ATBTLC1000 BluSDK

Observer Application - Getting Started Guide

USER GUIDE

Introduction

This guide describes the setup of ATBTLC1000 to be used in conjunction with either a SAM L21 or supported platforms. The document also explains bringing-up an example profile supplied as part of BluSDK. The Bluetooth Observer application is an example application that is embedded as part of the software release package.

The Observer Application continuously listens the advertisement data over the air.

This document explains the details about

1. Getting started with the setting up the ATBTLC1000 Wing board using supported platforms.
2. Using the ATBTLC1000 Wing board as an Observer to listen for the advertisement packets.

The Observer example application supports 12 advertisement data types. They are listed as follows:

- Incomplete List of 16-bit Service Class UUID
- Complete List of 16-bit Service Class UUIDs
- Incomplete List of 32-bit Service Class UUIDs
- Complete List of 32-bit Service Class UUIDs
- Incomplete List of 128-bit Service Class UUIDs
- Complete List of 128-bit Service Class UUIDs
- Shortened Local Name
- Complete Local Name
- Appearance
- Manufacturer Specific Data
- TX Power
- Advertisement Interval

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1 Demo Setup

2 Supported Hardware Platforms and IDEs

Table 2-1. BluSDK – supported hardware and IDEs

Platform	MCU	Supported BLE device	Supported evaluation kits	Supported IDEs
SAM L21 (MCU)	ATSAML21J18B	ATBTLC1000	ATBTLC1000-XSTK (ATSAML21-XPRO-B + ATBTLC1000 XPRO)	Atmel Studio v6.2
SAM L21 (MCU)	ATSAML21J18A	ATBTLC1000	ATSAML21 XPRO + ATBTLC1000 XPRO	Atmel Studio v6.2
SAM D21 (MCU)	ATSAMD21J18A	ATBTLC1000	ATSAMD21-XPRO + ATBTLC1000 XPRO	Atmel Studio v6.2
SAM G55 (MCU)	ATSAMG55J19	ATBTLC1000	ATSAMG55-XPRO + ATBTLC1000 XPRO	Atmel Studio v6.2

3 Hardware Setup

SAML21 Xplained Pro Observer Setup

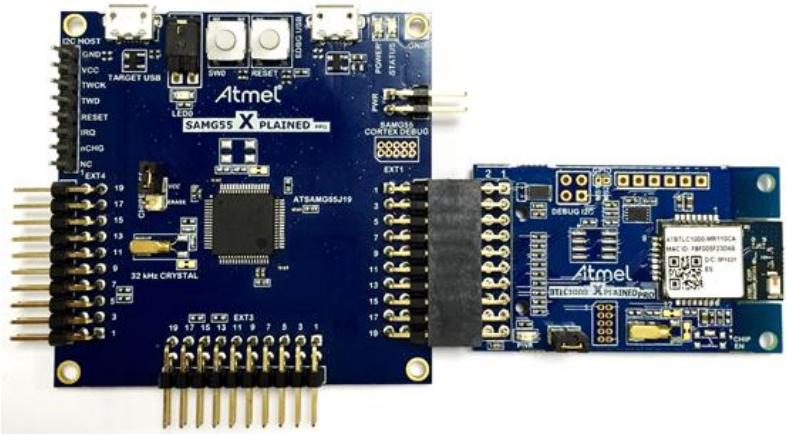
Figure 3-1. ATBTLC1000 Xplained Pro extension connected to a SAM L21 Xplained Pro

SAMD21 Xplained Pro Observer Set up

Figure 3-2. ATBTLC1000 Xplained Pro extension connected to a SAM D21 Xplained Pro

SAMG55 Xplained Pro Observer Setup

Figure 3-3. ATBTLC1000 Xplained Pro extension connected to a SAM G55 Xplained Pro



4 Software Setup

4.1 Installation Steps

1. Atmel Studio installation [**Atmel Studio 6.2 sp2 (build 1563) Installer – with .NET]**
   http://www.atmel.com/tools/atmelstudio.aspx

   (Note: SAML21 Rev A/SAMD21 part pack is built-in as part of Atmel Studio 6.2 sp2)

2. Part Packs.
   a. Install SAML21 Rev B Part Pack http://www.atmel.com/images/ATSAML21revB-6.2.6.zip

      (Note: Atmel BTLC1000 X-STK ships with SAML21 XPRO-B and requires this installer)
   b. Install SAMG55 Part pack http://www.atmel.com/images/as-partpack-ATSAMG55-6.2.13.zip.

