

## A high speed portable EIT system with wireless data transmission

**Keywords:** EIT; PORTABLE; HIGH SPEED

**Abstract:** In the clinical trials of electrical impedance tomography (EIT), a data acquisition system (DAS) with smaller size, lower weight, and higher speed fits better for the needs of monitoring in bedside. DAS powered by battery is essential for reduce size and weight. So applying pulse driving and demodulation techniques, rather than traditional continuous sine wave driving mode, a lower power consumption and battery powered DAS with 16 electrodes was designed. Combined with data recording and wireless transmission, laptop can receive the measured impedance data and reconstruct images in real-time. The specifications of DAS are: size 12X6X2cm, weight less than 150g including lithium battery which power capacity is 3.3v and 1200mAh, measurement accuracy better than 0.5%, continuous working time longer than 24h, data stored in Flash memory more than 8000 frames, data acquisition and transmission speed faster than 15f/s, wireless transmission length longer than 10m. Data receiving module is based on USB port (USB 2.0), image reconstruction algorithm is adaptive LMS and reconstructed images displayed in color cloudy mode. The preliminary test on normal human chest shows that the system could acquire, transmit, reconstruct and display lung EIT images in 15f/s. The system provides a portable platform for further clinical trials and monitoring in bedside.

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