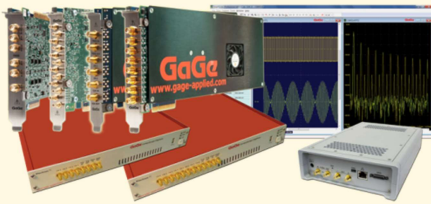


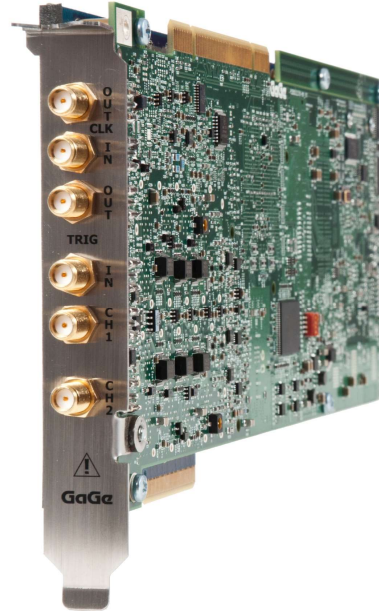
GaGe is a worldwide industry leader in high speed data acquisition solutions featuring a portfolio of the highest performance digitizers, PC oscilloscope software, powerful SDKs for custom application development, and turnkey integrated PC-based measurement systems.



## APPLICATIONS

RADAR Design and Test  
Signals Intelligence (SIGINT)  
Ultrasonic Non-Destructive Testing  
LIDAR Systems  
Communications  
Spectroscopy  
High-Performance Imaging  
Time of Flight  
Life Sciences  
Particle Physics

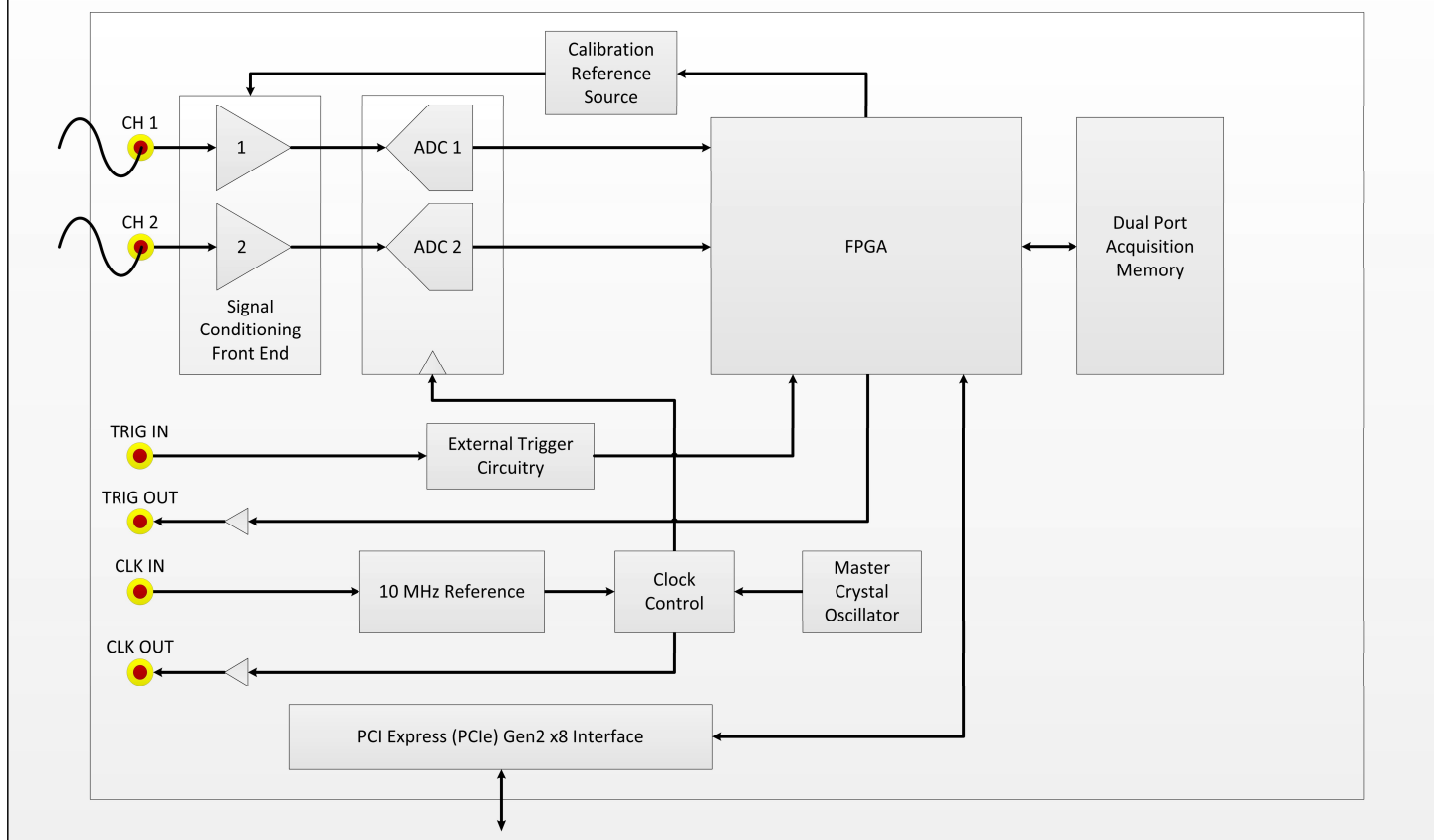
## CobraMax Express CompuScope 1-2 CH, 4 GS/s, 8-Bit, PCIe Gen2 Digitizer



