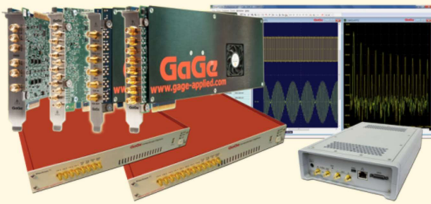


GaGe is a worldwide industry leader in high speed data acquisition solutions featuring a portfolio of the highest performance digitizers, PC oscilloscope software, powerful SDKs for custom application development, and turnkey integrated PC-based measurement systems.



APPLICATIONS

Automatic Test Equipment
Military & Commercial Testing – ATE
Wideband RF Signal Analysis
RADAR Design and Test
Real-Time Spectrum Operations
Electronic Warfare
Ultrasonic Non-Destructive Testing
LIDAR Systems
Communications
Optical Coherence Tomography
Spectroscopy
High-Performance Imaging
Time of Flight
Life Sciences
Particle Physics

4-Channel 16-Bit PXIe Gen3 RazorMax Express

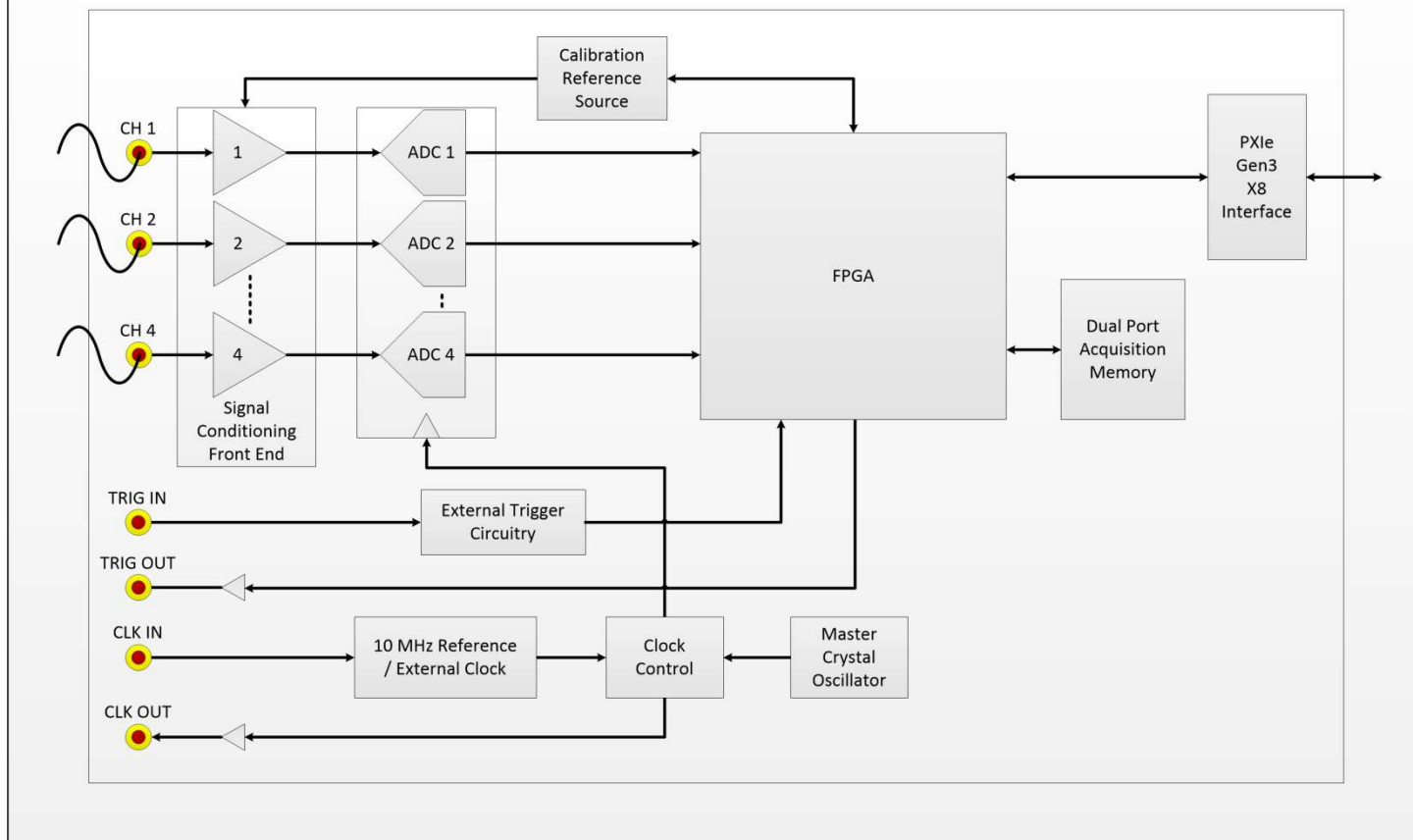
**Unprecedented Speed & Resolution in a 1 GS/s Streaming Digitizer
700 MHz Bandwidth with Stream Rates at 4+ GB/s**



FEATURES

- 16-Bit Vertical A/D Resolution with 4 or 2 Digitizing Input Channels
- 1 GS/s or 500 MS/s Maximum Sampling Rate per Channel
- 31 Software Selectable Sampling Rates from 1 kS/s to 1 GS/s
- Optional ADC Modes: Decimate-by-2 Filter, Decimate-by-4 Filter with Digital Mixer, Decimate-by-4 Filter with IQ Outputs
- 700 MHz Bandwidth @ 1 GS/s or 350 MHz Bandwidth @ 500 MS/s
- 4 GS (8 GB) Onboard Sample Memory Standard
- FPGA Based Applications for Real-Time DSP Functions
- Dual Port Memory with Sustained PXIe Gen3 Data Streaming at 4+ GB/s
- Full-Featured Front-End with DC Coupling (AC Optional) and 50 Ω Inputs
- Ease of Integration with External or Reference Clock In & Clock Out
- External Trigger In & Trigger Out
- 3U PXIe Generation 3.0 x8 Single-Slot 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

