

# NuTiny-SDK-M051 User's Manual

## For NuMicro M051™ Series

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## 1 Overview

NuTiny-SDK-M051 is the specific development tool for NuMicro M051™ series –M052/M054/M058/M0516. Users can use NuTiny-SDK-M051 to develop and verify the application program easily.

NuTiny-SDK-M051 includes 2 portions. One is M052\_Tiny-EVB and the other is Nu-Link-Me. M052\_Tiny-EVB is evaluation board and Nu-Link-Me is its Debug Adaptor. Thus, users do not need additional ICE equipment.

## 2 NuTiny-SDK-M051 introduction

NuTiny-SDK-M051 can support NuMicro M051™ series. Figure 2-1 is NuTiny-SDK-M051 for M051 series and the left portion is called M052-TINY-EVB and the right portion is Debug Adaptor called Nu-Link-Me.

M052-TINY-EVB is similar to other development board. Users can use it to develop and verify applications to emulate the real behavior. In fact, the real chip M0516LAN is mounted on the board. The on board chip covers M052, M054 and M058's features. The M052\_Tiny-EVB 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 Keil or IAR Please refer to “Nuvoton NuMicro™ IAR ICE driver user manual “ or Nuvoton NuMicro™ Keil ICE driver user manual” in detail.

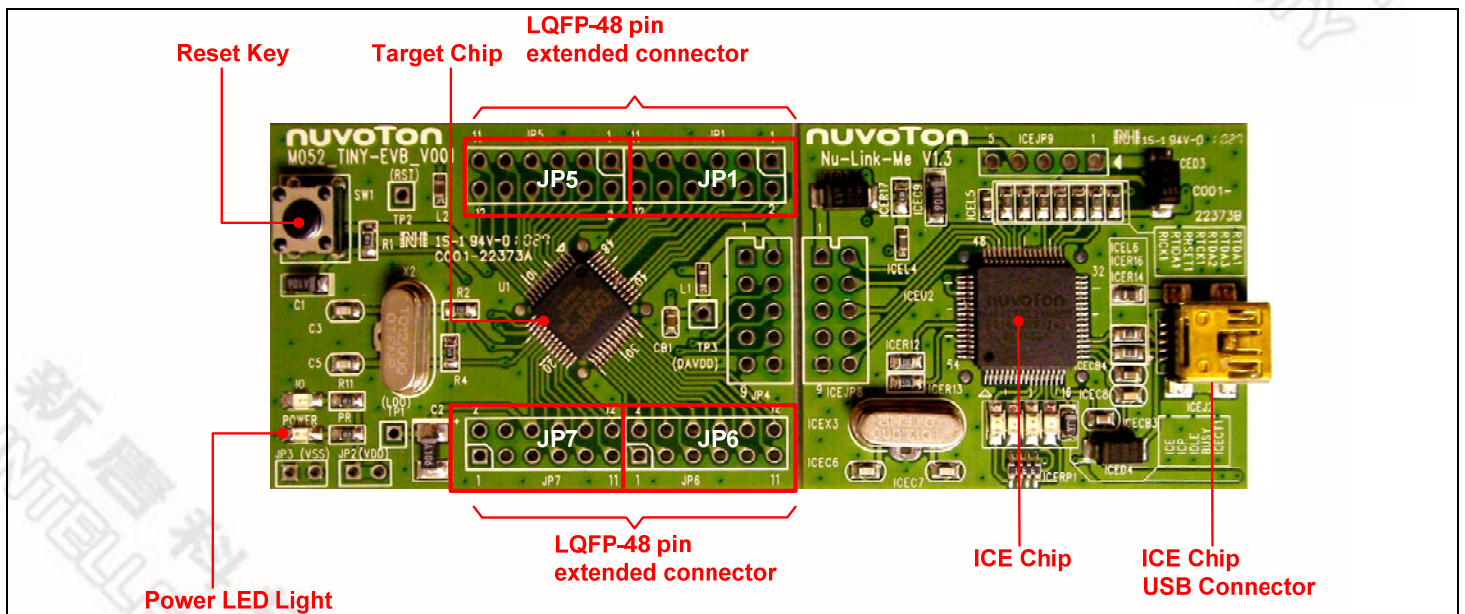


Figure 2-1 NuTiny-SDK-M051 (Green Color PCB Board)

## 2.1 NuTiny -SDK-M051 Jumper Description

### 2.1.1 Power Setting

- JP2: VCC5 Voltage connector in M052\_TINY-EVB
- J2: USB port in Nu-Link-Me

| POWER model | J1 USB port | J2 USB port   | JP2 VCC5          | MCU Voltage          |
|-------------|-------------|---------------|-------------------|----------------------|
| Model 1     | X           | Connect to PC | DC 5V output      | DC 5V                |
| Model 2     | X           | X             | DC 2.8-5.5V input | Voltage by VCC input |

X: Not use.

### 2.1.2 Debug Connector

- JP4: Target ICE Connector in M052\_TINY-EVB
- JP8: Nuvoton ICE Connector in Nu-Link-Me

### 2.1.3 USB Connector

- J1: mini USB Connector in M052\_TINY-EVB
- J2: mini USB Connector in Nu-Link-Me

### 2.1.4 Extended Connector

- JP1, JP5, JP6 and JP7: Show all of chip pins in M052\_TINY-EVB

### 2.1.5 Reset Button

- SW1: Reset button in M052\_TINY-EVB

### 2.1.6 Power Connector

- JP2: VCC connector in M052\_TINY-EVB
- JP3: GND connector in M052\_TINY-EVB

## 2.2 Pin Assignment for Extended Connector

M052\_TINY-EVB provides M0516LAN on board and the extended connector for LQFP-48 pin. Table 2-1 is the pin assignment for M0516LAN.

