

# **The front-end hardware design issue in ultrasonic tomography**

## **Abstract**

This paper explains the front-end hardware design for ultrasonic tomography. The ultrasonic tomography system presented in this paper uses a noninvasive sensing technique with transmission-mode approach for investigating gas bubbles in an experimental column. Several explanations regarding the common tomography technique and the hardware preparation are also discussed. The sensory parts consist of 32 units of ultrasonic transceivers to form the fan-shaped beam projections. A low voltage of 20 V has been used to generate the ultrasonic burst tones. The electronic circuitry details, including the signal generator, the signal conditioning, and the signal acquisition strategy, are also presented. The results from this paper are useful for further development in ultrasonic tomography design.

## **Language of Original Document**

English

## **Author Keywords**

Tomography design; Ultrasonic sensor; Ultrasonic tomography

## **Index Keywords**

Electronic circuitry; Further development; Gas bubble; Hardware design; Low voltages; Mode approach; Non-invasive sensing; Shaped beam; Signal acquisitions; Signal conditioning; Ultrasonic bursts; Ultrasonic tomography

**Engineering controlled terms:** Design; Hardware; Signal generators; Signal processing; Tomography; Ultrasonic sensors; Ultrasonics

**Engineering main heading:** Ultrasonic testing