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Find the *DynamicSignals / GaGe CompuScope 8500-2M* at our website: *Click HERE*

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

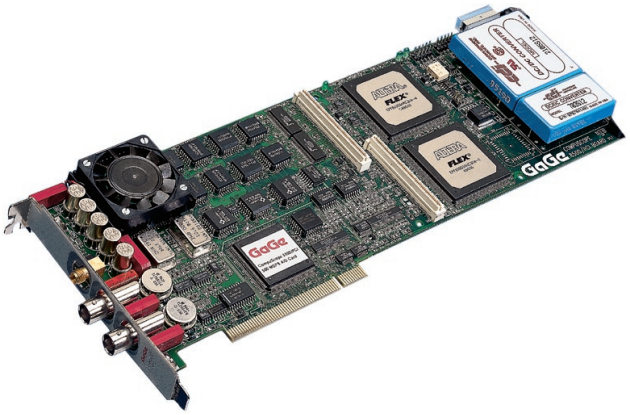
Reduce development time and costs for testing complex applications such as radar, wireless communications, spectroscopy, etc. by using our GageScope software or SDKs.

APPLICATIONS

Non-destructive testing
Military & Aerospace
Communications & wireless
Electro-optic
Radar
Laser
High energy physics
Embedded digitizer

CompuScope 8500

Ultra-Fast Waveform Digitizer Card for PCI Bus



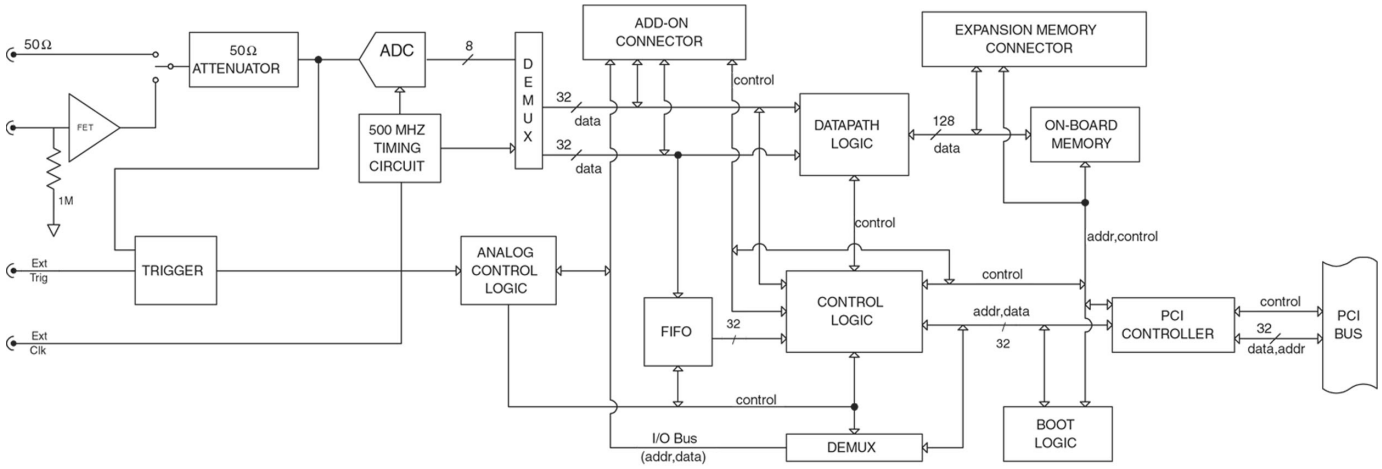
General-purpose digitizer capable of capturing up to 2 GigaBytes of data in on-board memory.

FEATURES

- 500 MS/s A/D sampling
- Up to 2 GigaBytes on-board acquisition memory
- Multi-card systems of up to 8 channels at 500 MS/s
- Fast data transfer rate to system RAM
- 250 MHz bandwidth
- 44 dB SNR
- Compatible with GageScope® oscilloscope software
- Software Development Kits available for LabVIEW, MATLAB, C/C#

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CompuScope 8500 Simplified Block Diagram



COMPUSCOPE 8500

CompuScope 8500 can sample one analog input at speeds up to 500 MS/s with 8 bit resolution and store the data in the very deep on-board memory.

