Central + Observer

Objective

This example demonstrates the central and observer role played by the PSoC 4 BLE Component.

Overview

BLE Central is a device that initiates connections to Peripherals and will therefore become a master when connected. Observer is one which scans for Broadcasters (devices that send advertising events over BLE) and reports the received information to an application. The Observer role does not allow transmissions.

In this example, the BLE Component which acts as a Central and also as an Observer, scans for Peripherals and displays the list of advertising peripherals and broadcasters. The user can select one of those for establishing a connection. The BLE Components keeps on scanning, and the user can feed his inputs to disconnect or connect any peripheral with it.

Note: The Central + Observer in this example can scan a maximum of 10 peripherals at the same time.

Requirements

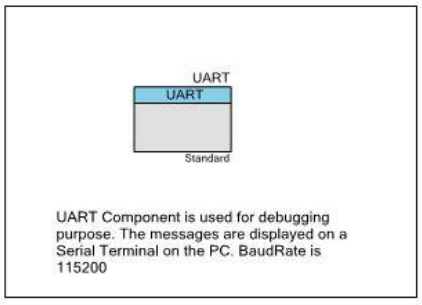
Design Tool: PSoC Creator 3.1 CP1

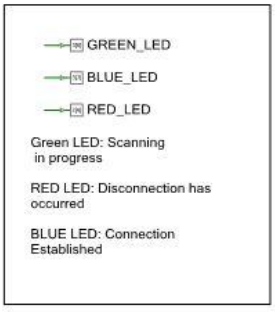
Programming Language: C (GCC 4.8.4 – included with PSoC Creator)

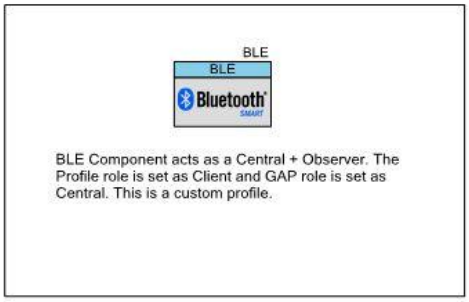
Associated Devices: All PSoC 4 BLE devices

Required Hardware: CY8CKIT-042-BLE Bluetooth® Low Energy (BLE) Pioneer Kit (at least 2)

