



ClearBlade ThunderBoard Integration Firmware

Goals



- Provide Sample Sensor Integration Environment
- Use Real Hardware
- Leverage Bluetooth (LE in this example)
- Tasks
 - Setup Programming Environment for Simplicity Studio
 - Program the ThunderBoard Sense with the ThunderBoard Sense project
 - Alter Thunderboard firmware for Constant Advertisement
 - Develop Adapter for Scanning, Connecting and Reading
 - Second Part of the series

ThunderBoard Sense

- Silicon Labs a ClearBlade HW partner
- Thunderboard Sense is a small and feature packed development platform for battery operated IoT applications. The multi-protocol radio
- Broad selection of on-board sensors
- Platform to develop and prototype a wide range of IoT applications.
- Cost Effective for end to end ClearBlade Demonstration



Simplicity Studio

*Faster, Easier Software Development
Tools for the IoT*

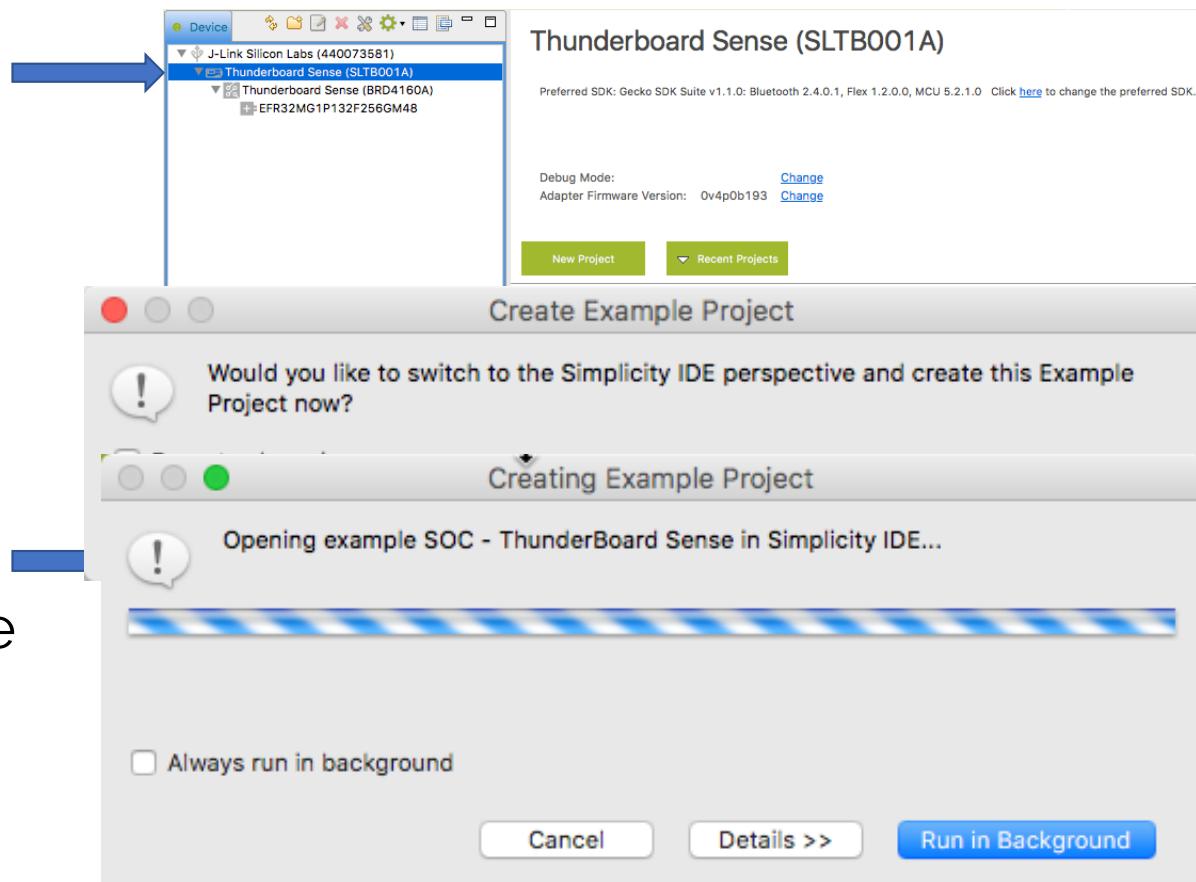


- Simplicity Studio (SI Labs Development Tool)
- Install Simplicity Studio
 - <https://www.silabs.com/products/development-tools/software/simplicity-studio>
 - Sign up for a free account if you don't have one
 - Start/Run Simplicity Studio

