

# Wireless low-power active-electrode EEG headset presented

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Imec's wireless EEG headset.

Imec, Holst Centre and Panasonic have developed a new prototype of a wireless EEG (electroencephalogram) headset. The system combines ease-of-use with ultra-low power electronics. Continuous impedance monitoring and the use of active electrodes increases the quality of EEG signal recording compared to former versions of the system. The data are transmitted in real-time to a receiver located up to 10m from the

system. The realization of this prototype is a next step towards reliable high-quality wearable EEG monitoring systems.

The system integrates circuit level components including [imec](#)'s active [electrodes](#) and EEG amplifier together with a microcontroller and a low power radio. It is capable of continuously recording 8 channel EEG signals while concurrently recording electrode-tissue contact impedance (ETI). This simultaneous ETI recording enables continuous, remote assessment of electrode contact status during EEG recording. The active electrodes reduce the susceptibility of the system to power-line interference and cable motion artifacts, thus improving [signal quality](#). The system can be configured at run-time to change the settings of the recordings such as the number of channels, or enabling/disabling the impedance recording. The autonomy of the system ranges from 22 hours (8 channels of EEG with ETI) to 70 hours (1 channel of EEG only).

The system has a high common-mode rejection ratio (>92 dB), low noise (

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