Agilent Technologies
High-Speed, High Resolution and USB Digitizers
Agilent Digitizers lead the market in performance and breadth of offering

High-Speed Digitizers provide a range of 500 MS/s, 1 GS/s, 2 GS/s, 4 GS/s and 8 GS/s high-speed digitizer cards with 8-, 10- and 12-bit resolution, wide bandwidths and large acquisition memories. These products, in PCI, PXI, cPCI, and VME formats, are used in research, ATE and OEM applications in industries as wide spread as Biotechnology, Semiconductors, Aerospace, Physics, and Astronomy. Configured together into a data acquisition system, the high-speed digitizers deliver essential multichannel oscilloscope capabilities in a compact, modular package, providing a wide range of functionalities that can not be matched by monolithic instruments. The whole system includes a fast PC connection and all the necessary software for a simple integration into any automated test system.

High Resolution Digitizers provide mid-range sample rates that compliment instruments in test systems such as DMMs, function generators, switch systems and counters. The digitizers provide high resolution for accurate waveform acquisition and on-board measurements in a new stand-alone LXI format. These digitizers are used in Automotive, Aerospace/Defense, Medical and Electronic Test applications.

U2500A Series USB Simultaneous Sampling Multifunction Data Acquisition gives you the choice and flexibility to create standalone or modular solutions that expand and evolve according to your test requirement needs. These modules provide from 250 kS/s up to 2 MS/s with additional Analog Output and Digital IO functionality that is simple enough for academic application and yet robust and versatile enough for use in applications in Medical, Consumer Electronics, Electronic Test, Construction, and Automotive industries.

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U1065A | 8 GS/s | 10 bits | cPCI | Pages 06-07
U1066A | 400 MS/s | 12 bits | cPCI | Pages 08-09
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CompactPCI High-Speed Multichannel Digitizers with 28-channel Synchronization Capability

**U1064A-004 Acqiris Quad-Channel, 1-4 GS/s High-Speed Digitizer**
- 1 GHz bandwidth
- Acquisition memory from 128-512 kSample up to 8-32 MSample (optional)

**U1064A-002 Acqiris Dual-Channel, 2-4 GS/s High-Speed Digitizer**
- 1 GHz bandwidth
- Acquisition memory from 256-512 kSample up to 16-32 MSample (optional)

**U1064A-001 Acqiris Single-Channel, 4 GS/s High-Speed Digitizer**
- 150 MHz bandwidth
- Acquisition memory from 128 kSample up to 2 MSample (optional)

**U1064A 4 GS/s 8-bit High-Speed cPCI Digitizer**

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<th>U1064A-002</th>
<th>U1064A-004</th>
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<tr>
<td>Sample Rate</td>
<td>100 S/s to 1 GS/s in 1, 2, 2.5, 4, 5 sequence and 2.5 GS/s, 4 GS/s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>8-bit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandwidth</td>
<td>1 GS/s</td>
<td></td>
<td>1 GS/s</td>
</tr>
<tr>
<td>Number of channels</td>
<td>Single at 4 GS/s</td>
<td>Single at 4 GS/s</td>
<td>Single at 4 GS/s</td>
</tr>
<tr>
<td></td>
<td>Dual at 2 GS/s</td>
<td>Dual at 2 GS/s</td>
<td>Dual at 1 GS/s</td>
</tr>
<tr>
<td>Voltage Input</td>
<td>50 mV to 5 V</td>
<td>50 mV to 5 V</td>
<td>50 mV to 50 V</td>
</tr>
<tr>
<td>Memory</td>
<td>512 kSamples</td>
<td>256 kSamples/channel</td>
<td>128 kSamples/channel</td>
</tr>
<tr>
<td>Optional memory</td>
<td>32 MSamples/channel</td>
<td>16 MSamples/channel</td>
<td>8 MSamples/channel</td>
</tr>
</tbody>
</table>

**Options and Accessories**
- U1064A-F50 Standard front-end, 50 Ω, 1 GHz
- U1064A-FHZ High-impedance front-end, 50 Ω/1 MΩ, 1 GHz/300 MHz
- U1064A-M8M 2 to 8 MSample acquisition memory option
- U1064A-M32M 8 to 32 MSample acquisition memory option
- U1064A-BB1 Battery back-up
10-bit CompactPCI Digitizers with Sampling of up to 8 GS/s

U1065A-004 Acquires Quad-Channel, 2-8 GS/s High-Speed Digitizer
• 2 Gb/s bandwidth with 50 Ω standard front end
• 1 Gb/s/300 MHz bandwidth with 50 Ω/1 MΩ high-impedance front end
• Acquisition memory from 256-1024 kSample up to 256-1024 MSample (optional)

