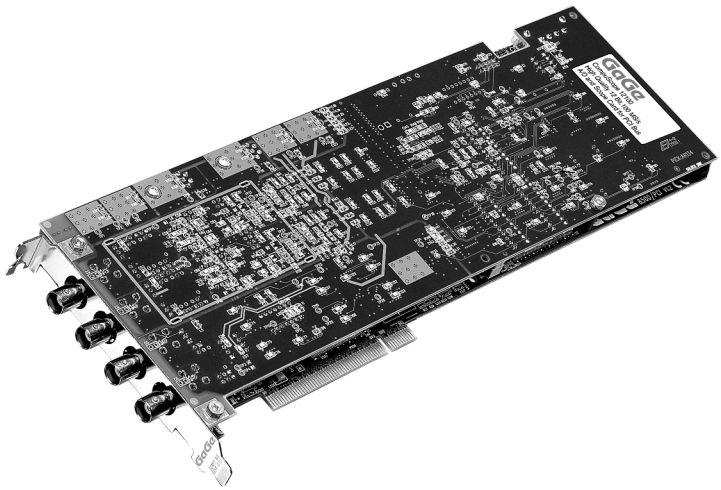
# CompuScope 12100

## Ultra-fast waveform digitizer card for PCI bus



**Versatile high-resolution digitizer for fast and deep signal capture in a wide range of applications requiring high accuracy.**

### FEATURES

- 12 bit, 100 MS/s A/D
- Up to 1 GigaSamples of on-board acquisition memory
- 60 dB signal to noise ratio
- Multi-card systems of up to 8 channels at 100 MS/s (16 channels at 50 MS/s)
- Fast data transfer rate to PC memory
- Compatible with GageScope software
- SDKs for C/C++, MATLAB, LabVIEW under Win 95/98/ME and Win NT/2000/XP

### APPLICATIONS

Detection & Remote Sensing - Sonar, Lidar, Radar, Spectroscopy

Manufacturing test

Synthetic instrumentation

Wireless communications

Signal intelligence

Non-destructive testing

GaGe

www.gage-applied.com

## COMPUSCOPE 12100

CompuScope 12100 samples analog signals at speeds up to 100 MS/s with 12 bit resolution and stores the data in on-board memory.

## 100 MS/S SAMPLING

CompuScope 12100 uses two monolithic sub-ranging A/D converters, each running at 50 MS/s, to provide a dual-channel simultaneous real-time sampling rate of 50 MS/s.

In the single-channel mode the two ADCs are clocked in a "ping-pong" mode to achieve up to 100 MS/s sampling. An on-board crystal-controlled timing circuit ensures timebase accuracy and long-term thermal stability.

The on-board auto-calibration circuitry allows the two channels to be matched in order to reduce the image signal.

## HIGH IMMUNITY TO DIGITAL NOISE

In order to isolate the high-frequency analog circuitry from PCI bus–related digital electronics, a two-board piggy-back configuration is used. This allows maximum separation of analog and digital grounds, thereby providing high immunity to digital noise.

## MEMORY DEPTH

CompuScope 12100 is available with memory depths of 1M, 4M, 8M, 64M, 256M, 512M and 1G (12-bit samples). This memory can be used as a circular buffer for storage of pre- and post-trigger data.

In the single-channel mode, the maximum number of sample points is equal to the memory depth of the CompuScope 12100 model being used, whereas in the dual-channel mode the maximum number of sample points is half the memory depth.

The data stored in the CompuScope 12100 memory can be transferred to the system RAM for post-processing, display or storage to hard disk without any interface bus (no GPIB bus required).

## FLEXIBLE TRIGGERING

CompuScope 12100 features state-of-the-art analog triggering. An analog comparator provides triggering from either one of the input channels, or from an external signal or from software.

In addition to the trigger source, trigger level and slope are also selectable by software, making the trigger system similar to traditional oscilloscopes.

## EXTERNAL CLOCK (OPTIONAL)

External clock upgrade can be ordered when a special sampling frequency is required.

In single-channel mode, the input signal is sampled at every rising edge of the External Clock.

In the dual-channel mode, sampling occurs on every other edge of the External Clock, i.e. the sample rate is half the frequency of the External Clock.

