



## APPLICATION NOTE

### Atmel AVR544: Migrating megaAVR USB projects to Atmel AVR Studio 5/6

8-bit Atmel Microcontroller

#### Features

- megaAVR® USB packages
  - Atmel® AT90USB1287/1286/647/646
  - Atmel AT90USB82/162
  - Atmel ATmega16/32U4

#### Introduction

This document describes how to migrate the megaAVR USB packages from AVR Studio® 4 to AVR® Studio 5.1 or Atmel Studio 6.



## 1. Glossary

AS4	Atmel AVR Studio 4 (Integrated Development Environment (IDE) for Atmel AVR applications)
AS5	Atmel AVR Studio 5
AS6	Atmel Studio 6
CDC	Communication Device Class
HID	Human Interface Device
OTG	USB On-The-Go
USB	Universal Serial Bus

## 2. Overview

All the software package available on Atmel website for megaAVR with USB interface come with AVR Studio 4 project with an old version of the AVR Toolchain and use external makefile.

The aim of this document is to be able to easily port these existing projects to AVR Studio 5.1 or Studio 6 projects. This needs some explanations to do it properly.

## 3. Software packages

Here is the list of the software packages concerned by this procedure:

- **AVR270: USB Mouse Demonstration on megaAVR with USB**  
[http://www.atmel.com/Images/AVR270\\_USB\\_mouse.zip](http://www.atmel.com/Images/AVR270_USB_mouse.zip)
- **AVR271: USB Keyboard Demonstration on megaAVR with USB**  
[http://www.atmel.com/Images/AVR271\\_USB\\_Keybord.zip](http://www.atmel.com/Images/AVR271_USB_Keybord.zip)
- **AVR272: USB CDC Demonstration: UART to USB Bridge, on megaAVR with USB**  
[http://www.atmel.com/Images/AVR272\\_USB\\_CDC\\_Virtual\\_Com\\_Port.zip](http://www.atmel.com/Images/AVR272_USB_CDC_Virtual_Com_Port.zip)
- **AVR273: USB Mass Storage Implementation on megaAVR with USB**  
[http://www.atmel.com/Images/AVR273\\_USB\\_Mass\\_Storage.zip](http://www.atmel.com/Images/AVR273_USB_Mass_Storage.zip)
- **AVR276: USB Software Library for megaAVR with USB Microcontrollers**  
[http://www.atmel.com/Images/AVR276\\_USB\\_Device-Host\\_Library.zip](http://www.atmel.com/Images/AVR276_USB_Device-Host_Library.zip)
- **AVR277: On-The-Go (OTG) add-on to USB Software Library for megaAVR with USB**  
<http://www.atmel.com/Images/avr277.zip>
- **AVR280: USB Host CDC Demonstration on megaAVR with USB**  
[http://www.atmel.com/Images/AVR280\\_USB\\_Host\\_CDC.zip](http://www.atmel.com/Images/AVR280_USB_Host_CDC.zip)
- **AVR287: USB Host HID and Mass Storage Demonstration**  
<http://www.atmel.com/Images/AVR287.zip>
- **AVR293: USB Composite Device on megaAVR with USB**  
[http://www.atmel.com/Images/AVR293\\_USB\\_Composite\\_Device.zip](http://www.atmel.com/Images/AVR293_USB_Composite_Device.zip)
- **AVR328: USB Generic HID Implementation on megaAVR devices**  
<http://www.atmel.com/Images/AVR328.zip>
- **AVR916: Upgrading the Flash memory using a U-Disk**  
<http://www.atmel.com/Images/AVR916.zip>