U1065A-002 Acquires Dual-Channel, 4-8 GS/s High-Speed Digitizer
• 2 Gb/s bandwidth with 50 Ω standard front end
• 3 Gb/s bandwidth with 50 Ω high-frequency front end
• Acquisition memory from 512-1024 kSample up to 512-1024 MSample (optional)

U1065A-001 Acquires Single-Channel, 8 GS/s High-Speed Digitizer
• 2 Gb/s bandwidth with 50 Ω standard front end
• 3 Gb/s bandwidth with 50 Ω high-frequency front end
• Acquisition memory from 1024 kSample up to 1024 MSample (optional)

U1065A-004 8 GS/s 10-bit High-Speed cPCI Digitizer
- 10-bit CompactPCI Digitizers with Sampling of up to 8 GS/s
- 10-bit resolution
- 10 MΩ DC/30 MHz or 50 Ω DC/2.5 GHz
- 256-1024 MSample memory (optional)

Options and Accessories
- U1065A-P50 Standard front-end option for DC222, DC252 and DC282, 50 Ω
- U1065A-RHZ High-impedance front-end for DC252, 250 Ω/1 MΩ
- U1065A-RHF High-frequency front-end for DC222 and DC282, 2.5 GHz
- U1065A-128 2 to 128 Sample acquisition memory option for 1 GΩ and 5 GΩ front-end
- U1065A-B128 256 to 1024 MSample acquisition memory option for 1 GΩ and 5 GΩ front-end
12-bit CompactPCI Digitizers with Amazing Speed and Accuracy

U1066A-001 Acqiris Dual-Channel, 400 MS/s High-Speed Digitizer
- 100 MHz DC-coupled standard input, 300 MHz AC-coupled HF input
- 4 MSample acquisition memory

U1066A-002 Acqiris Dual-Channel, 200 MS/s High-Speed Digitizer
- 100 MHz bandwidth
- 4 MSample acquisition memory

U1066A 400 MS/s 12-bit High-Speed cPCI Digitizer

Options and Accessories
- U1066A-M8M 8 MSample acquisition memory option
- U1066A-BB1 Battery back-up

Models and specifications

<table>
<thead>
<tr>
<th>U1066A-001</th>
<th>U1066A-002</th>
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<tbody>
<tr>
<td>Sample Rate</td>
<td>100 S/s to 500 MS/s</td>
</tr>
<tr>
<td>Resolution</td>
<td>B LM</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>DC to 158 MHz ≥ 106 mV FS</td>
</tr>
<tr>
<td></td>
<td>&gt; 90 MHz at 50 mV FS</td>
</tr>
<tr>
<td>Number of channels</td>
<td>Dual or 500 MS/s</td>
</tr>
<tr>
<td>Voltage Input</td>
<td>50 to 250 mV to 10 V</td>
</tr>
<tr>
<td>On-board Measurements</td>
<td>N/A</td>
</tr>
<tr>
<td>Memory</td>
<td>2 MSamples/channel</td>
</tr>
<tr>
<td>Optional Memory</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Figure 1 and 2: FFT analysis of a pure 25 MHz sinewave at 400 MS/s shows amazingly low noise floor, extremely high SFDR and little harmonic distortion for both the standard and high-frequency inputs (U1066A-001 only).

Figure 3: Frequency response: standard input Frequency response: HF input

Figure 4: Frequency response: HF input shows system bandwidth above the specified 300 MHz (U1066A-001 only).

Figure 5: SFDR & THD values at 170 MS/s SR and 80% of 1 V FS are remarkably high for both the standard and HF inputs (U1066A-001 only).

Figure 6: Effective bits at 170 MS/s SR and 80% of 1 V FS are well above 10 for both the standard and HF inputs (U1066A-001 only).
The Standard for 3U Single-slot High-Speed PXI Digitizers

U1061A-002 Acqiris Dual-Channel, 1-2 GS/s High-Speed Digitizer
• 1 GHz bandwidth
• Acquisition memory from 128-256 kSample up to 8-16 MSample (optional)
• Software support for easy integration

U1061A-001 Acqiris Dual-Channel, 0.5-1 GS/s High-Speed Digitizer
• 500 MHz bandwidth
• Acquisition memory from 64-128 kSample up to 2-4 MSample (optional)
• Software support for easy integration

Options and Accessories
• U1061A-M16 16 MSample acquisition memory for U1061A-002
• U1061A-M4M 4 MSample acquisition memory for U1061A-001
• U1061A-FC1 Frequency counter firmware

