

Revision History

Date	Revision History	Reviser
2010-04-11	Rev. V1.0	Neil Zhao

Abbreviation

Table of Contents

How to Debug ADUC with Different Keil Version	2
Goal	2
Instrument	2
Step	2
Appendix	9
rr	

How to Debug ADUC with Different Keil Version

Goal

Different ADUC products have different Keil version in the corresponding CD. The Keil uVision3 V3.22 which is integrated in our CD of ADuC702x can be used to debug ADE7169F16, ADuC7019, ADuC7020, ADuC7021, ADuC7022, ADuC7024, ADuC7025, ADuC7026, ADuC7027, ADuC7030, ADuC7032, ADuC812, ADuC814, ADuC816, ADuC824, ADuC831, ADuC832, ADuC834, ADuC836, ADuC841, ADuC842, ADuC843, ADuC845, ADuC847 and ADuC848 under the default configuration. The Keil uVision3 V3.55a which is integrated in our CD of ADuC706x can be used to debug ADuC7019, ADuC7020, ADuC7021, ADuC7022, ADuC7024, ADuC7025, ADuC7026, ADuC7027, ADuC7028, ADuC7030, ADuC7032, ADuC7033, ADuC7060, ADuC7128, ADuC7129 and ADuC7229 under the default configuration. But when you build target with Keil uVision3 V3.55a, you would be informed that the evaluation version has expired. Now, the recommended free version on Keil website is Keil uVision4 V4.03 and it can be used to debug ADuC7019, ADuC7020, ADuC7021, ADuC7022, ADuC7023, ADuC7024, ADuC7025, ADuC7026, ADuC7027, ADuC7028, ADuC7029, ADuC7030, ADuC7032, ADuC7033, ADuC7034, ADuC7036, ADuC7037, ADuC7038, ADuC7039, ADuC7060, ADuC7061, ADuC7062, ADuC7122, ADuC7128, ADuC7129 and ADuC7229. The website is: http://www.keil.com/demo/eval/arm.htm. Many customers have puzzles about how to use the new Keil version to debug our products since they even can not build the target with it. This document introduces the steps about how to debug ADUC products with the Keil uVision3 V3.22 (integrated in our CD) and the new one Keil uVision4 V4.03, we can see some difference between them about configuration and interrupt program. Different Keil version information is listed in appendix.

Instrument

Hardware: EVAL-ADuC7026 Software: Keil uVision3 V3.22, Keil uVision4 V4.03

Step

- Install Keil uVision3 and Keil uVision4. Please note that if you wanted to use same version but different sub-series such as Keil uVision3 V3.22 and Keil uVision3 V3.55a in the same computer, they should be installed in different path or the later one will overwrite the previous one.
- 2. Set up the project. Run Keil firstly, and choose New Project as figure 1 shows.

2

China Application Support Team Toll-free number: 800-810-1742 Toll-free fax: 800-810-1747 Email: <u>china.support@analog.com</u>

<u>File E</u> dit <u>V</u> iew <u>P</u> rojec	ct <u>D</u> ebug Fl <u>a</u> sh Peripherals <u>T</u> ools <u>S</u> VCS <u>W</u> indow <u>H</u> elp
12a 🛋 🖬 🗗 🚺	New Project
I	Import µVision 1 Project
🏶 🕮 🗶 🛛 🥵	Open Project
Project Workspace	Close Project

Figure 1

Input the project name and then save it. After that, choose the device as figure 2 shows.





Create a new file as figure 3 shows and save it as .c file.





Program it and add the file to "Source Group 1" by clicking right key on "Source Group 1" as figure 4 shows. If we use Keil uVision4 V4.03, then a file named irq_arm.c or irq_keil.c should also be added to "Source Group 1". Or else, the project can not be compiled. The irq_arm.c or irq_keil.c can be found from the Keil installation path such as following: C:\Keil\ARM\INC\ADI. If we have the same function definition with the one in irq_arm.c(irq_keil.c) in other .c file, we can delete the corresponding one in irq_arm.c(irq_keil.c) or we will get the error of multiply defined.

