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Single Channel Ultrasonic Inspection System (ULTIMA 200S)

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Abstract

ULTIMA 200S is a single channel Ultrasonic Testing System suitable for inspection of materials. It is based around an Industrial Personal Computer (IPC), which serves as the central controller. The electronics hardware constituents viz. Pulser/Receiver, Amplifier, Digitizer and Rectifier are configured in the form of a dedicated set of ISA and PCI bus compatible PC add on boards. It can also be interfaced to the external Pulser/Receiver units. A comprehensive windows based menu driven software package has been developed under CVI (LAB WINDOWS) for implementation of data acquisition, storage, signal analysis / processing and information display. The Digitizer card is the key element of this system. It can sample the ultrasonic echo signals at a maximum sampling rate of 200 Mega Samples Per Second (MSPS) and features a PCI bus interface supporting a peak data transfer of 50 Mbytes/sec. to/from the host. This enables very fast update of A-Scan on the screen. A special feature of the system is simultaneous display of the acquired data and its amplitude spectrum (FFT) in near real time. The software enables the operator to select appropriate parameters for acquiring optimum data and presenting the information in a desired manner. A status window is always available on the screen, to indicate the values of parameters selected by the user. Thus the key information regarding data acquisition is always available to the user. Two gates have been provided which generate an alarm whenever the acquired data crosses the amplitude limits set within the gates.