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ARM®

Technical Specifications

This document contains technical information on the ARM® microprocessor variants, feature and limitations supported by Proteus. For information on what is included in a particular Proteus product please click the link in the table of contents below

Contents

Proteus Platinum Edition

Summary

Proteus Platinum is the ultimate Proteus product and contains all of the product modules that we sell. This includes:

- All of our PCB Design features - top of the range PCB module.
- High Speed design and differential pairs support
- Shape based Autorouter
- Built-in access to millions of ready-made library parts and footprints.
- ProSPICE professional simulation engine
- All of our Proteus VSM microcotroller families (over 750 processor models).
- All of our Visual Designer and IoT Builder product modules.

PCB Features

PCB Design in Proteus Platinum has unlimited design capacity and includes all available PCB features.

- True Hierarchical Schematic Design.
- Fully Customisable Bill of Materials Reporting Module.
- Interactive Design Explorer with Cross Probing.
- Support for product Assembly Variants.
- Dedicated Reporting Module (Project Notes).
- Formal Design Re-use with Project Clips/Design Snippets.
- Integrated Library Part Import Tools.
- 3D Board Visualisation.
- Gerber X2, ODB++, IDF, PDF, STEP and IGES Output Formats.
- Adaptive Shape Based Autorouter in scriptable or interactive mode.
- Hardware Accelerated Display with Layer Transparency.
- Comprehensive Design Rule Configuration.
- Design Rule Aware Interactive Routing.
- Adaptive Shape Based Autorouter.
- Automatic Power Plane Generation.
- Differential Pair Routing Support
- Gerber Export.
- Automatic Length Matching / Net tuning of routes.
- Multiple Power Planes per Layer (e.g. an Analog Ground and Digital Ground).
- User drawn Power Planes of specific dimensions.
- Dynamic Teardrops.

VSM Families

The Platinum Version includes all the microcontroller variants that we support, across every family, architecture and silicon vendor. This includes :

- Proteus VSM for Microchip Technologies™ PIC10, 12, 16, 18, 24 and dsPIC33.

- Proteus VSM for Atmel® AVR® and Arduino™ AVR®.
- Proteus VSM for Texas Instruments™ MSP430® and PICCOLO®.
- Proteus VSM for NXP 8051 variants.
- Proteus VSM for all ARM® LPC2000, ARM® Cortex™-M0, ARM® Cortex™-M3 and Cortex™-M4 variants.

Other Modules

In addition to the unlimited PCB Layout and VSM Simulation software the Platinum Version also includes all of our supporting modules as standard, including:

- Visual Designer for Arduino™ AVR®.
- Visual Designer for Raspberry Pi®.
- Proteus IoT Builder.
- Advanced Simulation Features.
- USB Simulation Support.
- All Embedded Peripherals Libraries.

Proteus Enterprise Edition

Summary

Proteus Enterprise Version contains everything you need for professional PCB product design. It supports the complete product design lifecycle from schematic capture to simulation test/debug to PCB Layout and export for manufacture.

- Professional Schematic Capture module
- Unlimited Professional PCB Layout module
- High Speed design and differential pairs support
- Shape based Autorouter
- Built-in access to millions of ready-made library parts and footprints.
- ProSPICE professional simulation engine
- All Proteus VSM microcontroller families (over 750 processor models).

PCB Features

PCB Design in the Enterprise Version has unlimited design capacity and includes all available PCB features.

