

### Challenge

The customer is a leader in the field of acoustic micro-imaging. They use pulse ultrasound to image non-human materials. The ultrasound frequency used is between 100 and 200 MHz, as the materials they study can handle these frequencies (one cannot normally use such high frequencies with human tissue).

The customer's PRF (Pulse Repeat Frequency) is approximately 4 kHz, with a PRI (Pulse Repeat Interval) of 250  $\mu$ s. They need to capture approximately 2  $\mu$ s (1,000 points) of data for each pulse.

The customer wants to run the imaging system under Windows. The customer also wants oscilloscope emulation software to allow verification of board operation without having to write software.

Imaging applications like this type of ultrasonic system allow the discovery and scrutiny of small lesions in materials or human tissue (depending on the specific range of frequencies used). This particular application is critical to the diagnosis of failure causes in materials and stressed components, eventually leading to better and safer performance.

### Solution

The CompuScope 8500 card is ideal for this application.

The CompuScope 8500 can sample one analog input at speeds up to 500 MS/s with 8-bit resolution and store the data in the very deep on-board memory. The CS8500 uses a high-quality flash A/D converter which can digitize at 500 MS/s rate. In other words, a new sample is taken every 2 nanoseconds. An on-board crystal-controlled timing circuit ensures timebase accuracy and long-term thermal stability of CompuScope 8500.

The CompuScope 8500 is available with on-board acquisition memory depths of 2M, 8M, 16M, 128M, 512M, 1G and 2G. The on-board memory can be used as a circular buffer for storage of pre- and post-trigger data.

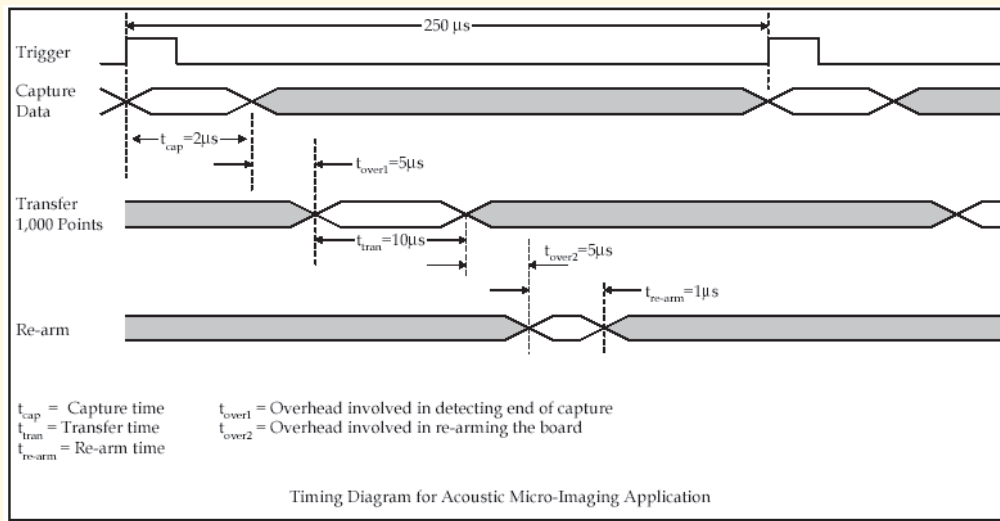
The CompuScope 8500 is supported by GaGe's advanced, 32-bit Windows drivers which are fully compatible with Windows.

In addition, GageScope software will allow the customer to do exactly what they asked: verify the operation of the CompuScope 8500 without writing any code.

*The customer is using pulse ultrasound to image non-human materials. They want to run the imaging system under Windows and they also want oscilloscope emulation software to allow verification of board operation without having to write software.*

*With the help of GaGe's CompuScope 8500, which has a high throughput of 80 MB/s, the customer was able to easily transfer the captured data. In addition, GageScope software allows the customer to verify the operation of the CompuScope 8500/PCI without writing any code.*





## CompuScope 8500

The CompuScope 8500 can sample one analog input at speeds up to 500 MS/s with 8-bit resolution and store the data in the very deep on-board memory.

The CompuScope 8500 uses a high-quality flash A/D converter which can digitize at 500 MS/s rate. In other words, a new sample is taken every 2 nanoseconds.

An on-board crystal-controlled timing circuit ensures timebase accuracy and long-term thermal stability of CompuScope 8500.

### Features

- 500 MS/s Sampling
- 8-Bit Resolution
- Up to 2 GigaSamples On-Board Acquisition Memory
- PCI Bus Card with Bus Mastering Capability
- Fast Data Transfer Rate to System RAM
- 250 MHz Bandwidth
- 44 dB SNR
- Up to 8 Cards in a Master/Slave System for up to 8 Simultaneous channels at 500 MS/s
- Software Development Kits for C/C#, MATLAB, and LabVIEW under Windows.



## Results

The high-speed, 32 bit, bus-mastering interface to the PCI bus allows the data from the on-board memory of the CompuScope 8500 to be transferred to the system RAM, or any other PCI destination, at sustained rates of up to 80 MB/s. With such high throughput, the customer can easily transfer the captured data over the PCI bus to the PC memory for each pulse and re-arm with plenty of time to spare (see timing diagram).

Drivers for Windows are available for the CompuScope 8500. In addition, GageScope oscilloscope software will allow the customer to do exactly what they asked: verify the operation of the CompuScope 8500 without writing any code.

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