eXpert™ Signal Averaging

Advanced On-board FPGA Technology

Signal averaging is a powerful method of improving the fidelity of noisy repetitive signals.

The process consists of making multiple acquisitions of a repetitive waveform and averaging all acquisitions together. Any random noise is subsequently averaged to near zero, while the amplitude of the underlying repetitive signal remains unchanged.

GaGe's new on-board signal averaging technology allows users to detect a small repetitive signal in a noisy environment. This powerful new signal averaging capability takes advantage of GaGe's on-board FPGA technology and allows rapid signal averaging with absolutely no CPU-loading. Using signal averaging, small signals can be extracted from a background of high-amplitude noise, which may even be larger than the actual signal itself.

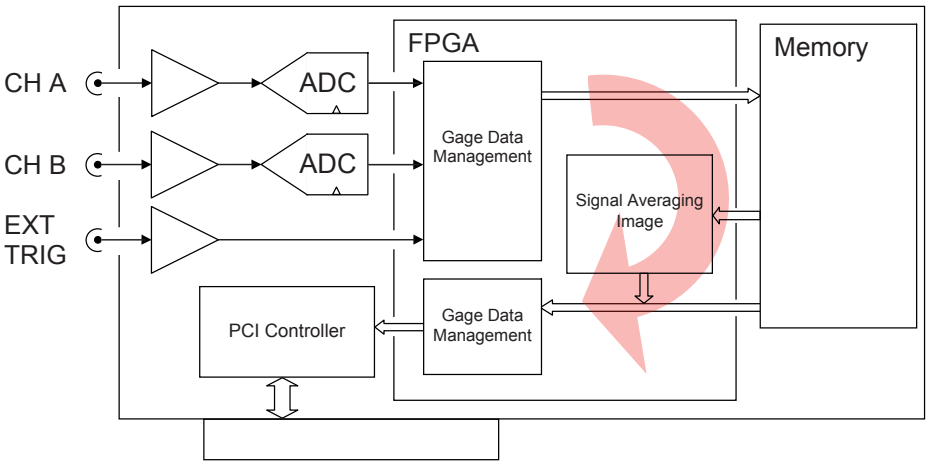
APPLICATIONS

Ultrasonic Testing
Lidar Testing
Optical Fiber Testing
Radar Testing
Stimulus/Response Test Systems
Network Analysis

FEATURES

- Waveforms may be signal-averaged at a rate of greater than 100,000 waveforms per second
- Maximum waveform length of 48,000 samples
- Signal Averaging is performed by GaGe hardware, allowing the host-PC to handle other tasks in parallel
- On-board intelligent processing reduces PCI data traffic by a factor of more than 1,000
- Compatible with CompuScope Software Development Kits (SDKs) for C/C#, LabVIEW and MATLAB

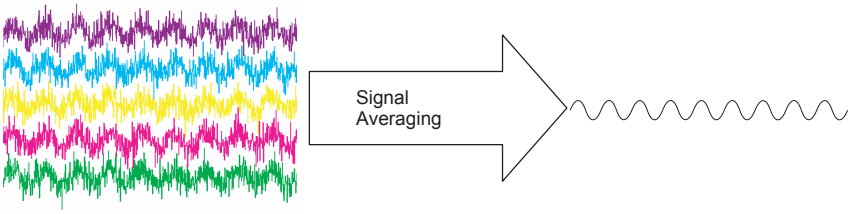
Signal Averaging Simplified Block Diagram



Random noise on a signal is reduced by the square root of the number of averages. For example, 16 signal averages will reduce the noise on a signal by a factor of 4, while 100 signal averages will reduce the noise by factor of 10.

The maximum number of samples in a waveform that may be averaged is 48 kiloSamples divided by the number of active channels per CompuScope card. For instance, for a CompuScope card with 4 active channels, waveforms of up to 12 kiloSamples may be averaged using the eXpert firmware.

The maximum number of averages that may be performed in one averaging session is 1024. Practically speaking, however, this is no real limitation. Since the data volume for transfer to the PC is reduced by a factor of more than 1,000 by the on-board signal averaging, the host CPU can then easily perform super-averaging of the averaged waveforms in order to extend the number of averages indefinitely.



ORDERING INFORMATION

Note: Refer to the Advanced Functionality Matrix on the GaGe Web site for CompuScope card compatibility information.

eXpert Signal Averaging Firmware Option	250-181-001
eXpert Firmware Option bundle (Signal Averaging, FIR Filtering and Peak Detection)	888-100-026

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