

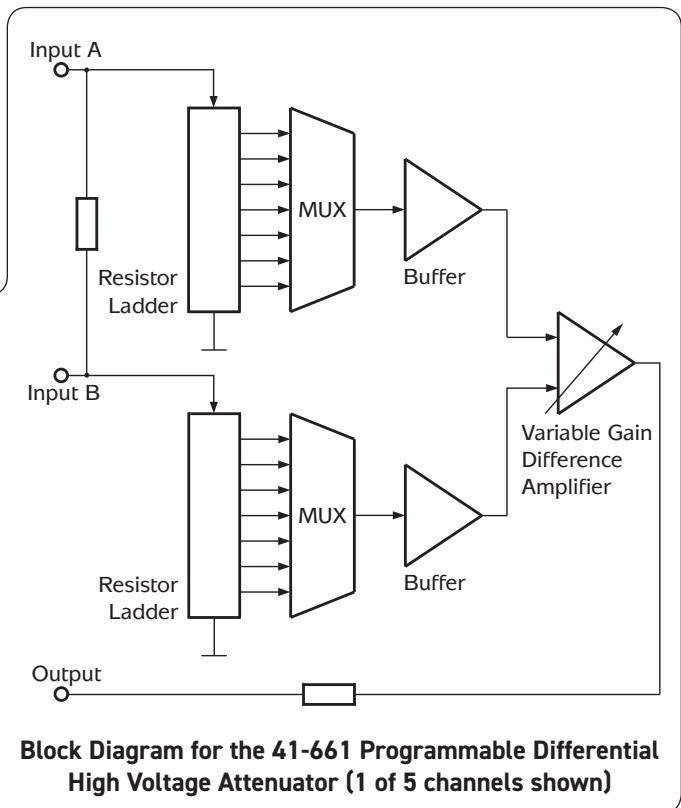
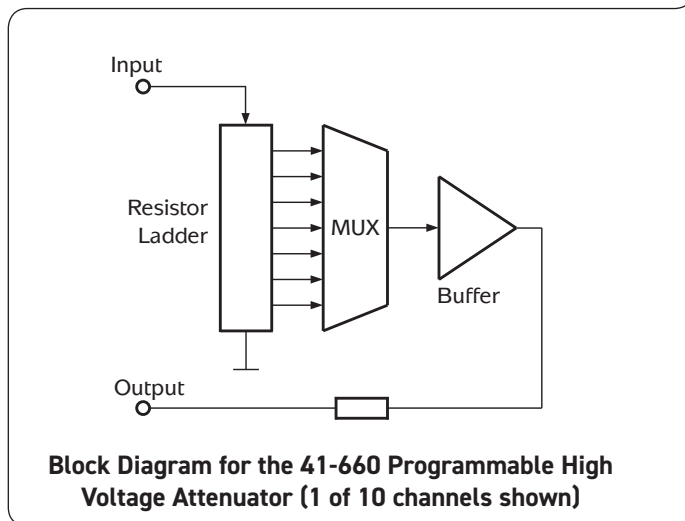
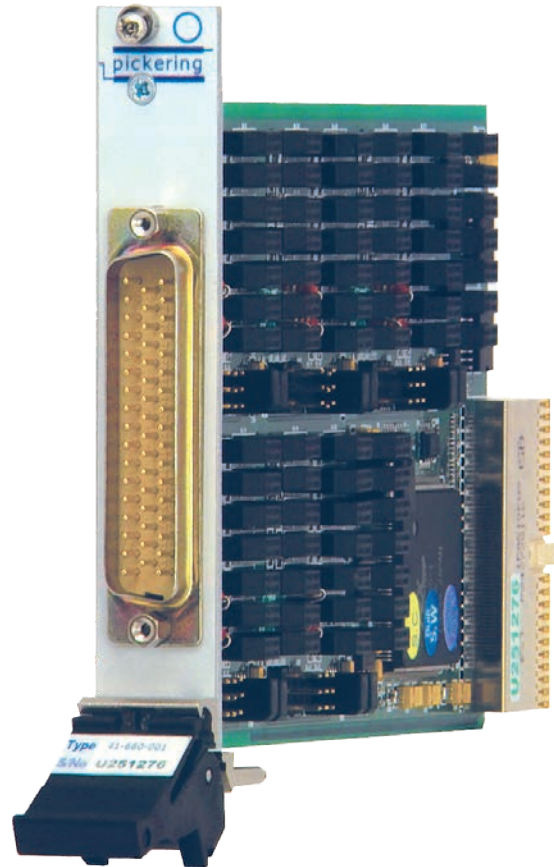
- High Input Impedance
- 600 Volt Input Rating
- Available With Single or Differential Input Configurations
- Buffered Single Ended Output Signal Provides Low Output Impedance
- Wide Output Bandwidth
- High Channel Density
- VISA Drivers Supplied for Windows
- 2 Year Warranty

The 41-660 and 41-661 are high voltage attenuators designed to reduce the high output voltages commonly generated by some types of sensors. This is in order to produce manageable signal levels that can be acquired by typical data acquisition devices in a PXI system.

The 41-660 provides 10 single ended attenuator channels while the 41-661 provides 5 differential attenuator channels. The attenuated signals are provided on 50Ω outputs to ensure they can drive simple data acquisition systems with no significant loss of signal level. Each model provides attenuation factors of 10 to 160, permitting a 600V peak signal to be attenuated to less than 4 Volts.

The 41-661 attenuates both the common mode and differential signal equally to ensure the signal cannot overload the data acquisition system and provides a single ended output from a difference amplifier.

