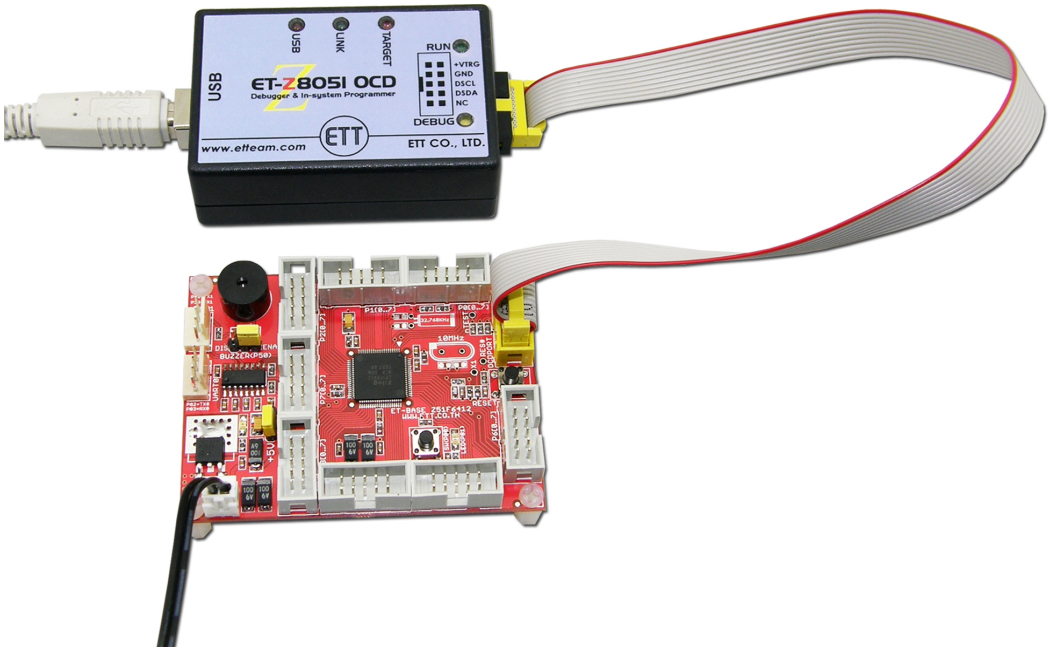
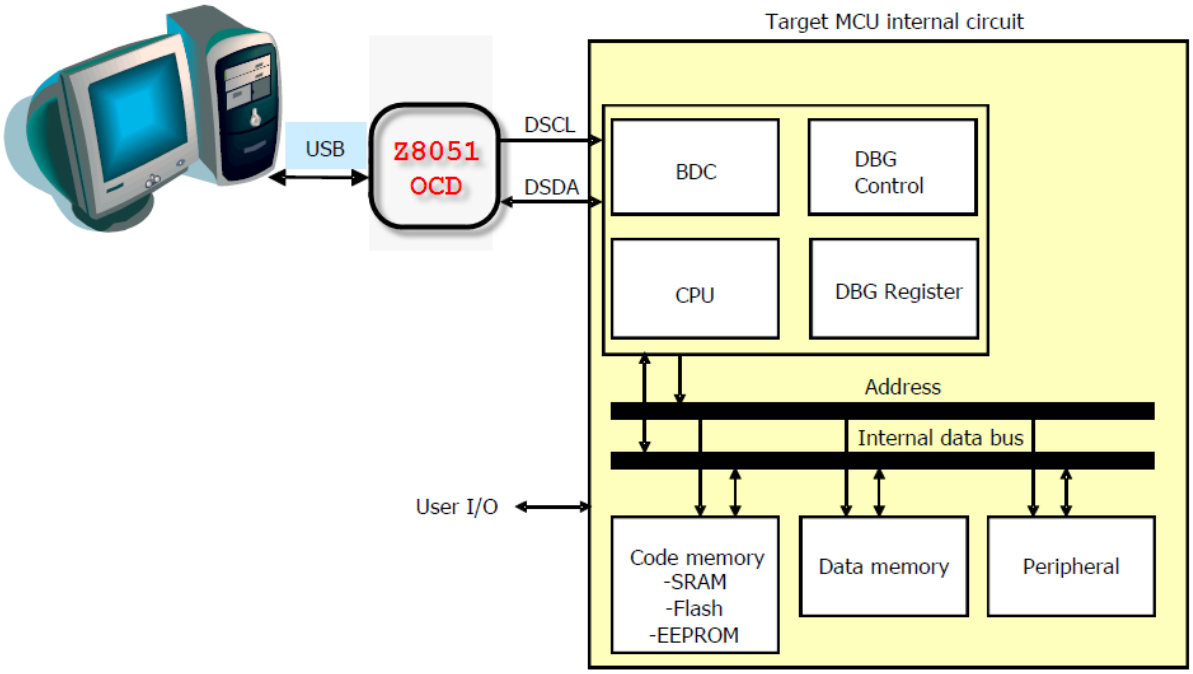
ET-Z8051 OCD

"**ET-Z8051 OCD**" is the device that is designed for developing Program MCU in a series of Z8051 from Zilog Inc; it is the intermediate between computer PC and Target Board that use MCU Z8051. In this case, user can command, check, test to see the value of Register or value of data in memory or value of variable of MCU while it is actually running. Function of this device can be both Debugger and In-System Programming (ISP).



ET-Z8051 OCD connects with computer PC through USB Port and it connects with Target Board of MCU through Connector IDE 10Pin by 10Pin Pair Cable. It is compatible with program that runs on computer PC; it supports the Operating System of Windows XP, Windows Vista 32Bit/64Bit and Window-7 32Bit/64Bit.



Specifications

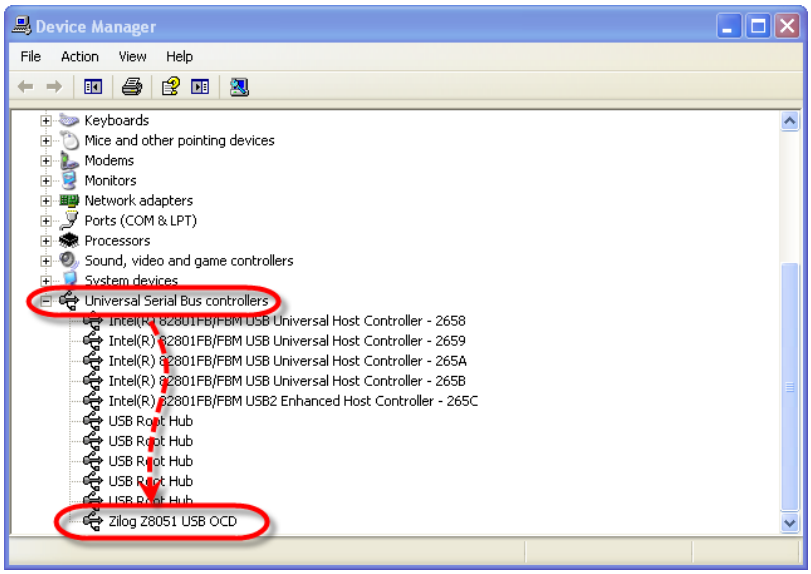
- Support the application with MCU Z8051 of Zilog Inc.
- Support File HEX and map/symbol File
- Debug by displaying value as variable in the program
- Access Code in MCU
- Support application of In-System Programming (ISP)
- Display Code and Disassembler
- Set value of PC (Program Counter) and Break Point
- Display and edit value of variable, memory, and Registers
- Display Code and value in Memory XDATA
- Auto Detect MCU number and automatically adjust Parameters by self
- Support application with MCU throughout the standard voltage level (2V-5.5V)
- Support applications with MCU that are both Internal Clock and External Crystal Clock
- Run, Step, Auto Step, Break, …

