# Si102x/Si103x WIRELESS MCU QUICK-START GUIDE

## 1. Introduction

This application note will help you get a quick start on demonstration, evaluation, or code development with the Si102x/3x products.

### 1.1. Choose between Evaluation, Demonstration, or Code Development

- **Evaluate the radio performance or experiment with register settings:**

1. Install one UDP Si102x/3x UPPI Pico Board on the provided MCU card. The white triangles on the boards should line up.
2. (Optional) Install the MCU card on the UDP motherboard.
3. Download the demonstration host firmware to the Si102x/3x MCU.
4. Install WDS and connect.
5. More information on WDS can be found at the link in "1.3. Wireless Development Suite (WDS)" on page 2.
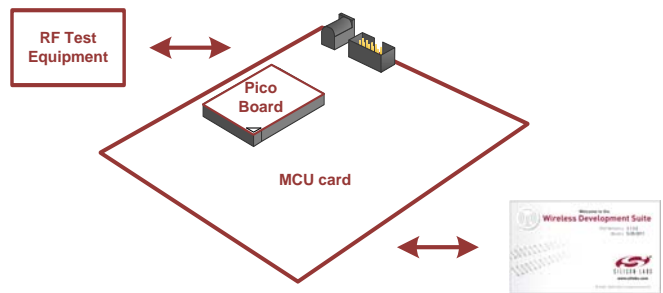


- **Compile and Download RF demonstration firmware:**

1. Install one UDP Si102x/3x UPPI Pico Board on the provided MCU card. The white triangles on the boards should line up.
2. (Optional) Install the MCU card on the UDP motherboard.
3. Install the Silicon Labs Integrated Development Environment (IDE).
4. Install an evaluation version of a C compiler.
5. Open→modify→build→download→go.
6. Skip to "1.4. Code Development" on page 3.
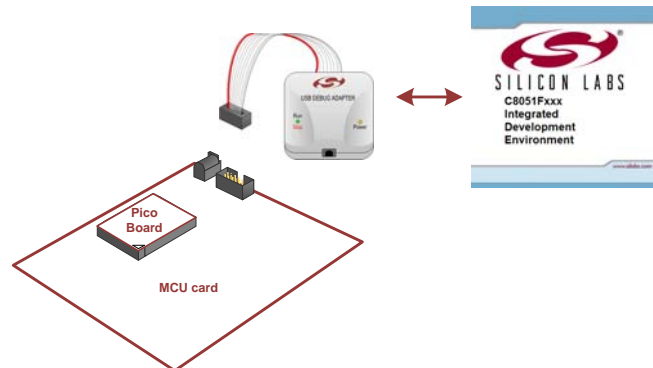
# Si102x/3x QSG

## 1.2. Kit Contents

The kit contents for the two types of Si102x/3x development kits are listed below:
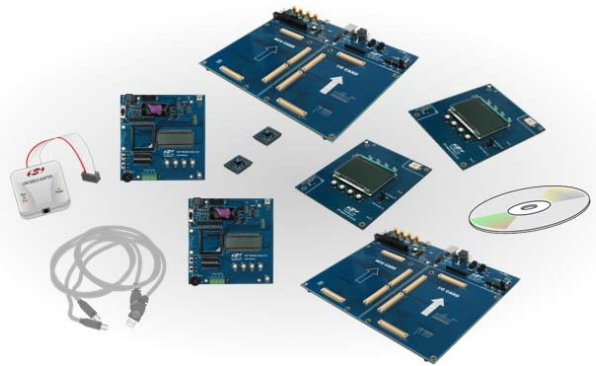
**Software Development Kit**

