

ARM[®] Cortex[®]-M23
32-bit Microcontroller

NuMicro[®] Family
NuTiny-M2351 Board Quick Start Guide

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Table of Contents

1 OVERVIEW3

2 BOARD SUPPORTING PACKAGE (BSP)3

3 INSTALLING TOOL DRIVERS.....4

4 BLINKY SAMPLE CODE6

5 REVISION HISTORY12

1 OVERVIEW

This document describes the firmware development environment used to build an application in the NuTiny-M2351 board and how to use board supporting package (BSP) including necessary drivers to develop applications with M2351. The guidelines on how to build the sample code of BSP are also included.

2 BOARD SUPPORTING PACKAGE (BSP)

The BSP contains M2351 driver, library and sample code. The driver is based on CMSIS. The libraries are smart card library and USB host library. All peripheral sample codes are provided to help user to understand how they work and how to use them. Furthermore, the TrustZone sample code is also included in the BSP. The detailed information of the BSP materials can be found in a readme file in the BSP root directory.

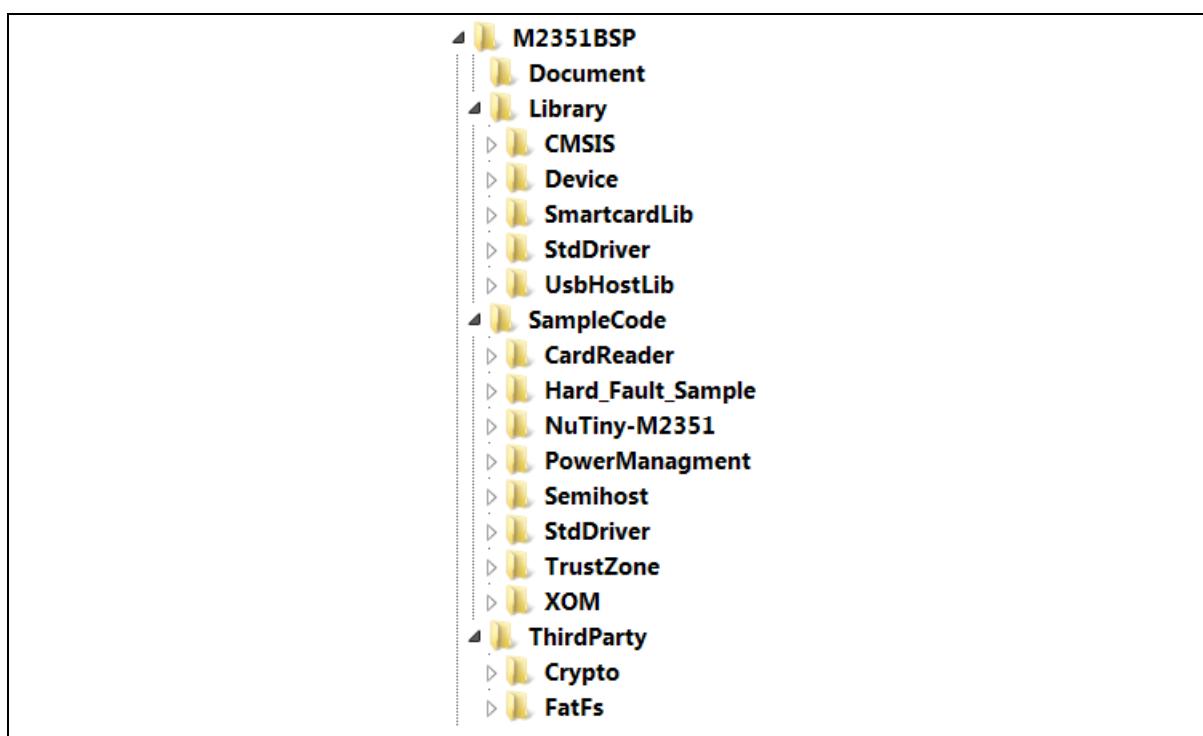


Figure 2-1 M2351 BSP Folder Structure

3 INSTALLING TOOL DRIVERS

The NuTiny-M2351 board has built in with Nuvoton Nu-Link ICE on board. By default KEIL and IAR project settings, the Nu-Link ICE is used to download and debug the sample code once the Nu-Link KEIL/IAR driver is installed and the Nu-Link ICE is connected via the USB cable.