500 MS/S SAMPLING

The CS8500 uses a high-quality flash A/D converter which can digitize at 500 MS/s rate. In other words, a new sample is taken every 2 nanoseconds.

An on-board crystal-controlled timing circuit ensures timebase accuracy and long-term thermal stability of CompuScope 8500.

1 MΩ AND 50 Ω INPUTS

In order to maximize the capabilities of the CompuScope 8500, two separate inputs have been provided and the user has the ability to select between the two.

The first input has 50 Ω input impedance and provides very high bandwidth. No input protection is provided for this input and the user must ensure that the amplifiers are not over-driven.

The second input has 1 MΩ input impedance. This input has on-board input protection circuitry and up to 90 MHz bandwidth.

MEMORY DEPTH

CompuScope 8500 is available with on-board acquisition memory depths of 2M, 8M, 16M, 128M, 512M, 1G and 2G.

The on-board memory can be used as a circular buffer for storage of pre- and post-trigger data.

The maximum number of sample points that the CompuScope 8500 can capture is equal to the memory depth of the model being used; for example, the 2 MB model can store 2 megasamples of data.

The data stored in the CompuScope 8500 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).

FAST BUS THROUGHPUT

The high-speed, 32-bit, bus-mastering interface to the PCI bus allows the data from the on-board memory of the CompuScope 8500 to be transferred to the system RAM, or any other PCI destination, at sustained rates of up to 80 MB/s under single-tasking operating systems. Under Windows, this rate depends on the architecture of the user application. Under controlled conditions, it is still possible to achieve 80 MB/s transfer speed to the system RAM.

BUS MASTERING

CompuScope 8500 is fully capable of becoming a PCI bus master in order to transfer data at the maximum rate of 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 CPU.

FLEXIBLE TRIGGERING

CompuScope 8500 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.

ADVANCED WINDOWS DRIVERS

CompuScope 8500 is supported by Gage's advanced, 32-bit Windows drivers which are fully compatible with Windows 98/ME/NT/2000/XP.

With over 30 man-years of register-level programming as well as operating system related coding, these drivers are the most advanced in the industry.

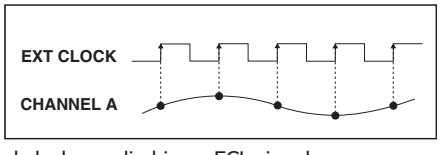
GageScope Software and Gage's Software Development Kits both use these drivers to provide optimal performance.

EXTERNAL CLOCK (OPTIONAL)

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

A new sample is taken on every rising edge of the external clock.

The user is responsible for ensuring that the external clock frequency remains higher than 200 MHz and lower than 500 MHz.



It is preferable if the external clock supplied is an ECL signal.

MULTIPLE RECORD

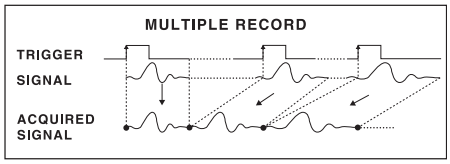
Even though the PCI bus allows very fast data throughput to system RAM, there may still be applications in which data bursts cannot be off-loaded either because of very fast trigger repeat frequency or because of software limitations.

Multiple Recording allows CompuScope 8500 to capture data on successive triggers and stack it in the on-board memory. Up to 8,388,608 triggers can be captured in Multiple Record mode.

It should be noted that only post-trigger data can be captured in Multiple Record Mode.

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

Once the CompuScope 8500 has finished capturing a Multiple Record segment, the trigger circuitry is automatically re-armed within 24 sample clock cycles 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.

Another situation in which Multiple Recording may be used is when data storage has to be optimized. These are cases in which only certain portions of the incoming signal are of interest and data capture during the dead-time between successive portions is not useful.

Examples of these situations are radar pulses, ultrasound data, lightning pulses, imaging signals and explosion testing.

