

41-180

DC to 3GHz Programmable Attenuator

- DC to 3GHz Attenuator
- 1dB Attenuation Resolution Ideal for Optimizing Signal Levels in Measuring Systems
- Maximum Attenuation 63dB
- Single or Dual Version in One PXI Slot
- Use of Switched Resistive Attenuator Pads Ensures High Linearity and True DC Coupled Operation
- Input and Output Connector Savers Easily Replaced if Damaged
- VISA, IVI & Kernel Drivers Supplied for Windows XP/Vista/7/8
- 3 Year Warranty

The 41-180 Programmable Attenuator Module is available with either one or two independently programmable attenuators in a single width 3U PXI module. Each attenuator uses high reliability mechanical switches to operate binary weight attenuator pads, providing attenuation values from 0 to 63dB in 1dB steps. Attenuator operating time is typically just 5ms, ensuring fast setting times.

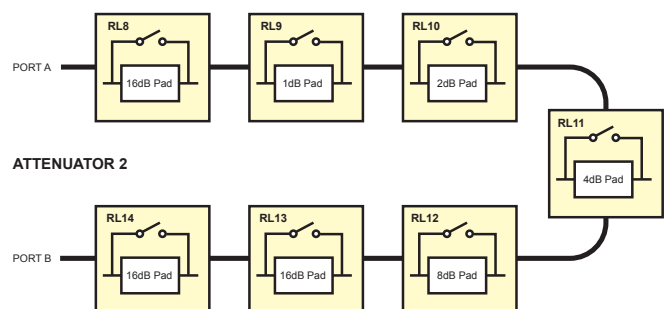
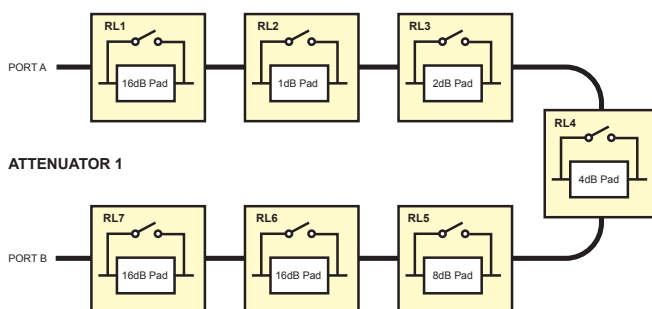
The module is ideal for conditioning the signal levels from devices under test and ensuring that other measuring instruments are operating close to their optimum operating point for noise and linearity. The use of mechanically switched attenuators ensures broad operating bandwidth and freedom from non-linear behavior that might degrade the signals being measured.

The attenuators can be used for back-to-back testing of RF products, allowing the signal levels to be adjusted to quantify the path loss that can be inserted before the communication efficiency degrades, providing a quick indication of receiver sensitivity.

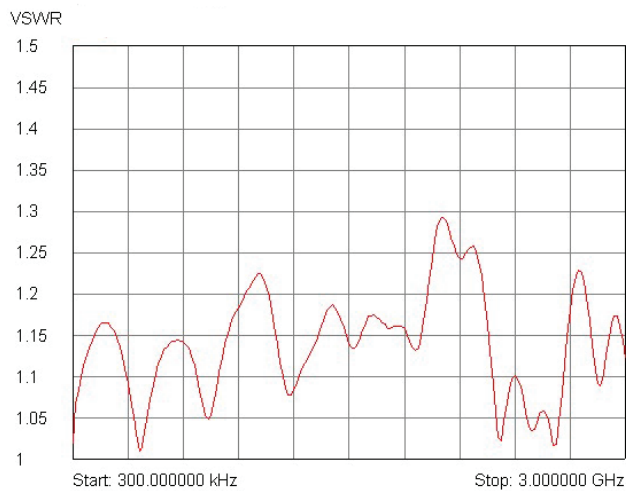


The 41-180 Programmable Attenuator Module is ideal for conditioning the output level of special to type sources, saving the systems integrator the time and effort of providing a variable output level. The use of a PXI solution for variable attenuation requirements minimizes the need for components and cables located outside the PXI chassis, saving time and development costs for systems integrators.

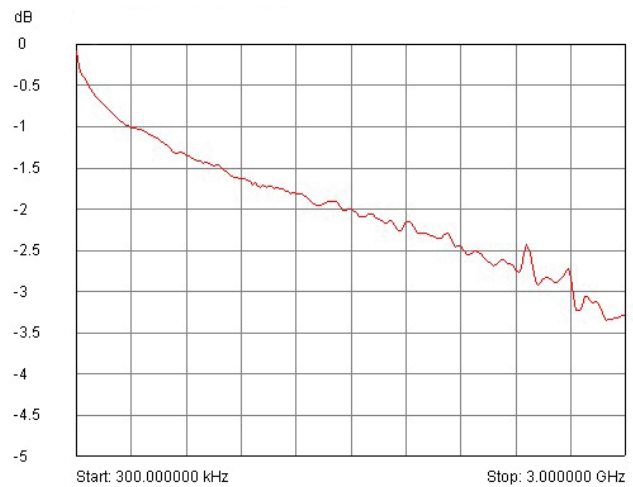
The input and output connectors of the attenuators can be interchanged and the design allows the user to change the front panel connectors quickly and easily in the event of damage occurring. The attenuators can be connected in series to increase the total available attenuation.



