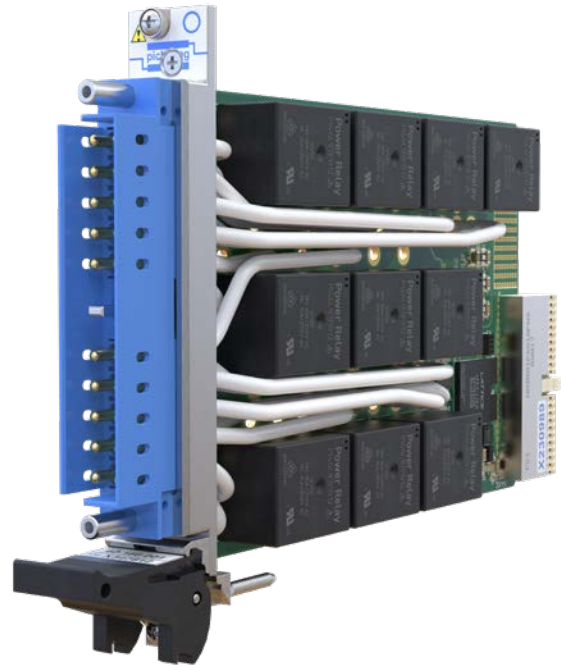


- High Density, High Current Switching
- SPST, SPDT or SP4T Configurations
- 20A (SPDT & SP4T) & 30A (SPST) Maximum Switch Current
- Switch up to 480VAC or 300VDC
- 5500VA/600W Maximum Power (SPST)
- Connector Keying for 20A & 30A Versions
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- 3 Year Warranty



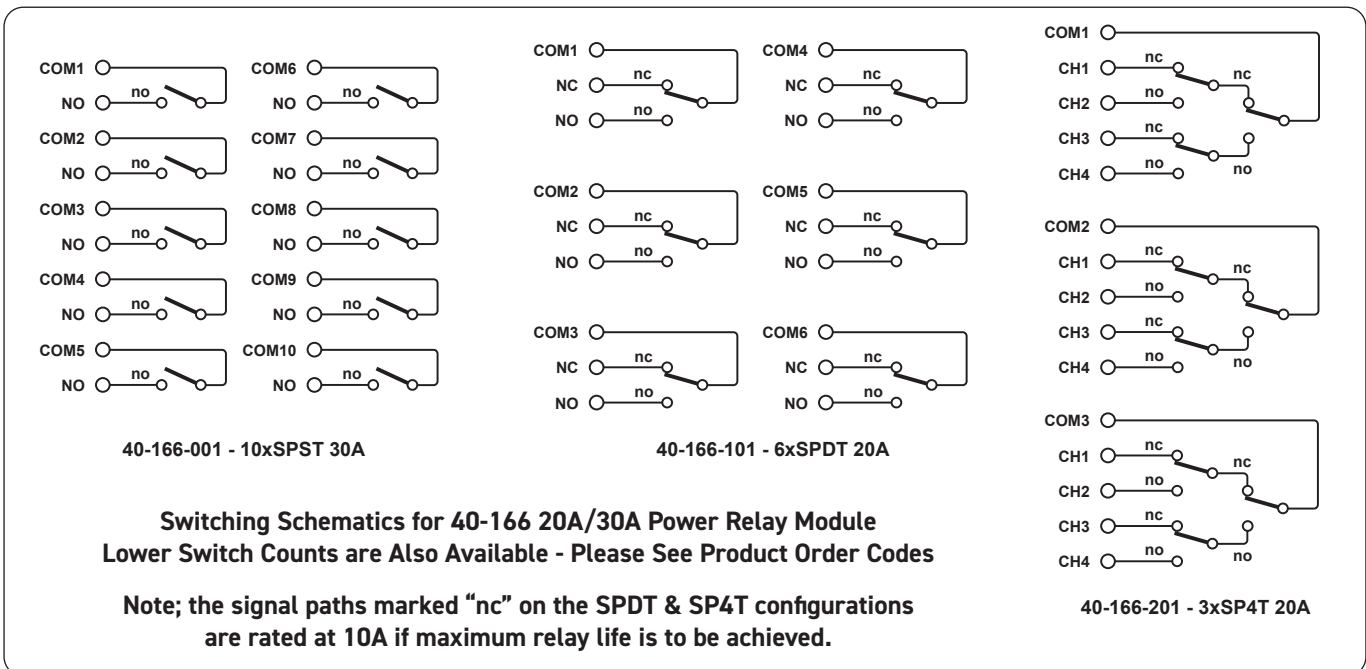
Pickering's Range of PXI High Power Switch Modules					
Model No.	Configuration	Relay Type	Max Voltage	Max Current	
40-150/151	8 or 12xDPST	Electro-mechanical	125VDC, 250VAC	5A	
40-155/156	8 or 16xSPDT		35VDC, 250VAC	5A	
40-160	10 or 20xSPST or 10xDPST		125VDC, 250VAC	10A or 8A	
40-161	10, 12 or 16xSPST or 6, 12xSPDT	Electro-mechanical	300VDC, 250VAC	16A	
40-166	10 or 5xSPST, 6 or 3xSPDT or 3, 2 or 1xSP4T		300VDC, 480VAC	30A or 20A	
40-170	2xSPST or 2xDPST		30VDC, 250VAC	30A	
40-180	2 or 4xSPST		Electro-mechanical	14VDC or 28VDC	40A or 20A
40-181	2xSPDT			200VDC/AC peak	10A
40-182	3 or 6xSPST		Solid State	40VDC/AC peak	40A
40-183	6xSPST			100VDC/AC peak	25A
40-184	3 or 6xSPST			400VDC/AC peak	1.5A
40-185	3 or 6xSPST				

