Proteus VSM for Arduino™

System Level Simulation for Arduino™

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 Arduino™' product includes the following main software modules:

- Professional Schematic Capture module

- ProSPICE professional Simulation Engine

- All supported VSM microcotroller variants in the Arduino Family.

- All of the Proteus Embedded Simulation Peripheral Libraries.

- VSM Studio IDE with automatic compiler configuration.

- Over 10,000 standard simulation models.

⚠ *The full Proteus VSM for AVR Product also includes simulation of the entire range of supported Atmel AVR variants but does not include the ARM STM32 variant.*

Variants

The following is a current list of supported variants in the Arduino™ family:

- ATMEGA168, ATMEGA328, ATMEGA2560, STM32F103C8T6

⚠️ *The full Proteus VSM for AVR Product also includes simulation of the entire range of supported Atmel AVR variants but does not include the ARM STM32 variant.*

Shields

There is a vast selection of available Ardino™ Shields available. These are listed below:

- Any schematic of a shield that you draw yourself
- Arduino™ 2 Channel Relay Shield.
- Arduino™ 4 Channel Relay Shield.
- Arduino™ 7-segment Common Anode Breakout Board.
- Arduino™ 7-segment Common Cathode Breakout Board.
- ADS1110 Breakout Board.
- BME280 Breakout Board.
- BMP180 Breakout Board.
- BMP280 Breakout Board.
- Button Breakout Board.
- Buzzer Breakout Board.
- DHT11 Humidity & Temperature sensor Breakout Board.
- GPS Module Breakout Board.
- Hall-Effect Current Sensor Breakout Board.
- HX711 for Load Cell Breakout Board.
- ILI9341 TFT LCD Shield.
- INA219 Current Sensor Breakout Board.
- Infra Red Demodulator.
- Arduino™ 8x8 LED's.
- Arduino™ 16-channel PWM Servo Adafruit Shield.
- Arduino™ 74HC595 Shift Register Breakout Board.
- Arduino™ AD8495 K-Type Thermocouple Amplifier Breakout Board.
- Arduino™ Data Logger Shield.
- Arduino™ DHT22 Humidity & Temperature sensor Breakout Board.
- Arduino™ DS18B20 Breakout Board.
- Arduino™ DS1302 RTC Breakout Board.
- Arduino™ EA DOGS102N-6 Graphics Display

Breakout Board.

- Arduino™ ENC28J60 Ethernet Breakout Board.
- Arduino™ HYT271 Precision Humidity & Temperature sensor Breakout Board.
- Arduino™ I2C 16x2 LCD Breakout Board.
- Arduino™ I2C 20x4 LCD Breakout Board.
- Arduino™ IOX-16 Shield with MCP23017 I/O Expander.
- Arduino™ KS0108 128x64 Graphics Display Breakout Board.
- Arduino™ KS0108 192x64 Graphics Display Breakout Board.
- Arduino™ LCD Shield.
- Arduino™ LED Bar Breakout Board.
- Arduino™ LED Shield.

- Arduino™ MCP3208 12bit ADC Breakout Board.
- Arduino™ MCP3304 13bit ADC Breakout Board.
- Arduino™ MCP3421 18-bit ADC Breakout Board.
- Arduino™ MCP4921 12bit DAC Breakout Board.
- Arduino™ MCP23008 I2C Expander.
- Arduino™ Motor Shield with Servos.
- Arduino™ Motor Shield.
- Arduino™ MPX4250AP absolute pressure sensor Breakout Board.
- Arduino™ Nokia 5110-3310 Monochrome LCD Breakout Board.
- Arduino™ PCA9555 I2C Expander Breakout Board.
- Arduino™ SD Card Breakout Board.
- Arduino™ Serial 16x2 LCD Breakout Board.
- Arduino™ Serial LED Breakout Board.
- Arduino™ Serial LED Horizontal Breakout Board.
- Arduino™ SRF04 Ultrasonic Ranger Breakout Board.
- Arduino™ SSD1306 128x64 Graphics Display I2C Breakout Board.
- Arduino™ SSD1306 128x64 Graphics Display

SPI Breakout Board.

- Arduino™ Temperature & Light Breakout Board.
- Arduino™ Terminal Shield.
- Arduino™ Thermistor Breakout Board.
- Arduino™ Wave Shield.
- Arduino™ Weather Station Shield.
- K Type Thermocouple Amplifier Breakout board.
- Keyes remote.
- MAX31856 THC to Digital Breakout Board.
- MAX31865 RTD to Digital Breakout Board.
- MCP9600 Thermocouple Breakout Board.
- MCP9601 Thermocouple Breakout Board.
- RGB Common Anode LED.
- RGB Common Cathode LED.
- Serial 16x2 LCD Breakout Board.
- ST7735R TFT LCD Shield.
- TC74 Breakout Board.
- Temperature & Light Breakout Board.
- Velleman VMA203 LCD & Keypad Shield.

Limitations

The following is a listing of known limitations in the current version of the Arduino™:

x No significant functional limitations.

x HFINTOSC as CLC1 input is not supported for efficiency reasons.

x IVR Internal Voltage Regulator and VREGCON register effect are not modeled.

x BORCON register effect are not modeled.

x Blue Pill STM32 Arduino board clocks at 16MHz by default (for performance).

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

- Arduino
- GCC