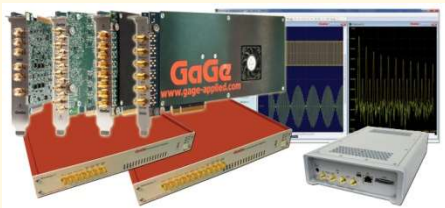# GaGe

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.

Octopus Express CompuScope
8 CH, 25 to 125 MS/s, 14/16-Bit PCIe 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

- 8 Digitizing Input Channels

- 125 MS/s, 100 MS/s, 65 MS/s or 25 MS/s Max. Sampling Rate per Channel

- 100 MHz or 20 MHz Analog Input Bandwidth

- 14-Bit or 16-Bit Vertical A/D Resolution

- 2 GS (4 GB) Onboard Memory Standard, Expandable up to 8 GS (16 GB)

- Dual Port Memory with Sustained PCIe Data Streaming at 2.0 GB/s

- Full-Featured Front-End with AC/DC Coupling and 50 Ω /1M Ω Inputs

- Software Control of Input Voltage Ranges, Coupling and Impedances

- Ease of Integration with External or Reference Clock In & Clock Out

- External Trigger In & Trigger Out

- Synchronized Multi-Card Systems up to 8 Cards for 64 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

Octopus Express CompuScope Simplified Block Diagram
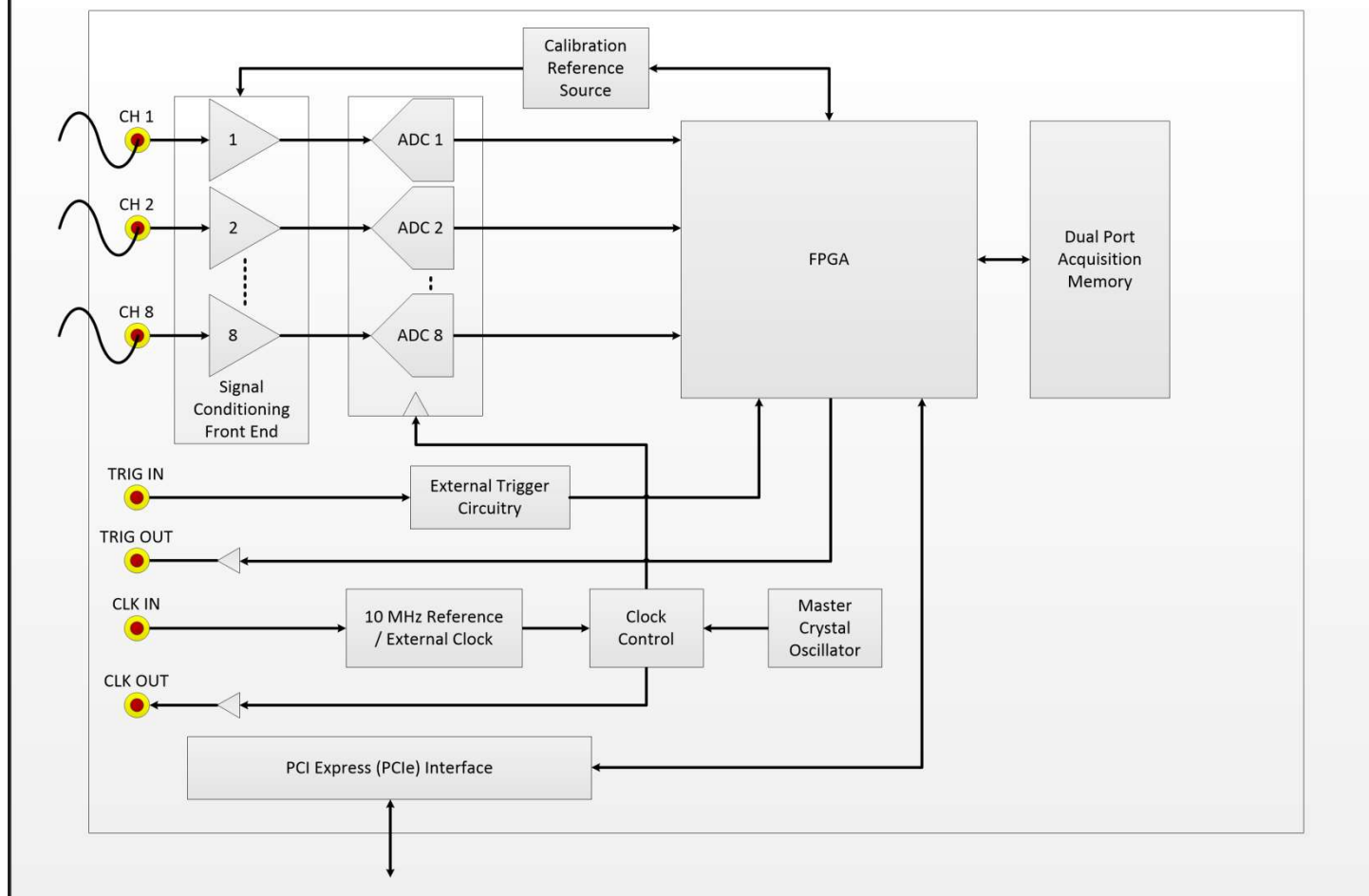
MAIN SPECIFICATIONS

