

- Available as a PXI or PXIe Module
- High Density Electro-mechanical Relay Module
- 80 x SPST, 40 x DPST, 52 x SPDT or 26 x DPDT Configurations
- Maximum Current 2 A Hot or Cold Switching
- Switch up to 300 VDC/250 VAC and up to 60 W Max Power
- VISA, IVI & Kernel Drivers Supplied for Windows
- PXI Version Supported by PXI or LXI Chassis
- Supported by **eBIRST™**
- 3 Year Warranty



The 40-139A (PXI) and 42-139A (PXIe) 2 A modules are suitable for high density switching applications with medium power.

Featuring 2A current capacity and voltage rating to 300VDC/250VAC, available configurations are:

- 80 x SPST (Single Pole Single Throw)
- 40 x DPST (Double Pole Single Throw)
- 52 x SPDT (Single Pole Double Throw)
- 26 x DPDT (Double Pole Double Throw)

Connections are made via a front panel mounted 160 pin DIN 41612 high density connector. Pickering provide a wide range of connector and cabling solutions to support this module, refer to Pickering's "Interconnection Catalog" or visit our web site.

Typical applications will be found in Automotive, Aerospace, Military and Power Cell Testing applications

Supported by eBIRST

eBIRST test tools simplify fault-finding by quickly testing the system and graphically identifying the faulty relay.

For more information go to: pickeringtest.com/ebirst

Alternative Slot-Saving High Density Mixed Configuration Relay Module:

40-138	Custom Solutions from a mix of SPST, DPST, SPDT & DPDT Relays
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Alternative High Density 2 A Relay Module:

40-100	83 x SPDT Relays
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Alternative Lower Density 2 A Relay Modules:

40-132	16 or 32 x SPST Relays
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40-137	39 x SPST Relays
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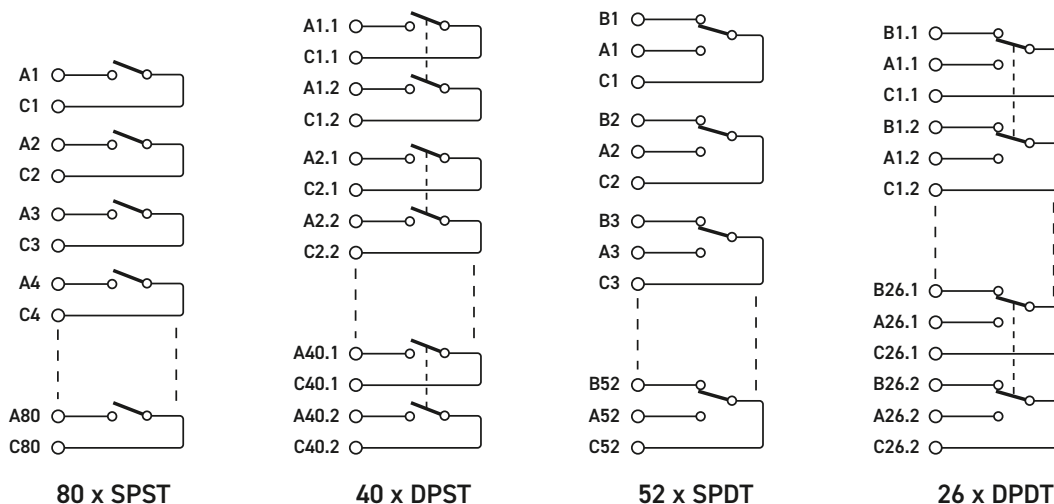
40-132	16 or 19 x DPST Relays
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40-131	16 or 26 x SPDT Relays
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40-130	8 or 13 x DPDT Relays
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Updated Product Information

This product has been introduced as an update to the 40-139, the change is to provide PXIe options.



40/42-139A High Density Relay Module Configurations

Relay Type

40-139 series modules are fitted with electro-mechanical signal relays with palladium-ruthenium, gold covered contacts.

The module is of a single circuit board construction and uses through hole relays (not SMT relays) so field maintenance is greatly simplified. In addition a spare relay is built onto the circuit board to allow easy maintenance with minimum downtime.

