Using CodeWarrior V4.5 ASM with Adapt9S12DP512 and Serial Monitor

This document assumes that CodeWarrior has already been installed. It also assumes that the user has all the necessary hardware on hand, and just needs assistance in getting started using CodeWarrior.

Download and install CodeWarrior from Freescale's site. http://www.freescale.com/webapp/sps/site/homepage.jsp?nodeId=012726

Getting Started:



Click on the CodeWarrior IDE icon ^{CodeWarrior IDE.Ink} to get started. Notice that the IDE is greyed out to indicate a blank working space.



New Project:

Let's create a new project by clicking on File menu. File-New as shown below.

Freescale CodeWa	nier				• • <u>•</u> = 🗆 ×
File Edit Wew Deard New Text File New Open Find and Open File Date:	h Protect Protes Coll+N Coll+Shift+N Coll+C Coll+C	sortzpert Window Hep	5 H B P		
Sava Gave Al Gave As I Sava A Capy As I Savari	onden Onderholtens				
Open Workspace Close Workspace Save Workspace Save Workspace As					
Treport Project Depart Project					
Page Setup Production	Coler.				
Open Recent					
Exit					

On the project tab select HC(S)12 New Project Wizard.

HC(S)12 New Project Wizard	Project name:
	Location:
	C:\ Set.
	Project:

Project Name:

Type a project name called *Test*. Press on the Set... button to create a Test subfolder to save the test.mcp file.

Create New Pr	roject		? ×
Save in: ն	test		* 🎟 🕇
		Up Or	ne Level
File name:	test		Save
Save as type:	Project Files (*.mcp)	•	Cancel
☑ Create Fold	ler		1.

As can be seen below the setup for the folders are set. Press OK to continue.

HC(S)12 New Project Wizard	Project name:
HCS12 Stationery	test
	Location:
	C:\test\test
	Add to Project:
	Project:

New Project Wizard - Page 1 press Next to continue



Selecting the MCU:

Scroll up or down to locate the MCU of interest. In this example the Adapt9S12DP512 is used. Select the MCU type as MC9S12DP512 then press Next button to continue.

10101		
l'all and the second	Derivatives	
0.000	MC9512D32	
	MC9512D64	
12 Contraction	MC9512DB128A	
and the second second	MC9512DB128B	
	MC9512DG128B	
	MC9512DG256B	
	MC9512DJ128B	
	MC9512DJ256B	and a second
	MC9512DJ64	
	MC9512DP256B	
	MC9512DP512	
	MC9512DT128B	
	MC9512DT256B	
2	MC9512E128	
🗲 freescale	MC9512E256	
semiconductor	MC9512E32	-
	MCOCLOCK	Pierre and Pierre

In this example the Assembly box is selected as shown. One may select C or C++ according the user's programming preference. Press Next button to continue.

New Project Wizard - Page 3		×
L'aron	Please choose the set of languages to be supported initially. You can make multiple selections.	
Contractor of the second se	✓Assembly	
	This will set up your application with an ANSI-C compliant startup code (doing initialization of global variables).	
	< Back Next > Canc	el

Absolute or Relocatable:

In this example the Relocatable assembly is selected as shown. Press Next to continue.



Serial Monitor:

The Adapt9S12DP512 is pre-programmed with a modified version of Freescale's Serial Monitor. Checkmark the *HCS12 Serial Monitor* then click the *Finish* button to continue.



Setup Complete:

Below is the IDE after the setup is completed.



Files Tab:

Note that a new window pane is added. It contains the Files, Link Order and Targets tabs.

Files tab contain 6 subfolders called **Sources**, **Prm**, **Linker Map**, **Libraries**, **Debugger Project File** and **Debugger Cmd Files**.

By clicking on the + icon, the contents of these subfolders are revealed. The Sources folder contains the working files. By default, CW creates a file called main.asm. The Prm folder contains programming parameters. Please note that this document will only go through the important aspects of the IDE. Refer to other available documents for understanding how to use CW.



Double click on main.asm to view its contents.

Debug:

Connect a serial cable between *COM 1* of the PC and the Adapt9S12DP512 board. Make sure the Run/Load switch is in Load mode. Power up the board and the PWR (Green) LED comes ON. If the board is already powered up, press the RESET button.

Select the Project Menu. Project/Debug as shown below.