The External Clock must be a 5 Volt TTL signal with a maximum frequency of 100 MHz and minimum frequency of 10 MHz.

## X1 EXTERNAL CLOCK (OPTIONAL)

A special external clock upgrade can be ordered which allows the hardware to simultaneously sample both inputs on every low-to-high transition of the External Clock, instead of every other one.

The maximum External Clock frequency for a CompuScope 12100 with this upgrade is 50 MHz, and the minimum is 5 MHz.

It must be noted that it is not possible to operate the card in single-channel mode once this upgrade is performed, i.e. the maximum sample rate is 50 MS/s and the maximum memory per channel is half the on-board RAM.

## MULTIPLE RECORD

Even though the PCI bus allows fast data throughput to system RAM, there may still be applications in which data bursts cannot be off-loaded either due to very fast trigger repeat frequency or due to software limitations.

Multiple Recording allows CS12100 to capture data on successive triggers and stack it in on-board memory. Up to 65,536 triggers can be captured in Multiple Record mode. It should be noted that only post-trigger data can be captured in Multiple Record Mode.

Once the CS12100 has finished capturing a Multiple Record segment, the trigger circuitry is automatically re-armed within 16 sample clock cycles to start looking for the next trigger. No software intervention is required.

## MULTI-CARD SYSTEMS

A Multi-card system, comprised of one Master and up to 7 Slave CS12100 boards, can be ordered if the user wants to capture more than two channels with a common clock and trigger. Refer to the detailed spec for available configurations for different memory models. A board-to-board interconnect is supplied with the system which carries all the signals needed for synchronization.

GageScope software can display all channels from these boards on the same screen.

## ORDERING INFORMATION

### Hardware & Upgrades

| | |
|---|---|
| CompuScope 12100-1M | 121-001-002 |
| CompuScope 12100-4M | 121-001-003 |
| CompuScope 12100-8M | 121-001-004 |
| CompuScope 12100-64M | 121-001-005 |
| CompuScope 12100-256M | 121-001-006 |
| CompuScope 12100-512M | 121-001-007 |
| CompuScope 12100-1G | 121-001-008 |
| CS12100 Memory Upgrade Charge | 121-181-200 |
| External Clock Upgrade | 121-181-004 |
| X1 External Clock Upgrade | 121-181-008 |
| Master Multi-Card Upgrade | 121-181-005 |
| Slave Multi-Card Upgrade | 121-181-006 |

### GageScope Software

| | |
|---|---|
| GageScope: Lite Edition | included |
| GageScope: Standard Edition *(with Purchase of CompuScope Hardware)* | 300-100-351 |
| GageScope: Professional Edition *(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 |

*All Upgrades performed at the factory.*

# COMPUSCOPE 12100 SPECIFICATIONS

## SYSTEM REQUIREMENT

PCI-based computer with at least one free full-length PCI slot, 128 MB RAM, 50 MB hard disk and SVGA video.

## SIZE

| Memory Depth: | Board Width occupies: |
|---|---|
| 1M | 1 full length slot |
| 4M and 8M | 2 full length slots |
| 64M, 256M | 3 full length slots |
| 512M, 1G | 3 full length slots |

## POWER (IN WATTS)

| +5 V | | |
|---|---|---|
| Memory | Worst | Typical |
| 1M | 12.4 | 11.3 |
| 4M | 15.4 | 14.3 |
| 8M | 15.4 | 14.3 |
| 64M | 17.4 | 15.3 |
| 256M | 19.9 | 17.3 |
| 512M | 19.9 | 17.3 |
| 1G | 22.4 | 19.3 |
| **- 5V** | | |
| | Worst | Typical |
| All Models | 0.0 | 0.0 |
| **+12 V** | | |
| | Worst | Typical |
| All Models | 6.6 | 6.0 |
| **-12 V** | | |
| | Worst | Typical |
| All Models | 4.4 | 4.0 |

## CHANNELS A & B

Inputs per card: 2

Impedance: 1 MΩ, 25 pF or 50 Ω, software selectable

Coupling: AC or DC

Resolution: 12 bits

Bandwidth:
(DC) DC to 50 MHz, ±5 MHz
(AC) 10 Hz to 50 MHz, ±5 MHz

Full Scale Input Range: ±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V

Max. Amplitude:
1 MΩ Impedance: ±15 V (continuous)
50Ω Impedance: ±5 V (continuous)

