CompuScope 12400

General-purpose digitizer for the PCI bus

The CompuScope 12400 PCI bus digitizer features 12-bit vertical resolution, 400 MS/s sampling, and high 200 MHz bandwidth.

The fast sampling rate enables the capture of high-speed signals with ultra-high timing precision. The high resolution allows the capture of signals with very high dynamic range. Now available with up to 2 GS of on-board memory.



The CS12400 general-purpose digitizer features 12-bit vertical resolution and high sampling speed up to 400 MS/s.

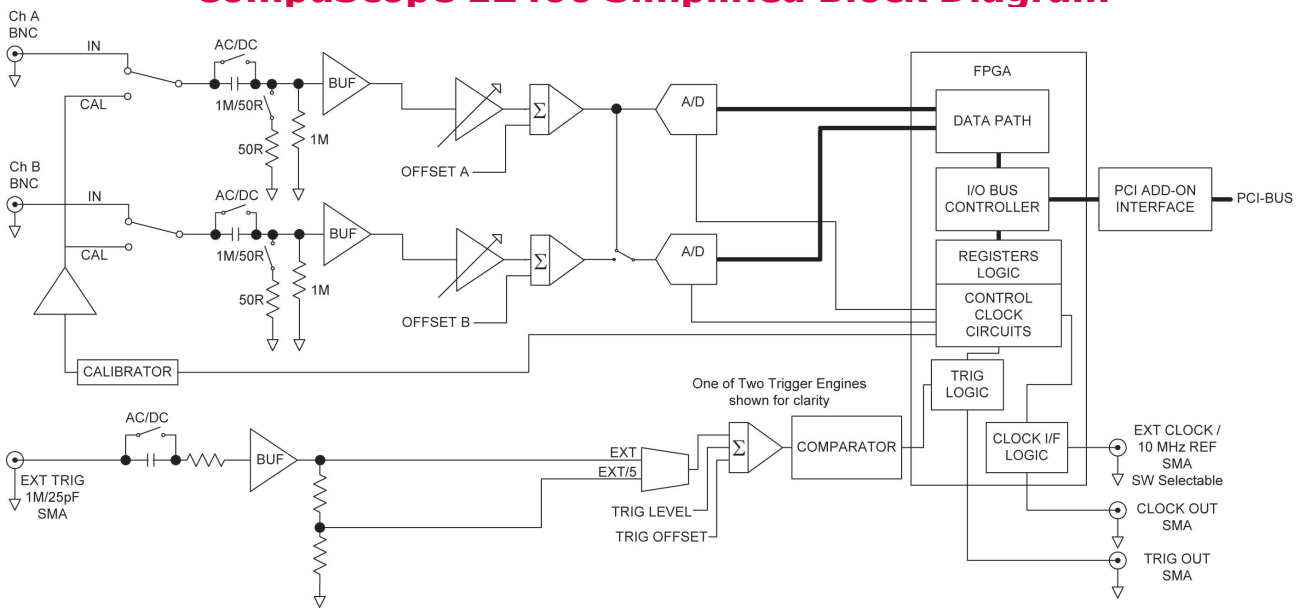
APPLICATIONS

Spectroscopy
Radar System Design and Test
Signal Intelligence
Lidar Systems
Communications
Ultrasonic Testing
High-Performance Imaging
Manufacturing Test

FEATURES

- 400 MS/s sampling on one channel or 200 MS/s on 2 synchronous channels
- 12 bits nominal resolution
- 200 MHz bandwidth
- Full-size, single-slot PCI card
- Up to 2 Gigasamples of on-board acquisition memory
- Full-featured, software-controlled front-end
- 32 bits, 66 MHz PCI standard for 200 MB/s transfer to PC memory
- Compatible with GageScope oscilloscope software
- Software Development Kits available for LabVIEW, MATLAB, C/C#, LabWindows/CVI

