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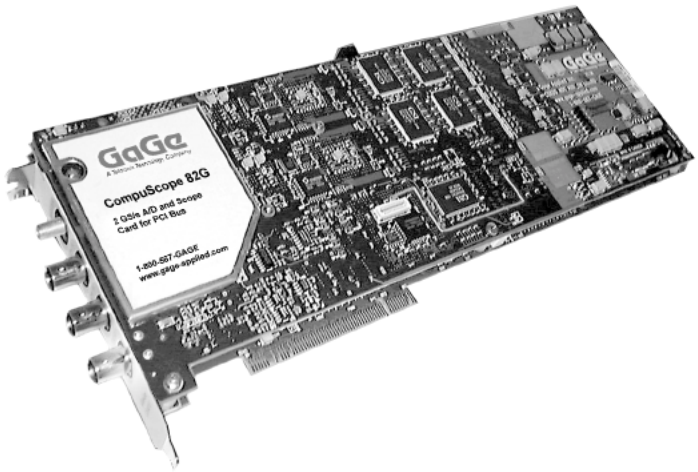
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Find the *DynamicSignals / GaGe CompuScope 82G* at our website: *Click HERE*

CompuScope 82G

Ultra-fast waveform digitizer card for PCI bus



Top performance general-purpose digitizer with the versatility and ease of integration to satisfy the most demanding applications.

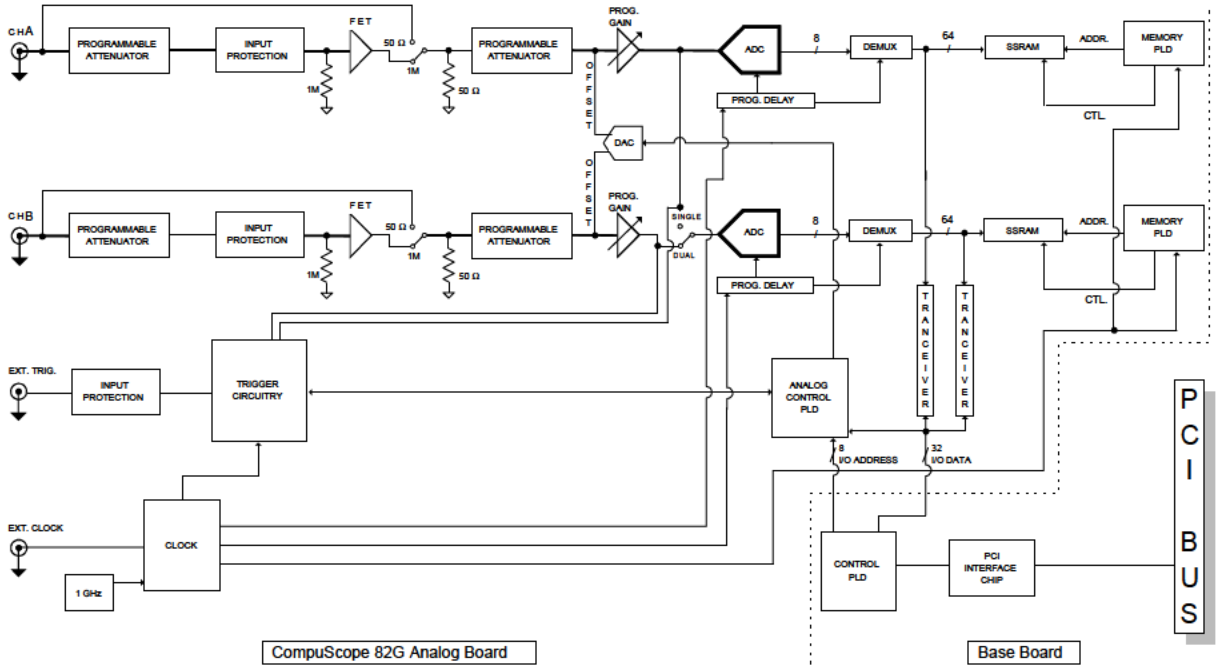
FEATURES

- 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
- GageScope compatible

APPLICATIONS

Non destructive testing
Synthetic instrumentation
Communications & wireless
Electro-optic
Laser/Radar
High energy physics
Embedded digitizer
Scope replacement

CompuScope 82G Simplified Block Diagram



COMPUSCOPE 82G

CompuScope 82G is a single slot, PCI bus card capable of performing 8 bit A/D conversion at sampling rates up to 2 GS/s in one-channel mode and 1 GS/s in dual channel simultaneous mode.