- True Hierarchical Schematic Design.
- Fully Customisable Bill of Materials Reporting Module.
- Interactive Design Explorer with Cross Probing.
- Support for product Assembly Variants.
- Dedicated Reporting Module (Project Notes).
- Formal Design Re-use with Project Clips/Design Snippets.
- Integrated Library Part Import Tools.
- 3D Board Visualisation.
- Gerber X2, ODB++, IDF, PDF, STEP and IGES Output Formats.
- Adaptive Shape Based Autorouter in scriptable or interactive mode.
- Hardware Accelerated Display with Layer Transparency.
- Comprehensive Design Rule Configuration.
- Design Rule Aware Interactive Routing.
- Adaptive Shape Based Autorouter.
- Automatic Power Plane Generation.
- Differential Pair Routing Support
- Gerber Export.
- Automatic Length Matching / Net tuning of routes.
- Multiple Power Planes per Layer (e.g. an Analog Ground and Digital Ground).
- User drawn Power Planes of specific dimensions.
- Dynamic Teardrops.

VSM Families

The Enterprise Version includes all the microcontroller variants that we support, across every family, architecture and silicon vendor. This includes :

- Proteus VSM for Microchip Technologies™ PIC10, 12, 16, 18, 24 and dsPIC33.
- Proteus VSM for Atmel® AVR® and Arduino™ AVR®.
- Proteus VSM for Texas Instruments™ MSP430® and PICCOLO®.
- Proteus VSM for NXP 8051 variants.
- Proteus VSM for all ARM® LPC2000, ARM® Cortex™-M0, ARM® Cortex™-M3 and Cortex™-M4 variants.

Other Modules

In addition to the unlimited PCB Layout and VSM Simulation software the Enterprise Version also includes the following supporting modules:

- Advanced Simulation Features.
- USB Simulation Support.
- All Embedded Peripherals Libraries.

Proteus VSM for ARM7/LPC2000

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 ARM&reg7/LPC2000;' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- All supported VSM microcotroller variants in the ARM7® Family.
- All of the Proteus Embedded Simulation Peripheral Libraries.
- VSM Studio IDE with automatic compiler configuration.
- Over 10,000 standard simulation models.

⚠ *Proteus VSM for ARM® Bundle products are ideal if you need to simulate more than one family of ARM micro-controllers.*

Variants

The following is a current list of supported variants in the ARM7 family:

- LPC2104, LPC2105, LPC2106.
- LPC2114, LPC2124
- LPC2131, LPC2132, LPC2134, LPC2136, LPC2138.
- LPC2101, LPC2102, LPC2103.
- ARM7TDMI and ARM7TDMI-S core models.

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:

- Full support for both ARM and THUMB instruction sets.
- Supports all port and other I/O pin operations.
- Supports all on-chip peripherals (GPIO, timers, RTC, U(S)ARTs, SPI, I2C, MAM, PLL & ADC).
- Supports full functionality of the VIC interrupt system.
- Up to 10MIPS simulation throughput on 3GHz PC.
- Load and debug any ELF/DWARF2 program file.
- Debugger drivers available for IAR Embedded Workbench and Keil UV3.
- 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 ARM7®:

x The bootloader is not modelled.

x The JTAG interfaces and in-circuit programming modes are not supported.

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
- Keil

Proteus VSM for ARM Cortex-M3

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 ARM® Cortex™-M3' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- All supported VSM microcotroller variants in the ARM® Cortex™-M3 Family.
- All of the Proteus Embedded Simulation Peripheral Libraries.
- VSM Studio IDE with automatic compiler configuration.
- Over 10,000 standard simulation models.

⚠ *Proteus VSM for ARM Bundle products are ideal if you need to simulate more than one family of ARM micro-controllers.*

Variants

The following is a current list of supported variants in the ARM® Cortex™-M3 family:

- STM32F103C4, STM32F103R4, STM32F103T4, STM32F103C6
- LM3S300, LM3S301, LM3S308, LM3S310
- LM3S315, LM3S316, LM3S317, LM3S328
- ATSAM3N00A, ATSAM3N00B, ATSAM3N0A, ATSAM3N0B
- ATSAM3N0C, ATSAM3N1A, ATSAM3N1B, ATSAM3N1C
- ATSAM3N2A, ATSAM3N2B, ATSAM3N2C, ATSAM3N4A
- STM32F103R6, STM32F103T6, ATSAM3N4B, ATSAM3N4C
- LPC1311FHN33, LPC1313FHN33, LPC1313FBD48
- LPC1342FHN33, LPC1311FHN33, LPC1313FHN33
- LPC1313FBD48, LPC1342FHN33, LPC1342FBD48
- LPC1343FHN33, LPC1343FBD48

