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Microcontroller Based ECG Amplifier

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Microcontroller Based ECG Amplifier

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Abstract

A microprocessor that reads ECG data and detects heart arrhythmias can help keep people safe while working in high-risk environments. Mining professionals, firefighters, and athletes have strenuous jobs that would benefit from non-invasive ECG monitoring. We use a Microchip Peripheral Interface Controller (PIC) for serial peripheral interface (SPI™) communication with a Texas Instruments ADS1298 development board. The ADS1298 is an 8-channel analog-to-digital converter (ADC) that is configured to record ECG data at a rate of 250 samples per second. The PIC is a master to the ADS1298 slave and is responsible for writing registers, receiving ECG data, and transmitting the data to a PC through an RS-232 serial connection. Our ADS1298 is configured to receive four channels of ECG data and up to four channels of accelerometer data, which are used to measure the noise due to acceleration that is embedded within the ECG signal.