UG271: CP2615-EK User's Guide

The CP2615 device is designed to enable rapid development of USB-based audio applications.

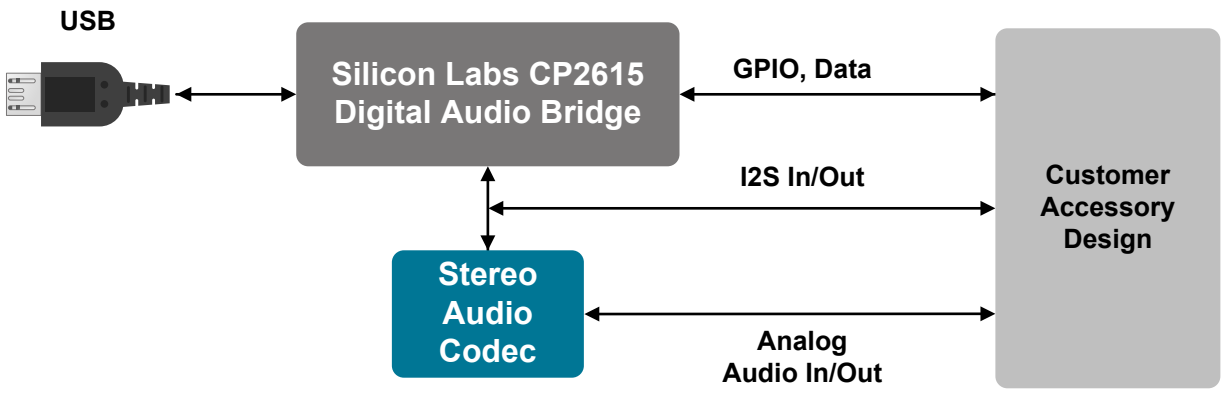
The CP2615 simplifies the process of transferring audio data from USB to I2S without any code development, speeding time to market for USB audio accessories such as USB speakers, USB headphones and USB music boxes, as well as VoIP systems. The CP2615 includes a USB 2.0 full-speed function controller, USB transceiver, oscillator, I2S (audio) interface, I2C (control) interface and UART interface in a compact 5 x 5 mm QFN-32 package ideal for space-constrained portable audio applications.

The CP2615-EK kit includes the following:

- CP2615 Audio Bridge evaluation board
- 1 x Micro USB OTG adapter
- 1 x USB Type-C to USB-A adapter
- 1 x mini USB cable
- 1 x micro USB cable
- Quick-Start Card

