PXI Data Communications MUX 40-736

- Multiplexer Designed For Differential Signals
- Configurable To Single, Dual and Quad Multiplexer
- Wide Differential Bandwidth
- Controlled Differential Impedance of 100 Ω
- Suitable For Telephony, Ethernet, AFDX, BroadR-Reach, LVDS, RS232 and USB Switching Applications
- Compatible With 1 Gb Ethernet
- Designed to Work With AFDX and Future Implementations of ARINC's ADN
- Differential Pair Reversing Switch to Simulate Crossover Cables
- Available With Interface System to Ethernet/AFDX Connectors
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- Supported by ***eBIRST*** ™
- 3 Year Warranty

The 40-736 is designed specifically for multiplexing or demultiplexing differential signal pairs having controlled 100 Ω impedance. The multiplexer can be configured under software control to have single 32, dual 16 or quad 8 signal pair switching. The dual and quad versions are particularly suited for switching AFDX, Ethernet and BroadR-Reach links. The 40-736 is capable of switching 1 Gb Ethernet signals and the design includes a switching network that simplifies the swapping of Tx and Rx pairs to simulate the effect of crossover cables.

The module is ideal for testing multiple devices that use serial interfaces, allowing one target device from many to be selected. The design is bi-directional and can be used as a multiplexer or de-multiplexer with no impact on performance. The module is compatible with Power Over Ethernet.

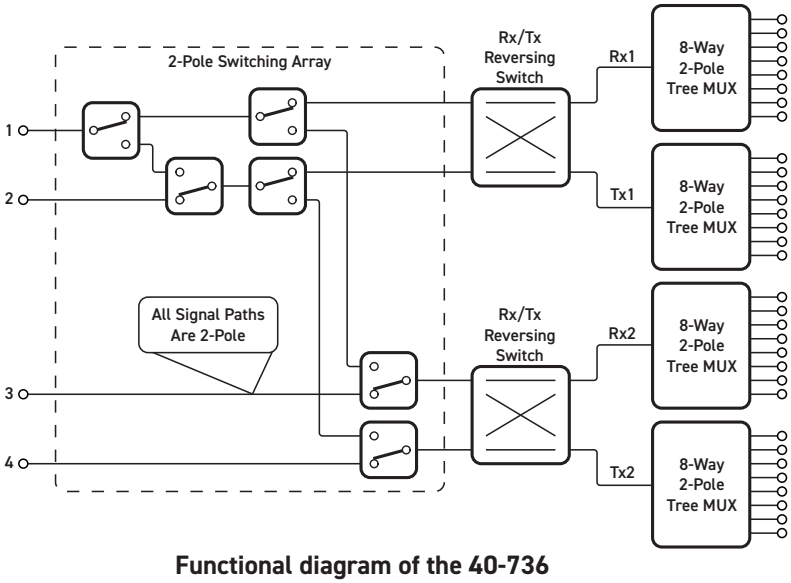
Other applications include the switching of telephone cabling or the routing of LVDS, RS232 and USB serial interface signals.

The design uses long life electro-mechanical relays characterized for use in telephony.

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

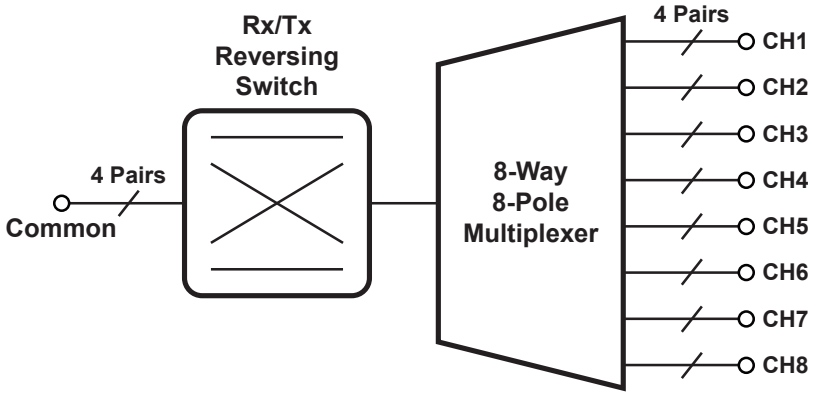
Pickering's Range of Data Comms Multiplexers		
Model No.	**Configuration**	**Application**
40-735	Single 36 channel or Dual 18 channel, differential pair	USB, RS232
40-736	Single 32, Dual 16, Quad 8 channel, differential pair	1 Gb Ethernet, AFDX, BroadR-Reach, LVDS, USB, RS232
40-737	Single 8:1 or 16:1 differential pair and power	USB1, USB2



