

PRELIMINARY DATA

- Available as a PXI or PXIe Module
- Up to 64-Channel Outputs
- High Side or Low Side Driving
- 0.1 A Low Side Sink Capability
- 0.4 A High Side Source Capability
- Fully Protected Outputs
- High Side External Voltage Input
- Drivers Supplied for Windows & Linux, Plus Support for Real-time Systems
- PXI Versions Supported by PXI or LXI Chassis
- 3 Year Warranty

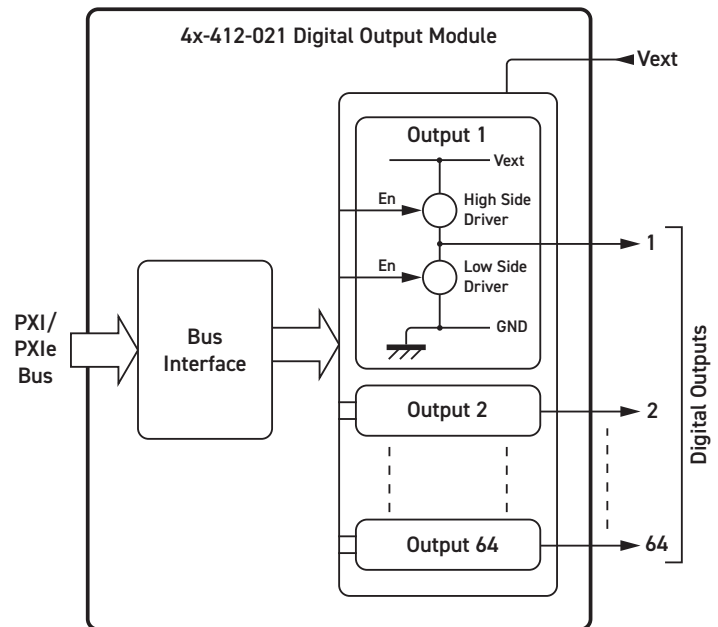


The 40-412A (PXI) and 42-412A (PXIe) are Digital Output modules with high output voltage and current capability.

Up to 64 outputs can be used for high or low drive and each channel is capable of sourcing 0.4 A from the high side or 0.1 A sink on the low side. Accidental operation of both high and low side driver on the same channel is prevented by the supplied driver. Outputs are fully protected against over-voltage, over-current and thermal overload, ensuring robust and reliable operation in the toughest test environments. For high side driving, the voltage source is supplied externally, allowing the module to drive high capacity loads separate from the chassis power supply. For low side driving, the external source is not used and the module's output operates an open collector or open drain driver.

The built in protection systems include an over-voltage clamp so the module can drive relay coils without the use of fly back diodes.

Connection to the module's outputs is via an easy to use 78-pin D-type connector which is fully supported by a range of connector accessories.



Functional Diagram for 4x-412A-021 64-Channel Digital Output Module

Output Specification

No. of Output Channels:	16, 32, 48 or 64
Output States:	Driven high, driven low or off.
Low Side Driver Output Resistance:	0.9 Ω at 0.1 A
High Side Driver Output Voltage:	Vext less 1.3V at 0.4 A
Maximum Current:	0.1 A for Low Side drivers, 0.4 A for High Side drivers, 7 A module total
Maximum Voltage:	+50 V*
Output Protection:	Current limited, overvoltage limited, thermal protection. Overvoltage limit can be used to limit back emf generated from inductive loads such as relay coils.
Vext:	User supplied +5V to +50V, applied to multiple pins of user connector, relative to front panel ground.

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

Power Requirements - 40-412A

+3.3V	+5V	+12V	-12V
150 mA (typical)	0	0	40 mA (typical)

Power Requirements - 42-412A

+3.3V	+12V
TBD	TBD

Mechanical Characteristics

40-412A - Single slot 3 U PXI (CompactPCI card).

42-412A - Single slot 3 U 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

40-412A - PXI bus via 32-bit P1/J1 backplane connector.

42-412A - PXIe bus via XJ3 and XJ4 backplane connectors.

