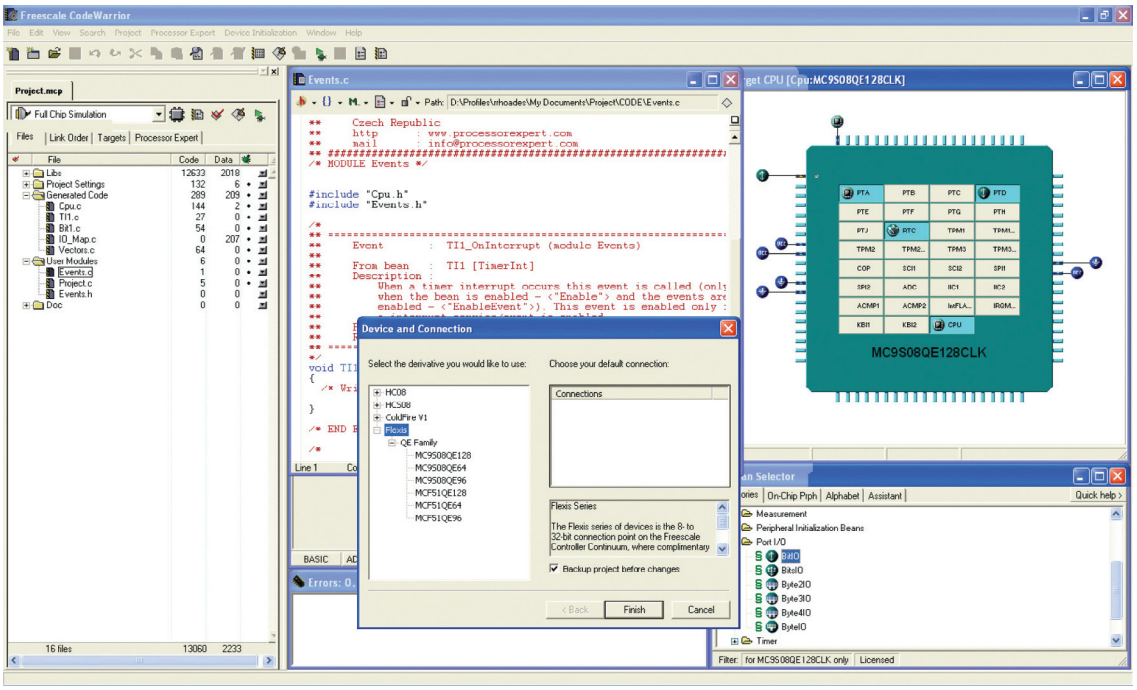
Controller Continuum

CodeWarrior™ Development Studio for Microcontrollers V6.3

Flexible Tools to Maximize Your Market Impact

Freescale's CodeWarrior™ Development Studio for Microcontrollers V6.3 is a single, integrated tool suite designed to get you on the design fast track with RS08, HC(S)08 and V1 ColdFire® members of the Freescale Controller Continuum. Whether your design is an 8-bit, entry-level application (e.g. smoke detector) or a 32-bit, high-end application (e.g. fire alarm control panel), CodeWarrior Development Studio for Microcontrollers provides optimized tools to take full advantage of the Freescale microcontroller you selected for your design.



Re-Target Your Application in Four Mouse Clicks

The award-winning CodeWarrior tool suite goes well beyond basic code generation and debugging—if market requirements change mid-project, the MCU Change Wizard allows you to re-target the project to a new microcontroller in as few as four mouse clicks. Simply select a new microcontroller (from the same or a different architecture—RS08, HC08, HCS08, or ColdFire V1), select the default connection and the CodeWarrior tool suite automatically reconfigures your project for the new microcontroller with the correct build tools (compiler, assembler, linker) and the appropriate support files (header files, libraries and linker files). For projects switching between 8-bit and 32-bit Flexis™ series microcontrollers this is the extent of the porting effort.

Porting Assistance at Your Fingertips

To move other 8-bit applications to V1 ColdFire a porting guide is provided, which details the differences between the architectures and the impact these differences have on software design. The V1 ColdFire compiler also flags code that needs to be manually inspected and ported (assembly code, interrupt service routines).

Easy Migration with Processor Expert™

If you use Processor Expert—a rapid application design tool integrated into the CodeWarrior tool suite—migrating between Freescale microcontrollers is a breeze. Just define the functionality you need for your application and Processor Expert generates tested, optimized C-code tuned for your application and the selected microcontroller. When you change the microcontroller with the MCU Change Wizard, Processor Expert maps the software and peripheral components that describe your application's functionality to the resources available on the new microcontroller. All you have to do is resolve any resource issues flagged by Processor Expert and you're finished.

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CodeWarrior Development Studio provides the capabilities required by every engineer in the development cycle: from board bring-up to firmware development to final application development.

