

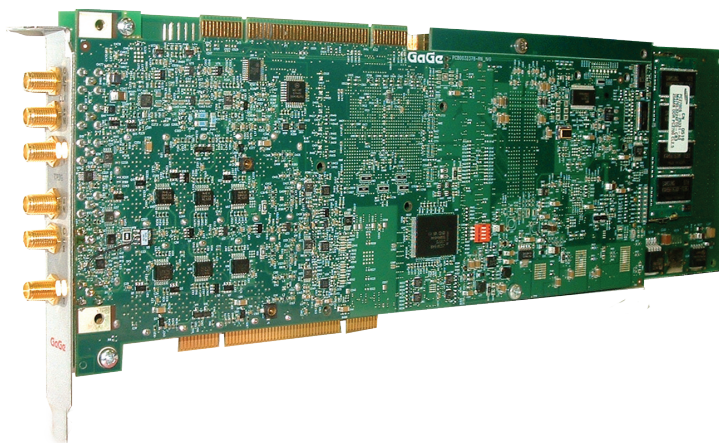
The GaGe Cobra™ family of digitizers features up to 2 channels in a single-slot PCI card with up to 2 GS/s sampling per channel, and up to 4 GB of on-board acquisition memory. Combine several Cobra cards for up to 16 simultaneous channels in a single system.

## APPLICATIONS

Wireless Communications  
Military & Aerospace  
Manufacturing Test  
Signal Intelligence  
Non-destructive Testing  
Synthetic instrumentation  
Electro-optic  
Radar/Lidar  
Laser Optics  
Embedded digitizer  
Scope replacement

## Cobra CompuScope Family

**Next-Generation High-Speed Digitizers for the PCI Bus**

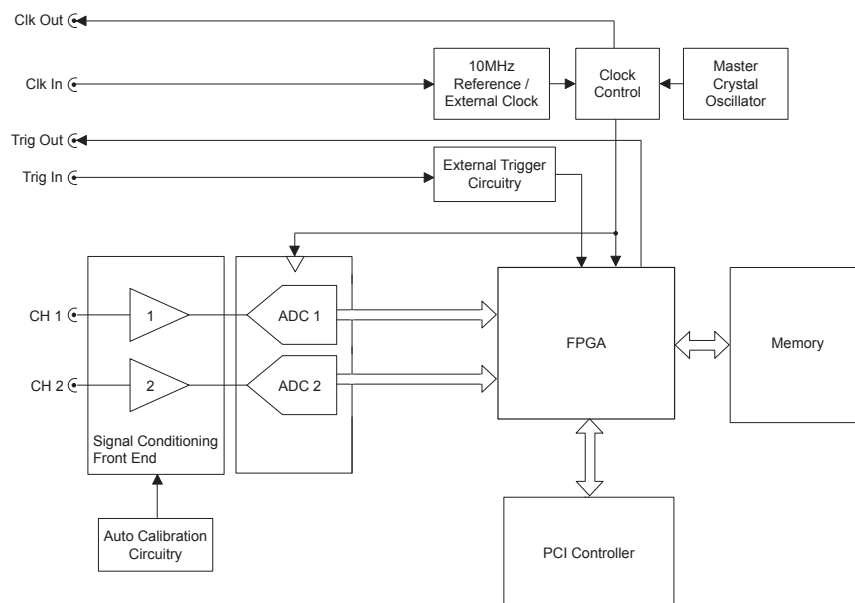


The Cobra CompuScope family is a new generation of GaGe high-speed 8-bit digitizers that provides the most powerful combination of speed, memory, and bandwidth as well as a wide portfolio of advanced acquisition features.

## FEATURES

- 1 or 2 digitizing channels
- 1 or 2 GS/s maximum sampling rate per channel
- 8 bits vertical resolution
- 256 MS to 4 GS on-board acquisition memory
- Up to 1 GHz bandwidth
- Full-size, single-slot PCI card
- Full-featured front-end, with software selection of all signal conditioning settings
- 32 bits, 66 MHz PCI standard for 200 MB/s transfer to PC memory
- Ease of integration with External or Reference Clock In and Clock Out, External Trigger In and Trigger Event Out
- Programming-free operation with GageScope® oscilloscope software
- Software Development Kits available for LabVIEW, MATLAB, C/C# and more