Freescale CodeWarrio	r					• • • • • ×
File Edit View Search	Project Processor Expert Win	dow Help				
🎁 造 🖻 📕 의 🖞	Add main, asm to Project			E		
	Add Hies Create Group					3
Test.mcp	Create Target,					_ 🗆 X
	Check Syntax	Ctrl+;			main.asm	
	Preprocess		llo/data_c	notion		Ď
Files Link Order Tar	Precompile	cul 177	IDED_RAM:	SECTION		
💉 File	Disassemble	Ctrl+F7 Ctrl+Shift+F7	here you ds.w	ir data definition. 1		
readme.txt	Prina I In Ta Data	Chilui -	ds.w	1		
vps.cxt ✓ ⊡- 🔄 Sources	Make	F7				
💉 🔄 🛄 main.asm	Stop Build	Ctrl+Break	SECTI	ON		
V Burner.bbl	Remove Object Code	Ctrl+-				
₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩	Re-search for Files			FFF	DOW have the FDOOK and	
E Libraries	Reset Project Entry Paths		HCS12_SER	lap the KAH wamp, EEF PLALMON	ron here. See Ebsoo.pui	-
Debugger Project Debugger Cmd Fi	Synchronize Modification Date	5	; set CLR	registers at \$0000 \$11	INITRG= \$0	
	Debug	F5	; set	ram to end at \$3fff	a manantanaki dan	
	Set Default Project	•	STAB	\$10	; INITRM= \$39	
	Set Default Target	,) ; set	eeprom to end at \$0	Offf	
			LDAA STAA	#\$9 \$12	· TNITEE= 09	
		endif	JIM	V12	, INTIEL V)	
			LDS	#SEG_END_SSTACK	; initialize the stack pointer	
			CLI		; enable interrupts	
		Endless	Loop:		Ψ	
		CouterL	DOD:	#1	, A contains counter	
			STX BSR	Counter CalcFibo	; update global.	
			STD	FiboRes	; store result	_
			INX	counter.		
			CPX BNE	#24 CouterLoop	; larger values cause overflow.	
			BRA	EndlessLoop	; restart.	
12 files	0		225225		gaaaaa	•
•	Þ	Line 29 C	ol 2 🛛 📢			• //
						1.

CW will immediately launch the Debugger, displaying the Monitor Setup screen, as shown.

Monitor Setup	×
Monitor Communication Load Options	
HOST Serial Communication Port:	
Please select in this dialog the serial communication port us to connect to the hardware.	sed
HOST Serial Communication Port: [COM1:	
┌─ Communication protocol	
Show Monitor TX/BX	
1	
ОКС	ancel
	

COM1 is selected for Host Serial Port. Click the Load Options tab and check **Enable Automatic Erase Flash on Load** as shown.

Application Loading Options Enable Automatic Erase Flash on Load By default, the Monitor DLL will automatically erase the flash when a load is performed. To disable this feature, uncheck the checkbox.	Ionitor Communication	Load Options
Enable Automatic Erase Flash on Load By default, the Monitor DLL will automatically erase the flash when a load is performed. To disable this feature, uncheck the checkbox.	Application Loading C)ptions
By default, the Monitor DLL will automatically erase the flash when a load is performed. To disable this feature, uncheck the checkbox.	🔽 Enable Automati	ic Erase Flash on Load
	when a load is perfo To disable this featu	rmed. re, uncheck the checkbox.

Click OK to continue. If the serial cable is not connected, or if the wrong COM port was selected, the error below will appear. Check the serial cable or select the correct COM port. Then click Retry.

	HI-WAVE	×
hcs12serialmon 🗙	0	
Could not connect to hardware.	Fatal Error	
ОК	Retry Canc	el

True Time Simulator and Real_Time Debugger:

The Simulator will appear as shown once communication between AD9S12DP512 and the PC has been established.

True-Time Simulator & Real-Time Debugger C:\Test\Test\HCS1	2_Serial_Mo	onitor.ini 🔷	
File View Run MONITOR-HCS12 Component Procedure Window He	elp		
	€		
S Source		Assembly	- O ×
]		I	
		COFF LDS OxFFFF	-
		C102 LDS 0xFFFF C105 LDS 0xFFFF	
		C108 LDS OxFFFF	_
		C10B LDS OxFFFF	<u> </u>
		Register	
		HC12	Auto
Data	- U ×)
Auto Symb	Global	IP COFF PC COFF PPAGE 10	
		SP 4001 CCR SXHINZVC	
		P Procedure	
	1-1-1-1-1		
in Command			
done .\cmd\HCS12_Serial_Monitor_postload.cmd	-	Memory	
Postload command file correctly executed.		Auto	
ins		000080 00 00 00 20	-
			ᅱ
For Help, press F1	MC9512DP5:	i12 done .\cmd\HCS12 Serial Monito	r postload. //

To load the S-record, select MONITOR-HS12 then Load, as shown.

