

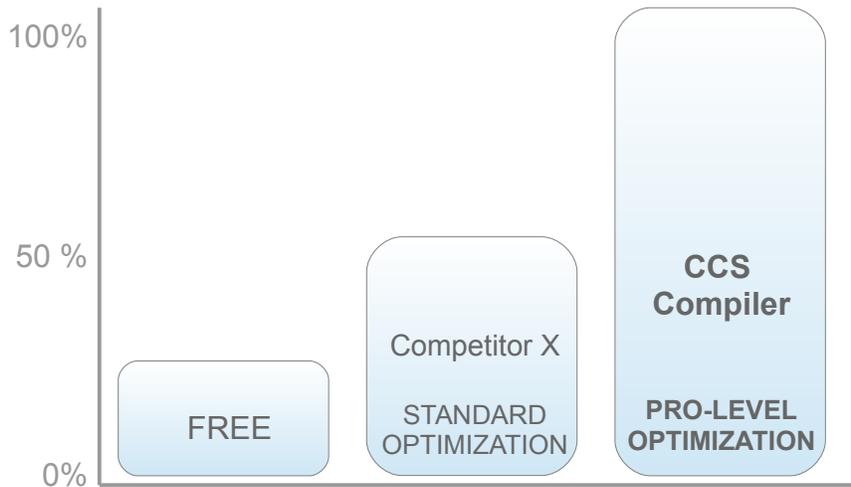
## The Hidden Cost of Free C Compilers

CCS C Compilers are designed specifically for the PIC® MCU architecture, unlike free competitive compilers based on a GNU or common engine with a generic code generator. Every aspect of the CCS C Compiler is specially optimized for the PIC® MCU. The Pro-Level Optimization of our PIC® compilers include Standard C constructs, numerous pre-processor functions, and an extensive library of built-in functions. This provides developers with unique access to device hardware features at the embedded C language level. C syntax and special functions have a uniform syntax across all chip families, allowing for migration to a new chip trivial. Program examples, and device libraries, empower rapid development of applications incorporating leading edge technologies such as capacitive touch, wired and wireless communications, motion and motor controls, and energy management.

Free C compilers distributed by semiconductor manufacturers can cost companies thousands of dollars in component costs by forcing them to use larger, more expensive microcontrollers than what is really necessary. These compilers typically have most optimizations shut off, increasing code size and requiring the engineer to select a device with more program memory.

How much can free compilers blow up code size? According to one semiconductor manufacturer, their free compiler's code size can be double that of what can be achieved with an optimizing compiler.

### Optimization Levels



This means that that a PIC® MCU with up to twice the program memory size needs to be used in the design. What impact does this have on component costs for the project? To determine that, one needs only to compare pricing for devices that are identical except for program memory size. Using the manufacturer's own published volume pricing, costs were compared for three different projects.

|           | Device      | Program Memory | Component Cost Difference | Project Cost Penalty (1Ku) |
|-----------|-------------|----------------|---------------------------|----------------------------|
| Project 1 | PIC18F24J10 | 16K            | \$0.14                    | \$140.00                   |
|           | PIC18F25J10 | 32K            |                           |                            |
| Project 2 | PIC18F1220  | 4K             | \$0.21                    | \$210.00                   |
|           | PIC18F1230  | 8K             |                           |                            |
| Project 3 | PIC18F2585  | 48K            | \$0.28                    | \$280.00                   |
|           | PIC18F2680  | 64K            |                           |                            |

The hidden cost of a free C compiler becomes much more apparent when component costs are examined, and directly affect the project's profitability. This cost penalty is further compounded by the number of MCUs used in the project and the number of projects that the compiler is used for.

The cost of a Pro-Level Optimizing C compiler from CCS can often be recouped from just the component cost savings on a single project, with considerable additional savings far in excess of component costs realized from improved developer productivity. All of our compilers are ANSI C Compliant with Pro-Level Optimization. We offer flexible software configurations to fit any project requirements.

## About CCS

Established in 1996, CCS is a leading worldwide supplier of embedded software, and hardware development tools, that enable companies to develop premium products based on Microchip PIC®MCU and dsPIC® DSC devices. CCS C Compilers are the most advanced, highly developed and most widely used compiler in the industry. These compilers include a generous library of built-in functions, pre-processor commands, and ready-to-run example programs to quickly jump-start any project. CCS IDE C compiler products provide a unique Profiler Tool to track time and usage information for use on functions, code blocks, as well as receiving live data from running programs. Complete proven tool chains include a full line of programmers and debuggers, application specific hardware prototyping boards, and software development kits. CCS is also a leading provider of electronic engineering services for embedded software development, R&D support, hardware design, and custom electronic products that adhere to our client's high-quality standards.

Learn more by visiting [www.ccsinfo.com](http://www.ccsinfo.com)