

- High Density, High Current Switching
- 16 x SPST, 12 x SPST, 10 x SPST, 12 x SPDT and 6 x SPDT Options
- 16A Maximum Switch Current
- Switch up to 300VDC or 250VAC
- 448W/4000VA Maximum Power
- 400VDC Standoff Voltage
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- 3 Year Warranty

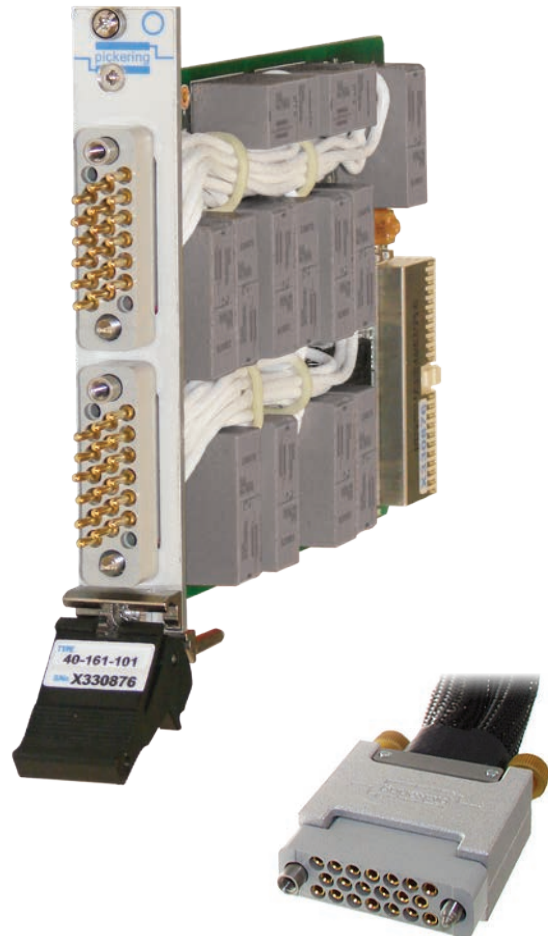
The 40-161 module has a choice of SPST, and SPDT power relay configurations and issuitable for switching loads up to 16A at 250VAC.

Power relay modules are intended for switching heavy AC or DC loads or for the slave switching of large external relays, contactors and solenoids.

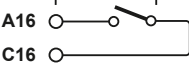
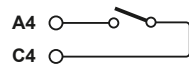
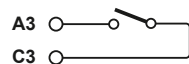
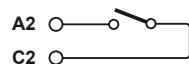
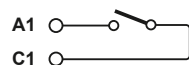
The 40-161 is ideal for switching up to 16A in both AC and DC applications.

## Range Description:

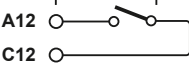
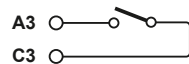
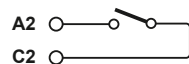
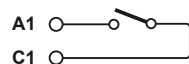
- 40-161-001 16 x SPST Power Relays
- 40-161-002 12 x SPST Power Relays
- 40-161-003 10 x SPST Power Relays
- 40-161-101 12 x SPDT Power Relays
- 40-161-102 6 x SPDT Power Relays



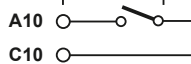
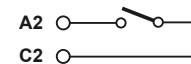
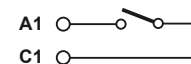
**20-pin 16 Amp  
Power Connector for  
40-161 Module**



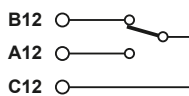
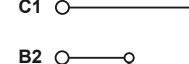
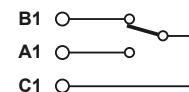
**40-161-001 Relay  
Module - 16 x SPST**



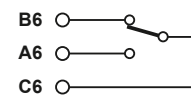
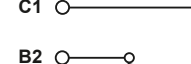
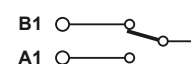
**40-161-002 Relay  
Module - 12 x SPST**



**40-161-003 Relay  
Module - 10 x SPST**



**40-161-101 Relay  
Module - 12 x SPDT**



**40-161-102 Relay  
Module - 6 x SPDT**

## Relay Type

The 40-161 is fitted with electro-mechanical power relays with silver alloy contacts. A spare relay is built onto the circuit board to allow easy maintenance with minimum downtime.

