PXI/PXIe High Density 2 A Multiplexer 4x-614D

- Available as PXI or PXIe Modules
- Low Cost Fixed Configuration Alternative to Versatile Solutions - Simpler to Program & Improved Isolation Between Banks
- 23 Configurations
- 1, 2, 4, 5, 8, 10, 16 or 26 Multiplexer Banks
- Channel Counts of 4, 8, 16, 32, 64 or 128
- Available With 1, 2, 3, 4, 8, 16 or 32 Poles
- 2 A Hot or Cold Switching
- Switch up to 300 VDC/250 VAC and up to 60 W Max Power
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- PXI Versions Supported by PXI or LXI Chassis
- Supported by *eBIRST* ™ Test Tool
- 3 Year Warranty

The 40-614D (PXI) and 42-614D (PXIe) high density multiplexer modules are available in 23 configurations as outlined on the following pages. They all use high quality electro-mechanical signal relays allowing each channel to switch current up to 2 A and voltage up to 300 VDC/250 VAC.

The module is suitable for signal routing in ATE and data acquisition systems. It offers a lower cost and simpler alternative to our configurable architecture "versatile" multiplexers such as the 4x-612B and 40-613A. Connections are made via a front panel 160-pin DIN 41612 connector. Larger multiplexers may be constructed by daisy-chaining the common signals from multiple modules.

The 4x-614D can be operated as a conventional multiplexer with break-before-make action when a new channel is selected. Alternatively, 2, 3, 4, 8, 16 and 32-pole variants of the multiplexer can be supplied that allow multiple channels to be simultaneously selected.

Note: The multiple channel selection option is not available for 1-pole versions of the 4x-614D multiplexer.

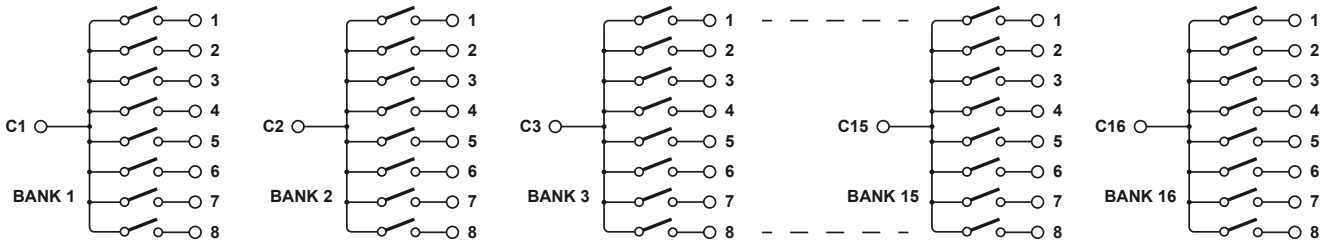
Updated Product Information

This product has been introduced as a "form & fit" update to the 40-614C, the changes are to provide PXIe options. Otherwise, the electrical performance is very similar, the pinout and software are identical.

It should be noted that the channel selection configurations of the 4x-614D have been revised from the 40-614A. The 4x-614D defaults to single channel selection with multiple channel selection variants defined by use of a suffix.

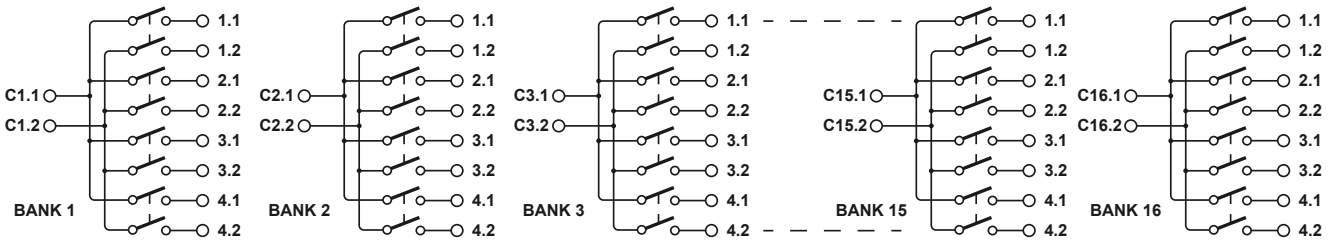
Supported by *eBIRST*

eBIRST switching system test tools simplify fault-finding by quickly testing the system and graphically identifying the faulty relay. For more information go to: pickeringtest.com/ebirst

