

Bluetooth SensorTag

Welcome to the main page for the Bluetooth SensorTag

Bluetooth Smart is a new standard that allows Bluetooth equipment to run for years on a single coin cell battery. According to IMS Research the market for Bluetooth Smart accessories is expected to be the fastest growing mobile phone accessory market in the coming years. This new technology combined with new low power sensors and countless mobile phone app developers opens up limitless opportunities for mobile phone apps

The SensorTag is designed to shorten the design time for Bluetooth app development from months to hours, the kit removes the barriers to entry for smartphone app developers who want to take advantage of the growing number of Bluetooth low energy-enabled smartphones and tablets. This is the first Bluetooth low energy development kit focusing on wireless sensor applications and it is the only development kit targeting smartphone app developers.

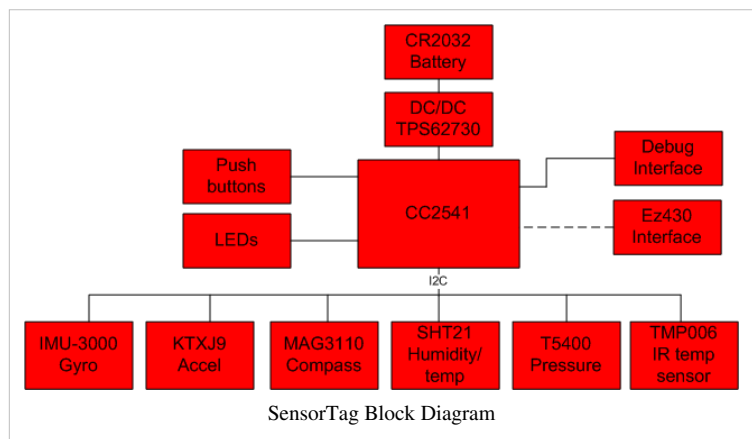
The Bluetooth SensorTag demonstrates the low power capabilities of *Bluetooth* low energy(aka *Bluetooth* 4.0 and *Bluetooth* smart)

- NO embedded software design knowledge required
- NO embedded compiler required
- Includes 6 low-power MEMS sensors and Bluetooth low energy radio powered by a single coin cell battery
- iOS sample apps are included to demonstrate use of the sensors(Android sample apps are coming when Android releases an Bluetooth 4.0 API)

The SensorTag can be used as a reference design and development platform for a variety of smartphone accessories.

The block diagram shows the sensors on the SensorTag and lists some potential applications, most engineers that start working on the SensorTag comes up with their own app ideas!

Buy the SensorTag on TI eStore ^[1]



SensorTag App on App store

With the SensorTag App you can build your own SensorTag app in minutes by enabling the SensorTag sensors. It allows quick and easy prototyping and generates sample code for use in your own apps. It also includes links to 3rd party apps that support the SensorTag

Supported App Development Platforms

To use the SensorTag a Bluetooth Smart (4.0 or newer) device is required and the API of the device must support the *Bluetooth* low energy API. Current the following devices are supported:

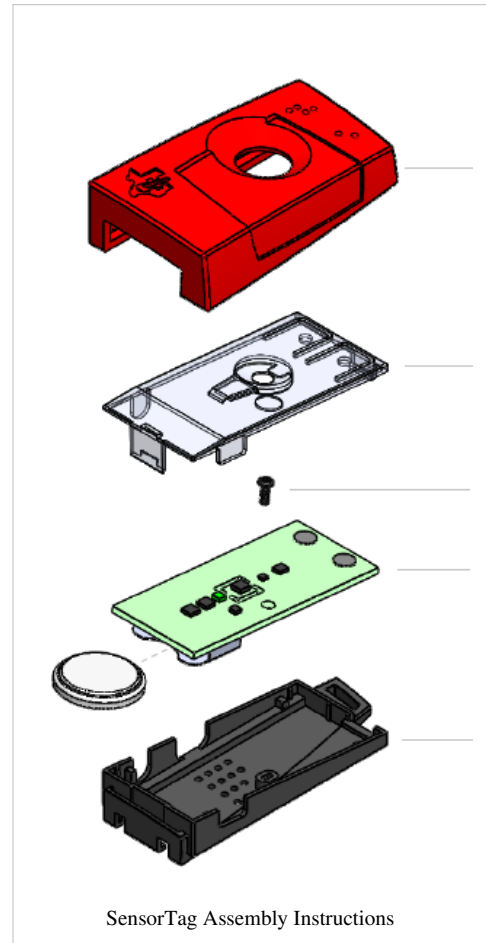
- iPhone 4S and newer
- iPad(3) and newer
- iPad mini
- iPod Touch (5. gen)
- Any Windows PC with CC2540 USB dongle ^[2] connected using BLE Device Monitor ^[3].

