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Microchip Technologies™

Technical Specifications

This document contains technical information on the Microchip Technologies™ 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 PIC12

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 PIC10/12' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- All supported VSM microcotroller variants in the PIC10/12 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 PIC® Bundle products are ideal if you need to simulate more than one family of PIC micro-controllers.*

Variants

The following is a current list of supported variants in the PIC10/12 family:

- PIC10F200, PIC10F202, PIC10F204, PIC10F206
- PIC10F220, PIC10F222, PIC10F320, PIC10F322
- PIC10LF320, PIC10LF322,PIC12C508A, PIC12C509A
- PIC12C671, PIC12C672, PIC12CE518, PIC12CE519
- PIC12F508, PIC12F509
- PIC12CE673, PIC12CE674, PIC12F510, PIC12F609
- PIC12F615, PIC12F629, PIC12F675, PIC12F683
- PIC12F1501, PIC12LF1501, PIC12F752, PIC12HV752
- PIC12F1822, PIC12LF1822, PIC12F1840, PIC12LF1840
- PIC12F1571, PIC12F1572, PIC12LF1571, PIC12LF1572

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 including weak pullup.
- Supports all timers including watchdog timer, sleep mode and wake-up from sleep.
- Supports Analogue-to-Digital Conversion (ADC) module including support for voltage reference pins.
- Supports the Analogue Comparator and Voltage Reference modules.
- Supports internal code and data EEPROM memory inc. code protection and data persistence.
- Supports all interrupt modes including pin change interrupts.
- Supports the Complementary Output Generator (CWG) module in appropriate variants.
- Supports the Configurable Logic Cell (CLC) module in appropriate variants.
- Supports the Pulse Width Modulation (PWM) module in appropriate variants.
- Supports the Numerical Controlled Oscillator (NCO) module in appropriate variants.
- Supports the Complementary Waveform Generator (CWG) module in appropriate variants.
- 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.).
- more... Fully integrated in to the VSM source level debugging system.
- more... Fully integrated into the Proteus Diagnostic Control System.

Limitations

The following is a listing of known limitations in the current version of the PIC10/12:

- 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.

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
- HI-TEC
- Microchip XC8
- Microchip XC16
- Proton+
- CCS
- Source Boost
- Byte Craft

Proteus VSM for PIC16

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 PIC16' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- All supported VSM microcotroller variants in the PIC16 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 PIC® Bundle products are ideal if you need to simulate more than one family of PIC micro-controllers.*

Variants

The following is a current list of supported variants in the PIC16 family:

- PIC16C61, PIC16C62B, PIC16C63A, PIC16C64A
- PIC16C65B, PIC16C66, PIC16C67, PIC16C72A
- PIC16C73B, PIC16C74B, PIC16C76, PIC16C77
- PIC16F506, PIC16F526, PIC16F610, PIC16HV610
- PIC16F630, PIC16F631, PIC16F648A, PIC16F676
- PIC16F616, PIC16HV616, PIC16F627A, PIC16F628A
- PIC16F677, PIC16F684, PIC16F685, PIC16F687
- PIC16F688, PIC16F689, PIC16F690, PIC16F716
- PIC16F722A, PIC16F723A, PIC16F724, PIC16F726
- PIC16F727, PIC16LF722A, PIC16LF723A, PIC16LF724
- PIC16LF726, PIC16LF727, PIC16F785, PIC16HV785
- PIC16F818, PIC16F819, PIC16F83, PIC16F84A
- PIC16F87, PIC16F870, PIC16F871, PIC16F873
- PIC16F873A, PIC16F874, PIC16F874A, PIC16F876
- PIC16F876A, PIC16F877, PIC16F877A, PIC16F88
- PIC16F882, PIC16F883, PIC16F884, PIC16F886
- PIC16F887, PIC16F913, PIC16F914, PIC16F916
- PIC16F917, PIC16F946, PIC16F1454,PIC16F1455
- PIC16F505, PIC16F707, PIC16LF707, PIC16F1788
- PIC16LF1788, PIC16F1789, PIC16LF1789
- PIC16F1459, PIC16LF1454, PIC16LF1455, PIC16LF1459
- PIC16F1503, PIC16LF1503, PIC16F1507, PIC16LF1507
- PIC16F1508, PIC16LF1508, PIC16F1509, PIC16LF1509
- PIC16F1516, PIC16LF1516, PIC16F1517, PIC16LF1517
- PIC16F1518, PIC16LF1518, PIC16F1519, PIC16LF1519
- PIC16F1574, PIC16LF1574, PIC16F1575, PIC16LF1575
- PIC16F1578, PIC16LF1578, PIC16F1579, PIC16LF1579
- PIC16F1703, PIC16F1704, PIC16F1705, PIC16LF1703
- PIC16LF1704, PIC16LF1705, PIC16F1707, PIC16F1708
- PIC16F1709, PIC16F1823, PIC16F1824, PIC16F1825
- PIC16F1826, PIC16LF1707, PIC16LF1708, PIC16LF1709
- PIC16F1784, PIC16F1786, PIC16F1787, PIC16LF1784
- PIC16LF1786, PIC16F1829, PIC16LF1823, PIC16LF1824
- PIC16LF1787, PIC16LF1825, PIC16LF1826, PIC16F1827
- PIC16F1828, PIC16LF1827, PIC16LF1828, PIC16LF1829
- PIC16F1933, PIC16F1938, PIC16F1934, PIC16F1936
- PIC16F1937, PIC16F1939, PIC16LF1933, PIC16LF1934
- PIC16LF1936, PIC16LF1937, PIC16LF1938, PIC16LF1939
- PIC16F1946, PIC16F1947, PIC16LF1946, PIC16LF1947
- PIC16F1615, PIC16L1619, PIC16LF1615, PIC16LF1619
- PIC16F1847, PIC16LF1847, PIC16F18854, PIC16F18855
- PIC16F18856, PIC16F18857, PIC16F18875,PIC16F18876
- PIC16F1613, PIC16F1614, PIC16F1618, PIC16F1713
- PIC16F1716, PIC16F1717, PIC16F1718, PIC16F1719

