We offer the widest range of high-speed digitizers and instrumentation cards available on the market today. Our powerful PC-based instrumentation products allow you to create reliable, flexible and high-performance solutions quickly and easily.

Reduce development time and costs for testing complex applications such as radar, wireless communications, spectroscopy, etc. by using our Windows-based application software or our SDKs.

## APPLICATIONS

Communications & wireless
Military & Aerospace
Non-destructive testing
Synthetic instrumentation
Electro-optic
Laser/Radar

# Gage Measurement Systems

## Guaranteed performance in customized turn-key solutions

A broad mix of analog and digital input and output cards can be combined with a variety of software environments and housed in an appropriate Instrument Mainframe to create a cost effective, COTS-based solution for your most demanding test and measurement challenges.

## FEATURES

- 2 GS/s A/D sampling on one channel
- 1 GS/s A/D sampling on two channels
- Up to 1.2 GHz bandwidth
- 8 bit resolution
- Up to 16 M memory buffer
- Bus mastering design
- Pre-Trigger Multiple Record mode
- Compatible with GageScope® oscilloscope software
- Software Development Kits available for LabVIEW, MATLAB, C/C#, LabWindows/CVI

## WHAT IS A GAGE MEASUREMENT SYSTEM

A Gage Measurement System consists 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.

CompuScope cards can be of the same type (3 CompuScope 82G cards) or different (1 CompuScope 14100, 1 CompuScope 82G and one CompuGen 1100).

CompuScope and CompuGen cards can either be in Master/Slave configuration or Multiple/Independent.

## WHO NEEDS A GAGE MEASUREMENT SYSTEM

A typical customer of Gage Measurement Systems is any scientist or engineer with a complex test and measurement application that requires either mixed mode (analog and digital) measurements, stimulus-response (synchronized input and output) measurements or multi-channel oscilloscope measurements.

## WHY USE A GAGE MEASUREMENT SYSTEM

If box-level instruments such as oscilloscopes, waveform generators, logic analyzers and spectrum analyzers cannot solve a measurement problem on their own due to their limited flexibility and feature-set, a Gage Measurement System is the only solution.

Such a system uses hardware and software instrument building blocks (IBBs) manufactured by Gage to create a complete solution for a particular problem. This is an ideal compromise between a very expensive, totally custom-built system and a non-flexible, box-level solution such as an oscilloscope.

In other cases, a Gage Measurement System may be the only equipment that can solve a particular measurement problem.

## SIZE REDUCTION

One of the advantages a Gage Measurement System brings to the market is the tremendous reduction in size that can be achieved by housing instrument cards inside an Instrument Mainframe, rather than mounting them in a rack.

For example, one semiconductor customer required 16 channels of simultaneous acquisition at 5 GS/s. Such capability is impossible in the traditional box-style oscilloscopes. A Gage Measurement System with 8 CompuScope 85G working under a C++ program written using the C/C++ SDK was able to solve the problem that had stumped all other oscilloscope companies.

## SYSTEM SYNCHRONIZATION

Coherent acquisition and generation systems are very important in wireless communication, radar and ultrasound applications.

Coherence requires the clocking of oscilloscopes and waveform generators to be synchronized, in order to minimize phase jitter in the system. External clock inputs of CompuScope cards can be tied to the Clock Out signal of CompuGen cards, and vice-versa, to achieve such synchronization at minimal incremental cost.

## SOFTWARE INTEGRATION

All PC based instruments are heavily dependent on software. Gage Measurement Systems take software integration to new heights, as the customer's requirement can be translated into a proof-of-concept software application written in the customer's preferred language.

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

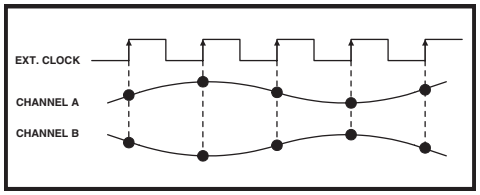
Perhaps the most user-friendly part of a Gage Measurement System is that Gage's Applications Engineers and the customer work together to create a well defined, clearly articulated Acceptance Test that proves the operation of the system beyond the shadow of a doubt.

