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TECHNOLOGY GROUP

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Find the *DynamicSignals / GaGe CompuScope 12100* at our website: *Click HERE*

GAGE APPLIED TECHNOLOGIES

CS12100 and CS1250 Hardware Manual

Reorder #: MKT-HWM-PCI01-CS12100/CS1250
0408

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First Edition (August 2004)

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Please complete the following section and keep it handy when calling Gage for **technical support**:

Owned by: _____
Serial Number(s): _____
_____
Purchase Date: _____
Purchased From: _____

You must also have the following information when you call:

- Software Driver & Application Version
- Software Development Kit, if applicable
- Brand name and type of computer
- Processor and bus speed
- Total memory size
- Information on all other hardware in the computer

How to reach Gage Applied Technologies for Product Support
Toll-free phone: (800) 567-GAGE Toll-free fax: (800) 780-8411

To reach Gage from outside North America
Tel: (514) 633-7447 Fax: (514) 633-0770

Email: prodinfo@gage-applied.com **Website**: www.gage-applied.com

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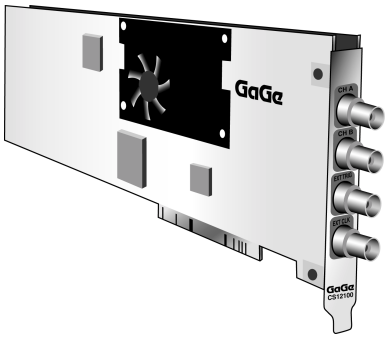
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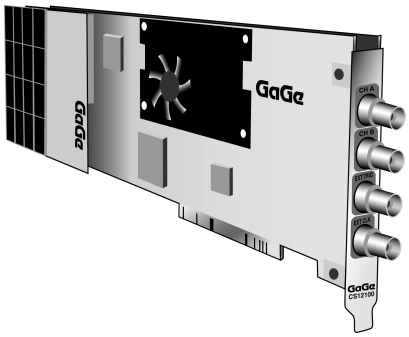
What you should receive with your CS12100 or 1250

If you order an independent CompuScope 12100 or CompuScope 1250 card, you should receive the following articles:

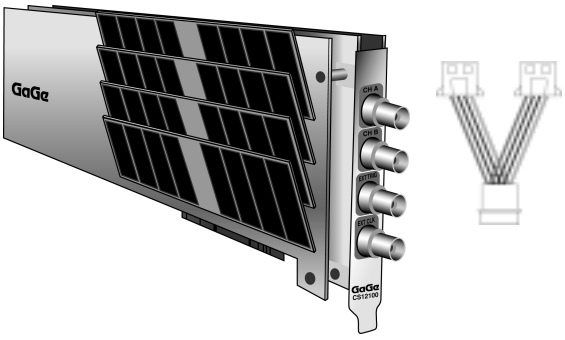
- CompuScope 12100 or CompuScope 1250 card



If you purchased a CompuScope 12100-4M, CompuScope 12100-8M, CompuScope 1250-4M or CompuScope 1250-8M card, you should see a piggyback memory board attached to the back of the card, as shown below:



If you purchased a CompuScope 12100 or CompuScope 1250 card with 64M, 256M, 512M or 1G acquisition memory, you should see a full-length piggyback memory board attached to the back of the card, as shown below. You should also receive a Y-cable for connecting power to the piggyback memory board.



- Y-Cables for powering CompuScope cards in a multi-card system (Master/Slave or multiple independent). You will receive one Y-cable for each card.



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- Standard items included with each independent CompuScope card

  Hardware Manual, including Driver Installation Guide



  Note that you will receive only one copy of the Hardware Manual per order placed with Gage. Additional copies can be requested at order time.

  The Hardware Manual is also available in PDF format on the Gage Software Disk or you can download card-specific manuals from Gage's Web site (www.gage-applied.com).

  Gage Software Disk (with GageScope Software)



  The Gage Software Disk, included at the back of the Hardware Manual and Installation Guide, contains all of the software drivers you need to operate your Gage hardware. The CD also contains all of the installers for the application packages provided by Gage, including Lite, Standard and Professional editions of GageScope.

  Note that some packages will only be available if you have purchased the software and have a key provided by Gage.

  CompuScope Certificate of NIST Traceable Calibration



  Each CompuScope card is shipped with a Certificate of NIST Traceable Calibration. NIST is the National Institute to Standards and Technologies - the US organization that is responsible for the definitions and measurement of metrology standards.

  Prior to shipment, Gage runs each CompuScope card through a battery of over 1000 automated performance verification tests using a NIST traceable calibration source. The tested CompuScope is then considered a NIST traceable calibration instrument for a period of one year – the calibration interval that is generally accepted by the Test and Measurement industry.

  Warranty card



- You may also receive a number of optional items, if purchased:

  GageScope® software and
  Standard or Professional edition
  Software Key envelope



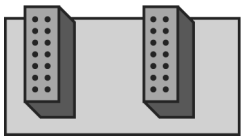
  Software Development Kits (SDKs)
  & applicable manual(s)



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- If you ordered Master or Slave upgrades with your CompuScope 12100 or CompuScope 1250 cards, you will receive one of the following Master/Slave Timing Modules, one Y-cable and 4 BNC lock washers and nuts per CompuScope card in your Master/Slave system (actual Master/Slave Timing Module may not be exactly as shown).

