WLINK ICE
Operation Manual
REV. 1.2
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Version	Date	Applicant	Description
V1.0 V1.1 V1.2	2012/1/10 2012/4/17 2013/9/10	Derek	

WLINK ICE Operation Manual

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Chapter 1: Preface

➢ WLINK ICE must work together with WLINK Adapter or WLINK-SWUT Adapter and WLINK-I2C Adapter.

➢ WLINK-SWUT can be applied to the MCU product : WT56Fxxx series, WT51Fxxx series (exclude WT51F516)

➢ WLINK-I2C can be applied to the MCU product: WT51F516.

Chapter 2: Introduction

WLINK can connect to Taiwan famous IC design house (WELTREND) general purpose MCU; in 8052 core to program and debug. Now the complete development tool for 8051/8052 chip is Keil C uVision. This development tool is in Windows environment, and focus on 8051/8052 core chip. It has perfect management, and provide interface that users can edit, assemble, connect, and execute.

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┌─────────────────────────────────────────────┐
│       uVision2 IDE with Editor & Make        │
└─────────────────────────────────────────────┘

┌──────────────────┐            ┌──────────────────┐
│       C51        │            │       A51        │
│  ANSI C Complier │            │  Macro Assembler │
└──────────────────┘            └──────────────────┘

┌──────────┐   ┌──────────┐   ┌──────────────┐
│  ANSI C  │   │  LIB51   │   │    RTX51     │
│ Standard │   │ Library  │   │  Real-Time   │
│ Library  │   │ Manager  │   │  Operating   │
│          │   │          │   │   System     │
└──────────┘   └──────────┘   └──────────────┘

┌─────────────────────────────────────────────┐
│           BL51 Linker / Locater              │
└─────────────────────────────────────────────┘

┌──────────────────────────┐
│     uVision2 Debugger     │
└──────────────────────────┘

┌──────────┐   ┌──────────┐   ┌──────────────┐
│  ANSI C  │   │Monitor-51│   │  Emulator &  │
│ Standard │   │  Target  │   │    PROM      │
│ Library  │   │ Debugger │   │  Programmer  │
└──────────┘   └──────────┘   └──────────────┘
```
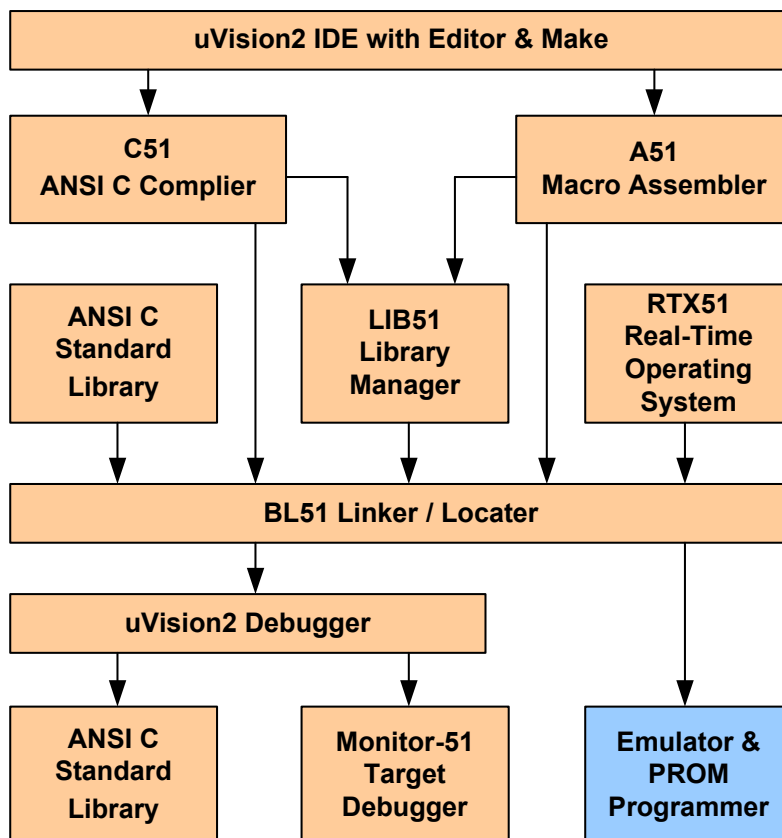
Keil C µVision function structure (refer to: http://www.keil.com/uvision/)

In above block diagram, there are four parts of function:

➢ uVision IDE: combine edit operating environment; has compile, assemble, link, and build project functions

➢ C51 provides ANSI C compiler; A51 provide 8051 Macro Assembler.

➢ When program links, it provides standard ANSI database, LIB51 program administrator, and RTX51 real-time operation system.

➢ uVision Debugger: has strength debug tool and parallel simulation system.

WLINK can connect to development board to proceed ICE function. Weltrend provides all 8051/8052 chip DLL (Dynamic Link Library) file, and can be embedded in Keil C uVision, and through WLINK to debug. The following is system block diagram.

ICE Debug System Diagram

【Note 1】Before using WLINK ICE, it must install WLINK driver and Keil C uVision IDE software.

【Note 2】WLINK Driver install procedure, please see (WLINK Adapter Installation Manual).

【Note 3】Before In-Circuit Emulation, the ICE program should be burned in the demo board.

【Note 4】Keil uVision IDE software document and download trial version, please see website http://www.keil.com/uvision/.

【Note 5】Keil uVision IDE user manual (English Version) http://www.keil.com/support/man/docs/uv4/.

(JapanseVersion) http://www.keil.com/support/man/docs/uv4jp/

Chapter 3: Installation Driver program

3.1 Automatic Installation Operation Description

【**Step 1**】Go to the Weltrend Website, clicks "Weltrend_ICE_Setup.msi", enter into ICE Driver Installation wizard.

the installation program just supports WT56F216/WT56F104/WT51F516, please confirm your IC type,
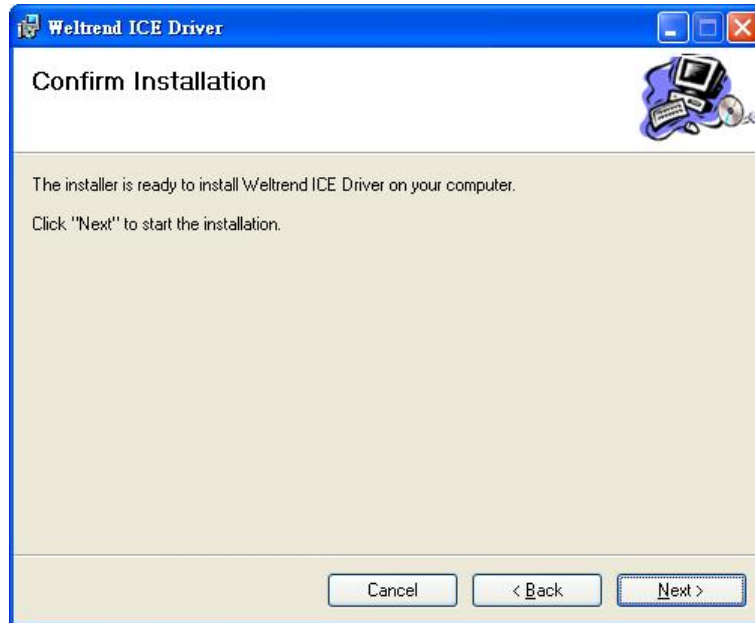
then press "Next".
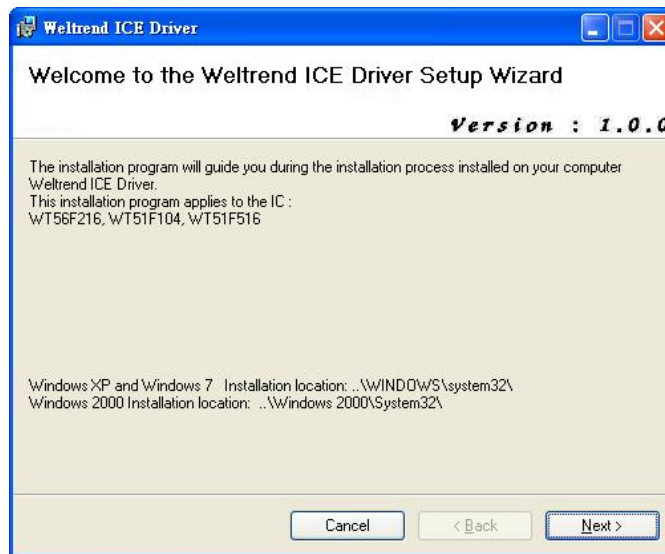
Installation first page

【**Step 2**】Now the installation program stop at "Select Installation Folder" page, confirm PC operating system, then select

the installation disk, then press "Next". "Windows XP: path C:\WINDOWS\system32", "Windows 7 32bit OS:

path C:\WINDOWS\system32", "Windows 7 64bit OS: path C:\WINDOWS\sysWoW64", "Windows 2000: path

C:\WINDOWS 2000\system32".
