

Introduction

The HID over GATT (HOGP) profile defined by the Bluetooth® SIG enables support of HID services over a Bluetooth Low Energy (BLE) protocol stack using Generic Attribute profile (GATT). This allows devices like keyboard or mouse implementing HOGP to connect to a compatible HOGP/BLE host device (e.g.: Mobile Phone, Tablet, TV, etc.)

The HOGP Mouse device application example (referred as HID Mouse device in this document) supports the following features:

- Advertisement
- Pairing
- Services: HID Service and Device Information Service.
- Report Mode (Mouse)

The HID Mouse device application example supports the following characteristics for HID service:

- Protocol Mode
- Report
- Boot Mouse Input Report
- Report Map
- HID Information
- HID Control Point

For the purpose of demonstration, the example application simulates the function of a mouse. Once the handshake and connection procedure between a mobile phone and the Atmel® ATSAMB11 emulating a mouse device example is completed, a mouse cursor will appear on the mobile device's screen. Pressing the button on the ATSAMB11 platform simulates movement of mouse in a pre-defined pattern as described in later in this document.

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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 HID Mouse device example application that is embedded as part of the software release package.

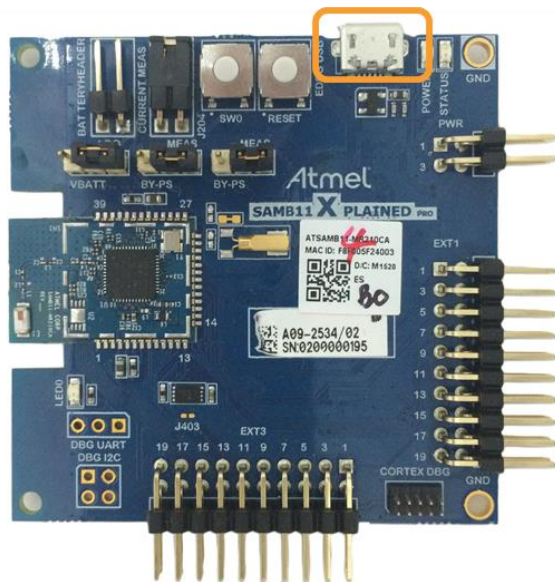
2 Demo Setup



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:

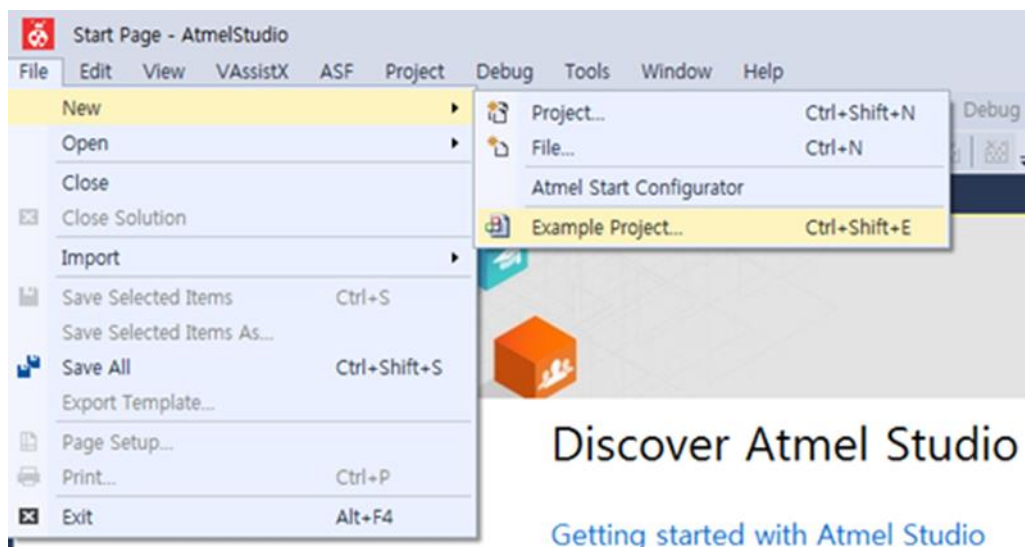
- HID Device Application for ATSAMB11

4.2 Build Procedure

The following procedure is explained for ATSAMB11 application example.

