2.4 GHz ZigBee™ Development Kit User's Guide

1. Kit Contents

The 2.4 GHz ZigBee™ Development Kit contains the following items, shown in Figure 1.

- 2.4 GHz 802.15.4/ZigBee Target Boards (6)
- Antennas (6)
- 9 V batteries (6)
- 2.4 GHz ZigBee Development Kit User's Guide (this document)
- Silicon Laboratories Development Kit IDE and Product Information CD-ROM. CD content includes the following:
  - Silicon Laboratories Integrated Development Environment (IDE)
  - Keil Software 8051 Development Tools (evaluation assembler, linker and C compiler)
  - ZigBee Application Programming Interface (API) library
  - Source code examples and register definition files
  - 2.4 GHz ZigBee Demonstration Software
  - Documentation
- AC to DC power adapter
- USB debug adapter (USB to debug interface)
- USB cables (2)

Figure 1. 2.4 GHz ZigBee Development Kit

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2. Kit Overview

The 2.4 GHz ZigBee Development kit contains everything necessary to demonstrate and develop a six-node ZigBee network. The ZigBee Demonstration Software provides a quick and convenient graphical PC-based demonstration with no programming required. A complete development environment is provided in the kit for those wishing to develop a custom ZigBee application. The development environment includes an IDE, evaluation C compiler, software libraries, and a code example.

3. Demonstration Tools

The kit includes a demonstration to enable the user to quickly construct a ZigBee network, shown in Figure 2.

The demonstration application has two components: development board firmware and a PC application, the 2.4 GHz ZigBee Demonstration Software. It includes example temperature, radio signal strength, and analog measurement applications. Development boards are shipped with the firmware preloaded. Software and firmware updates are available upon request through Silicon Laboratories' Applications group.

Detailed instructions are in document "AN240: 2.4 GHz ZigBee Demonstration Software User's Guide", included with this kit.

Figure 2. 2.4 GHz ZigBee Demonstration Software

4. Development Tools

The 2.4 GHz ZigBee Development Kit includes everything necessary to write, compile, download, and debug a simple ZigBee-based application.

The Silicon Laboratories Integrated Development Environment (IDE) serves as the primary programming and debugging tool. The IDE includes an evaluation versions of the Keil C compiler, assembler, and linker, limited to 4 kB of linked user code. The included ZigBee library components do not count against this limit. The kit also includes an adapter for programming and debugging from the IDE environment as shown in Figure 3.

The software library includes the 802.15.4 MAC and ZigBee Network layers. A Network Application Programming Interface (API) contains all necessary network primitives to manage and access a ZigBee network from a user-defined application. A software example illustrates the Network API. This example builds an ad-hoc ZigBee network using the included Network API software library.

Refer to "AN241: ZigBee Network Application Programming Interface Layer Guide" for a complete description of the API commands and usage. This guide closely follows the format of the ZigBee Alliance Network Specification, which should also be reviewed before beginning development. "AN242: 2.4 GHz ZigBee Network API Programming Example Guide" describes the Network API programming example, IDE setup and operation, and details of using the software library. Both documents are included in this kit.
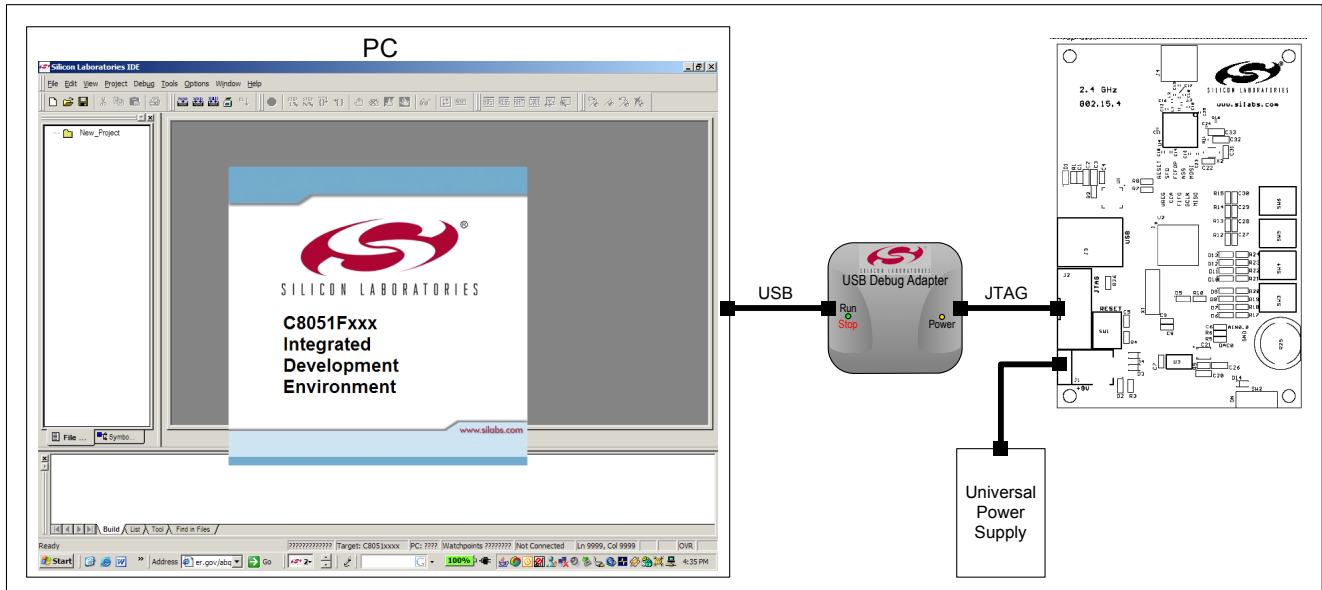

Figure 3. Development Environment Components

5. Hardware

The 2.4 GHz ZigBee Development Kit includes six target boards. These boards are all identical and may be used for demonstration or development.

Each board features a Silicon Laboratories C8051F121 microcontroller and a Chipcon CC2420 2.4 GHz 802.15.4 transceiver. Support components include a USB interface, JTAG programming interface, a variety of pushbuttons and LED's, and a voltage regulator.

Refer to "AN222: 2.4 GHz 802.15.4/ZigBee Development Board Hardware User's Guide" for schematics, PCB layout, and configuration instructions.

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NOTES:

ZigBee-2.4-DK

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