2 GS/s SAMPLING

The CS82G uses two monolithic A/D converters each running at 1 GS/s.

In single-channel mode the two ADCs are clocked in a “ping-pong” mode to achieve up to 2 GS/s sampling.

In dual channel mode, the two ADCs are clocked absolutely simultaneously to provide coherent sampling.

An on-board clock oscillator and related timing circuit ensures timebase accuracy and long-term thermal stability of sampling rates.

HIGH IMMUNITY TO DIGITAL NOISE

In order to isolate the high-frequency analog circuitry from PCI bus-related digital electronics, a two-board piggyback configuration is used. This scheme allows maximum separation of analog and digital grounds, thereby providing high immunity to digital noise.

MEMORY DEPTH

CompuScope 82G is available with memory depths of 2 MegaSamples, 8 MegaSamples and 16 MegaSamples. This memory can be used as a circular buffer for storage of pre- and post-trigger data.

In the single-channel mode, the maximum number of sample points is equal to the memory depth of the CompuScope 82G model being used, whereas in the dual-channel mode the maximum number of sample points is half the memory depth.

The data stored in the CompuScope 82G memory can be transferred to the system RAM for post-processing, display or storage to hard disk without any interface bus (no GPIB bus required).

The powerful Multiple Record feature, standard on version 1.3 and higher CompuScope 82G cards, allows further optimization of the on-board memory.

BUS MASTERING

CompuScope 82G is fully capable of becoming a PCI bus master in order to transfer data at rates up to 80 MB/s.

A PCI bus master is a card which can take control of the bus and transfer data to any PCI target device, such as system RAM, without any involvement from the host CPU.

This capability acts as enabling technology for many applications which were previously impossible to accomplish due to slow data transfer rates of traditional DSOs.

Gage’s advanced software drivers allow this fast throughput to be exploited by user applications written in various Windows environments.

PROGRAMMABLE INPUT AMPLIFIERS

CompuScope 82G offers completely programmable input amplifiers, including coupling, impedance, gain and offset.

Each channel is independently programmable, allowing different settings on different channels.

FLEXIBLE TRIGGERING

CompuScope 82G features state-of-the-art analog triggering.

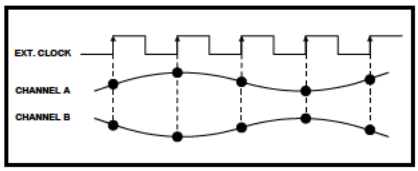
An analog comparator provides triggering from the input channel, from an external signal or from software.

In addition to the trigger source, trigger level and slope are also selectable by software, making the trigger system similar to traditional oscilloscopes.

EXTERNAL CLOCK (OPTIONAL)

An external clock upgrade can be ordered from the factory in situations where a special real-time sampling frequency is required or when the digitization must be coherent with the rest of the system.

In dual channel mode, a new sample is taken on every rising edge of the clock.



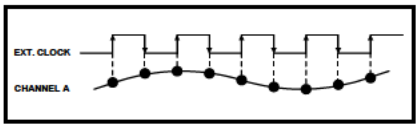
The user is responsible for ensuring that the external clock frequency remains between 10 MHz and 1 GHz.

The external clock signal must be a sine wave signal with a minimum amplitude of 225 mV RMS and a maximum amplitude of 500 mV RMS.

Care should be taken to drive the external clock with a low jitter clock source in order to maximize signal conversion fidelity.