KEY FEATURES

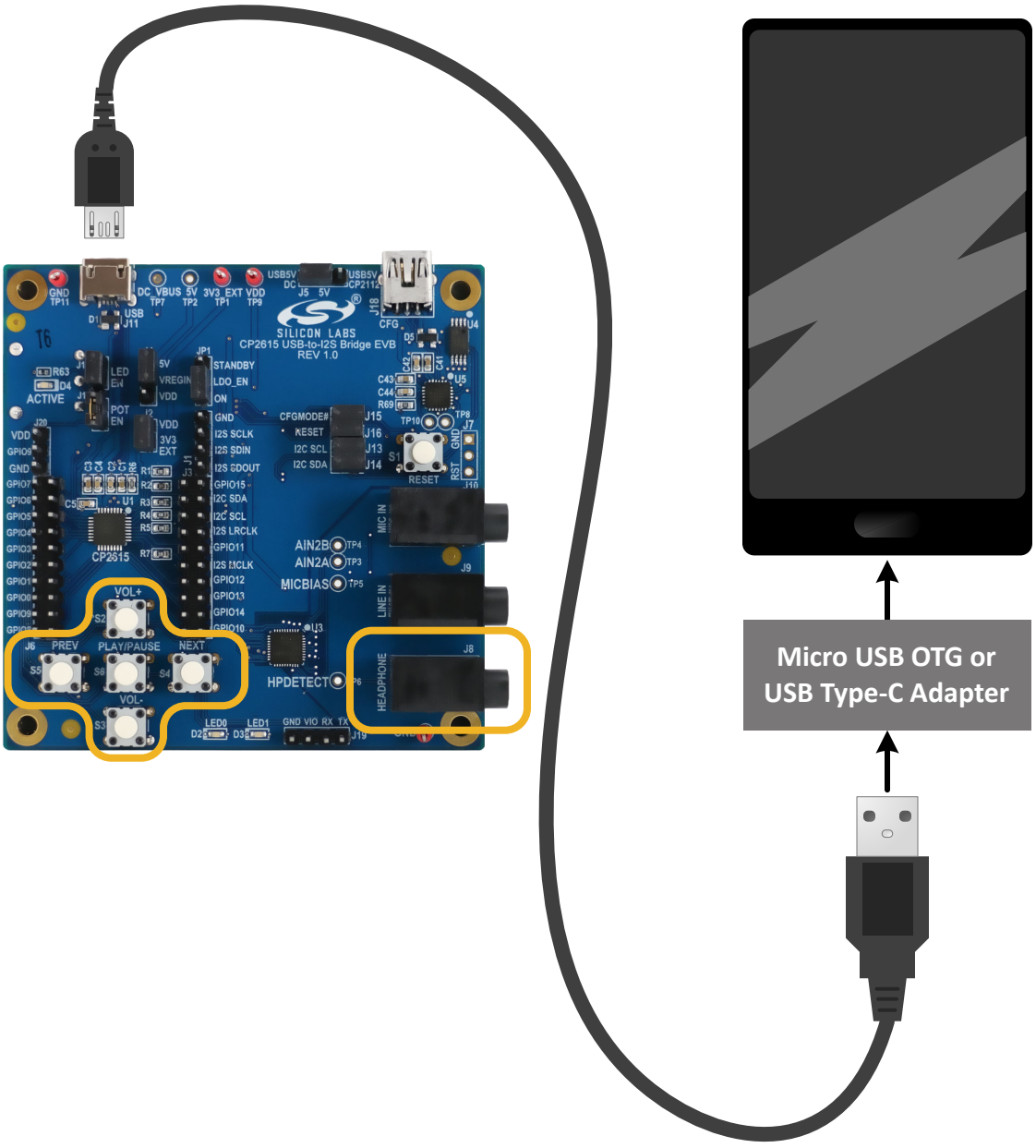
- USB Audio class 1.0
- Supports USB HID Consumer Controls for Volume and Mute Synchronization
- Includes USB-UART bridge function
- Supports 48 kHz,16-bit/ 24-bit stereo digital audio
- Integrated USB transceiver; no external resistors required
- Integrated clock; no external crystal required
- On-chip voltage regulator: 3.45 V output
- Self-powered or Bus-powered
- No firmware development



1. Getting Started

To start developing with the CP2615-EK Kit:

1. Connect the USB micro cable to [**J11**] of the CP2615 board. Depending on the type of receptable on your phone, attach either the micro OTG adapter or the USB Type-C adapter to the other end of the USB cable. Then connect the other end of the adapter to your Android phone.



Micro OTG Adapter Cable

USB Type-C Adapter Cable

2. Connect headphones to [**J8**] of the CP2615 board and use your favorite Android audio application to play music.
3. Use the buttons to control volume, play and pause the music, and skip to the next track or back to the previous track.

2. Hardware Overview

The CP2615-EK board enables audio development. The figures below provide an overview of the board and the simplified board block diagram. Full schematics for the board can be found in the Schematics section.

