CompactPCI Compliance - 40-323

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.

## PXIe Compliance - 42-323

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 70 % non-condensing

Altitude: 5000 m

Storage Temperature: -20 °C to +75 °C

Humidity: Up to 70 % non-condensing

Altitude: 15000 m

## Product Order Codes

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PXI High Voltage Power Relay Module	
7 x SPST With Hardware Interlock	40-323-900-HI
14 x SPST With Hardware Interlock	40-323-901-HI

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PXIe High Voltage Power Relay Module	
7 x SPST With Hardware Interlock	42-323-900-HI
14 x SPST With Hardware Interlock	42-323-901-HI

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## 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.

## Support Products

### Spare Relay Kits

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

Product	Relay Kit
4x-323-90x-HI	91-100-121

For further assistance, please contact the Pickering sales office.

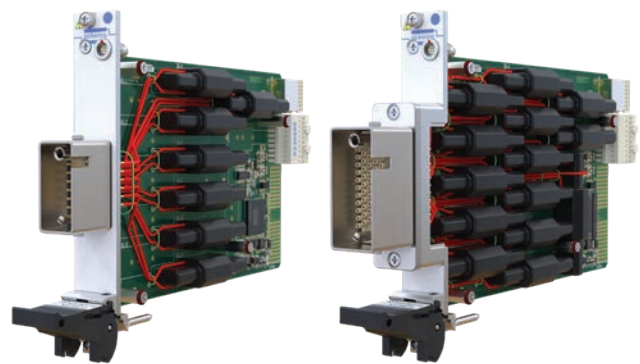
### Interlock Connectors

Spare/replacement connectors can be ordered for the interlock function.

Product	Description
44-961-040	Connector with internal link.
44-960-040	Connector only, no internal wiring (replacing that supplied with the module).

### Mating Connectors & Cabling

For connection accessories for the 40/42-323 range please refer to the [90-025HVD](#) 22-pin Redel K series or the [90-026HVD](#) 51-pin Redel S series Connector Accessories data sheet where a complete list and documentation can be found for accessories.



42-323-900-HI & 42-323-901-HI PXIe High Voltage Power Relay Modules (covers not shown for clarity)

## 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:

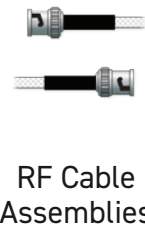
- Choose from 1000+ Pickering PXI Modules
- Ethernet or USB control enables remote operation
- Low-cost control from practically any controller
- LXI provides manual control via Web browsers
- Driverless software support
- Power sequencing immunity
- Ethernet provides chassis/controller voltage isolation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





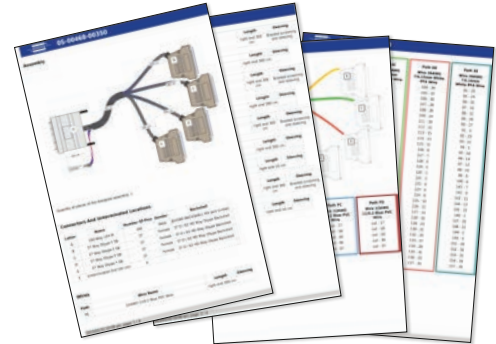
## Connectivity Solutions

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.



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)

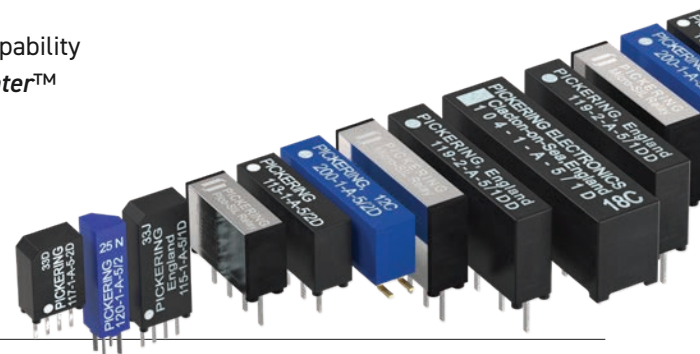
## Mass Interconnect

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](http://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**

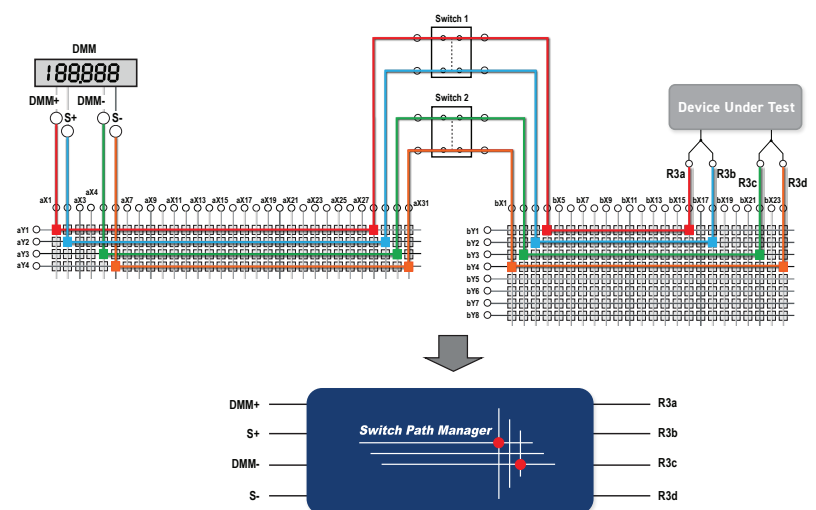
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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

