CANSEC Bluetooth Low Energy Development Kit

For CC254X Module

User Guide V2.4

Contens

1. Introduction

The Bluetooth Low Energy Development Kit provides a complete solution for developing, testing, and evaluating the CC254X device.

1.1 Minimum requirements

- 1 Bluetooth Development Kit
- 1 iPhone4S Phone
- 1 PC running Microsoft Windows (XP or later; 32-bit support only), as well as Microsoft .NET Framework 3.5 Service Pack 1 (SP1) or greater

2. Development Kit content

The Bluetooth Development Kit consists of hardware and access to software components, documentation, and design files from helen@alarmsources.com or sarolyn@alarmsources.com

2.1 Bluetooth Development Kit hardware content

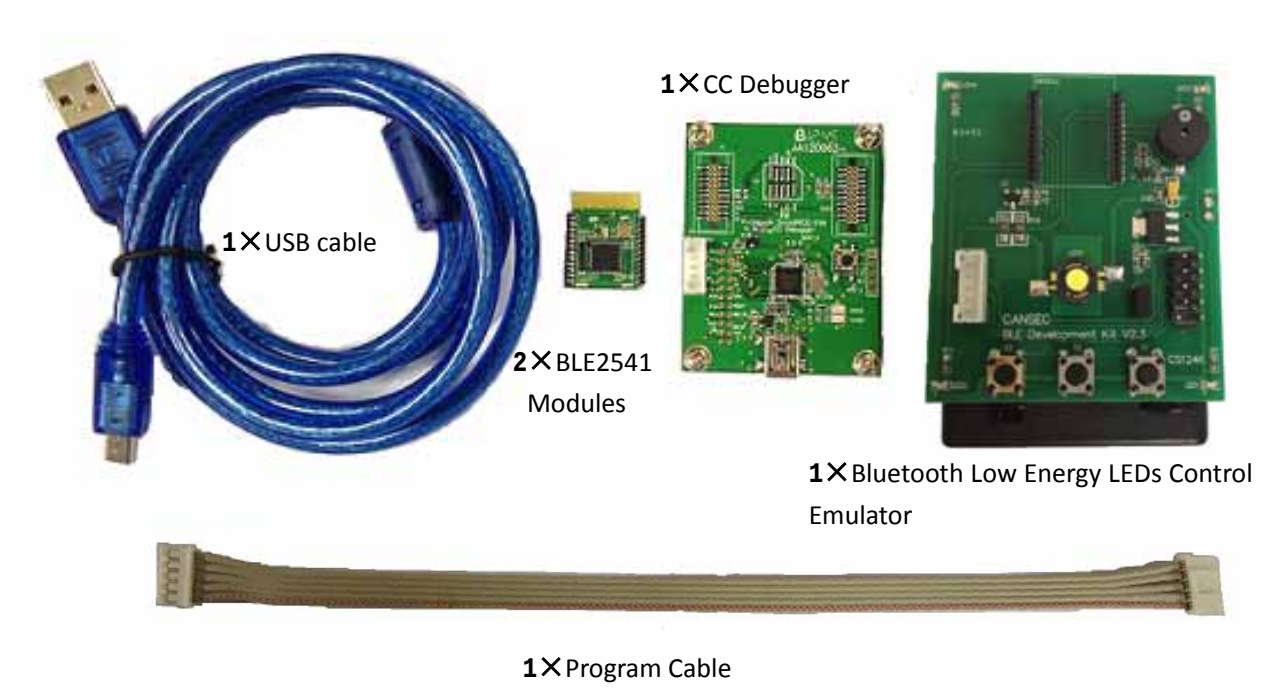


Figure 1 *Bluetooth Development Kit hardware content*

2.2 Downloadable content

The Bluetooth Development Kit includes firmware source code, documentation, and hardware schematic. To access these files, download the files from helen@alarmsources.com or sarolyn@alarmsources.com