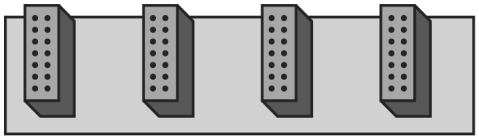
2 Slot
Master/Slave
Timing Module



2-Slot Master/Slave Timing Module is used for:

2-Card Master/Slave system of CS12100-1M or CS1250-1M

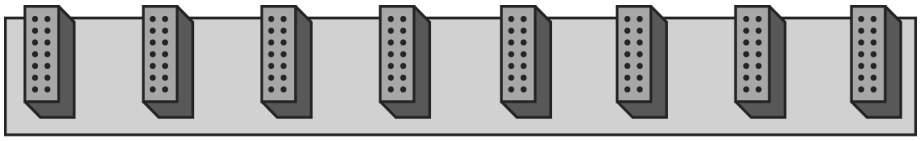
4 Slot
Master/Slave
Timing Module



4-Slot Master/Slave Timing Module is used for:

4-Card Master/Slave system of CS12100-1M or CS1250-1M
2-Card Master/Slave system of CS12100-4M or -8M or CS1250-4M or -8M

8 Slot
Master/Slave
Timing Module



8-Slot Master/Slave Timing Module is used for:

6-or 8-Card Master/Slave system of CS12100-1M or CS1250-1M
3-or 4-Card Master/Slave system of CS12100-4M or -8M or CS1250-4M or -8M
2-or 3-Card Master/Slave system of CS12100-64M, CS12100-256M, CS12100-512M or CS12100-1G or CS1250-64M, CS1250-256M, CS1250-512M or CS1250-1G

Carefully inspect these articles before proceeding further. If you find any damage caused by transportation, please report it to the organization from which you purchased the CompuScope card.

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CompuScope 12100 & 1250 compliance statement

CompuScope 12100 and CompuScope 1250 meet the following EMC standards:

Category	Standards or description
EC Declaration of Conformity – EMC	Meets intent of Directive 89/336/EEC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities: EN 61326 EMC requirements for Class A electrical equipment for measurement, control and laboratory use. [1, 2, 3] IEC61000-4-2 Electrostatic Discharge (Performance criterion B) IEC61000-4-3 RF Electromagnetic Field (Performance criterion A) IEC61000-4-4 Electrical Fast Transient/Burst Immunity (Performance criterion B) IEC61000-4-5 Power Line Surge Immunity (Performance criterion B) IEC61000-4-6 Conducted RF Immunity (Performance criterion A) IEC61000-4-11 Voltage Dips and Interruptions Immunity (Performance criterion B) EN 61000-3-2 AC Power Line Harmonic Emissions
Australia / New Zealand Declaration of Conformity - EMC	Complies with EMC provision of Radio communications Act per the following standard(s): AS/NZS 2064.1/2 Industrial, Scientific and Medical Equipment: 1992 [1, 2, 3]

CONDITIONS

In order to maintain continued compliance, the following conditions must be met:

1. High-quality shielded cables must be used to ensure compliance to the above listed standards
2. Compliance demonstrated on a three card Master/Slave configuration (qty 3 cards maximum)
3. On the host PC used by the customer, all unused back panel slots must be covered with EMI blocking plates

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CompuScope 12100 & 1250 product introduction

CompuScope 12100 is a 12 bit, waveform digitizer card for the PCI Bus, capable of 100 MS/s sampling on one channel and 50 MS/s sampling on two simultaneous channels.

CompuScope 1250 is a 12 bit, waveform digitizer card for the PCI Bus, capable of 50 MS/s sampling on one channel and 25 MS/s sampling on two simultaneous channels.

Recognizing that until very recently, almost all multi-Megahertz data acquisition was done using Digital Storage Oscilloscopes under GPIB or IEEE 488 control, Gage has ported all the features of these DSOs onto the CompuScope card. This means that you do not have to rethink the solution in terms of a completely unknown data acquisition card. You can simply develop the data acquisition system as if an oscilloscope were being used, but instead use a CompuScope card to take advantage of its attractive price and performance.

Of course, CompuScope cards are much more than just another DSO under GPIB control:

- CS12100 and CS1250 feature 12 bit vertical resolution as opposed to the 8 bit resolution offered by DSOs.
- CS12100 and CS1250 feature up to 1 billion samples of on-board acquisition memory.
- Multi-card Master/Slave systems provide from 2 to 16 channels of simultaneous A/D conversion, something normal DSOs simply cannot do.
- Data transfer rates from CompuScope memory to PC memory or extended memory run as high as 80 MB/s for the CS12100 and CS1250 as compared to a few hundred KB/s for GPIB.
- CompuScope cards are easier to program, as Software Development Kits are available for C/C++, MATLAB and LabVIEW.
- CompuScope cards are installed inside the PCI bus chassis, so there is no external box such as a DSO.
- CS12100 and CS1250 cards have standard features such as Multiple Record, which help optimize the use of the on-board memory by stacking data from successive bursts.
- You can also write software for a multi-card system in which all the cards are not in a Master/Slave configuration. Drivers supplied by Gage support all these multi-card configurations.

