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Find the *Pickering 40-145-201* at our website: ***Click HERE***

40-145/146/148
High Density SPST, SPDT & DPST Relay Module

- SPST Choice of 50, 75 or 100 Relays Per Module
- DPST Choice of 25 or 50 Relays Per Module
- SPDT Choice of 32, 48 or 64 Relays Per Module
- SPST, Normally Closed, Choice of 50, 75 or 100 Relays Per Module
- Electro-mechanical High Density Relays
- Pin Compatible With Alternate 40-140A Reed Relay Modules
- Operating Speed 3ms Typical
- Switching up to 150V/1A/60W
- Single PCB Construction With Leaded Relays Allow Easy Maintenance
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- Supported by eBIRST
- 3 Year Warranty



The 40-145/146/148 range of high density switching modules are available in Normally Open (SPST & DPST), Changeover (SPDT) and Normally Closed (SPST) 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 up to larger switches or for operating external devices (e.g. lamps, solenoids etc.).

Range Description:

40-145	50, 75 or 100 x SPST Relays (Normally Open or Normally Closed Versions).
40-146	25 or 50 x DPST Relays.
40-148	32, 48 or 64 x SPDT Relays.

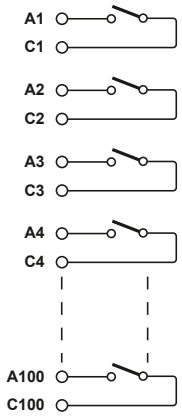
Choice of Signal Relay Types

40-145/146/148 series modules are fitted with **Electro-mechanical Relays** (Palladium-Ruthenium, Gold covered) offering 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.

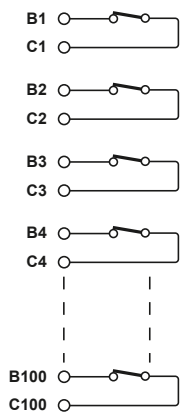
Reed Relays (Sputtered Ruthenium Type) which are designed solely for high-end instrumentation applications are used in series 40-140A/141/142/143 modules, they offer very long life up to 1000 million operations, fast operate time of 0.25ms and exceptional low level switching performance. Reed Relays 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).

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.

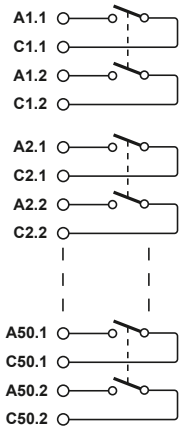
Exactly which type to select depends on your application, if in doubt please contact your nearest Pickering sales office.



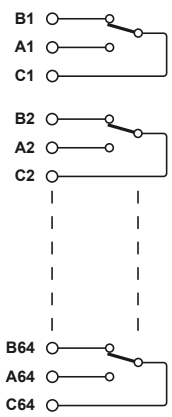
40-145-201 SPST Relay Module



40-145-201-NC SPST Normally Closed Relay Module



40-146-202 DPST Relay Module



40-148-201 SPDT Relay Module

Supported by eBIRST

This product is supported by eBIRST which tests the switching system using an external tool. eBIRST provides a graphical output of its tests which includes an image showing the location of any defective relay. For more information on eBIRST see 93-000D.pdf

High Density 200-pin Connector

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

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Relay Type & Maintenance

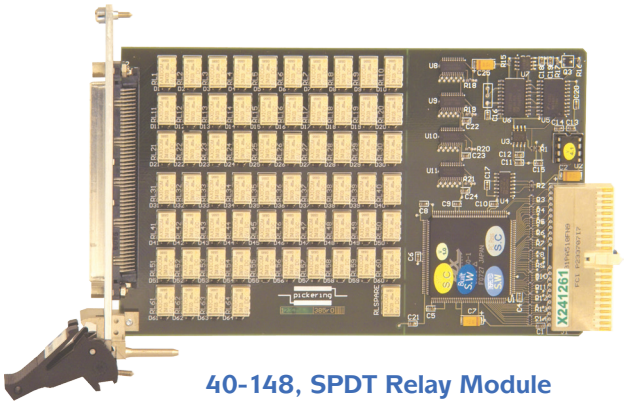
The 40-145/46/48 series modules are fitted with electro-mechanical signal relays, palladium-ruthenium, gold covered contacts. The module is of a single circuit board construction and uses leaded relays (not SMT relays) so in field maintenance is greatly simplified. In addition a **Spare Relay** is built onto the circuit board to facilitate easy maintenance with minimum downtime.

