SimElectronics® Release Notes

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SimElectronics® Release Notes

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Summary by Version

This table provides quick access to what's new in each version. For clarification, see "Using Release Notes" on page 1.

Version (Release)	New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Latest Version V1.3 (R2009b)	Yes Details	Yes Summary	Bug Reports	Printable Release Notes: PDF Current product documentation
V1.2 (R2009a)	Yes Details	No	Bug Reports	No
V1.1 (R2008b)	Yes Details	No	Bug Reports	No
V1.0 (R2008a+)	Yes Details	Not applicable	Bug Reports	No

Using Release Notes

Use release notes when upgrading to a newer version to learn about:

- New features
- Changes
- Potential impact on your existing files and practices

Review the release notes for other MathWorks™ products required for this product (for example, MATLAB® or Simulink®). Determine if enhancements, bugs, or compatibility considerations in other products impact you.

If you are upgrading from a software version other than the most recent one, review the current release notes and all interim versions. For example, when you upgrade from V1.0 to V1.2, review the release notes for V1.1 and V1.2.

What Is in the Release Notes

New Features and Changes

- New functionality
- Changes to existing functionality

Version Compatibility Considerations

When a new feature or change introduces a reported incompatibility between versions, the **Compatibility Considerations** subsection explains the impact.

Compatibility issues reported after the product release appear under Bug Reports at The MathWorks™ Web site. Bug fixes can sometimes result in incompatibilities, so review the fixed bugs in Bug Reports for any compatibility impact.

Fixed Bugs and Known Problems

The MathWorks offers a user-searchable Bug Reports database so you can view Bug Reports. The development team updates this database at release time and as more information becomes available. Bug Reports include provisions for any known workarounds or file replacements. Information is available for bugs existing in or fixed in Release 14SP2 or later. Information is not available for all bugs in earlier releases.

Access Bug Reports using your MathWorks Account.

Version 1.3 (R2009b) SimElectronics Software

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	Yes—Details labeled as **Compatibility Considerations**, below. See also Summary	Bug Reports	Printable Release Notes: PDF Current product documentation

New features and changes introduced in this version are organized by these topics:

- "Actuators & Drivers Library Blocks" on page 3
- "New Abstracted Timer Block" on page 4
- "New Demos" on page 4

Actuators & Drivers Library Blocks

New features and changes introduced in this version are:

- "New Generic Rotary Actuator Block" on page 3
- "New Generic Linear Actuator Block" on page 3
- "Improved Servomotor Block" on page 4
- "Compatibility Considerations" on page 4

New Generic Rotary Actuator Block

The Generic Rotary Actuator block models the torque-speed characteristics of a generalized rotary actuator.

New Generic Linear Actuator Block

The Generic Linear Actuator block models the force-speed characteristics of a generalized linear actuator.

Improved Servomotor Block

The Servomotor block now allows for the specification of additional parameters from within the Block Parameters dialog box.

Compatibility Considerations

During simulation, the updated Servomotor block is backwards-compatible with models defined in earlier versions of the software. However, the model generates a warning in this version because the block dialog box supports additional unit options for torque and speed data. To remove the warnings, open the block dialog box and select appropriate units for the torque and speed data.

New Abstracted Timer Block

The new Timer block, located in the Integrated Circuits library, is an abstracted behavioral model of a timer integrated circuit, such as the NE555.

New Demos

Demos introduced in this version are:

- Brushless DC Motor

- ARINC 429 Communications Link

- PNP Bipolar Transistor Characteristics

For more information, see the Demos section of the SimElectronics® documentation.

Version 1.2 (R2009a) SimElectronics Software

This table summarizes what's new in V1.2 (R2009a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports	Printable Release Notes: PDF Current product documentation

New features and changes introduced in this version are organized by these topics:

- "Actuators & Drivers Library" on page 5
- "Passive Devices Library" on page 6
- "Sources Library" on page 7
- "SPICE-Compatible Semiconductors Library" on page 7

Actuators & Drivers Library

New features and changes introduced in this version are:

- "New Piezo Motor Blocks" on page 5
- "Enhanced H-Bridge Block" on page 6

New Piezo Motor Blocks

The Actuators & Drivers library now contains blocks for modeling piezoelectric travelling wave motors. The library contains these new blocks:

- The Piezo Rotary Motor models the torque-speed characteristics of a rotary piezoelectric motor.
- The Piezo Linear Motor models the force-speed characteristics of a linear piezoelectric motor.

Enhanced H-Bridge Block

The H-Bridge block now provides the option to dissipate current via two freewheeling diodes when the signal at the PWM port is low. To use this new option, select `Via two freewheeling diodes` for the `Freewheeling mode` parameter.

Passive Devices Library

New features and changes introduced in this version are:

- "New Switch Blocks" on page 6
- "New Resistor Block" on page 6
- "New Crystal Block" on page 6
- "Enhanced Variable Inductor and Variable Capacitor Blocks" on page 6

New Switch Blocks

The Passive Devices library now contains Current-Controlled Switch and Voltage-Controlled Switch blocks to model electrical switches with hysteresis.