Since the M2351 architecture is based on ARM-v8M with TrustZone® inside. It is recommended to use KEIL MDK Plus/Pro v5.20 or IAR EWARM v7.80 and later version.

- Install Nu-Link KEIL/IAR driver:
To use Nu-Link ICE with M2351, please install the Nu-Link driver by double clicking the installer file.

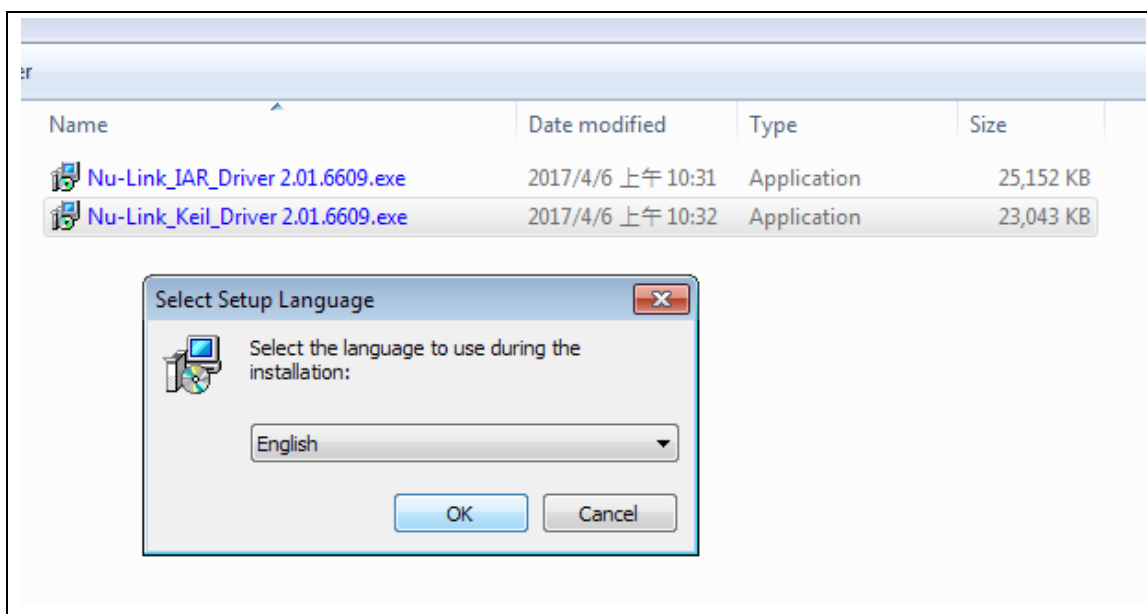


Figure 3-1 KEIL/IAR Driver Installer

- Install M2351 KEIL Software Pack:

In KEIL MDK, It is necessary to update Nuvoton KEIL Software Pack to support M2351. In uVision IDE environment, click the “**Pack Installer**” icon to open the pack installer. Then, use “**File -> Import...**” to install Nuvoton KEIL software pack.

