

Adrian Fernandez

At TI we understand that the connected technology industry is rapidly evolving and more competitive than ever. Because of this atmosphere, we are constantly looking for new ways to help developers get up and running faster, hit the market first, and deliver innovative connected applications. That's why we created [SimpleLink™ Academy](#).

SimpleLink Academy provides a comprehensive and interactive learning experience for the SimpleLink portfolio of devices covering all phases of development from getting started to advanced debug, optimization, and stack development. For each wireless technology and topic, SimpleLink Academy also provides a suggested curriculum of trainings as a guide through the development process. SimpleLink Academy makes it quick and easy to start developing your next connected application.

Each training module provides detailed background information on each topic along with interactive quizzes and coding exercises (shown in [Figure 1](#) and [Figure 2](#)). The self-paced, hands-on training approach provides a holistic view of the SimpleLink MCU platform. Developers learn how to get started and optimize solutions involving all of the supported wireless technologies. To keep up with the rapidly changing industry, SimpleLink Academy modules are updated quarterly to align with new SimpleLink SDK releases.

Through this hands-on approach to learning, users receive a more comprehensive view of the SimpleLink MCU platform and can better understand the intricacies of RTOSes, TI Driver APIs and connectivity in general.

Introduction

The purpose of this exercise is to familiarize the users with the RF driver, Code Composer Studio and SmartRF™ Studio, by importing and modifying existing RX & TX example applications.

Task 1: Send and receive packets with SmartRF Studio.

Task 2: Import and run an existing TX example with Code Composer Studio.

Task 3: Export RF settings from SmartRF Studio to Code Composer Studio example application.

Task 4: Send data from firmware, receive it using SmartRF Studio.

Task 5: Import and modify an existing RX example with Code Composer Studio.

Task 6: Send data from SmartRF Studio and receive it with the firmware.

Task 7: Test two LaunchPads with the flashed TX and RX firmware.

Figure 1. Task-based Exercises

?

Quiz

Which type of legacy advertising does not receive (RX) any packets (is transmit (TX) only)? Choose the correct answer(s).

ADV_IND

ADV_DIRECT_IND

ADV_SCAN_IND

ADV_NONCONN_IND

What information can the Common Extended Advertising Payload Format extended header contain? Choose the correct answer(s).

Whether the packet is scannable and connectable.

Tx power of the advertisement data is not part of the header.

The advertisement data

The target device (in case of directed advertisements)

Figure 2. Interactive Quizzes

Powered by TI Resource Explorer

SimpleLink Academy is delivered through [TI Resource Explorer](#), which serves as a comprehensive cloud-enabled repository of development resources for TI's embedded processing devices. SimpleLink Academy trainings are located with the corresponding SDK in Resource Explorer. Here, users will find a consolidated view of documentation, code examples, API guides, training, and more for each SimpleLink MCU. By hosting SimpleLink Academy within TI Resource Explorer, developers are able to seamlessly transition between SimpleLink Academy training modules and other resources needed to start their development. TI Resource Explorer and its contents can be accessed through both the cloud at dev.ti.com or within the Code Composer Studio™ integrated development environment (IDE). This seamless integration enables developers to easily import example projects into the IDE for further development. Additionally, by using [Code Composer Studio Cloud \(CCS Cloud\) IDE](#), developers can import code examples from Resource Explorer into the CCS Cloud IDE to begin developing and debugging without downloading any tools. SimpleLink Academy trainings will continue to grow, and [Figure 3](#) below shows an example list of training modules across various topics related Bluetooth 5.

Bluetooth 5

Labs related to using Bluetooth 5 and the BLE5-Stack. We recommend starting with the "Fundamentals" lab for a jump directly into Bluetooth® low energy and then progressing down the list of labs. If you are unfamiliar with the TI SDKs you might want to read through the lecture on RTOS Concepts and do a TI-RTOS lab first.

Lab	Description
Bluetooth Low Energy 5 Fundamentals	Setting up the debug environment, connecting to Project Zero using the Device Monitor PC tool, reading and writing characteristic data, changing the advertisement/device name
Scanning and Advertising	Tutorial on how to use the advertising and scanning features of the TI BLE-Stack with example code.
Connections	This tutorial will give you an overview of how to set up Bluetooth low energy connections suited to your needs. Explanation of key concepts such as master-slave and connection parameters.
Bluetooth 5 PHY	Learn about Bluetooth 5 PHYs - Higher throughput with 2 Mbps PHY compared to Legacy 1 Mbps PHY or increase range with Coded PHY.
Custom Profile	Explanation of the GATT and ATT protocols that Bluetooth Low Energy data exchange is based on, a walk-through of how to implement a custom Bluetooth service using the APIs provided in the TI BLE SDK, and a basic code generator for custom services

Figure 3. Growing List of Training Modules across Various Topics

Growing Collection of Trainings

Right now the below topics and many more are currently available online:

- **Out of the Box:** Step-by-step guide to getting started with your new SimpleLink LaunchPad development kit
- **TI Drivers:** Use, configure and develop with TI Drivers, a set of standardized functional APIs available in the SimpleLink software development kit (SDK) for your SimpleLink MCU.
- **TI-RTOS:** Learn RTOS basics, develop multi-threaded applications using TI-RTOS, and utilize POSIX in your applications
- **FreeRTOS:** Get up and running with FreeRTOS
- **Wi-Fi®:** Add Wi-Fi connectivity to your next project
- **Bluetooth Low Energy:** Create custom profiles and exchange data with other Bluetooth low energy and Bluetooth 5 enabled products

-
- **Proprietary RF:** Develop Sub-1 GHz RF-based multi-node applications
 - **Zigbee, Open Thread, and TI 15.4-Stack:** Develop connected applications using industry-standard wireless protocols
 - **Tools and Debugging:** Learn about the tools available to ease development with TI SimpleLink MCUs, like SysConfig and ImageCreator
 - **DMM:** Get started with the Dynamic Multi-protocol Manager (DMM), which allows multiple wireless stacks to coexist and operate concurrently on a single radio on a CC13x2 or CC26x2 device

To get started on SimpleLink Academy today, be sure to visit: www.ti.com/simplelinkacademy. To learn more about the SimpleLink MCU platform, check out www.ti.com/simplelink.

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#) or other applicable terms available either on [ti.com](https://www.ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2023, Texas Instruments Incorporated