The 40-166 is a high power relay module available with SPST, SPDT or SP4T switching configurations. It uses power relays which are suitable for switching loads up to 20A at 240VAC (SPDT & SP4T versions) or 30A at 277VAC (SPST versions).

Power Relay Modules are intended for switching heavy AC or DC loads or for controlling large external relays, contactors and solenoids. The 40-166 is suitable for applications requiring switching of either mains voltage or DC current.

### Power Relay Type

The 40-166 range is fitted with electro-mechanical power relays with silver-tin oxide contacts.



## Switching Specification

	40-166-00x (SPST)	40-166-10x (SPDT)	40-166-20x (SP4T)
Relay Type:	Electro-mechanical		
Contact Material	Silver-Tin Oxide		
Max Switching Current:	30A†	20A†	20A†
Max Carry Current:	30A	20A	20A
Max Switching Power:	5500VA /600W†	4800VA /480W†	
Max Switching Voltage:	480VAC or 300VDC*†	480VAC or 300VDC*†	
Min Switching Capacity:	1A, 12VAC/12VDC		
Max Continuous Total Switch Path Loading:	4000A <sup>2</sup> ‡(Example allowed conditions - 10 channels at 20A) For information on module loading & pulsed currents please visit: <a href="#">Pickering's Wiki page on module current capacity</a>		
Initial On Path Resistance:	35mΩ max, 20mΩ typical		
Off Path Resistance:	>1x10 <sup>8</sup> Ω		
Bandwidth (-3dB):	30MHz (typical)		
Typical Operate Time:	22ms	66ms	
Frequency of Operation:	360 cycles/hour (with load) 3600 cycles/hour (without load)		
Expected Life - Mechanical Endurance:	1x10 <sup>7</sup> operations		
Full Power Load:	1x10 <sup>5</sup> operations		

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

† For variation of maximum hot switching capacity of voltage with current refer to plots