RazorMax Express CompuScope Simplified Block Diagram



MAIN SPECIFICATIONS

Model #	: <u>CSX16502</u>	<u>CSX16504</u>	<u>CSX161G2</u>	<u>CSX161G4</u>
# of Input Channels	: 2	4	2	4
Vertical A/D Resolution	: 16-bit	16-bit	16-bit	16-bit
Max. Rate per Channel	: 500 MS/s	500 MS/s	1 GS/s	1 GS/s

A/D SAMPLING

Rates per Channel, Model dependent (software selectable)	: 1 GS/s, 875 MS/s, 800 MS/s, 750 MS/s, 650 MS/s, 600 MS/s, 525 MS/s, 500 MS/s, 425 MS/s, 400 MS/s, 375 MS/s, 325 MS/s, 300 MS/s, 250 MS/s, 200 MS/s, 100 MS/s, 50 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)

Optional ADC Modes (Consult Factory)

Decimate-by-2 Filter	: DDC block providing decimation FIR half-band filter with 41 taps for each ADC channel.
Decimate-by-4 Filter with Digital Mixer	: DDC block providing band-pass decimation filter with digital mixer and 3 concatenated FIR filters.
Decimate-by-4 Filter with IQ Outputs	: DDC block providing a fixed digital $f_s / 4$ mixer with IQ pass band approximately at ± 110 MHz centered at $f_s / 4$ with 41 taps for decimation filter.

ACQUISITION MEMORY

Acquisition memory size is shared and equally divided among all active input channels (1, 2 or 4).	
Standard Size	: 4 GS (8 GB)
Architecture	: Dual Port
Data Streaming	: Yes



ANALOG INPUT CHANNELS

Connectors	: SMA
Impedance	: 50 Ω
Coupling	: DC (standard) or AC (option, consult factory)
Analog Bandwidth	: DC to 700 MHz at 1 GS/s Sample Rate DC to 350 MHz at 500 MS/s Sample Rate
Voltage Ranges	: ± 1 V (contact us for custom ranges)
DC User Offset	: Spans Full Scale Input Range (FSIR) (software selectable)
Absolute Max. Input	: ± 3 V (over-voltage protection included)

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. Signal amplitude must be at least 10% of full scale to cause a trigger to occur. Smaller signals are rejected as noise.
Post-Trigger Data	: 32 points minimum. Can be defined with 32 point resolution.

EXTERNAL TRIGGER

Connector	: SMA
Impedance	: $\approx 1k \Omega$
Coupling	: AC
Bandwidth	: >100 MHz
Voltage Range	: 0-3 V (unipolar)

TRIGGER OUT

Connector	: SMA
Impedance	: 50 Ω
Amplitude	: 0 – TTL

CLOCK OUT

Connector	: SMA
Signal Level	: 0 – 1.5 V
Impedance	: 50 Ω Compatible
Duty Cycle	: 50%
Output Modes	: Maximum Sampling Clock Frequency or 10 MHz Reference Clock
Max. Frequency	: 1 GHz
Min. Frequency	: 250 MHz
10 MHz Reference Clock Mode Rate	: 10 MHz from Internal Reference

CLOCK IN

Connector	: SMA
Signal Level	: Minimum 0.2 V RMS, Maximum 0.5 V RMS
Impedance	: 50 Ω
Coupling	: DC
Duty Cycle	: 50% $\pm 5\%$
Input Modes	: External Clock or 10 MHz Reference Clock
External Clock Mode Rates	: Minimum 250 MHz, Maximum 1 GHz
External Reference Clock Mode Rate	: 10 MHz ± 1000 ppm; the external reference time base is used to synchronize the internal sampling clock.
Variable/Inactive External Clock Mode	: Supports variable rate k-clocking or inactive external clock, particularly useful for OCT applications.

MULTIPLE RECORD

Pre-Trigger Data	: Up to FPGA Memory Size
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TIME-STAMPING

Timing Resolution	: One Sample Clock Cycle
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DIMENSIONS

Size	: Single Slot, 3U Height
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POWER CONSUMPTION

Power	: 30 Watts (typical)
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SYSTEM REQUIREMENTS

PX1e Slot	: 1 Free 3U Single Slot PX1e Gen1, Gen2 or Gen3
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	Input Bandwidth	Memory Size	Order Part Number
CSX16502	16-bit	2	500 MS/s	350 MHz	4 GS (8 GB)	RMX-X65-020
CSX16504	16-bit	4	500 MS/s	350 MHz	4 GS (8 GB)	RMX-X65-040
CSX161G2	16-bit	2	1 GS/s	700 MHz	4 GS (8 GB)	RMX-X61-G20
CSX161G4	16-bit	4	1 GS/s	700 MHz	4 GS (8 GB)	RMX-X61-G40

Front End Options

AC-Coupled Front End Option (Consult Factory)	RMX-FAC-001
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Cable Accessories

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

eXpert FPGA Firmware Options

eXpert PCIe Data Streaming	STR-181-000
eXpert Signal Averaging	250-181-001
eXpert Fast Fourier Transform (FFT)	250-181-004
eXpert Optical Coherence Tomography (OCT)	250-181-006

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.

Data Sheet Revision 2 – 09/27/2017

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