The 41-620A is a compact 3 channel function generator in a PXI 3U single slot module. It is capable of generating sine waves to 10MHz with 48-bit frequency resolution referenced to the 10MHz PXI clock, a high stability internal 10MHz clock or to an external standard. It can generate arbitrary waveforms loaded into the internal 256k memory, allowing emulation of many signal types, including the typical waveforms of automotive and aerospace sensors.

The function generator has a very simple method of providing variable output frequencies through the use of Direct Digital Synthesis (DDS), making it far easier to use than an ARB for repetitive waveform generation.

It is capable of generating fast swept frequency signals, allowing the emulation of variable speed devices. Sweeps can be single shot events or continuous up and down ramps. DDS technology ensures the settling time is extremely fast, limited only by the update time via the PXI bus.

Each channel can be amplitude modulated from a single AM input connector to allow independent time varying output levels to be produced. One channel of the module can be externally connected to provide the time varying level control independently of the waveform being generated.

Waveforms for the function generator are stored in independent 256k memory blocks, allowing each channel to provide a different signal. Waveforms are easily created externally, using Excel or similar tools, and loaded into the module’s memory via the backplane. When 2 or 3 channels are set to generate periodic waveforms of the same frequency with continuous trigger, they can be phase aligned via a single command.
Typical Waveforms Generated by 41-620A With Output Attenuation Set to 10dB and Loaded into 50Ω

- Triangular Waveform at Frequency of 1MHz
- Triangular Waveform at Frequency of 3MHz
- Triangular Waveform at Frequency of 5MHz
- Square Wave at Frequency of 3MHz
- Square Wave at Frequency of 5MHz
- Swept Sine Wave from 1kHz to 10kHz in 10Hz Steps at 10µs Intervals

41-620A Function Generator Block Diagram
Specifications

**Function Generator – 41-620A**

**Specifications**

**Frequency**
- **Frequency range:** DC to 10MHz (sine wave)
- **Frequency resolution:** 48-bit
- **Frequency accuracy:** As PXI backplane / external 10MHz clock or 10ppm if internal source selected.
- **Frequency sweep:** Frequency sweeps can be single or continuous (ramp up and/or down) phase continuous through use of DDS sweep facility.

**Output**
- **Maximum Output:** ±10V, open circuit load.
- **Waveform Signal:** 10V pk to pk, open circuit load
- **Output Offset Voltage:** Settable from -5V to +5V in 10mV steps
- **Output DAC Resolution:** 10-bit
- **Signal Level Control:** 0 to -40dB, <-0.1dB steps.
- **Output Impedance:** 50Ω
- **Output Loading:** Capable of driving 600Ω with 10V peak EMF. Typically capable of driving a 50Ω load with 6V peak EMF output (DC & signal).

**AM Input**
- **Functionality:** Single input connection can be used to amplitude one, two or three output channels. AC coupled, modulation frequency range 10Hz to 20kHz.

**Waveforms**
- **Waveform memory:** 256k per channel of fixed length. Permits any waveform to be loaded and replayed, including sine, square, ramp. Waveform fidelity limited by fixed 15MHz low pass filter.

**Parametric Performance**
- **SFDR:**
  - >40dB (DC to 1MHz, 5Vpp)
  - >35dB (1MHz to <10MHz, 5Vpp)
  - >25dB @ 10MHz (5Vpp)
- **Amplitude accuracy:** ±2% DC to 1MHz
  - 0 to -15% (typically -8%) at 10MHz

**Trigger and Clock**
- **Clock source:** 10MHz PXI clock or external clock source.
- **Trigger:** Level or edge triggered. Initiates single shot or continuous operation PXI trigger sources or external source.
- **Level:** Clock and trigger inputs require DC coupled signal derived from 5V CMOS logic drivers, nominal +2.5V input threshold voltage.

**Power Requirements**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>+3.3V</th>
<th>+5V</th>
<th>+12V</th>
<th>-12V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>1.8A</td>
<td>110mA</td>
<td>75mA</td>
<td>150mA</td>
</tr>
</tbody>
</table>

**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 SMB connectors.

**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, Uses a 33MHz 32-bit backplane interface.

**Safety & CE Compliance**

Ordering Information

Product Order Codes

| Three Channel Function Generator | 41-620A-003 |

Latest Details

Please refer to pickeringtest.com for latest product details.

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 41-620A module please refer to the 90-011D RF Cable Assemblies 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.

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:

driver setup

class setup

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:

driver setup

class setup

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.