Special features of the CompuScope 12100 and CompuScope 1250 include:

- Bus Mastering

  CompuScope 12100 and CompuScope 1250 cards are fully capable of becoming a bus master in order to transfer data at the maximum rate of 80 MB/s.

  A bus Master is a card that can take control of the bus and transfer data to any PCI target device such as system RAM without any involvement from the CPU.

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CompuScope 12100 specifications

PLEASE CHECK THE GAGE WEBSITE FOR THE MOST UP-TO-DATE 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

1 M Acquisition Memory	1 slot
4 M Acquisition Memory	2 slots
8 M Acquisition Memory	2 slots
64 M Acquisition Memory	3 slots
256 M Acquisition Memory	3 slots
512M Acquisition Memory	3 slots
1 G Acquisition Memory	3 slots

POWER (IN WATTS)

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

Notes:

1. Y-cable must be connected to auxiliary power connector if more than one CS12100 cards are installed.
2. Power connector on the deep memory board of 64M, 256M, 512M and 1G models must also be connected using a Y-cable.

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 to 50 MHz ±5 MHz (DC coupled) 10 Hz to 50 MHz ±5 MHz (AC coupled)
Input Voltage Ranges:	±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V

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Absolute Maximum Amplitude:

1 MΩ impedance: ±15 Volts (continuous)
50 Ω impedance: ±5 Volts (continuous)

DC Accuracy relative to full scale input:

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

Sampling Rate

Single-Channel Mode (channel A only)

MS/s: 100, 50, 20, 10

Dual-Channel Mode (Channels A and B simultaneously)

MS/s: 50, 25, 10, 5

Protection

1 MΩ impedance: Diode Clamped
50 Ω impedance: 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: 1 Msamples,
4 Msamples
8 Msamples,
64 Msamples,
256 Msamples
512 Msamples,
1 Gsamples

Maximum memory depth:

Single Channel Mode: Up to full on-board memory
Dual Channel Mode: Up to half on-board memory per channel

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TRIGGERING

Number of Trigger Inputs:	2 per system
Trigger Source:	CH A, CH B, EXT or Software
Input combination:	Wired-OR
Type:	Analog triggering
Sensitivity:	± 10% of full scale
Level Accuracy:	± 5% of full scale
Slope:	Positive or Negative, software selectable
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 degrees Celsius)

EXTERNAL CLOCK (OPTIONAL)

Maximum Frequency:	100 MHz with External Clock Upgrade 50 MHz with X1 External Clock Upgrade
Minimum Frequency:	10 MHz with External Clock Upgrade 5 MHz with X1 External Clock Upgrade
Signal Level:	0 to +5 Volt TTL
Impedance:	50 Ω
Sampling Edge:	Rising
Coupling:	DC
Duty Cycle:	50% ±30% for External Clock Upgrade 50% ±5% for X1 External Clock Upgrade

MULTIPLE RECORD

Pre-trigger Data:	None
Record Length:	128 *(256)* points minimum. Can be defined with a 64 *(128)* point resolution in dual *(single)* channel mode
Maximum Number of Triggers:	4,194,304

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MULTI-CARD SYSTEMS

Operating modes: Master/Slave or Multiple Independent

Maximum Number of Cards

Master/Slave: 2 to 8 cards for 1M memory
2, 3 or 4 cards for 4M and 8M memory
2 or 3 cards for 64M, 256M, 512M and 1G

Multiple/Independent: Limited by the backplane

Maximum number of Channels in Master/Slave Mode:

16 at 50 MS/s (1M model)
8 at 100 MS/s (1M model)

MASTER/SLAVE SYSTEM TRIGGERING

Number of Trigger Inputs: 2 per system

Trigger Source: CH A, CH B, EXT or Software (Master card only)

Input combination: Wired-OR

Sensitivity: ± 10% of full scale

Level Accuracy: ± 5% of full scale

Slope: Positive or Negative, software selectable

OPERATING SYSTEMS SUPPORTED

- Windows 98/ME/NT* CompuScope Driver version 3.60.22
  * Version 4, SP3 or higher
- Windows 2000**/XP CompuScope Driver version 3.80.xx
  ** SP1 or higher

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 98/ME/NT/2000/XP
  Includes Sample Programs in Visual C++
- CompuScope SDK for MATLAB
  For Windows 98/ME/NT/2000/XP
- CompuScope SDK for LabVIEW
  For Windows 98/ME/NT/2000/XP

ENVIRONMENTAL

Operating Temperature: 5 degree Celsius to 40 degree Celsius

Relative Humidity: Less than 80%, non-condensing

Maximum Altitude: 2,000 meters

WARRANTY

One year parts and labor

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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CompuScope 12100 ordering information

