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Find the *Pickering 40-290-121* at our website: ***Click HERE***

40-290/291
Programmable Resistor Module

- Dual 16-Bit or Quad 8-Bit Resolution Resistor Module
- Programmable From 0Ω to 32767.5Ω in 0.5Ω Steps
- Built-In Non-Volatile Parametric Memory For Calibration Data
- Option To Include 16 SPDT Reed Relays
- Uses High Reliability Pickering Reed Relays For Maximum Performance
- Over 1000 Value Changes Per Second
- Special Versions Built To Order
- VISA & Kernel Drivers Supplied for Windows XP/Vista/7/8
- Supported by PXI or LXI Chassis
- 3 Year Warranty



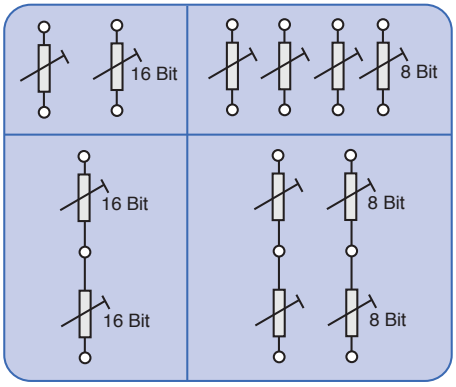
The 40-290 Programmable Resistor Module comprises a dual 16 bit resistor chain together with 16 optional SPDT Reed Relays (see diagram below). The 40-291 is configured as a quad 8 bit programmable resistor chain and also has the option of 16 SPDT relays. Connections are made via a front panel 68 pin male connector.

Programmable resistors may be connected together either in series or in parallel to form many types of configuration. For example potentiometers (2 resistors in series) and more accurate resistors (connecting in parallel). Each programmable resistor has a position for a user inserted offset value.

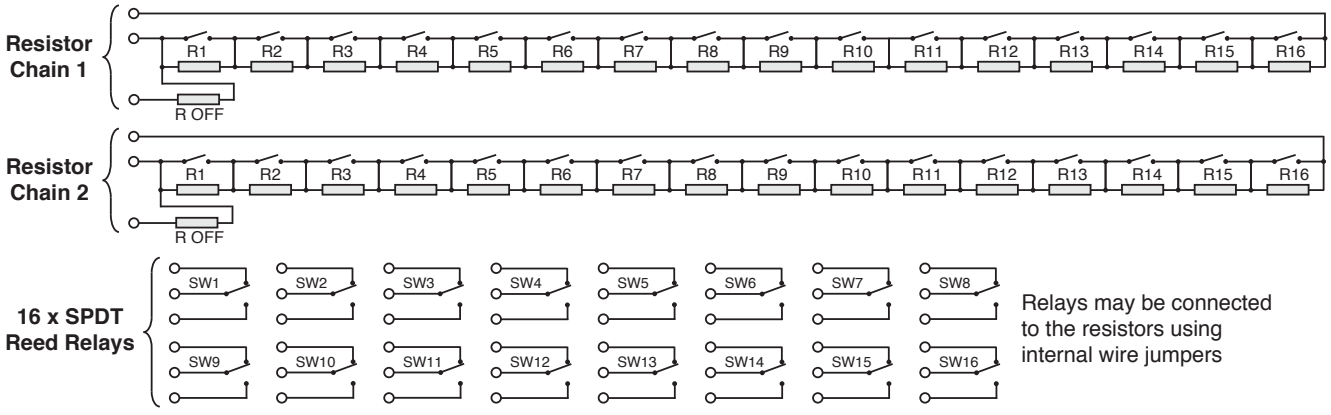
The 40-290 and 40-291 use Ruthenium Reed Relays for maximum switching accuracy and operating life.

To give maximum accuracy each resistor chain has on-board E²PROM, this allows accurate calibration data to be recorded for each resistor in the chain.

If versions are required with different resistor ranges than those shown, please contact the Pickering Interface's Sales Office for assistance.



Programmable Resistor Module Overview



Programmable Resistor Module Configured In Dual 16-Bit Resistor Mode With 16 x SPDT Reed Relays

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Relay Type

The 40-290 and 40-291 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.

