Process-Control Testing
using the WaveBook/512™

Production line monitoring is critical to the operation of a large international pharmaceutical company. Its process control engineers selected a portable, PC-based digitizer as the primary production line monitoring tool for the startup, optimization, and maintenance of a new production line process. This 1-MHz digitizer collects data from several production process parameters. After analyzing the data, the process control engineers tweak these parameters to obtain maximum throughput and efficiency, and they continue to monitor the parameters to predict production line maintenance.

Application Summary

To monitor their production line effectively, the process control engineers required a versatile data acquisition solution capable of monitoring several key parameters, including the vacuum pressure occurring along the production line, the pressure applied by the injection molding machines used to encapsulate drugs, and the amount and timing of liquid dispensation. Portability was also important as the production maintenance people needed to walk up and down a long production line to acquire data without being encumbered by an AC power cord. Finally, large amounts of data needed to be collected on 8 channels at rates up to 120 kHz and saved in a PC-compatible data file for analysis.

Software also played a key role. With time at a premium during the startup phase of the production line, software development using a programming language was out of the question. A software solution that produced immediate results was an absolute requirement.

Potential Solutions

The production engineers initially considered an oscilloscope because it easily met their acquisition speed requirement. However, they rejected this approach because of a scope's bulky size and weight, limited expansion capability, AC power requirements, limited data storage capacity, and awkward interface to the PC.

IOtech's Solution

In contrast, the WaveBook/512 had none of these limitations. The same size as a notebook PC, its size and weight make it easy to carry up and down a production line. Its ability to operate from DC power freed the production engineers from the restraints of an AC power cord. Also, the WaveBook's simultaneous sample and hold (SS&H), low pass filter, and expansion options assured the engineers that the system could satisfy their future needs. (See figure below.)

Even more importantly, IOtech's WaveView software, with its *Out-of-the-Box*™ functionality, delivered immediate results in the timing-critical start-up phase of the production line.

WaveView easily saved data on the PC's hard disk at the required 120-kHz acquisition rate. Unlike the case with scopes, there was no need to worry whether the entire acquisition would fit on the limited disk space provided. What's more, WaveView's data files are limited in size only by the PC's hard disk. Also in contrast to scopes, WaveView's data is immediately available for analysis on the PC and required no awkward transfer of data from the scope to the PC.

The actual process parameters were derived offline using software that performed statistical and frequency (FFT) calculations on the acquired data. Because of the vast amount of data, using a conventional spreadsheet package such as Microsoft Excel was not feasible. Therefore, the production engi-
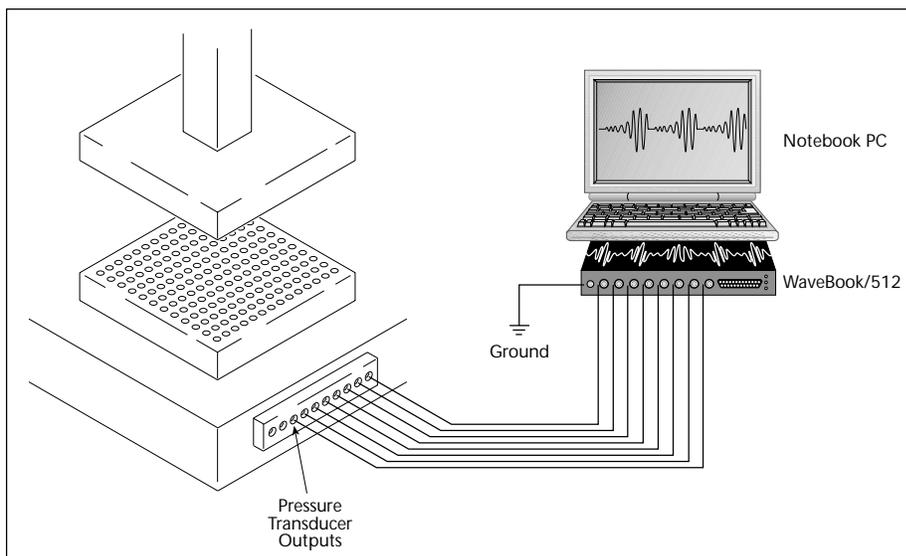

Figure: Process-control set-up

neers turned to DASYLab to read the previously acquired data and calculate the necessary process parameters.