## FEATURES

- 2 or 1 Digitizing Input Channels with 8-Bit Vertical A/D Resolution
- 4 GS/s or 2 GS/s Maximum Sampling Rates
- 19 Software Selectable A/D Sampling Rates from 5 kS/s to 4 GS/s
- 1.5 GHz Analog Input Bandwidth
- 2 GS (2 GB) Onboard Memory Standard, Expandable up to 16 GS (16 GB)
- Dual Port Memory with Sustained PCIe Data Streaming at 2 GB/s
- Full-Featured Front-End with AC/DC Coupling and 50  $\Omega$  Inputs
- Software Control of Input Voltage Ranges and Coupling
- Ease of Integration with Reference Clock In & Reference Clock Out
- External Trigger In & Trigger Out with Advanced Triggering Operations
- Synchronized Multi-Card Systems up to 8 Cards for 16 Channels
- Full-Height Full-Length PCI Express (PCIe) Generation 2.0 x8 Card
- Programming-Free Operation with GaGeScope PC Oscilloscope Software
- Software Development Kits Available for C/C#, LabVIEW and MATLAB
- Windows 10/8/7 and Linux Operating Systems Supported

## CobraMax Express CompuScope Simplified Block Diagram



### MAIN SPECIFICATIONS

Model #	: <u>CSE14G8</u>	<u>CSE24G8</u>
# of Input Channels	: 1	2
Vertical A/D Resolution	: 8-bit	8-bit
Max. Rate per Channel	: 4 GS/s	1-CH @ 4 GS/s 2-CH @ 2 GS/s

### DYNAMIC PARAMETER PERFORMANCE

ENOB	: 7.6 Bits	Dynamic parameter measurements are done by acquiring a high purity 10 MHz sine wave with amplitude of 95% of the input range sampling at 2 GS/s. These measurements were taken on the $\pm 500$ mV input range using 50 $\Omega$ termination and DC coupling and with applied anti-aliasing filter.
SNR	: 47.2 dB	Dynamic parameter calculations are done from a 16 kiloSample Fourier Spectrum after applying a 7-term Blackman Harris Windowing Function to the time-domain waveform.
THD	: -59.3 dB	
SINAD	: 47.0 dB	
SFDR	: 56.5 dB	

### A/D SAMPLING

Rates per Channel, Model dependent (software selectable)	: 4 GS/s, 2 GS/s, 1 GS/s, 500 MS/s, 250 MS/s, 125 MS/s, 50 MS/s, 25 MS/s, 10 MS/s, 5 MS/s, 2.5 MS/s, 1 MS/s, 500 kS/s, 250 kS/s, 100 kS/s, 50 kS/s, 25 kS/s, 10 kS/s, 5 kS/s
Rate Accuracy	: $\pm 1$ part-per-million (0° to 50° C ambient)

### ACQUISITION MEMORY

Acquisition memory size is shared and equally divided among all active input channels (1 or 2).	
Standard Size	: 2 GS (2 GB)
Optional Sizes	: 16 GS (16 GB)
Architecture	: Dual Port
Data Streaming	: Yes

## ANALOG INPUT CHANNELS

Connectors	: SMA
Impedance	: 50 $\Omega$
Coupling	: DC or AC (software selectable)
Analog Bandwidth	: DC (50 $\Omega$ ) = DC to 1.5 GHz AC (50 $\Omega$ ) = 20 kHz to 1.5 GHz
Voltage Ranges	: $\pm 50$ mV, $\pm 100$ mV, $\pm 200$ mV, $\pm 500$ mV, $\pm 1$ V, $\pm 2$ V, $\pm 5$ V (software selectable)
Flatness	: Within $\pm 0.5$ dB of ideal response to 800 MHz.
DC Accuracy	: $\pm 1\%$ on all input ranges
DC User Offset	: $\pm 100\%$ on all input ranges, except $\pm 5$ V that is $\pm 20\%$
Absolute Max. Input	: 6 V RMS on all input ranges, except $\pm 5$ V that is 8.5V RMS