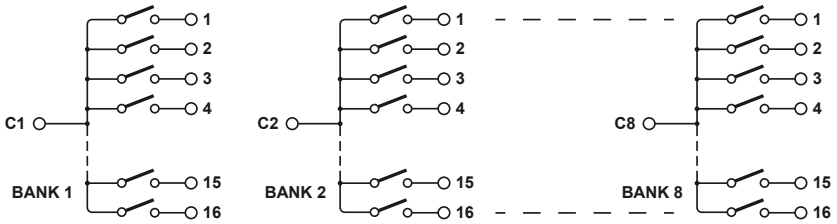


16-Bank, 8-Channel, 1-Pole Multiplexer, Part Number 4x-614D-001

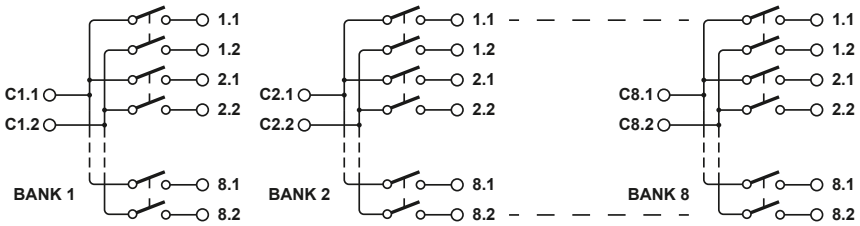
Issue 2.0 September 2023



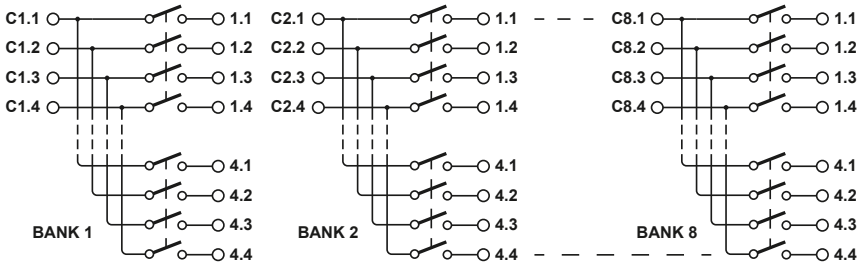
16-Bank, 4-Channel, 2-Pole Multiplexer, Part Number 4x-614D-002



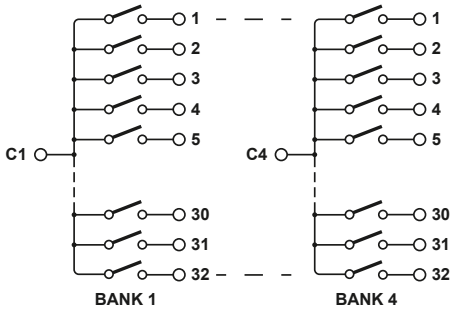
8-Bank, 16-Channel, 1-Pole Multiplexer, Part Number 4x-614D-003



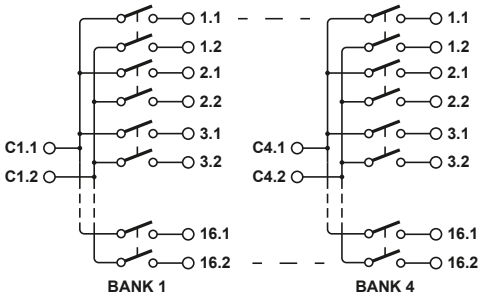
8-Bank, 8-Channel, 2-Pole Multiplexer, Part Number 4x-614D-004



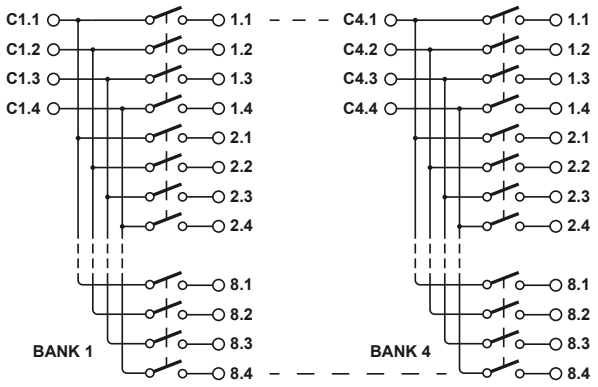
8-Bank, 4-Channel, 4-Pole Multiplexer, Part Number 4x-614D-005