Switching Specification

Switch Type:	**Electro-mechanical**
Contact Type:	Palladium-ruthenium, Gold Covered Bifurcated contact
Max Switching Voltage:	150VDC/100VAC
Max Power: Max Switch Current: Max Carry Current:	60W/62.5VA 1A 1A
Initial On Path Resistance: Initial Off Path Resistance: Minimum Voltage: Thermal Offset:	<500mΩ typical $>10^9$Ω 100µV <10µV
Operate Time:	<3ms
Expected Life (operations) Very low power load: Low power load (2W): Med power load (30W): Full power load (60W):	 $>1x10^8$ $>1.5x10^7$ (0.1A, 20VDC) $>5x10^6$ (1A, 30VDC) $>1x10^5$ (1A, 60VDC)

Power Requirements

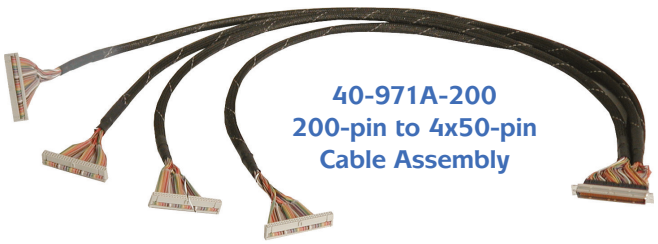
+3.3V	+5V	+12V	-12V
0	1440mA (typ 840mA)	0	0



40-148, SPDT Relay Module

40-961A-200
200-pin
Mating Connector





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

Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).
Module weight: 200g (40-145-201)
125g (40-146-202)
180g (40-148-201)

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.

Product Order Codes

50 x SPST Electro-mechanical Relays	**40-145-001**
75 x SPST Electro-mechanical Relays	**40-145-101**
100 x SPST Electro-mechanical Relays	**40-145-201**
50 x SPST Normally Closed Relays	**40-145-001-NC**
75 x SPST Normally Closed Relays	**40-145-101-NC**
100 x SPST Normally Closed Relays	**40-145-201-NC**
25 x DPST Electro-mechanical Relays	**40-146-002**
50 x DPST Electro-mechanical Relays	**40-146-202**
32 x SPDT Electro-mechanical Relays	**40-148-001**
48 x SPDT Electro-mechanical Relays	**40-148-101**
64 x SPDT Electro-mechanical Relays	**40-148-201**

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 see **eBIRST**.

Product	Test Tool	Adaptor
All Types	**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
All Types	**91-100-001**

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

Mating Connectors & Cabling

For connection accessories for the 40-145 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.

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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: www.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**
- **MTQ Testsolutions** Tecap Test & Measurement Suite
- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Keysight** VEE • **Mathworks** Matlab • **Marvin** ATEasy

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 a 33MHz 32-bit backplane interface.

Safety & CE Compliance

All modules are fully CE compliant and meet applicable EU directives: Low-voltage safety EN61010-1:2001, 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 Guide.



Latest Details

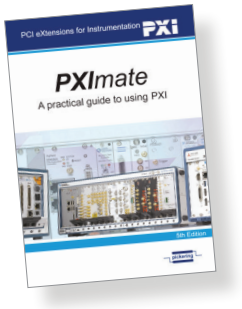
Please refer to our Web Site for Latest Product Details.
www.pickeringtest.com



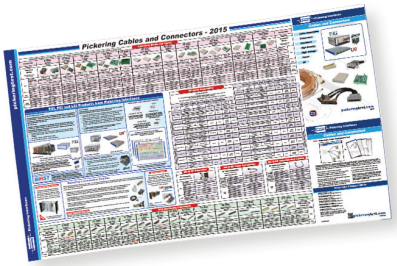
Please refer to the 200 page Pickering Interfaces "**Connection Solutions**" catalog for the full list of connector/cabling options, including drawings, photos and specifications. Available in either print or as a download.
Alternatively our web site has dynamically linked connector/cabling options,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



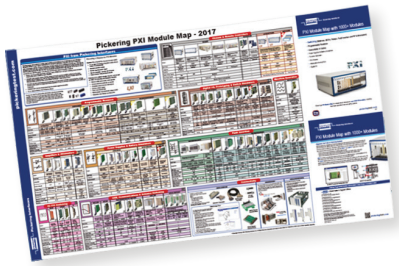
"**The Big PXI Catalog**" gives full details of Pickering's entire range of PXI switch modules, instrument modules and support products.
At over 500 pages, the Big PXI Catalog is available on request or can be downloaded from the Pickering website.



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 1000+ PXI Modules.

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