## 4. Hardware kits

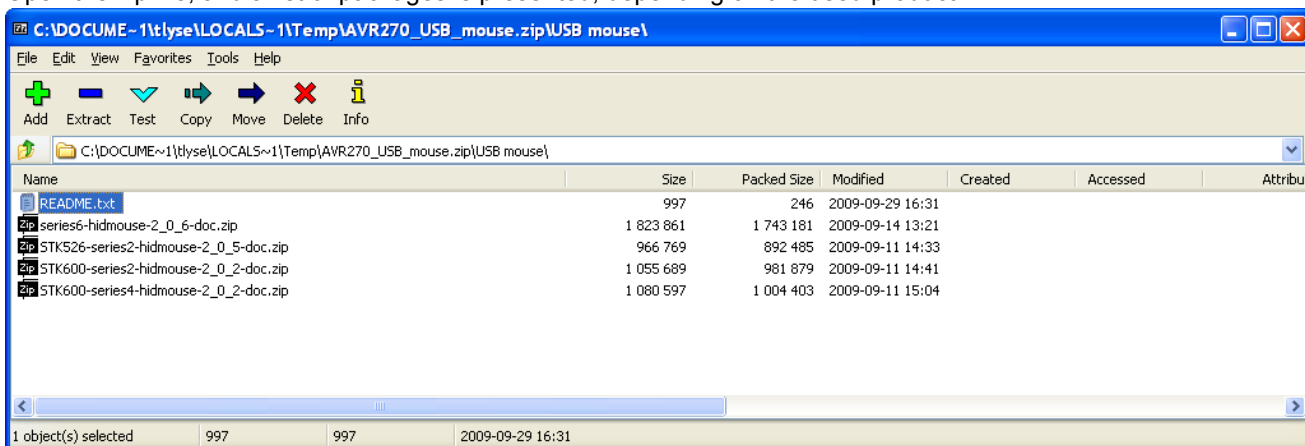
All the above software packages are working on Atmel starter kits or reference designs:

- **STK<sup>®</sup> 525 for AT90USB1287/1286/647/646 devices**  
<http://www.atmel.com/Images/doc7608.pdf>
- **STK526 for AT90USB162/82, ATmega32U2 devices**  
<http://www.atmel.com/Images/doc7709.pdf>
- **AT90USBKEY for AT90USB1287/1286/647/646 devices**  
<http://www.atmel.com/Images/doc7627.pdf>
- **ATSTK600 with appropriate routing and socket cards for AT90USB82/162, ATmega16/32U4 devices**  
<http://www.atmel.com/tools/STK600.aspx>

## 5. Procedure to move to AS5 projects

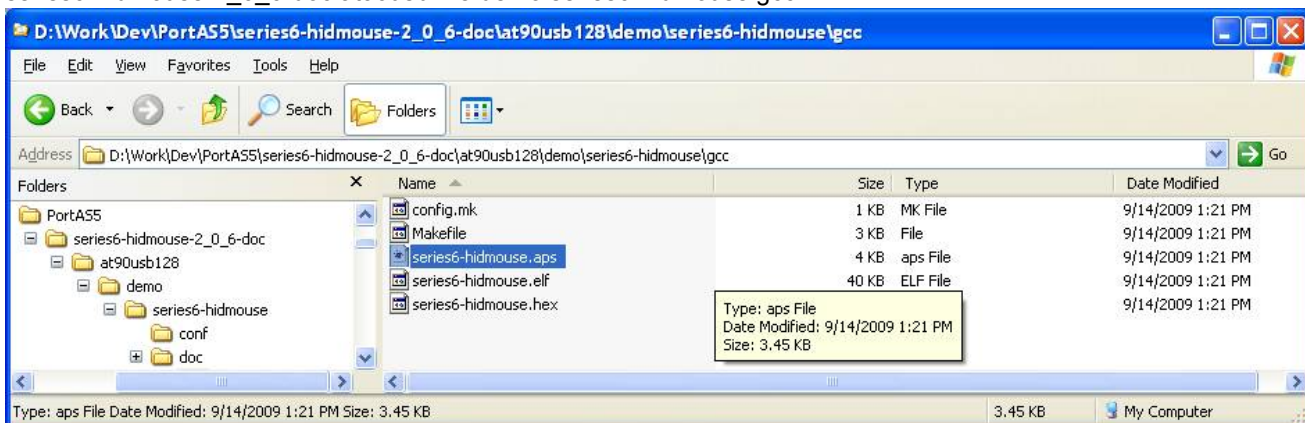
The example explained hereunder is based on the AVR270: USB Mouse Demonstration on megaAVR with USB:

- Open the zip file, and a list of packages is presented, depending on the used product:

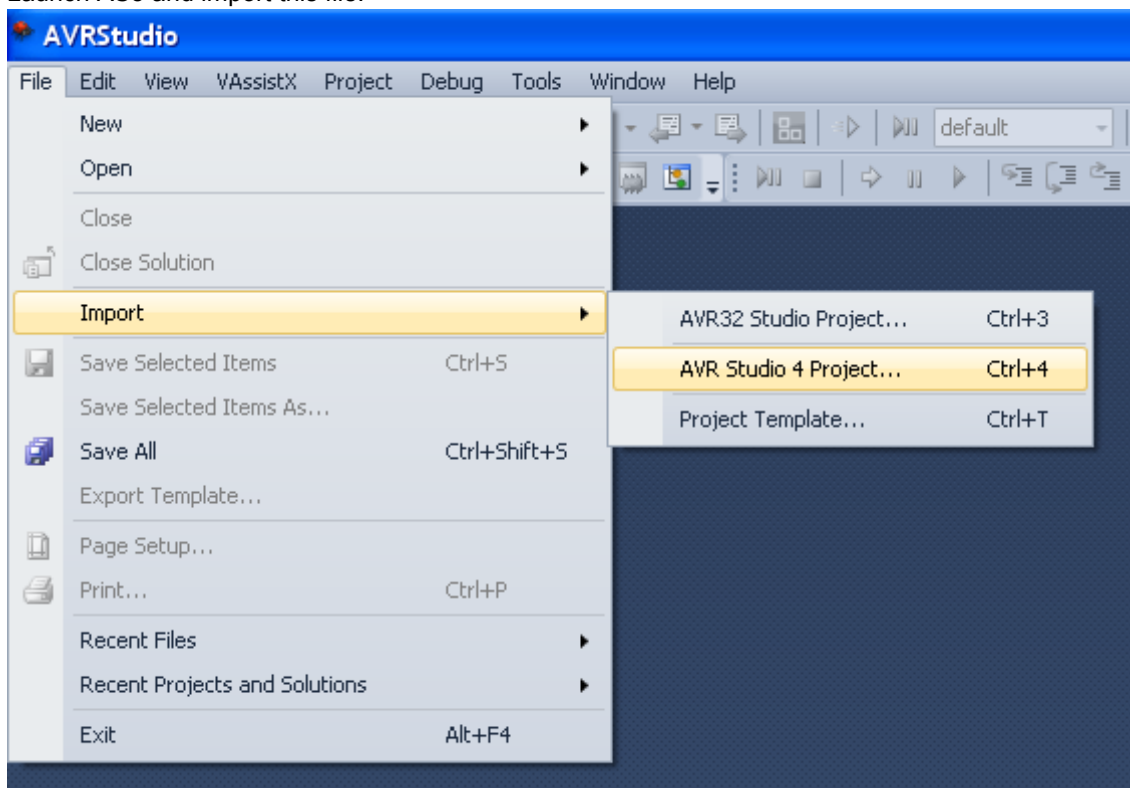


The one to be used for the example is the “series6-hidmouse-2\_0\_6-doc.zip”.

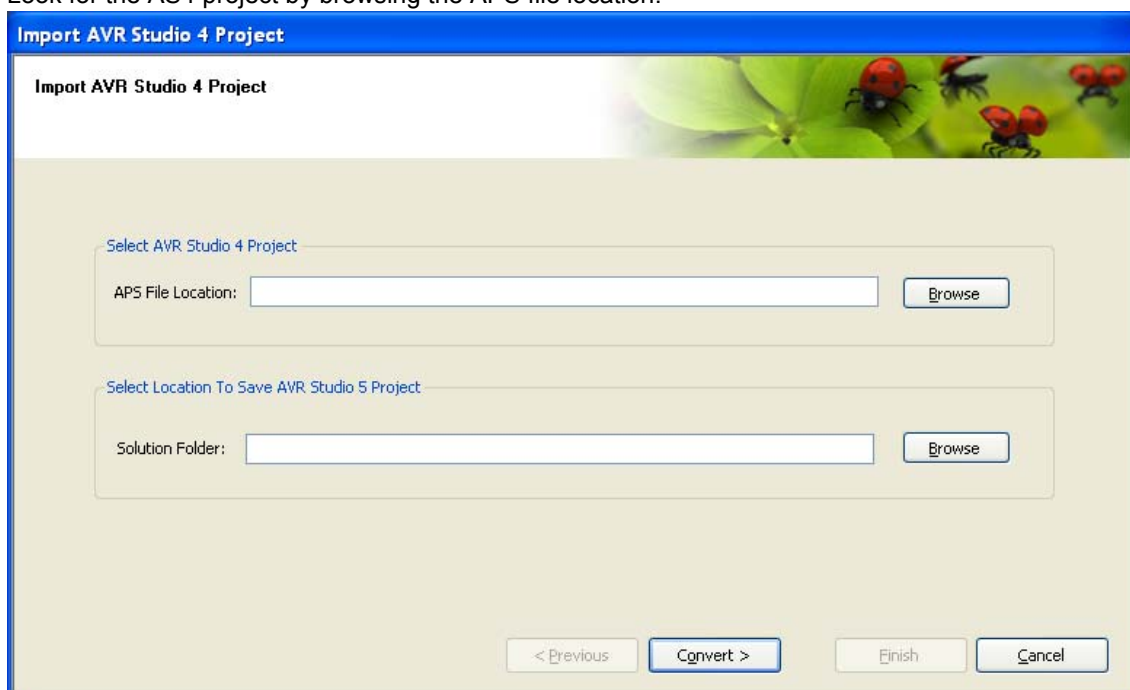
- Once unzipped, the AS4 project is available in the following folder:  
series6-hidmouse-2\_0\_6-doc\at90usb128\demo\series6-hidmouse\gcc



