

Visual Disassembler  
for the  
Atmel © AVR  
Microprocessor Family

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## Introduction

Visual Disassembler for the Atmel © AVR is an interactive disassembler for the AVR microprocessor family. The user simply opens an Intel hex file and the file is disassembled and placed in a text view. The user does not edit the text directly. Comments and program/ IO labels are added by address through dialog boxes. Each entry shows an immediate result in the text view. Program / IO labels are resolved throughout the entire file. Intermediate work can be saved and resumed later. Upon completion of the disassembly the file can be saved as an assembly listing text file. The assembly listing can be easily converted to an assembler source file to reconstruct the original hex file. The assembler source file may require editing due to the requirements of the assembler.

New features

- Added AVR part selection
  - resolves memory space, registers, and ISR vectors
- Added memory space control
  - Allows definition of data and code areas in the memory space

The program is a plug-in for the Eclipse IDE and can be sold as an individual component or bundled with the Eclipse CDT IDE.

This can be bundled with the Visual Disassembler:

ECLIPSE CDT 3.4

<http://www.eclipse.org>

de.innot.avreclipse-2.2.0.20080618PRD.zip

<https://sourceforge.net/projects/avr-eclipse>

WinAVR-20080610-install.exe

<http://winavr.sourceforge.net/index.html>

Visual Disassembler Jar

com.favorites4u.visualdisassembler.avr\_1.0.2.jar

Questions?

Contact us: [webmaster@CreativeRealtimeHeuristics.org](mailto:webmaster@CreativeRealtimeHeuristics.org)

***Visual Disassembler***  
***For the Atmel © AVR***

## **Requirements**

### ***Visual Disassembler***

The Visual Disassembler requires Eclipse version 3.4.x. and will run on both Windows and Linux platforms.

It must be installed in the eclipse/plugins directory.

### ***Eclipse***

Eclipse 3.4.x requires the Java Runtime Environment (JRE)6.

It can be obtained from <http://java.sun.com>.

## **Installation**

Unzip the file in the CD into a new folder.

Find the eclipse folder and locate the file eclipse.exe.

Create a shortcut to your desktop.

Note:

You can create a clean directory by unzipping the eclipse CDT file into a new folder.

Next copy the visual disassembler jar file into the eclipse\plugins directory.

Type eclipse -clean and verify that the visual disassembler plugin is installed by looking in the Help\About Eclipse\Plug-in Details dialog box.

## **Quick Start**

1. Open hex file
2. Select Device
3. Modify Control Table
4. Add comments
5. Add labels
6. Save as vdavr file
7. Repeat steps 3 through 6 until satisfied with disassembly
8. Save listing to text file

# Visual Disassembler For the Atmel © AVR

## Typical View

A typical view of the Visual Disassembler is shown below in figure 1.

File Types Opened by the Application:

The default file extension is - .vdavr

An alternative extension is an Intel hex file - .hex

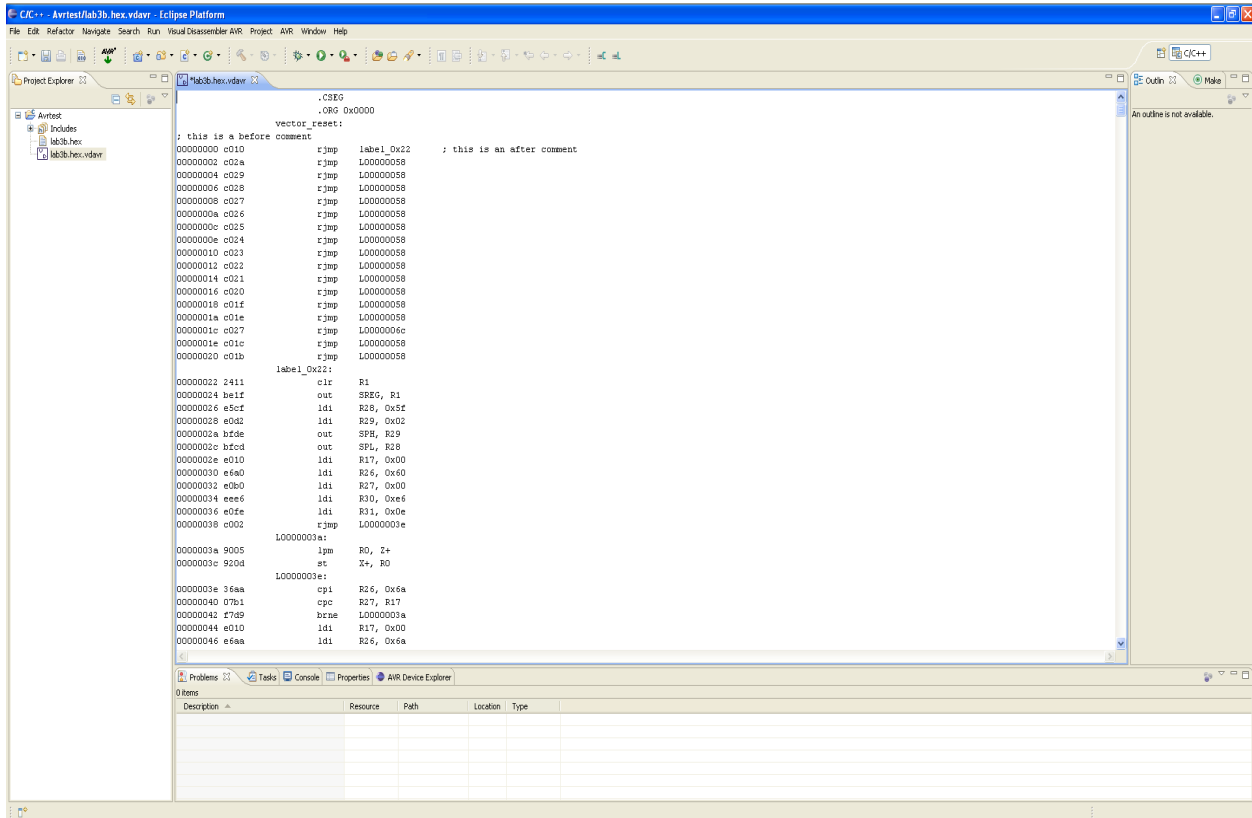


Figure 1

# Visual Disassembler For the Atmel © AVR

## Open a File Intel Hex File

Figure 2 shows Open / Other... dialog box.

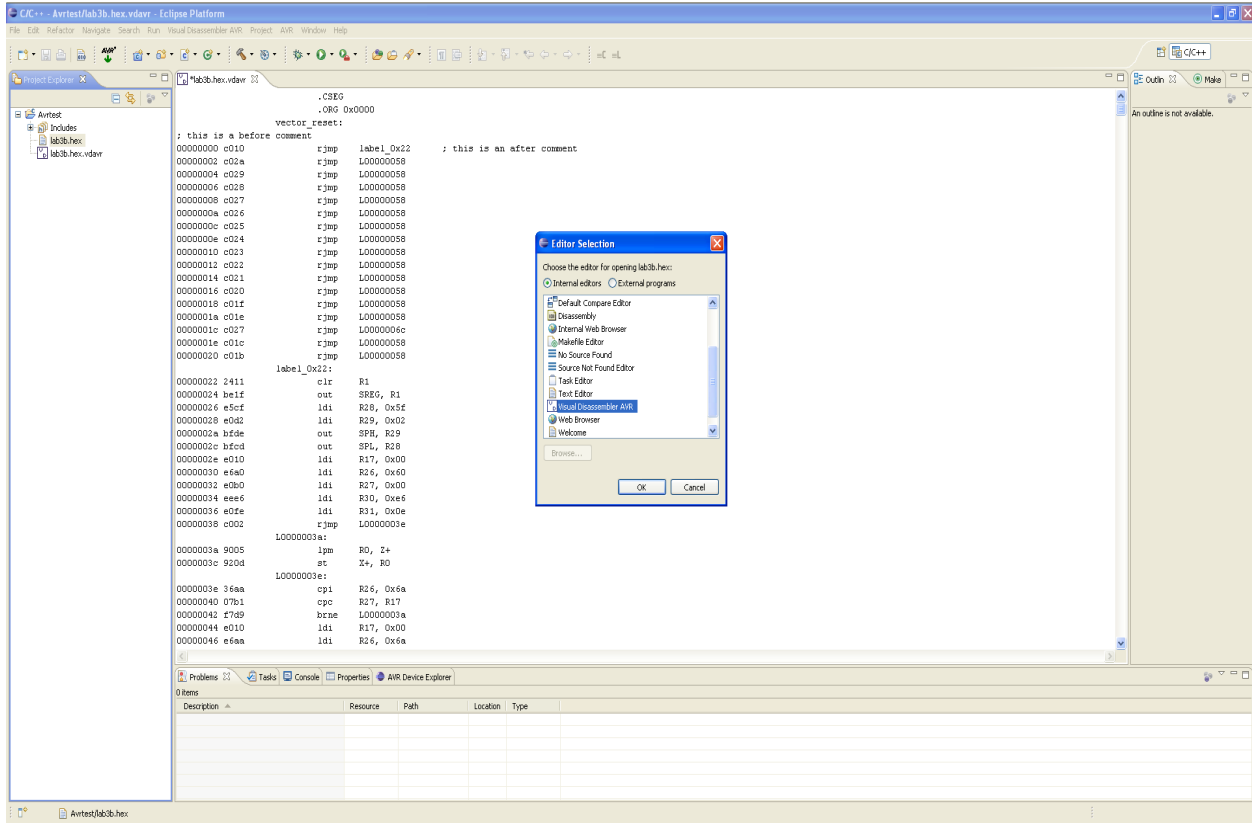


Figure 2

# Visual Disassembler For the Atmel © AVR

## VDAVR File – Default file format

The Open With dialog box is shown in figure 3.