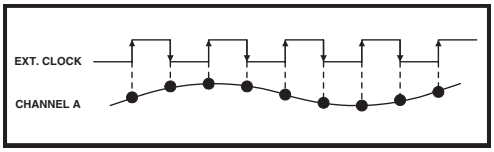
Since a Gage Measurement System consists of one or more CompuScope and/or CompuGen cards configured to a particular customer's requirement, a fully documented testing procedure may or may not exist for that exact configuration. This mutually agreed-upon Acceptance Test document serves the dual purpose of final Quality Control at Gage as well as customer's incoming Quality Control.

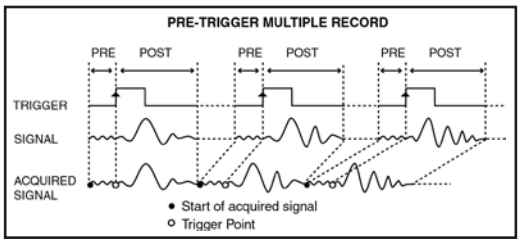
Charges resulting from software development for the Acceptance Test will be billed to the customer. The exact charges will depend upon the complexity of the work.

Customers who may not have all the equipment needed to verify and approve their Gage Measurement System, are welcome to visit the Gage factory to witness the Acceptance Test. An appointment needs to be made at least 4 weeks in advance to book an appropriate time slot.

Customers with valid credit have a guarantee that they will not have to pay a single cent to Gage or its distributors until the system passes the Acceptance Test.




## SYSTEM REQUIREMENTS

PCI-based computer with at least one free full-length PCI slot, 128 MB RAM, 50 MB hard disk and SVGA video.

## SIZE

Single-slot full-length card 13" x 4.1" x 0.8"

POWER (in Watts)

| +5 Volts | Worst Case | Typical | PowerDown |
|---|---|---|---|
| 2 M | 25.0 | 22.0 | 10.0 |
| 8 M | 26.2 | 23.2 | 11.2 |
| 16 M | 27.0 | 24.0 | 12.0 |
| **-5 Volts** | **Worst Case** | **Typical** | **PowerDown** |
| All Mem Depths | 0 | 0 | 0 |
| **+12 Volts** | **Worst Case** | **Typical** | **PowerDown** |
| All Mem Depths | 35.0 | 32.0 | 5.0 |
| **-12 Volts** | **Worst Case** | **Typical** | **PowerDown** |
| All Mem Depths | 3.0 | 3.0 | 3.0 |

Note: Auxilary Power cable must be connected

## CHANNELS A & B

Number of Inputs per card: 2

†Impedance: 1 MΩ, 25 pF or 50 Ω, software-selectable

†Coupling: AC or DC, software-selectable

Resolution: 8 bits

†Typical DC Coupled Bandwidth:

| | 50 Ω BW Dual | 50 Ω BW Single | 1 MΩ BW Dual | 1 MΩ BW Single |
|---|---|---|---|---|
| ±100mV | N/A | N/A | 250 MHz | 200 MHz |
| ±200mV | 250 MHz | 150 MHz | 300 MHz | 200 MHz |
| ±500mV | 400 MHz | 300 MHz | 300 MHz | 250 MHz |
| ±1V | 400 MHz | 300 MHz | 300 MHz | 250 MHz |
| ±2V | 400 MHz | 300 MHz | 300 MHz | 250 MHz |
| ±4V | 400 MHz | 300 MHz | N/A | N/A |
| ±5V | N/A | N/A | 300 MHz | 250 MHz |
| ±10V | N/A | N/A | 300 MHz | 250 MHz |