Features	Benefit	Special Edition	Basic Edition	Standard Edition	Professional Edition
IDE					
Project Wizard	Gets you up and programming fast.	Yes	Yes	Yes	Yes
Program Manager	Eliminates confusing and often complex make-files with visual preference panels.				
• Projects		Unlimited	Unlimited	Unlimited	Unlimited
• Sub Projects		Yes	Yes	Yes	Yes
Build Tools					
Macro Assembler for HC(S)08, RS08 and V1 ColdFire® MCUs	For specific optimizations only you can provide.	Unlimited	Unlimited	Unlimited	Unlimited
Optimizing Compiler for HC(S)08, RS08 and V1 ColdFire MCUs	Reduces code size and maximizes the capabilities of the microcontroller to achieve top performance.	HC(S)08/RS08: C–32 KB, V1 ColdFire: C–64 KB	HC(S)08/RS08: C–64 KB, V1 ColdFire: C–128 KB	C–Unlimited	C–Unlimited C++–Unlimited
Libmaker	Allows reuse and maintenance of code through libraries.	Yes	Yes	Yes	Yes
Debug Tools					
Source-Level Debugger	Speeds debug cycles by viewing the source code as it executes.	ASM–Unlimited HC(S)08: C–32 KB V1 ColdFire: C–64 KB	ASM–Unlimited HC(S)08: C–64 KB V1 ColdFire: C–128 KB	ASM–Unlimited C–Unlimited	ASM–Unlimited C–Unlimited C++–Unlimited
Flash Programming	Fully integrated flash programming improves the build-debug cycle because it automates your downloads.	Yes	Yes	Yes	Yes
Simulator	Reduces costs and eliminates possible hardware issues during development.	Yes	Yes	Yes	Yes
Decoder	Allows you create listings of ELF files.	Yes	Yes	Yes	Yes
Data Visualization and I/O Stimulation	Lets you see how your program effects peripherals and responds to outside input.	One Component/ Three Elements	One Component/ Three Elements	Unlimited	Unlimited
OSEK Awareness	Ready to work with OSEK, for RTOS-aware debug capabilities.				Yes
Session Record and Play	Automates repetitive debug cycles during program validation.				Yes
Advanced Tools					
Device Initialization for HC(S)08/RS08 and V1 ColdFire MCUs	Allows you to graphically set up the CPU peripheral registers and generate initialization code (ASM or C) tailored to your application.	Yes	Yes	Yes	Yes
Processor Expert™ for HC(S)08 and V1 ColdFire MCUs	Abstracts the hardware layer and generates optimized, microcontroller-specific code (C) tailored to your application, so you can concentrate on design.				
• Basic Beans		Yes	Yes	Yes	Yes
• Software Beans				Yes	Yes
• Advanced Beans					Yes
Bean Wizard	Allows you to create reusable software components, which can be easily retargeted to any Freescale hybrid, HC(S)08 or HC(S)12 microcontroller.				Yes
Profile Analysis and Code Coverage	Gives you visibility into your running program to allow fine tuning and better quality metrics.				Yes
PC-Lint Plug-In	Ensures compliance with MISRA and other code quality and style guidelines.				Yes

Service Packs, which add support for new devices, are also available at **www.freescale.com/codewarrior/downloads**.

Build System

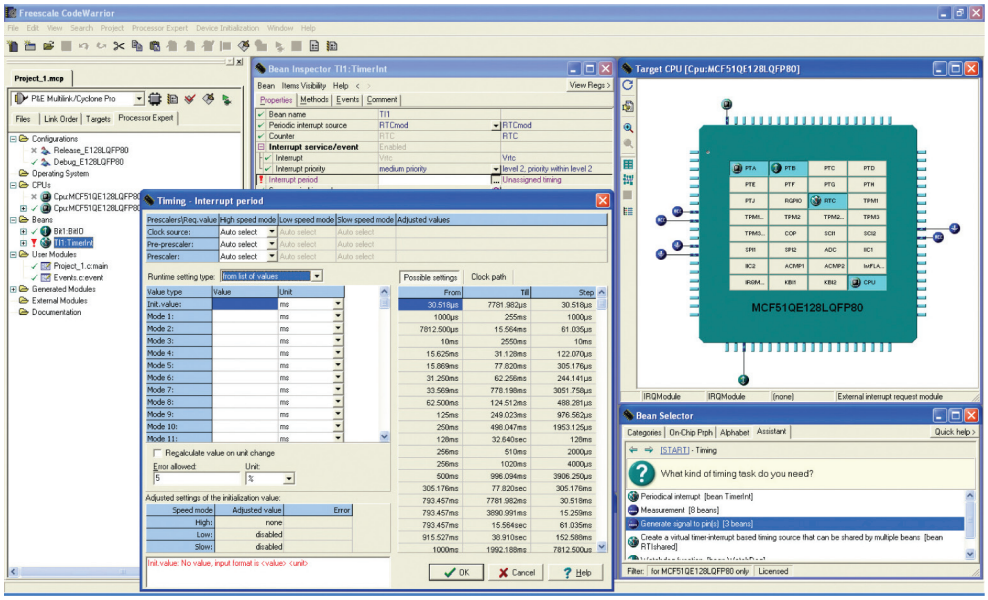
The CodeWarrior build system helps you develop applications with the smallest code size and fastest execution time. The build system for HC(S)08 and ColdFire have been in production devices for well over 15 years—they represent the robust, reliable tools you can trust will come from Freescale. Primary features include:

- Optimizing ANSI C compilers for HC(S)08, RS08 and V1 ColdFire that:
  - Operate off a standard front-end for consistent syntax
  - Generate standard ELF/DWARF files for execution and debugging
  - Include ANSI C compatible standard libraries and compact runtime libraries
- Compiler provides HCS08 to V1 ColdFire migration assistance by automatically flagging code that needs to be manually inspected and/or ported
- HC(S)08 C++ compiler includes support for EC++ guidelines
- V1 ColdFire C++ compiler includes ISO C++ compatible standard libraries
- Macro assemblers for HC(S)08, RS08 and V1 ColdFire MCUs
- Linkers that dead-strip unused code for the optimal code size

Graphical Source-Level Debugger

The CodeWarrior tool suite includes a state-of-the-art source-level debugger with a wide array of sophisticated features that help you troubleshoot and repair your application faster. This common debugger gives you consistent debug tools for the Controller Continuum. The debugger provides the power you need with the simplicity of a Windows® based point-and-click environment for fast and easy execution. Key capabilities include:

- C and assembly source code windows provide debug support for RS08, HC08, HCS08 and V1 ColdFire processors
- Precise breakpoints help solve sophisticated problems
- Complex, emulator-like debug capability using HCS08 and V1 ColdFire on-chip trace features
- Graphical display of data values, complex data structures and expressions to speed run-time analysis, without stopping or single stepping the processor



- Detailed information on every aspect of your project: break points, watch points, stack, symbol table, pending events, pending exceptions and I/O registers
- Full-chip simulation for most HC(S)08, RS08 and V1 ColdFire microcontrollers including CPU instruction set, peripherals, interrupts and I/O
- Support for kernel aware debugging
- Fast flash programming support:
  - HC08: Via MON08
  - HCS08, RS08, V1 ColdFire: Via BDM
- Ability to preserve a memory range during programming
- Ability to program user-selectable TRIM values
- Support for open-source BDM connection interfaces
- Support for P&E Microcomputer Systems' Cyclone Pro stand-alone programmer and multi-link hardware interfaces
- Support for SofTec Microsystems' FlashRunner stand-alone programmer and inDART-one hardware interface

Processor Expert

Processor Expert is a rapid application design tool that combines easy-to-use component-based application creation with an expert knowledge system. CPU, on-chip peripherals, external peripherals and software functionality are encapsulated into components called embedded beans. You tailor each component's functionality to fit your application requirements by modifying the component's properties, methods and events. When you build the project, Processor Expert automatically generates highly optimized embedded C-code and places the source files into your project.

Endless troubleshooting cycles are a thing of the past. Processor Expert's knowledge base only provides valid choices and immediately flags potential resource conflicts (e.g. pin muxing, invalid timer settings), allowing you to resolve the problems during the initial design phase.

Device Initialization

If you prefer a more hands-on approach to development, then the Device Initialization tool is for you. It provides a fast and easy way to configure and generate initialization code for HC08, HCS08, RS08 and V1 ColdFire microcontrollers. The Device Initialization tool contains only one set of beans: peripheral initialization beans.

You control how the generated code is added to your project. The Device Initialization tool can add the code directly to your project or it can create a separate text file—it's your choice. If you decide to create a separate text file, you can easily add the code to your project by cutting and pasting the code to an existing file in your project or adding the text file to your project.