- PIC16F1764, PIC16F1765, PIC16F1768, PIC16F1769
- PIC16LF1613, PIC16LF1614, PIC16LF1618, PIC16LF1713
- PIC16LF1716, PIC16LF1717, PIC16LF1718, PIC16LF1719
- PIC16LF1764, PIC16LF1765, PIC16LF1768, PIC16LF1769
- PIC16F18877

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 all timers including watchdog timer, sleep mode and wake-up from sleep.
- Supports both Capture-Compare-PWM (CCP) modules in all modes and ECCP modules.
- Supports Parallel Slave Port (PSP) module on appropriate devices.
- Supports MSSP in both the SPI mode and the I2C master and slave modes.
- Supports Standard 10-bit Analogue-to-Digital Conversion (ADC) module including support for voltage reference pins.
- Supports additional features for extended ADC module with 12-bit resolution and differential/single ended modes in appropriate variants.
- Supports Analogue Comparator modules including support for internal and external voltage references including FVR module.
- Supports USART in all modes and EUSART for appropriate variants.
- Supports internal code and data EEPROM memory inc. code protection and data persistence.
- Supports all interrupt modes.
- Supports the LCD controller module in appropriate variants.
- Supports the Configurable Logic Cell (CLC) module in appropriate variants.
- Supports the Pulse Width Modulation (PWM) module in appropriate variants.
- Supports the Numerical Controlled Oscillator (NCO) module in appropriate variants.
- Supports the Complementary Waveform Generator (CWG) module in appropriate variants.
- Supports the Ultra Low Power Wake Up module in appropriate variants.
- Supports the Digital Signal Modulator (DSM) in appropriate variants.
- Supports the Capacitive Sensing Module (CSM) in appropriate variants.
- Supports Operational Amplifier module (OPA) in appropriate variants.
- Supports Digital to Analog Converter (DAC) either 5 or 8-bit in appropriate variants.
- Supports Programmable Switch Mode Control (PSMC) module(s) in appropriate variants.
- Supports Complementary Output Generator (COG) in appropriate variants.
- 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.
- Enhanced PIC16 core architecture including Program and Data memory extentions, 14 new instructions, linear mapping, enhanced indirect addressing and automatic interrupt context save.

Limitations

The following is a listing of known limitations in the current version of the PIC16:

- x The external programming interface (PGC/PGD pins) are not modelled.
- x Brown-out detection is not modelled.
- x The new I2C features (SSPCON3 register) are not supported. Only bits PCIE, SCIE, SBCDE and BOEN are modelled. I2C will work in legacy mode only for remaining bits.
- x HFINTOSC as CLC1 input is not supported for efficiency reasons.
- x For efficiency reasons the CSM analog oscillator is not modeled. The capacitance on the CPSx inputs is computed more efficiently, though.

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
- HI-TEC
- Microchip XC8
- Microchip XC16
- Proton+
- CCS
- Source Boost
- Byte Craft

Proteus VSM for PIC18

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 PIC18' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- All supported VSM microcotroller variants in the PIC18 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 PIC® Bundle products are ideal if you need to simulate more than one family of PIC micro-controllers.*

Variants

The following is a current list of supported variants in the PIC18 family:

- PIC18F242, PIC18F252, PIC18F442, PIC18F452
- PIC18F248, PIC18F258, PIC18F448, PIC18F458
- PIC18F1220, PIC18F1320, PIC18F2220, PIC18F2331
- PIC18F2320, PIC18F2410, PIC18F2420, PIC18F2431
- PIC18F2510, PIC18F2515, PIC18F2520, PIC18F2525
- PIC18F2610, PIC18F2620, PIC18F4220, PIC18F4320
- PIC18F4331, PIC18F44J10, PIC18F45J10, PIC18F24J10
- PIC18F25J10, PIC18F4410, PIC18F4420, PIC18F4431
- PIC18F4510, PIC18F4515, PIC18F4520, PIC18F4525
- PIC18F4610, PIC18F4620, PIC18F6520, PIC18F6585
- PIC18F8585, PIC18F8680, PIC18F6620, PIC18F6680
- PIC18F6720, PIC18F8520, PIC18F8620, PIC18F8720
- PIC18F8722, PIC18F8627, PIC18F8622, PIC18F8527
- PIC18F6722, PIC18F6627, PIC18F6622, PIC18F6527
- PIC18F6628, PIC18F6723, PIC18F23K20, PIC18F24K20
- PIC18F25K20, PIC18F26K20, PIC18F43K20, PIC18F44K20
- PIC18F45K20, PIC18F46K20, PIC18F2450, PIC18F2455
- PIC18F2458, PIC18F2550, PIC18F2553, PIC18F4450
- PIC18F4455, PIC18F4458, PIC18F4550, PIC18F4553
- PIC18F13K50, PIC18F14K50, PIC18LF13K50, PIC18LF14K50
- PIC18F2480, PIC18F2580, PIC18F4480, PIC18F4580
- PIC18F2585, PIC18F2680, PIC18F4585, PIC18F4680
- PIC18F2682, PIC18F2685, PIC18F4682, PIC18F4685
- PIC18F46J13, PIC18F47J13, PIC18LF46J13, PIC18LF47J13
- PIC18F25K80, PIC18F26K80, PIC18F45K80, PIC18F46K80
- PIC18F65K80, PIC18F66K80, PIC18LF25K80, PIC18LF26K80
- PIC18F1230, PIC18F1330, PIC18F2423, PIC18F2523
- PIC18F4423, PIC18F4523, PIC18F6390, PIC18F6490
- PIC18F8390, PIC18F8490, PIC18F6393, PIC18F6493
- PIC18F8393, PIC18F8493, PIC18F63J90, PIC18F64J90
- PIC18F65J90, PIC18F83J90, PIC18F84J90, PIC18F85J90
- PIC18F13K22, PIC18F14K22, PIC18LF13K22, PIC18LF14K22
- PIC18F2221, PIC18F2321, PIC18F4221, PIC18F4321
- PIC18F23K22, PIC18F24K22, PIC18F25K22, PIC18F26K22
- PIC18LF23K22, PIC18LF24K22, PIC18LF25K22, PIC18LF26K22
- PIC18F43K22, PIC18F44K22, PIC18F45K22, PIC18F46K22
- PIC18LF43K22, PIC18LF44K22, PIC18LF45K22, PIC18LF46K22
- PIC18F65K22, PIC18F66K22, PIC18F24K50, PIC18F25K50
- PIC18F45K50, PIC18LF24K50, PIC18LF25K50, PIC18LF45K50
- PIC18F67K22, PIC18F85K22, PIC18F86K22, PIC18F87K22
- PIC18F24J50, PIC18F25J50, PIC18F26J50, PIC18LF24J50
- PIC18LF25J50, PIC18LF26J50, PIC18F44J50, PIC18F45J50
- PIC18F46J50, PIC18LF44J50, PIC18LF45J50, PIC18LF46J50
- PIC18F26J53, PIC18F27J53, PIC18LF26J53, PIC18LF27J53
- PIC18F46J53, PIC18F47J53, PIC18LF46J53, PIC18LF47J53
- PIC18F26J13, PIC18F27J13, PIC18LF26J13, PIC18LF27J13
- PIC18LF45K80, PIC18LF46K80, PIC18LF65K80, PIC18LF66K80