Lower Frequency Limit, AC Coupled:

| | |
|---|---|
| 1 MΩ input: | 10 Hz |
| 50 Ω input: | 20 kHz |

†Input Voltage Ranges:

| | |
|---|---|
| 1 MΩ Input: | ±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V, ±10V |
| 50 Ω Input: | ±200mV, ±500mV, ±1V, ±2V, ±4V |

Absolute Maximum Continuous Voltage Input:

| | |
|---|---|
| 1 MΩ Input: | ± 15 Volts (continuous) |
| 50 Ω Input: | ± 5 Volts (continuous) |

DC Accuracy relative to full scale input: ± 2 % of full scale input

Sampling Rate:

| | | |
|---|---|---|
| Single Channel Mode: | GS/s: | 2, 1 |
| | MS/s: | 500, 250, 200,100, 40, 20 |
| Dual Channel Mode: | GS/s: | 1 |
| | MS/s: | 500, 250, 125, 100, 50, 20, 10, 5, 2, 1 |
| | S/s: | 500, 200, 100 |

†Input Protection: Diode clamped for 1 MΩ input only

Connector: BNC

## †DYNAMIC PARAMETERS

Measured using 10 MHz sine wave input at 1 GS/s in dual-channel mode on Channel A with amplitude of 95% of full scale on the ±1V range. Typical values listed below.

| | |
|---|---|
| SNR: | 45 dB |
| SFDR: | 55 dB |
| SINAD: | 44 dB |
| THD: | -52 dB |
| ENOB: | 7.2 bits |

## ACQUISITION MEMORY

| | |
|---|---|
| Data Storage: | In on-board memory |
| Memory Size: | 2M, 8M or 16M samples |
| Maximum Memory Depth: | |
| Single Channel Mode: | Up to full on-board memory |
| Dual Channel Mode: | Up to half on-board memory/ch |

## †TRIGGERING

| | |
|---|---|
| Number of Trigger Inputs: | 1 per system |
| Source: | CH A, CH B, EXT or Software |
| Type: | Analog triggering |
| Sensitivity: | ±10 % of full scale |
| Level Accuracy: | ±5 % of full scale |
| Slope: | Positive or Negative, software selectable |
| Post-Trigger Data: | 256 *(512)* points minimum. Can be defined with a 128 *(256)* point resolution in dual *(single)* channel mode. |

## EXTERNAL TRIGGER

| | |
|---|---|
| Impedance: | 1 MΩ, 25 pF |
| Amplitude: | Absolute Maximum ±15 Volts |
| Voltage Range: | ±1 V and ±5 V |
| Bandwidth: | 300 MHz |
| Coupling: | AC or DC |
| Connector: | BNC |

## INTERNAL CLOCK

| | |
|---|---|
| Source: | SAW oscillator |
| Accuracy: | ±200 ppm |

## EXTERNAL CLOCK (OPTIONAL)

| | |
|---|---|
| Maximum Frequency: | 1 GHz |
| Minimum Frequency: | 10 MHz |
| Signal Type: | Sine Wave |
| Signal Level: | MINIMUM 225 mV RMS<br>MAXIMUM 500 mV RMS |
| Impedance: | 50 Ω |
| Sampling Edge: | Rising only (Dual-channel)<br>Rising & Falling (Single-channel) |
| Coupling: | AC |
| Single Channel Duty Cycle: | 50% ± 5 % Single/Dual |

## MULTIPLE RECORD

| | |
|---|---|
| Pre-trigger Data: | Up to 32K points |
| Record Length: | 256 *(512)* points minimum. Can be defined with a 128 *(256)* point resolution in dual *(single)* channel mode |
| Maximum Number of Triggers: | 21,845 (with 16M model) |
| Re-Arm Time: | 152 *(304)* sample clock cycles in dual *(single)* channel mode |

## MULTI-CARD SYSTEMS

| | |
|---|---|
| Operating Mode: | Master/Slave or Multiple Independent |
| Number of Cards: | |
| Master/Slave: | 2, 4, 6 or 8 cards |
| Multiple/Independent: | Limited by backplane |

