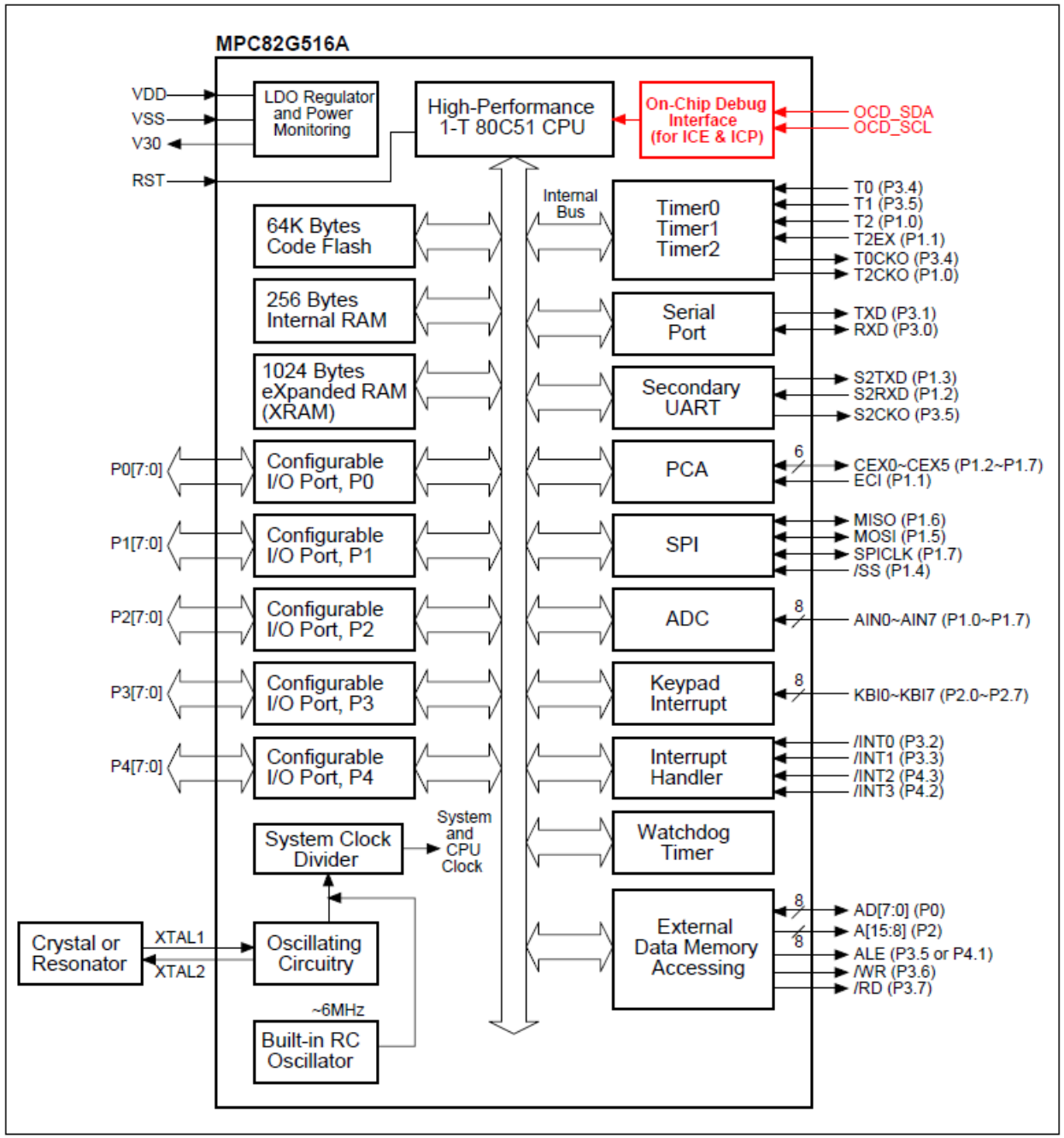
MPC82G516A
and
Development Environment

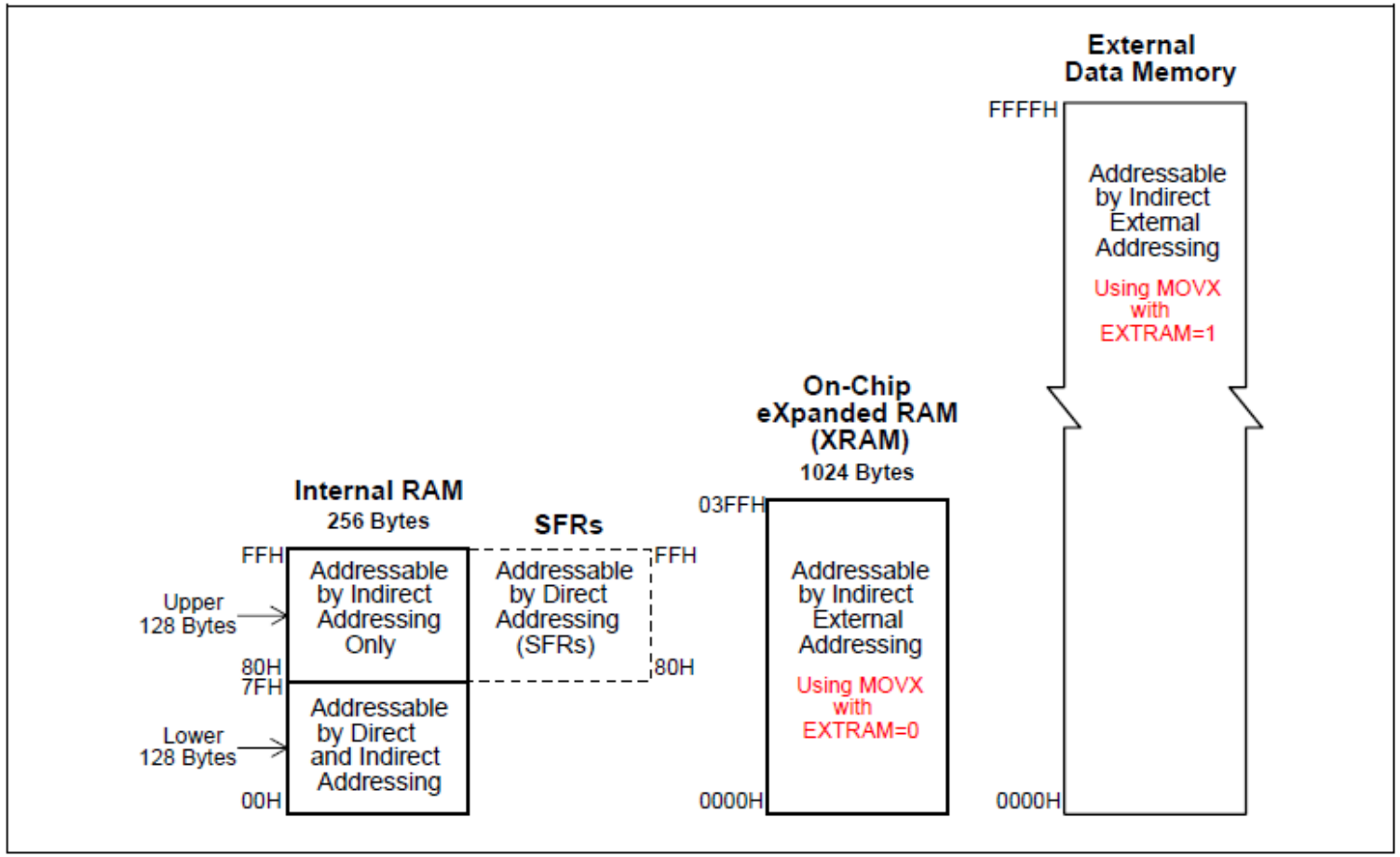
Datasheet can be download from

http://www.alldatasheet.com/datasheet-pdf/pdf/302673/MEGAWIN/MPC82G516A.html



MPC82G516A –

- 8051 CPU
- 64K flash memory for code
- 1024-byte XRAM (Expanded RAM)
- 5 I/O ports
- 3 Timers
- 2 serial ports
- And others,



- Memory Map
  - Internal data memory
  - On-chip eXpanded RAM (XRAM)
  - External Data memory
  - EXTRAM is in extended SFR

Reset value

Others											
AUXR	Auxiliary Register	**8EH**	URTS	ADRJ	P41ALE	P35ALE	-	-	EXTRAM	-	00H
AUXR1	Auxiliary Register 1	**A2H**	P4KB	P4PCA	P4SPI	P4S2	GF2	-	-	DPS	00H
AUXR2	Auxiliary Register 2	**A6H**	T0X12	T1X12	URM0X6	S2TR	S2SMOD	S2TX12	S2CKOE	T0CKOE	00H
T2MOD	Timer 2 Mode Control	**C9H**	-	-	-	-	-	-	T2OE	DCEN	00H
STRETCH	External Access Stretch	**8FH**	-	-	ALES1	ALES0	-	RWS2	RWS1	RWS0	23H
PCON2	Power Control 2	**C7H**	-	-	-	-	-	SCKD2	SCKD1	SCKD0	00H
WDTCR	Watch-dog Timer	**E1H**	WRF	-	ENW	CLRW	WIDL	PS2	PS1	PS0	00H#
EVRCR	EVR Control Register	**97H**	EOPFI	ECPFI	OPF	CPF	PMUOFF	-	-	-	30H#

- In assembly language, the programmer need to manage the location of program/data in memory

- Using **Segment define directives**

```
symbol                SEGMENT    segment_type
; the following program was form a segment
; called symbol or segment name,
; The content is segment_type (code or data)
```

segment_type can be one of

- **CODE** (program)
- **XDATA** (the extended data segment for MPC82G516A)
- **DATA** (direct address space, 00-7fH)
- **IDATA** (indirect address space, 80-FFH)
- **BIT** (bit address space)

OR using

- **CSEG AT** (equivalent to SEGMENT CODE + ORG)
- **XSEG AT**
- **DSEG AT**
- **ISEG AT**
- **BSEG AT**