| Pin No | Pin Name         | Pin No | Pin Name        |
|--------|------------------|--------|-----------------|
| 01     | MOSI_0,AIN5,P1.5 | 25     | P2.5,AD13,PWM5  |
| 02     | MISO_0,AIN6,P1.6 | 26     | P2.6,AD14,PWM6  |
| 03     | SCLK0,AIN7,P1.7  | 27     | P2.7,AD15,PWM7  |
| 04     | /RST             | 28     | P4.4,/CS        |
| 05     | P3.0,RXD         | 29     | P4.5,ALE        |
| 06     | AVSS             | 30     | P4.6,ICE_CLK    |
| 07     | P3.1,TXD         | 31     | P4.7,ICE_DATA   |
| 08     | P3.2,/INT0,STADC | 32     | P0.7,AD7,SCLK1  |
| 09     | P3.3,/INT1,MCLK  | 33     | P0.6,AD6,MISO_1 |
| 10     | P3.4, T0,SDA     | 34     | P0.5,AD5,MOSI_1 |
| 11     | P3.5,T1,SCL      | 35     | P0.4,AD4,/SS1   |
| 12     | P4.3,PWM3        | 36     | P4.1,PWM1       |
| 13     | P3.6,/WR,CKO     | 37     | P0.3,AD3,RTS0   |
| 14     | P3.7,/RD         | 38     | P0.2,AD2,CST0   |
| 15     | XTAL2            | 39     | P0.1,AD1,RTS1   |
| 16     | XTAL1            | 40     | P0.0,AD0,CTS1   |
| 17     | VSS              | 41     | VDD             |
| 18     | LDO_CAP          | 42     | AVDD            |
| 19     | P2.0,AD8,PWM0    | 43     | P1.0,AIN0,P1.0  |
| 20     | P2.1,AD9,PWM1    | 44     | P1.1,AIN1,T3    |
| 21     | P2.2,AD10,PWM2   | 45     | P1.2,AIN2,RXD1  |
| 22     | P2.3,AD11,PWM3   | 46     | P1.3AIN3,TXD1   |
| 23     | P2.4,AD12,PWM4   | 47     | P1.4,AIN4,/SS0  |
| 24     | P4.0,PWM0        | 48     | P4.2,PWM2       |

Table 2-1 pin assignment for M0516LAN

## 2.3 NuTiny-SDK-M051 PCB Placement

Users can refer Figure 2-2 for the NuTiny -SDK-M051 PCB placement.

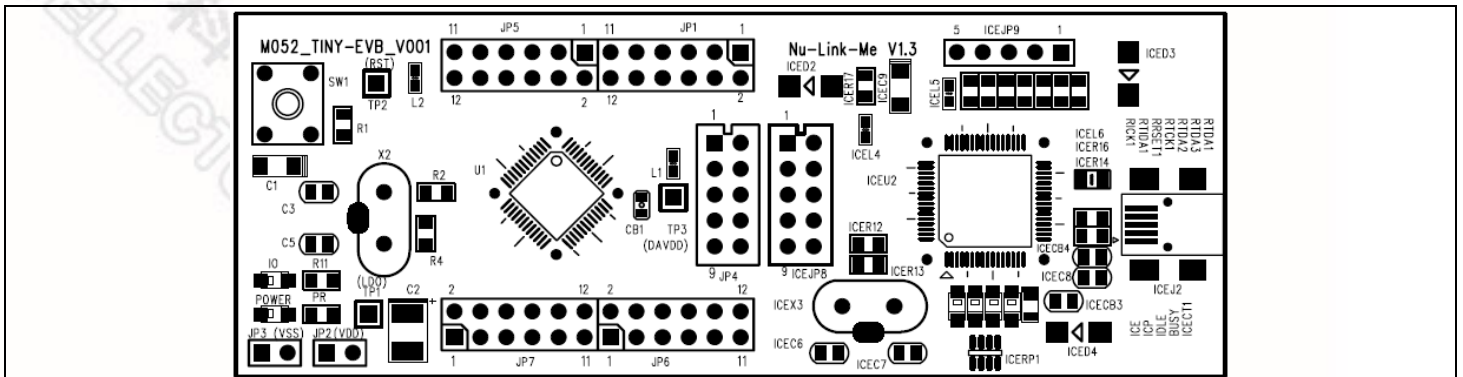


Figure 2-2 NuTiny-SDK-M051 PCB Placement



## 3 How to start NuTiny -SDK-M051 on the Keil uVision® IDE

### 3.1 Keil uVision® IDE Software Download & Install

Please connect to Keil company website (<http://www.keil.com>) to download the Keil uVision® IDE and install the RVMDK.

### 3.2 Nuvoton Nu-Link Driver Download & Install

Please connect to Nuvoton company NuMicro™ website ( <http://www.nuvoton.com/NuMicro> ) to download “NuMicro™ Keil uVision® IDE driver” file. Please refer the Chapter 6.1 for the detail download flow. When the download had finished, 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

