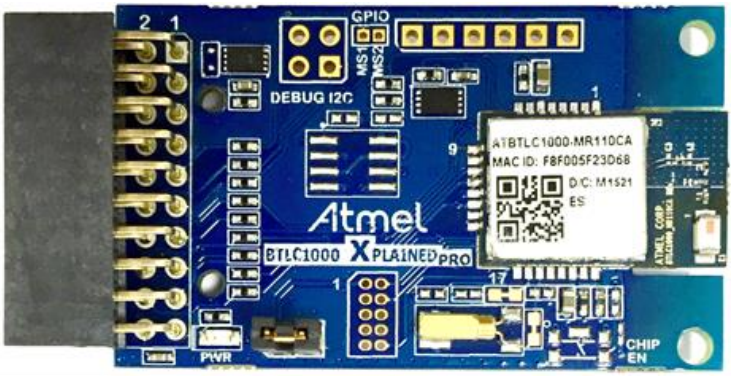
ATBTLC1000 BluSDK

Device Information Service - Getting Started Guide

USER GUIDE



Introduction

This guide describes the setup of the Atmel® ATBTLC1000 to be used in conjunction with a supported platforms (see Table 3-1) bringing-up an example to add device information service as part of BluSDK release. The device information service application is an example application that is embedded as part of the software release package.

The device information service application provide user to define and use the BLE DIS service. Any application discovering the database can access the DIS service instance during discovery services.

This document explains the details about:

1. Getting started with the setting up supported platforms (see Table 3-1).
2. To get the Device Information Service example application working on the above mentioned setup.

Table of Contents

1 Supported Characteristics in Device Information Service 3

2 Demo Setup 3

3 Supported Hardware Platforms and IDEs 3

4 Hardware Setup 4

4.1 SAM L21 Xplained Pro Device Information Service Setup 4

4.2 SAM D21 Xplained Pro Device Information Service Setup 4

4.3 SAM G55 Xplained Pro Device Information Service Setup 5

4.4 SAM 4S Xplained Pro Device Information Service Setup 5

5 Software Setup 6

5.1 Installation Steps 6

5.2 Build Procedure 6

6 Running the Demo 10

7 Console Logging 14

8 BluSDK Software Architecture 15

9 Adding a BLE Standard Service 16

10 ATMEL EVALUATION BOARD/KIT IMPORTANT NOTICE AND DISCLAIMER 21

11 Revision History 22

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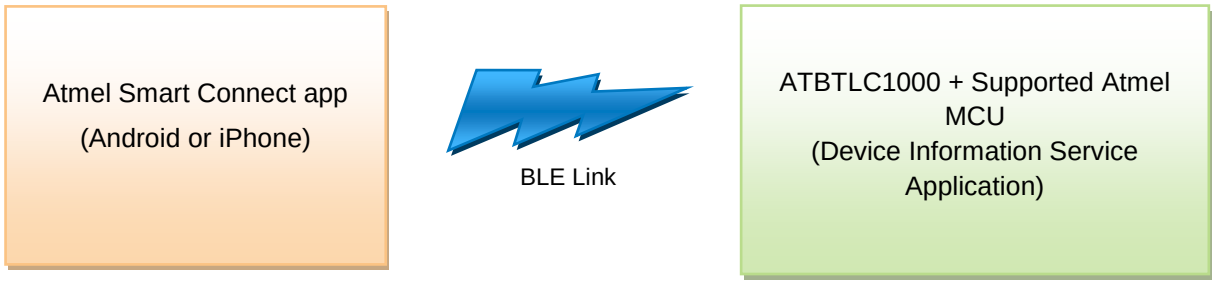
1 Supported Characteristics in Device Information Service

- Manufacturer name string
- Model number string
- Serial number string
- Hardware revision string
- Firmware revision string
- Software revision string
- System ID
- IEEE® 11073-20601 Regulatory Certification Data List
- PnP ID

2 Demo Setup



3 Supported Hardware Platforms and IDEs

Table 3-1. BluSDK – Supported Hardware and IDEs

Platform	MCU	Supported BLE Module	Supported evaluation kits	Supported IDEs
SAM L21 (MCU)	ATSAML21J18B	ATBTLC1000	ATBTLC1000-XSTK (ATSAML21-XPRO-B + ATBTLC1000 XPRO)	Atmel Studio v7.0
SAM L21 (MCU)	ATSAML21J18A	ATBTLC1000	ATSAML21 XPRO + ATBTLC1000 XPRO	Atmel Studio v7.0
SAM D21 (MCU)	ATSAMD21J18A	ATBTLC1000	ATSAMD21-XPRO + ATBTLC1000 XPRO	Atmel Studio v7.0
SAM G55 (MCU)	ATSAMG55J19	ATBTLC1000	ATSAMG55-XPRO + ATBTLC1000 XPRO	Atmel Studio v7.0
SAM 4S (MCU)	ATSAM4SD32C	ATBTLC1000	ATSAM4S-XPRO + ATBTLC1000 XPRO	Atmel Studio v7.0

4 Hardware Setup

4.1 SAM L21 Xplained Pro Device Information Service Setup

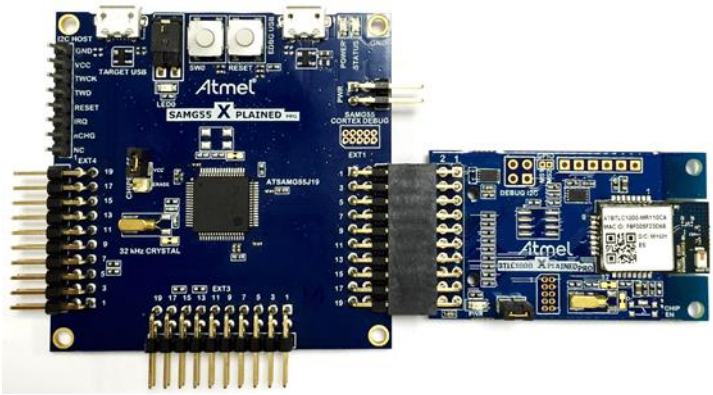
Figure 4-1. ATBTLC1000 Xplained Pro Extension connected to a SAM L21 Xplained Pro

4.2 SAM D21 Xplained Pro Device Information Service Setup

Figure 4-2. ATBTLC1000 Xplained Pro Extension connected to a SAM D21 Xplained Pro