How to connect MCU with ET-Z8051 OCD in Debug Mode

This operation mode is suitable for application in the process of developing program because user can command MCU as required; it controls, tests, stops, including checks and adjusts Registers while MCU is actually running. So, user does not erase and program MCU frequently. This operation mode is compatible with Program **'Zilog Z8051 OCD"**; nowadays (August, 2012), this program is updated to **"Zilog Z8051 OCD Version1.147"**. This is brief procedures for using program as follows;

1. Install Program **"Zilog Z8051 OCD"** completely, and Run File name **"Z8051_1.1.exe"**.
2. Interface Cable USB of ET-Z8051 OCD with computer PC and install Driver of the device completely; user does this process only one time. ET-Z8051 OCD of ETT uses the Driver as same as Zilog Z8051 OCD of Zilog Inc.; normally, this Driver is installed with Program called **"Z8051_1.1.exe"** in step No.1. If user installs the Program according to the Default value, this Driver is in the Location **"\device drivers\OCD USB\"** under Directory of the program installation. Nowadays, the Driver can support the application with the Operating System of Windows for computer that is both 32Bit and 64Bit as follows;
   a. **32Bit:** "C:\Program Files\Zilog\Z8051_1.1\device drivers\OCD USB\x32"
   b. **64Bit:** "C:\Program Files\Zilog\Z8051_1.1\device drivers\OCD USB\x64"

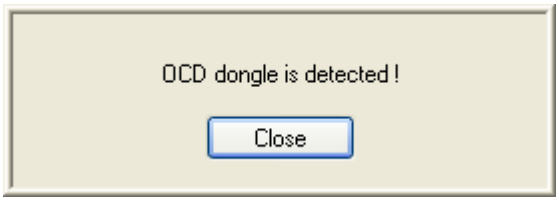
   If everything is correct, red LED USB on ET-Z8051 OCD is lit up (ON); when enter **Device Manager**, it found USB Device in **Tab Universal Serial USB Controller** called **"Zilog Z8051 USB OCD"** as shown in the example below;

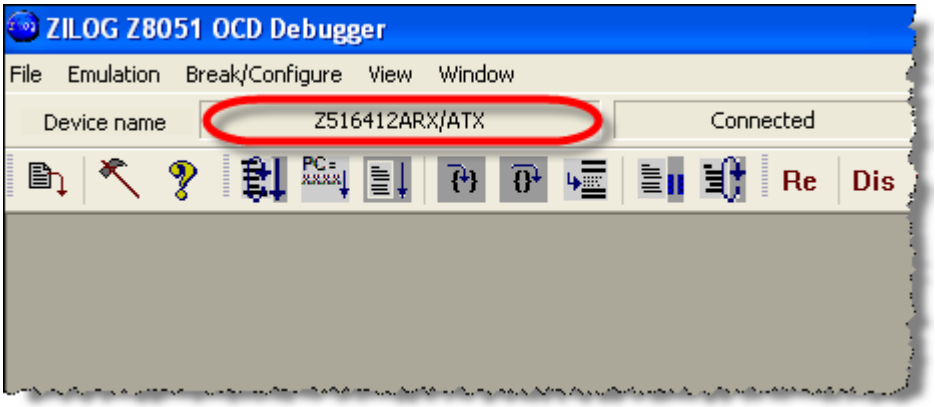


3. Run Program **"Zilog Z8051 OCD V1.147"**. When the Program first starts running, it shows message Dialog to notify user to know that it found the Z8051 OCD Device completely as shown in the example below. Moreover, green LED LINK on OCD Device of ET-

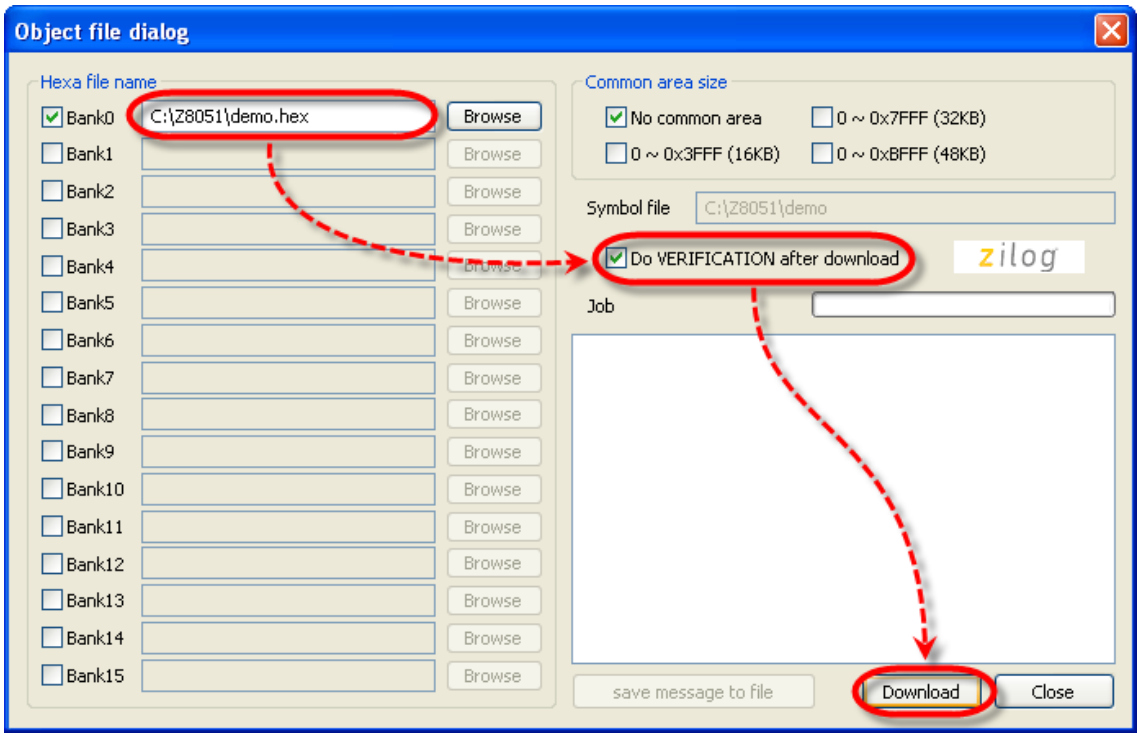
Z8051 OCD is lit up (ON), it means that the OCD Device is ready to run.