- PIC18F25Q10, PIC18F26Q10, PIC18F27Q10, PIC18F45Q10
- PIC18F46Q10,PIC18F47Q10, PIC18F26K40, PIC18F45K40
- PIC18F46K40, PIC18F24K40, PIC18F25K40, PIC18F27K40
- PIC18F47K40, PIC18F65K90, PIC18F66K90, PIC18F67K90
- PIC18F85K90, PIC18F86K90, PIC18F87K90

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 all timers including watchdog timer, sleep mode and wake-up from sleep.
- Supports Deep Sleep mode including independent watchdog timer and wake up from WDT, RTCC, ULPWM, INT0 and MCRL.
- Supports all Capture-Compare-PWM (CCP) modules in all modes and ECCP modules.
- Supports Parallel Slave Port (PSP) module on appropriate devices.
- Supports Parallel Master Port (PMP) module on appropriate devices.
- Supports MSSP in both the SPI mode and the I2C master and slave modes.
- Supports Analogue-to-Digital Conversion (ADC) module inc. support for voltage reference pins.
- Supports Analogue Comparator modules inc. support for internal and external voltage references.
- Supports CTMU, Charge Time Measurement Unit. All modes are simulated.
- Supports ULPWU, Ultra low-power wake-up input.
- Supports REFO, Reference Clock Output.
- Supports RTCC, Real-Time Clock and Calendar.
- Supports SRLatch module.
- Supports DSM, Data Signal Modulator on appropriate devices.
- Supports USART in all modes and EUSART for appropriate variants.
- Supports Universal Serial Bus (USB) on appropriate devices.
- Supports internal code and data EEPROM memory inc. code protection and data persistence.
- Supports Peripheral Pin Select (PPS) on appropriate devices.
- Supports Open-Drain Outputs capability on appropriate devices.
- Supports all interrupt modes.
- 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 PIC18:

- The External Memory Interface (EMI) of devices such as the PIC18F8X20 is not modelled. These devices can only be modelled when the PMx configuration bits select the Microcontroller Mode (MC) mode of operation. Specifically, the Microprocessor Mode (MP), Microprocessor with Boot Block Mode (MPBB) and Extended Microcontroller Mode (EMC) modes are not supported.
- Power Managed Modes is not modelled. Specifically, the use of IDLEN and SCS/SCSx bits in the OSCCON register to switch oscillator sources and the behaviour of the SLEEP command is not modelled. The SLEEP command always puts the processor in to full sleep mode. This limitation is largely due to poor documentation on how the power managed modes actually affect peripherals.
- Brown-out detection and High-Low Voltage Detect (HLVD) is not modelled.
- RELEASE bit effects and Brown-out wakeup from Deep Sleep mode are not modelled.
- The Internal/External Switch Over (IESO configuration bit) and the Fail Safe Clock Monitor (FSCM configuration bit) are not modelled.
- The CAN/ECAN module is not currently modelled.
- The SPP (Streaming Parallel Part) of the USB variants is not currently modelled.
- Isochronous USB transactions in the USB variants is not currently modelled.
- The external programming interface (PGC/PGD pins) are not modelled.
- The DMA features for SPI2 PGD pins are not modelled.
- The PMDx registers effects are not modelled.
- The VREGCON register effects are not modelled.
- The ACTCON register effects are not modelled.
- The SRLCON register effects are 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
- HI-TEC
- Microchip XC8
- Microchip XC16
- Proton+
- CCS
- Source Boost
- Byte Craft

Proteus VSM for PIC24

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 PIC24' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- All supported VSM microcotroller variants in the PIC24 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 PIC® Bundle products are ideal if you need to simulate more than one family of PIC micro-controllers.*

Variants

The following is a current list of supported variants in the PIC24 family:

- PIC24FJ32GA004, PIC24FJ48GA002, PIC24FJ48GA004
- PIC24FJ64GA002, PIC24FJ64GA004, PIC24FJ16GA004
- PIC24FJ64GA006, PIC24FJ128GA006, PIC24FJ64GA008
- PIC24FJ128GA008, PIC24FJ64GA010, PIC24FJ96GA010
- PIC24F16KA101, PIC24F08KA102, PIC24F16KA102
- PIC24FJ128GA010, PIC24F04KA200, PIC24F08KA101
- PIC24FJ96GA008, PIC24FJ96GA006, PIC24FJ16GA002
- PIC24FJ64GA106, PIC24FJ192GA106, PIC24FJ256GA106
- PIC24FJ128GA108, PIC24FJ192GA108, PIC24FJ256GA108
- PIC24FJ64GA110, PIC24FJ128GA110, PIC24FJ256GA110
- PIC24FJ32GA102, PIC24FJ32GA104, PIC24FJ64GA104
- PIC24FJ32GA002, PIC24FJ64GA102, PIC24FJ192GA110
- PIC24FJ64GA108, PIC24FJ128GA106, PIC24F04KA201

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 timers including watchdog timer, sleep mode and wake-up from sleep.
- Supports both Capture-Compare and PWM modules in all modes.
- Supports Parallel Master Port (PMP) module including legacy PSP modes.
- Supports all serial communication peripherals including SPI, I2C and UART.
- Supports Analogue-to-Digital Conversion (ADC) module including support for voltage reference pins.
- Supports Analogue Comparator modules including support for internal and external voltage references.
- Supports the CTMU (Charge Time Measurement Unit) features.
- Supports Real Time Clock including automatic initialisation from the PC time.
- Supports 16-bit Programmable Cyclic Redundancy Check (CRC-16) Generator for appropriate variants.
- Supports all interrupt modes including interrupt priorities.
- Support for the Peripheral Pin Select module on low pincount devices.
- Support for extended instruction set for appropriate variants.
- Support for 256 words (512 bytes) EEPROM for appropriate variants.
- 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 PIC24:

- The following "core" registers are either not modelled at all. Functionality enabled by these registers is therefore not available: DISICNT, ODCx, CLKDIV, OSCTUN, PMDx.
- The OSCCON register not modelled except for the SOSCEN bit (which must be set to enable the secondary oscillator for use by either timer 1 or the Real Time Clock Module)
- Brown-out detection is not modelled.
- The A/D converted Cad capacitance is not modelled. Whether the effects of Cad have to be taken into the account for CTMU calibration purposes then an external capacitor must be used.
- The SPI modules do not currently support either "enhanced" mode (FIFO buffering) or "framing" modes (essentially, any feature enabled via SPIxCON2).
- The 32-bit Programmable Cyclic Redundancy Check (CRC-32) Generator is not modelled yet.

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
- HI-TEC
- Microchip XC8
- Microchip XC16
- Proton+
- CCS
- Source Boost
- Byte Craft

Proteus VSM for dsPIC33

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 dsPIC33®' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- All supported VSM microcotroller variants in the dsPIC33® 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 PIC® Bundle products are ideal if you need to simulate more than one family of PIC® micro-controllers.*

Variants

The following is a current list of supported variants in the dsPIC33® family:

- dsPIC33FJ12GP201, dsPIC33FJ12GP202, dsPIC33FJ32GP202
- dsPIC33FJ32GP204, dsPIC33FJ16GP304, dsPIC33FJ12MC201
- dsPIC33FJ12MC202, dsPIC33FJ32MC202, dsPIC33FJ32MC204
- dsPIC33FJ16MC304

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 simulation of the entire instruction set.
- Supports all port and other I/O pin operations.
- Supports all timers including watchdog timer, sleep mode and wake-up from sleep.
- Supports both Capture-Compare and PWM modules in all modes.
- Supports Parallel Master Port (PMP) module including legacy PSP modes.
- Supports all serial communication peripherals including SPI, I2C and UART.
- Supports Analogue-to-Digital Conversion (ADC) module including support for voltage reference pins.
- Supports Analogue Comparator modules including support for internal and external voltage references.
- Supports Real Time Clock including automatic initialisation from the PC time.
- Supports all interrupt modes including interrupt priorities.
- Support for extended instruction set for appropriate variants.
- 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 dsPIC33®:

- x The FOSCEL, FOSCEL, CLKDIV and OSCTUN bits/registers are not supported.
- x Loop back and irDA modes are not currently supported.
- x The SPI modules do not currently support either "enhanced" mode (FIFO buffering) or "framing" modes (essentially, any feature enabled via SPIxCON2).
- x The register PMDx effects are not modelled.
- x Brown out detection is not currently modelled.
- x Quadrature encode interface - bit QEI1CON Stop in Idle mode not modelled.
- x Motor Control PWM - bit PxTCON, PWM Time Base Stop in Idle Mode not modelled.
- x ADC with SS&H - only the variant up to 13 analog input pin and without DMA is supported at moment.

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
- HI-TEC
- Microchip XC8
- Microchip XC16
- Proton+
- CCS
- Source Boost
- Byte Craft

Proteus VSM for PIC Bundle 8bit

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 8-bit PIC 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 PIC® Bundle products are ideal if you need to simulate more than one family of PIC micro-controllers.*

Variants

The following is a current list of supported variants in the PIC10/12 family:

- PIC10F200, PIC10F202, PIC10F204, PIC10F206
- PIC10F220, PIC10F222, PIC10F320, PIC10F322
- PIC10LF320, PIC10LF322,PIC12C508A, PIC12C509A
- PIC12C671, PIC12C672, PIC12CE518, PIC12CE519
- PIC12F508, PIC12F509
- PIC12CE673, PIC12CE674, PIC12F510, PIC12F609
- PIC12F615, PIC12F629, PIC12F675, PIC12F683
- PIC12F1501, PIC12LF1501, PIC12F752, PIC12HV752
- PIC12F1822, PIC12LF1822, PIC12F1840, PIC12LF1840
- PIC12F1571, PIC12F1572, PIC12LF1571, PIC12LF1572

The following is a current list of supported variants in the PIC16 family:

- PIC16C61, PIC16C62B, PIC16C63A, PIC16C64A
- PIC16C65B, PIC16C66, PIC16C67, PIC16C72A
- PIC16C73B, PIC16C74B, PIC16C76, PIC16C77
- PIC16F506, PIC16F526, PIC16F610, PIC16HV610
- PIC16F630, PIC16F631, PIC16F648A, PIC16F676
- PIC16F616, PIC16HV616, PIC16F627A, PIC16F628A
- PIC16F677, PIC16F684, PIC16F685, PIC16F687
- PIC16F688, PIC16F689, PIC16F690, PIC16F716
- PIC16F722A, PIC16F723A, PIC16F724, PIC16F726
- PIC16F727, PIC16LF722A, PIC16LF723A, PIC16LF724
- PIC16LF726, PIC16LF727, PIC16F785, PIC16HV785
- PIC16F818, PIC16F819, PIC16F83, PIC16F84A
- PIC16F87, PIC16F870, PIC16F871, PIC16F873
- PIC16F873A, PIC16F874, PIC16F874A, PIC16F876
- PIC16F876A, PIC16F877, PIC16F877A, PIC16F88
- PIC16F882, PIC16F883, PIC16F884, PIC16F886
- PIC16F887, PIC16F913, PIC16F914, PIC16F916
- PIC16F917, PIC16F946, PIC16F1454,PIC16F1455
- PIC16F505, PIC16F707, PIC16LF707, PIC16F1788
- PIC16LF1788, PIC16F1789, PIC16LF1789
- PIC16F1459, PIC16LF1454, PIC16LF1455, PIC16LF1459
- PIC16F1503, PIC16LF1503, PIC16F1507, PIC16LF1507
- PIC16F1508, PIC16LF1508, PIC16F1509, PIC16LF1509
- PIC16F1516, PIC16LF1516, PIC16F1517, PIC16LF1517
- PIC16F1518, PIC16LF1518, PIC16F1519, PIC16LF1519
- PIC16F1574, PIC16LF1574, PIC16F1575, PIC16LF1575
- PIC16F1578, PIC16LF1578, PIC16F1579, PIC16LF1579
- PIC16F1703, PIC16F1704, PIC16F1705, PIC16LF1703
- PIC16LF1704, PIC16LF1705, PIC16F1707, PIC16F1708
- PIC16F1709, PIC16F1823, PIC16F1824, PIC16F1825
- PIC16F1826, PIC16LF1707, PIC16LF1708, PIC16LF1709
- PIC16F1784, PIC16F1786, PIC16F1787, PIC16LF1784
- PIC16LF1786, PIC16F1829, PIC16LF1823, PIC16LF1824
- PIC16LF1787, PIC16LF1825, PIC16LF1826, PIC16F1827
- PIC16F1828, PIC16LF1827, PIC16LF1828, PIC16LF1829
- PIC16F1933, PIC16F1938, PIC16F1934, PIC16F1936
- PIC16F1937, PIC16F1939, PIC16LF1933, PIC16LF1934
- PIC16LF1936, PIC16LF1937, PIC16LF1938, PIC16LF1939
- PIC16F1946, PIC16F1947, PIC16LF1946, PIC16LF1947
- PIC16F1615, PIC16L1619, PIC16LF1615, PIC16LF1619
- PIC16F1847, PIC16LF1847, PIC16F18854, PIC16F18855
- PIC16F18856, PIC16F18857, PIC16F18875,PIC16F18876
- PIC16F1613, PIC16F1614, PIC16F1618, PIC16F1713
- PIC16F1716, PIC16F1717, PIC16F1718, PIC16F1719
- PIC16F1764, PIC16F1765, PIC16F1768, PIC16F1769

- PIC16LF1613, PIC16LF1614, PIC16LF1618, PIC16LF1713
- PIC16LF1716, PIC16LF1717, PIC16LF1718, PIC16LF1719
- PIC16LF1764, PIC16LF1765, PIC16LF1768, PIC16LF1769
- PIC16F18877

The following is a current list of supported variants in the PIC18 family:

- PIC18F242, PIC18F252, PIC18F442, PIC18F452
- PIC18F248, PIC18F258, PIC18F448, PIC18F458
- PIC18F1220, PIC18F1320, PIC18F2220, PIC18F2331
- PIC18F2320, PIC18F2410, PIC18F2420, PIC18F2431
- PIC18F2510, PIC18F2515, PIC18F2520, PIC18F2525
- PIC18F2610, PIC18F2620, PIC18F4220, PIC18F4320
- PIC18F4331, PIC18F44J10, PIC18F45J10, PIC18F24J10
- PIC18F25J10, PIC18F4410, PIC18F4420, PIC18F4431
- PIC18F4510, PIC18F4515, PIC18F4520, PIC18F4525
- PIC18F4610, PIC18F4620, PIC18F6520, PIC18F6585
- PIC18F8585, PIC18F8680, PIC18F6620, PIC18F6680
- PIC18F6720, PIC18F8520, PIC18F8620, PIC18F8720
- PIC18F8722, PIC18F8627, PIC18F8622, PIC18F8527
- PIC18F6722, PIC18F6627, PIC18F6622, PIC18F6527
- PIC18F6628, PIC18F6723, PIC18F23K20, PIC18F24K20
- PIC18F25K20, PIC18F26K20, PIC18F43K20, PIC18F44K20
- PIC18F45K20, PIC18F46K20, PIC18F2450, PIC18F2455
- PIC18F2458, PIC18F2550, PIC18F2553, PIC18F4450
- PIC18F4455, PIC18F4458, PIC18F4550, PIC18F4553
- PIC18F13K50, PIC18F14K50, PIC18LF13K50, PIC18LF14K50
- PIC18F2480, PIC18F2580, PIC18F4480, PIC18F4580
- PIC18F2585, PIC18F2680, PIC18F4585, PIC18F4680
- PIC18F2682, PIC18F2685, PIC18F4682, PIC18F4685
- PIC18F46J13, PIC18F47J13, PIC18LF46J13, PIC18LF47J13
- PIC18F25K80, PIC18F26K80, PIC18F45K80, PIC18F46K80
- PIC18F65K80, PIC18F66K80, PIC18LF25K80, PIC18LF26K80
- PIC18F1230, PIC18F1330, PIC18F2423, PIC18F2523
- PIC18F4423, PIC18F4523, PIC18F6390, PIC18F6490
- PIC18F8390, PIC18F8490, PIC18F6393, PIC18F6493
- PIC18F8393, PIC18F8493, PIC18F63J90, PIC18F64J90
- PIC18F65J90, PIC18F83J90, PIC18F84J90, PIC18F85J90
- PIC18F13K22, PIC18F14K22, PIC18LF13K22, PIC18LF14K22
- PIC18F2221, PIC18F2321, PIC18F4221, PIC18F4321
- PIC18F23K22, PIC18F24K22, PIC18F25K22, PIC18F26K22
- PIC18LF23K22, PIC18LF24K22, PIC18LF25K22, PIC18LF26K22
- PIC18F43K22, PIC18F44K22, PIC18F45K22, PIC18F46K22
- PIC18LF43K22, PIC18LF44K22, PIC18LF45K22, PIC18LF46K22
- PIC18F65K22, PIC18F66K22, PIC18F24K50, PIC18F25K50
- PIC18F45K50, PIC18LF24K50, PIC18LF25K50, PIC18LF45K50
- PIC18F67K22, PIC18F85K22, PIC18F86K22, PIC18F87K22
- PIC18F24J50, PIC18F25J50, PIC18F26J50, PIC18LF24J50
- PIC18LF25J50, PIC18LF26J50, PIC18F44J50, PIC18F45J50
- PIC18F46J50, PIC18LF44J50, PIC18LF45J50, PIC18LF46J50
- PIC18F26J53, PIC18F27J53, PIC18LF26J53, PIC18LF27J53
- PIC18F46J53, PIC18F47J53, PIC18LF46J53, PIC18LF47J53
- PIC18F26J13, PIC18F27J13, PIC18LF26J13, PIC18LF27J13
- PIC18LF45K80, PIC18LF46K80, PIC18LF65K80, PIC18LF66K80
- PIC18F25Q10, PIC18F26Q10, PIC18F27Q10, PIC18F45Q10

- PIC18F46Q10,PIC18F47Q10, PIC18F26K40, PIC18F45K40
- PIC18F46K40, PIC18F24K40, PIC18F25K40, PIC18F27K40
- PIC18F47K40, PIC18F65K90, PIC18F66K90, PIC18F67K90
- PIC18F85K90, PIC18F86K90, PIC18F87K90

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
- HI-TEC
- Microchip XC8
- Microchip XC16
- Proton+
- CCS
- Source Boost
- Byte Craft

Proteus VSM for PIC Bundle 8/16bit

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 8-bit and 16-bit PIC 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 PIC® Bundle products are ideal if you need to simulate more than one family of PIC micro-controllers.*

Variants

The following is a current list of supported variants in the PIC10/12 family:

- PIC10F200, PIC10F202, PIC10F204, PIC10F206
- PIC10F220, PIC10F222, PIC10F320, PIC10F322
- PIC10LF320, PIC10LF322,PIC12C508A, PIC12C509A
- PIC12C671, PIC12C672, PIC12CE518, PIC12CE519
- PIC12F508, PIC12F509
- PIC12CE673, PIC12CE674, PIC12F510, PIC12F609
- PIC12F615, PIC12F629, PIC12F675, PIC12F683
- PIC12F1501, PIC12LF1501, PIC12F752, PIC12HV752
- PIC12F1822, PIC12LF1822, PIC12F1840, PIC12LF1840
- PIC12F1571, PIC12F1572, PIC12LF1571, PIC12LF1572

The following is a current list of supported variants in the PIC16 family:

- PIC16C61, PIC16C62B, PIC16C63A, PIC16C64A
- PIC16C65B, PIC16C66, PIC16C67, PIC16C72A
- PIC16C73B, PIC16C74B, PIC16C76, PIC16C77
- PIC16F506, PIC16F526, PIC16F610, PIC16HV610
- PIC16F630, PIC16F631, PIC16F648A, PIC16F676
- PIC16F616, PIC16HV616, PIC16F627A, PIC16F628A
- PIC16F677, PIC16F684, PIC16F685, PIC16F687
- PIC16F688, PIC16F689, PIC16F690, PIC16F716
- PIC16F722A, PIC16F723A, PIC16F724, PIC16F726
- PIC16F727, PIC16LF722A, PIC16LF723A, PIC16LF724
- PIC16LF726, PIC16LF727, PIC16F785, PIC16HV785
- PIC16F818, PIC16F819, PIC16F83, PIC16F84A
- PIC16F87, PIC16F870, PIC16F871, PIC16F873
- PIC16F873A, PIC16F874, PIC16F874A, PIC16F876
- PIC16F876A, PIC16F877, PIC16F877A, PIC16F88
- PIC16F882, PIC16F883, PIC16F884, PIC16F886
- PIC16F887, PIC16F913, PIC16F914, PIC16F916
- PIC16F917, PIC16F946, PIC16F1454,PIC16F1455
- PIC16F505, PIC16F707, PIC16LF707, PIC16F1788
- PIC16LF1788, PIC16F1789, PIC16LF1789
- PIC16F1459, PIC16LF1454, PIC16LF1455, PIC16LF1459
- PIC16F1503, PIC16LF1503, PIC16F1507, PIC16LF1507
- PIC16F1508, PIC16LF1508, PIC16F1509, PIC16LF1509
- PIC16F1516, PIC16LF1516, PIC16F1517, PIC16LF1517
- PIC16F1518, PIC16LF1518, PIC16F1519, PIC16LF1519
- PIC16F1574, PIC16LF1574, PIC16F1575, PIC16LF1575
- PIC16F1578, PIC16LF1578, PIC16F1579, PIC16LF1579
- PIC16F1703, PIC16F1704, PIC16F1705, PIC16LF1703
- PIC16LF1704, PIC16LF1705, PIC16F1707, PIC16F1708
- PIC16F1709, PIC16F1823, PIC16F1824, PIC16F1825
- PIC16F1826, PIC16LF1707, PIC16LF1708, PIC16LF1709
- PIC16F1784, PIC16F1786, PIC16F1787, PIC16LF1784
- PIC16LF1786, PIC16F1829, PIC16LF1823, PIC16LF1824
- PIC16LF1787, PIC16LF1825, PIC16LF1826, PIC16F1827
- PIC16F1828, PIC16LF1827, PIC16LF1828, PIC16LF1829
- PIC16F1933, PIC16F1938, PIC16F1934, PIC16F1936
- PIC16F1937, PIC16F1939, PIC16LF1933, PIC16LF1934
- PIC16LF1936, PIC16LF1937, PIC16LF1938, PIC16LF1939
- PIC16F1946, PIC16F1947, PIC16LF1946, PIC16LF1947
- PIC16F1615, PIC16L1619, PIC16LF1615, PIC16LF1619
- PIC16F1847, PIC16LF1847, PIC16F18854, PIC16F18855
- PIC16F18856, PIC16F18857, PIC16F18875,PIC16F18876
- PIC16F1613, PIC16F1614, PIC16F1618, PIC16F1713
- PIC16F1716, PIC16F1717, PIC16F1718, PIC16F1719
- PIC16F1764, PIC16F1765, PIC16F1768, PIC16F1769