2.2.1 Bluetooth Development Kit Software content

- IAR Embedded Workbench for 8051 8.10 Evaluation or later http://www.iar.com/en/Products/IAR-Embedded-Workbench/8051/
- BLE-CC254x-1.2.1 or later from http://www.ti.com/tool/BLE-Stack
- CANSEC_CC254X_DK_SW from http://www.alarmsources.com

2.2.2 Bluetooth Development Kit Documentation

- Bluetooth_Development_Kit_User Guide V2.4.pdf
- BLE2541SA-A SPEC.pdf

2.2.3 Schematics

- *BLE2541.pdf*
- *Bluetooth Low Energy LEDs Control Emulator_Schematic.pdf*

3 Quick start

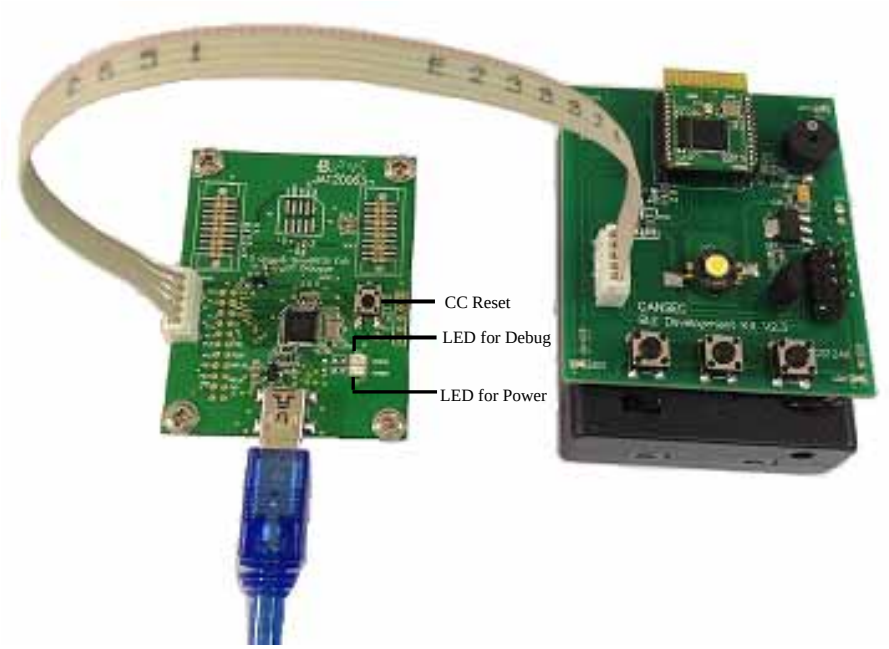
This section shows you how to set up the Bluetooth Development Kit and provides example applications to help you start programming your device.

3.1 Download and install

1. Download and install IAR Embedded Workbench for 8051 Evaluation from http://www.iar.com/en/Products/IAR-Embedded-Workbench/8051/ to your hard drive. Embedded Workbench Evaluation downloads to C:\Program Files\IAR Systems unless you change the location when installing.
2. Download and run the BLE-CC254x-1.2.1.exe for Windows from http://www.ti.com/tool/BLE-Stack. BLE-CC254x-1.2.1 downloads to C:\Texas Instruments unless you change the location when installing.
3. Download the CANSEC_CC2540_DK_SW folder (contains several files which have been modified)
4. Replace *C:\Texas Instruments\BLE-CC254x-1.2.1\Components\hal* with *CANSEC_CC254x_DK_SW\hal*
5. Locate *'common'*, *'config'*, *'Include'*, *'Profiles'*, and *'SimpleBLEPeripheral'* in C:\Texas Instruments\BLE-CC254x-1.2.1\Projects\ble\ .Delete all the 5 files .
6. Copy *'common'*, *'config'*, *'Include'*, *'Profiles'*, and *'SimpleBLEPeripheral'* from CANSEC_CC254x_DK_SW folder to C:\Texas Instruments\BLE-CC254x-1.2.1\Projects\ble

