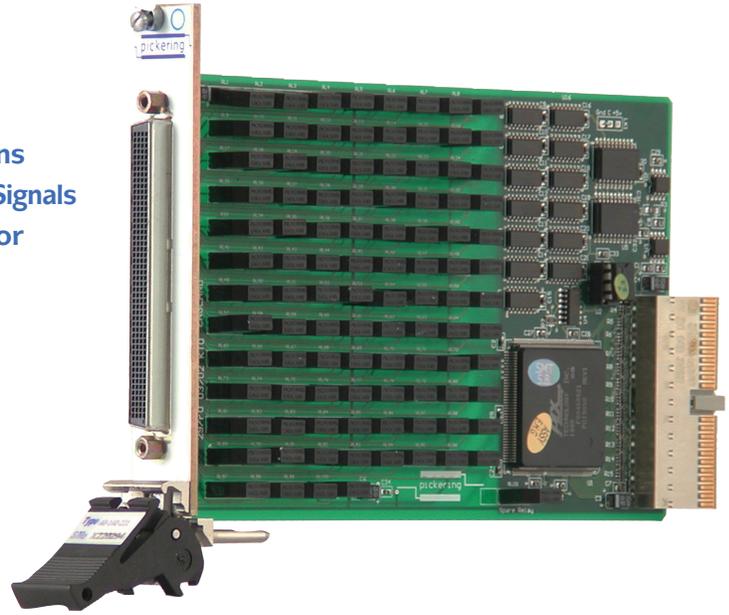# 40-140A/141/142/143
High Density Reed Relay Module

- **Highest Density Reed Relay Modules in PXI**
- **Up To 100 Reed Relays Per Module**
- **SPST, DPST, SPDT and Shielded Configurations**
- **Ruthenium Reed Relays Suitable For Low Level Signals**
- **Uses High Reliability Pickering Reed Relays For Maximum Performance**
- **Fast Operating Speed 250µs Typical**
- **Pin Compatible With Alternate 40-145 Electro-mechanical Relay Modules**
- **Switch up to 150Volts, 1A with 20W Max Power**
- **Single PCB Construction With Leaded Relays Allow Easy Maintenance**
- **VISA, IVI & Kernel Drivers Supplied for Windows XP/Vista/7/8**
- **Self-Test Diagnostic Tool Available (PI-MXT)**
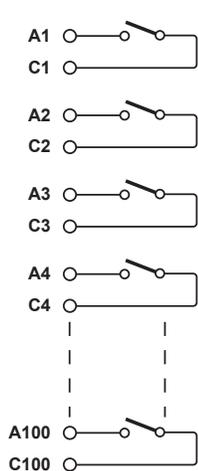- **Supported by PXI or LXI Chassis**
- **3 Year Warranty**

The 40-140A/141/142/143 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.

For applications requiring improved bandwidth and crosstalk performance please look at the 40-142 shielded reed relay module.
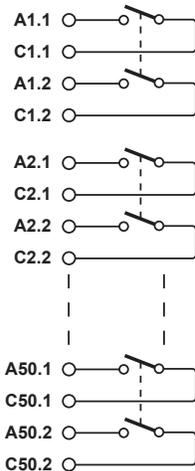
General purpose reed relays are suitable for the construction of small switching networks, I/O port switching, for slaving up to larger switches or for operating external devices (e.g. lamps, solenoids etc.).
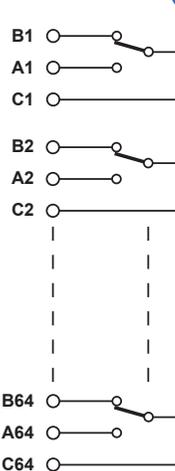
Range Description:

40-140A	50, 75 or 100 x SPST Reed Relays.
40-141	50 x DPST Reed Relays.
40-142	50 x Shielded SPST Reed Relays.
40-143	48 or 64 x SPDT Reed Relays.

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 Reed Relay Module

40-141-022 DPST Reed Relay Module

40-143-221 SPDT Reed Relay Module

High Density 200-Way Connector

Pickering Interfaces have a range of connector solutions for the 200 way connector used on the 40-14X module. These include mating connectors, pre-made cable assemblies and also cable assemblies that break out the 200-way to more manageable 50-way transition connectors. Please refer to web site for latest details or the Interconnection Solutions Catalog.

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Relay Type

The 40-140A series are fitted with Reed Relays (Ruthenium sputtered type), 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, www.pickeringrelay.com.