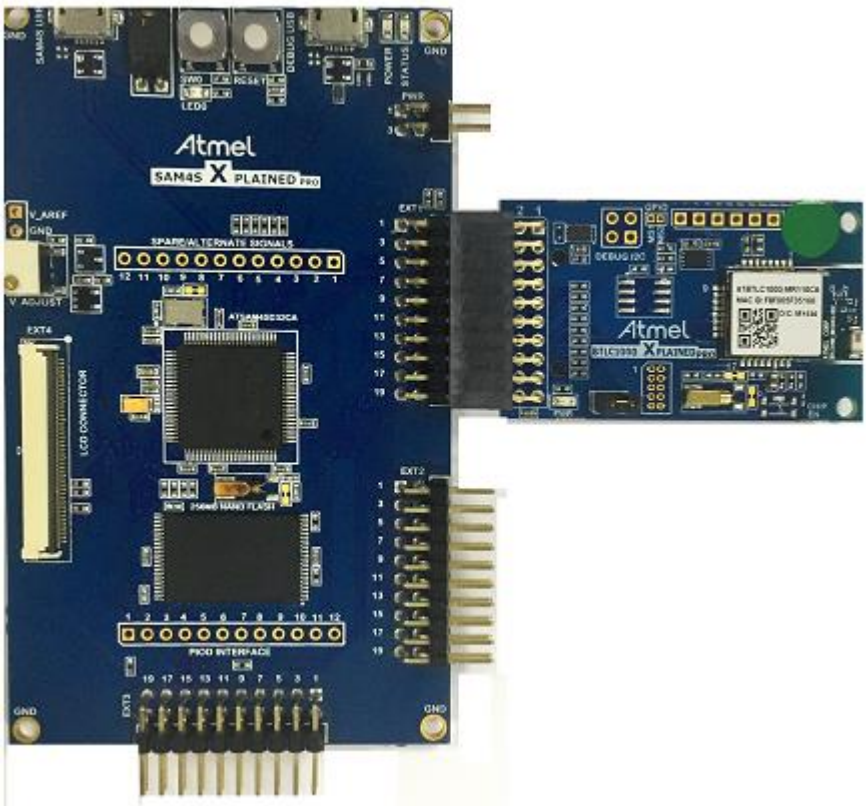
4.3 SAM G55 Xplained Pro Device Information Service Setup

Figure 4-3. ATBTLC1000 Xplained PRO Extension connected to a SAMG55 Xplained PRO



4.4 SAM 4S Xplained Pro Device Information Service Setup

Figure 4-4. ATBTLC1000 Xplained PRO Extension connected to a SAM 4S Xplained PRO



5 Software Setup

5.1 Installation Steps

1. Atmel Studio installation [**Atmel Studio 7.0 (build 594) Installer – with .NET**] http://www.atmel.com/tools/atmelstudio.aspx.
   (Note: SAM L21 Rev B/SAM D21/SAM G55/SAM 4S part pack is built-in as part of Atmel Studio 7.0)
2. Atmel USB Driver Installer 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:

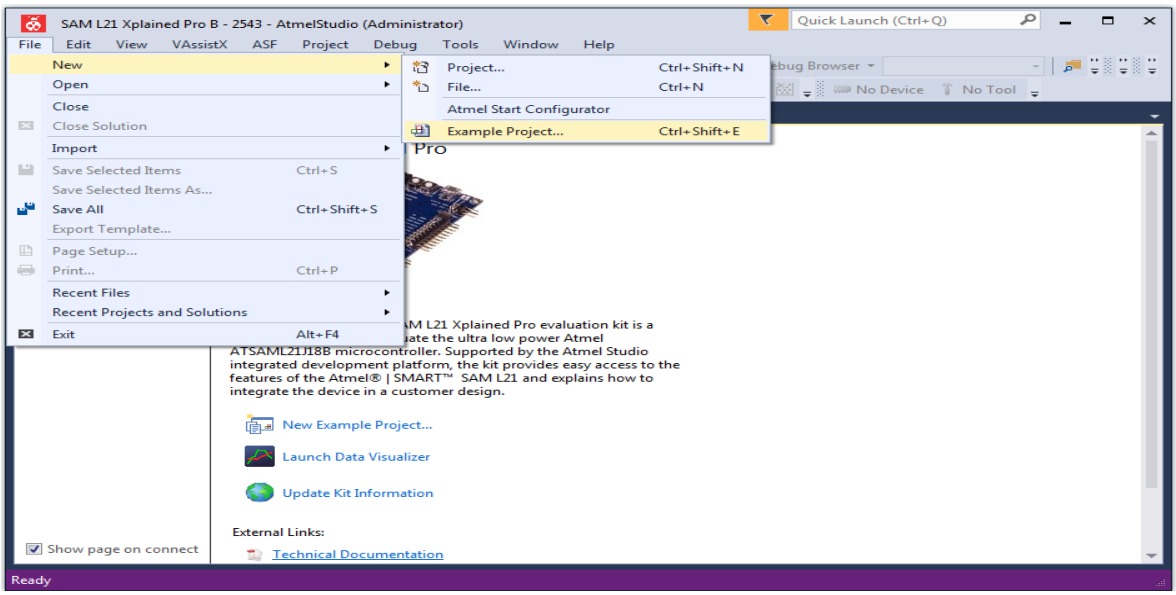
1. Device Information Service Application for SAM L21.
2. Device Information Service Application for SAM D21.
3. Device Information Service Application for SAM G55.
4. Device Information Service Application for SAM 4S.

5.2 Build Procedure

The following procedure is explained for SAM L21 application example. The same procedure is valid for the case of all the other supported platforms (see Table 3-1) as well.