4. If it has already provided Power Supply for Board ET-BASE Z51F6412, it should remove Cable Power Supply of Board ET-BASE Z51F6412 from board first. Next, it should interface 10Pin Pair Cable between ET-Z8051 OCD with yellow Connector IDE 10Pin (PORT-OCD) of Board ET-BASE Z51F6412 completely; and finally, it provides Power Supply into Board ET-BASE Z51F6412. If everything is correct, all 3 LEDs of ET-Z8051 OCD are lit up (ON) that are USB LINK and TARGET; moreover, 2 message Dialogs appear on the screen of program respectively, including the number "**Z516412ARX/ATX**" in the box of **Device name** as shown in the example below;

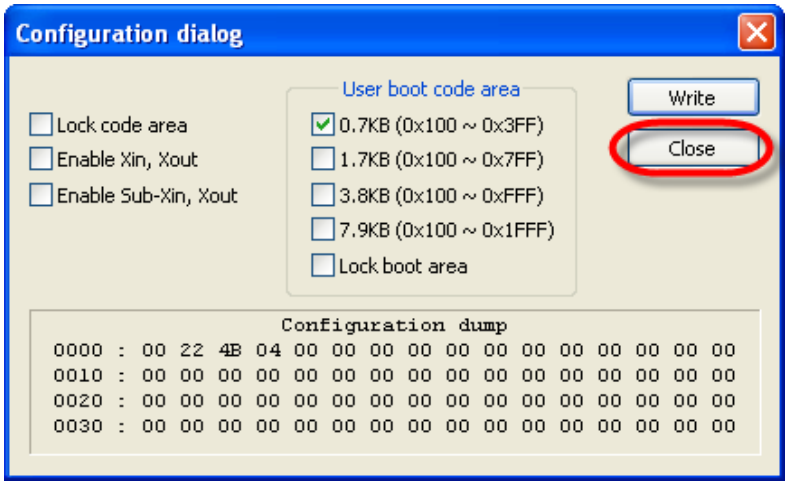




5. Now, it shows that the connection between MCU on Board ET-BASE Z51F6412 and OCD Device of ET-Z8051 OCD is correct; and now user can command Program Zilog Z8051 OCD to run as required. Next, it has to choose the Program HEX File to download into MCU on board; click Menu **File → Load HEX**, specifying the preferable file name, and finally, click **Download** as shown in the example;

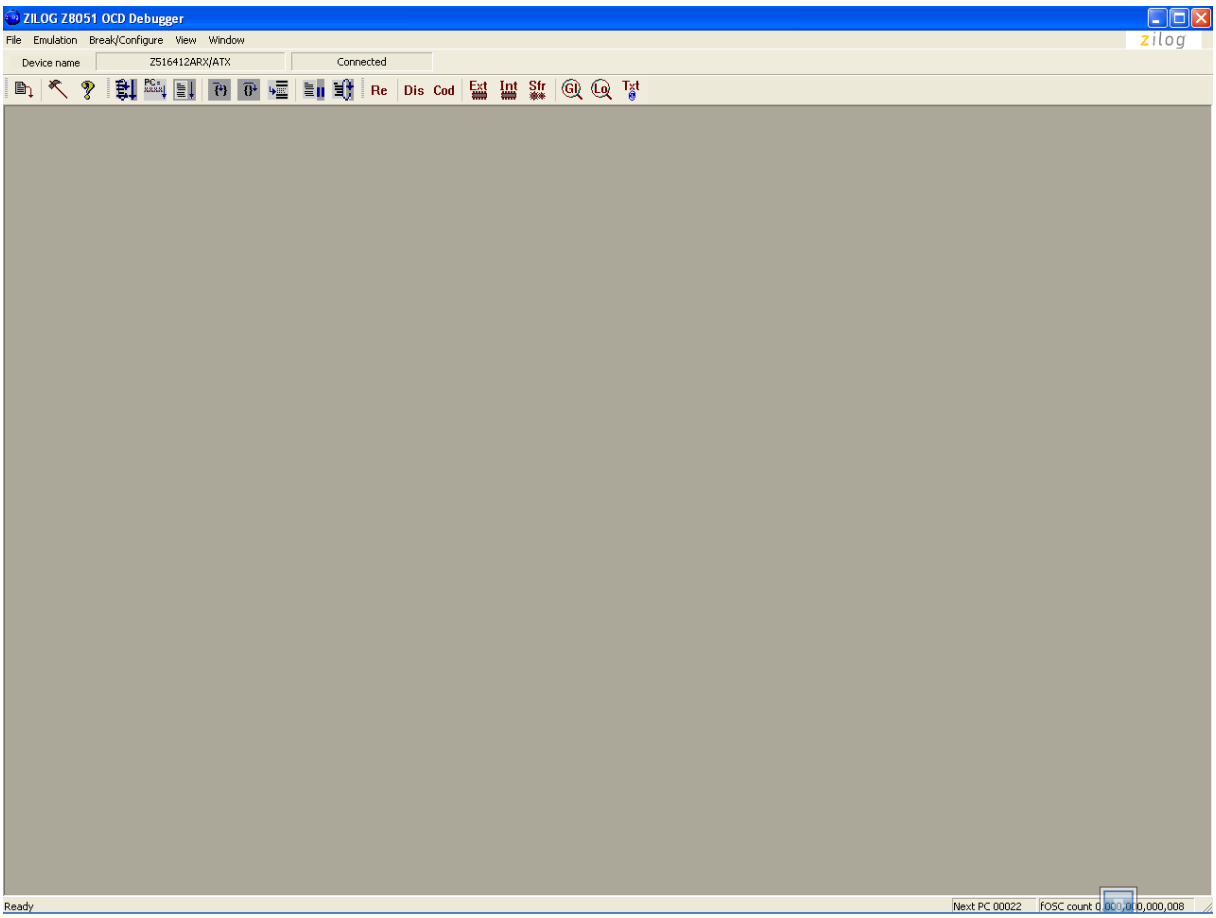


In the part of **Configuration**, user can click **Close** instantly if user does not edit or change any value of this **Configuration**; but, if user edits or changes any value of this **Configuration**, user has to choose **Write** after user has setup the preferable value completely. In this case, click **Chose** because it sets this **Configuration** according to the Default value from factory as shown in the example below;



6. After downloaded HEX File into MCU completely, user can command MCU to run as desired instantly; in this case, it may run (GO) to see the actual operational results, or it may set position to stop (BREAK), or it may run command by command (STEP) to check if the operational result of program is correct according to the designed program. At first the program displays the

