

Wireless Connectivity








2016 Distribution Planning

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WW Marketing Manager, Wireless Connectivity

October 2015

TI Information – Selective Disclosure

NFC RFID	Bluetooth® Bluetooth low energy	Proprietary 2.4 GHz	ZigBee®	Wi-Fi®	6LowPAN	Proprietary Sub-1 GHz
Identification	Personal connection	Customizable	Mesh	Existing infrastructure	IP Mesh	Customizable
						

Agenda

- WCS Introduction
- Major Product Line Themes or Thought Leadership Campaigns
- NPI/EPGI Device and Tools Calendar
 - By Quarter

WCS value proposition

THE Largest selection

Support for all key technologies and standards for industrial, automotive and consumer

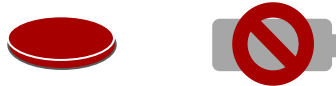
A solution for any application.
Future proof.
Leverage your investment



THE lowest power

Use a coin cell for multi-year, always-on operation or go battery-less with energy harvesting

Ultra-low power by design



Easiest to design with

Quickest learning-curve and development time with full broad market ecosystem

Software, tools, E2E, certified TI modules, TI Designs, SensorTag







WCS Portfolio positioning

SimpleLink™ Solutions








WiLink™ Solutions

Existing Products – proven foundation of millions of devices shipped in the market

Smart RF Transceivers	Wireless Network Processors (WNPs)	Wireless Microcontrollers (MCUs)	Wi-Fi Combo Devices
			
Application	Application	Application	Application
Wireless Stack	Wireless Stack	Wireless Stack	Wireless Stack
RF Radio	RF Radio	RF Radio	RF Radio

- **SimpleLink:** Broad offering of RF transceiver, wireless network processors and wireless microcontrollers
- **WiLink:** High performance Wi-Fi + Bluetooth/BLE combo devices

TI broad portfolio: A solution for each industry challenge

	NFC RFID	Bluetooth® Bluetooth low energy	Proprietary 2.4 GHz	ZigBee®	Wi-Fi®	6LowPAN	Proprietary Sub-1 GHz
Network type	Identification 	Personal connection 	Customizable 	Mesh  ZigBee® Control your world	Existing infrastructure 	IP Mesh 	Customizable 
Range	Proximity	Personal area networks		Local area networks			Neighborhood area networks
Key differences	Data <ul style="list-style-type: none">• Up to 848 Kbps• No battery to coin cell	Data or voice <ul style="list-style-type: none">• Up to 3 Mbps• Coin cell to AAA	Data <ul style="list-style-type: none">• Up to 1 Mbps• Coin cell	Data <ul style="list-style-type: none">• Up to 256 Kbps• Energy harvesting to AAA	Voice or video <ul style="list-style-type: none">• Up to 100 Mbps• AA battery	Data <ul style="list-style-type: none">• Up to 256 Kbps• Energy harvesting to AAA	Data <ul style="list-style-type: none">• Up to 1 Mbps• Coin cell
Industrial applications	<ul style="list-style-type: none">• Device configuration / Firmware upgrade	<ul style="list-style-type: none">• Lighting• Wire replacement• Beacons• Asset tracking• Factory automation	<ul style="list-style-type: none">• Building and factory automation• Beacons	<ul style="list-style-type: none">• Smart energy• Building automation• Lighting networks• Industrial Internet	<ul style="list-style-type: none">• Assets tracking• Remote control of machinery• Sensors• Building automation	<ul style="list-style-type: none">• Smart energy• Building automation• Lighting networks• Low-power Industrial Internet-gateways	<ul style="list-style-type: none">• Metering• Smart grid• Alarm and security• Environmental monitoring

Where does Sub-1 GHz fit?

Target Markets



Home Automation



Lighting control
Door locks
White goods

Logistics



Tollroad tags
Asset Tracking

Retail



ESL / Price Tags
Locationing
Cold chain mgmt

Alarm & Security



Security alarms
Smoke/CO2 alarms
Security sensors

Smart Grid



Flow Meters
E-Meters
Heat cost allocators

Factory Automation



Monitoring sensors
Cable replacement

Agriculture



Irrigation systems
Rodent traps
Animal tracking

Other



Rescue tracking
RC toys

Bluetooth Smart *Target Markets*

Home Automation



Lighting
Home Automation

Industrial



Remote Display
Maintenance
Cable Replacement

Retail



Beacons
ESL / Price Tags
Locationing

Automotive



Remote Keyless Entry
Tire Pressure
Non-critical Sensors

Health & Medical



Thermometer
Patches
Blood Glucose Meter

Sport & Fitness



Heart Rate
Speed / Cadence
Watches

HID



Remote Control
Keyboard & Mouse

Toys



Toys
Professional Toys

Where does Wi-Fi fit?

