CodeWarrior Development Tools

CodeWarrior Development Studio for QorIQ LS Series

Overview

CodeWarrior Development Studio for QorIQ LS series featuring ARM®v7 ISA is a development software tool created by Freescale based on the award-winning CodeWarrior technology. This software is one of the first software tools used and developed in lockstep with the Freescale QorIQ LS series of communications processors.

This software can be obtained by purchasing any of the CodeWarrior Development Suites for Networked Applications.

The Tower Edition suite contains the complete CodeWarrior Development Studio for QorIQ LS series for ARMv7 ISA, however it is optimized to provide an economic development platform for the Tower System modules only. It is an easy upgrade to extend the Tower Edition to the Suite Edition that works with any QorIQ LS series-based boards.

Integrated into an Eclipse development framework, which is customized for embedded multicore development, Freescale's CodeWarrior development tools for QorIQ LS series utilizing ARMv7 ISA combine build tools and highly advanced multiprocessor and multicore debugging with software analysis capabilities, ultimately allowing you to build, debug and optimize the performance of Freescale's multicore QorIQ LS series of devices running on a Tower System module.
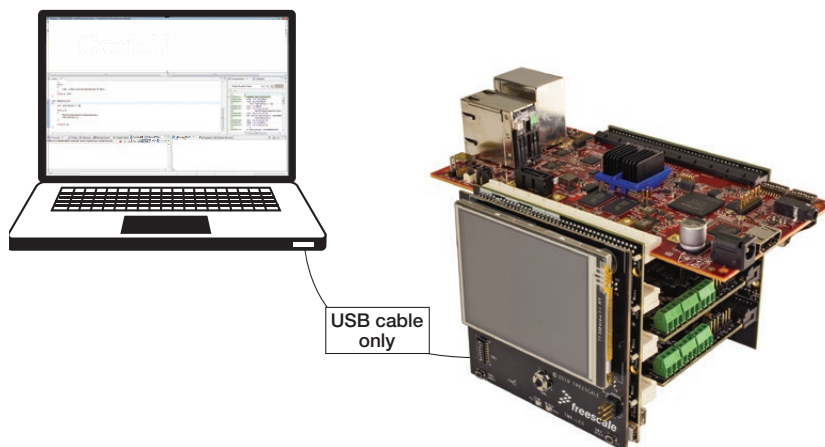
Features

- Flash memory programmer
- Debugger built for multicore devices, flexible project management and software build system
- Reference manual data completely up-integrated into the debugger down to bit field information
- Linux®-aware debug—bare metal, kernel or applications debugging
- Freescale designed, tested and packaged
- Integration with other Freescale software preinstalled, such as the DDR Configuration Tool
- DDR configuration, DDR validation, PBL/RCW configuration and Device Tree Editor

Configure–QorIQ Configuration and Validation Tools

Configuration tools help reduce the time to get a new QorIQ communications processor configured down to a day and sometimes even to a few hours. Get all the advantages of the power and sophistication of the QorIQ communications processors without having to read the technical manuals.

Configuration software modules are preinstalled into CodeWarrior IDE and can be used even when the CodeWarrior license is not enabled. This means that you can get these tools and use them just by getting an evaluation version of CodeWarrior IDE. Tools that will work in the CodeWarrior IDE installation, even when CodeWarrior is no longer licensed, will be marked with "*" behind it.

CodeWarrior Tower Suites Debug Configuration

USB cable only

- **DDR Configuration*:** This program makes configuring DDR controllers a snap
- **DDR Validation:** This add-on program helps find DDR sweet-spot configuration through automated trial and error which is invaluable if you are constantly evaluating new memories for your project
- **PBL/RCW Configuration*:** Configure RCW out of reset and specify pre-boot initialization commands
- **Device Tree Editor*:** Graphically view and edit device trees with real-time validation

Freescale's validation tools can do in a few hours what has taken several months for customers to write scripts and do on their own. These tools can raise performance and reliability for only a fraction of the cost to do it yourself.