      (Note: This installer is needed only if the bring-up is being done on the SAM G55 platform)

2. Atmel USB Driver Installer from http://www.atmel.com/tools/atmelstudio.aspx.

3. Install the standalone ASF package from
   http://www.atmel.com/tools/AVRSOFTWAREFRAMEWORK.aspx.

Note: Refer to the BluSDK release notes for updates to version numbers of the components mentioned above.

This package will install the following examples within the Atmel Studio environment.

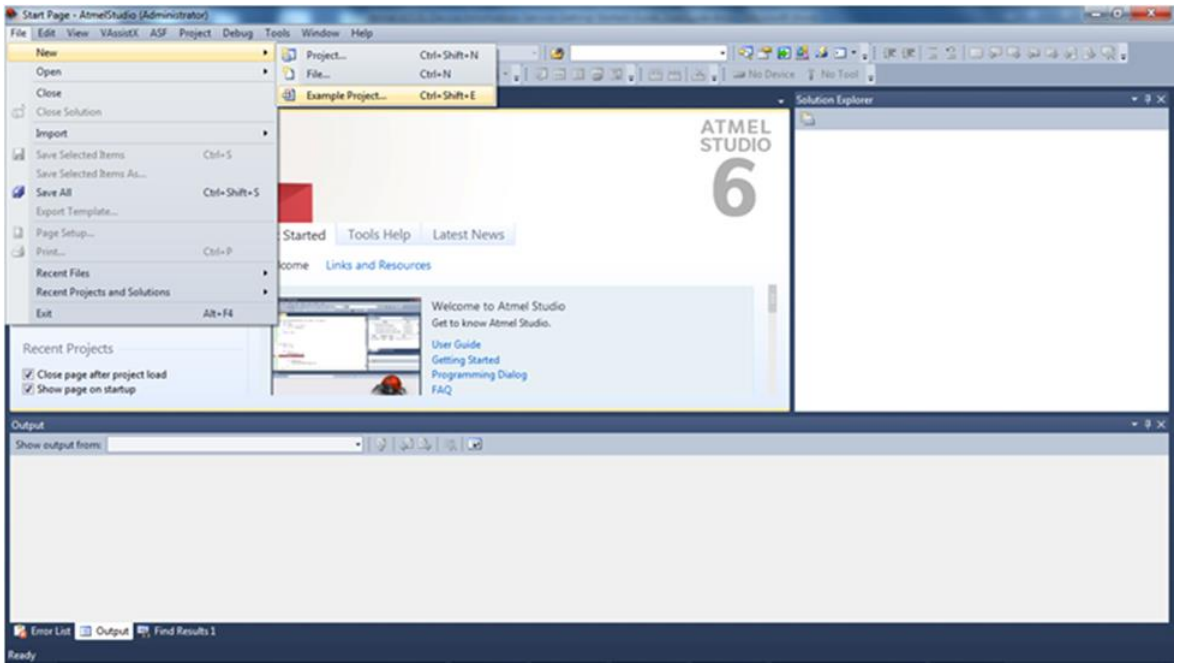
1. Observer Application for SAM L21.
2. Observer Application for SAM D21.
3. Observer Application for SAM G55.

4.2 Build Procedure

The following procedure is explained for SAM L21 application example. The same procedure is valid for the case of Atmel supported platforms as well.

