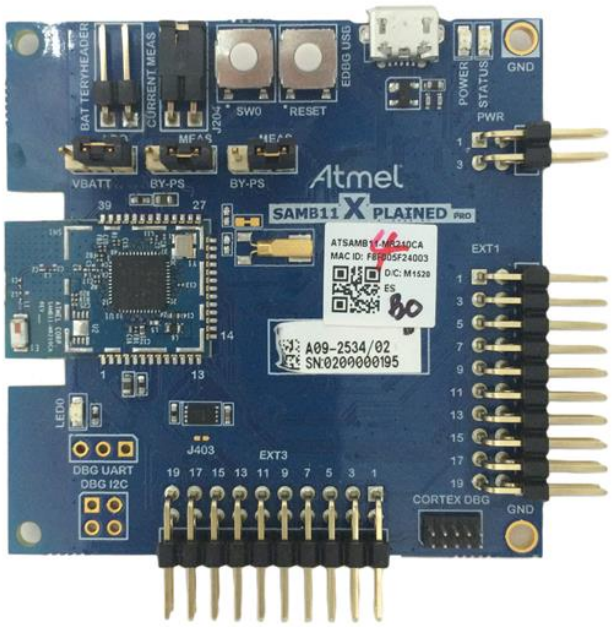
ATSAMB11 BluSDK SMART

Proximity Monitor - Getting Started Guide

USER GUIDE



Introduction

The Proximity profile defined by the Bluetooth® SIG enables proximity monitoring between two devices. The Proximity Monitor (a GATT client) configures the behavior of a peer Proximity Reporter device (GATT server) based on link conditions. The Proximity Monitor configures desired behavior of the peer device through setting Alerts Levels on Link Loss and Path Loss. In addition, it also maintains the connection with the Proximity Reporter and monitors the link quality of the connection based on RSSI reporting from the peer device.

The Proximity Monitor example application supports the following features:

- Device Discovery and Disconnection
- Services and Characteristics Discovery
- Services: Link Loss Service, Immediate Alert Service, and TX Power Service.
- Setting up Path Loss and Link Loss
- RSSI Sampling

Table of Contents

1 Purpose

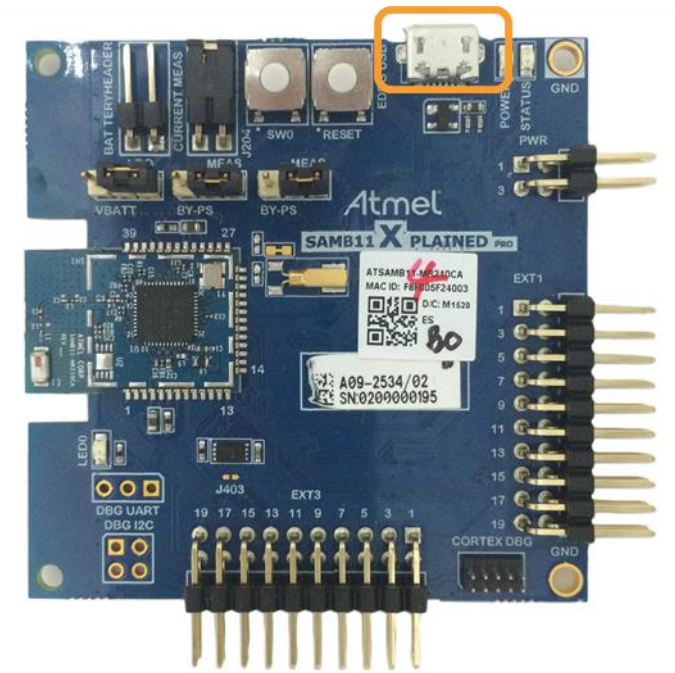
This getting started guide describes the setup of an Atmel® ATSAMB11 Xplained board and bringing up an example profile supplied as part of BluSDK SMART release. This document explains the bring-up of Bluetooth Proximity Monitor example application that is embedded as part of the software release package.

2 Demo Setup

3 Hardware Setup

Connect the ATSAMB11 board to the host PC using a Micro-USB cable.

Figure 3-1. EDBG USB Port



4 Software Setup

4.1 Installation Steps

1. Install the latest Atmel Studio **[Atmel Studio 7.0 (build 629 or later) web installer (recommended)]**
   http://www.atmel.com/tools/ATMELSTUDIO.aspx.
2. Install the latest Atmel Software Framework.

