

CodeWarrior™ Development Studio for Microcontrollers v11.1

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1. What's New

CodeWarrior for Microcontrollers v11.1 integrates the development tools for the ColdFire®, ColdFire+, DSC, Kinetis, Qorivva, RS08, S08 and S12Z architectures into a single product based on the Eclipse open development platform. Eclipse offers an excellent framework for building software development environments and is a standard framework used by many embedded software vendors.

1.1. General

1.1.1. Features

- Latest versions of P&E run-control are included
- Added latest firmware support for the following P&E Hardware Interfaces:
 - Cyclone Universal and Cyclone Universal FX
 - Multilink Universal FX firmwares

1.1.2. Bug Fixes

- [CMPGCCARM-95] crcgen utility now able to use the LMA rather than the VMA to match segments.

1.2. ColdFire/ColdFire+

No update

1.3. Digital Signal Controller (DSC)

1.3.1. Features

- Added standalone 56800E Flash Programmer tool located at <CW11>\MCU\M56800x Support\56800E flash programmer. The tool allows basic flash operations and programming of s-record and .elf file formats for MC56F8xxx family.
- Removed code size limitation for the Special edition for compiler and debugger
- Compiler optimization improvements – for details please refer to <install dir>\MCU\Release_Notes\56800_E_Notes\Compiler_Notes
- New optimization options added for compiler:
 - added support for tail call optimization
Feature is controlled by "-[no]tailcall". Enabled by default.
 - added support for BraD (branch with delay machine instruction)
Feature is controlled by "-[no]brad". Enabled by default.
 - added support for JmpD (jump with delay machine instruction)
Feature is controlled by "-[no]jmpd". Enabled by default.
 - added support for RtsD (return with delay machine instruction)
Feature is controlled by "-[no]rtsd". Enabled by default.
 - added support for loop unrolling in the backend.
Feature is controlled by "-[no]unroll". Enabled by default.
 - added support for branch to epilogue
Feature is controlled by "-[no]bratorts". Enabled by default.
 - added support for Tcc machine instruction
Feature is controlled by "-[no]tcc". Enabled by default.
 - added support for basic block reordering
Feature is controlled by "-[no]bbreorder". Enabled by default.
 - added binary flash image file generation
Feature is controlled by "-bin". Disabled by default.
 - added support for live range splitting.
Feature is controlled by "-[no]lrsplit". Enabled by default.
 - new pragma added to control the HWL support
#pragma allowHWL <no_nested, nested, off, reset>
- Binary flash image generation supported by linker
- DSC Compiler project properties page on tab "Processor" now allow to choose Small, Large (default) and Huge Program Model.

1.3.2. Bug Fixes

- [CMPLG-163] Bug fixed in DSC core simulator to support addressing above 0xffff program space.
- [CMPLG-164]: SP save/restore chain is broken when function does no return (e.g. while(1){}) and thus no epilogue is generated. Added a new command line option: genepiloguealways to force epilogue generation. Disabled by default.
- [CMPLG-138]: if the "-sprog" option is used but the absolute address to be loaded is larger than 16b we still have to use "move.l #addr, reg" to load the absolute address.
- [CWM-278] DSC wizard now point to correct libraries build for Large Program Model

1.4. Kinetis

No update

1.5. Qorivva

No update

1.6. RS08/S08

1.6.1. Features

- HCS08QL Family added with HCS08QL8/HCS08QL4
- HCS08PL60/16/32/4 updated, HCS08PL2 removed and Processor Expert support removed
- HCS08SD8 updated

1.7. S12Z

1.7.1. Bug Fixes

- CMPLG-85 - fixed an alignment issue added with the changes that were made for CW 11.0 (where "aligned" attribute was not generating the expected alignment)
- fixed compiler issue related to handling of zero-initialized absolute variables (where absolute variables were not zeroed-out, even if the user was explicitly initializing them with zero)