Programmable Resistor Specification

Max Switch Voltage:	100V
Resolution:	0.5Ω
† Accuracy of Fitted Resistor:	0.5%
Residual Resistance, typical (when chain is set to 0Ω):	1Ω (8-bit) 2Ω (16-bit)
Max Power: 0.5 to 10Ω 10 to 100Ω 100Ω+	1W 0.5W 0.25W
Thermal Offset:	<50µV
Operate Time: Release Time:	<0.5ms <0.5ms
Expected Life, Low power load: Expected Life, Full power load:	>1x10^8 operations >1x10^6 operations

† Overall accuracy of module is a combination of the fitted resistor accuracy and the relay/track resistance that makes up the residual path resistance.

Switching Specification (16 x SPDT Reed Relays)

Switch Type:	**Ruthenium Reed**
Max Standoff Voltage:	100V
Max Power: Max Switch Current: Max Carry Current:	3W 0.25A 0.5A
Initial Path Resistance, On: Path Resistance, Off: Thermal Offset:	<250mΩ >1x10^{9}Ω <50µV
Operate Time: Release Time:	<0.5ms <0.5ms
Expected Life, Low power load: Expected Life, Full power load:	>1x10^8 operations >1x10^6 operations

Power Requirements

+3.3V	+5V	+12V	-12V
0	740mA (typ 400mA)	0	0

Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).
Module weight: 180g (40-290-021)
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 68-Way female SCSI style micro-D connector. Each resistor has 4 wire connections (Kelvin) so allowing elimination of wires and connectors in high accuracy measurements.

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 †	
Highest Resistance	
Resistance Resolution	
Overall Accuracy	
Maximum Power/Current	
Number of Channels (variable resistors)	

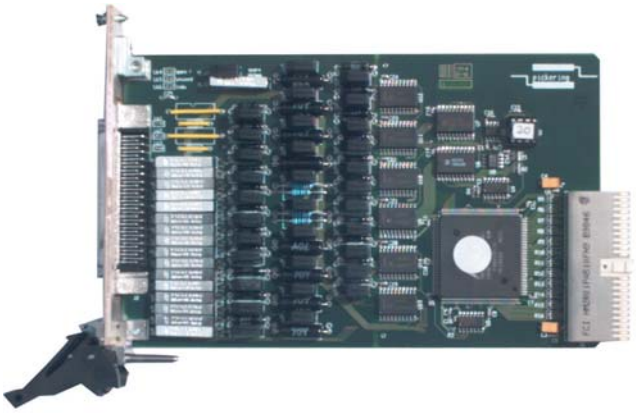
† Resistance is as measured across the user connector terminals, minimum resistance must have a non-zero value.

Product Order Codes

Dual 16 Bit Resistor Module *(resistor value is 0Ω to 32,767.5Ω excluding residual resistance)*	**40-290-021**
Dual 16 Bit Resistor Module + 16 x SPDT Relays *(resistor value is 0Ω to 32,767.5Ω excluding residual resistance)*	**40-290-121**
Quad 8 Bit Resistor Module *(resistor value is 0Ω to 127.5Ω excluding residual resistance)*	**40-291-021**
Quad 8 Bit Resistor Module + 16 x SPDT Relays *(resistor value is 0Ω to 127.5Ω excluding residual resistance)*	**40-291-121**

Mating Connectors & Cabling

For connection accessories for the 40-290 series please refer to the **90-015D** 68-way SCSI style micro-D Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.



40-290 Resistor Module

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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 Switching 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 Pickering Interfaces "**Connection Solutions**" catalog for the full list of connector/cabling options, including drawings, photos and specifications. This is 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.



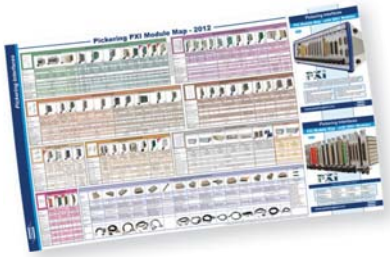
"**The Big PXI Catalog**" gives full details of Pickering's entire range of PXI switch modules, instrument modules and support products.
At over 500 pages, the Big PXI Catalog is available on request or can be downloaded from the Pickering website.



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

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