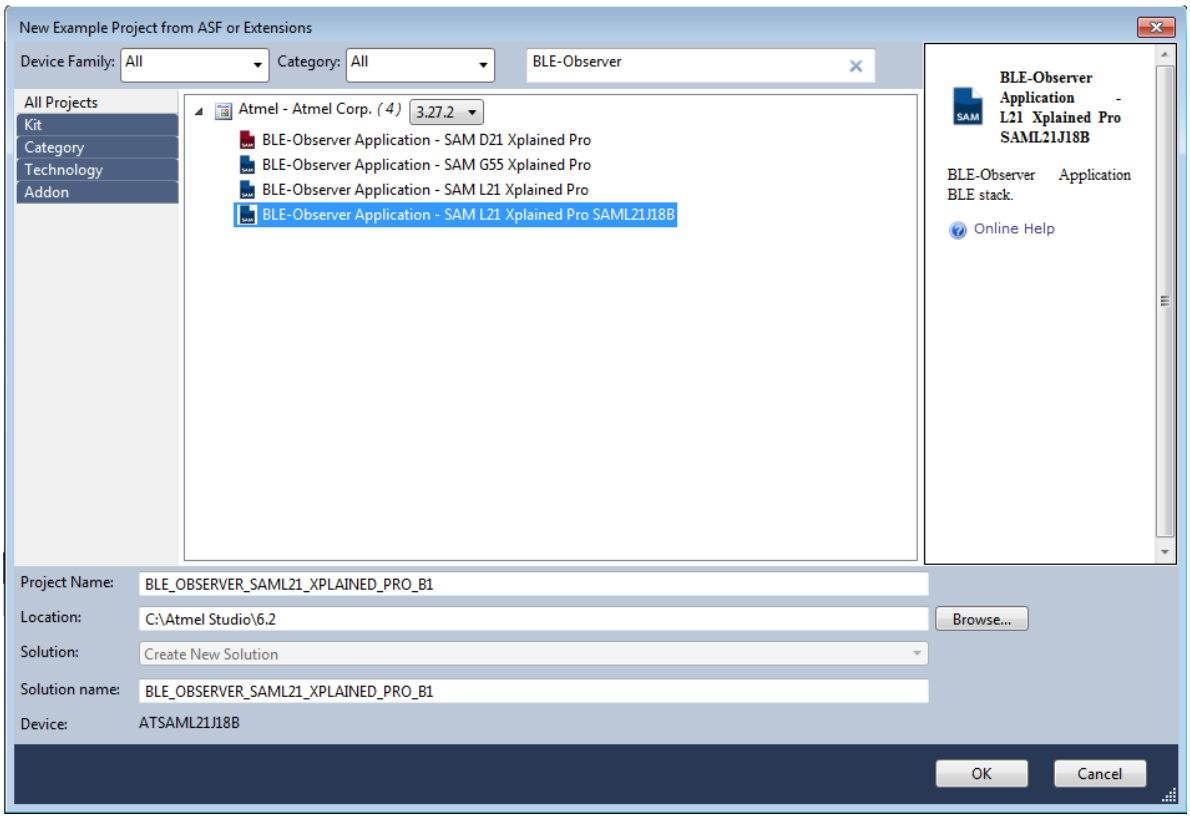
1. Select New Example Project.

Figure 4-1. Creation of Project



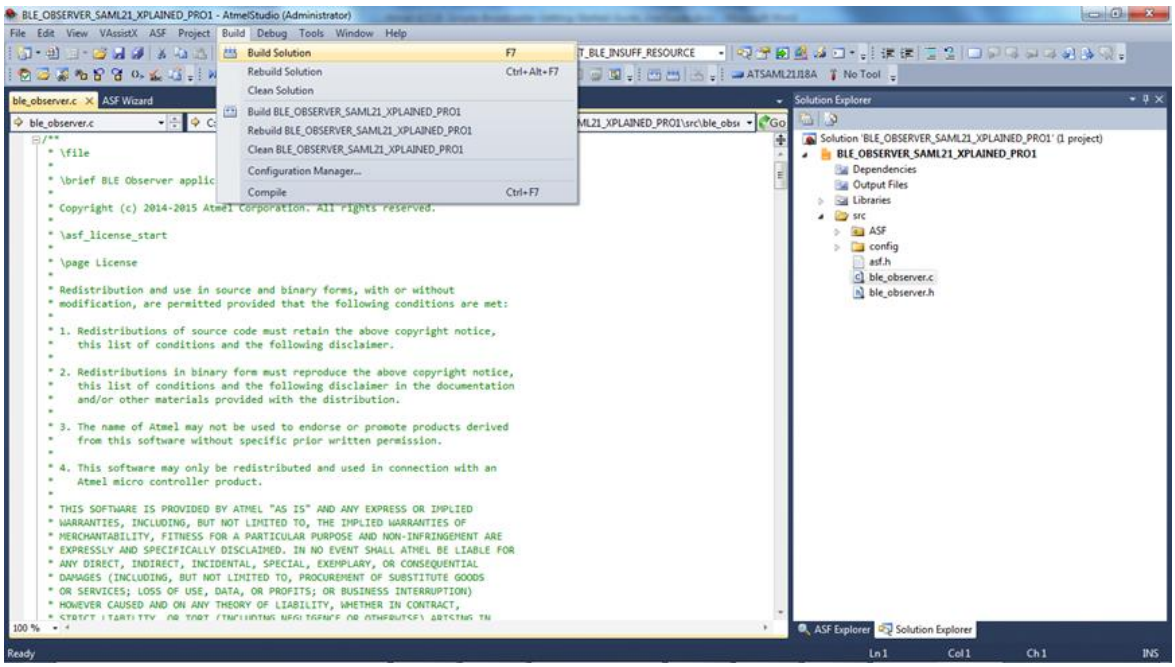
2. Enter “BLE-Observer” in search window and expand Atmel Corp Projects. The location and the name of the project can be selected in the respective fields. Click **OK**