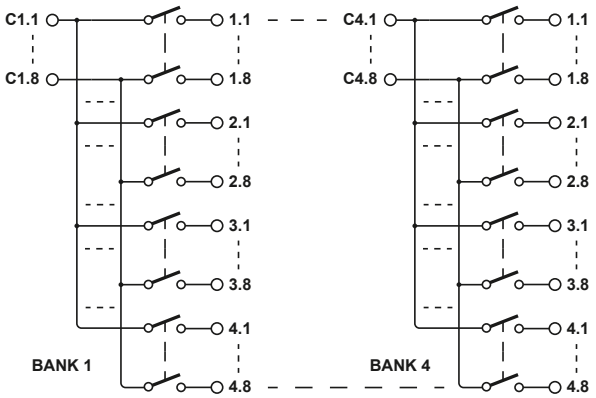
4-Bank, 32-Channel, 1-Pole Multiplexer,
Part Number 4x-614D-006



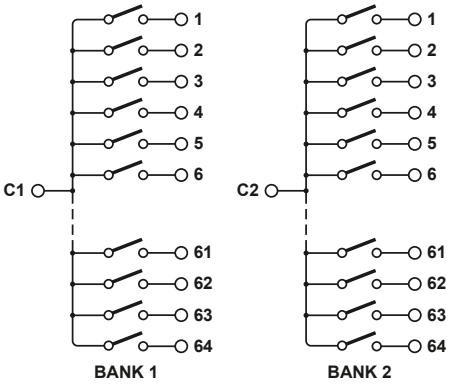
4-Bank, 16-Channel, 2-Pole Multiplexer,
Part Number 4x-614D-007



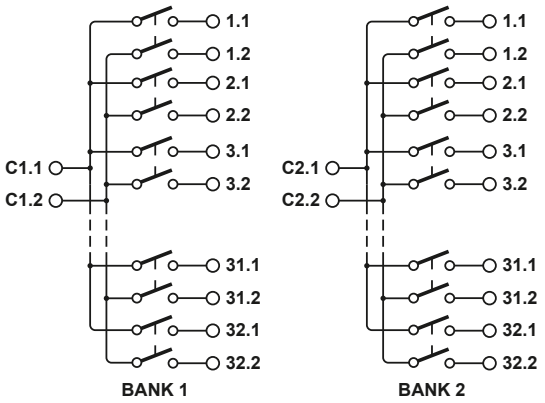
4-Bank, 8-Channel, 4-Pole Multiplexer,
Part Number 4x-614D-008



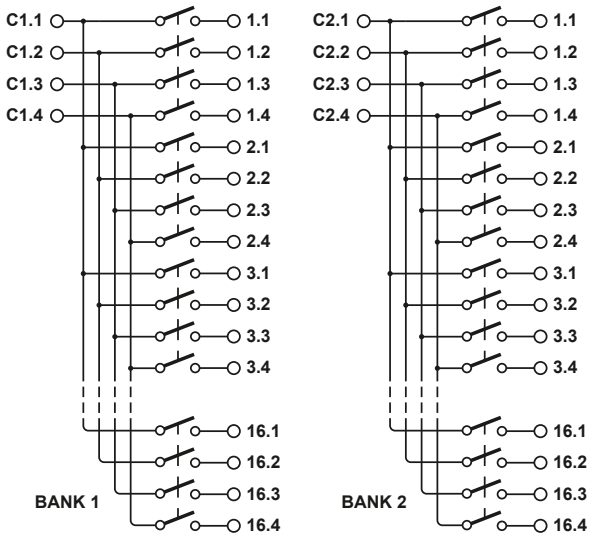
4-Bank, 4-Channel, 8-Pole Multiplexer,
Part Number 4x-614D-009



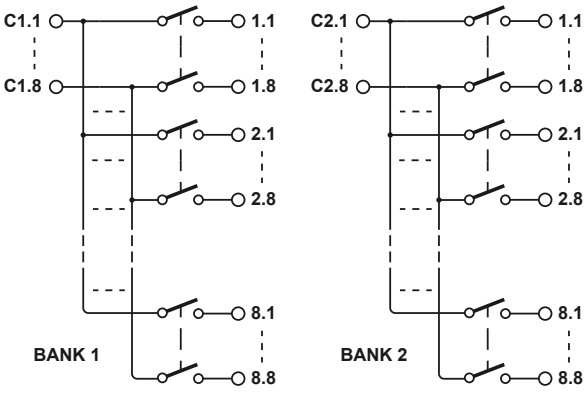
2-Bank, 64-Channel, 1-Pole Multiplexer,
Part Number 4x-614D-010



