

- Available as PXI or PXIe Modules
- Suited for 1000Base-T1/100Base-T1 Switching
- Fault Insertion on 1 or 2 Channels of 2 Wire Connections
- Dual MUX for External Systems
- Controlled Transmission Line Impedance
- Simple Insertion of Shorted Pair, Open and Battery/Ground Connection
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- 3 Year Warranty



The 40-204 (PXI) and 42-204 (PXIe) are designed to simulate common faults on high-speed two wire communication interfaces such as 1000Base-T1. They support 1 or 2-channels of two wire serial interfaces. Each channel pair can be looped out to external equipment or the switches can be used simulate a channel open fault. Using the fault bus, switches can simulate a short between both wires or a short to one of two externally applied fault conditions – such as battery supply or ground - via two fault buses.

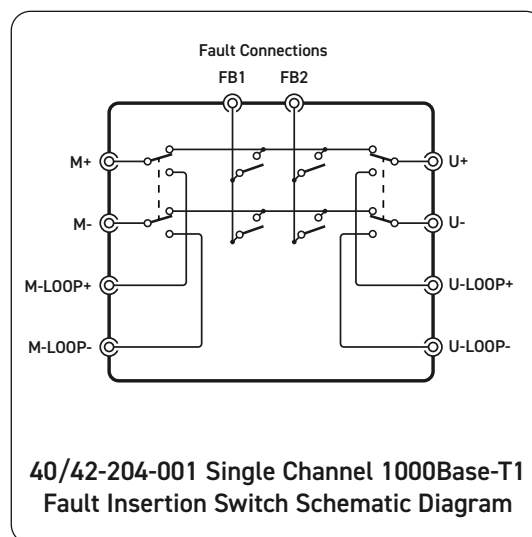
Each channel can carry up to 0.8A and is rated up to 200V between wire pairs. The wire pairs have controlled transmission line impedance suited to most differential

signalling systems, including high-speed 1000Base-T1, the fault buses are capable of carrying 0.8A and also have controlled transmission line impedance. The front panel signal connectors are easy to use MMCX which are fully supported by our range of connector accessories. The module uses high quality electro-mechanical relays designed for high frequency application with long service life.

Differential Bus Switching

We also offer the 40-736 and 40-737 multiplexers which are suitable for switching Ethernet, USB and other serial communications signals.

Pickering's Range of Fault Insertion Switches					
Model No.	Signal Channels	Fault Buses	Fault Inputs	Max Voltage	Max Current or Bus Type
40-190B	74, 64 or 32	1 or 2	4 or 8	165 V	2 A
40-191A	6	2	2	40 V	30 A
40-192	6	2	2	200 V	10 A
40-193	7	1 or 2	1 or 2	16 V	20 A, 1 A min
40-194	7	1 or 2	1 or 2	16 V	20 A, no min
40-195	22 or 11 pairs	—	8 or 4	150 V	1 A
40-196	10 or 5 pairs	—	10 or 5	110 V	5 A
40-197A	34 or 16	4	8	300 V	2 A
40-198	20	1 or 2	3 or 6	250 V	5 A
40-199	10	1 or 2	2	250 V	10 A
40-200	4 or 8 differential	4	8	100 V	CAN, FlexRay
40-201	4 or 8 differential	2	4	100 V	Ethernet/AFDX /BroadR-Reach
40-202	22 or 11 pairs	—	22 or 11	150 V	1 A
40/42-204	1 or 2 differential	2	2	200 V	1000Base-T1



Specification

Configuration:	1 or 2-pairs of two wire connections designed for use on differential serial interfaces with multiplexers for connection to external equipment.
Faults Simulated:	Open on wire pairs or loop out to external fault system via 2 fault buses (for dual versions, the fault buses for each bank are isolated from each other).
Ground Connection:	Each multiplexer bank has isolated ground planes that are directly connected to the outer of the front panel connectors.
Differential Line Impedance:	100 Ω
Fault Bus Impedance:	50 Ω
Voltage Rating:	200 V*
Carry Current Rating:	0.8 A
Max Hot Switch Current:	0.5 A
Path Resistance:	<1 Ω
Typical Bandwidth:	>700 MHz Differential
Operate Time:	0.5 ms

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

Power Requirements - 40-204

+3.3V	+5V	+12V	-12V
0.03 A	0.3 A	0	0

Power Requirements - 42-204

+3.3V	+12V
0.03 A	0.15 A

Mechanical Characteristics

40-204 - Single slot 3U PXI (CompactPCI card).

42-204 - Single slot 3U PXIe, compatible with PXIe hybrid slot.

Module weight: 210g

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

Connectors

40-204 - PXI bus via 32-bit P1/J1 backplane connector.

42-204 - PXIe bus via XJ3 and XJ4 backplane connectors.

Signals via front panel mounted MMCX coaxial connectors.

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 - 40-204

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 - 42-204

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.

Product Order Codes

PXI 1000Base-T1 Dual MUX With Fault Insertion:

1-Channel	40-204-001
2-Channel	40-204-002

PXIe 1000Base-T1 Dual MUX With Fault Insertion:

1-Channel	42-204-001
2-Channel	42-204-002

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.

Mating Connectors & Cabling

For connection accessories for the 40/42-204 module please refer to the [90-011D](#) RF Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.



**42-204-001 PXIe 1-Channel
PXIe 1000Base-T1 Fault Insertion Switch**

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

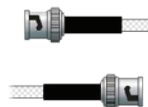
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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

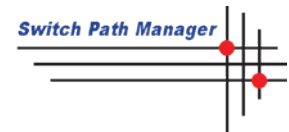
- **Pickering Interfaces Switch Path Manager**
- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, VeriStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C++)
- **Keysight** VEE and OpenTAP
- **Mathworks** Matlab
- **Marvin** ATEasy
-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