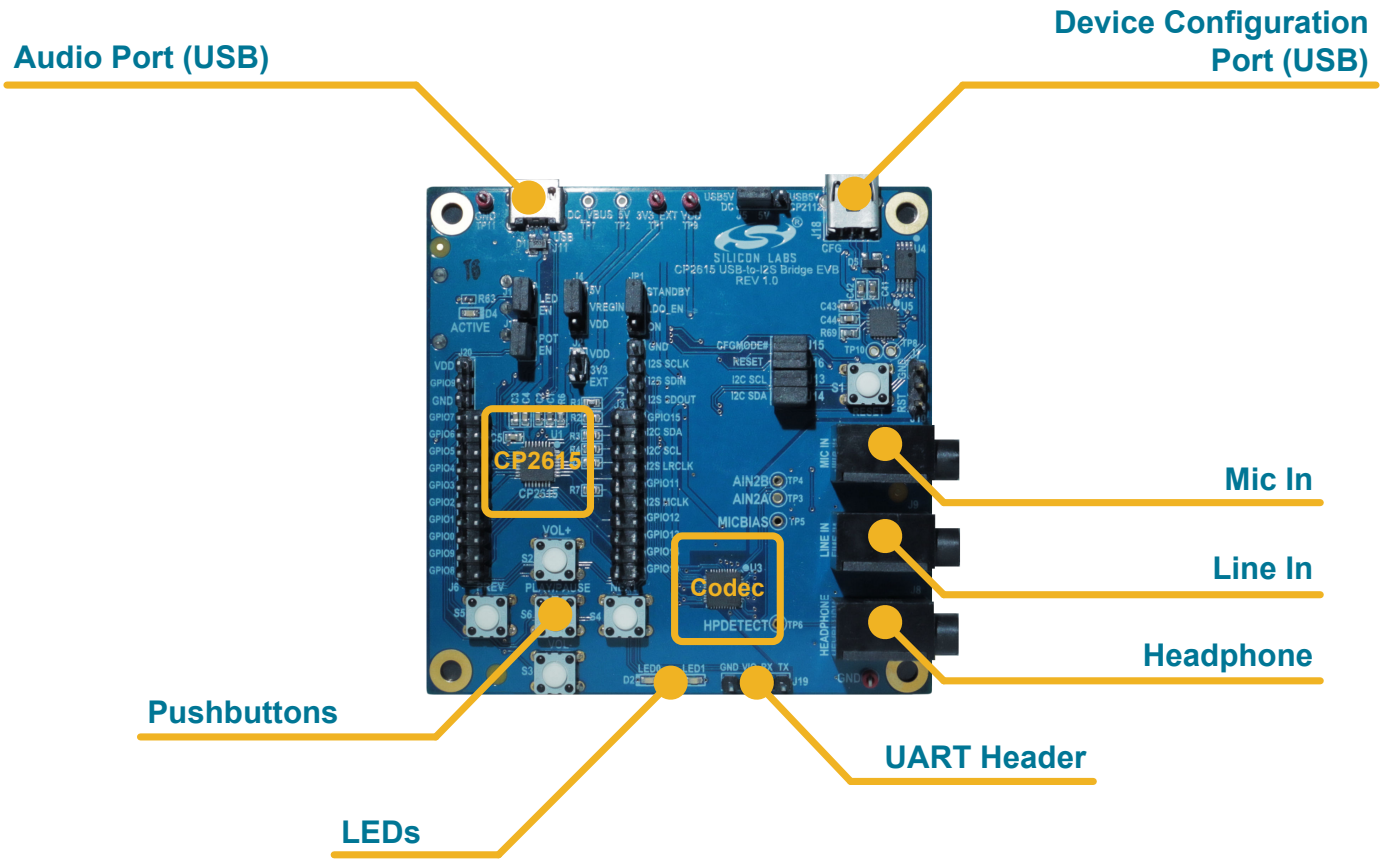