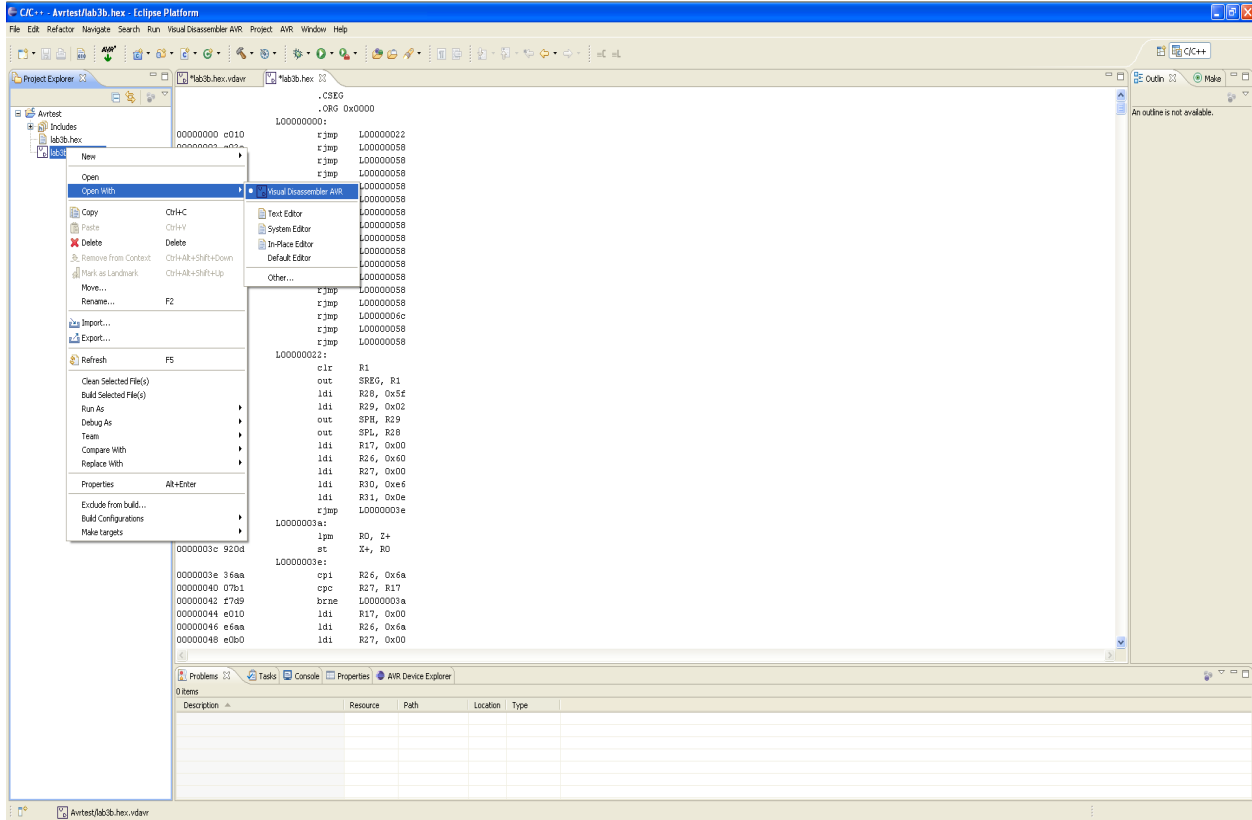


Figure 3

# Visual Disassembler For the Atmel © AVR

## Menu View

Figure 4 shows the Visual Disassembler AVR menu items.

- Select Device... Allows the user to select an AVR device file  
(*resolves registers, vectors and memory space*)
- Edit Comment... Allows the user to add comments at any location in the source file
- Edit I/O / Program Label... Allows the user to add labels any program location  
(*These labels are resolved on branch and call instructions.*)
- Allows the user to add I/O port labels  
(*These labels are resolved in the in / out instructions.*)
- Edit Control Table... Allows the user to define the memory space boundaries