Attenuation values are controlled by high quality instrument grade relays to ensure long service life. All active devices are fully protected against the application of over-voltages or short circuit loads.



## General Specification

Number of Input Channels	
41-660:	10 off (Single Ended)
41-661:	5 off (Differential)
Maximum Input Voltage:	±600V
Input Impedance	
41-660:	1MΩ
41-661 (Differential):	0.666MΩ
41-661 (Common Mode):	0.5MΩ
Attenuation Values:	10, 20, 40, 80 or 160
Attenuation Accuracy:	1% excluding DC offset
Output Offset Voltage	
41-660:	<10mV
41-661:	<40mV
Output Impedance:	50Ω nominal, single ended
Output Voltage (Max):	±10V into open circuit
Output Current:	Up to 10mA per channel
Output Bandwidth:	20kHz
Output Slew Rate:	13V/μs typical
PCI Interface:	33MHz 32-bit address

## Power Requirements

+3.3V	+5V	+12V	-12V
30mA	100mA	0	0

## Mechanical Characteristics

Single slot 3U PXI (CompactPCI) instrument module.

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 50-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

**10-Channel High Voltage Attenuator**      **41-660-001**

**5-Channel Differential High Voltage Attenuator**      **41-661-001**

Other versions can be supplied with lower channel count or different input impedance. Please contact your Pickering Interface sale office with your requirements.

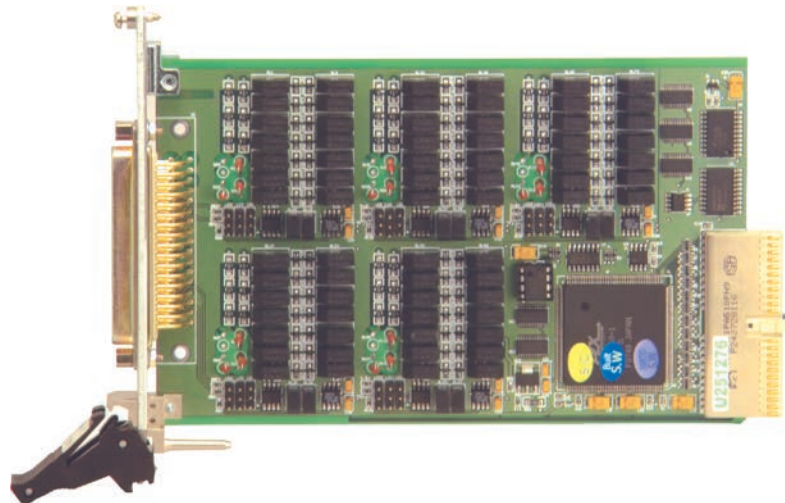
## Product Customization

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 41-660/661 module please refer to the [90-005D](#) 50-pin D-type data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.



**PCB Layout for the 41-660 High Voltage Attenuator**

## 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



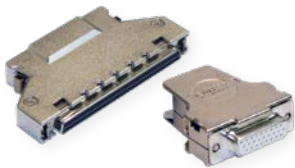
### Pickering LXI or LXI/USB Modular Chassis—only accept our 1000+ PXI Switching & Simulation Modules:

- 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

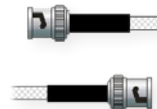
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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



Connectors & Backshells



Multiwire 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](http://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](http://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](http://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
- **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.

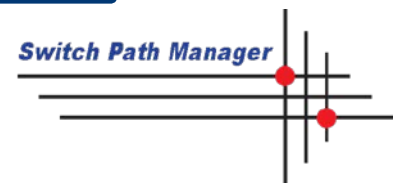
We provide Soft Front Panels (SFPs) for our products for familiarity and manual control, as well as comprehensive documentation and example programs to help you develop test routines with ease.

To learn more about software drivers and development environments, please go to: [pickeringtest.com/software](http://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](http://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](http://pickeringtest.com/ebirst)

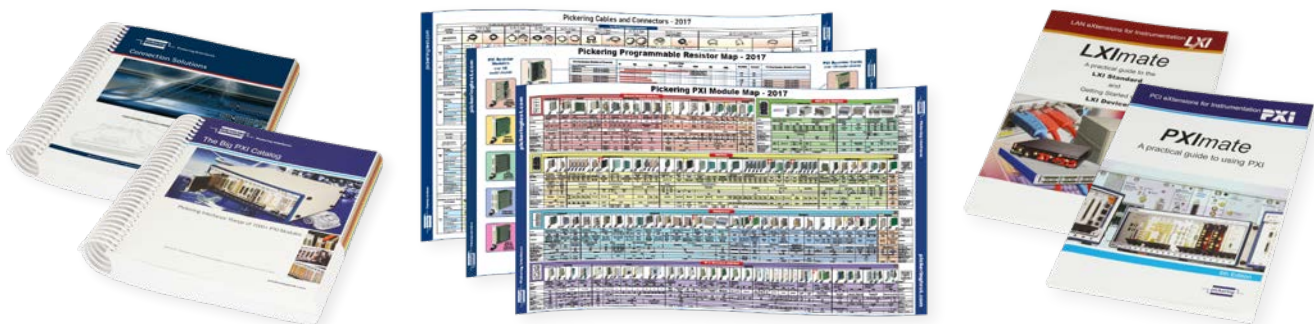


## Three Year Warranty & Guaranteed Long-Term Support

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](http://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 for the PXI and LXI standards.



To view, download or request any of our product resources, please visit: [pickeringtest.com/resources](http://pickeringtest.com/resources)

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