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
**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**

<table>
<thead>
<tr>
<th>14-bit A/D</th>
<th>16-bit A/D</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENOB</td>
<td>11.1 Bits</td>
</tr>
<tr>
<td>SNR</td>
<td>68.7 dB</td>
</tr>
<tr>
<td>THD</td>
<td>-81.9 dB</td>
</tr>
<tr>
<td>SINAD</td>
<td>68.5 dB</td>
</tr>
<tr>
<td>SFDR</td>
<td>84.6 dB</td>
</tr>
</tbody>
</table>

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: 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#
## ORDERING INFORMATION

### Hardware

<table>
<thead>
<tr>
<th>Model Number</th>
<th>A/D Resolution</th>
<th># of Channels</th>
<th>Max. Sampling Rate per Channel</th>
<th>Memory Size</th>
<th>Order Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE8382</td>
<td>14-bit</td>
<td>8</td>
<td>25 MS/s</td>
<td>2 GS (4 GB)</td>
<td>OCE-838-002</td>
</tr>
<tr>
<td>CSE8482</td>
<td>16-bit</td>
<td>8</td>
<td>25 MS/s</td>
<td>2 GS (4 GB)</td>
<td>OCE-848-002</td>
</tr>
<tr>
<td>CSE8385</td>
<td>14-bit</td>
<td>8</td>
<td>65 MS/s</td>
<td>2 GS (4 GB)</td>
<td>OCE-838-005</td>
</tr>
<tr>
<td>CSE8387</td>
<td>14-bit</td>
<td>8</td>
<td>100 MS/s</td>
<td>2 GS (4 GB)</td>
<td>OCE-838-007</td>
</tr>
<tr>
<td>CSE8389</td>
<td>14-bit</td>
<td>8</td>
<td>125 MS/s</td>
<td>2 GS (4 GB)</td>
<td>OCE-838-009</td>
</tr>
</tbody>
</table>

### 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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