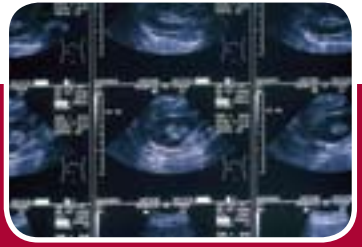
SHORTFORM CATALOG

GaGe

SPEED PRECISION EXCELLENCE



ADVANCED INSTRUMENTS FOR THE WORLD

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GaGe is a customer-oriented, worldwide industry leader in PC-based instrumentation. Established in 1987, GaGe serves the Test and Measurement, Embedded Data Acquisition and Automated Test market segments with PCI and CompactPCI digitizers, modular instruments and turnkey measurement systems.

Our products are used worldwide across diverse industries in Communications, Computers, Semiconductor, Aerospace, Research Laboratories and Education. Major applications served are Manufacturing Test, Advanced Research, Ultrasonics, Lasers and Embedded DAQ.

About GaGe

GaGe, a DynamicSignals LLC (www.DynamicSignals.com) brand, designs and manufactures data acquisition systems and modules for the PCI and CompactPCI/PXI platforms. We continue to grow our product portfolio to provide an ever-broader family of products to meet the evolving needs of our customers' applications.

GaGe sells its products through an independent sales organization in North America, and internationally through an extensive network of qualified distributors.

As a worldwide industry leader in high-performance digitizers, GaGe's CompuScope and CompuGen products are world renowned for high speed, high data throughput, high resolution, low noise, deep on-board acquisition memory, and much more. Our easy-to-use GageScope oscilloscope software and suite of powerful Software Development Kits (SDKs) allow you to create reliable, flexible, and high-performance solutions quickly and easily.

GaGe's motivated employees, exciting new products, diversified customer base and a growing international presence have positioned GaGe for continued growth and success.

GaGe Products

GaGe's extensive line of products includes ultra-high-speed data acquisition cards, digital oscilloscope cards, analog and digital signal generation cards, arbitrary waveform generator cards, digital pattern generation cards, digital input cards and supporting software.

GaGe makes the most advanced computer-based instruments in the world. Our products are the fastest, of the highest quality, the most versatile, and include up to 4 GB of on-board acquisition memory. GaGe designs and manufactures more than 50 different hardware cards and numerous software packages to operate them or integrate them into a test system.

For applications that require more than one card; GaGe products can be synchronized via special bridging circuitry to provide true multi-channel solutions. Independent cards can also be operated together to form complex impulse-response as well as mixed-mode test systems.

GAGE'S OEM STATEMENT

"We value our OEM customers. We understand our OEM customers' needs to complete their projects on time, and we provide the tools they need to succeed. We work very closely with our OEM customers and can customize our products with special upgrades and modifications if necessary. With our reliable, high-quality products and support, our OEM customers gain valuable time-to-market and save tens of thousands of development dollars. Our knowledgeable support staff assist our OEM customers through all product lifecycle stages from development to production. This OEM-friendly philosophy is why we have so many satisfied OEM customers around the world."

- Eric R. Gillas, General Manager

What is an OEM?

Original Equipment Manufacturers (OEM) are customers who incorporate one or more of GaGe's ultra-fast A/D or D/A cards into their end-product and resell the complete system to end-users.

Message to OEMs

OEMs represent a major market for GaGe. Over the years, we have forged strategic relationships with OEM customers by customizing GaGe instruments to the customer's technical specifications, both in hardware and software, and by providing the added support required.

OEMs work with GaGe on a long-term basis because they need a reliable, long-term strategic supplier who will provide the required product and support. We have come to be recognized as the company that will make sure that projects are completed on time, often going the extra distance to assist with system integration and software development.

Why do OEMs use GaGe Cards?

Technology

GaGe's proven leadership in ultra-fast A/D and D/A technology means that OEMs get the best product available on the market.

Quality/Reliability

All GaGe products are tested, burnt-in and retested before they are shipped to our customers. We know that OEMs need reliable products that won't fail in the field.

Customization

While GaGe's products are designed to serve a great number of applications, we realize that some customers may need a modified version of our product. We can customize our products to meet your specific needs.

Tech Support

When OEMs use GaGe products, they have direct support from our design engineers. We will work closely with you to ensure your project's success.

ATE APPLICATIONS

Automatic Testing Equipment (ATE) and its large subcategory of Manufacturing Test have always been important applications for GaGe instrument products. The ultra-fast PCI data transfer speed of GaGe digitizers has significantly reduced manufacturing test times for many ATE customers. These improvements translate directly into cost reductions. Multiple GaGe boards may be combined with other hardware under the control of user-developed software to create a compact system that is customized for the user's ATE requirement. GaGe's powerful and easy-to-use Software Development Kits assist customers in developing their ATE applications.

Storage Media Testing

GaGe has provided many different varieties of ATE solutions for the storage media industry over the years. Examples include straight data read-back for data storage integrity testing, optical testing of hard drive disk flatness and verification of read-head ASIC error recovery circuitry. GaGe high-resolution digitizers allow sensitivity to small signal features on high dynamic range analog read-head signals. Ultra-deep acquisition memory allows long unbroken acquisition of read-head signals.

Typical Customers

Typical customers are computer peripheral manufacturers such as Seagate, Storage Tek, and Imation.

Recommended Products

- CS82G - 2 GS/s, 8 bit digitizer
- CS14200 - 14 bit, 200 MS/s digitizer
- CS12400 - 12 bit, 400 MS/s digitizer
- CS1602 - 16 bit, 2.5 MS/s digitizer
- CS3200 - 32 bit, 100 MHz digital input card

Electrical Component Testing

GaGe digitizers are used in a variety of electrical component test solutions. Examples include multi-point circuit board testing, high-speed oscillator testing and digital-stimulus response testing for ASICs. Similar to other ATE applications, electrical component testing benefits from GaGe digitizers' high resolution, ultra-fast sampling speeds, deep on-board memory and fast PCI transfer rates. In addition, GaGe digitizers provide unmatched DC accuracy. Electrical component testing often requires high DC accuracy for absolute voltage, current and power measurements. All CompuScope digitizers are tested for DC accuracy against NIST traceable standards and are shipped with an attestation certificate.

