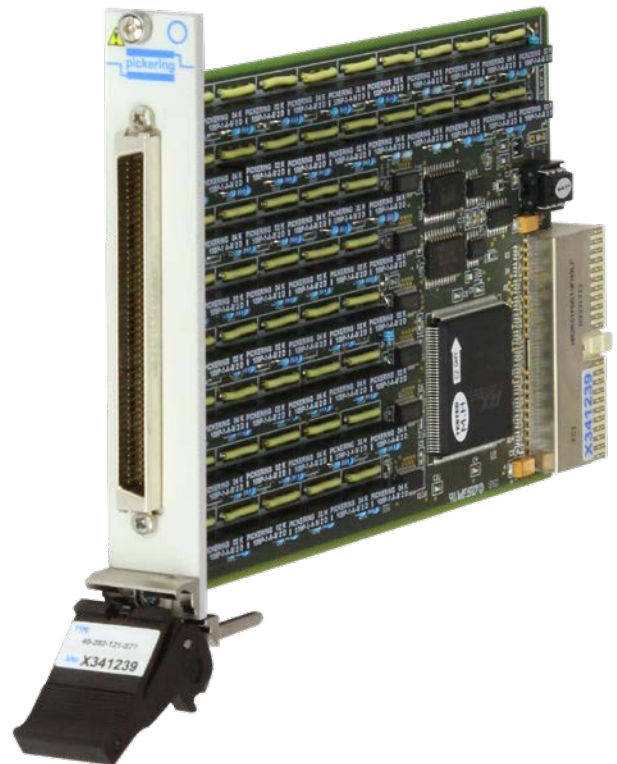


- High Density Selectable Resistor Module
- Up to 48 Separate Channels of Switchable Resistors
- Customer Defined Resistor Values
- Channels Can be Set as Open or Short Circuit or a Pre-set Resistor Value (40-280)
- Version Available With Switchable Offset Resistance (40-281)
- Potential Divider Version Available (40-282)
- Uses High Reliability Pickering Reed Relays For Maximum Performance
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- 3 Year Warranty



The 40-280 series provides a cost effective, high-density solution for applications requiring a high channel count of simple resistor configurations.

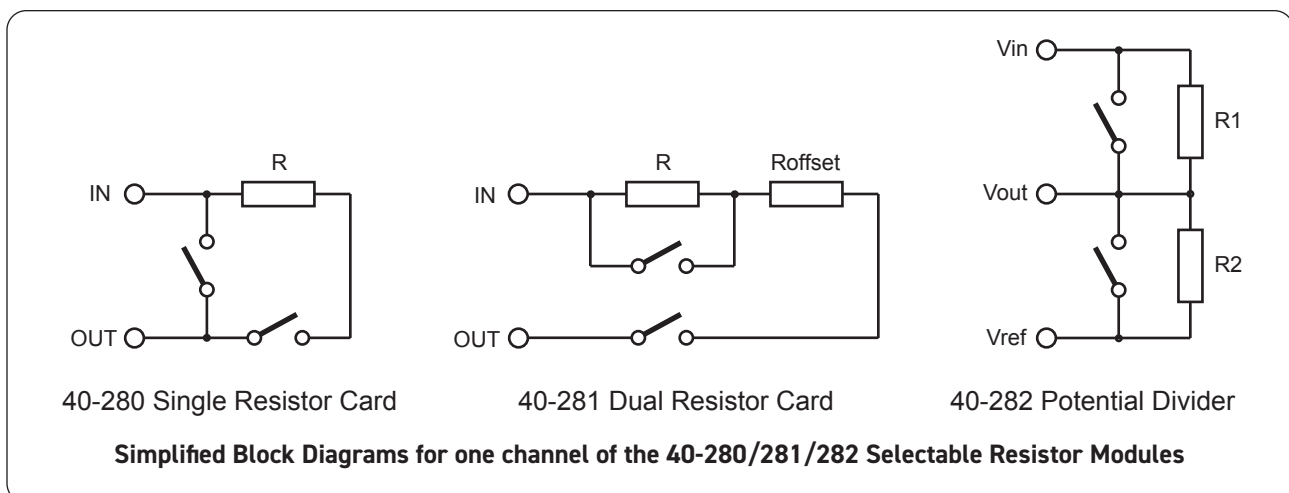
The 40-280 provides up to 48 isolated channels, each of which can be programmed as a short circuit, an open circuit or a fixed resistor value.

The 40-281 provides up to 24 isolated channels, each of which can be set as an open circuit, an offset resistor value or a fixed resistor value plus the offset.

The 40-282 is a potential divider with up to 24 separate channels. This can be used to emulate potentiometer devices, each channel having a fixed R1 R2 ratio. Additionally, the centre point can be shorted to either of the potentiometer end points.

Modules are supplied without any resistors fitted, permitting the user to fit the values required. The flexibility of this allows users to select components that best meet their application needs. Alternatively, please contact the Pickering Sales Office if the module is required pre-fitted with resistors.

All versions of the 40-280 series use high quality instrument grade reed relays to ensure long service life. The modules are ideal for applications involving go/no-go testing where emulation of adjustable components or remote sensors is required. The modules provide a lower cost and higher density solution than approaches using fully programmable resistor chains.