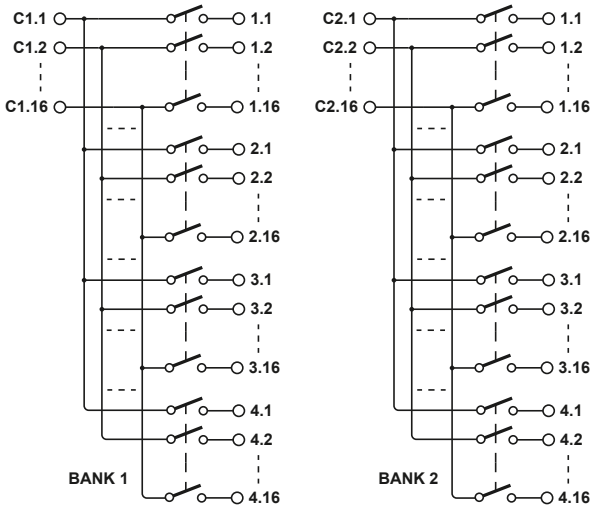
2-Bank, 32-Channel, 2-Pole Multiplexer,
Part Number 4x-614D-011



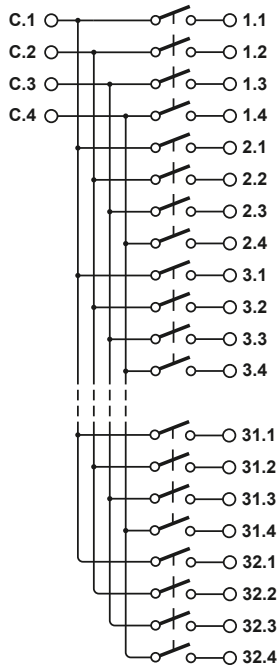
2-Bank, 16-Channel, 4-Pole Multiplexer,
Part Number 4x-614D-012



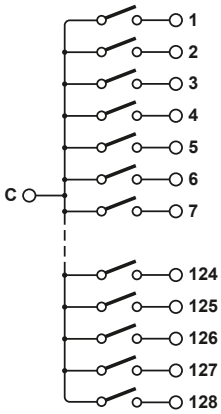
2-Bank, 8-Channel, 8-Pole Multiplexer,
Part Number 4x-614D-013



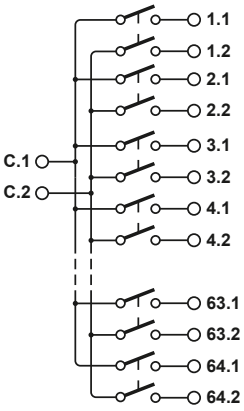
2-Bank, 4-Channel, 16-Pole Multiplexer, Part Number 4x-614D-014



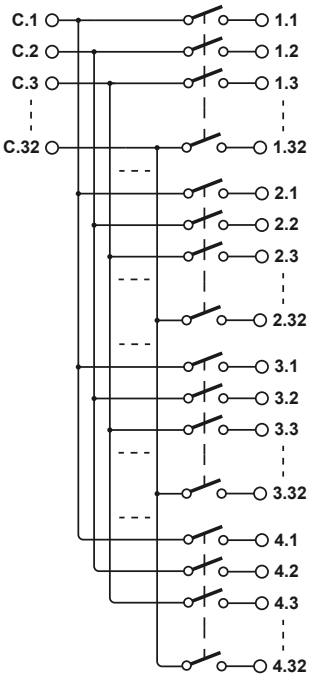
1-Bank, 32-Channel, 4-Pole Multiplexer, Part Number 4x-614D-017



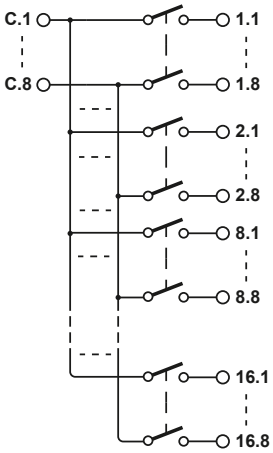
1-Bank, 128-Channel, 1-Pole Multiplexer, Part Number 4x-614D-015