## Cobra CompuScope Simplified Block Diagram



### A/D SAMPLING

Resolution:	8 bits
Maximum Sampling Rate:	1 or 2 GS/s (model-dependent)
Sampling Rates:	2 GS/s, 1 GS/s, 500 MS/s, 250 MS/s, 125 MS/s, 100 MS/s, 50 MS/s, 25 MS/s, 10 MS/s, 5 MS/s, 2 MS/s, 1 MS/s, 500 kS/s, 200 kS/s, 100 kS/s, 50 kS/s, 20 kS/s, 10 kS/s, 5 kS/s, 2 kS/s

### ACQUISITION MEMORY

Available on-board memory:	256 MS, 512 MS, 1 GS, 2 GS, 4 GS
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### INPUT CHANNELS

Number of Inputs:	1 or 2 (model-dependent)
Connector:	SMA
Input Voltage Ranges:	$\pm 50$ mV, $\pm 100$ mV, $\pm 200$ mV, $\pm 500$ mV, $\pm 1$ V, $\pm 2$ V, $\pm 5$ V
DC Accuracy:	$\pm 1$ % (see Note 1)
Protection:	Diode-clamped
Absolute Maximum Input Voltage (see Note 2):	6 V RMS
Impedance:	50 $\Omega$
Coupling:	AC or DC
ENOB (see Note 3):	7.4
SNR (see Note 3):	46 dB
THD (see Note 3):	-60 dB
SINAD (see Note 3):	46 dB
SFDR (see Note 3):	60 dB
DC Coupled Bandwidth:	DC to >500 MHz
AC Coupled Bandwidth:	20 kHz to >500 MHz
Flatness:	Within $\pm 1$ dB of ideal response to 100 MHz signal frequency

### LOW-PASS FILTER

Type:	3-pole Bessel, 1 per channel
Cut-off Frequency:	200 MHz
Operation:	Individually software-selectable

### DC OFFSET

A software-adjustable DC offset voltage may be independently applied to each input channel in order to optimize input range usage.

Span:	$\pm 100$ % on all input ranges
Accuracy:	1 %

### TRIGGERING

Source:	CH 1 or 2, EXT or manual
Trigger Level Accuracy:	Internal: $\pm 2$ % of Full Scale External: $\pm 10$ % of Full Scale
Slope:	Positive or Negative
Sensitivity:	5% of Full Scale Signal swing must be at least 5% of full scale in order to cause a trigger event. Smaller signals are rejected as noise.
Post-Trigger Data:	64 points minimum May be increased with 64 point resolution.
Trigger Engines:	2 per channel, 1 for External Trigger
Source Combination:	All trigger source combinations may be logically OR'ed together

### TRIGGER IN (EXTERNAL TRIGGER)

Impedance:	2 k $\Omega$ or 50 $\Omega$
Amplitude:	Absolute Maximum 6 V RMS
Voltage Range:	$\pm 1$ V, $\pm 5$ V
Bandwidth:	>300 MHz
Coupling:	AC or DC
Connector:	SMA

## TRIGGER OUT

Amplitude:	0 to 1.5 V into 50 $\Omega$ load
Impedance:	50 $\Omega$ compatible
Connector:	SMA

## INTERNAL CLOCK

Accuracy:	$\pm 1$ ppm (0 to 50°C ambient)
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## CLOCK IN (EXTERNAL CLOCK)

Maximum Frequency:	1 GHz
Minimum Frequency:	200 MHz
Absolute Maximum Input Voltage (see Note 1):	6 V RMS
Signal Level:	Minimum 200 mV RMS Maximum 500 mV RMS
Minimum Signal Slew Rate:	2 V/ns
Termination Impedance:	50 $\Omega$
Duty Cycle:	50% $\pm 5\%$
Connector:	SMA
Coupling:	AC

## EXTERNAL REFERENCE

A 10 MHz External Reference signal may be used to synchronize Internal Sampling Clock

Signal Type:	Square Wave
Frequency:	10 MHz $\pm 50$ ppm
Signal Level:	Minimum 200 mV RMS Maximum 500 mV RMS
Impedance:	50 $\Omega$
Connector:	SMA

## CLOCK OUT

Maximum Frequency:	1 GHz
Minimum Frequency:	10 MHz
Signal Level:	$\pm 300$ mV into 50 $\Omega$ Load
Connector:	SMA

Note: 10 MHz reference signal may be selected as output for synchronizing other instruments.

