

The hardware design technique for ultrasonic process tomography system

Abstract:

This paper describes a work carried out to design and development an ultrasonic process tomography system. The hardware design technique is of interest of this paper. A number of 32-ultrasonic transducers have been employed and the interrogation of ultrasonic information is based on transmission-mode approach. The hardware design technique including the signal processing methodology and the data acquisition technique has been detailed. An embedded controller has been used on each channel to simplify the hardware design as well as for system synchronization. An autocalibration approach has also been used to calibrate 544 signals information. At the end of the paper, several tomograms reconstructed using the sensor array is discussed.