China Application Support Team Toll-free number: 800-810-1742 Toll-free fax: 800-810-1747 Email: china.support@analog.com

🖹 Eile Edit	<u>V</u> iev	v <u>P</u> roject <u>D</u> ebug Fl <u>a</u> sh Peripherals <u>T</u> ools <u>S</u> VC	S <u>W</u> indow <u>H</u> elp	
11 🚅 🗎	٥	3 🏽 🖀 ユニ 車車 🛦 % %	光 🐪 📃 🖬 州	
۵ 🗈 🖷	X	🛱 🔊 Target 1 💌	<u></u>	
Project Workspa	асе	- × Cor = #2 1 - 2	- (ADUC7096 L)	
🗆 🔁 Target	t 1		e\ADUU7020.n>	
		Options for Group 'Source Group 1'	lay(int length){ le(length>0)	
		Open List File	gth;	
		Open Map File		
		Open File		
	(21) (11)	Rebuild target	in(void)	
	1000	Build target F7		
		Translate Eile	lock Initial	
	~		KEY1 = 0x01;	//Start PLL Setting
	m		CON = OxOO;	//Set PLL Active Mode With CD =
			KEY2 = 0xF4:	//Finish PLL Setting
		Add Files to Group 'Source Group 1'	,	
	₽	Manage Components	$DAT = 0 \times 01010000$:	//Configure P4.0 as an output an
		Remove Group 'Source Group 1' and it's Files		,,,
			le(1)	
	~	Indude Dependencies		
		19 20 21 22 _}	delay(1000000); GP4DAT ^= 0x00010000;	

Figure 4

- 3. Configure Keil.
- (1) Choose the "Options of Target" as figure 5 shows.





(2) Choose "Create HEX File" under Output tab so that we can get .hex file to download as figure 6 shows.

China Application Support Team Toll-free number: 800-810-1742 Toll-free fax: 800-810-1747 Email: <u>china.support@analog.com</u>

Options for Target 'Target 1'	×
Device Target Output Listing User C/C++ Asm Linker Debug Utilities	
Select Folder for Objects Name of Executable: Tap	
Create Executable: .\Tap Debug Information Create Batch File Create HEX File A Browne Information	
C Create Library: .\Tap.LIB	
OK Cancel Defaults Help	

Figure 6

After that, we can program ADUC7026 with ARMWSD for Keil uVision3 V3.22. Refer to Keil uVision4 V4.03, sometimes there is no problem for compiling, but the performance of MCU is not the expected when interrupt function is used. The further configuration as listed below is needed.

Options for T	arget 'Target 1'	K
Device Targe	et Output Listing User C/C++ Asm Linker Debug Utilities	
I Use Mem ☐ Make ☐ Don't I Report	Involution of the provided and the provided	
Scatter File	Tap.sct Edit	
Misc controls		
Linker control string	cpu ARM7TDMI *.ostrictscatter "Tap.sct" autoatsummary_stderrinfo summarysizesmapxrefcallgraphsymbols	
	OK Cancel Defaults Help]

(3) Tick the Use Memory Layout from Target Dialog in the Linker window as figure 7 shows.

Figure 7

(4) Select the J-LINK case in the debug window as figure 8 shows.

China Application Support Team Toll-free number: 800-810-1742 Toll-free fax: 800-810-1747 Email: <u>china.support@analog.com</u>

Options for Target 'Target 1'	
Device Target Output Listing User C/C++ Asm	Linker Debug Utilities
C Use <u>Simulator</u> <u>Settings</u> Limit Speed to Real-Time	Ese: J-LINK / J-TRACE Settings
Load Application at Startup Initialization File:	Load Application at Startup Run to main() Initialization File:
Restore Debug Session Settings	Restore Debug Session Settings
CPU DLL: Parameter:	Driver DLL: Parameter:
SARM.DLL -cADuC70	SARM.DLL J-cADuC70
Dialog DLL: Parameter: DARMAD.DLL -pADuC7024	Dialog DLL: Parameter: TARMAD.DLL pADuC7024
OK Car	ncel Defaults Help

Figure 8

(5) Put the bellowing settings in the J-LINK interface driver setup as figure 9 shows.

JLink/JTrace Interface Driver Setup						
JTAG Speed: C Auto Selection C Adaptive Clocking kHz: 750	Debug Cache Options: Cache Code Cache Memory	jTrace Trace Options: Enable Trace Cycle-accurate Max. Trace Samples: 64K				
Reset Strategy: Info Software for Analog Device ADuC7xxx MCUs JLink OK Cancel Help Nn Nn						

Figure 9

(6) Verify the settings in the utilities window as figure 10 shows.

