Using MULTI[®]2000 V3.6 with the AT91 Library V2.1x

Introduction

The AT91 Library V2.1x is configured for use with Green Hills software MULTI[®]2000 V3.01. When any other version of MULTI[®]2000 is used, the project must be updated to ensure ARM UK assembly syntax compatibility.

This document describes the optimal settings when using MULTI[®]2000 V3.6 IDE to debug an application written using the AT91Library V2.1x on an AT91 ARM-based product evaluation board.

Setting the Target Project

- 1. Load the project. Make sure that all project files are displayed by double-clicking on project_name.bld.
- 2. If necessary, convert the target connection when opening the project:

onvent old style targ	jet connect	ion?
This project contains a	n old-style tar	get connection setting:
"armserv -banner"		
MULTI now uses the C connections in projects old-style connection se your project? You may	Connection Fil s. Would you atting to a Con also choose	es (*.con) to store targe like to convert this inection File added to to discard the setting.

AT91 ARM[®] Thumb[®] Microcontrollers

Application Note

Rev. 2686A-ATARM-03/03





- 3. For this project and all un-built libraries included in this project, select the associated .bld file. Check the project ARM option:
 - Select "CPU Option" in the menu "Project".
 - Enable the "Accept ARM UK assembly syntax" option by checking the box.

Processor:	ARM 7tm	T
Floating point processor:	None	1
F Thumb code		
F Thumb libraries		
F Accept ARM UK asse	mbly syntax	
F No automatic interrupt	table	
🖻 Position independent	code	
F Position independent	code data	
 Position independent Position independent Big endian byte order 	code data	
 Position independent Position independent Big endian byte order Long long support 	code data	
 Position independent Position independent Big endian byte order Eig long support Large switch statemer 	code data 18	
 Position independent Position independent Big endian byte order Long long support Large switch statemer Always generate far c 	code data nts alls	

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Application Note

Setting Project Files

For this project and all un-built libraries included in this project, check the .c and .arm file build options using the File Option window:

- 1. Select the project (project_name.bld).
- 2. Select "File option" in the "Project" menu or by clicking the right mouse button.
- 3. Choose "Configuration".
- 4. For .c and .arm files, check that:
- the C Compiler Command name is "ecomarm" and
- the C Compiler (Compatibility Mode) Command name is "ccomarm".

To change, click "Edit", make the change and click "Apply". To view settings, click "View".

uilder:	C:\GHS\ARM36\build
elect:	
ireen Hills C++ include dirs:	C:\GHS\ARM36\scxx
reen Hills C include dirs:	C:\GHS\ARM36\include\arm.C:\GHS\ARM36\ansi
ystem include dirs:	
ireen Hills library dirs:	C:\GHS\ARM36\thumb
ystem library dirs:	
ools directory:	C:\GHS\ARM36
lternate tools dir:	
ommands	
C Compiler	
Fortran Compiler	-
C Compiler (Comp	patibility Mode)
Matime C Commile	ar P
è i i i	C:\GHS\ARM36
Lommand directory:	
Command directory: Command name:	ecomarm

5. Rebuild the project.





Setting the Application Project Toolchain Assembler

Update options depending on the download/execution method used:

- Angel ROM Monitor method
 - AT91_DEBUG_ANGEL
 - SEMIHOSTING preprocessor option can be set
- ICE or SRAM method
 - AT91_DEBUG_ICE
 - SEMIHOSTING preprocessor option can be set
- Flash method
 - AT91_DEBUG_NONE

To update the toolchain assembler:

- 1. Load the project. Make sure that all project files are displayed by double-clicking on the project_name.bld.
- 2. For each .arm file (including cstartup.arm), select the file and proceed to the next step (3). Do this for each .arm file prior to rebuilding the project in step (4).
- 3. In the menu "Project", select "Toolchain Options for xx_file.arm". Click on the tab "Assembler".
 - In the "General assembler option" field, add the command "-armuk,-pd=AT91_DEBUG_xxx SETA 1".
 - If the SEMIHOSTING preprocessor option is set, add the command "-pd=SEMIHOSTING SETA 1".

Be sure to separate the commands by a comma.

Linker Assembler	
Assembler options Disable warnings Error for undefined symbolic Preprocess assembly file	a) S
General assembler options:	-armuk,-pd=AT91_DEBUG_ICE SETA 1
Listing file options	
Listing file name: Listing file directory:	

4. Rebuild the project

5. If a link error occurs on another .arm file, repeat the procedure starting at Step 2.

Note: When a configuration change is made, the project must be saved.

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Troubleshooting

Error in Building the .c File

- Problem: Errors concerning "C" commands occur during compilation but the "C" commands are syntactically correct.
- Action: The project is configured to use the wrong compiler. Change the compiler selection as described in "Setting Project Files" on page 3.