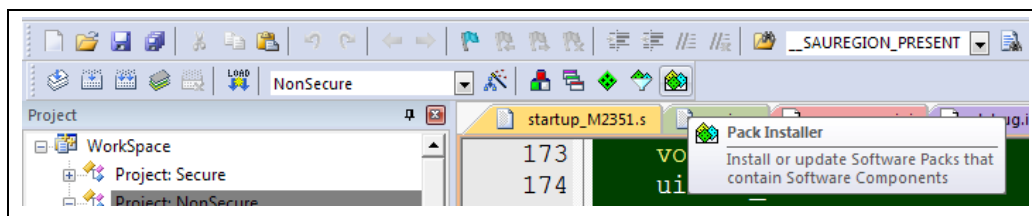


Figure 3-2 Pack Installer

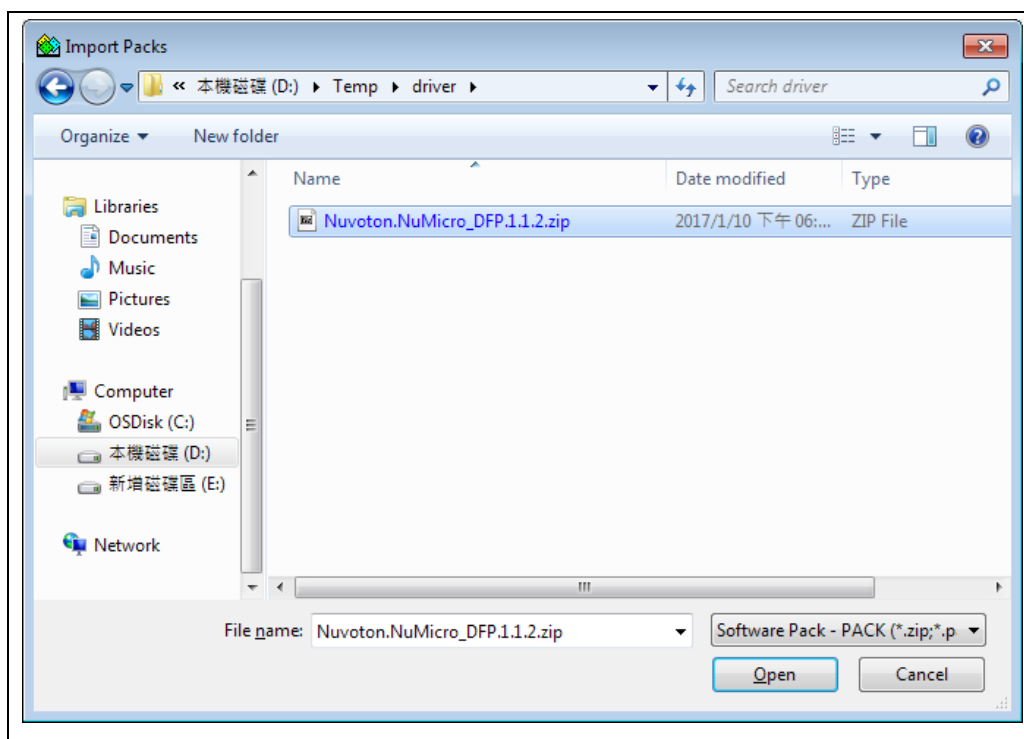


Figure 3-3 M2351 Software Pack File

4 BLINKY SAMPLE CODE

The Blinky sample code is a simple code to toggle LED on/off around the NuTiny-M2351 board.

The project file is located at:

bsp\SampleCode\NuTiny-M2351\Blinky\Keil\Blinky.uvprojx (For KEIL MDK)

or

bsp\SampleCode\NuTiny-M2351\Blinky\IAR\Blinky.eww (For IAR EWARM)

- Connect the Nu-Link ICE on the NuTiny-M2351 board to PC with USB

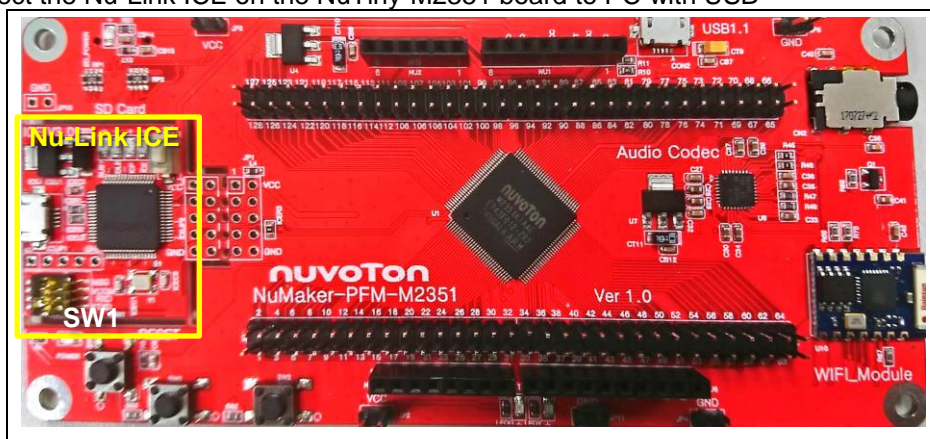


Figure 4-1 NuTiny-M2351 Board

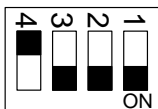
The Nu-Link ICE has a Virtual COM port function for debug messages. After connecting Nu-Link, user can find VCOM on hardware manager in Windows PC.

