PXI CAN/FlexRay/Differential Fault Insertion Switch 40-200

- Fault Insertion on 4 or 8 Channels of 2 Wire Connections
- Suited for CAN Bus and FlexRay Fault Insertion
- Controlled Transmission Line Impedance
- Simple Insertion of Shorted Pair, Open and Battery/Ground Connection
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- Supported by PXI or LXI Chassis
- Supported by *eBIRST* ™
- 3 Year Warranty

The 40-200 is designed to simulate common faults on two wire communication interfaces such as CAN Bus.

It supports 4 or 8 channels of two wire serial interfaces. Each channel pair can simulate an open fault in either or both wires, a short between both wires or a short to one of eight externally applied fault connections – such as battery supply or ground - via four fault buses.

Each channel can carry up to 0.3 A and is rated up to 100 V between wire pairs. The wire pairs have controlled transmission line impedance suited to most differential signalling systems, including fast CAN Bus and RS422/485.

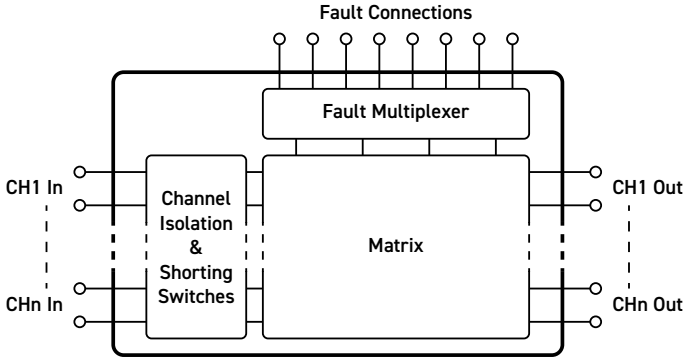
The fault buses are capable of carrying 2 A allowing multiple channels to be connected to the same fault condition. Additionally, the fault buses have changeover relays allowing the user to select alternative external fault conditions.

The front panel signal connector is an easy to use 78-pin D-type which is fully supported by our range of connector accessories. The module uses high quality EMR relays designed for telecommunications with a long service life.

Supported by *eBIRST*

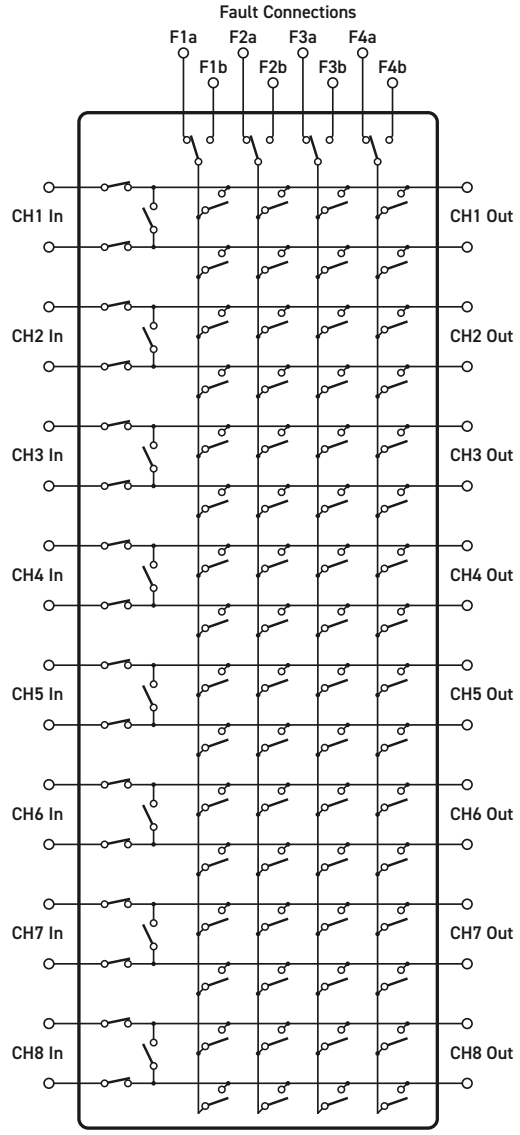
eBIRST switching system test tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay. For more information go to: pickeringtest.com/ebirst

Pickering's Range of PXI 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 or11	150 V	1 A

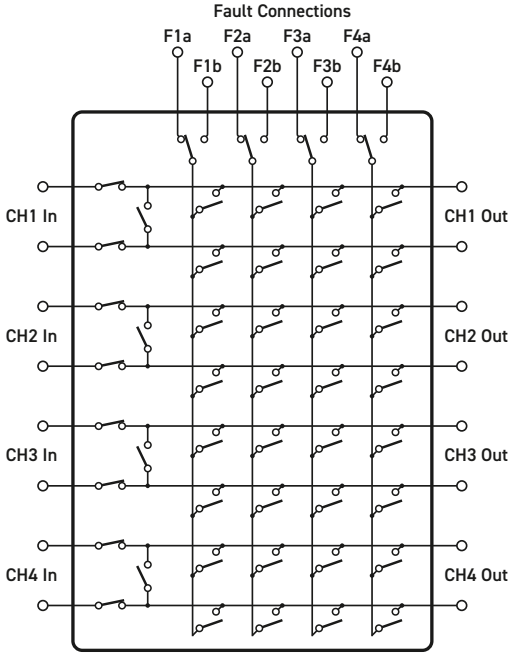


40-200 Differential Fault Insertion Switch Module Overview Diagram

Issue 2.4 April 2023



2-Wire, 8-Channel Fault Insertion Switch Module Switching Diagram (Part No. 40-200-008)