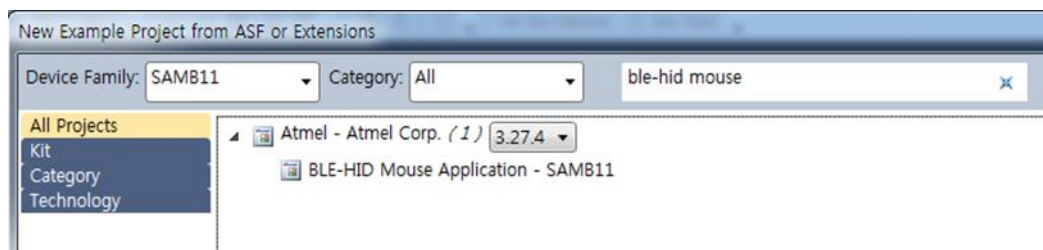
1. Select New Example Project.

Figure 4-1. Creating a New Example Project



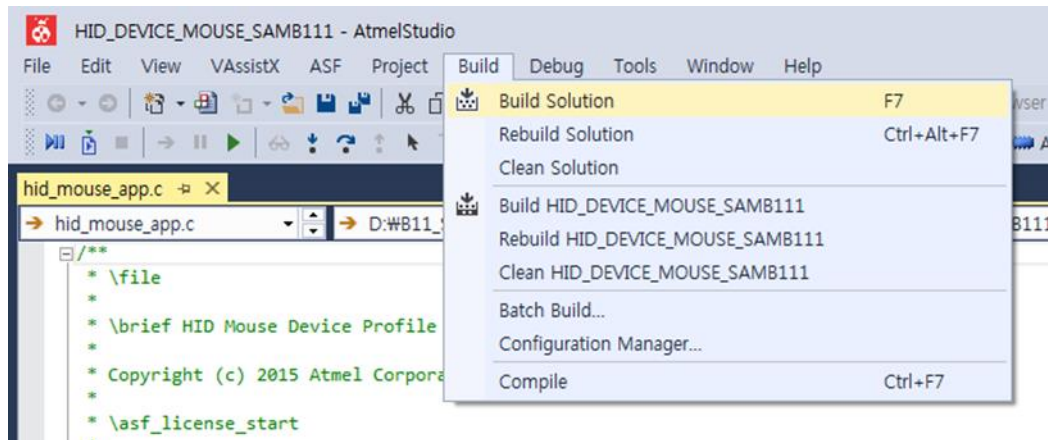
2. Select "SAMB11" in device family, enter "ble-hid mouse" in the search window, and expand Atmel Corp Projects. The location and the name of the project can be selected in the respective fields. Click OK.

Figure 4-2. Selecting HID Device Application from Example Projects



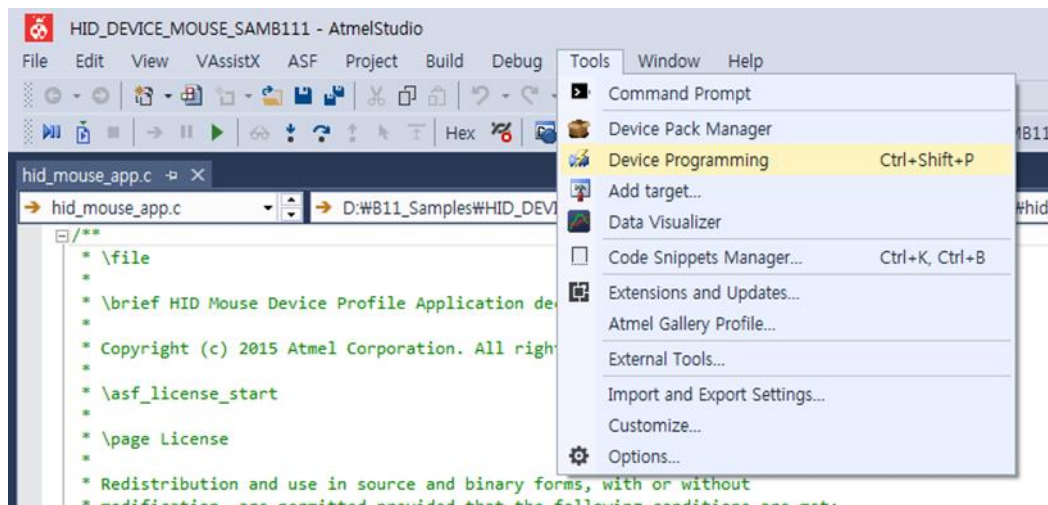
3. Accept the license Agreement. The studio will generate the BLE-HID Mouse project for ATSAMB11.
4. Build the solution.