- **GUI working environment**

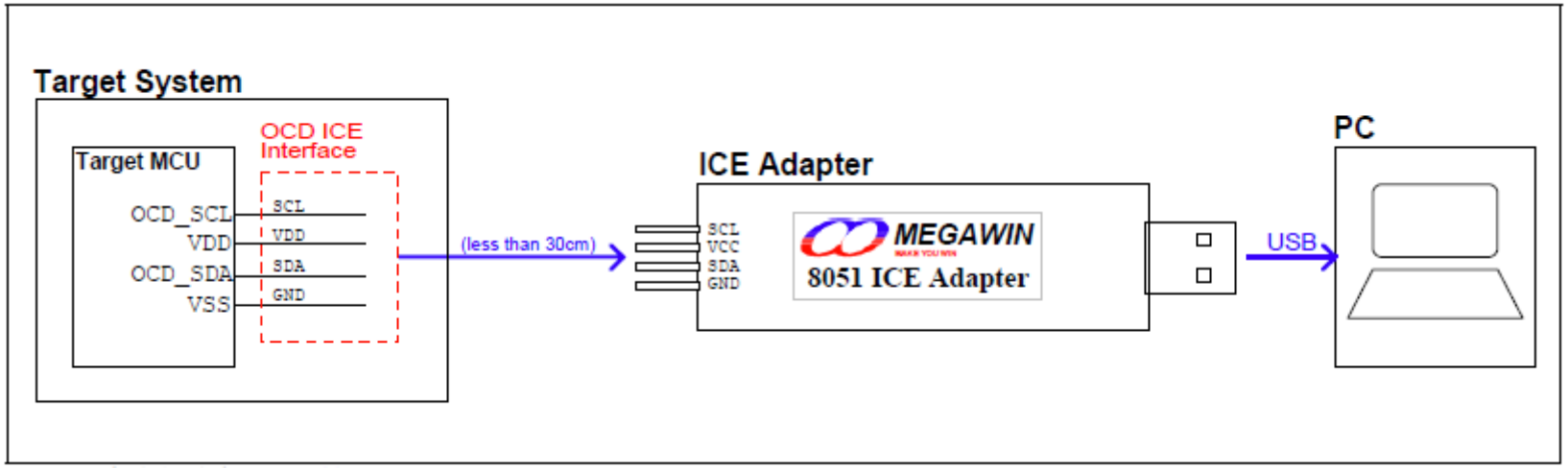
  - Assember, link, download the code to target CPU
    Build project, a project is the programs and **environment setting**

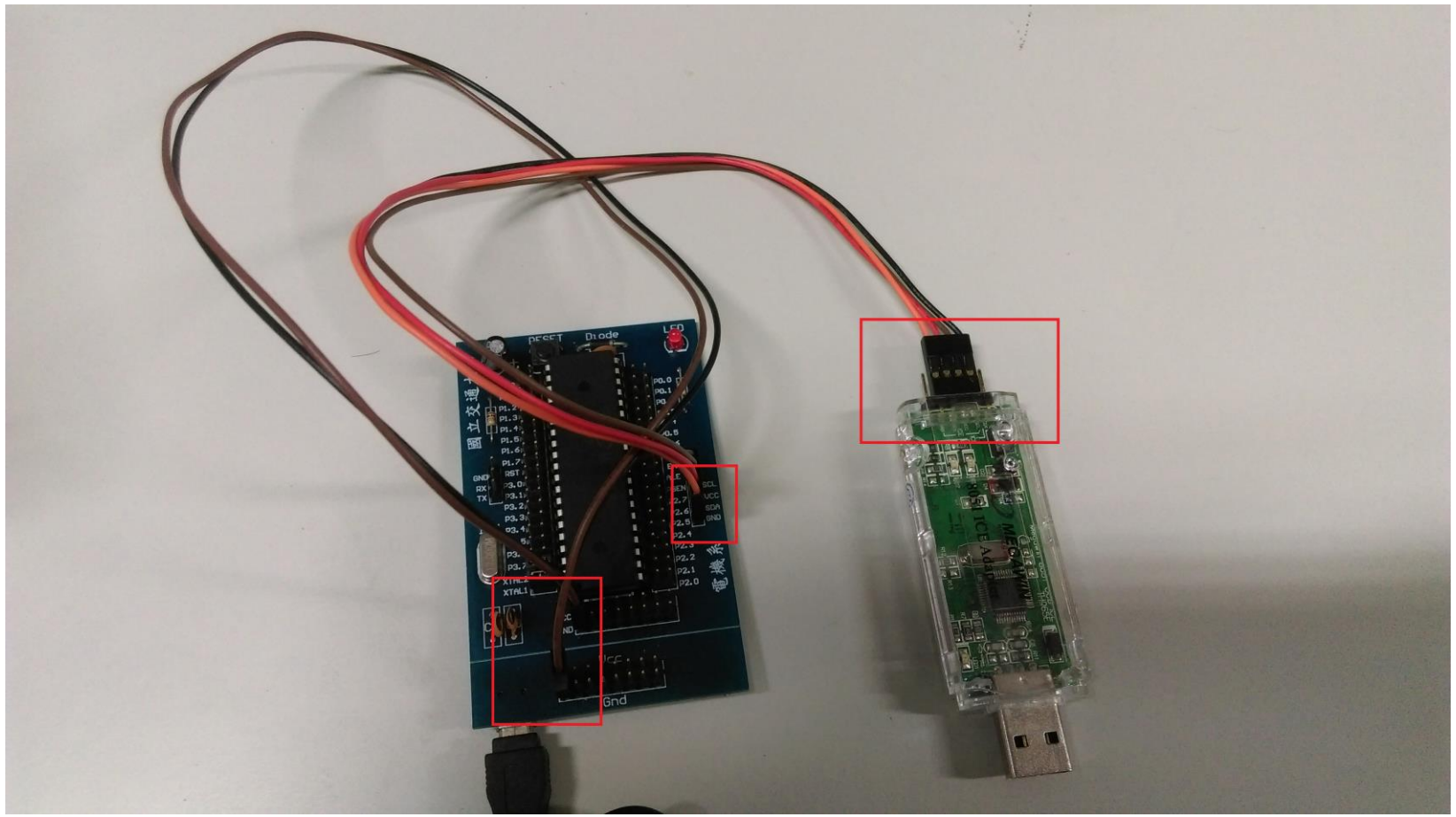
  - How to debug the program without I/O statement and OS?
    CPU will execute the program instruction by instruction
    So we need to halt the CPU and check the intermediate data (in registers or memory), in order to check the correctness of program.

  - **Debugger**
    - Control the program execute
      STEP, BREAK POINT, RUN
    - Check and Modified the data in memory (intermediate data)

