ARM Cortex™-M0

32-BIT MICROCONTROLLER

NuTiny-SDK-100 User Manual
For NuMicro™ NUC100 Series

The information described in this document is the exclusive intellectual property of Nuvoton Technology Corporation and shall not be reproduced without permission from Nuvoton.

Nuvoton is providing this document only for reference purposes of NuMicro™ microcontroller based system design. Nuvoton assumes no responsibility for errors or omissions.

All data and specifications are subject to change without notice.

For additional information or questions, please contact: Nuvoton Technology Corporation.

Publication Release Date: Aug. 20, 2010
Revision V1.0

Downloaded from Elcodis.com electronic components distributor

1 Overview 3

2 NuTiny-SDK-100 Introduction 3

2.1 NuTiny -SDK-100 Jumper Description 4
2.2 Pin Assignment for Extended Connector 5
2.3 NuTiny-SDK-100 PCB Placement 5

3 How to Start NuTiny -SDK-100 on the Keil µVision® IDE 6

3.1 Keil µVision® IDE Software Download & Install 6
3.2 Nuvoton Nu-Link Driver Download & Install 6
3.3 Hardware Setup 6
3.4 Smpl_NuTiny-NUC100 Example Program 7

4 How to Start NuTiny-SDK-100 on the IAR Embedded Workbench 8

4.1 IAR Embedded Workbench Software Download and Install 8
4.2 Nuvoton Nu-Link Driver Download and Install 8
4.3 Hardware Setup 8
4.4 Smpl_NuTiny-NUC100 Example Program 9

5 NuTiny-EVB-100 Schematic 10

6 To Download NuMicro™ Family Related Files from Nuvoton Company 11

6.1 To Download NuMicro™ Keil µVision® IDE driver 11
6.2 To Download NuMicro™ IAR EWARM driver 12
6.3 To Download NuMicro™ NUC100 series BSP Software Library 13

7 Revision History 14

Downloaded from Elcodis.com electronic components distributor

1 Overview

NuTiny-SDK-100 is the specific development tool for NuMicro NUC100 series. Users can use NuTiny-SDK-100 to develop and verify the application program easily.
NuTiny-SDK-100 includes 2 portions. One is NuTiny-EVB-100 and the other is Nu-Link-Me. NuTiny-EVB-100 is the evaluation board and Nu-Link-Me is its Debug Adaptor. Thus, users do not need other additional ICE or debug equipment.

2 NuTiny-SDK-100 Introduction

NuTiny-SDK-100 uses the NUC100LE3AN as the target microcontroller. Figure 2-1 is NuTiny-SDK-100 for NUC100 series and the left portion is called NuTiny-EVB-100 and the right portion is Debug Adaptor called Nu-Link-Me.
NuTiny-EVB-100 is similar to other development board. Users can use it to develop and verify applications to emulate the real behavior. The on board chip covers NUC100 series features. The NuTiny-EVB-100 can be a real system controller to design user target system.
Nu-Link-Me is a Debug Adaptor. **The Nu-Link-Me Debug Adaptor connects your PC's USB port to your target system (via Serial Wired Debug Port) and allows you to program and debug embedded programs on the target hardware.** To use Nu-Link-Me Debug adaptor with IAR or Keil, please refer to "Nuvoton NuMicro™ IAR ICE driver user manual "or Nuvoton NuMicro™ Keil ICE driver user manual" in detail. These 2 documents will be stored in local hard disk when user installs each driver.