Switching Specification

Switch Type:	Ruthenium Reed
Max Switching Voltage:	150VDC/100VAC
Max Power:	20W (3W for SPDT)
Max Switch Current:	1A (0.25A for SPDT)
Max Carry Current:	1A
Initial Path Resistance On: Off:	 $<500m\Omega$ ($300m\Omega$ typical) $>10^9\Omega$
Operate Time: Release Time:	$<0.5ms$, 0.25ms typical $<0.5ms$, 0.25ms typical
Expected Life Low power load: Full power load:	 1×10^9 operations $>1\times10^6$ operations

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

40-961A-200
200-Way Mating Connector

40-971A-200 200 Way to 4x50-Way Cable Assembly

Power Requirements

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

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

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**
50 Shielded SPST Reed Relays	**40-142-021**
48 x SPDT Reed Relays	**40-143-121**
64 x SPDT Reed Relays	**40-143-221**

Mating Connectors & Cabling

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

Support Products

Self-Test Diagnostic Tool (PI-MXT)

Most of these modules are compatible with Pickering's 90-100 PI-MXT test tool. This enables all switch paths to be automatically tested so that faulty relays can be easily identified. The tool consists of a Windows executable program and an adapter for the specific module, a user supplied multimeter capable of 4-wire resistance measurement is also required.

The PI-MXT test adapters required for the 40-140 series are as follows:

        90-100-113 supports 40-140A-021
        90-100-112 supports 40-140A-121
        90-100-114 supports 40-140A-221
        90-100-214 supports 40-141-022
        90-100-125 supports 40-143-121
        90-100-126 supports 40-143-221

For further details on the PI-MXT tool, please refer to the 90-100 data sheet and user manual available from the Pickering website.

Spare Relay Kits

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

The relay kits for the 40-140 range are as follows:

        91-100-015 kit for 40-140A-021/121/221
        91-100-005 kit for 40-141-022
        91-100-011 kit for 40-142-021
        91-100-025 kit for 40-143-121/221

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

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Programming

Pickering provide kernel, IVI and VISA (NI and Agilent) drivers which are compatible with 32/64-bit versions of Windows including XP, Vista, 7 and 8 operating systems. 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:

- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Agilent** VEE
- **Mathworks** Matlab
- **Geotest** ATE Easy
- **MTQ Testsolutions** Tecap

Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries.

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 33MHz 32-bit backplane interface.

Safety & CE Compliance

All modules are fully CE compliant and meet applicable EU directives: Low-voltage safety EN61010-1:2001, EMC Immunity EN61000-6-1:2001, Emissions EN55011:1998.

PXI & LXI Chassis Compatibility

Compatible with all chassis conforming to the 3U PXI and 3U cPCI specification. Compatible with Legacy and Hybrid peripheral slots in a 3U PXI Express chassis.
Compatible with Pickering Interfaces LXI Modular Chassis. For information on driving your switching solution in an LXI environment refer to the LXI Product Catalog.
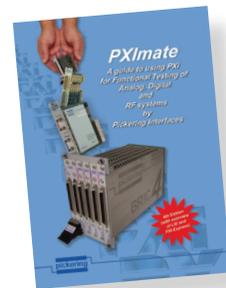

Latest Details

Please refer to our Web Site for Latest Product Details.
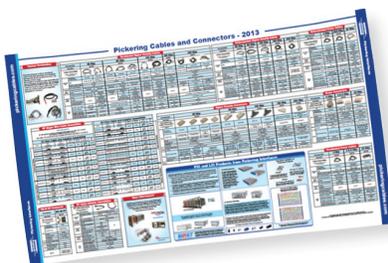www.pickeringtest.com

Please refer to the 200 page Pickering Interfaces "**Connection Solutions**" catalog for the full list of connector/cabling options, including drawings, photos and specifications. Available in either print or as a download. Alternatively our web site has dynamically linked connector/cabling options, including pricing, for all Pickering PXI modules.
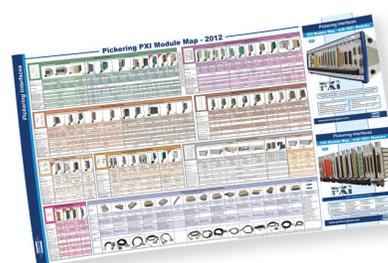

"**The Big PXI Catalog**" gives full details of Pickering's entire range of PXI switch modules, instrument modules and support products.
At over 500 pages, the Big PXI Catalog is available on request or can be downloaded from the Pickering website.

Ever wondered what PXI is all about?
Pickering Interfaces' "**PXImate**" explains the basics of PXI and provides useful data for engineers working on switch based test systems.
The PXImate is available free on request from the Pickering website.

The "**Cables & Connectors Map**" - outlines the cable and connector options available for all PXI Modules.

The "**PXI Module Map**" - a simple fold-out selection guide to all Pickering's 600+ PXI Modules.

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