Figure 4-2. Selecting Observer Application from Example Projects



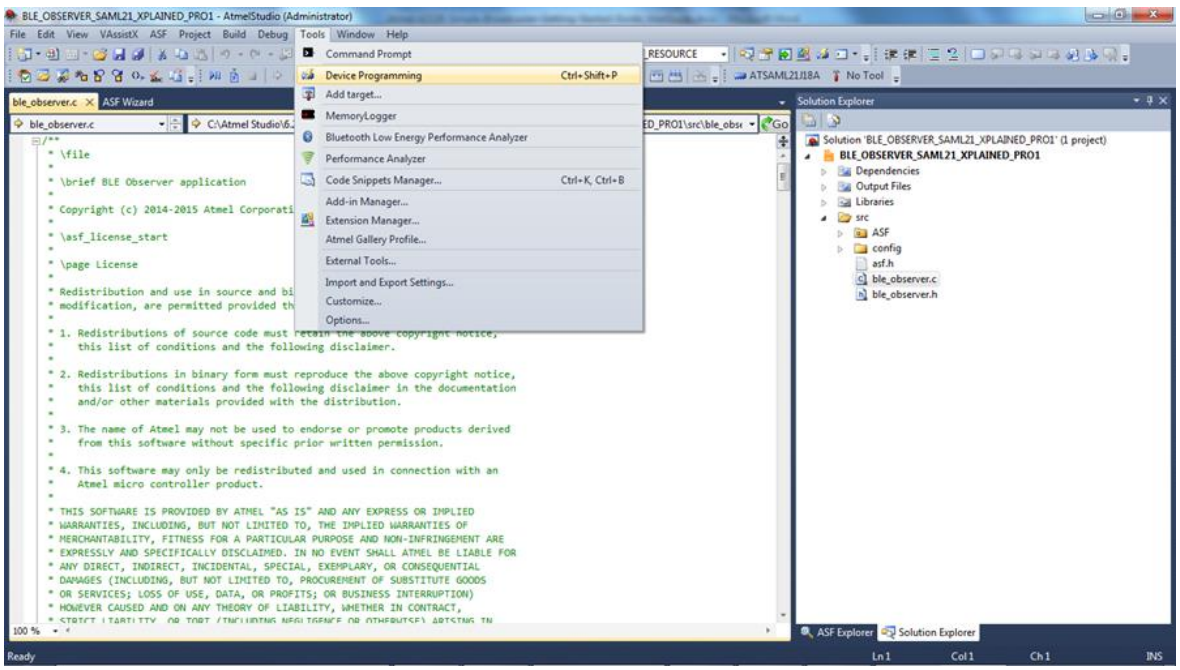
3. Build the solution.