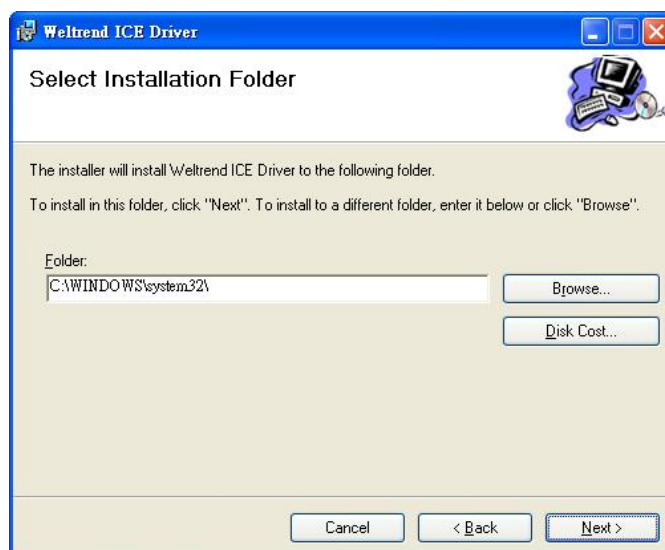
【**Step 3**】Press "Next".

Confirm Installation page

【**Step 4**】

Installing page

【**Step 5**】Program will stop at the Page "Do you want to add supported IC in the TOOLS.ini file ?", the default install path is

At "C:\keil\TOOLS.INI", if Keil C install at other path, please press "Open" to choose suitable path, then

press "Load Keil C Tool.ini".

Keil C Tag input

【**Step 6**】If the window information appears as below, please press "Close" to finish the installation program.
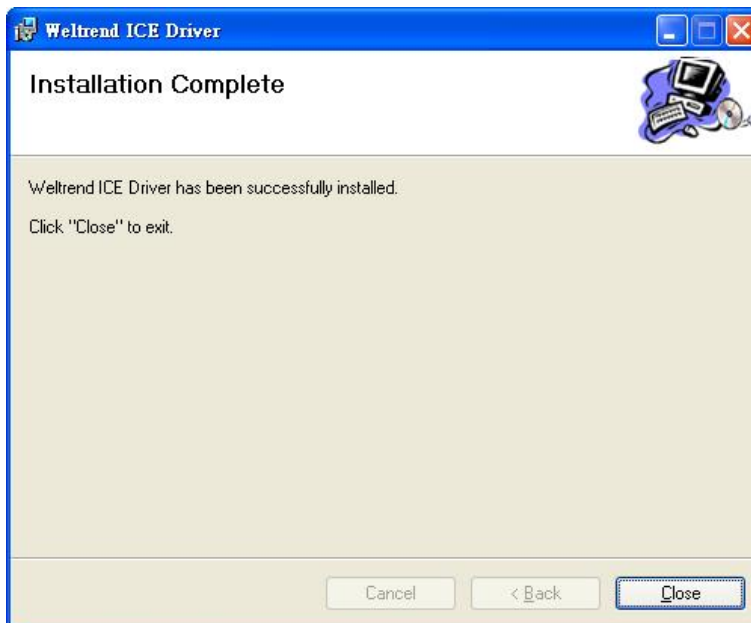
Installation Complete

【Note】If the installation is failure, please refer to the manual installation guide; If the installation is successful, please go

Chapter 4 and continue your operation.

3.2   Manual Operation Guide

3.2.1 WLINK-SWUT Manually Operation Guide

The following example illustrates WT56F216

■   Go to Weltrend website and choose UPort.dll and WT56F216_AGDI.dll file, copy to "Windows XP: path C:\WINDOWS\system32", Windows 7 32bit OS: path C:\WINDOWS\system32", "Windows 7 64bit OS: path C:\WINDOWS\sysWoW64", "Windows 2000: path C:\WINDOWS 2000\system32" folder.

■   If the operating system is not installed in C: \, please select the correct operating system installation directory.
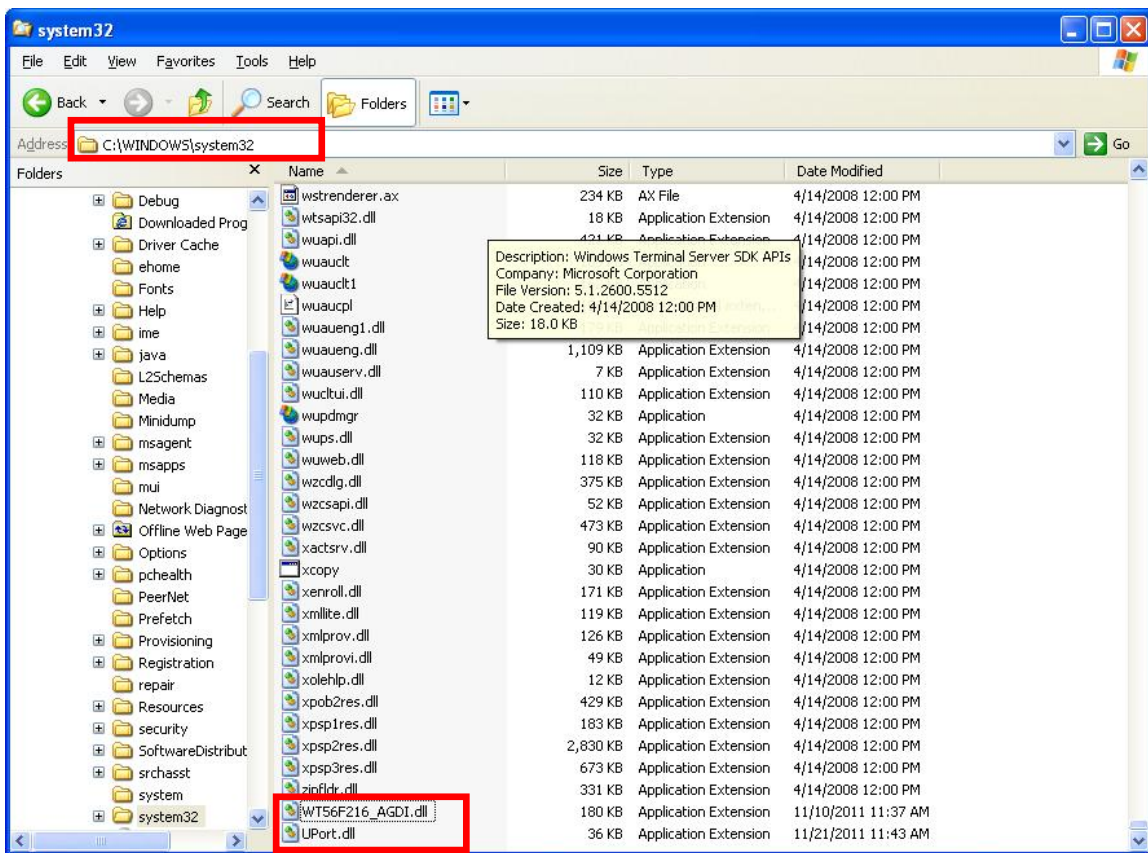
Copy UPort.dll and WT56F216_AGDI.dll

■ Add WLINK ICE Driver list:

Firstly in the Keil C installation directory can be found "TOOLS.INI" file (Keil C installation directory, the standard path is C: \ Keil), then use the file editing software to edit.

1. Add TDRV10 = C: \ windows \ system32 \ WT56F216_AGDI.dll ("WT56F216 Driver") to a file.

   Where TDRV0 is already used the list, the order TDRV0 TDRV1, TDRV2 ... TDRVN).

   Please remember the x behind TDRV cannot be repeated.