Pleased with its ease of use, they also later used DASYLab for the entire data acquisition and analysis task: acquiring the data, calculating the necessary process parameters, and saving them to a file. Like WaveView, DASYLab provided a complete software solution without the burden of programming.

Conclusion

The WaveBook/512's small size and light weight coupled with its speed, expandability, and PC compatibility are unmatched by any other solution on the market. Further, WaveView's no programming approach delivers immediate results. Also, software options, such as DASYLab, exist for more demanding applications which require both acquisition and analysis.

the smart approach to instrumentation™

WaveBook/512

IOtech's WaveBook/512 portable, high-speed, multichannel digitizer lets you acquire data at 1-MHz with notebook or desktop PCs. It is operable from either AC or DC, making it ideal for both lab and field applications. Its DSP-based design provides you with multichannel triggering capability typical of far more expensive waveform recorders.

Features

- 12-bit, 1-MHz sampling rate
- 8 analog inputs, expandable to 72
- Eight 1-MHz digital inputs
- 1-MHz continuous streaming to RAM
- 700-kHz continuous streaming to disk*
- Programmable multichannel triggering with pre- & post-trigger sample rates
- 128-location programmable channel/range sequencer
- PC connection via EPP & optional PCMCIA or ISA card
- AC, DC, or optional rechargeable battery module

* speed dependent on particular PC
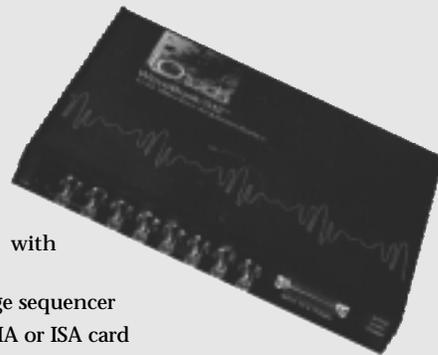
Signal-Conditioning Options

- 8-channel ICP®-style dynamic-signal module for acoustic & vibration measurements
- 8-channel simultaneous sample & hold & low-pass filter card (internal)
- 8-channel signal-conditioning module for isolated voltage, strain, temperature, & other analog inputs
- High-voltage input adapter with probes
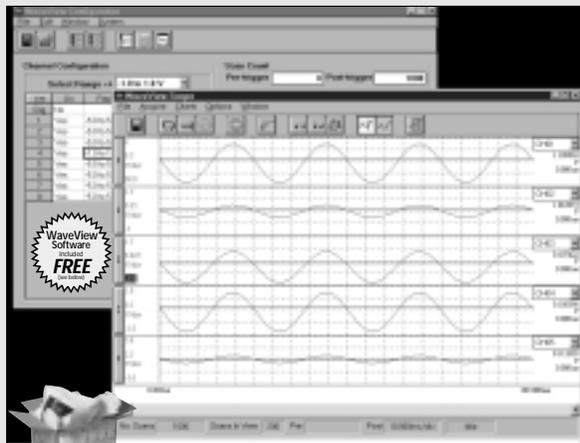
Includes WaveView software for Out-of-the-Box™ set-up, data acquisition, & real-time display

Included Software

- WaveView™ for effortless set-up, acquisition, & real-time display right *Out-of-the-Box™*:
  - Scope mode for real-time waveform display
  - Logger mode for continuous streaming to disk
- PostView™ for post-acquisition viewing
- WaveCal™ for easy recalibration
- Available with drivers for Visual Basic™ & C++™ for Windows™; QuickBASIC™, C™, & Pascal™ for DOS™; & DASYLab™, Snap-Master™, & LabVIEW®.