Target Markets

Home Automation



Alarm & Security
Lighting
Energy Control

Building Automation



Access control
Equipment monitoring

Home appliances



Services
Maintenance
warranty cost

Process Measurements



Continuous monitoring

EPOS/EFT



Payment solutions

Real time location



Asset tracking
Indoor navigation

Wearable



Smart watch
Fitness tracking

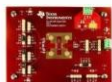
Audio



Speakers
Soundbars
Head-set

Wireless Connectivity *per Technology*

Bluetooth® Low Energy / Bluetooth® Dual Mode



RS-485



Haptic Feedback



Gas Sensor



Keyfob



Light Harvesting



BLE Light



Postage Stamp



Long Range



Mini Broadcaster



BLE to Wi-Fi gateway



USB Dongle



SensorTag



Heart Monitor



Body Composition



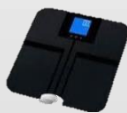
Audio Sink



Display



Optical Heart Rate



Weight Scale



Audio Source



Led Audio



Pulse Oximeter



SensorTag iBeacon



CC256x EM



UART to BLE

WiFi®

CC3200MOD LaunchPad

CC3100MOD BoosterPack



Smart Electric Meter



Smart Plug



Wi-Fi Camera



Audio Streaming

CC3200 Battery Power



Smart Plug

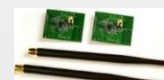
Sub-1 GHz



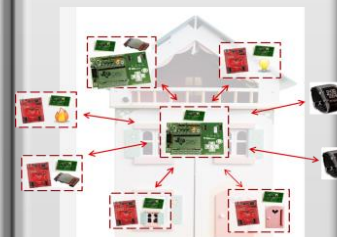
ETSI Cat. 1 Receiver



RF Layout Reference Design for 420-470 MHz



RF Layout Reference Design for 868-930 MHz



Home network



Network Range Extender



Home Automation Gateway



Light Link Development Kit



Low End In-Home Display



CC2538 EM

ZigBee®

TI Design example

UART to Bluetooth® Low Energy (BLE) Bridge Reference Design

Worldwide (In English)

(ACTIVE) TIDC-SPPBLE-SW-RD

Description & Features

Technical Documents

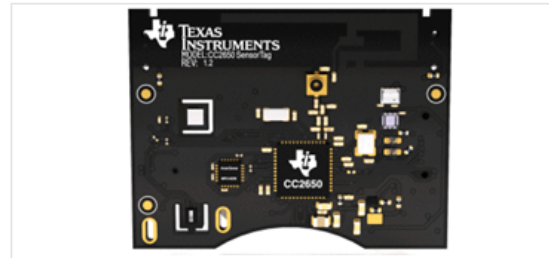
Support & Community

Order Now

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Description

This is a reference software solution to demonstrate how to implement a UART to BLE bridge and to communicate serial data wirelessly bidirectionally between wired UART to a device supporting BLE protocol. This will accelerate the software design process by just dropping modular code into existing and new products to enable IoT applications that connects wired serial protocols such as RS232 to BLE. The solution also includes an RS232 to UART hardware reference design.



UART to Bluetooth® Low Energy Bridge (BLE) Reference Design

Features

- Enables Easy Integration Through Modular Code
- Runs On the SimpleLink™ Bluetooth low energy CC2640 wireless MCU
- Uses the TI Royalty Free BLE-Stack™
- Ports Easily to Other Boards Including the SimpleLink SensorTag 2.0
- Offers a Generic Design to Fit Various Applications
- This easy-to-use software sub-system is tested and ready to be copied and pasted into your next wireless project

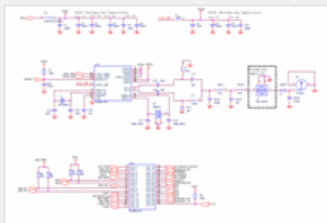
View [available purchase options](#) for designs kits, evaluation modules and/or the bill of materials.

