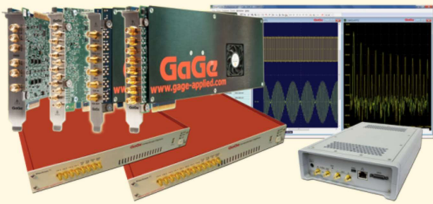# GaGe

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.

Cobra Express CompuScope
1-2 CH, 2 GS/s, 8-Bit, PCIe Gen2 Digitizer

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
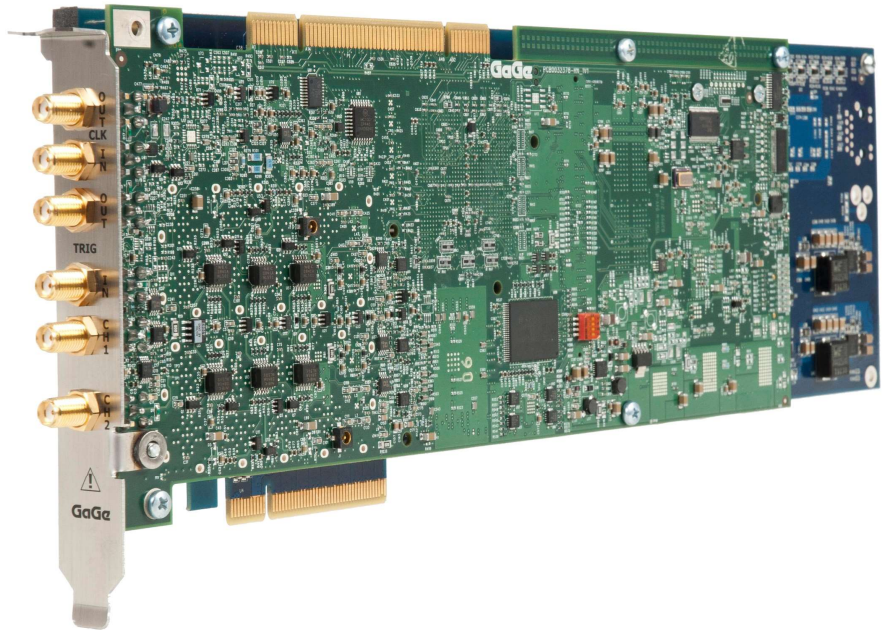
FEATURES

- 2 or 1 Digitizing Input Channels with 8-Bit Vertical A/D Resolution

- 2 GS/s, 1 GS/s, or 500 MS/s Maximum Sampling Rates

- 20 Software Selectable A/D Sampling Rates from 2 kS/s to 2 GS/s

- 500 MHz 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 Ω Inputs

- Software Control of Input Voltage Ranges and Coupling

- Ease of Integration with External or Reference Clock In & 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

Cobra Express CompuScope Simplified Block Diagram
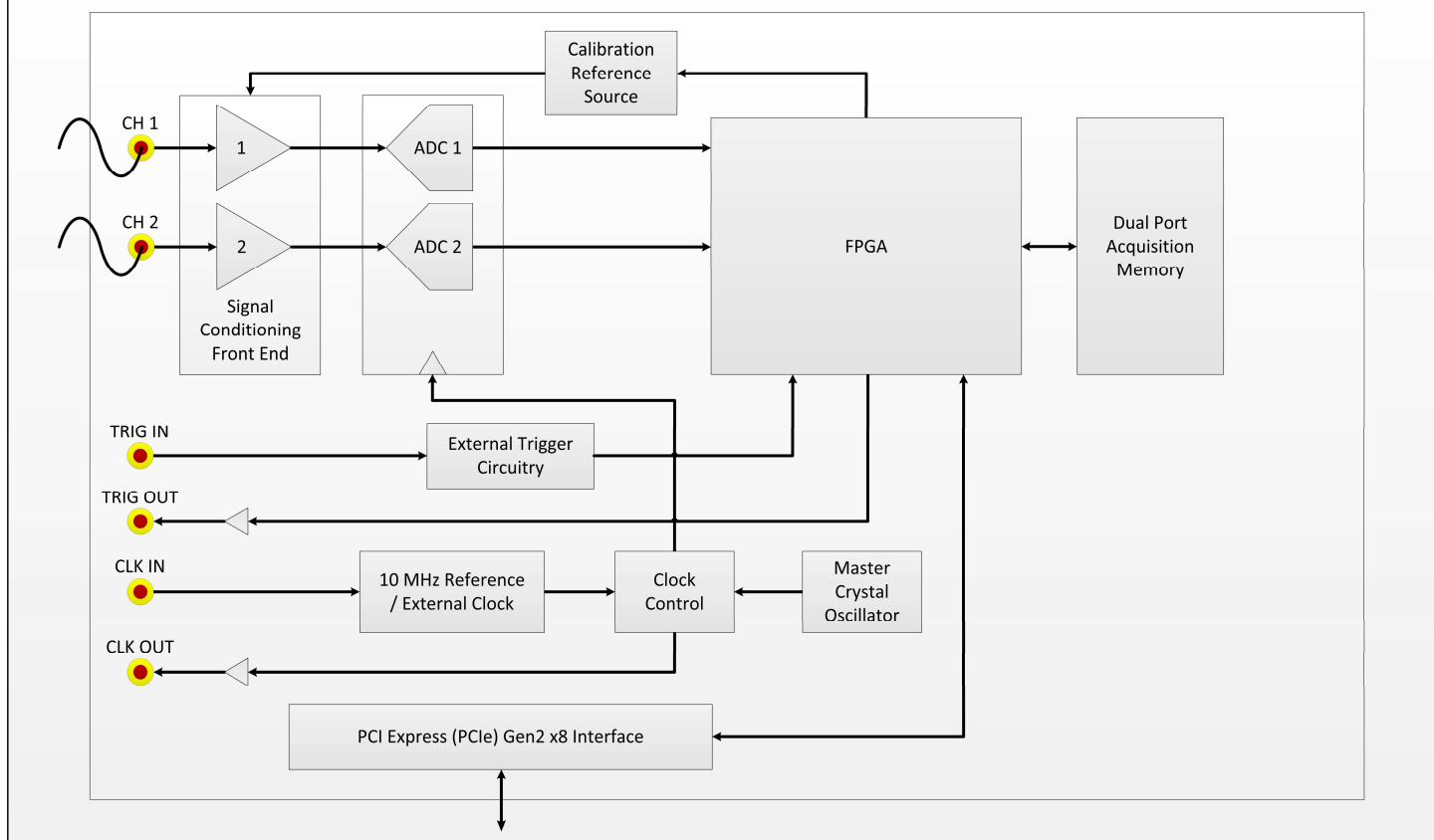
MAIN SPECIFICATIONS