Features

- New Project Wizard
- MCU Change Wizard
- Create single file assembly projects to complex C projects with multiple files
- Build system with optimizing C/C ++ compilers for HC(S)08, RS08 and V1 ColdFire MCUs
- Assembler (absolute, relocatable, mixed and in-line) for HC(S)08, RS08 and V1 ColdFire MCUs
- Graphical, source-level debugger
- HCS08 and V1 ColdFire on-chip trace support
- Flash programming support
- Full-chip simulation for HC(S)08, RS08 and V1 ColdFire MCUs
- Data visualization
- UNIS Device Initialization tool to generate HC(S)08, RS08 and V1 ColdFire CPU and peripheral initialization code
- UNIS Processor Expert with Bean Wizard and components for HC(S)08 and V1 ColdFire CPUs, on-chip peripherals, external peripherals and software algorithms
- Over 150 assembly and C example projects to use as templates for your next project
- Animated tutorials to give you a boost up the learning curve
- HCS08 to V1 ColdFire Porting Guide

Specifications

- IDE version: 5.9
- Host platforms: Microsoft® Windows XP/Vista
- Language support: Assembly, C/C ++
- Build tools output formats: ELF/DWARF 2.0, Hiware, Freescale S-Record, Intel® hex, binary
- RS08 device support: KA, KB, LA, LE
- HC08 device support: AB, AP, AS, AZ, BD, EY, GP, GR, GT, GZ, JB, JG, JK, JL, JW, KX, LB, LD, LJ, LK, MR, QB, QC, QL, QT, QY, RF, SR families
- HCS08 device support: AC, AW, DE, DN, DV, DZ, EL, EN, FL, GB, GT, JM, JR, JS, LC, LG, LL, MP, MPXY, QA, QB, QD, QE, QG, QT, RC, RD, RE, RG, SC, SE, SG, SH, SL, SV families
- V1 ColdFire device support: AC, CN, EM, JM, QE
- Board support: FSICE, DEMOAC128KIT, DEMO51AC256KIT, DEMOJM, DEMOQE128, DEMO908AP64, DEMO9S08FL16, DEMO908GZ60, DEMO908JL16, DEMO908LB8, DEMO908QB8, DEMO908QC16, DEMO9S08AW60, DEMO9S08JM16, DEMO9S08JS16, DEMO9S08LC60, DEMO9S08LG32, DEMO9S08LL16, DEMO9S08MP16, DEMO9S08QB8, DEMO9S08QE8, DEMO9S08QE32, DEMO9S08QG8, DEMO9S08SC4, DEMO9S08SE8, DEMO9S08SG32, DEMO9S08SH8, DEMO9S08SH32, DEMO9S08SV16, DEMO9RS08KA2, DEMO9RS08KA8, DEMO9RS08KB12, DEMO9RS08LA8, DEMO9RS08LE4, DEMOEM, EVBQE128, EVB9S08DZ60, EVB51JM128, TWR-MCF51CN, USBSPYDER08
- Host target interfaces: HCS08 Open-source BDM (based on HC9S08JB16 platform), HCS08 FSL Open Source BDM (based on HC9S08JM60 platform), CFV1 FSL Open Source BDM (based on HC9S08JM60 platform), USB inDART (SofTec Microsystems) Cyclone Pro, MON08 Multilink, USB MON08 Multilink, USB BDM Multilink (P&E Microsystems) System

Requirements

- 1.0 GHz Pentium® compatible processor or better
- Microsoft Windows XP/Vista
- 512 MB RAM (1 GB recommended)
- 2 GB hard disk space, 400 MB on Windows system disk
- CD-ROM drive for installation
- USB port for communications with target hardware
- Ethernet port for communications with target hardware (optional)

Support Policy

- Online help and documentation
- Includes 12-month technical support
- Free 30-day evaluation license available

CodeWarrior Development Studio for Microcontrollers is included in the CodeWarrior Development Tool Suites. To order the product, select the part number for the CodeWarrior Development Tool Suite that meets your needs.

Special Suite—CodeWarrior for Microcontrollers, Special Edition	
Special Edition	CWX-HXX-SE
Basic Suite—C Compiler Upgrade	
Perpetual	**$995**
• Node Locked	CWP-BASIC-NL
• Floating	CWP-BASIC-FL
• Tech Support *After first year*	CWT-BASIC $195
Annual Subscription	**$395**
• Node Locked	CWA-BASIC-NL
• Floating	CWA-BASIC-FL
Standard Suite—CodeWarrior for Microcontrollers, Standard Edition	
Perpetual	**$2495**
• Node Locked	CWP-STANDARD-NL
• Floating	CWP-STANDARD-FL
• Tech Support *After first year*	CWT-STANDARD $495
Annual Subscription	**$995**
• Node Locked	CWA-STANDARD-NL
• Floating	CWA-STANDARD-FL
Professional Suite—CodeWarrior for Microcontrollers, Professional Edition	
Perpetual	**$4995**
• Node Locked	CWP-PRO-NL
• Floating	CWP-PRO-FL
• Tech Support *After first year*	CWT-PRO $995
Annual Subscription	**$1995**
• Node Locked	CWA-PRO-NL
• Floating	CWA-PRO-FL

Contact your local Freescale representative for more information.

Fast Track™

Learn More:

For current information on Flexis™ series microcontrollers, please visit **www.freescale.com/flexis**.

You can also find more information about Fast Track, Freescale's online support services center, at **www.freescale.com/fasttrack**.

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