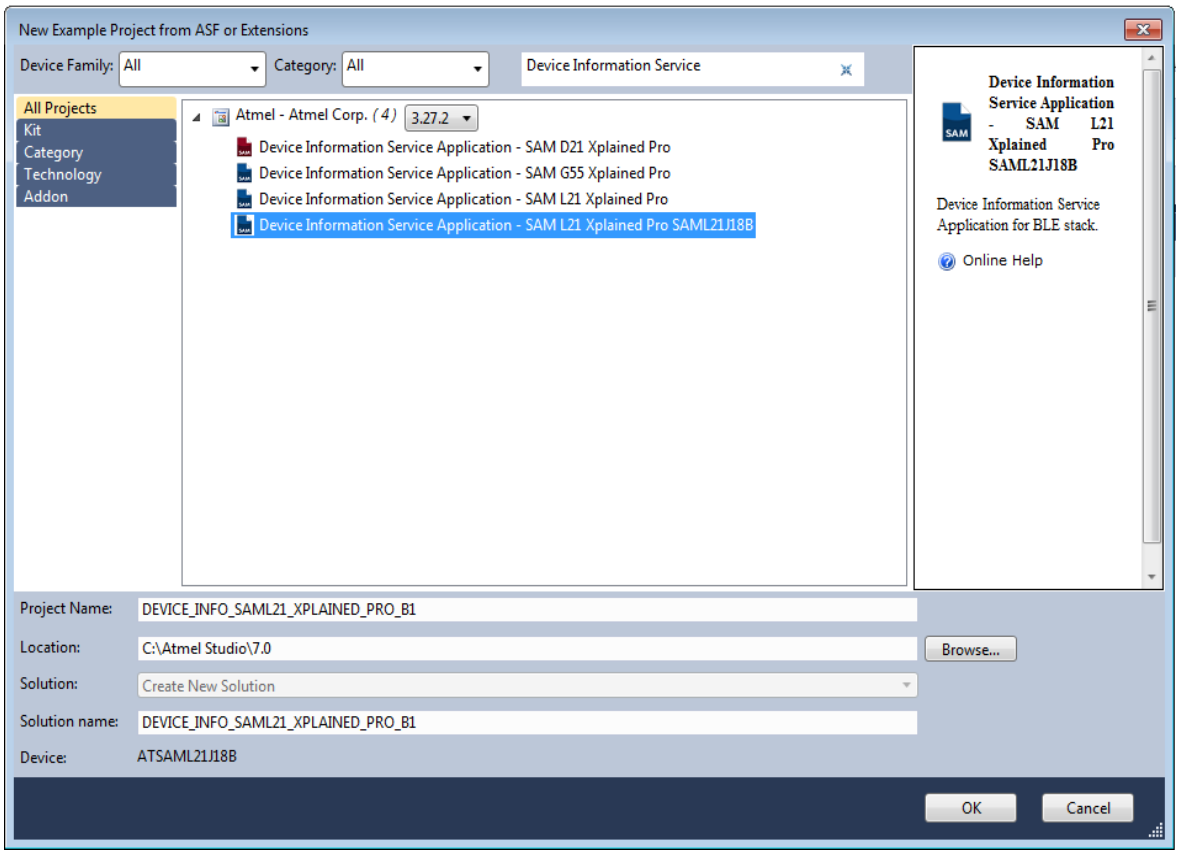
1. Select New Example Project.

Figure 5-1. Creating a New Project



2. In search box, enter “Device Information” in the search window and expand Atmel Corp. Projects. The location and the name of the project can be selected in the respective fields. Click **OK**.

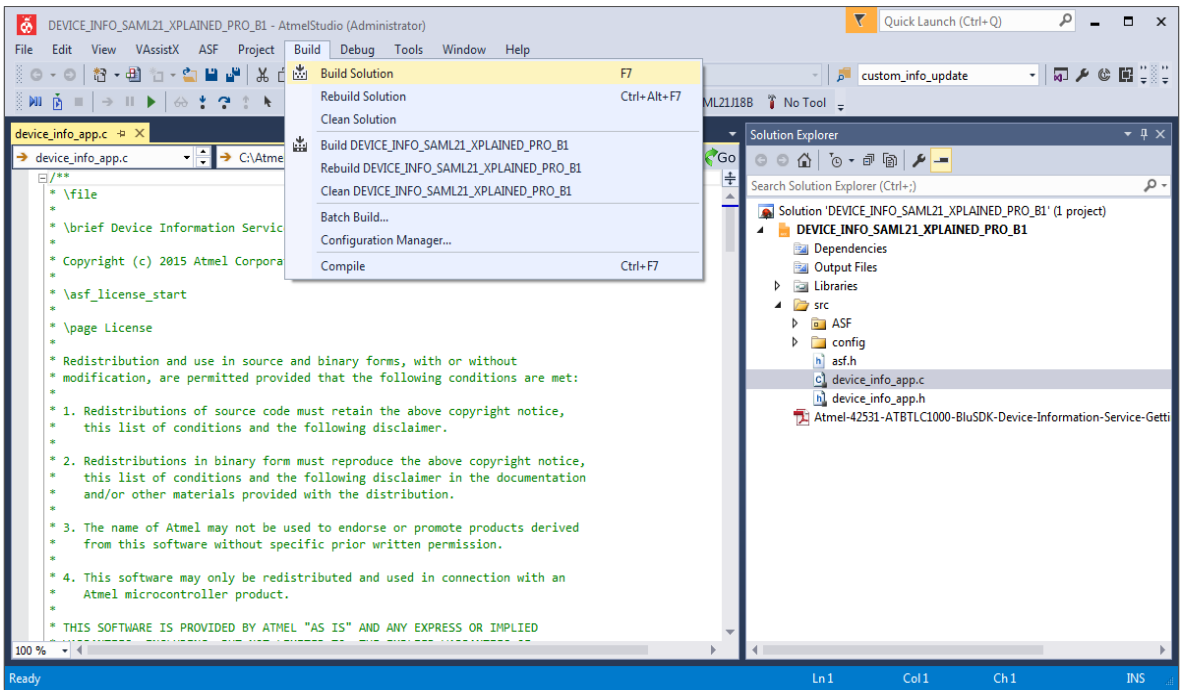
Figure 5-2. Searching for Device Information Service Example



3. Accept the license agreement. The Atmel Studio will generate the Device Information Service Example project for SAM L21.