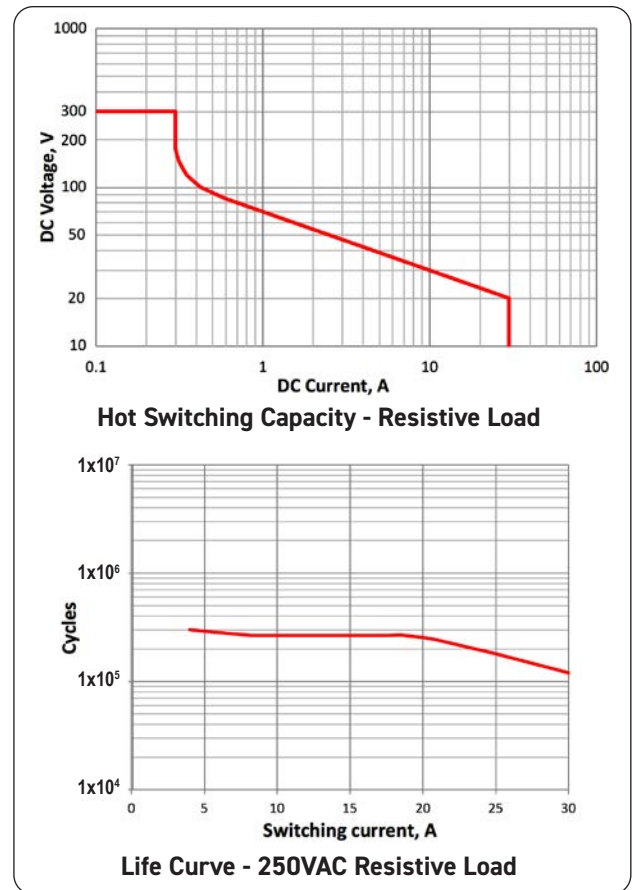
‡ 4000A<sup>2</sup> = ΣI<sup>2</sup>, the sum of the squares of the current in each relay.

### Notes:

Max switching voltage 480VAC (Resistive load 15.6A SPST).  
 Max switching voltage 277VAC (General purpose load 30A SPST).  
 Max switching voltage 240VAC (Resistive load 20A SPDT Normally Open and 10A SPDT Normally Closed).  
 Max switching voltage 20VDC (Resistive load 30A SPST).  
 Max switching voltage 24VDC (Resistive load 20A SPDT Normally Open and 10A SPDT Normally Closed).  
 Maximum switching power is rated at 250VAC and 20VDC for Normally Open Contacts.

### Full power load life rating:

250VAC UL general purpose load, 22A SPST.  
 240VAC UL resistive load, 20A SPDT Normally Open, 10A SPDT Normally Closed.



## Power Requirements

+3.3V	+5V	+12V	-12V
200mA	0	750mA	0

## Mechanical Characteristics

Single slot 3U PXI (CompactPCI card). Module weight: TBD  
 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 male 20-pin Positronic Scorpion type connector. The Scorpion connector is fitted with a multi-position keying module with one position for 30A cards and another for 20A cards, this is to ensure that cables carrying 30A signals can only interface with 30A cards.

## 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.

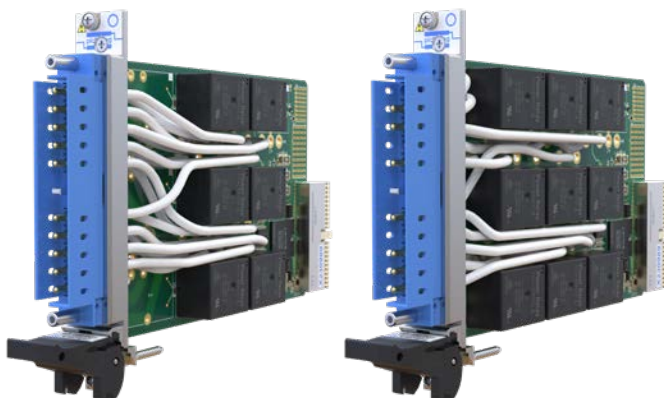
Uses a 33MHz 32-bit backplane interface.