Quick Start Guide

The Quick Start Guide ^[4] shows the first steps for assembling the SensorTag, downloading the SensorTag App and get the sensor reading on the phone in minutes- Follow this link to download the Quick Start Guide ^[4]

Download summary

This section contains download links to all SW and HW resources for the SensorTag





SensorTag IR temp sensor used for measuring cooking temperature



SensorTag IR temp sensor used for measuring coffee temperature



SensorTag used as keyfob for tracking keys



SensorTag accelerometer used as level construction tool

Description	Download link
SensorTag app on App Store	[5]
NEW! SensorTag app source code example	[6]
BLE Device Monitor for Windows PC	[7]
TI Bluetooth low energy software stack	[8]
SensorTag HW reference design	[9]
SensorTag Firmware	[10]

SensorTag User Guide

The User Guide ^[11] provides all details of the SensorTag hardware and firmware including conversion algorithms and overview of *Bluetooth* low energy commands used to communicate with the phone

SensorTag User Guide ^[11]

How to Certify your Bluetooth Product

The SensorTag reference design has passed FCC(US)/ETSI(Europe)/IC(Canada) RF certification. It is also received Bluetooth End Product certification ^[12]. This section explains what certifications the SensorTag has completed and the steps required to certify your own product: How to Certify your Bluetooth product ^[13]

Not ready to go through full FCC/ETSI certification? Use certified modules from our 3rd party partners: [Bluetooth low energy modules ^[14]]

BLE Device Monitor User Guide

The BLE Device Monitor is a PC tool that allows you to read and write characteristics to *Bluetooth* low energy devices. For the SensorTag the BLE device monitor includes a production test script that is used to perform self-test.

The BLE device monitor require a CC2540 USB dongle ^[2]

BLE Device Monitor User Guide ^[15]

SensorTag enabled iOS apps

The official TI SensorTag app Download app ^[5]

Sensirion Confort Guide Download app ^[16]

Byteworks SensorTag app built using techBASIC Download app ^[17]

Weight Training-Genie Download app ^[18]

Gammapoint Weather Run - Bike, Walk, Hike Tracker Download app ^[19]

Bluetooth low energy blogs

MAKE | Teardown of the TI SensorTag

“...try this, you’ll love it.” Teardown of the TI SensorTag ^[20]

Write your own Bluetooth Smart Sensor App in an Hour

Bluetooth SIG webinar on how to write apps for the SensorTag View Webinar recording ^[21]

Raspberry Pi and TI CC2541 SensorTag

Thanks to Michael Saunby, the SensorTag is now supported on Raspberry Pi

Michael Saunby Blog ^[22]

SensorTag Android app on HTC One

Lance Nanek has posted a cool example of SensorTag interface for Android on an HTC One NeatoCode Blog ^[23]

Because Bluetooth Smart is happening !

