

Mixed-Signal Blockset™ Release Notes



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R2020a

Digital to Analog Converter: Introducing Binary Weighted DAC and relevant measurement and testbench blocks	1-2
Nonlinearity Measurement in Data Converters: Introducing function inldnl	1-2
Phase Noise Measurement in PLL: Introducing function phaseNoiseMeasure	1-2

R2019b

New ADC Examples: Learn how to evaluate the performance of different ADCs	2-2
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R2019a

Introducing Mixed-Signal Blockset: Design, simulate, and verify analog and mixed-signal systems	3-2
White-Box Behavioral Models of PLL and ADC: Design and analyze mixed-signal systems based on typical architectures using data-sheet specifications	3-2
White-Box Building Blocks: Design custom mixed-signal systems following a top-down methodology	3-2
Models of Impairments: Model timing effects, phase noise, jitter, leakage, and other impairments	3-2
Measurement Blocks and Testbenches: Verify the performance of PLL and ADC with application-specific metrics	3-3
Mixed-Signal Blockset Models: Explore an add-on library with additional mixed-signal models for ADCs, PLLs, SerDes, and SMPS (Introduced April 2019)	3-3

R2020a

Version: 1.2

New Features

Bug Fixes

Digital to Analog Converter: Introducing Binary Weighted DAC and relevant measurement and testbench blocks

Use the Binary Weighted DAC block as a starting point to model digital to analog converters. Also use DAC AC measurement, DAC DC measurement, and DAC Testbench blocks to validate the Binary Weighted DAC, or a DAC of your own implementation.

Nonlinearity Measurement in Data Converters: Introducing function inldnl

Using the inldnl function, you can measure the differential and integral nonlinearities of ADCs and DACs.

Phase Noise Measurement in PLL: Introducing function phaseNoiseMeasure

Using the phaseNoiseMeasure function, you can measure and plot phase noise profile at specific frequency offset points.

R2019b

Version: 1.1

New Features

Bug Fixes

New ADC Examples: Learn how to evaluate the performance of different ADCs

Explore new featured examples to learn how to design and evaluate different types of ADCs such as successive approximation ADC, interleaved ADC, and subranging ADC. You can analyze ADCs with impairments and measure their offset error, gain error, and linearity.

R2019a

Version: 1.0

New Features

Introducing Mixed-Signal Blockset: Design, simulate, and verify analog and mixed-signal systems

Mixed-Signal Blockset provides models of components and impairments, analysis tools, and test benches for designing and verifying mixed-signal integrated circuits (ICs).

You can model PLLs, data converters, and other systems at different levels of abstraction and explore a range of IC architectures. You can customize models to include impairments such as noise, nonlinearity, and quantization effects, and refine the system description using a top-down methodology.

Using the test benches provided, you can verify system performance and improve modeling fidelity by fitting measurement characteristics or circuit-level simulation results. Rapid system-level simulation using variable-step Mixed-Signal Blockset solvers lets you debug the implementation and identify design flaws before simulating the IC at the transistor level.

With Mixed-Signal Blockset you can simulate mixed-signal components together with complex DSP algorithms and control logic. As a result, both analog and digital design teams can work from the same executable specification.

White-Box Behavioral Models of PLL and ADC: Design and analyze mixed-signal systems based on typical architectures using data-sheet specifications

Use the provided PLL models such as Fractional N PLL with Analog Compensation, Fractional N PLL with Delta Sigma Modulator, Integer N PLL with Dual Modulus Prescaler, Integer N PLL with Single Modulus Prescaler to design and simulate your own customized PLL at the system level. Verify and visualize the open loop and closed loop responses.

Use the provided ADC architectures Flash ADC and SAR ADC to design and simulate your own customized ADC at the system level.

White-Box Building Blocks: Design custom mixed-signal systems following a top-down methodology

Mixed-Signal Blockset provides white-box building blocks that you can use to design custom mixed-signal systems. See the PLL Building Blocks and ADC Building Blocks for more information.

Models of Impairments: Model timing effects, phase noise, jitter, leakage, and other impairments

Model rise/fall times, finite slew rate, and variable time delays in your feedback loop for both PLL and ADC systems.

Model the phase noise in PLL system. For more information, see Phase Noise at PLL Output.

Model the aperture jitter, offset error, and gain error in ADCs.

Measurement Blocks and Testbenches: Verify the performance of PLL and ADC with application-specific metrics

Use the provided Measurements and Testbenches to

- Measure the lock time, phase noise profile, operating frequency of a PLL.
- Characterize the performance of building blocks such as VCO, PFD, and charge pump.
- Measure AC and DC characteristics and aperture jitter of ADCs.

Mixed-Signal Blockset Models: Explore an add-on library with additional mixed-signal models for ADCs, PLLs, SerDes, and SMPS (Introduced April 2019)

Mixed-Signal Blockset provides an add-on library called Mixed-Signal Blockset Models that contains additional mixed-signal system models for ADCs, PLLs, SerDes, and SMPS.

To access the Mixed-Signal Blockset Models, first download the Mixed-Signal Blockset Models from the Add-On Explorer.