3.2 Connect the hardware

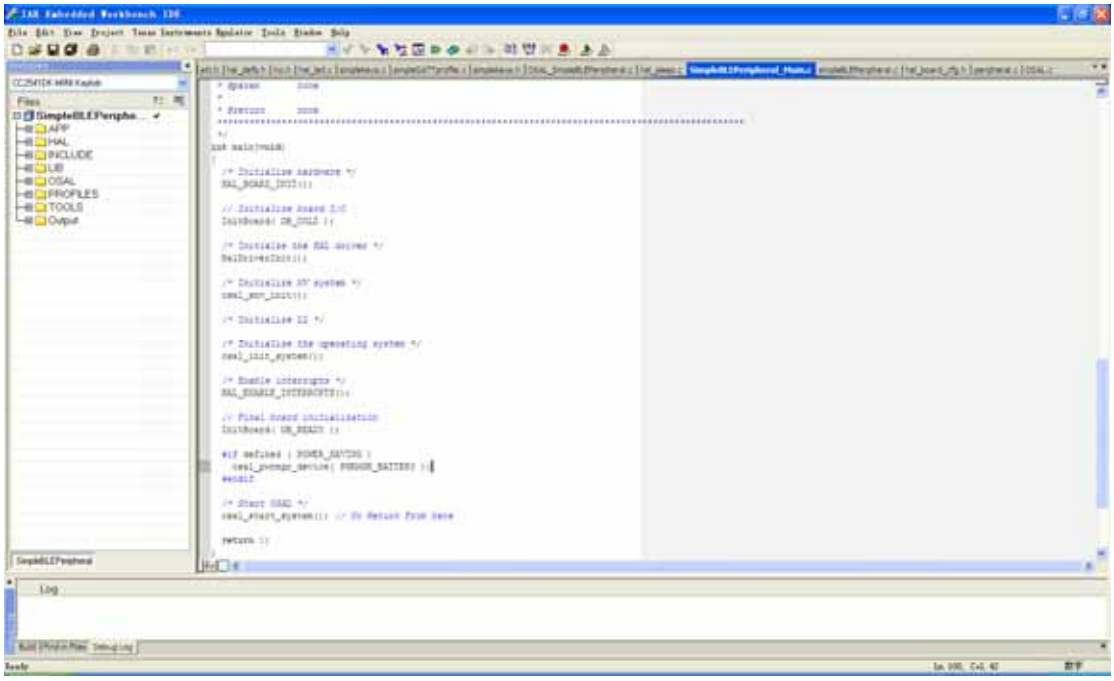
1. Connect a USB cable from the CC Debugger to your computer.
2. Plug the BLE2541 Modules into the Bluetooth Low Energy LEDs Control Emulator.
3. Connect the CC Debugger to the Bluetooth Low Energy LEDs Control Emulator BLE2541 with Program Cable