Note1:

Nu-Link driver (KEIL or IAR) should be installed first before using the VCOM.

Note2:

The SW1 needs to be set as below to enable VCOM function of Nu-Link ICE.



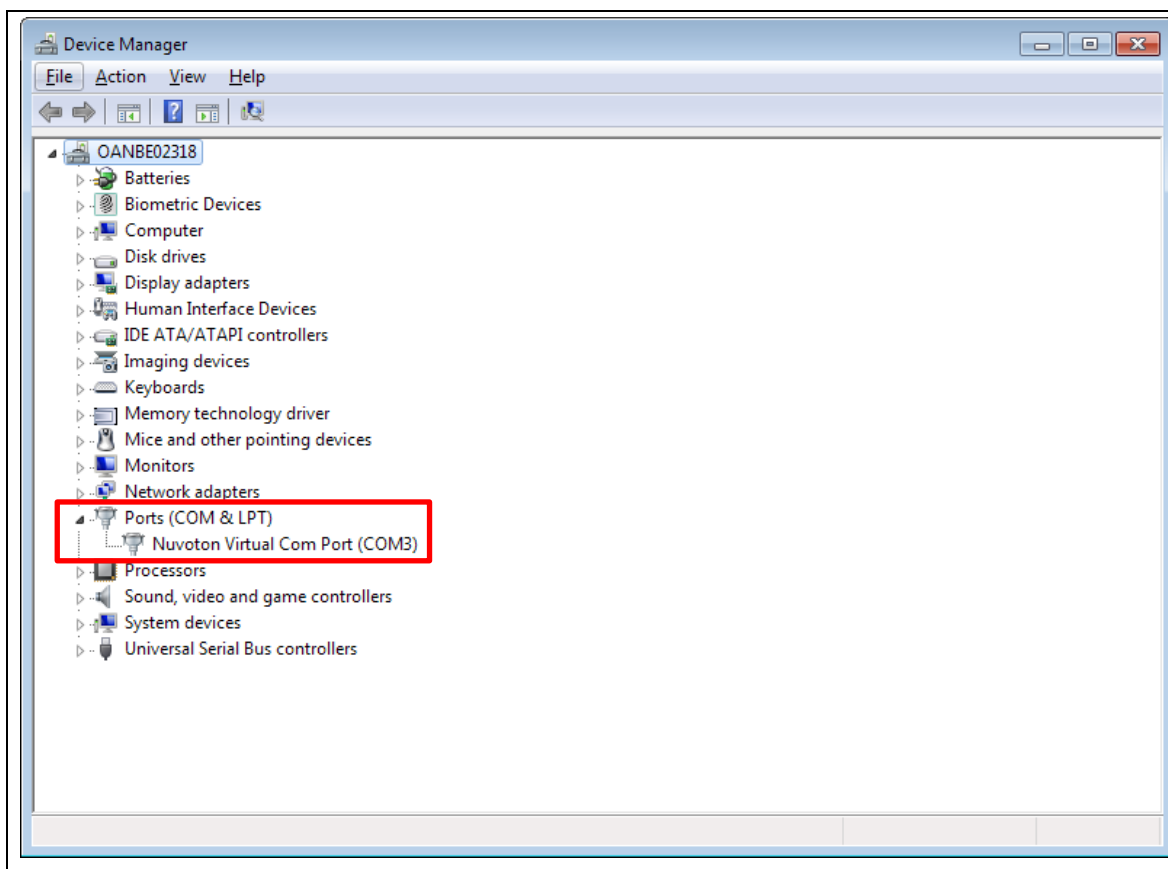


Figure 4-2 Nuvoton Virtual Com Port

A terminal tool can be used to open the virtual COM port to monitor the M2351 debug message.

- Open the sample code:
User can open the sample code with KEIL uVision by double clicking the project file.