Set up Environment

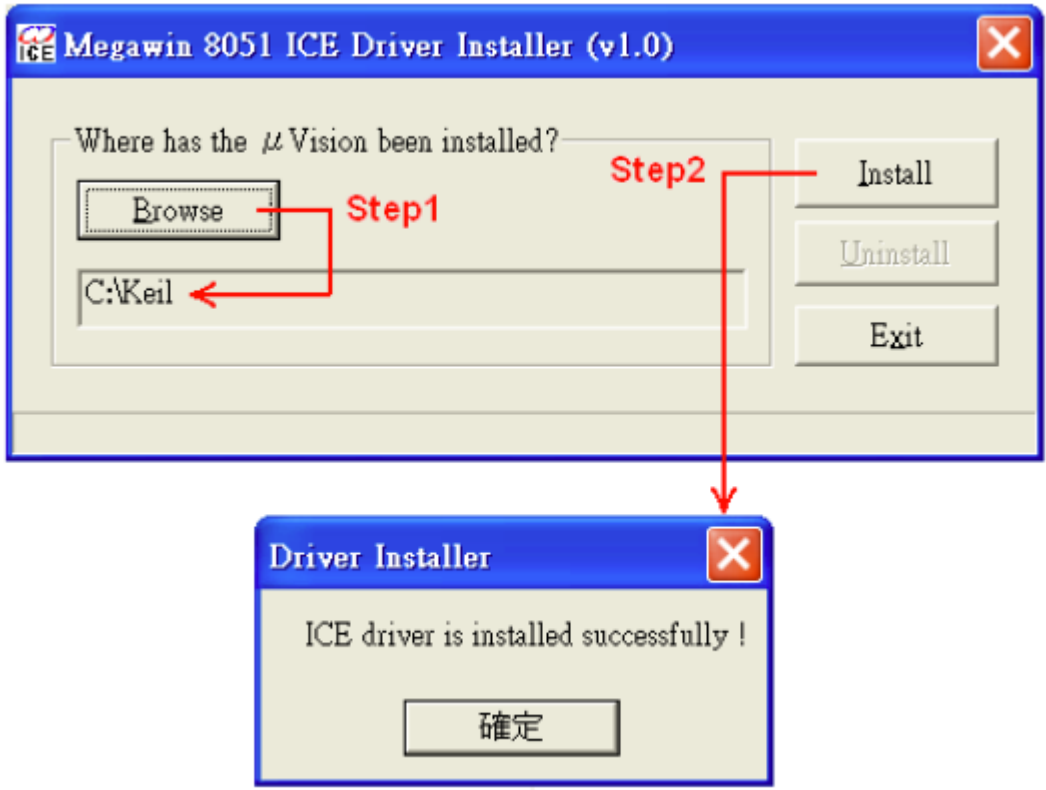
Megawin 8051 OCD ICE Adapter




Diode
LED
Gnd

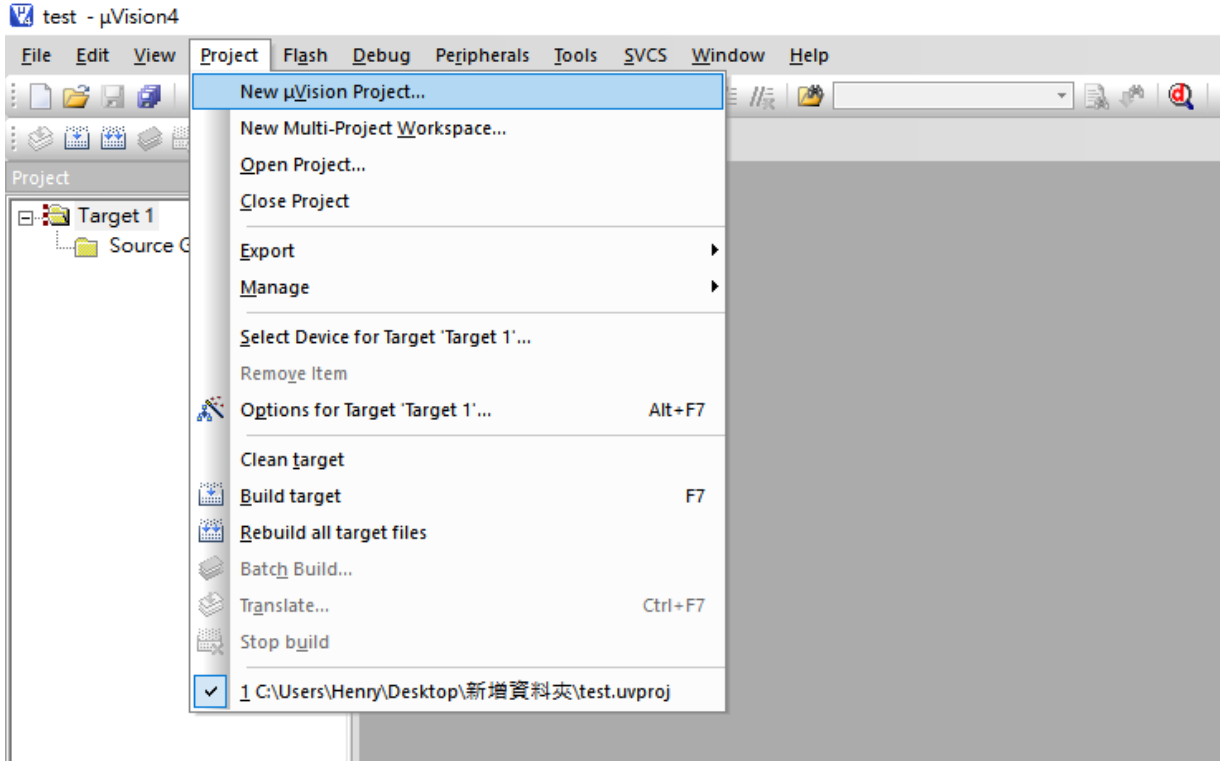
Install and Patch Software

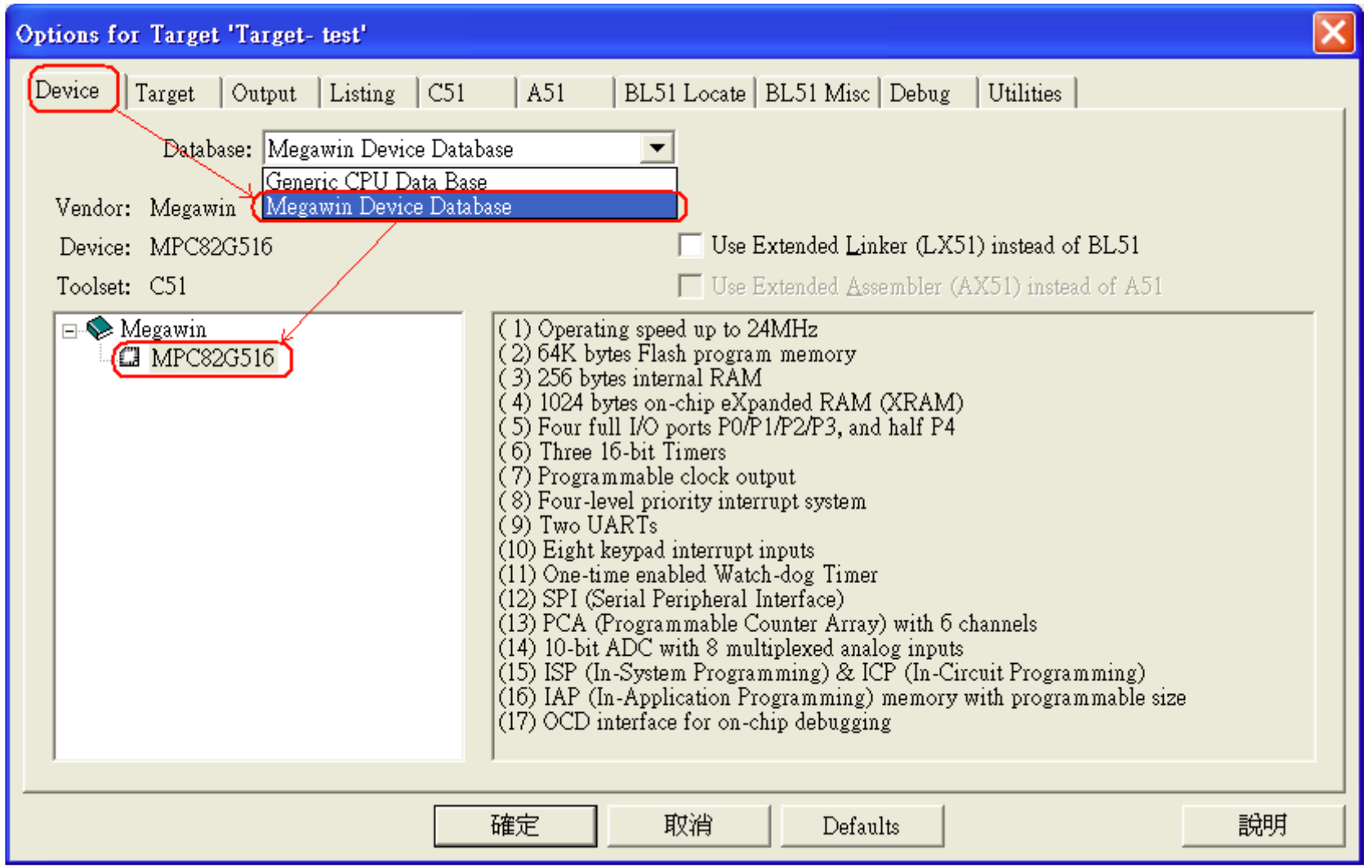
1. Connect the ICE adapter
2. Install **Keil C µVision**
3. Patch “Meagawin” database to Keil C
   - “Driver Installer” -> “Setup.exe”

