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PXI High Voltage Programmable Amplifier 41-650

- Up to 5 Amplifier Channels
- Programmable Gain
- DC to 120 kHz Large Signal Bandwidth (-1 dB)
- Powered by the Chassis
- Short Circuit and Thermal Protection
- Up to ±30 Vpk Output (±33 Vpk for -S1 Version)
- Single Slot Width, 3U
- VISA Drivers Supplied for Windows Plus Soft Front Panel
- Supported in PXI or LXI Chassis
- 3 Year Warranty



Model No.	Channels	Max. Signal Output	Large Signal 1dB Bandwidth	Small Signal 1dB Bandwidth	Gain Settings
41-650	5	±30 Vpk (±33 Vpk -S1 version)	120 kHz	1.5 MHz	x1, x2, 5x, x7, x10, x14, x20

The 41-650 is a 5 channel voltage amplifier that is ideal for increasing the output voltage from other PXI modules, enabling users to easily generate the signal voltages commonly required in applications such as automotive test.

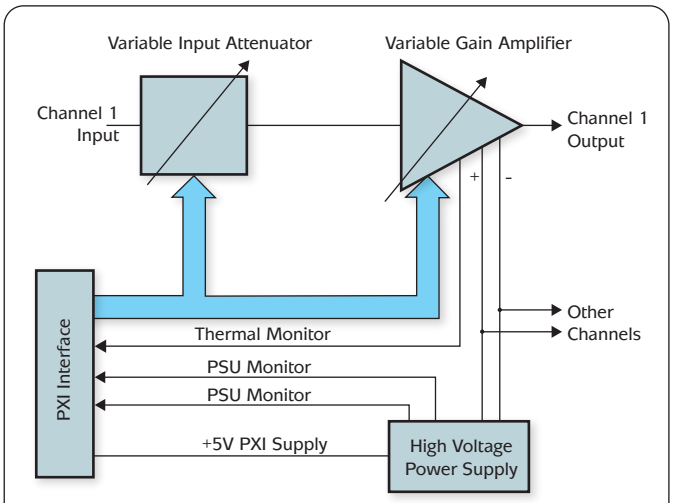
Each channel can be independently programmed to a gain of 1, 2, 5, 7, 10, 14 or 20, enabling it to be used with modules with low output voltage capability. Input and output connections can be specified as either via a single D-type or separate SMB connectors to suit the user's wiring system.

The 41-650 includes automatic thermal and short circuit protection on all outputs and is capable of supplying load currents up to 50 mA peak from each channel.

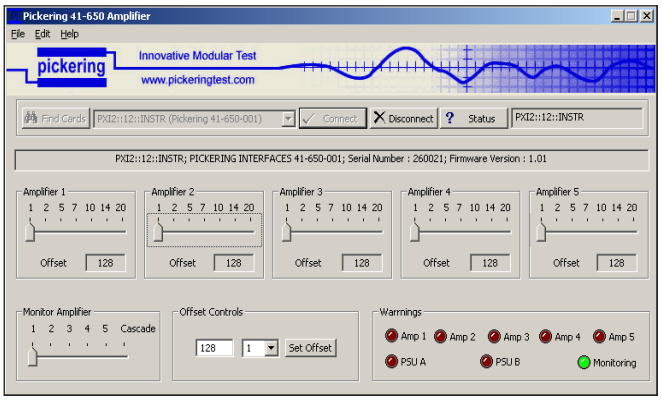
The module requires no external power supply, all power for the amplifier system is drawn from the PXI chassis.

The module includes monitoring of the thermal protection system for detection of fault conditions in the DUT and protection of the internal power supplies.

A DC offset facility allows the user to null out the small DC offset generated by the module, or to null out small external DC offsets from the driving source. A monitor facility via a separate connector can be used for a DMM to monitor the output of each amplifier to aid the nulling of each channel without external multiplexing.

