Release Notes

CodeWarrior™ Development Studio for Microcontrollers V10.0

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1. Product Overview

CodeWarrior for Microcontrollers v10.0 is a major new release of CodeWarrior Development Studio. It integrates the development tools for the RS08, HCS08 and ColdFire® architectures into a single product based on the Eclipse open development platform. Eclipse offers an excellent framework for building software development environments and is becoming a standard framework used by many embedded software vendors. The product features include the following:

1.1 IDE

- Eclipse IDE 3.4
- New Project Wizard to create a new project in as few as 6 clicks
- MCU Change Wizard to retarget a project to a new device in as few as 6 clicks

1.2 Build Tools

- Optimizing ANSI C compilers for HCS08, RS08 and 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
- HCS08 C++ compiler includes support for EC++ guidelines
- ColdFire Embedded Warrior Libraries provide scalable C/C++ standard libraries and a librarian with a simple interface to select functionality
- Macro assemblers for HCS08, RS08 and ColdFire derivativess
- Linkers that dead-strip unused code for the optimal code size

1.3 Debugger

- C and assembly source code windows provide debug support for HCS08, RS08, and ColdFire derivatives
- Precise breakpoints help solve sophisticated problems
- Complex, emulator-like debug capability using HCS08 and V1 ColdFire on-chip trace features
- 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
- Full-chip simulation for most HCS08 and RS08 microcontrollers including CPU instruction set, peripherals, interrupts and I/O
- Kernel-aware debugging with OSEK, MQX* or Linux real-time operating systems
- Fast flash programming support
- Support for open-source BDM connection interfaces
- Support for CodeWarrior USB TAP and CodeWarrior Ethernet TAP connection interfaces
- Support for P&E Microcomputer Systems' Cyclone Pro/Max stand-alone programmers and Multilink hardware interfaces (Rev C or later)
- Ability to program user-selectable TRIM values with P&E Microcomputer Systems' Multililnk and Cyclone Pro connection interfaces
- Ability to download a binary file (S12, BIN or ELF) to a target without a project.
- Support for multi-chip debugging by providing the ability to connect to multiple devices on a board.

- Project import utility to import projects created with CW MCU v6.x. and CW CF v7.x
- Scripting capability (TCL, PERL, COMM) for stand-alone, command-line debugging
- SDK explains how to create custom flash programming files for on-chip memory.

* Available as a separate download.

1.4 Software Analysis

- Display trace in a dedicated Trace Viewer, with: address, assembly, source code, function, raw bytes, corresponding target FIFO entry
- Display the trace flow within a dedicated timeline view; ability to zoom in/out, scroll, synchronize to trace
- Display the profile and coverage information in a dedicated Critical Code viewer, with: assembly/source/mixed modes; statistics per functions, per assembly and per source line; code coverage, number of passes, code size
- Ability to set start/stop trace points in Source, Assembly, Variables and Memory windows
- Support overwrite and continuous trace modes
- Support expert settings mode
- Support sampling mode for CFv1
- Support data trace for both HCS08 and CFv1 targets
- Support start/stop/reset trace on demand during execution
- Support re-configure trace after execution starts

1.5 Processor Expert

- Processor Expert support for HCS08, RS08, and V1-V4 ColdFire derivatives.
- Device Initialization
- Component Wizard utility with support for any embedded components purchased for use with the CodeWarrior Classic
- Even though the CodeWarrior can be run on Linux, the current version of Processor Expert core still needs to be run in Windows environment. It's necessary to have a working windows CodeWarrior installation. There is also possibility to run Processor Expert core on Linux using "wine" (http://www.winehq.org/) For more details see:
  CodeWarrior documentation: CodeWarrior for Microcontrollers V10.0 Processor Expert Help > Introduction > Linux
  Web: http://www.winehq.org/

1.6 Documentation

CodeWarrior Development Studio for Microcontrollers V10.0 contains a significant amount of new documentation.

