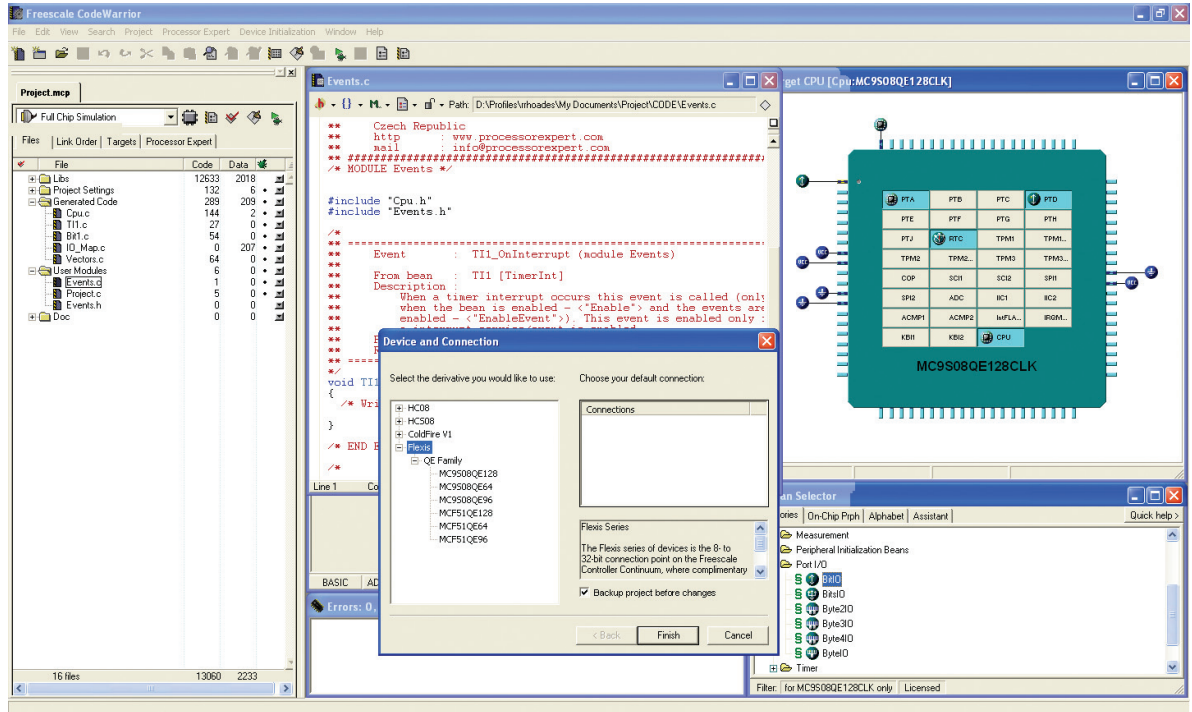# CodeWarrior™ Development Studio

for Microcontrollers v6.0

Flexible tools to maximize your market impact

Freescale's CodeWarrior™ Development Studio for Microcontrollers v6.0 is a single, integrated tool suite designed to get you on the design fast track with RS08, HC(S)08 and ColdFire V1 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 4 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. You 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 ColdFire V1 a porting guide is provided, which details the differences between the architectures and the impact these differences have on software design. The ColdFire V1 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.