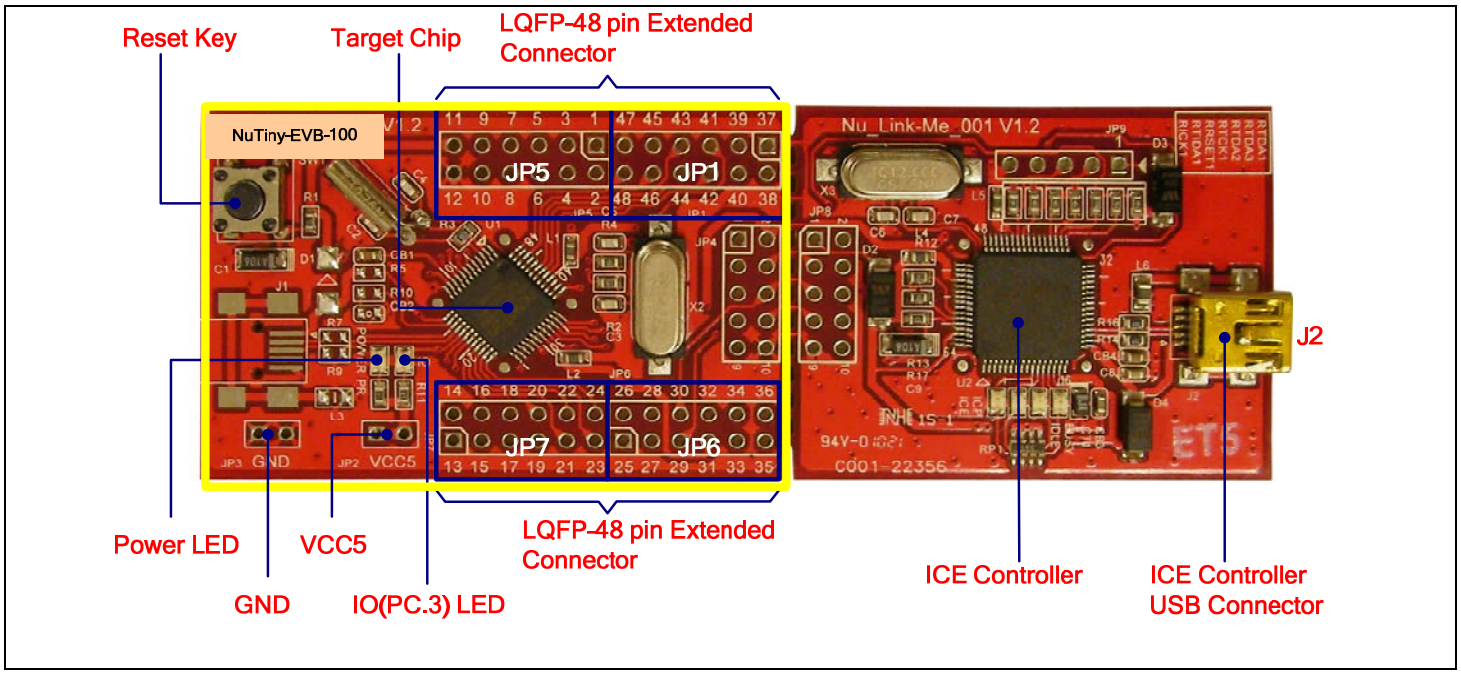


Figure 2-1 NuTiny-SDK-100 (Red Color PCB Board)

Downloaded from Elcodis.com electronic components distributor

2.1 NuTiny -SDK-100 Jumper Description

2.1.1 Power Setting

- JP2: VCC5 Voltage connector in NuTiny-EVB-100
- J2: USB port in Nu-Link-Me

POWER model	J2 USB port	JP2 VCC5	MCU Voltage
Model 1	**Connect to PC**	**DC 5V output**	**DC 5V**
Model 2	**X**	**DC 2.8-5.5V input**	**Voltage by VCC input**

X: Not use.

2.1.2 Debug Connector

- JP4: Connector in target board(NuTiny-EVB-100) for connecting with Nuvoton ICE adaptor (Nu-Link-Me)
- JP8: Connector in ICE adaptor (Nu-Link-Me) for connecting with a target board (for exampl NuTiny-EVB-100)

2.1.3 USB Connector

- J1: Mini USB Connector in NuTiny-EVB-100 for application use
- J2: Mini USB Connector in Nu-Link-Me connected to a PC USB port

2.1.4 Extended Connector

- JP1, JP5, JP6 and JP7: Show all of chip pins in NuTiny-EVB-100

2.1.5 Reset Button

- SW1: Reset button in NuTiny-EVB-100

2.1.6 Power Connector

- JP2: VCC connector in NuTiny-EVB-100
- JP3: GND connector in NuTiny-EVB-100

Publication Release Date: Aug. 20, 2010
Revision V1.0

Downloaded from Elcodis.com electronic components distributor

2.2 Pin Assignment for Extended Connector

NuTiny-EVB-100 provides NUC100LE3AN on board and the extended connector for LQFP-48 pin. Table 2-1 is the pin assignment for NUC100LE3AN.

Pin No	Pin Name	Pin No	Pin Name
01	PB.12, CPO0. CLKO	25	PA.15, PWM3, I2SMCLK
02	X32O	26	PA.14, PWM2,
03	X32I	27	PA.13, PWM1
04	PA.11, I2C1SCL	28	PA.12, PWM0
05	PA.10, I2C1SDA	29	ICE_DAT
06	PA.9, I2C0SCL	30	ICE_CLK
07	PA.8, I2C0SDA	31	AVSS
08	PB.4, RX1	32	PA.0, ADC0
09	PB.5, TX1	33	PA.1, ADC1
10	LDO	34	PA.2, ADC2
11	VDD	35	PA.3, ADC3
12	VSS	36	PA.4, ADC4
13	PB.0, RX0	37	PA.5, ADC5
14	PB.1, TX0	38	PA.6, ADC6
15	PB.2, RTS0	39	PA.7, ADC7
16	PB.3, CTS0	40	AVDD
17	PC.3, MOSI00, I2SDO	41	PC.7, CPN0
18	PC.2, MISO00, I2SDI	42	PC.6, CPP0
19	PC.1, SPICLK0, I2SBCLK	43	PB.15, /INT1
20	PC.0, /SPISS00, I2SLRCLK	44	XT1_OUT
21	PE.5, PWM5	45	XT1_IN
22	PB.11, TM3, PWM4	46	/RESET
23	PB.10, TM2, /SPISS01	47	PVSS
24	PB.9/ TM1	48	PB.8, STADC, TM0

Table 2-1 Pin Assignment for NUC100 Series

2.3 NuTiny-SDK-100 PCB Placement

Users can refer Figure 2-2 for the NuTiny -SDK-100 PCB placement.

