



Cypress EZ-USB® FX3™ SDK

Firmware Sources – User Guide

Version 1.3.4

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1 FX3 Firmware Sources



The FX3 SDK includes the FX3/FX3S/CX3/SD3/FX2G2 firmware libraries and example firmware applications which can be used with the EZ-USB FX3 DVK, along with documentation on the firmware API and the programming model.

Cypress provides the sources for almost all of the SDK firmware. The only code that is excluded in this package is:

1. Sources for the ThreadX operating system. Cypress uses version 5.1 of the ThreadX Operating System, and is not licensed to release the OS sources. Please contact Express Logic, Inc (<http://www.rtos.com>) to obtain the ThreadX sources.
2. Source for a small set of FX3 device and USB configuration API. These APIs cover functionality that corresponds to Cypress's protected IP, and are restricted for security reasons.
3. Source for the Aptina and OmniVision sensor initialization, that is used in the CX3 firmware examples. This code is restricted and can only be provided under NDA from the image sensor vendor.

This version of the firmware sources corresponds to the 1.3.3 release of the FX3 SDK, and includes support for the FX3, FX2G2, FX3S and CX3 devices.

The firmware can be compiled with the ARM RealView Compilation Tools (RVCT) tool-chain or the Sourcery G++ Lite tool-chain that is provided with the FX3 SDK.

Cypress uses the RVCT tool-chain to build the libraries released in the SDK. Using the Sourcery G++ Lite tool-chain will result in slightly poorer performance and application code size.

1.1 Using the Firmware Sources

The firmware sources are provided in the form of a ZIP archive called `fx3_sdk_1_3_4_src.zip` which is located under the `<SDK INSTALL ROOT>/firmware` folder. The ZIP archive contains sources for both firmware libraries (RTOS based and boot library) as well as build scripts for both of them.

Extract the ZIP file to a preferred location. We recommend that you choose a location outside the "Program Files" folder.

Cypress uses a GNU make based command line build mechanism to compile the sources into library form. You will need to have GNU make version 3.8 or later, as well as standard GNU utilities such as the BASH shell, sed, grep, cut etc. to use these build scripts. You can get these utilities on Windows by installing the Cygwin DLL along with the BASH shell, GNU coreutils and GNU make.