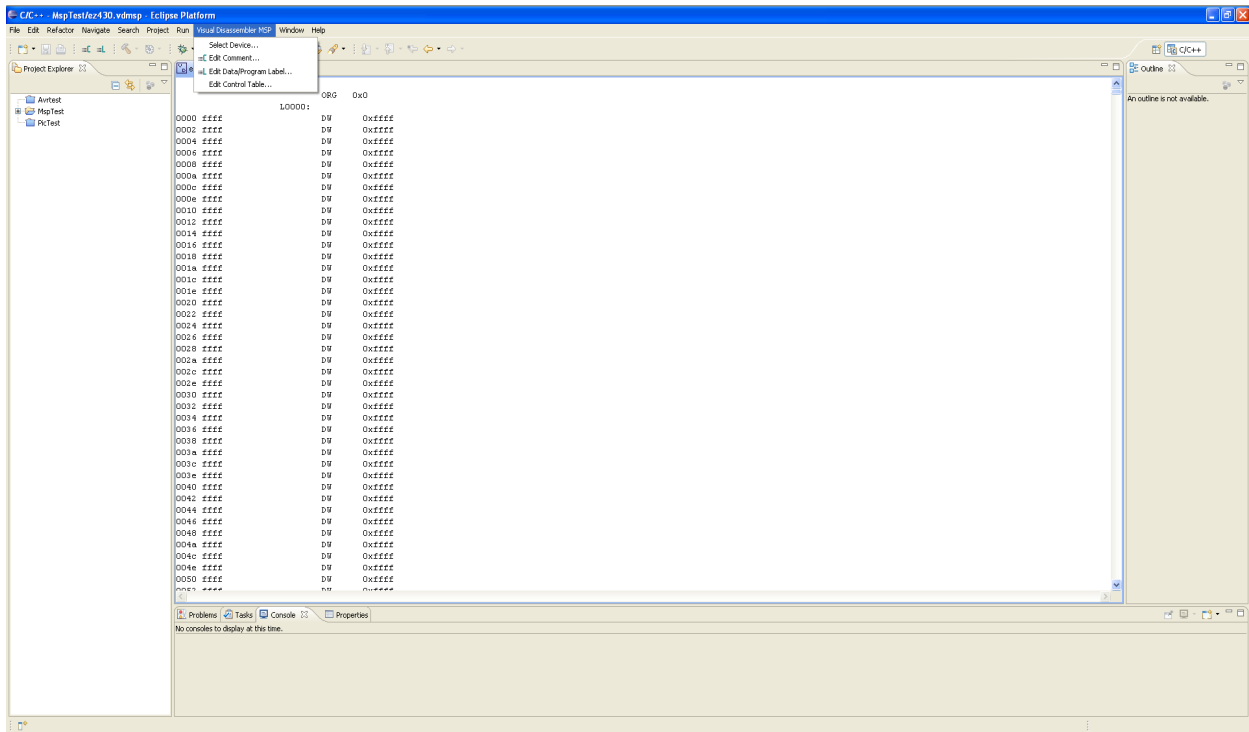
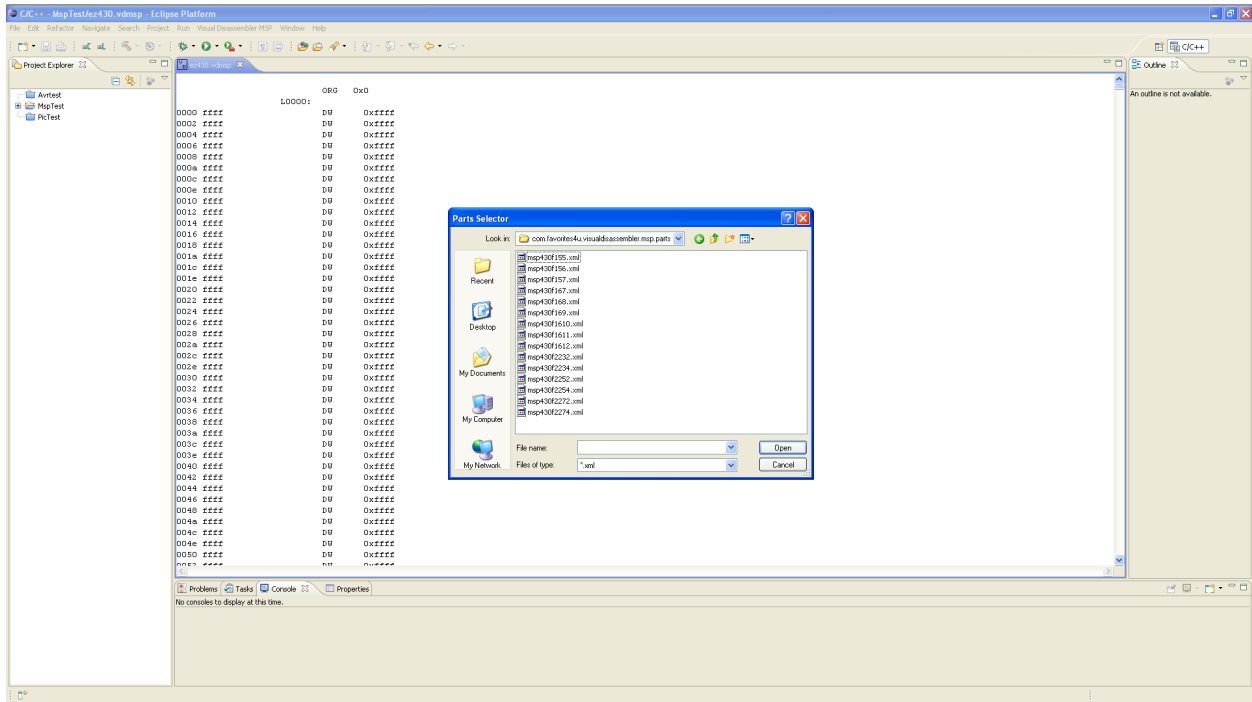


Figure 4

# Visual Disassembler For the Atmel © AVR

## Menu Item – Select Device...

This menu item allows the user to select a specific device to use for the disassembly. It provides memory space, register, and ISR vector information to the disassembler.



# Visual Disassembler For the Atmel © AVR

## ToolBar Button View – Edit Comment Tooltip

The Visual Disassembler AVR Edit Comment Button shown in figure 5 duplicates the menu item in the Visual Disassembler AVR / Edit Comment... menu.

