Keysight Technologies
High-Speed Digitizers

Selection Guide
With its PXIe and AXIe high-speed digitizers, Keysight offers you a reliable partnership for your advanced developments.

Keysight unique technology uses proprietary ICs so you can take the most out of the ADCs and FPGAs integrated into the digitizer. On-board real-time algorithm in the FPGA allows fast detection of signal characteristics in various domains.

We offer an extended range of firmware and application options:

- Firmware options: Specific real-time functions speeding-up your overall system response time, such as averager or digital down-conversion.
- Application options: Bundle including software and firmware for specific configurations targeting specific requirements, such as streaming & recording.

Moreover, if you need to integrate your own custom real-time IP algorithm, an additional software bundle, the FPGA Development Kit is available.

Keysight high-speed digitizer cards are used as component in several applications, such as:

- Aerospace & Defense: Radar and satellite
- Physics: Advanced and multichannel experiments
- RF Communication: 5G, wideband, MIMO

Whether your application requirements are clear or you are at the earlier stage of your selection, our digitizer specialists are there to help you define the best solution for your applications.

**Added values**

- Better measurement fidelity and signal integrity
  - Display deeper and sharper results
  - Repeatability

- Higher measurement throughput
  - Speed to detection and decision
  - Productivity

- Smaller footprint
  - Design for size and power optimization
  - High channel density

- Lower total cost of ownership
  - Interoperability
  - Reusability and upgradability
  - Very high reliability
  - Support and maintenance
# PXIe High-Speed Digitizers

## Key specifications

<table>
<thead>
<tr>
<th>Product</th>
<th>PXIe 12-bit High-Speed Digitizer/Wideband Digital Receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Channels</td>
<td>1 - 2 ch</td>
</tr>
<tr>
<td>Max. Sampling Rate</td>
<td>3.2 GS/s (1 ch)</td>
</tr>
<tr>
<td></td>
<td>1.6 GS/s (2 ch)</td>
</tr>
<tr>
<td>ADC Resolution</td>
<td>12-bit</td>
</tr>
<tr>
<td>Max. Bandwidth</td>
<td>DC to 2 GHz</td>
</tr>
<tr>
<td>Max. Memory</td>
<td>4 GB (1 GSa/ch)</td>
</tr>
<tr>
<td>FPGA Signal Processing</td>
<td>Xilinx FPGA</td>
</tr>
<tr>
<td>Full Scale Range (FSR)</td>
<td>Dual, 1 V and 2 V</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>50 Ω</td>
</tr>
<tr>
<td>Form Factor</td>
<td>PXIe, 2-slot, fully shielded, built-in cooling system</td>
</tr>
<tr>
<td>Soft Front Panel (SFP) and Driver</td>
<td>Included</td>
</tr>
<tr>
<td>Operating System</td>
<td>Windows, Linux</td>
</tr>
</tbody>
</table>

## Firmware options

- **DGT**: Digitizer firmware
- **INT**: Interleaved channel sampling functionality
- **FDK**: Custom firmware capability
- **DDC**: Wideband real-time digital down-conversion
- **TSR**: Triggered simultaneous acquisition and readout

## Applications options

- **CB0**: Digitizer streaming and recording
- **CB2**: Digital down converter streaming at 1.6 GS/s
- **BB1**: High fidelity digitizer

## Related softwares

- **U5340A**: FPGA Development Kit for High-Speed Digitizers
- **U1092A-S0x**: AcqirisMAQS Multichannel Acquisition Software
- **W1462BP**: SystemVue FPGA Architect
- **89601B**: 89600 VSA Software, transportable license

## Related products

- **M9019A**: PXIe 18-slot Chassis, 3U, 24 GB/s
- **M9021A**: PXIe to PCIe Cable Interface
- **M9048A**: PCIe Desktop Adapter
- **M9036A**: PXIe Embedded Controller
- **M9037A**: PXIe High Performance Embedded Controller
- **M9039A**: PXIe Performance Vector Signal Analyzer, 50 GHz
- **M9362AD01**: PXIe Quad Downconverter, 10 MHz to 50 GHz

## Added values

**Better measurement fidelity and signal integrity**
- Display deeper and sharper results
- Repeatability

**Higher measurement throughput**
- Speed to detection and decision
- Productivity

**Smaller footprint**
- Design for size and power optimization
- High channel density

**Lower total cost of ownership**
- Interoperability
- Reusability and upgradability
- Very high reliability
- Support and maintenance
# AXIe High-Speed Digitizers