Install Simplicity Studio

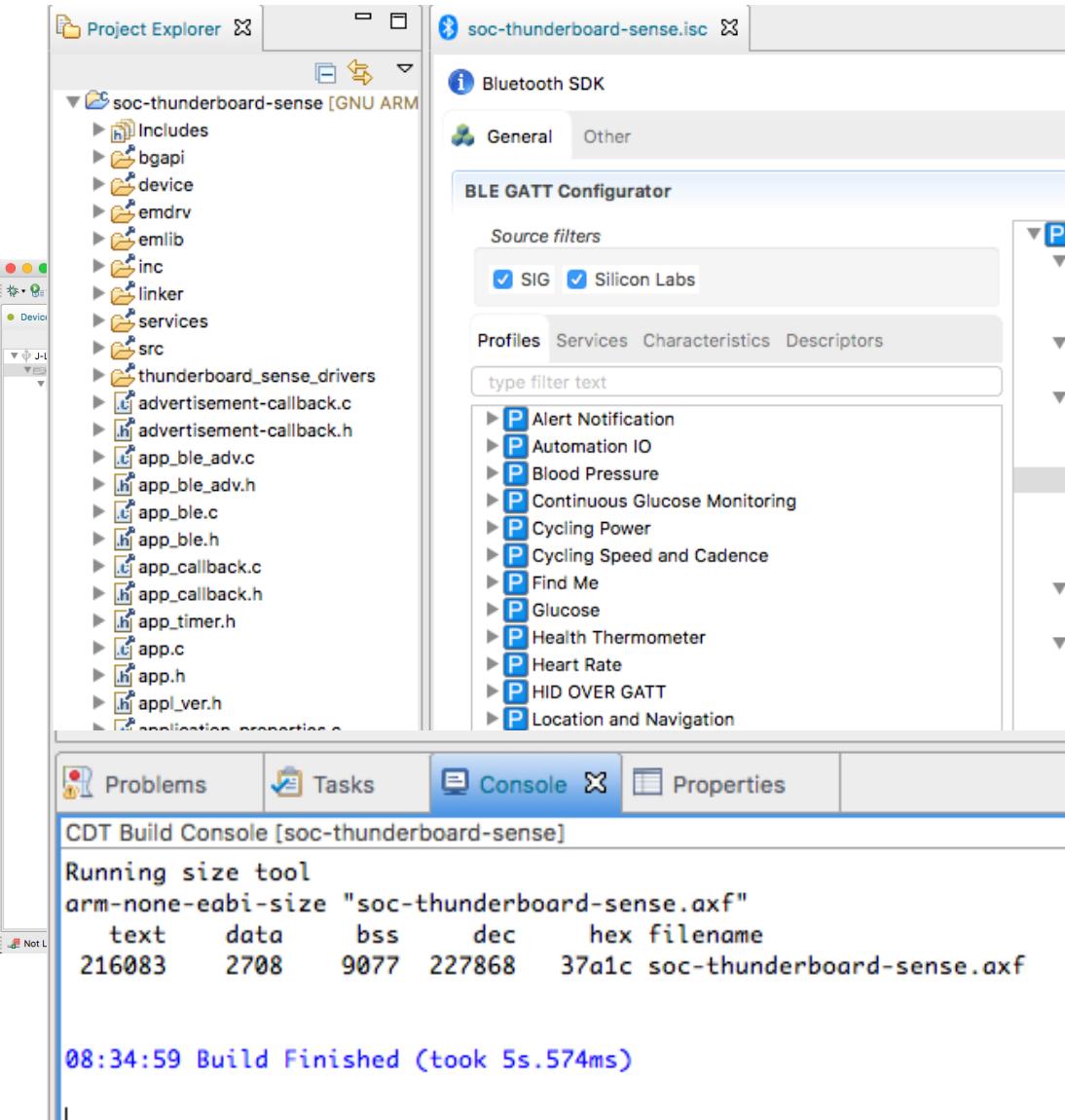
Load ThunderBoard Sense Project

- Plug in Device
 - Drill to ThunderBoard Sense
 - Screen will update with projects
- Under Software Examples
 - Select “SOC – ThunderBoard Sense”
 - Select Yes to the Create Example Project Dialog