Models and specifications

<table>
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<th>Resolution</th>
<th>Bandwidth</th>
<th>Number of channels</th>
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<th>On-board Measurements</th>
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<th>Optional memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>U1061A-002</td>
<td>100 S/s to 1 Gs/s</td>
<td>8-bit</td>
<td>DC to 1 GHz</td>
<td>2 at 50 MHz/s</td>
<td>50-150 mV to 15 V</td>
<td>Frequency Counter (optional)</td>
<td>64 kSample/channel</td>
<td>2 MSample/channel</td>
</tr>
<tr>
<td>U1061A-001</td>
<td>100 S/s to 2 Gs/s</td>
<td>8-bit</td>
<td>DC to 1 GHz</td>
<td>2 at 50 MHz/s</td>
<td>50-150 mV to 15 V</td>
<td>128 kSample/channel</td>
<td>16 MSample/channel</td>
<td></td>
</tr>
</tbody>
</table>
The World’s First 10-bit 4 GS/s 3U PXI Digitizers for Fast RF and ATE Applications

U1062A-002 Acqiris Dual-Channel, 4 GS/s High-Speed Digitizer
- 2 GHz bandwidth
- Acquisition memory from 256-512 kSample up to 256-512 MSample (optional)
- Software support for easy integration

U1062A-001 Acqiris Single-Channel, 4 GS/s High-Speed Digitizer
- Standard input option, with 2 GHz bandwidth, 50 Ω, DC or AC-coupled, with internal DC calibration
- Acquisition memory from 512 kSample up to 512 MSample (optional)
- Software support for easy integration

U1062A-002-001 Acqiris Dual-Channel, 4 GS/s High-Speed Digitizer
- Sample rate: 1 GS/s to 3.5 GS/s at 1.5 GS/s
- Resolution: 10 bit
- Bandwidth: DC to 1.5 GHz
- Number of channels: Single at 4 GS/s, Dual at 2 GS/s
- Voltage input: 512 x 10 mV to 5 V
- Memory: 512 kSample
- Optional memory: 512 MSample

U1062A-001-002 Acqiris Single-Channel, 4 GS/s High-Speed Digitizer
- Sample rate: 1 GS/s to 2 GS/s in 1, 2, 2.5, 5 sequence and 4 GS/s
- Resolution: 10 bit
- Bandwidth: DC to 2 GHz
- Number of channels: Single at 4 GS/s
- Voltage input: 50 Ω: 50 mV to 5 V
- Memory: 256 kSample
- Optional memory: 512 MSample

Options and Accessories
- U1062A-2F5 Dual-channel 50 ohm, 2 GHz front end
- U1062A-2HZ Dual-channel 1 Mohm / 50 ohm, 2 GHz front end
- U1062A-F50 Single-channel 50 ohm, 2 GHz front end
- U1062A-F50 Single-channel 50 ohm, 2 GHz front end
- U1062A-F50 Single-channel 50 ohm, 2 GHz front end
- U1062A-M64 64 MSample acquisition memory

Multi GHz bandwidth front end
- The front end mezzanine includes a proprietary front-end amplifier chip. This integrated circuit includes a proprietary gain stage amplifier (PGA) with on-chip filtering and trigger circuits. It provides pre-ADC signal conditioning and amplification, essential for high performance high-speed data conversion systems. The filter section, which is useful for signal noise reduction, allows a 2 pole Bessel bandwidth limiting at 700 MHz and 200 MHz.

Auto-synchronous bus system
- In case that 2 asynchronous data acquisition channels are required, several digitizers (to be combined using the second generation highbandwidth auto-synchronous bus system AD2bus2). The system provides superior synchronization in the standard 33 MHz PCI reference clock. AD2bus2 bus can be extended up to three U1062A modules.

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Trigger mezzanine with Ctrl I/O
- Dual comparators for window triggering mode
- On-chip DACs for threshold adjustment
- Additional inputs for 8 additional external trigger coupling
- It is possible to include an AF disable by front-end

Ctrl I/O
- The trigger mezzanine also includes the proprietary front-end amplifier chip. The trigger processing circuit embedded in the package includes:
  - Dual comparators for window triggering mode
  - On-chip DACs for threshold adjustment
  - Additional inputs for 8 additional external trigger coupling
  - It is possible to disable an AF disable by front-end

Auto-synchronous bus system
- In case that 2 asynchronous data acquisition channels are required, several digitizers (to be combined using the second generation highbandwidth auto-synchronous bus system AD2bus2). The system provides superior synchronization in the standard 33 MHz PCI reference clock. AD2bus2 bus can be extended up to three U1062A modules.

