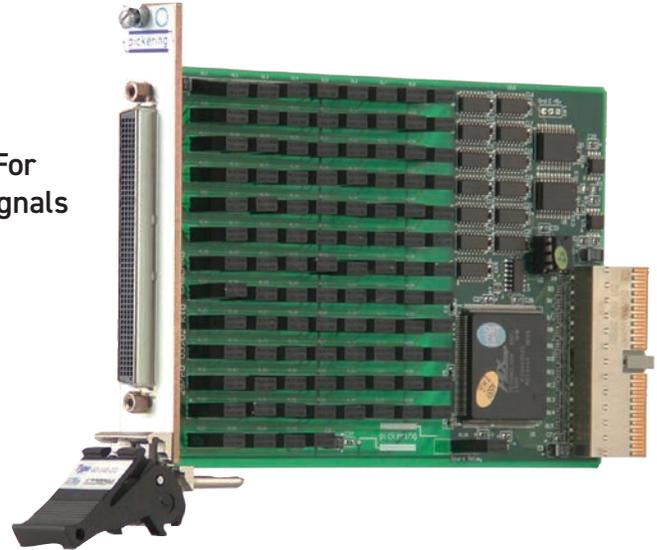- **Highest Density Reed Relay Modules in PXI - Up To 100 Per Module**
- **SPST, DPST and SPDT Configurations**
- **High Reliability Pickering Ruthenium Reed Relays For Maximum Performance - Suitable For Low Level Signals**
- **Fast Operating Speed 250µs Typical**
- **Pin Compatible With Alternative 40-145 Electro-mechanical Relay Modules**
- **Switch up to 150Volts, 1A with 20W Max Power**
- **Single PCB Construction With Leaded Relays Allows Easy Maintenance**
- **VISA, IVI & Kernel Drivers Supplied for Windows**
- **Supported by PXI or LXI Chassis**
- **Supported by *eBIRST ™***
- **3 Year Warranty**

The 40-140A/141/143 range of high density switching modules are available in Normally Open (SPST & DPST) and changeover (SPDT) configurations. Connections are made via a front panel 200-pin female connector.

General purpose reed relays are suitable for the construction of small switching networks, I/O port switching, for slaving switching larger relays or for operating external devices such as lamps and solenoids.

Range Description:

- 40-140A   50, 75 or 100 x SPST Reed Relays.
- 40-141   50 x DPST Reed Relays.
- 40-143   48 or 64 x SPDT Reed Relays.

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

High Density 200-pin Connector

We have a range of connector solutions for the 200 pin connector used on the 40-140 series of modules. These include mating connectors, pre-made cable assemblies and cable assemblies that break out the 200 conductors into more manageable 50-pin transition connectors. Please refer to our web site for more details or the Interconnection Solutions Catalog.
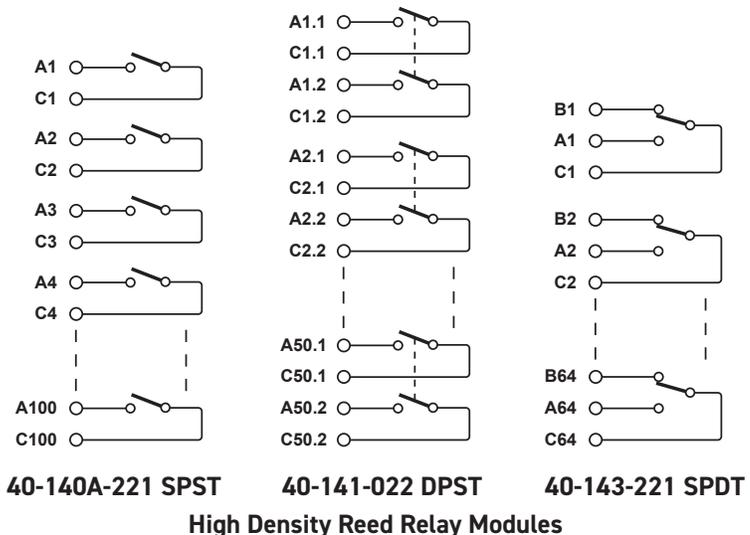
Choice of Signal Relay Types

40-140A/141/142/143 series modules are fitted with Reed Relays (Sputtered Ruthenium Type) which are designed solely for high-end instrumentation applications. They offer very long life to 1000 million operations, fast operate time of 0.25ms and exceptional low level switching performance. Reed Relays are hermetically sealed so ensuring consistent and stable contact resistance with long life. All of the reed relays used in our PXI modules are manufactured by our sister company Pickering Electronics:(www.pickeringrelay.com).

Electro-mechanical Relays (Palladium-Ruthenium, Gold covered) are used in module series 40-145/146/148. They offer good general purpose performance, switching times of 3ms and are lower cost than instrumentation grade reed relays. Overall they offer a good general purpose choice.

Pin Compatibility. 40-140A & 40-145 series modules are 100% pin compatible (except shielded types) so allowing use of either module type in your Test System.

Exactly which type to select depends on your application, if in doubt please contact your nearest Pickering sales office.

40-140A-221 SPST   **40-141-022 DPST**   **40-143-221 SPDT**

High Density Reed Relay Modules

pickering

Relay Type

The 40-140A range 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 facilitate easy maintenance with minimum downtime.