7

China Application Support Team Toll-free number: 800-810-1742 Toll-free fax: 800-810-1747 Email: <u>china.support@analog.com</u>

Flash Download Setup				×
Download Function C Erase Full Chip Erase Sectors C Do not Erase	 ✓ Program ✓ Verify ☐ Reset and Run 	RAM for /	Algorithm 0x00010000 Size: 0x0800	
Programming Algorithm				
Description	Device Type	Device Size	Address Range	
ADuC702X Flash (v1.1)	On-chip Flash	62k	00080000H - 0008F7FFH	
		Start:	0x00080000 Size: 0x0000F800	
Add	Remove	ОК	Cancel <u>H</u> elp	

Figure 10

4. Interrupt Programming.

In Keil uVision3 V3.22, the fast interrupt request (FIQ) can be processed by void FIQ_Handler() __fiq. But Keil uVision4 V4.03(RealView compiler) does not support the "__fiq" token, we can use _irq instead. The example below shows how to use IRQ and FIQ at the same time with Keil uVision4 V4.03.

//I2C Initial

```
I2C1CFG = 0x0000082;
                              // Master Enable & Enable Generation of Master Clock
                                                    0xCFCF = 100kHz
I2C1DIV = 0x3232;
                              // 0x3232 = 400 \text{kHz}
FIQEN = SM_MASTER1_BIT; //I2C1 Master Interrupt
//UART Initial
                 Baud Rate = 9600
COMCON0 = 0x080;
COMDIV0 = 0x088;
COMDIV1 = 0x000;
COMCON0 = 0x007;
COMIEN0 = 0x01;
                              //Enable Receive Buffer Full Interrupt
IRQEN = UART_BIT;
                              //Enable UART Interrupt
void IRQ_Handler() __irq
```

{;}
void FIQ_Handler() __irq
{;}

8

China Application Support Team Toll-free number: 800-810-1742 Toll-free fax: 800-810-1747 Email: <u>china.support@analog.com</u>

Appendix

About µVision3				
	V3.22 (c) Keil Elektron	nik GmbH / Keil Software, Inc	. 1995 - 2005	
C Compiler: C C Compiler: C Assembler: A Linker/Locator: Bl Librarian: Ll Hex Converter: Ol CPU DLL: St Dialog DLL: Dl	NKell/C51/BIN/ 51.Exe L51.Exe IB51.Exe H51.Exe 8051.DLL P51.DLL	V7.04 V7.04 V5.02 V4.24 V2.6 V2.36 V2.36 V2.36		



About µVision3			K
輝ision3 V3	3.55a		
Copyright (c) Keil Elektroni	k GmbH / Keil Software, Inc. 1995 - 2007	
Toolchain:	RealView MDF	K-ARM Version: 3.15b	
Toolchain Path:	BIN31\		
C Compiler:	Armcc.Exe	V3.1.0.914	
Assembler:	Armasm.Exe	V3.1.0.914	
Linker/Locator:	ArmLink.Exe	V3.1.0.914	
Librarian:	ArmAr.Exe	V3.1.0.914	
Hex Converter:	FromElf.Exe	V3.1.0.914	
CPU DLL:	SARM.DLL	V3.15b	
Dialog DLL:	DARMP.DLL	V1.31	
Target DLL:	BIN\UL2ARM.[DLL V1.32	
Dialog DLL:	TARMP.DLL	V1.31	



About µVision			
礎ision Copyrig	V4.03 ht (c) Keil Elektroni	ik GmbH / Keil Software, Inc. 1995 - 2009	
Toolchain: Toolchain Path: C Compiler: Assembler: Linker/Locator: Librarian: Hex Converter: CPU DLL: Dialog DLL:	RealView MDF BIN40\ Armcc.Exe Armasm.Exe ArmLink.Exe ArmAr.Exe FromElf.Exe SARM.DLL DARMAD.DLL	K-ARM Version: 4.10 V4.0.0.728 [Evaluation] V4.0.0.728 [Evaluation] V4.0.0.728 [Evaluation] V4.0.0.728 [Evaluation] V4.0.0.728 [Evaluation] V4.0.0.728 [Evaluation] V4.10 . V1.14	

Keil uVision4 V4.03

9

China Application Support Team Toll-free number: 800-810-1742 Toll-free fax: 800-810-1747 Email: china.support@analog.com