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Compact Multichannel Acquisition System with Embedded PC or Computer Interface

Chassis
• 3-, 5- or 8-slot CompactPCI chassis

Interface or Processor
• A choice of interfaces for desktop or laptop PC’s or in system single-board computer

Software
• Turnkey AcqirisMAQS software for multichannel visualization, or standard software support for easy integration into your measurement system

Data Acquisition Modules
• Mix and match from a variety of digitizer, TDC or processing modules

U1056B High-Speed Data Converter Systems

Portable high-resolution system
This low power, 3-slot portable system provides 4 synchronized input channels with 12-bit resolution and a high-speed interface to a laptop PC with ExpressCard slot. Ideal for Telecom testing or Ultrasound systems.

High-speed data acquisition
The 5-slot crate provides four vacant slots to be used by Agilent data converter modules. By including 4 U1065A modules, synchronized using the AS bus 2 connectors, this system offers 16 high-speed (2 GS/s) data acquisition channels that to the embedded high-performance host processor look to be one single instrument.

Rack mountable 80-channel system
Held in a 21-slot 9U crate, this example systems with 80 acquisition channels each running with a real-time sampling rate of 1 GS/s, has a power consumption of less than 900W. The whole system can sit on a desk or be mounted into a 19” rack. The AcqirisMAQS software allows easy control of the system and visualization of the acquired data through a desktop PC interfaced through the PCI bus. With 80 input channels, large scale experiments as in radio astronomy or particle physics, can be integrated and controlled in a single desktop solution.
Compact, Low-Power Digitizer that Maximizes Measurement Throughput

U1071A-001 Acquire Dual-Channel, 1 GS/s High-Speed Digitizer
- 1 GHz bandwidth
- 256 kSample to 256 MSample acquisition memory
- Low power (15 W)

U1071A-002 Acquire Dual-Channel, 1 GS/s High-Speed Digitizer
- 500 MHz bandwidth
- 256 kSample to 256 MSample acquisition memory
- Low power (15 W)

U1071A-004 Acquire Dual-Channel, 1 GS/s High-Speed Digitizer
- 200 MHz bandwidth
- 128 kSample to 256 MSample acquisition memory
- Low power (15 W)

Options and Accessories
- U1071ATM1 Preconfigured with 1 GHz, 1 to 2 GS/s, 256 MSample acquisition memory
- U1071ATM2 Preconfigured with 500 MHz, 1 to 2 GS/s, 256 MSample acquisition memory
- U1071ATM4 Preconfigured with 200 MHz, 0.5 to 1 GS/s, 128 MSample acquisition memory
- U1071A-SAR Simultaneous multibuffer acquisition and readout firmware

On-board Measurments
- N/A

Memory
- 256 kSample
- Optional memory up to 256 MSample/channel

Sample Rate
- 100 S/s to 2 GS/s

Resolution
- 8 bits (1:256)

Bandwidth
- DC to 1 GHz

Number of channels
- 256 kSample to 256 MSample/channel

Voltage Input
- 50 Ω: 50 mV to 5 V
- 1 MΩ: 50 mV to 50 V

On-board Measurements
- N/A

Trigger connections with Ctrl I/O

SAR Mode

A high-speed data demultiplexer with on-board memory is designed for the capture and memorization of digital data up to 10-bit, capable of up to 2 GS/s. It has high internal data bit rates, high clock frequencies, and is able to accept and generate LVDS (low-voltage differential signal, 100 mV - 600 mV range) levels for best input/output interfaces. The circuit allows storage of the input data on a self-addressed, 256 kSample internal memory, and provides high throughput operation with the optional SAR mode to provide data handling for the 128, 256, and 512 MSample optional memory extensions.

The memory and acquisition controller of the U1071A digitizer is a digital CMOS integrated circuit. A high-speed data demultiplexer with on-board memory is designed for the capture and memorization of digital data up to 10-bit, capable of up to 2 GS/s. It has high internal data bit rates, high clock frequencies, and is able to accept and generate LVDS (low-voltage differential signal, 100 mV - 600 mV range) levels for best input/output interfaces. The circuit allows storage of the input data on a self-addressed, 256 kSample internal memory, and provides high throughput operation with the optional SAR mode to provide data handling for the 128, 256, and 512 MSample optional memory extensions.
High-Speed PCI Digitizer with Exceptional 12-bit Performance

**U1070A-001 Acqiris Single-Channel, 400 MS/s High-Speed Digitizer**
- 100 MHz DC-coupled standard input, 300 MHz AC-coupled HF input
- 4 MSample acquisition memory
- High measurement throughput with PCI interface

