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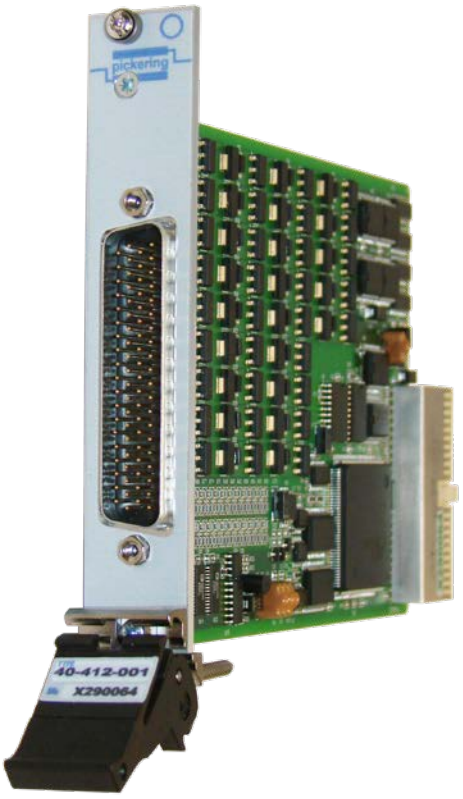
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PXI 32 Channel I/O - Programmable Threshold 40-412-101

- 32-Channel Input
- Dual Programmable Voltage Threshold, 0.3 to 50V
- Parallel Acquisition
- High Input Voltage Tolerance
- 32-Channel Output
- High Side or Low Side Driving
- 0.5A Low Side Sink Capability
- 0.4A High Side Source Capability
- Fully Protected Outputs
- High Side External Voltage Input
- VISA, IVI & Kernel Drivers Supplied for Windows
- Supported by PXI or LXI Chassis
- 3 Year Warranty



The 40-412-101 is a 32-channel Digital I/O module with high output voltage and current capability and a dual variable threshold input.

The 32 outputs can be used for high or low drive and each channel is capable of sourcing 0.4A from the high side or 0.5A 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 PXI 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.

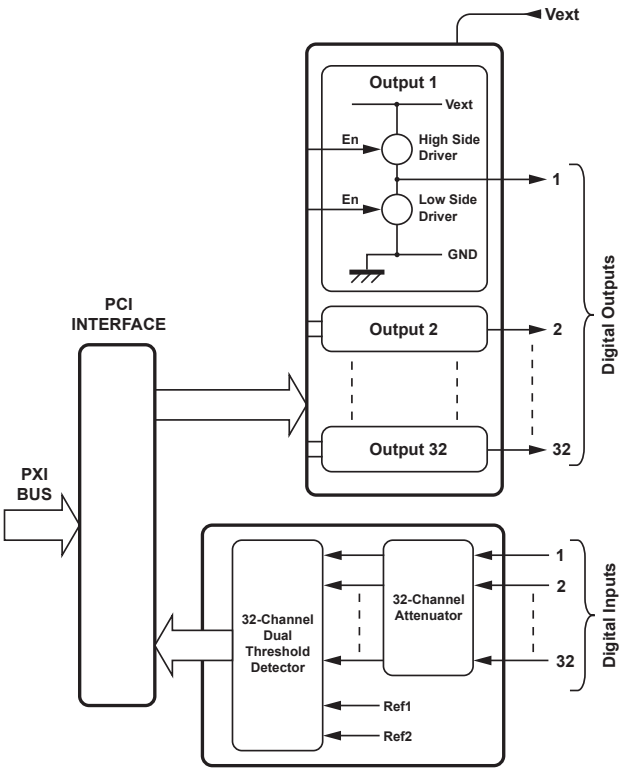
The built in protection systems include an over-voltage clamp so the module can drive relay coils without the use of fly back diodes.

The states of the 32 input channels are read via the PXI interface by comparing the input level to two threshold voltages. These can be set between 0.3V and 50V and have a resolution of 12.5mV. This allows the input to be tested against system limits that define a logic low or logic high.

The 40-412-101 uses 32 sets of comparators to synchronously capture all 32 input states and then reads the status in a single operation.

Each input can withstand the accidental application of voltage greater than 100V. The inputs can be user connected to the outputs without risk of damage, allowing the module to operate as 32 channels of independent input and output or as 32 channels of configurable I/O.

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



Functional Diagram 40-412-101 32-Channel Digital I/O Module With Parallel Input Acquisition

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Output Specification

No. of Output Channels:	32
Output States:	Driven high, driven low or off.
Low Side Driver Output Resistance:	0.6Ω at 0.5A
High Side Driver Output Voltage:	Vext less 1.5V at 0.4A
Maximum Current:	0.5A for Low Side drivers, 0.4A for High Side drivers, 8A module total.
Maximum Voltage:	+50V*
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.

Input Specification

No. of Input Channels:	32
Logic Threshold:	Compares selected input voltage against two reference voltages, each of which can be set from 0.3 to 50V with 12.5mV setting resolution. 40-412-101 uses faster parallel acquisition from a common pair of threshold voltages.
Settling Time:	5µs following a state change. Read back time for all 32 states 50µs typical.
Channel Selection:	Single channel selection or automated sequential access to all 32 channels.
Maximum Input Voltage:	100V*
Input Impedance:	1MΩ

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

Power Requirements

+3.3V	+5V	+12V	-12V
0	0.1A	0.05A	0.05A

Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).
Module weight: 180g.
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:	5000m

Storage and Transport Conditions

Storage Temperature:	-20°C to +75°C
Humidity:	Up to 90% non-condensing
Altitude:	15000m

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 33MHz 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

32-Channel Digital I/O Module - Parallel Input Acquisition, Programmable Threshold	**40-412-101**

Product Customization

Pickering PXI 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.

Mating Connectors & Cabling

For connection accessories for the 40-412-101 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

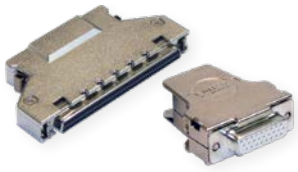


Pickering LXI or LXI/USB Modular Chassis—only accept our 1000+ PXI Switching & Simulation Modules:

- 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

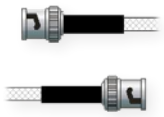
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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



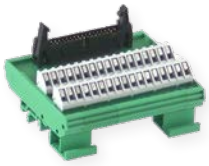
Connectors & Backshells



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.



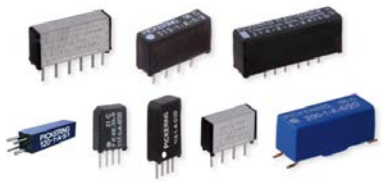
Mass Interconnect

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 sister company, Pickering Electronics. 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



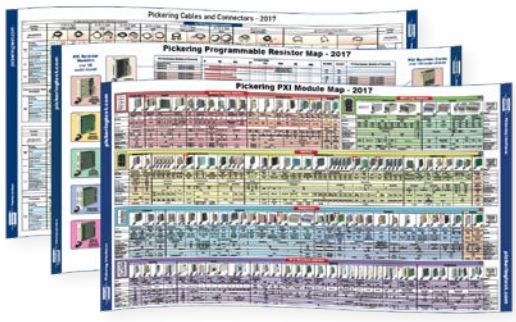
Three Year Warranty & Guaranteed Long-Term Support

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, as well as complete product catalogs and product reference maps to assist when looking for the switching, simulation and cable and connector 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

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Pickering Interfaces maintains a commitment to continuous product development, consequently we reserve the right to vary from the description given in this data sheet.

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Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

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Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

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