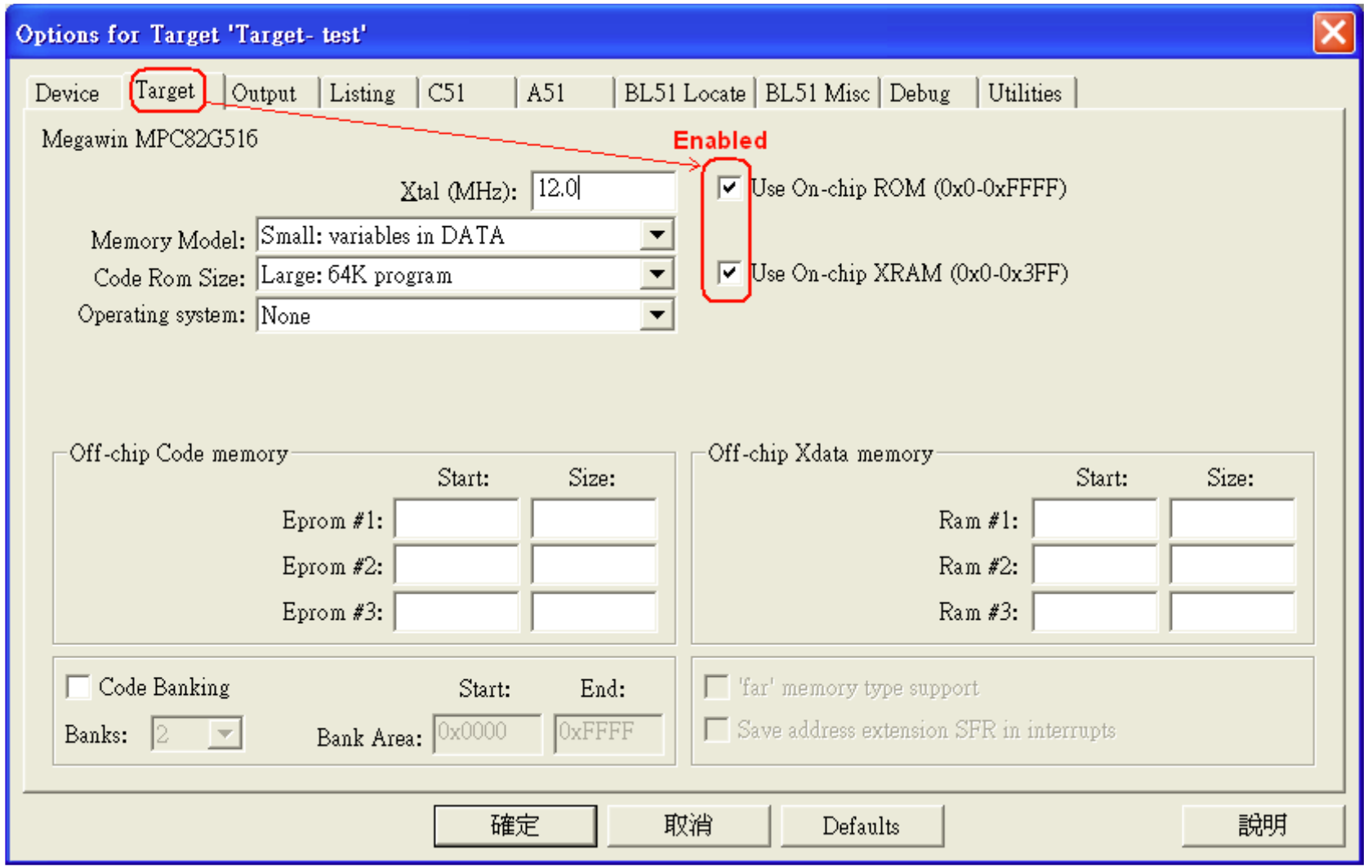


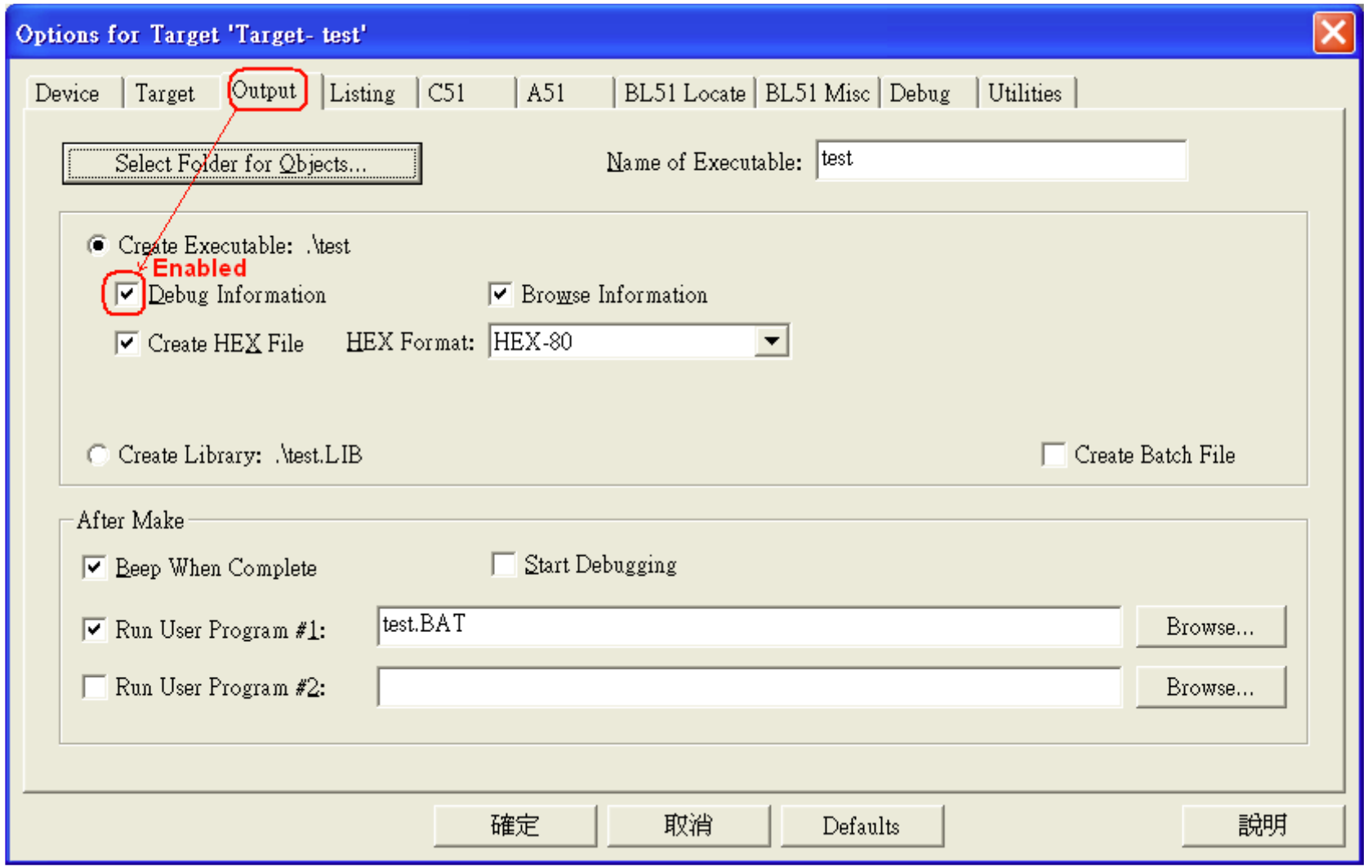
Create a Project

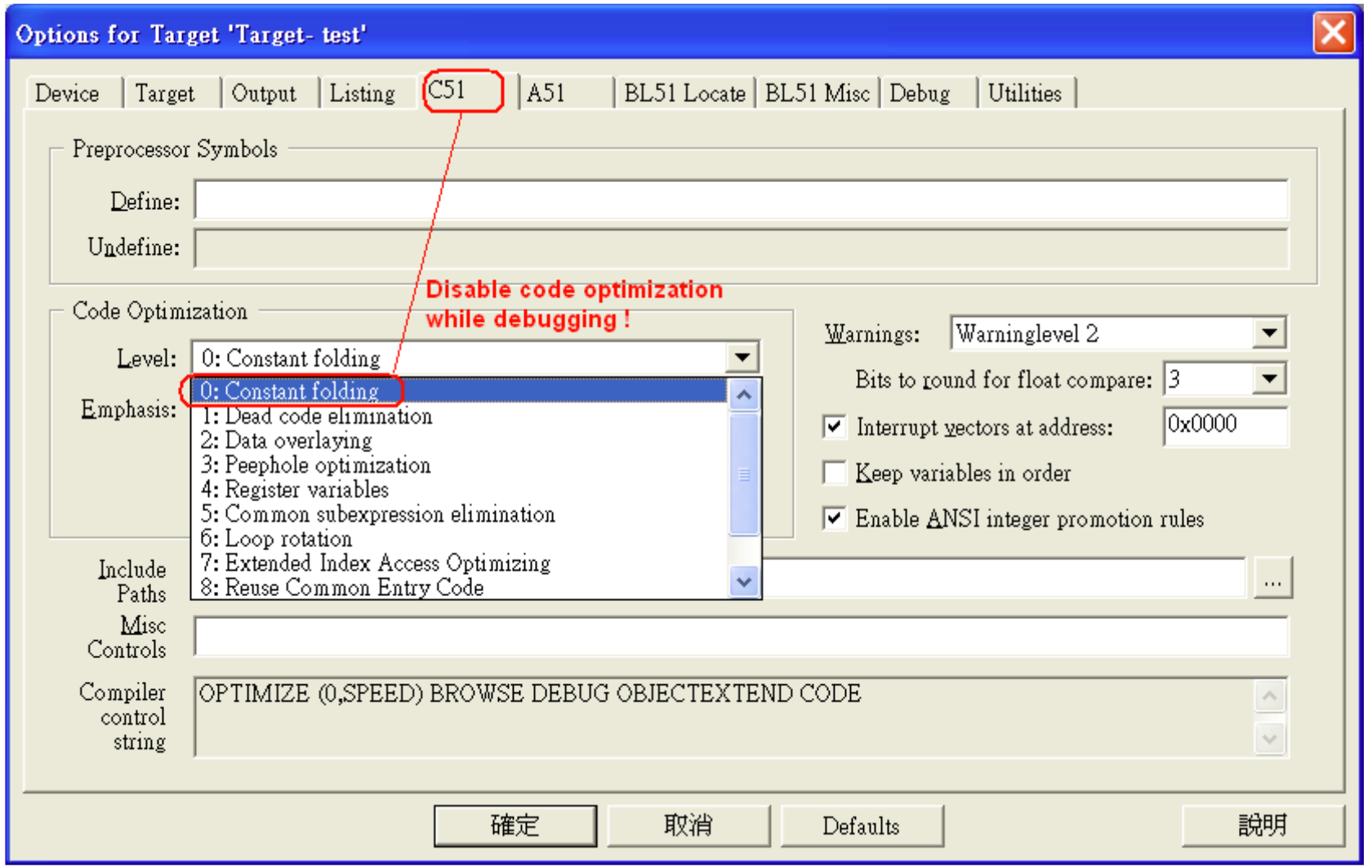
1. “Project” -> “New µVision Project”
    1. Option “Device”
    2. Option “Target”
    3. Option “Output”
    4. Option “C51”
    5. Option “Debug”
    6. Option “Utilities”

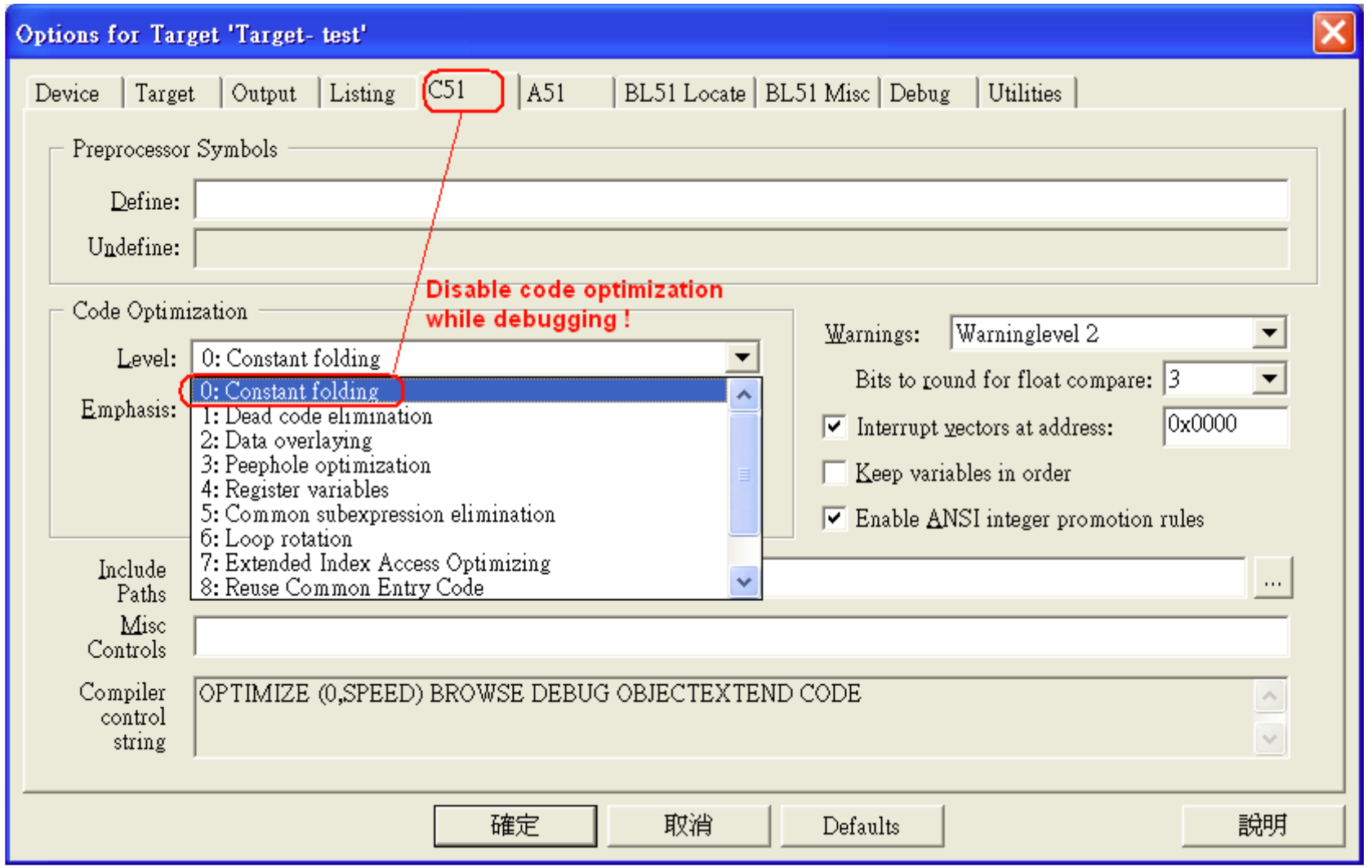



Options for Target 'Target- test'
Device
Target
Output
Listing
C51
A51
BL51 Locate
BL51 Misc
Debug
Utilities
Database:
Megawin Device Database
Generic CPU Data Base
Megawin Device Database
Vendor: Megawin
Device: MPC82G516
Toolset: C51
Use Extended Linker (LX51) instead of BL51
Use Extended Assembler (AX51) instead of A51
Megawin
MPC82G516
(1) Operating speed up to 24MHz
(2) 64K bytes Flash program memory
(3) 256 bytes internal RAM
(4) 1024 bytes on-chip eXpanded RAM (XRAM)
(5) Four full I/O ports P0/P1/P2/P3, and half P4
(6) Three 16-bit Timers
(7) Programmable clock output
(8) Four-level priority interrupt system
(9) Two UARTs
(10) Eight keypad interrupt inputs
(11) One-time enabled Watch-dog Timer
(12) SPI (Serial Peripheral Interface)
(13) PCA (Programmable Counter Array) with 6 channels
(14) 10-bit ADC with 8 multiplexed analog inputs
(15) ISP (In-System Programming) & ICP (In-Circuit Programming)
(16) IAP (In-Application Programming) memory with programmable size
(17) OCD interface for on-chip debugging
確定
取消
Defaults
說明


