Bootloader and Bootloadable Example Project 1.0

Features

- Bootloader with I²C communication interface
- Switching between bootloader and bootloadable applications

General Description

This example project demonstrates the basic operation of the Bootloader and Bootloadable components.

Development Kit Configuration

This example project is designed to run on the CY8CKIT-042 kit from Cypress Semiconductor. A description of the kit, along with more example programs and ordering information, can be found at http://www.cypress.com/go/cy8ckit-042.

The project requires configuration settings changes to run on other kits from Cypress Semiconductor. Table 1 is the list of the supported kits. To switch from CY8CKIT-042 to any other kit, change the project's device with the help of Device Selector called from the project's context menu.

Table 1. Development Kits vs Parts

Development Kit	Device
CY8CKIT-040	CY8C4014LQI-422
CY8CKIT-042	CY8C4245AXI-483
CY8CKIT-042-BLE	CY8C4247LQI-BL483
CY8CKIT-044	CY8C4247AZI-M485

The pin assignments for the supported kits are in Table 2 and Table 3.

Table 2. Pin Assignment of the Bootloader_PSoC4_Example project

Pin Name	Development Kit			
	CY8CKIT-040	CY8CKIT-042	CY8CKIT-042 BLE	CY8CKIT-044
\I2C_Slave:scl\	P1[2]	P3[0]	P3[5]	P4[0]
\I2C_Slave:sda\	P1[3]	P3[1]	P3[4]	P4[1]
Bootloader_Status	P0[2]	P0[3]	P3[7]	P6[5]

Table 3. Pin Assignment of the of the Bootloadable_PSoC4_Example project

Pin Name	Development Kit			
	CY8CKIT-040	CY8CKIT-042	CY8CKIT-042 BLE	CY8CKIT-044
Bootloadable_Status	P1[1]	P0[2]	P3[6]	P2[6]

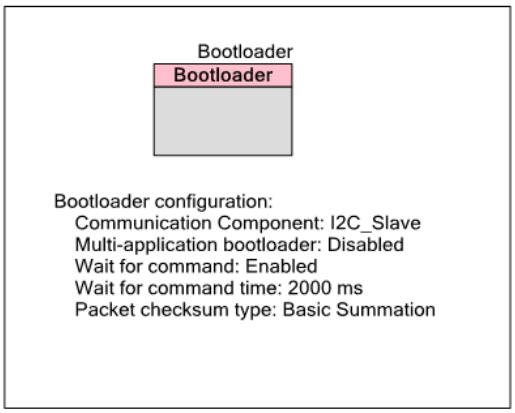
Bootloader Project Configuration

The example project consists of the Bootloader, SCB (in I2C Slave mode) and Pins components.

Bootloader

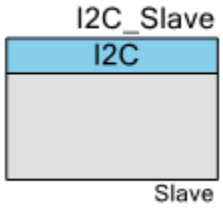
The Bootloader component allows you to update the device flash memory with new code. The bootloader accepts and executes commands, then passes the command responses back to the communications component. The bootloader collects and arranges the received data and manages the actual writing of flash through a simple command/status register interface.

Figure 1. Bootloader



PSoC 4 SCB

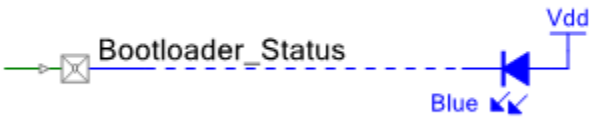
The PSoC 4 SCB component is configured to implement I^2C bus in the Slave mode and manages the communications protocol to receive commands from an external system, and passes those commands to the bootloader. It also passes command responses from the bootloader back to the off-chip system.
The I^2C connection depends on the development kit and is available in Table 2.
Figure 2. PSoC 4 SCB



Pins

The Pins component is used to indicate the bootloader application running status. The pin connection depends on the development kit and is available in Table 2.