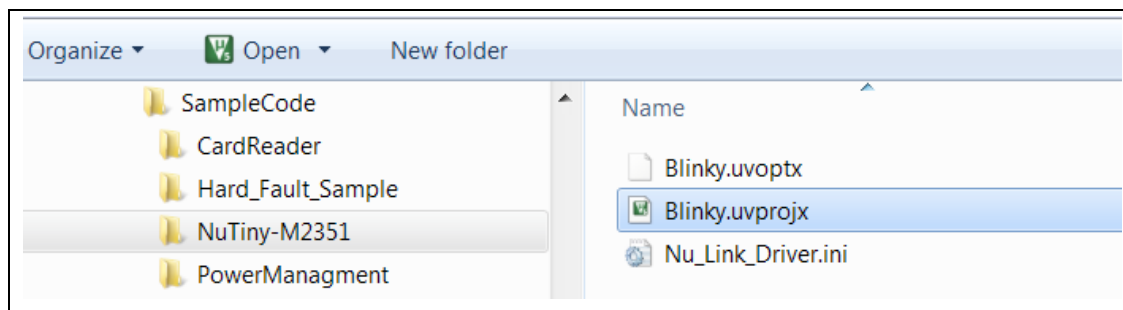


Figure 4-3 Blinky KEIL Project File

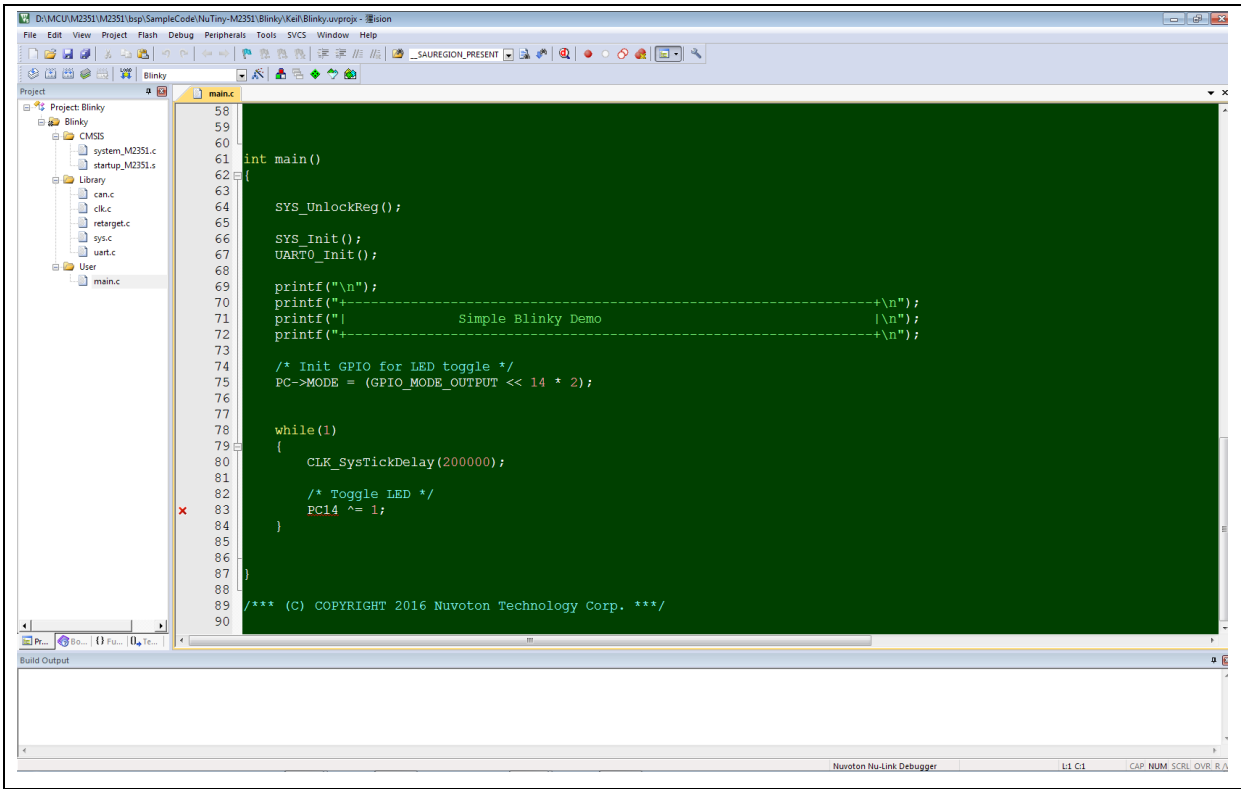


Figure 4-4 Blinky Sample Code KEIL Project Screenshot

If IAR EWARM is used, user can open the project by double clicking the Blinky.eww file.