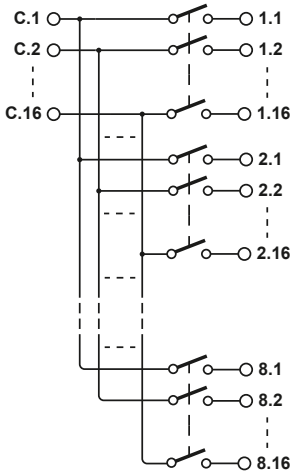
1-Bank, 64-Channel, 2-Pole Multiplexer, Part Number 4x-614D-016



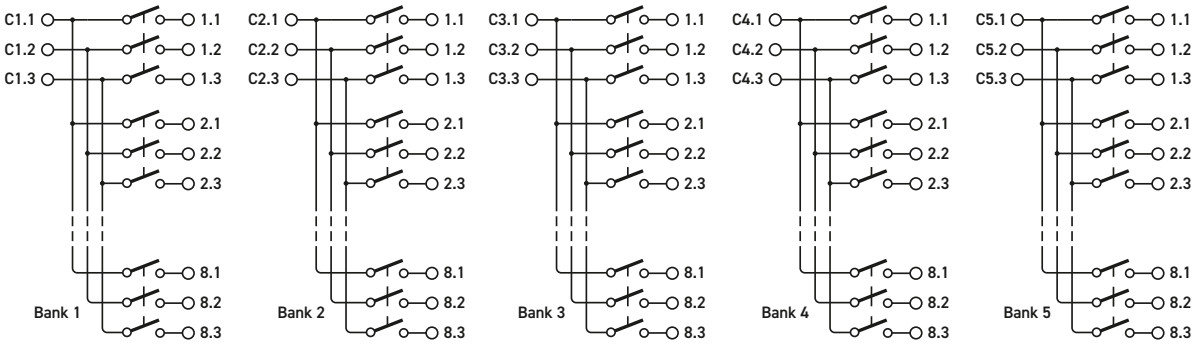
1-Bank, 4-Channel, 32-Pole Multiplexer, Part Number 4x-614D-020



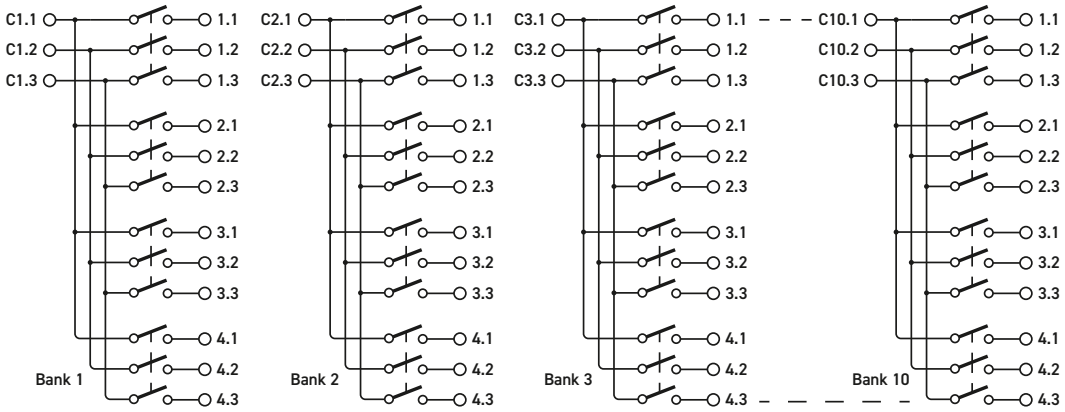
1-Bank, 16-Channel, 8-Pole Multiplexer, Part Number 4x-614D-018



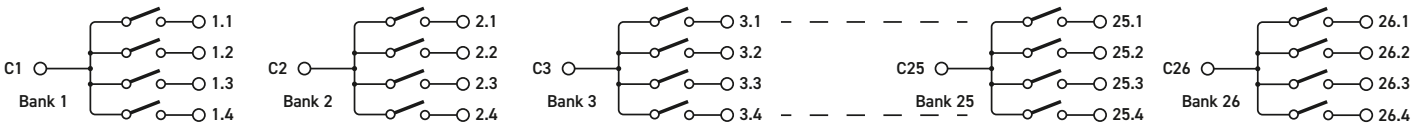
1-Bank, 8-Channel, 16-Pole Multiplexer, Part Number 4x-614D-019



