Intel® Firmware Engine Quick Start Guide
Version 4.0.1 – March 2018

The Intel® Firmware Engine provides a simple and efficient way to create custom firmware images, starting from supported Intel reference designs. Using a block diagram provided by the application, you modify the diagram layout to match your project design. You can also modify configuration settings as needed, and then build a custom firmware image. Use the reports provided to validate your image. After you verify the image and set up a flash programmer, you can use the application to flash your image to a compatible device.

System Requirements

- 64-bit CPU
- Operating System:
    - Microsoft Windows* version 8.1 or higher, or
    - Linux (validated on Ubuntu 16.04.2 LTS)
- Latest graphics driver from the graphic vendor's website; must be OpenGL 1.4 compliant.
- Graphics resolution of 1360 x 768 or higher recommended.
- The application must be run locally (not remotely), and might not work within a virtual machine.

Getting Started

To start a new firmware project, open the application and select *File > New Project* from the top menu. Select a *Source project* reference platform, enter a *New project name* and optional *Project Notes,* and choose a *New project path*. Click OK, review options in the *New Project* and *Settings* dialogs, and click OK again to create your project. Note that the project creation step may take a minute or so.

Editing the Project

When you open a project, the application will display a block diagram like the one shown below. Modify this diagram to match your device layout by removing unused components, adding new components, and moving components to relevant connection points. The application uses the changes you make to the block diagram, along with other settings, to generate your custom firmware image.
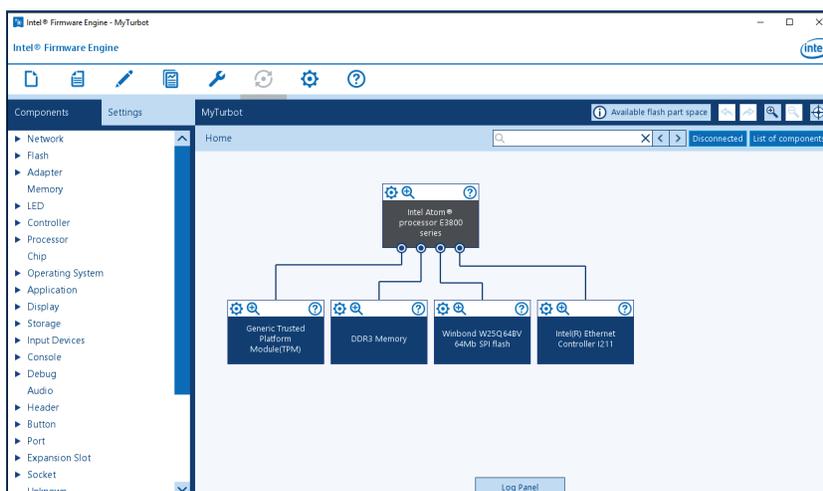
To see more details of the block diagram for editing, click on a magnifying glass icon in one of the component blocks. To remove an unused component from your diagram, right-click on it and select *Delete*. To add a new component to your diagram, drag it from the *Components* list onto the block

where it connects, or right-click in the *Components* list and select a connection point from the menus. To temporarily disconnect a component for placement later, right-click and select the current connection point from the submenu. See *Help > Application* for more details on using the interface.

Firmware Settings / GPIO

To modify firmware settings for your project, including GPIO pin assignments, use the *Settings* tab near the top left of the application window. You can also modify some firmware settings by right-clicking on any component in your block diagram and selecting *Properties*.

Saving or Canceling Changes

To save your project changes, use the *File* menu. To save a snapshot of your project separate from the main version, use *Project > Set Restore Point*. To cancel all changes since your last save, use *Project > Close*.

Check the SPI Flash part

Make sure your block diagram shows the correct SPI flash part for the device you plan to flash. Check the documentation from your device vendor for the correct flash part name.

For example, suppose you want to flash a MinnowBoard Max, but you started with the default project for a MinnowBoard Turbot B21. Delete the default "Winbond W25Q64BV 64Mb SPI Flash" from your block diagram, and drag the "Numonyx N25Q064A11 64Mb SPI Flash" from the *Components* list onto the Intel Atom® processor E3800 series in the diagram.

Building and Flashing a Firmware Image

To build a new firmware image: make sure all required components are present in the diagram, clear the *Disconnected* list, and click *Build* in the top menu. The build process will start, with messages appearing in the *Log Panel* at the bottom of the window.

To flash an image using a flash programmer (e.g. DediProg*):

- Click on the *Settings* tab, then select *Flash Settings > Flash programmer setup*.
- In the *Flash Programmer* panel, click on *Enable Flash Programmer* and enter the path to your flash programmer, plus any necessary command line parameters.
- Select the .fd image file from your latest build, using the path shown in the *Log Panel*.
- Unplug power from the device you plan to flash, connect the flash programmer, and click on the *Flash* icon in the application menu.

To flash an image to your device using a USB drive: Copy the firmware image (.fd) or capsule file (.cap) to the USB drive, along with one of the Flash Update Utilities or CapsuleApp.efi. Attach the USB drive to the device to be flashed, and run the appropriate utility.

For more information about the Intel Firmware Engine, including downloads and tutorials, see http://intel.com/FirmwareEngine.