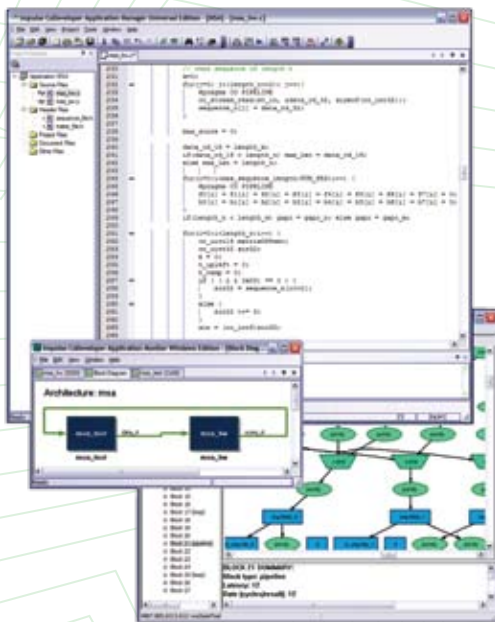


# Accelerate C in FPGA

*Fast Prototyping, Fast Optimization, Fast Applications*

## Move C to FPGA in a Fraction of the Time

Impulse C™ is a C-language development tool for FPGA-accelerated computing. Use familiar C-language programming methods to create applications targeting a wide range of FPGA-based computing platforms. Impulse CoDeveloper™ tools include a software-to-hardware compiler, interactive parallel optimizer, and Platform Support Packages allowing you to quickly develop high-performance applications for a wide range of FPGA-based boards and systems.



Shown above are the Impulse CoDeveloper IDE, parallel process monitor and graphical, interactive optimizer.

C is the language of choice for signal and image processing, military, scientific, financial, and other high-performance algorithms. Impulse C allows you to easily convert these algorithms to optimized FPGA hardware, often with just a few hours of work. Impulse C simplifies algorithm profiling and debugging, allowing you to identify compute-intensive code and accelerate that code through parallelizing, iterative optimization and automatic compilation to FPGA hardware.

## Get Started Fast

Impulse C includes extensive examples, tutorials and libraries to get you started right away. Take advantage of our active user's group and outstanding technical support. New examples are added regularly.

## Freedom to Experiment

Quickly experiment with different algorithmic approaches, with alternate hardware and software partitioning, and with alternate FPGA computing platforms. Use Impulse C to:

- Create single hardware processes for FPGA module generation
- Create a hardware-accelerated peripheral for an FPGA-embedded processor.
- Create an FPGA coprocessor for a high-performance workstation or server application.

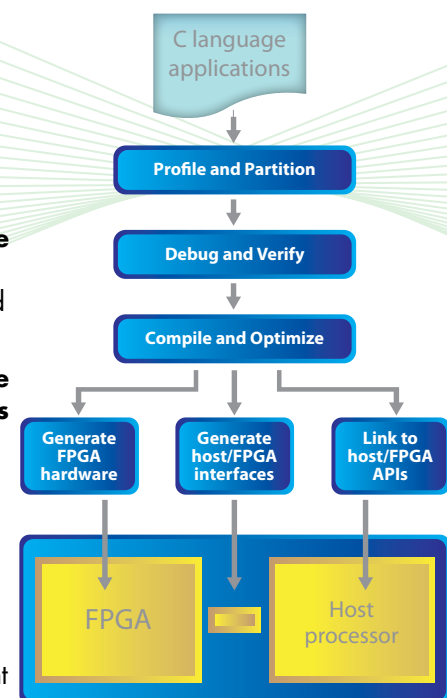
Use the same C source code to evaluate applications and their constituent algorithms using different hardware and software targets. Optimizations that can take weeks or months using traditional hardware design methods now take just days.

