CROSSWARE®

8051 Development Suite and the Cygnal Chips

Crossware first introduced support for the Cygnal chips in February 2001 providing comprehensive simulation for the on-chip peripherals of the C8051F000 and it's variants and an integrated interface to Cygnal's EC1 JTAG cartridge. Crossware continued to extend it's support as Cygnal introduced new chips, new emulation cartridges and new debugging protocols. Since February 2001 the Crossware 8051 Development Suite has been and continues to be the most comprehensive software development environment for the mixed signal microcontrollers from Cygnal Integrated Products.

Using the Crossware 8051 Development Suite you can write programs for the Cygnal chips in C and assembler. A comprehensive set of easy to use Code Creation Wizards will help you by generating configuration and application code and outline interrupt handlers in C for all on-chip peripherals and a complete set of I/O handlers for the UARTs.

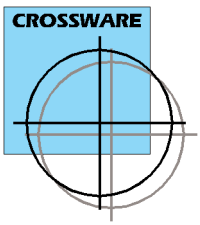
The Crossware tool chain (C compiler, assembler and linker) will build your program which you can then immediately run in the cycle accurate integrated simulator. Simulator activity views will show you the affect your program is having on the on-chip peripherals. You can view the values of your C and assembler variables. You can watch the progress of interrupt handlers as they are activated by your program and trigger any of them manually if you wish.

An external interface will allow you to extend the simulator so that you can apply custom inputs to and receive outputs from the on-chip analog and digital peripherals and trigger external interrupts in a way that mimics your hardware. You can develop extensions that will allow you to simulate your complete target system.

You can connect your target board to your PC using a Cygnal EC1 or EC2 cartridge. If you need to configure your program to take account of the chips oscillator characteristics a Crossware Wizard will activate this connection and either accurately measure the oscillator frequency or read the factory programmed calibration register and perform all calculations required to set your desired oscillator frequency.

When you toggle the Crossware environment from simulation to remote debugging mode you can run your program on your target board using exactly the same set of commands that you used in the simulator. The integrated debugger drives the JTAG or C2 interface. It can start and stop your program, read and display registers and memory and set hardware PC and data breakpoints. A drag-and-drop visual interface allows you to set complex interdependent source level breakpoints so that your program will halt under the conditions that you specify. The debugger will even transparently set the on-chip stack monitor so that you will know immediately if a stack overflow or underflow occurs in your program.

Some of the key features are illustrated overleaf and an evaluation version of the Crossware 8051 Development Suite is available which will enable you to explore all of the features of this package.



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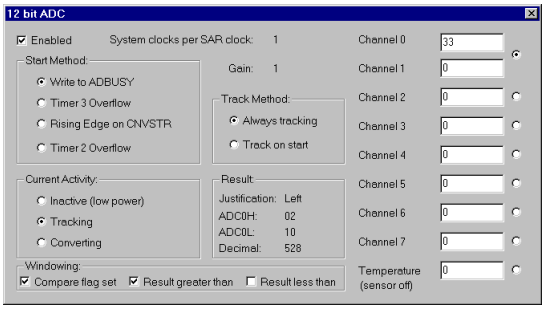
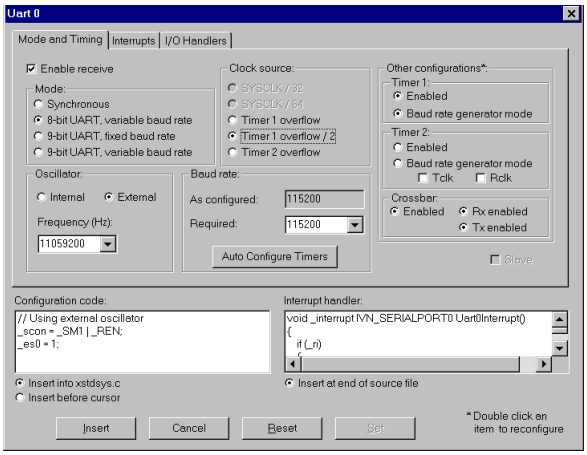
Activity Views



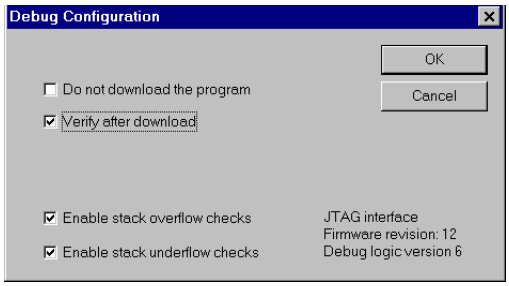
Activity views show the operation of the on-chip peripherals while your program is running in the simulator. The ADC activity view shown above also allows you to apply analog inputs to the simulating ADC. Alternatively you can apply analog inputs to the simulating ADC and also trigger it using the CNVSTR pin via your own custom extension.

Code Creation Wizards



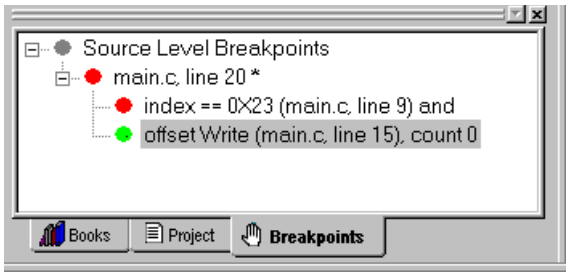
Code Creation Wizards generate configuration and application code and outline interrupt handlers in C. The UART Wizard shown above will also generate a complete set of interrupt driven I/O handlers.

Debugger Interface



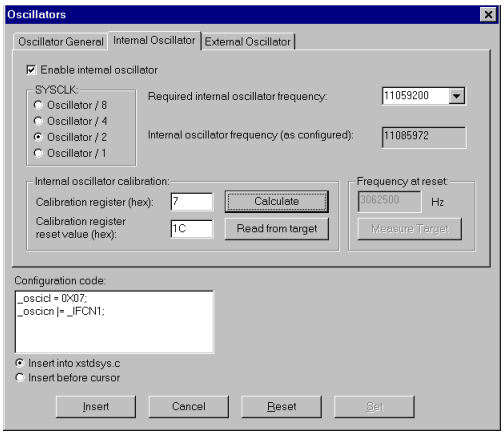
The integrated interface to the Cygnal EC1 and EC2 cartridges supports both JTAG and C2 protocols. If you wish, the debugger will transparently set the hardware stack overflow and underflow traps.

Complex Breakpoints



Complex source level PC and data breakpoints can be set using an easy to use drag and drop interface to halt execution during both simulation and on-chip debugging. When on-chip debugging, the hardware PC and internal memory breakpoint features of the chip are utilised.

Internal Oscillator Calibration



The Oscillator Wizard can measure the internal oscillator frequency allowing your program to compensate for the 20% frequency variation between chips. Alternatively, for the factory calibrated C8051F300 it will read the on-chip factory set calibration register and create the configuration code required to set your desired oscillator frequency (see above) .