



QSG155: Using the Silicon Labs Dynamic Multiprotocol Demonstration

This document shows how to use the dynamic protocol demonstration introduced with EmberZNet SDK version 6.0.0. In this demo, a light dynamic protocol application incorporating both Zigbee 3.0 and Bluetooth LE functionality can be controlled either from a Zigbee 3.0 switch application or from a Bluetooth LE-enabled smartphone app.

KEY POINTS

- Prerequisite for the demo
- Demo firmware installation
- Instructions for using the demo

1 Prerequisites

The Silicon Labs dynamic multiprotocol demonstration is designed to illustrate dynamic multiprotocol operation without any need to configure or compile software. This document assumes that you have already:

- Obtained a Mighty Gecko (EFR32MG) Mesh Networking Kit. For the demo you will use two main boards and two EFR32MG12 or higher radio boards. If you already have the WSTK Main Boards, you can purchase the required radio boards [here](#).
- Downloaded the latest version of Simplicity Studio and installed version 6.0.0.0 of the EmberZNet SDK, as described in *QSG106: Getting Started with EmberZNet PRO*.

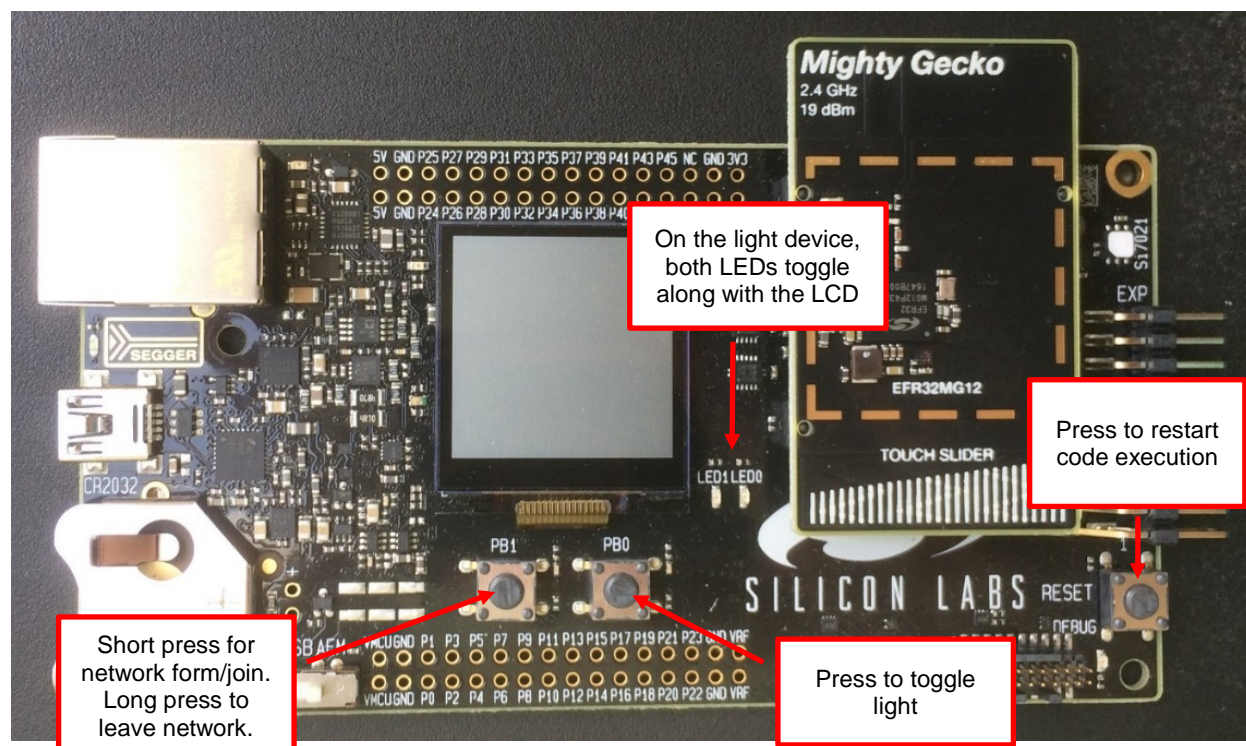
Note: This document describes using the precompiled images supplied with the EmberZNet SDK. See section **Next Steps** for information on continuing with customizing the building the source code for these demonstration images.