Hardware and upgrades

Product	Order No.
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
CS12100: External Clock Upgrade	121-181-004
CS12100: X1 External Clock Upgrade	121-181-008
CS12100: Master Multi-Card Upgrade	121-181-005
CS12100: Slave Multi-Card Upgrade	121-181-006
CS12100: Trigger Out Upgrade	121-181-010
CS12100: Internal BNC Modification	121-181-020

GageScope Software

Product	Order No.
GageScope Lite Edition	Included
GageScope Standard Edition – purchased with CompuScope hardware	300-100-351
GageScope Standard Edition – purchased independently	300-100-352
GageScope Professional Edition – purchased with CompuScope hardware	300-100-354
GageScope Professional Edition – purchased independently	300-100-355

Software Development Kits (SDKs)

Product	Order No.
Gage SDK Pack on CD (No Hardcopy of Manuals included)	200-113-000
Gage SDK Pack on CD (Hardcopy of Manuals included)	200-113-002
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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CompuScope 1250 specifications

PLEASE CHECK THE GAGE WEBSITE FOR THE MOST UP-TO-DATE 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

1 M Acquisition Memory	1 slot
4 M Acquisition Memory	2 slots
8 M Acquisition Memory	2 slots
64 M Acquisition Memory	3 slots
256 M Acquisition Memory	3 slots
512M Acquisition Memory	3 slots
1 G Acquisition Memory	3 slots

POWER (IN WATTS)

+ 5 Volts		
Acquisition Memory	**Worst Case**	**Typical**
1M	12.1 W	11.0 W
4 M	15.1 W	14.0 W
8M	15.1 W	14.0 W
64 M	17.1 W	15.0 W
256 M	19.6 W	17.0 W
512 M	19.6 W	17.0 W
1G	22.1 W	19.0 W
- 5 Volts		
	Worst Case	**Typical**
All models	0.0	0.0
+ 12 Volts		
	Worst Case	**Typical**
All models	6.6 W	6.0 W
- 12 Volts		
	Worst Case	**Typical**
All models	4.4 W	4.0 W

Notes:

1. Y-cable must be connected to auxiliary power connector if more than one CS1250 cards are installed.
2. Power connector on the deep memory board of 64M, 256M, 512M and 1G models must also be connected using a Y-cable.

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 to 25 MHz ±5 MHz (DC coupled) 10 Hz to 25 MHz ±5 MHz (AC coupled)
Input Voltage Ranges:	±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V

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Absolute Maximum Amplitude:

1 MΩ impedance: ±15 Volts (continuous)

50 Ω impedance: ±5 Volts (continuous)

DC Accuracy relative to full scale input:

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

Sampling Rate

Single-Channel Mode (channel A only)

MS/s: 50, 20, 10

Dual-Channel Mode (Channels A and B simultaneously)

MS/s: 25, 10, 5

Protection

1 MΩ impedance: Diode Clamped

50 Ω impedance: 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: 1 Msamples,
4 Msamples
8 Msamples,
64 Msamples,
256 Msamples
512 Msamples,
1 Gsamples

Maximum memory depth:

Single Channel Mode: Up to full on-board memory

Dual Channel Mode: Up to half on-board memory per channel

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TRIGGERING

Number of Trigger Inputs:	2 per system
Trigger Source:	CH A, CH B, EXT or Software
Input combination:	Wired-OR
Type:	Analog triggering
Sensitivity:	± 10% of full scale
Level Accuracy:	± 5% of full scale
Slope:	Positive or Negative, software selectable
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:	25 MHz
Coupling:	AC or DC
Connector:	BNC

INTERNAL CLOCK

Source:	50 MHz Clock oscillator
Accuracy:	± 50 ppm (0 to 70 degrees Celsius)

EXTERNAL CLOCK (OPTIONAL)

Maximum Frequency:	50 MHz with External Clock Upgrade 25 MHz with X1 External Clock Upgrade
Minimum Frequency:	10 MHz with External Clock Upgrade 5 MHz with X1 External Clock Upgrade
Signal Level:	0 to +5 Volt TTL
Impedance:	50 Ω
Sampling Edge:	Rising
Coupling:	DC
Duty Cycle:	50% ±30% for External Clock Upgrade 50% ±5% for X1 External Clock Upgrade

MULTIPLE RECORD

Pre-trigger Data:	None
Record Length:	128 *(256)* points minimum. Can be defined with a 64 *(128)* point resolution in dual *(single)* channel mode
Maximum Number of Triggers:	4,194,304

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MULTI-CARD SYSTEMS

Operating modes: Master/Slave or Multiple Independent

Maximum Number of Cards

Master/Slave: 2 to 8 cards for 1M memory
2, 3 or 4 cards for 4M and 8M memory
2 or 3 cards for 64M, 256M, 512M and 1G

Multiple/Independent: Limited by the backplane

Maximum number of Channels in Master/Slave Mode:

16 at 25 MS/s (1M model)
8 at 50 MS/s (1M model)