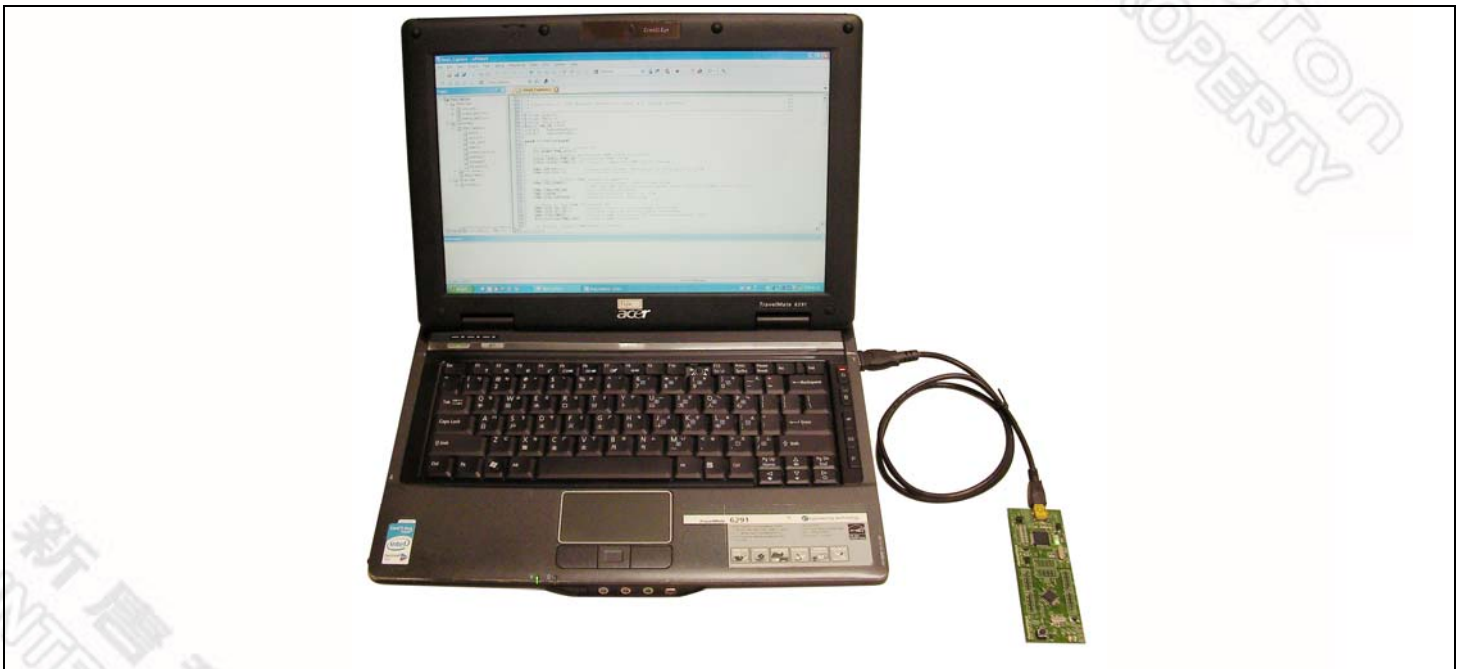


Figure 3-1 NuTiny-SDK-M051 Hardware Setup

## 3.4 Smpl\_NuTiny-M051 Example Program

This example demonstrates the ease of downloading and debugging an application on a NuTiny-SDK-M051 board. The example can be found on the Figure 3-2 list directory.

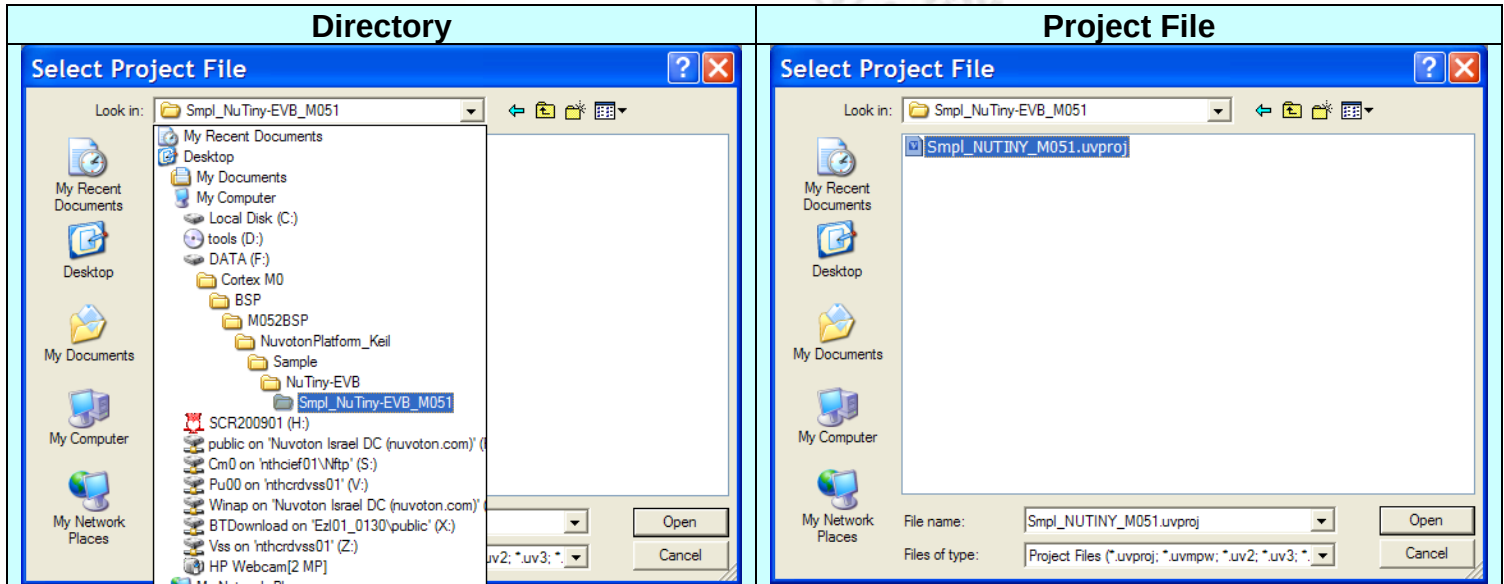


Figure 3-2 Smpl\_NuTiny-M051 Example Directory

To use this example:

- **Start uVision**
- Open the Smpl\_NuTiny-M051.uvproj project file  
**Project-Open**
- Compile and link the Smpl\_NuTiny-M051 application  
 **Project - Build**
- Program the application into on-chip Flash ROM  
 **Flash – Download**

The LED will toggle on the M052\_TINY-EVB board.

- **Start debug mode**  
Using the debugger commands, you may:
  - Single step through code
  - Run the application\
  - Review variables in the watch window
  - Reset the device to re-run the application

## 4 How to start NuTiny-SDK-M051 on the IAR Embedded Workbench

### 4.1 IAR Embedded Workbench Software Download & Install

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

### 4.2 Nuvoton Nu-Link Driver Download & Install

Please connect to Nuvoton company NuMicro™ website ( [www.nuvoton.com/NuMicro](http://www.nuvoton.com/NuMicro)) to download “NuMicro™ IAR ICE driver user manual” file. Please refer the 6.2 for the detail download flow. When the download had finished, 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 3-1

