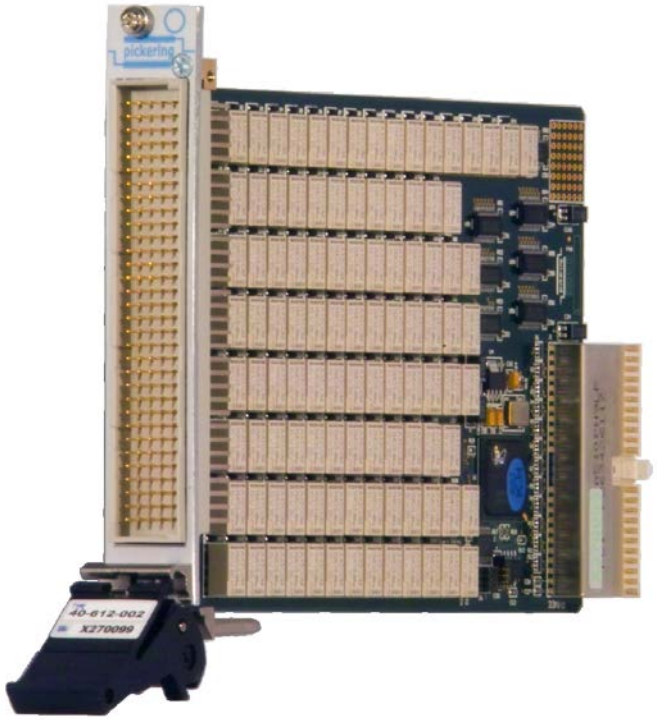
PXI Very High Density Versatile Multiplexer 40-612

- **Versatile Multiplexer - For Now & The Future**
- **Flexible Software Configured Architecture Can be Set to Different Configurations as Needs Change**
- **8-Bank 8-Channel 2-Pole Multiplexers, 1-Pole Selection, Inter-bank Connection & Isolation Switching**
- **Many Different Configurations up to a Single 128-Channel 1-Pole Multiplexer, Including Mixed Channel Count & Custom Configurations**
- **Maximum Current 2A Hot or Cold Switching**
- **Switch up to 300VDC/250VAC and up to 60W Max Power**
- **Isolation Switches Reduce Capacitive Loading in Large Systems**
- **VISA, IVI & Kernel Drivers Supplied for Windows**
- **Supported by PXI or LXI Chassis**
- **Supported by *eBIRST* ™**
- **3 Year Warranty**



The 40-612 Very High Density Versatile Multiplexer module features a wide range of software selectable switching configurations. It is especially useful where a high density MUX array is required that can adapt to different test configurations for different test targets, or where a test system may have to be reconfigured in the future. Typical applications include signal routing in ATE and data acquisition systems. The 40-612 uses high quality electro-mechanical relays, connections are made via a front panel 160-pin DIN 41612 connector.

MUX Configurations

The module can be software configured as one of a large number of different multiplexers. Relays allow the banks to be set as 1 or 2-pole and inter-bank switching allows a maximum of 128 channels (refer to schematic diagram overleaf).

Typical Configurations
8 Banks, 16 Channels, 1-Pole 8 Banks, 8 Channels, 2-Pole
4 Banks, 32 Channels, 1-Pole 4 Banks, 16 Channels, 2-Pole
2 Banks, 64 Channels, 1-Pole 2 Banks, 32 Channels, 2-Pole
1 Bank, 128 Channels, 1-Pole 1 Bank, 64 Channels, 2-Pole

Pickering's Range of Versatile Multiplexer Modules with the same switching architecture

Model No.	Max Voltage	Max Current	Operate Time	Relay Type
40-612	300VDC/ 250VAC	2A	3ms	Electro-mechanical
40-681	±60V	350mA	200µs	Solid State
40-682	±40V	250mA	80µs	Solid State
40-683	±100V	125mA	500µs	Solid State

The versatility of the 40-612's architecture allows all banks to be inter-linked and common connections used as extra signal inputs.

The 40-612 may be operated as a conventional multiplexer with break-before-make action when a new channel is selected. For 2-pole configurations, multiple channels can be simultaneously selected without restriction. For 1-pole configurations the channels that can be simultaneously selected are limited because the multiplexer uses 2-pole relays.

Isolation switching connects only the currently active multiplexer bank to the analog common, keeping capacitive loading and leakage currents in large multiplexer systems to a minimum. Larger multiplexers may be constructed by daisy chaining the common signals from multiple modules.

Supported by *eBIRST*

eBIRST switching system test tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.