Figure 3. Pins



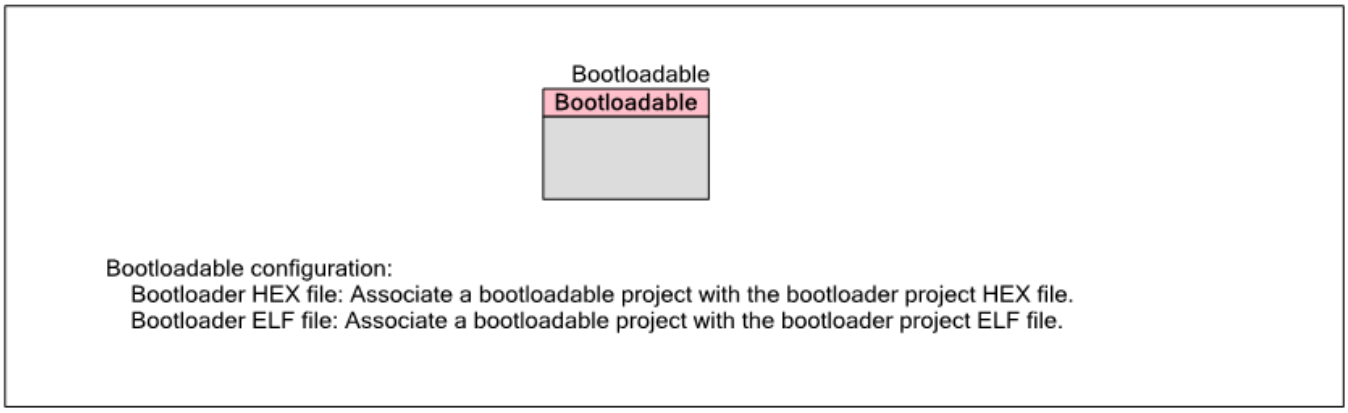
Bootloadable Project Configuration

The example project consists of the Bootloadable and Pin components.

Bootloadable

The Bootloadable component allows specifying additional parameters for the bootloadable project.

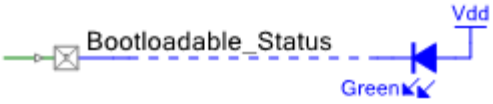
Figure 4. Bootloadable



Pins

The Pins component is used to indicate the bootloadable application running status. The pin connection depends on the development kit and is available in Table 3.

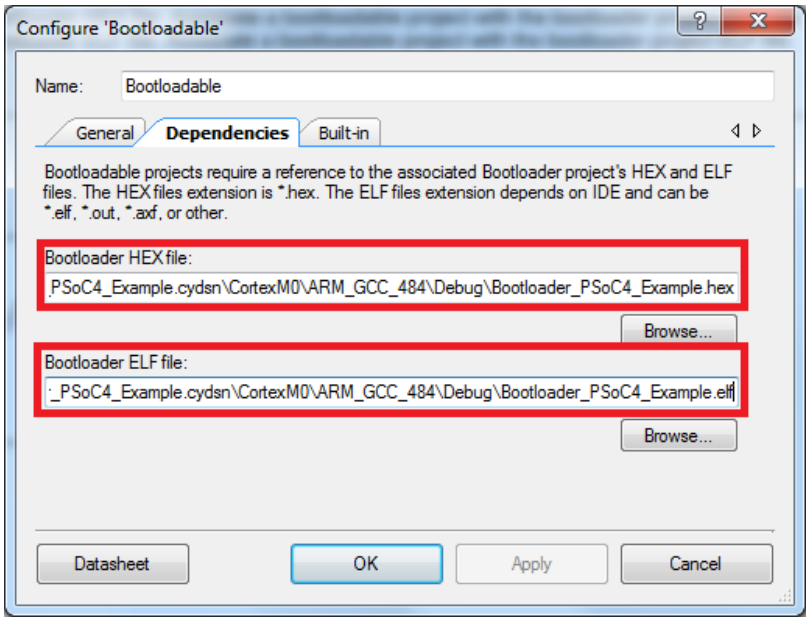
Figure 5. Pins



Projects Description

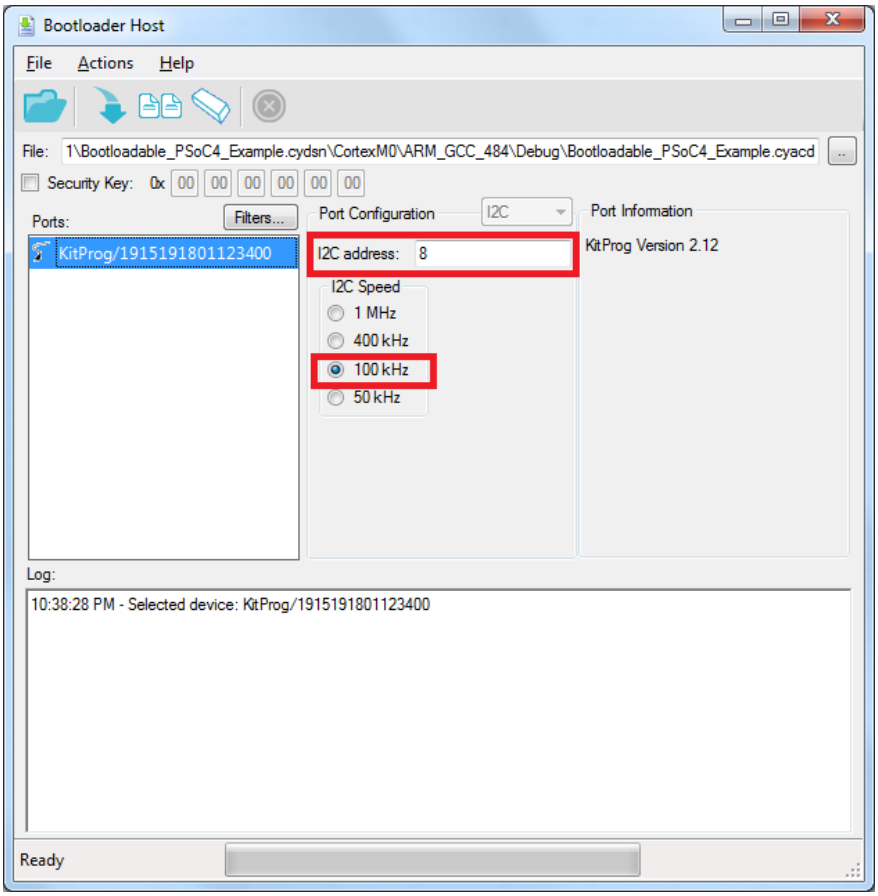
1. Build the *Bootloader_PSoC4_Example* project and program it into a device.
2. Open the top design schematic of the Bootloadable_PSoC4_Example project. Specify path to the bootloader project HEX and ELF files by double-clicking on the Bootloadable component. Go to the **Dependencies** tab and link Bootloadable to the Bootloader_PSoC4_Example.hex file, as Figure 6 shows.