Edit Comment - Allows the user to add comments at any location in the source file

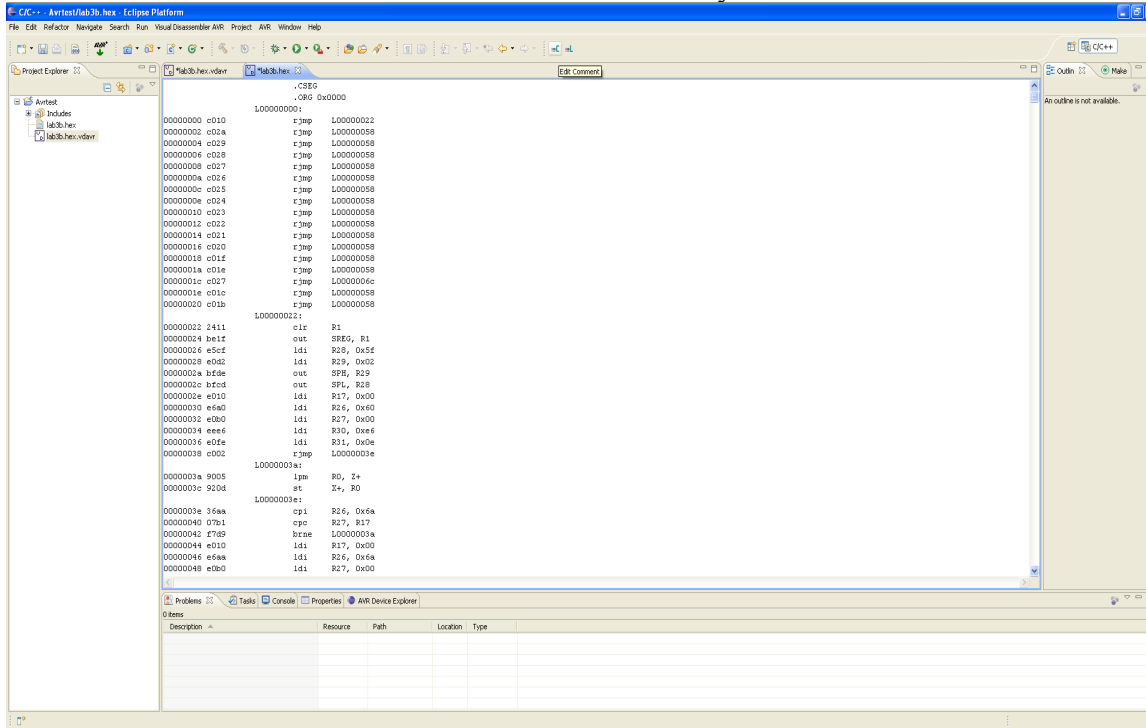


Figure 5

## Menu Item – Edit Comment

Figures 6 and 7 show the Visual Disassembler AVR Edit Comment dialog box. This dialog box allows entering a comment before or after any line in the source file

