

Cygnal C8051 Support

Keil Software and Cygnal Integrated Products have teamed-up to provide you with a state-of-the-art development platform for the Cygnal C8051F family of mixed-signal, System-on-a-Chip MCUs.

The Cygnal C8051F family integrates world-class analog, a high-speed 8051 CPU (up to 25MIPS), in-system programmable Flash memory, and on-chip debugging logic in each device.

Development tools from Keil Software support the Cygnal C8051F family with the C51 Compiler, A51 Assembler, BL51 Linker, and μ Vision2 IDE (a fully integrated Editor, Project Manager, and Debugger) in a single environment.

New! Keil Debugger Supports In-System Debugging for Cygnal Devices

A new μ Vision2 driver allows the μ Vision2 Debugger to communicate with Cygnal's JTAG-based on-chip debugging logic. You may use the μ Vision2 Debugger to start and stop program execution, set breakpoints, check variables, inspect and modify memory contents, and single-step through programs running on your actual target hardware.

In-system Flash memory programming (integrated into the driver) allows you to rapidly update target code.

JTAG Debugging Speeds Development

Cygnal's JTAG-based on-chip debug logic requires no system resources: no code memory, no RAM, no interrupts, no timers, no serial ports, and no run-time overhead. Hardware control (stop/start execution) is always available.

You need not relocate your program code nor make hardware changes to debug on your target system. The Cygnal JTAG interface and the Keil μ Vision2 Debugger allow you to debug your actual program in real-time using production target hardware.

C51

Cygnal Support In
 μ Vision2 Debugger

New Cygnal Devices Included
In Device Database

Sophisticated IDE
Makes Getting Started Easy

This Newsletter Contains Information About:

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Creating a Project

The μ Vision2 Project Manager and Device Database make it easy to design applications for Cygnal C8051F devices. A project organizes all the source files, tool configuration options, and build directions required to create a target program. You may create several program targets from a single project (for example, one target for testing and another for an application release version). Select the Cygnal C8051F device from the Device Database and all necessary options are automatically set for you.

To create a new project for the Cygnal C8051:

1. Start μ Vision2 and select **New Project** from the **Project** menu to create a new project.
2. Use **Select Device for Target** from the **Project** menu to select the Cygnal device for your project from the Device Database.
3. Use the **File New** menu option to enter source code in a new editor window.
4. Add source files to your project. Right-click on **Source Group 1** in the **Project Window Files** page and select the **Add Files to Group** option. Browse and select the source files to add to your project.
5. Right-click on a target, group, or file to set the Tool Options using the **Target Options Dialog**.

Building a Target Program

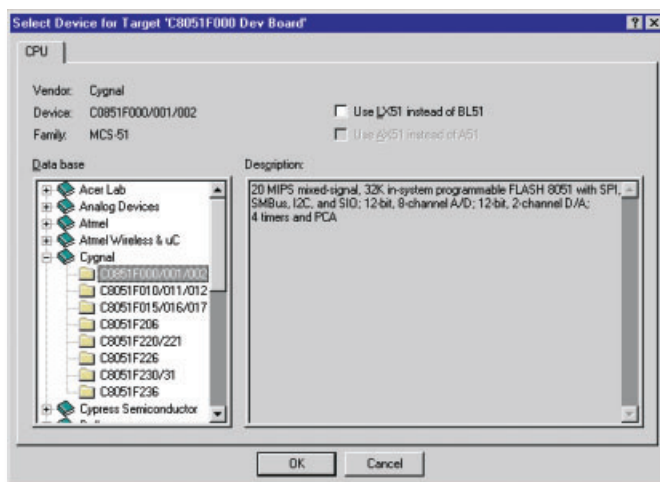
Once you have created a project, you must compile the source files and link the object files into an executable program.

1. Select a target to build from the project using the drop-down list on the **Build Toolbar**. If you have not created additional targets, your target will be called **Target 1**.
2. Click on the **Build Target** button on the toolbar to compile and link your application.