1.6.1 Getting Started

- Microcontrollers V10.x Getting Started Guide
- Quick Start for Microcontrollers V10.0
- Quick Start for CodeWarrior Project Importer
- Eclipse Quick Reference Card
- HCS08 Profiling and Analysis for Microcontrollers V10.0 Quick Start
- ColdFire V1 Profiling and Analysis for Microcontrollers V10.0 Quick Start

1.6.2 Users Guides

- Freescale Eclipse Extensions Guide

- Microcontrollers V10.x Targeting Manual
- HCS08 Build Tools Reference Manual for Microcontrollers V10.x
- RS08 Build Tools Reference Manual for Microcontrollers V10.x
- ColdFire Build Tools Reference Manual for Microcontrollers V10.x
- MISRA-C:2004 Compliance Exceptions for the HC(S)08, RS08 and ColdFire Libraries Reference Manual for Microcontrollers V10.x
- EWL C Reference Manual
- EWL C++ Reference Manual
- HCS08/RS08 Assembler Reference Manual for Microcontrollers V10.x
- ColdFire Assembler Reference Manual for Microcontrollers V10.x
- Profiling and Analysis User Guide for Microcontrollers V10.x
- USB TAP Probe Users Guide
- Ethernet TAP Probe Users Guide
- Open Source BDM-JM60 Users Guide
- Processor Expert User Manual
- Device Initialization User Manual
- Processor Expert Components

1.6.3 Application Notes

- AN3859 – Adding Device(s) to the CodeWarrior Flash Programmer for Microcontrollers V10.x
- AN3967 – How to Write Flash Programming Applets
- AN4104 – Converting ColdFire Projects to CodeWarrior Development Studio for Microcontrollers V10.x

1.6.4 Supporting Information

- Microcontrollers V10.x FAQ Guide

1.6.5 Cheat Sheets

- Microcontroller V10.x Specific
  - Building Library (HCS08)
  - Creating, Building and Debugging a Project
  - Creating New Project from Example Project
  - Changing P&E Connections Setting
  - Configuring Perspectives
  - Creating, Debugging, Collecting, and Viewing Data for the ColdFire V1 Target
  - Creating, Debugging, Collecting, and Viewing Data for the HCS08 Target
  - Debugging Projects in ROM
  - Debugging Project Using Command Line
  - Examples:Porting Classic IDE Projects to Eclipse
  - Importing and Debugging Externally Built Executable File
  - Using Memory View
  - Using Microcontrollers Change Wizard
  - Using Registers View
  - Working with Build Configurations
- Core (Common to other CodeWarrior products)
  - Importing Archive Files
  - Importing Break Points
  - Importing Classic CodeWarrior Projects
  - Importing Existing Projects into Workspace
  - Importing Preferences

- Importing Resources from Local File Systems
- Importing Team Project Set
- Making C/C++ the IDE's Default Perspective
- Using the Flash Programmer

2 System Requirements

2.1 Recommended Configuration

- 1.8 GHz Pentium® compatible processor or better
- Microsoft Windows XP/Vista
- 1 GB RAM
- 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)

2.2 Operational Minimum Configuration

- 1.4 GHz Pentium® compatible processor or better
- Microsoft Windows XP
- 512 MB RAM
- 1 GB hard disk space, 400 MB on Windows system disk
- CD-ROM drive for installation
- USB port for communications with target hardware

2.3 Host Operating System Support

- Microsoft® Windows XP 32-bit and 64-bit (Professional Edition)
- Microsoft Windows Vista® 32-bit and 64-bit (Home Premium Edition and Business Edition)
- Microsoft Windows 7 32-bit and 64-bit (Home Premium Edition and Professional Edition)
- Red Hat Enterprise Edition 5.2 (32-bit)

3 Product WEB page

CodeWarrior Development Studio for Microcontrollers v10.0 is available for download at http://www.freescale.com/cwmcu10. This web page also includes product information, task based videos and all related documentation.

4 Installation and Licensing

To install CodeWarrior Development Studio for Microcontrollers v10.0, double-click the installation package and a wizard will guide you through the installation process. For specific installation instructions on Linux, Windows Vista and Windows 7 systems, see Appendix C and Appendix D.

If you are installing the Special Edition, the Special Edition license is automatically installed with your product and you do not need to register it. This license allows you to develop projects with unlimited assembly code, up to 32KB of C code for HCS08/RS08 derivatives, up to 64KB of C code for V1 ColdFire derivatives and up to 128KB of C code for V2-V4 ColdFire derivatives.

If you are installing the Evaluation Edition, the Evaluation license is automatically installed with your product and you do not need to register it. This license allows you to develop projects as Professional Edition within the 30-day evaluation period. After 30 days, the license works as Special Edition license (free permanent, but feature limited) which supports unlimited assembly code, up to

32KB of C code for HCS08/RS08 derivatives, up to 64KB of C code for V1 ColdFire derivatives and up to 128KB of C code for V2-V4 ColdFire derivatives.