Options for Target 'Target- test'
Device
Target
Output
Listing
C51
A51
BL51 Locate
BL51 Misc
Debug
Utilities
Megawin MPC82G516
Enabled
Xtal (MHz): 12.0
Use On-chip ROM (0x0-0xFFFF)
Memory Model: Small: variables in DATA
Code Rom Size: Large: 64K program
Use On-chip XRAM (0x0-0x3FF)
Operating system: None
Off-chip Code memory
Start:
Size:
Eprom #1:
Eprom #2:
Eprom #3:
Off-chip Xdata memory
Start:
Size:
Ram #1:
Ram #2:
Ram #3:
Code Banking
Start:
End:
Banks: 2
Bank Area: 0x0000 0xFFFF
'far' memory type support
Save address extension SFR in interrupts
確定
取消
Defaults
說明


Options for Target 'Target- test'
Device
Target
Output
Listing
C51
A51
BL51 Locate
BL51 Misc
Debug
Utilities
Select Folder for Objects...
Name of Executable: test
Create Executable: .\test
Enabled
Debug Information
Browse Information
Create HEX File
HEX Format: HEX-80
Create Library: .\test.LIB
Create Batch File
After Make
Beep When Complete
Start Debugging
Run User Program #1: test.BAT
Browse...
Run User Program #2:
Browse...
確定
取消
Defaults
說明


Options for Target 'Target- test'
Device
Target
Output
Listing
C51
A51
BL51 Locate
BL51 Misc
Debug
Utilities
Preprocessor Symbols
Define:
Undefine:
Disable code optimization while debugging !
Code Optimization
Level:
0: Constant folding
Emphasis:
0: Constant folding
1: Dead code elimination
2: Data overlaying
3: Peephole optimization
4: Register variables
5: Common subexpression elimination
6: Loop rotation
7: Extended Index Access Optimizing
8: Reuse Common Entry Code
Warnings:
Warninglevel 2
Bits to round for float compare:
3
Interrupt vectors at address:
0x0000
Keep variables in order
Enable ANSI integer promotion rules
Include Paths
...
Misc Controls
Compiler control string
OPTIMIZE (0,SPEED) BROWSE DEBUG OBJECTEXTEND CODE
確定
取消
Defaults
說明


Options for Target 'Target- test'
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C51
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BL51 Misc
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Define:
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Code Optimization
Level:
0: Constant folding
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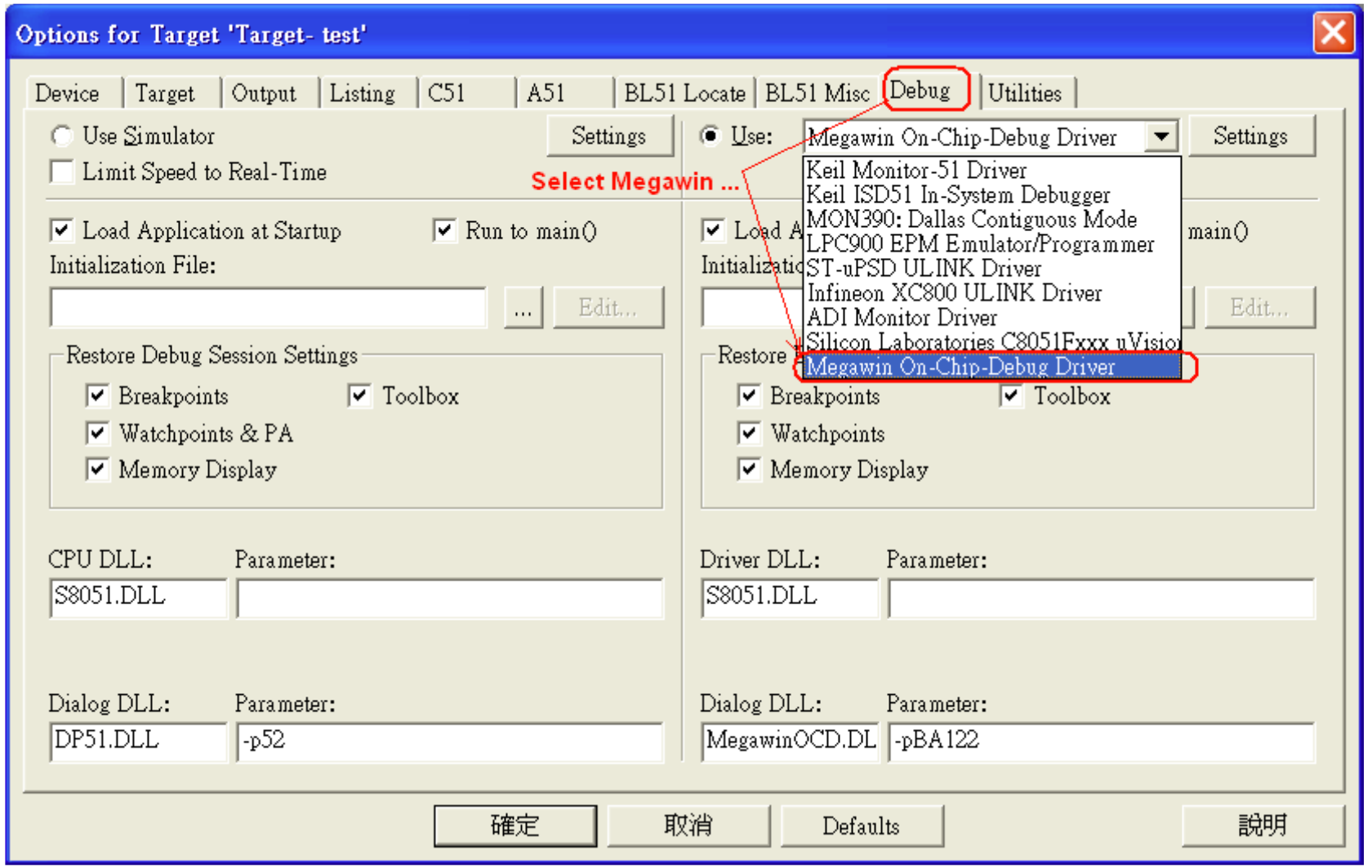
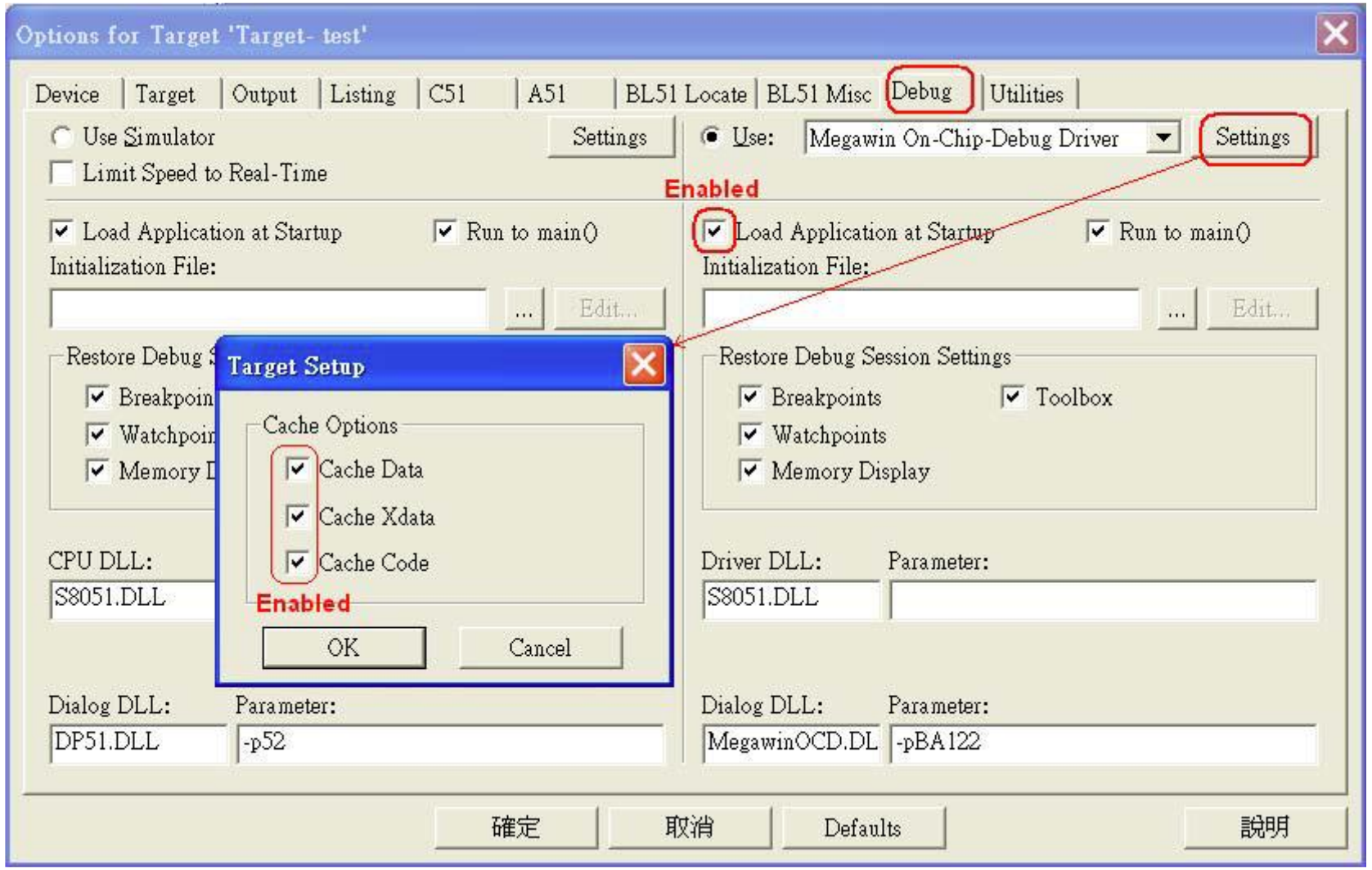
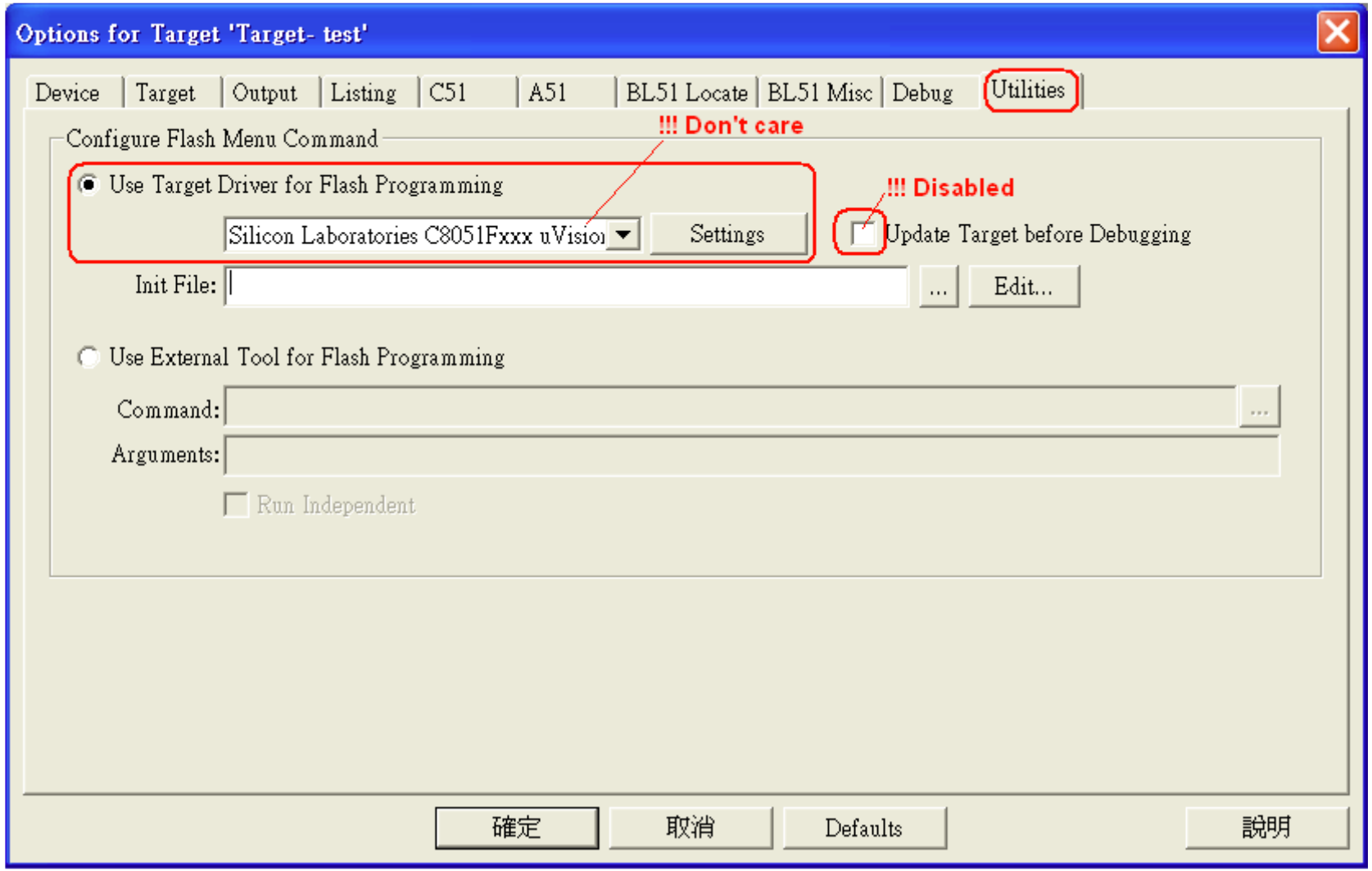
Warnings:
Warninglevel 2
Bits to round for float compare:
3
Interrupt vectors at address:
0x0000
Keep variables in order
Enable ANSI integer promotion rules
Include Paths
...
Misc Controls
Compiler control string
OPTIMIZE (0,SPEED) BROWSE DEBUG OBJECTEXTEND CODE
確定
取消
Defaults
說明

