



# USBDM 仿真器说明书

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#### 一)USBDM 简介:

USBDM 是一种针对飞思卡尔单片机的仿真器与编程器的组合体,可以仿真和烧写飞思卡尔的很多型号的芯片。目前支持 HCS08、HCS12、CodefireV1、和 kinetis (SWD)。



#### 二)装箱单:

- USBDM 仿真器……1 台
- Mini-USB 线……1 条
- HCS08HCS12/CodefireV1 6 针 BDM 线……1 条
- Kinetis mini10 线……1 条

#### 三) 接口:

支持 HCS08 /HCS12/CodefireV1 6 针 BDM、Kinetis mini10 共 2 种接口,如图

BGND 1	•	•	2 GND
NC 3	•	•	4 RESET
NC 5	•	•	6 TVCC

HCS08 /HCS12/CFV1 BDM



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Kinetis Mini10

四)、支持的 codewarrior 版本

- v5.1 v6.3 v7.2 v8.3 v10.x
- 五)、支持的系统

Xp win7

六)、支持的芯片类型

HCS08、HCS12、CodefireV1、和 kinetis (SWD)。





### 二、集成开发环境 Codewarrior 与仿真器安装

1、 安装 Codewarrior

根据你的需要,安装 USBDM 支持的 codewarrior 版本(见第三页)。在这里,我安装 codewarrior10.3。具体的安装步骤就不再列出。

注意:要先安装 codewarrior,再进行以下安装步骤。若只把 USBDM 当作编程器使用,可以不用安装 codewarrior.

#### 2、 安装 USBDM 软件

我这里以 USBDM\_4\_10\_5b 为例说明。双击目录下的 USBDM\_4\_10\_5b\_Win.msi。









单击"Next",

🔂 USBDI Setup	
End-User License Agreement Please read the following license agreement carefully	
GNU GENERAL PUBLIC LICENSE	
Version 2, June 1991	
Copyright (C) 1989, 1991 Free Software Foundation, Inc. 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA	Ł
Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.	~
☑ I accept the terms in the License Agreement]	
Print Back Next	Cancel



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单击"Next",

🛃 USBDI Setup	
Custom Setup Select the way you want features to be installed.	
Click the icons in the tree below to change the way I	features will be installed.
Image: USBDM 4.10.5       Image: Vision of the second	The complete package. This feature requires 5KB on your hard drive. It has 12 of 14 subfeatures selected. The subfeatures require 41MB on your hard drive.
Location: C:\Program Files\pgo\USBDM 4.10	D.5\ Browse
Re <u>s</u> et Disk <u>U</u> sage	<u>B</u> ack <u>N</u> ext Cancel

#### 单击 "Next",

🔂 USBDE Setup	
Ready to install USBDM	Ð
Click Install to begin the installation. Click Back to review or change any of your installation settings. Click Cancel to exit the wizard.	
<u>B</u> ack Install	Cancel



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单击"Install",

🛃 USBDI Setup	
Installing USBDM	$\mathfrak{G}$
Please wait while the Setup Wizard installs USBDM.	
Status: Publishing product information	
<u>B</u> ack <u>N</u> ext	Cancel

经过短暂等待后,出现安装完成对话框。





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单击"finish",安装完成。

此时,在"程序"菜单中,出现 USBDM4.10.5.







Web:www.free-tech.com.cn

3, 安装驱动

首先,连接仿真器。

如果你的系统是 xp,需要安装 USBDM\_Drivers\zadig\

zadig\_v1.1.1.143.exe.

如果你的系统是 win7,需要安装 zadig\_v2.0.1.161.exe.

我这里安装 USBDM\_Drivers\zadig\ zadig\_v1.1.1.143.exe



出现如下对话框:

Zadig		
Device Options Help		
Device Interface 0 - USBDM (Interface 0)		Clit Name
Details VID: 16D0 PID: 0567 MI: 00	Driver Current: (NONE)	Target: WinUSB (v6.1.7600.16385)
	Install Driver	
2 devices found.		

单击"Install Driver",



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Lauig	🛛 🗡
Device Options Help	
Device Interface 0 - USBDM (Interfation Installing Driver Details Installing Driver	Edit Name
VID: 16D0 PID: 0567	USB (v6.1.7600.16385)

短暂等待后,出现驱动安装完成对话框。表明驱动成功安装。

Zadig				
Device Options Device Interface 0 - USB Details VID: 16D0 PI	Driver Installat	: <b>ion</b> nstalled successfully,	Close	2 Edit Name
		Install Driver		
Driver Installatio	on: SUCCESS			



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打开设备管理器



若看到 USBDM BDM interface,表明驱动安装成功。

接下来,验证 USBDM 是否可用:

打开 "开始/程序/USBDM4.10.5/ARM Programmer",



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Flash Programmer - ARM	🛛 🔀
USBDM Target Advanced	
USBDM-JS16-SWD_SER-0001	Detect
USBDM HCS08, HCS12, CFV1, ARM-SWD BDM	
Target Vdd Control	
© _0ff C 3.3V C 5V	
□ ⊆ycle target Vdd on reset	
Cycle target Vdd on connection problems	
Leave target powered on exit	
Connection control	
Automatically re-connect	
Connection Speed 2MHz	
BDM Firmware Ver 4, 10.4	DLL Ver 4.10.5.0
	Close

如果看到 Select BDM 一栏下面,出现

说明驱动已经安装成功。

USBDM-JS16-SWD\_SER-0001

**4**、为 Codewarrior 打补丁

单击"开始/程序/USBDM 4.10.5/Codewarrior Wizard Patches/Modify CW for MCU V10.3 ELF Importer Wizard"