PSoC Creator Schematic



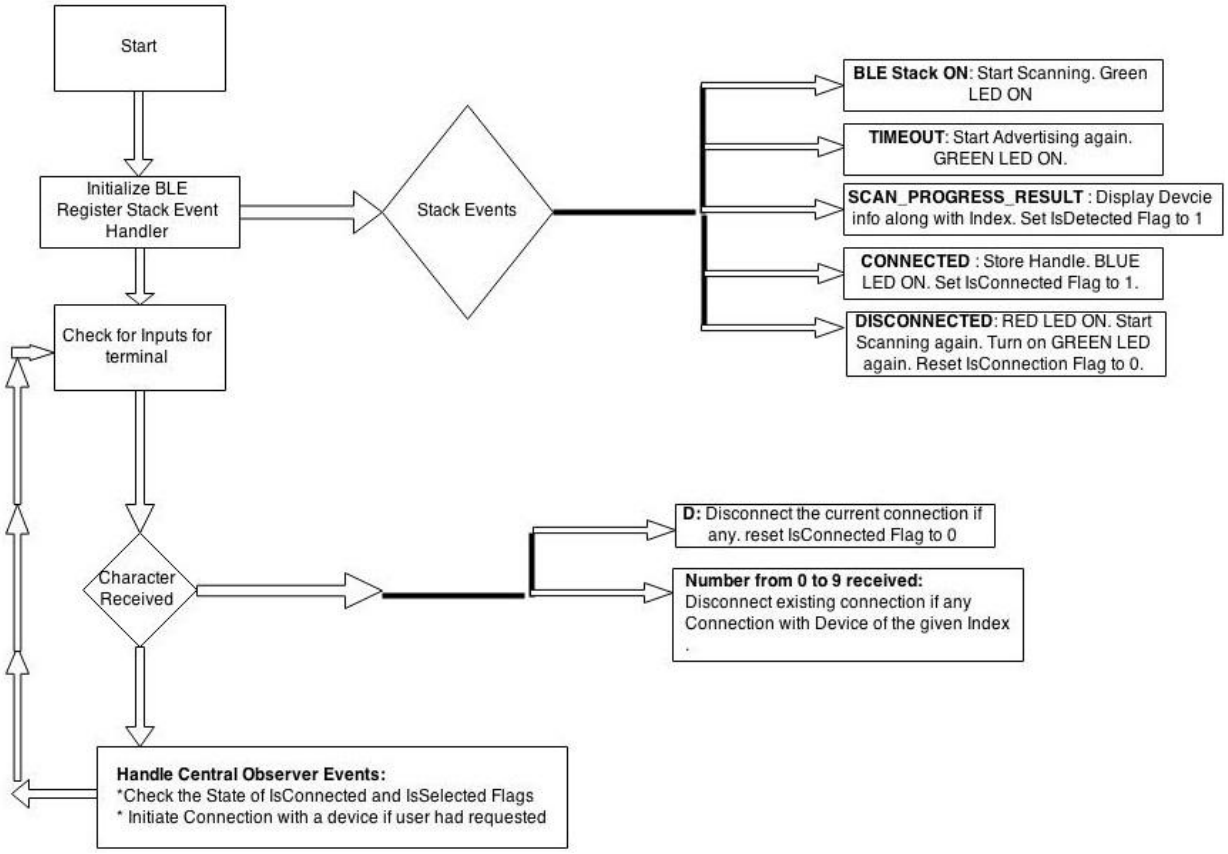




Hardware Setup

The BLE Component in this project is configured as a Central + Observer. For testing scanning and connection, any peripheral based example projects in the PSoC Creator can be used with few other BLE Pioneer Kits (Example: BLE Heart Rate Sensor, BLE Glucose Meter etc.)

Firmware Flow:



Build and Program

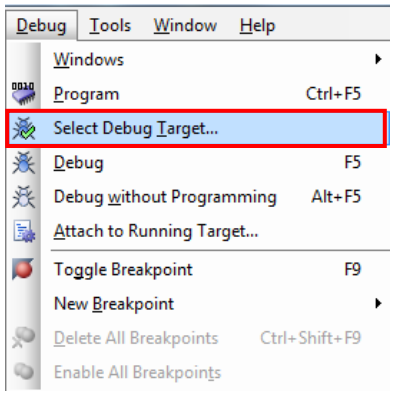
This section shows how to build the project and program the PSoC 4 BLE device. The BLE Pioneer Kit is used in this example.

1. On PSoC Creator, select Build > Clean from Menu bar and click on **Build BLE_Central_Observer.**
2. On a successful build, the total flash and SRAM usage is reported as shown below

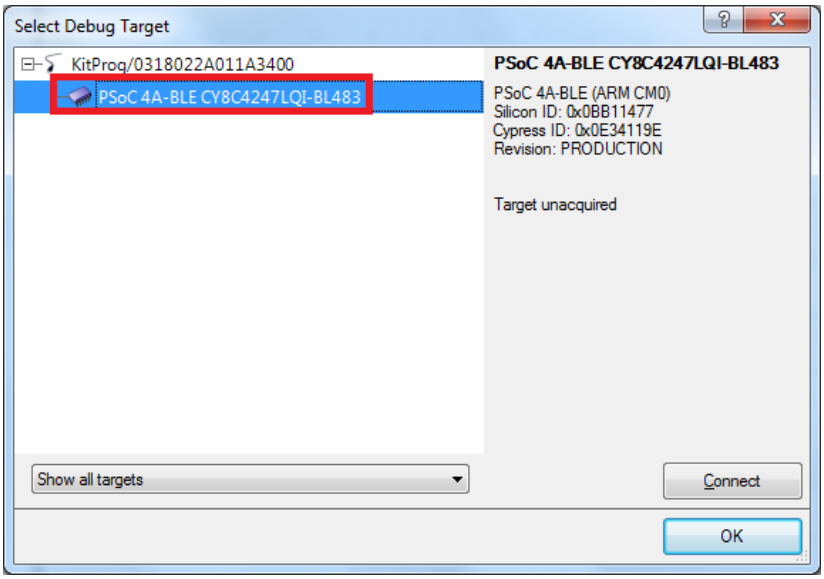
```
Flash used: 81233 of 131072 bytes (62.0 %).
SRAM used: 12724 of 16384 bytes (77.7 %). Stack: 2048 bytes. Heap: 1024 bytes.
--------------- Build Succeeded: 02/19/2015 17:18:55 ---------------
```

3. Select **Debug** > **Select Debug Target**, as shown below.

Selecting Debug Target

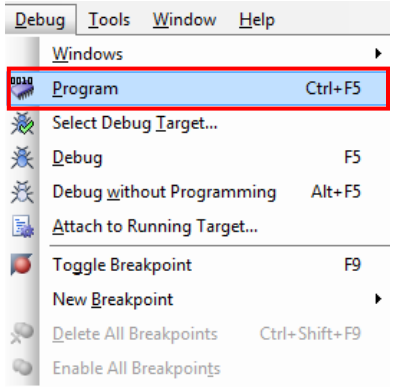


4. In the **Select Debug Target** dialog box, click **Port Acquire**, and then click **Connect** as shown below. Click **OK** to close the dialog box.

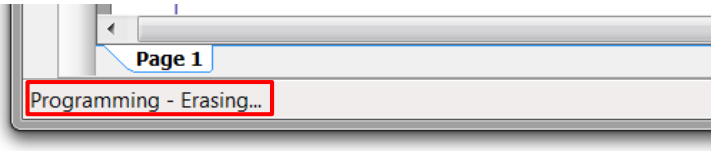


If you are using your own hardware, make sure the Port Setting configuration under Select Debug Target window for your programming hardware is configured as per your setup.