Figure 4-3. Building the HID Device Application



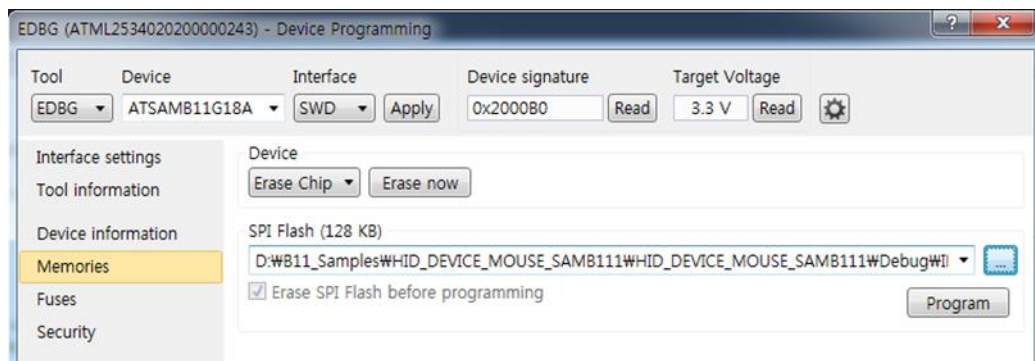
5. Download the application via the USB to the ATSAMB11 board by using the Device Programming option available in Tools as shown below.

Figure 4-4. Selecting Device Programming Option



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. Flashing the Application on Atmel MCU



5 Console Display

For the purpose of debugging, logging is made available through a serial console. The logging interface utilizes the same COM port that connects to ATSAMB11. A serial port monitor application (for example TeraTerm) shall be opened and attached to the appropriate COM port enumerated by the device on the PC.

6 Running the Demo

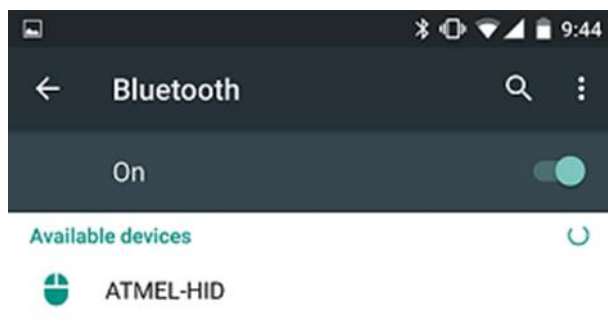
1. Power on the ATSAMB11 by connecting the USB cable.
2. On the PC, open any Terminal Application (e.g. TeraTerm). Select the appropriate COM Port. (Settings: Baudrate 115200, None Parity, one Stop bit, one Start bit, no Hardware Handshake.)
3. Press the Reset button on the ATSAMB11 board.
4. The board is now in advertising mode as shown below.

Figure 6-1. HID Keyboard Device in Advertising Mode

```
Initializing HID Mouse Application
HID Profile Configured
Initializing SAMB11
BLE-chip id : 0x002000B0
BD Address:0xF8F005F0B299, Address Type:0
Device Started Advertisement
```

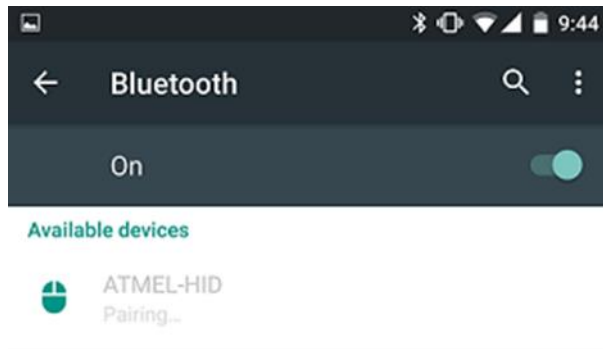
5. The demo requires use of an Android mobile phone supporting HOGP. The HOGP profile is natively supported in Android from version 4.4 (Android KitKat) and upwards. In Bluetooth settings scan for the devices. The device with “ATMEL-HID” will be found as shown below. Click on “ATMEL-HID” to get connected.

Figure 6-2. Mouse Device Discover on Bluetooth Device



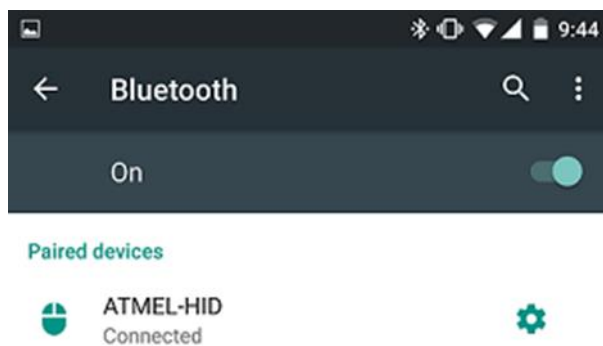
6. Once the user clicks on “ATMEL-HID”, pairing procedure started.