New Resistor Block

The Passive Devices library now contains a Resistor block to model a resistor as a function of temperature and process data.

New Crystal Block

The Passive Devices library now contains a Crystal block to model the electrical characteristics of a crystal resonator.

Enhanced Variable Inductor and Variable Capacitor Blocks

The Variable Inductor and Variable Capacitor blocks have the following enhancements:

- The Variable Inductor block now provides two options for the relationship between the voltage across the device and the current through the inductor. The new **Equation** parameter lets you select the voltage-current equation that you want.

- The Variable Capacitor block now provides two options for the relationship between the current through the device and the voltage across the capacitor. The new **Equation** parameter lets you select the current-voltage equation that you want.

Sources Library

New features and changes introduced in this version are:

- "Enhanced Solar Cell Block" on page 7
- "New Two-Input Dependent Source Blocks" on page 7

Enhanced Solar Cell Block

The Solar Cell block has the following enhancements:

- The block now provides the option to use an 8-parameter model that includes an additional diode and a parallel resistor.
- The block now models temperature dependence.

New Two-Input Dependent Source Blocks

The SPICE-Compatible Sources library (in the Sources library) contains blocks for modeling dependent sources with two controlling inputs. The library contains these new blocks:

- PCCCS2 — Model polynomial current-controlled current source with two controlling inputs
- PCCVS2 — Model polynomial current-controlled voltage source with two controlling inputs
- PVCCS2 — Model polynomial voltage-controlled current source with two controlling inputs
- PVCVS2 — Model polynomial voltage-controlled voltage source with two controlling inputs

SPICE-Compatible Semiconductors Library

New features and changes introduced in this version are:

Enhanced NMOS and PMOS Blocks

The NMOS and PMOS blocks now provide the option to model the electrical characteristics of SPICE Level-3 MOSFET devices.

Version 1.1 (R2008b) SimElectronics Software

This table summarizes what's new in V1.1 (R2008b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports	Printable Release Notes: PDF Current product documentation

New features and changes introduced in this version are:

- "New CMOS Logic Gate Blocks" on page 9
- "New Piezo Stack Block" on page 10
- "New Relay Block" on page 10
- "New Fuse Block" on page 10
- "New NMOS and PMOS Blocks" on page 10

New CMOS Logic Gate Blocks

The Logic library (in the Integrated Circuits library) contains blocks for modeling CMOS logic gates behaviorally. The library contains these new blocks:

- CMOS AND
- CMOS Buffer
- CMOS NAND
- CMOS NOR
- CMOS NOT
- CMOS OR
- CMOS XOR

New Piezo Stack Block

The Actuators & Drivers library now contains a Piezo Stack block to model the electrical and force characteristics of a piezoelectric stacked actuator.

New Relay Block

The Passive Devices library now contains a Relay block to model the resistive and delay characteristics of a relay controlled by an external physical signal.

New Fuse Block

The Passive Devices library now contains a Fuse block to model the following fuse characteristics:

- Resistance.
- Rated current at which the fuse blows when exceeded for a specified amount of time.

New NMOS and PMOS Blocks

The SPICE-Compatible Semiconductors library (in the Semiconductor Devices library) now contains NMOS and PMOS blocks to model the electrical characteristics of SPICE Level-1 MOSFET devices.

Version 1.0 (R2008a+) SimElectronics Software

This table summarizes what's new in V1.0 (R2008a+):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	Not applicable	Bug Reports	Printable Release Notes: PDF Current product documentation

Product Introduction

SimElectronics software is a modeling environment for the engineering design and simulation of electronic and electromechanical systems within the Simulink environment.

Version 1.0 includes these features:

- A library of electronic and electromechanical blocks that model components such as:
  - Sensors
  - Semiconductors
  - Actuators

  For these blocks, you enter key parameter values directly from industry datasheets.

  For more information about the available blocks, see "SimElectronics Block Libraries".

- A function, `netlist2sl`, for creating library blocks that represent circuit data in a SPICE netlist.

  For more information, see "Importing SPICE Models Into a SimElectronics Library" or the `netlist2sl` reference page.

- Ability to convert SimElectronics models to C code.

For more information about code generation, see "Generating Code" in the Simscape™ documentation.

- Access to linearization and steady-state solve capabilities in Simscape.

  For more information about linearization, see "Linearizing Simscape Models" in the Simscape documentation.

  For more information about how Simscape solves models, see "How Simscape Simulation Works" in the Simscape documentation.

Compatibility Summary for SimElectronics Software

This table summarizes new features and changes that might cause incompatibilities when you upgrade from an earlier version, or when you use files on multiple versions. Details are provided in the description of the new feature or change.

Version (Release)	New Features and Changes with Version Compatibility Impact
Latest Version V1.3 (R2009b)	See the **Compatibility Considerations** subheading for this new feature or change: • "Actuators & Drivers Library Blocks" on page 3
V1.2 (R2009a)	None
V1.1 (R2008b)	None
V1.0 (R2008a+)	None