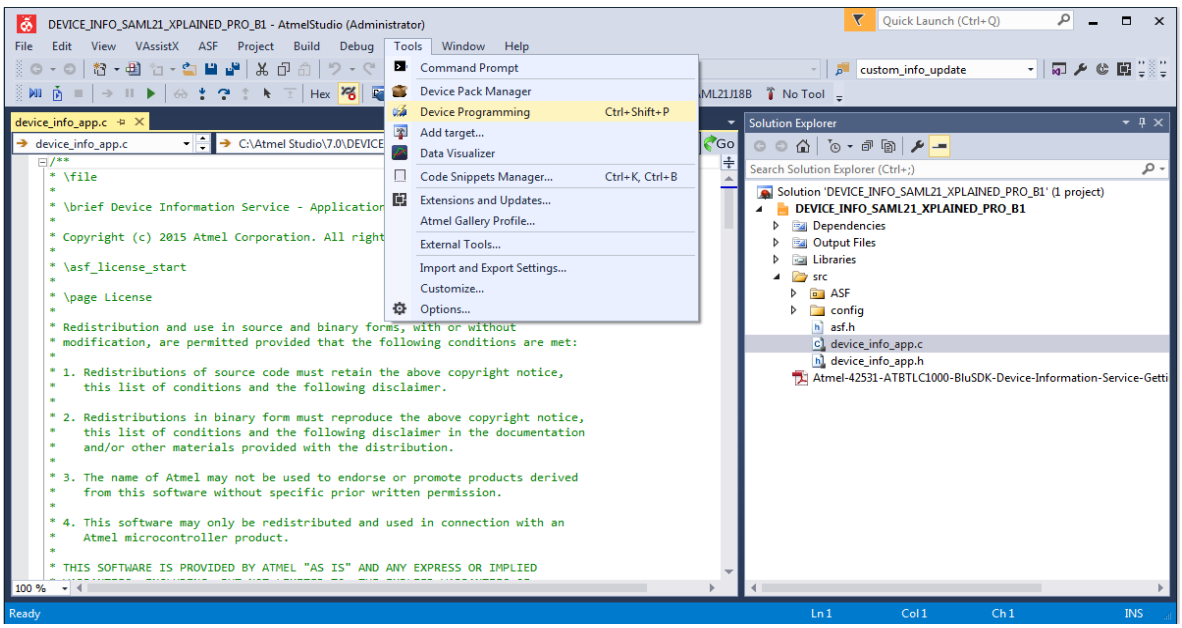
4. Build the solution.

Figure 5-3. Building the Device Information Service Application



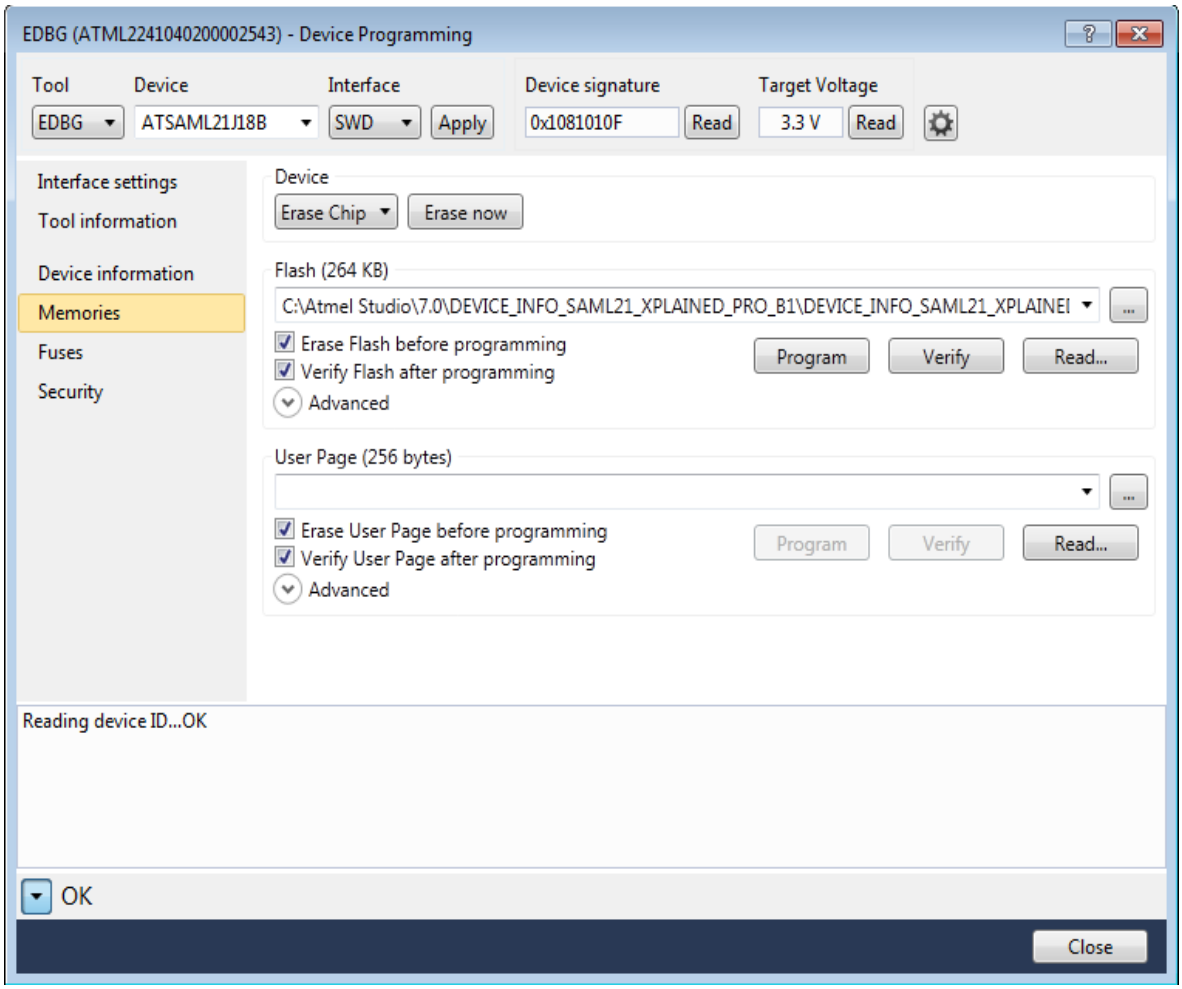
5. Download the application via the DEBUG-USB to the SAM L21 board using Device Programming option available in Tools as mentioned in Figure 5-4.

Figure 5-4. Selecting Device Programming



6. Inside device programming user have to select the correct configuration for device and finally program the device using program button.

