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Proteus VSM for Atmel® AVR®

System Level Simulation for Atmel® AVR® Microcontrollers.

Summary

Proteus Virtual System Modelling (VSM) combines mixed mode SPICE circuit simulation, animated components and microprocessor models to facilitate co-simulation of complete microcontroller based designs.The 'Proteus VSM for Atmel® AVR®' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- All supported VSM microcotroller variants in the AVR Family.
- All of the Proteus Embedded Simulation Peripheral Libraries.
- VSM Studio IDE with automatic compiler configuration.
- Over 10,000 standard simulation models.

Variants

The following is a current list of supported variants in the AVRAtmel® AVR® family:

- AT90USB646, AT90USB1286
- ATMEGA169, ATMEGA19P, ATMEGA329, ATMEGA3290 (LCD AVR's)
- ATMEGA329P, ATMEGA3290P, ATMEGA649, ATMEGA6490 (LCD AVR's)
- ATMEGA640, ATMEGA644, ATMEGA644P, ATMEGA645, ATMEGA162, ATMEGA165
- ATMEGA165P, ATMEGA325, ATMEGA325P, ATMEGA3250, ATMEGA3250P, ATMEGA2313
- ATMEGA8515, ATMEGA8535, ATMEGA1284P, ATMEGA8, ATMEGA8(32PIN), ATMEGA16
- ATMEGA32, ATMEGA48, ATMEGA48P, ATMEGA48P(32PIN), ATMEGA48(32PIN)
- ATMEGA64, ATMEGA88, ATMEGA88P, ATMEGA88P(32PIN, ATMEGA88(32PIN)
- ATMEGA128, ATMEGA164PATMEGA168, ATMEGA168P, ATMEGA328P, ATMEGA328P
- ATMEGA168P(32PIN), ATMEGA168(32PIN), ATMEGA324P, ATMEGA1280, ATMEGA1281
- ATMEGA2560, ATMEGA2561, ATMEGA6450, ATMEGA103, ATTINY10, ATTINY11
- ATTINY12, ATTINY13, ATTINY15ATTINY24, ATTINY25, ATTINY44, ATTINY45
- ATTINY48, ATTINY48(32PIN)ATTINY84, ATTINY85, ATTINY88, ATTINY88 (32PIN)
- ATTINY261, ATTINY461ATTINY861, ATTINY2313, AT90S1200, AT90S2313
- AT90S2323, AT90S2333, AT90S2343, AT90S4433, AT90S4434, AT90S8515, AT90S8535

Features

We believe our simulation models are the most accurate and the most complete on the market today. A summary of model capabilities is listed below:

- Supports the entire instruction set.
- Supports all port and other I/O pin operations.
- Supports all counter/timers including seperate prescalers, capture compare and PWM modes.
- Supports watchdog timer.
- Supports serial U(S)ART.
- Supports master slave SPI, USI and TWI serial interfaces.
- Supports Analogue-to-Digital Conversion (ADC) and analogue comparator modules in all modes.
- Supports all internal and external interrupt modes.
- Supports internal code and data EEPROM memory inc. code protection and data persistence.
- Internally generated processor clock for performance. Event timing accurate to one clock period.
- Provides internal consistency checks on code (e.g. execution of invalid op-codes, illegal memory accesses, stack overflow checking, etc.).
- Fully integrated in to the VSM source level debugging system.
- Fully integrated into the Proteus Diagnostic Control System.

Limitations

The following is a listing of known limitations in the current version of the AVR® family:

- x Brown-out Reset is not implemented.
- x Power supply voltage changing is not supported.
- x JTAG and other in-circuit debugging interfaces are not supported.
- x External programming of memories is not supported.
- x Electrical characteristics dependency of the temperature is not implemented.

Compilers

Supported Third Party Compilers

Proteus VSM models will fundamentally work with the exact same HEX file as you would program the physical device with. However, far more debugging information is available when using a compiler to write the firmware and providing these object files to Proteus in place of the HEX file provides a much richer working environment.

We recommend you use the free Labcenter VSM Studio IDE. This will greatly simplify the task as it will automatically configure supported compilers to work with a Proteus VSM simulation.

If you prefer to work inside your own IDE then you will need to set your compiler options manually. After compiling for debug, all you need to do is specify the debug file from the compiler as the program property of the microcontroller on the schematic.

VSM Studio supported toolchains

- IAR
- GCC
- Arduino
- ImageCraft
- HP Info Tech
- Bascom AVR

With continual development on the Proteus Design Suite we endeavour to keep all content updated with the latest product details. On rare occasions this may not happen immediately, and website content will then be incomplete or inaccurate. We will attempt to correct any such errors as soon as possible, E&OE.