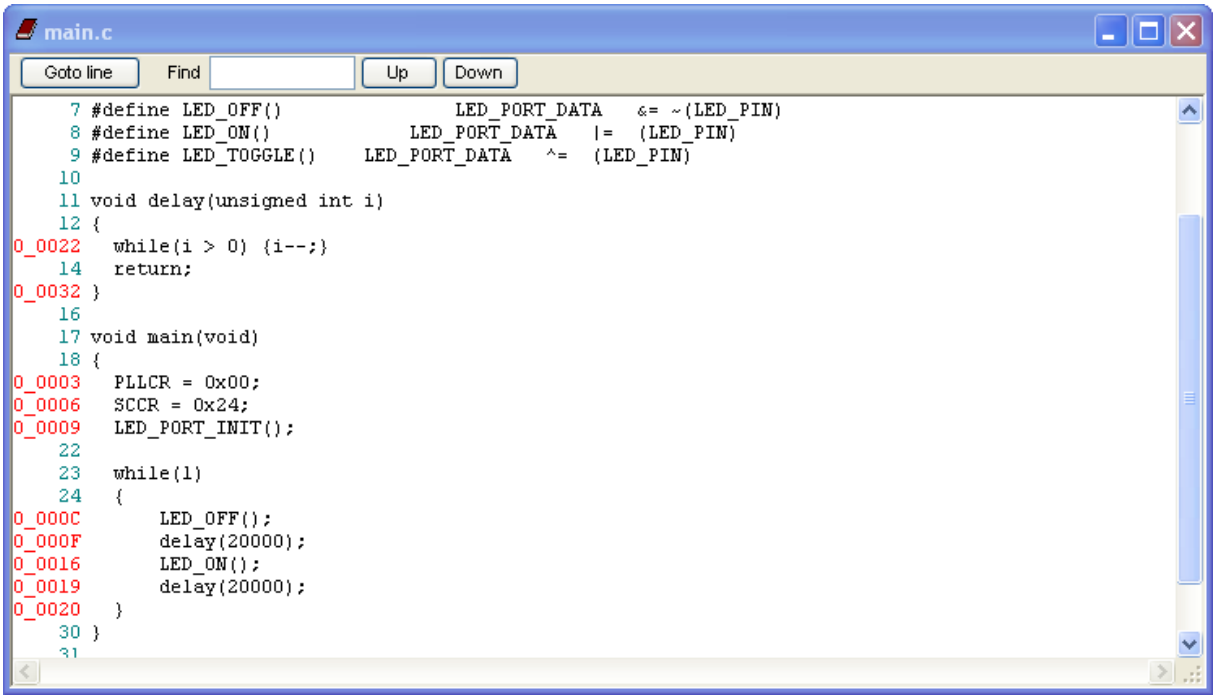
blank screen of program because user has not set any value for displaying result of program yet as shown in the picture below;



User can setup values for screen of program to show values of Code Program or Variable and Registers of MCU as required. User can adjust the screen size of parts suitably; click Menu **View**, choose the preferable thing that user requires displaying, or choose the preferable menu symbol in the part of **Window Open Bar** as shown in the example below;

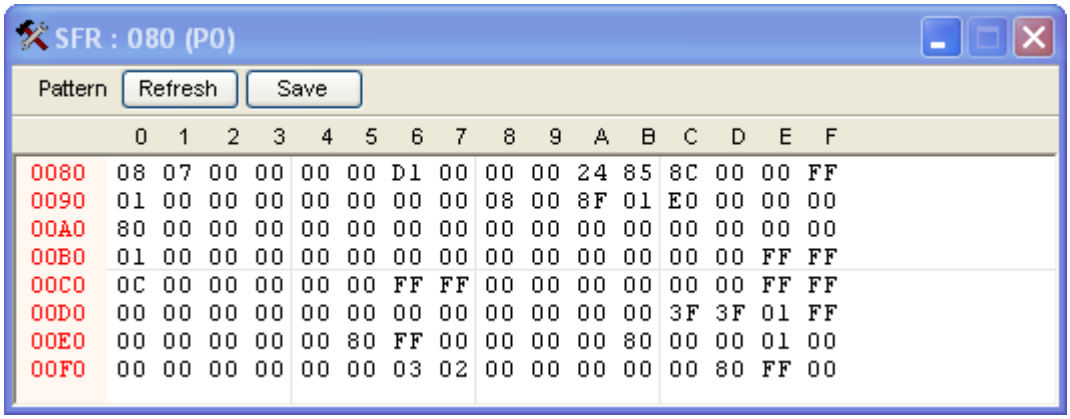
How to Display Command Code

If user requires displaying Code Command of program, click Menu **View → Text file**, choose the preferable File Source Code to see the value; in this case, it chooses **main.c**. The program shows line of the Code Command and Address position of command that is from compiling command as shown in the example below;



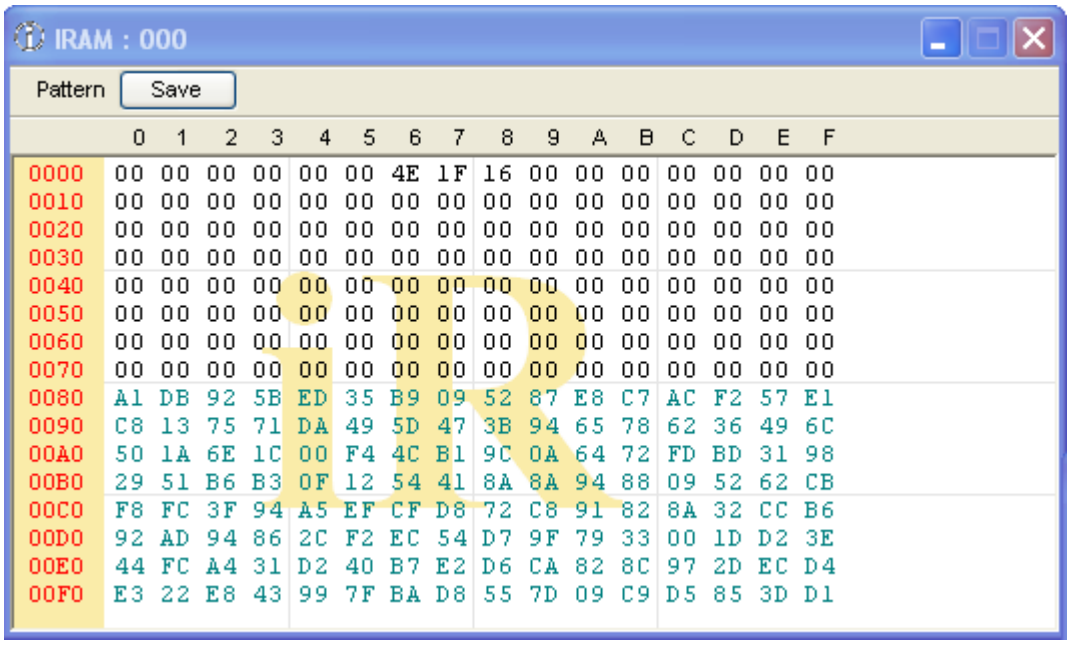
How to display value of Register and SFR Register

If user requires displaying the value of Special Function Register, click Menu **View → SFR dump**; the program shows window that displays value of SFR Register with value in Registers as shown in the example below;