Figure 4-3. Building Observer Application



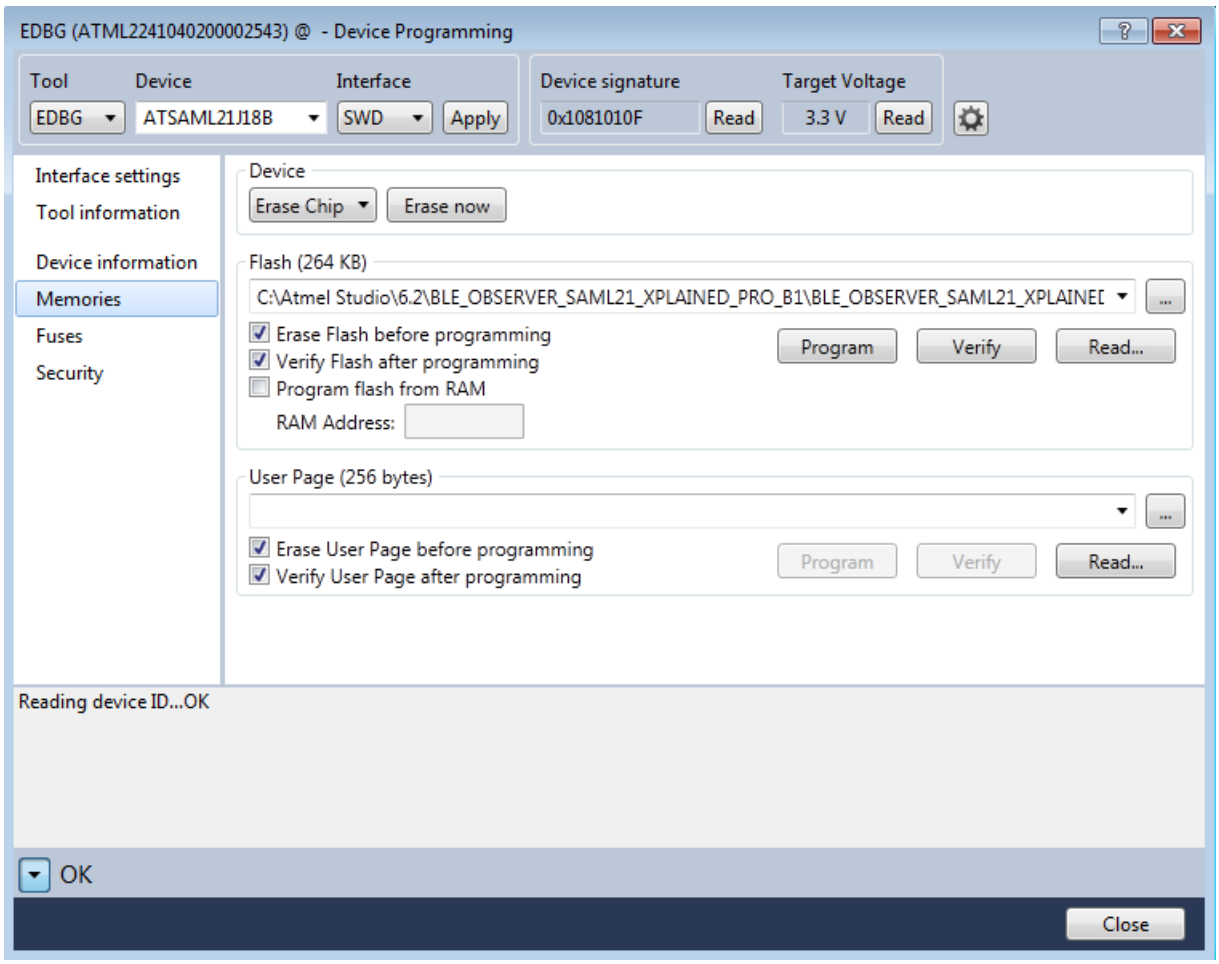
4. Download the application via the USB to the SAM L21 board using Device Programing option available in Tools as shown below.

Figure 4-4. Selecting device programming option



5. Program the device to download the Observer application as shown below

Figure 4-5. Flashing the Application using Debugger to SAM L21



6. The device is now ready to be used as Observer application.

5 Running the demo

1. Connect the ATBTLC1000 Xplained Pro Board to supported platforms as indicated in Figure 3-1 to Figure 3-3.
2. Power on the SAML21 by connecting the USB Cable.
3. Open any Terminal Application (e.g Teraterm). Select the COM Port and following settings shall be used - Baudrate 115200, Parity None, 1 Stop bit, 1 Start bit, No Hardware Handshake
4. Press the Reset button on the supported platforms.
5. The device is now ready to be used as Observing and starts to scan for nearby BLE devices.

6 Console Logging

For the purpose of debugging, a logging interface had been implemented in the Broadcaster Application.

The logging interface utilizes the same PC COM port that connects to supported platforms. A serial port monitor application (for example Teraterm) shall be opened and attached to the USB COM port.

The screenshot below displays Observer application initialization and results of a scan.