1.8. Component Development Environment (CDE)

No update

2. System Requirements

2.1. Recommended Configuration

- 2.6GHz Pentium® compatible processor or better
- 4GB RAM
- 20GB (When installing full product or updates for all architectures)
- 400MB on Windows system disk
- DVD drive for installation
- USB port for communications with target hardware
- Ethernet port for communications with target hardware (optional)

2.2. Operational Minimum Configuration

- 1.8GHz Pentium® compatible processor or better
- 2GB RAM
- 20GB (When installing full product or updates for all architectures)
- 400MB on Windows system disk
- DVD 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 7 32-bit and 64-bit (Home Premium Edition and Professional Edition)
- Microsoft Windows 8 32-bit and 64-bit (Home Premium Edition and Professional Edition)
- Microsoft Windows 8.1 32-bit and 64-bit (Home Premium Edition and Professional Edition)
- Microsoft Windows 10 32-bit and 64-bit (Home Premium Edition and Professional Edition)

3. Product WEB page

CodeWarrior Development Studio for Microcontrollers v11.1 is available for download at <http://www.nxp.com/cwmcu11>.

4. Installation and Licensing

To install CodeWarrior Development Studio for Microcontrollers v11.1, choose the download option that meets your needs.

The online installer package contains the CW MCU v11.1 core tools and an installer, which assumes your computer has internet access. During the installation process the core tools will be installed and you will be asked to select the Freescale architecture support you want installed. The installer will automatically access the internet, download the necessary archives and install them in your CodeWarrior directory.

The offline installer package contains the complete CW MCU v11.1 tool suite and an installer, which assumes your computer does NOT have internet access. All data needed by the installer will be downloaded and no other download will be performed. Double-click the installation package and a wizard will guide you through the installation process.

An 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 during the evaluation period. After 30 days, the license works as a Special Edition license (free, permanent, but feature limited) which supports unlimited assembly code, up to 64KB of C code for S08/RS08, V1 ColdFire/ColdFire+, Kinetis L Series derivatives; up to 128KB of C code for V2-V4 ColdFire, S12Z, and Kinetis K Series derivatives; and up to 512KB of C code for Qorivva derivatives. There is no code size limitation for DSC derivatives.

New functionality including support for new devices and other FSL architectures can be added to CodeWarrior Development Studio for Microcontrollers v11.1 (CW MCU v11.1) with archives, service packs, updates and patches. Archives add support for other FSL architectures. Service packs add specific support for new devices. Updates and patches correct software defects and add general functionality affecting more than one device family.

New support can be added directly from the Internet or from a downloaded archive. If your computer is connected to the Internet, select Install New Software in the Help Menu and all available updates will be displayed. If your computer does not have Internet access, you can download the archive that contains the service pack, update or patch you need from CW MCU v11.1 Update & Patches and follow the Service Pack Updater procedure posted on the site.

NOTE:

Before installing archives, updates, service packs or patches, select Restart in the File menu to perform a CodeWarrior restart. This will ensure all processes (e.g. debugger shell) are closed. CodeWarrior should NOT be used during the installation process.

5. Technical Support

All CodeWarrior issues are tracked through the CodeWarrior Public NXP Community space:
<https://community.nxp.com/community/codewarrior/cw-mcu>.

**CodeWarrior™ Development Studio
for Microcontrollers v11.1
Release Notes, Rev. 1.0, 12/2018**

For confidential cases and cases which cannot be publicly shared on NXP Community please follow the steps described here:

<https://community.nxp.com/docs/DOC-329745>

Appendix A. Known issues and Workarounds

Issue ID	Description
General	
ENGR00265598	<p>Description: When using "call by return" mechanism for calling functions in Performance View, a function will appear as if it has no children, and all its children will appear to be called from the function's parent.</p> <p>Workaround: None</p>
ENGR00285343	<p>Description: Duplicate global variables are shown in the Variable View.</p> <p>Workaround: Use "Remove Global Variables" command to clean the Variable View and then add the required global variable(s) again.</p>
ENGR00300203	<p>Description: Disassembly View is empty when a breakpoint is set in Outline View and the Disassembly View is no active when the breakpoint is hit.</p> <p>Workaround: Use the "Link with Active Debug Context" button to refresh the Disassembly View. Uncheck it and then check it again. The Disassembly View will be refreshed.</p>
ENGR00299517	<p>Description: The user component name in PEx project should be different than the name of the Eclipse project..</p> <p>Workaround: None.</p>
ENGR00337948	<p>Description: Adding a New Component Category doesn't work [CDE]. It's not possible to add a user category for component. If the File->New->Other->Component Development Environment->Category wizard is used to create a category, the new category does not appear in the CDE and is not available for selection..</p> <p>Workaround: Step 1: Add the category to the file located in CodeWarrior directory: {CW10.6}\MCU\ProcessorExpert\Config\CDE\categories.xml. Step 2: Restart CodeWarrior..</p>
ColdFire/ColdFire+	
ENGR00258435	<p>Description: Target Task flash programmer fails to calculate the correct number of sectors to erase before programming a MCF54418 external NAND flash.</p> <p>Workaround: Modify the Target Task to erase the correct number of sectors.</p>

ENGR00277322	<p>Description: If the "reset" button is selected during a ColdFire debug session using a USB TAP (as opposed to "terminating" the debug session), CodeWarrior will hang.</p> <p>Workaround: Terminate the DE.EXE program in the task manager.</p>
ENGR00328361	<p>Description: After enabling Processor Expert in the existing project, new project wizard doesn't remove cfm.c file. It causes a compilation error.</p> <p>Workaround: Remove Sources\cfm.c file in the project before or after enabling Processor Expert in the existing project..</p>
DSC	
ENGR00282103	<p>Description: CW MCU v10.4 DSC project using <code>-largeAddrInSdm</code> option will not build.</p> <p>Workaround: There is no support for <code>-largeAddrInSdm</code> option in project settings. The option can be specified on the "C/C++ Build->Settings->Tool Settings" panel of the "DSC Compiler/Language" page in the field "Other Flags".</p>
ENGR00287718	<p>Description: Processor Expert validation rejects valid configurations of DSC peripheral cross bar.</p> <p>Workaround: Use PESL macros instead of init components (Init_ENC and Init_AOI) or use ConnectPin method instead of high level and init components (QuadratureEncoder and Init_AOI). QuadratureEncoder must be configured for pin sharing.</p>
ENGR00299457	<p>Description: Problem with breakpoints when debugging with USBTAP.</p> <p>Workaround: The issue occurs when a short watchdog period is specified. The watchdog should be disabled during debugging.</p>
ENGR00299753	<p>Description: Unable to fill the DSC unused memory space with data 0x00.</p> <p>Workaround: None. INITVAL representing the link-time initialization value to be used for watermarking a memory segment in a linker command file does not work for zero input.</p>
ENGR00329421	<p>Description: Processor Expert cannot detect name conflict between component name and PESL module name..</p> <p>Workaround: Do not use following names for component: ADC, ADC_SAR, AOI, CAN, CMP, COP, CRC, DAC, DECODER, DMA, EWM, FCAN, FCANMB, FLASH, FMC, FTFL, GPIO, HI8, HSCMP, I2C, INTC, LVI, MCM, MSCAN, MSCANMB, OCCS, PDB, periph, PESLlib, PGA, PIT, PMC, PWM, QSCI, QSPI, QTIMER, REF, RTC, SCI, SEMI, SIM, SPI, SSI, SYS, TOD, TSENSOR and XBAR. Please note that Processor Expert may also cause such conflict. See option 'Set periph. Init</p>