## LOW-PASS FILTER

Type	: 3-pole, 1 per Channel
Cut-Off Frequency	: 200 MHz
Operation	: Individually Software Selectable

## TRIGGERING

Engines	: 2 per Channel, 1 for External Trigger
Source	: Any Input Channel, External Trigger or Software
Input Combination	: All Combinations of Sources Logically OR'ed
Slope	: Positive or Negative (software selectable)
Sensitivity	: $\pm 5\%$ of Full Scale Input Range of Trigger Source. This implies that signal amplitude must be at least 5% of full scale to cause a trigger to occur. Smaller signals are rejected as noise.
Accuracy	: Internal: $\pm 2\%$ of Full Scale External: $\pm 10\%$ of Full Scale
Post-Trigger Data	: 64 points minimum. Can be defined with 64 point resolution.

## EXTERNAL TRIGGER

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

## TRIGGER OUT

Connector	: SMA
Impedance	: 50 $\Omega$
Amplitude	: 0 – 1.5 V

## EXTERNAL REFERENCE CLOCK IN

Connector	: SMA
Signal Level	: Minimum 200 mV RMS, Maximum 500 mV RMS
Impedance	: 50 $\Omega$
External Reference Clock Mode Rate	: 10 MHz $\pm 50$ ppm; the external reference time base is used to synchronize the internal sampling clock.

## EXTERNAL REFERENCE CLOCK OUT

Connector	: SMA
Signal Level	: $\pm 300$ mV
Impedance	: 50 $\Omega$
Output Modes	: 10 MHz Reference Clock
Frequency	: 10 MHz

## MULTIPLE RECORD

Pre-Trigger Data	: Up to almost full on-board memory
Record Length	: 64 points minimum. Can be defined with 64 point resolution.

## TIME-STAMPING

Timing Resolution	: One Sample Clock Cycle
Counter Turnover	: $>24$ Hours Continuous

## MULTI-CARD SYSTEMS

Master/Slave Mode	: Provides synchronized triggering and sampling on all channels for all cards to create larger multi-channel systems.
Independent Mode	: Each card operates independently within the system.
Number of Cards	: 2 to 8 Cards for up to 16 Channels Total

## DIMENSIONS

Size	: Single Slot, Full Height, Full Length
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## POWER CONSUMPTION

Power	: 34.8 Watts (typical)
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## PC SYSTEM REQUIREMENTS

PCI Express (PCIe) Slot	: 1 Free Full-Height Full-Length PCIe Gen1, Gen2 or Gen3, x8 or x16 Slot
Operating System	: Windows 10/8/7 (32-bit/64-bit), Linux – Requires SDK for C/C#



## ORDERING INFORMATION

### Hardware

Model Number	A/D Resolution	# of Channels	Max. Sampling Rate per Channel	Memory Size	Order Part Number
CSE14G8	8-bit	1	4 GS/s	2 GS (2 GB)	CXE-014-000
CSE24G8	8-bit	2	1-CH: 4 GS/s 2-CH: 2 GS/s	2 GS (2 GB)	CXE-024-000

### Memory Upgrades

Memory Upgrade: 2 GS (2 GB) to 4 GS (4 GB)	MEM-181-101
Memory Upgrade: 2 GS (2 GB) to 8 GS (8 GB)	MEM-181-103
Memory Upgrade: 2 GS (2 GB) to 16 GS (16 GB)	MEM-181-105

### Cable Accessories

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

### Master/Slave Upgrades

Master Multi-Card Upgrade	CXE-181-012
Slave Multi-Card Upgrade	CXE-181-013

### eXpert FPGA Firmware Options

eXpert PCIe Data Streaming	STR-181-000
eXpert Signal Averaging	250-181-001

### GaGeScope Software

GaGeScope: Lite Edition	Included
GaGeScope: Standard Edition	300-100-351
GaGeScope: Professional Edition	300-100-354

### Software Development Kits (SDKs)

GaGe SDK Pack (includes C/C#, MATLAB, LabVIEW SDKs)	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

## WARRANTY

Standard two years parts and labor.

Unless otherwise specified, all dynamic performance specs have been qualified on engineering boards. All specifications subject to change without notice.

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