Typical Customers

Typical customers are electrical component manufacturers such as Cisco, Credence, and Intel.

Recommended Products

- CS82G - 2 GS/s, 8 bit digitizer
- CS14200 - 14 bit, 200 MS/s digitizer
- CS12400 - 12 bit, 400 MS/s digitizer
- CS1602 - 16 bit, 2.5 MS/s digitizer
- CS3200 - 32 bit, 100 MHz digital input card

MILITARY APPLICATIONS

GaGe digitizers are used in many Military/Aerospace applications including aircraft inspection, radar, communications, explosion testing, lidar, lightning testing, sonar, mobile equipment testing and field servicing of LRUs. GaGe's hardware and software portfolio is designed for easy maintenance, upgradeability and scalability. These attributes are very important for military systems that are routinely designed for a lifetime of over 20 years. GaGe provides outstanding support and service to Military/Aerospace customers and can also provide specific terms in order to satisfy their often unique concerns.

Aircraft Testing

GaGe's wide portfolio of CompuScope digitizers provides a compact and integrated solution for aircraft testing systems as compared with a bulky, remote stand-alone oscilloscope with slow data throughput. GaGe provides digitizers in the CompactPCI format, which is emerging as the standard platform for many aircraft testing systems due to its ruggedness, front-panel connector access and fast swapability. GaGe can also provide custom solutions to meet customers' specific needs, such as the Armada digitizer units that were provided to the U.S. Navy for F-18 fighter testing. The Armada is a CompuScope digitizer in a PC that is controlled through the GPIB bus. The Armada's software makes it behave like the obsolete tube-based digitizer unit that it replaced.

Typical Customers

Typical customers are Military/ Aerospace companies like Navair, Northrop Grumman, Lockheed Martin and Honeywell.

Recommended Products

- CS82G - 2 GS/s, 8 bit digitizer
- CS14200 - 14 bit, 200 MS/s digitizer
- CompactPCI CompuScope digitizers

Signal Intelligence

Increasingly, military and government agencies must discretely monitor radar and communications signals of unknown origin. Since the sources are uncontrolled, trigger signals are often unavailable. GaGe deep memory digitizers provide the best available method for monitoring high-speed signals over long periods of time. For instance, a Master/Slave pair of CS12400-2G digitizers can continuously acquire on two simultaneous channels at 400 MS/s for over 5 seconds. The CS3200 is also available with deep on-board acquisition memory for capture of 32-bit digital signals at rates of up to 100 MS/s.

Typical Customers

Typical customers are the military and aerospace companies such as USAF, Navair, Lockheed Martin, Raytheon, and US Coast Guard.

Recommended Products

- CS82G - 2 GS/s, 8 bit digitizer
- CS12400 - 12 bit, 400 MS/s digitizer
- CS3200 - 32 bit, 100 MHz digital input card
- Deep memory CompuScope digitizers

ULTRASONIC APPLICATIONS

GaGe high-resolution digitizers are ideally suited for ultrasonic signals, which usually contain a combination of reflection echoes with vastly different amplitudes. GaGe high-resolution digitizers allow the detectability limits of a given ultrasonic system to be significantly improved so that it is sensitive to the smallest amplitude feature echoes. Fast PCI data transfer rates allow continuous waveform capture of up to 10,000 waveforms per second into user-accessible PC RAM, which is crucial for fast repetitive capture requirements. In addition, GaGe high-resolution digitizers feature on-board signal averaging, advanced triggering & clocking and on-board time-stamping which may be fully exploited in ultrasonic applications.

Ultrasonic Non-Destructive Material Testing

GaGe high-resolution digitizers are used extensively within ultrasonic Non-Destructive Testing (NDT) systems such as scanning-immersion inspection systems, on-line pipe inspection systems, aircraft inspection systems, and laser ultrasonic inspection systems. Since a few hundred MS/s is usually sufficient for NDT systems, GaGe's high-resolution 12 and 14-bit digitizers may be used for the best possible echo detection. The Multiple Record Mode feature on GaGe digitizers, which allows hundreds of thousands of waveforms to be acquired into Gigabytes of acquisition memory, is ideally suited for ultrasonic scanning systems.

Typical Customers

Typical customers are the military, aerospace companies, Universities, and NDT system vendors. We have supplied products to customers such as Boeing, UTEX, and Iowa State University.

Recommended Products

- CS14200 - 14 bit, 200 MS/s digitizer
- CS12400 - 12 bit, 400 MS/s digitizer
- CS82G - 2 GS/s, 8 bit digitizer

Medical Ultrasonics

GaGe has provided digitizer solutions for a wide range of medical ultrasonic applications such as mammography, ultrasonic tissue ablation, ultrasonic micro-dispensing and intravascular ultrasonics (IVUS). While requirements of medical ultrasonic measurements are broadly similar to those of NDT, higher sampling speeds at high repetition rates (as in IVUS) are usually required because the biological system to be inspected is usually smaller or has smaller features. In these applications, the Multiple Record Mode feature of GaGe digitizers allow data to be acquired into Gigabytes of on-board acquisition memory. GaGe Master/Slave digitizer systems allow simultaneous acquisition and comparison of multiple transducers signals.

Typical Customers

Typical customers are biotechnology and medical companies and Universities such as Volcano, Cleveland Clinic, Johns Hopkins, and Penn State.

Recommended Products

- CS82G - 2 GS/s, 8 bit digitizer
- CS12400 - 12 bit, 400 MS/s digitizer
- CS14200 - 14 bit, 200 MS/s digitizer

COMMUNICATIONS APPLICATIONS

While communication systems are diverse, most communications applications do share common requirements. Communication signals are typically demodulated down from a multi-GHz carrier frequency to an Intermediate Frequency (IF) below 100 MHz. Demodulators often produce two outputs called the In-phase and Quadrature components (I&Q), which must be simultaneously digitized. Communication signals are almost always analyzed in the frequency domain, so that digitizers that maintain the highest spectral purity are required. Finally, long unbroken capture of communication signals over long time periods is often necessary. GaGe deep memory digitizers are ideally suited for communications applications.