 $\overline{\mathbf{v}}$ 



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#### 出现如下内容:



按回车键退出。





Web:www.free-tech.com.cn

单击"开始/程序/USBDM 4.10.5/Codewarrior Wizard

Patches/Modify CW for MCU V10.3 MQX Lite New

Project Wizard"



同样出现如下内容:



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📋 Modify CW for MCU V10.3 MQX Lite New Project Wizard	x
mergeFile = 'C:\Program Files\pgo\USBDM 4.10.5\WizardPatches\PatchMQXLiteNewProj ectWizard_U10.3.xml' 	
convertPattern(): inputFilenameMask = 'd:\Freescale\CW MCU v10.3\eclipse\plugins\com.freescale. mcu.mqxlite.projectwizard_1.*.*.*' filename= 'plugin.xml'	
<pre>convertDirectory(): dirPath = 'd:\Freescale\CW_MCU_v10.3\eclipse\plugins\com.freescale.mcu.mgx lite.projectwizard_1.0.0.FSL_b04004' filename = 'plugin.xml' Info: Applying patches: C:\Program Files\pgo\USBDM_4.10.5\WizardPatches\PatchMQX LiteNewProjectWizard_V10.3.xml &lt;= d:\Freescale\CW_MCU_v10.3\eclipse\plugins\com.freescale.mcu.mgxlite.projectw izard_1.0.0.FSL_b04004\plugin.xml.original =&gt; d:\Freescale\CW_MCU_v10.3\eclipse\plugins\com.freescale.mcu.mgxlite.projectw izard_1.0.0.FSL_b04004\plugin.xml Warning: Backup already exists OK</pre>	
=======================================	
Press Enter to close	
a	-

按回车键退出。

## 单击"开始/程序/USBDM 4.10.5/Codewarrior Wizard Patches/Modify CW for MCU V10.3 New Project Wizard"





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出现如下内容:

Modify CW for MCU V10.3 New Project Wizard	- 🗆	×
mergeFile = 'C:\Program Files\pgo\USBDM 4.10.5\WizardPatches\PatchNewWizardP n_V10.3.xml' ====================================	lugi	
convertPattern(): inputFilenameMask = 'd:\Freescale\CW MCU v10.3\eclipse\plugins\com.freesc	ale.	
mcu.projectwizard_1.*.*.*' filename= 'plugin.xml' 		
convertDirectory(): dirPath = 'd:\Freescale\CW_MCU_v10.3\eclipse\plugins\com.freescale.mcu jectuizard 1 4 & FSL b04030-03'	. pro	
filename = 'plugin.xml'	1-61	
Info: Hpp19ing patches: C:\rrogram Files\pgo\USBDM 4.10.5\wizardratches\ratc WizardPlugin_V10.3.xml	nnew	
<pre>&lt;= d:\Freescale\CW_MCU_v10.3\eclipse\plugins\com.freescale.mcu.projectwizar 4.8.FSL_b04030-A3\plugin.xml.original</pre>	d_1.	
=> d:\Freescale\CW_MCU_v10.3\eclipse\plugins\com.freescale.mcu.projectwizar 4.8.FSL_b04030-A3\plugin.xml	d_1.	
Warning: Backup already exists OK		
Press Enter to close		
		-

按回车键退出。

至此,为 Codewarrior 10.3 打补丁的工作已经完成。

经过上述步骤,您已成功安装 Codewarrior 10.3 集成开发环境,并支持 USBDM 仿真器。





# 三、配置两个开关(重要)

首先,确定目标芯片的运行电压。

若目标芯片运行电压为 5V,则需要将电压值开关拨到"5.0V"一端。 若目标芯片的运行电压为 3.3V,则需要将电压值开关拨 到"3.3V"一端。

其次,确定你的目标板是否需要仿真器供电。

若目标板有外接电源,而不需要仿真器供电,需要将对外供电开关拨到"OFF"一端。若目标板没有外接电源,而需要仿真器供电,则需要将对外供电开关拨到"ON"一端。





# 四、用 USBDM 调试 kinetis

进行下一步之前,请确认你已经执行了第三部分的内容(配置板子上的跳线)。

一)、建立工程

打开 Codewarrior 10.3 IDE, 如下图所示:





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单击"□□",出现下面对话框

🥦 New	
Select a wizard Create an MCU Bareboard Project	
Wizards:	
type filter text	
Bareboard Project         Inux/uClinux Application Project         MQX-Lite Project Wizard         General         C/C++         CodeWarrior         CodeWarrior         CodeWarrior         CVS         Processor Expert         Remote System Explorer	
	Canaal
	Cancel





## 选择"Bareboard Project",单击"Next",出现:

🏴 New Bareboard Project 📃 🗖 🔀
Create an MCU Bareboard Project
Choose the location for the new project
Project name: KL05z32_Test
Location: D: Documents and Settings Administrator (workspace (KL05z32_Test] Browse
< Back Next > Finish Cancel



Add:北京市海淀区上地十街辉煌国际3号楼0818室 Tel:010-62669831/9931 Fax:010-62669293-612 Web;www.free-tech.com.cn

### 为工程起个名字,单击"Next",出现:

🥦 New Bareboard Project	
Devices	
Select the derivative or board you would like to use	
Device or board to be used:	
type filter text	
• Kinetis K Series • Kinetis L Series • KL0x Family • KL04Z (48 MHz) Family • KL05Z (48 MHz) Family • MKL05Z8 • MKL05Z16 • MKL05Z32 • KL 1x Family • KL2x Family • RS08 • S08	
Project Type / Output:	<u>^</u>
Sack Next > Finish	Cancel