\$29.00(USD)

[Order Now](#)

Schematic/Block Diagram

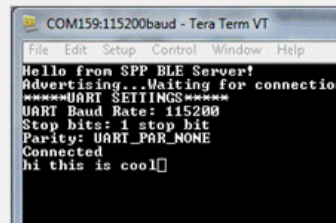
Quickly understand overall system functionality.



Download Schematic

Test Data

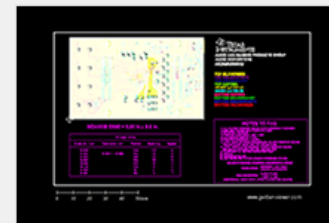
Get results faster with test and simulation data that's been verified.



Download Test Data

Design Files

Download ready-to-use system files to speed your design process. [Get Viewer.](#)



Download Design Files

Bill of Materials (BOM)

Find the complete list of components in this reference design.

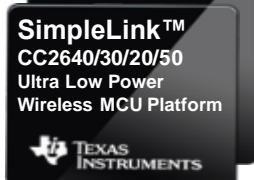
Download BOM

2015 WCS Key Products

New Products



Feb' 15



Feb' 15

CC2640 BLE
CC2630 ZigBee/6LowPAN
CC2620 RF4CE
CC2650 Multi protocol



Sep' 15

CC2564 module with Antenna



Aug' RTM

Nov' Promotion
Sub-1 GHz Wireless MCU



4Q15

CC322x



4Q15

BLE/ ZigBee/
6LoWPAN/802.15.4
(pending PPR)



4Q/1Q RTM



Existing Products



Mar' 15

MSP430+CC1120



Mar' 15

CC2564
1st release of TI BT Stack



Jun '15

Broad market
BLE/6LoWPAN/ZigBee



3Q15

CC2564
Booster pack for TI MCU



3Q15

Audio sync capabilities
For WL8



Dec '15

CC2650

TI Designs



2Q15

Smart Plug CC3200



2Q15

BLE SensorTag - CC2650



2Q15

Sub-1 GHz
Connected Home



2Q15

CC2640 BLE to RS232

WiFi + BLE Gateway

CC3200+CC2650

RTM: **3Q15**



CC2650 μTag

RTM: **3Q15**



3Q15

WL8+ZigBee capable cap
for Sitara™ processors



4Q15 - 6LoWPAN to Wi-Fi Gateway

4Q 2015 – WCS RTM plan

Product Name	Statement	Category	Applications	RTM Date
SimpleLink UPL CC1310	World's Lowest power sub-1GHz wireless MCU	Sub 1GHz	Metering, Building Automation, WSN, Security	Oct 1 st Campaigning Nov 15'
SigFox Evaluation kit (MSP430 + CC1120 + CC1190)	SigFox certified development kit (US market focus in 4Q15)	Sub 1GHz		December Campaign mid dec or January
Walink8 Audi Solution	Wi-Fi time synchronization for Audio speakers	Wi-Fi	Audio	Dec (TBC)

Thought Leadership / BU Focus Areas

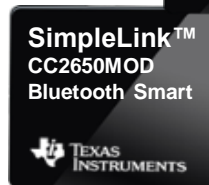
New Products



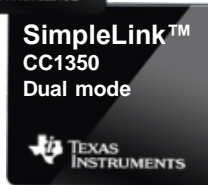
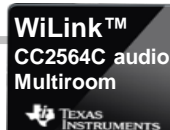
Oct' 15
Wireless MCU