- 2 Si102x/3x UPPI Pico Boards.
- 2 UDP MCU cards.
- 2 antennas.
- 2 Lithium batteries.
- Silicon Laboratories USB Debug Adapter.
- Supporting cables.
- Development Kit CD.
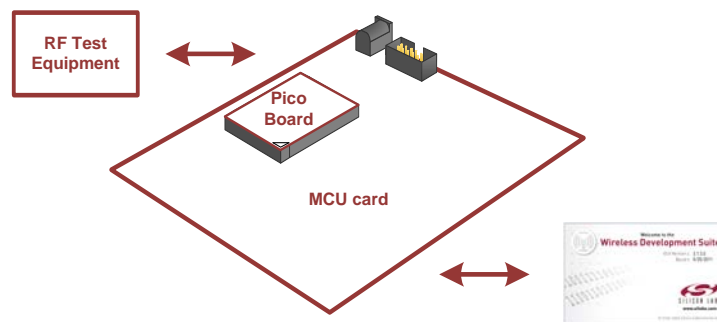- Si102x/3x Quick Start Guide (this document).

**Wireless Development Kit**

- 2 Si102x/3x UPPI Pico Boards.
- 2 UDP MCU cards.
- 2 antennas.
- 2 Lithium batteries.
- 2 UDP Motherboards.
- 2 I/O cards.
- Silicon Laboratories USB Debug Adapter.
- Supporting cables.
- Development Kit CD.
- Si102x/3x Quick Start Guide (this document).

## 1.3. Wireless Development Suite (WDS)



Using the WDS Chip Configurator software is the best way to evaluate the RF performance in the lab with a PC in various configurations. The WDS GUI provides a convenient way to run configuration scripts and to change the radio settings bit-by-bit.

The WDS GUI can be found on the Silicon Laboratories website: www.silabs.com/wds.

## 1.4. Code Development
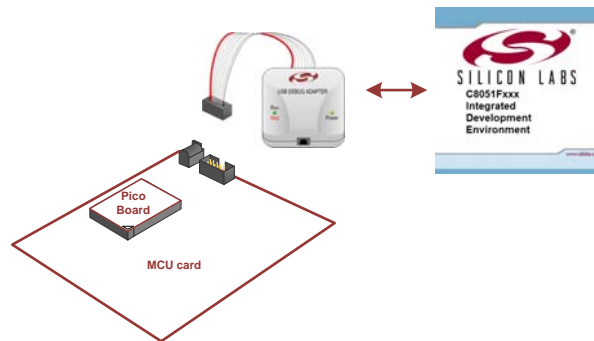


A number of RF programming examples are included with the standard Silicon Laboratories IDE installation. This section will describe how to start building and running one of these examples.

### 1.4.1. Running the TX Spectrum Example

1. Install the Silicon Labs IDE software. Use the included CD or download from www.silabs.com.
2. Install a C compiler. This example uses SDCC. A list of compiler links is available on the Silicon Laboratories website: http://www.silabs.com/products/mcu/Pages/DevelopmentTools.aspx
3. Connect the USB Debug Adapter to your computer.
4. Install a Si102x/3x 915 MHz radio card on the provided MCU card.
5. (Optional) Install the MCU card on the UDP motherboard.
6. Move the MCU card SW5 VBAT switch to the middle VREG position.
7. Move the MCU card SW7 VIO switch to the upper VBAT position.
8. Move the MCU card SW12 VIORF switch to the upper VBAT position.
9. Connect the USB Debug Adapter ribbon cable to J13 on the MCU card.
10. Connect power.
11. Launch the Silicon Labs IDE software: All Programs→Silicon Laboratories→Silicon Laboratories IDE.
12. Select the SDCC compiler.
    a. Project →Tool Chain Integration …
    b. Select the SDCC preset.
    c. Click OK.