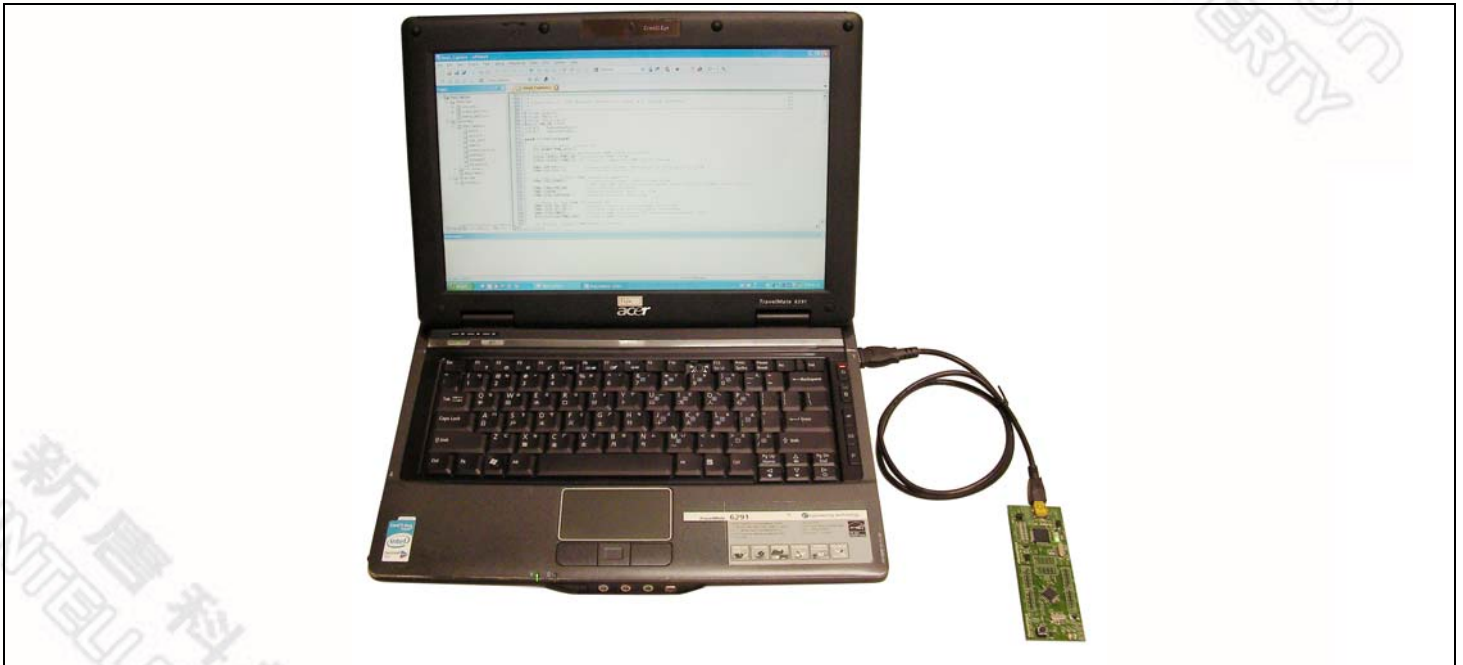


Figure 4-1 NuTiny- SDK-M051 Hardware Setup



#### 4.4 Smpl\_NuTiny-M051 Example Program

This example demonstrates the ease of downloading and debugging an application on a NuTiny-SDK-M051 board. The example can be found on the Figure 3-2 list directory. (Samples code can be download from Nuvoton website)

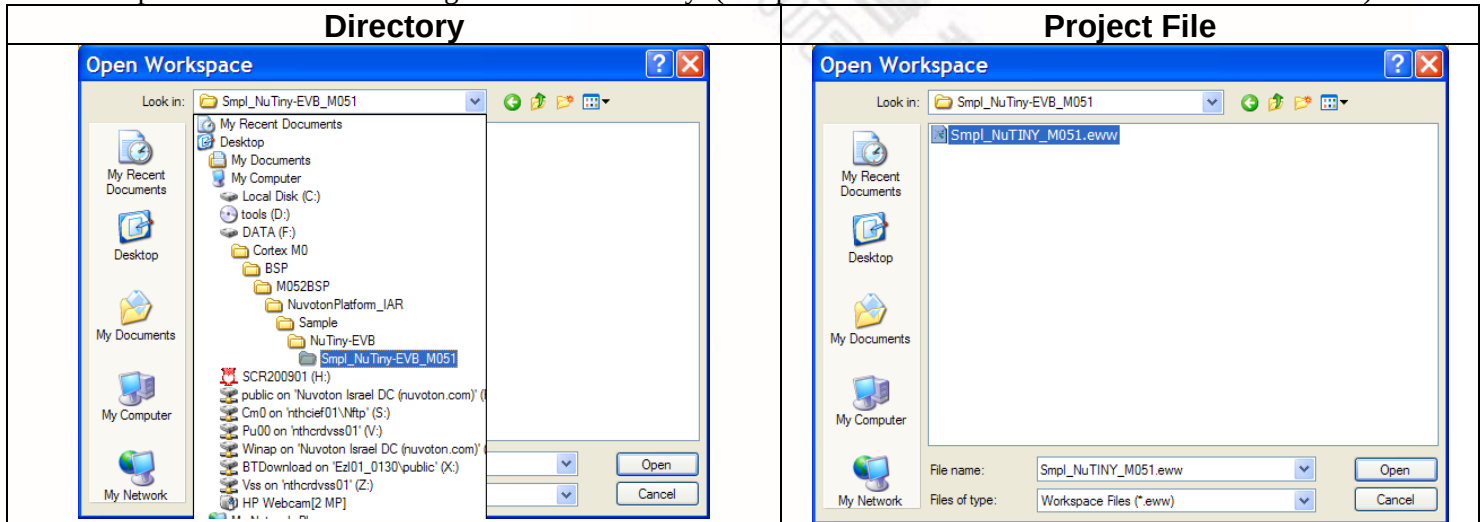


Figure 4-2 Smpl\_NuTiny-M051 Example Directory

To use this example:

-  Start IAR Embedded Workbench
- Open the Smpl\_NuTiny-M051.eww workspace file  
**File-Open-Workspace**
- Compile and link the Smpl\_NuTiny-M051 application



#### Project - Make

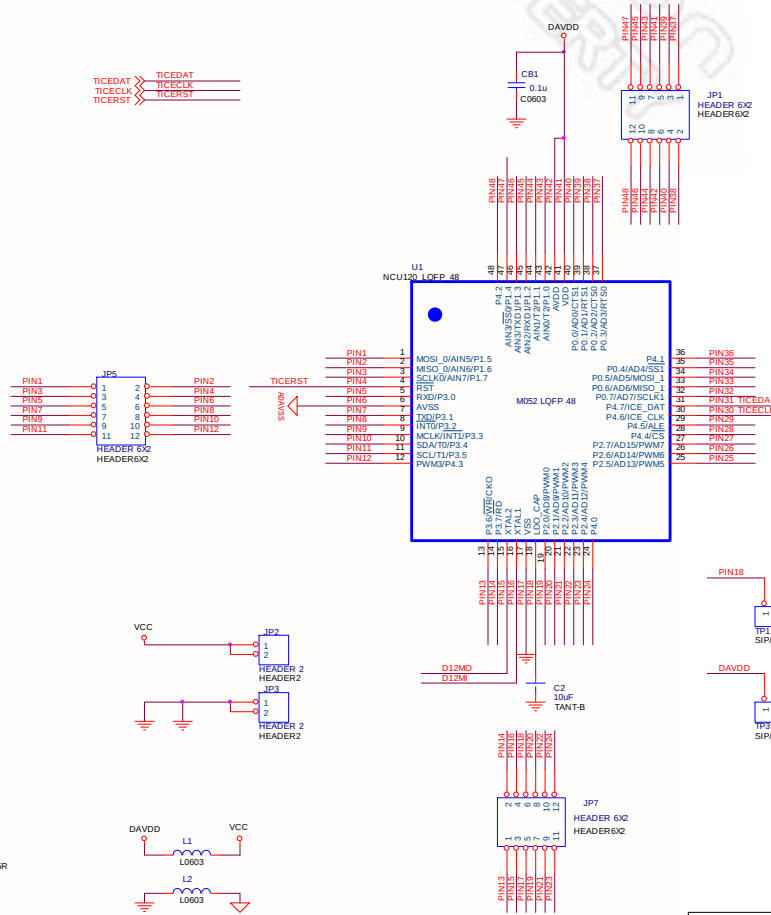
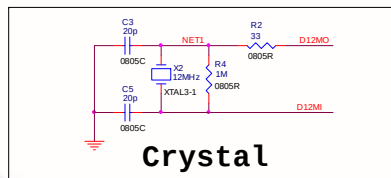
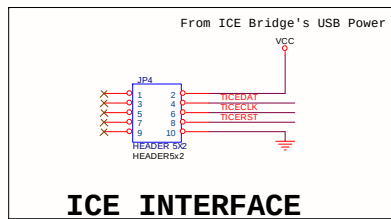
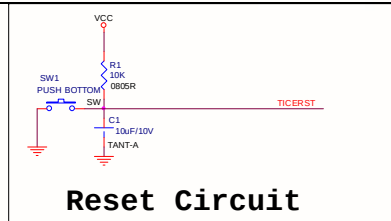
- Program the application into on-chip Flash ROM