1.2 Directory Structure

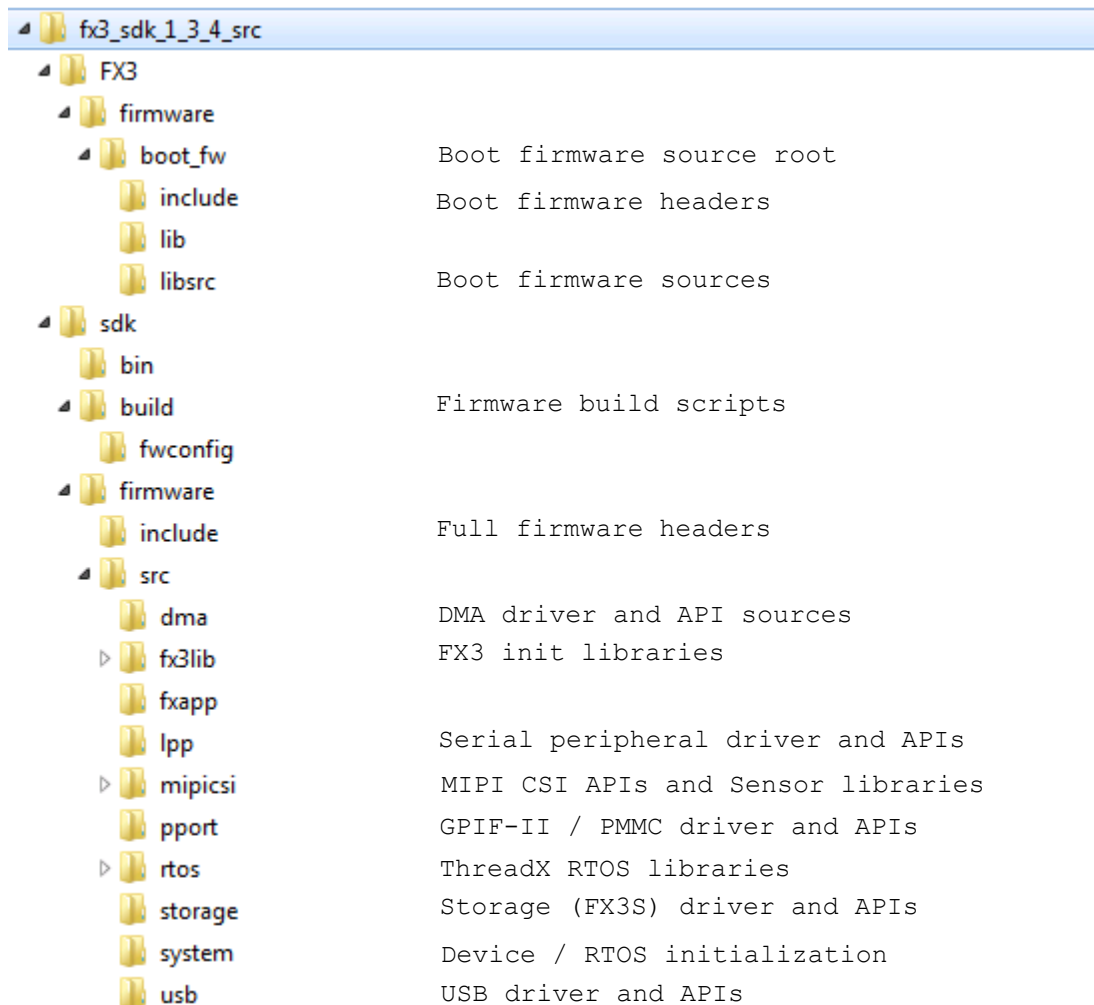


Figure 1: FX3 Source Directory Structure

Figure 1 shows the directory structure of the firmware sources in this package. The package includes the header files, source files and the GNU make scripts used for compiling the libraries.

The FX3 Mini library (sdk/firmware/src/fx3lib) contains libraries that encapsulate a small set of API which are defined in the sdk/firmware/include/cyfx3_api.h header file. These APIs are used by the rest of the firmware sources, and are not expected to be called directly by user code. This mini library is used by the boot firmware sources as well as by the full firmware sources.

The sources for the boot firmware (2-stage boot) are located under the FX3/firmware/boot_fw/include and FX3/firmware/boot_fw/libsrc folders.

The sources for the full FX3 firmware are located under the sdk/firmware/include and sdk/firmware/src folders.

1.3 Build Instructions

1.3.1 Pre-requisites

1. Sourcery G++ Lite Tool-chain for ARM processors. This is part of the FX3 SDK release which can be obtained from <http://www.cypress.com/?rID=57990>
2. GNU Make version 3.8 or later
3. Cygwin or similar shell environment with GNU coreutils package included.

1.3.2 Building the Boot Firmware Library

1. Change to the FX3/boot_fw/libsrc directory
2. Invoke “make” to build the library.
 - a. Use “make CYTOOLCHAIN=armcc” to compile with the RVCT tool-chain. The Sourcery G++ Lite tool-chain is used by default.

Note: When changing tool-chains, please make sure that you execute “make clean” to get rid of any stale object files.

3. The cyfx3_boot.a library file can be found in the FX3/boot_fw/lib directory at the end of the build.

1.3.3 Building the FX3 Firmware Libraries

1. Change to the sdk/firmware/src folder.
2. Invoke “make CYCONFIG=fx3_debug” or “make CYCONFIG=fx3_release” to build the firmware libraries (debug or release version).
 - a. Add “CYTOOLCHAIN=armcc” to the make command line to build using the ARM RVCT tool-chain. The Sourcery G++ Lite tool-chain is used by default.
e.g.: make CYCONFIG=fx3_release CYTOOLCHAIN=armcc

Note: When changing tool-chains, please make sure that you execute “make CYCONFIG=<cfg> clean” to get rid of any stale object files.

3. The output libraries (cyu3threadx.a, cyfxapi.a, cyu3lpp.a, cyu3mipicsi, cyu3sport.a, cy_as0260.a and cy_ov5640.a) can be found in the sdk/bin/fw/fx3_debug (or sdk/bin/fw/fx3_release) folder at the end of the build.