CompuScope 12400 Simplified Block Diagram



A/D SAMPLING

Number of Inputs:	2
Resolution:	12 bits
ENOB (see Note 1):	10.0 bits
SNR (see Note 1):	62.0 dB
SFDR (see Note 1):	72.0 dB
SINAD (see Note 1):	61.4 dB
Sampling Rates	
Channels A and B simultaneously:	200 MS/s, 100 MS/s, 50 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
Channel A only:	400 MS/s, 200 MS/s, 100 MS/s, 50 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
Connector:	BNC
Impedance:	1 MΩ 40 pF or 50 Ω; (software-selectable)
Coupling:	AC or DC; (software-selectable)
AC Coupled Bandwidth:	10 Hz to 200 MHz (see Note 2)
DC Coupled Bandwidth:	DC to 200 MHz (50 Ω only, less for 1 MΩ, see Note 2)
Flatness:	Within 1 dB of ideal response over 75% of bandwidth (see Note 2)
DC Accuracy:	±0.5 %
Input Voltage Ranges:	±100 mV, ±200 mV, ±500 mV, ±1 V, ±2 V, ±5 V (±5 V is only available in 50 Ω)
DC Offset:	± 1xFull Range, except in ±5 V input range
Protection	
with 1 MΩ impedance:	Diode-clamped
with 50 Ω impedance:	No protection
Absolute Maximum Amplitude	
with 1 MΩ impedance:	±15 V (continuous)
with 50 Ω impedance:	±5 V (continuous); ±15 V (for 1 ms duration)

DIRECT-TO-ADC SAMPLING MODE

Mode Control:	Software-selectable
AC Coupled Bandwidth:	30 kHz to 170 MHz (50 Ω, AC only; see Note 2)
Range:	± 500 mV
Protection:	No protection
Absolute Maximum Amplitude:	± 2 V (continuous)
Sample Rate:	<=200 MS/s

ACQUISITION MEMORY

Data Storage:	In on-board memory
Dual-Channel Mode:	16M, 32M, 64M, 128M, 256M, 512M, 1G (12-bit samples in 16-bit words)
Single-Channel Mode:	2 GS (up to full on-board memory)

TRIGGERING

Trigger Engines:	2 per system
Source:	CH A, CH B, EXT or Software (software-selectable)
Input Combination:	1, 2, 1 or 2
Type:	Digital triggering on channels Analog triggering on external trigger
Trigger Level Accuracy:	±5% of Full Scale
Slope:	Positive or Negative (software-selectable)
Sensitivity:	±10% of Full Scale This implies that signal amplitude must be at least 20% of full scale to cause a trigger to occur. Smaller signals are rejected as noise.
Post-Trigger Data:	128 points minimum. Can be defined with a 64 point resolution.
Maximum Record Length:	Maximum memory depth

INTERNAL CLOCK

Source:	Clock oscillator
Accuracy (0 to 50° ambient):	±25 ppm for 200 MHz and lower ±50 ppm for 400 MHz

EXTERNAL TRIGGER

Impedance:	1 MΩ, 35 pF
Amplitude:	Absolute maximum ±15 V
Voltage Range:	±1 V, ±5 V (software-selectable)
Bandwidth:	80 MHz
Coupling:	AC or DC
Connector:	SMA
Type:	Analog Triggering

TRIGGER OUT

Impedance:	50 Ω
Amplitude:	0-2.5 V (TTL)
Connector:	SMA

EXTERNAL CLOCK

Maximum Frequency:	420 MHz
Minimum Frequency:	40 MHz
Signal Level:	Minimum 1 V RMS Maximum 2 V RMS
Impedance:	50 Ω
Sampling Edge:	Rising
Duty Cycle:	50% ± 5%
Connector:	SMA

EXTERNAL REFERENCE (OPTIONAL)

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

Frequency:	10 MHz; (software-selectable)
Signal Level:	Minimum 1 V RMS Maximum 2 V RMS
Impedance:	50 Ω
Sampling Edge:	Rising
Duty Cycle:	50% ± 5%
Connector:	SMA

