

Danlaw Low-profile BLE Beacon Theory of Operation

The Danlaw Low-profile BLE Beacon is a small credit card sized device that is meant to be carried by a user in a wallet, in a purse or on a keychain. The Danlaw Low-profile BLE Beacon communicates with the Danlaw OBDII Wireless Datalogger products via Bluetooth Low Energy (Bluetooth Smart) to pass the vehicle driver or occupant information.

The Danlaw Low-profile BLE Beacon consists of a plastic enclosure, battery holder, 3 CR2412 batteries and a wireless flexible printed circuit assembly. The wireless flexible printed circuit assembly consists of a radio transceiver, a 32.768 kHz crystal, a 16 MHz crystal, battery contacts, programming contacts, discrete balun components, matching components and a trace antenna.

The radio solution uses the Nordic nRF51822-QFAA module with an ARM Cortex M0-based core. This is a low power 2.4 GHz system-in-package module solution for Bluetooth Low Energy applications. The design utilizes GFSK modulation. The nRF51822-QFAA uses 39 channels, spaced 2 MHz apart, spanning 2402 MHz to 2480 MHz with a transmit power set to approximately -4 dBm but capable of +4 dBm. The nRF51822-QFAA has a very small footprint, approximately 6 x 6 x .85 mm.