Functional diagram of the 40-736 Data Communications Multiplexer

ISSUE 5.2 JUL 2021

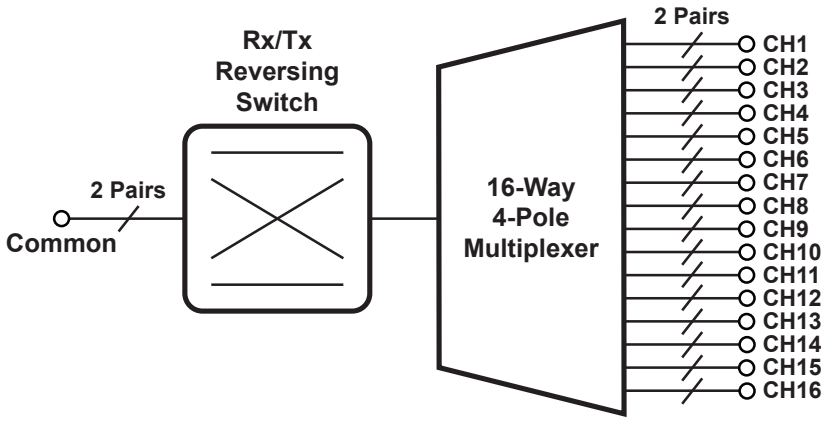
40-736 Data Communications Multiplexer: Example Configurations



8-Way Multiplexer Switching 4 Pairs of Signals

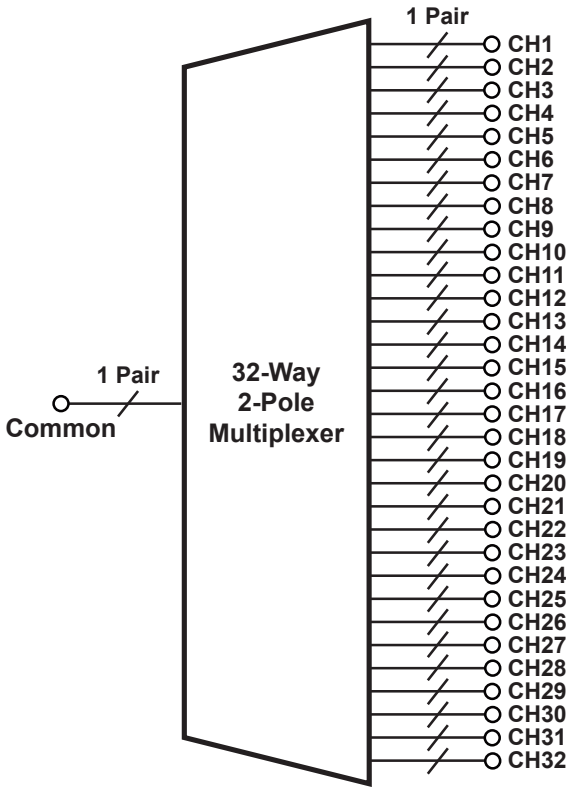
Suitable for 1 Gb Ethernet switching.

The Low Cost option 40-965-901 and Compact option 40-965-907 converter boards allow the easy connection of RJ45 leads to the 40-736 and at the same time maintaining signal integrity.