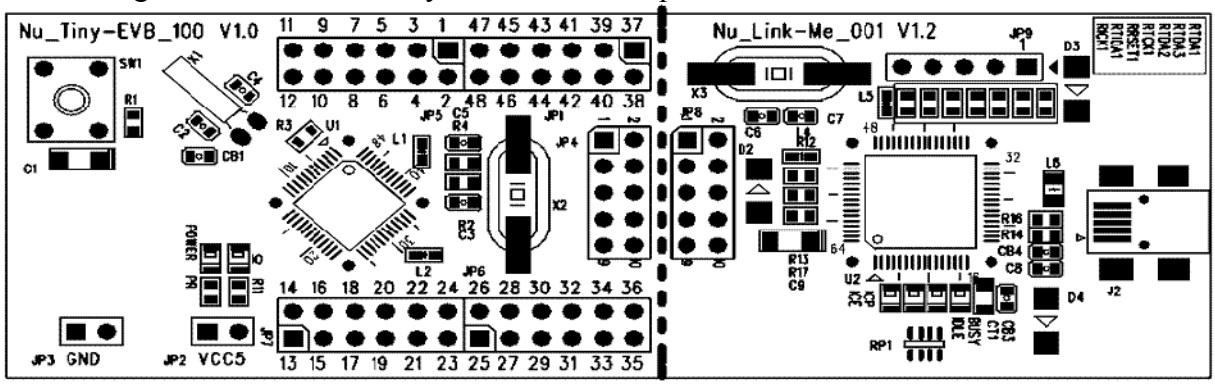


Figure 2-2 NuTiny-SDK-100 PCB Placement

Downloaded from Elcodis.com electronic components distributor

3 How to Start NuTiny -SDK-100 on the Keil µVision® IDE

3.1 Keil µVision® IDE Software Download & Install

Please visit the Keil company website (http://www.keil.com) to download the Keil µVision® IDE and install the RVMDK.

3.2 Nuvoton Nu-Link Driver Download & Install

Please visit Nuvoton company NuMicro™ website (http://www.nuvoton.com/NuMicro) to download "NuMicro™ Keil µVision® IDE driver" file. Please refer the Chapter 6.1 for the detail download flow. When the Nu-Link driver have been download ok, please unzip the file and execute the "Nu-Link_Keil_Driver.exe" to install the driver.

