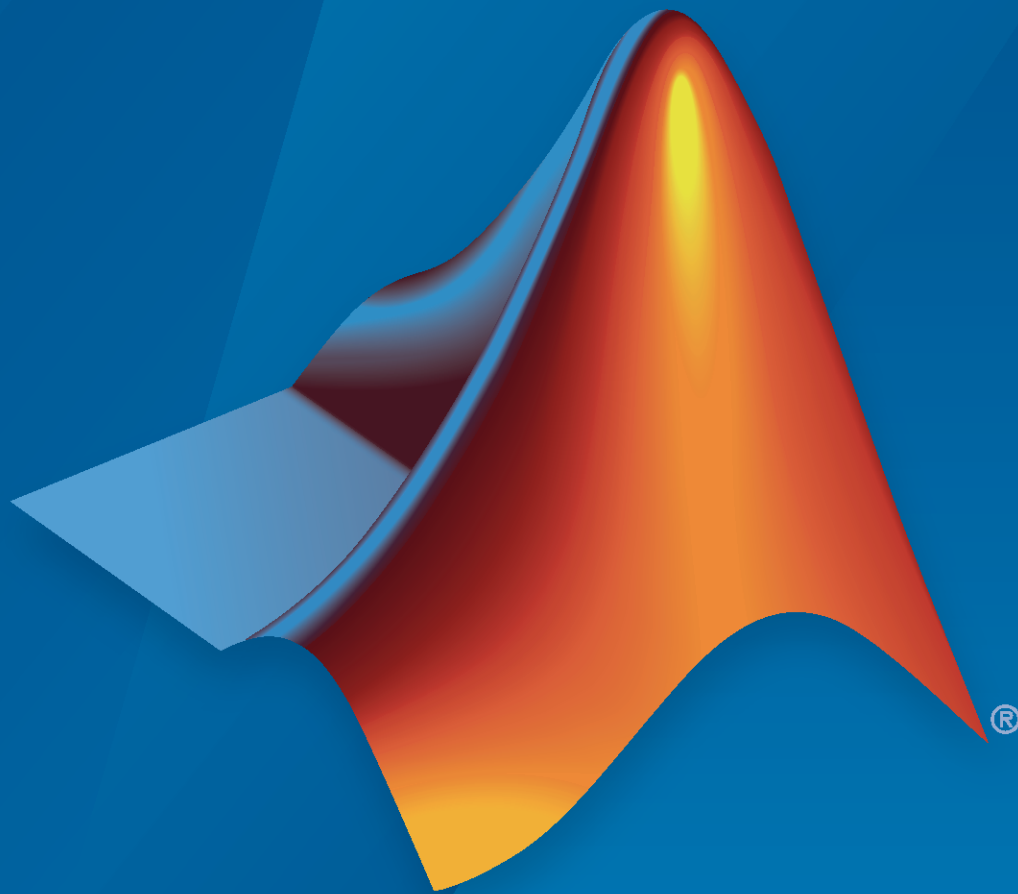


Simulink® Real-Time™ Release Notes



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Simulink® Real-Time™ Release Notes

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R2021a

Version: 7.1

New Features

Bug Fixes

Compatibility Considerations

Parameter set operations

In R2021a, the `saveParamSet` function and `loadParamSet` function let you save the model parameters to a file from a real-time application on the target computer and reload the parameters from the file. Using the `ParameterSet` object, you can work with the parameters from the development computer and transfer updated parameters to a model. For more information, see “Save and Reload Parameters by Using the MATLAB Language” and the `ParameterSet` object functions.

Target computer passwords

In R2021a, you can set the password for the user account `slrt` on the target computer. For more information, see “Change Password for Target Computer”.

GCC -ffast-math performance

In R2021a, you can improve real-time application performance by selecting the **Compile with GCC -ffast-math** configuration option. For more information, see “Compile with GCC -ffast-math”.

File log data import from target computer

In R2021a, you can copy file logs for simulation runs on the target computer to the development computer and import the log data into the Simulation Data Inspector. This workflow eliminates the possibility of losing data if a communications interruption occurs during automatic file log upload. For more information, see the `slrealtime.fileLogList` function and the `slrealtime.fileLogImport` function.

