

- 26x or 13x SPST Relays or 16x or 8x 2:1 Multiplexers per Module
- Switched Guard for Maximized Isolation Resistance
- Up to $10^{13} \Omega$ Isolation Resistance
- Uses High Reliability Pickering Ruthenium Reed Relays For Maximum Performance
- Fast Operating Speed 500 μ s Typical
- Switch up to 100 V
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- Supported by PXI or LXI Chassis
- 3 Year Warranty



The 40-121 provides 26 or 13 SPST switches or 16 or 8 2:1 multiplexers in a single slot PXI module and designed to provide an isolation resistance in excess of $10^{13} \Omega$.

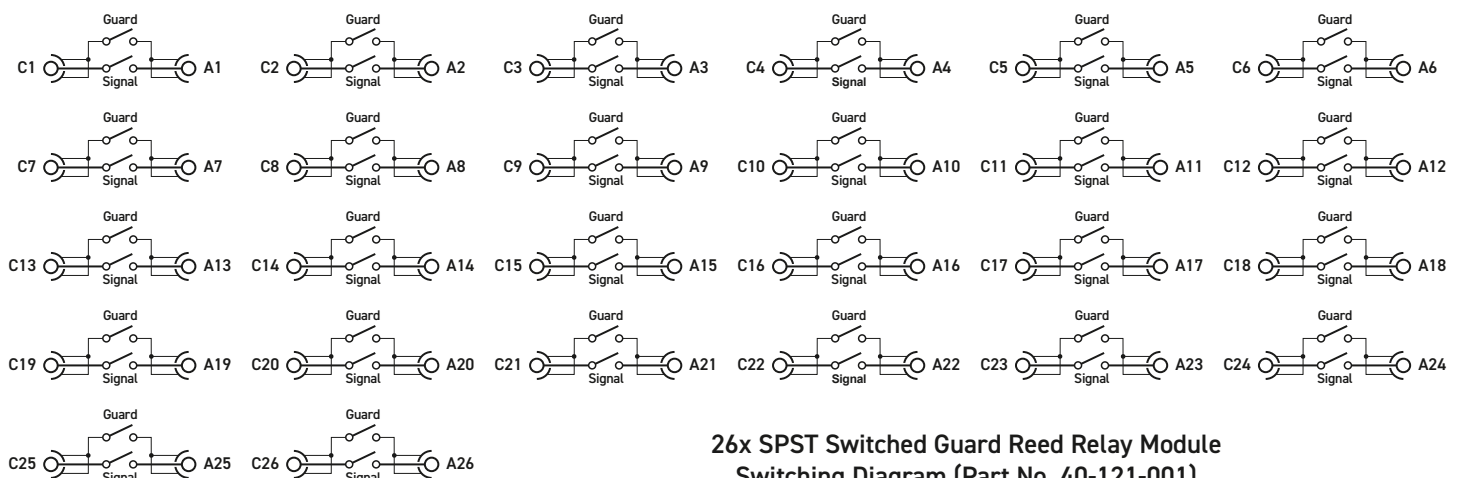
It has been designed to ensure high isolation resistance through the use of switched guards, making it ideal for low level measurements and semiconductor test.

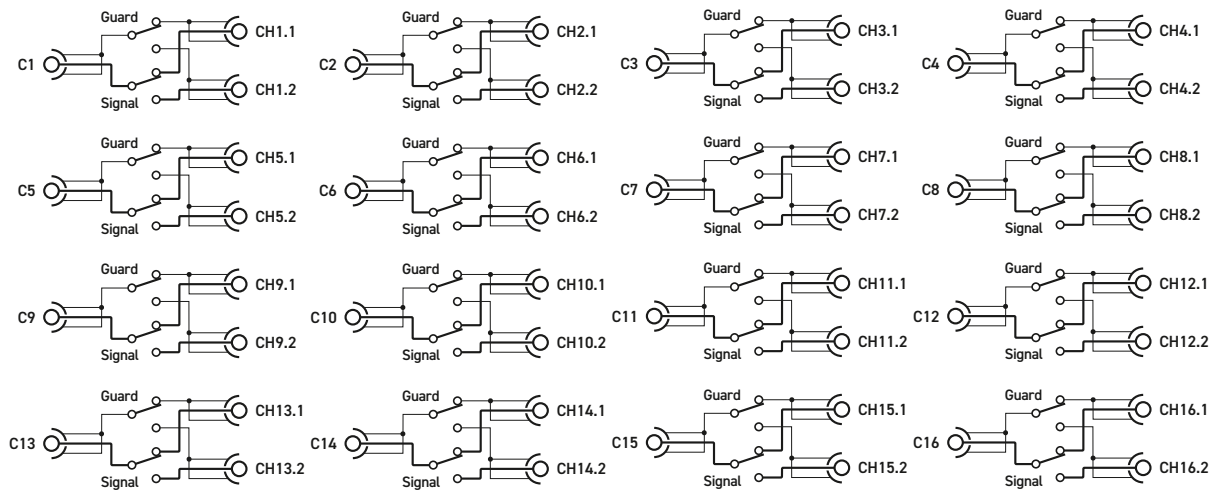
Relay Type

The 40-121 is 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 Relay Division: pickeringrelay.com