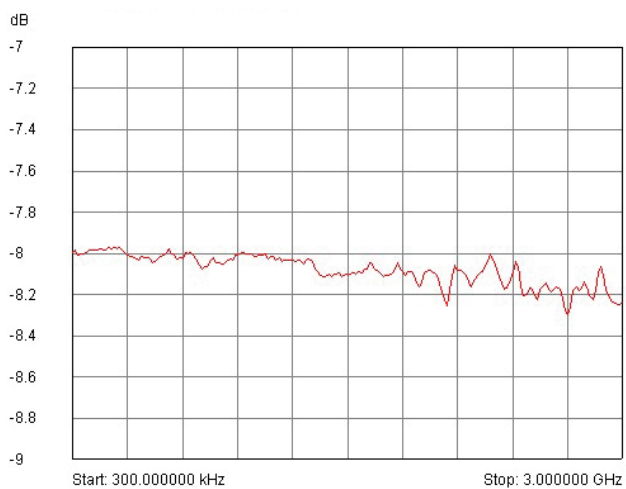
Dual DC to 3GHz Attenuator Block Diagram



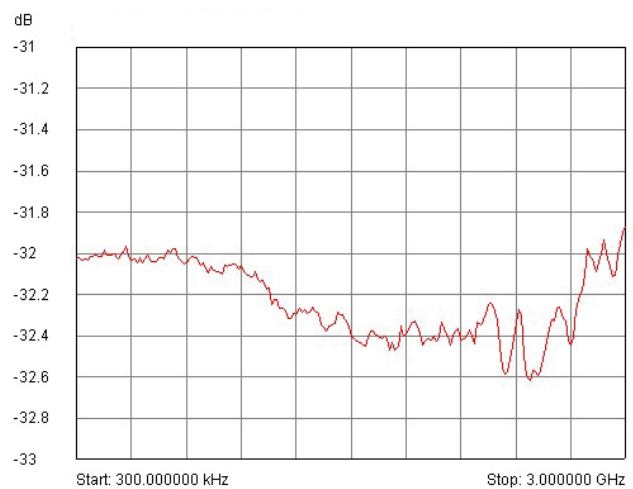
**Typical VSWR Versus Frequency With
No Attenuation Set**



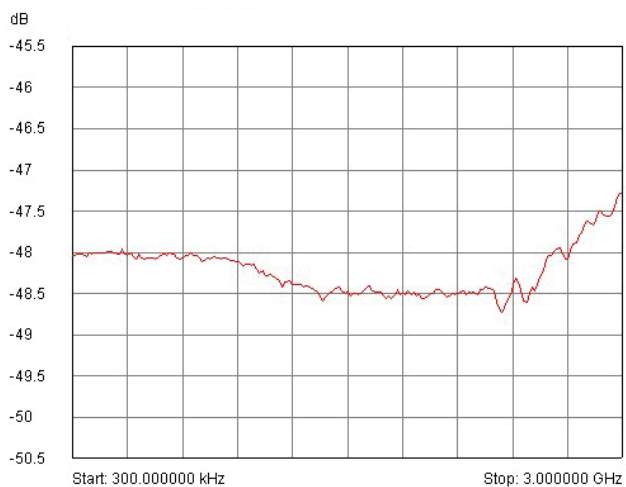
**Typical Insertion Loss Versus Frequency With
No Attenuation Set**



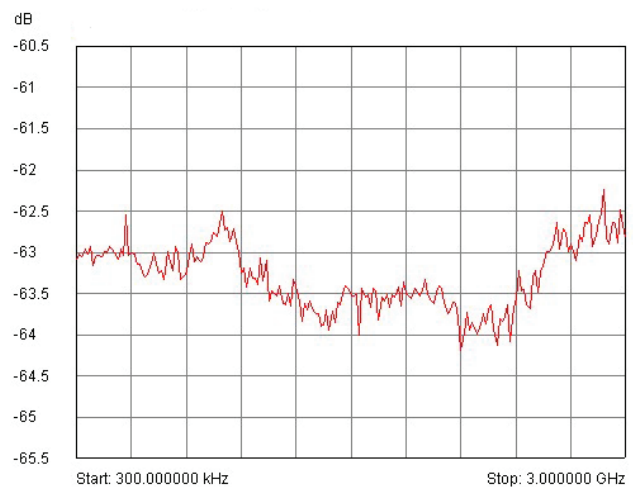
**Attenuation Accuracy Versus Frequency With
8dB of Attenuation Set**



**Attenuation Accuracy Versus Frequency With
32dB of Attenuation Set**



**Attenuation Accuracy Versus Frequency With
48dB of Attenuation Set**



**Attenuation Accuracy Versus Frequency With
63dB Set**

General Characteristics

Frequency range:	DC to 3GHz.
Maximum Input Power:	1 Watt continuous.
Input Impedance:	50Ω, DC coupled.
VSWR (SMA connector):	Less than 1.5, typically less than 1.3
RF Connectors:	SMA, input and output connections are interchangeable. Versions with SMB connectors can be made available.
Contact Life (each pad):	Typically 1×10^7 operations. At max power 1×10^6 operations.
Switching Time (each pad):	Typically 2ms. Maximum 4ms.