2-Wire, 4-Channel Fault Insertion Switch Module Switching Diagram (Part No. 40-200-004)

Data Path Specification

Configuration:	4 or 8 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 eight fault connections via four fault buses.
Differential Line Impedance:	120 Ω
Voltage Rating:	100 V*
Current Rating:	0.3 A
Max Hot Switch Power:	30 W
Path Resistance:	<2 Ω
Typical Bandwidth:	50 MHz Differential
Operate Time:	4 ms (typical)†

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

† Including Mode A restricted usage feature overhead - see user manual for further information.

Fault Bus Specification

Configuration:	Four fault buses each with a changeover relay for selecting one of two fault conditions.
Voltage Rating:	100 V*
Current Rating:	2 A
Max Hot Switch Power:	60 W

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

Power Requirements

+3.3 V	+5 V	+12 V	-12 V
150 mA	1 A	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 78-pin male D-Type connector, for pin outs please refer to the operating manual.

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 33 MHz 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.

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

Product Order Codes

4-Channel CAN/FlexRay/Differential Bus Fault Insertion Switch:	40-200-004
8-Channel CAN/FlexRay/Differential Bus Fault Insertion Switch:	40-200-008

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

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
40-200-00x	93-006-001	Not Required

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
40-200-00x	91-100-001

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

Mating Connectors & Cabling

78-pin D-type male to female cables with twisted pairs for differential signals:

0.5m length	A078DMR-078DFR-9A050
1m length	A078DMR-078DFR-9A100
2m length	A078DMR-078DFR-9A200

Note: Other lengths and terminations are available, please contact your local Pickering Sales Office for details.

For other connection accessories for the 40-200 modules please refer to the 90-006D 78-pin D-Type Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

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 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

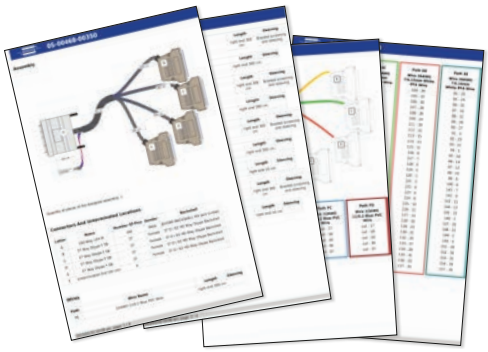
Breakouts

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



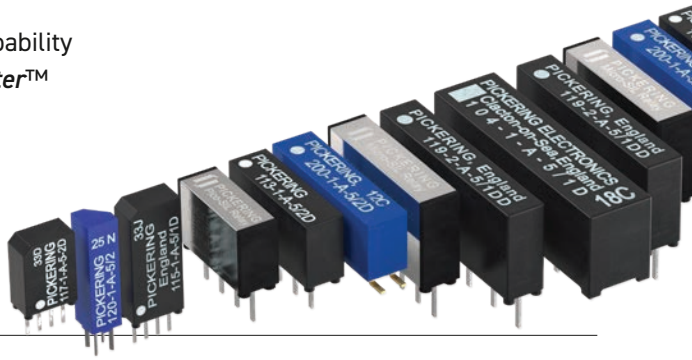
Mass Interconnect

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

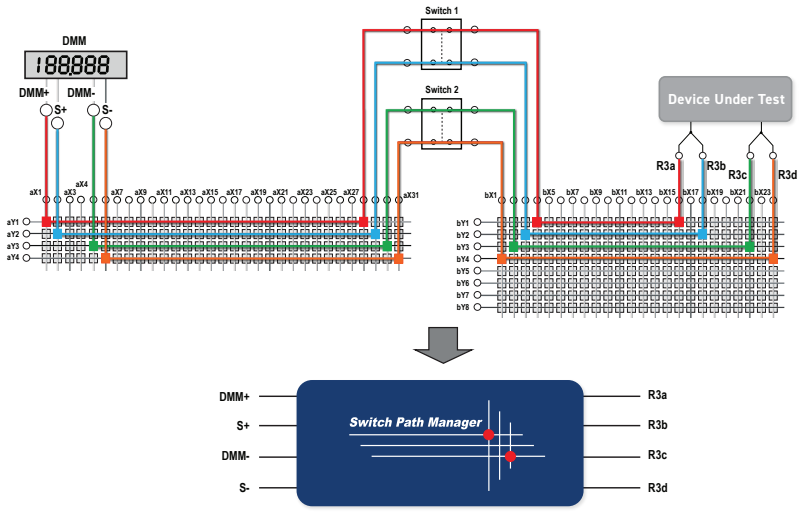
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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