Model #	:	**CSE21G8**	**CSE22G8**
# of Input Channels	:	2	2
Vertical A/D Resolution	:	8-bit	8-bit
Max. Rate per Channel	:	1-CH @ 1 GS/s	1-CH @ 2 GS/s
		2-CH @ 500 MS/s	2-CH @ 1 GS/s

DYNAMIC PARAMETER PERFORMANCE

ENOB	:	7.4 Bits
SNR	:	46 dB
THD	:	-60 dB
SINAD	:	46 dB
SFDR	:	60 dB

Dynamic parameter measurements are done by acquiring a high purity 10 MHz sine wave with amplitude of 95% of the input range sampling at 1 GS/s. These measurements were taken on the ±500 mV input range using 50 Ω termination and DC coupling and with applied anti-aliasing filter. 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.

A/D SAMPLING

Rates per Channel, Model dependent (software selectable)	:	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
Rate Accuracy	:	±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 Ω
Coupling	:	DC or AC (software selectable)
Analog Bandwidth	:	DC (50 Ω) = DC to 500 MHz AC (50 Ω) = 20 kHz to 500 MHz
Voltage Ranges	:	±50 mV, ±100 mV, ±200 mV, ±500 mV, ±1 V, ±2 V, ±5 V (software selectable)
Flatness	:	Within ±0.5 dB of ideal response to 100 MHz.
DC Accuracy	:	±1% on all input ranges
DC User Offset	:	±100 % on all input ranges, except ±5V that is ±20 %
Absolute Max. Input	:	6 V RMS on all input ranges, except ±5V 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	:	±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: ±2% of Full Scale External: ±10% of Full Scale
Post-Trigger Data	:	64 points minimum. Can be defined with 64 point resolution.

EXTERNAL TRIGGER

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

TRIGGER OUT

Connector	:	SMA
Impedance	:	50 Ω
Amplitude	:	0 – 1.5 V

CLOCK IN

Connector	:	SMA
Signal Level	:	Minimum 200 mV RMS, Maximum 500 mV RMS
Impedance	:	50 Ω
Coupling	:	AC
Duty Cycle	:	50% ±5%
Input Modes	:	External Clock or 10 MHz Reference Clock
External Clock Mode Rates	:	Minimum 200 MHz to Maximum 1 GHz
External Reference Clock Mode Rate	:	10 MHz ±50 ppm; the external reference time base is used to synchronize the internal sampling clock.

CLOCK OUT

Connector	:	SMA
Signal Level	:	±300 mV
Impedance	:	50 Ω
Output Modes	:	Maximum Sampling Clock Frequency or 10 MHz Reference Clock
Max. Frequency	:	1 GHz
Min. Frequency	:	10 MHz from External Clock, 200 MHz from Internal Clock

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

POWER CONSUMPTION

Power	:	33.8 Watts (typical)

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#

GaGe

ORDERING INFORMATION

Hardware

Model Number	A/D Resolution	# of Channels	Max. Sampling Rate per Channel	Memory Size	Order Part Number
CSE21G8	8-bit	2	1-CH: 1 GS/s 2-CH: 500 MS/s	2 GS (2 GB)	CBE-021-000
CSE22G8	8-bit	2	1-CH: 2 GS/s 2-CH: 1 GS/s	2 GS (2 GB)	CBE-022-000

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	CBE-181-012
Slave Multi-Card Upgrade	CBE-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

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Email:
prodinfo@gage-applied.com

To find your local sales representative or distributor or to learn more about GaGe products visit:

www.gage-applied.com

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.