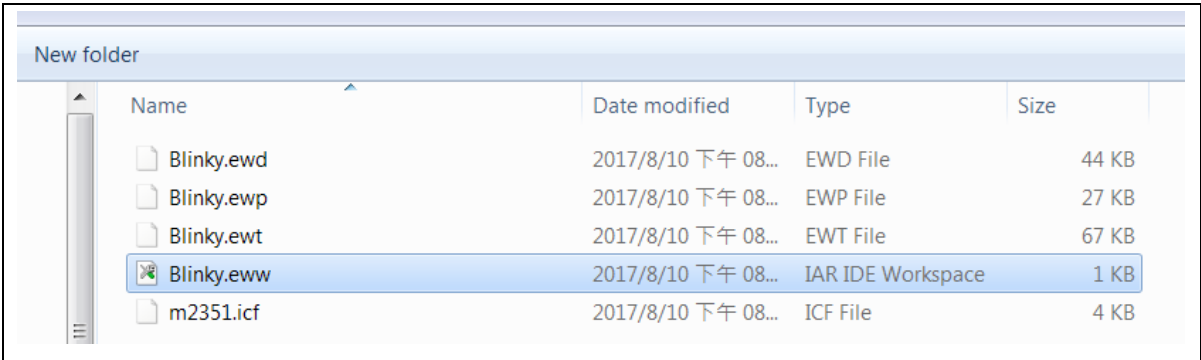


Figure 4-5 Blinky IAR Project File

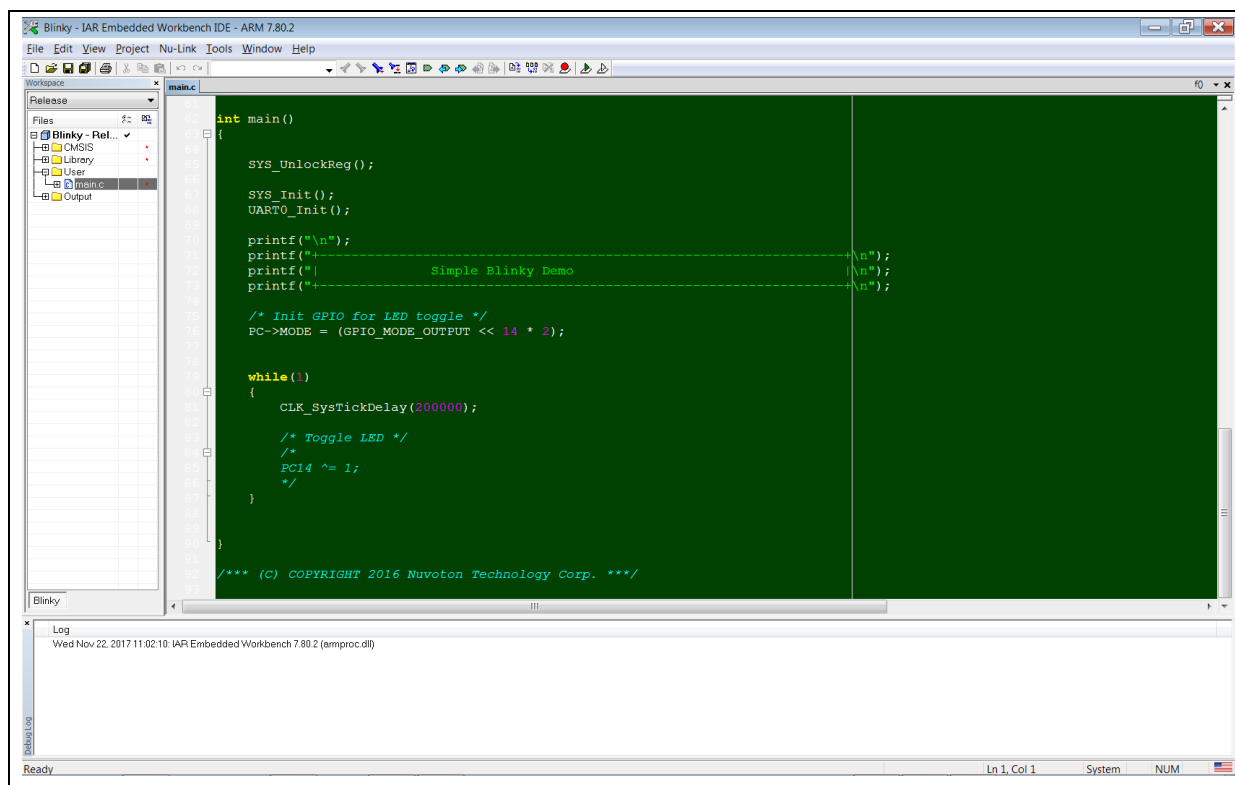


Figure 4-6 Blinky Sample Code IAR Project Screenshot

- Build the sample code:
User can click the **"Rebuild"** icon to build the sample code in KEIL MDK.

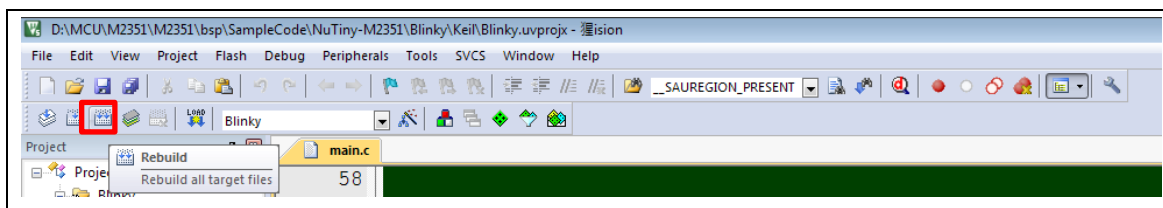


Figure 4-7 Rebuild with KEIL MDK

Or click “**Project -> Rebuild All**” in IAR EWARM.