Communications Testing

GaGe's CS12400 digitizer, with two 12-bit, 200 MS/s simultaneous input channels, provides a pass-band of over 200 MHz and is ideal for the capture of communications signals. The CS14105 digitizer, with two 14-bit transformer-coupled input channels and 105 MS/s simultaneous sampling, provides superior linearity and noise rejection over solid state coupling, making it also ideal for communications testing.

GaGe also provides a complete turn-key solution, the NEXUS 802.11 WiFi Testing System, for testing of 802.11 a, b, g, and n wireless devices (see page 25).

Typical Customers

Typical customers are wireless or optical communications companies, and universities. We have supplied products to customers such as SAT, Broadcom and Cisco.

Recommended Products

- CS14105 - 14 bit, 105 MS/s Comm Analyzer
- CS12400 - 12 bit, 400 MS/s digitizer
- CS82G - 2 GS/s, 8 bit digitizer
- NEXUS 802.11 WiFi Testing System

Communications Monitoring

With the proliferation of wireless devices such as cell phones, satellite radio and wireless networks comes the universal problem of insufficient coverage. Manufacturers of such devices must understand coverage problems in order to improve next-generation transceivers. Given the high cost of developing transceiver ASICs, using a GaGe deep memory digitizer to diagnose problems is a cost-effective solution. GaGe deep memory digitizers, available with up to 4 Gigabytes of on-board acquisition memory, allow continuous high-speed sampling for extended lengths of time. For example, with 2 GigaSamples of acquisition memory, a user may sample at 100 MS/s for a full 20 seconds.

Typical Customers

Typical customers are communications companies such as Lucent and Sirius Radio.

Recommended Products

- CS14105 - 14 bit, 105 MS/s Comm Analyzer
- CS12400 - 12 bit, 400 MS/s digitizer
- CS82G - 2 GS/s, 8 bit digitizer
- Deep memory CompuScope digitizers

LASER APPLICATIONS

Typically, laser applications require the digitization of signals from a light detector such as a photo-diode or a photo-multiplier tube. Often, waveforms must be acquired whenever the laser light is activated, which may be due to the intrinsic repetitive flashing of a pulsed laser or to repetitive blocking of the laser light by an optical chopper or the object under study. Laser light intensity may vary over an extremely high dynamic range. As such, GaGe high-resolution digitizers are ideal for laser applications. Alternately, short nanosecond duration pulses from fast lasers may be characterized by GaGe's high-speed digitizers. The fast PCI data transfer rate and Multiple Record Mode feature of GaGe digitizers allow acquisition of laser pulses with extremely high repetition rates.

Lidar (Laser Radar)

Lidar, or laser radar, involves illuminating a remote object with a laser and detecting a mere trickle of back-scattered light with a photo-detector. Simple time-of-flight measurements are used for object ranging and imaging, but Doppler lidar may be used for velocity measurements. Usually ground-based for atmospheric sciences, airborne lidar systems are also used in oceanography and forestry studies. Since single amplitudes decrease rapidly with range, lidar signals usually have a high dynamic range. Consequently, GaGe high-resolution digitizers are often employed. GaGe high-speed digitizers are also used for high position accuracy.

Typical Customers

Typical customers are universities, government labs, aerospace companies and the military. We have supplied products to customers such as NASA, Applied Physics Labs, MIT, Boeing, and Jet Propulsion Labs.

Recommended Products

- CS14200 - 14 bit, 200 MS/s digitizer
- CS12400 - 12 bit, 400 MS/s digitizer
- CS82G - 2 GS/s, 8 bit digitizer

Laser Cavity Ringdown Spectroscopy

Laser Cavity Ringdown Spectroscopy (LCRDS) involves monitoring the decay of laser light intensity within a cavity bounded by high-reflectance mirrors. Gasses introduced into the cavity produce characteristic decay curves, so that LCRDS may be used for trace gas detection in applications such as ozone or green-house gas monitoring. LCRDS transient light decays are archetypal high dynamic range signals and following the long decay tail is essential for precise exponential fitting. Since LCRDS decay times are usually a microsecond or more, sampling rates of a few hundred MS/s are sufficient. Consequently, LCRDS these signals are ideal for acquisition by a GaGe high-resolution digitizer. GaGe digitizers are also used in granular particle, fluorescence, and infrared spectroscopy applications.

Typical Customers

Typical customers are universities and government labs such as George Washington University, U.C. Berkeley, and Harvard.

Recommended Products

- CS14200 - 14 bit, 200 MS/s digitizer
- CS12400 - 12 bit, 400 MS/s digitizer

OTHER POPULAR APPLICATIONS

Nuclear and Particle Physics
High Voltage Transformer Testing
Plasma Physics
Electric Motor Transient Testing
Video/CCD/Frame Grabber Applications
Time Of Flight Mass Spectrometry
Lightning Monitoring
Atomic Force and Electron Microscopy
ADC Testing
FPGA/ASIC Digital Stimulus-Response Testing
Ultrasonic Transducer Characterization
Ultrasonic Dispensing Technology
Laser Pulse Characterization
Eddy Current Measurements
Electrical Impedance/Power Measurements
Medical Resonance Imaging
Silicon Wafer Testing
Electron Beam Characterization
Radio Telescopy
Xray and Thermal Imaging
Turbine Testing
Engine Testing
Time Domain Reflectometry
Wireless Positioning Systems
Telemetry
and many more...

GaGe digitizers

All GaGe digitizers come with programming-free GageScope oscilloscope software for easy operation. Easy-to-use Software Development Kits for C/C#, MATLAB, LabVIEW, and other programming environments such as Visual Basic and LabWindows/CVI are also available for creating custom applications.

NEW! 12 or 14-bit multi-channel PCI digitizers

GaGe's Octopus multi-channel digitizers feature up to 8 channels in a single-slot PCI card with up to 125 MS/s sampling per channel, and up to 4 GB of on-board acquisition memory.