#### Project – Download and Debug

The I/O will toggle on the M052\_TINY-EVB board.

## 5 M052\_TINY-EVB Schematic



|         |                                        |                    |         |
|---------|----------------------------------------|--------------------|---------|
| nuvoTon |                                        |                    |         |
| File    | Nuvoton M052_TINY-EVB Board Versin 002 |                    |         |
| Size    | Document Number                        | M052_TINY_V002.DSN | Rev 004 |
| Date    | Tuesday, August 10, 2010               | Sheet              | 1 of 1  |

## 6 To Download NuMicro™ Family Related Files From Nuvoton Company

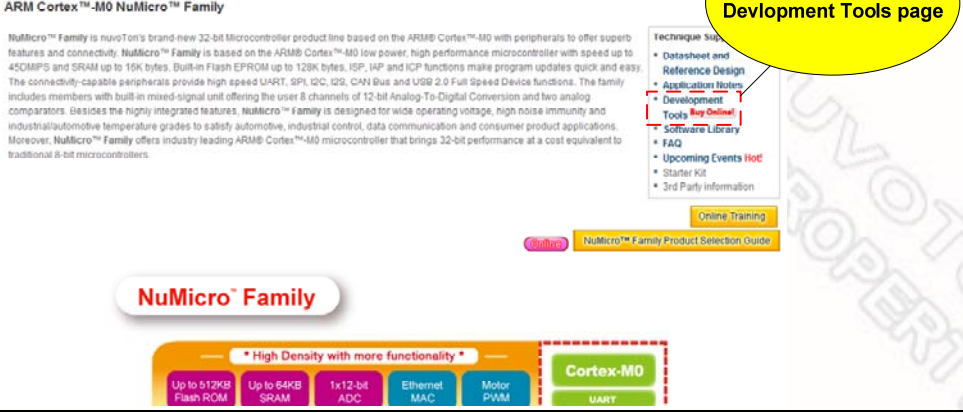
### 6.1 To Download NuMicro™ Keil uVision® IDE driver