	component name as peripheral'..
CWM-61	<p>Description: No power cycle dialog popped out when USBTAP is used and "Wait for device to power up at connect" is checked</p> <p>Workaround: None available.</p>
CWM-60	<p>Description: BIN file can't be programmed into the chip properly when "Flash File To Target" tool is used.</p> <p>Workaround: During "Flash File to Target" check "Save as Target Task". Open saved Target Task (Menu "Open Flash Programmer"). Uncheck "Erase and Program" Operation for X_FLASH. This Target Task then should be used instead of "Flash File to Target".</p>
CMPLG-26	<p>Description: The compiler returns an error when 64-bit argument is used in asm function definition.</p> <p>Workaround: There is a compiler's limitation which expects that all the parameters of an assembly function to be in registers. The workaround for this is to only declare the assembly function in the c file in which it is used and define it in another file with no parameter. In its definition, you can assume that the int64 argument is passed on the stack</p>
CMPLG-23	<p>Description: Argument definition error in some integer division functions of intrinsics_56800E.h.</p> <p>Workaround: for __div_s4q_int the arguments are swapped, the arguments should be swapped in function call</p>
Kinetis	
ENGR00251403	<p>Description: Timestamps greater than zero are reported in Trace Data View when Timestamps are disabled for ITM trace. The development platform is a Tracelink connected to a K21DN512 board.</p> <p>Workaround: None. When timestamps are disabled, the timestamps in the Trace Data View should be zero.</p>
ENGR00284177	<p>Description: When an MQX project is edited to debug out of DDR on a TWR-K70 board, the debugger does not download the code to the external DDR memory.</p> <p>Workaround: None available.</p>
ENGR00291252	<p>Description: Fail to get trace data when using Tracelink after reset. The trace data shows "Trigger packet - ETB" with no other data showing.</p> <p>Workaround: Move trace viewer scroll bar up and down to refresh table content.</p>

ENGR00320744	<p>Description: DMATransfer_LDD component with MQX does not put the #include "mqx.h" into the generated code and _mem_free in Deinit() is referring to an undefined variable.</p> <p>Workaround: 1) stop code generation of DMATransfer_LDD component 2) add missing #include "mqx.h" 3) In DMAT1_Deinit() method delete ((DMAT1_TDeviceData *)DeviceDataPtr)->DescriptorPtr = NULL; 4) In DMAT1_Deinit() method replace _mem_free(DescriptorPtr) with _mem_free(((DMAT1_TDeviceData *)DeviceDataPtr)->DescriptorPtr);</p>
ENGR00349911	<p>Description: User can get the same 'conflicting types for ...' error on the same components functions when build the "build_wsd" lib of twrk60d100m; then under the bsp_twrk60n512, add the "ExInt_LDD" compnent; enable "GerVal" method and build project.</p> <p>Workaround: Add C preprocessor definition "bool=_Bool" in the GCC C Compiler settings - Define Symbols..</p>
Qorivva	
ENGR00260637, ENGR00274574	<p>Description: Software breakpoints do not work correctly on multi-core MPC56xx devices when a software breakpoint is set on one core while the other core is running. Due to software breakpoint corruption, the breakpoint on the running core is never activated. This only occurs when trying to debug two cores concurrently.</p> <p>Workaround: Use hardware breakpoints, which work without limitations, when debugging two cores concurrently. Use software breakpoints when debugging a single MPC56xx core.</p>
ENGR00284202	<p>Description: The PXMMU configurator plugin is unavailable for MPC567xK. The MMU configurator view does not show the MMU entries and complains that the MCU is not in the devices list.</p> <p>Workaround: None.</p>
ENGR00288114	<p>Description: Debugger stops at a breakpoint on a line that has already executed.</p> <p>Use Case: This issue may occur on E200 devices when the debugger is halted manually by the user at an assembly line just in front of the software breakpoint. During software breakpoint handling the PC is changed by an offset of 2 which is especially problematic if a software breakpoint is set within a tight loop.</p> <p>Workaround: Use hardware breakpoints which work without limitations.</p>

S12Z	
ENGR00296204	<p>Description: Debugger Register View missing CPMUCOP (@0x0006cc) under Clock, Reset and Power Management Unit (CPMU).</p> <p>Workaround: The register CPMUCOP is displayed under "Computer Operating Properly Watchdog (COP)" group.</p>
S08	
ENGR00286342	<p>Description: The Target Task (Flash file to Target) does not program S19 files into MC13237.</p> <p>Workaround: The default "Flash File to Target" task can be modified to remove restricted areas. The following actions are required:</p> <ul style="list-style-type: none"> • Select "Save as Target Task" in the "Flash File to Target" dialog • Specify task name • Perform Erase and Program • In the dialog "Save Resource" specify the path • Open the Target Tasks tab • Select the saved task • Select "Edit task Configuration" from local menu • Double click on Erase and Program operations in the list of Flash Programmer actions • "Add Program/Verify Action" dialog will open • Uncheck "Restrict to Addresses in this Range" • Close dialog with "Update Program Action" button. <p>Now use this task to flash the S19 files into MC13237.</p>