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

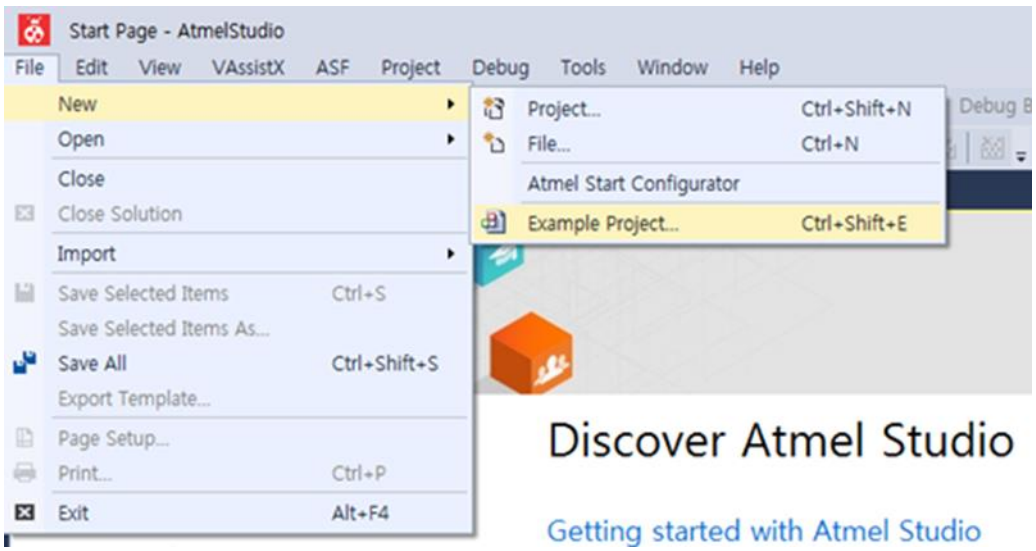
- Proximity Monitor Application for ATSAMB11

4.2 Build Procedure

The following procedure is explained for ATSAMB11 application example.

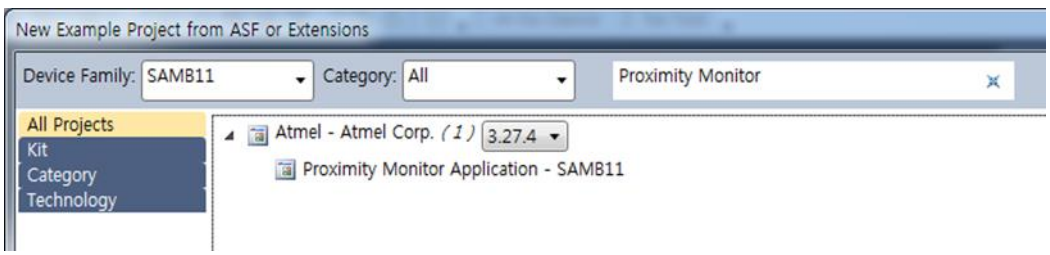
1. Select New Example Project.

Figure 4-1. Creating a New Example Project



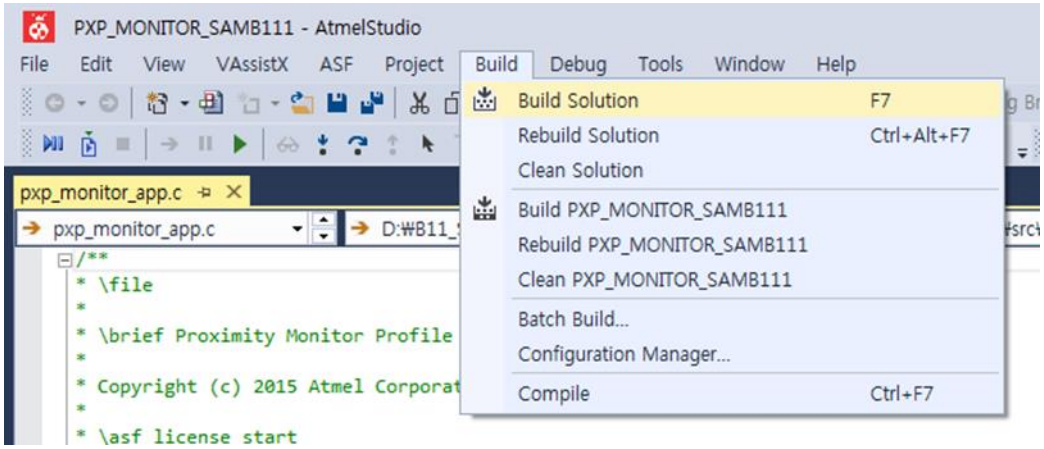
2. Select “SAMB11” in device family, enter “Proximity Monitor” in search window, and expand Atmel Corp Projects. The location and the name of the project can be selected in the respective fields. Click OK.