Figure 6. Bootloadable Component Configuration



3. Open the Bootloader Host tool by navigating to Tools > Bootloader Host in PSoC Creator.
4. Make sure that the bootloader host application's I^2C configuration, shown in Figure 7, is the same as the bootloader project's I2C Component configuration (Figure 2).

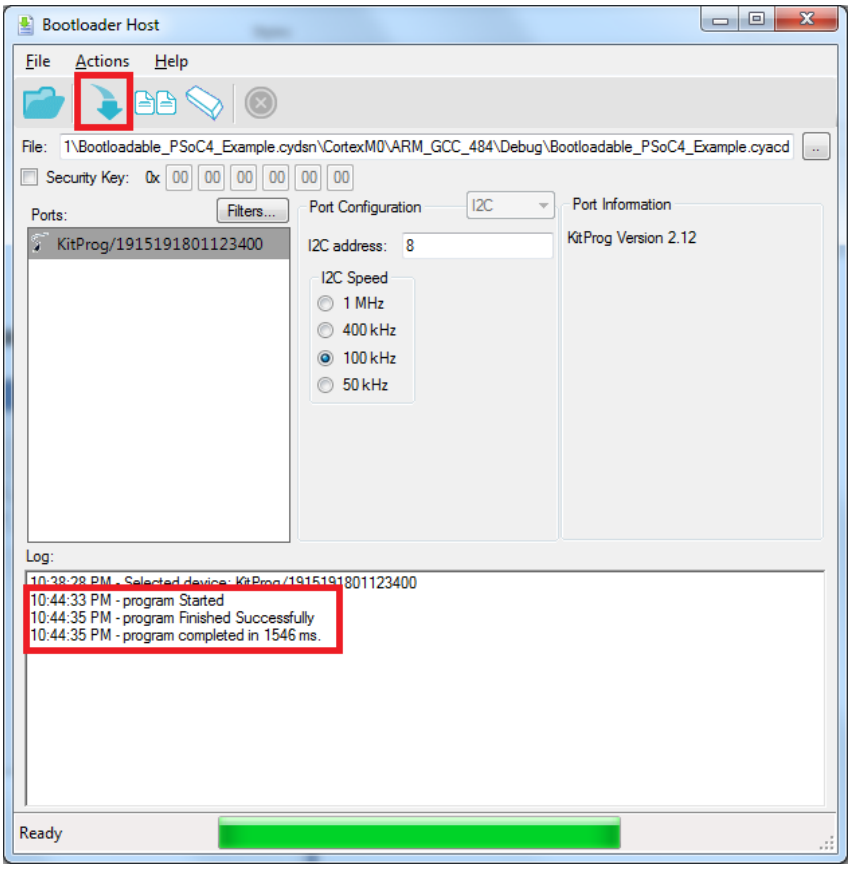
Figure 7. Bootloader Host Application



5. Press the File button and choose the bootloadable file Bootloadable_PSoC4_Example.cyacd in the bootloadable project's Debug/Release folder: ..\Bootloadable_PSoC4_Example.cydsn\CortexM0\ARM_GCC_484\

6. To bootload the device, click the **Program** button. You should get a screen similar to Figure 8.

Figure 8. Bootloading Bootloadable Application



7. After the bootloadable project is downloaded successfully, a software reset occurs, and the device starts executing the new application. The green LED turns on.

Expected Results

Program the device with the bootloader project. Transfer the bootloadable application as described in the section above. Once started, the bootloadable application runs for 7 seconds and switches back to the bootloader application. While the bootloader application is running the blue LED turns on and while the bootloadable application is running the green LED turns on.

Cypress Semiconductor
198 Champion Court
San Jose, CA 95134-1709

Phone : 408-943-2600
Fax : 408-943-4730
Website : www.cypress.com