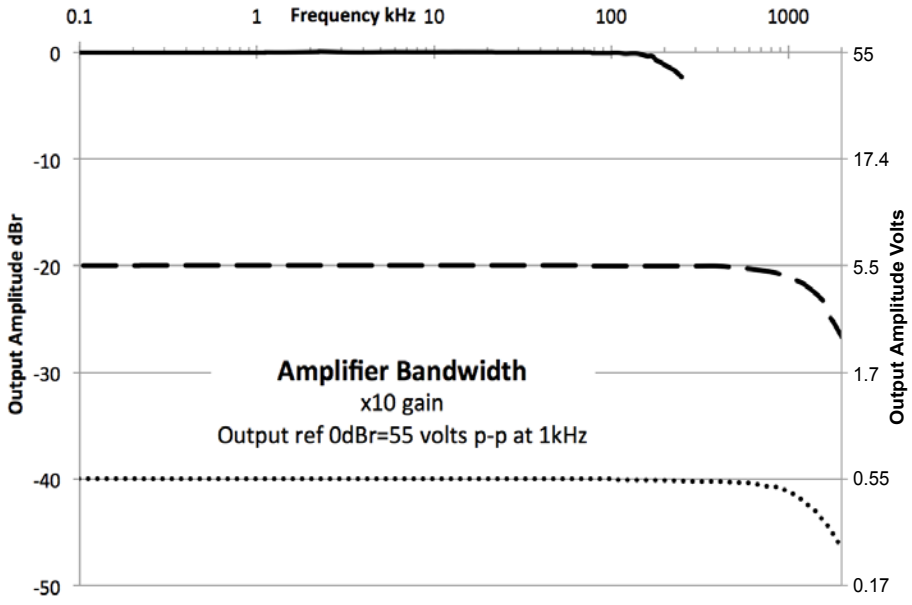


Simplified Functional Diagram Showing One (of the Five) Amplifier Channels

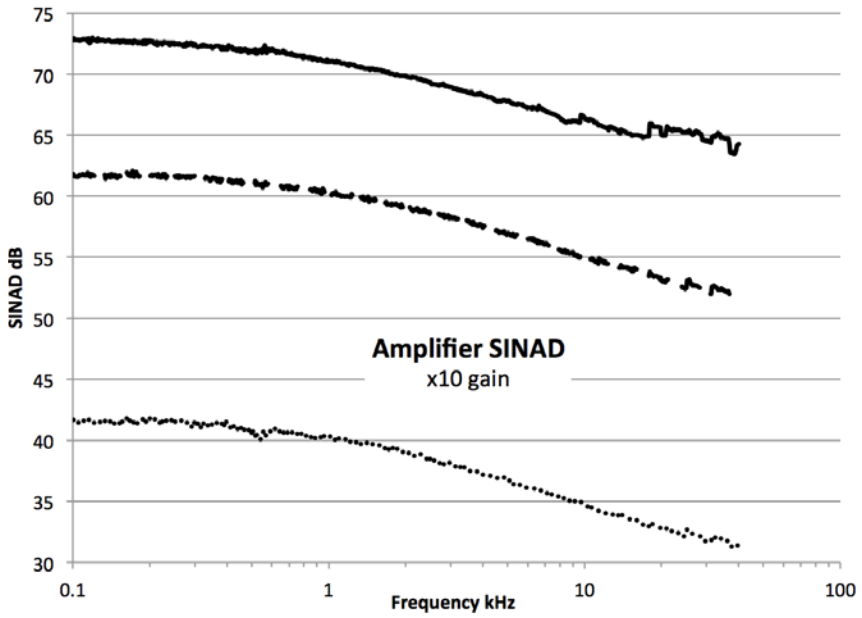


Supplied Soft Front Panel for the 41-650 Voltage Amplifier

ISSUE 7.7 MAY 2022



41-650 High Voltage Amplifier - Typical Bandwidth Plot



41-650 High Voltage Amplifier - SINAD Plot

Solid line: Input = 5.5 V peak to peak
Large dashed line: Input = 0.55 V peak to peak
Small dotted line: Input = 0.055 V peak to peak

General Specification

General	
Number of Channels:	Up to 5
Channel Crosstalk:	Typically 50 dB at 100 kHz
Output Range:	±30 Vpk (±33 Vpk -S1 version)
Inputs	
Input Impedance:	Single ended 600 Ω or 10 kΩ according to model
Max Input Voltage:	10 V
Input Offset Tolerance:	±20 mV
DC Offset:	Adjustable control for offsetting the input voltage by ±25 mV, 8-bit resolution. Monitor output allows the use of a DMM to null any channel.
Outputs	
Output Impedance:	50 Ω
Gain:	Adjustable to 1, 2, 5, 7, 10, 14, 20
Gain Accuracy:	<1.5 % at DC (typically <1 %), excluding DC offset.
Output Slew Rate:	23 V/µs typical
Group Delay:	Less than 1 µs from 100 Hz to 100 kHz
Noise Floor:	Typically 1 mV AC rms from 100 Hz to 300 kHz
Output Current:	±50 mA each channel (full power into 600 Ω).
Output Protection:	Short circuit proof, thermal protection on each channel. Operation of thermal protection detected over the PXI interface.

Power Requirements

+3.3 V	+5 V	+12 V	-12 V
0	1.2 A Idle 3.5 A at Max. Load	0.05 A	0.05 A

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 connectors:

- 25-pin male D-type (41-650-001, 41-650-011, 41-650-001-S1)
- 10 x 50 Ω SMB coaxial (41-650-002, 41-650-012)

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.*

Ordering Information

Product Order Codes

Voltage Amplifier, 600 Ω, D-Type	**41-650-001**
Voltage Amplifier, 600 Ω, SMB	**41-650-002**
Voltage Amplifier, 10 kΩ, D-Type	**41-650-011**
Voltage Amplifier, 10 kΩ, SMB	**41-650-012**
Voltage Amplifier, ±33 Vpk output, D-Type	**41-650-001-S1**

Other versions of this product can be supplied. with variations in input impedance, connector type and voltage rating. Please contact your local Pickering sales office.

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.

Mating Connectors & Cabling

For connection accessories for the 41-650 module please refer to the 90-008D 25-pin D-type and 90-011D RF Cable Assemblies data sheets 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

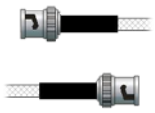
We provide a full range of supporting cable and connector solutions for all our switching products—20 connector families with 1200+ products. We offer everything from simple mating connectors to complex cables assemblies and terminal blocks. All assemblies are manufactured by Pickering and are guaranteed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



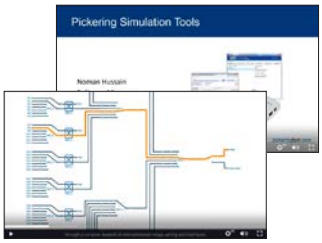
eBIRST Switching System Test Tools are designed specifically for our PXI, PCI or LXI products, these tools simplify switching system fault-finding by quickly testing the system and graphically identifying the faulty relay.
To learn more, please go to: pickeringtest.com/ebirst

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

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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

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We buy equipment

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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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