MASTER/SLAVE SYSTEM TRIGGERING

Number of Trigger Inputs: 2 per system

Trigger Source: CH A, CH B, EXT or Software (Master card only)

Input combination: Wired-OR

Sensitivity: ± 10% of full scale

Level Accuracy: ± 5% of full scale

Slope: Positive or Negative, software selectable

OPERATING SYSTEMS SUPPORTED

- Windows 98/ME/NT* CompuScope Driver version 3.60.22
  * Version 4, SP3 or higher
- Windows 2000**/XP CompuScope Driver version 3.80.xx
  ** SP1 or higher

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 98/ME/NT/2000/XP
  Includes Sample Programs in Visual C++
- CompuScope SDK for MATLAB
  For Windows 98/ME/NT/2000/XP
- CompuScope SDK for LabVIEW
  For Windows 98/ME/NT/2000/XP

ENVIRONMENTAL

Operating Temperature: 5 degree Celsius to 40 degree Celsius

Relative Humidity: Less than 80%, non-condensing

Maximum Altitude: 2,000 meters

WARRANTY

One year parts and labor

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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CompuScope 1250 ordering information

Hardware and Upgrades

Product	Order No.
CompuScope 1250 - 1M	215-001-002
CompuScope 1250 - 4M	215-001-003
CompuScope 1250 - 8M	215-001-004
CompuScope 1250 - 64M	215-001-005
CompuScope 1250 - 256M	215-001-006
CompuScope 1250 - 512M	215-001-007
CompuScope 1250 - 1G	215-001-008
CS1250: Memory Upgrade Charge	215-181-200
CS1250: External Clock Upgrade	215-181-004
CS1250: X1 External Clock Upgrade	215-181-008
CS1250: Master Multi-Card Upgrade	215-181-005
CS1250: Slave Multi-Card Upgrade	215-181-006
CS1250: Trigger Out Upgrade	215-181-018
CS1250: Internal BNC Modification	215-181-020

GageScope Software

Product	Order No.
GageScope Lite Edition	Included
GageScope Standard Edition – purchased with CompuScope hardware	300-100-351
GageScope Standard Edition – purchased independently	300-100-352
GageScope Professional Edition – purchased with CompuScope hardware	300-100-354
GageScope Professional Edition – purchased independently	300-100-355

Software Development Kits (SDKs)

Product	Order No.
Gage SDK Pack on CD (No Hardcopy of Manuals included)	200-113-000
Gage SDK Pack on CD (Hardcopy of Manuals included)	200-113-002
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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CompuScope 12100 & 1250 simplified block diagram

