PROTEUS
VSM SIMULATION

Proteus VSM brings Agile development into the embedded workflow. It enables rapid prototyping of both hardware design and firmware design in software, making it easy to make changes to both.

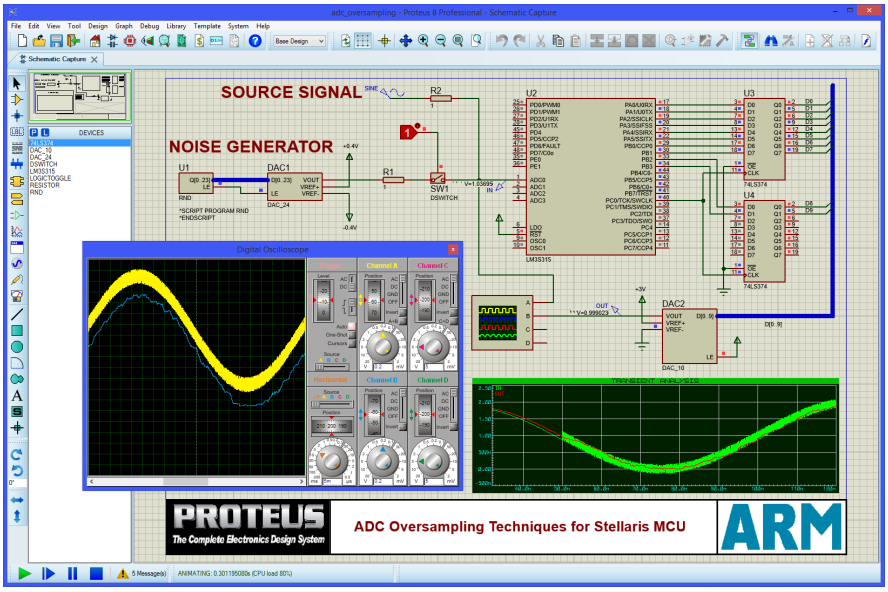
Complete Embedded Workflow

Proteus VSM provides a unique development platform for the embedded engineer. It allows you to specify a program (HEX file, COF File etc.) as a property of the microcontroller part on the schematic and during simulation will show you the effects of the program on the schematic you have created.

You can change your 'hardware' by rewiring the schematic, changing component values for resistors, capacitors etc. and deleting or adding new components to the design. You can change your firmware in the IDE of your choice and, once compiled, test the new code on the new system at the press of a button. This gives you total freedom to experiment with different ideas and to find the optimal design solution for your project. The schematic serves as a 'virtual prototype' for the firmware and it's quick and easy to make changes to either.

Typically, engineers spend as much time finding and fixing problems and testing projects as they do in creating them in the first place. This is an area where Proteus VSM excels. When working in Proteus and a breakpoint is set in the code the entire system stops when that line of code is reached. This effectively stops time, allowing the engineer to focus on debugging while protecting the design from unwanted real world effects (e.g. capacitors discharging, motors losing momentum) which often hinder static analysis. Single step debugging then advances the entire system, showing the effects of the execution of that line of code on the schematic (virtual prototype). This unique ability to control the program flow through the electronics of a design makes it easier to work out where a particular problem lies and whether the software design or hardware design is at fault.

Proteus VSM will save time and effort during the design phase and in the testing/debugging phase. The ability to use the schematic in Proteus as a virtual prototype for firmware design and debugging improves the quality of the physical prototype. Less design iterations mean less delays at manufacturing and lower manufacturing costs.



"I am very pleased with the Proteus simulator. I got my project designed and working in no time, without having to develop a breadboard."

Boeing Satellite Development Center

VSM SIMULATION

Over 750 processor models from 8-bit through 32-bit architectures.

ARM ATMEL PIC

Includes thousands of embedded peripherals from sensors to motors to TFT displays.

DESIGN

For embedded engineers, Proteus VSM bridges the gap in the design workflow between schematic capture and PCB layout. It enables you to write and apply your firmware to a microcontroller component on the schematic and then co-simulate the program within a mixed-mode SPICE circuit simulation. For design entry and development therefore you use the Proteus capture tool to draw a schematic representing the electronics for your project. Proteus capture is a long established product, combining ease of use with innovative features and powerful editing tools. It is used both to design 'virtual hardware' for Proteus VSM simulation and then also for PCB design using our PCB Layout module (ARES).

SIMULATE

Proteus can fully simulate the interaction between software running on an MCU and any analogue or digital electronics connected to it on the schematic. The MCU sits on the schematic along with the other elements of your design. It simulates the execution of your object code, just like a real chip. If the firmware 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. The models typically support all on-board peripherals of the real device. Unlike other simulators, the interaction of the MCU with the external circuit (schematic) is modelled down to waveform level and the entire system can therefore be tested.

ANALYZE

Proteus VSM includes a number of virtual instruments including an Oscilloscope, Logic Analyser, Function Generator, Pattern Generator, Counter Timer and Virtual Terminal as well as simple voltmeters and ammeters. In addition, we provide dedicated Master/Slave/Monitor mode protocol analysers for SPI and I2C - simply wire them onto the serial lines and monitor or interact with the data live during simulation. A truly invaluable (and inexpensive!) way to get your communication software right prior to hardware prototyping. Also available for more detailed analysis are graphing capabilities for things like frequency, fourier, distortion, noise or sweep analyses.

DEBUG

Whilst Proteus VSM is already unique in its capability to run near real time simulations of complete micro-controller systems, its real power comes from its ability to perform these simulations in single step mode. This works just like your favourite software debugger, except that as you single step the code, you can observe the effect on the entire design - including all the electronics external to the microcontroller. You have full access to variables display and watch window where you can monitor address and/or register contents. You can also set breakpoints on a logical condition of any watch window item making it easy for example to trap a timer overflow.

Diagnostic messaging system can log system wide activity during simulation.

ACK I2C

Set breakpoints either on software conditions or on hardware conditions.

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