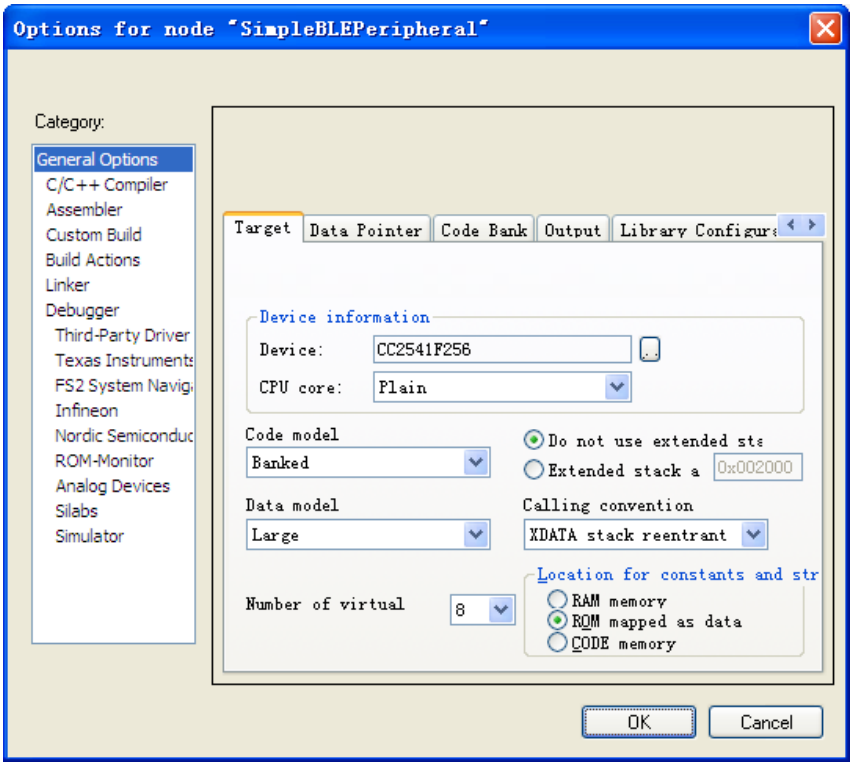
NOTE: LED for Power indicates the power of *CC Debugger* is ok, and LED for Debug indicates the connected from *CC Debugger* to the *Bluetooth Low Energy LEDs Control Emulator*. CC Reset button is the reset button for the *Bluetooth Low Energy LEDs Control Emulator* connected to *CC Debugger.* Pressing this button causes a full reset of the CC Debugger.

3.3 Download the SimpleBLEPeripheral project to Bluetooth Low Energy LEDs Control Emulator

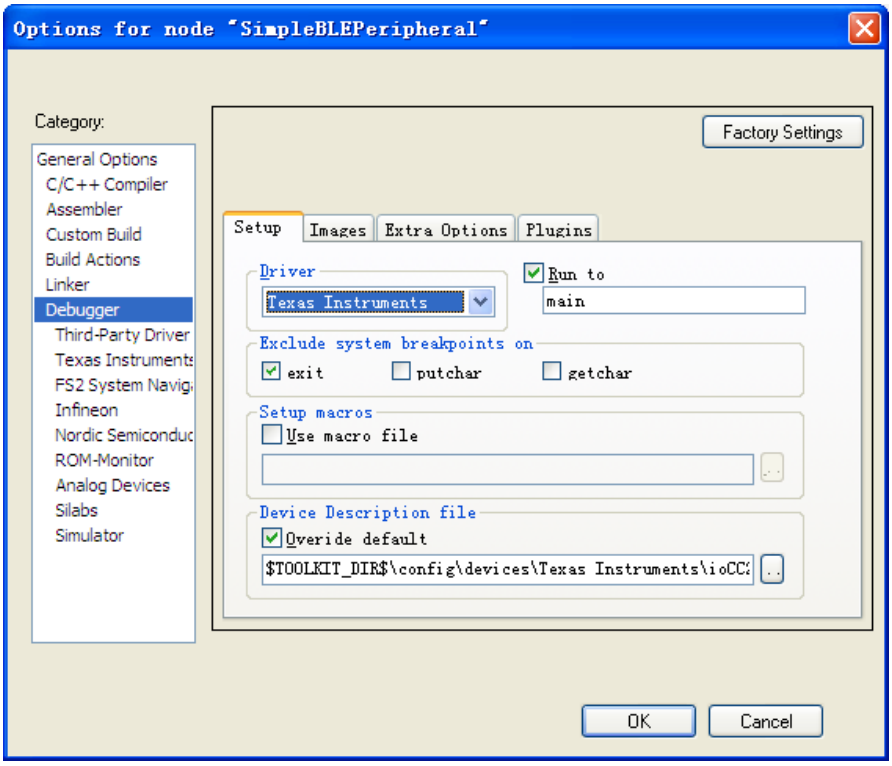
1. Locate to the *SimpleBLEPeripheral* project found under C:\Texas Instruments\BLE-CC254x-1.2.1\Projects\ble\SimpleBLEPeripheral\CC2541DB.
2. Open the project in IAR Embedded Workbench by double clicking the *SimpleBLEPerpheral.eww.*