| Step1                                                                                                                                             | To connect to the Nuvoton NuMicro™ Website: <a href="http://www.nuvoton.com/NuMicro">http://www.nuvoton.com/NuMicro</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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---------------------------------------------------------------------------|--------------------------------|-------|----------------------------------------------------------------------------------------------------------|-------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------|
| Step2                                                                                                                                             | <div><div>ARM Cortex™-M0 NuMicro™ Family</div><div><p>NuMicro™ Family is nuvoton's brand-new 32-bit Microcontroller product line based on the ARM® Cortex™-M0 with peripherals to offer superb features and connectivity. NuMicro™ Family is based on the ARM® Cortex™-M0 low power, high performance microcontroller with speed up to 45DMIPS and SRAM up to 16K bytes. Built-in Flash EPROM up to 128K bytes, ISP, IAP and ICP functions make program updates quick and easy. The connectivity-capable peripherals provide high speed UART, SPI, I2C, I2S, CAN Bus and USB 2.0 Full Speed Device functions. The family includes members with built in mixed-signal unit offering the user 8 channels of 12-bit Analog To Digital Conversion and two analog comparators. Besides the highly integrated features, NuMicro™ Family is designed for wide operating voltage, high noise immunity and industrial/automotive temperature grades to satisfy automotive, industrial control, data communication and consumer product applications. Moreover, NuMicro™ Family offers industry leading ARM® Cortex™-M0 microcontroller that brings 32-bit performance at a cost equivalent to traditional 8-bit microcontrollers.</p><div><div>NuMicro™ Family</div><div><div>Up to 512KB Flash ROM</div><div>Up to 64KB SRAM</div><div>1x12-bit ADC</div><div>Ethernet MAC</div><div>Motor PWM</div><div>Cortex-M0</div><div>UART</div></div></div></div><div><div>Technique Support</div><ul style="list-style-type: none"><li>Datasheet and Reference Design</li><li>Application Notes</li><li>Development Tools <a href="#">Buy Online!</a></li><li>Software Library</li><li>FAQ</li><li>Upcoming Events <a href="#">Hot!</a></li><li>Starter Kit</li><li>3rd Party information</li></ul><div>Online Training</div><div><a href="#">NuMicro™ Family Product Selection Guide</a></div></div><div><div>Click here to enter Development Tools page</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                      |                                                                                                                                                     |                                                                                       |                                                                                                                                      |                                                                                       |              |            |                                                          |                                      |                                                                                                                                                |                                                                                       |             |             |                                                                       |                                      |                                                                                                                                                     |                                                                                       |              |           |             |  |                                                                                                                                          |                                     |       |                                                                                                                                             |                                                                                                                       |       |                                                                                                                                                   |                                                                                                                                                     |       |                                                                                                                        |                                |       |                                                                                                          |                               |       |                                                                                                                                |                                   |      |
| Step 3                                                                                                                                            | <table><tr><td>Nu-LB</td><td><div>› Nu-LB</div></td><td>NUC100<br/>NUC120<br/>NUC130<br/>NUC140</td><td><div>› A Starter Kit made by Nuvoton<br/>› Keil MDK-ARM (evaluation version) included<br/>› Examples with source code included</div></td><td></td><td>Check Disty!</td></tr><tr><td>Nu-IAR-SKT</td><td><div>› EVB w/M-Link<br/>› USB Cable<br/>› Setup CD</div></td><td>NUC100<br/>NUC120<br/>NUC130<br/>NUC140</td><td><div>› Starter Kit made by IAR<br/>› IAR EWARM (evaluation version) Included<br/>› IAR C/C++ Compiler included<br/>› USB Plug &amp; Play</div></td><td></td><td>Buy Online!</td></tr><tr><td>Nu-Keil-SKT</td><td><div>› U-LINK-ME<br/>› MCBNUC1XX<br/>› USB Cable<br/>› Setup CD</div></td><td>NUC100<br/>NUC120<br/>NUC130<br/>NUC140</td><td><div>› Starter Kit made by Keil<br/>› Keil MDK –ARM (evaluation version) included<br/>› ARM C/C++ Compiler included<br/>› USB Plug &amp; Play</div></td><td></td><td>Check Disty!</td></tr></table> <div><div>File Download</div><table><tr><th>File name</th><th>Description</th><th></th></tr><tr><td> NUC1xx Quick Start Guide for Keil uVision4 V1.00.zip</td><td>Quick start guide using Keil™ RVMDK</td><td>V1.00</td></tr><tr><td> NuMicro Keil uVision® IDE driver (Build 4033) V1.02.zip</td><td>The Nuvoton NuMicro Keil uVision® Driver allows the Keil uVision® IDE to communicate with Nuvoton Nu-Link ICE bridge.</td><td>V1.02</td></tr><tr><td> NuMicro IAR Embedded Workbench® driver (Build 4033) V1.02.zip</td><td>The Nuvoton NuMicro IAR Embedded Workbench® drive allows the IAR Embedded Workbench IDE above v5.41 to communicate with Nuvoton Nu-Link ICE bridge.</td><td>V1.02</td></tr><tr><td> NuMicro ICP (Build 4033) V1.02.zip</td><td>NuMicro ICP tool &amp; user manual</td><td>V1.02</td></tr><tr><td> NUC1xx ISP V1.08.zip</td><td>NUC1xx ISP tool &amp; user manual</td><td>V1.08</td></tr><tr><td> NUC1xx Nu-EVB 001 Board Schematic v2.0.pdf</td><td>NUC1xx Nu-EVB 001 Board Schematic</td><td>V2.0</td></tr></table><div><div>To download the file</div></div></div> | Nu-LB                                | <div>› Nu-LB</div>                                                                                                                                  | NUC100<br>NUC120<br>NUC130<br>NUC140                                                  | <div>› A Starter Kit made by Nuvoton<br/>› Keil MDK-ARM (evaluation version) included<br/>› Examples with source code included</div> |  | Check Disty! | Nu-IAR-SKT | <div>› EVB w/M-Link<br/>› USB Cable<br/>› Setup CD</div> | NUC100<br>NUC120<br>NUC130<br>NUC140 | <div>› Starter Kit made by IAR<br/>› IAR EWARM (evaluation version) Included<br/>› IAR C/C++ Compiler included<br/>› USB Plug &amp; Play</div> |  | Buy Online! | Nu-Keil-SKT | <div>› U-LINK-ME<br/>› MCBNUC1XX<br/>› USB Cable<br/>› Setup CD</div> | NUC100<br>NUC120<br>NUC130<br>NUC140 | <div>› Starter Kit made by Keil<br/>› Keil MDK –ARM (evaluation version) included<br/>› ARM C/C++ Compiler included<br/>› USB Plug &amp; Play</div> |  | Check Disty! | File name | Description |  |  NUC1xx Quick Start Guide for Keil uVision4 V1.00.zip | Quick start guide using Keil™ RVMDK | V1.00 |  NuMicro Keil uVision® IDE driver (Build 4033) V1.02.zip | The Nuvoton NuMicro Keil uVision® Driver allows the Keil uVision® IDE to communicate with Nuvoton Nu-Link ICE bridge. | V1.02 |  NuMicro IAR Embedded Workbench® driver (Build 4033) V1.02.zip | The Nuvoton NuMicro IAR Embedded Workbench® drive allows the IAR Embedded Workbench IDE above v5.41 to communicate with Nuvoton Nu-Link ICE bridge. | V1.02 |  NuMicro ICP (Build 4033) V1.02.zip | NuMicro ICP tool & user manual | V1.02 |  NUC1xx ISP V1.08.zip | NUC1xx ISP tool & user manual | V1.08 |  NUC1xx Nu-EVB 001 Board Schematic v2.0.pdf | NUC1xx Nu-EVB 001 Board Schematic | V2.0 |
| Nu-LB                                                                                                                                             | <div>› Nu-LB</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | NUC100<br>NUC120<br>NUC130<br>NUC140 | <div>› A Starter Kit made by Nuvoton<br/>› Keil MDK-ARM (evaluation version) included<br/>› Examples with source code included</div>                |  | Check Disty!                                                                                                                         |                                                                                       |              |            |                                                          |                                      |                                                                                                                                                |                                                                                       |             |             |                                                                       |                                      |                                                                                                                                                     |                                                                                       |              |           |             |  |                                                                                                                                          |                                     |       |                                                                                                                                             |                                                                                                                       |       |                                                                                                                                                   |                                                                                                                                                     |       |                                                                                                                        |                                |       |                                                                                                          |                               |       |                                                                                                                                |                                   |      |
| Nu-IAR-SKT                                                                                                                                        | <div>› EVB w/M-Link<br/>› USB Cable<br/>› Setup CD</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | NUC100<br>NUC120<br>NUC130<br>NUC140 | <div>› Starter Kit made by IAR<br/>› IAR EWARM (evaluation version) Included<br/>› IAR C/C++ Compiler included<br/>› USB Plug &amp; Play</div>      |  | Buy Online!                                                                                                                          |                                                                                       |              |            |                                                          |                                      |                                                                                                                                                |                                                                                       |             |             |                                                                       |                                      |                                                                                                                                                     |                                                                                       |              |           |             |  |                                                                                                                                          |                                     |       |                                                                                                                                             |                                                                                                                       |       |                                                                                                                                                   |                                                                                                                                                     |       |                                                                                                                        |                                |       |                                                                                                          |                               |       |                                                                                                                                |                                   |      |
| Nu-Keil-SKT                                                                                                                                       | <div>› U-LINK-ME<br/>› MCBNUC1XX<br/>› USB Cable<br/>› Setup CD</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NUC100<br>NUC120<br>NUC130<br>NUC140 | <div>› Starter Kit made by Keil<br/>› Keil MDK –ARM (evaluation version) included<br/>› ARM C/C++ Compiler included<br/>› USB Plug &amp; Play</div> |  | Check Disty! 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| File name                                                                                                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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|  NUC1xx Quick Start Guide for Keil uVision4 V1.00.zip          | Quick start guide using Keil™ RVMDK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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|  NuMicro Keil uVision® IDE driver (Build 4033) V1.02.zip       | The Nuvoton NuMicro Keil uVision® Driver allows the Keil uVision® IDE to communicate with Nuvoton Nu-Link ICE bridge.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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|  NuMicro IAR Embedded Workbench® driver (Build 4033) V1.02.zip | The Nuvoton NuMicro IAR Embedded Workbench® drive allows the IAR Embedded Workbench IDE above v5.41 to communicate with Nuvoton Nu-Link ICE bridge.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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|  NuMicro ICP (Build 4033) V1.02.zip                            | NuMicro ICP tool & user manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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|  NUC1xx ISP V1.08.zip                                          | NUC1xx ISP tool & user manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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|  NUC1xx Nu-EVB 001 Board Schematic v2.0.pdf                    | NUC1xx Nu-EVB 001 Board Schematic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     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| Step 4                                                                                                                                            | To download the :uMicro Keil uVision® IDE driver                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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## 6.2 To Download NuMicro™ IAR EWARM driver