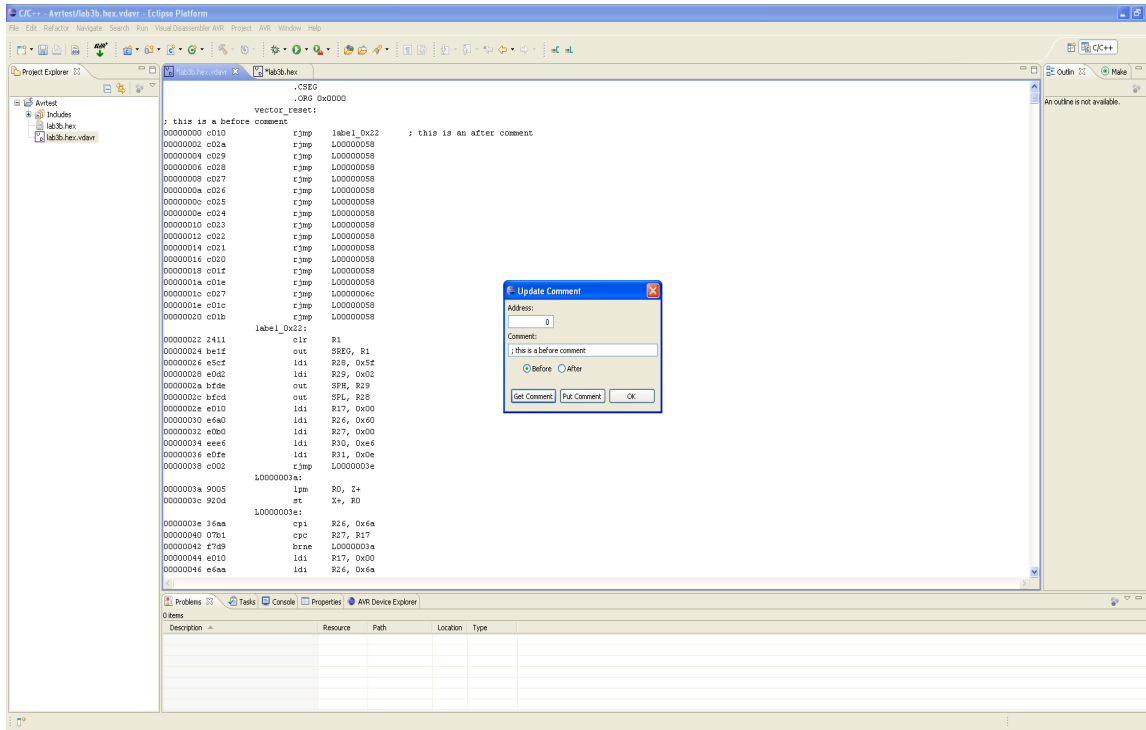


Figure 6

# Visual Disassembler For the Atmel © AVR

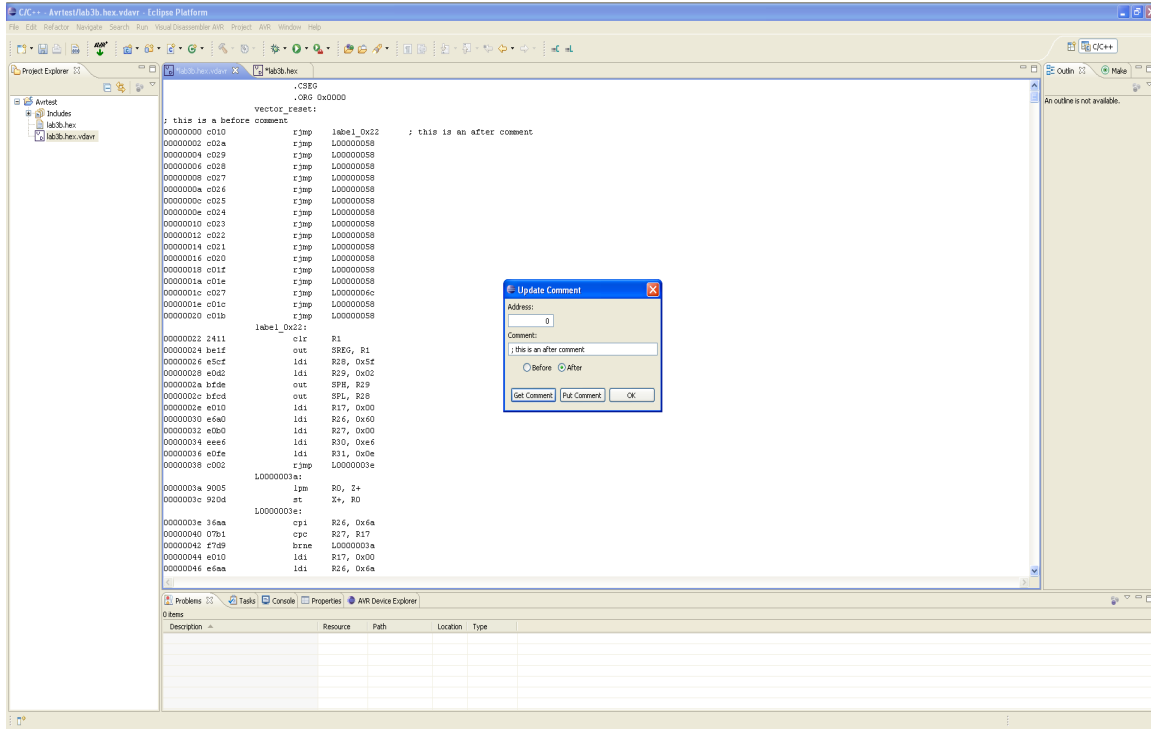


Figure 7

## ToolBar Button View – Edit I/O / Program Label Tooltip

Figure 8 shows the Visual Disassembler AVR button item – Edit I/O / Program Label  
This button duplicates the menu item Visual Disassembler AVR / Edit I/O / Program Label...  
menu item

- Edit I/O / Program Label - Allows the user to add labels any program location  
(These labels are resolved on branch and call instructions.)
- Allows the user to add I/O port labels  
(These labels are resolved in the in / out instructions.)