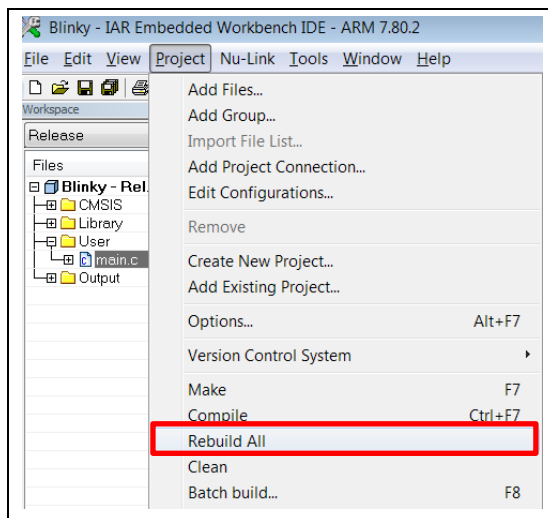


Figure 4-8 Rebuild with IAR EWARM

- Download firmware to M2351:
User can click the “**Download**” icon to download the code to M2351.

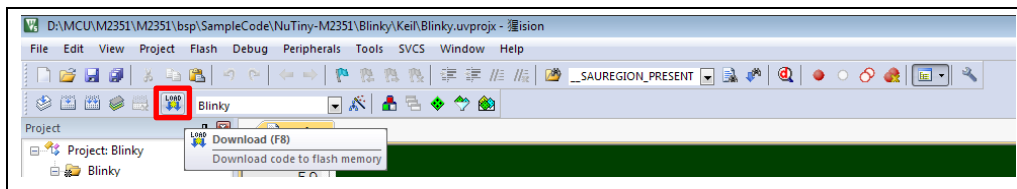


Figure 4-9 Firmware Download with KEIL

Or click “**Project -> Download -> Download active application**” to download the code to M2351.