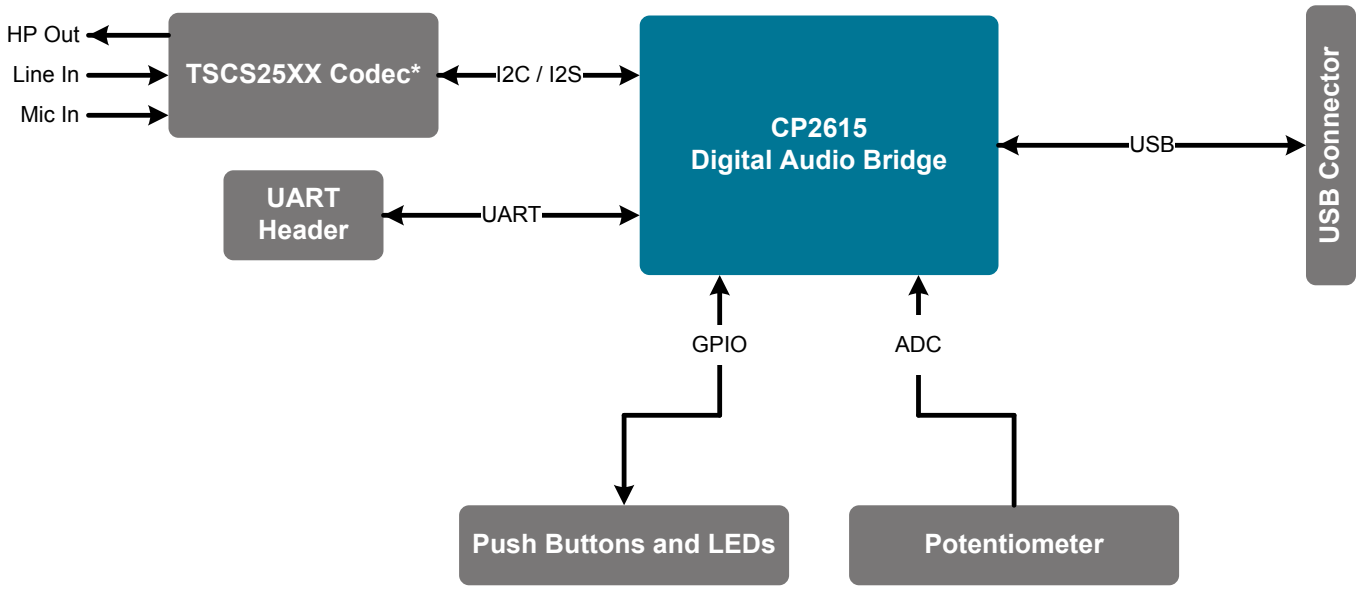