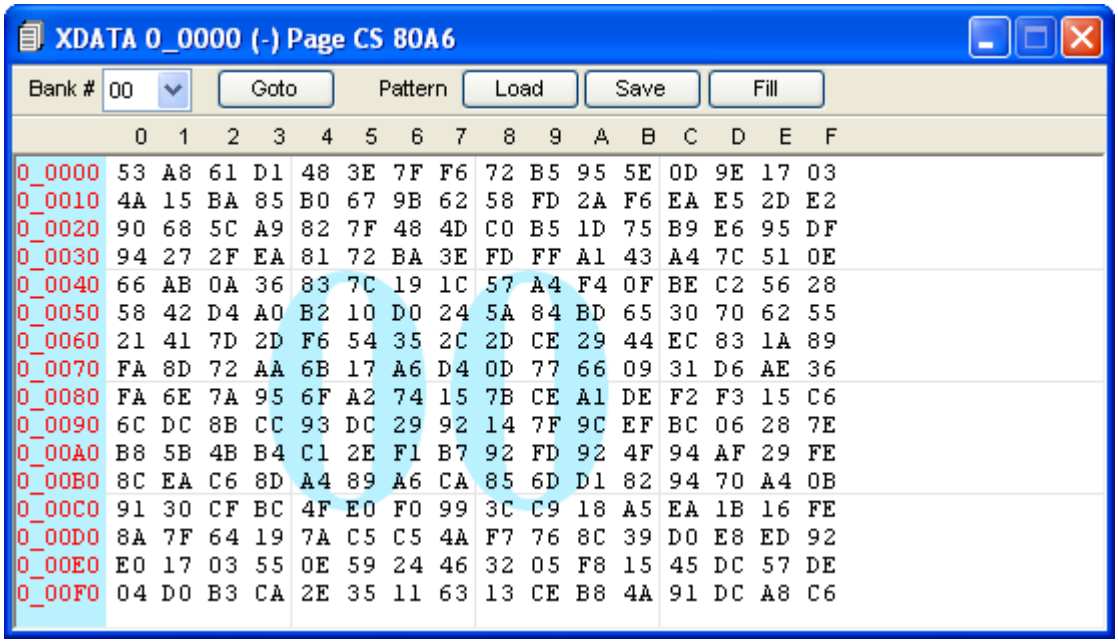
How to display value of Internal RAM

If user requires displaying value of Internal RAM, click Menu **View → IRAM dump**; the program shows window that displays value of Internal RAM with value in the memory as shown in the example below;



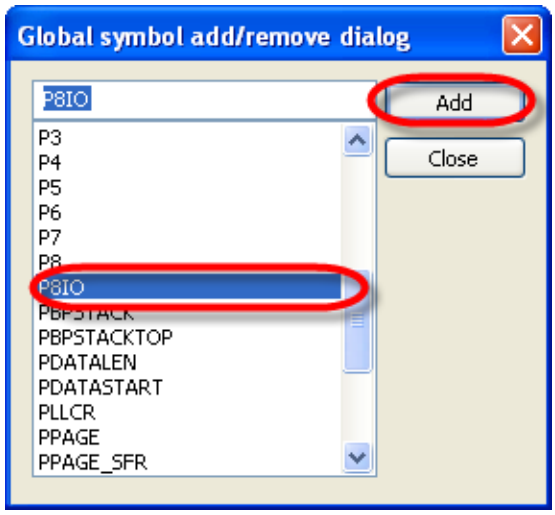
How to display value of External RAM(XRAM)

If user requires displaying value of Internal RAM, click Menu **View → XDATA dump**; the program shows window that displaying value of XRAM with value in the memory as shown in the example below;



How to display value of Variable Global

If user requires displaying value of Variable Global; click Menu **View → Watch Global**, choose Tab **Add Symbol**, and choose the preferable variable name or Register that user requires checking the value, and finally click **Add**. If user requires disabling the display of any Register, user only clicks Remove symbol to cancel as shown in the example below;



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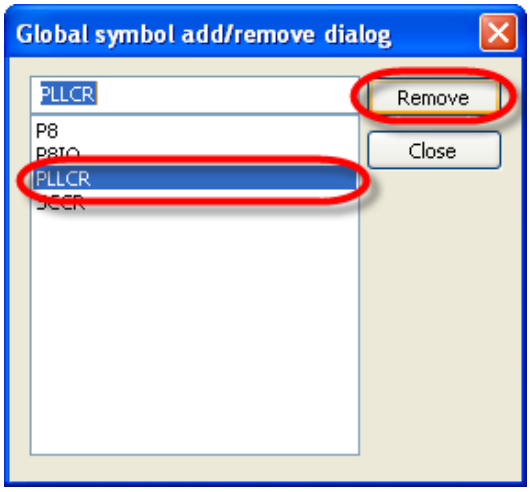

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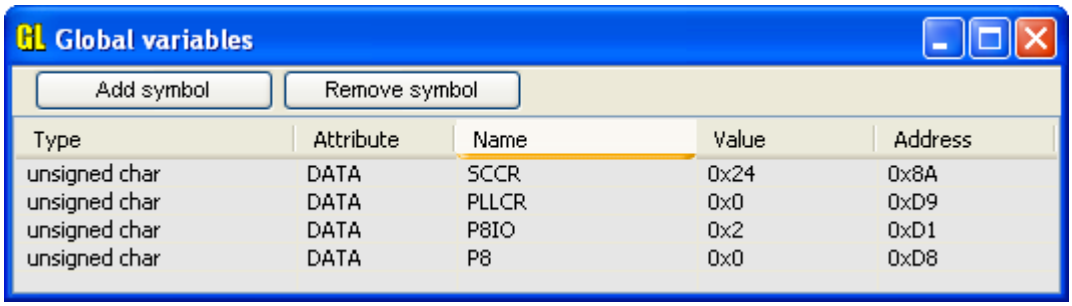
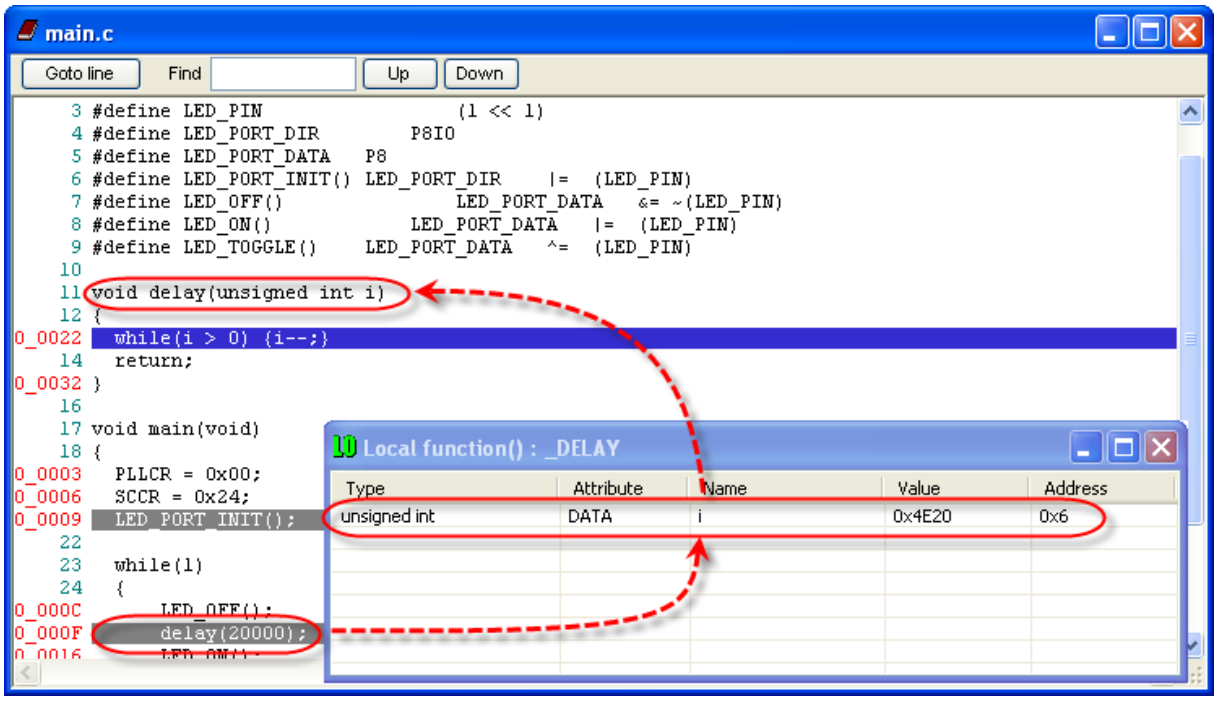


