Embedded Software Essentials

Module Introduction

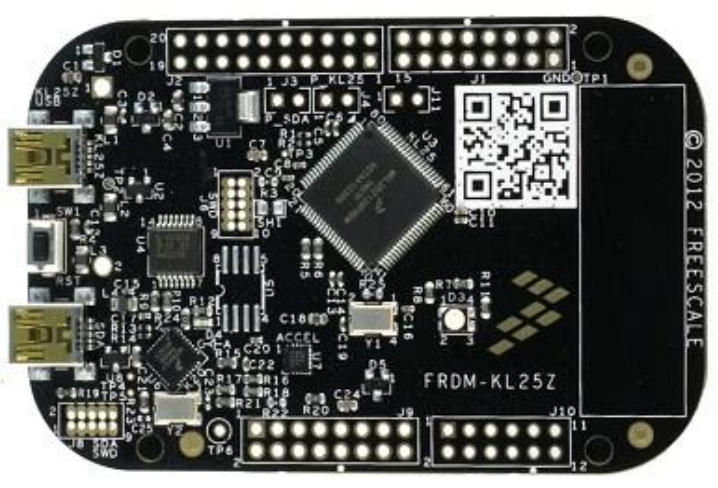
C1 M1 V1

Be Boulder.

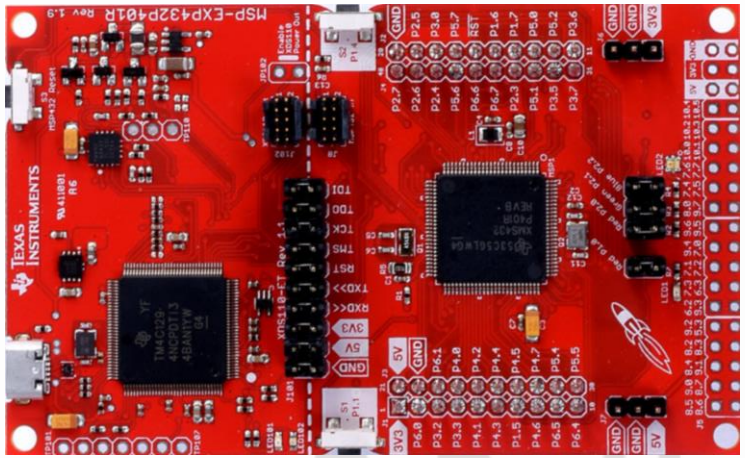
University of Colorado Boulder

Development Kits

- A hardware development kit required
  - Only need one, you choose
- Both are under $20 (US Dollars)
- Hardware Kits
  - NXP Freedom Board - FRDM-KL25z
  - Texas Instruments Launchpad - MSP432p401r



FRDM-KL25z
Development board[1]



MSP432
Development board[2]

Software Requirements

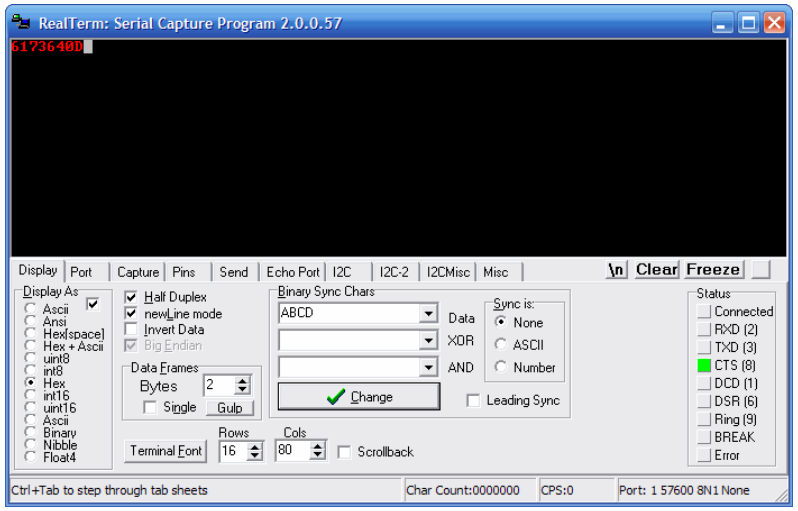
- All software needed is free!!!
- You will need your vendor's **Integrated Development Environment (IDE)**
- **Kinetis Design Studio (KDS)**
  - NXP Freedom Board - FRDM-KL25z
- **Code Composer Studio (CCS)**
  - Texas Instruments Launchpad - MSP432p401r