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:

- Fully simulates the entire instruction set (excluding operations for multiprocessor support).
- Supports all port and other I/O pin operations.
- Supports sleep and deep sleep modes.
- Supports Watchdog Timer.
- Supports General Purpose Timers in all modes.
- Supports Universal Asynchronous Receiver/Transmitter (UART) with FIFO mode.
- Supports Synchronous Serial Interface (SSI) with following frame types: Freescale, MICROWIRE, or Texas Instruments.
- Supports Inter-Integrated Circuit (I2C) in all modes on appropriate devices.
- Supports Analog Comparators in all configurations of signal sources.
- Supports Analog-to-digital 10-bit converter (ADC) with several input channels plus internal temperature sensor.
- Supports internal code and data FLASH memory including Cortex-M3 memory region protection.
- Supports all interrupt modes.
- 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 integrity 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 ARM® Cortex™-M3:

- x Bitband alias regions are of type XN (Execute Never).
- x Cache information is not used.
- x Systick calibration value register (SYST_CALIB) is ignored.
- x Data Barrier instructions (DMB,DSB) are treated as NOP.
- x Register PLLCFG is not modelled.
- x Clock Verification Timers and Internal brown-out detector not modelled.
- x Registers DR2R,DR4R,DR8R,SLR are not modelled.
- x Loopback feature of the I2C Module is not documented and therefore not modelled.

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
- KEIL

Proteus VSM for ARM Cortex-M0

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 ARM® Cortex™-M0' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- All supported VSM microcotroller variants in the ARM® Cortex™-M0 Family.
- All of the Proteus Embedded Simulation Peripheral Libraries.
- VSM Studio IDE with automatic compiler configuration.
- Over 10,000 standard simulation models.

⚠ *Proteus VSM for ARM Bundle products are ideal if you need to simulate more than one family of ARM™ micro-controllers.*

Variants

The following is a current list of supported variants in the ARM® Cortex™-M0/M0+ family:

- LPC1110FD20, LPC1111FDH20/002
- LPC1111FHN33/101, LPC1111FHN33/102
- LPC1111FHN33/103, LPC1111FHN33/201
- LPC1111FHN33/202, LPC1111FHN33/203
- LPC1112FD20/102, LPC1112FDH20/102
- LPC1112FDH28/102, LPC1112FHN24/202
- LPC1112FHN33/101, LPC1112FHN33/102
- LPC1112FHN33/103, LPC1112FHN33/201
- LPC1112FHN33/202, LPC1112FHN33/203
- LPC1113FBD48/301, LPC1113FBD48/302
- LPC1113FBD48/303, LPC1113FHN33/201
- LPC1113FHN33/202, LPC1113FHN33/203
- LPC1113FHN33/301, LPC1113FHN33/302
- LPC1113FHN33/303, LPC1114FBD48/301
- LPC1114FBD48/302, LPC1114FBD48/303
- LPC1114FBD48/323, LPC1114FBD48/333
- LPC1114FDH28/102, LPC1114FHN33/201
- LPC1114FHN33/202, LPC1114FHN33/203
- LPC1114FHN33/301, LPC1114FHN33/302
- LPC1114FHN33/303, LPC1114FHN33/333
- LPC1114FN28/102, LPC1115FBD48/303
- LPC1115FET48/303, ATSAMD21E15A
- ATSAMD21E16A, ATSAMD21E17A
- ATSAMD21E18A, ATSAMD21G15A
- ATSAMD21G16A, ATSAMD21G17A
- ATSAMD21G18A, ATSAMD21J15A
- ATSAMD21J16A, ATSAMD21J17A
- ATSAMD21J18A