Jan' 16
Small size



Feb' 16
Module



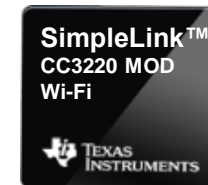
April' 16
Sub-1GHz and BLE



April' 16
Power optimization,
Provisioning enhancement,
IPV6, Homekit



Dec' 16
More flash memory



3Q' 16
Gen2 module



Broad market Kits and Tools



Jan' 16



Jan' 16??
IoT tool



Feb' 16



Feb' 16



March 16
BLE + Sub-1GHz



April 16
IoT tool



June 16

TI Designs

CC1310
Temp Sensor
Feb'16

CC1310
People counter
March 16

CC2640 WCSP
Size optimized
1Q16

CC1310
C02 Alarm
May 16

CC2650M
Boosterpack
2Q'16

CC1350
SensorTag
3 Q16

Bluetooth Smart
to Wi-Fi Gateway
4Q16

CC3200
Wi-Fi Low power
1Q'16

CC3200 Wi-Fi video
camera with omnivision
1Q'16

CC3200
Wi-Fi homekit
2Q16

1Q 2016 – WCS Disty plan

Product Name	Statement	Category	Applications	RTM Date
SimpleLink™ CC1310 new silicon Sub-1GHz	Worlds Lowest Power Sub-1GHz wireless MCU TIDesign + Embedded World push?	Sub 1GHz		October 2nd
CC2650 LaunchPad	Low cost BLE development kit	Bluetooth Smart		January 16
SimpleLink™ CC2640 WCSP Bluetooth Smart	Extreme size optimized	Bluetooth Smart	Banking and loyalty cards Wearables Health & Medical	
SimpleLink™ CC3200 SensorTag Wi-Fi	Connect sensors to the cloud in minutes with Wi-Fi	Wi-Fi		<i>e/o Jan</i>
CC2564MODA (+ booster pack + Driver for SMT32)	Dual Mode BT made easier with new module with antenna integrated + SW for STM32 attach	Dual Mode Bluetooth	Audi, POS,	Mid Jan
CC2564MOC	Multi-room Audio solution	Dual Mode Bluetooth	Audio	March

CC1310 Whole Product

Introduction

- [Introduction](#)
- [How to Sell](#)
- Success stories
- [Technical Training](#)
- Competition
- Videos:
 - How to get Started
 - CC1310 HW Design Intro
- [WCS Roadmap*](#)



Collateral

- [CC1310 product folder](#), [Datasheet](#), [Errata](#), [TRM](#)
- [Application notes](#)
 - CC13xx+PA, [Bootloader Interface](#), [Optimum radio range](#), [GCC/GDB](#)
 - [Antenna quick guide](#), [CC13xx under ARIB](#)
- [White Papers](#)
 - [Wireless Connectivity in Industrial IoT](#), [RTOS Power management](#)
 - [Wireless Scalability to Intelligent Sensing Applications](#)
- Training videos
 - CC1310 SW examples (multiple), CC1310 Why RTOS?
 - Sensor controller studio intro
- Reference designs
 - CC1310EM-7XD-7793, [Temperature / Humidity sensor](#)

HW and Kits

- [CC1310](#) (4x4/5x5/7x7 QFN)
- [CC1310DK](#) (\$299), video
- [CC1310EMK](#) (\$99)
- CC1310LP (\$29-\$99, Q1 2016)
- Modules
 - Module partner Wiki



SW & Resources

- Software
 - CC1310 SW Landing Page – step by step guide
 - [CC1310 Power Management SW Dev. Guide](#)
 - [TIRTOS](#), EasyLink examples
 - [CC13xx-ware – Driverlib & Firmware](#)
 - TIMAC2.0 (Star network, Q1 2016)
 - [Contiki-6LoWPAN](#)
- Tools
 - [SensorController Studio](#)
 - [IAR & CCS](#)
 - [SmartRF Studio](#)
 - [Flash Programmer2](#)

More information: [Sub-1GHz Wiki](#), [E2E](#)

CC2640 in WCSP package

PREVIEW

Features

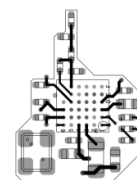
- WCSP package with only 2.7x2.7mm footprint
- Complete ref design available with 36mm footprint including crystal and passives
- Thinnest BLE design, only 0.6mm high vs 1mm for QFN package

Benefits

- Ideal space constrained BLE applications
- Thinner designs possible
- Target applications include
 - medical & health
 - sensors & beacons
 - sport & fitness
 - RF modules

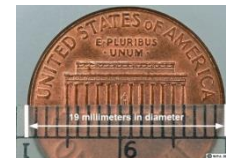
Tools & Resources

- CC2650DK & SmartRF06EBK
- CC2640 EM Reference Design
- SmartRF Studio
- TI Design for small size layout