Pickering's Range of Switched Guard Modules:

40-121-001	26 x SPST Switches	
40-121-002	13 x SPST Switches	
40-121-011	16 x 2:1 Multiplexers	
40-121-012	8 x 2:1 Multiplexers	
4x-590-101	16x4 Matrix	
4x-590-102	8x4 Matrix	
65-290-001	16x16 Matrix	(plug-in modules for 65-200 LXI Scalable Chassis)
65-290-002	8x16 Matrix	





16x 2:1 Multiplexer Switched Guard Reed Relay Module Switching Diagram (Part No. 40-121-011)

Switching Specification

Switch Type:	Pickering Reed Relay (Ruthenium Sputtered)
Max Switch Voltage:	100 V *
Max Guard Voltage:	100 V *
Max Power:	20 W
Max Switch Current:	1 A
Bandwidth (-3 dB):	150 MHz
Typical Operate Time:	0.5 ms
Settling Time:	2 minutes
Initial On Path Resistance:	Signal: <400 mΩ (typical) Guard: <200 mΩ (typical)
Off Path Resistance:	>10 ⁹ Ω
Offset Voltage (EMF after 5 min.):	TBC
Offset Current **:	TBC
Isolation Resistance:	Up to 10 ¹³ Ω †
Capacitance, Channel Crosstalk (signal-to-signal):	TBC
Capacitance, Guard Crosstalk (signal-to-guard):	TBC
Expected Life, low power:	1x10 ⁹ operations
Expected Life, high power:	>1x10 ⁶ operations

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

** When zero voltage applied to all input & output ports.

† Point to point utilising the driven guard, 10 V drive, 21 °C, 40 % RH.

Power Requirements

+3.3 V	+5 V	+12 V	-12 V
250 mA	500 mA	0	0

Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).

Module weight: 330 g

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 connectors:

- 40-121-001 2x male 26-pin MS-M RF multi-way
- 40-121-002 1x male 26-pin MS-M RF multi-way
- 40-121-011 2x male 26-pin MS-M RF multi-way
- 40-121-012 1x male 26-pin MS-M RF multi-way

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

Switched Guard Reed Relay Module:	
26x SPST Switches	40-121-001
13x SPST Switches	40-121-002
16x 2:1 Multiplexers	40-121-011
8x 2:1 Multiplexers	40-121-012

Product Customization

Pickering's 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.

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

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.

Support Products

Mating Connectors & Cabling

For connection accessories for the 40-121 please refer to the [90-017D](#) 26-pin MS-M RF Connector Accessories data sheet where a complete list and documentation can be found for accessories.



Pickering can supply mating connectors and cable assemblies to enable easy integration of the 40-121 switched guard relay modules

Pickering Electronics State-Of-The-Art Reed Relays

This module is constructed using custom reed relays manufactured by our Relay Division.

Sputtered Ruthenium Reed Relays offer maximum performance, they are hermetically sealed and offer a very stable, long life relay contact (typically 10⁹ operations) with very fast operate time. Alternative



types such as electro-mechanical armature relays or non-instrumentation grade reed relays are lower cost but do not offer the consistent contact resistance, long life, fast switching speed and low level switching capability of a reed relay.

All of the reed relays used in our switching modules are manufactured by our Relay Division, these offer maximum switching performance. Please visit the reed relay web site at pickeringrelay.com for further information.

Chassis Compatibility

This PXI module must be used in a suitable chassis. It is compatible with the following chassis types:

- All chassis conforming to the 3U PXI and 3U Compact PCI (cPCI) specification
- Legacy and Hybrid Peripheral slots in a 3U PXI Express (PXIe) chassis
- Pickering Interfaces LXI or LXI/USB Modular Chassis

Chassis Selection Guide

Standard PXI or hybrid PXIe Chassis From Any Vendor:

- Mix our 1000+ PXI switching & simulation modules with any vendor's PXI instrumentation
- Embedded or remote Windows PC control
- Real-time Operating System Support
- High data bandwidths, especially with PXI Express
- Integrated module timing and synchronization



Pickering LXI or LXI/USB Modular Chassis

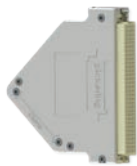
Only accept our PXI Switching & Simulation Modules:

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



Connectivity Solutions

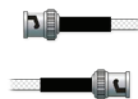
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed to mechanically and electrically mate to our modules. These accessories are detailed in Connector Accessories data sheets, where a complete list and documentation can be found for each accessory.



Connectors & Backshells



Multi-way Cable Assemblies



RF Cable Assemblies



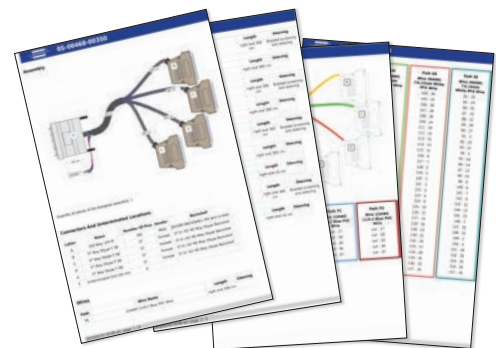
Breakouts



Connector Blocks

We also offer customized cabling and have a free online **Cable Design Tool** that can be used to create custom cable solutions for many applications.