Bus signal names display in Simulation Data Inspector

In R2021a, the limitation on viewing overridden signal names in nonvirtual buses is removed. Signal names for nonvirtual buses display the bus object names or overridden names (if set) in the Simulation Data Inspector when live streaming data.

Simulink Real-Time Explorer application operations

In R2021a, the Explorer provides access to real-time application actions and properties through an application context menu and access to real-time application start options through the **Start** button.

- When you right-click an application name in the **Targets Tree**, the Explorer displays a menu of actions for the application.
- The application **Start** button provides `ReloadOnStop` and `AutoImportFileLog` options.

For more information, see **Simulink Real-Time Explorer**.

Status Monitor disk usage display

In R2021a, the Status Monitor includes a display of the disk usage of the target computer. For more information, see “Target Computer Status Monitor”.

Model root inports stimulation on target computer

In R2021a, support for root inport stimulation is enhanced by the addition of the `Target.Stimulation` object and functions. This stimulation APIs lets you control the stimulation of root inport signal data on the target computer and get the stimulation status of the root-input ports on the target computer. You can start, pause, stop, and restart the stimulation on the target computer without reloading the real-time application. For more information, see “Control and Update Stimulation of Inports to Real-Time Application”.

Logitech G29 Steering Wheel block

In R2021a, the Logitech G29 Steering Wheel block is supported. You can read the data from a Logitech G29 steering wheel into the model. For more information, see Logitech G29 Steering Wheel.

UDP Multicast Receive block

In R2021a, the UDP Multicast Receive block is supported, and the UDP Send block has multicast support. These blocks provide multicast message support for the UDP communications protocol. For more information, see UDP Multicast Receive and UDP Send.

Real-time application signal values

In R2021a, the `getsignal` function returns the signal values from signals in the real-time application. For more information, see `getsignal`.

EtherCAT device signal names

In R2021a, the `slrealtime.EtherCAT.getSignalNames` function returns the signal names for EtherCAT devices connected to a model. For more information, see `slrealtime.EtherCAT.getSignalNames`.

Target computer support information

In R2021a, the `getTargetInfo` function returns target computer information from a target object. For more information, see `getTargetInfo`.

Functionality being removed or changed

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
<p>Change of recommended IP address for development and target computers. In R2021a, the recommended IP address for the development computer is 192.168.7.2, and the recommended IP address for the default target computer is 192.168.7.5.</p> <p>This change makes the IP address recommendations in the Simulink Real-Time documentation consistent with the Speedgoat documentation.</p>	Not applicable	Not applicable	Not applicable
<p>Added support for logging Stateflow states from real-time applications to the Simulation Data Inspector. For more information, see “Instrument a Stateflow Subsystem”.</p>	Not applicable	Not applicable	Not applicable

R2020b

Version: 7.0

New Features

Bug Fixes

Compatibility Considerations

Release notes from previous releases

In R2020b, Simulink Real-Time had a major release. The information from release notes from previous releases do not apply for R2020b and future releases.

For release notes from releases previous to R2020b, see Archived MathWorks Documentation.

64-bit POSIX compliant real-time operating system for target computers

Starting in R2020b, target computers use a 64-bit POSIX compliant real-time operating system. In R2020a and earlier, Simulink Real-Time used a 32-bit operating system.

In R2020b, you can install multiple real-time applications on your target computer. You can control these applications by using Simulink Real-Time Explorer, the MATLAB Command Window, or the target computer command-line interface. For more information, see Simulink Real-Time Workflows and Real-Time Application and Target Computer Modes.

You can connect to the target computer by using SSH and control real-time applications through the target computer command-line interface. For more information, see Target Computer Command-Line Interface and Execute Target Computer RTOS Commands at Target Computer Command Line.

Tools to compile real-time applications

To compile real-time applications, the cross-compiler is provided free of charge and is installed through the Simulink Real-Time Target Support package. For more information, see Install Development Computer Software.

Graphical instrument panels and applications

R2020b expands MATLAB-based API and App Designer support. You can create graphical instrument panels and other custom applications for monitoring signals and tuning parameters on your target computer. The APIs for the `Instrument` and `Target` objects support streaming data from a real-time application to an instrument panel application. Simulink Real-Time Explorer can generate code that creates these connections. For an example, see <https://www.mathworks.com/help/releases/R2020b/slrealtime/ug/add-app-des-app-to-inverted-pendulum-mdl.html>.