3.3 Hardware Setup

The hardware setup is shown as Figure 3-1

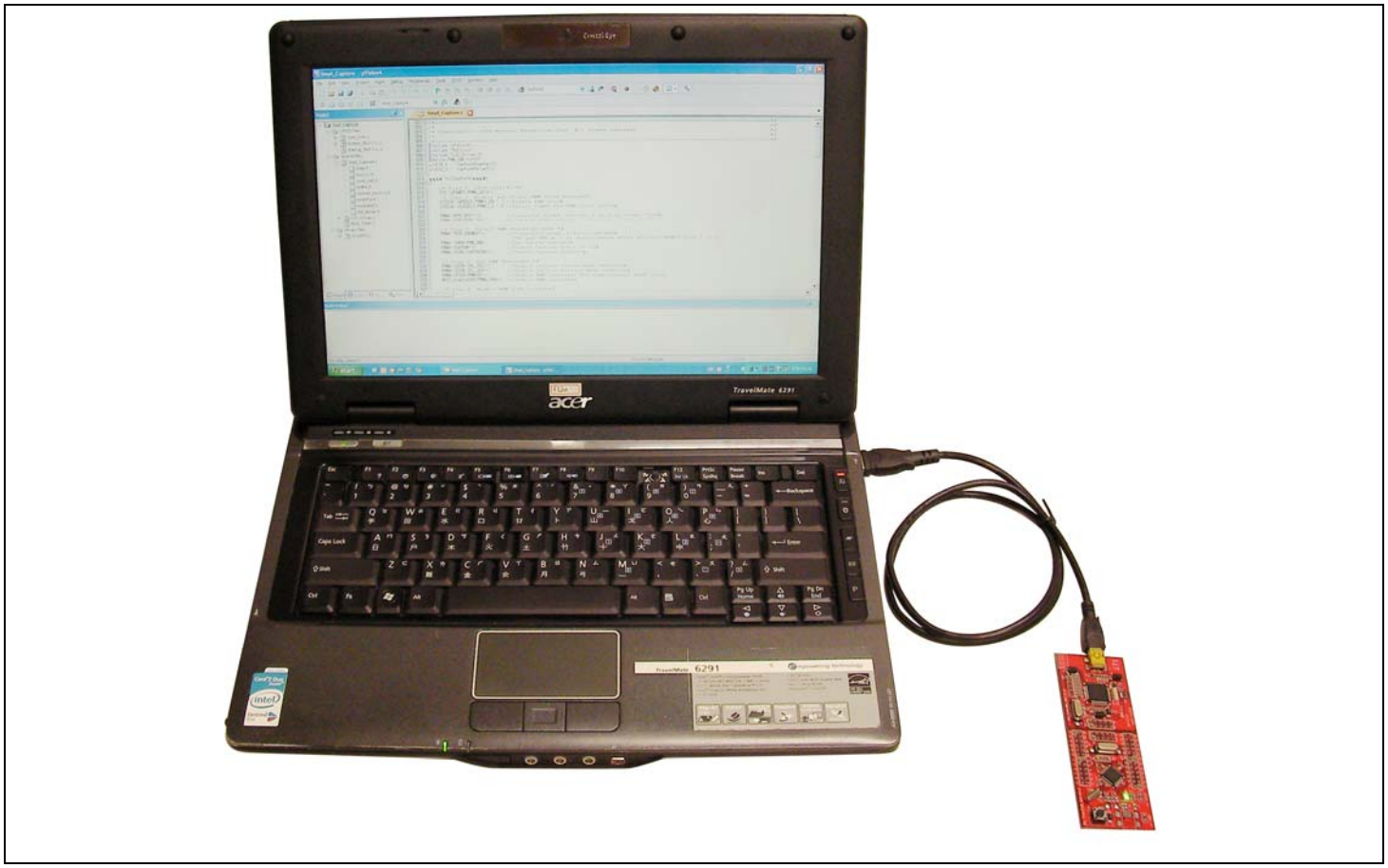


Figure 3-1 NuTiny-SDK-100 Hardware Setup

Downloaded from Elcodis.com electronic components distributor

3.4 Smpl_NuTiny-NUC100 Example Program

This example demonstrates the ease of downloading and debugging an application on a NuTiny-SDK-100 board.
It can be found on the Figure 3-2 list directory and downloaded from Nuvoton NuMicro™ Website following Chapter 6.3.

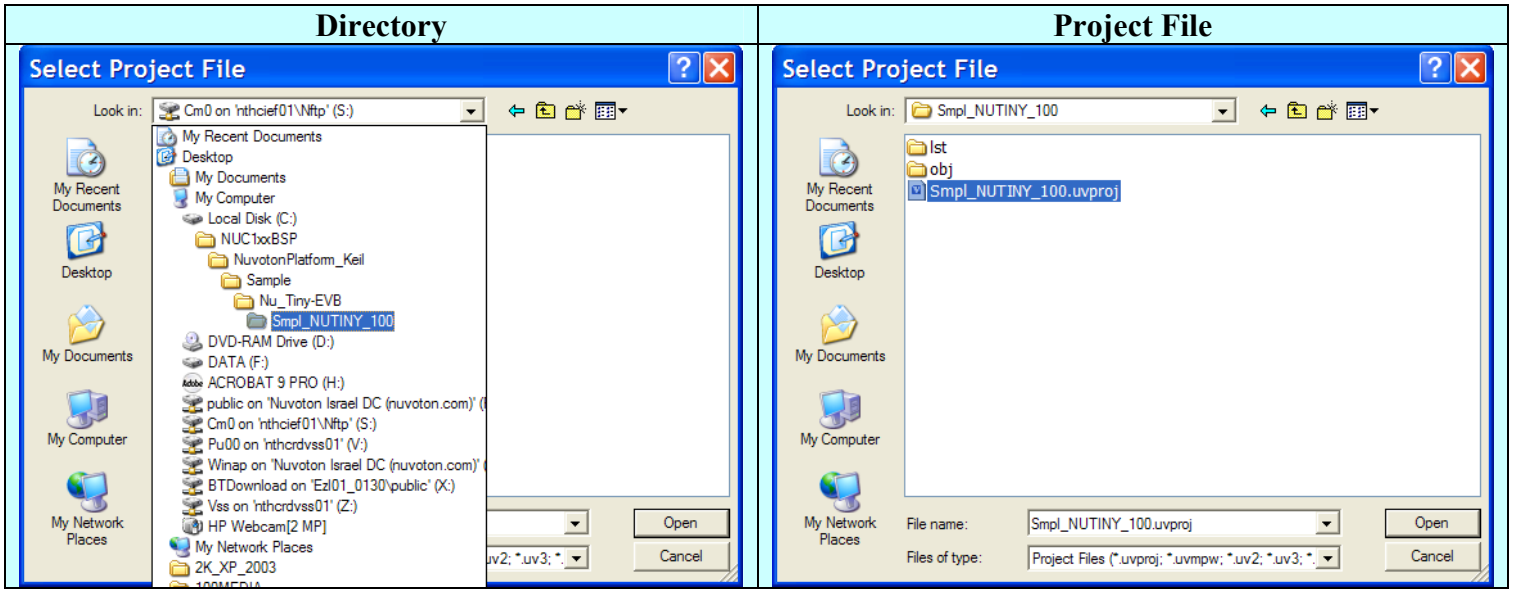


Figure 3-2 Smpl_NuTiny_100 Example Directory

To use this example:
The PC.3 LED will toggle on the NuTiny-EVB-100 board.

- **Start µVision®**
- **Project-Open**
  Open the Smpl_NuTiny_100.uvproj project file
- **Project - Build**
  Compile and link the Smpl_NuTiny-NUC100 application
- **Flash – Download**
  Program the application code into on-chip Flash ROM
- **Start debug mode**
  Using the debugger commands, you may:
  - Review variables in the watch window
  - Single step through code
  - Reset the device
  - Run the application

Publication Release Date: Aug. 20, 2010
Revision V1.0

Downloaded from Elcodis.com electronic components distributor

4 How to Start NuTiny-SDK-100 on the IAR Embedded Workbench

4.1 IAR Embedded Workbench Software Download and Install

Please connect to IAR company website (http://www.iar.com) to download the IAR Embedded Workbench and install the EWARM.