## MULTIPLE RECORD

Pre-trigger Data:	Up to almost full on-board memory
Record Length:	64 points minimum. May be increased with 64 points resolution

## TIMESTAMPING

Resolution:	One sampling interval
Counter turnover:	>24 hours continuous

## CARD SIZE

Single-slot, full-length PCI

## SYSTEM REQUIREMENTS

PCI-based computer, minimum Pentium II 500 MHz, with at least one free full-length PCI slot, 128 MB RAM, 1 GB hard drive.

## POWER CONSUMPTION (IN WATTS, PER CARD)

DC Supply Voltage	Worst Case	Typical
+5 Volts	10 W	8 W
- 5 Volts	0 W	0 W
+3.3 Volts	21 W	20 W
+12 Volts	0.7 W	0.6 W
-12 Volts	0.7 W	0.6 W

Note: The 4 GS Cobra model consumes an extra 3 Watts of power from the +5 Volts supply, as compared with the 256 MS model. Intermediate memory models consume extra power proportionately.

## PCI BUS INTERFACE

Bus Mastering:	Fully supported
Scatter-Gather:	Fully supported
Bus Width:	32 bits
Bus Speed:	66 MHz or 33 MHz
Bus Throughput:	200 MB/s to PC memory (PCI-X compatible at 66 MHz bus speed)
Compatibility:	PCI-compliant, v.2.2 Also operates in v.2.1 systems that supply 3.3 V to PCI slot

## MULTI-CARD SYSTEMS

Operating Mode:	Master/Slave or Multiple Independent
Number of Cards:	
Master/Slave:	2 to 8 cards
Multiple/Independent:	Limited only by backplane

Note: In contrast to external multi-card synchronization methods, the Cobra CompuScope's internal rigid bridge-board Master/Slave architecture provides true simultaneous sampling, triggering and arming of all channels within a Master/Slave system.

Cobra CompuScopes automatically self-configure as Master, Slave or Independent cards depending upon detection of the Master/Slave bridge-board.

## OPERATING SYSTEMS

Windows Vista, XP:	All Versions
Windows 2000:	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.



## WARRANTY

One year parts and labor

Certificate of NIST Traceable Calibration is included.

All specifications subject to change without notice.

## Notes to specifications:

- 1) DC accuracy is  $\pm 1\%$  on all input ranges
- 2) On the  $\pm 5$  V Input Range, the maximum input is 8.5 V RMS Voltage
- 3) Measured at maximum sample rate using a 10 MHz sine wave with an amplitude of 95% of full scale. No on-board filtering is used.

## 1 GHz Cobra CompuScope Models

The signal conditioning front-end circuitry of the standard Cobra CompuScope models limits the 3 dB roll-off of their frequency response to slightly more than 500 MHz. On the 1 GHz Cobra CompuScope models, whose names include the post-fix "-1GHz", most front-end signal conditioning circuitry is bypassed so that the 3 dB roll-off frequency is greater than 1GHz. Input protection and AC/DC coupling selection are absent on the 1 GHz Cobra CompuScope models and there is a single input range of  $\pm 200$  mV in both single and dual channel modes. All other standard Cobra CompuScope functionality is preserved.

## ORDERING INFORMATION

### Hardware & Upgrades

Cobra Model	Number of channels	Max. Single Channel Sampling Rate	Max. Dual Channel Sampling Rate	Part Number
CS22G8	2	2 GS/s	1 GS/s	COB-022-000
CS21G8	2	1 GS/s	500 MS/s	COB-021-000
CS11G8	1	1 GS/s	-	COB-011-000
CS22G8-1GHz	2	2 GS/s	1 GS/s	COB-022-001
CS21G8-1GHz	2	1 GS/s	500 MS/s	COB-021-001
CS11G8-1GHz	1	1 GS/s	-	COB-011-001

Memory Upgrade: 256 MS to 512 MS	MEM-181-001
Memory Upgrade: 256 MS to 1 GS	MEM-181-003
Memory Upgrade: 256 MS to 2 GS	MEM-181-005
Memory Upgrade: 256 MS to 4 GS	MEM-181-007

Master Multi-Card Upgrade	COB-181-002
Slave Multi-Card Upgrade	COB-181-003

Set 1 Cable SMA to BNC	ACC-001-031
Set 4 Cable SMA to BNC	ACC-001-033

eXpert Signal Averaging Firmware Option	250-181-001
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### 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

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**[www.gage-applied.com](http://www.gage-applied.com)**

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