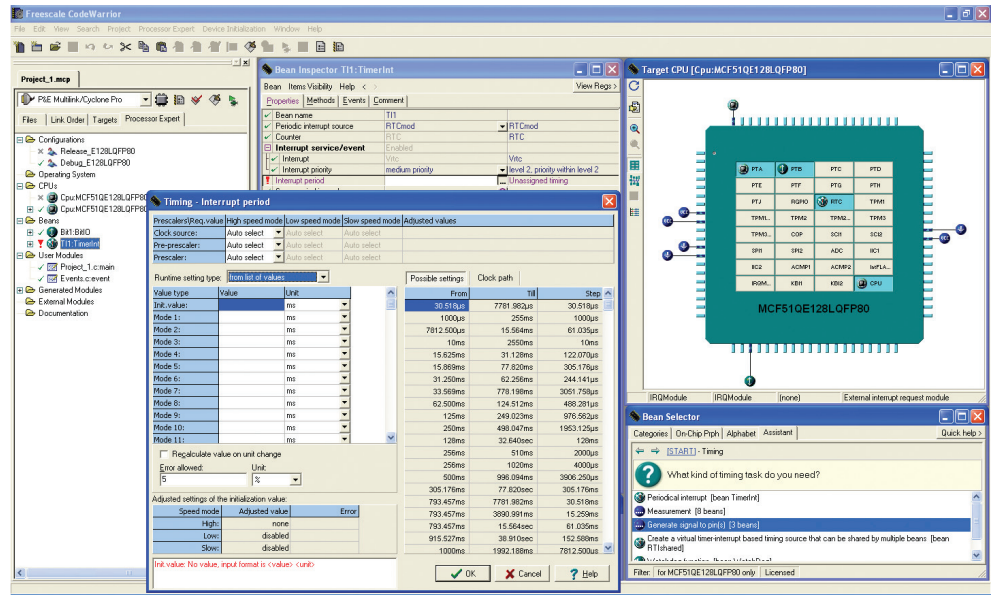| Feature	Benefit	Special Edition	Standard Edition	Professional Edition
IDE				
Project Wizard	Gets you up and programming fast.	Yes	Yes	Yes
Program Manager • Projects • Sub Projects	Eliminates confusing and often complex make-files with visual preference panels.	Unlimited Yes	Unlimited Yes	Unlimited Yes
Build Tools				
Macro Assembler for HC(S)08, RS08 and ColdFire V1 MCUs	For specific optimizations only you can provide.	Unlimited	Unlimited	Unlimited
Optimizing Compiler for HC(S)08 and ColdFire V1 MCUs	Reduces code size and maximizes the capabilities of the microcontroller to achieve top performance.	HC(S)08: C – 32K ColdFire V1: C – 64K	C – Unlimited	C – Unlimited C++ – Unlimited
Libmaker	Allows reuse and maintenance of code through libraries.	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 – 32K ColdFire V1: C – 64K	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
Simulator	Reduces costs and eliminates possible hardware issues during development.	Yes	Yes	Yes
Decoder	Allows you create listings of ELF files.	Yes	Yes	Yes
Data Visualization and I/O Stimulation	Let's you see how your program effects peripherals and responds to outside input.	1 components/ 3 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 ColdFire V1 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
Processor Expert for HC(S)08 and ColdFire V1 MCUs > Basic Beans > Software Beans > Advanced Beans	Abstracts the hardware layer and generates optimized, microcontroller-specific code (C) tailored to your application, so you can concentrate on design.	Yes	Yes Yes	Yes Yes 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

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 and ColdFire V1 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 ColdFire V1 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.
- ColdFire V1 C++ compiler includes ISO C++ compatible standard libraries.
- Macro assemblers for HC(S)08, RS08 and ColdFire V1 MCUs
- Linkers that dead-strip unused code for the optimal code size.

Graphical Source-Level Debugger

The CodeWarrior tool suite includes a state-of-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 ColdFire v1 processors
- Precise breakpoints help solve sophisticated problems
- Complex, emulator-like debug capability using HCS08 and ColdFire V1 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 and RS08 microcontrollers including CPU instruction set, peripherals, interrupts and I/O
- Support for kernel aware debugging
- Fast Flash programming support:
  - HC08: Via MON08
  - HCS08, RS08, ColdFire V1: 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 standalone programmer and Multilink hardware interfaces
- Support for SofTec Microsystems' FlashRunner standalone 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 ColdFire V1 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 and ColdFire V1 MCUs
- Assembler (absolute, relocatable, mixed and in-line) for HC(S)08, RS08 and ColdFire V1 MCUs
- Graphical, source-level debugger
- HCS08 and ColdFire V1 on-chip trace support
- Flash programming support
- Full-chip simulation for HC(S)08 and RS08 MCUs
- Data visualization
- UNIS Device Initialization tool to generate HC(S)08, RS08 and ColdFire V1 CPU and peripheral initialization code
- UNIS Processor Expert™ with Bean Wizard™ and components for HC(S)08 and ColdFire V1 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 ColdFire V1 Porting Guide

Specifications

- IDE version: 5.7
- Host platforms: Microsoft® Windows XP/2000/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
- 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: AW, DE, DN, DV, DZ, EN GB, GT, JR, LC, RC, RD, RE, RG, QD, QE, QG, QT families
- ColdFire V1 device support: QE
- Board support: FSICE, EVBQE128, DEMO-QE128
- Host target interfaces:
  - Open Soure BDM connections
  - 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 2000/XP/Vista
- 512 MB RAM (1 GB recommended)
- At least 700 MB hard disk space
- CD-ROM drive for installation
- USB port for communications with target hardware
- (optional) Ethernet port for communications with target hardware

Support Policy

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

Part Numbers	
Products	**Part#**
CodeWarrior for Microcontrollers, Standard Edition	CWS-H08-STDED-CX
CodeWarrior for Microcontrollers, Professional Edition	CWS-H08-PROED-CX
Support	
CodeWarrior for Microcontrollers, Standard Edition	CWT-H08-STDED-TX
CodeWarrior for Microcontrollers, Professional Edition	CWT-H08-PROED-TX
Upgrades	
C Compiler Upgrade for Special Edition	CWS-H08-CUPG-CX
Microcontollers Upgrade to Standard Edition	CWX-H08-STDED-UX
Microcontrollers Upgrade Standard to Professional Edition	CWX-H08-PROED-UX

Contact your local Freescale representative for more information.

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**.