# 2.4 GHz SimpliciTI™ Protocol on Stellaris®

**TEXAS INSTRUMENTS**

The Stellaris® 2.4 GHz SimpliciTI™ Wireless Kit (DK-EM2-2500S) from Texas Instruments provides a low-power RF network solution for customers' end equipment. The solution combines TI's easy-to-use SimpliciTI™ protocol with the new Stellaris EM2 expansion board and the Chipcon CC2500EM 2.4 GHz evaluation module along with the full suite of tools an engineer needs to develop and prototype 2.4 GHz wireless embedded applications with Stellaris. The DK-EM2-2500S wireless kit works with our most popular Stellaris microcontroller development kit, the DK-LM3S9B96 (sold separately).

SimpliciTI's open-source software is aimed at simple, small RF networks and was designed for easy implementation on several TI RF platforms. Such networks typically contain a limited number of battery-operated devices which require long battery life, low data rate, and low duty cycle that talk either directly to each other or through optional access points and range extenders. The minimal resource requirements for a SimpliciTI™ implementation make it a perfect low-cost solution for wireless communication.

The Stellaris® SimpliciTI™ solution allows software application developers to become familiar with the operation of the CC2500EMK using their Texas Instruments' Stellaris embedded microcontroller platform without having to be concerned about the RF portion of the system. The Stellaris EM2 expansion board facilitates the connection of up to two wireless expansion modules using SPI as the primary interface to the DK-EM2-2500S module.



**Stellaris® LPRF Block Diagram**
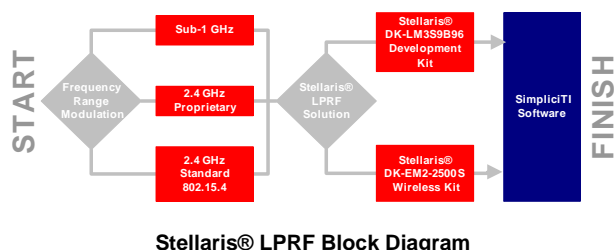
## Features

- Low power
  - A TI-proprietary low-power network protocol
- Flexible
  - Direct device-to-device communication
  - Simple star with access point for store and forward to multiple ultra-low power end devices
  - Range extenders to increase range to 4 hops
- Simple—Utilizes a 5-command API
- Low data rate and low duty cycle
- Easy to learn and easy to use

## Included Software Sample Applications

- Simple Peer-to-Peer Communication
- Cascading End Devices

- Polling with Access Point
  - Access point
  - End device
  - Range extender
- Access Point as Data Hub
  - Access point
  - End device
  - Channel sniffer
- Access Point for eZ430-Chronos (with the CC1101EM, sold separately)

## Kit Contents



**DK-EM2-2500S Kit Contents**

The Stellaris® 2.4 GHz SimpliciTI™ Wireless Kit provides the tools engineers need to set up and develop wireless applications right out of the box including:

- 1 DK-LM3S9B96-EM2 Expansion Board
- 1 CC2500EMK 2.4 GHz Evaluation Module
- 1 ez430-RF2500 MSP430 Wireless Development Tool
  - MSP430F2274
  - 1 AAA battery pack with expansion board (batteries included)
  - 1 MSP430 Development Tool CD-ROM
  - 1 eZ430-RF USB debugging interface
  - 2 eZ430-RF2500T wireless target boards
- CD with tools, documentation, and source code

## Ordering Information

| Product Number | Description |
|---|---|
| DK-EM2-2500S | Stellaris® 2.4 GHz SimpliciTI™ Wireless Kit *(includes DK-LM3S9B96-EM2 Expansion Board)* |
| DK-LM3S9B96 | Stellaris® LM3S9B96 Microcontroller Development Kit *(sold separately)* |

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## Additional Sub-1 GHz Protocol Support

The CD that comes with the Stellaris® 2.4 GHz SimpliciTI™ Wireless Kit contains all the necessary software to develop a SimpliciTI™ protocol application with Stellaris. This wireless solution can be used to implement any protocol that is compatible with the following radio transceivers and frequency bands.

| Supported Transceivers | |
|---|---|
| Transceiver | Frequency Band |
| CC1101 | 433 MHz |
| CC1101 | 868 MHz |
| CC1101 | 915 MHz |
| CC2500 | 2.4 GHz (proprietary) |
| CC2520 | 2.4 GHz (802.15.4) |

## Additional Evaluation Kits Supported

Texas Instruments also provides a number of Low Power RF wireless development kits and evaluation modules featuring different radio frequencies and transceivers. The Stellaris® 2.4 GHz SimpliciTI™ Wireless Kit makes evaluation easy by combining all the components needed to populate a full heterogeneous Low Power RF network, but it is also possible to separately buy other kits that are also supported by the software in this kit. The Stellaris software provided in this kit (and in the DK-LM3S9B96-EM2 kit) also supports the following Texas Instruments wireless development kits and evaluation modules.

### Additional Transceiver Support (each sold separately)

| CC1101EMK433 | CC1101EMK868-915 | CC2520EMK |
|---|---|---|
|  |  |  |
| CC1101 Evaluation Module 433MHz | CC1101 Evaluation Module 868-915MHz | CC2520 Evaluation Module Kit |

### Additional Wireless Hardware Support (each sold separately)

| EZ430-CHRONOS | MSP-EXP430FG4618 | SmartRF04/05 Boards |
|---|---|---|
|  |  |  |
| eZ430-Chronos Wireless Watch Development Tool | MSP430FG4618/F2013 Experimenter Board | SmartRF04 Experimenter Board |

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Cortex
Intelligent Processors by ARM

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