6.7mm

36mm² PCB design for WCSP



WiFi SensorTag

- 10 Low power sensor
- Low power
 - AAA batteries
- SensorTag app support
- Easy cloud connection
- SensorTag SW compatible
- Display DevPack support
- \$29



- 10 Low power sensor
- Longer battery life
- View sensor data on the phone
- Connect to the cloud in 3 minutes
- Easy migration between Wifi and Bluetooth Smart

2Q 2016 NPI/EPGI Devices and Tools

Product Name	Statement	Category	Applications	RTM Date
SimpleLink CC1350	Worlds only dual band solution Bluetooth Smart + Sub-1GHz, Ultra low Power Wireless MCU	Dual Band Bluetooth Smart + Sub-1GHz		
SimpleLink CC1350 SensorTag	Connect sensors to the cloud for industrial using sub -1GHz and BLE	Dual Band Bluetooth Smart + Sub-1GHz		April
SimpleLink™ CC1310 TIMAC + LaunchPad Sub-1GHz	Sub-1GHz made easy	Sub-1GHz		June <i>(discussion with Sylvain)</i>
SimpleLink CC2650MOD	TI Module for Bluetooth Smart Easy evaluation with Boosterpack	Bluetooth Smart		
SimpleLink Wi-Fi CC3220 SimpleLink Wi-Fi CC3120	Power optimization, Provisioning enhancement, IPV6, Homekit Security	Wi-Fi		

TI Information – Selective Disclosure

CC1350 Sub-1GHz + Bluetooth SMART

System setup/config



Remote Display



Security sensors



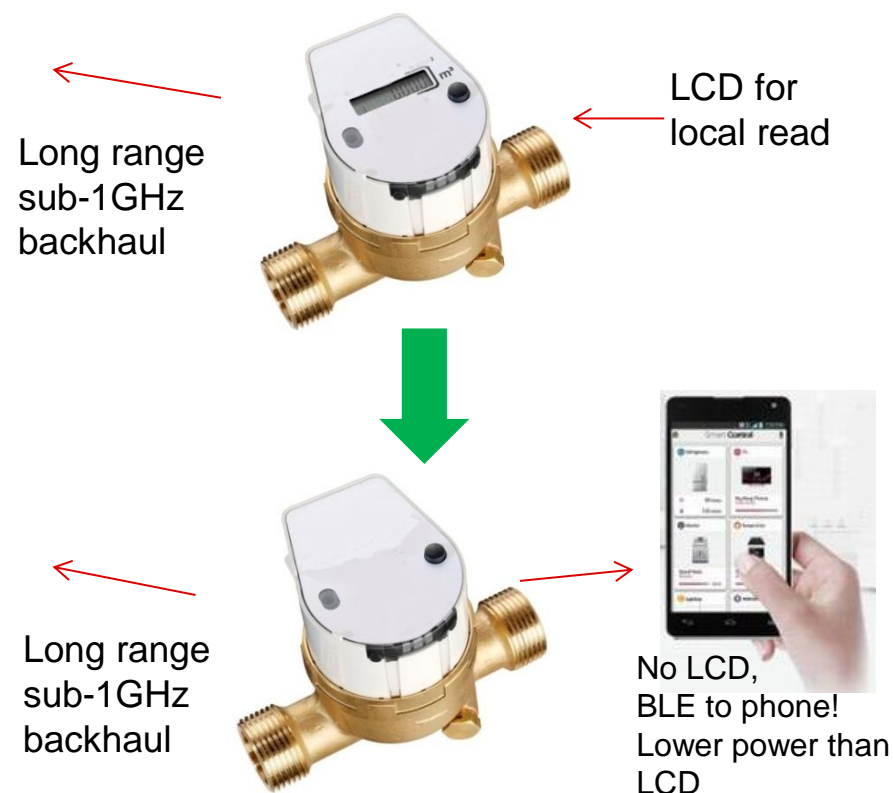
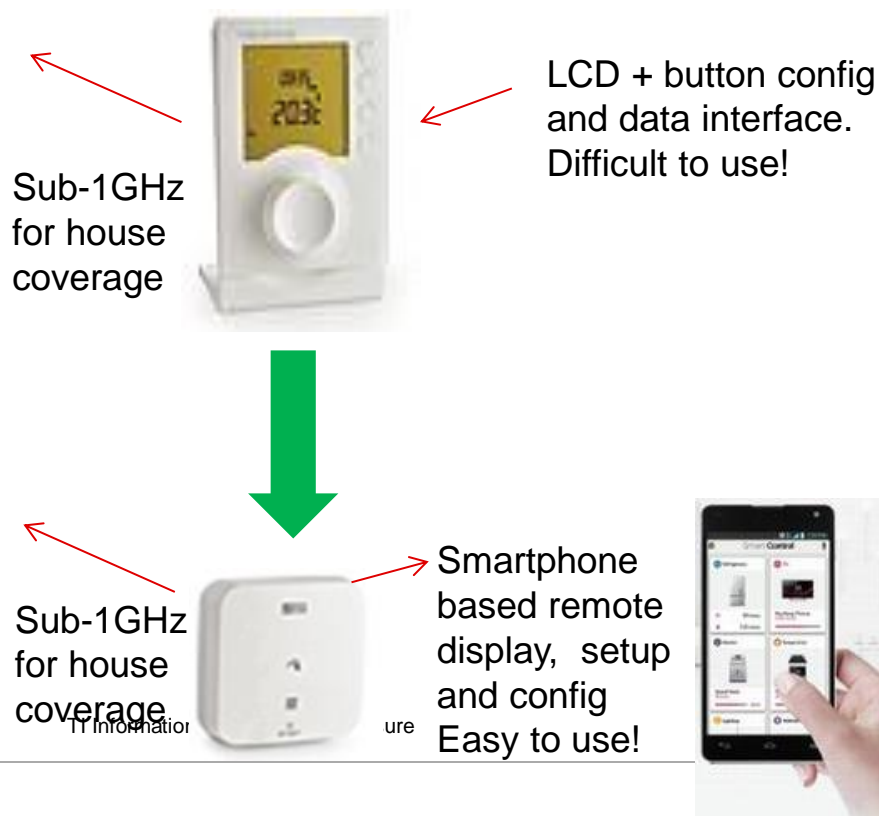
Garage door opener