If you are installing the Basic, Standard, or Professional Editions, the Evaluation license will be installed with your product. You will need to register your product to receive the appropriate license file.

5 Technical Support

All CodeWarrior issues are tracked through Freescale's normal Service Request Process. To report feature requests (enhancements) or defects for CodeWarrior Development Studio for Microcontrollers v10.0, please submit a Service Request.

1. Go to http://www.freescale.com/support
2. Log in.
3. On the resulting MyFreescale page, click Enter a Service Request
4. Choose category Technical Request
5. Choose topic CodeWarrior
6. Click Continue.
7. Provide the required information. An attachment up to 10 MB may be attached to the SR. You may also specify email addresses of people you would like to keep notified on the progress of the SR. Separate multiple email addresses with commas.

    - **Type:** pick from Query (Question), Change Request (Enhancement) or Problem Report (Bug)
    - **Target:** specify the hardware microcontroller/microprocessor family involved
    - **Product:** CW for Microcontrollers
    - **Major:** 10
    - **Minor:** 0
    - **Priority:** choose from Normal, High, or Highest
    - **Subject:** be short and descriptive
    - **Description:** details about whatever it is you're filing the SR about

    Please note: The Product field must be set to CW for Microcontrollers. This will allow Freescale to find SRs related to this project very easily, report on them, and gather statistics on how the project is doing.

8. When finished, click Submit.

After Submit is selected, a confirmation page will be displayed with the SR number. You will also receive a confirming email sent to the address specified in your Freescale account.

Appendix A: Known issues and Workarounds

Issue ID	Description
Debugger	
MTWX31779	**Issue:** MCU Flash Programmer does not provide the ability to protect sections of memory. **Workaround:** Use restrict address range to protect memory sections. Ensure the sector that should be protected is outside the address range for programming. The Flash programmer will write only in the specified area
MTWX41032	**Issue:** Cannot connect to TWR-LL64 board with using OSBDM if target is in STOP mode **Workaround**: Add functionality to the application to exit STOP mode and to enter RUN mode, so OSBDM is able to connect (e.g. adding functionality to a button on the board to exit STOP mode)
MTWX41255	**Issue:** A breakpoint at the program entry point cannot be removed. **Workaround:** There are two possible workarounds: 1) Specify Stop on startup at program entry point instead of specifying the entry point in the "user specified field;" or 2) Remove the breakpoint using the Debugger Shell: bp #x off where x is the breakpoint ID (obtained by using the bp command)
MTWX41383	**Issue:** Thread stays in “stepping” state for ColdFire C++ class constructors **Workaround:** There are two possible workarounds: 1) Put a breakpoint on the first instruction from the constructor (where “step over” should get) and resume the target; or 2) Use “step into” from the beginning of the function to the first instruction.
MTWX41559	**Issue:** Debugger does not run correctly when a breakpoint or trigger is set **Workaround:** The Debugger and Software Analysis tools use the device’s resources (hardware breakpoints) to set breakpoints and triggers. Therefore, the limited resources on the target may not allow breakpoints to be active and executed in the debugger while trace is active.
IDE	
MTWX40228	**Issue**: A classic CodeWarrior project built in Windows and imported into Linux will not build correctly. **Workaround**: Ensure all filenames included in the project match exactly since Linux filenames are case sensitive. Change all backward slashes in the project build artifact settings to forward (‘/’) slashes to comply with the Linux host.
MTWX40447	**Issue:** No error message is displayed when a project is imported into an overlapping workspace location when “Copy project into workspace” is selected. **Workaround:** Do not check “Copy project into workspace”
MTWX41438	**Issue:** Syntax error is displayed in the editor for C++ files even though the HCS08 project built correctly **Workaround:** In the project properties, under the section "C/C++ General | File Types", add the following entry: Filename: *.h Description: C++ Header file