展开你所用的产品系列(本例中是 Kinetis L series ->KL05 Family),选择你使用的芯片型号(本例中是 MkL05Z32),单击"Next",出现:

New Bareboard Project	🛛 🔀
Connections	
Choose the connection to use for this project	
Connection to be used:	
PAE Cyclone MAX 050	
Open Source JTAG	
Open Source SDA	
Segger J-Link / J-Trace / SWO (SWD based)	
USBDM	
Connect to P&E USB MultiLink Universal [FX] / USB MultiLink.	<u>~</u>
	✓
Contract (Section 2)	Cancel



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## 选择"USBDM",以后一切默认,单击"Next"即可,直到完成。 之后出现:





二)、编译工程

单击" **」**",编译工程(该步骤是为了生成一个.elf 文件,在后 续步骤中用到)。



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三)、配置工程

<u>+-</u> w	🗉 😂 KL05z32_Test : FLAS	,,	一出十十四	℃件Wienenenentiene#	ਜਿਤਾਰ
仕		-	上 早 击 右 铤,	远 properties ,	出现:

Properties for KL05z32_Test		_ 🗆 🔀
type filter text	Run/Debug Settings - KL05z32_Test	<b>⇔</b> • ⇔ • •
⊕- Resource Builders ⊕- C/C++ Build	This page allows you to manage launch configurations associated with the curren resource.	tly selected
C/C++ General	Launch configurations for 'KL05z32_Test':	
	C KL05z32_Test_FLASH_USBDM	New Duplicate
		Edit
		Delete
	Restore Defa	ults Apply
?	OK	Cancel

选中 🗖 KL05z32\_Test\_FLASH\_USBDM



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Properties for KL05z32_Test		_ 🗆 🔀
type filter text	Run/Debug Settings - KL05z32_Test	⇔ - ⇔ - ▼
<ul> <li>Bereserve</li> <li>Builders</li> <li>C/C++ Build</li> <li>C/C++ General</li> <li>Run/Debug Settings</li> </ul>	This page allows you to manage launch configurations associated with selected resource. Launch configurations for 'KL05z32_Test':           KL05z32_Test_FLASH_USBDM	the currently          New         Duplicate         Edit         Delete
	Restore Defau	Ilts Apply
?	ОК	Cancel

单击"Edit", 出现:



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🔑 Edit Configuration	X
Edit launch configuration properties Download an application to a target, then debug or run the application.	
Name:       [L05z32_Test_FLASH_USBDM         Main       OP Arguments       Source       Environment       Common       Trace and Profile         C/C++ application       Project:       KL05z32_Test       Browse       Browse         Application:       FLASH/KL05z32_Test.elf       Search Project       Browse         Build (if required) before launching       Build configuration:       FLASH         Build configuration:       FLASH         Select configuration using 'C/C++ Application'         O Enable auto build       O Disable auto build         O Use workspace settings       Configure Workspace Settings         Connection:       Image: KL05z32_Test_FLASH_USBDM       Edit	Browse Variables
Apply	Revert
(?) OK	Cancel

#### 选择"Edit",出现



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Properties for KL05z32_Test	FLASH_USBDM		
Hardware or Simulator Connect	Hardware or Simulator Connection $\Leftrightarrow * \Rightarrow *$		
	Parent profile: 20130514-0949		
	Name: KL05z32_Test_FLASH_USBDM		
	Description:		
	Template: None Apply Defaults		
	Target:     KL05z32_Test_FLASH_US8DM Target     Edit     New       Connection type:     US8DM ARM Interface     Image: Connection type:     Image: Connection type: Connection type:		
	Connection Advanced		
	Preferred BDM Any connected USBDM Refresh Restore Default		
	Generic BDM Advanced Options		
	Off ○ 3V3 ○ 5V Automatically re-connect		
	Cycle target Vdd on reset Cycle target Vdd on connection problems		
	Leave target powered on exit		
	All usbdm-arm-gdi		
	Enable logging		
?	OK Cancel		

"Connection type"选择"USBDM ARM Interface",其余 默认即可。



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单击 "OK"

🖗 C/C++ - CodeWarrior Development Studio	🗖 🗖 🖉
File Edit Search Project Run MQX Tools Processor Expert	Window Help
🕴 📩 🖷 🕼 💊 🕶 🍇 🕴 💋 🔹 🗍 (Active)	🔽 🐔 🗄 🎋 • 🗄 🖋 • 🗄 🛃 • 🖏 - 🏷 • 🗇 • 🔛 🔠 🗞 Hardware 🔅 De 🎽
CodeWarrior Projects 🛛	
📰 🦺 🥫 🖉 File Name	
File Name	ld l
🗉 🚔 KL05z32_Test : FLAS	
	😰 Problems 🖳 Console 🛛 🕞 Progress 🔞 Target Tasks 🔤 🗖
	CDT Build Console [KL05z32_Test] 🕹 🖓 🙀 📰 🔜 🛃 🔹 🛃 🗸 🗂 🗸
🚖 Commander 🛛 🔀 🗸 🗖	-W1 -Man KL05z32 Test man -n -snecs=ewl c snecs -Vlinker -
	-undefined= pformatter -Xlinker -
Project Creation     Build/Debug	-defsym=pformatter=pformatterXlinker -
Import project  Settings	-undefined=sformatter -Xlinker -
Import example project     Miscellaneous	-defsym=_sformatter=_sformatter -mcpu=cortex-m0 -mthumb
New MOX-Lite project	-miloat-abl=soit -g3 -gawari-2 -gstrict-dwarf
New MCU project	'Finished building target: KL05z32 Test.elf'
	· · · []