Build #5 - led_swing.bld - Failed		_ 🗆 🗵
🔚 🚑 💌 🏲 🛠 🔳 🔍		
Output:		
Building led_swing.bld		-
Compiling C:\at91\software\projects\led_swing_eb55\	<pre>led_swing.c because "led_swing.o" doesn't exist</pre>	
[ASARM] (error) C:\at91\software\periph\stdc\std_c.	h 23: unknown instruction	
unsigned int u_int		
<pre>[ASARM] (error) C:\at91\software\periph\stdc\std_c. typedef unsigned short u_short ^</pre>	h 24: label multiply defined	
[ASARM] (error) C:\at91\software\periph\stdc\std_c. typedef unsigned char u_char ^	h 25: label multiply defined	
[ASARM] (error) C:\at91\software\periph\stdc\std_c. typedef volatile unsigned short flash_word ^	h 28: label multiply defined	
[ASARM] (error) C:\at91\software\periph\stdc\std_c. typedef volatile unsigned int at91_reg ^	h 31: label multiply defined	
[ASARM] (error) C:\at91\software\periph\ebi\ebi.h 2 typedef struct ^	7: label multiply defined	
[ASARM] (error) C:\at91\software\periph\ebi\ebi.h 2 (^	8: "("	
[ASARM] (error) C:\at91\software\periph\ebi\ebi.h 2 at91_reg EBI_CSR [8] ^	9: unknown instruction	
FACADMI (arror) C.lat01/coftware/marinh/ahi/ahi h 3	0. unknown instruction	•
Errors:		
Location	Message	
C:\at91\software\periph\stdc\std_c.h:23	: unknown instruction	
C:\at91\software\periph\stdc\std_c.h:24	: label multiply defined	
C:\at91\software\periph\stdc\std_C.h:25	: label multiply defined	
C:\at91\software\periph\stdc\std_c.h:31	: label multiply defined	-
		► <mark>AAA</mark>





Problem: Link error occurs, but all files are built correctly:

Compiling C:\At91\software\targets\eb55\cstartup.arm because "cstartup.o" doesn't exist

Linking ghs\sram_ice\<project name>.ghs

[ELXR] (error) unresolved symbols: 1

__main from <elxr>

Linking ghs\sram_ice\<project name>.ghs

[ELXR] (error) during processing

Error: build failed

Build terminated

Build failed

 Action: Check the toolchain assembler option as described in "Setting the Application Project Toolchain Assembler" on page 4.



- Error in Building the .arm File Problem: Errors occur during compilation of the .arm file.
 - Action: Check the .arm file project compiler setting as described in "Setting the Application Project Toolchain Assembler" on page 4.

If the file compiler setting is correct, check the project CPU option setting as described in "Setting the Target Project" on page 1.

Failure to Save the Project

- Problem: MULTI[®]2000 does not save the user modification in the project file.
- Action: Close the project. Check that the project (.bld files) attributes are not in Read-Only mode and try to save the project again.

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Application Note

Appendix

Project files can also be set using the MULTI[®]2000 editor (cf. "Setting Project Files" on page 3). This method provides a linear view of project details.

In the root project, the same procedure must be applied for all child projects.

- 1. Select the project (project_name.bld).
- 2. Press CTRL-E.
- 3. The MULTI[®]2000 editor screen displays the project build file.
- 4. Erase all references to "ccomarmuk".
- 5. For child projects only: Check that the .c and .arm files are built as follows, if their compilers are defined:

:ec_compiler.name=ecomarm

C:\at91\software\projects\led_swing_eb42_test36\led_swing_ice_ghs.bld		
File Edit View Block Tools Version Config Windows Help		
<mark>2∻ 🔒 ½ 🖻 🛍 🖇 🌮 ભ 🗢 🗃 🕅</mark>		
ille: C:\at91\software\projects\led_swing_eb42\led_swing_ice_ghs.bld	Line: 25	5/32
#!build		
default:		
program		
:elxr_map_option=nomap		
:elxr_map_option=nocrossreference		
:auto_mvc=false		
:debuglevel=multi		
:startfile_dir=-		
:outputname=ghs\sram_ice\led_swing_ice_ghs		
:object_dir=ghs\sram_ice		
:remote=ocdserv rlpt1 arm7t -nobss -s c:\at91\software\targ	ets\atmel_eb42.0	ocd
:startfiles=-		
:libdirs=c:\at91\software\parts\m42800\optm_none		
:defines=AT91_DEBUG_ICE		
:defines=SEMIHOSTING		
:ec_compiler.name=ecomarm		
:oldc_compiler.name=ccomarm		
C:\At91\software\targets\ghs_lnk_sram_ice.lnk		
linker_file		
C:\AT91\software\parts\m42800\ghs\optm_none\m42800_lib16.a		
library		
C:\AT91\software\drivers\lib_drv\ghs\optm_none\lib_drv_16.a		
library		
C:\AT91\software\targets\eb42\cstartup.arm		
assembly		
:start_address=InitReset		
wait_irq.arm		
assembly		
led_swing.c		
lea_swing_ice_gns.con		
a sub s sub i su s		
connections		

- 6. Save and close the MULTI[®]2000 editor
- 7. Update the toolchain assembler as described in "Setting the Application Project Toolchain Assembler" on page 4 and rebuild the project.
- Note: By using MULTI[®]2000 editor, the user can erase all references to "ec_compiler.name" and "oldc_compiler.name" in the root project and, later, in the child project.
- Note: After editing and saving the build file using the text editor, MULTI[®]2000 detects that the file has changed and asks the user if the project should be reloaded. The user should respond with yes to ensure that future changes do not revert to "ccomarmuk" options.





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