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:

- Fully simulates the entire instruction set.
- Supports all port and other I/O pin operations.
- Supports sleep and deep sleep modes.
- Supports Watchdog Timer.
- Supports General Purpose Timers in all modes.
- Supports Universal Asynchronous Receiver/Transmitter (UART) with FIFO mode.
- Supports Synchronous Serial Interface (SSI) with following frame types: Freescale, Microwire, or Texas Instruments.
- Supports Inter-Integrated Circuit (I2C) in all modes on appropriate devices.
- Supports Analog Comparators in all configurations of signal sources.
- Supports Analog-to-digital 10-bit converter (ADC) with several input channels plus internal temperature sensor.
- Supports all interrupt modes.
- 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 integrity checking, etc.).
- Fully integrated in to the VSM source level debugging system.
- Fully integrated into the Proteus Diagnostic Control System.
- 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 ARM® Cortex™-M0:

- x Bitband alias regions are of type XN (Execute Never). Fetches from these regions are invalid.
- x Cache information is not used.
- x SysTick Calibration value Register (SYST_CALIB) is ignored.
- x Alignment of memory accesses is not analyzed.
- x Data Barrier instructions (DMB, DSB) are treated as NOP.
- x Power monitoring and Brown-Out Detection circuit are not implemented.
- x Flash programming firmware is not supported.
- x LPC111X specific: Hysteresis bit CONIO.HYST is not modeled.

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
- KEIL

Proteus VSM for ARM Cortex M4

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 ARM® Cortex™-M4' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- All supported VSM microcotroller variants in the ARM® Cortex™-M4 Family.
- All of the Proteus Embedded Simulation Peripheral Libraries.
- VSM Studio IDE with automatic compiler configuration.
- Over 10,000 standard simulation models.

⚠ *Proteus VSM for ARM Bundle products are ideal if you need to simulate more than one family of ARM micro-controllers.*

Variants

The following is a current list of supported variants in the ARM® Cortex™-M4 family:

- STM32F401CB, STM32F401CC, STM32F401CD, STM32F401CE
- STM32F401VB, STM32F401VC, STM32F401VD, STM32F401VE
- STM32F401RB, STM32F401RC, STM32F401RD, STM32F401RE

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:

- Fully simulates the entire instruction set (excluding operations for multiprocessor support).
- Fully simulates FPU instruction set.
- Supports all port and other I/O pin operations.
- Supports powerdown modes.
- Supports Window Watchdog Timer and Independent Watchdog Timer.
- Supports General Purpose Timers (TIM1, TIM2-TIM5, TIM9-TIM11) in all modes.
- Supports Real-time Clock.
- Supports I2C with multimaster capability and packet error checking.
- Supports SPI with Texas Instruments frame type and hardware CRC calculation.
- Supports USART with full duplex asynchronous communication
- Supports 12-bit ADC with several input channels, all conversion modes and configurable resolution.
- Supports internal code and data FLASH memory including Cortex-M4 memory region protection.
- Supports Universal Serial Bus on-the-go full speed (USB-OTG_FS) in device mode.
- Supports all interrupt modes.
- Provides internal consistency checks on code (e.g. execution of invalid op-codes, illegal memory accesses, stack integrity 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 ARM® Cortex™-M4:

- x Clock security system is not implemented.
- x SPI doesn't support IrDA and I2S audio protocols
- x I2C::TRISE is not implemented
- x I2C doesn't support SMBus protocol
- x Tamper detection and backup functionality are not implemented
- x Flash programming algorithm is not implemented.
- x USB OTG Host capabilities and HNP protocol are not implemented.
- x RTC doesn't perform reference clock detection
- x RTC doesn't support calibration (RTC_CALR register)
- x SDIO is not implemented
- x Pins VCAP_1 and VCAP_2 are not modeled
- x USART doesn't support Smartcard, LIN, IrDA protocols