MULTI-CHANNEL SYSTEMS WITH VERY DEEP ACQUISITION MEMORY

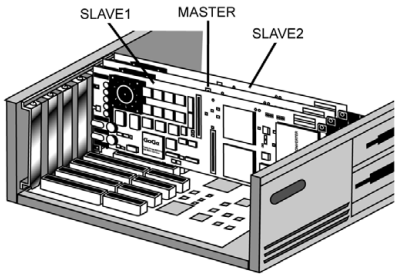
Many engineers involved in wireless communication have employed the CompuScope 8500 to capture a very long stream of data for analysis as part of the receiver design, development and deployment.

Typically, a 4 channel CompuScope 8500 Master/Slave system with 2 GB of on-board acquisition memory is used to capture signals from multiple points in the receiver circuitry. The resulting data is stored and then processed using sophisticated algorithms.

MULTI-CARD SYSTEMS

One of the most unique features of the CompuScope cards is the Multi-Card system that can be configured.

A Multi-Card system, comprised of one Master and up to 7 Slave CS8500 cards can be ordered if the user wants to capture more than one channel with a common clock and trigger. A Master/Slave Timing Module (MSTM) is needed with the system. This MSTM carries all the clock, trigger and initialization signals needed for proper synchronization.



The following Master/Slave systems can be configured:

- For 2M Memory Models: 2, 4, 6 or 8 cards can be configured
- For 8M & higher Memory Models: 2, 3 or 4 cards can be configured

GageScope software can display all channels from these boards on the same screen. Software drivers also support Master/Slave systems.

Another class of Multi-Card systems is the Multiple/Independent type. A Multiple/Independent system does not have common clock and triggering but can consist of CompuScope boards of different types and memory depths.

SYSTEM REQUIREMENT

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

SIZE

Plugs into one full length PCI Slot: 13" x 4.1"

Memory Depth	Independent or Master Card	Slave Card
2M	1 slot	1 slot
8M, 16M	2 slots	2 slots
128M, 512M, 1G, 2G	3†slots	2 slots

†Contact factory for optional 2-slot deep memory solution.

POWER (IN WATTS)

+5 V			
Memory Depth	Worst case	Typical	Power Down
2M	25.0	15.0	10.0
8M, 16M	28.0	18.0	13.0
128M	30.0	19.0	12.0
512M, 1G	32.5	21.0	13.0
2G	35.0	23.0	14.0
+12 V			
	Worst case	Typical	Power Down
All Models	20.0	15.0	0.1
-12 V			
	Worst	Typical	PowerDown
All Models	1.0	0.6	0.6

Note 1: Y-cables must be connected to auxiliary power connectors of all CS8500 cards installed in the system.

Note 2: Power connector on the deep memory board of 128M, 512M, 1G and 2G models must also be connected using a Y-cable.

INPUT CHANNEL

Inputs per card: 1

Impedance: 1 MΩ, 25 pF or 50 Ω, through separate input connectors

Resolution: 8 bits

50 Ω INPUT

Impedance: 50Ω

Coupling: DC only

Bandwidth:

Input Range	Typical Bandwidth
±500mV	250 MHz
±1V, ±2V, ±5V	250 MHz
±200mV	90 MHz
±100mV	90 MHz

Input Voltage Ranges: ±100 mV, ±200 mV, ±500 mV, ±1 V, ±2 V, ±5V

Absolute Maximum Amplitude: ±6 Volts (continuous)

DC Accuracy Relative to Full Scale Input: ± 2 %

Sampling Rate (MS/s): 500, 250, 200, 125, 100, 50, 25

Protection (50 Ω impedance): No Protection

Connector: SMA

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1 MΩ INPUT

Impedance: 1 MΩ, 25 pF
Coupling: AC or DC; software-selectable
Bandwidth:

Input Range	Typical Bandwidth
±4V	75 MHz
±2V, ±1V	90 MHz
±400mV	90 MHz
±200mV	90 MHz

Input Voltage Ranges: ±200 mV, ±400 mV, ±1 V, ±2 V, ±4 V
Absolute Maximum Amplitude: ±15 Volts (continuous)
DC Accuracy Relative to Full Scale Input: ±2 %
Sampling Rate (MS/s): 500, 250, 200, 125, 100, 50, 25
Input Protection: 1 MΩ impedance: Diode Clamped
Connector: BNC