Figure 4-2. Selecting Proximity Monitor Application from Example Projects



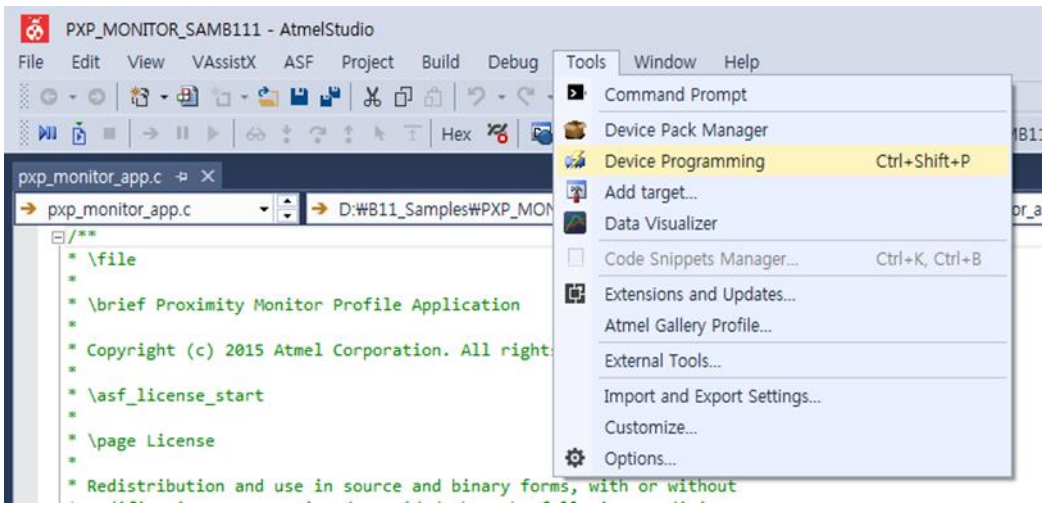
3. Accept the license Agreement. The studio will generate the Proximity Monitor project for ATSAMB11.
4. Build the solution.

Figure 4-3. Building the Proximity Monitor Application



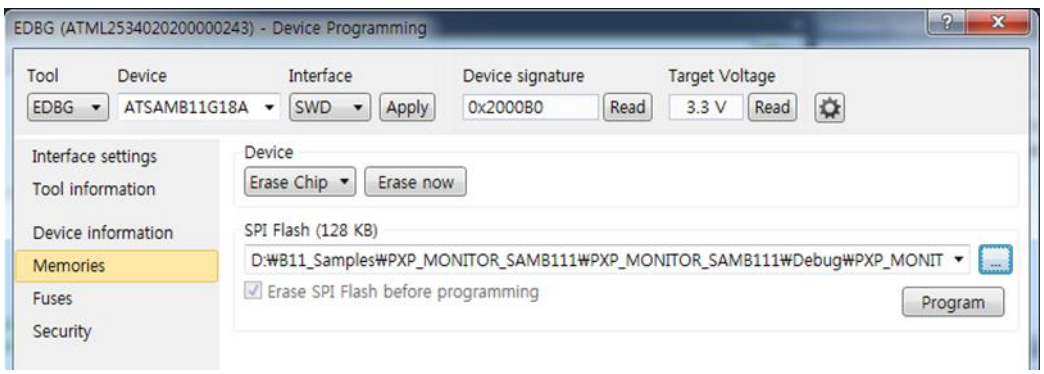
5. Download the application via the USB to the ATSAMB11 board by using the Device Programing option available in Tools as shown below.

Figure 4-4. Flashing the Application on Atmel MCU



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

Figure 4-5. Flash Programming



7. Once the application is flashed, it is ready to work as a Proximity Monitor Device.

5 Console Logging

For the purpose of debugging, a logging interface has been implemented in the Proximity Monitor Application.

The logging interface utilizes the same EDBG port that connects to ATSAMB11. A serial port monitor application (for example TeraTerm) shall be opened and attached to the corresponding COM port enumerated on the PC by the device.

6 Running the Demo

1. Power on the ATSAMB11 by connecting the USB cable.
2. Open the console using TeraTerm or any serial port monitor application and connect to the corresponding COM port enumerated by the device on the PC.
3. Press the Reset button on the ATSAMB11 board.
4. The device will initialize and start up as seen in the console log shown below.

