

## USB CompuScope Family

High-speed Digitizers for USB

The USB CompuScope family of digitizers features high vertical resolution with up to 1.1 GS/s sampling in a compact USB 2.0 format.



GaGe's USB digitizers offer many powerful advanced features including:

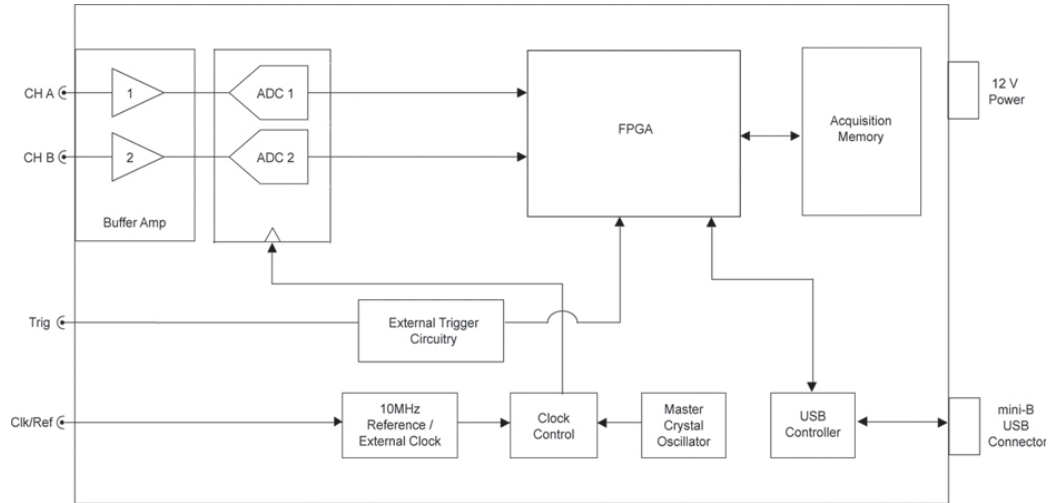
### APPLICATIONS

Communications  
Signal Intelligence  
Radar Design and Test  
Lidar Systems  
Fiber Optics  
Manufacturing Test  
Non-destructive Testing  
Spectroscopy  
High-Performance Imaging  
Ultrasound Test

### FEATURES

- 1 or 2 digitizing channels
- Up to 1.1 GS/s maximum sampling per channel
- 12 or 14 bits vertical resolution
- 128 MS on-board acquisition memory
- Up to 1.2 GHz bandwidth
- High-speed USB 2.0 Interface
- External Triggering and External or Reference Clock
- Programming-free operation with GageScope® oscilloscope software
- Software Development Kits available for LabVIEW, MATLAB, C/C#
- Optional Battery Pack

## USB CompuScope Family Block Diagram



### A/D SAMPLING

| USB CompuScope Family             | CS148001U   | CS144002U       | CS121G11U       |
|-----------------------------------|---|-----------------|-----------------|
| Number of Channels                | 1   | 2               | 1               |
| Resolution                        | 14-bit  | 14-bit          | 12-bit          |
| <b>Dynamic Parameters</b>         |   |                 |                 |
| SINAD (see Note 1)                | 69dB  | 69dB            | 62dB            |
| ENOB (SINAD) (see Note 1)         | 11.2  | 11.1            | 10.2            |
| SFDR (see Note 1)                 | 82dB  | 85dB            | 76dB            |
| Maximum Sampling Rate per channel | 800 MS/s  | 400 MS/s        | 1.1 GS/s        |
| Sampling Rates                    | Available sampling rates are in a rough 1-2-5 sequence down to 10KS/s |                 |                 |
| AC Coupled Bandwidth              | 10 Hz - 700 MHz   | 10 Hz - 1.2 GHz | 10 Hz - 700 MHz |
| Flatness                          | 300 MHz   | 800 MHz         | 300 MHz         |
| Acquisition Memory (per channel)  | 128 MS  | 64 MS           | 128 MS          |

Connector: SMA  
 Input Voltage Ranges:  $\pm 1.1$  V  
 Impedance: 50  $\Omega$   
 Coupling: AC (10 Hz lower cut-off)  
 CS144002U also has selectable DC-coupled range  
 Gain Accuracy:  $\pm 5\%$   
 Absolute Max Input:  $\pm 2.2$  V

### TRIGGERING

Source: CHA, CHB, EXT or Software  
 Trigger Level: Variable for Internal Triggering. Fixed for External Triggering  
 Slope: Positive/Negative for Internal Triggering.  
 Post-Trigger Data: 32 points minimum. Can be defined with 32 point resolution.  
 Pre-Trigger Data: Supported up to full