Octopus CompuScope 82XX/CompuScope 83XX

A new family of GaGe multi-channel digitizers that has advanced features such as timestamping, faster PCI transfer speeds, deep memory in a single PCI slot, and pre-trigger multiple recording. Available in 12-bit (CompuScope 82XX) or 14-bit (CompuScope 83XX) resolution.

- 2, 4, or 8 digitizing channels
- 10, 25, 50, 65, 100, or 125 MS/s sampling per channel
- 12 or 14-bit vertical resolution
- 128 MS to 2 GS on-board acquisition memory
- More than 100 MHz bandwidth
- Optional eXpert™ Signal Averaging, Finite Impulse Response (FIR) Filtering, and Peak Detection technology provide a fast and efficient means for users to process data on-board GaGe digitizers and transfer only the data that is of interest to the PC for further analysis. (see p.22)
- Full-size, single-slot PCI card
- Full-featured front-end, with software control over input ranges, coupling and impedances
- Ease of integration with External or Reference Clock In and Clock Out, External Trigger In and Trigger Event Out
- 32 bits, 66 MHz PCI standard for 200 MB/s transfer to PC memory
- Programming-free operation with GageScope® oscilloscope software
- Up to 8 cards in a multi-card system for up to 64* channels

*Contact factory for higher channel count systems

Multi-card Octopus Systems

The GaGe Octopus family of multi-channel digitizers may be configured into extremely large channel-count systems of up to 64* channels. Available in 12-bit (CompuScope 82XX) or 14-bit (CompuScope 83XX) resolution.

- Up to 64* digitizing channels per system
- 10, 25, 50, 65, 100, or 125 MS/s sampling per channel
- 12 or 14-bit vertical resolution
- Low cost - pay only for the number of channels, sampling rate, and resolution required
- Full-featured front-end, with software control over input ranges, coupling and impedances
- 32 bits, 66 MHz PCI standard for 200 MB/s transfer to PC memory

*Contact factory for higher channel count systems

8-bit PCI digitizers

GaGe offers up to 2 GS/s sampling on its 8-bit PCI bus digitizers

CompuScope 82G

A versatile general-purpose ultra-high-speed digitizer card

- 8-bit, 2 GS/s digitization on one channel or 1 GS/s sampling on 2 simultaneous channels
- Features Bus Mastering and Multiple Record, including the capture of pre-trigger data, for very fast data transfers
- Available with up to 1.2 GHz bandwidth
- Completely programmable input amplifiers, including coupling, impedance, gain and offset
- Up to 8 cards in a Master/Slave system for up to 8 simultaneous channels at 2 GS/s and 16 channels at 1 GS/s

12-bit PCI digitizers

GaGe offers up to 400 MS/s sampling and up to 4 GB of on-board acquisition memory on its 12-bit PCI bus digitizers.

CompuScope 12400

The CS12400 is one of GaGe's new-generation PCI cards, which include many new advanced features and options.

- 200 MS/s sampling on 2 synchronous channels or 400 MS/s on one channel
- 12 bits vertical resolution
- Up to 2 GigaSamples of on-board acquisition memory

- 200 MHz bandwidth
- Optional Signal Averaging FPGA technology for extracting small signals from a background of high-amplitude noise (see p.22)
- Optional Finite Impulse Response (FIR) Filtering FPGA technology for removing unwanted signal features from a single waveform acquisition and emphasizing signal features of interest (see p.22)
- Optional eXpert™ Peak Detection FPGA technology for detecting peaks within a set of digitized waveform data, a widely used data analysis and reduction technique (see p.22)
- Time-stamp trigger events - 44-bit wide on-board time-stamping counter is provided for logging the occurrence time of trigger events with an accuracy of 7.5 nanoseconds
- Capture an extremely large amount of pre-trigger multiple record data, up to the full capacity of on-board memory
- Advanced timing connections (Trigger Out, Clock Out, External Clock)
- Custom turn-key solutions built to your specifications - up to 8 cards in a Master/Slave system for up to 8 simultaneous channels at 400 MS/s or 16 simultaneous channels at 200 MS/s
- 32 bits, 66 MHz PCI standard featuring 200 MB/s transfer to PC memory

CompuScope 1220

A versatile high-resolution waveform digitizer card

- 12 bit vertical resolution
- 20 MS/s dual-channel sampling
- Up to 2 GB of on-board acquisition memory, enabling capture and storage of up to 1 GigaSample of data
- Single-ended inputs
- Enhanced external clocking capability for better system synchronization at low sampling rates
- 55 dB Signal to Noise Ratio
- PCI bus card with Bus Mastering capability
- Fast data transfer rate to system RAM – 50 MB/s
- Custom turn-key solutions built to your specifications - up to 8 cards in a Master/Slave system for up to 16 simultaneous channels at 20 MS/s

14-bit PCI digitizers

GaGe offers up to 200 MS/s sampling and up to 4 GB of on-board acquisition memory on its 14-bit PCI bus digitizers.

CompuScope 14200

The CS14200 is one of GaGe's new-generation PCI cards, which include many new advanced features and options.

- 14 bits vertical resolution
- 200 MS/s sampling on 2 synchronous channels
- Up to 4 GigaBytes of on-board acquisition memory, enabling capture and storage of up to 2 GigaSamples of data
- Up to 100 MHz bandwidth
- Optional eXpert™ Signal Averaging FPGA technology, for extracting small signals from a background of high-amplitude noise (see p.22)
- Optional eXpert™ Finite Impulse Response (FIR) Filtering FPGA technology for removing unwanted signal features from a single waveform acquisition and emphasizing signal features of interest (see p.22)
- Optional eXpert™ Peak Detection FPGA technology for detecting peaks within a set of digitized waveform data, a widely used data analysis and reduction technique (see p.22)

- Time-stamp trigger events - 44-bit wide on-board time-stamping counter is provided for logging the occurrence time of trigger events with an accuracy of 7.5 nanoseconds
- Capture an extremely large amount of pre-trigger multiple record data, up to the full capacity of on-board memory
- Advanced timing connections (Trigger Out, Clock Out, External Clock)
- Custom turn-key solutions built to your specifications - up to 8 cards in a Master/Slave system for up to 16 simultaneous channels at 200 MS/s
- 32 bits, 66 MHz PCI standard featuring 200 MB/s transfer to PC memory

CompuScope 14105

The CS14105 is one of GaGe's new-generation PCI cards, which include many new advanced features and options.