Figure 6-1. Proximity Monitor Device Initialization

```
Initializing SAMB11
BD Address:0xF8F005F353D0, Address Type:0
High Alert RSSI range: -91dBm and above
Mild Alert RSSI range: -70dBm to -90dBm
No Alert RSSI range:   -69dBm and below
Initializing Proximity Monitor Application
```

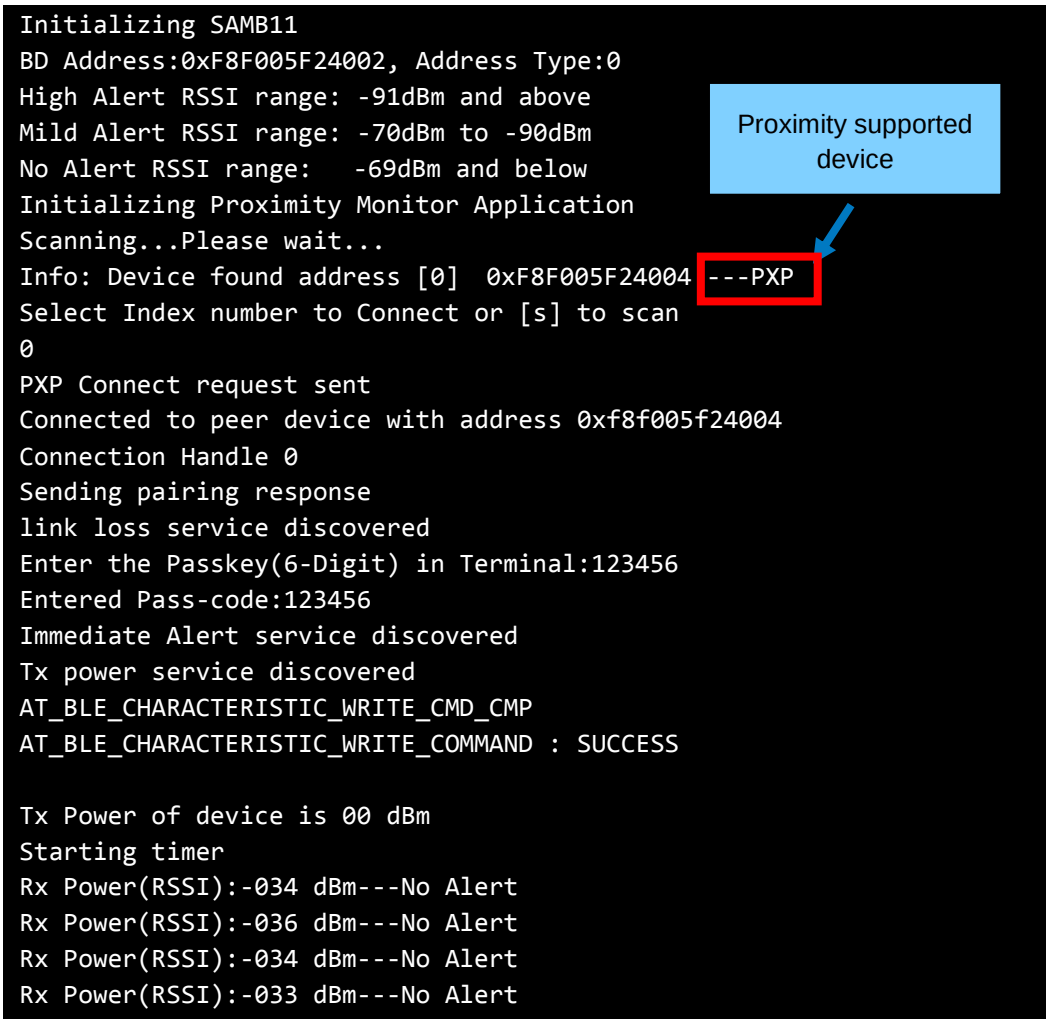
5. The device will then start scanning and will display devices found as shown below.

Figure 6-2. Proximity Monitor – Scanning Devices

```
Initializing SAMB11
BD Address:0xF8F005F353D0, Address Type:0
High Alert RSSI range: -91dBm and above
Mild Alert RSSI range: -70dBm to -90dBm
No Alert RSSI range:   -69dBm and below
Initializing Proximity Monitor Application
Scanning...Please wait...
Info: Device found address [0]  0xF8F005F24004 ---PXP
Select Index number to Connect or [s] to scan
```

6. The proximity monitor scans and then displays the list of all BLE devices which are advertising. Proximity Reporter devices (GATT server role) are indicated with tag “ ---PXP ”. Select the appropriate index number for the Proximity Reporter. The Proximity Monitor will then connect to the selected peer device.