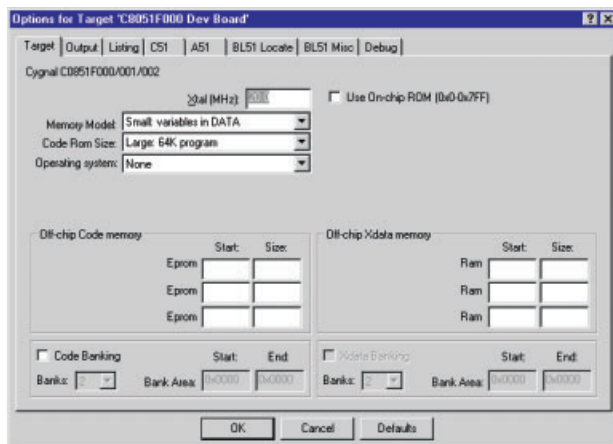
During each build, the μ Vision2 IDE checks source file dependencies and compiles only those files that have changed since the last build.

Double-click on error messages in the output window to move the cursor to syntax errors in your program.

Build Toolbar



Select the chip to use from the Device Database in μ Vision2.



Set the project options to match your target hardware.

Starting the Target Debugger

The Cygnal C8051F Driver works with the μ Vision2 Debugger to debug programs running on your actual target. You connect the μ Vision2 Debugger to the on-chip debugging hardware using your PC's COM port, a serial cable, and the Cygnal Serial Adapter.

1. Select **Use: Cygnal C8051F Driver** in the **Target Options - Debug** dialog to connect μ Vision2 to the Cygnal on-chip debugging hardware.
2. Click the **Load Application at Startup** checkbox.
3. Build your project and start the μ Vision2 Debugger.

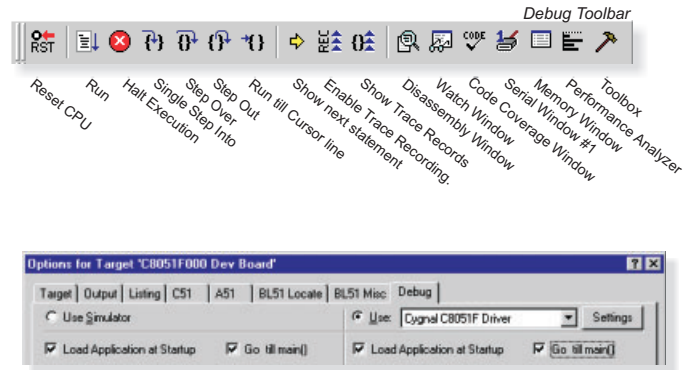
The debugger automatically downloads your application to on-chip Flash program memory when you start your debugging session. As you start and stop program execution, run to breakpoints, check variables, inspect/modify memory contents, and single-step through programs using the μ Vision2 Debugger, you are executing code on your actual target hardware.

Cygnal Debugging Interface

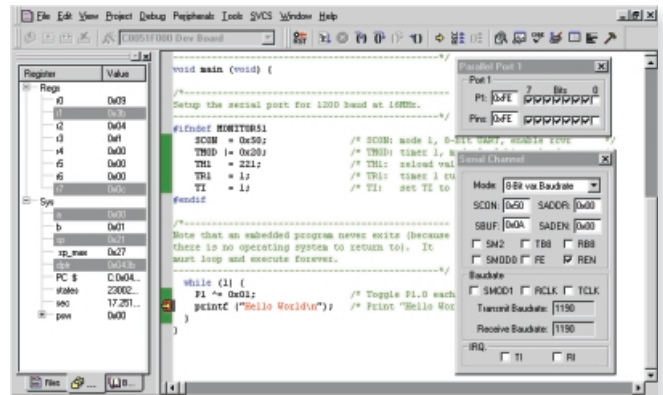
Every Cygnal C8051F device comes with on-chip debug logic, in-system programming support, and a dedicated serial debug interface. This means you can update code and debug in-system using your production hardware. Cygnal development kits include a Serial Adapter to connect the debugger running on a PC to the on-chip debug logic.