Figure 6-1. Observer Console Output

```
Initializing BTLC1000
BD Address:0xF8F005F23E02, Address Type:0
Scanning...Please wait...
Scanning process initiated
Scan Complete. Total No.of device scanned:0
Scanning...Please wait...
Scanning process initiated


Advertisement type          :  ADV_IND
Device address type         :  PUBLIC_ADDRESS
Device address              :  0xf8f005f23ded
RSSI                        :  -77
Flags                       :  LE_GENERAL_DISCOVERABLE_MODE BREDR_NOT_SUPPORTED LE_BREDR_CAPABLE_CONTROLLER
Appearance                  :  0x3c1
Complete Local Name         :  ATMEL-HID
Complete_16bit_service_uuids:  0x1218


Advertisement type          :  ADV_SCAN_RESPONSE
Device address type         :  PUBLIC_ADDRESS
Device address              :  0xf8f005f23ded
RSSI                        :  -77
Manufacturer Specific Data  :  0x00 0x06 0xd6 0xb2 0xf0 0x05 0xf0 0xf8
Scan Complete. Total No.of device scanned:2
Scanning...Please wait...
Scanning process initiated
```

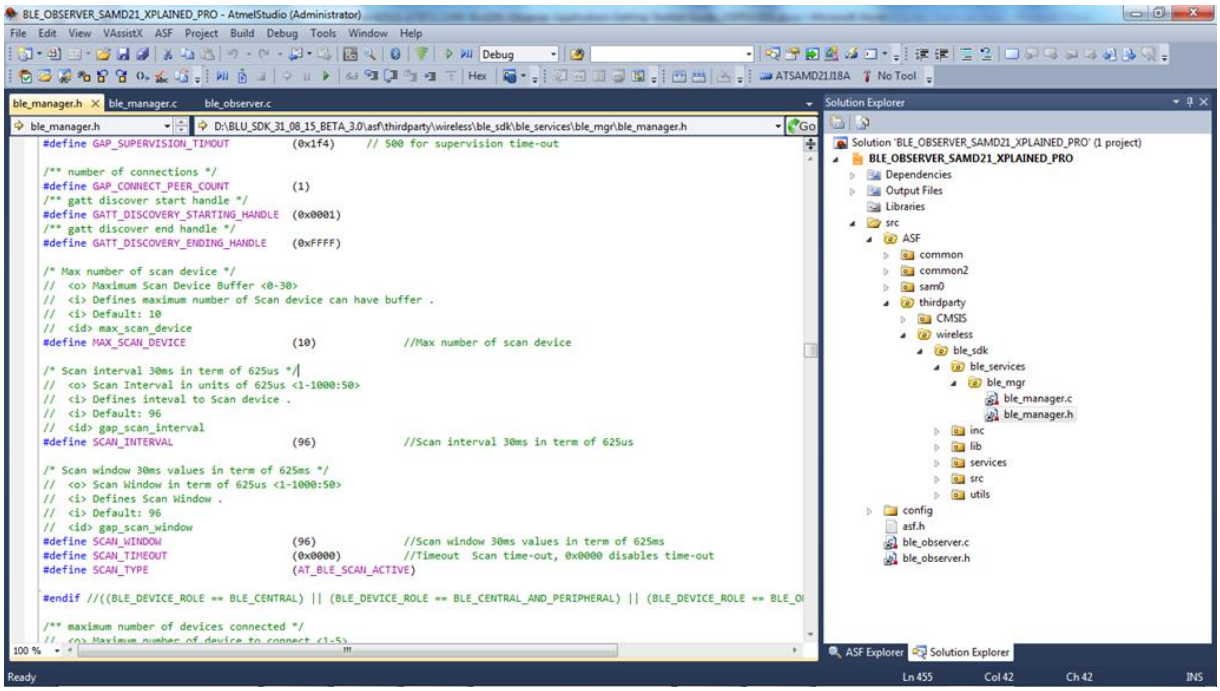
7 Configuration Options

The default scanning parameters of Observer are mentioned below:

```
MAX_SCAN_DEVICE                    (10)
SCAN_INTERVAL                      (96)
SCAN_WINDOW                        (96)
SCAN_TIMEOUT                       (0x0000)
SCAN_TYPE                          (AT_BLE_SCAN_ACTIVE)
```

The above options can be changed by as per user requirement. They are available in the *ble_manager.h* found in *\asf\thirdparty\wireless\ble_sdk\ble_services\ble_mgr,* Snapshot of the header file is shown in the picture below.