MTWX41674	**Issue:** Importing a classic CodeWarrior *text* based project is not possible. **Workaround:** The Project Importer does not import text based classic CodeWarrior projects (e.g. from CW for MCU 6.3 or CW for ColdFire 7.2). In order to import the project, open the project in the classic CodeWarrior product. Open the IDE General Preferences (menu Edit > Preferences) and deselect the option in General > IDE Extras > Use text based projects. Rebuild the project.
MTWX41677	**Issue:** Creation of a project inside the current workspace with 'use default location' checked results in an error. **Workaround:** Always check 'use default location' when a project is created inside the current workspace.
MTWX41724	**Issue:** Preprocess for S08/RS08 does not open output file. **Workaround:** Open the generated listing file (*.lst). The location/file name of the file is listed in the output window.
MTWX41902	**Issue:** The Activate button in the Help > Freescale Licenses dialog opens a dialog, but I don't know what to enter in the dialog. **Workaround:** No workaround. The Activate button is no longer needed as part of the WEB Licensing process for CodeWarrior so it should NOT be used.
MTWX42153	**Issue:** Switching the eclipse workspace in Linux, may not work correctly – the eclipse IDE does not restart automatically with the new workspace. **Workaround:** Restart the eclipse IDE with the new workspace.
MTWX42164	**Issue:** Using the device/connection wizard to retarget a Linux application project to a new device results in a Windows bare board project. **Workaround:** No workaround. The device/connection wizard can only be used with Windows bare board projects.
Build Tools	
MTWX40668	**Issue:** Not all HCS08 build tool options are present in the build tool settings **Workaround:** Launch the build tool binaries and use -h option to display all options. This information is also listed in the manual. Add the option manually to the options in the 'other options' field.
MTWX41972	**Issue:** CW MCU v10.0 reacts and refreshes slowly in the following situations: • Lots of projects are open in the workspace • A project includes several hundred files • A project includes files that are on a high latency file system **Workaround:** This is a known eclipse problem. To improve performance go to the menu in Window > Preferences > General > High Latency File System and disable one or more features to improve the editor performance.
Software Analysis	
MTWX40870	**Issue:** Trigger point B not hit as expected for "Instruction at Address A or at Address B is Executed" **Workaround:** Perform the following actions: [Precondition]: Debug session started. [Action]: Resume the target. [Event]: Target is suspended when trigger A is hit. [Action]: Perform a target step from the Debug View. [Event]: The target step is performed. [Action]: Resume the target. [Event]: Trigger B is hit and the target is suspended.
MTWX41259	**Issue:** Launching Eclipse is slow. **Workaround:** When Eclipse is first started the Software Analysis engine is initialized. After the initialization is finished Eclipse performance is no longer impacted. For large projects and big files, you might disable the eclipse indexer in the eclipse settings in

	the menu Window > Preferences > C++ > Indexer. Additionally close any not needed projects in the workspace.
MTWX41696	**Issue:** Cannot collect trace with #define TRACE_MODE TRACE_CONTINUOUS (trace user configuration) **Workaround:** This issue only appears if the trace debug block is controlled directly from application code. To collect trace in continuous mode on V1 ColdFire, use the configuration user interface for software analysis.
Processor Expert	
MTWX42165	**Issue:** If MCU Change Wizard is used to retarget a V1 ColdFire Processor Expert project to V2-V4 ColdFire device, the new project will not build due to incorrect build tool settings. **Workaround:** • Compiler Input Settings should not refer to the V1 ColdFire project path. If it exists, this path should be deleted. • All files in the Generated_Code folder should be deleted from the new project after project creation. Processor Expert will regenerate these files for the new device when Generate Code is selected.
Run Control	
MTWX38114	**Issue:** Conditional watchpoints do not work with an OSBDM connection. **Workaround:** No workaround. OSBDM does not support conditional watchpoints.
MTWX41634	**Issue:** Can't establish communication with the OSBDM on the TWR-CN128 REV B board. **Workaround:** CW MCU v10.0 needs the latest OSBDM firmware (B26 or later) on the board (e.g. TOWER boards), so the firmware may need to be updated. The firmware and instructions can be found in <installation_folder>\Drivers\osbdm-JM60. **Note:** OSBDM does not support connecting to a device in low power mode (e.g. STOP mode). OSBDM does not support connecting to or reprogramming a device that has flash blocks secured. To reprogram a secured device solder the BDM header on the board and program the device using an external BDM cable.
MTWX41833	**Issue:** Project Importer fails to import debug configuration for OSBDM connection from classic CW projects **Workaround:** CW MCU v10.0 does not support the older OSBDM connections based on the JB16 platform. These connections are called "HCS08 Open Source BDM" and "CF Open Source BDM" in the classic CW products.
Installer	
MTWX41724	**Issue:** It takes too long to uninstall CW MCU v10.0 on Linux. **Workaround:** After about 10 minutes, invoke xkill and point to the installer window. The uninstall process is complete at this point, but the installer does not close.
MTWX41994	**Issue:** A service pack cannot be installed for CW MCU v10.0 (Linux) in user mode. **Workaround:** Perform service pack installations as ROOT user.