2. Finish editing and saving the file.
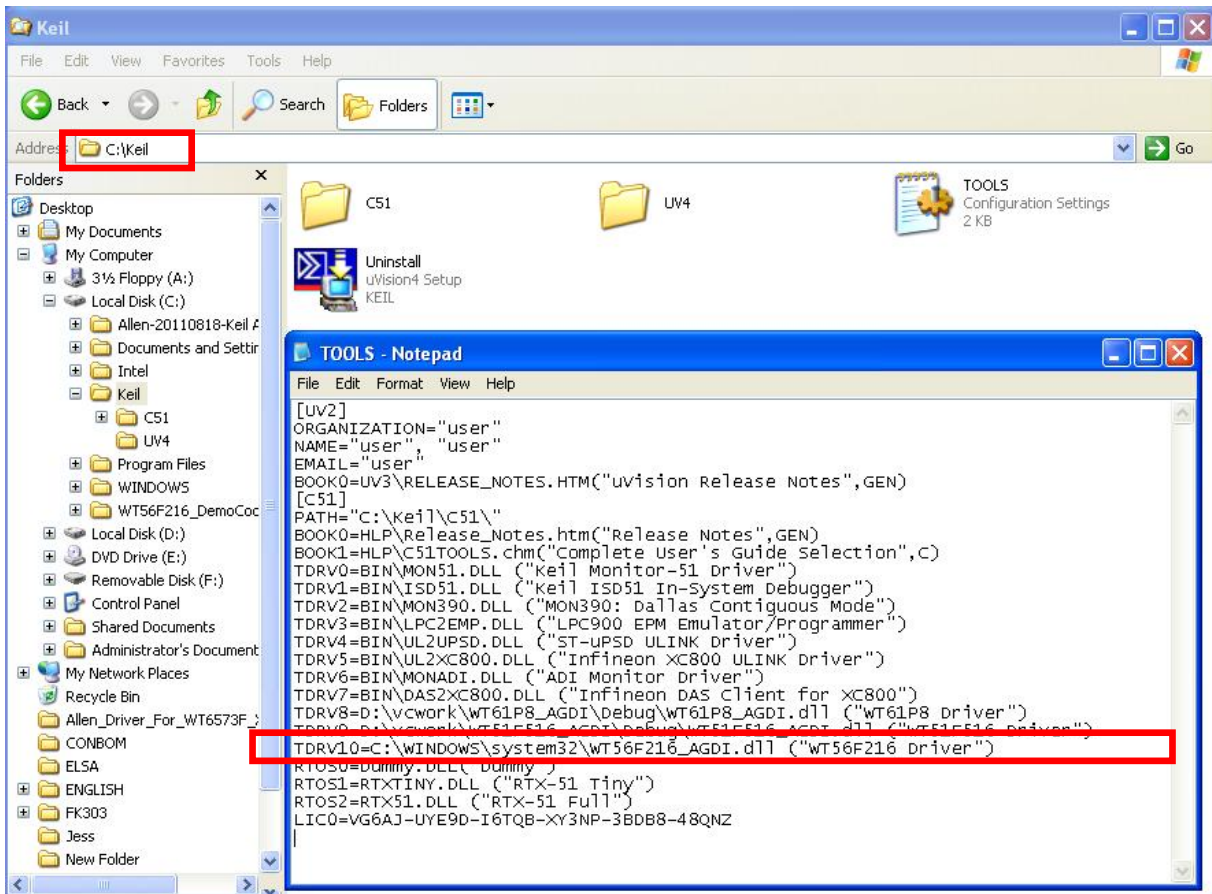
Editing TOOL.INI

3.2.2 WLINK-I2C Manual Installation Guide

The following example illustrates WT51F516:

- Go to the Weltrend website and choose "WT_I2C.dll" and "WT51F516_AGDI.dll" file, copy to "Windows XP: path C:\WINDOWS\system32", Windows 7 32bit OS: path C:\WINDOWS\system32", "Windows 7 64bit OS: path C:\WINDOWS\sysWoW64", "Windows 2000: path C:\WINDOWS 2000\system32" folder.

- If the operating system is not installed in C:\, please select the correct operating system installation directory.
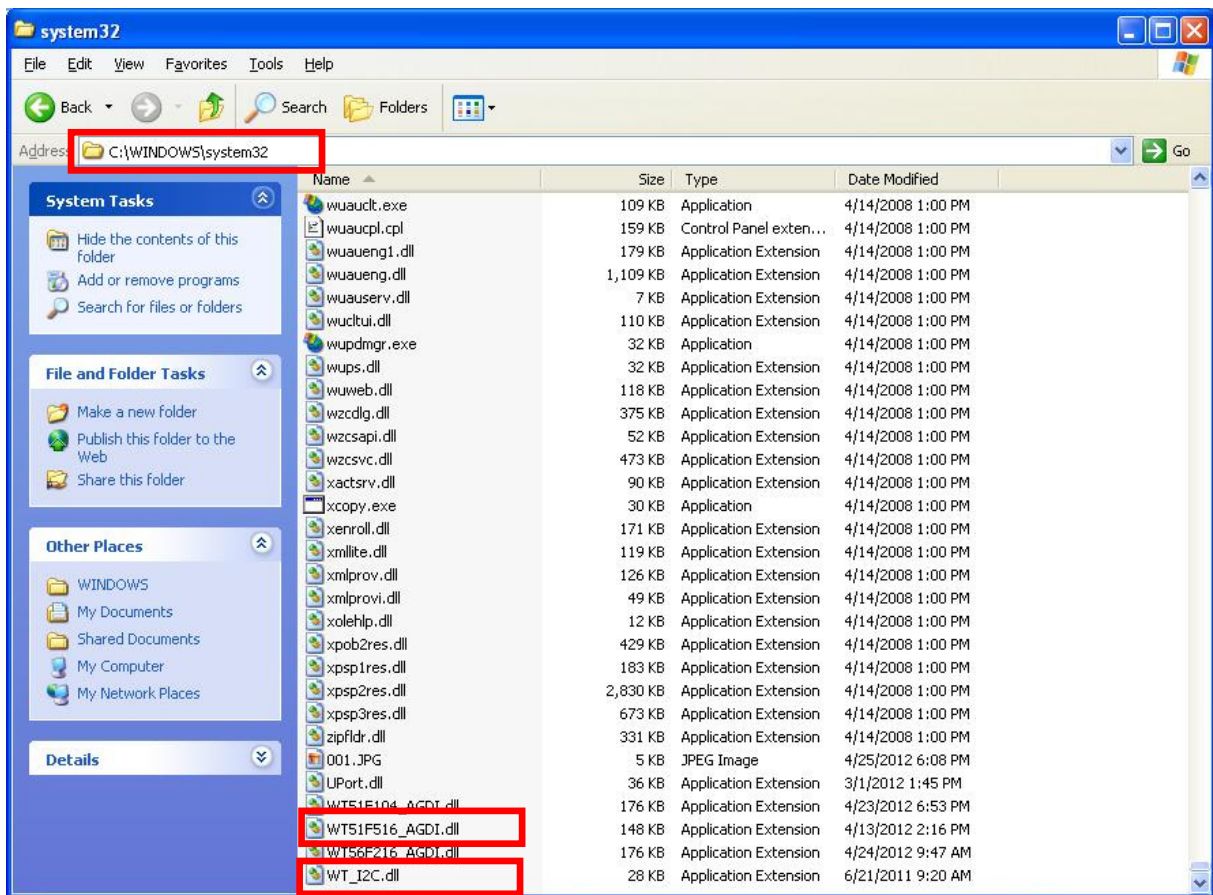
Copy WT_I2C.dll and WT51F516_AGDI.dll

■ Add WLINK ICE Driver List:

Firstly Keil C in the Keil C installation directory can find "TOOLS.INI" file (Kiel C installation directory, the standard path is C:\Keil), then use the file editing software to edit.

1. Add "**TDRV10 = C:\windows\system32\ WT51F516_AGDI.dll ("WT51F516 Driver")"** to file,

   TDRV0 is used list; the series are **TDRV0, TDRV1, TDRV2…TDRVN**.

   Please remember the **x** number behind **TDRVx** cannot be repeated.

