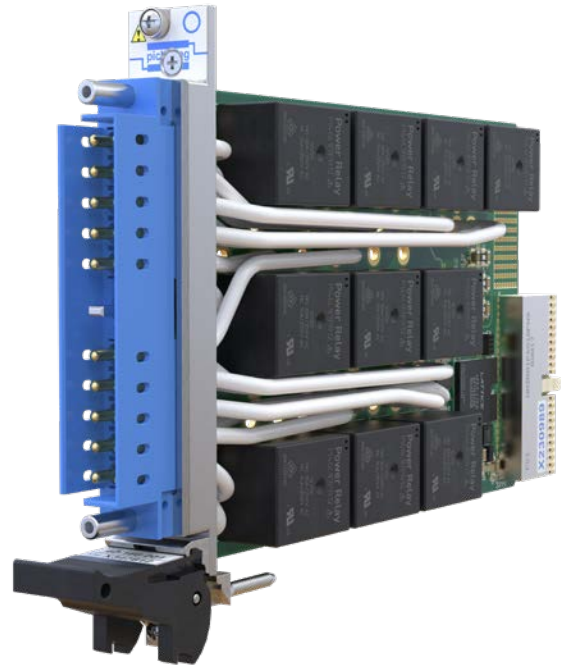


- Available as a PXI or PXIe Module
- High Density, High Current Switching
- SPST, SPDT or SP4T Configurations
- 20 A (SPDT & SP4T) or 30 A (SPST) Maximum Switch Current
- Switch up to 480 VAC or 300 VDC
- 5500 VA/600 W Maximum Power (SPST)
- Connector Keying for 20 A & 30 A Versions
- VISA, IVI & Kernel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



Pickering's Range of PXI/PXIe High Power Switch Modules				
Model No.	Configuration	Relay Type	Max Voltage	Max Current
40-150/151	8 or 12xDPST	EMR	125 VDC, 250 VAC	5 A
40-155/156	8 or 16xSPDT		35 VDC, 250 VAC	5 A
40-160	10 or 20xSPST or 10xDPST		125 VDC, 250 VAC	10 A or 8 A
40-161	10, 12 or 16xSPST or 6, 12xSPDT		300 VDC, 250 VAC	16 A
40/42-166	10 or 5xSPST, 6 or 3xSPDT or 3, 2 or 1xSP4T	EMR	300 VDC, 480 VAC	30 A or 20 A
40-170	2xSPST or 2xDPST	EMR	30 VDC, 250 VAC	30 A
40-180	2 or 4xSPST		14 VDC or 28 VDC	40 A or 20 A
40-181	2xSPDT			
40-182	3 or 6xSPST	Solid State	200 VDC/AC	10 A
40-183	6xSPST		40 VDC/AC	40 A
40-184	3 or 6xSPST		100 VDC/AC	25 A
40-185	3 or 6xSPST		400 VDC/AC	1.5 A

The 40-166 (PXI) and 42-166 (PXIe) are high power relay modules available with SPST, SPDT or SP4T switching configurations. They use power relays which are suitable for switching loads up to 20 A at 240 VAC (SPDT & SP4T versions) or 30 A at 277 VAC (SPST versions).

Power relay modules are intended for switching heavy AC or DC loads or for controlling large external relays, contactors and solenoids. The 40/42-166 is suitable for applications requiring switching of either mains voltage or DC current.

Power Relay Type

The 40/42-166 range is fitted with electro-mechanical power relays with silver-tin oxide contacts.

40/42-166-001 - 10xSPST 30A

40/42-166-101 - 6xSPDT 20A

40/42-166-201 - 3xSP4T 20A

Switching Schematics for 40/42-166 20 A/30 A Power Relay Module
Lower Switch Counts are Also Available - Please See Product Order Codes

Note; the signal paths marked "nc" on the SPDT & SP4T configurations are rated at 10A if maximum relay life is to be achieved.

Switching Specification

	40/42-166-00x (SPST)	40/42-166-10x (SPDT)	40/42-166-20x (SP4T)
Relay Type:	Electro-mechanical		
Contact Material	Silver-Tin Oxide		
Max Switching Current:	30 A†	20 A†	20 A†
Max Carry Current:	30 A	20 A	20 A
Max Switching Power:	5500 VA /600 W†	4800 VA /480 W†	
Max Switching Voltage:	480 VAC or 300 VDC*†	480 VAC or 300 VDC*†	
Min Switching Capacity:	1 A, 12 VAC/12 VDC		
Max Continuous Total Switch Path Loading:	4000 A ² ‡(Example allowed conditions - 10 channels at 20 A) For information on module loading & pulsed currents please visit: Wiki page on module current capacity		
Initial On Path Resistance:	35 mΩ max, 20 mΩ typical		
Off Path Resistance:	>1x10 ⁸ Ω		
Bandwidth (-3 dB):	30 MHz (typical)		
Typical Operate Time:	22 ms	66 ms	
Frequency of Operation:	360 cycles/hour (with load) 3600 cycles/hour (without load)		
Expected Life - Mechanical Endurance:	1x10 ⁷ operations		
Full Power Load:	1x10 ⁵ 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