Figure 5-5. Flash Programming



7. Once the application is flashed, it is ready to be simulated as Device Information service.

6 Running the Demo

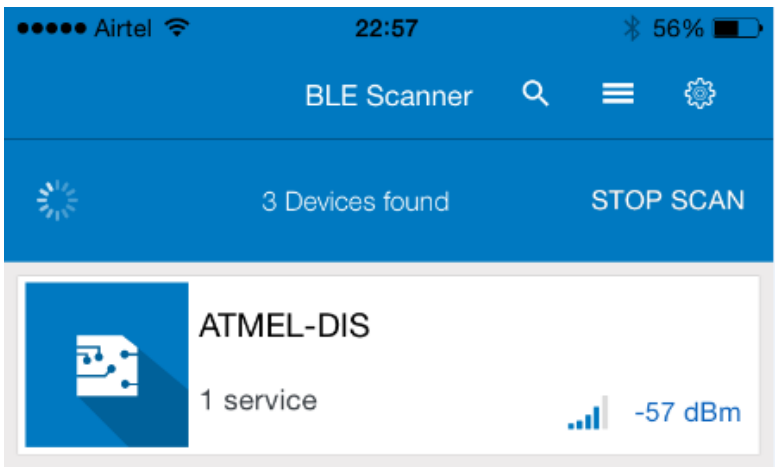
1. Connect the ATBTLC1000 Xplained Pro Board to SAM L21 Xplained Pro EXT1 as indicated in Figure 4-2.
2. Power on the SAM L21 by connecting the USB Cable.
3. Open any Terminal Application (e.g. TeraTerm), select the COM Port and configure setting: Baudrate 115200, Parity None, one Stop bit, one Start bit, no Hardware Handshake.
4. Press the Reset button on the SAM L21 board or supported platforms (see Table 3-1) board.
5. The device is now in advertising mode.

Figure 6-1. Console Display for Device in Advertising Mode

```
Initializing Device Information Service Application
Initializing BTLC1000
BD Address:0xF8F005F23DED, Address Type:0
BLE Started Adv
```

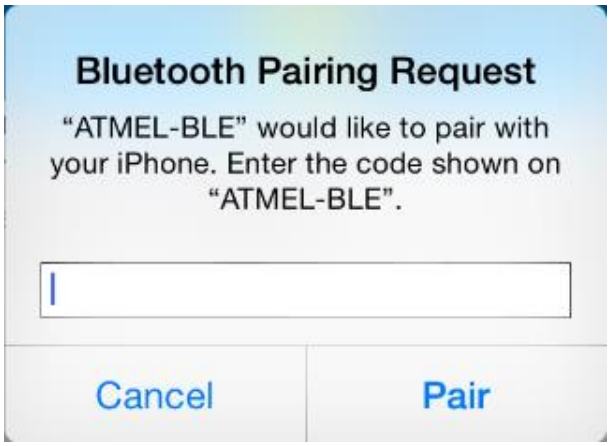
6. Enable Bluetooth® from Settings page on BLE compatible Android phone or iPhone®. Use the Atmel Smart Connect mobile application to scan for peripheral devices. A device with name ‘ATMEL-DIS’ will appear amongst the list of scanned devices.

Figure 6-2. ATMEL-DIS Device Discovered by Atmel SMART Application



7. Click on ATMEL-DIS device. A pop-up will appear requesting pass-key. Enter “123456” and click on ‘Pair’.

Figure 6-3. Pairing Pop-up Screen

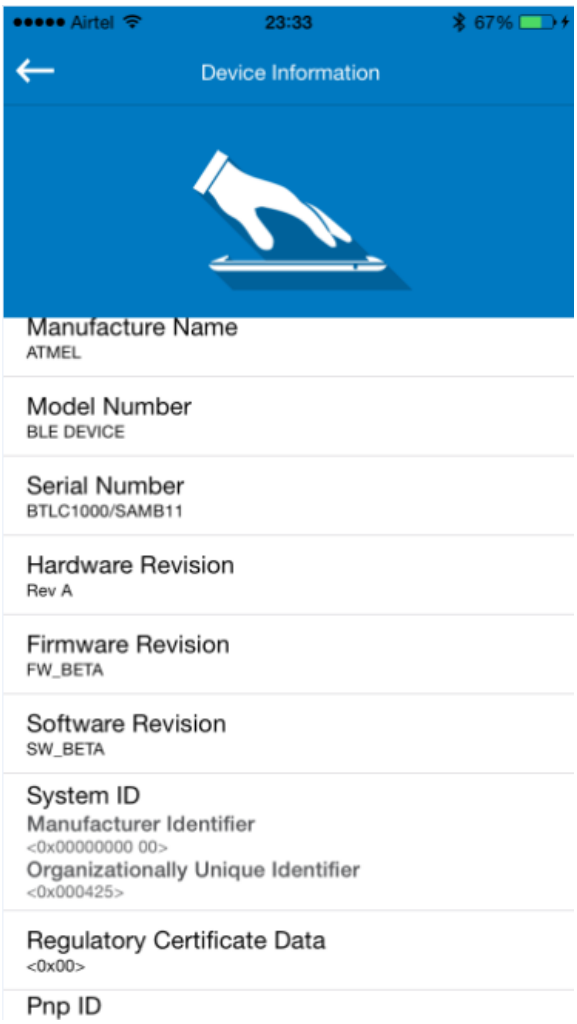


8. User can see the device information service as shown below.

Figure 6-4. Display of Device Information Service

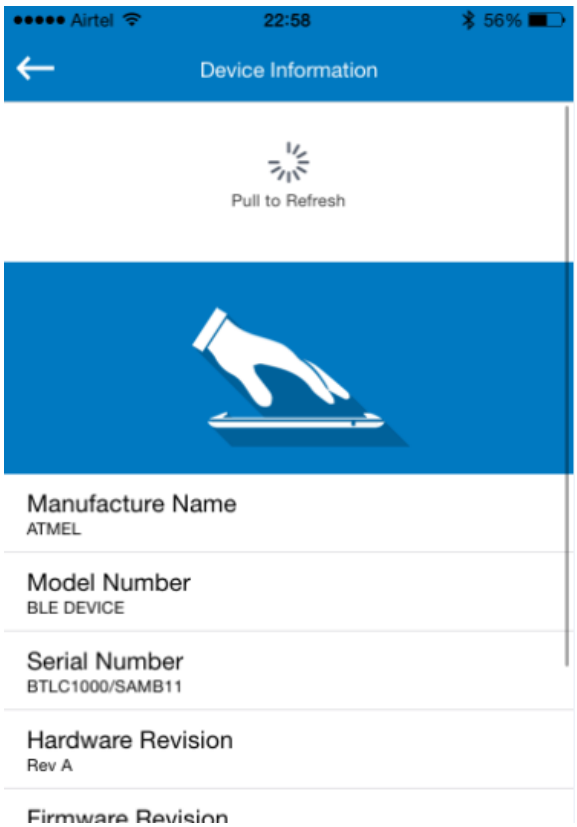
9. Once the Device Information service is clicked, User can see the device information service characteristics as shown below.