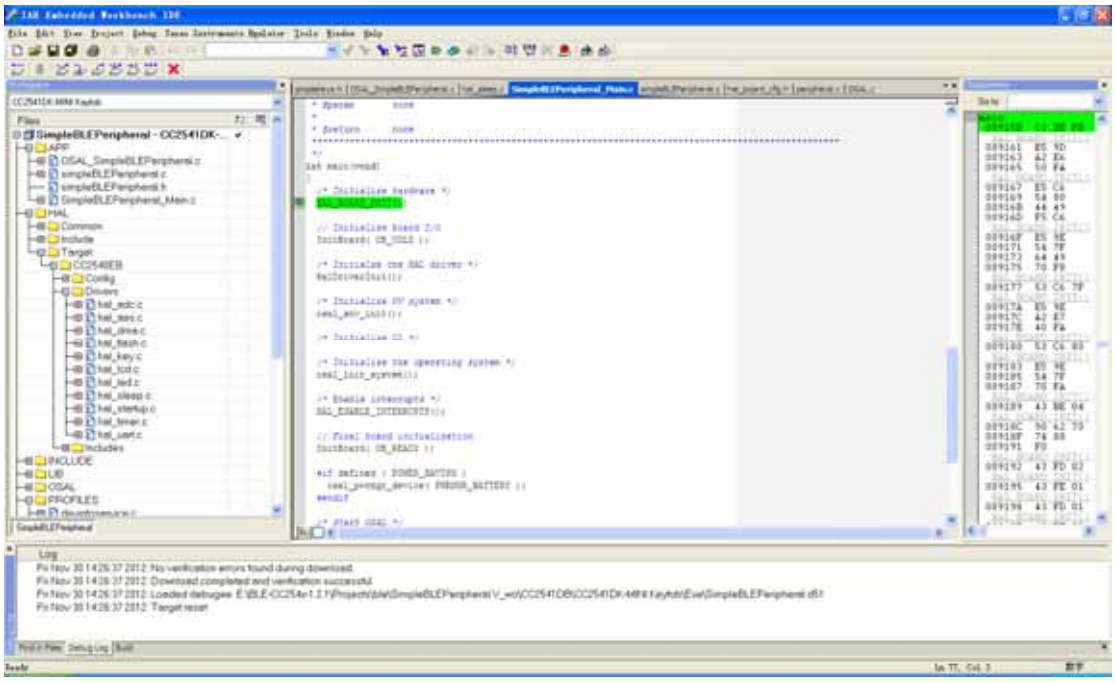
3. In IAR, select Options for node “SimpleBLEPeripheral”(ALt+F7)from the Project menu. The Options for node “SimpleBLEPeripheral” dialog box appears.
4. Select General Options tab.
5. Apply the Target option and select the CC2541F256 from the Device information list.



6. Select **Debugger** tab.
7. To enter **Setup option** and select the **Texas Instruments** from the **Driver**.



8. Click **Compile** or press **Ctrl+F7** to compile the *SimpleBLEPeripheral* project.
9. Click the Download and Debug icon to download and run the *SimpleBLEPeripheral* example.