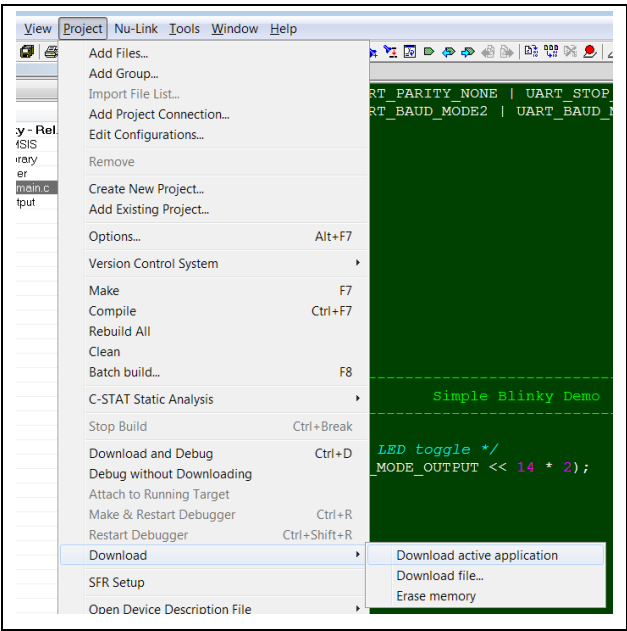


Figure 4-10 Firmware Download with IAR

- Press reset on the board to execute the code
After downloading the code, user can press reset to execute the firmware. The IO_LED on the board will blink and a sample code message will be shown on the debug port.

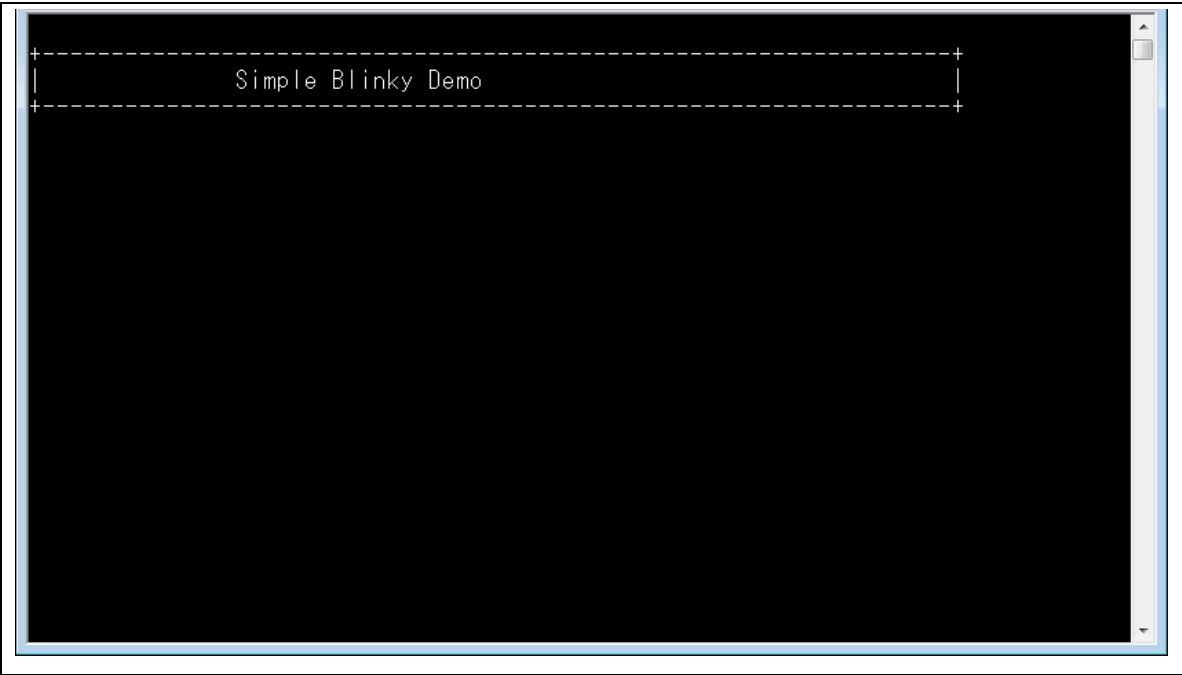


Figure 4-11 Blinky Sample Code Screenshot

5 REVISION HISTORY

Date	Revision	Description
2017.11.30	1.00	1. Initially issued.

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