DC Accuracy relative to full scale input:

| Input Range | Accuracy |
|---|---|
| ± 5 V | 1% |
| ± 2 V | 0.5% |
| ± 1 V | 0.5% |
| ± 500 mV | 0.5% |
| ±200 mV | 0.5% |
| ±100 mV | 1% |

Sampling Rate
Single-channel: MS/s: 100, 50, 20, 10
Dual-channel: MS/s: 50, 25, 10, 5

Protection: 1 MΩ : Diode Clamped
50Ω : No Protection

Connector: BNC

## DYNAMIC PARAMETERS

Measured using 1 MHz sine wave input at 50 MS/s, dual channel mode with amplitude of 95% of full scale on the ±1V range

SNR: 60 dB
SFDR: 59 dB
SINAD: 55 dB
THD: -57 dB
ENOB: 9.67 bits

## ACQUISITION MEMORY

Data Storage: In on-board memory
Memory Sizes: 1M, 4M, 8M, 64M, 256M, 512M, 1G
Maximum Memory Depth:
Single-Ch.Mode: Full on-board memory
Dual-Ch. Mode: Up to half on-board memory per channel

## TRIGGERING

# of Trigger Inputs: 2 per system
Trigger Source: CH A, CH B, Ext, Software
Input Combination: Wired-OR
Type: Analog triggering
Sensitivity: ±10% of full scale
Level Accuracy: ±5 % of full scale
Slope: Positive or Negative
Post Trigger Data: 64 *(128)* points minimum. Can be defined with a 64 *(128)* point resolution in dual *(single)* channel mode

## EXTERNAL TRIGGER

Impedance: 1 MΩ, 30 pF
Amplitude: Absolute Max ±15V
Voltage Range: ±1V and ±5V
Bandwidth: 30 MHz
Coupling: AC or DC
Connector: BNC

## INTERNAL CLOCK

Source: 100 MHz Clock Oscillator
Accuracy: ±50 ppm (0 to 70 deg C)

## EXTERNAL CLOCK (OPTIONAL)

Max. Freq.: 100 MHz in Ext. Clock
50 MHz in X1 Ext. Clock
Min. Freq.: 10 MHz in Ext. Clock
5 MHz in X1 Ext. Clock
Signal Level: 0 to +5 Volt TTL
Impedance: 50Ω
Sampling Edge: Rising
Coupling: DC
Duty Cycle: 50% ±30% for Ext Clk
50% ±5% for X1 Ext Clk

## MULTIPLE RECORD

Pre-trigger Data: None
Record Length: 128 *(256)* points min. Can be defined with a 64 *(128)* point resolution in dual *(single)* channel mode
Max # of Triggers: 65,536

## MULTI-CARD SYSTEMS

Operating Mode: Master/Slave or Multiple Independent
Number of Cards in:
- Master/Slave Mode:
  1M models: 2, 4, 6 or 8 cards
  4M & 8M models: 2, 3 or 4 cards
  64M & higher models: 2 or 3 cards
- Multiple Ind. Mode: Limited by backplane

## OPERATING SYSTEMS

Windows 95/98/ME/NT*/2000/XP
* Version 4, SP3 or higher

## ELECTROMAGNETIC COMPATIBILITY CE Compliant

EC Council Directive 89/336/EEC
EN 61326 Class A
IEC 61000-4-2 Electrostatic Discharge (Perf.Crit.B)
IEC 61000-4-3 RF Electromagnetic Field (Perf.Crit.A)
IEC 61000-4-4 Electrical Fast Transient/Burst (Perf.Crit. B)
IEC 61000-4-5 Power Surge (Perf.Crit.B)
IEC 61000-4-6 Conducted RF (Perf.Crit.A)
IEC 61000-4-11 Voltage Dips & Interruptions (Perf.Crit B)
EN 61000-3-2 AC Power Line Harmonics Emissions
AS/NZS 2064
Australian emissions standard for Industrial, Scientific and Medical Equipment
Compliance demonstrated on a 3 board Master/Slave configuration

## WARRANTY

One year parts and labor

*All specifications subject to change without notice*
*Specification Last Updated: February 2003*