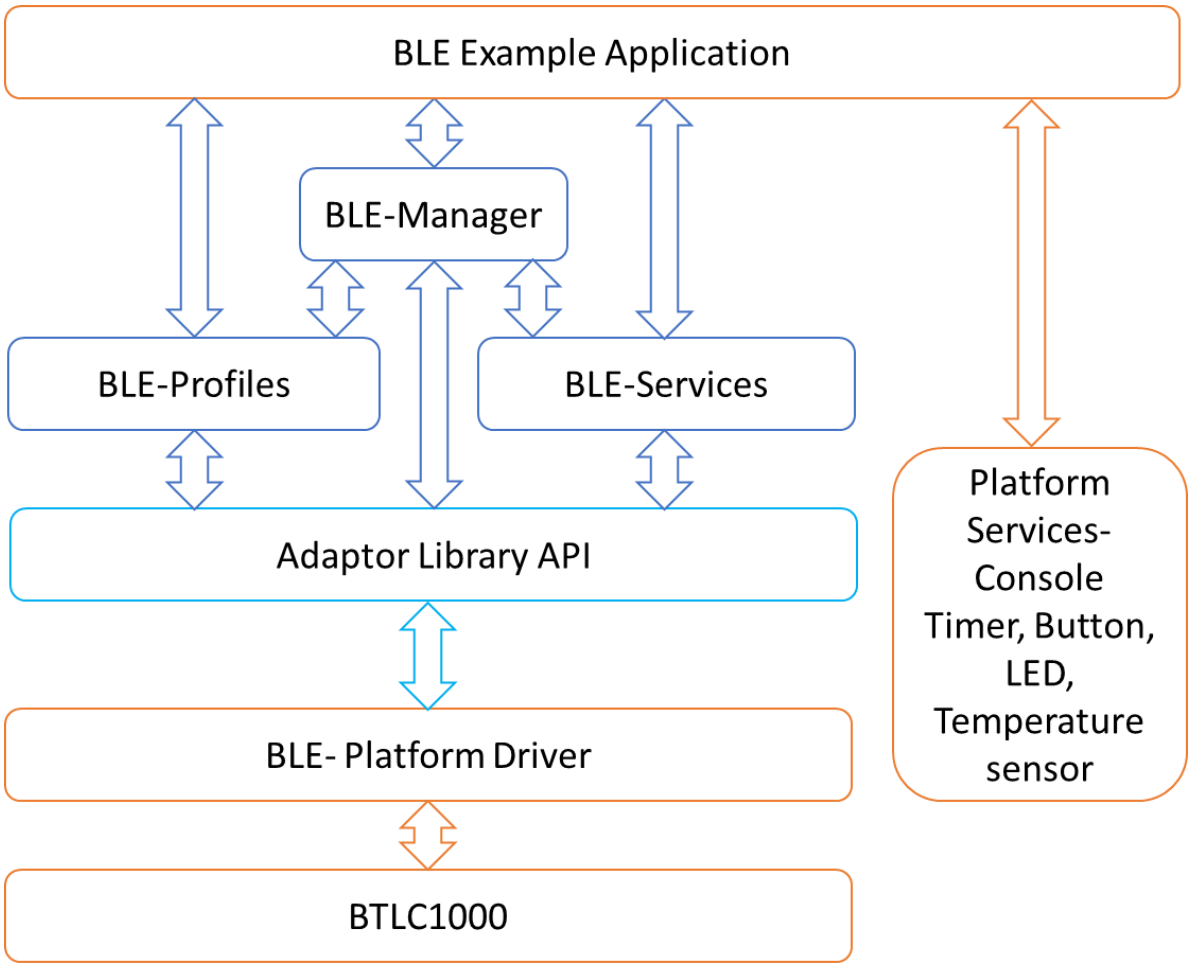
Figure 7-1. Configuration Header File for Observer



8 BluSDK Software Architecture

The following diagram illustrates the various layers in the BLE subsystem for the BTLC1000 configuration. The External host can be SAMD21 or SAMG55.

Figure 8-1. BluSDK Software Architecture



9 ATMEL EVALUATION BOARD/KIT IMPORTANT NOTICE AND DISCLAIMER

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10 Revision History

Doc Rev.	Date	Comments
42515A	09/2015	Initial document release.

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