<table>
<thead>
<tr>
<th>Key specifications</th>
<th>M9703B</th>
<th>M9710A</th>
<th>M9709A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product</strong></td>
<td>AXIe 12-bit High-Speed Digitizer/Wideband Digital Receiver</td>
<td>AXIe 10-bit High-Speed Digitizer/DAQ</td>
<td>AXIe 8-bit High-Speed Digitizer/DAQ</td>
</tr>
<tr>
<td><strong>Number of Channels</strong></td>
<td>4 - 8 ch</td>
<td>2 - 4 ch</td>
<td>32 ch</td>
</tr>
<tr>
<td><strong>Max. Sampling Rate</strong></td>
<td>3.2 GS/s (4 ch) 1.6 GS/s (8 ch)</td>
<td>10 GS/s (2 ch) 5 GS/s (4 ch)</td>
<td>1 GS/s</td>
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<tr>
<td><strong>ADC Resolution</strong></td>
<td>12-bit</td>
<td>10-bit</td>
<td>8-bit</td>
</tr>
<tr>
<td><strong>Max. Bandwidth</strong></td>
<td>DC to 2 GHz</td>
<td>DC to 2.5 GHz</td>
<td>DC to 500 MHz</td>
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<tr>
<td><strong>Max. Memory</strong></td>
<td>16 GB (1 GSa/ch)</td>
<td>8 GB (1.6 GSa/ch)</td>
<td>16 GB (512 MSa/ch)</td>
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<tr>
<td><strong>FPGA Signal Processing</strong></td>
<td>Xilinx FPGAs (4x)</td>
<td>Xilinx FPGAs (2x)</td>
<td>Xilinx FPGAs (4x)</td>
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<tr>
<td><strong>Full Scale Range (FSR)</strong></td>
<td>Dual, 1 V and 2 V</td>
<td>Dual, 250 mV and 1 V</td>
<td>Multiple, 250 mV up to 5 V</td>
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<tr>
<td><strong>Input Impedance</strong></td>
<td>50 Ohm</td>
<td>50 Ohm</td>
<td>50 Ohm</td>
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<tr>
<td><strong>Form Factor</strong></td>
<td>AXIe, 1-slot, fully shielded, built-in cooling system</td>
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<td>Windows, Linux</td>
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<tr>
<td><strong>Firmware options</strong></td>
<td>-DGT Digitizer firmware</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>-INT Interleaved channel sampling functionality</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>-FDK Custom firmware capability</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>-DDC Wideband real-time digital down-conversion</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>-LDC Limited real-time digital down conversion firmware</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>-TSR Triggered simultaneous acquisition and readout</td>
<td>● NEW</td>
<td>● NEW</td>
</tr>
<tr>
<td><strong>Applications options</strong></td>
<td>-CB1 Digital down converter streaming at 1 GS/s</td>
<td>● NEW</td>
<td>● NEW</td>
</tr>
<tr>
<td></td>
<td>-CB2 Digital down converter streaming at 1.6 GS/s</td>
<td>● NEW</td>
<td>● NEW</td>
</tr>
<tr>
<td></td>
<td>-B01 Enhanced signal processing</td>
<td>● NEW</td>
<td>● NEW</td>
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<tr>
<td><strong>Related softwares</strong></td>
<td>U5340A FPGA Development Kit for High-Speed Digitizers</td>
<td>●</td>
<td>●</td>
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<tr>
<td></td>
<td>U1092A-S0x AcqirisMAQS Multichannel Acquisition Software</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>W1462BP SystemVue FPGA Architect</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>89601B 89600 VSA Software</td>
<td>●</td>
<td>●</td>
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<tr>
<td><strong>Related products</strong></td>
<td>M9502A AXIe 2-slot Chassis</td>
<td>Up to 16 ch 12-bit system</td>
<td>Up to 8 ch 10-bit system</td>
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<td></td>
<td>M9505A AXIe 5-slot Chassis</td>
<td>Up to 40 ch 12-bit system</td>
<td>Up to 20 ch 10-bit system</td>
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<td></td>
<td>M9514A AXIe 14-slot Chassis</td>
<td>Up to 104 ch 12-bit system</td>
<td>Up to 52 ch 10-bit system</td>
</tr>
<tr>
<td></td>
<td>M9537A AXIe High Performance Embedded Controller</td>
<td>●</td>
<td>●</td>
</tr>
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</table>
High-Speed Digitizer Software Platform

Specific applications
Streaming, FFT

High-Speed Digitizer Application DVD

Included with your digitizer option

Standard system

High-Speed Digitizers

MD2 Driver & SFP
Including:
- Selected firmware option(s)
- Soft Front Panel (SFP)

Included with your digitizer

Advanced measurements, signal analysis and demodulation

VSA 89600 Software
+ Digitizer hardware extension

Custom real-time processing

US340A + FDK option
FPGA Development Kit for High-Speed Digitizers

Multichannel acquisitions

U1092A-S0x AcqirisMAQS

Software requiring additional license

High-Speed Digitizer Application DVD

Included with your digitizer option

IO Libraries Suite
Windows only

Included with your digitizer
High-Speed Multichannel Data Acquisition Systems

The Keysight AXIe high-speed digitizer provides the ideal solution for advanced experiments in hydrodynamics, plasma fusion, particle physics, and aerospace & defense. With these modules you can build a large number of synchronous acquisition channels with unprecedented measurement fidelity in the smallest footprint. Advanced IP design, state-of-the-art technology and on-board real-time data processing are combined to achieve outstanding performance.

Build multi-channels data acquisition systems

Large systems can be built by simply populating a chassis with your choice of digitizers.

A selection of configurable companion products is also provided, including signal conditioning, chassis and controllers.

Moreover, the AcqirisMAQS Multichannel Acquisition Software, designed specifically for large scale experiments, enables configuration management as well as visualization of data for hundreds of channels from a single console.

Example configuration

Figure 1. Two M9703B AXIe 12-bit digitizers installed in the M9505A 5-slot AXIe chassis to form a 16-channel 12-bit acquisition system.

Figure 2. Five M9703B AXIe 12-bit digitizers installed in the M9505A 5-slot AXIe chassis to form a 40-channel 12-bit acquisition system.

Figure 3. Eight M9703B AXIe 12-bit digitizers installed in the M9514A 14-slot AXIe chassis to form a 64-channel 12-bit acquisition system. Contact factory for possible configuration.
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