Cygnal's on-chip debug logic requires no system resources: no code memory, no RAM, no interrupts, no timers, no serial ports, and no run-time overhead. Hardware control (stop/start execution) is always available even while executing an Interrupt Service Routine! You can single-step through your code, including interrupt service routines, while all digital peripherals remain synchronized with code execution. Breakpoints are implemented in hardware so you no longer have to worry about the impact a software breakpoint will have on code execution.

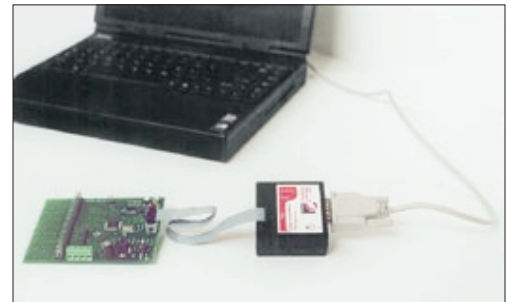
Your code runs from on-chip Flash program memory (no relocation of code or special target hardware support is required). The on-chip debug logic and in-system programming mean you debug with your **real code in real-time** using your actual **production target hardware**.



Use the Cygnal C8051F Driver to debug your programs using the μ Vision2 Debugger.



The μ Vision2 Debugger provides a complete debugging interface for your Cygnal target applications.



Visit www.cygnal.com for more information about devices from Cygnal Integrated Products.

Part Number	MIPS (peak)	FLASH (bytes)	RAM (bytes)	SMIBus I ² C	SPI	UART	16-bit Timers	PCA	I/O Pins	ADC Resolution (bits)	ADC Conversion Speed (kps)	ADC Inputs	Voltage Reference	Temp Sensor	DAC Resolution (bits)	DAC Outputs	Voltage Comparator	Package
C8051F000	20	32K	256	✓	✓	✓	4	✓	32	12	100	8	✓	✓	12	2	2	TQ64
C8051F001	20	32K	256	✓	✓	✓	4	✓	16	12	100	8	✓	✓	12	2	2	TQ48
C8051F002	20	32K	256	✓	✓	✓	4	✓	8	12	100	4	✓	✓	12	2	1	LQ32
C8051F005	25	32K	2304	✓	✓	✓	4	✓	32	12	100	8	✓	✓	12	2	2	TQ64
C8051F006	25	32K	2304	✓	✓	✓	4	✓	16	12	100	8	✓	✓	12	2	2	TQ48
C8051F007	25	32K	2304	✓	✓	✓	4	✓	8	12	100	4	✓	✓	12	2	1	LQ32
C8051F010	20	32K	256	✓	✓	✓	4	✓	32	10	100	8	✓	✓	12	2	2	TQ64
C8051F011	20	32K	256	✓	✓	✓	4	✓	16	10	100	8	✓	✓	12	2	2	TQ48
C8051F012	20	32K	256	✓	✓	✓	4	✓	8	10	100	4	✓	✓	12	2	1	LQ32
C8051F015	25	32K	2304	✓	✓	✓	4	✓	32	10	100	8	✓	✓	12	2	2	TQ64
C8051F016	25	32K	2304	✓	✓	✓	4	✓	16	10	100	8	✓	✓	12	2	2	TQ48
C8051F017	25	32K	2304	✓	✓	✓	4	✓	8	10	100	4	✓	✓	12	2	1	LQ32
C8051F206	25	8K	1280		✓	✓	3		32	12	100	32					2	TQ48
C8051F220	25	8K	256		✓	✓	3		32	8	100	32					2	TQ48
C8051F221	25	8K	256		✓	✓	3		32	8	100	32					2	LQ32
C8051F226	25	8K	1280		✓	✓	3		32	8	100	32					2	TQ48
C8051F230	25	8K	256		✓	✓	3		32								2	TQ48
C8051F231	25	8K	256		✓	✓	3		32								2	LQ32
C8051F236	25	8K	1280		✓	✓	3		32								2	TQ48



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