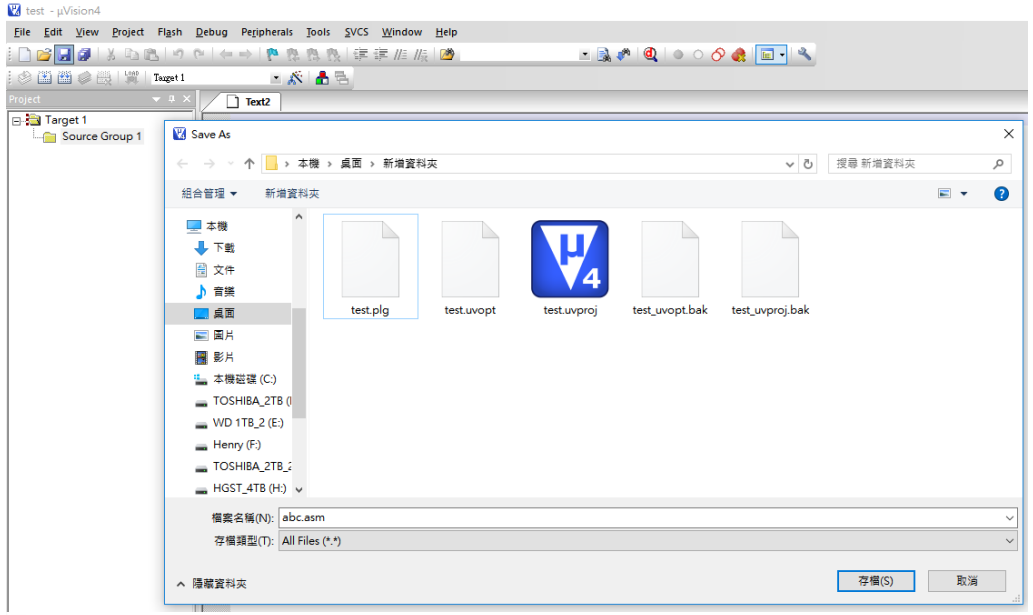

Options for Target 'Target- test'
Device
Target
Output
Listing
C51
A51
BL51 Locate
BL51 Misc
Debug
Utilities
Use Simulator
Limit Speed to Real-Time
Settings
Use:
Megawin On-Chip-Debug Driver
Settings
Select Megawin ...
Keil Monitor-51 Driver
Keil ISD51 In-System Debugger
MON390: Dallas Contiguous Mode
LPC900 EPM Emulator/Programmer
ST-uPSD ULINK Driver
Infineon XC800 ULINK Driver
ADI Monitor Driver
Silicon Laboratories C8051Fxxx uVisio
Megawin On-Chip-Debug Driver
Load Application at Startup
Run to main()
Initialization File:
...
Edit...
Restore Debug Session Settings
Breakpoints
Toolbox
Watchpoints & PA
Memory Display
CPU DLL:
Parameter:
S8051.DLL
Dialog DLL:
DP51.DLL
-p52
Driver DLL:
S8051.DLL
Dialog DLL:
MegawinOCD.DL
-pBA122
確定
取消
Defaults
說明

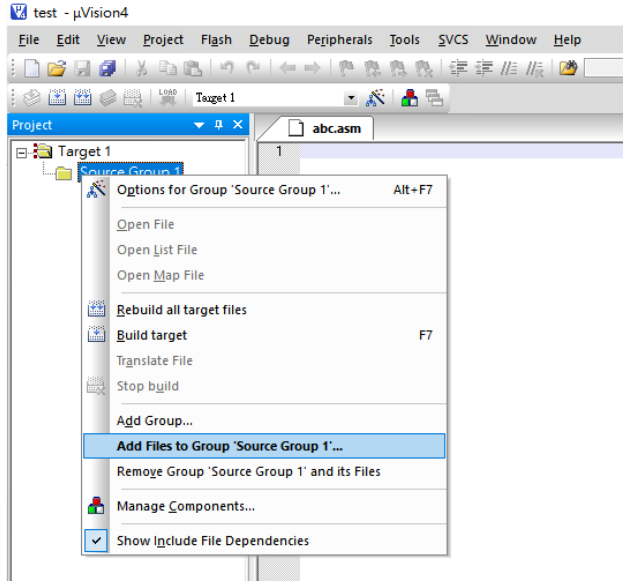

Options for Target 'Target- test'
Device
Target
Output
Listing
C51
A51
BL51 Locate
BL51 Misc
Debug
Utilities
Use Simulator
Settings
Limit Speed to Real-Time
Use:
Megawin On-Chip-Debug Driver
Settings
Enabled
Load Application at Startup
Run to main()
Initialization File:
Edit...
Restore Debug Session Settings
Breakpoints
Toolbox
Watchpoints
Memory Display
Target Setup
Cache Options
Cache Data
Cache Xdata
Cache Code
Enabled
OK
Cancel
CPU DLL:
S8051.DLL
Driver DLL:
Parameter:
S8051.DLL
Dialog DLL:
Parameter:
DP51.DLL
-p52
MegawinOCD.DL
-pBA122
確定
取消
Defaults
說明


Options for Target 'Target- test'
Device
Target
Output
Listing
C51
A51
BL51 Locate
BL51 Misc
Debug
Utilities
!!! Don't care
Configure Flash Menu Command
Use Target Driver for Flash Programming
Silicon Laboratories C8051Fxxx uVisio
Settings
!!! Disabled
Update Target before Debugging
Init File:
...
Edit...
Use External Tool for Flash Programming
Command:
...
Arguments:
Run Independent
確定
取消
Defaults
說明