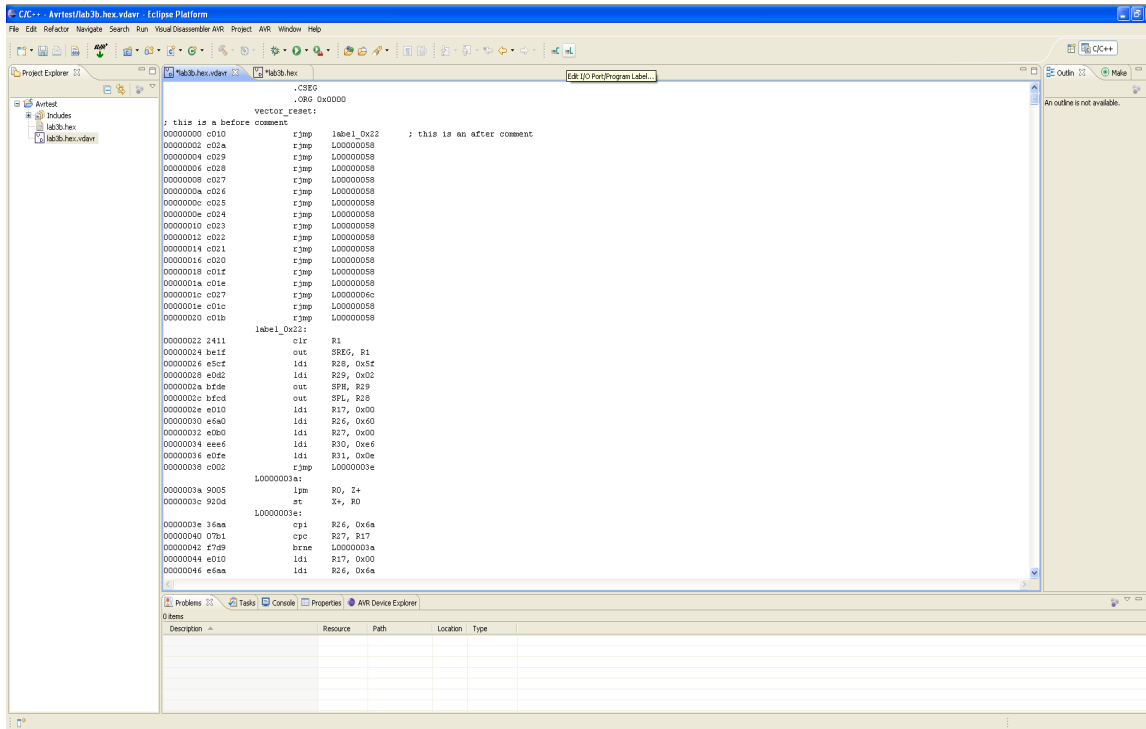


Figure 8

# Visual Disassembler For the Atmel © AVR

## Dialog Box – Edit Program Label

Figures 9 and 10 display the Visual Disassembler AVR Edit I/O / Program Label dialog box.

Edit I/O / Program Label - Allows addition of an I/O Port or Program label at any line in the source file