## Switching Specification

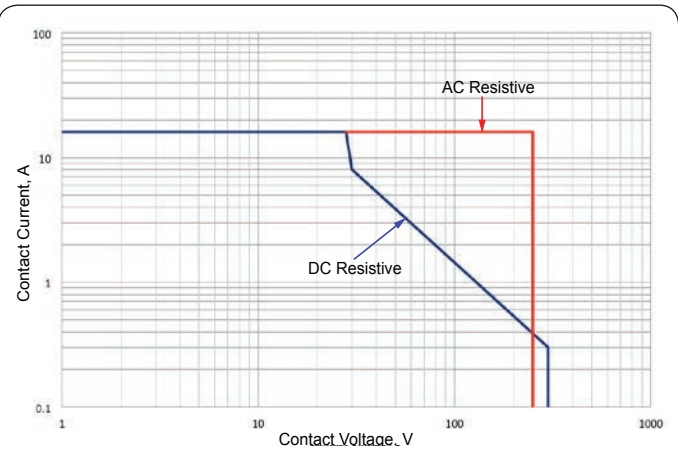
Relay Type:	Electro-mechanical Power Relay
Contact Type:	Silver Alloy (AgNi)
Cold Switching Capacity	
Maximum Current:	16A
Maximum Voltage:	400VDC/250VAC*
Hot Switching Capacity (Resistive Load)	
Maximum Current:	16A
Maximum Voltage:	300VDC/250VAC*
Maximum Power:	448W/4000VA
Minimum Switching Capacity:	100mA, 12V
Maximum Continuous Total Switch Path Loading:	1536A <sup>2</sup> †(Example allowed conditions - 6 channels at 16A)
Module Thermal Time Constant:	4 minutes typical
For information on module loading & pulsed currents please visit: <a href="#">Pickering's Wiki page on module current capacity</a>	
Maximum Standoff Voltage:	400VDC*
Initial On Path Resistance:	<20mΩ (12mΩ typical)
Off Path Resistance:	>10 <sup>9</sup> Ω
Bandwidth:	>20MHz
Typical Operate Time:	10ms
Expected Life (operations)	
Mechanical Endurance	
DC Coil:	>3x10 <sup>7</sup>
Maximum Switch Capacity (Resistive Load)	
16A @ 250VAC (4000VA):	1x10 <sup>5</sup>
8A @ 30VDC (240W):	>1x10 <sup>5</sup> (NC/NO Contacts, Frequency of Operation 0.1Hz, Duty Cycle 90%)
16A @ 28VDC (448W):	>1x10 <sup>5</sup> (NC/NO Contacts, Frequency of Operation 0.1Hz, Duty Cycle 90%)

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

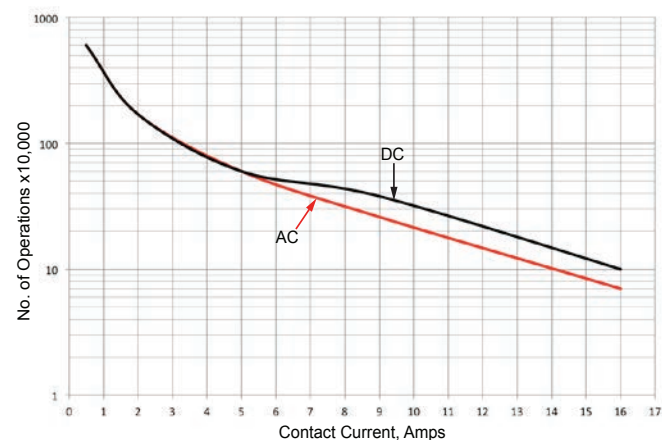
† 1536A<sup>2</sup> =  $\sum I^2$ , the sum of the squares of the current in each relay.

## Power Requirements

+3.3V	+5V	+12V	-12V
0	1.3A max	0	0



**40-161 Maximum Switching Capacity**



**40-161 Operations Versus Hot Switch Current at Rated Power**

## Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).

Module weight: 480g maximum.

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 connectors, for pin outs please refer to the operating manual.

- 40-161-001: 2 x 20-pin male GMCT connectors.
- 40-161-002: 2 x 20-pin male GMCT connectors.
- 40-161-003: 1 x 20-pin male GMCT connector.
- 40-161-101: 2 x 20-pin male GMCT connectors.
- 40-161-102: 1 x 20-pin male GMCT connector.

## 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.

## Product Order Codes

16 x SPST, 16A Power EMR Module	40-161-001
12 x SPST, 16A Power EMR Module	40-161-002
10 x SPST, 16A Power EMR Module	40-161-003
12 x SPDT, 16A Power EMR Module	40-161-101
6 x SPDT, 16A Power EMR Module	40-161-102

## 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 relay types
- Mixture of 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

### 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
40-161-001/002/003	91-100-092
40-161-101/102	91-100-091

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

## Mating Connectors & Cabling

For connection accessories for the 40-161 series please refer to the [90-014D](#) 20-pin GMCT Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

## 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



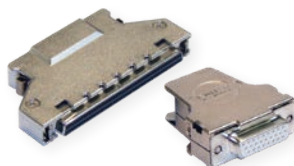
### Pickering LXI or LXI/USB Modular Chassis—only accept our 1000+ PXI Switching & Simulation Modules:

- 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

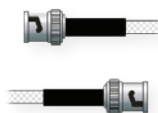
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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

### 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





## Programming

Pickering provide kernel, I/O and VISA (NI & Keysight) drivers which are compatible with all Microsoft supported versions of Windows and popular older versions.

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**
- **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.

## 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.



## 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.



## 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.

## 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 for the PXI and LXI standards.