How to display value of Variable Local

If user requires displaying value of Variable Local; click Menu **View → Watch Local**, the program displays window to display the Variable Local that is used in the program. In this case, it displays variable type, variable name, memory location that is used to create variable, and value in the variable to notify user to know; these variables show the value to user to know when the program runs and reaches the Command Line that has already been passed the value to the variable only. For example, when it calls Function Time Delay, it passes variable to the variable i that is announced as unsigned int and it shows details of this variable to user. User can stop or edit any value for the variable to test the operation of this variable. For example, user tries to adjust any value for the variable i to test the suitable value for Time Delay; in this case, click the box of Value to edit the value as required, and finally click **Modify** as shown in the example below;



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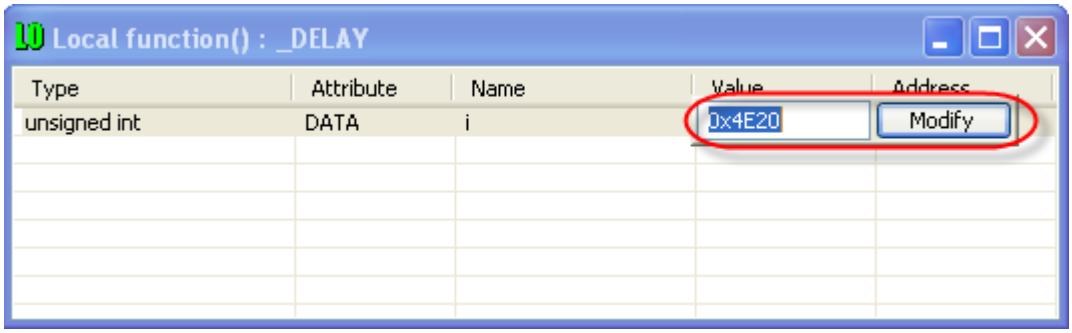
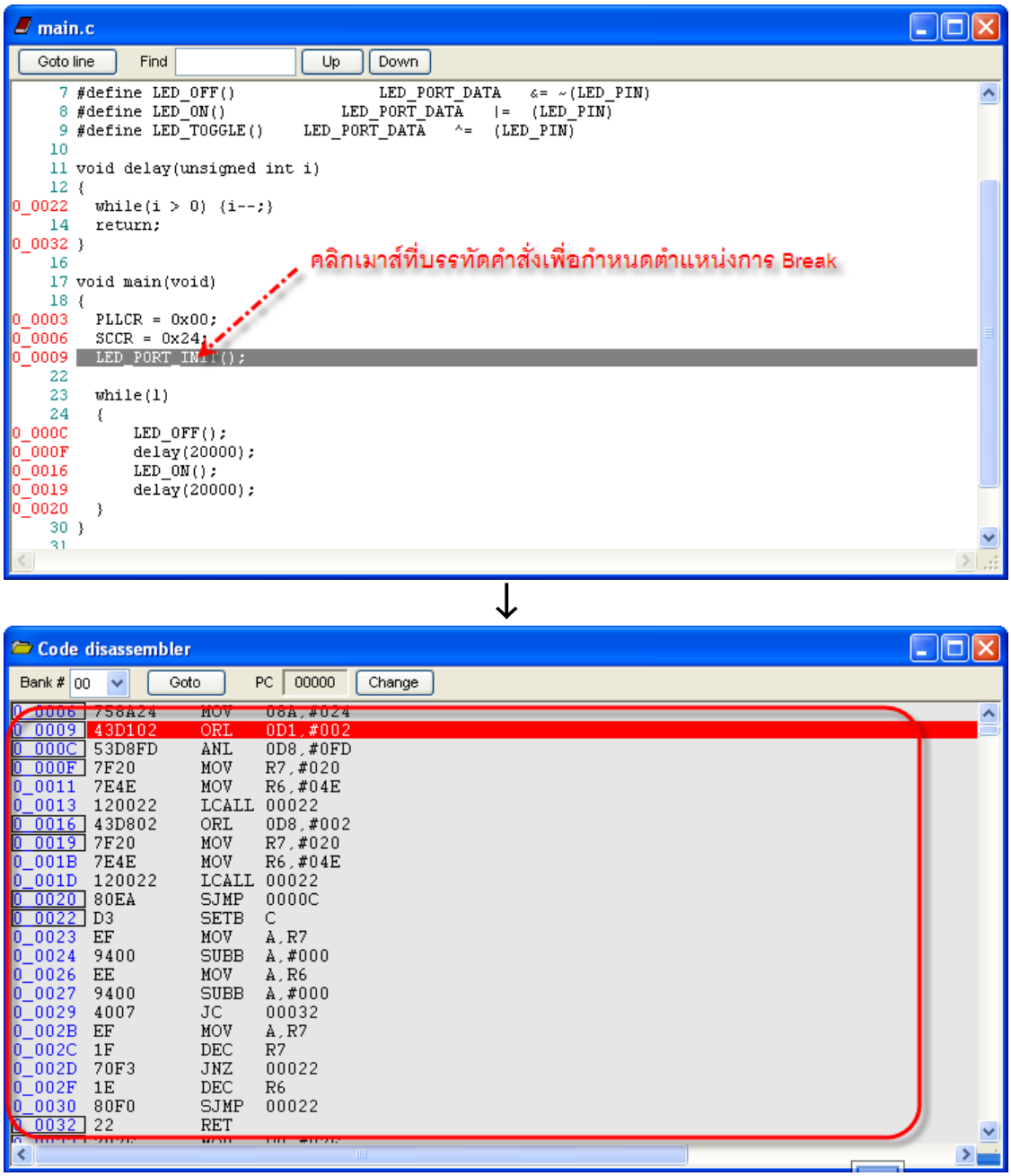