**U1070A-002 Acqiris Single-Channel, 200 MS/s High-Speed Digitizer**
- 100 MHz bandwidth
- 4 MSample acquisition memory
- High measurement throughput with PCI interface

**U1070A-003 Acqiris Single-Channel, 100 MS/s High-Speed Digitizer**
- 50 MHz bandwidth
- 4 MSample acquisition memory
- High measurement throughput with PCI interface

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<th>Resolution</th>
<th>Bandwidth</th>
<th>Number of Channels</th>
<th>Voltage Input</th>
<th>On-board Measurements</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>U1070A-001</td>
<td>400 MS/s to 420 MS/s</td>
<td>12 bits at 100 MHz to 300 MS/s</td>
<td>12 bits at 100 MHz to 300 MS/s</td>
<td>Single at 420 MS/s</td>
<td>50 Ω: 250 mV to 10 V</td>
<td>4 MSamples/channel</td>
<td>4 MSamples/channel</td>
</tr>
<tr>
<td>U1070A-002</td>
<td>200 MS/s</td>
<td>12 bits at 100 MHz to 200 MS/s</td>
<td>DC to 100 MHz</td>
<td>Single at 200 MS/s</td>
<td>50 Ω: 250 mV to 10 V</td>
<td>4 MSamples/channel</td>
<td>4 MSamples/channel</td>
</tr>
<tr>
<td>U1070A-003</td>
<td>100 MS/s</td>
<td>12 bits at 50 MHz to 100 MS/s</td>
<td>DC to 50 MHz</td>
<td>Single at 100 MS/s</td>
<td>50 Ω: 250 mV to 10 V</td>
<td>4 MSamples/channel</td>
<td>4 MSamples/channel</td>
</tr>
</tbody>
</table>

**Unique Tools for Complex Frequency Analysis**
Agilent's Acqiris high-speed PCI Digitizers (U1070A) set the standard in high-resolution data acquisition. Using the latest technology, the digitizers provide fast sample rates of up to 420 MS/s and wide bandwidths of up to 300 MHz. The digitizers feature long 4 MSample acquisition memory. Waveforms are transferred directly into the digitizers' large acquisition memory so that complex signals can be stored over long time periods. Large memory is essential for maintaining fast sampling rates and timing resolution.

The sample rate selection and bandwidth combine to allow the high-resolution capture of signals with a high spurious free dynamic range (typ. 90 dB into the HF input and 75 dB otherwise) and a high signal-to-noise ratio (typ. 65 dB into the HF input, 62 dB otherwise). Additional outstanding specifications include typical total harmonic distortion (THD) of -78 dB, very low noise floor spectrum at -90 dB and effective bits (ENOB) of more than 10.

Such specifications make the U1070A digitizers a perfect match for test and measurement applications in automotive, ultrasonic medical imaging, lidar, NDT, and high-accuracy analytical instruments. The HF input of the DPO70000 is ideal for wireless communication equipment testing, general G/AM or RF/IF digital receivers, and radar embedded communication and analysis (RECA) applications.
Reconfigurable Data Converters Provide On-the-Fly Processing

U1080A-001 Acqiris Dual-Channel, 1-2 GS/s High-Speed Digitizer with on-board Signal Processing

- 1 GHz bandwidth
- 7 Mbits FPGA
- Optional external processing memory providing 512 MB of SDRAM and 1 MB dual-port SRAM
- Fiber optic data output

U1080A-002 Acqiris Dual-Channel, 1-2 GS/s High-Speed Digitizer with on-board Signal Processing

- 1 GHz bandwidth
- 7 Mbits FPGA
- Optional external processing memory providing 512 MB of SDRAM and 1 MB dual-port SRAM
- Fiber optic data output

U1080A 2 GS/s 8-bit High-Speed Digitizer with On-Board Signal Processing

Options and Accessories
- U1080A-FDK Firmware development kit for AC/SC platform
- U1080A-FFT 32 Kpoint FFT Analyzer firmware at 2 GS/s, only for -001
- U1080A-ODL High-rate optical data link, only for U1080A-002

On-Board FPGA Processing

The U1080A is a dual channel 8-bit CompactPCI®/PXI™ digitizer with on-board real time data processing that handles front panel data output. The platform is designed to meet high-speed sampling requirements encountered in radar, sonar, and related applications. The on-board FPGA and on-board memory allow the platforms to be easily reconfigured to perform real-time signal processing on the digitized signal.
U1082A-001 Acqiris Dual-Channel, 1-2 GS/s High-Speed Digitizer with on-board Signal Processing
- 1 GHz bandwidth
- Processing memory from 6-12 MB up to 24-48 MB (optional)
- Firmware for signal averaging, peak detection and ping-pong data handling