ISSUE 12.0 JAN 2019

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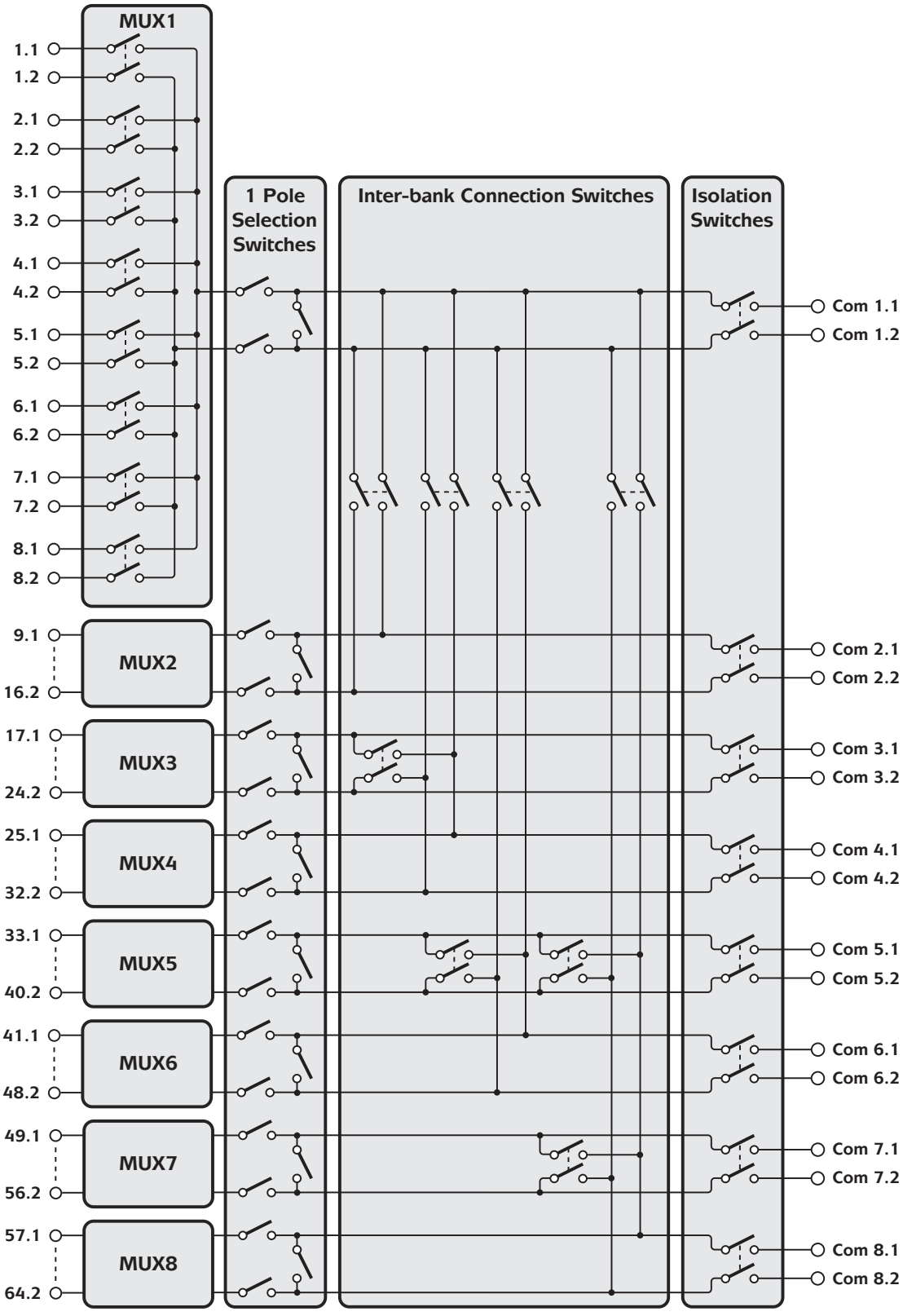


Switching Diagram for the 40-612-002 Very High Density
8 Bank, 8 Channel, 2 Pole Versatile Multiplexer

Relay Type

The 40-612 is fitted with electro-mechanical 2-pole relays, palladium-ruthenium gold covered contacts. A spare relay is built onto the circuit board to allow easy maintenance with minimum downtime.

