

# IAR Embedded Workbench® for 8051

*IAR Embedded Workbench is a set of highly sophisticated and easy-to-use development tools for embedded applications. It integrates the IAR C/C++ Compiler™, assembler, linker, librarian, text editor, project manager, and C-SPY® Debugger in an integrated development environment (IDE). With its built-in chip-specific code optimizer, IAR Embedded Workbench generates very efficient and reliable FLASH/PROMable code for the 8051 microcontroller. In addition to this solid technology, IAR Systems also provides professional worldwide technical support.*

## MODULAR AND EXTENSIBLE IDE

- A seamlessly integrated environment for building and debugging embedded applications.
- Powerful project management allowing multiple projects in one workspace
- Build integration with IAR visualSTATE
- Hierarchical project representation
- Dockable and floating windows management
- Smart source browser
- Feature-rich editor with code templates and multi-byte support
- Tool options configurable on global, group of source files, or individual source files level
- Multi-file compilation support
- Flexible project building via batch build, pre/post-build or custom build with access to external tools in the build process
- Integration with source code control systems
- Extensive device support with ready-made header files, device description files and linker command files
- Ready-made code and project examples for various 8051 evaluation boards

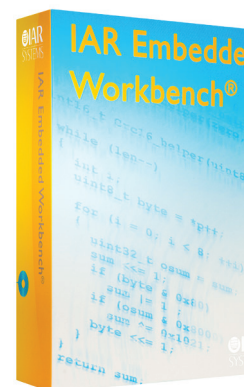
## HIGHLY OPTIMIZING C/C++ COMPILER

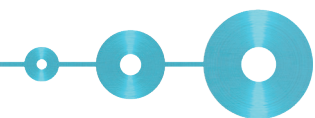
- Support for C and C++
- C99 compliance
- Automatic checking of MISRA C rules
- Full support for most classic and extended 8051 architectures
- Language extensions for embedded applications with target-specific support,
  - Extended keywords for data/functions defining and declaring with memory/type attributers

- Pragma directives for controlling compiler's behavior, such as how it allocates memory
- Intrinsic functions for direct access in C source to low-level processor operations
- Support for the hardware multiplier peripheral module via dedicated runtime library modules.
- User control of register usage for optimal performance
- Support for DATA, IDATA, XDATA, PDATA and BDATA
- Support for multiple DPTR in compiler and libraries
- Bitwise addressing for SFRs
- Possibility to use up to 32 virtual registers
- Full support for memory attributes in C++
- Efficient interrupt handling directly in C/C++
- 32-bit IEEE-compatible floating-point arithmetic
- Mixed C/C++ and assembler listings
- Support for inline assembler
- Highly optimized reentrant code models making the project portable between different targets
- Multiple levels of optimizations on code size and execution speed allowing different transformations enabled, such as function inlining, loop unrolling etc.
- Advanced global and target-specific optimizer generating the most compact and stable code

## STATE-OF-THE-ART C-SPY® DEBUGGER

- Complex code and data breakpoints
- Very fine granularity execution control (function call-level stepping)
- Stack window to monitor the memory consumption and integrity of the stack
- Complete support for stack unwinding even at high optimization levels





- Profiling and code coverage performance analysis tools
- Trace simulation utility with expressions to examine execution history
- Versatile monitoring of registers, structures, call chain, locals, global variables and peripheral registers
- Smart STL container display in Watch window
- Symbolic memory window and static watch window
- I/O and interrupt simulation
- Timeline window in the simulator allows graphically correlated visualization of the call stack, and the interrupt log, plotted against time
- RTOS-aware debugging with built-in plugins for OSEK Run Time Interface (ORTI)
- Extensive target system support
  - Configurable IAR ROM-monitor for the NXP LPC935/LPC93xx and TI MSC1211 devices
  - Analog Devices ROM-monitor for ADu83x/ADu84x, ADE51xx/ADE55xx and ADE71xx/ADE75xx devices
  - Analog Devices USB EA-Emulator
  - Texas Instruments USB/JTAG interface for 8051 based CC11xx, CC24xx and CC25xx SoC:s
  - Texas Instruments 8051 based Sensium devices
  - Infineon Debug Access Server (DAS) for the Infineon XC8xx device family
  - Silicon Laboratories USB and serial (EC2) JTAG adapters supporting all C8051Fxxx devices
  - MIPS System Navigator Probe for 8051 Microcontroller Cores
  - Nordic Semiconductor nRF GO development platform (nRF-Probe)
  - Third party plugins: DoCD HAD Probe, Phyton JEM52, Phyton PICE52, Manley Electronics ME52HU and N-Link emulators, FlashPro-CC and GangPro-CC USB flash programming adapters

## IAR ASSEMBLER

- A powerful relocating macro assembler with a versatile set of directives and operators
- Built-in C language preprocessor, accepting all C macro definitions

## IAR visualSTATE®

IAR visualSTATE is a suite of graphical design automation tools for embedded systems.

- Design an embedded application by drawing objects, events, actions etc in a flowchart-like manner
- Perform extensive tests before committing to hardware: validation of the application behavior, regression testing, verification of the run-time model and simulation on-chip

## IAR XLINK LINKER

- Complete linking, relocation and format generation to produce FLASH/PROMable code
- Flexible segment commands allowing detailed control of code and data placement
- Optimized linking removing unused code and data
- Direct linking of raw binary images, for instance multimedia files
- Optional code checksum generation for runtime checking
- Comprehensive cross-reference and dependency memory maps
- Support for over 30 industry-standard output formats compatible with most popular debuggers and emulators

## IAR LIBRARY AND LIBRARY TOOLS

- All required ISO/ANSI C and C++ libraries included
- All low-level routines such as writechar and readchar provided in full source code
- Lightweight runtime library, user-configurable to match the needs of the application; full source included
- Library tools for creating and maintaining library projects, libraries and library modules
- Listings of entry points and symbolic information

## COMPREHENSIVE DOCUMENTATION

- Perfect-bound user guides with detailed information
- Efficient coding hints for embedded application
- Extensive step-by-step tutorials
- Context sensitive help and hypertext versions of the user documentation available online

## FREE EVALUATION SOFTWARE

Free evaluation softwares—4KB KickStart and 30-day evaluation versions are available at [www.iar.com/ew8051](http://www.iar.com/ew8051).

*For the latest product news, up-to-date device support list, and hardware debugger support, please visit [www.iar.com/ew8051](http://www.iar.com/ew8051)*

- Automatically generate micro-tight C/C++ code that is 100% consistent with your design as well as complete design documentation

Together with IAR Embedded Workbench, IAR visualSTATE forms a complete set of development tools for the the 8051 microcontrollers, supporting you through the entire development process.

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