Figure 2.1. CP2615-EK Digital Audio Evaluation Kit



* Other codec solutions are supported.

Figure 2.2. CP2615-EK Digital Audio Evaluation Kit—Simplified Board Block Diagram

2.1 Power Selection Jumpers

The CP2615-EK supports USB bus-powered or self-powered configurations based on jumper settings. In USB bus-powered mode, the CP2615-EK is powered by VBUS from the Audio USB connector (J11). In self-powered mode, the CP2615-EK is powered from either the Configuration USB connector (J18) or from an external supply.

Table 2.1. USB Bus-Powered Configuration

Header	Position
J5	USB5V/DC (left)
J4	5V – VREGIN (top)
J2	Open (not installed)

Table 2.2. Self-Powered Configuration

Header	Position
J5	Open (not installed)
J4	VREGIN – VDD (bottom)
J2	Installed
TP1	Apply external 3.3 V

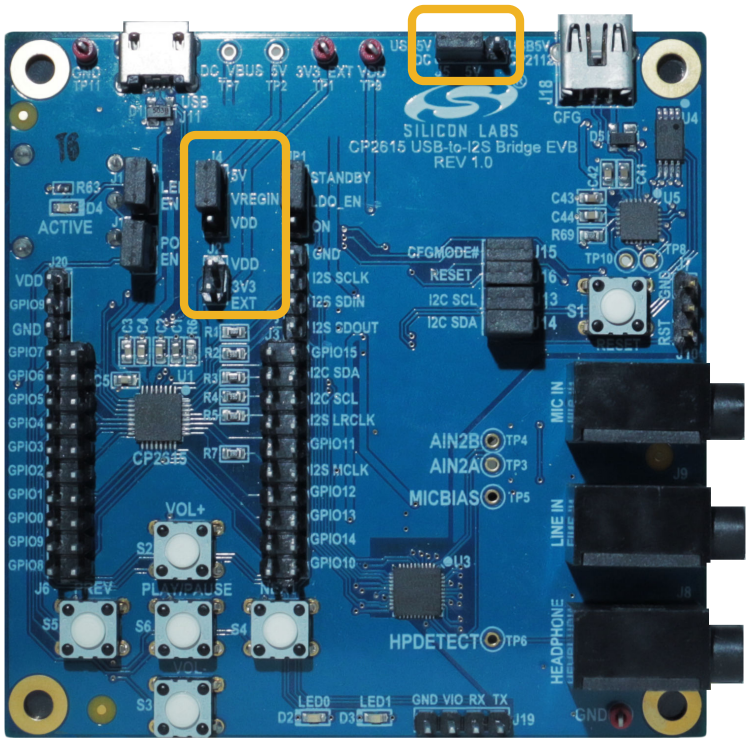


Figure 2.3. Power Jumpers

2.2 CP2615 Configuration Jumpers

The CP2615-EK includes a CP2112 and a set of jumpers that are used to configure the CP2615 device over the I2C bus.

Table 2.3. CP2615 Configuration Jumpers

Header	Description
J15	Connects CP2112 pin GPIO.0/TXT to the CP2615 CFGMODEb pin
J16	Connects CP2112 pin GPIO.1/RXT to the CP2615 RSTb pin
J13	Connects CP2112 SCL pin to the I2C_SCL net and CP2615 I2C SCL pin
J14	Connects CP2112 SDA pin to the I2C_SDA net and CP2615 I2C SDA pin

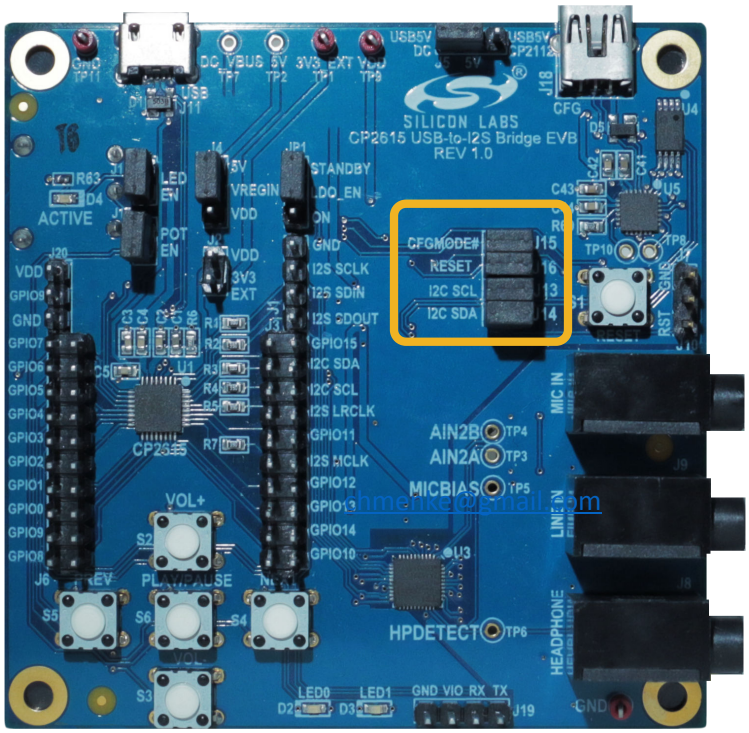


Figure 2.4. CP2615 Configuration Jumpers

2.3 Other Jumpers

The remaining jumpers on the boards disconnect peripherals like the potentiometer. All I/O also connect to the CP2615 through a zero-Ω resistor to isolate I/O from the board functions and enable development with application-specific hardware.