Attenuation

The attenuator is made up of 1, 2, 4, 8 and 16dB (3 off) switched pads, attenuation is set to 0dB with no power applied.

Insertion Loss (0dB set):	Typically 3.6dB at 3GHz
Attenuation Range:	0 to 63dB in 1dB steps relative to 0dB condition.

Attenuation Accuracy (individual pads measured in 50Ω system referenced to 0dB condition):

Attenuator Pad	DC to 1GHz		1GHz to 3GHz	
	Maximum	Typical	Maximum	Typical
1dB	±0.05dB	±0.05dB	±0.3dB	±0.12dB
2dB	±0.1dB	±0.08dB	±0.35dB	±0.2dB
4dB	±0.2dB	±0.15dB	±0.5dB	±0.4dB
8dB	±0.2dB	±0.15dB	±0.48dB	±0.4dB
16dB	±0.24dB	±0.24dB	±0.96dB	±0.5dB

Power Requirements

+3.3V	+5V	+12V	-12V
0	100mA	200mA	0

Width and Dimensions

Single width 3U PXI/CompactPCI instrument module.
3D models for all versions in a variety of popular file formats are available on request.

Connectors

PXI bus:	32-bit P1/J1 backplane connector.
RF Signals:	Front panel SMA connectors. Versions with SMB connectors can be made available.

Product Order Codes

Single DC to 3GHz Attenuator	41-180-021
Dual DC to 3GHz Attenuator	41-180-022

Latest Details

Please refer to our Web Site for Latest Product Details.
www.pickeringtest.com

Mating Connectors & Cabling

For connection accessories for the 41-180 module please refer to the **90-011D** RF Connector Accessories data sheet where a complete list and documentation can be found for accessories.

Alternatively, refer to the Pickering Interfaces **"Connection Solutions"** catalog for the full list of connector/cabling options, including drawings, photos and specifications. This is available in either print or as a download. Alternatively our web site has dynamically linked connector/cabling options, including pricing, for all Pickering PXI modules.



Dual DC to 3GHz Programmable Attenuator
41-180-022

Programming

Pickering provide kernel, IVI and VISA (NI and Agilent) drivers which are compatible with 32/64-bit versions of Windows including XP, Vista, 7 and 8 operating systems. 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:

- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Agilent VEE**
- **Mathworks Matlab**
- **Geotest ATE Easy**
- **MTQ Testsolutions Tecap**

Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries.

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 33MHz 32-bit backplane interface.

Safety & CE Compliance

All modules are fully CE compliant and meet applicable EU directives: Low-voltage safety EN61010-1:2001, EMC Immunity EN61000-6-1:2001, Emissions EN55011:1998.

PXI & LXI Chassis Compatibility

Compatible with all chassis conforming to the 3U PXI and 3U cPCI specification. Compatible with Legacy and Hybrid peripheral slots in a 3U PXI Express chassis.

Compatible with Pickering Interfaces LXI Modular Switching chassis. For information on driving your switching solution in an LXI environment refer to the LXI Product Guide.



Latest Details

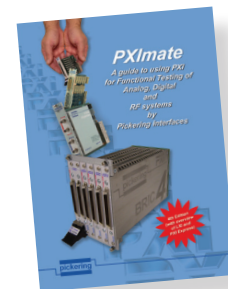
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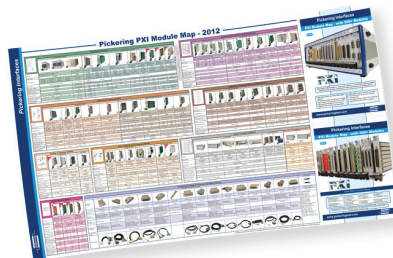
"The Big PXI Catalog" gives full details of Pickering's entire range of PXI switch modules, instrument modules and support products. At over 500 pages, the Big PXI Catalog is available on request or can be downloaded from the Pickering website.



Ever wondered what PXI is all about?

Pickering Interfaces' **"PXImate"** explains the basics of PXI and provides useful data for engineers working on switch based test systems.

The PXImate is available free on request from the Pickering website.



The **"PXI Module Map"** - a simple fold-out selection guide to all Pickering's 600+ PXI Modules.