- PIC16LF1613, PIC16LF1614, PIC16LF1618, PIC16LF1713
- PIC16LF1716, PIC16LF1717, PIC16LF1718, PIC16LF1719
- PIC16LF1764, PIC16LF1765, PIC16LF1768, PIC16LF1769
- PIC16F18877

The following is a current list of supported variants in the PIC18 family:

- PIC18F242, PIC18F252, PIC18F442, PIC18F452
- PIC18F248, PIC18F258, PIC18F448, PIC18F458
- PIC18F1220, PIC18F1320, PIC18F2220, PIC18F2331
- PIC18F2320, PIC18F2410, PIC18F2420, PIC18F2431
- PIC18F2510, PIC18F2515, PIC18F2520, PIC18F2525
- PIC18F2610, PIC18F2620, PIC18F4220, PIC18F4320
- PIC18F4331, PIC18F44J10, PIC18F45J10, PIC18F24J10
- PIC18F25J10, PIC18F4410, PIC18F4420, PIC18F4431
- PIC18F4510, PIC18F4515, PIC18F4520, PIC18F4525
- PIC18F4610, PIC18F4620, PIC18F6520, PIC18F6585
- PIC18F8585, PIC18F8680, PIC18F6620, PIC18F6680
- PIC18F6720, PIC18F8520, PIC18F8620, PIC18F8720
- PIC18F8722, PIC18F8627, PIC18F8622, PIC18F8527
- PIC18F6722, PIC18F6627, PIC18F6622, PIC18F6527
- PIC18F6628, PIC18F6723, PIC18F23K20, PIC18F24K20
- PIC18F25K20, PIC18F26K20, PIC18F43K20, PIC18F44K20
- PIC18F45K20, PIC18F46K20, PIC18F2450, PIC18F2455
- PIC18F2458, PIC18F2550, PIC18F2553, PIC18F4450
- PIC18F4455, PIC18F4458, PIC18F4550, PIC18F4553
- PIC18F13K50, PIC18F14K50, PIC18LF13K50, PIC18LF14K50
- PIC18F2480, PIC18F2580, PIC18F4480, PIC18F4580
- PIC18F2585, PIC18F2680, PIC18F4585, PIC18F4680
- PIC18F2682, PIC18F2685, PIC18F4682, PIC18F4685
- PIC18F46J13, PIC18F47J13, PIC18LF46J13, PIC18LF47J13
- PIC18F25K80, PIC18F26K80, PIC18F45K80, PIC18F46K80
- PIC18F65K80, PIC18F66K80, PIC18LF25K80, PIC18LF26K80
- PIC18F1230, PIC18F1330, PIC18F2423, PIC18F2523
- PIC18F4423, PIC18F4523, PIC18F6390, PIC18F6490
- PIC18F8390, PIC18F8490, PIC18F6393, PIC18F6493
- PIC18F8393, PIC18F8493, PIC18F63J90, PIC18F64J90
- PIC18F65J90, PIC18F83J90, PIC18F84J90, PIC18F85J90
- PIC18F13K22, PIC18F14K22, PIC18LF13K22, PIC18LF14K22
- PIC18F2221, PIC18F2321, PIC18F4221, PIC18F4321
- PIC18F23K22, PIC18F24K22, PIC18F25K22, PIC18F26K22
- PIC18LF23K22, PIC18LF24K22, PIC18LF25K22, PIC18LF26K22
- PIC18F43K22, PIC18F44K22, PIC18F45K22, PIC18F46K22
- PIC18LF43K22, PIC18LF44K22, PIC18LF45K22, PIC18LF46K22
- PIC18F65K22, PIC18F66K22, PIC18F24K50, PIC18F25K50
- PIC18F45K50, PIC18LF24K50, PIC18LF25K50, PIC18LF45K50
- PIC18F67K22, PIC18F85K22, PIC18F86K22, PIC18F87K22
- PIC18F24J50, PIC18F25J50, PIC18F26J50, PIC18LF24J50
- PIC18LF25J50, PIC18LF26J50, PIC18F44J50, PIC18F45J50
- PIC18F46J50, PIC18LF44J50, PIC18LF45J50, PIC18LF46J50
- PIC18F26J53, PIC18F27J53, PIC18LF26J53, PIC18LF27J53
- PIC18F46J53, PIC18F47J53, PIC18LF46J53, PIC18LF47J53
- PIC18F26J13, PIC18F27J13, PIC18LF26J13, PIC18LF27J13
- PIC18LF45K80, PIC18LF46K80, PIC18LF65K80, PIC18LF66K80
- PIC18F25Q10, PIC18F26Q10, PIC18F27Q10, PIC18F45Q10