## Accelerate Applications

FPGAs can outperform higher-clock-rate processors by virtue of their inherent parallelism. Impulse C allows you to exploit this parallelism both at the system-level and at the level of your performance-critical inner code loops. Parallelism at the system level can be achieved by using multiple parallel processes, which are easy to describe using Impulse C. Lower-level parallelism can be obtained through automated Impulse C compiler optimizations such as operator scheduling, loop unrolling, and pipelining. Impulse C users routinely achieve acceleration results of 10X, 100X and even 500X over software-only implementations, for both embedded and high performance computing applications.

## Seven Easy Steps From C to FPGA

1. **Use standard C tools** and programming methods to accelerate your embedded, workstation and server applications.
2. **Profile and partition** your algorithms between the processor and the FPGA accelerator. Use multiple parallel processes for increased performance.
3. **Verify and debug** your code using familiar C-language development tools. Use the Impulse Application Monitor to analyze parallel dataflow.
4. **Compile and optimize** using interactive, graphical tools. Automatically parallelize and pipeline your critical inner code loops.
5. **Automatically generate FPGA hardware** ready for use with your selected FPGA-based platform.
6. **Automatically generate host-to-FPGA interfaces** for selected FPGA-based platforms.
7. **Select from dozens of different FPGAs and FPGA-based platforms** for embedded and high performance computing. Use platform-independent Impulse C tools and choose the platform most appropriate for your application.



## Impulse C: C-to-FPGA Done Right

Impulse C allows you to compile C code directly into optimized logic ready for use with popular FPGA devices. Use the Impulse tools to quickly prototype mixed software/hardware systems and perform design iterations in just minutes or hours, instead of days or weeks.

Impulse C is fully compatible with popular FPGA development tools, and with popular C-language development environments.

Impulse C provides you with a faster path to prototype and greater flexibility for deployment while maintaining compatibility with existing C-language tools and methods. Impulse C works with standard C development tools for development and debugging, and is fully compatible with popular FPGA synthesis and simulation tools. Impulse C is the fastest path to accelerating your applications in FPGAs.

## Reduce your Deployment Costs

Impulse C generates redistributable, royalty-free hardware outputs. There are no run-time costs when using Impulse C to accelerate your applications.

## Services

Impulse Accelerated Technologies provides software-to-hardware design tools, Platform Support Packages, custom IP, design services and training for teams creating the most advanced, FPGA-accelerated applications and systems.

## Professional Services for Custom Products and IP

Need help with your custom FPGA development projects? Impulse FPGA experts can work as part of your team, or independently to meet your project needs. Impulse draws on thousands of hours of FPGA design expertise in all families of programmable platforms. These FPGA development professionals incorporate hardware and software co-design technologies to quickly bring your concept to silicon.

If you already have an FPGA-based project, our experts can help make your applications run more efficiently. Let our consultants work with your team on speed, power and resource objectives, and to optimize your code to meet your project goals. They can help you quickly try out different approaches.

## Education and Training

Impulse offers customized on-site and remote, web-based training programs. Training can be tailored to meet the needs of your team. Training programs can include significant hands-on lab components, and are led by experienced FPGA application developers.

## Solutions

### Signal and Image Processing

- 1D and 2D FFTs
- Color conversion
- Edge detection
- Finite Impulse Response filters
- HDTV video processing
- Instrumentation and control
- Kalman filters
- MPEG decoding
- Speech encoding

### Military/Aero

- Advanced radar processing
- Battlefield analysis
- Object recognition
- Radar/Sonar/Lidar
- Robotics and machine vision
- Software-defined radio
- Threat detection

### Financial

- Currency valuations
- Feed handling and arbitrage
- Financial modeling and analytics
- Options trading

### Scientific

- Biomedical computing
- Climate modeling
- Data compression
- Earth sciences
- Medical imaging
- Oil and gas exploration

### Automotive

- Factory automation
- Robotics and inspection
- Vehicle telematics
- Virtual instrumentation

*Contact us to discuss your application and needs. We'll get you started fast!*



**Impulse Accelerated Technologies, Inc.**

[www.ImpulseC.com](http://www.ImpulseC.com)

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