📙 True-Time Sir	nulator & Real-Ti	me Debugger C:\Te	est\Test\H	512_Serial_Mo	nitor.ini		• B _ D ×
File View Run	MONITOR-HCS12	Component Procedu	re Window	Help			
	Load Reset	Ctrl+L Ctrl+R	¢ & ⊣	e			
S Source	Setup Communication. Select Derivative Command Files Debugging Mem				Assembly COFF LDS C102 LDS C105 LDS C108 LDS	OxFFFF OxFFFF OxFFFF OxFFFF	<u> </u>
Data	Set Hardware B	, ,	Auto S	× ymb Global	C10B LDS Register HC12 D 0 IX 0 IP COFF	A O IY FF PC COFF	Auto B 0 PPAGE 10
En Command					P Procedure	CUR SXHI	
done .\cmd Postload co in>	\HCS12_Serial_	Monitor_postload	l. cmd l.		Memory 000080 00 00 000084 05 00 000088 80 00	00 20 00 00	Auto
Load a new applicat	ion			MC9512DP5:	12 don	e .\cmd\HCS12	

Load Executable File explorer window will appear to help locate the file as shown.

Load Executable File	<u>? ×</u>
Look in: 🔁 Test 💌 🖛	🗈 📸 🎹 -
È bin È cmd È prm È Sources È Test_Data	
File name: [Files of type: [Executables (*.abs; *.elf)]	Open Cancel
Advanced Commands Load Code Load Symbols Verify Code	•
Open and Load Code Options Automatically erase and program into FLASH and EEPF Verify memory image after loading code	ROM
Complete image C First byte of each loaded block (faster)	
Run after successful load Stop at Function:	

Click on the bin subfolders to locate **HCS12_Serial_Monitor.abs** Click on the file to select it. Then click **Open** to continue.

Load Executa	ble File	<u>? ×</u>
Look in: 🔀	bin 💌 🗢 🗈 (
HCS12_Se	rial_Monitor.abs	
File name:	HCS12_Serial_Monitor.abs	Open
Files of type:	Executables (*.abs; *.elf)	Cancel
Advanced	Commands	
Load Co	de Load Symbols Verify Code	
- Open and L	.oad Code Options	
Autom	atically erase and program into FLASH and EEPROM	
🗖 Verify r	nemory image after loading code	
🕤 Com	plete image	
C First	byte of each loaded block (faster)	
🗖 Run af	ter successful load	
🗖 Stop	at Function:	
		1

The True Time Simulator will immediately erase and program the FLASH as shown.

True Time Simulator & Real-Time Debugger C2(Test)/IES12(Serial_Moni Fig. Vine Rin, NONTOR-IES12, Concernet: Assembly Window High	terini			<u>a - n x</u>
Source		Assembly		
C/\Tesh/Tesh/Tesh/bin/unein.dog	Line 2335	1		
BFWMFRCLK_FCKA1: equ 400000010 BFWMFRCLK_FCKA2: equ 400000100 BFWMFRCLK_FCKB0: equ 400010000 BFWMFRCLK_FCKB1: equ 400100000 BFWMFRCLK_FCKB2: equ 401000000	1	3E7000 08 3E7000 000000 3E7000 0010112 3E7013 13 3E7014 1415 3E7016 161718 3E7016 161718	RTI BEET 13,X,#14 BEET 13,X,#14 BEELR -16,X,#17,*+22 EMU1 DECC #21 73B Dx1718 LEAT -6.X	لد لح
) *** FURCAE - FWM Center Align Enable Register; Ox00000044 ***		1		1/1
FINEAR: equ \$00000044 ; bit numbers for usage in DCLR, DSET, DRCLR and DRSET	Jawa MOG	Register		
FUNCAE_CAE0; equ 0	: Cente 🚽	HC12	1 26 Hill	Auto
	2 //		B Q	
👷 Data	그미즈	IP FEFF IC TYPE	PPAGE 0	
Auto	Symb Elabal	SP 4002 CCR 500	LENZYC.	
		Procedure		
128 Command				
dome .\cmd\RC512_Serial_Romitor_startup.cmd	-			Intel
Startup command file correctly executed.	88		à to	
110-	22	000080 00 00 00 20 05	00 00 00	
		000088 80 00 00 00 00	00 00 FF	
	-	00 00 00 00 00 00 00 00 00 00 00 00 00	00 00 00	
×	1	0000A0 00 00 00 00 00	00 00 00	-
for Help, press F1		NC9512DP512	done .lond\HCS12_Seriel_Monito	_startup.c ,

This concludes the demonstration. For help with CodeWarrior, be sure to join Freescale's CodeWarrior support forum, at <u>http://forums.freescale.com/</u>