## 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.



The 40-166 20A/30A Power Relay Module Uses a 20-pin Positronic Scorpion Type Connector



The 40-166 20A SPDT Version

The 40-166 20A SP4T Version

## Product Order Codes

Power Relay Module, 10xSPST, 30A	40-166-001
Power Relay Module, 5xSPST, 30A	40-166-002
Power Relay Module, 6xSPDT, 20A	40-166-101
Power Relay Module, 3xSPDT, 20A	40-166-102
Power Relay Module, 3xSP4T, 20A	40-166-201
Power Relay Module, 2xSP4T, 20A	40-166-202
Power Relay Module, 1xSP4T, 20A	40-166-203

**Note:** These modules are also available in PXIe versions, please contact the factory for details.

## 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 reed relay types
- Mixture of reed 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
40-166-00x	91-100-103
40-166-10x	91-100-104
40-166-20x	91-100-104

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

## Mating Connectors & Cabling

For connection accessories for the 40-166 modules please refer to the [90-023D](#) 20-pin Positronic 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

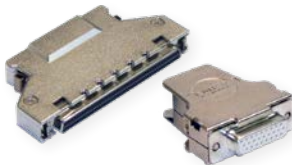
### Pickering LXI or LXI/USB Modular Chassis—only accept our 1000+ PXI Switching & Simulation Modules:

- 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

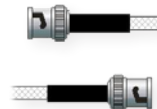
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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

Visit: [pickeringtest.com/cdt](http://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 Relay Division. These instrument grade reed relays feature **SoftCenter™** technology, ensuring long service life and repeatable contact performance.

To learn more, please go to: [pickeringrelay.com](http://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](http://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

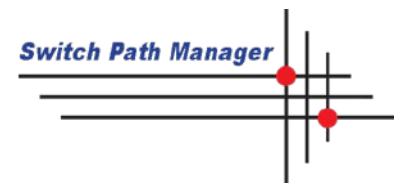
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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

To learn more about software drivers and development environments, please go to:

[pickeringtest.com/software](http://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](http://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](http://pickeringtest.com/ebirst)

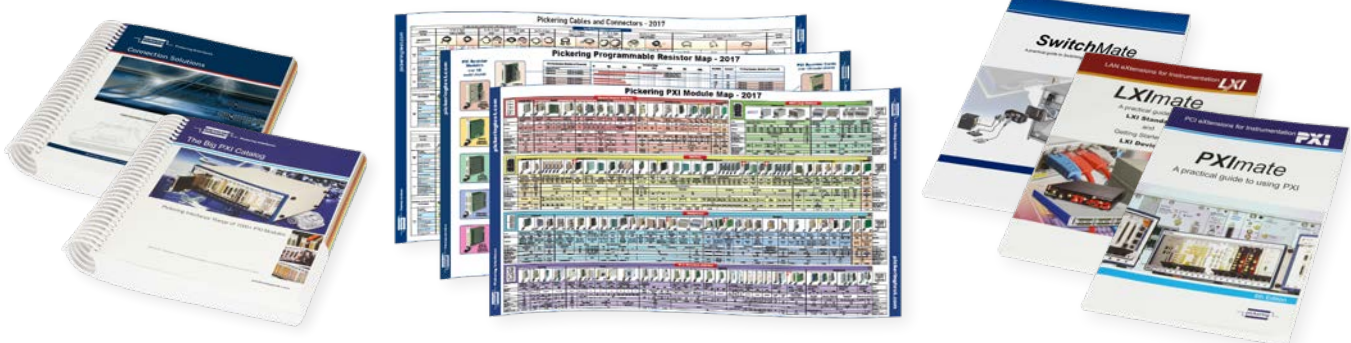


## Three Year Warranty & Guaranteed Long-Term Support

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](http://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](http://pickeringtest.com/resources)