5. Select **Debug** > **Program** to program the device with the project, as shown below.

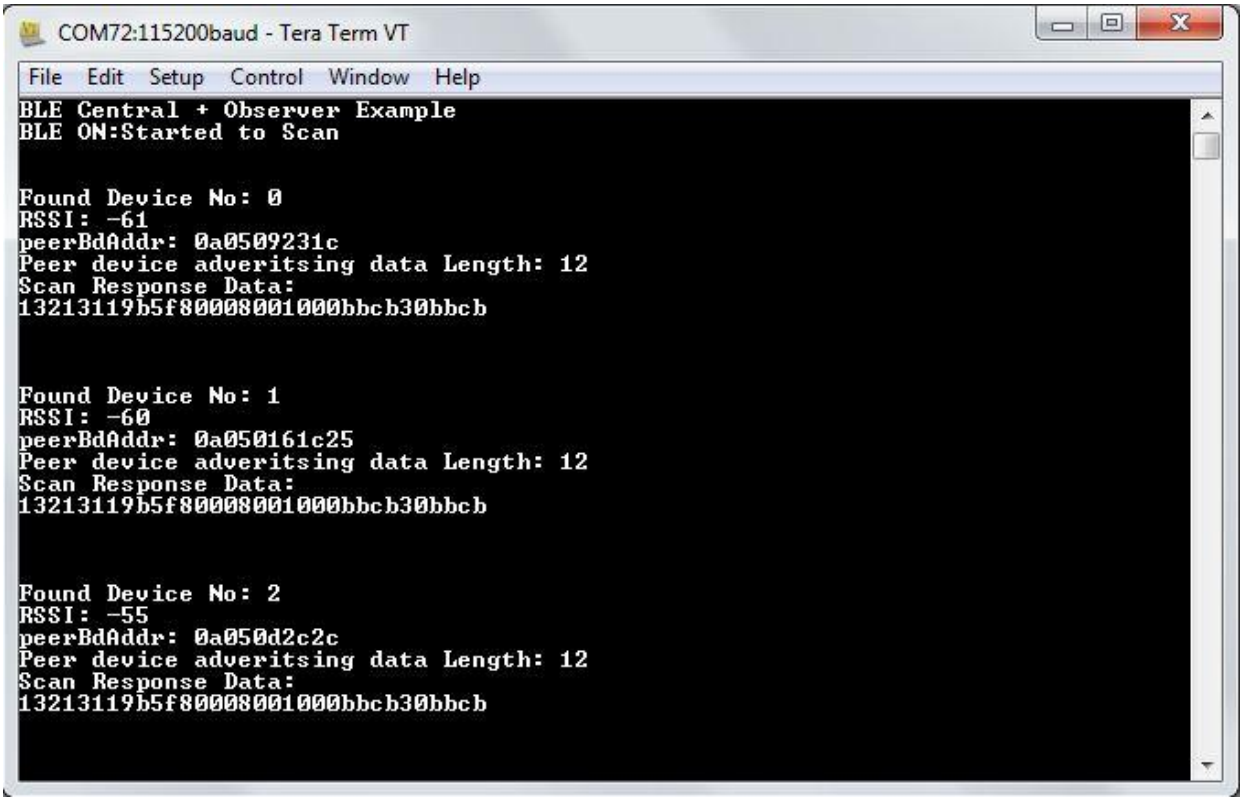


You can view the programming status on the PSoC Creator status bar (lower-left corner of the window), as shown below.



Operation

1) Having the kit connected and programmed, open a Serial terminal and have the Baud Rate as 115200. Press SW1 in the Kit. You can see the "**BLE Central + Observer Example"** and "**BLE ON: Started to Scan"** messages to confirm if the terminal works.



2) Have one or more other Kits that act as Broadcasters / Peripherals. You can use another PSoC 4 BLE Kit which is programmed with any of the example projects in PSoC Creator for peripheral role (Example: BLE Heart Rate Sensor, BLE Blood Pressure Sensor). You can find these example projects by selection **File -> Example Projects**. Program these example projects into other BLE Pioneer Kits by following the same procedure given in "**Build and Program"** section of this document. Once initialization messages start to appear on Terminal, turn on the advertising peripheral devices. You can see the devices getting displayed in the terminal along with a Device Number and its address.

3) Among the list of devices displayed, enter the device number of the device to which connection should be established.

4) After the connection is established, the device still scans for any new devices selected and lists them.

5) Entering new device index would disconnect the previous connection and establish connection with the new device.

6) Press 'D' for making a disconnection. The device keeps scanning for peripherals. The scanning will start again.

Related Documents

Error! Reference source not found. Table below lists all relevant application notes, code examples, knowledge base articles, device datasheets, and Component / user module datasheets.

. Related Documents

Document	Title	Comment
AN91267	Getting Started with PSoC® 4 BLE	A guide for beginners on PSoC 4 BLE
001-90479	Programmable System-on-Chip (PSoC®)	PSoC® 4: PSoC 4XX7_BLE Family Datasheet