New Simulink Real-Time Explorer

In R2020b, Simulink Real-Time Explorer provides a single point of contact for interacting with real-time applications. You can monitor and trace signals, tune parameters and stream data to the Simulation Data Inspector. For more information, see Configure and Control Real-Time Application by Using Simulink Real-Time Explorer.

Upgrade Advisor for Simulink Real-Time

Use the Upgrade Advisor to upgrade models from previous releases. For more information, see Troubleshoot Model Upgrade for R2020b. Using the Upgrade Advisor eliminates many manual steps in upgrading a model, such as manually changing the code generation target to `slrealtime.tlc`.

Note that for models with their code generation target set to `slrt.tlc`, builds do not process and selecting **AppsSimulink Real-Time** does not set the code generation target to `slrealtime.tlc`.

New File Log block and other new blocks in Simulink Real-Time block library

To support the 64-bit POSIX compliant real-time operating system for target computers in R2020b, the blocks in the Simulink Real-Time block library have been updated and new blocks added. An upgrade advisor helps you upgrade your models to use the updated blocks. For a list of all blocks, see Simulink Real-Time Blocks.

The new File Log block provides enhanced signal logging capabilities with full Simulink data type support. For an example, see <https://www.mathworks.com/help/releases/R2020b/slrealtime/ug/parameter-tuning-and-data-logging.html>.

License change to support test engineering workflows

In R2020b, Simulink Real-Time does not require Simulink, Simulink Coder™, and MATLAB® Coder to develop apps and run scripts to interact with a real-time application. This support enables new workflows for test engineers who need to develop instrumentation, test benches, or other tooling for pre-built real-time applications.

Simulink, Simulink Coder, MATLAB Coder and the Simulink Real-Time Target Support Package are required to create models and build real-time applications.

For more information regarding product dependencies, see Product Requirements & Platform Availability for Simulink Real-Time. For a description of software installation and licensing, see Install Development Computer Software.

Target Computer Upgrade by Using Speedgoat Software

In R2020b, the change to a 64-bit POSIX compliant real-time operating system on the target computer requires a software upgrade for your Speedgoat real-time target machine. For this upgrade, the Speedgoat I/O Blockset provides an interactive tool. To retain compatibility with previous versions of MATLAB, you can choose to upgrade the target machine to a dual-boot system where you can select the operating system at startup. Or, you can upgrade the target machine to use only the new operating system. For the upgrade, you need a USB drive and the target machine needs a keyboard and a monitor.

To upgrade your software:

- 1 Install Simulink Real-Time and other required products.
- 2 Install the Simulink Real-Time Target Support Package by using the MATLAB **Add-Ons** menu.
- 3 Install the Speedgoat I/O Blockset. Go to the Speedgoat customer portal.
- 4 To start the target machine upgrade, in the MATLAB Command Window, type:

```
speedgoat.migrateTarget
```

For more information, go to the Speedgoat website.

Bus Signal Names Display Limitation in Simulation Data Inspector

For Simulink Real-Time models, there are some limitations on displaying signal names and grouping signals for live streaming to the Simulation Data Inspector. These limitations apply only to live streaming. When simulating the model or using the File Log block for signal data logging, signal names and signal grouping appear correctly in the Simulation Data Inspector.

- Signal names for non-virtual buses display the bus object names (not overridden names) in the Simulation Data Inspector when live streaming.
- Signals that are grouped into a virtual bus display as individual signals in the Simulation Data Inspector when live streaming.

Global Data Stores for Referenced Models

In R2020b, Simulink Real-Time model builds support global data stores for referenced models. For more information, see Data Store Memory and Local and Global Data Stores (Simulink).

Functionality Being Removed or Changed

The functionality being removed or changed table indicates a number of removed product features due to the operating system change to the QNX® Neutrino® real-time operating system for target computers.

If any of the removed functionality is important to your workflow, please provide feedback through the **Why did you choose this rating?** feedback for this help page.

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
Block library <code>xpcethernetlib</code> and blocks are removed: <ul style="list-style-type: none"> • Real-Time Ethernet Configuration • Create Ethernet Packet • Ethernet Tx • Ethernet Rx • Extract Ethernet Packet • Header Extract • Filter Address • Filter Type 	The model Upgrade Advisor warns that these blocks are unavailable. In R2020b, no replacement suggestions are available for these blocks. For more information, see Troubleshoot Model Upgrade for R2020b.	Consider using UDP and TCP blocks instead of raw Ethernet blocks.	