| Step1                                                         | To connect to the Nuvoton NuMicro™ Website: <a href="http://www.nuvoton.com/NuMicro">http://www.nuvoton.com/NuMicro</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      |                                                                                                                                                                                  |                                                                                       |                                                                                                                                                            |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
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| Step2                                                         | <div><div>ARM Cortex™-M0 NuMicro™ Family</div><div><p>NuMicro™ Family is nuvoTon's brand-new 32-bit Microcontroller product line based on the ARM® Cortex™-M0 with peripherals to offer superb features and connectivity. NuMicro™ Family is based on the ARM® Cortex™-M0 low power, high performance microcontroller with speed up to 450MIPS and SRAM up to 16K bytes. Built-in Flash EPROM up to 128K bytes, ISP, IAP and ICP functions make program updates quick and easy. The connectivity-capable peripherals provide high speed UART, SPI, I2C, I2S, CAN Bus and USB 2.0 Full Speed Device functions. The family includes members with built-in mixed-signal unit offering the user 8 channels of 12-bit Analog-To-Digital Conversion and two analog comparators. Besides the highly integrated features, NuMicro™ Family is designed for wide operating voltage, high noise immunity and industrial/automotive temperature grades to satisfy automotive, industrial control, data communication and consumer product applications. Moreover, NuMicro™ Family offers industry leading ARM® Cortex™-M0 microcontroller that brings 32-bit performance at a cost equivalent to traditional 8-bit microcontrollers.</p></div><div><div>Technique Support</div><ul style="list-style-type: none"><li>• Datasheet and Reference Design</li><li>• Application Notes</li><li>• Development Tools</li><li>• Tools for Online Software Library</li><li>• FAQ</li><li>• Upcoming Events</li><li>• Hot Starter Kit</li><li>• 3rd Party Information</li></ul><div>Online Training</div><div>Continue NuMicro™ Family Product Selection Guide</div></div><div><div>NuMicro™ Family</div><div><div>* High Density with more functionality *</div><div><div>Up to 512KB Flash ROM</div><div>Up to 64KB SRAM</div><div>1x12-bit ADC</div><div>Ethernet MAC</div><div>Motor PWM</div><div>Cortex-M0</div><div>UART</div></div></div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      |                                                                                                                                                                                  |                                                                                       |                                                                                                                                                            |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| Step 3                                                        | <div><table><tr><td>Nu-LB</td><td><div><div>› Nu-LB</div></div></td><td>NUC100<br/>NUC120<br/>NUC130<br/>NUC140</td><td><div><div>› A Starter Kit made by Nuvoton</div><div>› Keil MDK-ARM (evaluation version)included</div><div>› Examples with source code included</div></div></td><td></td><td><a href="#">Check Disty!</a></td></tr><tr><td>Nu-IAR-SKT</td><td><div><div>› EVB w/M-Link</div><div>› USB Cable</div><div>› Setup CD</div></div></td><td>NUC100<br/>NUC120<br/>NUC130<br/>NUC140</td><td><div><div>› Starter Kit made by IAR</div><div>› IAR EWARM (evaluation version) Included</div><div>› IAR C/C++ Compiler included</div><div>› USB Plug &amp; Play</div></div></td><td></td><td><a href="#">Buy Online!</a></td></tr><tr><td>Nu-Keil-SKT</td><td><div><div>› U-LINK-ME</div><div>› MCBNUC1XX</div><div>› USB Cable</div><div>› Setup CD</div></div></td><td>NUC100<br/>NUC120<br/>NUC130<br/>NUC140</td><td><div><div>› Starter Kit made by Keil</div><div>› Keil MDK –ARM (evaluation version) included</div><div>› ARM C/C++ Compiler included</div><div>› USB Plug &amp; Play</div></div></td><td></td><td><a href="#">Check Disty!</a></td></tr></table><div><div>File Download</div><table><tr><th>File name</th><th>Description</th><th>Version</th></tr><tr><td> NUC1xx Quick Start Guide for Keil uVision4 V1.00.zip</td><td>Quick start guide using Keil™ RVMDK</td><td>V1.00</td></tr><tr><td> NuMicro Keil uVision® IDE driver (Build 4033) V1.02.zip</td><td>The Nuvoton NuMicro Keil uVision® Driver allows the Keil uVision® IDE to communicate with Nuvoton Nu-Link ICE bridge.</td><td>V1.02</td></tr><tr><td> NuMicro IAR Embedded Workbench® driver (Build 4033) V1.02.zip</td><td>The Nuvoton NuMicro IAR Embedded Workbench® drive allows the IAR Embedded Workbench IDE above v5.41 to communicate with Nuvoton Nu-Link ICE bridge.</td><td>V1.02</td></tr><tr><td> NuMicro ICP (Build 4033) V1.02.zip</td><td>NuMicro ICP tool &amp; user manual</td><td>V1.02</td></tr><tr><td> NUC1xx ISP V1.08.zip</td><td>NUC1xx ISP tool &amp; user manual</td><td>V1.08</td></tr><tr><td> NUC1xx Nu-EVB_001 Board Schematic v2.0.pdf</td><td>NUC1xx Nu-EVB_001 Board Schematic</td><td>V2.0</td></tr></table></div></div> | Nu-LB                                | <div><div>› Nu-LB</div></div>                                                                                                                                                    | NUC100<br>NUC120<br>NUC130<br>NUC140                                                  | <div><div>› A Starter Kit made by Nuvoton</div><div>› Keil MDK-ARM (evaluation version)included</div><div>› Examples with source code included</div></div> |  | <a href="#">Check Disty!</a> | Nu-IAR-SKT | <div><div>› EVB w/M-Link</div><div>› USB Cable</div><div>› Setup CD</div></div> | NUC100<br>NUC120<br>NUC130<br>NUC140 | <div><div>› Starter Kit made by IAR</div><div>› IAR EWARM (evaluation version) Included</div><div>› IAR C/C++ Compiler included</div><div>› USB Plug &amp; Play</div></div> |  | <a href="#">Buy Online!</a> | Nu-Keil-SKT | <div><div>› U-LINK-ME</div><div>› MCBNUC1XX</div><div>› USB Cable</div><div>› Setup CD</div></div> | NUC100<br>NUC120<br>NUC130<br>NUC140 | <div><div>› Starter Kit made by Keil</div><div>› Keil MDK –ARM (evaluation version) included</div><div>› ARM C/C++ Compiler included</div><div>› USB Plug &amp; Play</div></div> |  | <a href="#">Check Disty!</a> | File name | Description | Version | NUC1xx Quick Start Guide for Keil uVision4 V1.00.zip | Quick start guide using Keil™ RVMDK | V1.00 | NuMicro Keil uVision® IDE driver (Build 4033) V1.02.zip | The Nuvoton NuMicro Keil uVision® Driver allows the Keil uVision® IDE to communicate with Nuvoton Nu-Link ICE bridge. | V1.02 | NuMicro IAR Embedded Workbench® driver (Build 4033) V1.02.zip | The Nuvoton NuMicro IAR Embedded Workbench® drive allows the IAR Embedded Workbench IDE above v5.41 to communicate with Nuvoton Nu-Link ICE bridge. | V1.02 | NuMicro ICP (Build 4033) V1.02.zip | NuMicro ICP tool & user manual | V1.02 | NUC1xx ISP V1.08.zip | NUC1xx ISP tool & user manual | V1.08 | NUC1xx Nu-EVB_001 Board Schematic v2.0.pdf | NUC1xx Nu-EVB_001 Board Schematic | V2.0 |