Figure 6-3. Pairing Process with HID Device



7. Once the pairing is done, the connected device is listed in the paired device list.

Figure 6-4. Connected Device Inside Paired Devices



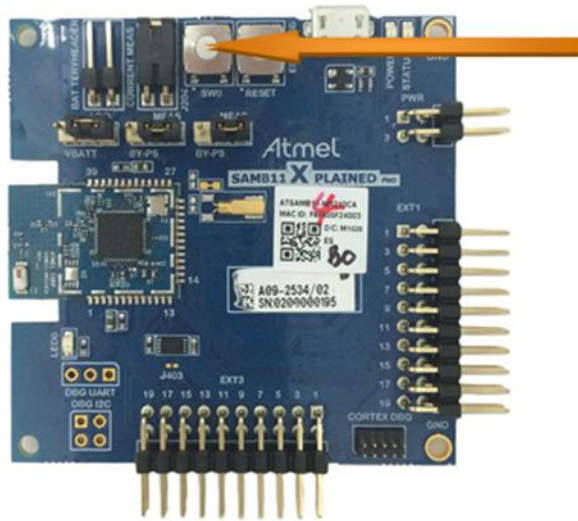
8. Console log on the HID device side for the pairing and connection procedure.

Figure 6-5. HID Mouse Log for Pairing and Connection Procedure

```
Initializing HID Mouse Application
HID Profile Configured
Initializing SAMB11
BLE-chip id:0x002000B0
BD Address:0xF8F005F0B299, Address Type:0
Device Started Advertisement
Connected to peer device with address 0x7b5bfc5cf8d0
Connection Handle 0
Remote device request pairing
Sending pairing response
AT_BLE_CONN_PARAM_UPDATE
Pairing procedure completed successfully
```

9. Once the device is connected to the host (Phone), the user can select the button for simulating mouse movement.

Figure 6-6. Press Button for Mouse Movement



10. For every press on button, the user can see corresponding cursor movement on HID host as described below:

First 5 Button Press:	Cursor moves right
Next 5 Button Press:	Cursor moved down
Next 5 Button Press:	Cursor moves left
Next 5 Button Press:	Cursor moved up

The same sequence is repeated based on user input. A snapshot of the console logs are shown below.

Figure 6-7. HID Device Console Log for Movement

```
Mouse Right Movement
Mouse Right Movement
Mouse Right Movement
Mouse Right Movement
Mouse Right Movement
Mouse Down Movement
Mouse Down Movement
Mouse Down Movement
Mouse Down Movement
Mouse Down Movement
Mouse Left Movement
Mouse Left Movement
Mouse Left Movement
Mouse Left Movement
Mouse Left Movement
Mouse UP Movement
Mouse UP Movement
Mouse UP Movement
Mouse UP Movement
Mouse UP Movement
```

Figure 6-8. Mouse Cursor Position on Phone

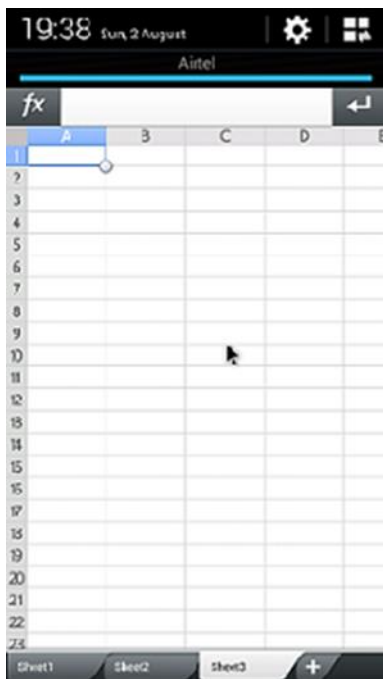
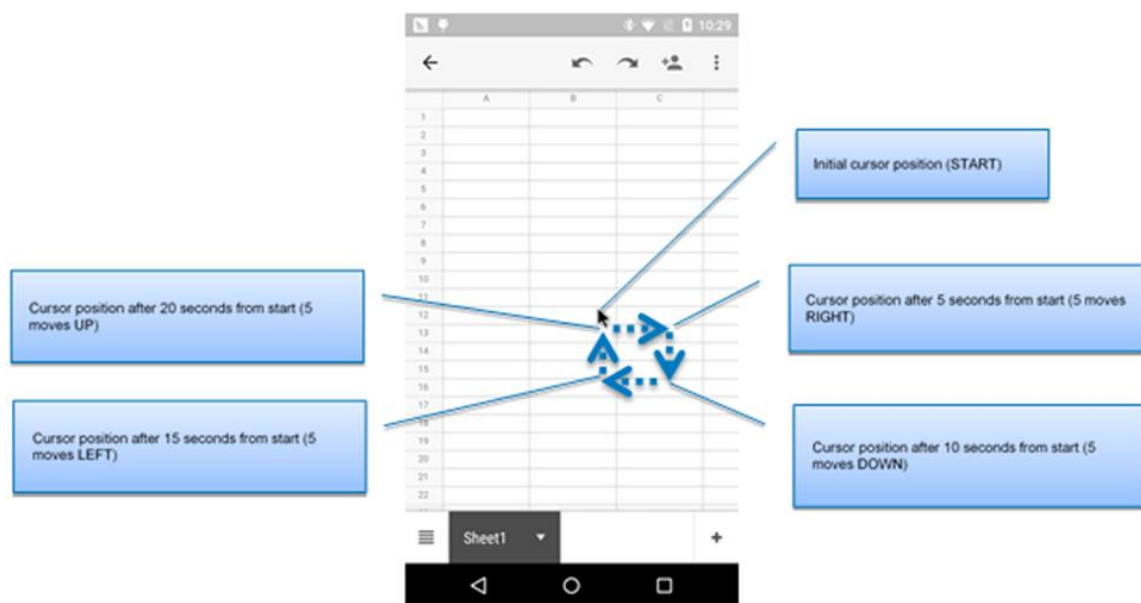