Table 2.4. Other Jumpers

Header	Description
J12	Connects the ACTIVE LED (D4) to CP2615 pin GPIO.2
J17	Connects the potentiometer (R63) to CP2615 pin GPIO.8/VBUS_SENSE/ADC
J19	UART Connector
JP1	Codec regulator enable selection. This is either controlled by the CP2615 or always on.

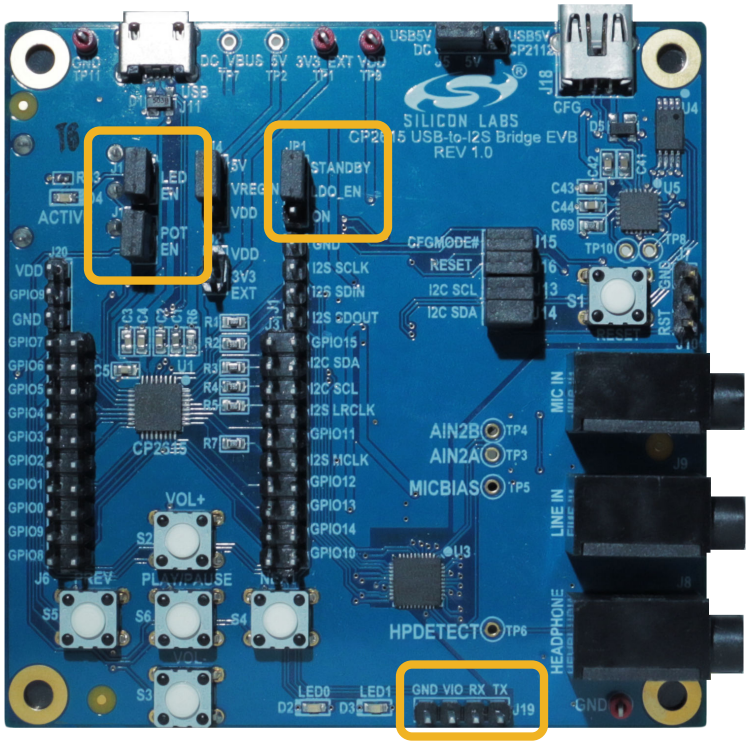


Figure 2.5. Other Jumpers

3. Device Customization

The CP2615 has several configurable options. The application note, *AN1044: CP2615 Customization Utility User Guide*, describes the configuration options in detail and how to use Xpress Configurator in Simplicity Studio (www.silabs.com/simplicity) to configure a CP2615 device. Once testing and development are complete, Silicon Labs offers CP2615 pre-programming services. Contact your local sales representative for more information.

Note: The following shorting blocks need to be installed to program a device using Xpress Configurator:

- J15 — CFGMODE#
- J16 — RESET
- J13 — I2C SCL
- J14 — I2C SDA

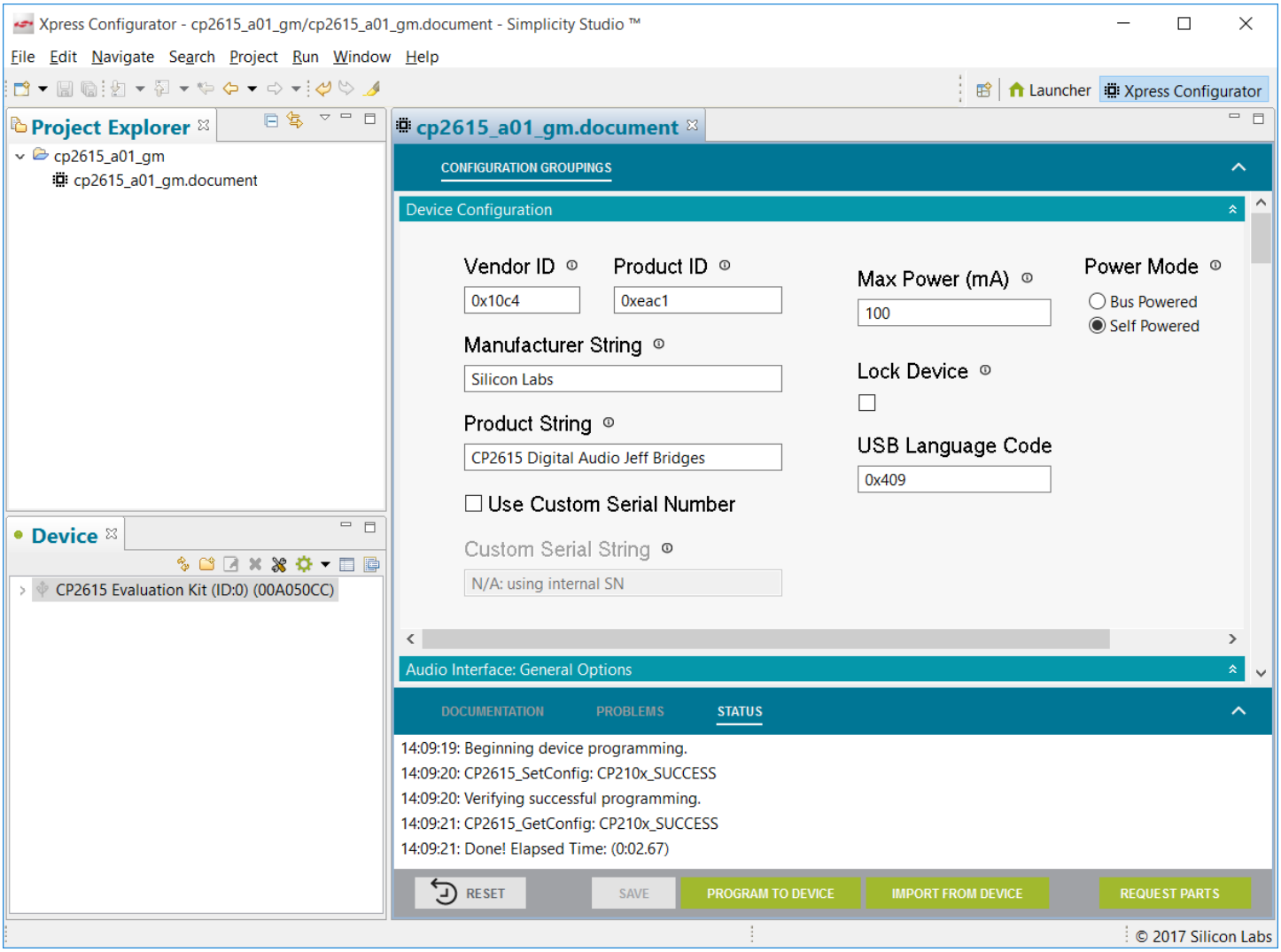


Figure 3.1. Xpress Configurator

4. Schematics and Bill of Materials

The schematics and bill of materials (BOM) for the CP2615-EK board are available through Simplicity Studio (www.silabs.com/simplicity) when the kit documentation package has been installed.

5. Board Revision History

- 1.0 — Initial production revision.

1.0 Revision Boards

The left and right audio channels are reversed on this revision of the board. There is a codec setting that can swap the channels to the correct order, but the default board configuration will be incorrect. For more information on how to update the board configuration setting for an affected board, see the following Knowledge Base article:

http://community.silabs.com/t5/Interface-Knowledge-Base/LEFT-and-RIGHT-CODEC-Channels-Reversed-on-the-CP2615-USB-to-I2S/ta-p/197919

This issue will be corrected in the next revision.

