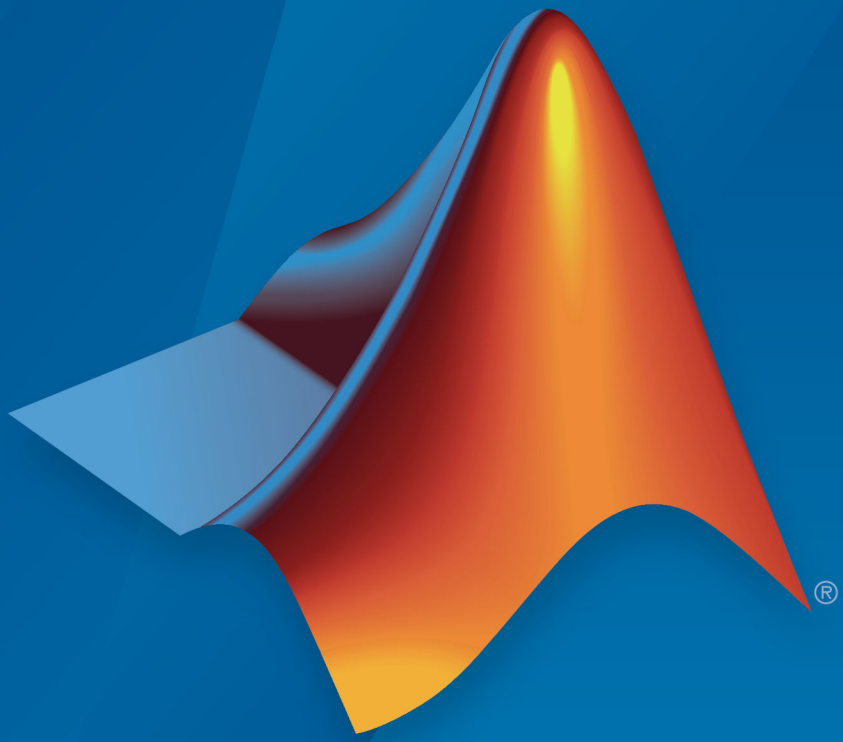
SerDes Toolbox™ Release Notes



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R2019b

Version: 1.1

New Features

Bug Fixes

Channel Impulse Response: Specify impulse response and crosstalk in the SerDes Designer app channel model

Add impulse response from the **SerDes Designer** app or Simulink® to model your desired channel. You can also inject crosstalk via an impulse matrix from the **SerDes Designer** app.

Tap Support: Introduce additional taps with IBIS-AMI manager

Introduce tap structure to equalizer blocks directly from the IBIS-AMI manager in the Configuration block. These additional taps are included both in the Simulink model and the exported IBIS-AMI models. The taps enable you to adjust equalization, especially when you define your custom blocks from scratch.

Jitter and Noise: Include standard-compliant jitter and noise specifications in generated AMI files

Select the transmitter and receiver jitter and noise profiles you want to add to the AMI file from the IBIS-AMI manager inside the Configuration block. The jitter and noise profile are only for the use of EDA tools. Simulink ignores these profiles.

R2019a

Version: 1.0

New Features

Introducing SerDes Toolbox: Design SerDes systems and generate IBIS-AMI models for high-speed digital interconnects

SerDes Toolbox provides a MATLAB® and Simulink model library and a set of analysis tools and apps for the design and verification of serializer/deserializer (SerDes) systems.

With the SerDes Designer app, you can use statistical analysis to rapidly design wired communication transmitters and receivers. The app provides MATLAB based parameterized models and algorithms that let you explore a wide range of equalizer configurations and generate eye diagrams to assess performance metrics.

With building blocks such as CTLE, DFE, FFE, and CDR, you can describe your chosen architecture and simulate control and adaptation algorithms. White-box examples of typical applications such as PCI, USB, Ethernet, and DDR provide reference designs that you can use as a basis for your own designs.

SerDes Toolbox supports automatic generation of dual IBIS-AMI models. These models can be used with third-party channel simulators for system integration and verification.

SerDes Designer App: Design and analyze SerDes systems including transmitters and receivers with arbitrary configuration

SerDes Toolbox provides **SerDes Designer** app to design SerDes system on a system-level and perform statistical analysis. From the app, you can generate MATLAB scripts and Simulink models for further customization and time-domain simulation. You can also generate IBIS-AMI analog models compliant with the industry standards directly from the app.

Statistical Analysis and Time-Domain Simulation: Perform link analysis, compute pulse response, visualize the eye diagram, and measure the performance of your SerDes system

SerDes Toolbox enables you to perform statistical analysis and time-domain simulation. You can perform link analysis and generate impulse response and sample-by-sample processing of the SerDes signal. Use the Eye Diagram Scope to visualize the eye diagram, and measure the key performance metrics from eye contours, bit error rate (BER), bathtub curves, and other metrics. You can also perform time-domain simulation of

adaptive algorithms using customizable Simulink blocks and channel models capturing frequency-dependent attenuation, reflections, and arbitrary impulse responses.

Library of MATLAB System object and Simulink Blocks: Use parametrized equalization algorithms, non-ideal amplifiers, channel models, and other typical SerDes components

SerDes Toolbox provides white-box building blocks and System objects that you can use to develop adaptive equalizers and customize your SerDes system. You can use parametrized blocks and algorithms for single-ended and differential signals. You can also generate pseudorandom binary sequence (PRBS) and custom stimulus patterns supporting PAM4 and NRZ modulation.

For more information, see Design and Simulate SerDes Systems.

IBIS-AMI Dual Model Generation: Generate standard-compliant Init and GetWave IBIS-AMI models for import in any third-party channel simulator

SerDes Toolbox enables you to automatically generate statistical (Init) and time-domain (GetWave) IBIS-AMI models. You can customize the model interface by managing the IBIS-AMI parameters from **SerDes Designer** and Simulink. For more information, see Create and Customize IBIS-AMI Models.

You can use the generated IBIS-AMI models in third party channel simulators such as SiSoft QCD/QSI, Keysight ADS, Mentor Graphics HyperLynx, and Cadence Sigrity SystemSI.

Industry Standard Reference Designs: Use white-box models of communication protocols such as Ethernet CEI-56G, DDR5, PCI-Gen4

SerDes Toolbox provides reference models of standard-compliant designs of PCIe Gen4, DDR5, and Ethernet OIF. Refine these reference models to design the next generation communication protocols using NRZ and higher-order modulations such as PAM4. For more information, see Industry Standard IBIS-AMI Models.