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四)、调试

# 单击" 🏂 ",进入调试界面。

🥦 Debug - KL05z32_Test/Sources/main.c - CodeWarrior Development Studio					
File Edit Search Project Run MQXTools RTCS MQX Window Help					
🛅 = 🔜 🔞   🗞 = 🍇   🤣 = 🍠 =   🏇 =   🛷 =   🖉 = 🖗 🗢	• 🖒 •			🖹 🏇 Deb	ug »
🏇 Debug 🛛 🖓 🗖	(x)= Variables 🛛 🔍 🗞 Brea	akpoints 📋 Memory 🐰 Reg	isters		
		<u>(*</u>	) 📲 🖬 🛛	🚱 - 🔮 🤉	K 💥 📑 🗸
🍇 🗶 🕀 🗈 🔳 🖉 🕹 🦻 🕐 🖉 🔜 🖬 📲 🛲 -	Name	Value	Location		
	(X)= counter	536871460	0x20000bf4		
€ main.c ⊠		- D 🗄 Outline 🕅	↓ª	L 🔍 🗙 🗕	<b>₩</b> ~
12 13 14 int main (void) 21 5 6 16 int counter = 0; 17 18 19 20 21 for (::) {					
🖹 Problems 📮 Console 🛛 🔋 🔳 🗮 💥 📑 💭 🚰 🚽 📬 🖛 📬	° 🗆 🔯 Debugger Shell 🖷	Progress 💣 Software Analys	is 🛛		- 0
ARIM Processors, KL.05z32_Test.elf	Software Ana	lysis		Ş	» 🕀 🖻 🚺
	Name	Fest_FLASH_USBDM	Trace	Timeline	Critical Code
	Writable Smart I	insert 15:1			

现在,就可以进行单步、设断点等调试。





五、用 USBDM 调试 HCS08、HCS12、CodefireV1 的方法

进行下一步之前,请确认你已经执行了第三部分的内容(配置板子上的跳线)。

一) 在工程里选择仿真器:

新建工程时按下表选择仿真器

CodeWarrior 版本	选择仿真器型号
CW HCS12 V5.x	TBDML
CW for Microcontrollers	HCS08 Open Source BDM
V6.x(HCS08 Target)	
CW for Microcontrollers	USBDM
V10.x	
CW for Microcontrollers	CFv1 Opensource BDM
V6.x(Coldfire V1 Target)	

二)步骤:

下面以 HCS08 为例, 描述一下具体操作步骤。

1、单击 🛄 建立一个新工程,出现下面对话框:



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Tizard Sap	Select the derivative you like to use:	would	Choose your default connection:
Device and Connectio	+ HCSO8E Family	~	Connections
Project Parameters	HCSO8EL Family     HCSO8EL Family     HCSO8FL Family		Full Chip Simulation P&E Multilink/Cyclone Pro
Add Additional Files	HCS08G Family     HCS08IA Family		SofTec HCS08 HCS08 Open Source BDM
Processor Expert	+ HCSO8IB Family + HCSO8IC Family + HCSO8JM Family + HCSO8JE Family		
	<ul> <li>HCSO8JS Family</li> <li>HCSO8LC Family</li> <li>HCSO8LG Family</li> <li>HCSO8LL Family</li> <li>HCSO8MP Family</li> <li>HCSO8MP Family</li> </ul>		Connect to the USB-based Freescale MCSO8 Open Source BDM Cable.
	MC9S08MP16	×	8

2、左边选择您所用的芯片型号,右边选择"HCS08 Open Source BDM"。单击"下一步",出现:

Microcontrollers No.	ew Project	×
Tizard Map Device and Connection	Please choose the set of languages to be supported initially. You can make multiple selections.	Project name: Project_7.mcp
<b>Project Parameters</b> Add Additional Files	Absolute assembly Relocatable assembly C	Location: E:\Document\HCSO8\Project_7\
Processor Expert	C++	Set
C/C++ Options PC-Lint	C language support will be included in the project	
	<u>〈上一步®)</u>	下一步 (20) > 完成 取消





3、为工程起个名字,选择你希望的路径,单击"完成"即可(如 果你想对后续步骤做特殊设置,此处单击"下一步",进行希望的 设置后,单击"完成")。

4、单击 上开始调试,出现:

Flash Programmer - HCS08	
USBDM Target Advanced	
Select BDM	
USBDM-JS16-SWD_SER-0001	Detect
USBDM HCS08, HCS12, CFV1, ARM-SWD BDM	
Target Vdd Control	
© Off C 3,3V C 5V	
Cycle target Vdd on reset	
Cycle target Vdd on connection problems	
Leave target powered on exit	
Connection control	
Automatically re-connect	
Use RESET signal	
BDM Firmware Ver 4.10.4	DLL Ver 4.10.5.0
	Close

下面对常用选项卡做简要说明:





Select BDM USBDM-JMxx-CF-0001 USBDM RS08, HCS08, HCS12, DSC, Coldfire BDM

### BDM 选择:如果电脑上同时连接多个 BDM,可以在这里选择使

用的 BDM。

Target Vdd Control

Off O 3.3V O 5V

Cycle target Vdd on reset

Cycle target Vdd on connection problems
Leave target powered on exit

目标板供电选项:暂时无法选择。只能通过板子上的跳线帽进行选择。



连接控制选项,一般默认即可。

5、根据需要选择上面的选项,单击"OK",如果出现:







#### 6、单击"OK",进入调试界面。

🛃 True-Time Simulator & Real-Time Debugger 🛛 E:\Document	\HCS08\Project_7\HCS08_0pe 📃 🗖 🗙
Eile View Bun MCSO8 Open Source BDM Component Memory Window Melp	
▯ᄚᇦ຺Ӽฃ฿ํ฿ํ฿ํ฿ํ → ๖ ಈ ಈ + ●	
S Source	Assembly
E:\Document\HCS08\Project_7\Sources\main.c Line: 7	main
	C092 CLI
/* include your code here */	C093 LDA #0x355 C095 LDHX #0x1800
	CO98 STA ,X
×	
<u>×                                     </u>	
🛛 Procedure	HCS08 Auto
	HX C000 SP 17F
main ()	SR 6A Status VHTNZC
🖥 Data: 1 📃 🗖 🗙	🖬 Ienory 📃 🗖 🗙
main.c Auto Symb Global	Auto
_SRS <1> volatile SRSSTR	0080 00 00 00 00 00 00 FF FF
	0088 00 01 00 00 00 00 00 00
🖥 Data:2	🖾 Command 📃 🗖 🗙
main Auto Symb Local	<u> </u>
	in> 💌
For Help, press F1 Automatic (triggers, breakpoints, watchpoints, e	and trace possible) MC9SO8MP16 Breakpo

就可以进行"单步"、"设断点"等调试操作。





### 三) HCS12 和 CodefireV1 的对话框:

进行下一步之前,请确认你已经执行了第三部分的内容(配置板子上的跳线)。

Tizard Bap	Select the derivative you would like to use	Choose your default connection:
Device and Connecti- troject Farameters Add Additional Files Trocessor Expert	HCS12C Family     MCS12D Family     MCS12D Family     MCS512D82     MCS512D84     MCS512D81284     MCS512D81288     MCS512D81288     MCS512D87268     MCS512D87268	Connections PAE Cyclene PBD (USB) PAE Cyclene PBD (Serial) PAE Cyclene PBD (CPFP) Soffec HCS12 Abatros BDI HCS12 Serial Monitor
	MCGS1220568 MCGS1220568 MCGS12205568 MCGS12205568 MCGS1220556 MCGS1220556 MCGS1220556	Connect to a board through Freezcale TSDML (TurboSDM Light).
crocontrollers Re	<u>v Project</u>	下一步 (g) > 取消
erocontrollers Te Tizard Ray	• Project Select the derivative you would	下一步(g) > 三三 取消 Choose your default connection:
crocontrollers Te Tixard Hap Serice and Connecti-	• Project Select the derivative you would like to use	下一步(g) > 三三 取消 Choose your default connection:
crocontrollers Te Tizard Hap Serice and Connecti- Trainet Permeters	• Project Select the derivative you would like to use • MOS	下一步(g) > 三三 取消 Choose your default connection: Connections Full Chip Simulation
erocontrollers Je Tizard Rep Serice and Connecti- froject Parmeters Md Additional Files	Project Select the derivative you would like to use     HOS8     HOS8     HOS8     ColdFire VI	下一步(g) > 二 取消 Choose your default connection: Connections Full Chip Simulation Pall Chip Simulation Pall Multilink/Cycleae Pro Soffee ColdWire
crocontrollers Fo Tirerd Bop Device and Connecti- broject Parmeters Add Additional Files Processor Espert	Project  Select the derivative yes would like to use:      HOS     HOS     HOS     Coldrine VI     BOFSIAC Fuely     BOFSIAE Fuely	下一步(g) 〉 二 取納 Choose your default connection: Connections Full Chip Simulation Pail Chip Sim



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Flash Programmer - HCS08	_ 🗆 🔀
USBDM Target Advanced	
Select BDM	
USBDM-JS16-SWD_SER-0001	Detect
USBDM HCS08, HCS12, CFV1, ARM-SWD BDM	
Target Vdd Control	
© Off C 3,3V C 5V	
Cycle target Vdd on reset	
Cycle target Vdd on connection problems	
Leave target powered on exit	
Connection control	
Automatically re-connect	
Use RESET signal	
BDM Firmware Ver 4.10.4	DLL Ver 4.10.5.0
	Close

### 四)用 codewarrior10.3 调试 HCS08

进行下一步之前,请确认你已经执行了第三部分的内容(配置板子上的跳线)。

1,打开 codewarrior10.3



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C/C++ - KL05z32_Test/Sources/main.c - CodeWarrior Development Studio			🛛
File Edit Search Project Run MQX Tools Processor Expert Window Help			
📫 ▼ 📰 😨   🍕 ▼ 🍕   🍠 ▼    (Active) 🔛 🕵    🎋 ▼    🔗 ▼	🖗 • 🖗 • 🌤	⇐ • 🔶 •	🔛 🥎 Hardware 🕸 De 🌺
🗖 CodeWarrior Projects 🛛 👘 🗖 🚺 main.c 🛛			- 8
🔡 📮 🦻 🤽 File Name			
File Name 🔺 Size Type Build 10 #include "deriva	tive.h" /* i	include per	ipheral declarations */
🗉 😂 KL05z32_Test : FLAS			
12			
$14 \text{ int } \text{main}(\text{vol}\alpha)$			
16 int counter	= 0;		
17			
18			
19			
20			
21 IOT(;;) {			
22 Counter			
24			
			>
🖳 Problems 📃 Console 🕅	🔍 🖏 Progress 👔	Target Tasks	🔓 🚮 📑 🖃 - 📑 - 🗖 -
Processor Expert			
Jul 10, 2013 11:53:	05 AM Starti	ng Processo	or Expert service
System directory =	D:\Freescale	CW MCU V10	.3\MCU\ProcessorExpert
User working direct	pry = C:\Doc	uments and	Settings All Users Application Data Proc
Project Creation     Build/Debug     Jul 10 2013 11.53.	52 AM Succes	scuments an sfully star	ted Processor Expert service
Import project		sectory bour	Sea receiver angere bervioe
Import example project			
Import MCU executable file Miscellaneous			
New MQX-Lite project			
[] New MCU project			
	Writable	Smart Toport	15.1
	wittable	Sinar e Inser e	13.1