Create and Add File

- Create and Save file
- Add Files into project



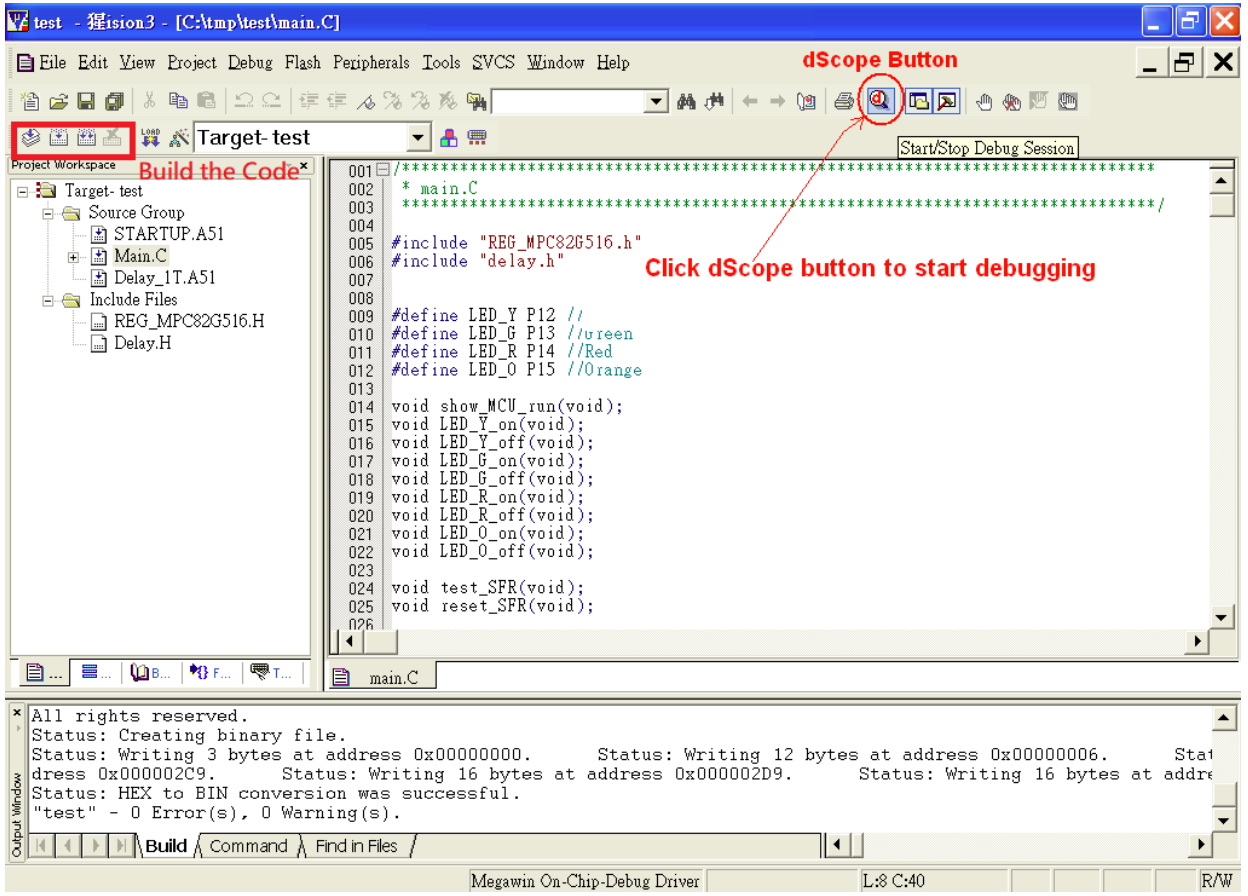


Example

```
ORG     0H
MOV     R5, #25H
MOV     R7, #34H
MOV     A, #0
ADD     A, R5
ADD     A, R7
ADD     A, #12H
END
```