U1082A-002 Acqiris Dual-Channel, 0.5-1 GS/s High-Speed Digitizer with on-board Signal Processing
- 500 MHz bandwidth
- Processing memory from 6-12 MB up to 24-48 MB (optional)
- Firmware for signal averaging, peak detection and ping-pong data handling

U1082A 2 GS/s 8-bit High-Speed PCI Digitizer with On-Board Signal Processing

Options and Accessories
- U1082A-M24 24 MB processing memory for U1082A
- U1082A-SSR Firmware for sustained sequence recording
- U1082A-AVG Firmware for real-time sampling and averaging
- U1082A-TDC Firmware for time-to-digital conversion and peak analysis

Flexible PCI Data Converters to Maximize Measurement Throughput

Models and specifications

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<tr>
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<th>Number of Channels</th>
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<td>U1082A-001</td>
<td>100 S/s to 2 GS/s</td>
<td>8-bit</td>
<td>DC to 1 GHz</td>
<td>Dual at 1 GS/s or Single at 2 GS/s</td>
<td>50 Ω: 50 mV to 5 V</td>
<td>2 MSamples/channel of 24 bits</td>
<td>Firmware dependant</td>
<td>U1082A-M24 24 MB processing memory for U1082A</td>
</tr>
<tr>
<td>U1082A-002</td>
<td>100 S/s to 1 GS/s</td>
<td>8-bit</td>
<td>DC to 500 MHz</td>
<td>Dual at 500 MS/s or Single at 1 GS/s</td>
<td>50 Ω: 50 mV to 5 V</td>
<td>4 MSamples/channel of 24 bits (with –SSR option)</td>
<td>Firmware dependant</td>
<td>U1082A-SSR Firmware for sustained sequence recording</td>
</tr>
</tbody>
</table>

Two on-board FPGA’s (Xilinx Virtex-2) are reconfigurable or reprogrammable options. A family of firmware options enables the platform to perform a variety of user or factory-defined on-the-fly processing tasks on the digitized data.
LXI digitizers with a high performance front end and on-board measurements

- 20 MSamples per second
- 16-bit ADC Simultaneous sampling
- ±250mV to ±250V DC, isolated
- AC or DC coupling
- Standard 32MS/Ch or Extended 128 MS/Ch memory
- On-board measurements
- Built-in Web Interface
- Gigabit LAN and HS USB 2.0 interfaces
- 1U, Full Rack stand alone instrument
- LXI Class C compliant

The Agilent L4532A and L4534A 20 MSa/s LXI digitizers offer 2 or 4 input channels in a stand-alone LXI format unlike the typical VXI, PXI and PCI digitizers available today. The digitizers have high performance front ends with isolated inputs and the ability to float up to 40V to accommodate differential signals. The voltage input is ±250mV to ±250V. A real benefit when analyzing high voltage and transient signals seen in many automotive and aerospace defense applications.

The front end design eliminates many customers' needs for signal conditioning and attenuation that they are currently using with these digitizers. The LXI digitizers have Gigabit LAN for fast data transfers and on-board measurements. The on-board measurements are useful especially in manufacturing applications where measurement results are needed. Transferring the results eliminates the need for post processing and storing large sets of data, saving both time and money.

Save test time and money with high performance analog inputs

The digitizer’s individually isolated channel inputs have been designed for high performance with an A/D converter per channel to ensure the signals you measure are accurately digitized without distortion or additional noise. Channel input range is configurable from ±250 mV up to ±250 V with a floating voltage up to ±40 V to accommodate differential waveform acquisition. You can also choose to enable 2 MHz and 200 KHz input filters to each digitizer. The high voltage input, isolated inputs and selection of noise filters reduces the need to add expensive input signal attenuation and input conditioning circuits, saving test development time and money.