Figure 6-5. Display of Device Information Service Characteristics



10. User can pull the page to get the updated characteristic value of all characteristics as shown below.

Figure 6-6. Pull the Page for Updated Characteristics Value



7 Console Logging

For the purpose of debugging, a logging interface had been implemented in the Device information service Application. The logging interface utilizes the same EDBG port that connects to supported platforms (see Table 3-1). A serial port monitor application (for example TeraTerm) shall be opened and attached to the COM port enumerated by the device on the PC.

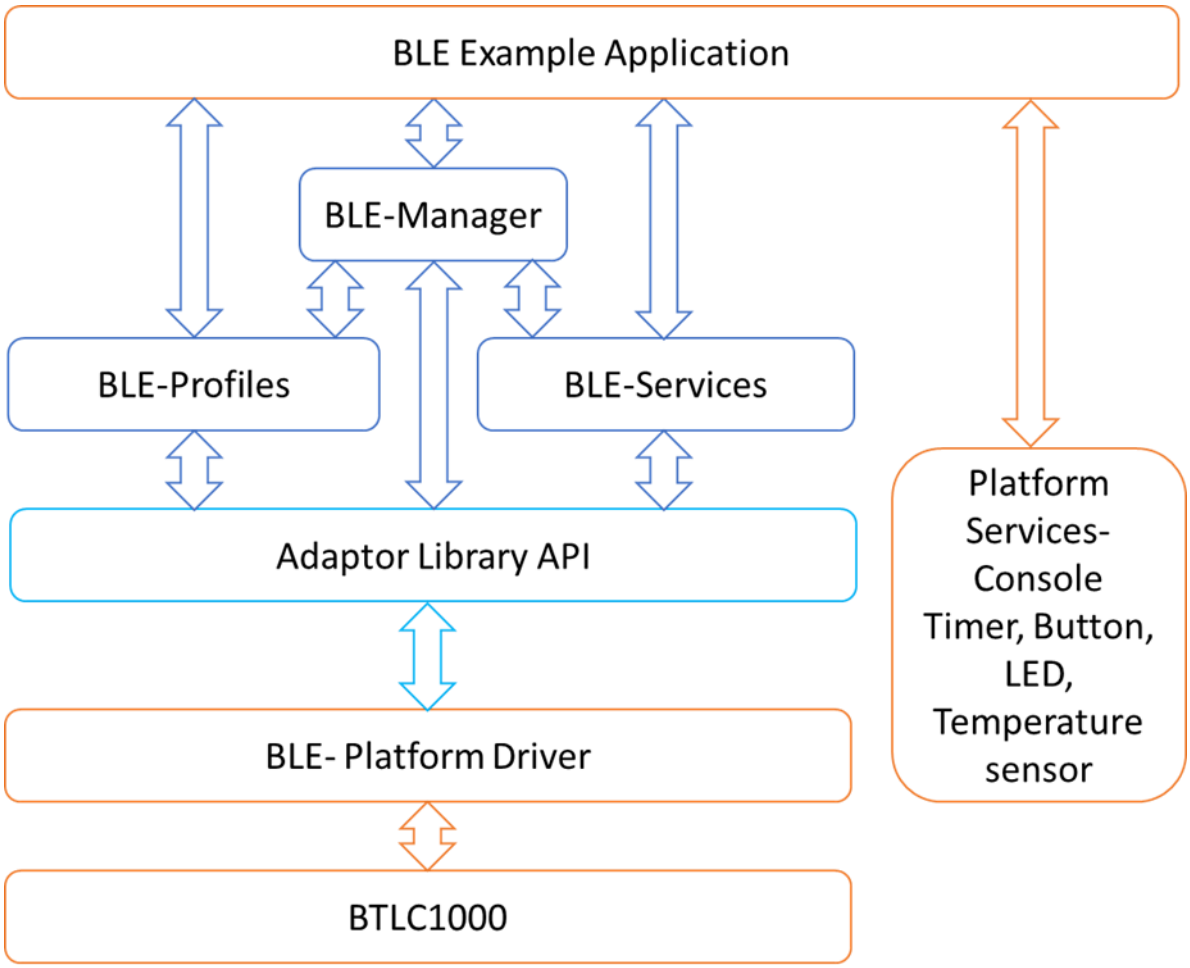
The screenshot below shows the information about BLE initialization and firmware revision after every time interval.

Figure 7-1. Device Information Service Application Console

8 BluSDK Software Architecture

Figure 8-1 illustrates the various layers in the BLU-SDK Architecture. The External host can be supported platforms (see Table 3-1).

