

Gas Sensor Platform with Bluetooth low-energy

The Gas Sensor Platform with *Bluetooth* low-energy (BLE) is intended as a reference design that customers can use to develop end-products for consumer and industrial applications to monitor gases like carbon monoxide (CO), oxygen (O₂), ammonia, fluorine, chlorine dioxide etc. . BLE adds a wireless feature to the platform that enables seamless connectivity to an iPhone® or an iPad®. Customers can easily replace the targeted gas sensor based on their application, while keeping the same analog frontend(AFE) and BLE design. The system runs on a CR2032 coin-cell battery. AFE from TI — LMP91000 —interfaces directly with the electrochemical cell. The LMP91000 interfaces with CC2541 which is a BLEsystem on a chip from TI.

An iOS application running on an iPhone 4S® and newer generations or an iPad 3® and newer generations lets customers interface with this reference platform. Customers can use and customize the iOS application, the hardware files and firmware source code of CC2541, which TI provides as an open source. The Gas Sensor Platform with BLE provides customers with a low-power, configurable AFE and the option to integrate wireless features in gas-sensing applications. This platform helps customers access the market faster and helps differentiate from performance, power, and feature sets.

The heart of this reference platform is the AFE from TI, the LMP91000. The LMP91000 is perfect for use in micropower, electrochemical-sensing applications. The LMP91000 provides a complete signal-path solution between a sensor and a microcontroller that generates an output voltage proportional to the cellcurrent. This device provides all of the functionality for detecting changes in gas concentration based on a delta current at the working electrode.

Gas Sensor Platform With BLE Design Features

- Coin-cell operation (CR2032)
- Low-power configurable AFE (LMP91000) that provides flexibility for customers to use the same AFE for different gas-sensing platforms and configure different platforms with a simple firmware update
- Provides reference design for BLE antenna design - leveraging low-cost trace antenna
- Enables customers to use the platform to incorporate wireless features in gas-sensing applications
- TI provides BLE firmware and iOS application software as open-source to help customers get to the market faster.
- The platform is comprised of two boards that are stacked together and are referred to as SAT0009 (power board) and SAT0010 (AFE and *Bluetooth* board).

Featured Applications

The Gas Sensor Platform with BLE Reference Platform is designed to demonstrate how a configurable AFE can be used with a low-power wireless radio to provide a reference platform that will help customers develop their next-generation gas-sensing solutions for:

- Industrial: gas-sensing application
- Consumer: carbon monoxide-sensing application
- Healthcare facilities: gas-sensing application