2,单击左下角的 <sup>™</sup> New MCU project



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🥦 New Bareboard Project	
Create an MCU Bareboard Project	
Choose the location for the new project	
Project name:	
Use default location	
Location: D:\Documents and Settings\Administrator\workspace	Browse
Sack Next > Finish	Cancel

输入工程的名字,这里我输入"QG4\_Test",然后单击 "Next"



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🏁 New Bareboard Project	
Devices Select the derivative or board you would like to use	
Device or board to be used: type filter text - HCS08PL Family - HCS08PT Family - HCS08Q Family - MC9S08QA2 - MC9S08QA4 - MC9S08QB4 - MC9S08QB8 MC9S08QB8	
Project Type / Output: Application Library	
MC9508QG4	
A Sack Next > Fin	nish Cancel

选择芯片"MC9S08QG4",点击"Next"



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🏁 New Bareboard Project	_ 🗆 🔀
Connections	
Choose the connection to use for this project	
Connection to be used:	
P&E Full Chip Simulation	
P&E USB MultiLink Universal [FX] / USB MultiLink	
Connect to USBDM Open Source BDM.	
	✓
(?) < Back Next > Finish	1 Cancel

这里要选择上"USBDM",点击 Next,



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🥦 New Bareboard Project	
Languages	
Language: C C++ Relocatable Assembly Absolute Assembly	
C language support will be included in the project	×
Contemporary Co	Cancel

这里是语言的选择,选择 c,点击 Next,



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🥦 New Bareboard Project	
Rapid Application Development	
Processor Expert, Device Initialization	
Rapid Application Development	
None	
O Device Initialization	
O Processor Expert	
Start with perspective designed for	
O Hardware configuration (pin muxing and device initialization)	
<ul> <li>Use current perspective</li> </ul>	
Initialize all peripherals	
project how Processor Expert can be enabled (if not done here).	ne.txt in 🔥
Use current perspective and show Processor Expert views.	
Sack Next > Finish	Cancel

这里可以选择是否使用 PE,我不使用,点击 Next,



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P New Bareboard Project	
C/C++ Options	
Which memory model shall be used?	
Small	
Banked	
Select the floating point format supported. Select "None" for best code density.	
◯ Float is IEEE32, Double is IEEE32	
○ Float is IEEE32, Double is IEEE64	
Which level of startup code shall be used? Use "Minimal Startup Code" for best code Minimal Startup Code ANSI Startup Code	e density.
By default all variables are outside the zero page (extended memory access). Varia the zero page can be used with pragmas or the near keyword.	ibles in 🔥
Don't use floating point support.	
This will perform an ANSI compliant startup code: it initializes global variables/object calls the application main routine.	ts and
Seck Next > Finish	Cancel

这个对话框中,有一项需要特别注意的是浮点数选择,如果你的 程序中使用浮点数,就需要选择 float,这里我没有使用,默认即 可。然后,点击"finish".



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C/C++ - KL05z32_Test/Sources/main.c - CodeWarrior Development Studio	_ 🗆 🔀
File Edit Search Project Run MQX Tools Processor Expert Window Help	
🖸 マ 🖫 🔞   🔦 マ 🎕   🖇 マ   (Active) 🔤 🚳   林 マ   🔗 マ   夕 マ   夕 マ 🖓 マ	are 🕸 De 🎽
🗖 CodeWarrior Projects 🕱 💎 🗖 🔃 main.c 🕸	- 8
	<u>^</u>
File Name 🔺 Size Type Build 10 #include "derivative.h" /* include peripheral declarations */	
B ∉ KL05232_Test : FLAS 11	
14 int main (void)	
15 {	
16 int counter = 0;	
17	≡
18	
20	
21 for(;;) {	
22 counter++;	
23 }	
Target Tasks	
Processor Expert	
Sustem directory = D:\Frequence\( MCL) v10.3\MCL\ProcessorExpert	<u> </u>
A Commander X	ta\Proc
Project Creation & Build /Dabug	Data\P:
Jul 10, 2013 11:53:52 AM Successfully started Processor Expert service	
P Indext avande project > Settings	
Na Imoci scutable file  Miscellaneous	
New MOX-Lite project	
New MCU project	

#### 右键工程, build project



在 console,可以看到编译的信息



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🗜 Problems 🖳 Console 🕴 🕞 Progress) 🛍 Target Tasks 🛛 🕴 👘 🕆 🗖 🕆 👘
CDT Build Console [QG4_Test]
Generating MAP file 'D:\Documents and Settings\Administrator\workspace\QG4_Test\FLASH\QG4_Test.map'
SmartLinker: *** 0 error(s), 0 warning(s), 0 information message(s) ***
SmartLinker: *** Processing ok ***
'Finished building target: QG4_Test.abs'
'Executing target #5 QG4_Test.abs.s19'
'Invoking: S08 Burner'
"D:/Freescale/CW MCU v10.3/MCU/prog/burner" -ArgFile"QG4_Test.abs.args" -f="/Project_Settings/Linker_Files/burner.bbl"
-env"ABS_FILE=QG4_Test.abs"
'Finished building: QG4_Test.abs.s19'

