



Cypress FX3™ SDK

Firmware Sources - Readme

Version 1.3.1

Cypress Semiconductor
198 Champion Court
San Jose, CA 95134-1709
Phone (USA): 800.858.1810
Phone (Intl): 408.943.2600
<http://www.cypress.com>

Copyrights

Copyright © 2013 Cypress Semiconductor Corporation. All rights reserved.

FX3 and FX3S are the trademarks of Cypress Semiconductor. All other trademarks or registered trademarks referenced herein are the property of their respective owners.

The information in this document is subject to change without notice and should not be construed as a commitment by Cypress. While reasonable precautions have been taken, Cypress assumes no responsibility for any errors that may appear in this document. No part of this document may be copied or reproduced in any form or by any means without the prior written consent of Cypress. Made in the U.S.A.

Disclaimer

CYPRESS MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Cypress reserves the right to make changes without further notice to the materials described herein. Cypress does not assume any liability arising out of the application or use of any product or circuit described herein. Cypress does not authorize its products for use as critical components in life-support systems where a malfunction or failure may reasonably be expected to result in significant injury to the user. The inclusion of Cypress' product in a life-support systems application implies that the manufacturer assumes all risk of such use and in doing so indemnifies Cypress against all charges.

License Agreement

Please read the license agreement during installation.

1 FX3 Firmware Sources

The FX3 SDK includes the FX3/FX3S 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 significant portions 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.

This version of the firmware sources correspond to the 1.3.1 version of the FX3 SDK, and include support for the FX3S device.

Note: Sources for the CX3 device libraries are not included in this package. They will be made available at a later stage along with the CX3 programming documentation.

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 Directory Structure

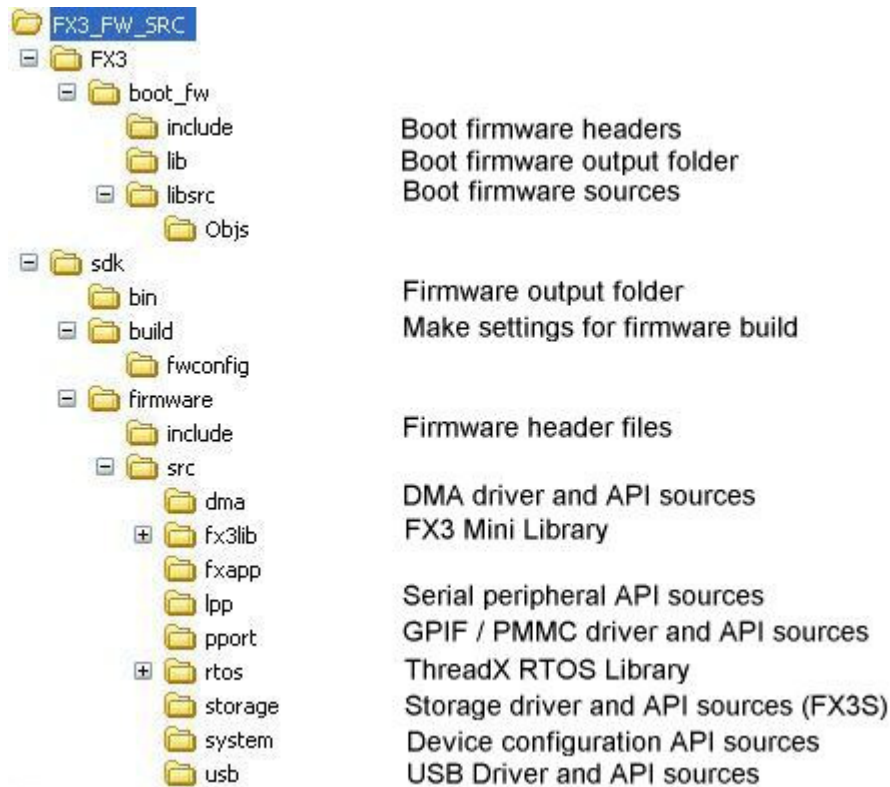


Figure 1: FX3 Source Directory Structure

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/boot_fw/include and FX3/boot_fw/libsrc folders.

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

1.2 Build Instructions

1.2.1 Pre-requisites

1. Source 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

1.2.2 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.

1.2.3 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 and cyu3sport.a) can be found in the sdk/bin/fw/fx3_debug (or sdk/bin/fw/fx3_release) folder at the end of the build.

1.3 Known Issues

1. When using the Sourcery G++ Lite tool-chain, the optimization level for the fx3_release configuration is set to “-O1”. Setting the optimization level to “-O2” or “-O3” may cause the compiler to generate incorrect register access code.
2. Some changes are required to the fx3.ld linker script from the FX3 SDK release, when linking against libraries built from this source package. These changes are required due to the change in tool-chain used to build the libraries, and involve placing a subset of the ThreadX functions in the I-TCM region. The updated linker scripts are available in the **sdk/build** folder of the source package.

These ld files should be copied into the firmware/common folder under the SDK installation before building the FX3 firmware applications.