DYNAMIC PARAMETERS

Measured using sine wave input at the specified frequency and sample rate, with amplitude of 95% of full scale on the ±1 V range with 50 Ω input impedance:

Parameter	Typical Value for 1.95 MHz input sampled at 250 MS/s	Typical Value for 96 MHz input sampled at 500 MS/s
SNR	44 dB	43 dB
SFDR	49 dB	45 dB
SINAD	43.5 dB	40.5 dB
THD	-56 dB	-46 dB
ENOB	7.0 bits	6.9 bits

ACQUISITION MEMORY

Data Storage: In on-board memory
Memory Sizes: 2M, 8M, 16M, 128M, 512M, 1G, 2G

TRIGGERING

Number of Trigger Inputs: 1 per system
Trigger Source: Input Channel, 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 points minimum.
Can be defined with a 128 point resolution

EXTERNAL TRIGGER

Impedance: 1 MΩ, 30 pF
Amplitude: Absolute Max ±15 V
Voltage Range: ±1 V and ±5 V
Bandwidth: 100 MHz
Coupling: AC or DC
Connector: BNC

INTERNAL CLOCK

Source: 500 MHz SAW oscillator
Accuracy: ±50 ppm (0 to 70° C)

EXTERNAL CLOCK (OPTIONAL)

Maximum Frequency: 500 MHz
Minimum Frequency: 200 MHz
Signal Level: 500 mV rms sine wave
Termination Impedance: 50 Ω
Sampling Edge: Rising
Coupling: AC
Duty Cycle: 50% ±30%
Connector: SMA

MULTIPLE RECORD

Pre-trigger data: None
Record Length: 256 points minimum.
Can be defined with a 128 point resolution
Maximum number of Triggers: 8,388,608

MULTI-CARD SYSTEMS

Operating Modes: Master/Slave or Multiple Independent
Number of Cards in:
Master/Slave Mode:
2M models: 2, 4, 6 or 8 cards
8M & higher models: 2, 3 or 4 cards
Multiple Independent Mode: Limited by backplane
Maximum Number of Channels in Master/Slave Mode: 8 at 500 MS/s (2M models)

MASTER/SLAVE SYSTEM TRIGGERING

Number of Trigger Inputs: 1 per system
Trigger Source: Input Channel, EXT or Software (Master card only)
Type: Analog triggering
Sensitivity: ±10% of full scale
Level Accuracy: ±5% of full scale
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

*C/C# SDK is compatible with LabWindows/CVI 7.0+ compiler.
Visual Basic.NET support available with purchase of C/C# SDK.

Contact your Gage Sales Agent for information on Linux support.

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ELECTROMAGNETIC COMPATIBILITY

EC Council Directive 89/336/EEC
CE Compliant
EN 61326 Class A
- IEC 61000-4-2 Electrostatic Discharge (Performance Criterion B)
- IEC 61000-4-3 RF Electromagnetic Field (Performance Criterion A)
- IEC 61000-4-4 Electrical Fast Transient/Burst (Performance Criterion B)
- IEC 61000-4-5 Power Surge (Performance Criterion B)
- IEC 61000-4-6 Conducted RF (Performance Criterion A)
- IEC 61000-4-11 Voltage Dips and Interruptions (Performance Criterion B)
- EN 61000-3-2 AC Power Line Harmonics Emissions

AS/NZS 2064
- Australian emissions standard for Industrial, Scientific and Medical Equipment

Compliance demonstrated on a single card configuration

ENVIRONMENTAL

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

WARRANTY

One year parts and labor
Certificate of NIST Traceable Calibration is included.

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

ORDERING INFORMATION

Hardware & Upgrades	
CompuScope 8500-2M	850-151-003
CompuScope 8500-8M	850-151-005
CompuScope 8500-16M	850-151-006
CompuScope 8500-128M	850-151-007
CompuScope 8500-512M	850-151-008
CompuScope 8500-1G	850-151-009
CompuScope 8500-2G	850-151-010
CS8500 Memory Upgrades	Contact Factory
External Clock Upgrade	850-181-005
Master Multi-Card Upgrade	850-181-006
Slave Multi-Card Upgrade	850-181-007
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.

Updated March 15th, 2006

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