5-Bank, 8-Channel, 3-Pole Multiplexer, Part Number 4x-614D-021



10-Bank, 4-Channel, 3-Pole Multiplexer, Part Number 4x-614D-022



26-Bank, 4-Channel, 1-Pole Multiplexer, Part Number 4x-614D-023

Switching Specification

Switch Type	Electro-mechanical
Contact Type:	Palladium-Ruthenium, Gold Covered Bifurcated
Max Switch Voltage:	300 VDC/250 VAC*
Max Power:	62.5 VA, 60 W from 30 V to 200 VDC, 30 W to 300 VDC (resistive load)
Max Switch Current:	2 A
Max Continuous Carry Current:	2 A
Max Pulsed Carry Current Example (for a single switch path):	6 A for 100 ms (up to 10 % duty cycle)
Initial Path Resistance - On:	400 mΩ max, 180 mΩ typical
Path Resistance - Off:	$>10^9$ Ω
Thermal Offset:	<10 µV (typical)
Operate Time:	6 ms typical, 3 ms for multi-channel mode
Expected Life (operations)	
Very low power signal load:	$>1x10^8$
Low power load (2 W):	$>1.5x10^7$ (0.1 A, 20 VDC)
Medium power load (30 W):	$>5x10^6$ (1 A, 30 VDC)
Full power load (60 W):	$>1x10^5$ (2 A, 30 VDC)

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

RF Specification - In a 50 Ω System

Bandwidth -3dB (typical):	40 MHz	(4x-614D-001)
	46 MHz	(4x-614D-002)
	30 MHz	(4x-614D-006)
	18 MHz	(4x-614D-010)
	10 MHz	(4x-614D-015)
	14 MHz	(4x-614D-016)
	33 MHz	(4x-614D-021)
	45 MHz	(4x-614D-022)
	55 MHz	(4x-614D-023)
Crosstalk (typical):	10 kHz:	-70 dB
	100 kHz:	-70 dB
	1 MHz:	-50 dB
	10 MHz:	-30 dB
Isolation (typical):	10 kHz:	65 dB
	100 kHz:	60 dB
	1 MHz:	55 dB
	10 MHz:	35 dB

Power Requirements - 40-614D

+3.3 V	+5 V	+12 V	-12 V
150 mA (typical)	200 mA (typical)	0	0

Power Requirements - 42-614D

+3.3 V	+12 V
390 mA (typical)	240 mA (typical)

Relay Type

The 4x-614D is fitted with electro-mechanical relays with Palladium-Ruthenium Gold covered contacts. A spare relay is built onto the circuit board to allow easy maintenance with minimum downtime.

Mechanical Characteristics

40-614D - Single slot 3U PXI (CompactPCI card).

42-614D - Single slot 3U PXIe, compatible with PXIe hybrid slot.

Module weight: 215g

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

Connectors

40-614D - PXI bus via 32-bit P1/J1 backplane connector.

42-614D - PXIe bus via XJ3 and XJ4 backplane connectors.

Signals via front panel 160-pin male DIN 41612 connector, for pin outs please refer to the operating manual.

PXI & CompactPCI Compliance - 40-614D

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 - 42-614D

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

Product Order Codes - PXI High Density 2 A MUX

Channel Selection	Model Variant	Order Code
Single	16 Bank, 8 Channel, 1-Pole	40-614D-001
Single	8 Bank, 16 Channel, 1-Pole	40-614D-003
Single	4 Bank, 32 Channel, 1-Pole	40-614D-006
Single	2 Bank, 64 Channel, 1-Pole	40-614D-010
Single	1 Bank, 128 Channel, 1-Pole	40-614D-015
Single	26 Bank, 4 Channel, 1-Pole	40-614D-023

Note: The above modules can only select a single channel.