Figure 6-3. Proximity Monitor Connection with a Proximity Reporter



7. Once the connection is established the Proximity Monitor will set link loss alert value to High Alert and start monitoring the RSSI value of the reporter device. The Proximity Monitor implements path loss monitoring in the case where a Proximity Reporter supports also ‘Immediate Alert Service’ and ‘TX-Power’ service. The Atmel Proximity Reporter application referred in this example supports both these optional services.

   The default alert settings are as follows:

   – High Alert RSSI set to -91dBm and above, alert type “HIGH ALERT”, LED will turn on
   – Mild Alert RSSI set to -70dBm to -90dBm, alert type “MILD ALERT”, LED will toggle
   – No Alert RSSI set to -69dBm and below, alert type “No Alert”, LED will be turned off

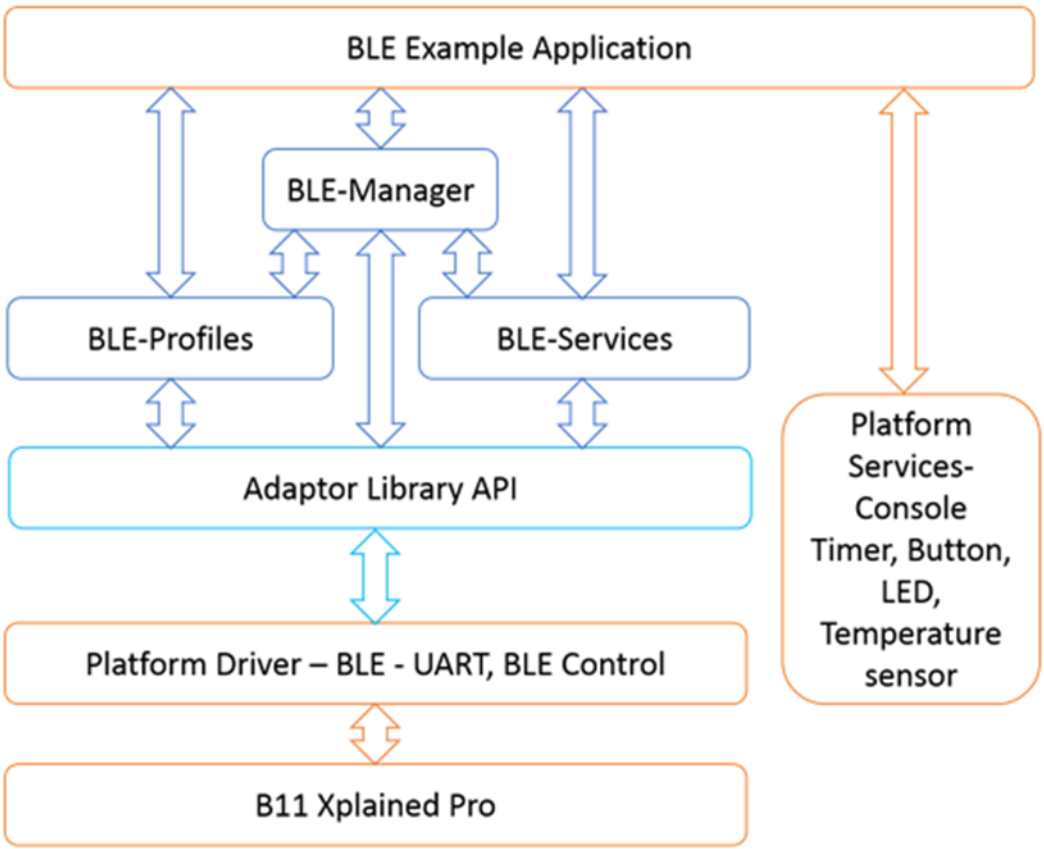
   If Proximity Reporter device moves out of the preset proximity range the corresponding alert value will be set and the alert notification will be displayed on the console as shown below.

Figure 6-4. Proximity Monitor Setting Alert Levels

7 BluSDK SMART Software Architecture

Figure 7-1 illustrates the top level diagram for the ATSAMB11 configuration.

Figure 7-1. ATSAMB11 Software Architecture



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ATMEL CORPORATION
1600 Technology Drive
San Jose, CA 95110
USA

9 Revision History

Doc Rev.	Date	Comments
42606A	11/2015	Initial document release.

Atmel Corporation 1600 Technology Drive, San Jose, CA 95110 USA **T:** (+1)(408) 441.0311 **F:** (+1)(408) 436.4200 | **www.atmel.com**