- 14 bits vertical resolution, 12 ENOB
- 105 MS/s sampling on 2 synchronous channels
- Up to 4 GigaBytes of on-board acquisition memory, enabling capture and storage of up to 2 GigaSamples of data
- 180 kHz to 230 MHz pass-band
- Optional eXpert™ Signal Averaging, Finite Impulse Response (FIR) Filtering, and Peak Detection technology provide a fast and efficient means for users to process data on-board GaGe digitizers and transfer only the data that is of interest to the PC for further analysis. (see p.22)
- Capture an extremely large amount of pre-trigger multiple record data, up to the full capacity of on-board memory
- Advanced timing connections (Trigger & Clock Out, External Clock)
- Time-stamp trigger events - 44-bit wide on-board time-stamping counter is provided for logging the occurrence time of trigger events with an accuracy of 7.5 nanoseconds
- Transformer-coupled AC inputs, 50 Ohm impedance
- 32 bits, 66 MHz PCI standard featuring 200 MB/s transfer to PC memory

16-bit PCI digitizers

GaGe offers up to 10 MS/s sampling and up to 2 GigaBytes of on-board acquisition memory on its 16-bit PCI bus digitizers.

CompuScope 1610

A versatile high-resolution, high-speed waveform digitizer card

- 16 bits vertical resolution
- 10 MS/s dual-channel sampling
- Up to 2 GigaBytes of on-board acquisition memory, enabling capture and storage of up to 1 GigaSample of data
- Differential or single-ended inputs
- 70 dB Signal to Noise Ratio
- Flexible, oscilloscope-like analog triggering
- PCI bus card with Bus Mastering capability
- Fast data transfer rate to system RAM – 50 MB/s
- Custom turn-key solutions built to your specifications - up to 8 cards in a Master/Slave system for up to 16 simultaneous channels at 10 MS/s

CompuScope 1602

A cost-effective solution for applications that require precision

- 16 bits vertical resolution
- 2.5 MS/s dual-channel sampling
- Up to 2 GigaBytes of on-board acquisition memory, enabling capture and storage of up to 1 GigaSample of data
- Differential or single-ended inputs
- 75 dB Signal to Noise Ratio
- Flexible, oscilloscope-like analog triggering
- Multi-card systems of up to 16 synchronous channels at 2.5 MS/s

CompactPCI digitizers

GaGe offers up to 2 GS/s sampling and up to 16-bit resolution on its CompactPCI/PXI bus digitizers.

CompuScope 82GC

A versatile general-purpose ultra-high-speed 6U digitizer card

- 8-bit, 2 GS/s digitization on one channel or 1 GS/s sampling on 2 simultaneous channels
- Features Bus Mastering and Multiple Record, including the capture of pre-trigger data, for very fast data transfers
- Available with up to 1.3 GHz bandwidth
- Completely programmable input amplifiers, including coupling, impedance, gain and offset
- Internal or External Clock and Trigger
- Fast data transfer rate to system RAM – 80 MB/s
- Multi-card systems of up to 4 simultaneous channels

CompuScope 14100C

A general-purpose 6U digitizer card with precision and speed

- 14-bit, 100 MS/s sampling on one channel or 50 MS/s sampling on 2 simultaneous channels
- Available with up to 1 GigaSample of on-board acquisition memory
- Fast data transfer rate to system RAM – 80 MB/s
- 63 dB Signal to Noise Ratio
- Multi-card systems with up to 6 simultaneous channels at 100 MS/s or 12 simultaneous channels at 50 MS/s

CompuScope 1610C

A versatile high-resolution, high-speed 6U waveform digitizer card

- 16-bit, 10 MS/s dual-channel sampling
- Available with up to 1 GigaSample of on-board acquisition memory
- Differential or single-ended inputs
- 70 dB Signal to Noise Ratio
- Flexible, oscilloscope-like analog triggering
- Custom turn-key solutions built to your specifications - up to 16 simultaneous channels at 10 MS/s

CompuScope eXpert™ Firmware Options

GaGe's eXpert™ FPGA technology options provide a fast and efficient means for users to process data on-board GaGe digitizers and transfer only the data that is of interest to the PC for further analysis. Analysis is performed by GaGe hardware, allowing the host-PC to handle other tasks in parallel. Compatible with CompuScope Software Development Kits, eXpert™ options may be integrated into custom test applications.

eXpert™ Peak Detection

Allows users to detect peaks within a set of digitized waveform data. Peak Detection is a widely used data analysis and reduction technique.

- Peak information consists of the maximum and minimum values within a waveform and their positions
- Compact Channel Peak Information Set occupies a data volume of less than 80 Bytes per CompuScope card
- Highly efficient PCI transfer of Peak Information Sets that are accumulated in a circular buffer within the FPGA that is periodically polled and flushed by the controlling software
- Re-arm time within 1~2 microseconds after waveform acquisition

eXpert™ Signal Averaging

Allows users to detect very small signals in noisy environments by making multiple acquisitions of a repetitive waveform and averaging all acquisitions together

- Waveforms may be signal-averaged at a rate of greater than 100,000 waveforms per second
- Maximum waveform length of 48,000 samples
- On-board intelligent processing reduces PCI data traffic by a factor of more than 1,000

eXpert™ Finite Impulse Response (FIR) Filtering

Allows users to filter digitized data from a single waveform acquisition in real-time with a completely flexible and user-customizable FIR filter

- Allows processing by an FIR filter with up to 20 taps; can be extended in software to up to 39 symmetric taps
- FIR filter coefficients can be tailored to emphasize signal pulses of a specific shape
- Data are filtered during transfer to the PC so that the repetitive signal capture rate of the digitizer is not reduced
- FIR filter algorithm covers a wide range of common numerical filters such as moving average filters and Gaussian filters

Analog Output Cards

GaGe offers 12-bit arbitrary waveform generators with speeds of up to 1 GHz. All GaGe arbitrary waveform generators come with easy-to-use Software Development Kits for C/C++, MATLAB and LabVIEW for creating custom applications, and free application software for programming-free operation