- Downloaded the **Wireless Gecko** Android application by Silicon Labs from Google Play onto a smartphone. **Note:** The minimum requirement for the smartphone is Android 6 (API23).

Use the support portal to contact Customer Support for any questions you might have about the demonstration. You can access the Silicon Labs support portal at <https://www.silabs.com/support> through Simplicity Studio Resources. Click the “Email-Support” link and log in with your self-registered credentials.

2 Demonstration Devices

The following features on the WSTK are used in the demo.

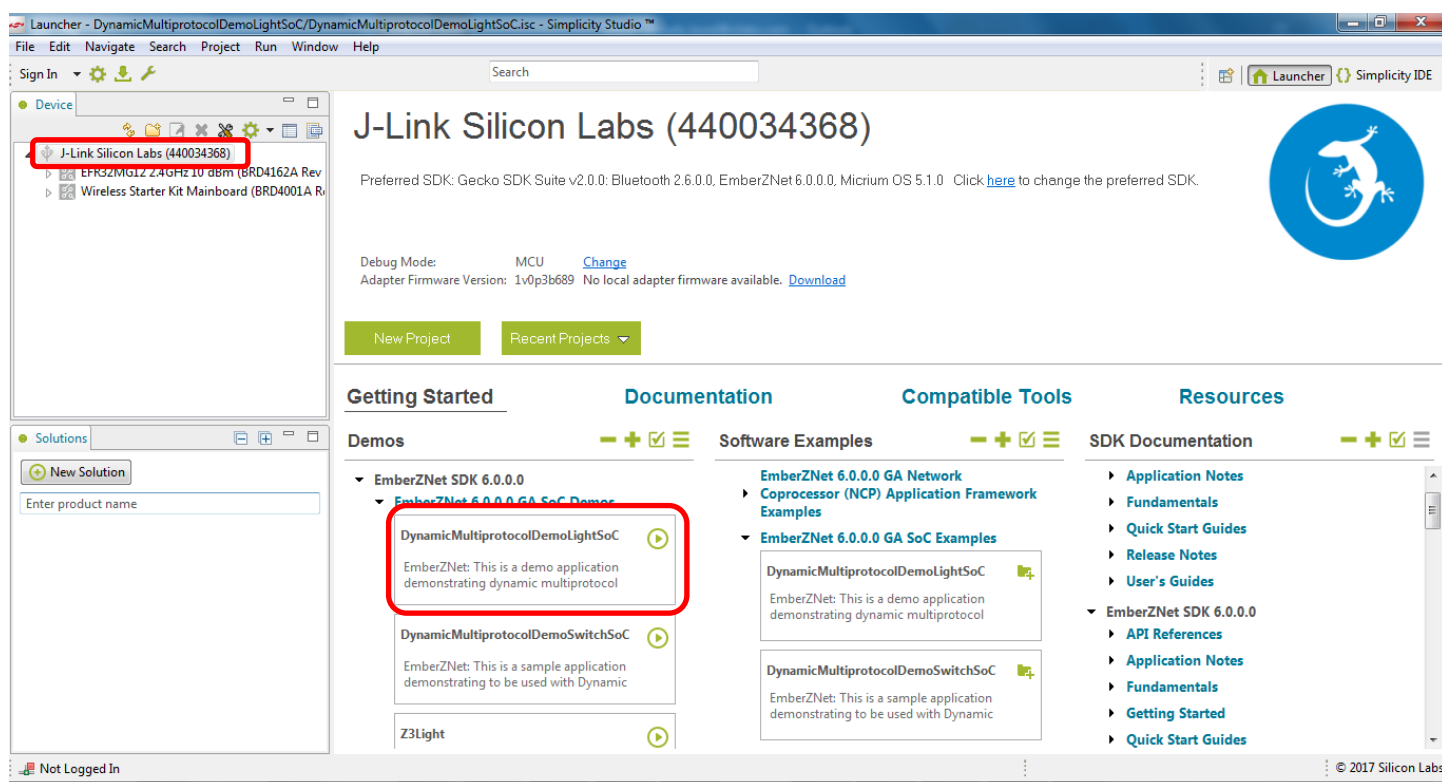


The following is a typical demo setup with two WSTKs and a smart phone.