6. Revision History

6.1 Revision 0.2

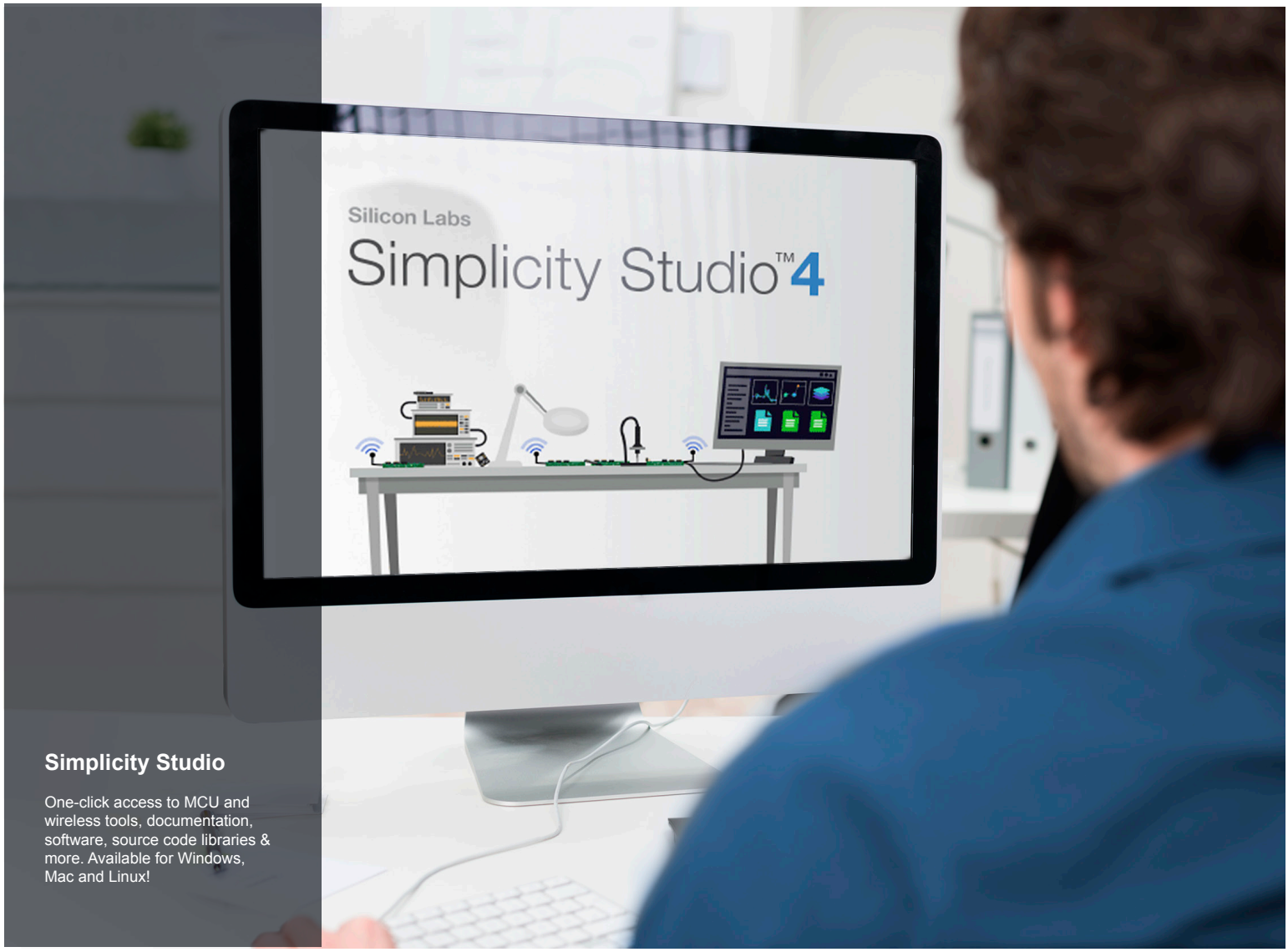
May 5, 2017

Added 5. Board Revision History.

6.2 Revision 0.1

April 12, 2017

Initial release.



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