- Fully supported on modern browsers and tablet operating systems.
- Built-in tutorials and videos allow you to get quickly up to speed.
- Store cable assemblies in the Cloud and develop over time.
- Each cable design has a downloadable PDF documentation file detailing all specifications



Start designing your custom cabling, go to pickeringtest.com/cdt

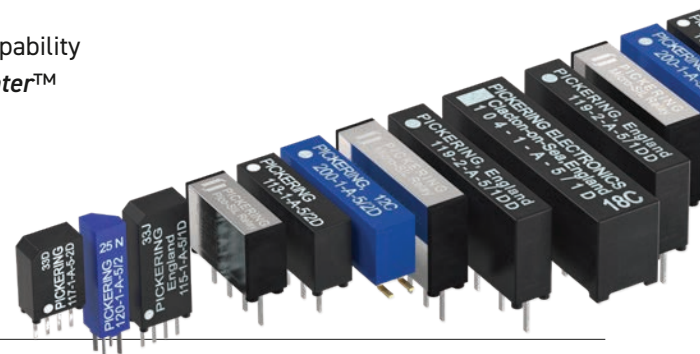
Mass Interconnect

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

Pickering Reed Relays

We are the only switch provider with in-house reed relay manufacturing capability via our Relay Division. These instrument grade reed relays feature **SoftCenter™** technology, ensuring long service life and repeatable contact performance.

To learn more go to pickeringrelay.com



Programming

Pickering provide kernel, IVI and VISA (NI & Keysight) drivers which are compatible with all Microsoft supported versions of Windows and popular older versions.

For more information go to pickeringtest.com/os

The VISA driver support is provided for LabVIEW Real Time Operating Systems (Pharlap and Linux-RT). For other RTOS support contact Pickering. These drivers may be used with a variety of programming environments and applications including:

- Pickering Interfaces Switch Path Manager
- National Instruments products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- Microsoft Visual Studio products (Visual Basic, Visual C++)
- Programming Languages C, C++, C#, Python
- Keysight VEE and OpenTAP
- Mathworks MATLAB, Simulink
- Marvin ATEasy
- MTQ Testsolutions Tecap Test & Measurement Suite

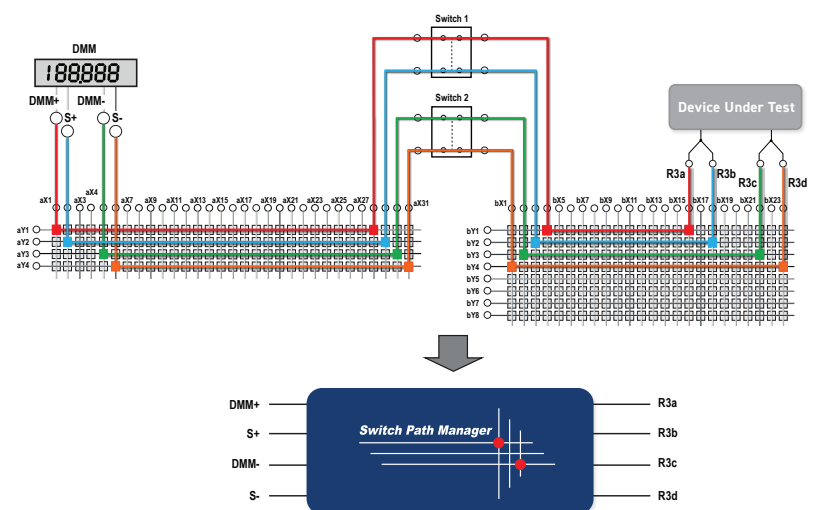
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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

To learn more about software drivers and development environments go to pickeringtest.com/software

Signal Routing Software

Our signal routing software, Switch Path Manager, automatically selects and energizes switch paths through Pickering switching systems. Signal routing is performed by simply defining test system endpoints to be connected together, greatly accelerating Test System software development.

To learn more go to pickeringtest.com/spm



Diagnostic Relay Test Tools

eBIRST Switching System Test Tools are designed specifically for our PXI, PCI or LXI products, these tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.

To learn more go to pickeringtest.com/ebirst



Three Year Warranty & Guaranteed Long-Term Support

All standard products manufactured by Pickering Interfaces are warranted against defective materials and workmanship for three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available with various levels for your requirements. Although we offer a 3-year warranty as standard, we also include guaranteed long-term support—with a history of supporting our products for typically 15-20 years.

To learn more go to pickeringtest.com/support

Available Product Resources

We have a library of resources including success stories, product and support videos, articles and white papers as well as application-specific brochures to assist you. We have also published reference books on switching technology and the PXI and LXI standards.

To view, download or request any of our product resources go to pickeringtest.com/resources