Figure 8-1. BluSDK Software Architecture

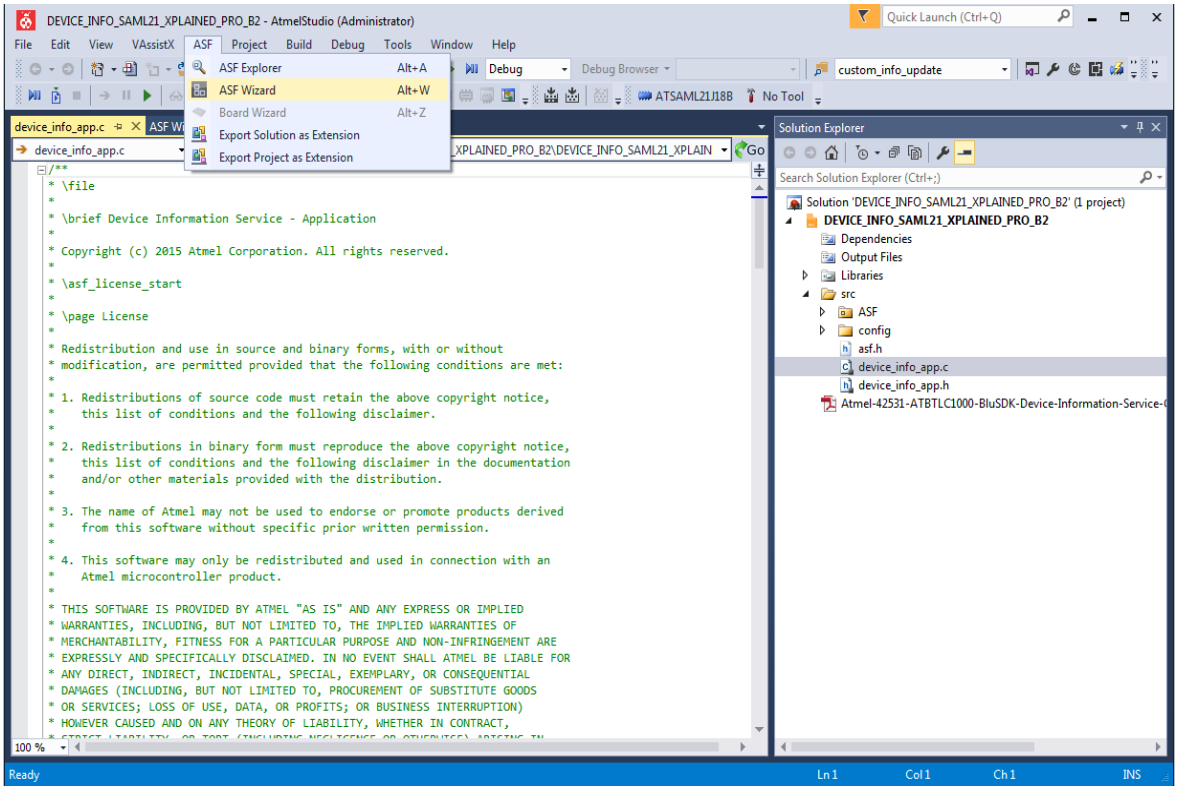


9 Adding a BLE Standard Service

User can add another service such as ‘Battery Service’ to the application by using the ASF wizard as mentioned below:

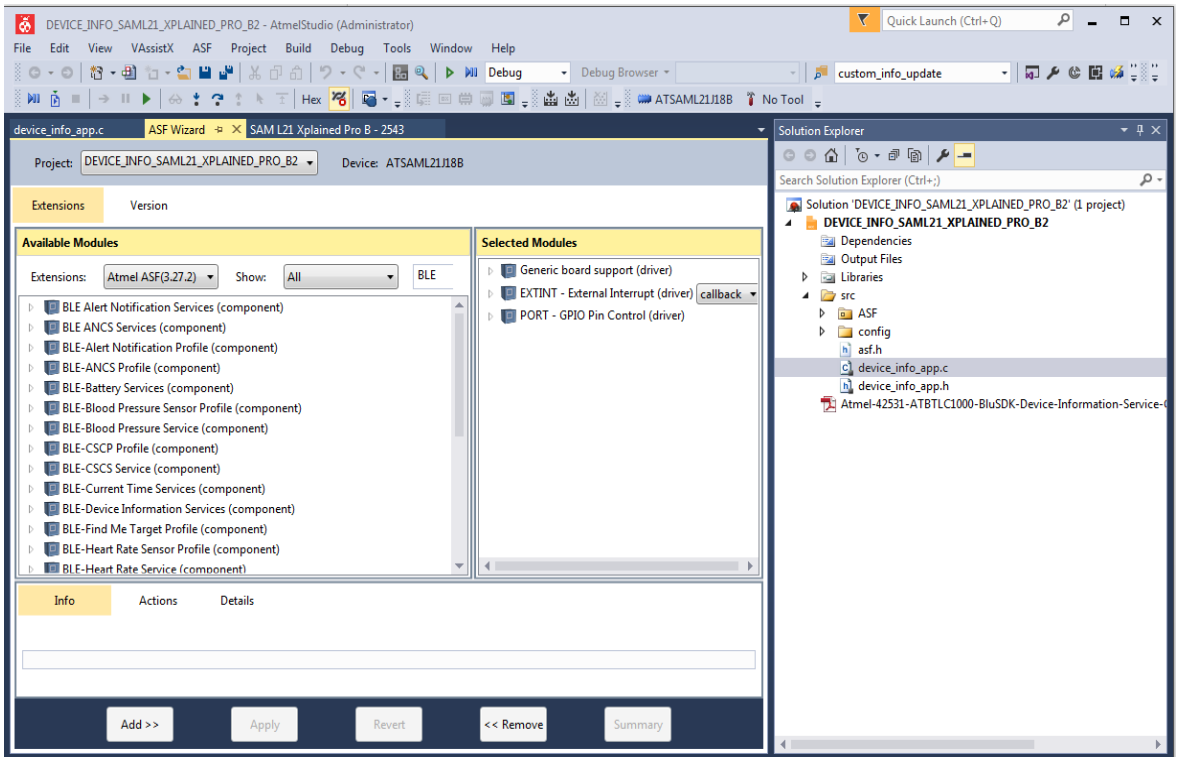
1. Select ASF → ASF Wizard as shown in Figure 9-1.

Figure 9-1. Invoking ASF Wizard



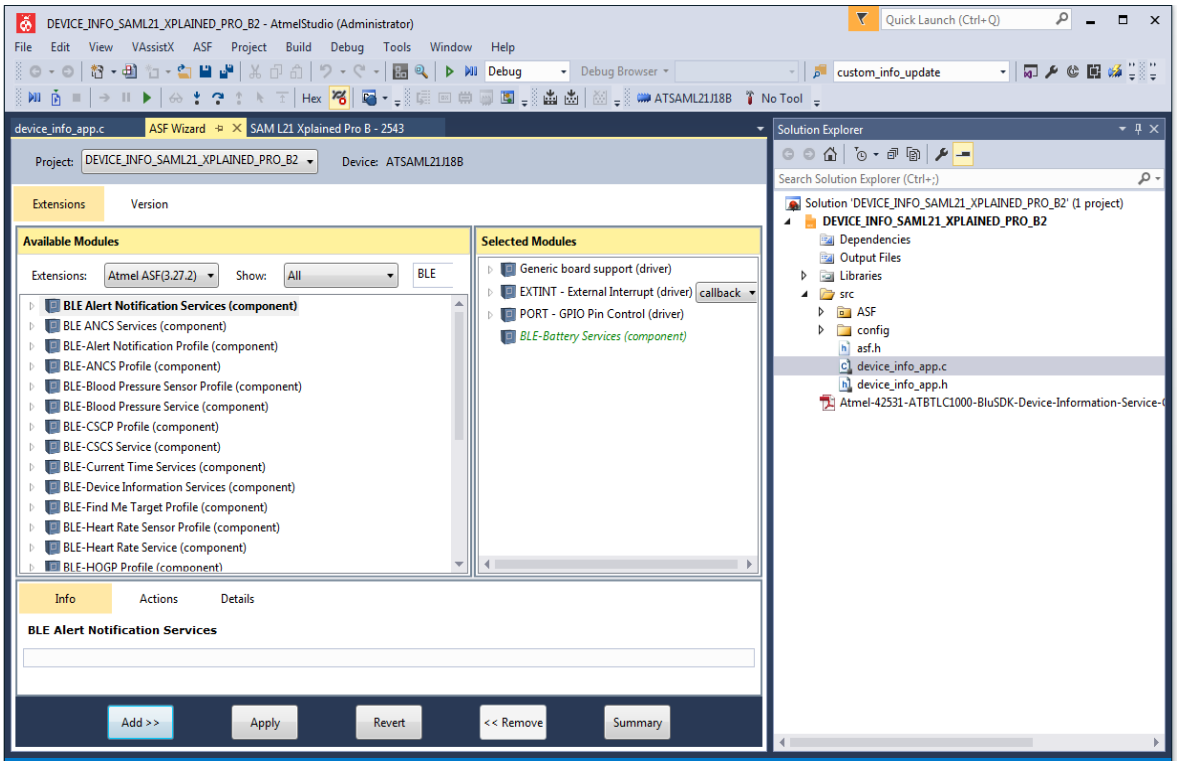
2. In ASF Wizard, enter the “BLE” text in search area as shown in Figure 9-2.