2. Finish editing and save.
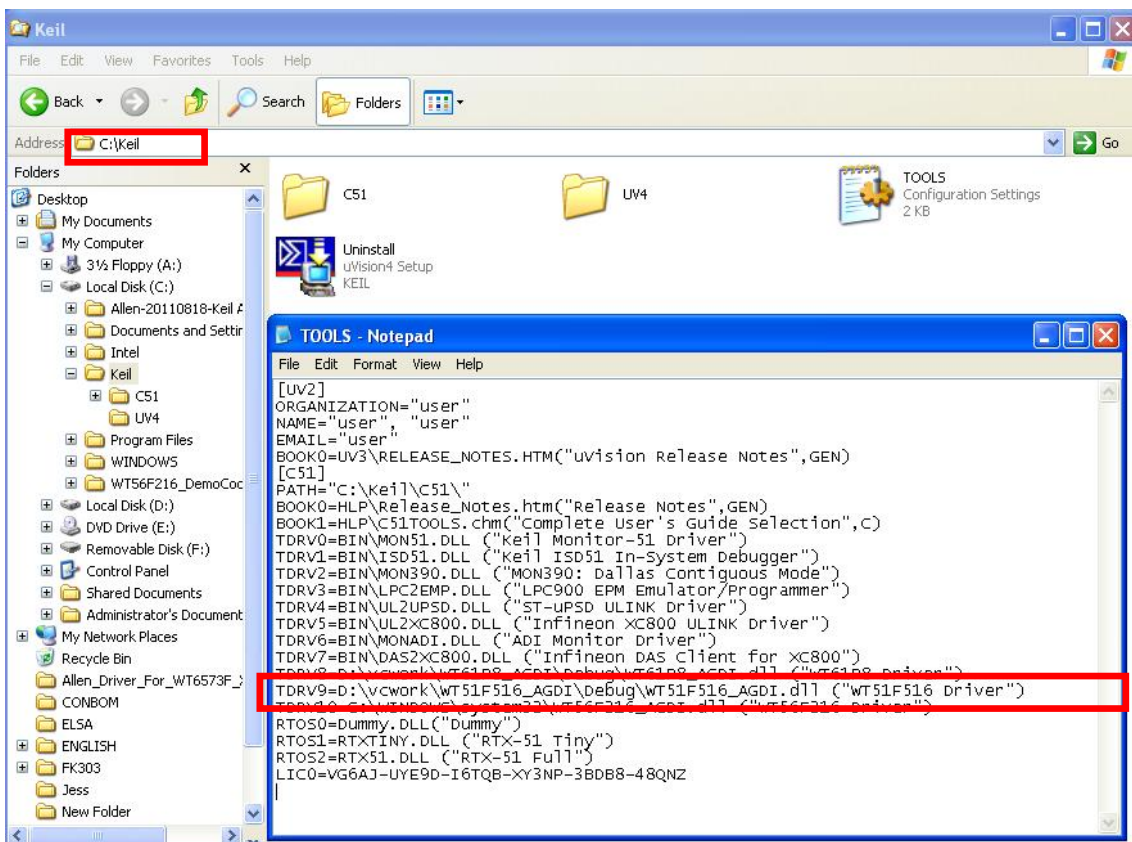
Editing TOOL.INI

Chapter 4: Keil C Program setting and Operation Description

4.1 Start Keil C uVision Project

Please go to Weltrend website and find the program file WT56F216_Sample.Uv2, click the file you can start **Keil C uVision project**.
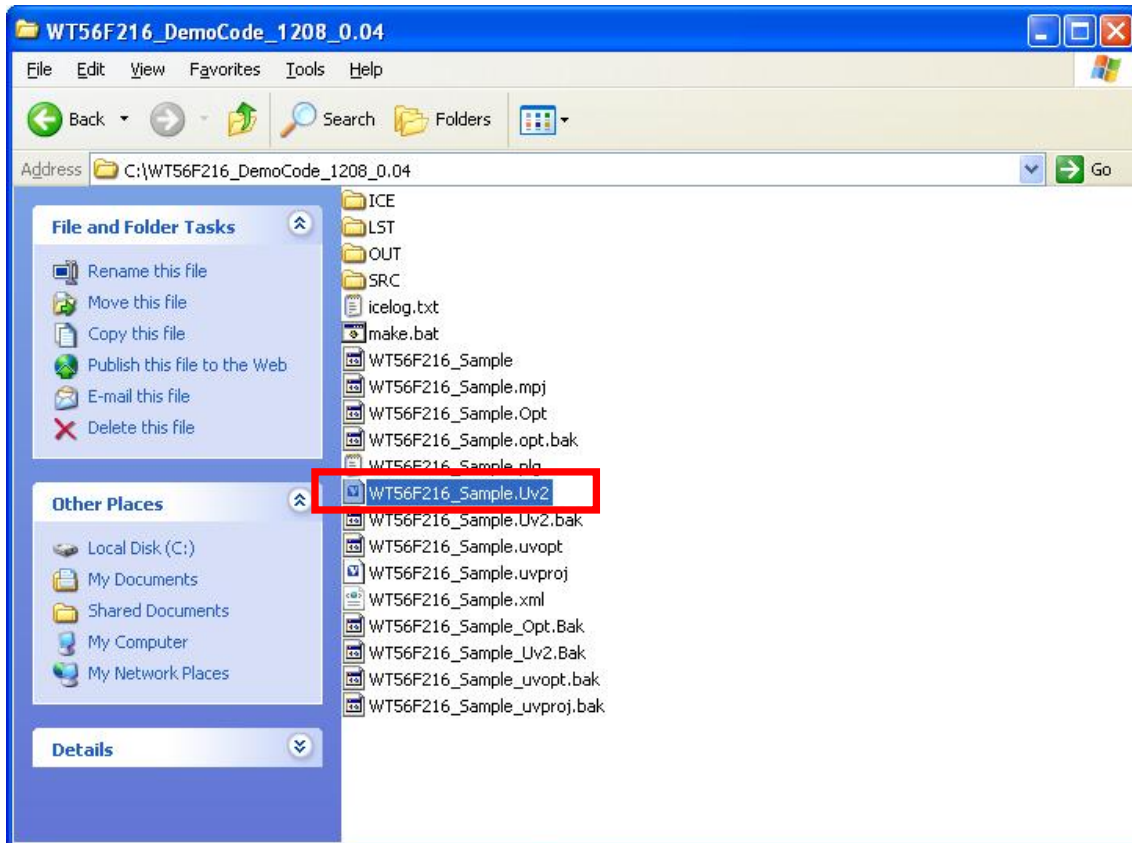
Start project

4.2 Keil C uVision Operation Environment Setting

After opening WT56F216 project, it will show the following figure, it needs to confirm [startup.a51] (ICE) internal driver program) is embedded in project or not, or it cannot use ICE function.