Signals via front panel 78-pin male D-type connector, for pin outs please refer to the operating manual.

PXI & CompactPCI Compliance - 40-412A

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 - 42-412A

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 Temperature: -20 °C to +75 °C

Humidity: Up to 90 % non-condensing

Altitude: 15000 m

Product Order Codes

PXI Digital Output Module	
64-Channels	40-412A-021
48-Channels	40-412A-022
32-Channels	40-412A-023
16-Channels	40-412A-024

PXIe Digital Output Module	
64-Channels	42-412A-021
48-Channels	42-412A-022
32-Channels	42-412A-023
16-Channels	42-412A-024

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.

Support Products

Mating Connectors & Cabling

For connection accessories for the 4x-412A modules please refer to the [90-006D](#) 78-pin D-type Connector data sheet where a complete list and documentation can be found for accessories.



42-412A-021 64-Channel Digital Output Module in PXIe Format

PRELIMINARY DATA

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



PRELIMINARY DATA

Connectivity Solutions

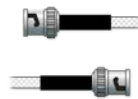
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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



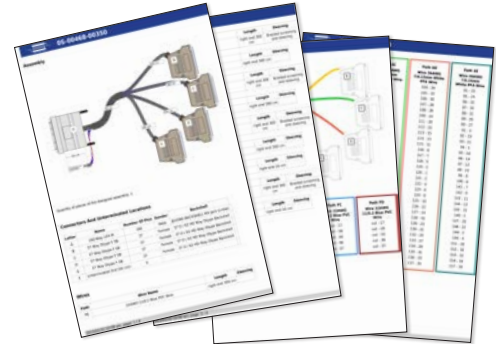
Breakouts



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

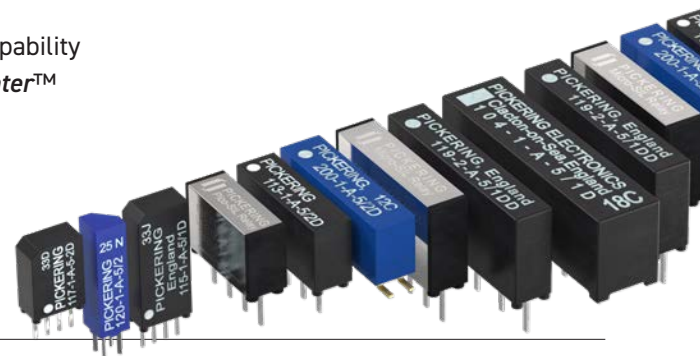
Mass Interconnect

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



PRELIMINARY DATA

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

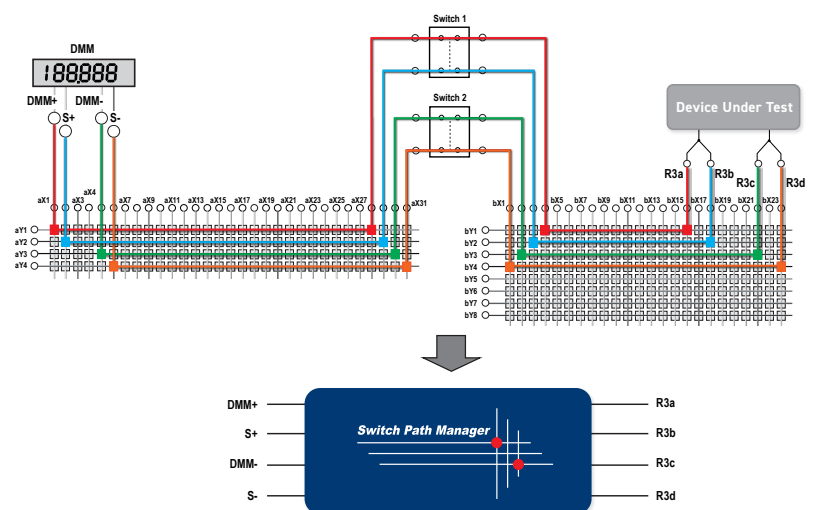
Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries. We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help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



PRELIMINARY DATA

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

