- Available as PXI or PXIe Modules
- Fault Insertion on up to 6 Channels of 2 Wire Connections
- Suited for 1000Base-T1/100Base-T1 Fault Insertion
- Controlled Transmission Line Impedance
- Simple Insertion of Shorted Pair, Open and Battery/ Ground Connection
- Relay Cycle Counting Included
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- PXI Versions Supported by PXI or LXI Chassis
- 3 Year Warranty

The 40-203 (PXI) and 42-203 (PXIe) are designed to simulate common faults on high-speed two wire communication interfaces such as 1000Base-T1. They support up to 6 channels of two wire serial interfaces. Each channel pair can simulate an open fault in either or both wires, and using the fault bus switches can simulate short between both wires or a short to one of two externally applied fault connections – such as battery supply or ground - via two fault buses.

Each channel can carry up to 0.8 A and is rated up to 200 V 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 0.8 A 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 reed relays designed for high frequency application with a long service life.

Relay Cycle Counting

To aid with module "health" monitoring all versions are provided with a relay cycle counting cycle feature. The number of operations per contact are stored on the module and can be used to determine if a relay is approaching EOL. This information could allow system connections to be revised so that signals applied to heavily used contacts are swapped with lightly used contacts to prolong the working life of the relay(s).
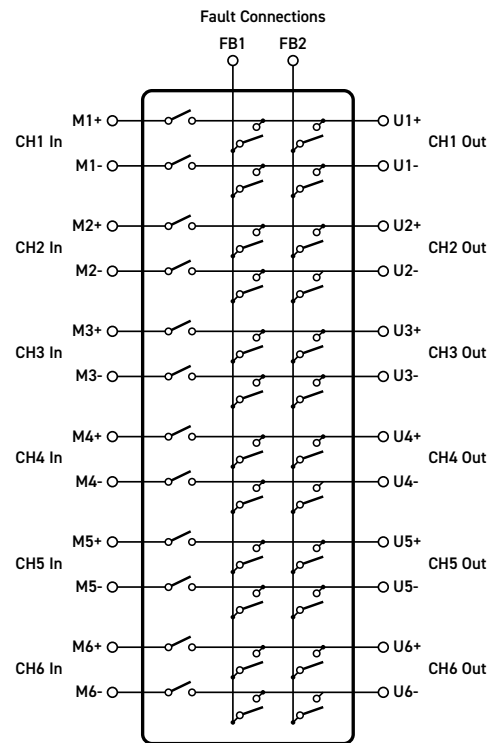
4x-203-002 2-Wire, 6-Channel 1000Base-T1 Fault Insertion Switch Schematic Diagram

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.

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Data Path Specification

Configuration:	3 or 6 pairs of two wire connections designed for use on differential serial interfaces.
Faults Simulated:	Open on either wire or both, short between wires, short to one of two fault connections via two fault buses.
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:	1.6 GHz (3 dB) 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 - 40-203

+3.3 V	+5 V	+12 V	-12 V
0.2 A	1 A	0	0

Power Requirements - 42-203

+3.3 V	+12 V
0.2 A	0.5 A

Mechanical Characteristics

40-203 - Single slot 3U PXI (CompactPCI card).

42-203 - Single slot 3U PXIe, compatible with PXIe hybrid slot.

Module weight: 230 g

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

Connectors

40-203 - PXI bus via 32-bit P1/J1 backplane connector.

42-203 - PXIe bus via XJ3 and XJ4 backplane connectors.

Signals via front panel mounted MMCX coaxial connectors. For pin outs please refer to the operating manual.

PXI & CompactPCI Compliance - 40-203

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 - 42-203

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.

Operating/Storage Conditions

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

Product Order Codes

PXI 1000Base-T1 Fault Insertion Switch:	
3-Channel	40-203-001
6-Channel	40-203-002
PXIe 1000Base-T1 Fault Insertion Switch:	
3-Channel	42-203-001
6-Channel	42-203-002

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.

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
4x-203	3 or 6 differential	2	2	200 V	1000Base-T1
4x-204	1 or 2 differential	2	2	200 V	1000Base-T1

Support Products

Mating Connectors & Cabling

For connection accessories for the 4x-203 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 website.

**42-203-002 PXIe 6-Channel
PXIe 1000Base-T1 Fault Insertion Switch**

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
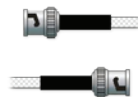
Connectivity Solutions

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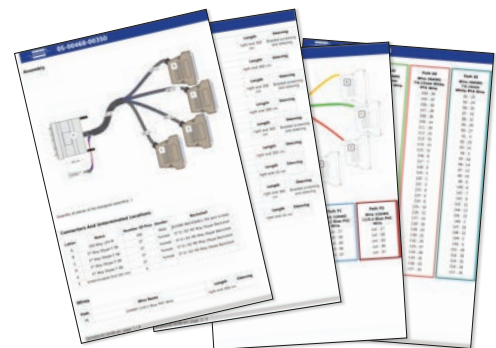
Start designing your custom cabling, go to pickeringtest.com/cdt

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
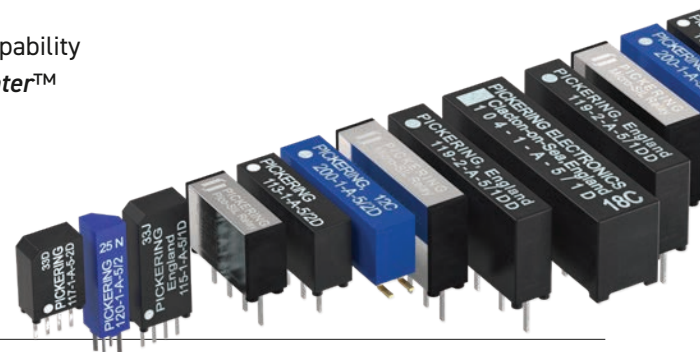
Programming

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
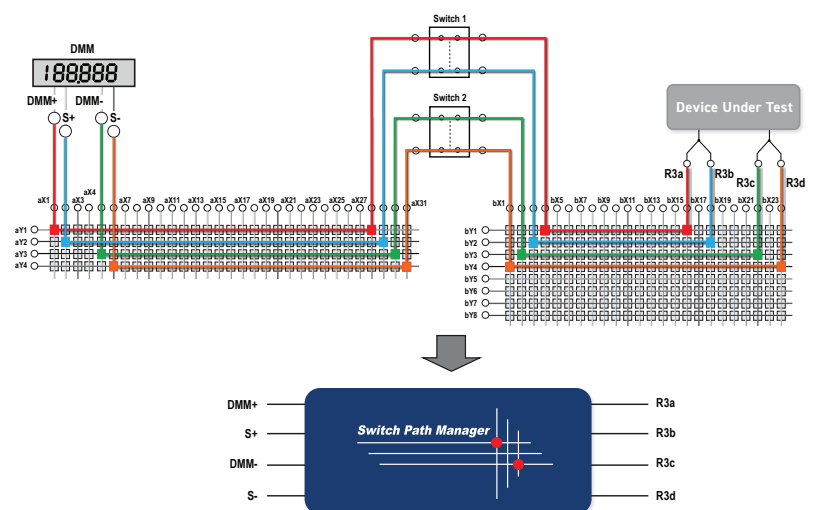
Diagnostic Relay Test Tools

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