Channel Selection	Model Variant	Order Code
Single	16 Bank, 4 Channel, 2-Pole	40-614D-002
Single	8 Bank, 8 Channel, 2-Pole	40-614D-004
Single	8 Bank, 4 Channel, 4-Pole	40-614D-005
Single	4 Bank, 16 Channel, 2-Pole	40-614D-007
Single	4 Bank, 8 Channel, 4-Pole	40-614D-008
Single	4 Bank, 4 Channel, 8-Pole	40-614D-009
Single	2 Bank, 32 Channel, 2-Pole	40-614D-011
Single	2 Bank, 16 Channel, 4-Pole	40-614D-012
Single	2 Bank, 8 Channel, 8-Pole	40-614D-013
Single	2 Bank, 4 Channel, 16-Pole	40-614D-014
Single	1 Bank, 64 Channel, 2-Pole	40-614D-016
Single	1 Bank, 32 Channel, 4-Pole	40-614D-017
Single	1 Bank, 16 Channel, 8-Pole	40-614D-018
Single	1 Bank, 8 Channel, 16-Pole	40-614D-019
Single	1 Bank, 4 Channel, 32-Pole	40-614D-020
Single	5 Bank, 8 Channel, 3-Pole	40-614D-021
Single	10 Bank, 4 Channel, 3-Pole	40-614D-022

Note: The above modules are available in multiple channel selection mode by adding the "-M" suffix to the part number. For example, a PXI 16-bank, 4-channel 2-pole MUX with multiple channel capability would be: **40-614D-002-M**

Product Order Codes - PXIe High Density 2 A MUX

Channel Selection	Model Variant	Order Code
Single	16 Bank, 8 Channel, 1-Pole	42-614D-001
Single	8 Bank, 16 Channel, 1-Pole	42-614D-003
Single	4 Bank, 32 Channel, 1-Pole	42-614D-006
Single	2 Bank, 64 Channel, 1-Pole	42-614D-010
Single	1 Bank, 128 Channel, 1-Pole	42-614D-015
Single	26 Bank, 4 Channel, 1-Pole	42-614D-023

Note: The above modules can only select a single channel.

Channel Selection	Model Variant	Order Code
Single	16 Bank, 4 Channel, 2-Pole	42-614D-002
Single	8 Bank, 8 Channel, 2-Pole	42-614D-004
Single	8 Bank, 4 Channel, 4-Pole	42-614D-005
Single	4 Bank, 16 Channel, 2-Pole	42-614D-007
Single	4 Bank, 8 Channel, 4-Pole	42-614D-008
Single	4 Bank, 4 Channel, 8-Pole	42-614D-009
Single	2 Bank, 32 Channel, 2-Pole	42-614D-011
Single	2 Bank, 16 Channel, 4-Pole	42-614D-012
Single	2 Bank, 8 Channel, 8-Pole	42-614D-013
Single	2 Bank, 4 Channel, 16-Pole	42-614D-014
Single	1 Bank, 64 Channel, 2-Pole	42-614D-016
Single	1 Bank, 32 Channel, 4-Pole	42-614D-017
Single	1 Bank, 16 Channel, 8-Pole	42-614D-018
Single	1 Bank, 8 Channel, 16-Pole	42-614D-019
Single	1 Bank, 4 Channel, 32-Pole	42-614D-020
Single	5 Bank, 8 Channel, 3-Pole	42-614D-021
Single	10 Bank, 4 Channel, 3-Pole	42-614D-022

Note: The above modules are available in multiple channel selection mode by adding the "-M" suffix to the part number. For example, a PXIe 16-bank, 4-channel 2-pole MUX with multiple channel capability would be: **42-614D-002-M**

Operating/Storage Conditions

Operating Temperature:	0 °C to +55 °C
Humidity:	Up to 90 % non-condensing
Altitude:	5000 m
Storage Temperature:	-20 °C to +75 °C
Humidity:	Up to 90 % non-condensing
Altitude:	15000 m

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 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.

42-614D High Density 2 A Multiplexer Module in PXIe Format

Support Products

eBIRST Switching System Test Tool

This product is supported by the *eBIRST* test tools which simplify the identification of failed relays, the required *eBIRST* tools are below. For more information go to: pickeringtest.com/ebirst

Product	Test Tool	Adaptor	Calibration
4x-614D	93-002-001	93-002-401	93-002-101

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
4x-614D	91-100-001

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

Mating Connectors & Cabling

For connection accessories for the 4x-614D module please refer to the 90-001D 160-pin DIN 41612 Connector Accessories data sheet where a complete list and documentation can be found.

40-614D-021 PXI 5-Bank, 8-Channel, 3-Pole Multiplexer Module

Chassis Compatibility

The PXI versions of this module 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

PXI and PXIe (with PXIe and/or Hybrid slots) Chassis from any Vendor:

- Mix our 1000+ PXI/PXIe switching & simulation modules with any vendor's PXI/PXIe 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 PXI Switching & Simulation Modules:

- Choose from 1000+ Pickering PXI 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. These accessories are detailed in Connector Accessories data sheets, where a complete list and documentation can be found for each accessory.