Figure 9-2. Showing ASF BLE Services and Components



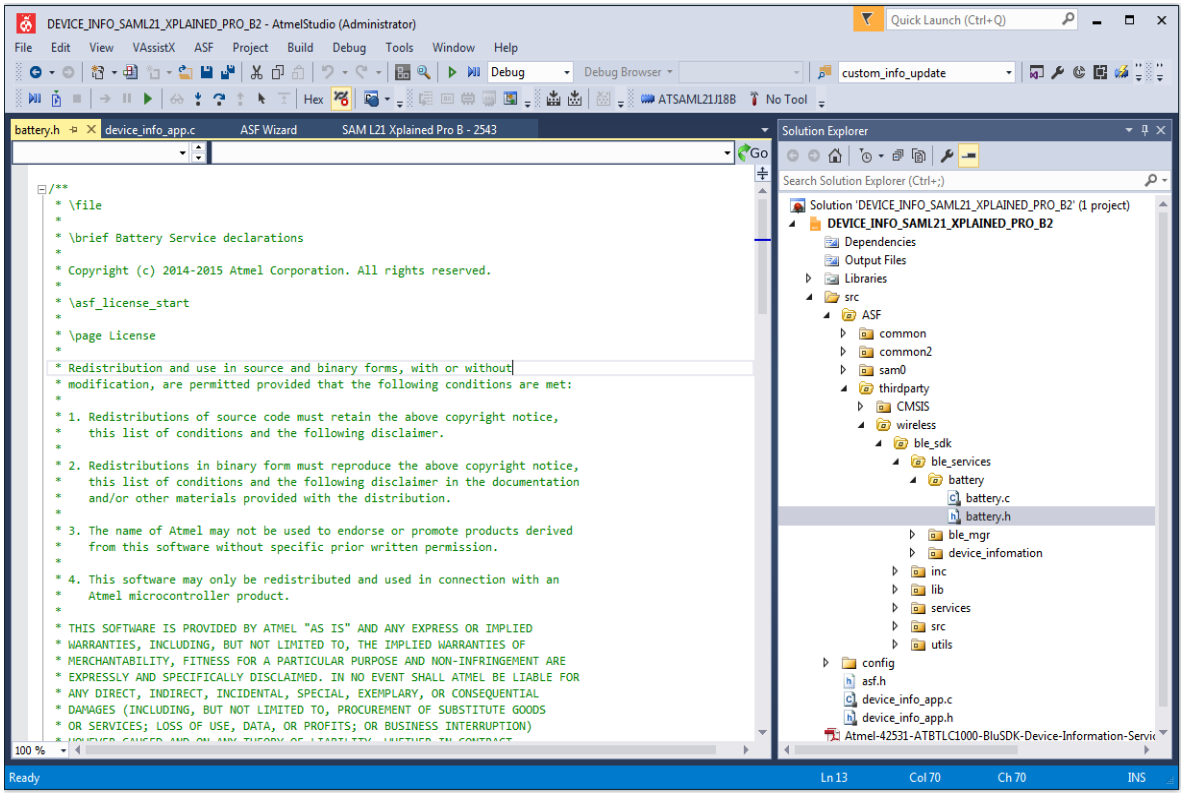
3. Select the required BLE Services/Profiles Component as shown in Figure 9-3 (e.g. Battery Services) then Press “Add >>” button and then press “Apply” button and press “OK”.

Figure 9-3. Selecting BLE Battery Service ASF Component



4. Added New BLE Service component will be shown as under src\thirdparty\wireless\ble_sdk\ble_services\battery.

Figure 9-4. Viewing Newly added ASF BLE Service Component



5. Use the APIs included in Battery Service header file (battery.h) for incorporating this service functionality if required in the application.

```
/**@brief Update the battery characteristic value after defining the services using
bat_primary_service_define
 *
 * @param[in] battery_serv battery service instance
 * @param[in] char_data New battery level
 * @param[in] flag flag to track the notification sent
 *
 * @return @ref AT_BLE_SUCCESS operation completed successfully
 * @return @ref AT_BLE_FAILURE Generic error.
 */
at_ble_status_t bat_update_char_value (bat_gatt_service_handler_t *battery_serv,
uint8_t char_data, bool volatile *flag);

/**@brief Battery service and characteristic initialization(Called only once by user).
 *
 * @param[in] battery_serv battery service instance
 *
 * @return none
 */
void bat_init_service(bat_gatt_service_handler_t *battery_serv, uint8_t
*battery_value);

/**@brief Register a battery service instance inside stack.
 *
 * @param[in] battery_service battery service instance
 *
 * @return @ref AT_BLE_SUCCESS operation completed successfully
 * @return @ref AT_BLE_FAILURE Generic error.
```

```
 */
at_ble_status_t bat_primary_service_define(bat_gatt_service_handler_t
*battery_service);
```

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11 Revision History

Doc Rev.	Date	Comments
42531C	02/2016	Table 3.1 is updated with SAM4S hardware support. Figure 4.4 is updated with SAM4S Xplained Pro image. Section 5.1 Installation Steps are updated.
42531B	11/2015	Figure 3-1 is updated. The screenshots in Chapter 5 and Chapter 9 are updated.
42531A	09/2015	Initial document release.

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