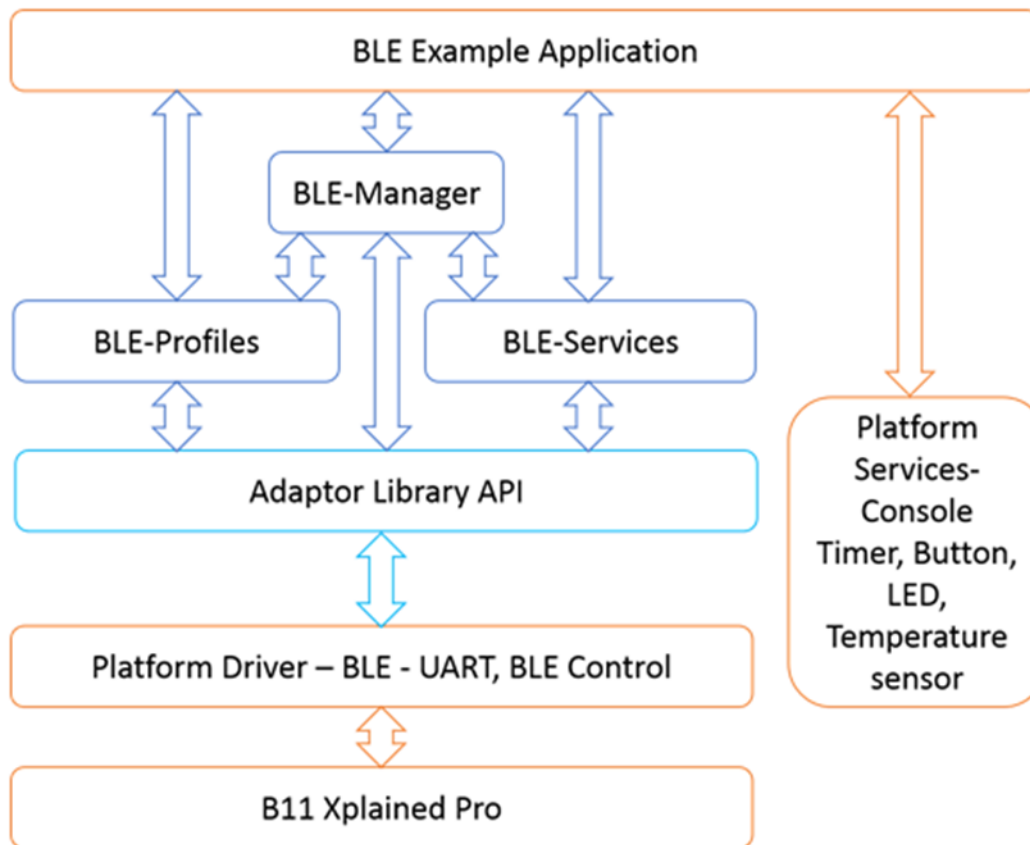
Figure 6-9. Mouse Move Simulation



7 BluSDK SMART Software Architecture

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

Figure 7-1. ATSAMB11 Software Architecture



8 **ATMEL EVALUATION BOARD/KIT IMPORTANT NOTICE AND DISCLAIMER**

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9 Revision History

Doc Rev.	Date	Comments
42603A	11/2015	Initial document release.



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