Objective

This example demonstrates Google's Eddystone Beacon using the PSoC 4 BLE device.

Overview

Google has come up with a new open-sourced beacon protocol called Eddystone, which gives users flexibility in beacon usage. Eddystone beacons can broadcast frames of three types – Eddystone UID, Eddystone URL, and Eddystone TLM.

The UID frames consist of 16-byte unique IDs which can be mapped to different devices, in a storage such as a cloud.

The URL frames consist of encoded URLs which can be decoded by the receiver and launched.

The TLM frames contain debugging information about the beacons, such as their battery levels, temperature, and the like.

This project implements the Eddystone beacon using the BLE Pioneer Kit. The kit broadcasts URL frames, with TLM frames interleaved between them. For more information on Eddystone, refer to its official GitHub page.

Requirements

Design Tool: PSoC Creator 3.2 SP1

Programming Language: C (GCC 4.8.4 – included with PSoC Creator)

Associated Devices: All PSoC 4 BLE devices

Required Hardware: CY8CKIT-042-BLE Bluetooth® Low Energy (BLE) Pioneer Kit, Android Phone with Locate Beacon app from Radius Networks

Hardware Setup

The BLE Pioneer Kit has all of the necessary hardware required for this lab. There is no special setup required.

Project Description

The project implements all three beacon frames – UID, URL, and TLM. The user can choose one of UID and URL frames as a compile-time option, and the project broadcasts that frame. TLM frames are interleaved between the UID/URL frames periodically. The TLM frame feature is optional and can be turned off using another compile time option.

Example 1 – the user can choose to have a URL frame that broadcasts every 1 second for 25 seconds, followed by a TLM frame every 1 second for 5 seconds, and then the URL frame again (this configuration is the default).

Example 2 – the user chooses a UID frame that broadcasts every 1 second forever.

All such configuration is possible via the BLE component wizard and the *Configuration.h* file in the project.

Once the required configuration is complete, build and program the project onto a BLE Pioneer Kit, and observe the beacon information on the *Locate Beacon* app from Radius Networks. The kit's Red LED turns ON when a UID/URL frame is broadcasted, and the Green LED turns ON when a TLM frame is broadcasted.

Related Documents

Table 1 lists all relevant application notes, code examples, knowledge base articles, device datasheets, and Component / user module datasheets.

Table 1. Related Documents

Document	Title	Comment
AN91267	Getting Started with PSoC 4 BLE	Provides an introduction to PSoC 4 BLE device that integrates a Bluetooth Low Energy radio system along with programmable analog and digital resources.
AN91445	Antenna Design Guide	Provides guidelines on how to design an antenna for BLE applications.