L4532A 20 MSa/s 16-bit High Resolution LXI Digitizer

Models and specifications

| L4532A |  
|---|---|
| Sample Rate | 20 MSa/s  |
| Resolution | 16-bit |
| Bandwidth | 20 MHz |
| Number of Channels | 2 simultaneously sampling |
| Voltage Input | ±250 mV to ±125 V DC, isolated |
| On-board Measurements | V min / V max, VPP, V avg / V rms, V top / V base, Rise/Fall time, |  |
| | Download / Period, Frequency / Period, Pulse width, Duty Cycle |
| Segmented Memory | 32 MSamples/channel |
| Options | Extended Memory, 128 MSamples/channel |

Options and Accessories

- Option 0B0 Deletes printed manual set (Full documentation included on CD-ROM)
- Option ABA English printed manual set
LXI digitizers with a high performance front end and on-board measurements

• 20 MSamples per second
• 16-bit ADC Simultaneous sampling
• ±250mV to ±250V Isolated inputs
• AC or DC coupling
• Standard 32MS/Ch or Extended 128 MS/Ch memory
• On-board measurements
• Built-in Web Interface
• Gigabit LAN and HS USB 2.0 interfaces
• 1U, Full Rack stand alone instrument
• LXI Class C compliant

Models and specifications

<table>
<thead>
<tr>
<th>L4534A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Rate</td>
<td>20 MS/s</td>
</tr>
<tr>
<td>Resolution</td>
<td>16-bit</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>20 MHz</td>
</tr>
<tr>
<td>Number of channels</td>
<td>4 simultaneously sampling</td>
</tr>
<tr>
<td>Voltage input</td>
<td>±250 mV to ±250 V, isolated</td>
</tr>
<tr>
<td>On-board Measurements</td>
<td>V min / V max, Vpp, V avg / V rms,</td>
</tr>
<tr>
<td>Segmented Memory</td>
<td>32 MSamples/channel</td>
</tr>
<tr>
<td>Options</td>
<td>Extended Memory, 128 MSamples/channel</td>
</tr>
</tbody>
</table>

Connect to the digitizers’ graphical web interface either by direct LAN or through the internet with your PC’s Java-enabled web browser (i.e. Internet Explorer). Enter the IP address displayed on the front of the digitizer into the web browser address and you will be able to configure, acquire and display waveforms and measurements without programming. The web interface simultaneously displays the channel signals and measurements and provides an instrument command log that is very useful during development or debugging.

Minimize post-processing with onboard measurements

The L4532A and L4534A digitizers include a collection of on-board “scope-like” measurements such as Vmin/Vmax, Vpp, frequency, rise/fall times, and more that can be applied to a selected portion or the overall waveform. There is no need for post-processing data to get the measurement results you need, saving time and minimizing the need to transfer and store large amounts of data. The waveform measurements are made within a user-selected region of the digitized waveform and include their time positions.
• High-speed USB 2.0 (480MBit/s) TMC 488.2 compliant
• Standalone and modular capabilities
• 14-bit resolution, simultaneous analog input channels, up to 2 MSa/s/ch
• 2 12-bit analog output channels, 1 MSa/s analog output update rate
• 24-bit programmable TTL input/output channels
• 2 general purpose digital counter channels

Models and specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Sample Rate</th>
<th>Resolution</th>
<th>Bandwidth</th>
<th>Number of channels</th>
<th>Voltage Input</th>
<th>On-board Measurements</th>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>U2531A</td>
<td>2 MSa/s</td>
<td>14 bit</td>
<td>12 MHz</td>
<td>4 (2 differential analog)</td>
<td>+/-10V (Analog Inputs); -0.7 to +4.7 V (max range)</td>
<td>Frequency/Period, Pulse Width</td>
<td>8 Mbit FIFO buffer</td>
</tr>
</tbody>
</table>

Options and Accessories
• U2901A Terminal block and SCSI-8 68-pin connector with 1-meter cable
• U2902A Terminal block and SCSI-8 68-pin connector with 2-meter cable
## Models and Specifications

### U2541A

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Rate</td>
<td>250 kSa/s</td>
</tr>
<tr>
<td>Resolution</td>
<td>16 bit</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>600 kHz</td>
</tr>
<tr>
<td>Number of channels</td>
<td>4 Differential Input (analog); 24 bit programmable input/output channels (digital)</td>
</tr>
<tr>
<td>Voltage Input</td>
<td>±10 V (For Analog inputs); VIL =0.7 V maximum; IIL =10 µA maximum; VIH =2.0 V minimum; IIL =10 µA maximum (For Digital Inputs)</td>
</tr>
<tr>
<td>On-board Measurements</td>
<td>Frequency/Period, Pulse Width</td>
</tr>
<tr>
<td>Memory</td>
<td>8 MSA FIFO buffer</td>
</tr>
</tbody>
</table>

### U2901A Options and Accessories

- U2901A Terminal block and SCSI--II 68-pin connector with 1-meter cable
- U2902A Terminal block and SCSI--II 68-pin connector with 2-meter cable

### Options and Accessories

- U2901A Terminal block and SCSI--II 68-pin connector with 1-meter cable
- U2902A Terminal block and SCSI--II 68-pin connector with 2-meter cable

