

CENTER FOR REMOTE SENSING, INC.

## IMPULSE™

A General Purpose Toolset for Simulation and Real-Time Implementation

CRS's IMPULSE™ software is a Windows® development system allowing users to utilize a point-and-click interface for the design, simulation, and implementation of complex systems. It allows a one-step process for the design, simulation, and operation of a variety of systems. It also offers high fidelity, rapid execution, scalability, interface to doctrinally correct modules, and a built-in analysis.

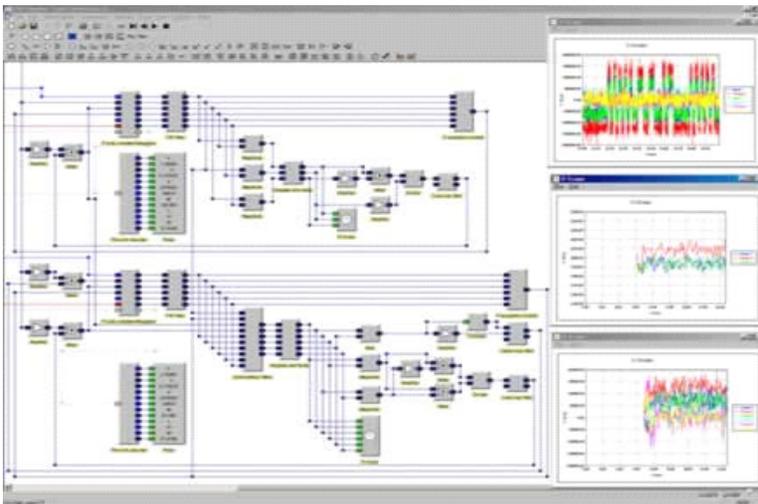
IMPULSE™ combines the speed and ease of graphical programming with the efficiency of C++ and utilizes the processing power of various hardware devices. It is intuitive and easy to use and allows scientists and engineers to design, develop, simulate, optimize, and operate functional systems—all this without the help of programmers. The time required for implementing advanced tasks can be reduced by an order of magnitude.

Various hardware interfaces (from analog to digital, digital to analog, digital to digital, and front end processors) are available for real-time interactions with the environment. These hardware interfaces allow real world signals to be acquired and processed in real-time using the power of host Pentium® processors. If needed, the finely-tuned C-codes can be directly transported to several DSPs, FPGA, ASIC, and others\*.

IMPULSE™ will speed up development and improve accuracy using tested modular components. Faster than alternative visual environments and easier to use and share than cryptic code, IMPULSE™ can help bring development to the next level.

The open architecture concept of IMPULSE™ can be used for a variety of applications, ranging from Radio, Sonar, medical, and various other systems involving signals and signal processing. The basic version comes with the General Modules and Display Module and specialized modules include Signal Processing, EW Analysis, Communication, Radar, and GPS. More modules are being developed and will be available soon.

Various software-based components, or building blocks, are provided in each module. These components are like functional Integrated Circuits (ICs) in a hardware design. These components are simple and are defined by Input/Output structures and State Engines. Simple menu-based parameters for these components are for flexibility and easy operation. State Engines allow the same elements to be configured differently under different conditions. Users can develop their own components and a "Wizard" helps the user interface his/her component (written in C++\_ to the IMPULSE™ DLL.



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Operation of the complete system consists of a few easy steps:

Select the components, join them as desired, select input and output, set the parameter for each component, set the states (optional), RUN.

Intuitive buttons (RUN, STOP, single-step, SAVE) allow the user to get operational in a matter of minutes.

## FEATURES

- It provides software building blocks like hardware components (chips)
- Once the system is assembled using the software building blocks, the system can be simulated and tested under different user-specified conditions.
- The simulated system is ready for real-time operations
- Various hardware options for real-time input/output are available
- Graphical User Interface for design and simulation
- Built-in object-oriented components allow for easy adjustments
- Menu-based parameter selections for most of the components
- User-defined modules and components can be easily integrated
- User-defined components can be in C, C++, Fortran, and assembly
- Wizard to support the development of user-specified components
- Fully extensible with new component packs being developed
- Built-in analysis tools
- Built-in visualization allows for real-time feedback from any component
- Proprietary development of components is available
- Can be used for a one-step process for design, simulation and operation
- Accepts real-time signals as well as stored (simulated) data
- Simulations and runs can be saved at any point.
- Self-contained platform for real-time operations is available. This allows for the simulation and real-time implementation in a one-step process.

## AVAILABLE MODULES

- General Module - Included with the basic IMPULSE™ package, this module includes such basics as the Clock, Adder, and File Handlers.
- Display Module - Included with the basic IMPULSE™ package, this module contains 2-D and 3-D plotting such as oscilloscope and phase plots. In addition, this module contains probes for measuring specific values.
- GPS Module - This add-on module contains required components to create a fully working GPS receiver. Capabilities include both C/A and P-codes, as well as dual-frequency. Various code-based, codeless, and semi-codeless architectures are built in. Additional advanced elements such as those with multiple antennas (beamforming, STAP, SFAP, anti-jam) and M-code are available. The GPS signal simulation module is available separately. The signal simulation module has all the components necessary for building a software simulator.

## SYSTEM REQUIREMENTS

- Windows® 95/98
- 15 MB free disk space
- 64 MB RAM
- 333 MHz Pentium® II
- Graphics Accelerator

## SYSTEM RECOMMENDATIONS

- Windows® 98
- 128 MB RAM
- 500 MHz Pentium® III
- 16 MB Graphics Card

## BASIC PACKAGE INCLUDES

- IMPULSE™ System Software
- General Module
- Display Module
- Signal Processing Module
- Other Modules and add-ons may be purchased