4.2 Nuvoton Nu-Link Driver Download and Install

Please connect to Nuvoton Company NuMicro™ website (http://www.nuvoton.com/NuMicro) to download "NuMicro™ IAR ICE driver user manual" file. Please refer the Chap6.2 for the detail download flow. When the Nu-Link driver have been download ok, please unzip the file and execute the "Nu-Link_IAR_Driver.exe" to install the driver.

4.3 Hardware Setup

The hardware setup is shown as Figure 4-1

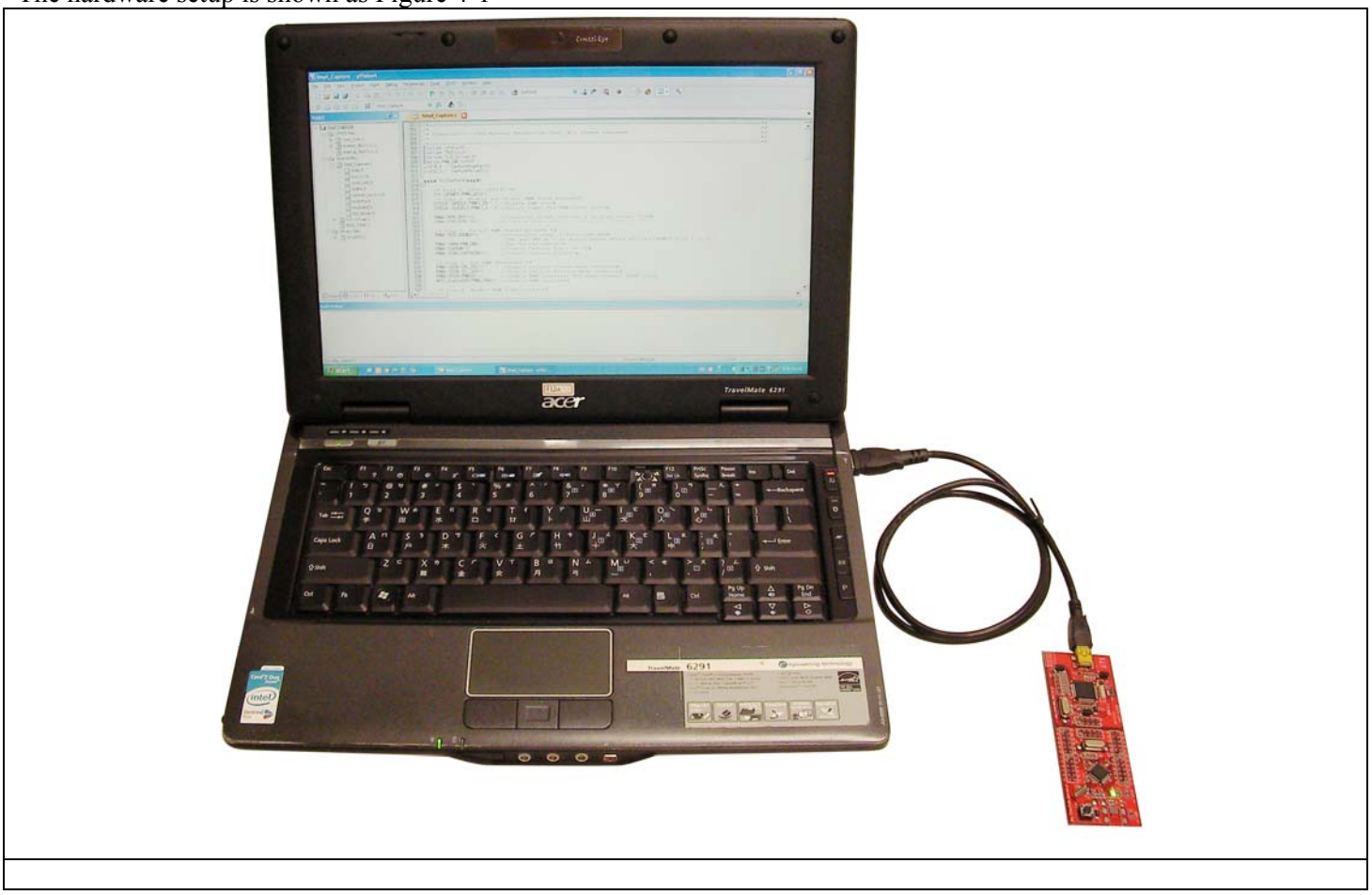


Figure 4-1 NuTiny- SDK-100 Hardware Setup

Downloaded from Elcodis.com electronic components distributor

4.4 Smpl_NuTiny-NUC100 Example Program

This example demonstrates the ease of downloading and debugging an application on a NuTiny-SDK-100 board.
It can be found on the Figure 4-2 list directory and downloaded from Nuvoton NuMicro™ Website following Chapter 6.3.