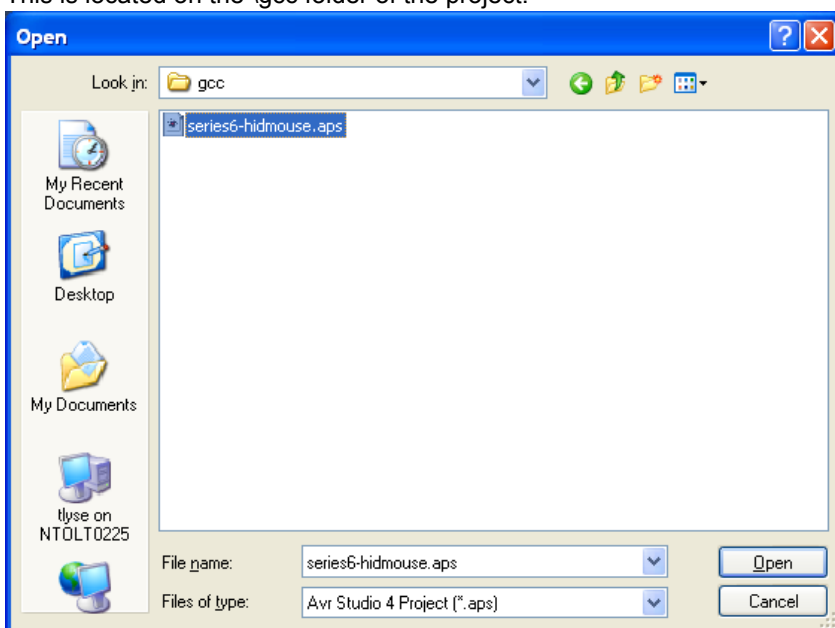
- Launch AS5 and import this file:



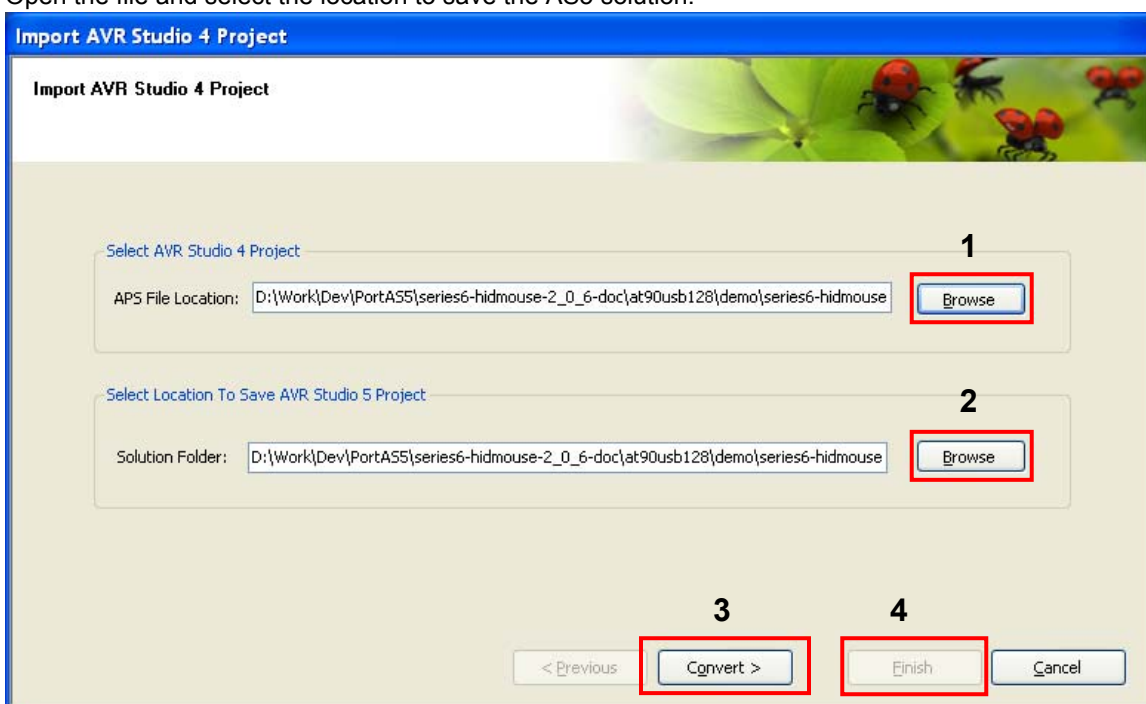
- Look for the AS4 project by browsing the APS file location:



- This is located on the \gcc folder of the project:

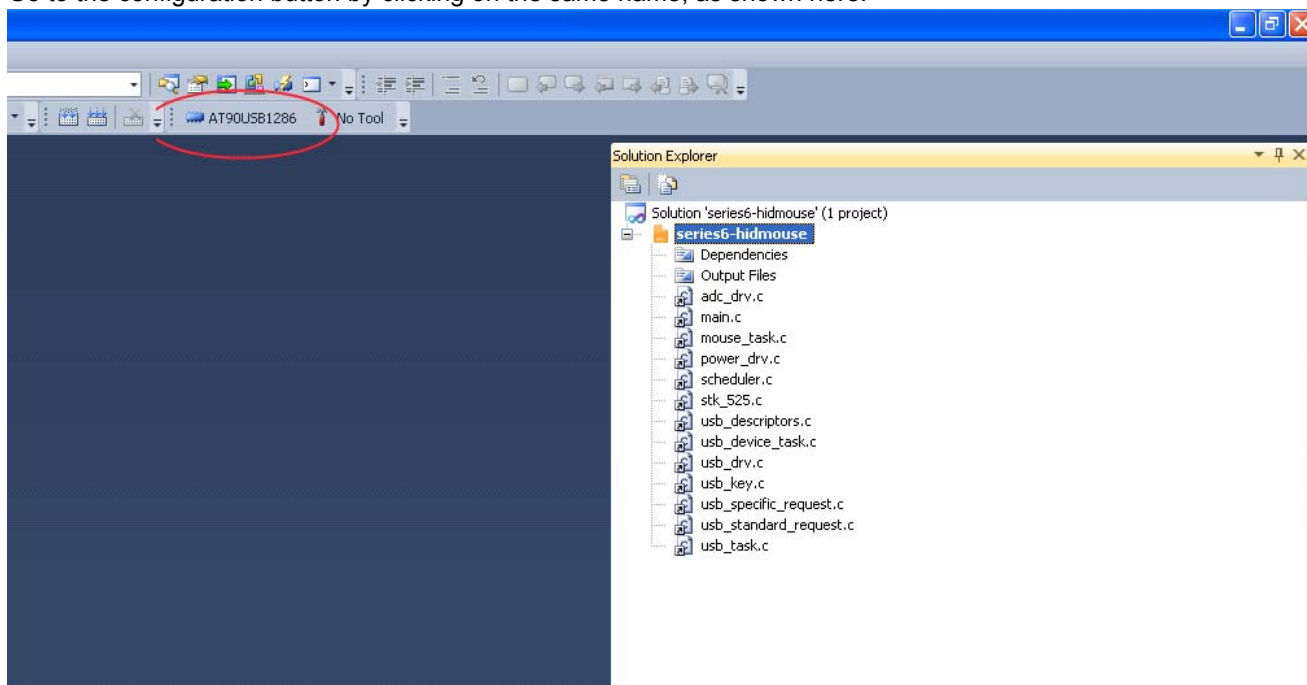


- Open the file and select the location to save the AS5 solution:

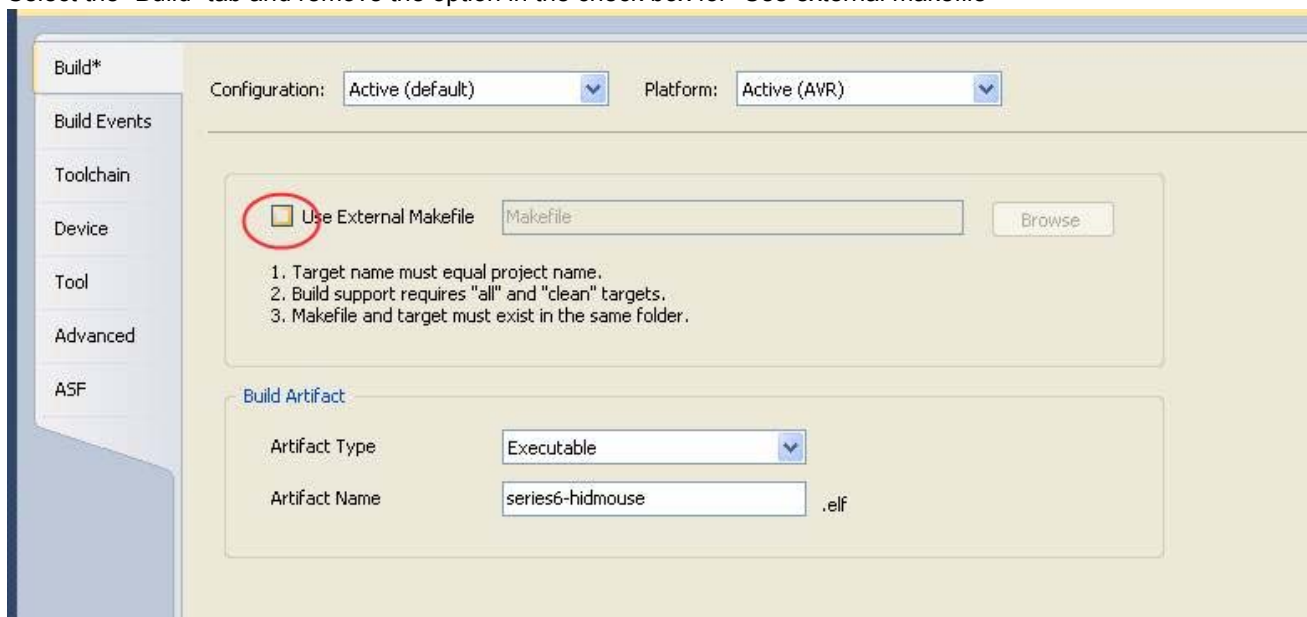


- Then select “convert” and finish

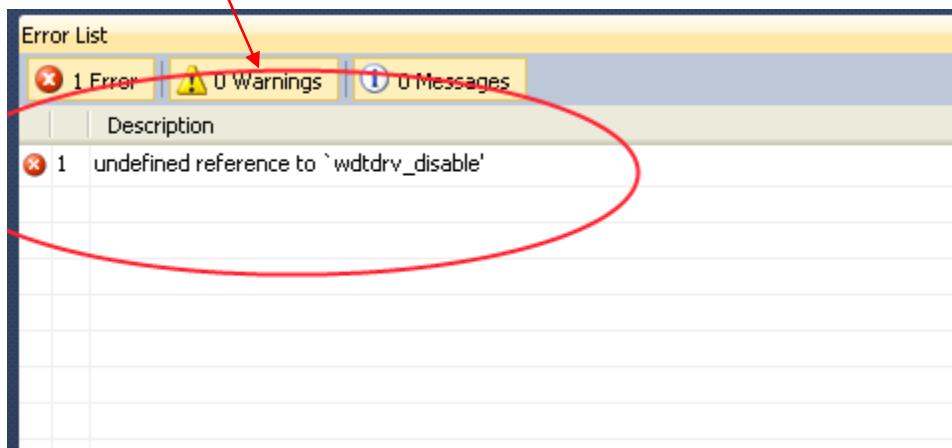
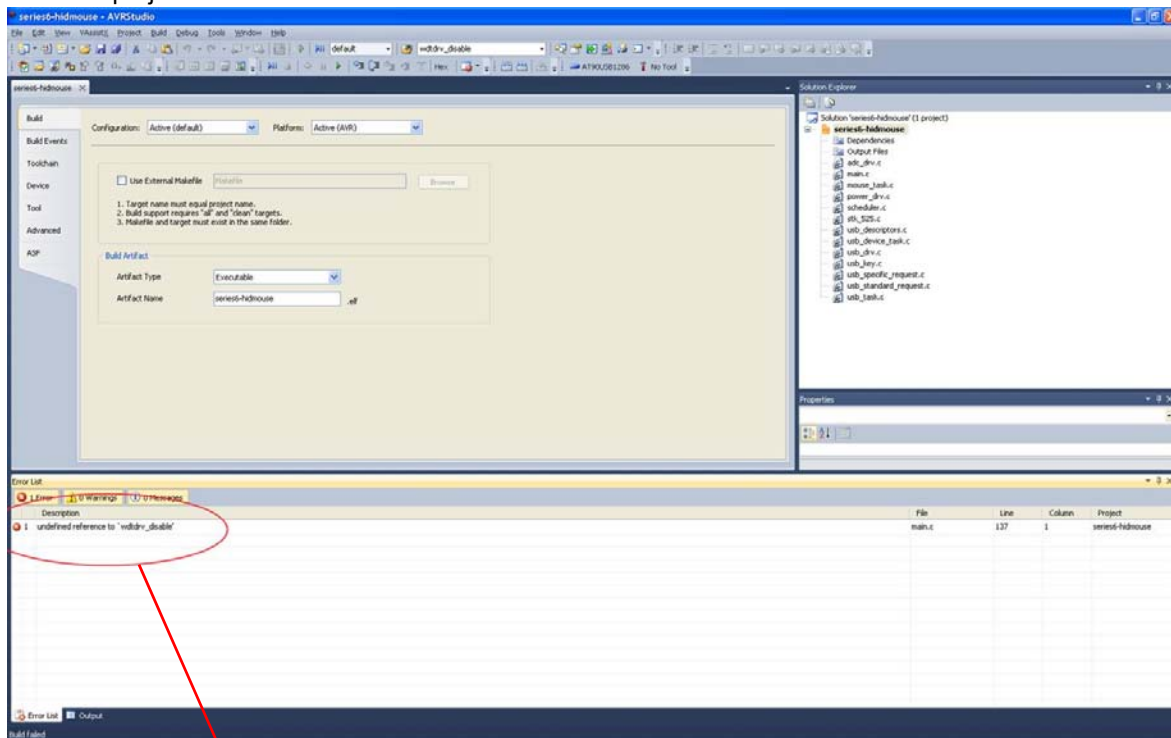
- Go to the configuration button by clicking on the same name, as shown here:



- Select the "Build" tab and remove the option in the check box for "Use external makefile"



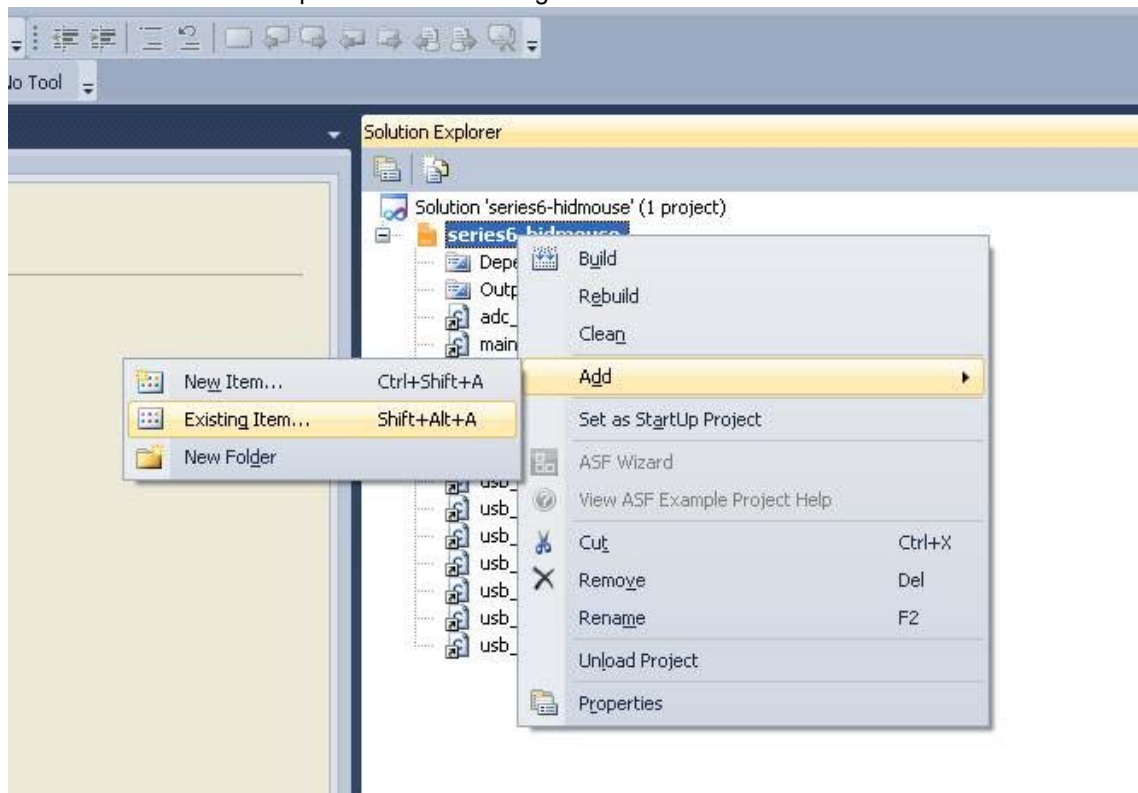
- Build the project: You will find one error:



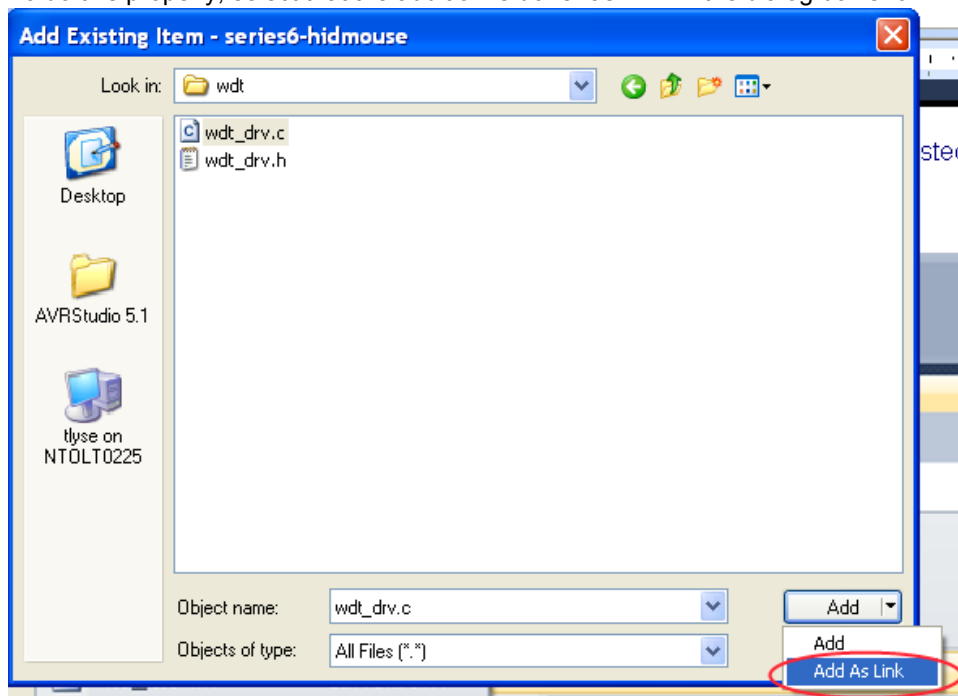
This was due to a file which was not included in the AS4 project but still linked as it was listed in the makefile. Because external makefile is not used anymore, user falls into this issue. (file wdt\_drv.h/.c)

Just add the file in the project but only as a link, as the file already exists and there is no need to have a local copy in the project folder:

- Choose in the Solution Explorer: Add -> Existing Item....



- To do this properly, select that the addition is done “as link” in the dialog box shown here:



- Rebuild the project, then this works!



Depending on the megaAVR USB package, some other files are also missing in the Atmel AVR Studio 4 project, even though they are listed in the makefile.

These can be:

- flash\_drv.S file missing in AVR272 – CDC – Series 4 example and AVR298 – Audio example projects
- start\_boot.c missing in applications that include DFU
- timer16\_drv.c missing in some host applications

## 6. Summary

Existing megaAVR USB packages based on AS4 projects can be imported to Studio5/6 through the import process available in Studio.

Special care has to be done that external makefiles are no longer used.

Then, some files which were listed in the external makefile, present in the project folders, were not part of the AS4 project and then must be added manually but as link since files are physically present on the project folders.

## 7. Revision History

Doc. Rev.	Date	Comments
42001A	04/2012	Initial document release



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