TI Information – Selective Disclosure

CC1350 dual band: From LCD to Remote BLE Display

- Today: Segment LCD, few control buttons, basic menu system, hard to setup and configure, bad user experience
- Tomorrow: Smartphone app with powerful features, easy setup and configuration, easy data access



CC2650 Module

PREVIEW

Features

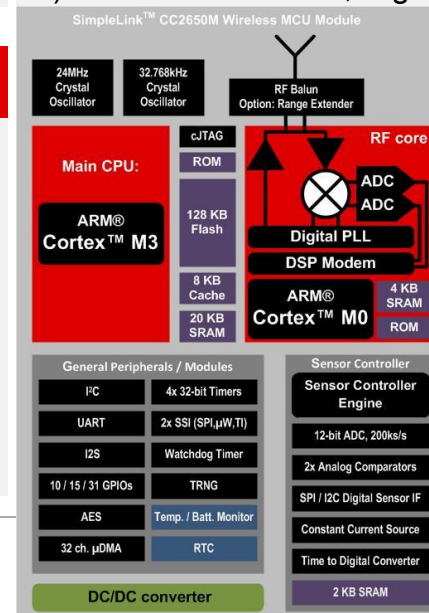
- RF Module with no external components needed
- FCC & ETSI certified
- Fully tested RF path
- Integrated antenna
- +5dBm Pout / -97dBm for BLE
- Simple Network Processor software available
 - BLE development with high level NWP API
 - Host examples available for MSP432 Launchpad