#### 点击"debug",进入调试界面,如下图

Pebug - QG4_Test/Sources/main.c - CodeWarrior Development Studio		🛛 🔀
File Edit Search Project Run MQX Tools RTCS MQX Window Help		
i 📬 • 🔜 🕼   🗞 - 🎕 i 🤣 • i 🍠 • i 🏇 • i 🔗 • i ½ • 🤤 🔶	• 🖒 •	🖹 🚫 Hardware 🛛 🕸 De
🎋 Debug 🗙 🗖 🗖	🗱 = Variables 🖄 💊 Breakpoints 🚺 Memory	1888 Registers 📃 🗖
		🗄 🏘 🕒   🚰 •   🗳 💥 💥 📑 🎽
🍇 M 😌 🕪 🗉 🔳 M 🍪 🌫 👁 🕫 🖶 😥 💞 🗰 🖞 🎬 m 🕶 🗌	Name Value	Location
QG4_Test_FLASH_USBDM [CodeWarrior Download]		
🖶 🔐 HCS08, QG4_Test.abs (Suspended)	<	
Thread IID: 0x01 (Suspended: Signal Halt' received, Description: User halted thread	<u></u>	
Re main.c Re main.c X		ne 🕄 🛛 🔩 💘 🖉 🗖 🗖
1#include <hidef.h> /* for EnableInterrupts macro */</hidef.h>		hidef.h
2 #include "derivative.h" /* include peripheral declarations	*/	derivative.h
3		main(void) : void
6		
7		
8 void main (void) {		
10 /* include your code here */		
🖹 Problems 🗳 Console 🛛 🛛 🔳 🗰 🍇 🚔 🛃 🗐 🍘 🛃 🕇 🦉 🗸 😭	° 🗖 🔯 Debugger Shell 🖷 Progress 💣 Software	e Analysis 🛛 🗌 🗆
HCS08, QG4_Test.abs	Software Analysis	🛷 🕀 🖻 👪
	Name	Trace Timeline Critical Code Pe
	🖃 🗁 KL05z32_Test	
	KL05z32_Test_FLASH_USBDM	
	×	>





# 六、USBDM 用作编程器的方法

进行下一步之前,请确认你已经执行了第三部分的内容(配置板子上的跳线)。

USBDM 不仅能用作仿真器,也可以用作独立的编程器。以后烧程序不用再点"DEBUG"进行复杂的操作。

USBDM 自带多种芯片编程器,不同的编程器烧写不同的芯片,如下面的表格所示。

编程器	支持的具体型号
ARM Programmer	Kinetis L 系列、 Kinetis K 系列
ColdFire V1 Programmer	ColdFire V1 系列
HCS08 Programmer	HCS08 系列
HCS12 Programmer	HCS12 系列





现在,以ARM芯片为例,描述烧写过程:

#### 1、打开"程序 -> USBDM 4.10.5 -> ARM Programmer"



出现如下界面:



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Flash Programmer - ARM	🛛 🔀
USBDM Target Advanced	
USBDM-JS16-SWD_SER-0001	Detect
USBDM HCS08,HCS12,CFV1,ARM-SWD BDM	
Target Vdd Control	
€ Off € 3.3V € 5V	
🔲 Cycle target Vdd on reset	
Cycle target Vdd on connection problems	
Leave target powered on exit	
Connection control	
Automatically re-connect	
Connection Speed 2MHz	
BDM Firmware Ver 4.10.4	DLL Ver 4.10.5.0
	Close

"USBDM"选项卡,选项默认即可。

点"Target "选项卡,出现:



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Flash Programmer - ARM
USBDM Target Advanced
Flash Image Buffer
Load Hex Files Incremental Load 🔽 Auto Reload
No File Loaded
Device Selection
MKL05Z32M4    Detect Chip
Filter by chip ID (none)
Clock type and parameters
Clock Module Trim Frequency
External 🔽 🔽 0.00 kHz
Clock Module Address NVTRIM Address
0 (hex) 0 (hex)
Security  Image Secure Unsecure Smart  Device Operations  Erase Options  EraseMass  Image Enable Sounds Trim Value: - 0x??.?  Program Flash Verify Flash Load and Go
Close

点"Flash Image Buffer"里的"Load Hex Files"按钮,出现:



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Select Binary Fi	le to Load				? 🔀
查找范围(I):	🗀 FLASH		•	🗢 🗈 💣 🎟	
武最近的文档     「」	Project_Setting Sources KL05z32_Test	gs .elf			
"美国" 我的文档					
我的电脑					
网上邻居					
	文件名(M):	KL05z32_Test		•	打开(0)
	文件类型(II):	Binary Files (*. s19, *. s	x, *. afz	t,*.elf) ▼	取消

选择要烧写的文件,单击"打开",文件名出现在"Flash Image Buffer"底部:



在"Device Sellection"里选择芯片型号(本例中是

MKL05Z32)  $_{\circ}$ 

在"Security"选项卡里选加密类型,可以选"加密"、"不加密"、 "保留 Image 里的加密设置"。



上述设置完毕,单击"Device Opetions"里的"Program Flash" 按钮就可以进行芯片烧写,出现:

Accessing Target	
Mass Erasing Target	_
Elapsed time: 0:00:00	

烧完之后出现:

Program	mming Completed	×	
2	Programming and verification of the flash has completed successfully.		
Program another device?.			
	是(1) 否(1)		

如果继续烧写芯片,则需换上芯片,点"是(Y)"。

否则点"否(N)"即可。





# 七、USBDM 用来校准内部时钟

#### 进行下一步之前,请确认你已经执行了第三部分的内容(配置板子上)

#### 的跳线)。

该功能仅限8位单片机使用,32位单片机暂时不适用。

下面以 MC9S08QG4 为例说明:

打开 HCS08 programmer

Flash Programmer - HCS08	
USBDM Target Advanced	
Select BDM	
USBDM-JS16-SWD_SER-0001	Detect
USBDM HCS08, HCS12, CFV1, ARM-SWD BDM	
Target Vdd Control	
€ Off C 3,3V C 5V	
Cycle target Vdd on reset	
Cycle target Vdd on connection problems	
Leave target powered on exit	
Connection control	
Automatically re-connect	
Use RESET signal	
BDM Firmware Ver 4.10.4	DLL Ver 4.10.5.0
	Close

选择 Target 选项卡,



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Flash Programmer - HCS08	_ 🗆 🔀		
USBDM Target Advanced			
Flash Image Buffer			
Load Hex Files Incremental Load Auto Reloa	d		
No File Loaded			
Device Selection			
QG-MC9S08QG4    Detect Chip			
Filter by chip ID (none)			
Clock type and parameters			
Clock Module Trim Frequency			
S08ICSV1 0.00 kHz			
Clock Module Address NVTRIM Address			
38 (hex) FFAE (hex	)		
Security			
Device Operations			
Erase Options			
EraseMass 💌 🗆 Enable Sounds Trim Value: - 0x??.?			
Program Flash Verify Flash Load and G	0		
	Close		

点击 load hex files,选择我们要下载的文件。我的文件是 QG4\_LED.s19 在 Device selection 部分,选择我们的芯片,这里我选择 MC9S08QG4 在 clock type and parameters 部分,选中 Trim Frequency, Security 部分,由于我不对芯片加密进行设置,所以我选择 image. Erase Options 部分,选择 EraseMass.



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Flash Programmer - HCS08
USBDM Target Advanced
Flash Image Buffer
Load Hex Files Incremental Load Auto Reload
QG4_LED.s19
Device Selection
QG-MC9S08QG4
✓ Filter by chip ID (2009 )
Clock type and parameters
Clock Module Trim Frequency
S08ICSV1 🔽 🔀 31.25 kHz
Clock Module Address NVTRIM Address
38 (hex) FFAE (hex)
Security
Device Operations
Erase Options
EraseMass 💌 🗆 Enable Sounds Trim Value: - 0x??.?
Program Flash Verify Flash Load and Go
Close

最后,点击"Program Flash"。





八,常见故障

Q: 若过程中出现下面对话框,



A: 点"确定"擦除一下芯片。

目标失去连接
<ul> <li>调试器和远程系统"USBDM 统"USBDM K10X256"已经失去连接。</li> </ul>
您是否要重新连接?
○是
□超时(秒): 20
③否,停止调试会话
□ 为这个系统自动执行,不必再询问
确定

Q: 若过程中出现下面对话框,

A: 是 JTAG 排线接触不良,检查排线或必要时更换一条排线。





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A: 选的固件(firmware)与硬件(hardware)不一致。



A: 路径中有中文, USBDM 不支持中文路径。

	Programming Error	
	Programming of the target flash failed! Reason: Program data not within target Flash Memory	
Q:	( ) ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (	
	-Device Operations Free Options	
A:	挖除选项选的不对,选成 EraseNone 了,应该选	ass 💌





USBDM Connection Error	USBDM Connection Error	USBDM Connection Error
Failed to connect to target.	Failed to connect to target.	Failed to connect to target.
Reason: BDM has no connection to target	Reason: Target SYNC timeout	Reason: Target Vdd not present
Return to connection dialogue?	Return to connection dialogue?	Return to connection dialogue?
<u>Yes</u> <u>N</u> o	<u>Yes</u> <u>N</u> o	<u>Yes</u> <u>N</u> o

A:仿真器与目标板没连好,或目标板没电。如果确认连好且有电, 点"Retry"。如果目标板没有供电,可以点"Change Settings" 选择让仿真器给目标板供电。



A:当与目标板连接时,你可能看到"cycle the target power" 的提示。断电再重新上电,点"Yes"重试连接。此操作过程中 "BKGD"引脚保持低电平,该操作对 HCS08 系列单片机在某种 模式下不响应软件复位很有用。比如有可能空的芯片有看门狗复 位,或处理器时钟停止,还有可能是 BKGD 引脚被程序用作 GPIO。





2	Target Vdd suppl	y interrupted.
$\checkmark$	Please restore po	ower to the target.
	Retry connection	8
	Yes	No
_	······································	

A:当一开始连接时,可能提示给目标板供电,意思是说仿真器检测到目标板没有电源。

USBDM -	Target Connection Failure	×
2	Target Vdd supply interrupted.	
~	Please restore power to the target.	
	Retry connection?	
[	Yes No	
-	Sector Se	

A:该警告是说用仿真器给目标板供电时,负载太重,超出仿真器 供电能力,也可能是负载瞬间短路所致。仿真器检测到该情况会 停止对目标板供电直到重新进调试模式。