Model #	:	CSE8382	CSE8482	CSE8385	CSE8387	CSE8389
# of Input Channels	:	8	8	8	8	8
Vertical A/D Resolution	:	14-bit	16-bit	14-bit	14-bit	14-bit
Max. Rate per Channel	:	25 MS/s	25 MS/s	65 MS/s	100 MS/s	125 MS/s

DYNAMIC PARAMETER PERFORMANCE

		14-bit A/D	16-bit A/D
ENOB	:	11.1 Bits	12.0 Bits
SNR	:	68.7 dB	74.0 dB
THD	:	-81.9 dB	-84.7 dB
SINAD	:	68.5 dB	73.5 dB
SFDR	:	84.6 dB	85.0 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 maximum 125 MS/s @ 14-bit and 25 MS/s @ 16-bit. 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)	:	125 MS/s, 100 MS/s, 65 MS/s, 50 MS/s, 40 MS/s, 25 MS/s, 20 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, 1 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, 2, 4 or 8).

Standard Size	:	2 GS (4 GB)
Optional Sizes	:	4 GS (8 GB), 8 GS (16 GB)
Architecture	:	Dual Port
Data Streaming	:	Yes

ANALOG INPUT CHANNELS

Connectors	:	SMB
Impedance	:	50 Ω or 1M Ω (software selectable)
Coupling	:	AC or DC (software selectable)
Analog Bandwidth	:	DC (50 Ω) = DC to 100 MHz (14-bit) or DC to 20 MHz (16-bit) AC (1M Ω) = 10 Hz to 100 MHz (14-bit) or 10 Hz to 20 MHz (16-bit)
Voltage Ranges	:	±100 mV, ±200 mV, ±500 mV, ±1 V, ±2 V, ±5 V, ±10 V (software selectable; ±10 V only available on 1M Ω)
Flatness	:	Within ±0.5 dB of ideal response to 90 MHz (14-bit) or 7 MHz (16-bit). Measured at 125 MS/s & 50 MS/s in the ±500 mV range with 50 Ω input impedance and 95% of full scale amplitude.
DC Accuracy	:	±0.5%. Measured on ±500 mV, ±1 V, ±2 V input ranges for both 50 Ω and 1M Ω input impedance settings.
DC User Offset	:	±1 x Full Range (above ±5 V is limited to ±2.5 V)
Absolute Max. Input	:	±15 V (50 Ω), ±75 V (1M Ω on all but two lowest Input Ranges, where Max is ±25 V)

LOW-PASS FILTER (14-bit Models Only)

Type	:	3-pole, 1 per Channel
Cut-Off Frequency	:	24 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	:	±2% of Full Scale Input Range of Trigger Source. This implies that signal amplitude must be at least 4% of full scale to cause a trigger to occur. Smaller signals are rejected as noise.
Accuracy	:	Less than ±2% of Full Scale for Channel Triggering
Post-Trigger Data	:	128 points minimum. Can be defined with 16 point resolution.

EXTERNAL TRIGGER

Connector	:	SMB
Impedance	:	2k Ω
Coupling	:	AC or DC
Bandwidth	:	>100 MHz
Voltage Range	:	±1 V, ±5 V (software selectable)

TRIGGER OUT

Connector	:	SMB
Impedance	:	50 Ω
Amplitude	:	0 – 2.5 V

CLOCK IN

Connector	:	SMB
Signal Level	:	Minimum 1 V RMS, Maximum 2 V RMS
Impedance	:	50 Ω
Coupling	:	AC
Duty Cycle	:	50% ±5%
Input Modes	:	External Clock (not supported on 16-bit CSE8482 model) or 10 MHz Reference Clock
External Clock Mode Rates	:	Minimum 10 MHz to Maximum Sampling Rate of 125 MHz
External Reference Clock Mode Rate	:	10 MHz ±1000 ppm; the external reference time base is used to synchronize the internal sampling clock.

CLOCK OUT

Connector	:	SMB
Signal Level	:	0 – 2.5 V
Impedance	:	50 Ω Compatible
Duty Cycle	:	50% ±5%
Output Modes	:	Maximum Sampling Clock Frequency or 10 MHz Reference Clock
Max. Frequency	:	125 MHz
Min. Frequency	:	10 MHz from External Clock, 1 kHz from Internal Clock

MULTIPLE RECORD

Pre-Trigger Data	:	Up to 32 kS Total
Record Length	:	128 points minimum. Can be defined with 16 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 64 Channels Total

DIMENSIONS

Size	:	Single Slot, Full Height, Full Length

POWER CONSUMPTION

Power	:	25 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
CSE8382	14-bit	8	25 MS/s	2 GS (4 GB)	OCE-838-002
CSE8482	16-bit	8	25 MS/s	2 GS (4 GB)	OCE-848-002
CSE8385	14-bit	8	65 MS/s	2 GS (4 GB)	OCE-838-005
CSE8387	14-bit	8	100 MS/s	2 GS (4 GB)	OCE-838-007
CSE8389	14-bit	8	125 MS/s	2 GS (4 GB)	OCE-838-009

Memory Upgrades

Memory Upgrade: 2 GS (4 GB) to 4 GS (8 GB)	MEM-181-203
Memory Upgrade: 2 GS (4 GB) to 8 GS (16 GB)	MEM-181-205

Cable Accessories

Set 1 Cable SMB to BNC	ACC-001-001
Set 4 Cable SMB to BNC	ACC-001-003

Master/Slave Upgrades

Master Multi-Card Upgrade	OCE-181-012
Slave Multi-Card Upgrade	OCE-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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