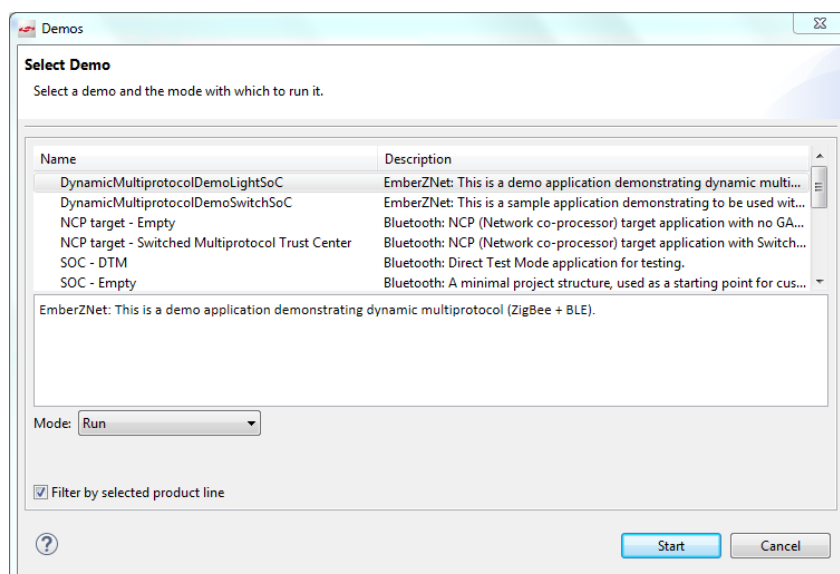


3 Install the Demonstration Applications

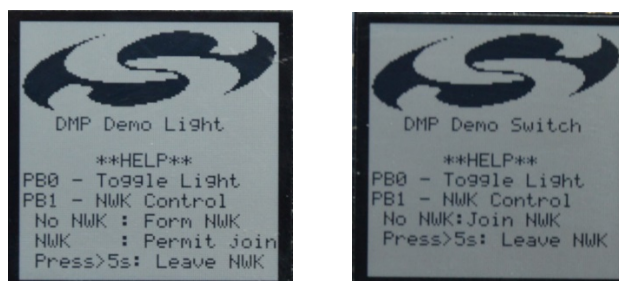
Open Simplicity Studio. To run the demo, load one device with **DynamicMultiprotocolDemoLightSoC** and one device with **DynamicMultiprotocolDemoSwitchSoC**.



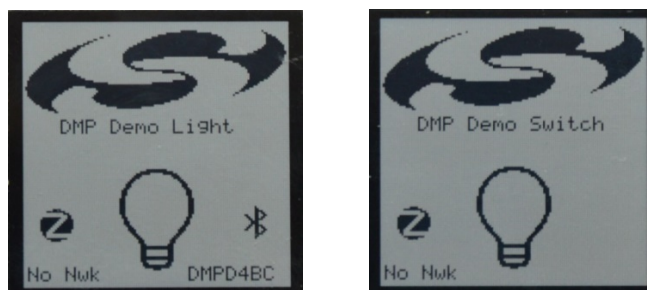
To load a demo, click a device in the Devices pane, then click the demo. The Select Demo dialog opens. In the **Mode** drop-down, select **Run**. Click **Start**. The demo software downloads automatically to the selected device.



When the applications download, they first show a help menu on the LCD, and then show the main display. The help menus are also displayed for approximately 10 seconds if you restart code execution by pressing the Reset button. Note that resetting the application breaks the Bluetooth connection between devices, if one has been formed, and interrupts communication on the Zigbee network, if one has been formed. The Help menus are:



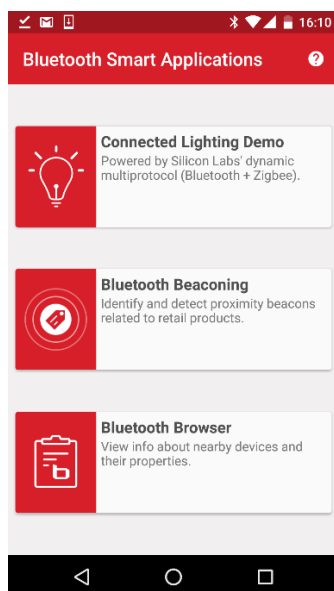
After the help menu, the LCDs show the application “Light Bulb” display.