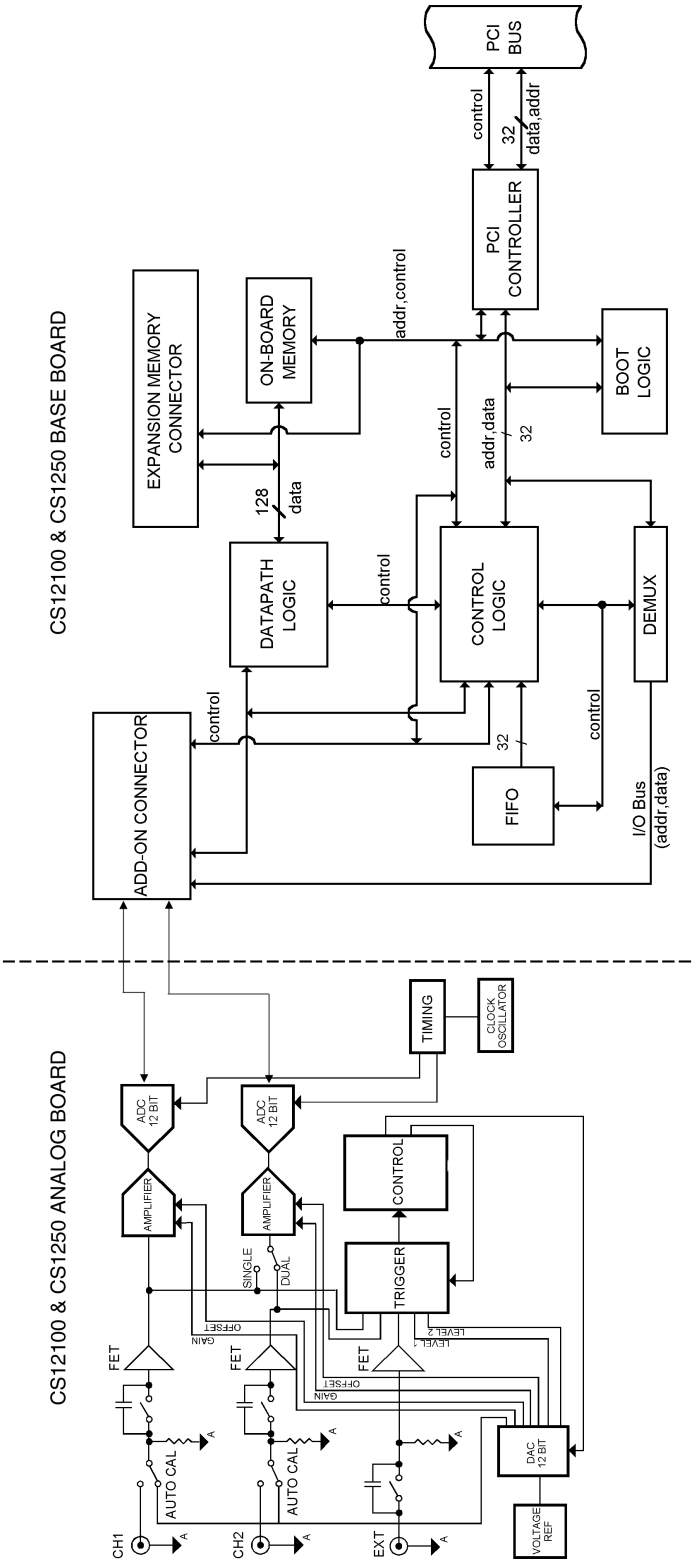


Figure 1: CS12100 and CS1250 block diagram

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CompuScope 12100 & 1250 connectors and headers

CompuScope cards connect to the outside world through connectors, both analog (BNC) and digital (PCI Bus, Master/Slave, etc.). This section describes these connectors for the CS12100 or CS1250 card.

The connectors and headers on the CS12100 or CS1250 card are shown below:

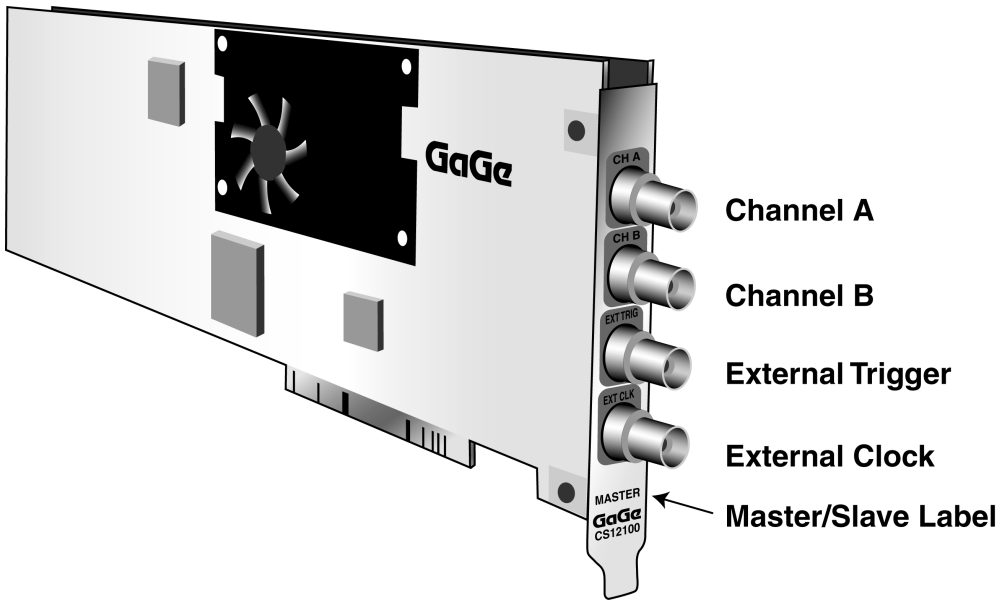


Figure 2: Connectors on CS12100 and CS1250

- **CH A BNC** connector is the single-ended input of channel 1 that is used to input an analog signal that is sampled as Channel 1.
- **CH B BNC** connector is the single-ended input of channel 2 that is used to input an analog signal that is sampled as Channel 2.
- **External Trigger BNC** connector is used to input an analog or digital signal, which may be used as an External Trigger. External Trigger is defined exactly as in an oscilloscope: this signal can be used to trigger the system but cannot be viewed or digitized.
- **External Clock** connector is used for the **External Clock Input**, as described in the section labeled *External Clock*.
- **PCI bus connector** is located at the bottom of the printed circuit board. This is an industry standard connector that complies with all specifications of the PCI bus.

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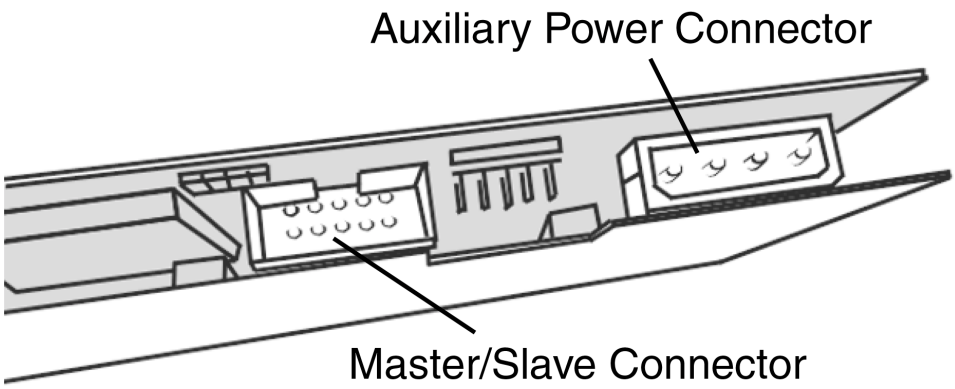


Figure 3: Auxiliary power connector and Master/Slave connector

- **Auxiliary Power Connector.** Power is supplied to the CompuScope 12100 and CompuScope 1250 cards via the PCI bus and the Auxiliary Power Connector.