Appendix B: Installing P&E Microcomputer Systems' USB drivers on a Linux system

To properly install P&E USB drivers to be on a Linux system, the user should verify the following requirements are satisfied before installation (either manually or via Codewarrior):

A. root access must be used during install.
B. kernel source must be included in the distribution (same version used to build the kernel).
C. GCC must be installed on the machine (same version as used to build the kernel).

See Section 2 for directions how to manually install the kernel source and GCC.

1. Determining whether the drivers have been installed properly

If driver installation fails, a warning message should be displayed during installation. The user can also look in the /usr/lib directory for the file libwdusb1002.so. If this file exists, driver installation was successful.

If the driver installation was unsuccessful, the drivers must be manually installed.

2. Manually installing GCC and kernel source on redhat 5

The same version of GCC, which was used to build the kernel, must be installed in the distribution. The same kernel source files, which were used to build the kernel, must also be installed (or at least the headers). The following steps demonstrate how to install the necessary resources on Red Hat 5 Enterprise Edition (32-bit).*

A. Open a console (terminal) window and use the 'su' command to enter root mode

B. Use the 'cat /proc/version' command to display the kernel version number and the GCC version number used to build the kernel.

C. Use the 'yum list gcc' command to display the version number of GCC in the yum repository. If it matches the version used to build the kernel, install it with the 'yum install gcc' command. Otherwise, download and install the appropriate GCC version from an on-line repository.

D. Use the 'yum list kernel-devel' command display the version number of the kernel source files in the yum repository. If it matches the kernel version number, install it with the 'yum install kernel-version' command. Otherwise, download and install the source from an on-line repository.

E. Change directory to the distribution source directory with the 'cd /usr/src' command.

F. Create a symbolic link which points to the source for this kernel. This is done by first using the 'ls kernels' command while in the /usr/src directory. This will display the version of source installed, such as 2.6.18-128.2.1.el5-i686. create the symbolic link with the command 'ln -s kernels/2.6.18-128.2.1.el5-i686 linux' where the version number of the kernel source would be replaced with the appropriate version number listed by the previous command.

For information about the driver installation requirements visit Jungo's website at:
http://www.jungo.com/st/support/installation_instructions.html

3. Manually installing the Jungo USB driver on redhat 5

After making sure that GCC and kernel source have been installed, the Jungo driver should be rebuilt/installed. The following are directions for doing this on redhat 5.

A. Open a console (terminal) window and use the 'su' command to enter root mode

B. If codewarrior has not been installed, install it. This should install the Jungo USB driver (see section 2 to determine if it has been properly installed).

C. To re-install the Jungo USB driver, change the console directory to the [CodewarriorInstallDir]/Drivers/pemicro. Run the driver build script by using the 'sh setup.sh' command. This will indicate success or failure.

* There are many ways to install the kernel source and GCC, and the methodology is different based on the distribution used.

Appendix C: CodeWarrior Eclipse usage on a Linux system

1. The CodeWarrior installer must be run from a root account. CodeWarrior service packs are installed with the Eclipse Updater. The updater must also be run from a root account. To start the Eclipse Updater select 'Window > Install new software' in the menu.

2. Eclipse needs read/write access to the installation folder. Make sure the eclipse installation folder has the appropriate permissions for all users.

3. Make sure your project workspace has read and write permissions.

4. If the CodeWarrior software does not restart automatically after a successful CodeWarrior update operation, run './cwide –clean' to launch the CodeWarrior software.

Appendix D: CodeWarrior Eclipse usage on a Windows Vista / Windows 7 system

1. Administrator rights are required to install CodeWarrior software on Microsoft Windows Vista and Windows 7 systems, since the installer copies files into the System and Program Files folders.

   The default CodeWarrior installation folder is C:\Program Files\Freescale\CW MCU v10.0. To protect against malware, Windows Vista and Windows 7 do not allow normal processes to change files in the Program Files folder; therefore, you must have administrator rights to install and run the CodeWarrior software from this location. If you will be running the CodeWarrior software with a non-administrative user account, then you need to install the CodeWarrior software in another folder (e.g. C:\Freescale\CW MCU v10.0).

2. Your project workspace needs to be setup in any folder that you can fully access.