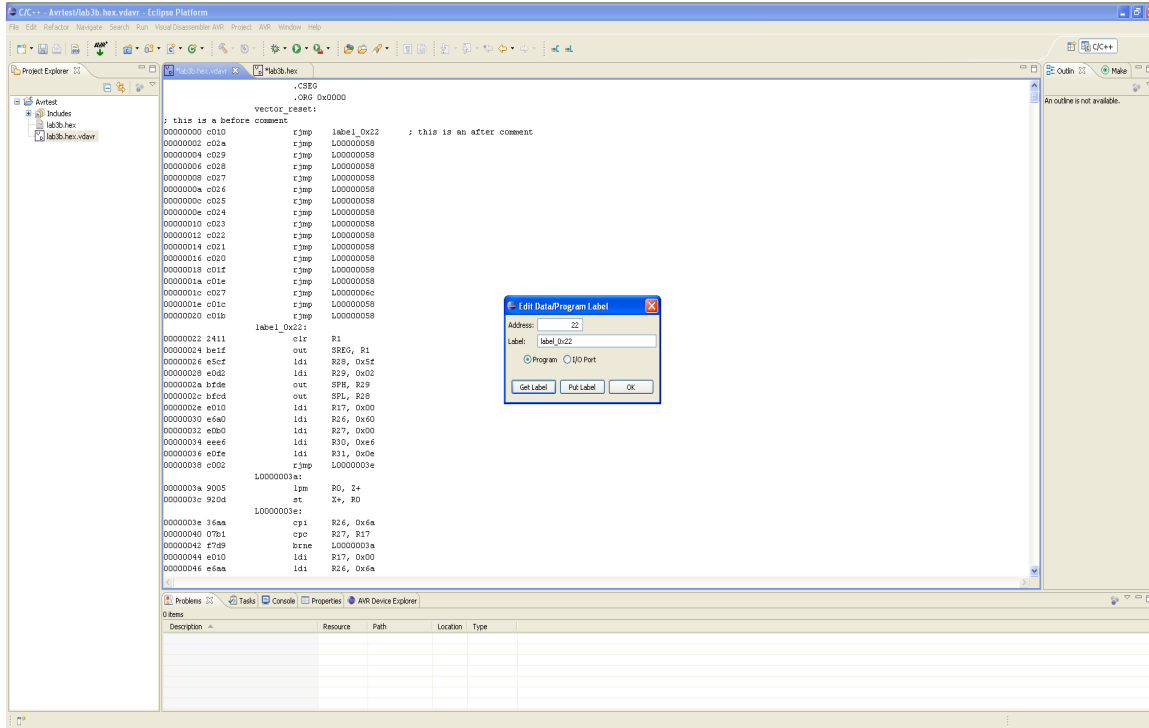


Figure 9

# Visual Disassembler For the Atmel © AVR

## Dialog Box – Edit I/O Label

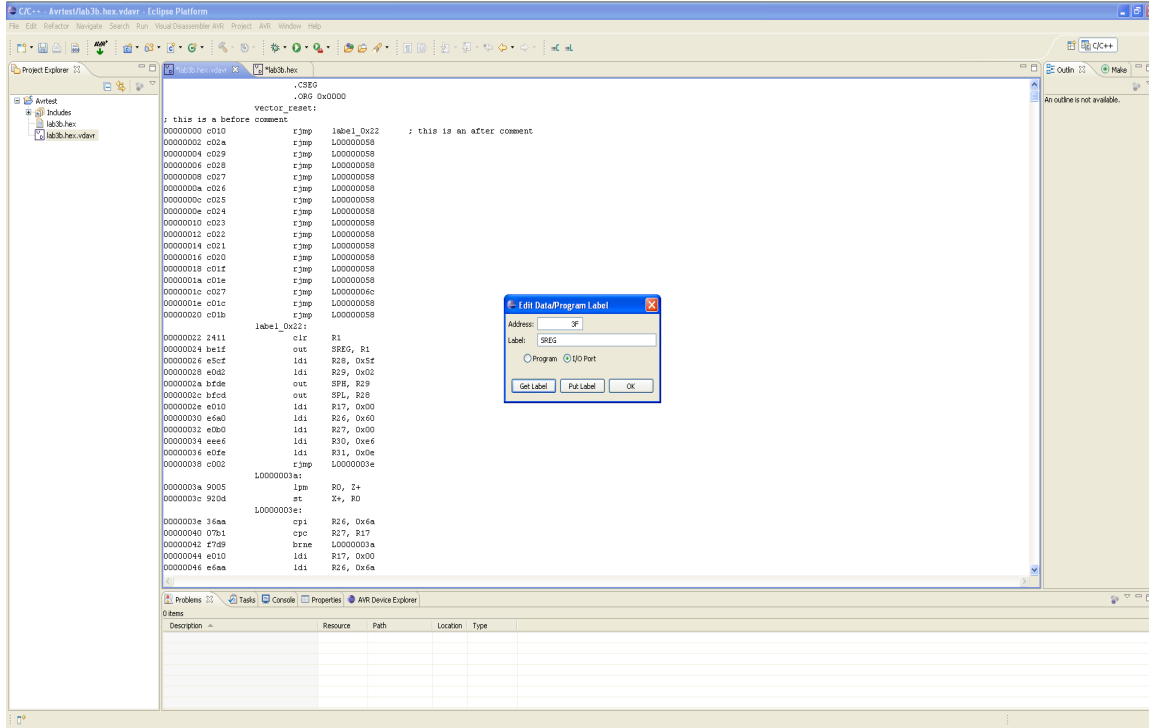
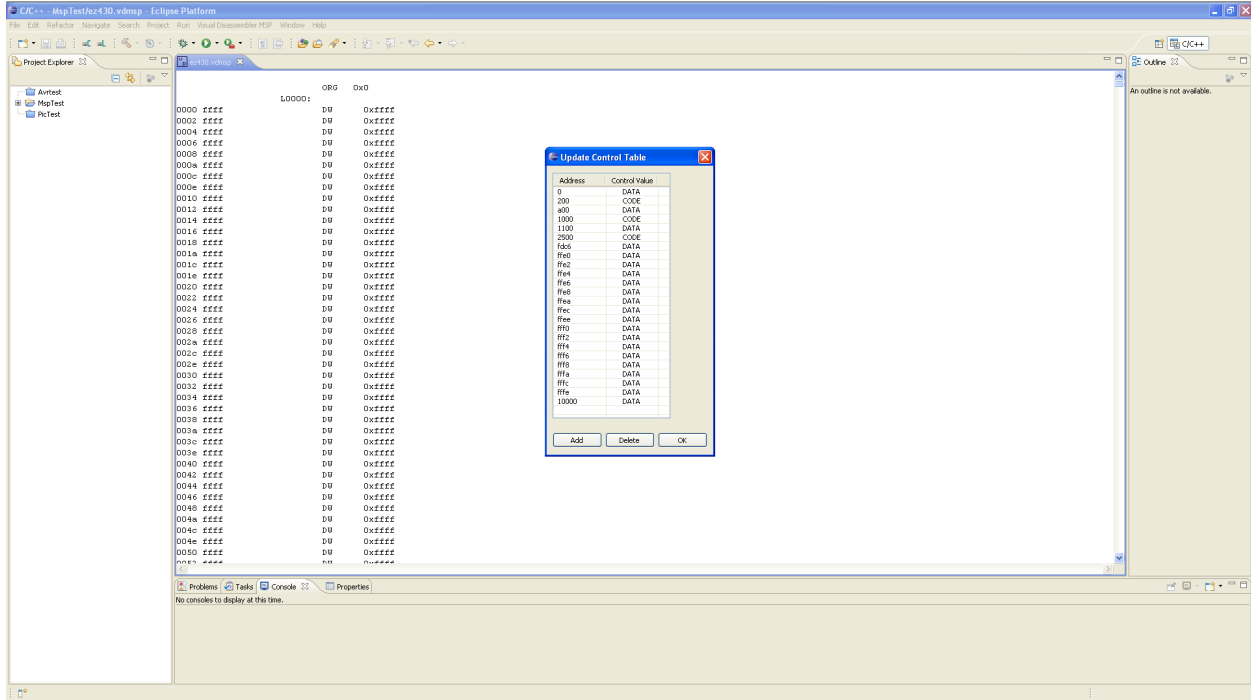


Figure 10

# Visual Disassembler For the Atmel © AVR

## Menu Item – Edit Control Table...

This menu item allows the user to modify the memory space parameters. The user can select between DATA and CODE space. A memory region specified as DATA space forces the disassembler to disassemble all opcodes as defined word (DW). The disassembler will disassemble all MSP opcodes in regions defined as CODE.



## **Saving the Assembly Listing**

Select all of the text in the Visual Disassembler text window (ctrl-A)

Copy all of the text in the Visual Disassembler text window (ctrl-C)

Open a text editor window

Paste the text from the Visual Disassembler text window into the text editor window.

Perform a Save-As and save the contents.

Editing the Assembly Listing may be required for the desired assembler.

Note: The address and opcode fields must be removed before it can be assembled.