Connectors & Backshells

Multi-way Cable Assemblies

RF Cable Assemblies

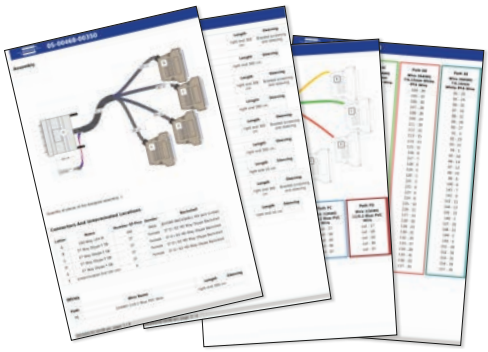
Breakouts

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.

- Fully supported on modern browsers and tablet operating systems.
- Built-in tutorials and videos allow you to get quickly up to speed.
- Store cable assemblies in the Cloud and develop over time.
- Each cable design has a downloadable PDF documentation file detailing all specifications

Start designing your custom cabling, go to pickeringtest.com/cdt



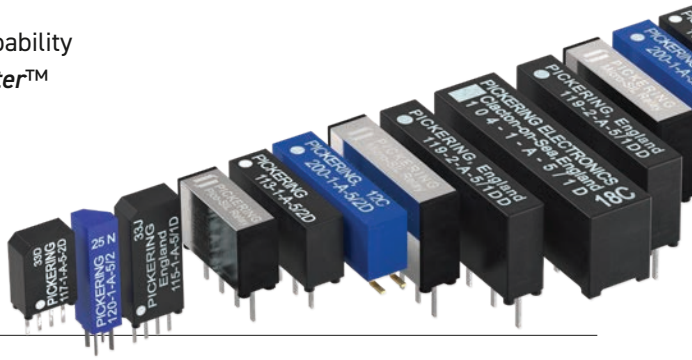
Mass Interconnect

We recommend the use of a mass interconnect solution when an Interchangeable Test Adapter (ITA) is required for PXI/LXI based test systems. Our modules are fully supported by 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 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 more information go to pickeringtest.com/os

The VISA driver support is provided for LabVIEW Real Time Operating Systems (Pharlap and Linux-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++)
- **Programming Languages** C, C++, C#, Python
- **Keysight** VEE and OpenTAP
- **Mathworks MATLAB, Simulink**
- **Marvin** ATEasy
- **MTQ Testsolutions** Tecap Test & Measurement Suite

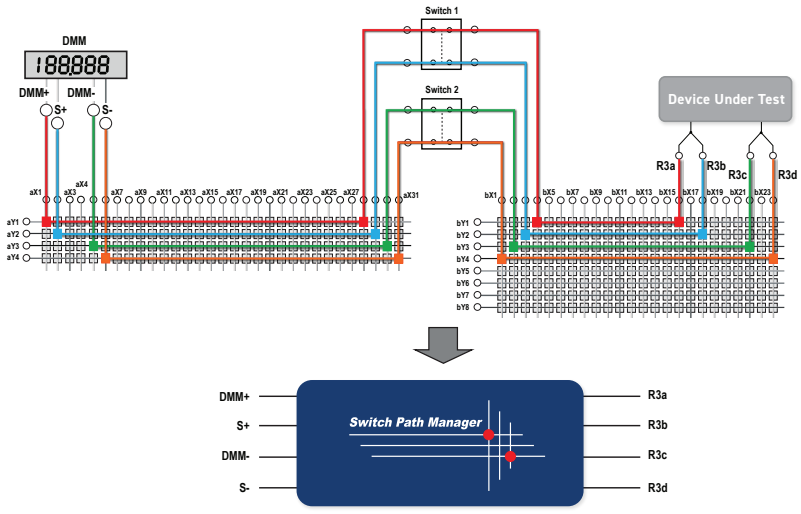
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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

To learn more about software drivers and development environments 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 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 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 three years from the date of delivery to the original purchaser. Extended warranty and service agreements are available with various levels for 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 go to pickeringtest.com/support

Available Product Resources

We have a library of resources including success stories, product and support videos, articles and white papers as well as application-specific brochures to assist you. We have also published reference books on switching technology and the PXI and LXI standards.

To view, download or request any of our product resources go to pickeringtest.com/resources