## MASTER/SLAVE SYSTEM TRIGGERING

| | |
|---|---|
| Number of Trigger Inputs: | 1 per system |
| Trigger Source: | CH A, CH B, EXT or Software (Master card only) |
| Sensitivity : | ± 10% of full scale |
| Level Accuracy : | ± 5% of full scale |
| Trigger Slope: | Positive or Negative, software selectable |

## PCI BUS INTERFACE

| | |
|---|---|
| Plug-&-Play: | Fully supported |
| Bus Width: | 32 bits |
| Bus Speed: | 33 MHz |
| Compatibility: | 5 Volt PCI-compliant slot |

## OPERATING SYSTEMS SUPPORTED

| | |
|---|---|
| Windows 98/ME/NT* | CompuScope Driver version †3.60.22 |
| * Version 4, SP3 or higher | |
| Windows 2000**/XP | CompuScope Driver version 4.xx.xx |
| ** SP1 or higher | |

## APPLICATION SOFTWARE

GageScope: Windows-based software for programming-free operation

| | |
|---|---|
| LITE Edition: | Included with purchase, provides basic functionality |
| Standard Edition: | Provides limited functionality of advanced analysis tools, except for Extended Math |
| Professional Edition: | Provides full functionality of all advanced analysis tools |

## SOFTWARE DEVELOPMENT KITS (SDK)

CompuScope SDK for C/C# for Windows
CompuScope SDK for MATLAB for Windows
CompuScope SDK for LabVIEW for Windows
CompuScope SDK for LabWindows/CVI for Windows

## ENVIRONMENTAL

| | |
|---|---|
| Operating Temperature: | 5 degree Celsius to 40 degree Celsius |
| Relative Humidity: | Less than 80%, non-condensing |
| Maximum Altitude: | 2,000 meters |

## ELECTROMAGNETIC COMPATIBILITY

EC Council Directive 89/336/EEC
EN 61326 Class A, AS/NZS 2064
Compliance demonstrated on a single card configuration

## MATERIALS SUPPLIED

One CompuScope 82G card
One Hardware Manual
One Gage CompuScope CD
Includes GageScope Lite Edition Software

## WARRANTY

One year parts and labor

All specifications subject to change without notice; specifications are not guaranteed under all possible combinations of modes of operation

†These specs differ slightly on the CompuScope 82G - 1 GHz Bandwidth version. Please refer to the *1 GHz Bandwidth version* section on page 4 of this datasheet for specs on this model.

## ORDERING INFORMATION

| | |
|---|---|
| **Hardware & Upgrades** | |
| CompuScope 82G-2M | 820-001-001 |
| CompuScope 82G-8M | 820-001-002 |
| CompuScope 82G-16M | 820-001-003 |
| CS82G-1GHz BW-2M | 820-181-201 |
| CS82G-1GHz BW-8M | 820-181-202 |
| CS82G-1GHz BW-16M | 820-181-203 |
| External Clock Upgrade | 820-181-001 |
| Master Multi-Card Upgrade | 820-181-002 |
| Slave Multi-Card Upgrade | 820-181-003 |
| Memory Upgrade | Contact Factory |
| CS82G: Upgrade to 1GHz Bandwidth | 820-181-205 |
| CS82G: Upgrade to 1GHz Bandwidth with Internal Trigger | 820-181-206 |
| **GageScope® Software** | |
| GageScope: Lite Edition | Included |
| GageScope: Standard Edition (with Purchase of CompuScope Hardware) | 300-100-351 |
| GageScope: Professional Edition (with Purchase of CompuScope Hardware) | 300-100-354 |
| **Software Development Kits (SDKs)** | |
| Gage SDK Pack on CD | 200-113-000 |
| CompuScope SDK for C/C# | 200-200-101 |
| CompuScope SDK for MATLAB | 200-200-102 |
| CompuScope SDK for LabVIEW | 200-200-103 |
| CompuScope SDK for LabWindows/CVI | 200-300-100 |

*All Upgrades performed at the factory.*

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