16-Way Multiplexer Switching 2 Pairs of Signals

Suitable for 100 BaseT Ethernet, POTs, USB 4-wire switching (with power).



32-Way Multiplexer Switching 1 Pair of Signals

Suitable for differential signalling, BroadR-Reach and USB data line multiplexing.

Relay Type

The 40-736 is fitted with electro-mechanical Relays, these offer long life with good switching performance. A spare relay is built onto the circuit board to allow easy maintenance with minimum downtime.

Specification

Switching Configuration:	Configure as single differential pair 32-way MUX, dual 16-way MUX or quad 8-way MUX. All configurations are 2-pole.
Differential Transmission Line Impedance:	100 Ω
Voltage Rating:	100 V between wires in same pair, 100V pair to pair*
Current Rating:	0.3 A
Maximum Power:	60 W
Minimum Switching Voltage:	100 µV
Contact Type:	Palladium Ruthenium, gold covered
Operate Time:	3 ms
Expected Life Mechanical Endurance: Full Power Load:	 $>10^8$ operations $>10^5$ operations
Path Resistance:	Typically <2 Ω
Typical Bandwidth:	450 MHz differential

* 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
0.05 A	0.5 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.

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

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.

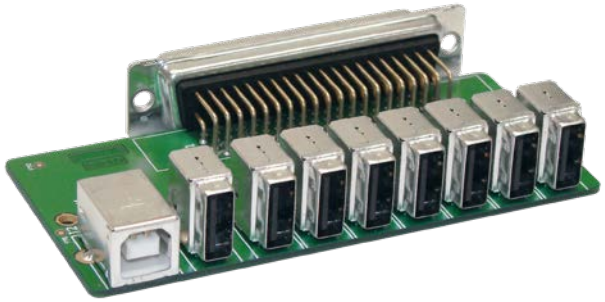
Product Order Codes

Data Communications Multiplexer	40-736-001
Accessories:	
Interface Board 8:1 Ethernet RJ45 converter low cost option	40-965-901
Interface Board 8:1 Ethernet RJ45 converter compact option	40-965-907
Interface Board 8:1 USB converter	40-965-903

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.

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.



The 40-965-903 converter board enables standard USB leads to be connected to the 78-pin plug of the 40-736 for 8:1 USB switching applications.

NOTE: This breakout card can be used with the 40-736 for USB1 switching and also for USB2 but with a maximum of 2 meters of external cabling.

The 40-965-901 low cost board enables 9 RJ45 leads to be connected to the 78-pin plug of the 40-736 for 8:1 Ethernet switching applications

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
40-736	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
40-736	91-100-001

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

Mating Connectors & Cabling

Note: To use the 40-736 up to its full operating frequency, cables with twisted pairs must be used, and for Gigabit Ethernet applications the 40-965-901 or 40-965-907 converter board is recommended with RJ45 cables of at least CAT5e specification.

For general purpose (non-differential) connection accessories for the 40-736 module please refer to the 90-006D 78-pin male D-type connector data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

The 40-965-907 compact board enables 9 RJ45 leads to be connected to the 78-pin plug of the 40-736 for 8:1 Ethernet switching applications

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:

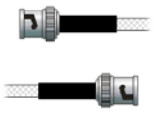
- Ethernet or USB control enables remote operation
- Low-cost control from practically any controller
- LXI provides manual control via Web browsers
- Driverless software support
- Power sequencing immunity
- Ethernet provides chassis/controller voltage isolation
- Independence from Windows operating 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. 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

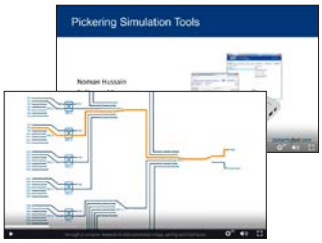
eBIRST Switching System Test Tools are designed specifically for our PXI, PCI or LXI products, these tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.
To learn more, please go to: pickeringtest.com/ebirst

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