Build–Compiler and Linker

- GCC for application development and bareboard development
  - Newlib for bare-metal
  - EGLIBC for Linux run-time applications
- Flexible build
  - Use CodeWarrior IDE's graphical Eclipse-based build
  - Benefit from CodeWarrior IDE's coordination with external makefile-based builds
- CodeWarrior IDE uses the same build/make systems in the Freescale SDK; everything works together

Debug

Finally, CodeWarrior intelligence now exists on an ARM-based platform for debugging. Use the debugger that puts the "multi" into multicore. You can expect all of the standard debugging features like view of CPU registers, memory mapped registers, stepping in/out of code, breakpointing and so much more.

But it's the subtle, hard-to-describe, additional features you get with CodeWarrior IDE that makes it special, such as:

- The entire QorIQ user's manual, where it makes sense, is encoded into the debugger. Registers, register fields and bit descriptions are provided along with names and register value choices
  - Populated with electronic design data that comes directly from the Freescale chip designers (subscription to this data in XML format are possible)

- Checked by Freescale teams at the same time the chip is being evaluated
- CodeWarrior is a living manual
- Cache management and other hardware management built-in
  - Don't write code snippets to do things that the tools should know how to do
  - CodeWarrior IDE implements the most debug software that surfaces great hardware features
  - Invalidate, pre-populate, flush and manipulate the caches the easy way
  - Get unprecedented visibility to advanced hardware
- Complex debug scenarios are CodeWarrior's business
  - CodeWarrior can debug your QorIQ device no matter where it is located on a scan chain
  - CodeWarrior can debug multiple QorIQ devices on a scan chain in arbitrary locations
  - Each of those QorIQ devices can be a multicore QorIQ device and CodeWarrior can represent the entire debug scenario in a sensible fashion
  - Using scripting and other non-code techniques, complex startup sequencing, debug triggering and multicore coordination is possible. Freescale uses these techniques all the time
- Situational awareness and views
  - Use CodeWarrior to debug Linux kernels with Linux awareness built-in
  - Third-party operating system awareness is easy to add
  - Debug via hypervisors
  - Application-level debugging from CodeWarrior is easy
  - Restated: Debug at the kernel level, bare board level, hypervisor level or application level with ease
- Customization is possible
  - Freescale can customize CodeWarrior for your special situation (call for details)
  - For example: Imagine wanting a secure debug capability via the internet through multiple layers of virtualization. Freescale is one of the few companies in the world that can do this because we have the Linux, processors and tools and can merge them together for you

Trace and Analysis

CodeWarrior software tools are built with the QorIQ communications processing platforms in mind. No software tool is more aware of the amazing on-chip debug capabilities built in to the different QorIQ communications processors.

If the capability exists on QorIQ processors, CodeWarrior software tools are your best bet to take advantage of the QorIQ special debug hardware.

We'll list some of the great CodeWarrior capabilities here, but make sure you consult the individual capabilities of your specific QorIQ device so you know what to expect.

- Trace with ARM technology
  - ETM Core Program Flow Trace stored in DDR
  - Extract using CodeWarrior TAP or using a debug agent in your OS
- Performance analysis
  - Hardware-assisted analysis via QorIQ on-chip resources called EPU
  - PERF-based analysis with both hardware assist and Linux standard performance techniques
  - Add-on tool, called Scenarios Tools, makes complex analysis a snap
- Trace viewer (trace stored in DDR)
  - Minimally intrusive hardware trace collection
  - Crash analysis
  - Multicore trace synchronization
  - Foundation for profiling statistics
- Profiling
  - Statistics based on minimally intrusive collected trace
- Code coverage (asm and C level)
- Optimize application using hierarchal profiler
- Spot bottlenecks using critical code
- Visually identify out-of-order execution using timeline
- Identify critical call chain using call tree
- Critical stack usage (simulator based)

System Requirements

- Windows® 7 SP1 or later systems. Includes 32-bit and 64-bit
- Ubuntu 64-bit OS: Supports the latest LTS version or within four months of LTS release
- Redhat 64-bit: Latest LTS version or within four months of LTS release

For more information, please visit freescale.com/CodeWarrior