| Nu-LB                                                         | <div><div>› Nu-LB</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | NUC100<br>NUC120<br>NUC130<br>NUC140 | <div><div>› A Starter Kit made by Nuvoton</div><div>› Keil MDK-ARM (evaluation version)included</div><div>› Examples with source code included</div></div>                       |  | <a href="#">Check Disty!</a>                                                                                                                               |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| Nu-IAR-SKT                                                    | <div><div>› EVB w/M-Link</div><div>› USB Cable</div><div>› Setup CD</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | NUC100<br>NUC120<br>NUC130<br>NUC140 | <div><div>› Starter Kit made by IAR</div><div>› IAR EWARM (evaluation version) Included</div><div>› IAR C/C++ Compiler included</div><div>› USB Plug &amp; Play</div></div>      |  | <a href="#">Buy Online!</a>                                                                                                                                |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| Nu-Keil-SKT                                                   | <div><div>› U-LINK-ME</div><div>› MCBNUC1XX</div><div>› USB Cable</div><div>› Setup CD</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | NUC100<br>NUC120<br>NUC130<br>NUC140 | <div><div>› Starter Kit made by Keil</div><div>› Keil MDK –ARM (evaluation version) included</div><div>› ARM C/C++ Compiler included</div><div>› USB Plug &amp; Play</div></div> |  | <a href="#">Check Disty!</a>                                                                                                                               |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| File name                                                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Version                              |                                                                                                                                                                                  |                                                                                       |                                                                                                                                                            |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| NUC1xx Quick Start Guide for Keil uVision4 V1.00.zip          | Quick start guide using Keil™ RVMDK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | V1.00                                |                                                                                                                                                                                  |                                                                                       |                                                                                                                                                            |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| NuMicro Keil uVision® IDE driver (Build 4033) V1.02.zip       | The Nuvoton NuMicro Keil uVision® Driver allows the Keil uVision® IDE to communicate with Nuvoton Nu-Link ICE bridge.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | V1.02                                |                                                                                                                                                                                  |                                                                                       |                                                                                                                                                            |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| NuMicro IAR Embedded Workbench® driver (Build 4033) V1.02.zip | The Nuvoton NuMicro IAR Embedded Workbench® drive allows the IAR Embedded Workbench IDE above v5.41 to communicate with Nuvoton Nu-Link ICE bridge.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | V1.02                                |                                                                                                                                                                                  |                                                                                       |                                                                                                                                                            |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| NuMicro ICP (Build 4033) V1.02.zip                            | NuMicro ICP tool & user manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | V1.02                                |                                                                                                                                                                                  |                                                                                       |                                                                                                                                                            |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| NUC1xx ISP V1.08.zip                                          | NUC1xx ISP tool & user manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | V1.08                                |                                                                                                                                                                                  |                                                                                       |                                                                                                                                                            |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| NUC1xx Nu-EVB_001 Board Schematic v2.0.pdf                    | NUC1xx Nu-EVB_001 Board Schematic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | V2.0                                 |                                                                                                                                                                                  |                                                                                       |                                                                                                                                                            |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |
| Step 4                                                        | To download the NuMicro™ IAR Embedded Workbench® driver                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      |                                                                                                                                                                                  |                                                                                       |                                                                                                                                                            |                                                                                       |                              |            |                                                                                 |                                      |                                                                                                                                                                             |                                                                                       |                             |             |                                                                                                    |                                      |                                                                                                                                                                                  |                                                                                       |                              |           |             |         |                                                      |                                     |       |                                                         |                                                                                                                       |       |                                                               |                                                                                                                                                     |       |                                    |                                |       |                      |                               |       |                                            |                                   |      |

## 6.3 To Download NuMicro™ M051 series BSP Software Library

|        |                                                                                                                         |
|--------|-------------------------------------------------------------------------------------------------------------------------|
| Step1  | To connect to the Nuvoton NuMicro™ Website: <a href="http://www.nuvoton.com/NuMicro">http://www.nuvoton.com/NuMicro</a> |
| Step2  |                                      |
| Step 3 | To download the NuMicro M051™ series software library                                                                   |

## 7 Revision History

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



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