All reed relays are manufactured by our sister company Pickering Electronics: pickeringrelay.com

Switching Specification

Switch Type:	Ruthenium Reed
Max Switching Voltage:	150VDC/100VAC*
Max Power:	20W (SPST & DPST) 3W (SPDT)
Max Switch Current:	1A (SPST & DPST) 0.25A (SPDT)
Max Carry Current:	1A
Initial On Path Resistance:	<500mΩ (300mΩ typical)
Off Path Resistance:	>10^9Ω
Operate Time:	<0.5ms, 0.25ms typical
Release Time:	<0.5ms, 0.25ms typical
Expected Life Low power load:	1×10^9 operations
Full power load:	>1×10^6 operations

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

Power Requirements

+3.3V	+5V	+12V	-12V
0	1400mA (typ 600mA)	0	0

RF Specification - In a 50Ω System (40-143)

Bandwidth (-3dB):	80MHz	
Crosstalk (typical):	10kHz:	-80dB
	100kHz:	-60dB
	1MHz:	-40dB
	10MHz:	-20dB
Isolation (typical):	10kHz	90dB
	100kHz:	70dB
	1MHz:	50dB
	10MHz:	30dB

Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).
Module weight: 200g (40-140A-121).
240g (40-140A-221)
200g (40-141-022)
200g (40-143-221)

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 200-pin female LFH connector, for pin outs please refer to the operating manual.

Operating/Storage Conditions

Operating Conditions

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

Storage and Transport Conditions

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

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.

**40-140A-121 Module Side View
(75 x SPST Ruthenium Reed Relays)**

Product Order Codes

50 x SPST, Ruthenium Reed Relays	40-140A-021
75 x SPST, Ruthenium Reed Relays	40-140A-121
100 x SPST, Ruthenium Reed Relays	40-140A-221
50 x DPST, Ruthenium Reed Relays	40-141-022
48 x SPDT, Reed Relays	40-143-121
64 x SPDT, Reed Relays	40-143-221

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.

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

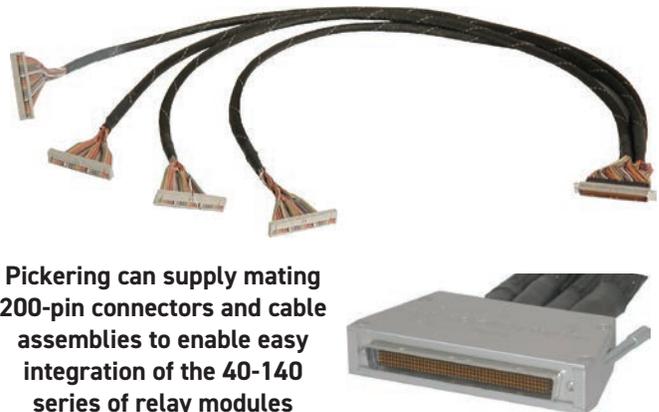| Product	Test Tool	Adapter
40-140A/ 141/143	93-002-001	Not Required

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
40-140A-021/121/221	91-100-015
40-141-022	91-100-005
40-143-121/221	91-100-025

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

Mating Connectors & Cabling

For connection accessories for the 40-140 series please refer to the 90-002D 200-pin LFH Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Pickering can supply mating 200-pin connectors and cable assemblies to enable easy integration of the 40-140 series of relay modules

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
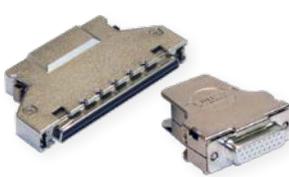- Integrated module timing and synchronization

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/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 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

pickeringtest.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
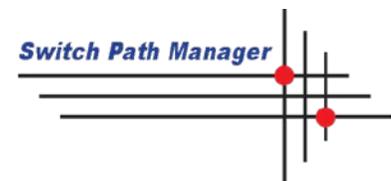- **MTQ Testsolutions** Tecap Test & Measurement Suite

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.
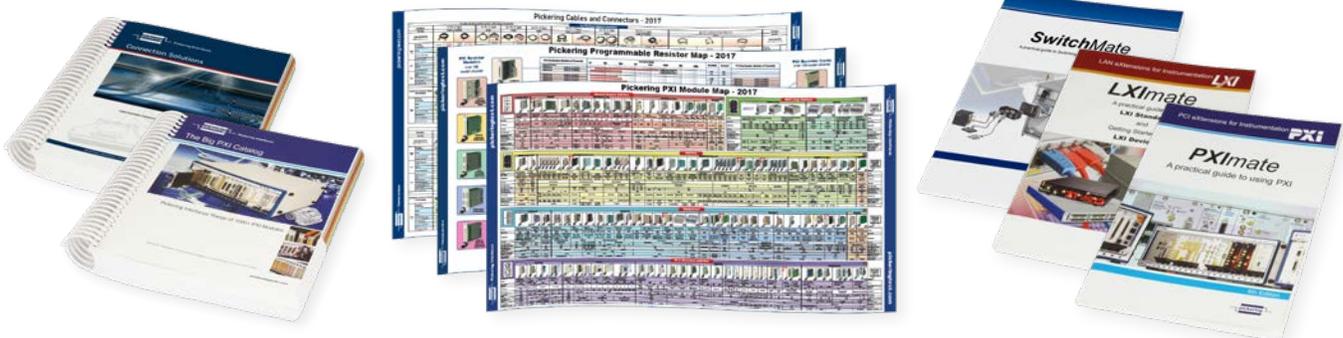
To learn more, please go to: pickeringtest.com/ebirst

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, 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 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

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