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

- GCC

Proteus VSM for ARM Bundle

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 Bundles include the following main software modules:

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

⚠ *Proteus VSM for ARM® Bundle products are ideal if you need to simulate more than one family of ARM micro-controllers.*

Variants

The following is a current list of supported variants in the ARM7 family:

- LPC2104, LPC2105, LPC2106.
- LPC2114, LPC2124
- LPC2131, LPC2132, LPC2134, LPC2136, LPC2138.
- LPC2101, LPC2102, LPC2103.
- ARM7TDMI and ARM7TDMI-S core models.

The following is a current list of supported variants in the ARM® Cortex™-M3 family:

- STM32F103C4, STM32F103R4, STM32F103T4, STM32F103C6
- LM3S300, LM3S301, LM3S308, LM3S310
- LM3S315, LM3S316, LM3S317, LM3S328
- ATSAM3N00A, ATSAM3N00B, ATSAM3N0A, ATSAM3N0B
- ATSAM3N0C, ATSAM3N1A, ATSAM3N1B, ATSAM3N1C
- ATSAM3N2A, ATSAM3N2B, ATSAM3N2C, ATSAM3N4A
- STM32F103R6, STM32F103T6, ATSAM3N4B, ATSAM3N4C
- LPC1311FHN33, LPC1313FHN33, LPC1313FBD48
- LPC1342FHN33, LPC1311FHN33, LPC1313FHN33
- LPC1313FBD48, LPC1342FHN33, LPC1342FBD48
- LPC1343FHN33, LPC1343FBD48

The following is a current list of supported variants in the ARM® Cortex™-M0/M0+ family:

- LPC1110FD20, LPC1111FDH20/002
- LPC1111FHN33/101, LPC1111FHN33/102
- LPC1111FHN33/103, LPC1111FHN33/201
- LPC1111FHN33/202, LPC1111FHN33/203
- LPC1112FD20/102, LPC1112FDH20/102
- LPC1112FDH28/102, LPC1112FHN24/202
- LPC1112FHN33/101, LPC1112FHN33/102
- LPC1112FHN33/103, LPC1112FHN33/201
- LPC1112FHN33/202, LPC1112FHN33/203
- LPC1113FBD48/301, LPC1113FBD48/302
- LPC1113FBD48/303, LPC1113FHN33/201
- LPC1113FHN33/202, LPC1113FHN33/203
- LPC1113FHN33/301, LPC1113FHN33/302
- LPC1113FHN33/303, LPC1114FBD48/301
- LPC1114FBD48/302, LPC1114FBD48/303
- LPC1114FBD48/323, LPC1114FBD48/333
- LPC1114FDH28/102, LPC1114FHN33/201
- LPC1114FHN33/202, LPC1114FHN33/203
- LPC1114FHN33/301, LPC1114FHN33/302
- LPC1114FHN33/303, LPC1114FHN33/333
- LPC1114FN28/102, LPC1115FBD48/303
- LPC1115FET48/303, ATSAMD21E15A
- ATSAMD21E16A, ATSAMD21E17A
- ATSAMD21E18A, ATSAMD21G15A
- ATSAMD21G16A, ATSAMD21G17A
- ATSAMD21G18A, ATSAMD21J15A
- ATSAMD21J16A, ATSAMD21J17A
- ATSAMD21J18A

The following is a current list of supported variants in the ARM® Cortex™-M4 family:

- STM32F401CB, STM32F401CC, STM32F401CD, STM32F401CE
- STM32F401VB, STM32F401VC, STM32F401VD, STM32F401VE
- STM32F401RB, STM32F401RC, STM32F401RD, STM32F401RE

Features

Please see individual product families for features and information on model details.

Limitations

Please see individual product families for information on model limitations of variants in that family.

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
- Keil