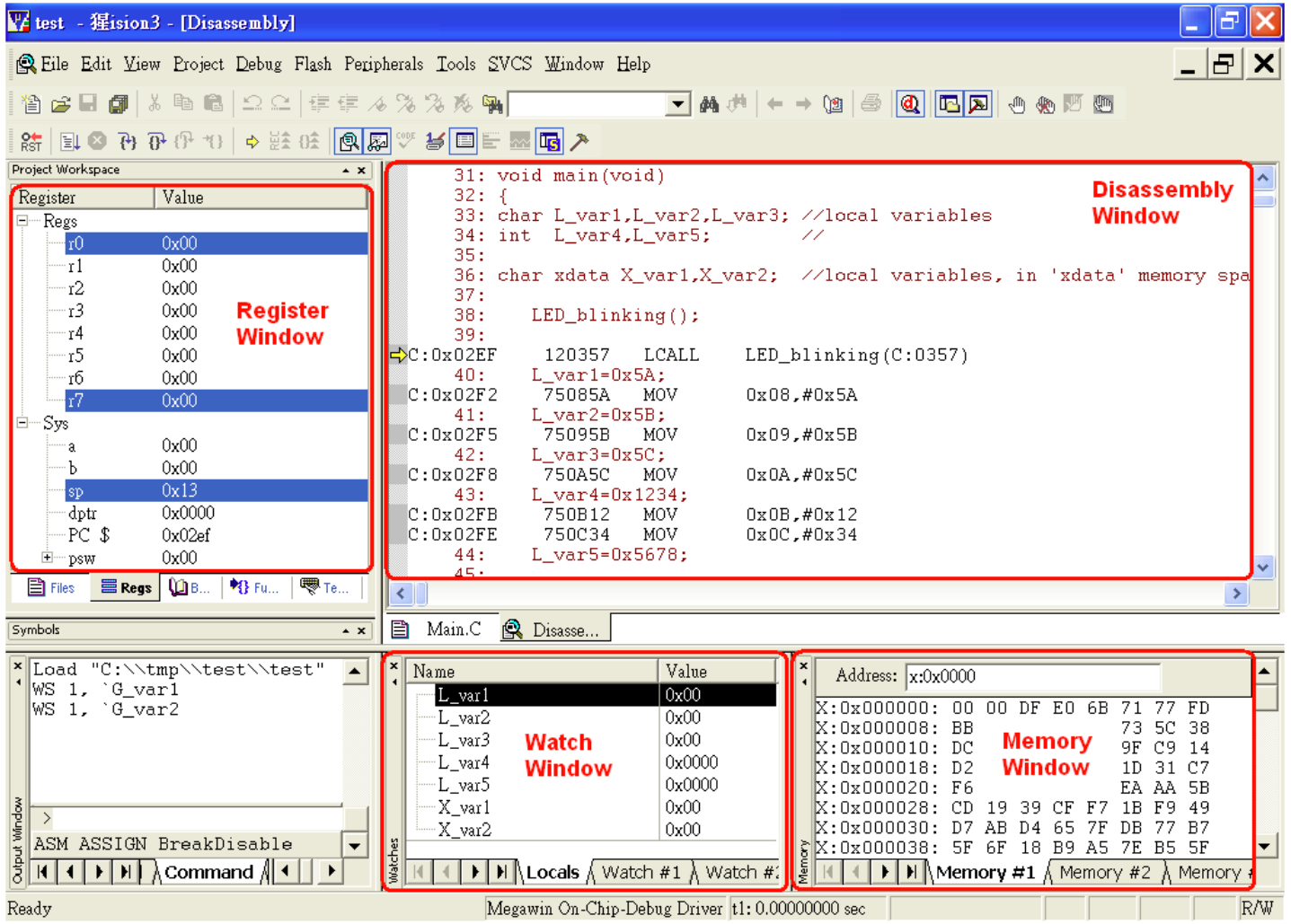
Debug with µVision

Start Debugger



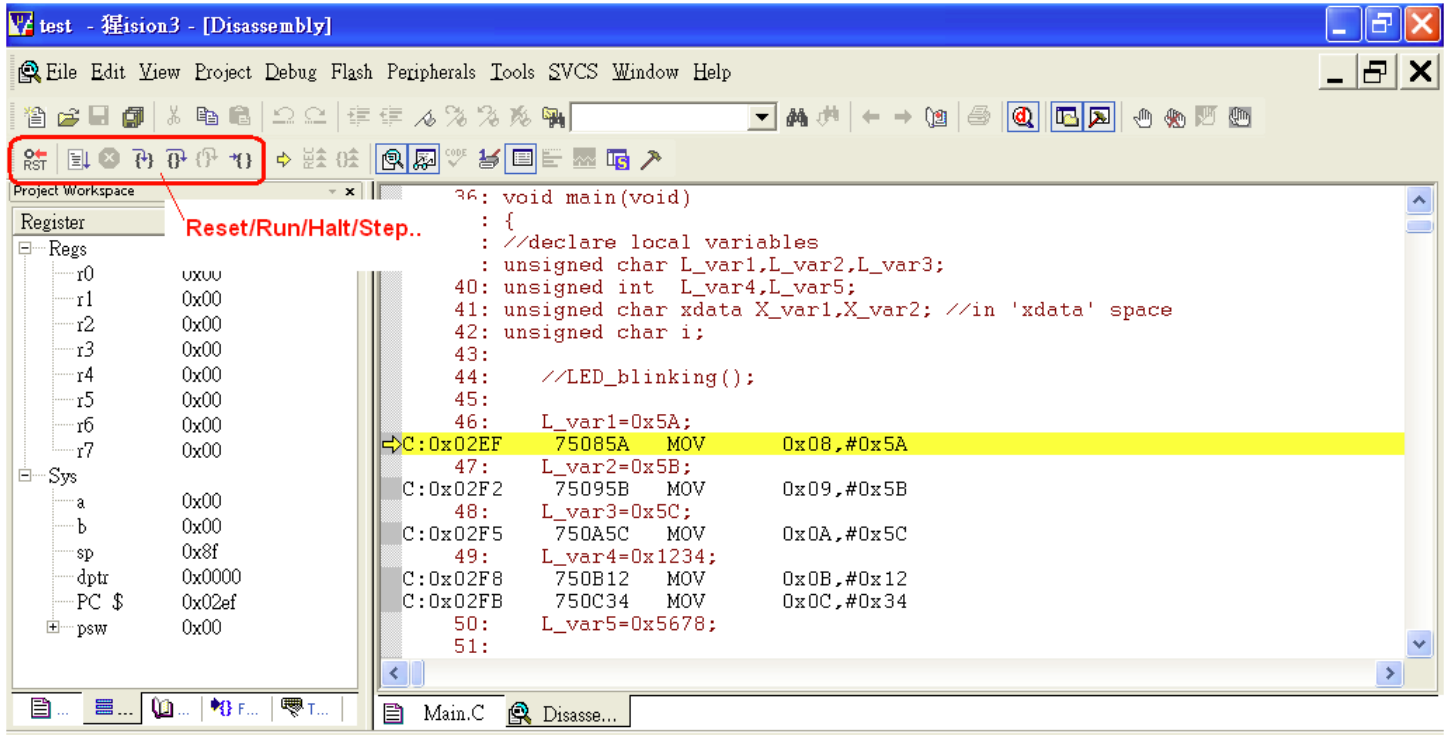
Debug Environment

- Register Window
- Disassembly Window
- Watch Window
- Memory Window



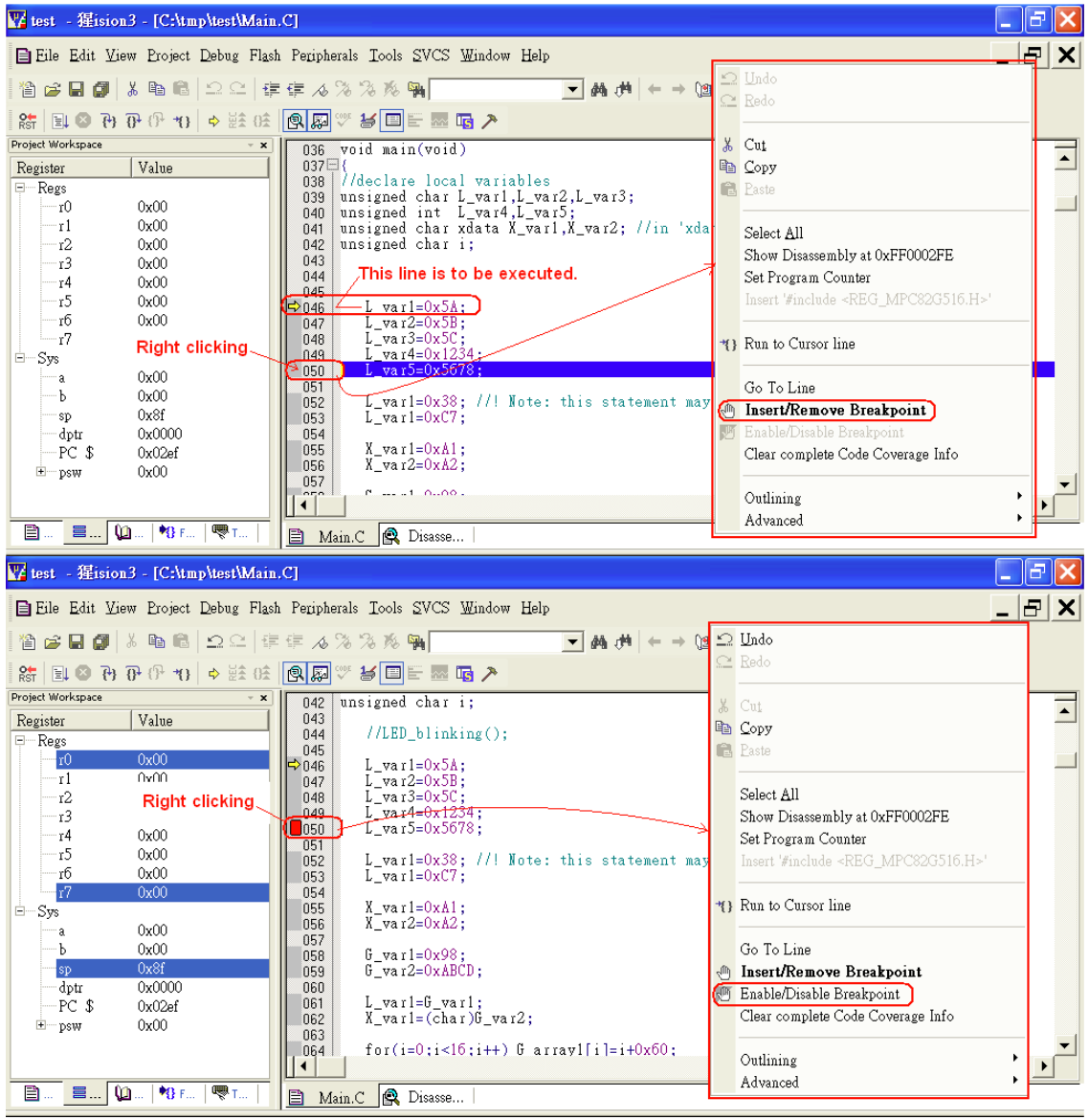
Basic Debug

- Reset
- Run
- Halt
- Step
- Run-to-Cursor

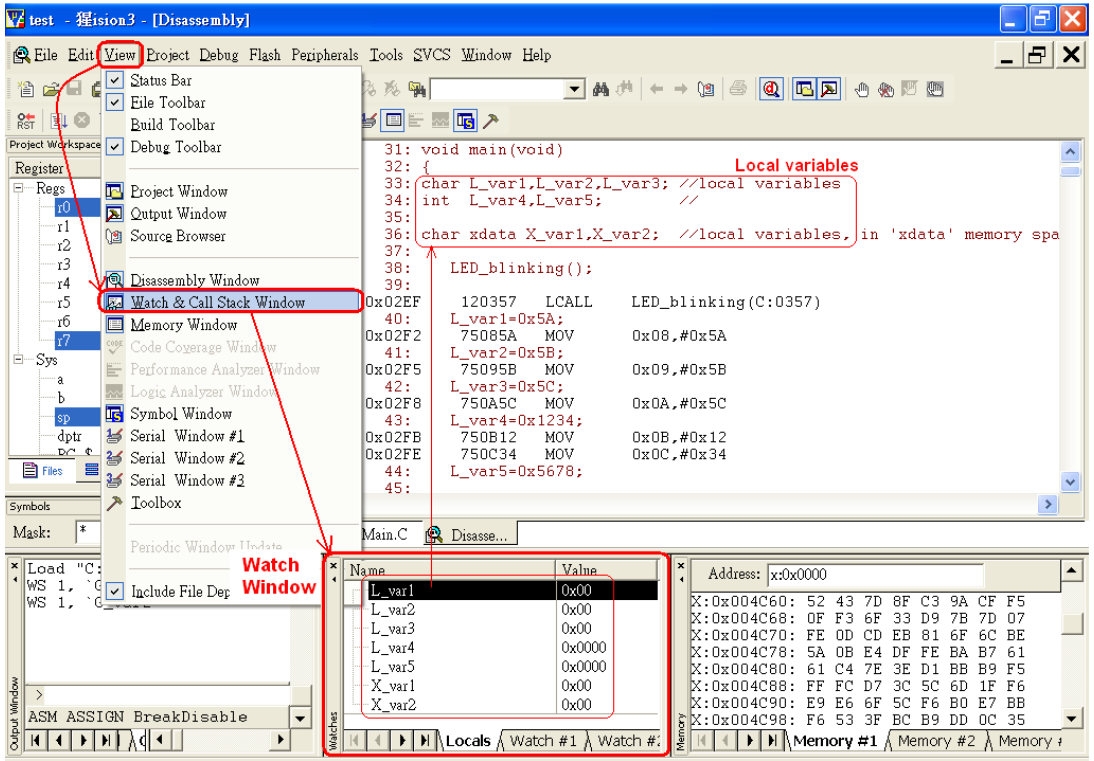


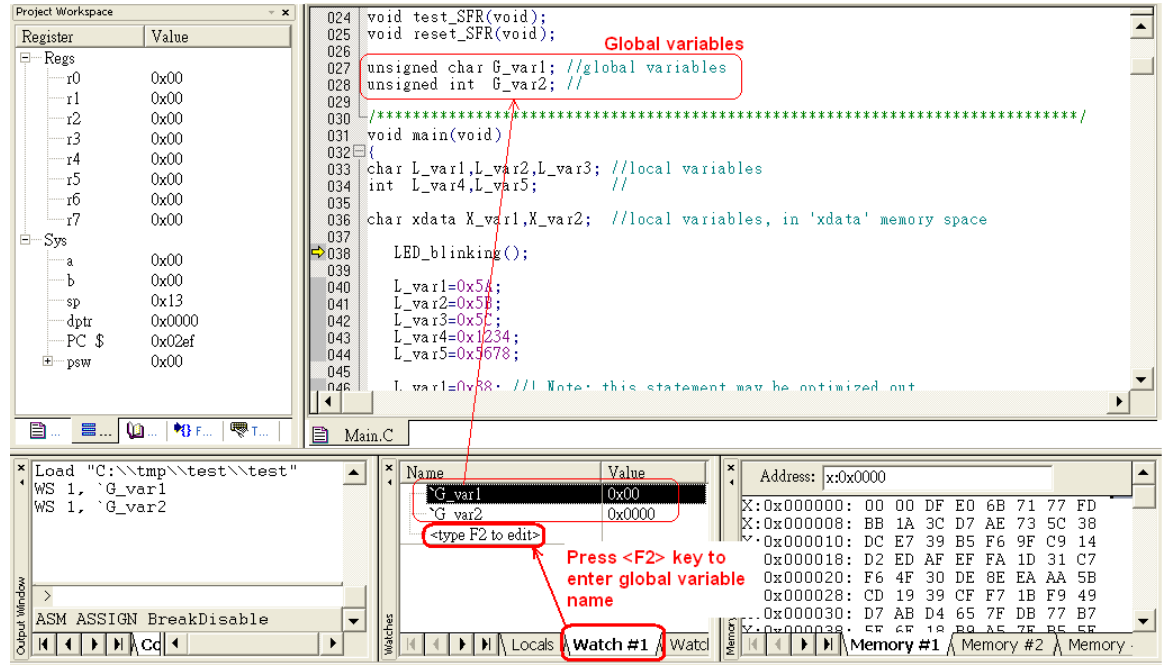
Break Point

- Insert/Remove Breakpoint
- Enable/Disable Breakpoint



View- Watch Window





View- Memory Window

1. d:0x00~d:0xFF, for '**data**' type
2. i:0x00~i:0xFF, for '**idata**' type
3. x:0x0000~x:0xFFFF, for '**xdata**' type
4. c:0x0000~c:0xFFFF., for '**code**' type