Switching Specification

Switch Type:	Electro-mechanical
Contact Type:	Palladium-Ruthenium, Gold Covered Bifurcated
Max Switch Voltage:	300 VDC/250 VAC *
Max Power:	62.5 VA, 60 W from 30 V to 220 VDC, 30 W to 300 VDC (resistive load)
Max Switch Current:	2 A **
Max Continuous Carry Current:	2 A **
Max Pulsed Carry Current	
Example (for single switch path):	6 A for 100 ms (up to 10% duty cycle)
Initial On Path Resistance:	<350 mΩ, 150 mΩ typical (1 A measurement condition)
Off Path Resistance:	>10 ⁹ Ω
Minimum Voltage:	100 μV
Thermal Offset:	<10 μV
Operate Time:	< 3 ms
Expected Life (operations)	
Very low power signal load:	>10 ⁸
Low power load (2W):	>1.5x10 ⁷ (0.1 A, 20 VDC)
Medium power load (30W):	>5x10 ⁶ (1 A, 30 VDC)
Full power load (60W):	>1x10 ⁵ (2 A, 30 VDC) >1x10 ⁵ (0.1A, 300 VDC)

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

** Limited to 1.5 A when all channels are used. No limitations when up to 50% of channels are used. See Guidance On Power Handling section in the user manual for further details.

RF Specification

Bandwidth (-3 dB):	65 MHz (40/42-139A-101) 70 MHz (40/42-139A-102) 60 MHz (40/42-139A-201) 50 MHz (40/42-139A-202)
Crosstalk (typical):	-60 dB at 10 kHz -60 dB at 100 kHz -40 dB at 1 MHz -20 dB at 10 MHz
Isolation (typical):	55 dB at 10 kHz 55 dB at 100 kHz 40 dB at 1 MHz 20 dB at 10 MHz

Power Requirements - 40-139A

+3.3 V	+5 V	+12 V	-12 V
0.14 A (typical)	0.26 A (40-139A-202) 0.40 A (40-139A-102) 0.52 A (40-139A-201) 0.78 A (40-139A-101)	0	0

Power Requirements - 42-139A

+3.3 V	+12 V
0.37 A (typical)	0.13 A (42-139A-202) 0.19 A (42-139A-102) 0.24 A (42-139A-201) 0.39 A (42-139A-101)

Mechanical Characteristics

40-139A - Single slot 3U PXI (CompactPCI card).

42-139A - Single slot 3U PXIe, compatible with PXIe hybrid slot.

Module weight: 200 g (40/42-139-101).
180 g (40/42-139-201).

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

Connectors

40-139A - PXI bus via 32-bit P1/J1 backplane connector.

42-139A - PXIe bus via XJ3 and XJ4 backplane connectors.

Signals via front panel 160-pin male DIN 41612 connector, for pin outs please refer to the operating manual.

We recommend that Pickering mating connectors are used with this module which are designed to ensure there are no mechanical interference problems when used in a PXI chassis.

Operating/Storage Conditions

Operating Conditions

Operating Temperature:	0 °C to +55 °C
Humidity:	Up to 90 % non-condensing
Altitude:	5000 m

Storage and Transport Conditions

Storage Temperature:	-20 °C to +75 °C
Humidity:	Up to 90 % non-condensing
Altitude:	15000 m

PXI & CompactPCI Compliance - 40-139A

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.

PXle Compliance - 42-139A

The module is compliant with the PXle 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.



42-139A PXle High Density Relay Module

Product Order Codes

PXI 80xSPST, 2 A Relay Module	40-139A-101
PXI 40xDPST, 2 A Relay Module	40-139A-102
PXI 52xSPDT, 2 A Relay Module	40-139A-201
PXI 26xDPDT, 2 A Relay Module	40-139A-202
PXle 80xSPST, 2 A Relay Module	42-139A-101
PXle 40xDPST, 2 A Relay Module	42-139A-102
PXle 52xSPDT, 2 A Relay Module	42-139A-201
PXle 26xDPDT, 2 A Relay Module	42-139A-202

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

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

Product	Test Tool	Adaptor
40/42-139A	93-002-001	93-002-410

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
40/42-139A-xxx	91-100-001

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

Mating Connectors & Cabling

For connection accessories for the 40/42-139A series please refer to the [90-001D](#) 160-pin DIN 41612 Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Chassis Compatibility

The PXI versions of this module must be used in a suitable chassis. They 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

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

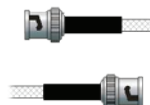
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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

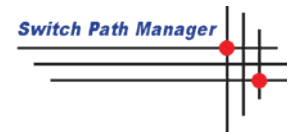
- **Pickering Interfaces Switch Path Manager**
- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C++)
- **Keysight** VEE and OpenTAP
- **Mathworks** Matlab
- **Marvin** ATEasy
- **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 and white papers as well as application specific product brochures to assist when looking for the switching, simulation and connection solutions you need. We have also published handy reference books on Switching Technology and for the PXI and LXI standards.



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