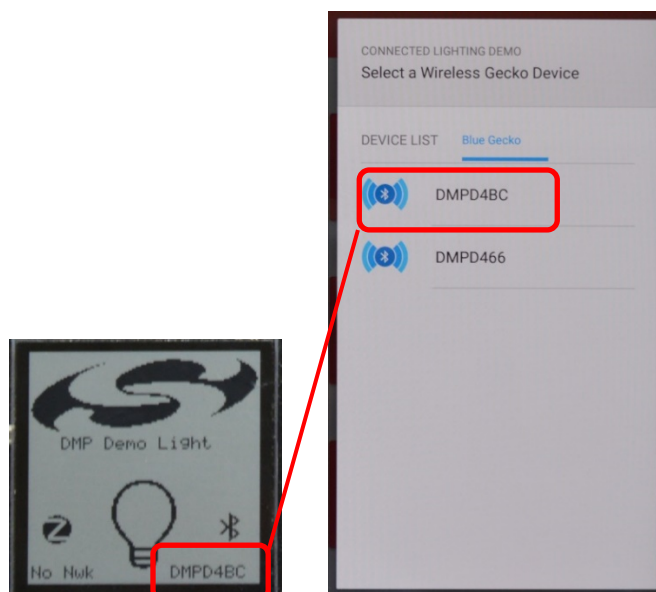
4 Use the Demonstration

4.1 With the Bluetooth Smartphone App Alone

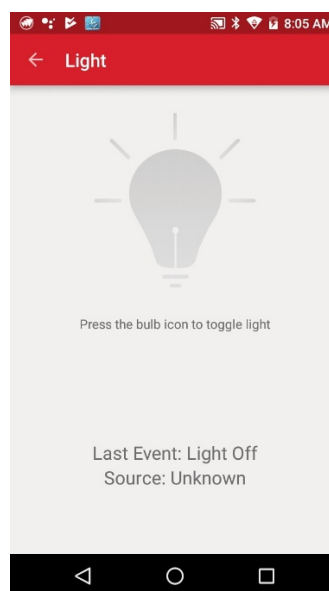
When both devices are ready, open the app and tap **Connected Lighting Demo**.



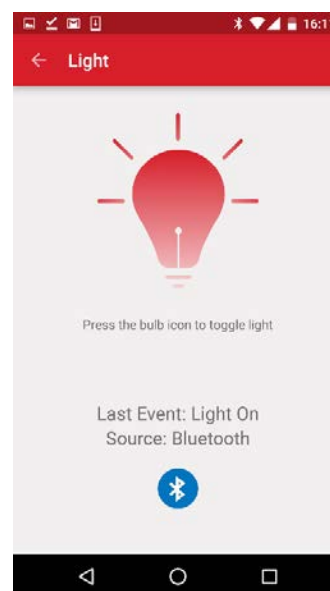
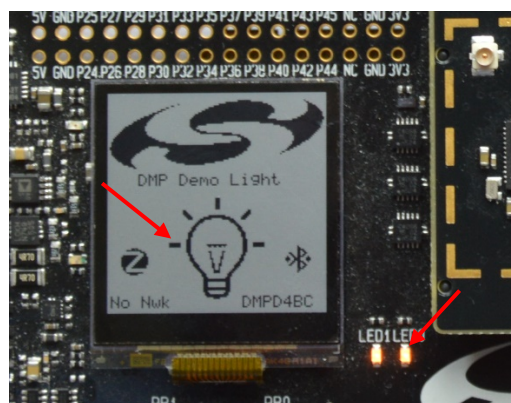
Tap the Bluetooth light device. If you see more than one, tap the one with the matching ID.



The app display changes to the Light Bulb, and the Bluetooth icon on the light's LCD changes as well, indicating a connection.



Tap the bulb icon on the smartphone app to toggle the light. The app display, the LCD display, and the LEDs all turn on. The app shows **Last Event: Light On** and **Source: Bluetooth**.



Tap again to turn the light off. The app shows **Last Event: Light Off** and **Source: Bluetooth**.