### EXTERNAL TRIGGER

Impedance: 50  $\Omega$   
 Amplitude: Absolute maximum  $\pm 3$  V  
 Voltage Range:  $\pm 2.5$  V  
 Trigger Conditions: 1 V Level, Rising Edge  
 Coupling: DC  
 Connector: SMA

### INTERNAL CLOCK

Accuracy:  $\pm 10$  ppm (0 to 50°C ambient)

### EXTERNAL CLOCK

Maximum Frequency: 400 MHz for CS144002U and CS148001U  
 550 MHz for CS121G11U  
 Minimum Frequency: 35 MHz  
 Signal Level: Minimum 0.1 V RMS  
 Maximum 0.7 V RMS  
 Termination Impedance: 50  $\Omega$   
 Duty Cycle: 50%  $\pm 5\%$   
 Connector: SMA  
 Coupling: AC  
 Amplitude: Absolute maximum 1.1 V RMS

## EXTERNAL REFERENCE

The External Reference timebase is used to synchronize the Internal Sampling Clock

|               |  |
|---------------|--|
| Frequency:    | 10 MHz                                 |
| Signal Level: | Minimum 0.3 V RMS<br>Maximum 1.1 V RMS |
| Impedance:    | 50 $\Omega$                            |
| Duty Cycle:   | 50% $\pm$ 5%                           |
| Connector:    | SMA                                    |
| Coupling:     | AC                                     |

## MULTIPLE RECORD

|                   |   |
|-------------------|---|
| Record Length:    | 32 points minimum.<br>Can be defined with a 32 points resolution. |
| Pre-trigger Data: | Supported   |

## TIMESTAMPING

|             |                       |
|-------------|-----------------------|
| Resolution: | One sampling interval |
|-------------|-----------------------|

## USB CASE SIZE

4" x 1.2" x 6.5"

## USB COMPUSCOPE HARDWARE KIT INCLUDES:

- USB digitizer unit
- 100/240 V to 12 V AC to DC adapter
- USB Type A Cable
- Carrying case

## †POWER (IN WATTS, PER UNIT)

<20 W (typical)

## PC REQUIREMENTS

One free USB 2.0 PORT on host PC or USB hub.  
Host PC must have at least 256MB RAM and 256MB hard drive space.

## USB BUS INTERFACE

|                     |                      |
|---------------------|----------------------|
| Compatibility:      | USB 2.0              |
| USB Connector Type: | Female mini-B        |
| USB Throughput:     | 25 MB/s to PC memory |

## MULTI-UNIT SYSTEMS

|                  |  |
|------------------|--|
| Operating Mode:  | Multiple Independent                           |
| Number of units: | Limited only by number of USB ports in host PC |

## OPERATING SYSTEMS

|                      |                               |
|----------------------|-------------------------------|
| Windows Vista/Win 7: | All Versions (32-bit/64-bit)  |
| Windows XP:          | SP2 or higher (32-bit/64-bit) |

## APPLICATION SOFTWARE

GageScope: Windows-based software for programming-free operation

|                       |   |
|-----------------------|---|
| LITE Edition:         | Included with purchase, provides basic functionality                                |
| Standard Edition:     | Provides limited functionality of advanced analysis tools, except for Extended Math |
| Professional Edition: | Provides full functionality of all advanced analysis tools                          |

## SOFTWARE DEVELOPMENT KITS (SDK)

CompuScope SDK for C/C# for Windows\*  
CompuScope SDK for MATLAB for Windows  
CompuScope SDK for LabVIEW for Windows

\*C/C# SDK is CLR compatible and is compatible with LabWindows/CVI 7.0+ compiler.  
Visual Basic.NET support available with purchase of C/C# SDK.

## WARRANTY

One year parts and labor  
All specifications subject to change without notice.

## Notes to specifications:

- 1) Measured at 70 MHz signal frequency
- 2) Sampling frequency is 2X external clock frequency for CS148001U and CS121G11U. Ratio is 1x for CS144001U



## ORDERING INFORMATION

### Hardware & Upgrades

|                    |             |
|--------------------|-------------|
| CompuScope 144002U | USB-214-000 |
| CompuScope 148001U | USB-114-000 |
| CompuScope 121G11U | USB-112-000 |

|                                    |             |
|------------------------------------|-------------|
| 2 Hour USB CompuScope Battery Pack | USB-BAT-001 |
| 4 Hour USB CompuScope Battery Pack | USB-BAT-002 |

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

### GageScope® Software

|   |             |
|---|-------------|
| GageScope: Lite Edition   | Included    |
| GageScope: Standard Edition<br>(with Purchase of CompuScope Hardware) | 300-100-351 |

|   |             |
|---|-------------|
| GageScope: Professional Edition<br>(with Purchase of CompuScope Hardware) | 300-100-354 |
|---|-------------|

### Software Development Kits (SDKs)

|                            |             |
|----------------------------|-------------|
| GaGe SDK Pack on CD        | 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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