8-bit PIC® MCU Bootloader Code Generator

A Simple Way to Add Remote Update Capability to Your Application

Summary

As embedded devices evolve in both capability and connectivity so does the need to enable remote application updates. Not limited to a single communications protocol, embedded connectivity takes many forms and is essential in growing markets such as the Internet of Things (IoT). Remote firmware updates allow for simplified and efficient upgrades to an existing application while increasing a product's useful life. The addition of new features to a product can be used to maintain a competitive advantage against new market offerings or unlock existing fee-based premium content. Additionally, software fixes can be quickly propagated to ensure reliable system operation.
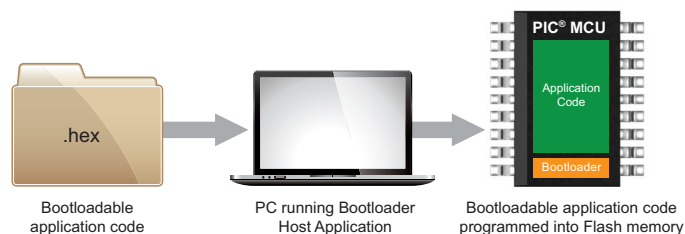
Bootloader Code Generator

To take advantage of this connectivity, bootloader firmware must reside within memory to provide self-programming capability to the microcontroller. Developing custom bootloader code can be a complex and time consuming process. Recognizing this, Microchip provides a Bootloader Code Generator to assist you. Using a simple GUI interface, you are able to create bootloader firmware designed to suit your application needs. The Bootloader Code Generator creates a custom assembly source file which can be programmed into the microcontroller's memory. By tailoring the bootloader code to the specific application, the code size is minimized ensuring maximum space for application code.
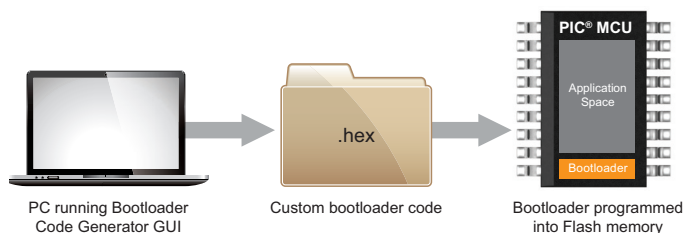
Bootloader Host Application

To complement the Bootloader Code Generator, Microchip also provides a Bootloader Host application. This tool is used to transfer new application code to the embedded device that contains the bootloader code. The GUI application can communicate with the target device through either UART, I²C™, USB or Ethernet protocols. The Bootloader Host application can be used to program the Flash memory for 8-bit PIC® MCUs and also supports EEPROM writes.

Bootloadable application code   PC running Bootloader Host Application   Bootloadable application code programmed into Flash memory

PC running Bootloader Code Generator GUI   Custom bootloader code   Bootloader programmed into Flash memory

In addition to saving development time and cost, these tools assist you in creating secure and reliable bootloaders. This includes detecting and recovering from a failed boot load as well as restricting read access of the program memory. These tools will help ensure robust operation, enhancing the flexibility of an embedded application whether it is currently in development or already being used by a customer. For more information visit www.microchip.com/bootloader.

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Key Features

Bootloader Code Generator

- GUI-based interface with drop-down selection menus
- Minimizes code space required for bootloader code
- Generates an assembly source file that will:
  - Determine if a valid application is loaded
  - Determine if it is time to boot load or run the end application
  - Communicate with the host
  - Erase and rewrite the device
  - Transfer control to the end application
  - Detect a failed boot load and recover
  - Allow or deny host read access to program memory
  - Protects from accidental self over-write of bootloader code

Bootloader Code Generator User Interface

Bootloader Host Application

- Multiple communication protocols:
  - UART
  - I²C
  - USB (future availability)
- Checksum verification to ensure correct programming
- Flash reading to verify correct programming
- Supports Flash and EEPROM writes

Bootloader Host User Interface

www.microchip.com/bootloader

Visit our web site for additional product information and to locate your local sales office.

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