Switching Specification

Switch Type:	Electro-mechanical
Contact Type:	Palladium-Ruthenium, Gold Covered Bifurcated
Max Switch Voltage:	300VDC/250VAC*
Max Power:	62.5VA, 60W from 30V to 220VDC, 30W to 300VDC (resistive load)
Max Switch Current:	2A
Max Continuous Carry Current:	2A
Max Pulsed Carry Current Example (for a single switch path):	6A for 100ms (up to 10% duty cycle)
Initial Path Resistance - On:	500mΩ max, 300mΩ typ†
Path Resistance - Off:	$>10^9$Ω
Minimum Voltage:	100µV
Thermal Offset:	<10µV †
Bandwidth (-3dB insertion loss, 50Ω):	>10MHz
Operate Time:	6ms typical, 3ms for multichannel mode
Expected Life (operations)	
Very low power signal load:	$>1x10^8$
Low power load (2W):	$>1.5x10^7$ (0.1A 20VDC)
Medium power load (30W):	$>5x10^6$ (1A 30VDC)
Full power load (60W):	$>1x10^5$ (2A 30VDC)
	$>1x10^5$ (0.1A 300VDC)

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

† Path resistance & thermal offset are dependent upon the signal route selected.

Power Requirements

+3.3V	+5V	+12V	-12V
5mA	2A max (typ 280mA)	0	0

Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).
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 160-pin male DIN 41612 connector, for pin outs please refer to the operating manual.

We recommend that Pickering mating connectors are used with this module which are designed to ensure there are no mechanical interference problems when used in a PXI chassis.

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 - Versatile Multiplexer

Channel Selection	Model Variant	Order Code
Multiple	**8-Bank, 8-Channel, 2-Pole MUX**	**40-612-002**

Note: The above module is available to select multiple channels.

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

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.

Product	Test Tool	Adaptor
40-612	93-002-001	93-002-410

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
40-612	91-100-001

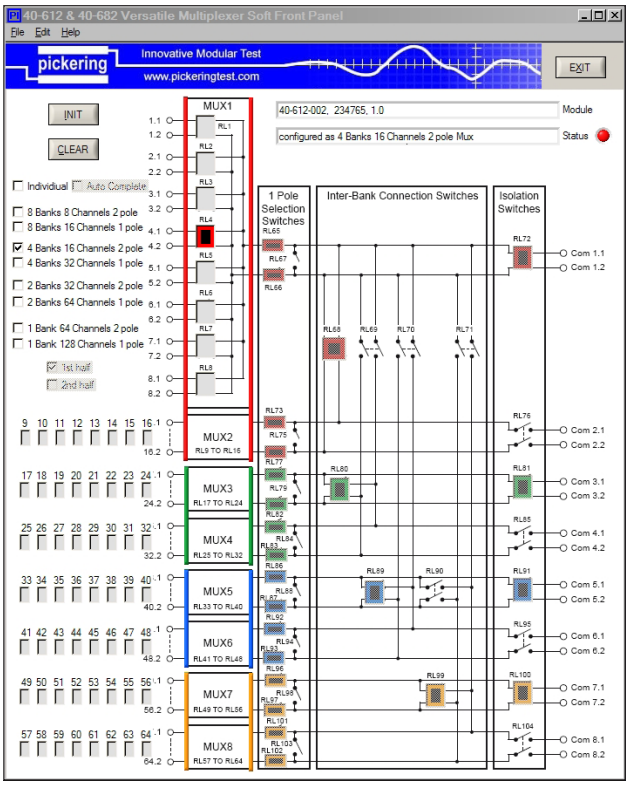
For further assistance, please contact your local Pickering sales office.

Mating Connectors & Cabling

For connection accessories for the 40-612 module please refer to the 90-001D 160-pin DIN 41612 Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

Soft Front Panel For The Versatile MUX

The Versatile Multiplexer Soft Front Panel for the 40-612-002, 40-681-001, 40-682-002 and 40-683-001 allows easy setting of various multiplexer configurations from 8-bank 8-channels 2-pole, up to 1-bank 128-channels 1-pole as well as individual relay control for custom configurations. The schematic in the background of the SFP simplifies understanding of the selected topology. During configuration setting, all relay control information is logged in a text file which can be re-used in a programming environment.



Soft Front Panel for the 40-612, 40-681, 40-682 and 40-683 Very High Density Versatile Multiplexers

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:

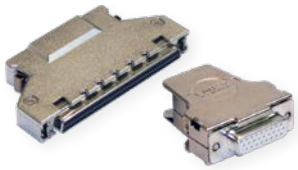
- Mix our 1000+ PXI switching & simulation modules with any vendor's PXI instrumentation
- Embedded or remote Windows PC control
- Real-time Operating System Support
- High data bandwidths, especially with PXI Express
- Integrated module timing and synchronization

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

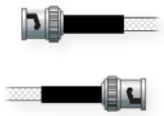
Connectivity Solutions

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.

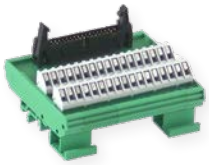


Connectors & Backshells

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.

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, IVI 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.