As you toggle the light with the app, an arrow is briefly displayed on the light LCD to indicate that the source of the command is Bluetooth.

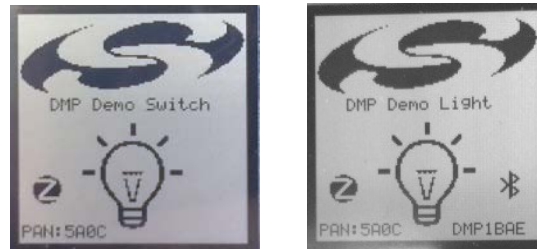


On the light device, press PB0 to toggle the light. The app display now shows **Source: Button**.

4.2 With the Zigbee Switch

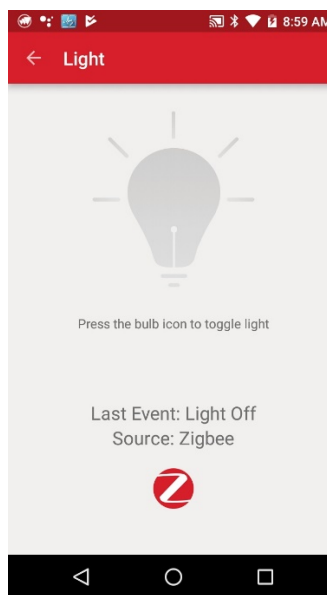
In order to operate the light from the Zigbee switch, you need to form a Zigbee network.

Press PB1 on the light WSTK. The display changes from **No Nwk** to **Forming** and then to a flashing PAN ID. While the PAN ID is flashing the light is in permit join mode. Press PB1 on the switch. The display changes to **Joining** and, after a brief delay, to the network's PAN ID.



Note: If you are in a busy environment, the switch might join to another network. Make sure the PAN IDs on both the light and the switch are the same. If not, press and hold PB1 on the switch for more than 5 seconds to take it off the network. Press PB1 on the light to put it back into permit join mode. Once the PAN ID is flashing, press PB1 on the switch.

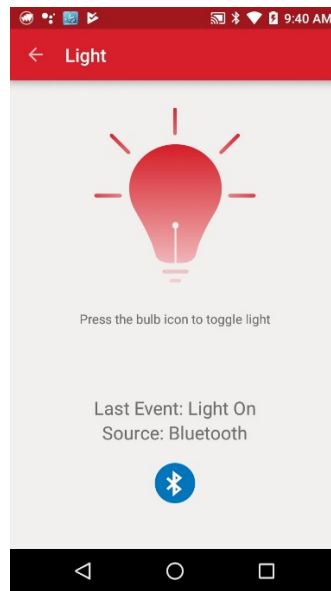
After the switch has successfully joined the network, press PB0 on the switch to toggle the light. The app shows **Source: Zigbee**.



Again, a briefly displayed arrow shows the source of the command on the Light LCD.



Now if you press the bulb icon on the app, both the light and the switch displays change.



5 Next Steps

The EmberZNet SDK contains the code used to produce these demo images. *QSG106: Getting Started with EmberZNet* describes how to generate, build, and flash example code

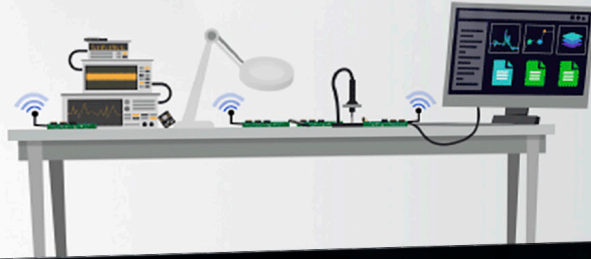
Note that you must download not only the EmberZNet SDK but also the Bluetooth SDK and the Micrium OS kernel in order to fully explore the examples. You must also install and use IAR-EWARM as your compiler.

The source code for the smartphone application is also available. Contact Technical Support if you are interested.

UG305: Dynamic Multiprotocol User's Guide contains details on the functionality underlying this demo. It also describes how the Radio Scheduler, a key component of the dynamic multiprotocol solution, works. Finally, it contains instructions on building a dynamic multiprotocol example, and how to change configuration settings to make an EmberZNet application into a dynamic multiprotocol application.

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