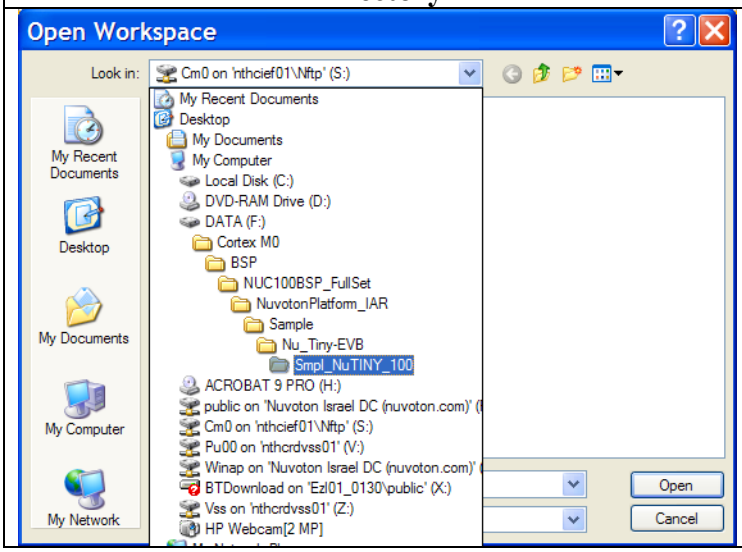
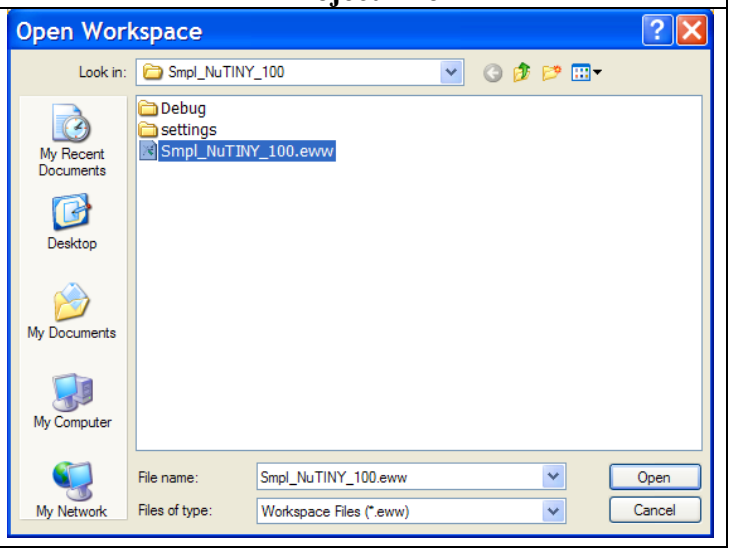
Directory	Project File
	

Figure 4-2 Smpl_NuTiny_100 Example Directory

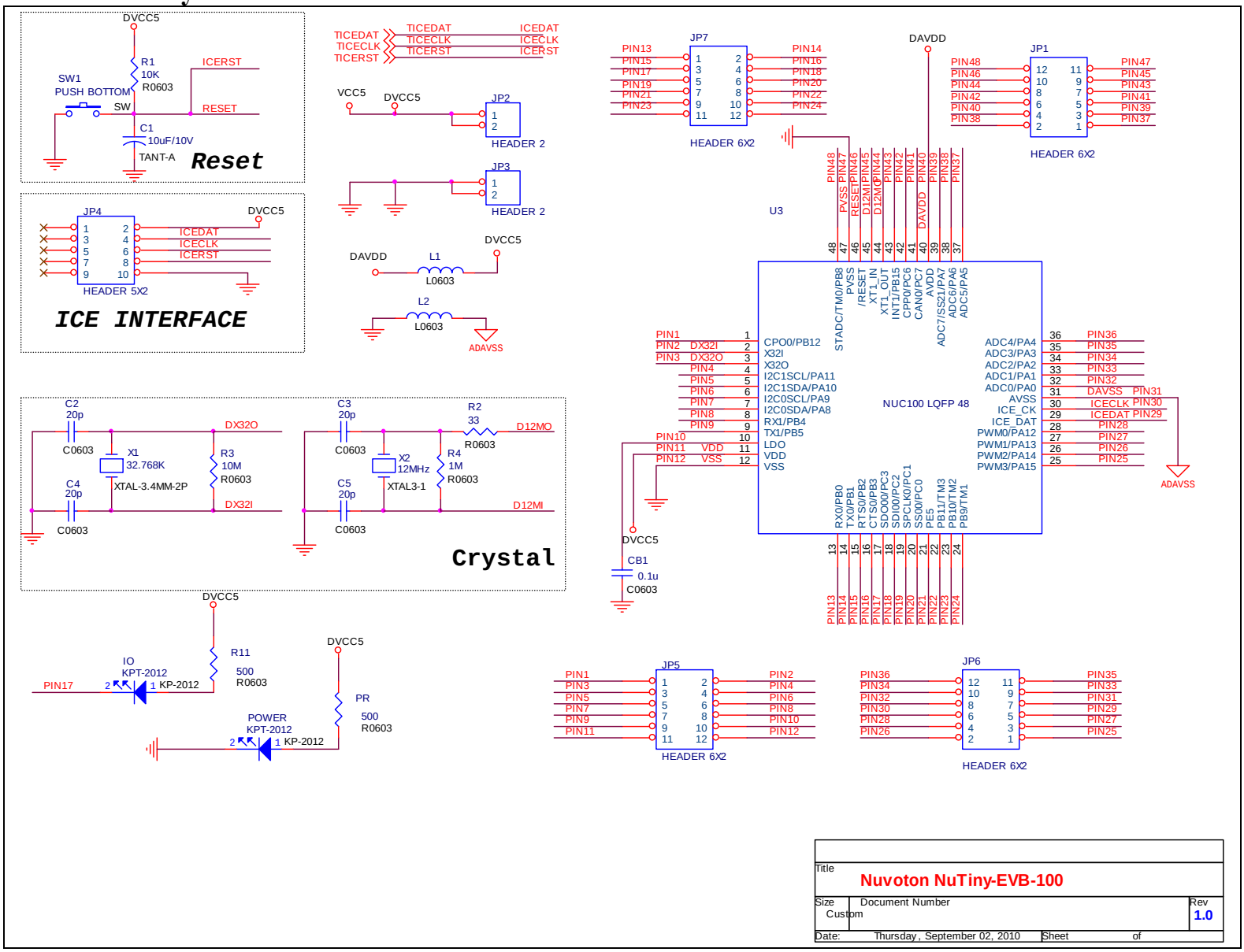
To use this example:
The PC.3 LED will toggle on the NuTiny-EVB-100 board.