Project View

- Default Project View
 - GATT profile is services available
 - Click Generate to Generate the profile
- Use Window/Perspective to switch to the C/C++ view
- Select Project/Clean from menu (clean all projects)
 - Assure no errors in console



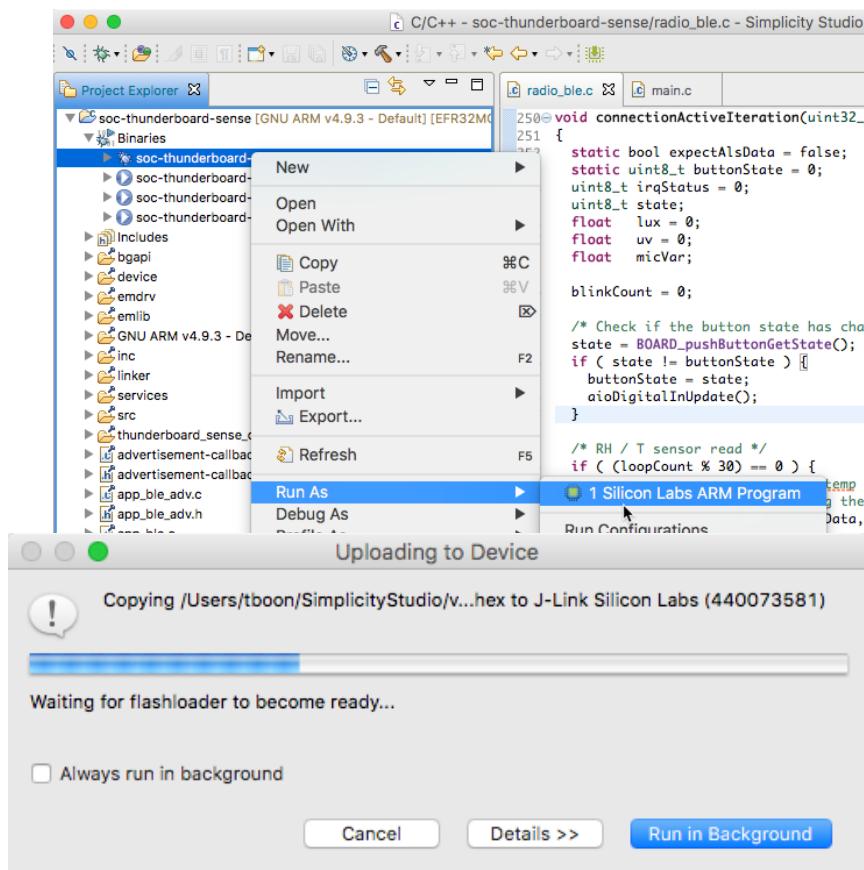
Altering Default Advertisement Time

- By Default the ThunderBoard Advertises for ~30 seconds
 - Green Flashing LED on Board
- Going to enable promiscuous advertising
 - Allows for continuous scanning/connections
 - Simplifies Testing/Validation
 - Typically would work with HW vendor to adapt to security model
- Open radio_ble.c
 - Comment out lines in UTIL_shutdown section

```
217 #ifndef DEBUG
218 //if ( (loopCount - advStartedLC) > sleepTimeout ) {
219 //  /* printf("\r\nSleep! %u %u", loopCount, advStartedLC); */
220 //  if ( !UTIL_isLowPower() ) {
221 //    MAIN_deinitSensors();
222 //  }
223 //  BOARD_picWriteReg(BOARD_PIC_REG_INT_CLEAR, 0);
224 //  BOARD_ledSet(0x00);
225 //  UTIL_shutdown();
226 //}
227#endif
```

Deploying to ThunderBoard

- Deploy to board
 - Drill to Binaries
 - Right-Click .axf file
 - Run As Silicon Labs ARM Program
- Will deploy new firmware to device
 - Should not stop advertising (green light flashing indefinitely)
 - Note: LED will turn off/to red when connected



Next Steps



- Didn't do any ClearBlade (yet)
- Setup the ThunderBoard to run constant BLE Advertising
- Simplifies Connectivity vs Reset Switch
- Next Steps
 - Define Required Data Points
 - Build Adapter
 - Adapter Deployment
 - Provisioning Steps/Process definition
 - Triggers for Capturing/Recording Data