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
<p>Block library <code>xpcvideousb</code>lib, block library <code>xpcvideoutill</code>lib and blocks are not available:</p> <ul style="list-style-type: none"> • From USB Video Device • USB Video Device List • Video Display • Image Receive • Image Transmit • JPEG Compression • JPEG Decompression 	<p>The model Upgrade Advisor warns that these blocks are unavailable. In R2020b, no replacement suggestions are available for these blocks.</p> <p>For more information, see Troubleshoot Model Upgrade for R2020b.</p>		
<p>Blocks from library <code>slrtlib</code> are removed:</p> <ul style="list-style-type: none"> • Scope removes Target Scope, Host, Scope, and File Scope blocks • To Target • From Target • Video Display • Task Execution Time • Elapse Time • Time Stamp Delta • CPU Temperature • Minimum Available Stack Size • Current Available Stack Size • Current Available Stack Size 	<p>The model Upgrade Advisor warns that these blocks are unavailable. In R2020b, no replacement suggestions are available for these blocks.</p> <p>For more information, see Troubleshoot Model Upgrade for R2020b.</p>		

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
Block from library logitechG29 is not available: <ul style="list-style-type: none"> Steering Wheel Read 	The model Upgrade Advisor warns that this block is unavailable. In R2020b, no replacement suggestion is available for this block. For more information, see Troubleshoot Model Upgrade for R2020b.		
Support is removed for signals marked for buffered logging with the Simulation Data Inspector. All signals are marked for immediate logging (also referred to as signal streaming).	The model Upgrade Advisor warns that signals marked for buffered logging are not supported. In R2020b, the Upgrade advisor offers to change the marked signals to immediate logging. For more information, see Troubleshoot Model Upgrade for R2020b.	For buffered logging, connect a File Log block in place of marking a signal for buffered logging.	
Support is removed for the Simulink Real-Time API for Microsoft .NET Framework and for the Simulink Real-Time C API.	The model build warns that these features are not supported.		
Support is removed for the Simulink Real-Time Performance Advisor Checks.			

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
<p>Support is removed for these MATLAB objects and their related functions:</p> <p><code>SimulinkRealTime.fileScope</code></p> <p><code>SimulinkRealTime.hostScope</code></p> <p><code>SimulinkRealTime.targetScope</code></p> <p><code>SimulinkRealTime.fileSystem</code></p> <p><code>SimulinkRealTime.crashInfo</code></p> <p>...</p>	<p>When run, scripts and callbacks that use these objects and related functions warn that these features are not supported.</p>	<p>Mark signals for logging with the Simulation Data Inspector or connect the signal to a File Log block for viewing in the Simulation Data Inspector. For more information, see https://www.mathworks.com/help/releases/R2020b/slrealtime/ug/inspect-signals-in-external-mode-using-simulation-data-inspector.html.</p>	
<p>Support is removed for some properties of these MATLAB objects:</p> <p>Scopes property of <code>SimulinkRealTime.target</code></p>	<p>When run, scripts and callbacks that use these properties warn that these features are not supported.</p>		

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
<p>Support is removed for these MATLAB functions:</p> <p>viewTargetScreen</p> <p>slrtsetCC</p> <p>slrtgetCC</p> <p>SimulinkRealTime.uti ls.minimumSampleTime</p> <p>SimulinkRealTime.uti ls.createInstrumenta tionModel</p> <p>SimulinkRealTime.uti ls.getFileScopeData</p> <p>getPCIInfo</p> <p>addscope</p> <p>getscope</p> <p>remscope</p> <p>getDiskSpace</p> <p>createStandAlone</p> <p>getlog</p> <p>getscope</p> <p>SimulinkRealTime.cop yFileToHost</p> <p>SimulinkRealTime.cop yFileToTarget</p> <p>display(crashinfo_ob ject)</p> <p>update(crashinfo_obj ect)</p>	<p>When run, scripts and callbacks that use these functions warn that these features are not supported.</p>		
<p>Support is removed for the slrtexplr command to start Simulink Real-Time Explorer.</p>	<p>If you type slrtexplr in the MATLAB Command Window, you are prompted to use the slrtExplorer command.</p>	<p>Use the slrtExplorer command to start Simulink Real-Time Explorer.</p>	