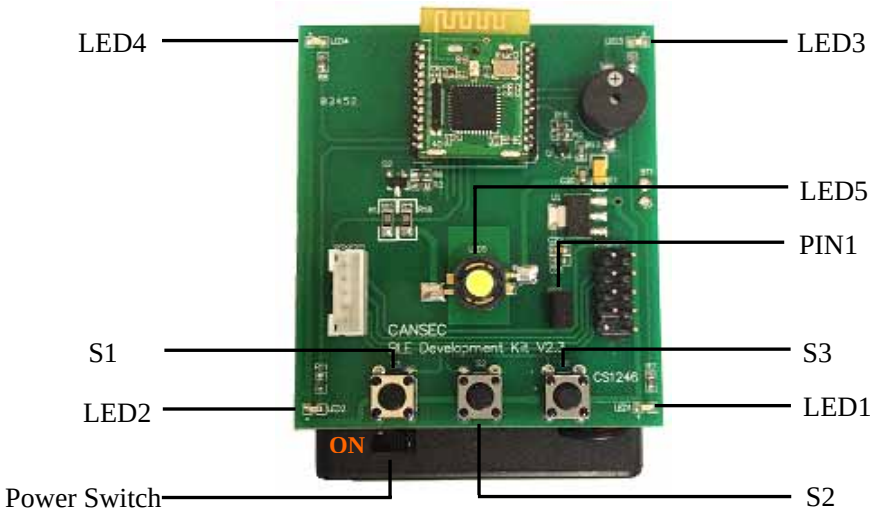
3.4 Download the BLE Acc to your iPhone4S Phone

There will be a **BLE Acc** icon appears if download and install successfully

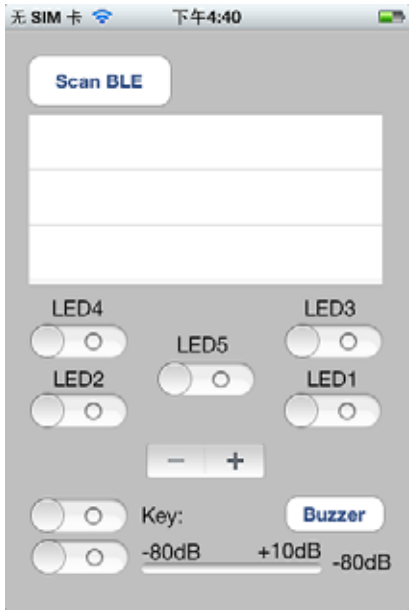
3.5 Start the SimpleBLEPeripheral example

1. Turn on the power of **Bluetooth Low Energy LEDs Control Emulator**, the white LED5 flash once represents the emulator is ready.

The Emulator powered by three (3)AA battery



2. Open BLE2541 Module broadcast Mode by Click S2 Key (the middle key) , LED1,LED2,LED3 and LED4 turns on ,buzzer have a short beep, BLE2541 Module enter broadcast mode.(Note: While powered by battery you must confirm that PIN1 is connected)
3. Open the BLE Acc , appears BLE operating panel:



4. On the BLE operating panel click Scan BLE, scan BLE2541 Module. If one Bluetooth device is successfully scanned there will display the ID of the device, and now you can click Stop Scan to stop scan.

5. Connected the BLECC2541 Module by click CansecBLEDevicesxxx. When display MAC address (for example 90:D7:EB:B3:13:E4) on the upper right corner means connected successfully.
   (Note: If it does not display the MAC address, then disconnect, repeat the connect process, or you can repeat scan, until display the MAC address.)

6. Now you can control the Bluetooth Low Energy LEDs Control Emulator by your iPhone4S Phone.
   - Turn on/off the LED1-4switches on the BLE window, can control LED1-4 on the Bluetooth Low Energy LEDs Control Emulator.
   - You can control LED5 brightness by stepper +/- when the LED5 switch is ON status.
   - Click the Buzzer button, you can make the buzzer beep.
   - Turn on the Key switch, you can find the Key status on the BLE window when the Key status changes.
   - Turn on the RSSI switch. It can auto to update the RSSI value every five second
7. Click CansecBLEDevicesxxx again to terminate the connecting.