

MULTI-CHANNEL ELECTROPHYSIOLOGIC SIGNAL DATA ACQUISITION SYSTEM (MESDAS)

BENEFITS

- Can acquire multiple electrophysiologic signals simultaneously with one IC
- Less expensive than conventional devices
- Relatively small and simple device that consumes little power
- Very flexible
- Can be used with existing systems
- Provides secure wired or potentially wireless data transmission

FEATURES

- Sigma-delta front end signal conditioning circuits can be programmed to acquire different electrophysiologic signals
- Integrated circuit may comprise a plurality of signal conditioning circuits to allow for simultaneous collection of multiple signals
- Conditioning circuits have embedded A/D converters
- Digital multiplexer combines digital outputs into a serial data stream and allows for networking

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The Multi-Channel Electrophysiologic Signal Data Acquisition System (MESDAS) is a novel “all-in-one” integrated circuit that allows users to collect data from multiple physiological systems simultaneously. The integrated circuit comprises two or more programmable sigma-delta front end signal conditioning circuits coupled with their respective inputs and outputs. Inputs are analog, while the outputs may be digital due to the inclusion of embedded A/D conversion. A digital multiplexer may be used to combine multiple signals into a continuous data stream or to network signals, allowing for secure data transmission (wired or potentially wirelessly). In order to acquire electrophysiologic signal inputs from a human patient (ECG, EEG, EMG, etc.), electrodes are placed in the appropriate locations for the desired signals. These electrodes are connected to the IC at their respective sigma-delta front end signal conditioning circuits that have been programmed for a specific signal, wherein the noise is removed and signals are converted from analog to digital form. Then, signals are passed to the digital multiplexer. Each conditioning circuit within the MESDAS can be programmed to accommodate different biological signals. The MESDAS is beneficial over the prior art not only because it can process multiple signals at the same time, but also because it is an “all-in-one” solution that is less expensive, less complex, consumes less power, is much smaller, and has increased flexibility than conventional circuits. Furthermore, the MESDAS can accommodate wired or wireless data transmission from the electrodes to the integrated circuit.



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