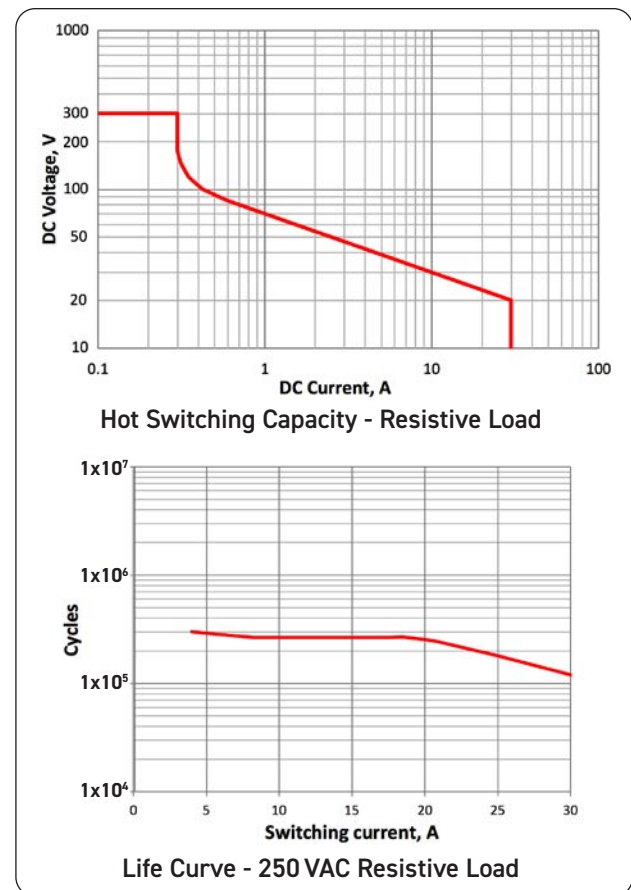
‡ 4000 A² = ∑I², the sum of the squares of the current in each relay.

Notes:

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

Full power load life rating:

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



Power Requirements - 40-166

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

Power Requirements - 42-166

+3.3V	+12V
400 mA	750 mA

Mechanical Characteristics

40-166 - Single slot 3U PXI (CompactPCI card).

42-166 - Single slot 3U PXIe, compatible with PXIe hybrid slot.

Module weight: <500 g

3D models for all versions in a variety of popular file formats are available on request.

Connectors

40-166 - PXI bus via 32-bit P1/J1 backplane connector.

42-166 - PXIe bus via XJ3 and XJ4 backplane connectors.

Signals via male 20-pin Positronic Scorpion type connector. The Scorpion connector is fitted with a multi-position keying module with one position for 30 A cards and another for 20 A cards, this is to ensure that cables carrying 30A signals can only interface with 30 A cards.

Operating/Storage Conditions

Operating Conditions

Operating Temperature: 0 °C to +55 °C
 Humidity: Up to 90% non-condensing
 Altitude: 5000 m

Storage and Transport Conditions

Storage Temperature: -20 °C to +75 °C
 Humidity: Up to 90% non-condensing
 Altitude: 15000 m

PXI & CompactPCI Compliance - 40-166

The module is compliant with the PXI Specification 2.2. Local Bus, Trigger Bus & Star Trigger are not implemented. Uses a 33 MHz 32-bit backplane interface.

PXIe Compliance - 42-166

The module is compliant with the PXIe Specification 1.0. Local Bus, Trigger Bus & Star Trigger are not implemented.

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 40/42-166 20 A/30 A Power Relay Module Uses a 20-pin Positronic Scorpion Type Connector



40-166 20 A SP4T Version



40-166 20 A SPDT Version



42-166 30 A SPST Version (PXIe Version)

Product Order Codes

PXI Power Relay Module, 10xSPST, 30 A	40-166-001
PXI Power Relay Module, 5xSPST, 30 A	40-166-002
PXI Power Relay Module, 6xSPDT, 20 A	40-166-101
PXI Power Relay Module, 3xSPDT, 20 A	40-166-102
PXI Power Relay Module, 3xSP4T, 20 A	40-166-201
PXI Power Relay Module, 2xSP4T, 20 A	40-166-202
PXI Power Relay Module, 1xSP4T, 20 A	40-166-203
PXIe Power Relay Module, 10xSPST, 30 A	42-166-001
PXIe Power Relay Module, 5xSPST, 30 A	42-166-002
PXIe Power Relay Module, 6xSPDT, 20 A	42-166-101
PXIe Power Relay Module, 3xSPDT, 20 A	42-166-102
PXIe Power Relay Module, 3xSP4T, 20 A	42-166-201
PXIe Power Relay Module, 2xSP4T, 20 A	42-166-202
PXIe Power Relay Module, 1xSP4T, 20 A	42-166-203

Product Customization

Pickering 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 switching products, simplifying servicing and reducing down-time.

Product	Relay Kit
40/42-166-00x	91-100-103
40/42-166-10x	91-100-104
40/42-166-20x	91-100-104

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

Mating Connectors & Cabling

For connection accessories for the 40/42-166 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

The PXI versions of this module must be used in a suitable chassis. They are 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

The PXIe versions of this module are compatible with the following chassis types:

- All chassis conforming to the 3U PXIe specification
- PXIe and Hybrid Peripheral slots in a 3U PXI Express (PXIe) 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

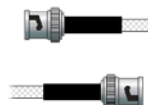
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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



Connectors & Backshells



Multiway 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 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



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:

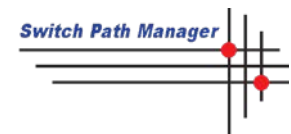
- **Pickering Interfaces Switch Path Manager**
- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Keysight** VEE and OpenTAP
- **Mathworks** Matlab
- **Marvin** ATEasy
- **MTQ 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.

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 and white papers as well as application specific product brochures to assist when looking for the switching, simulation and connection 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