Bluetooth Smart Log ^[24]

Byteworks Bluetooth low energy blog

Controlling the SensorTag with techBASIC blog ^[25]

Building iPhone and iPad Electronic Projects

Real-World Arduino, Sensor, and Bluetooth Low Energy Apps in techBASIC, By Mike Westerfield. This book includes a lot of details about programming BASIC for Bluetooth low energy apps Order the book from O'Reilly ^[26]

iOS Apps Development

Start Developing iOS Apps Today ^[27]

Bluetooth low energy wiki

When you are ready to develop your own firmware for the SensorTag, check out the: *Bluetooth* low energy wiki ^[28]

Videos

NEW! TI SensorTag introduction video ^[29]

TI promotion video ^[30]

Byte Works rocket flight video ^[31]

SensorTag training at Embedded World 2013 ^[32]<br<

Post your own projects

YmsCoreBluetooth

A framework for building Bluetooth 4.0 Low Energy (aka Smart or LE) iOS and OS X applications using the CoreBluetooth API. Includes Deanna and DeannaMac, applications to communicate with a TI SensorTag for iOS and OS X respectively.

Intended for iOS and OS X developers intent on shipping production-level code to communicate with BLE devices. Think of it as AFNetworking for BLE.

Features

- ObjectiveC Block-based API for Bluetooth LE communication
- Operations (e.g. scanning, retrieval, connection, reads, writes) map to the data object hierarchy of CoreBluetooth.

Where to get it

<http://kickingvegas.github.io/YmsCoreBluetooth/>

YmsCoreBluetooth in Action

SensorTag as iTunes Remote

Here is a video of an iOS app running in the background using YmsCoreBluetooth to characterize the SensorTag to control the Music app on an iPhone. Using YmsCoreBluetooth, time spent making this demo from concept to execution (including shooting the video) took a half-day, just in time to head for lunch.

- <http://yumymelon.com/ymsblog/sensortag-remote-control-for-itunes.html>

Bluetooth Dump

A simple xCode example of enumerating visible Bluetooth LE devices via Core Bluetooth and locating a TI SensorTag and connecting to it <https://github.com/jeradesign/BluetoothDump>

References

- [1] <https://estore.ti.com/CC2541DK-SENSOR-P3192.aspx>
- [2] <http://www.ti.com/tool/cc2540emk-usb>
- [3] <http://www.ti.com/product/cc2541#softTool>
- [4] <http://www.ti.com/lit/swru324>
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- [8] <http://www.ti.com/tool/ble-stack>
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- [10] http://processors.wiki.ti.com/index.php/SensorTag_Firmware
- [11] http://processors.wiki.ti.com/index.php/SensorTag_User_Guide
- [12] https://www.bluetooth.org/tpg/EPL_Detail.cfm?ProductID=24031
- [13] http://processors.wiki.ti.com/index.php?title=How_to_Certify_your_Bluetooth_product&action=submit
- [14] http://processors.wiki.ti.com/index.php/Category:BluetoothLE#TI_BLE_Module_Partners
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- [16] <http://itunes.apple.com/us/app/comfort-guide-sensible/id515236285?mt=8>
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- [19] <http://itunes.apple.com/us/app/weather-run-bike-walk-hike/id599397919?mt=8>
- [20] <http://blog.makezine.com/2013/04/18/teardown-of-the-ti-sensortag>
- [21] <http://developer.bluetooth.org/DevelopmentResources/Pages/Webinars.aspx?ItemID=11>
- [22] <http://mike.saunby.net/2013/04/raspberry-pi-and-ti-cc2541-sensortag.html>
- [23] <http://neatocode.tumblr.com/post/48928591866/esp-for-your-android-ti-sensortag>
- [24] <http://ble.stalliance.no>
- [25] http://www.byteworks.us/Byte_Works/Blog/Entries/2012/10/31_Controlling_the_TI_SensorTag_with_techBASIC.html
- [26] <http://shop.oreilly.com/product/0636920029281.do>
- [27] <https://developer.apple.com/library/ios/#referencelibrary/GettingStarted/RoadMapiOS/chapters/Introduction.html>
- [28] <http://www.ti.com/ble-wiki>
- [29] http://focus.ti.com/general/docs/video/Portal.tsp?entryid=1_v2cduesl&lang=en
- [30] http://focus.ti.com/general/docs/video/Portal.tsp?entryid=1_wg5w9k04&lang=en
- [31] <http://www.youtube.com/watch?v=8YNjwcNXOK4>
- [32] http://www.youtube.com/watch?v=wtC2L_PA7Q8

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