  It is not necessary to use the Auxiliary Power Connector unless more than one CompuScope 12100 or CompuScope 1250 card is to be installed in the same backplane or motherboard.

  This distribution of power is implemented to optimize the power management on the CompuScope 12100 or CompuScope 1250 in multi-card systems. Refer to *the CompuScope 12100 specifications* and *CompuScope 1250 specifications* sections in this manual where the cumulative power consumption for the CompuScope 12100 and CompuScope 1250 are tabulated.

NOTE FOR MULTI-CARD COMPUSCOPE 12100 AND COMPUSCOPE 1250 USERS:
IF Y-CABLES ARE NOT CONNECTED TO THE AUXILIARY POWER CONNECTORS OF YOUR COMPUSCOPE CARDS, THEY WILL NOT FUNCTION PROPERLY

- **Master/Slave Timing Module (MSTM) connector.** The MSTM connector is located near the top-left corner of the CompuScope 12100 and CompuScope 1250. In case of an Independent card (i.e. a card not upgraded to either a Master or a Slave), this connector may not be present.

  The Master/Slave Timing Module is used to pass all the signals necessary to synchronize Slave CompuScope 12100 or CompuScope 1250 cards with the Master. The MSTM connector on the CS12100 or CS1250 card is shown in *Figure 3.*

NOTE FOR COMPUSCOPE 12100 AND COMPUSCOPE 1250 DEEP MEMORY BOARD USERS:
IF Y-CABLES ARE NOT CONNECTED TO THE POWER CONNECTORS OF YOUR COMPUSCOPE DEEP MEMORY CARDS, THEY WILL NOT FUNCTION PROPERLY.

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CompuScope 12100 & 1250 throughput & maximum PRF

A number of applications require the CompuScope 12100 or CompuScope 1250 to acquire data based on a rapidly occurring trigger signal. These high Pulse Repeat Frequency (PRF) applications include imaging, radar, ultrasound and lightning test.

Gage has performed extensive repetitive capture benchmarks in single record mode. In this mode, the signal is captured into on-board CompuScope memory and the captured data are transferred through the PCI bus using PCI bus mastering to PC RAM.

Please note that much higher PRFs will be achieved using CompuScope Multiple Record mode.

The following test results were obtained using a computer configured as follows:

- Pentium III, 1 GHz processor
- 512 MB RAM
- 20 GB disk drive
- Windows 2000
- NT File System
- 33 MHz, 32 bit PCI bus
- All slots support bus mastering

A C application program optimized for fast repetitive capture in single record mode was used for throughput measurements. The CS12100 & CS1250 were operated using this application in both single and dual channel mode for many different capture depths and the results are plotted as points in the graphs below. The PCI transfer rates were calculated from the linear portion of the curves at high depths.

PCI data transfer rate (single channel):	***80 MB/s***
PCI data transfer rate (dual channel):	***50 MB/s***