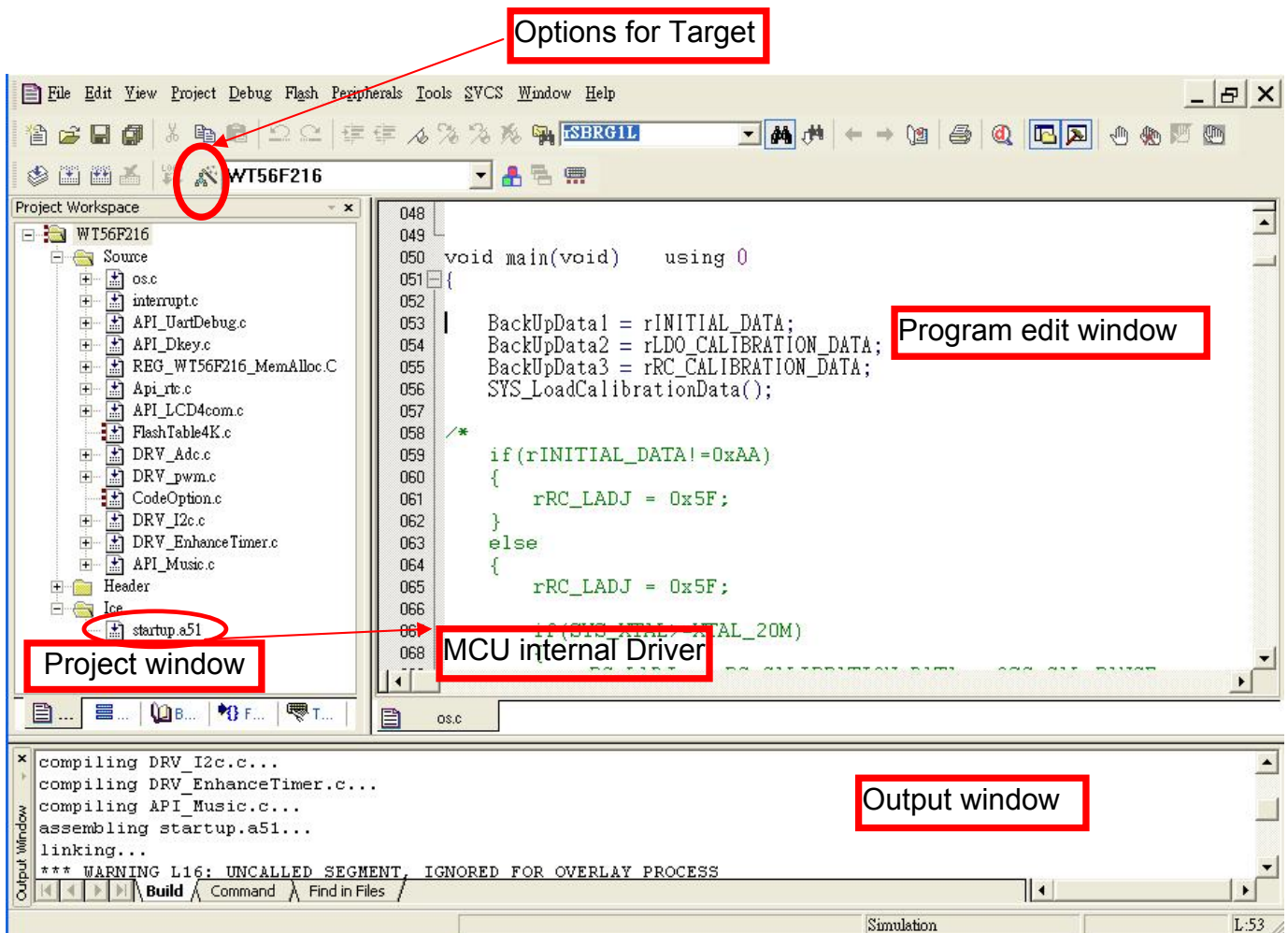

Keil C operation environment

【Note】[startup.a51] is the sub-program for interrupting ICE, every MCU has its own startup.a51, and the program version will be described at file.

4.3 Keil C uVision In-Circuit Emulation

### 4.3.1 WLINK-SWUT Keil C uVision In-Circuit Emulation Setting

➢ WLINK-SWUT Adapter connect port order number:

When WLINK connects to PC USB port, Operation System will detect the "USB-to-Serial Comm Port", now can enter into "Device Manager" and confirm the connecting port order number.
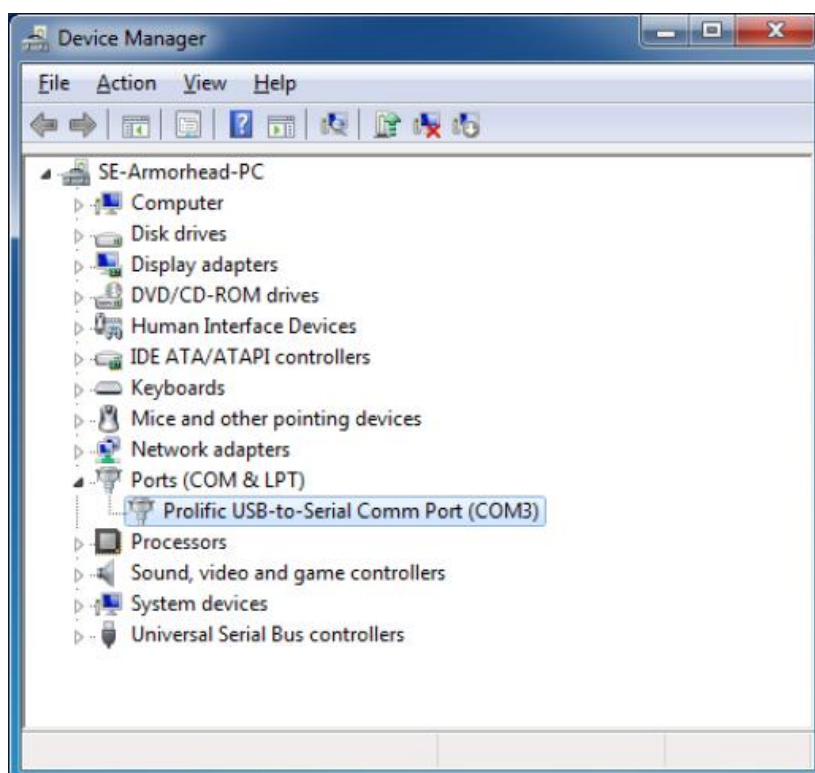
Device Manager-> Comm Port status

In Keil C environment, press "Options for Target" or select "Project -> Options", below figure will be opened. Select "Debug" tab, then press "Use" and select "WT56F216" in the Drop-down list. If no "WT56F216 Driver" in the Drop-down list, please go back to Keil C directory to confirm "TOOLS.INI" file location.
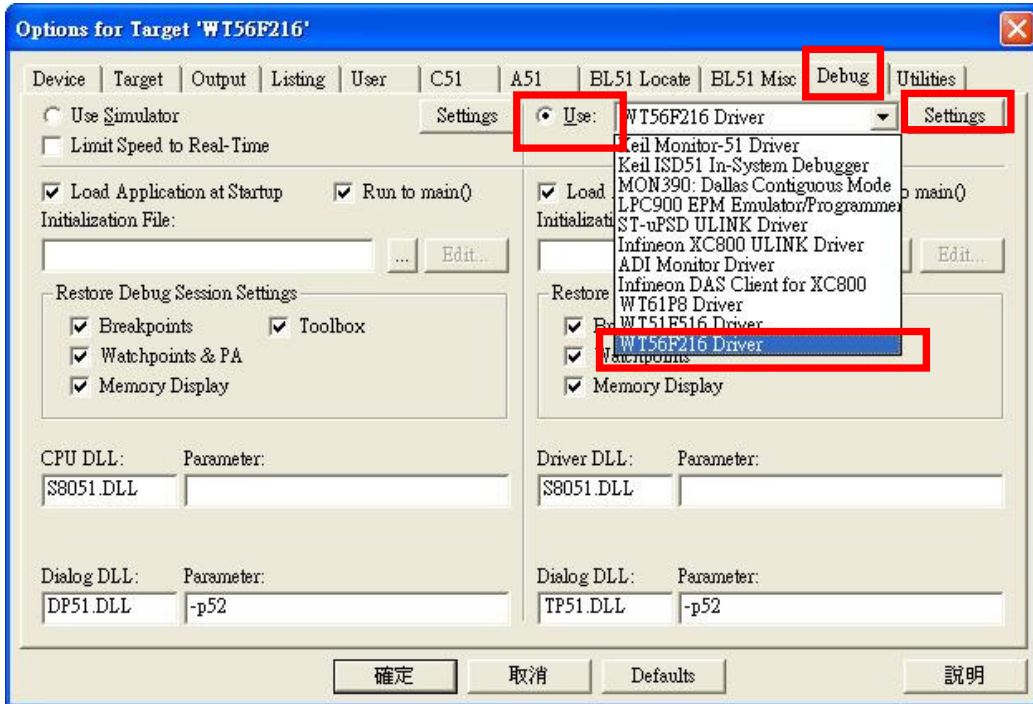
Options for Target

➢ WLINK-SWUT Adapter connecting port setting：

From above figure click "Settings" and choose Debugger Com Port, then will from the port connect WLINK Evaluation Board and execute ICE.