CompuGen 11G/11G2

Versatile ultra-high-speed PCI arbitrary waveform generator cards

- 12-bit, 1 GHz arbitrary waveform generator card
- 1 billion conversions per second
- 4 MS (CG11G) or 16 MS (CG11G2) of on-board memory

CompuGen 4300/4302

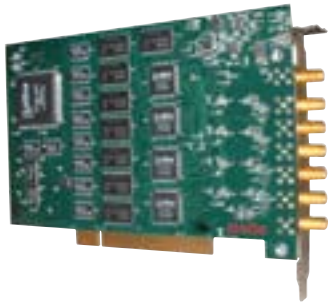
Versatile high-speed PCI arbitrary waveform generator cards

- 12-bit, 300 MHz arbitrary waveform generator card
- 300 million conversions per second
- 4 channels of simultaneous data generation on a single card
- 4 MS (CG4300) or 16 MS (CG4302) of on-board memory

CompuGen 8150/8152

Versatile high-speed PCI arbitrary waveform generator cards

- 12-bit, 150 MHz arbitrary waveform generator card
- 150 million conversions per second
- 8 channels of simultaneous data generation on a single card
- 4 MS (CG8150) or 16 MS (CG8152) of on-board memory



CompuGen 1100

A cost-effective arbitrary waveform generator card for the ISA bus

- 12-bit, 80 MHz arbitrary waveform generator card
- Up to 16 MS of on-board memory
- 80 million conversions per second
- 12.5 ns time resolution
- Multi-card systems with up to 8 channels of simultaneous data generation

Digital Input/Output Cards

GaGe offers digital input and digital output cards for the PCI, CompactPCI/PXI and ISA bus. All GaGe digital input and digital output cards come with GageBit software for the creation and editing of digital patterns.

CompuScope 3200

A versatile PCI digital capture card with logic analyzer characteristics for electronic test

- Capture 32 bits of digital data
- 100 MHz clock rates
- Software-configurable to provide 8, 16, or 32 bits
- TTL/CMOS or ECL/PECL data inputs
- Up to 2 GB of on-board acquisition memory
- External Clock and External Trigger capabilities
- Multi-card systems providing wider input words of 64, 96, or 128 bits
- Easy-to-use SDKs for C/C#, MATLAB, and LabVIEW available for creating custom applications

CompuScope 3200C

A versatile CompactPCI/PXI digital capture card with logic analyzer characteristics for electronic test

- Capture 32 bits of digital data
- 100 MHz clock rates
- Software-configurable to provide 8, 16, or 32 bits
- Up to 2 GB of on-board acquisition memory
- External Clock and External Trigger capabilities
- TTL/CMOS or ECL/PECL data inputs

CompuGen 3250

A cost-effective digital output card for the ISA bus

- 32-bit digital output
- 50 MHz clock rate
- Crystal-based clock source
- One-shot, multi-shot or endless looping of digital patterns
- Up to 256-bit output using an 8 card Master/Slave system
- Easy-to-use Software Development Kits for C/C++, LabVIEW and MATLAB included for custom programming

NEXUS 802.11 WiFi Testing System

This complete low-cost turn-key Wireless Testing System provides all signal generation / analysis hardware and software required for complete testing of 802.11 a, b, g, and n wireless devices.

GaGe NEXUS 802.11 WiFi Testing Systems are capable of generating complex 802.11 testing signals for up-conversion and transmission as well as acquiring and analyzing received and down-converted 802.11 signals.

Reduce design, development and testing time and cost for all your 802.11 devices with a NEXUS System featuring:

- Integrated high-resolution A/D and D/A
- Up to 100 MHz IF, 40 MHz Bandwidth
- Complete 802.11 a, b, g and n software
- Error Vector Magnitude measurements of -46 dB
- True MIMO capability
- Accepts 10 MHz timing reference standards
- Low price
- Scalability

All NEXUS Systems are equipped to accept a 10 MHz reference signal, which is used to synchronize internal conversion clocks so that the greatest possible timing accuracy and stability may be obtained. 10 MHz reference signals may be provided by GPS (IRIG) or atomic clock standard sources.

All NEXUS Systems come equipped with WLAN Wireless Testing software. Both stand-alone WLAN generation and analyzer software applications allow complete creation and analysis of 802.11 a, b, g and n wireless signals.

Instrument Mainframes

GaGe offers ruggedized computers featuring embedded Pentium processors designed to house one or more CompuScope and CompuGen cards.

Instrument Mainframe 7500

High-quality ruggedized portable enclosures for PCI and ISA CompuScope and CompuGen cards

- Built-in 14.1 inch color LCD screen
- Detachable keyboard and mouse
- 4 free full-length PCI slots
- Backplane model with 7 PCI and 2 ISA slots
- Qualified PCI motherboard (7500) or backplane (7500BP)
- Pentium IV processor
- High-quality, 400 Watt power supply
- IMF7500 card-retention mechanism
- Extra-wide slot opening

Instrument Mainframe 2000

High-quality ruggedized enclosures for PCI and ISA CompuScope and CompuGen cards

- Up to 17 slot capability
- 400 Watt power supply
- 128 CFM forced-air cooling
- Shock-mounted drive bay
- 19" rackmount option
- Qualified PCI backplane

Instrument Mainframe 8000C

High-quality ruggedized enclosures for cPCI/PXI CompuScope cards

- 7-slot capability
- High-quality, 550 Watt power supply
- 217 CFM forced-air cooling
- 19" rackmount option
- Qualified CompactPCI backplane
- Seamless extension of PC's PCI bus

GaGe Measurement Systems

GaGe Measurement Systems are complete turn-key systems that have been customized to meet the specific application requirements of our customers. They consist of a mix of CompuScope and CompuGen cards housed in an Instrument Mainframe and controlled by GageScope software or by one of the Software Development Kits (SDKs) offered by GaGe.

As there are numerous GaGe Measurement System configurations possible, customers can contact our qualified Application Engineers to discuss their particular needs.