EXTERNAL CLOCK UPGRADE FOR SINGLE CHANNEL MODE

CompuScope 82G uses both rising and falling edges of the external clock in order to sample in single channel mode.



This scheme was adopted to allow easier driving of clocks into the external clock input.

As a result, the external clock frequency must be half that of the desired sampling rate and the duty cycle of the signal must be 50%. If the duty cycle is not 50%, sampling will not be uniform in single channel mode.

The user is still responsible for ensuring that the external clock frequency remains between 10 MHz and 1 GHz.

ADVANCED WINDOWS DRIVERS

CompuScope 82G is supported by Gage's advanced, 32 bit Windows drivers which are fully compatible with Windows 95/98/ ME/NT/ 2000/XP.

GageScope Software and Gage's SDKs both use these drivers to provide optimal performance.

MULTIPLE RECORD

Even though the PCI bus allows very fast data throughput to system RAM, there may still be applications in which data bursts cannot be off-loaded either because of very fast trigger repeat frequency or because of software limitations.

Multiple Recording allows CompuScope 82G to capture data on successive triggers and stack it in the on-board memory. The minimum record size is 256 samples in dual channel mode and 512 samples in single channel mode. CompuScope 82G models with 16M of acquisition memory provide up to 21,845 records which can be captured in Multiple Record mode.

The CompuScope 82G is capable of capturing pre-trigger data in Multiple Record mode. Software can configure the CompuScope 82G to capture between 0 and 32K points of pre-trigger data.

GageScope Software can display the stacked data as individual acquisitions. Software drivers also provide support for accessing Multiple Record data.

Once the CS82G has finished capturing a Multiple Record segment, the trigger circuitry is automatically re-armed within 152 sample clock cycles in dual channel mode (304 sample clock cycles in single channel mode) to start looking for the next trigger. No software intervention is required.

Multiple Recording is useful for applications in which a series of bursts of data have to be captured in quick succession and there is not enough time to off-load the data to the system RAM.

1 GHz Bandwidth Version of CS82G

A version of CompuScope 82G is available with 1 GHz enhanced bandwidth.

With 1 GHz bandwidth, the compuScope 82G widens the precision and range of applications of fast digitizers. The enhanced bandwidth minimizes the distortion of high frequency components, improving the characterization of very fast transients from laser pulses and high speed electronic signals. While sampling at 2 GS/s, the new CompuScope 82G-1GHz allows undersampling, all the way up to the Nyquist frequency, of continuous periodic signals to extract important spectral information. A better frequency response also enables more reliable I&Q measurements in communication systems. The CompuScope 82G is the tool of choice for your critical test and measurements applications.

Internal Triggering is optional for the CompuScope 82G equiped with the 1 GHz bandwidth.

Some of the standard CompuScope 82G specifications are affected when purchasing the 1 GHz bandwidth version. Please see the detailed specifications on the next page for more information.

ORDERING INFORMATION

Hardware & Upgrades

CompuScope 82G-2M	820-001-001
CompuScope 82G-8M	820-001-002
CompuScope 82G-16M	820-001-003
CS82G Memory Upgrade Charge	820-181-200
External Clock Upgrade	820-181-001
Master Multi-Card Upgrade	820-181-002
Slave Multi-Card Upgrade	820-181-003
CS82G-1GHz Bandwidth - Upgrade	820-181-205
CS82G-1GHz Bandwidth - 2M	820-181-201
CS82G-1GHz Bandwidth - 8M	820-181-202
CS82G-1GHz Bandwidth - 16M	820-181-203
CS82G-1GHz Internal Trigger Option	820-181-204

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

All Upgrades performed at the factory.