Benefits

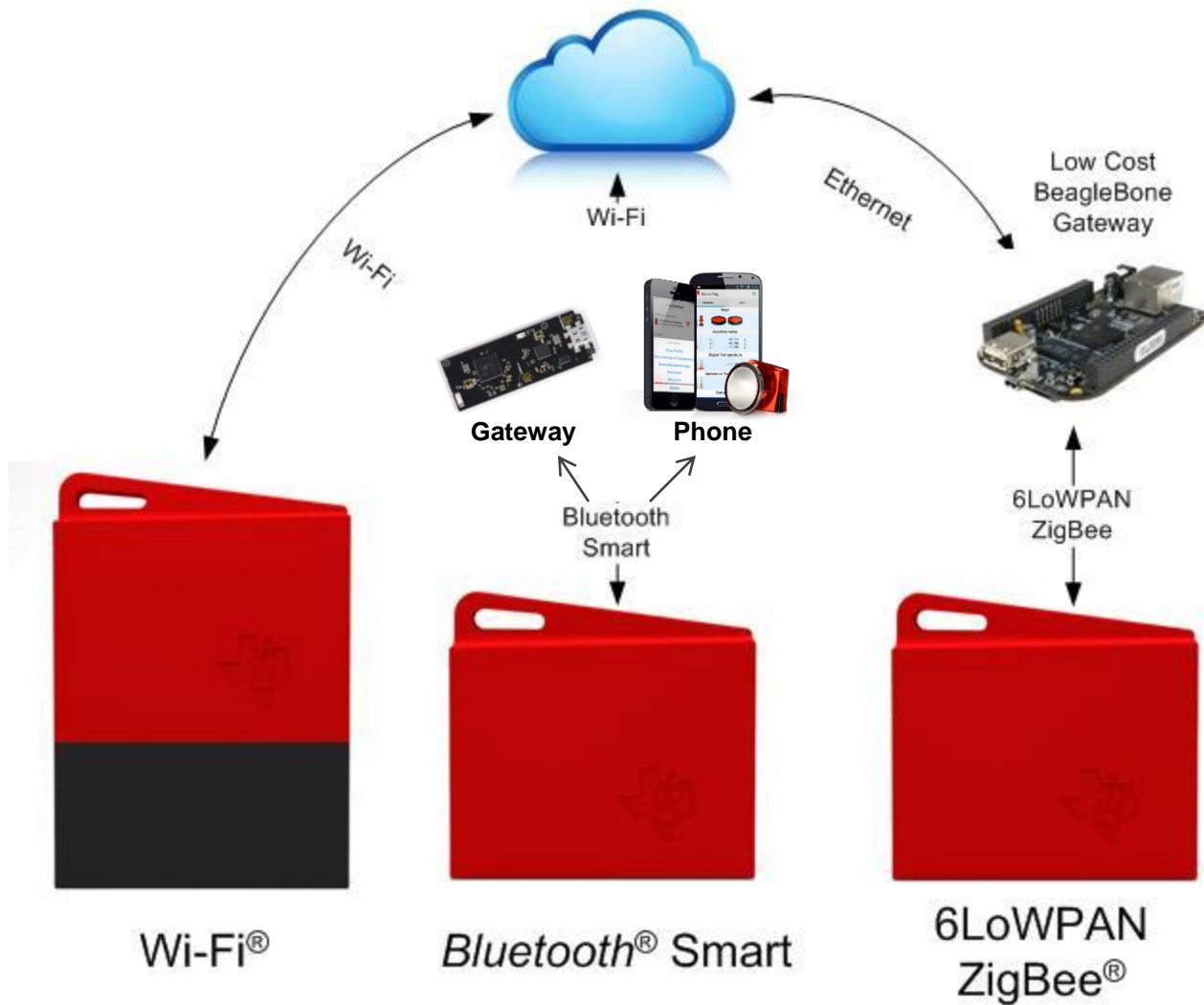
- 1) Shorten customers time to market
- 2) Easiest way to add BLE to an application
- 3) Lower prototyping cost
- 4) Lower production cost with precertified modules
- 5) Enable BLE to a broader set of customers without RF and Stack SW knowledge
- 6) Easy way from module to chip on board
- 7) TI's proven standard SW stack
- 8) TI Brand module, High quality, TI's supply chain

Tools & Resources

- CC2650 Module Boosterpack
- MSP432 Launchpad
- Bluetooth Smart Network Processor Software & Host example code for MSP432
- iOS + Android Launchpad App & Source Code



Whats next?



Wrap-up

- Focus on Sub-1GHz, Bluetooth Smart and Wi-Fi
- New silicon/ SW/ tools/ kits/ TIDesign in 2016 to support it
- Great differentiation on Sub-1GHz with CC1350 starting today with CC1310
- We will be the first SC company to make Sub-1GHz easy
- Accelerate FAE enablement + moving all training material on-line
- Success Measurements: # new customers