Who needs a GaGe Measurement System

Customers require GaGe Measurement Systems for complex test and measurement applications that require either mixed mode (analog and digital) measurements, stimulus-response (synchronized input and output) measurements, or multi-channel oscilloscope systems.

Why use a GaGe Measurement System

Hardware Integration - Complete integration of GaGe hardware is provided with every GaGe Measurement System. This includes assurance of adequate slot count and sufficient forced-air cooling. Furthermore, power budgeting on all DC supply voltages ensures worry-free system operation. Finally, custom card-retention bracketing ruggedizes the system for transportability.

Software Integration - All PC-based instruments are heavily dependent on software. A typical GaGe Measurement System is accompanied by a small application written by GaGe's System Integration group to prove the operation of the system, as described in the mutually agreed-upon Acceptance Test.

Acceptance Testing - Perhaps the most appealing part of a GaGe Measurement System is that GaGe's Applications Engineers and the customer work together to create a well defined Acceptance Test that proves the operation of the system. Since a GaGe Measurement System consists of one or more CompuScope and/or CompuGen cards configured to a particular customer's requirement, the Acceptance Test document serves the dual purpose of final Quality Control at GaGe as well as a documented testing procedure for the customer's specific configuration.

GaGe Measurement System Case Study

Airborne Deep Memory Communications Monitoring System

A military engineering support group searched for a solution capable of continuously capturing a communications signal at 100 MS/s for 30 seconds. The application required a minimum of 12 bits of vertical digitizer resolution in order to provide sensitivity to the high dynamic range communications signal. The raw communications signal with a ~GHz frequency carrier is mixed-down to a lower Intermediate Frequency (IF) on the order of 50 MHz.

While a minimum of 12 bits of resolution was required, the customer requested as much resolution as possible.

The Solution

GaGe recommended the CS14100, a 14 bit, 100 MS/s digitizer card for the PCI bus, featuring an impressive 70 dB SFDR and 63 dB SNR.

In order to capture and store the required 30 seconds of uninterrupted data, the minimum amount of on-board acquisition memory required is 100 MS/s × 30 sec. = 3000 MS, or 3 GigaSamples. At the time, the maximum amount of on-board memory available on a high-resolution digitizer card was 1 GS*.

GaGe produced a custom turnkey GaGe Measurement System consisting of three CS14100 digitizer cards, each with the maximum-available 1G of on-board memory, all housed into a chassis. The housing chassis was a GaGe Instrument Mainframe computer, running Windows 2000, with forced-air ventilation and a card-retention mechanism for the rugged airborne environment.

The 3 CS14100s were arranged in a Domino configuration, where triggering and clocking signals were cascaded amongst the 3 digitizer cards so that each card's on board memory was filled in succession.

Custom software was also provided in order to correct for the slight misalignment of the seam separating each of the 3 data sets from the three digitizers due to small internal fixed timing delays. Although the misalignment was only a few points, the customer required perfect seam matching for signal features that straddled the seams.

GaGe's solution required minimal software modifications and used straightforward external cabling to integrate three off-the-shelf products in order to deliver a complete turnkey solution to solve the customer's application.

*GaGe has since launched a series of high-resolution digitizer cards with up to 2 GS of on-board acquisition memory.

GaGe Measurement System Case Study

Portable Generator/Receiver System for Medical Ultrasonics

A supplier of medical ultrasonic systems required a portable and flexible system for the generation and reception of ultrasonic signals. In order to obtain more sensitivity to biological tissue echoes, this customer used an advanced method of ultrasonic transducer excitation. Instead of generating the usual pulse-like excitation signal, the customer wanted to excite the ultrasonic transducer using a chirp, which is a long tone pulse whose frequency increases with time. While analysis becomes more complex, chirp signals allow transducers to be excited using more energy, which is spread throughout the chirp duration. Flexible triggering and clocking are fundamental requirements of this technique.

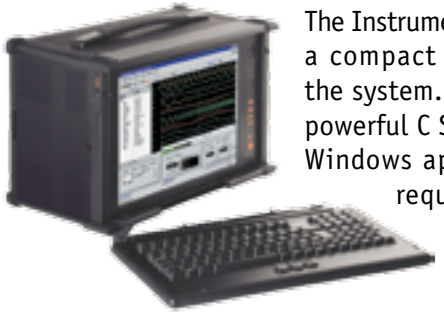
The Solution

GaGe provided a CompuScope 14200 and a CompuGen 4300 housed within an Instrument Mainframe 7500 lunchbox PC as a flexible and portable solution for the customer's requirement.

The CS14200 provides 14 bits of vertical resolution for the detection of small reflected signals from the ultrasonic receiver transducer. The 200 MS/s sampling was sufficient for sampling the customer's ultrasonic signals, whose frequencies are less than 20 MHz.

The CG4300 was connected to the customer's ultrasonic generation transducer, through a high-voltage driving amplifier. Using the CG4300's 300 MHz clocking rate, the user is able to create and generate any arbitrary chip-like excitation signal with a vertical resolution of 12 bits.

A crucial element of the customer's requirement is the ability to synchronously clock and trigger the CS14200 and CG4300. The CS14200 is equipped with Trigger In, Trigger Out, Clock In and Clock Out connectors. The CG4300 is equipped with all of these except for Clock Out, which may be created on one of the CG4300's four output channels. The advanced timing capabilities of the GaGe cards provided the customer with absolute clocking and triggering flexibility for signal synchronization.



The Instrument Mainframe 7500 provides a compact and portable package for the system. The customer used GaGe's powerful C SDK to create a customized Windows application targeted to the required analysis and display of the medical ultrasonic data.