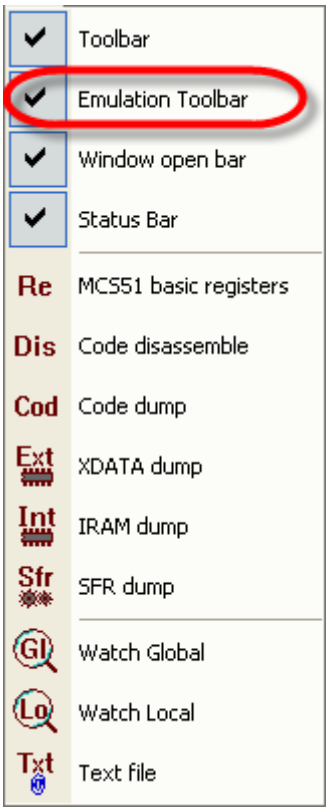
How to set Break Position

It sets Break position to stop the operation of program in the Command line that user requires considering if the value of Register and Variables is correct when MCU runs and reaches the identified Line Command. In this case, user can set the Break position from the window Text File that shows the value of Source Code. If user requires setting Break position at any Command Line, user can click that line instantly; but, if user requires cancelling, it only clicks the old position. If user has commanded to show value of Code dissembler, the colored tab also appeared on the Window Code Disable to show the Command Line of Assembler Language; it is the same Address position as the identified Command Line of Break as shown in the example below;

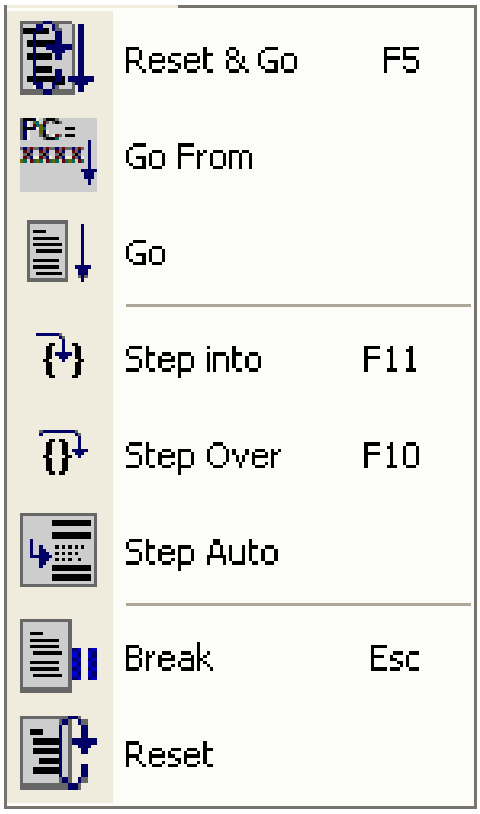


How to program

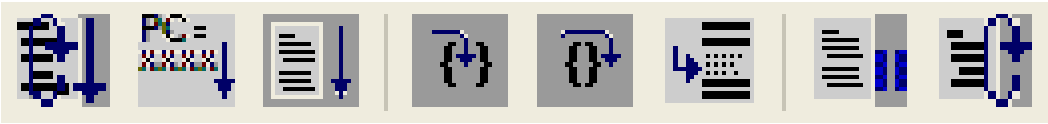
If user requires commanding Program Z8051 OCD, click Menu **Emulation** and choose the preferable tab command, or user can choose Menu Symbol of Emulation Toolbar directly. In this case, user has to command to display result of Emulation Toolbar in Menu **View** as shown in the example below;



Emulation Toolbar in Menu View

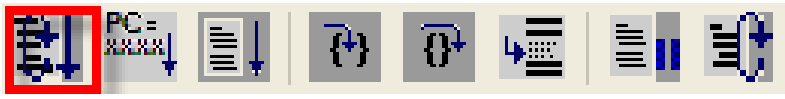


Menu Command in Emulation

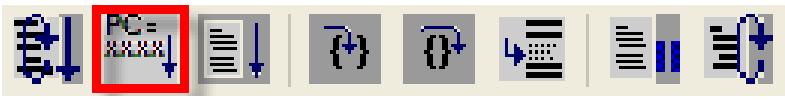


Emulation Toolbar

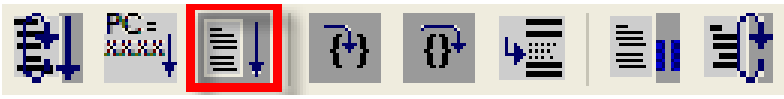
Reset & Go



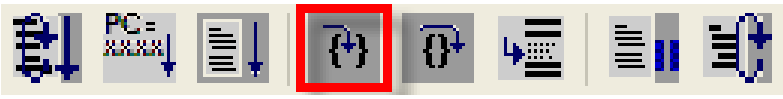
This command is used to Reset and Run by actual speed. Program resets the operation of MCU and it commands MCU to restart at Address position 0x0000.

Go Form 

This command is used to run by the actual speed, but user can set any initial Address position of program to run as preferred.

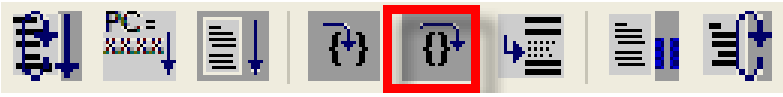
Go 

This command is used to run by the actual speed, the Program starts running after the Address position that is currently pointed by PC.

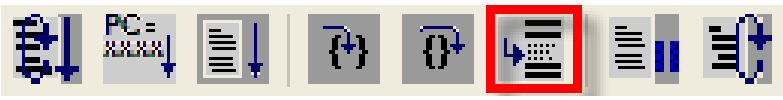
Step into 

This command is used to run program command by command to check the operation of program elaborately. When MCU runs completely according to each command, it stops running instantly in order to check the operational result; in this case, it shows the operational result through Hardware and Software. In the part of Hardware, it occurs because of the change in the actual situation; and, in the part of Software, it also occurs because of the change in Register and memory.

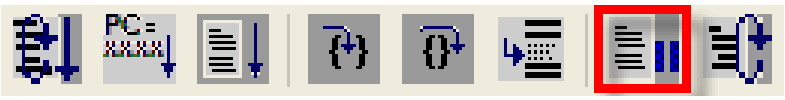
This Command is suitable for checking perfection of running sub-program or sub-function of the written program, it tests program separately.

Step Over 

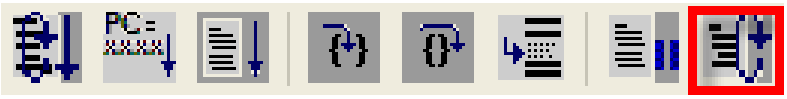
This Command is used to run program command by command; it tests the operation of Main Program to check if the cycle of program is correct. It is suitable for checking the operational result of Program Main after tested the operation of each sub-function completely.