- **Start IAR Embedded Workbench**
- **File-Open-Workspace**
  Open the Smpl_NuTiny_100.eww workspace file
- **Project - Make**
  Compile and link the Smpl_NuTiny-100 application
- **Project – Download and Debug**
  Program the application code into on-chip Flash ROM.
  - Single step through code
  - Reset the device
  - Run the application

Publication Release Date: Aug. 20, 2010
Revision V1.0

Downloaded from Elcodis.com electronic components distributor

5 NuTiny-EVB-100 Schematic

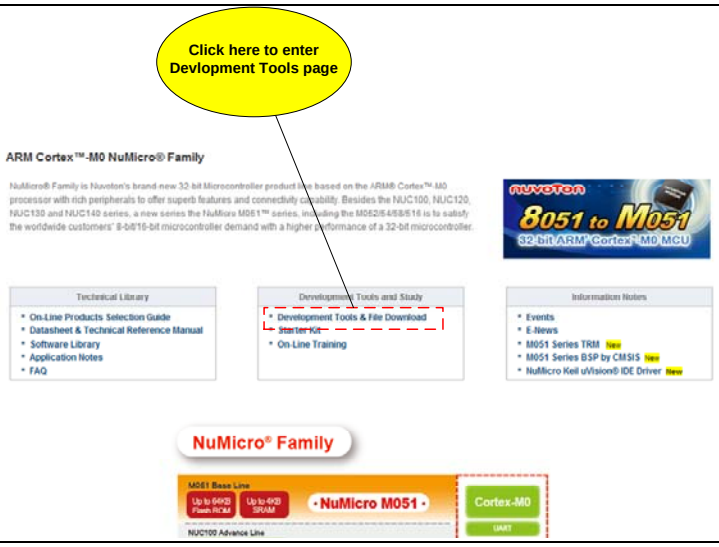
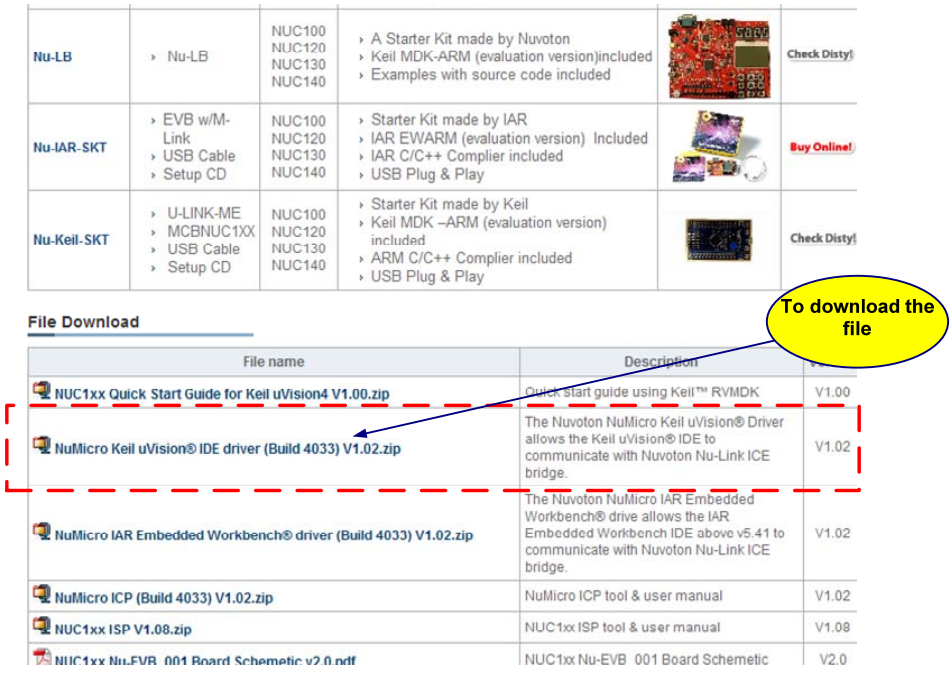