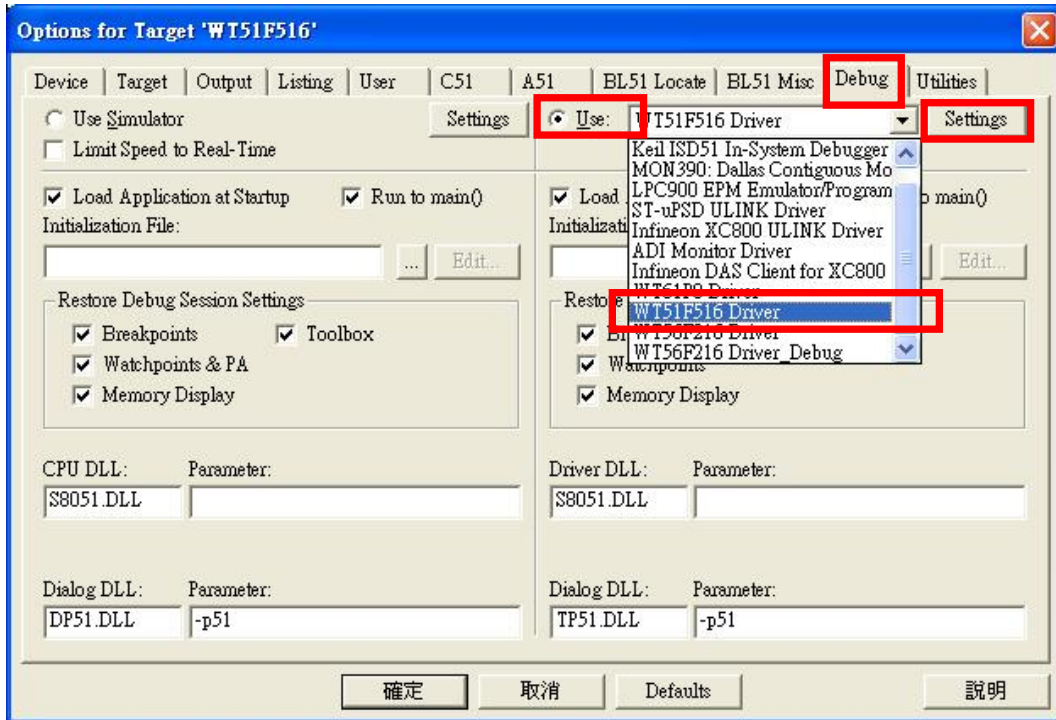
Debug ComPort

**4.3.2 WLINK-I²C Keil C uVision In-Circuit-Emulation setting**

Press "Options for Target" in Keil C operation environment or choose "Project->Options", and will open the following window. Then click "Debug" in the top, press "Use", and choose "WT51F516 Driver" in the Drop-down list. If no "WT51F516 Driver", please go back to Keil C directory to confirm "TOOLS.INI" file location.

Options for Target

➢ WLINK-I²C Adapter Port Set up:

In the above window, click "Settings", and choose "ICE Interface". This port connects WLINK-I²C to Evaluation Board, and proceeds ICE function.
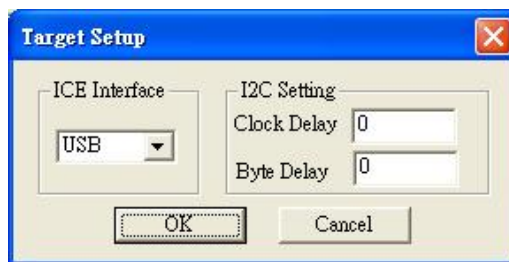
Debug ComPort

4.4 In-Circuit-Emulation

After finished all of Keil C operation system setting, click 'Build' will show a '*.HEX' file, then programming the HEX file to IC（referring to "WLINK-SWUT ISP Operation Manual"）, then press "Debug - Start/Stop Debug Session" or choose "Debug -> Start/Stop Debug Session" from the list, the program will enter into detection mode.
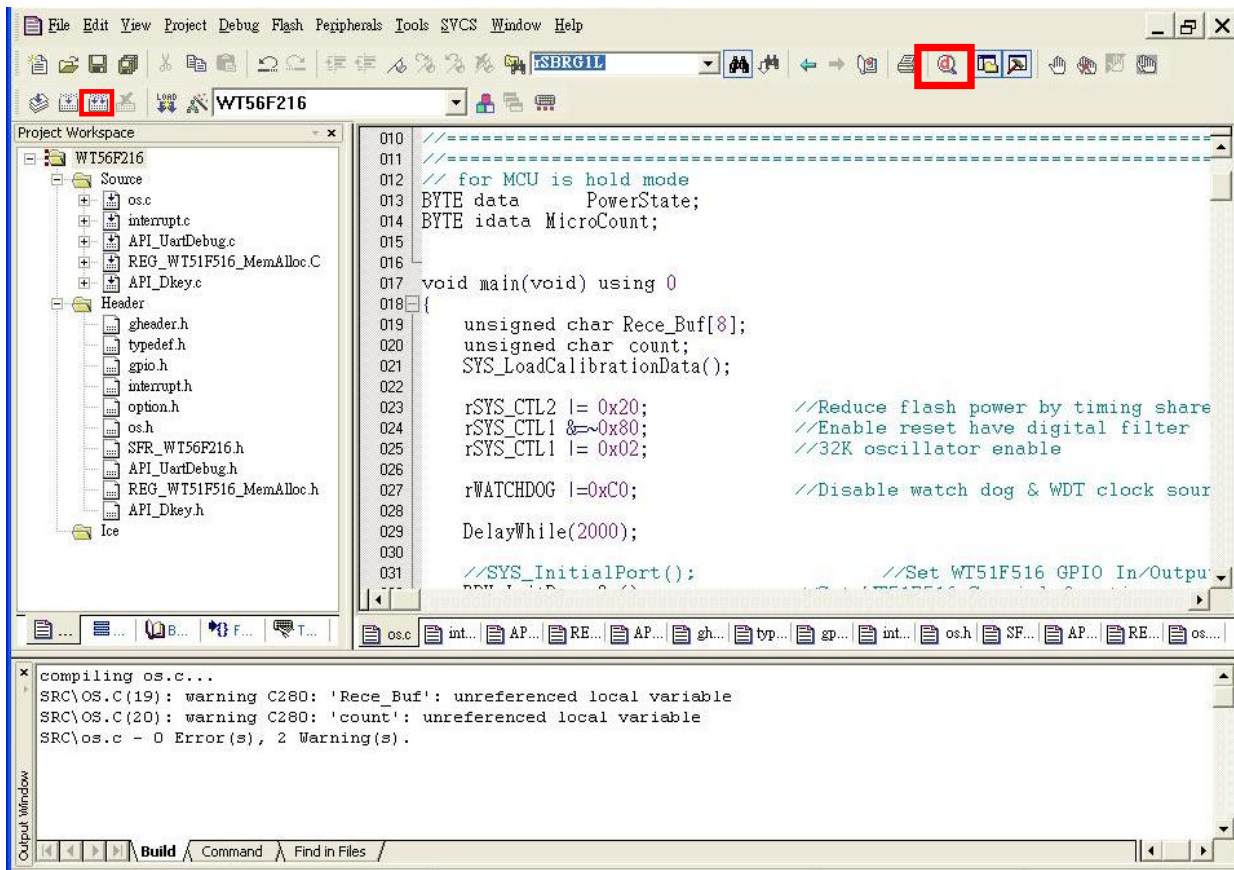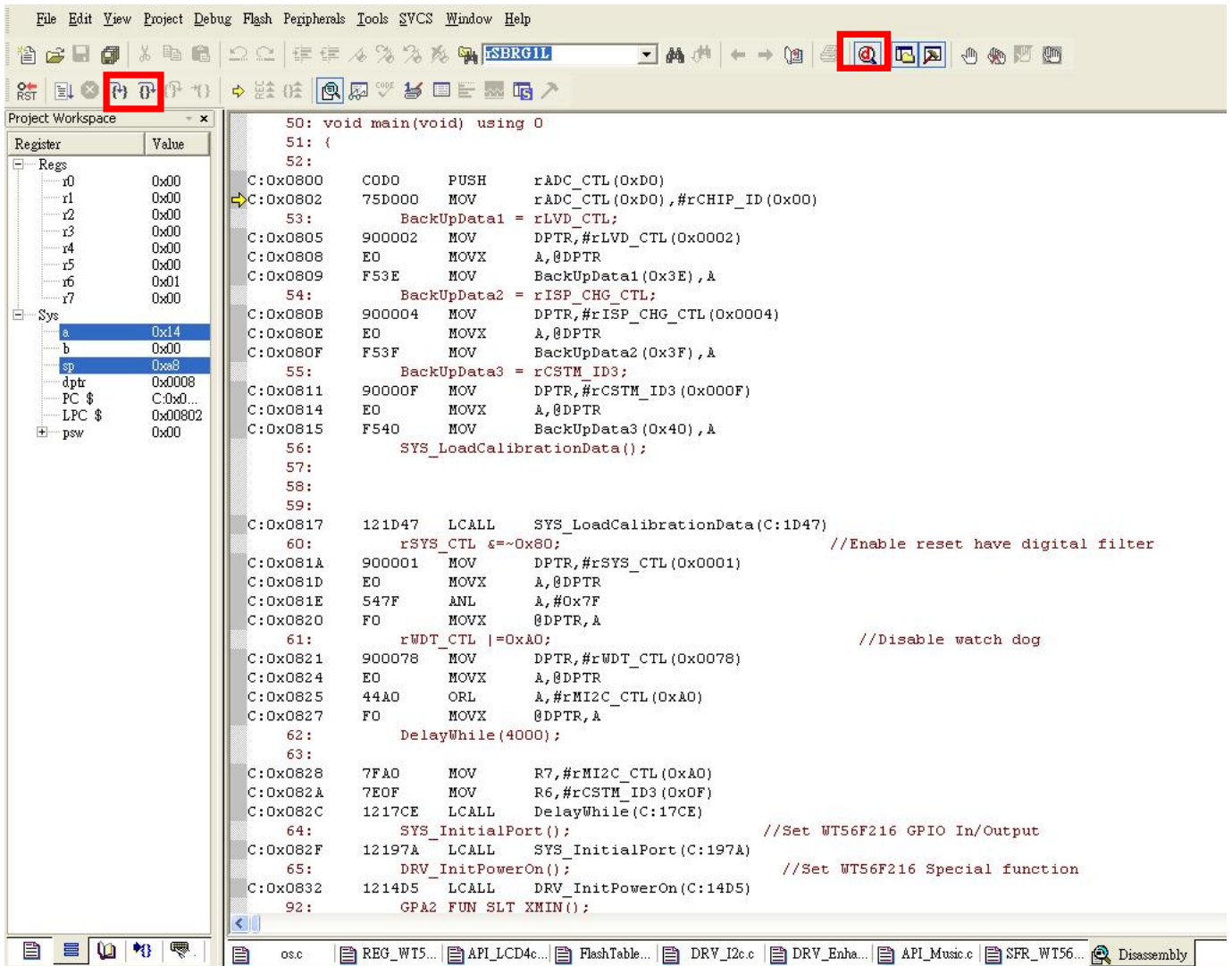

「Build」Figure

When program is in debug mode, it can use Keil C uVision to debug. The function is completed, and has breakpoints, single-step execution, show changes in the internal registers and memory situations, etc.

