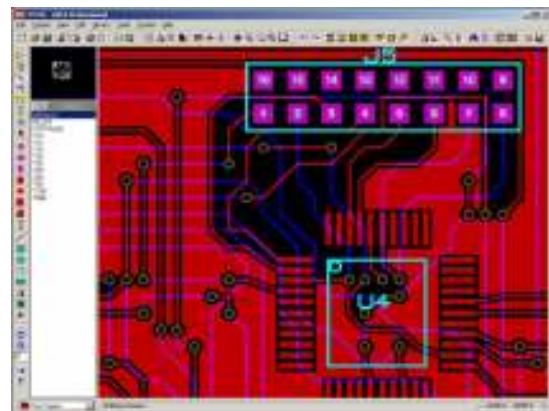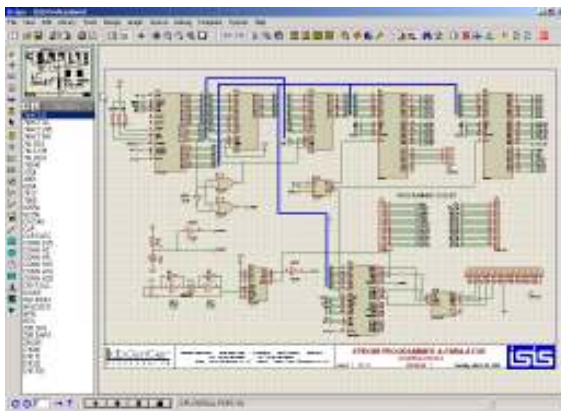# R4 Systems Inc.

R4 systems Inc. represents Labcenter's products in the USA and Canada.

Proteus consists of three main tools; ISIS for schematic capture, VSM for simulation and ARES for PCB Layout.

ISIS lies right at the heart of the PROTEUS system and is far more than just another schematic package. It combines an exceptionally powerful design environment with the ability to control most aspects of the drawing appearance. Whether your requirement is the rapid entry of complex designs for simulation & PCB layout, or the creation of attractive schematics for publication, ISIS is the tool for the job.
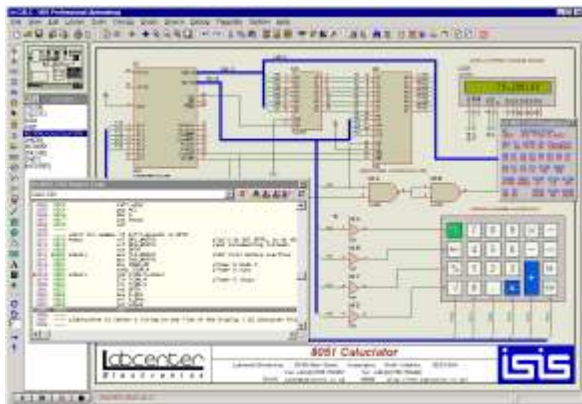
Our high performance netlist based PCB design software ARES, perfectly complements ISIS. Incorporating both automatic component placement and a highly effective rip-up and retry auto-router, ARES transfers both time and effort from you to your PC.

ISIS and ARES together form a complete Proteus PCB Design Package.

Proteus Virtual System Modeling (VSM) combines mixed mode SPICE circuit simulation, animated components and microprocessor models to facilitate co-simulation of complete micro controller based designs. For the first time ever, it is possible to develop and test such designs before a physical prototype is constructed.

This is possible because you can interact with the design using on screen indicators such as LED and LCD displays and actuators such as switches and buttons. The simulation takes place in real time (or near enough to it): a 300 MHz Pentium II can simulate a basic 8051 system clocking at over 12MHz. Proteus VSM also provides extensive debugging facilities including breakpoints, single stepping and variable display for both assembly code and high level language source.

The VSM architecture allows additional animated models to be created by anyone, including end users. Although many types of animated model can be produced without resort to coding, a documented interface has been provided for developers to write their own models packaged as Windows DLLs. These models can implement purely electrical behavior or combine this with graphical behavior so that almost any kind of application specific peripheral can be simulated.

VSM currently supports, PIC10s, PIC12s, PIC16s, PIC18s PIC24, Atmel AVR, Motorola HC11, MCS 8051/52, and the Basic Stamp. The most recent released model supports the ARM/7 processor (ARM/LPC2000).

Proteus VSM uses Labcenter's proven Schematic Capture software to provide the environment for design entry and development. ISIS is a long established product and combines ease of use with powerful editing tools.

R4 Systems Inc.

Proteus VSM will simulate the interaction between software running on a microcontroller and any analog or digital electronics connected to it. This gives a complete view of the users schematic.

The micro-controller model sits on the schematic along with the other elements of your product design. It simulates the execution of your object code (machine code), just like a real chip. If the program code writes to a port, the logic levels in circuit change accordingly, and if the circuit changes the state of the processor's pins, this will be seen by your program code, just as in real life.

The following is an example of a PIC Processor circuit that plays Chess on a graphic LCD screen. In this example we have paused the animation and are viewing the CPU Registers, the Source Code, CPU Stack, the Source Variables, the Simulation time and the User Schematic. Other items can also be viewed such as RAM, EEPROM, Flash, SPI and I2C.

CPU Registers

Source Code
(ASM, C or Basic)

CPU Stack

Source Code
Variables

Simulation
Time

User Schematic

The VSM CPU models fully simulate I/O ports, interrupts, timers, USARTs and all other peripherals present on each supported processor. It is anything but a simple software simulator since the interaction of all these peripherals with the external circuit is fully modeled down to waveform level.

VSM can even simulate designs containing multiple CPUs, since it is a simple enough matter to place two or more processors on a schematic and wire them together.

If you have any questions about Proteus or if you would like a quote, please give us a call toll free at 1-866-499-8184. To find more information about Proteus you can also visit our website at www.r4systems.com