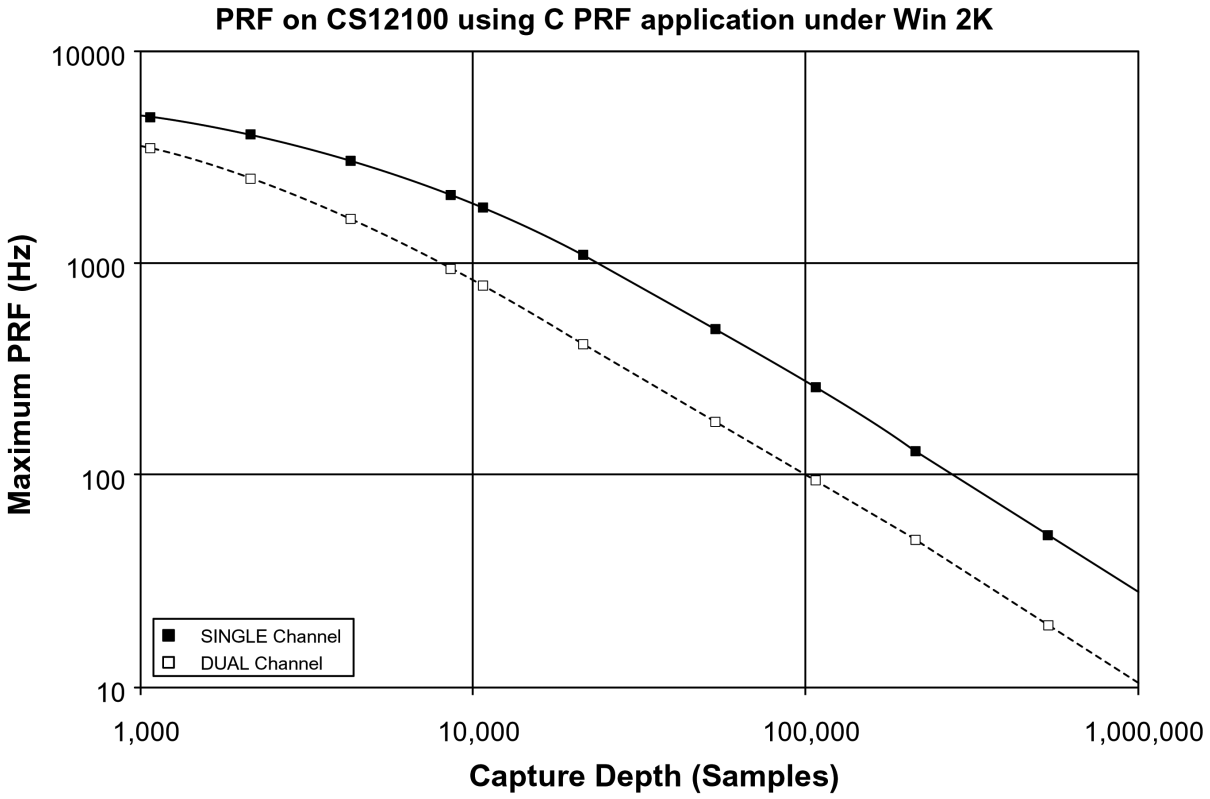


Figure 4: Maximum PRF vs. acquisition length on CS12100

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PCI data Transfer Rate (single channel): 80 MB/s
PCI data Transfer Rate (dual channel): 50 MB/s

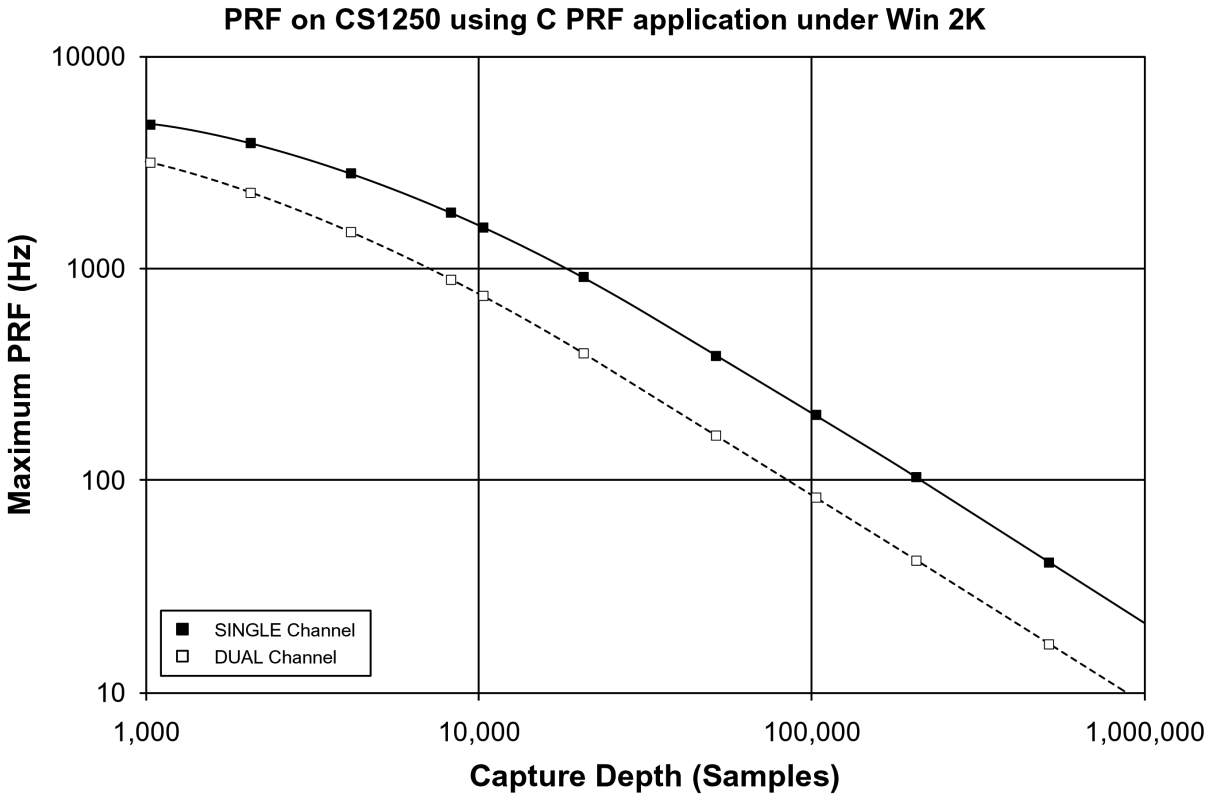


Figure 5: Maximum PRF vs. acquisition length on CS1250Notes

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