13. Establish a connection to the Si102x/3x device: Debug→Connect.
14. Open the Si102xx_TxSpectrum.c file.
    (path: C:\SiLabs\MCU\Examples\Si102x_3x\EZRadioPRO\TxSpectrum\Si102x_3x_TxSpectrum.c).
15. Ensure the correct Pico board is selected as a target at the top of the file.
16. Change the frequency to 913 MHz in the setTRxFrequency() function call in main.
17. Fine-tune the EVB's crystal frequency. Scroll down to the RadioInit() function and add a phyWrite() command:
18. Build the project and download the the device:
    a. Press ctrl-shift-F7 to compile and build.
    b. Press the [DL↓] Icon to download.
    c. Ensure Download Successful appears in the Output Window at the bottom of the IDE.
19. Run the code by pressing F5.
20. Connect a spectrum analyzer to the antenna port and verify the modulated spectrum.
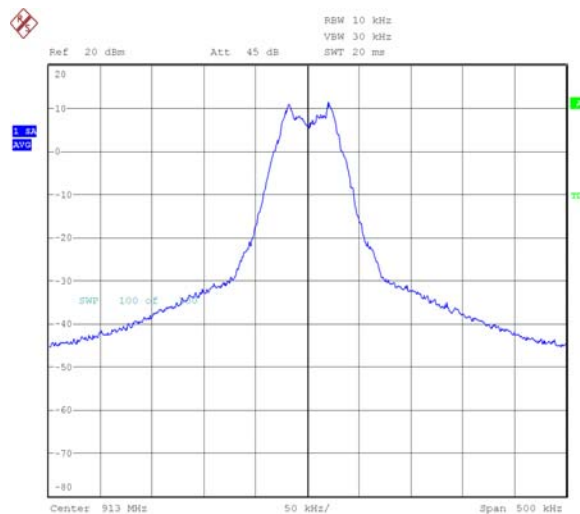


## 1.4.2. General Silicon Laboratories IDE Code Download Procedure

1. Install the Silicon Labs IDE software. Use the included CD or download from www.silabs.com.
2. Connect the USB Debug Adapter to your computer.
3. Plug the UPPI Pico Board in to the UDP MCU card.
4. (Optional) Install the MCU card on the UDP motherboard.
5. Move the MCU card SW5 VBAT switch to the middle VREG position.
6. Move the MCU card SW7 VIO switch to the upper VBAT position.
7. Move the MCU card SW12 VIORF switch to the upper VBAT position.
8. Connect the USB Debug Adapter ribbon cable to J13 on the MCU card.
9. Connect power.
10. Launch the Silicon Labs IDE software: All Programs → Silicon Laboratories -> Silicon Laboratories IDE.
11. Establish a connection to the Si102x/3x device: Debug → Connect.
12. Select the hex file to download: Debug → Download Object File. Choose the file, then select Download to initiate the programming.
13. Verify the successful download.
14. Disconnect the connection from IDE to Si102x/3x device: Debug → Disconnect.
15. Disconnect the USB Debug Adapter ribbon cable.
16. Reset by cycling the power.

# 2. For More Information

**Device data sheets**

■ Si102x/Si103x

**Evaluation board information**

■ UDP Motherboard, MCU card, Pico Board, and I/O card User's Guides (www.silabs.com/udp)
■ RF card schematics and PCB layout (www.silabs.com)

**Register information, programming guides, and examples**

■ AN440: Si4430/31/32 Register Descriptions
■ AN415: EZRadioPRO® Programming Guide
■ AN417: Si4x3x Family Crystal Oscillators
■ Si102x/Si103x MCU Example Code (included as part of the IDE installer)

**Lab testing and evaluation**

■ AN439: EZRadioPRO® RF Testing Quick-Start Guide
■ AN437: Si4432 RF Performance and FCC Compliance Test Results
■ AN445: Si4431 RF Performance and ETSI Compliance Test Results
■ AN459: Measurement Results for Si4430-B and 950 MHz ARIB STD-T96 Compliance

**Design**

■ AN435: Si4032/4432 PA Matching
■ AN436: Si4030/4031/4430/4431 PA Matching
■ AN463: Raw Data Mode with EZRadioPRO®

# 3. Contact Information

Please visit the Silicon Labs Technical Support web page:
https://www.silabs.com/support/pages/contacttechnicalsupport.aspx
and register to submit a technical support request.

## Simplicity Studio

One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!

**IoT Portfolio**
*www.silabs.com/IoT*

**SW/HW**
*www.silabs.com/simplicity*

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