Kinetis Design Studio (KDS) IDE[1]

Code Composer Studio (CCS) IDE[2]

Software Requirements

- Serial Terminal Emulator
  - RealTerm **(Suggested)**
  - Putty
- VirtualBox
  - Virtual Machine Hypervisor
- Linux Distribution
  - Ubuntu Latest LTS (16.04) (**Suggested**)
  - Other (use at your own risk)



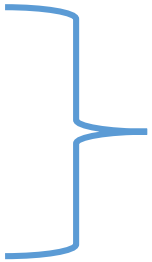
RealTerm[3]

VirtualBox[2]

Linux Distributions

- We will use Ubuntu for class demos and assessment design

- Many different Kinds
  - Ubuntu (**Suggested**)
  - RedHat
  - OpenSUSE
  - Arch
  - Gentoo



WARNING!!! Setup & Demo commands might vary for different Linux Distributions

- It needs to support our development packages

Linux Packages

- **Required** Linux Packages
  - git
  - GCC (host version)
  - ARM Embedded GCC (Cross-Compiler Version)
    - arm-none-eabi
- A text editor (choose one)
  - Command line
    - Vim (**suggested**)
    - Nano
    - Emacs
  - GUI
    - Sublime Text

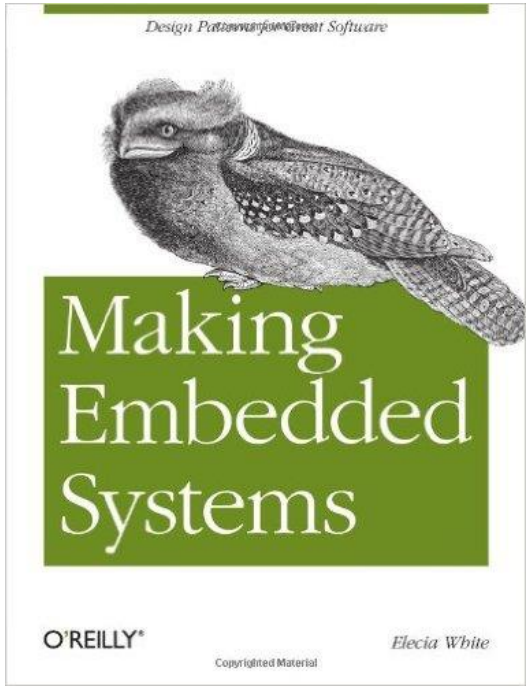
Reference Reading

- All reading is supplemental unless specified otherwise

- Reading will consist of:
  - Posted documents
  - Reference text book

- Reference Textbook (Not-Required):

  Making Embedded Systems. Elecia White, O-Reilly
  ISBN-13: 978-1-449-30214-6



Reference Textbook[1]

Module Video Topics

- Module Overview
- Introduction to Embedded Systems
- Embedded Software Engineering
- C-Programming Review
- Introduction to Source Configuration Management
- Standardized C and Team Coding Standards
- Embedded Development Environments Overview
- Development Kits and Documentation
- Version Control

Learning Outcomes

- *At the end of this module, you will be able to…*
  - Define the components of an embedded system
  - Classify the parts of an embedded systems developer's Source Configuration Management (SCM)
  - Apply git version control to software projects