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
Support is removed for Simulink Real-Time Explorer based instrument panels (*.slrtip).	In R2020b, Simulink Real-Time Explorer cannot open instrument panel files.	Use instrumentation object based instrument panels. For more information, see Instrumentation Apps for Real-Time Applications.	
Support is removed for Simulink Real-Time Explorer based signal logging to files.	In R2020b, Simulink Real-Time Explorer cannot create these files.	Connect a File Log block in place of using Simulink Real-Time Explorer for signal logging to files.	
Support is removed for FORTRAN S-functions.	The model build warns that these features are not supported.	Use C/C++ S-functions.	
Support is removed for Target object properties TimeLog, OutputLog, TETLog, and StateLog.	When run, scripts and callbacks that use these target object properties warn that these features are not supported.	Use the TET Monitor or execution profiling to observe this information. For more information, see slrtTETMonitor and getProfilerData.	
Support is removed for the slrt.tlc code generation target and its associated configuration parameters. The Simulink Real-Time pane is removed from the Code Generation tab of the Configuration Parameters dialog box.	The model Upgrade Advisor warns when a model uses unavailable configuration parameters. When you save the model, this configuration parameter is removed.	The slrealttime.tlc code generation target replaces slrt.tlc.	
Support for Visual C/C++ compiler is removed.	The toolchain for the slrealttime.tlc code generation target uses the QNX Neutrino C/C++ compiler.	Use QNX Neutrino C/C++ compiler that is installed with support package. If your workflow to build real-time applications applies external code integration, re-compile and link all external sources with the QNX Neutrino C/C++ compiler.	

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
Communications setup support for the development computer and target computer has changed.	Until the target computer is updated to use the QNX Neutrino operating system, the development computer cannot connect to the target computer.	For information about communications setup for the development computer, see Development Computer Requirements and Enable Development Computer Communication (Windows). For information about communications setup for the target computer, see the Speedgoat documentation.	
Target computer boot method support has changed.	Until the target computer is updated to use the QNX Neutrino operating system, the target computer cannot boot.	For information about boot method support for the target computer, see the Speedgoat documentation.	

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
<p>Support for target computer keyboard (console) commands has changed. The target computer command-line interface changes include:</p> <p>Removed target object property commands, including <code>getpar</code>, <code>setpar</code>, <code>stoptime</code>, <code>sampletime</code>.</p> <p>Removed scope and video object function commands, including <code>addscope</code>, <code>remscope</code>, <code>startscope</code>, <code>stopscope</code>, <code>addsignal</code>, <code>remsignal</code>, <code>show</code>, <code>hide</code>.</p> <p>Removed scope object property commands, including <code>numsamples</code>, <code>decimation</code>, <code>grid</code>, <code>scopemode</code>, <code>triggermode</code>, <code>prepostsamples</code>, <code>triggersignal</code>, <code>triggersample</code>, <code>triggerlevel</code>, <code>triggerslope</code>, <code>triggerscope</code>, <code>triggerscopesample</code>, <code>ylimit</code>.</p> <p>Removed aliasing with variable command commands, including <code>setvar</code>, <code>getvar</code>, <code>delvar</code>, <code>delallvar</code>, <code>showvar</code>.</p>	<p>With the target computer operating system change to QNX Neutrino, previous target computer operating system commands are not recognized.</p>	<p>For information about commands that you can run on the target computer by using an SSH utility on the development computer or by using the target computer keyboard, see Target Computer Command-Line Interface.</p>	
<p>Support for MATLAB compiler deployment of MATLAB applications to control real-time applications is disabled.</p>	<p>In R2020b, MATLAB application that control real-time applications cannot be compiled with the MATLAB compiler.</p>		

Functionality	What Happens When You Use This Functionality?	Use This Functionality Instead	Compatibility Considerations
Generation of ASAP2 (A2L) data description file has changed.	The Generate INCA/CANape extensions configuration parameter is not supported or required.	In R2020b, the real-time application contains the A2L file information. To extract the generated A2L file from real-time application file, use the extractASAP2 function.	
Support for the setparam function has changed. This function does not support the return history option that was supported.	Not available	Not available	