Appendix B. Appendix B: Freescale MQX™ RTOS Integration

- 1) MQX 3.8 was developed to work with CW MCU v10.1. It is not supported since CW MCU v10.6.
- 2) MQX v3.8.1 was developed to work with CW MCU v10.2. It is not supported since CW MCU v10.6.

- 3) MQX 4.0 was developed to work with CW MCU v10.2 and CW MCU v10.3. It has been tested and confirmed to work with CW MCU v10.6.
- 4) MQX 4.0.1 was developed to work with CW MCU v10.4. It has been tested and confirmed to work with CW MCU v10.6.
- 5) MQX 4.0.2 was developed to work with CW MCU v10.4 and CW MCU v10.5. It has been tested and confirmed to work with CW MCU v10.6.
- 6) MQX 4.1 was developed to work with CW MCU v10.5. It has been tested and confirmed to work with CW MCU v10.6.
- 7) MQX Lite RTOS is integrated with CW MCU v10.6. It supports Kinetis E, K, L and V Series devices. To create a new project with MQX-Lite RTOS do the following:
 - Select **New MQX-Lite Project** in the Commander View.
 - Name the project.
 - Select a Kinetis device in the Devices dialog
 - Select a connection in the Connections dialog
 - Select preferred language and build tools options
 - A Processor Expert project will be created with the **MQX-Lite** component.
 - Configure the **MQX-Lite** component.
 - Add and configure other peripheral components to the project.
 - Select **Generate Processor Expert Code icon** in the Components View.
 - Add your application code to the project.

MQX Task Aware Debugger is integrated with CW MCU v11.1 and is automatically installed. This plug-in can be used with all supported MQX versions (i.e. MQX 4.0.x, MQX 4.1 and MQX Lite).

Appendix C. Performance Considerations

CodeWarrior Development Studio for Microcontrollers v11.1 is a powerful tool chain. The following suggestions will help keep the CodeWarrior tools running at a respectable performance level.

- 1) To maximize performance, the CodeWarrior tools should be installed on a computer with the recommended system configuration. While the tools will operate on a computer with the

minimum configuration, the limited hardware will restrict its ability to function at desired performance levels.

- 2) Close unused projects. Eclipse caches files for all open projects in the workspace. If you need multiple projects open, try to limit the number of projects to no more than 10.
 - 3) The Eclipse IDE provides several options that provide user assistance tools. These options, however, use memory and cpu bandwidth. If performance is slow and you do not need these options, turn them off.
- Scalability options configure how eclipse deals with large source files.
 - Scalability options
 - Editor live parsing: impacts parsing while typing, Outline View, semantic highlighting, folding, etc.
 - Semantic highlighting: C/C++ identifiers are colored
 - Syntax coloring: coloring of keywords, comments and literals
 - Parsing-based content assist proposals: content assist proposals which require parsing the file
 - Content assist auto activation: content assist activated automatically on trigger sequences, like '!', '::' or '->'.
 - To disable:
 - Click menu 'Windows' -> 'Preference'
 - Expand 'C/C++' -> 'Editor' -> 'Scalability'
 - Uncheck 'enable scalability options'
 - Content Assist Auto Activation can reduce the number of keystrokes a developer must type to create code. The Content Assist plug-in consists of components that predict what a developer will type, based on the current context, scope and prefix.
 - To disable:
 - Click menu 'Windows' -> 'Preference'
 - Expand 'C/C++' -> 'Editor' -> 'Content Assist'
 - Uncheck all the options for 'Auto Activation'



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