- PIC18F46Q10,PIC18F47Q10, PIC18F26K40, PIC18F45K40
- PIC18F46K40, PIC18F24K40, PIC18F25K40, PIC18F27K40
- PIC18F47K40, PIC18F65K90, PIC18F66K90, PIC18F67K90
- PIC18F85K90, PIC18F86K90, PIC18F87K90

The following is a current list of supported variants in the PIC24 family:

- PIC24FJ32GA004, PIC24FJ48GA002, PIC24FJ48GA004
- PIC24FJ64GA002, PIC24FJ64GA004, PIC24FJ16GA004
- PIC24FJ64GA006, PIC24FJ128GA006, PIC24FJ64GA008
- PIC24FJ128GA008, PIC24FJ64GA010, PIC24FJ96GA010
- PIC24F16KA101, PIC24F08KA102, PIC24F16KA102
- PIC24FJ128GA010, PIC24F04KA200, PIC24F08KA101
- PIC24FJ96GA008, PIC24FJ96GA006, PIC24FJ16GA002
- PIC24FJ64GA106, PIC24FJ192GA106, PIC24FJ256GA106
- PIC24FJ128GA108, PIC24FJ192GA108, PIC24FJ256GA108
- PIC24FJ64GA110, PIC24FJ128GA110, PIC24FJ256GA110
- PIC24FJ32GA102, PIC24FJ32GA104, PIC24FJ64GA104
- PIC24FJ32GA002, PIC24FJ64GA102, PIC24FJ192GA110
- PIC24FJ64GA108, PIC24FJ128GA106, PIC24F04KA201

The following is a current list of supported variants in the dsPIC33® family:

- dsPIC33FJ12GP201, dsPIC33FJ12GP202, dsPIC33FJ32GP202
- dsPIC33FJ32GP204, dsPIC33FJ16GP304, dsPIC33FJ12MC201
- dsPIC33FJ12MC202, dsPIC33FJ32MC202, dsPIC33FJ32MC204
- dsPIC33FJ16MC304

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
- HI-TEC
- Microchip XC8
- Microchip XC16
- Proton+
- CCS
- Source Boost
- Byte Craft

Proteus VSM Starter Kit for PIC (16F84A, 16F877, 18F452)

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 Starter Kit for the PIC' product includes the following main software modules:

- Professional Schematic Capture module
- ProSPICE professional Simulation Engine
- Support for the PIC16F84A, PIC16F877 and the PIC18F4520 variants only.
- All of the Proteus Embedded Simulation Peripheral Libraries.
- VSM Studio IDE with automatic compiler configuration.
- Over 10,000 standard simulation models.

⚠ *The individual PIC® families contain the full range of supported variants in that family. The PIC Bundles offer a price discount over the individual families.*

Variants

The following is a current list of supported variants in the PIC Starter Kit family:

- 16F84A, 16F877, 18F452
- Please refer to the full family or bundle products for more complete coverage of Microchip PIC microcontrollers.

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 all timers including watchdog timer, sleep mode and wake-up from sleep.
- Supports both Capture-Compare-PWM (CCP) modules in all modes and ECCP modules.
- Supports Parallel Slave Port (PSP) module on appropriate devices.
- Supports MSSP in both the SPI mode and the I2C master and slave modes.
- Supports Standard 10-bit Analogue-to-Digital Conversion (ADC) module including support for voltage reference pins.
- Supports additional features for extended ADC module with 12-bit resolution and differential/single ended modes in appropriate variants.
- Supports Analogue Comparator modules including support for internal and external voltage references including FVR module.
- Supports USART in all modes and EUSART for appropriate variants.
- Supports internal code and data EEPROM memory inc. code protection and data persistence.
- Supports all interrupt modes.
- Supports the LCD controller module in appropriate variants.
- Supports the Configurable Logic Cell (CLC) module in appropriate variants.
- Supports the Pulse Width Modulation (PWM) module in appropriate variants.
- Supports the Numerical Controlled Oscillator (NCO) module in appropriate variants.
- Supports the Complementary Waveform Generator (CWG) module in appropriate variants.
- Supports the Ultra Low Power Wake Up module in appropriate variants.
- Supports the Digital Signal Modulator (DSM) in appropriate variants.
- Supports the Capacitive Sensing Module (CSM) in appropriate variants.
- Supports Operational Amplifier module (OPA) in appropriate variants.
- Supports Digital to Analog Converter (DAC) either 5 or 8-bit in appropriate variants.
- Supports Programmable Switch Mode Control (PSMC) module(s) in appropriate variants.
- Supports Complementary Output Generator (COG) in appropriate variants.
- 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.
- Enhanced PIC16 core architecture including Program and Data memory extentions, 14 new instructions, linear mapping, enhanced indirect addressing and automatic interrupt context save.

Limitations

The following is a listing of known limitations in the current version of the PIC families:

- x The external programming interface (PGC/PGD pins) are not modelled.
- x Brown-out detection is not modelled.
- x The new I2C features (SSPCON3 register) are not supported. Only bits PCIE, SCIE, SBCDE and BOEN are modelled. I2C will work in legacy mode only for remaining bits.
- x HFINTOSC as CLC1 input is not supported for efficiency reasons.
- x For efficiency reasons the CSM analog oscillator is not modeled. The capacitance on the CPSx inputs is computed more efficiently, though.

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
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