Intelligent Locations Case Study
RSL10 SIP Enables Smart Healthcare Beacons

Summary

Application	Location	Contracting Agency/Customer	Deployment	onsemi Products Used
Smart Healthcare	Deer Park, IL	Intelligent Locations	Real-Time Healthcare Mobile Asset, Patient, and Environmental Monitoring Platform	RSL10 SIP System-in-Package, *Bluetooth*® 5 Certified

Overview

Most hospitals are now chronically crowded, and healthcare workers are overburdened. Tracking medical equipment, like portable patient monitors and infusion pumps and non-medical equipment like wheelchairs or portable beds when patients come and go, is challenging to say the least. Being able to precisely locate every piece of equipment down to about a cubic foot and accurately track each patient in real-time and the condition of the asset or patient and their environment could be transformative for healthcare providers. Also, such a system could aid in contact tracing.

Intelligent Locations offers healthcare organizations an Internet of Things (IoT) solution providing advanced monitoring of assets, people, and processes with data insights. The solution solves those vexing problems, enabling them to help save lives. Intelligent Locations employs quarter-sized Bluetooth Low Energy enabled beacons tracked by gateway devices tagged to assets, including patients and portable medical equipment. Their cloud-based platform offers tracking maps, analytics, and key performance indicators via HIPAA-complaint mobile app and web-based interfaces.


Source: Intelligent Locations

Challenge

Intelligent Locations needed to design their beacons to be smaller and less expensive, with much longer battery life on a single coin cell battery. Intelligent Locations had attained a 2-year battery life with a leading competitor's Bluetooth Low Energy radio. The new solution needed to at least double the coin cell battery life.

Solution
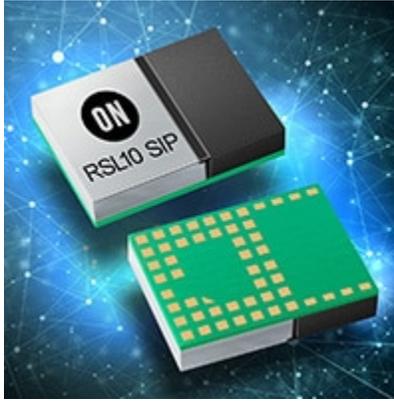
Arrow Electronics, an **onsemi** distributor, equipped Intelligent Locations with the tools they required to reduce the product size via an **onsemi** Bluetooth Low Energy solution that could more than double their battery life – the RSL10 System-in-Package (SiP).

Result

The RSL10 Bluetooth Low Energy enabled MCU improved RF power and battery performance in a small form factor. The **onsemi** RSL10 solution more than doubled battery life to a minimum of five years in deployment in the Intelligent Locations application. The figures below show typical battery lifetimes as a stand-alone system or system with a sensor companion.

Item:	Mode:	Actual Battery Life (years):	ADV Data Size (bytes):	ADV Interval (seconds):
1	Connectable	20	5	5
2	Non Connectable	27	5	5
3		15	5	2.5
4		17.7	31	5
5		10		2.5
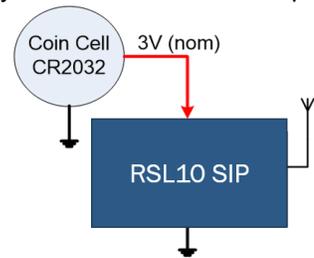
Figure 1: RSL10 System in Package (RSL10 SIP) without a sensor companion

Item:	Mode:	Actual Battery Life (years):	ADV Data Size (bytes):	ADV Interval (seconds):	Sensor Ave Current:
1	Non Connectable	6.73	31	2.5	1uA
2		5.23		2.5	2uA
3		4.71		2.5	2.5uA
4		10.12		5	1uA
5		7.08		5	2uA
6		6.15		5	2.5uA
7		5.44		5	3uA
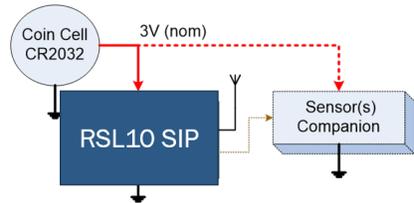
Figure 2: RSL10 SIP with a sensor companion

The Tables demonstrate that increasing the accuracy of location information consumes more power, shortening coin cell battery life while lower accuracy consumes less power, lengthening battery life. The **onsemi** Community Forums features our power profiler tool that enables designers to generate RSL10 power and current consumption estimates when operating in commonly used configurations.

IoT technology like Intelligent Locations provides healthcare facilities the ability to digitize objects and provide real-time, actionable data and insights, thus transforming their asset management. Location-based technologies determine the precise location of assets and patients while sensors monitor the assets' condition and environment. Actionable insights grant healthcare providers significant time savings that allow greater focus on patient care and outcomes.

onsemi provides a flexible design ecosystem for asset management. The RSL10 Bluetooth Low Energy radio Software Development Kit enables the rapid development of critical life-changing intelligent healthcare devices. The RSL10 offers advanced, multiprotocol wireless capabilities while optimizing system size and battery life, the industry's lowest power consumption. The RSL10 System-in-Package allows easy design-in, enabling rapid IoT application development. Smart Healthcare IoT application developers can leverage the simplicity to get to market faster and help improve people's lives.