Step Auto 

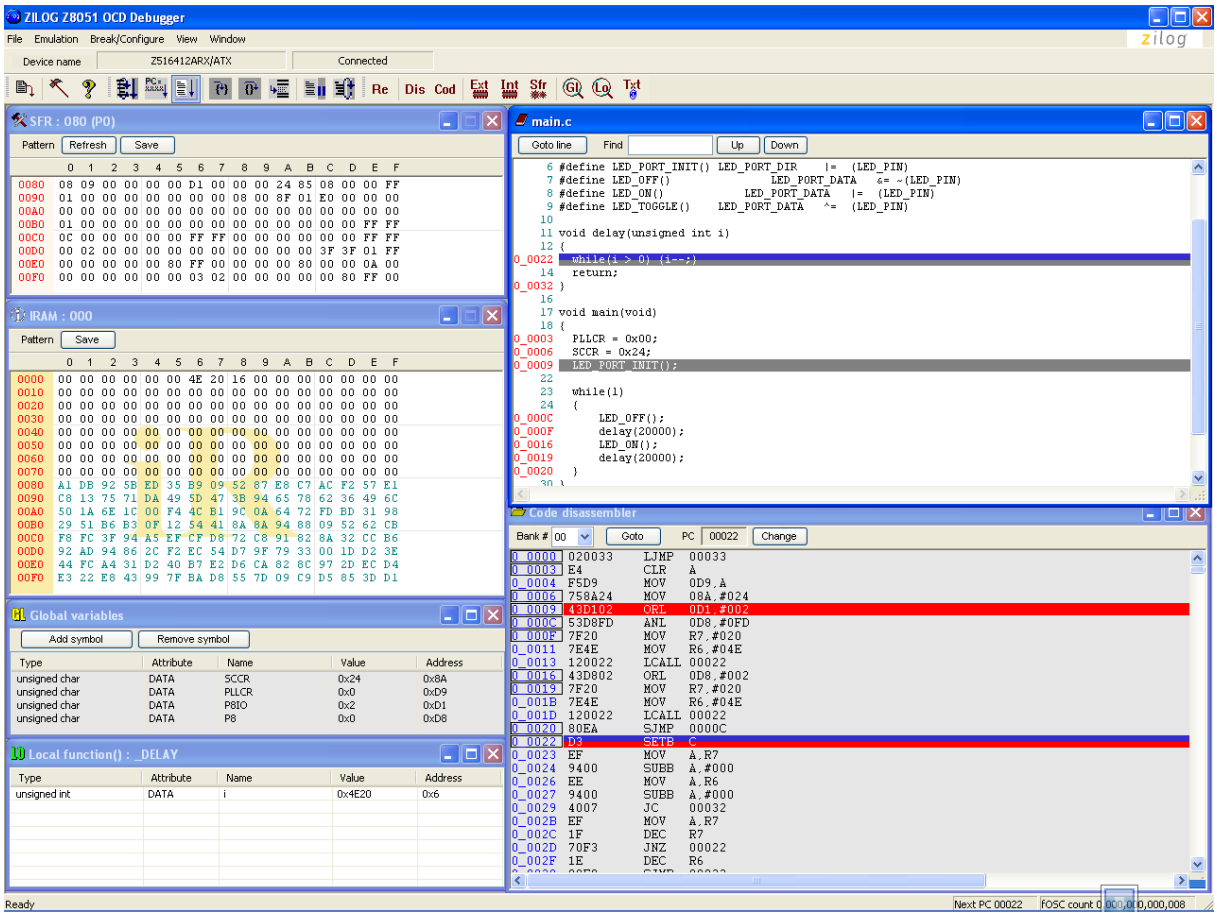
This command is used to run program step by step consecutively; it shows the change of Register Variable and memory according to running commands all the time. The operation of program is run in the format of Step that periodically pauses, so the speed of operation is not smooth. The operation of program is slower than normal Run.

Break 

This Command is used to stop the operation of the program is currently running. It is used to stop the operation of program to check the value of Register, Variable and memory that has been edited or changed.

Reset 

This Command is used to reset the operation of MCU and it setup value for PC to restart and return to Address position 0x0000.



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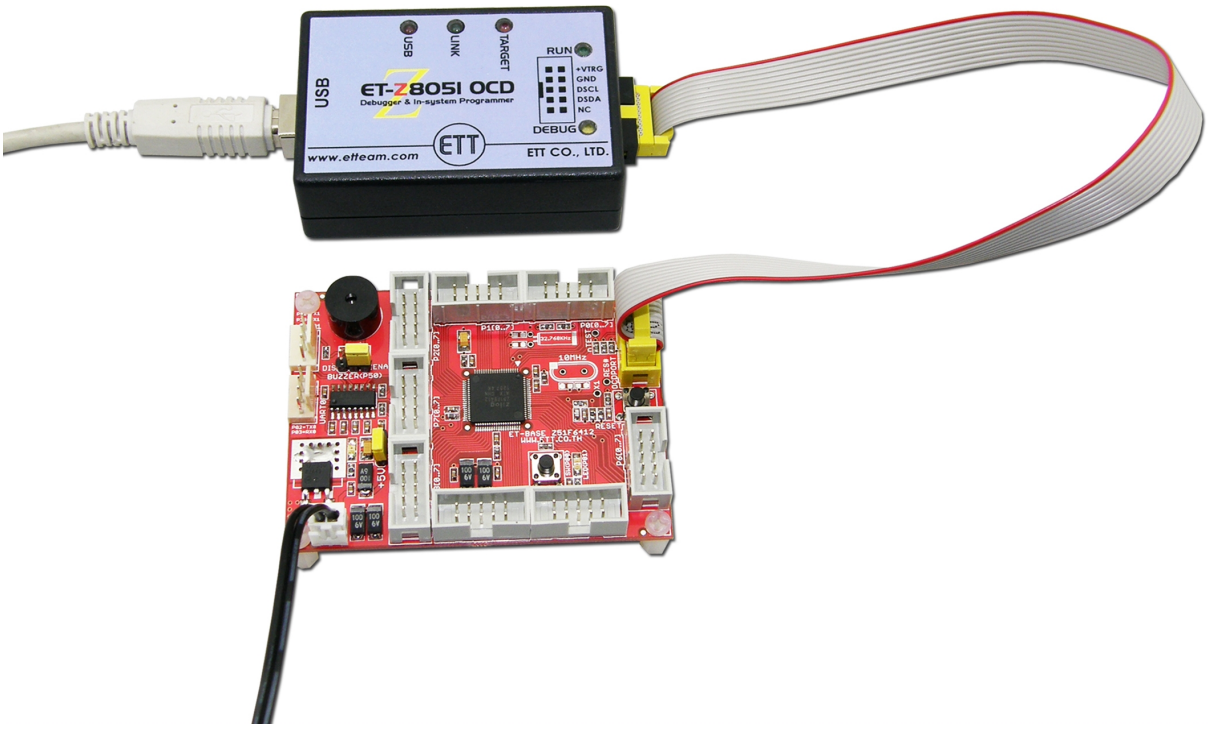

Picture shows an example of Debug for the operation of MCU through Program Zilog OCD v1.147.