CLOCK OUT

Maximum Frequency:	200 MHz
Minimum Frequency:	40 MHz (from External Clock) 50 kHz (from Internal Clock)
Output Frequency:	Equal to the sample rate when it is ≤ 200 MS/s Equal to half the sample rate when it is > 200 MS/s
Signal Level:	0-2.5 V (TTL)
Impedance:	50 Ω
Duty Cycle:	50% ± 10%
Connector:	SMA

TIMESTAMPING

Resolution:	7.5 ns
Counter turnover:	24 hours continuous

MULTIPLE RECORD

Pre-trigger Data:	Up to virtually full record length
Record Length:	128 points minimum. Can be defined with a 64 points resolution.
Maximum # Trigger:	16,777,216

MULTI-CARD SYSTEMS

A unique feature of the CS12400 is its ability to automatically reconfigure itself to Master/Slave or Independent multi-card system simply by adding or removing the Master/Slave Timing Module.

Operating Mode:	Master/Slave or Multiple/Independent configurations
Master/Slave:	2 to 8 cards
Multiple/Independent:	Limited by PC backplane

CARD SIZE

Plugs into one full-length PCI slot, for all memory configurations

SYSTEM REQUIREMENTS

PCI-based computer, minimum Pentium II 500 MHz, with at least one free full-length PCI slot, 128 MB RAM, 100 MB hard disk, and SVGA video.

COOLING SYSTEM

Minimum CFM Requirement:	Characterization in progress.

POWER (IN WATTS, PER CARD)

+5 V	
	Typical
All Memory Depths	18.0
+3.3 V	
	Typical
All Memory Depths	7.9
+12 V	
	Typical
All Memory Depths	0
-12 V	
	Typical
All Memory Depths	0

PCI BUS INTERFACE

Plug-&-Play:	Fully supported
Bus Mastering:	Fully supported
Scatter-Gather:	Fully supported
Bus Width:	32 bit
Bus Speed:	66 MHz or 33 MHz
Bus Throughput:	200 MB/s to PC memory (66 MHz PCI; dependent on motherboard and number of PCI-PCI bridges)
Compatibility:	PCI-compliant v.2.2 systems. Also v.2.1 systems that supply 3.3 V to PCI slot

OPERATING SYSTEMS

Windows XP:	All Versions
Windows 2000:	SP1 or higher

SOFTWARE SUPPORT

Software Development Kits: C/C#
MATLAB
LabVIEW
LabWindows/CVI

Software for programming-free operation:
GageScope®

MATERIALS SUPPLIED

One CompuScope 12400 card
One Gage CompuScope CD, includes GageScope® Lite Edition
One Hardware Manual

WARRANTY

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

Notes to specifications:

1) Unless otherwise specified, all dynamic performance specs (ENOB, SNR, SFDR, SINAD) are measured at Input Amplitude of 95% of Full Scale in Direct-to-ADC mode at 200 MS/s.

2) Detailed characterization curves will be available upon request.

ORDERING INFORMATION

Hardware & Upgrades

CompuScope 12400-32M	124-001-002
CompuScope 12400-64M	124-001-003
CompuScope 12400-128M	124-001-004
CompuScope 12400-256M	124-001-008
CompuScope 12400-512M	124-001-005
CompuScope 12400-1G	124-001-006
CompuScope 12400-2G	124-001-007
CS12400: Memory Upgrade	Contact Gage
CS12400: Master Multi-Card Upgrade	124-181-002
CS12400: Slave Multi-Card Upgrade	124-181-003
CS12400: Signal Averaging Firmware Option	124-181-004
CS12400: FIR Filtering Firmware Option	124-181-005
CS12400: External Reference Clock Option	124-181-006

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 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
CompuScope SDK for LabWindows/CVI	200-200-103

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Gage Applied Technologies

1 Provost, Suite 200
Lachine, Quebec
Canada H8S 4H2

Toll-Free (US and Canada):
phone 1-800-567-4243
fax 1-800-780-8411

Direct:
phone +1-514-633-7447
fax +1-514-633-0770

Email:
prodinfo@gage-applied.com

To find your local sales representative or distributor or to learn more about Gage Applied Technologies' products visit:

www.gage-applied.com