Publication Release Date: Aug. 20, 2010
Revision V1.0

Downloaded from Elcodis.com electronic components distributor

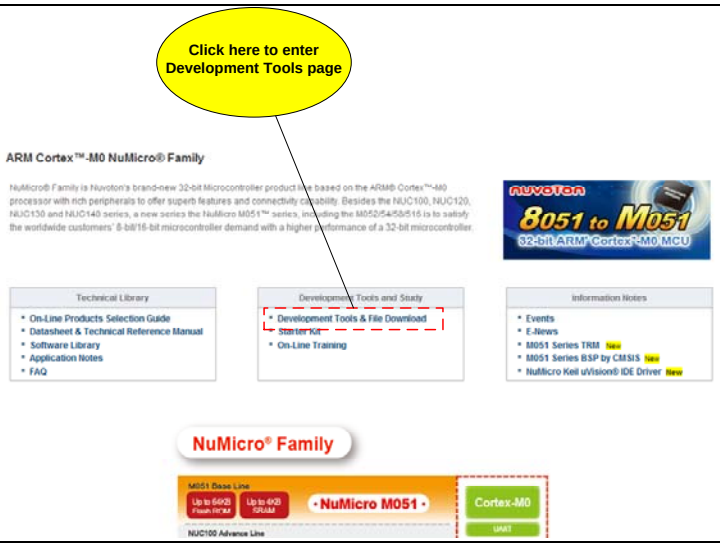
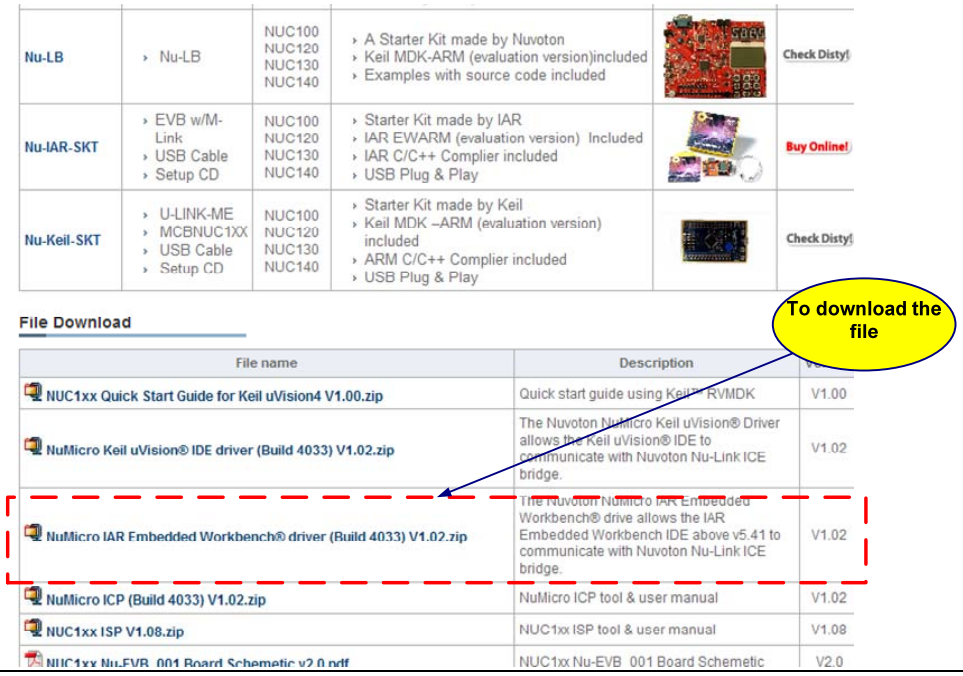
6 To Download NuMicro™ Family Related Files from Nuvoton Company

6.1 To Download NuMicro™ Keil µVision® IDE driver

Step1	To visit the Nuvoton NuMicro™ Website: **http://www.nuvoton.com/NuMicro**
Step2	
Step 3	
Step 4	To download the NuMicro Keil µVision® IDE driver

Downloaded from Elcodis.com electronic components distributor

6.2 To Download NuMicro™ IAR EWARM driver

Step1	To visit the Nuvoton NuMicro™ Website: **http://www.nuvoton.com/NuMicro**
Step2	
Step 3	
Step 4	To download the NuMicro™ IAR Embedded Workbench® driver

Downloaded from Elcodis.com electronic components distributor

6.3 To Download NuMicro™ NUC100 series BSP Software Library

Step1	To visit the Nuvoton NuMicro™ Website: **http://www.nuvoton.com/NuMicro**
Step2	
Step 3	To download the NuMicro™ NUC100 series software library

Downloaded from Elcodis.com electronic components distributor

7 Revision History

Version	Date	Page	Description
1.0	Aug. 20, 2010	--	Initial Release

Important Notice

Nuvoton products are not designed, intended, authorized or warranted for use as components in systems or equipment intended for surgical implantation, atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, or for other applications intended to support or sustain life. Further more, Nuvoton products are not intended for applications wherein failure of Nuvoton products could result or lead to a situation wherein personal injury, death or severe property or environmental damage could occur.

Nuvoton customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Nuvoton for any damages resulting from such improper use or sales.

Please note that all data and specifications are subject to change without notice. All the trademarks of products and companies mentioned in this datasheet belong to their respective owners.

Downloaded from Elcodis.com electronic components distributor