Other examples of GaGe Measurement Systems

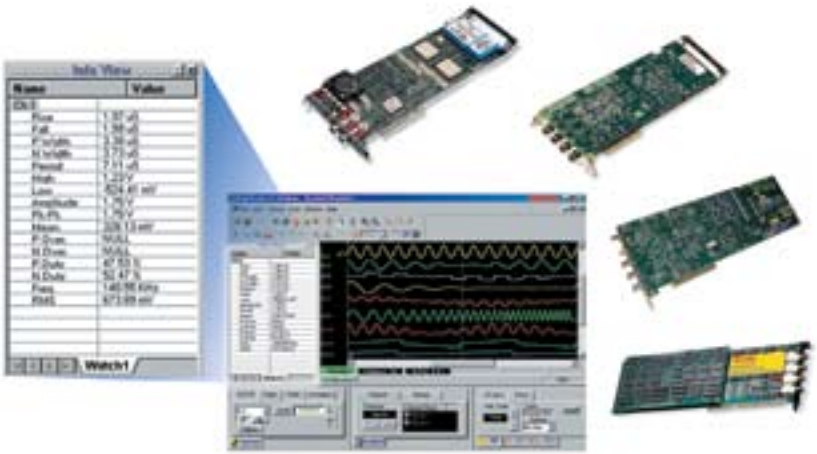
- 16-channel, 1 GS/s, 8-bit A/D system for mammography
- 12-channel, 14-bit, 200 MS/s system for explosion testing
- 128-bit digital input/output system for WiFi standard testing

Software

GaGe offers a comprehensive library of powerful and easy-to-use applications and Software Development Kits (SDKs) to assist you with your CompuScope and CompuGen cards.

Application Software

Programming-free operation with powerful and easy-to-use applications for your CompuScope and CompuGen cards. GageScope Lite, CGWIN, CGTest, and GageBit are available free of charge.



GageScope Software

The world's most powerful PC oscilloscope software

- No programming required!
- Capture, display and generate up to 60 channels
- Acquisition, display, storage and analysis of data sets up to 2 GS
- Quick data transfer to analysis packages such as MATLAB, Mathcad, and LabVIEW
- Powerful features include FFT Analysis, Waveform Parameters, Averaging, AutoSave, Extended Math...
- GageScope Lite is included with all CompuScope digitizer cards and can be upgraded to Standard or Professional editions
- For Windows 98/ME and Windows NT/2000/XP

Other Free Application Software

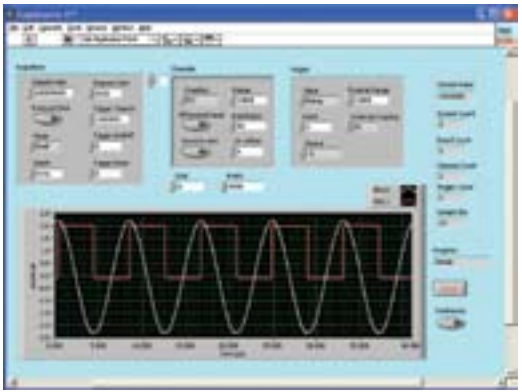
- **CompuGen Application (CGWIN)**: Windows-based application software for controlling ISA bus CompuGen cards
- **CGTest**: Windows-based application software for controlling PCI bus CompuGen cards
- **GageBit**: Allows control of all parameters of GaGe digital input or output cards from within one Windows-style dialog box

Software Development Kits

GaGe offers powerful and easy-to-use SDKs to help you integrate your CompuScope and CompuGen cards into your own software application, or create a custom application to suit your needs.

CompuScope SDKs

- Available for LabVIEW, C/C#, and MATLAB. Support available for other programming environments such as Visual Basic and LabWindows/CVI.
- Full control of configuration settings from all sample programs
- Full-featured sample programs to illustrate usage for all CompuScope operating modes and hardware combinations
- Easy querying for feedback on all current CompuScope hardware settings
- One universal software interface that controls all CompuScope cards to provide scalability (additional options, memory, etc.)



- Full support for advanced timing features such as on-board time-stamping, external clocking and 10 MHz reference synchronization
- Driver re-entrancy, which allows simultaneous operation of CompuScope hardware from different sample programs
- Transparent support for Master/Slave Multi-Card CompuScope systems
- Extra Advanced sample programs for support of CompuScope eXpert™ firmware options
- Comprehensive documentation on all aspects of CompuScope Software Development Kit usage
- Separate programming entry points for intermediate and advanced programmers

CompuGen SDKs

- Provided free with purchase of CompuGen PCI and ISA analog output (arbitrary waveform generator) and digital input cards
- Available for LabVIEW, C/C++ and MATLAB
- Easy querying for feedback on all current CompuGen hardware settings
- Transparent support for Master/Slave Multi-Card CompuGen ISA bus systems

Data Acquisition Solutions from KineticSystems

KineticSystems, a DynamicSignals LLC (www.DynamicSignals.com) brand, designs, manufactures and services high-performance data acquisition and control products based on CompactPCI, PXI, VXI, and CAMAC standards.

KineticSystems' products and systems have been used world-wide to perform cutting-edge research and development in the aerospace, automotive, and scientific laboratory markets.

Established in 1970, KineticSystems has a wealth of experience in solving the most demanding applications, from R&D to manufacturing test and ATE systems, with a wide range of COTS and custom systems and synthetic instrument-ready modules.

For full product line information and datasheets, go to **www.kscorp.com**.

KineticSystems has a full line of versatile data acquisition and control products such as:

- Mainframes
- Computer interfaces and controllers
- ADC modules
- Signal conditioners and programmable filters
- DAC and waveform generator modules
- Discrete I/O modules
- Stepper motor indexers
- Relay multiplexers
- Frequency counters
- Digitizers
- Termination panels
- Portable data acquisition systems

Delivering Results You Can Trust

GaGe's technical support team is dedicated to your success. We are committed to provide you with superior service and product support. Our customer support team can help you in various tasks from product installation, software activation, setup, API programming, application software assistance and much more.

Visit our Web site (www.gage-applied.com/support) today for instant access to our complete support tools and services such as:

- Frequently Asked Questions
- Software/Driver and User Manual downloads
- Application Requests
- Support Request forms
- Warranty and RMA Policies

Outstanding Customer Support

We take pride in the outstanding support we offer to our customers. We stand behind our products and ensure that we deliver the high quality and reliability that our customers have come to expect from GaGe.

Contact Us

For quick and easy access to our customer support specialists, visit our web site at www.gage-applied.com/support or send an email to tech-support@gage-applied.com.

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PCI LOCAL BUS

PXI™ Systems Alliance