## Product Highlights

- High-speed USB 2.0 (480MBit/s) TMC 488.2 compliant
- Standalone and modular capabilities
- 14-bit resolution, simultaneous analog input channels, up to 250 kSa/s/ch
- 2 12-bit analog output channels, 1 MSa/s analog output update rate
- 24-bit programmable TTL input/output channels
- General purpose digital counter channels

## Standard Shipped Accessories

- AC/DC Power Adapter
- Power Cable
- USB Extension Cable
- L-Mount Kit (used with modular product chassis)
- Agilent U2500A Series USB Multifunction Simultaneous Sampling DAQ Devices Quick Start Guide
- Agilent Measurement Manager for U2500A Series Quick Start Guide
- Agilent USB Modular Products Reference CD-ROM
- Agilent Automation-Ready CD (contains the Agilent I/O Libraries Suite)
- Certificate of Calibration

## Product Outlook and Dimensions

- Front view
- Rear view
- Top view

### Dimensions

- Front view: 44.00 mm x 182.40 mm x 120.00 mm
- Rear view: 44.00 mm x 182.40 mm x 120.00 mm
- Top view: 44.00 mm x 182.40 mm x 120.00 mm
Control, Acquire, Measure, Evolve with USB Simultaneous Sampling Data Acquisition

- High-speed USB 2.0 (480MBit/s) TMC 488.2 compliant
- Standalone and modular capabilities
- 14-bit resolution, simultaneous analog input channels, up to 500 kSa/s/ch
- 2 12-bit analog output channels, 1 MSa/s analog output update rate
- 24-bit programmable TTL input/output channels
- 2 general purpose digital counter channels

Models and specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Sample Rate</th>
<th>Resolution</th>
<th>Bandwidth</th>
<th>Number of channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>U2542A</td>
<td>500 kSa/s</td>
<td>16-bit</td>
<td>1 MHz</td>
<td>4 Differential Input (analog); 24 bit programmable input/output channels (digital)</td>
</tr>
</tbody>
</table>

Voltage Input
- +/-10 V (For Analog Inputs);
- V_{IL} = 0.7 V maximum; I_{IL} = 10 µA maximum
- V_{IH} = 2.0 V minimum; I_{IH} = 10 µA maximum (For Digital Inputs)

Option and Accessories
- U2901A Terminal block and SCSI--II 68-pin connector with 1-meter cable
- U2902A Terminal block and SCSI--II 68-pin connector with 2-meter cable

Typical Performance Graphs
**Frequency Domain**
- Communication (I&Q)
- Audio test
- Ultrasound & Life Sciences
- Hard disk drive and semiconductor testing
- Astrophysics
- Electronic warfare

**Time Domain**
- Electromechanical device (motors, solenoids, drives, printer heads) testing
- Product characterization (ECU’s, ……)
- Semiconductor characterization (diode, MOSFET)
- Synthetic instrument with small form factor for A/D
- Time of flight measurement (Radar, Lidar, Ultrasound, Particle acceleration)

**Scanning Digitizers (slow sampling, long test durations)**
- Data logging
- Physical test, mechanical test
- Data acquisition (thermal, strain)

**DVD Players and Recorders**
- Measurement of fast rise times, pulse widths and peak heights in the DUT
- High-speed data acquisition technology provides flexibility and low operational cost

**Neutron Capture for Nuclear Waste Reduction (CERN)**
- Neutron detectors connected to digitizers (8 synchronized channels at 1 GS/s)
- Measurement of neutron detection

**Non-destructive Testing within Microelectronic Packages**
- High frequency ultrasound is used to detect voids, cracks and delaminations
- Measurement of time of flight, velocity and magnitude of the ultrasound on the DUT

**ECU Testing**
- Front end isolation and high voltage input needed to test electro-mechanical DUTs
- Measurement of current sensors, solenoid fly-back voltages

**Signal Integrity**
- Increased measurement resolution by 10X
- Fewer false “pass” and “fail” increasing yields and lowering production costs
- Increased measurement resolution by 10X
Our repair and calibration services will get your equipment back to you performing like new, when promised. You will get full value out of your Agilent equipment throughout its lifetime. Your equipment will be serviced by Agilent-trained technicians using the latest factory calibration procedures, automated repair diagnostics and genuine parts. You will always have the utmost confidence in your measurements.

Agilent offers a wide range of additional expert test and measurement services for your equipment, including initial start-up assistance onsite education and training, as well as design, system integration, and project management.

For more information on repair and calibration services, go to www.agilent.com/find/removealldoubt