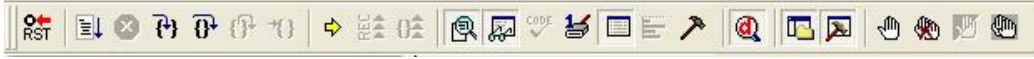【Note 1】Before In-Circuit Emulation, program must write to the MCU.

【Note 2】WT56F216 support 8 Breakpoints.

【Note 3】WT51F104 support 8 Breakpoints.

Debug mode Figure

4.5   Keil C ICE Operation Description

Above figure is Keil C debug tool list, the following are tool function description:

  Reset CPU: This key will reset CPU, and clear Time counter to 0.

  Start Debug: Start debug, and execute program.

  Stop Debug: Stop the program which is executing.

  Get into function: Execution step by step. Get in the function when function is encountered.

  Execution step by step: Execution step by step. Get in the function when function is not encountered.

  Perform to Cursor: Perform to cursor location.

   Debug: Shift debug and edit window.

  Breakpoints: Add or delete breakpoints in the program.

  Clear Breakpoints: Clear all breakpoints in the program.

   Disable Breakpoints: Ignore all breakpoints in the program.

Chapter 5: Keil C ISP Operation Description

WLKINK Adapter and WLINK-SWUT Adapter both support the Keil C ISP.

5.1   Keil C ISP Operation Environment setting

Please refer to Chapter 3, please install the driver firstly then open the Keil C uVision project. Under Keil C operation environment, press "Options for Target" or choose the "Flash" in the list -> "Configure Flash Tools…" the operation as the figure below.
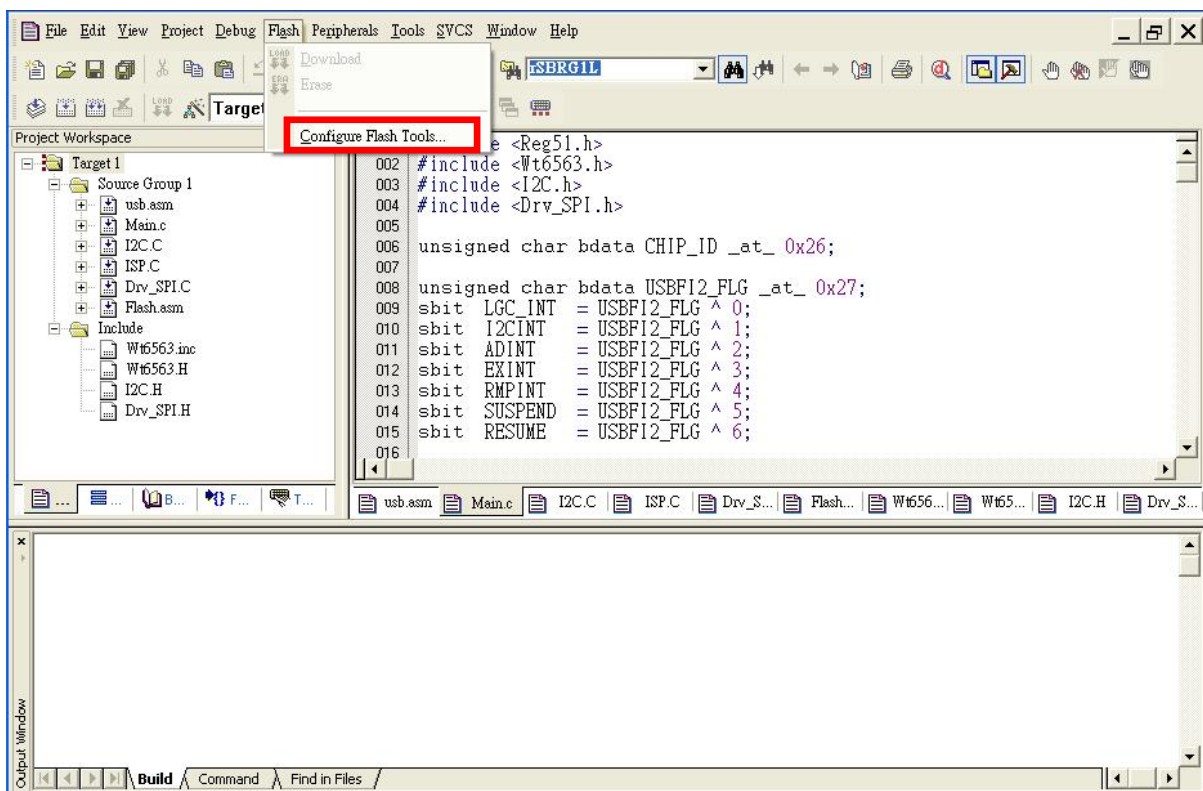
Keil C ISP setting

Click "Debug" from the window below, then press "Use" and choose "WT56F216 Driver" at Drop-down list。If no "WT56F216 Driver" appeared at the list, please go back to Keil C directory to confirm "TOOLS.INI" file location, then click "Settings" choose "ICE Interface" and choose "USB", after selected the port will connect WLINKI2C to Evaluation Board and execute ICE, after setting, press "OK" to exit ICE Interface setting window。
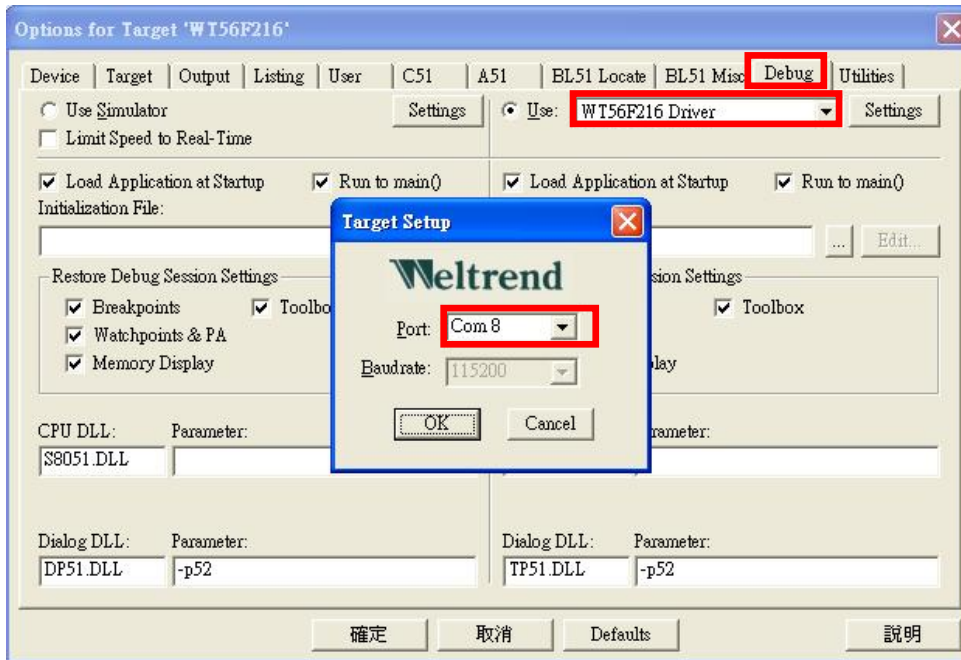

Keil C ISP setting

5.2   Keil C uVision Programming Environment setting

Choose Flash → Configure Flash Tools… → at the Command field open: Option for Target window, choose "Utilities", now will show the figure as below, at "Use Target Driver for Flash Programming" list choose "WT56F216 Driver".
