What are the available interfaces and APIs to interact with Speedgoat & Simulink Real-Time as a Standalone Operator in R2020b onwards?

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MathWorks Support Team STAFF
on 23 Sep 2021

Edited: MathWorks Support Team STAFF on 14 Dec 2023

Accepted Answer: MathWorks Support Team STAFF

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What are the available user interfaces and APIs to interact with a Speegoat target computer and the real-time application running on it in R2020b onwards, without having any MATLAB installation or license on the host computer that is connected to the Speedgoat?

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Accepted Answer

MathWorks Support Team STAFF
on 13 Sep 2024 at 0:00

Edited: MathWorks Support Team STAFF on 14 Dec 2023

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The following workflows do not require any MATLAB installation or license on the host computer to interact with Speedgoat:

1. Standalone App created with MATLAB Compiler (R2021b+)

The recommended way to create a fully customizable GUI for interaction with Speedgoat is with MATLAB App Designer.

Starting from R2021b, if the app developer has a MATLAB Compiler license, it is possible to compile and distribute the app as a standalone executable. This executable can be deployed to a host PC without a MATLAB installation or license. The end user only needs to install the free MATLAB Runtime.

The deployed app gives you access to most features from MATLAB and the MATLAB API for Simulink Real-Time. The app will allow controlling the target, real-time application, parameter tuning, and signal visualization at runtime. For more information, see:

- How can I create an App Designer app to control, tune, and visualize my Simulink Real-Time application?
- Create Standalone Instrument Panel App by Using Application Compiler

2. Access the Speedgoat Command Line via SSH

Starting from R2020b, the Speedgoat target machine supports Secure Shell (SSH). This enables any SSH client such as PuTTY to connect to the target machine and issue a limited set of controls (install, load, start, and stop the real-time application). The same commands also be executed by connecting a USB keyboard to the Speedgoat. For more information, see:

- Execute Target Computer RTOS Commands at Target Computer Command Line
- Target Computer Command-Line Interface
- How can I install a real-time application on my Speedgoat target machine without MATLAB?

3. Access the Speedgoat File System via FTP or SCP

Starting in R2021a, there is a supported workflow to copy file log data from the Speedgoat target computer to a host computer without MATLAB. However, note that eventually, you will need to launch MATLAB to import the data in Simulation Data Inspector (SDI) as you cannot view the raw data anywhere else. For more information, see:

- How can I download file log data manually from my Speedgoat target?

4. Exchange Data with Real-Time Application via Communication Protocols

Speedgoat real-time applications offer built-in support for standard communication protocols such as Real-Time UDP, TCP/IP, and serial communication by placing the appropriate block into your Simulink model. For more information, see:

- Communication Protocols supported by Simulink Real-Time

5. Calibrate Real-Time Application via Third-Party XCP Tools

Simulink Real-Time can be used in XCP Server mode (formerly XCP Slave mode) to support interaction with third-party calibration tools such as Vector CANape® and ETAS® Inca. For more information, see:

- Can I use a Speedgoat real-time target as an XCP Server device for interaction with third-party calibration tools such as CANape and Inca?

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Additional notes:

(1) Having a minimal installation of the two products MATLAB and Simulink Real-Time will provide access to more interfaces and testing workflows. See the following MATLAB Answers post for more information: https://www.mathworks.com/matlabcentral/answers/2018061-what-are-the-available-interfaces-and-apis-to-interact-with-speedgoat-simulink-real-time-as-a-test

(2) The Simulink Real-Time .NET API and Simulink Real-time C API (xPCFramework.dll & xpcapi.dll), provided until R2020a for standalone control and instrumentation of Speedgoat target machines, are no longer available since R2020b. Please use one of the workflows mentioned above instead.

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- ◯ address a code analyzer warning
- ◯ reflect on the skills I've gained
- ◯ get food on my mouse and keyboard
- ◯ All of the above

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