Resistor Specification

Resistor Value:	Customer specified
Resistor Tolerance:	Customer specified
Resistor Power:	0.5W

Switching Specification

Switch Type:	Ruthenium Reed
Max Switch Voltage:	150VDC/100VAC*
Max Power:	10W
Max Switch Current:	0.5A
Max Carry Current:	1.2A
Initial On Path Resistance:	<1Ω (500mΩ nominal)
Off Path resistance:	>10 ⁹ Ω
Thermal Offset:	<10μV
Operate Time:	<0.5ms, 0.25ms typical
Release Time:	<0.5ms, 0.25ms typical
Expected Life, low power load:	1x10 ⁹ operations
Expected Life, full power load:	>1x10 ⁶ operations

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

Power Requirements

+3.3V	+5V	+12V	-12V
0	0.57A max	0	0

Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).
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 96-pin male micro-D 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

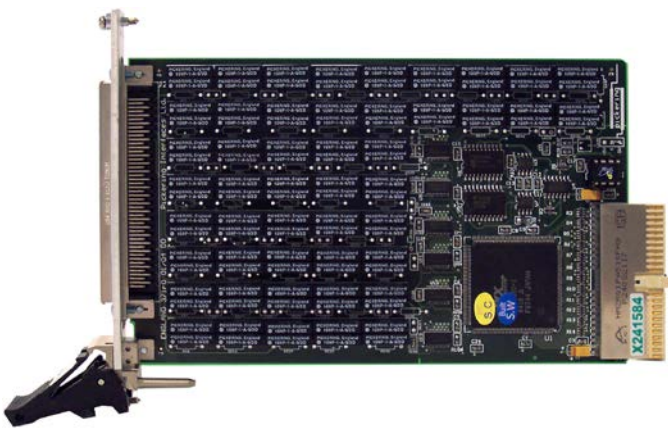
PXI & CompactPCI Compliance

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.



PCB Layout for the 40-280 Selectable Resistor Module

Product Order Codes

Fixed Value Selectable Resistor Module::	
24-Channel	40-280-021
48-Channel	40-280-121

Dual Selectable Resistor Module:	
12-Channel	40-281-021
24-Channel	40-281-121

Fixed Value Potential Divider Module:	
12-Channel	40-282-021
24-Channel	40-282-121

Note: Modules are supplied without any resistors fitted. Please contact the Pickering Sales Office if you require the module to be pre-fitted with resistors.

Mating Connectors & Cabling

For connection accessories for the 40-280 series please refer to the [90-016D](#) 96-pin D-Type Connector Accessories data sheets where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Other Resistor Modules

Pickering Interfaces manufacture a range of variable resistor modules in the PXI format. If you have a requirement for a variable resistor module please contact your local sales office with the information below and we will advise you on the best solution for your application.

Lowest Resistance †	<input type="text"/>
Highest Resistance	<input type="text"/>
Resistance Resolution	<input type="text"/>
Overall Accuracy	<input type="text"/>
Maximum Power/Current	<input type="text"/>
Number of Channels (variable resistors)	<input type="text"/>

† Resistance is as measured across the user connector terminals, minimum resistance must have a non-zero value.

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 resistance range
- Alternative resolution
- Different number of channels
- 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.

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

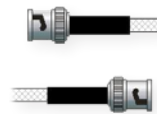
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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



Connectors & Backshells



Multiwire 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



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 Testolutions** Tecap Test & Measurement Suite

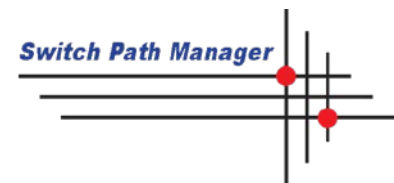
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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

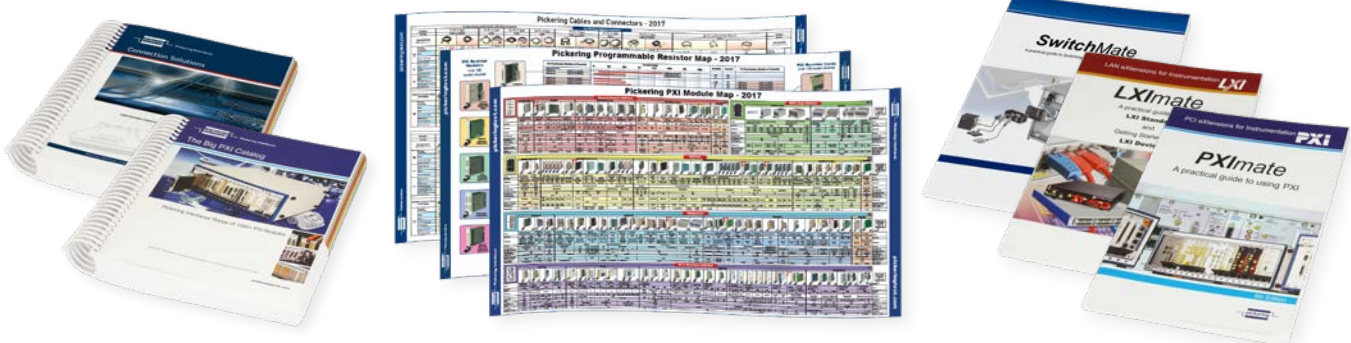


Three Year Warranty & Guaranteed Long-Term Support

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