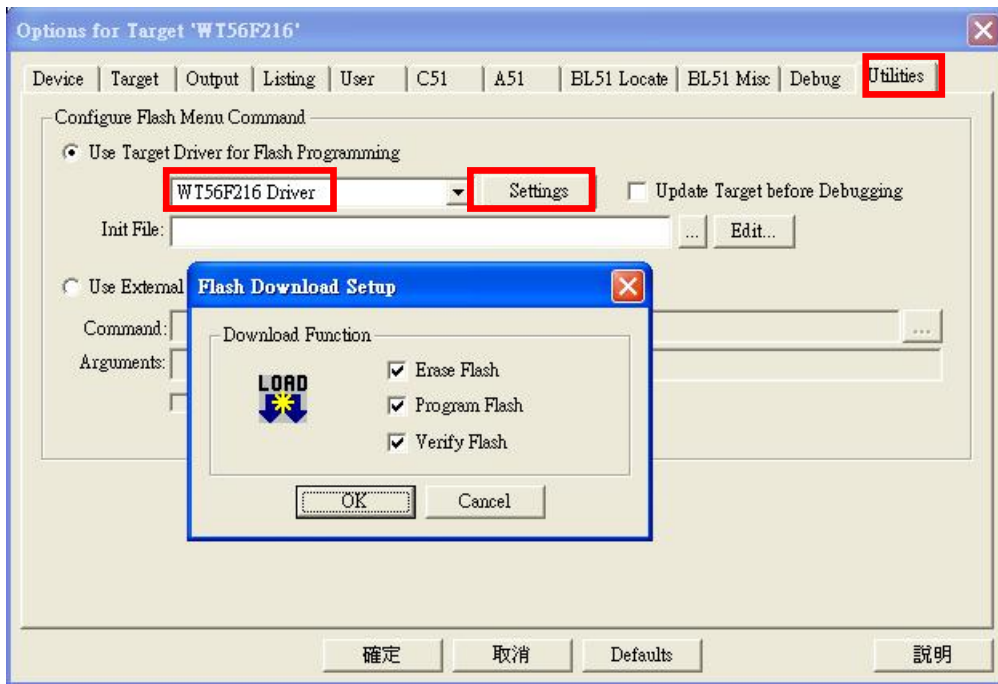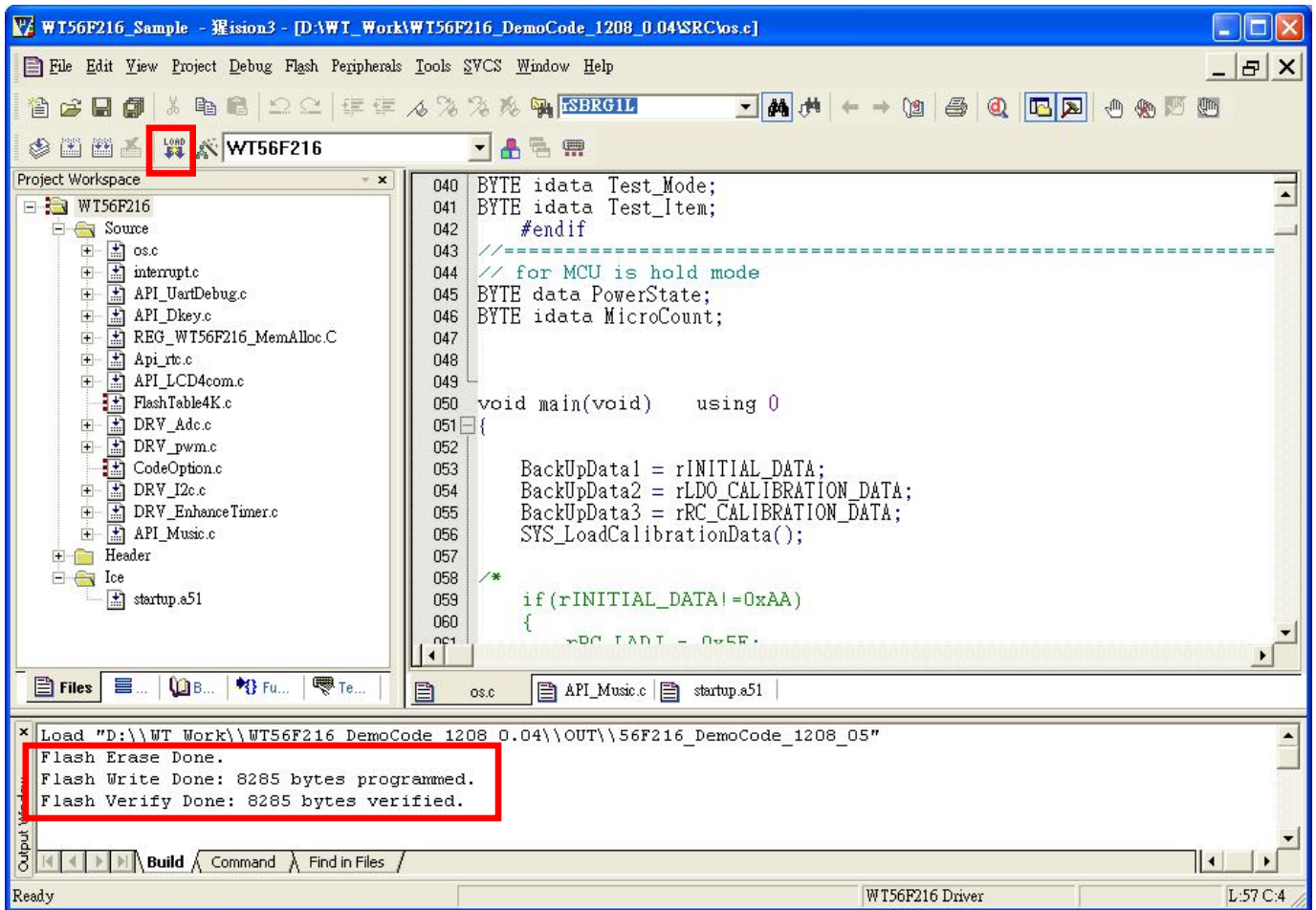

Keil C setting

From above figure press "Setting" then will show the "Flash Download Setup" window, at the main window press "Programming", will show the window. As the figure below, if all of the three options are chosen, when you press "programming" IC will be finished "Erase Flash", "Program Flash" and "Verify Flash" in order.
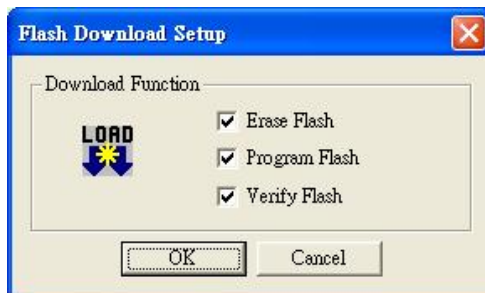
ISP procedure executed

5.3 Start Programming

After finishing all of the setting above mentioned, go back to the starting main page, you will find the "programming" key be enabled, now press the "programming" the programming will be executed follow up the setting as the figure above "Flash Download Setup", and the programming information will be showed on the "Output Windows" (as the figure below).

Keil C ISP programming figure