1 GHz Bandwidth Version

*Specification changes for CS82G boards featuring 1 GHz bandwidth:

Impedance: 50Ω
Coupling: DC
Full Scale Input Voltage:
Single Channel Mode: ±500 mV
Dual Channel Mode: ±250 mV
Absolute Max Input: ±1V
Input Protection: Diode Clamped

Specifications Without Internal Triggering:
Bandwidth (Typical):
Single Channel Mode: 1.2 GHz
Dual Channel Mode: 850 MHz

Typical Dynamic Parameters: Measured at specified input at 2 GS/s/1 GS/s (Single/Dual)

	Single Channel		Dual Channel	
	15 MHz	100 MHz	10 MHz	100 MHz
SNR (dB):	43	42	46	44
SFDR (dB):	52	55	54	54
SINAD (dB):	43	43	46	44
THD (dB):	-56	-55	-53	-52
ENOB (bits):	6.8	6.7	7.3	7.0

Specifications With Internal Triggering:
Internal Triggering: Optional
Bandwidth (Typical):
Single Channel Mode: 1 GHz
Dual Channel Mode: 465 MHz

Typical Dynamic Parameters: Measured at specified input at 2 GS/s/1 GS/s (Single/Dual)

	Single Channel		Dual Channel	
	15 MHz	100 MHz	10 MHz	100 MHz
SNR (dB):	43	42	46	44
SFDR (dB):	52	50	55	54
SINAD (dB):	43	41	45	43
THD (dB):	-56	-52	-53	-50
ENOB (bits):	6.8	6.7	7.3	7.0

COMPUSCOPE 82G SPECIFICATIONS

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 V	Worst	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 V	Worst	Typical	PowerDown
All Mem Depths	0	0	0
12 V	Worst	Typical	PowerDown
All Mem Depths	35.0	32.0	5.0
-12 V	Worst	Typical	PowerDown
All Mem Depths	3.0	3.0	3.0

CHANNELS A & B

No. of Inputs: 2
* Impedance: 1 MΩ / 25 pF or 50Ω
* Coupling: AC or DC
Resolution: 8 bits
* Typical DC Coupled Bandwidth:

	50Ω BW Dual	50Ω BW Single	1MΩ BW Dual	1MΩ BW Single
±100 mV	N/A	N/A	250 MHz	200 MHz
±200mV	250 MHz	150 MHz	300 MHz	200 MHz
±500 mV	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
50Ω input: 20 kHz
Full Scale Input Voltage Ranges:
1 MΩ Input: ±100mV,±200mV, ±500mV, ±1V, ±2V, ±5V,±10V
50Ω Input: ±200mV, ±500mV, ±1V, ±2V, ±4V
Absolute Max Continuous Voltage Input:
± 15 Volts for 1 MΩ Input
± 5 Volts for 50Ω Input
DC Accuracy relative to full scale input: ± 2 % of full scale input
Sampling Rate:
Single Ch: GS/s: 2, 1
MS/s: 500, 250, 200,100, 40, 20
Dual Ch: GS/s: 1
MS/s: 500, 250, 125, 100, 50, 20, 10, 5, 2, 1
KS/s: 500, 200, 100
* Input Protection: Diode Clamped for 1MΩ 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 16Msamples
Maximum Memory Depth
Single Channel: Full on-board memory
Dual Channel: Half on-board memory/ch

*TRIGGERING

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
Post-Trigger Data:
Dual Channel: 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 Max ±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

Max. Freq.: 1 GHz
Min. Freq.: 10 MHz
Signal Type: Sine Wave
Signal Level: MIN 225 mV RMS
MAX 500 mV RMS
Impedance: 50Ω
Sampling Edge: Rising only (Dual)
Rising & Falling (Single)
Coupling: AC
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
Max. # 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/Ind: Limited by backplane

MASTER/SLAVE SYSTEM TRIGGERING

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

OPERATING SYSTEMS SUPPORTED

Windows 95/98/ME/NT*/2000/XP
Version 4, SP3 or higher

ELECTROMAGNETIC COMPATIBILITY

CE Compliant

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 Software Disk on CD
One GageScope Lite Edition Software

WARRANTY

One year parts and labor

All specifications subject to change without notice
Specification Last Updated: October 2003

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