Simulink® Real-Time™

Simulink Real-Time Support Package for ASAM XIL Standard User's Guide (R2021b Nonrelease)
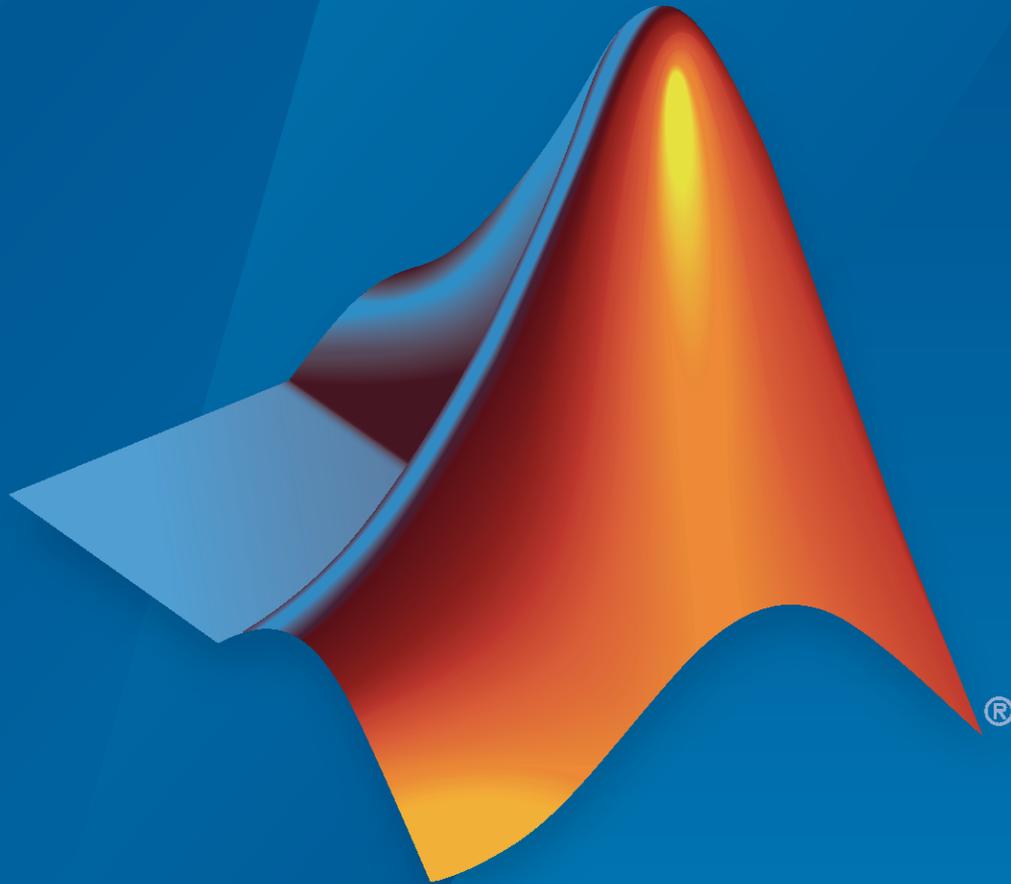
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Revision History

September 2021	PDF only	New for Version 1.0 (Release 2021b)

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ASAM XIL API Support

About the Simulink Real-Time Support Package for ASAM XIL Standard

This support package implements the ASAM XIL API standard for Simulink Real-Time target computers.

The Simulink Real-Time Support Package for ASAM XIL Standard implements the ASAM XIL standard API for Simulink Real-Time target computers. This C# API lets you run real-time hardware-in-the-loop tests on a Simulink Real-Time target computer by using test cases created from any test automation software with the XIL framework. Also, you can use the support package to develop a custom XIL test framework for Simulink Real-Time.

For more information, see:

- Install Support Package and Create Real-Time Application Test Case in ECU-TEST
- Classes and Methods of ASAM XIL API with ECU-TEST Usage.

Install Support Package and Create Real-Time Application Test Case in ECU-TEST

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"Configure Test Bench" on page 1-3
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The ECU-TEST product from TraceTronic GmbH lets you create test cases for automotive software.

Simulink Real-Time supports a subset of the ASAM XIL APIs in ECU-TEST. These APIs let you define an ECU M port, an ECU C port, and a Model Access port for an ECU-Test test case. To use these APIs in Simulink Real-Time, install the Simulink Real-Time XIL API support package by using the Add On Explorer. For a list of support ASAM XIL APIs in the support package, see Classes and Methods of ASAM XIL API with ECU-TEST Usage.

Prerequisites for Using ECU-TEST

To enable support for the ASAM XIL APIs for ECU-TEST, install the Simulink Real-Time XIL API support package.

1 In MATLAB, select **Home** > **Add-Ons** > **Get Add-Ons** and install the Simulink Real-Time XIL API support package.
2 After support package installation, verify that the manifest file `MathWorksXILServer.imf` that is located under `C:\ProgramData\ASAM\XIL\Implementation` provides the correct Assembly path.
3 Register MATLAB as the automation server. Share the MATLAB session. If you do not, ECU-TEST opens a new MATLAB session when you configure the test bench and test. In the MATLAB Command Window, type:

```
comserver('register','User','current');
enableservice('AutomationServer', true);
```

4 Build the model. The real-time application MLDATX file is required for setting up the test bench and test in ECU-TEST.
5 Create a configuration file for the test bench by using the `createPortConfigureFile` function.

Configure Test Bench

The ECU-TEST bench configuration identifies the Simulink Real-Time support package and the real-time application for the test.

1 To create a test bench configuration in ECU-Test, select **File** > **New** > **Test Bench Configuration** or click the **Create new tool host** button.
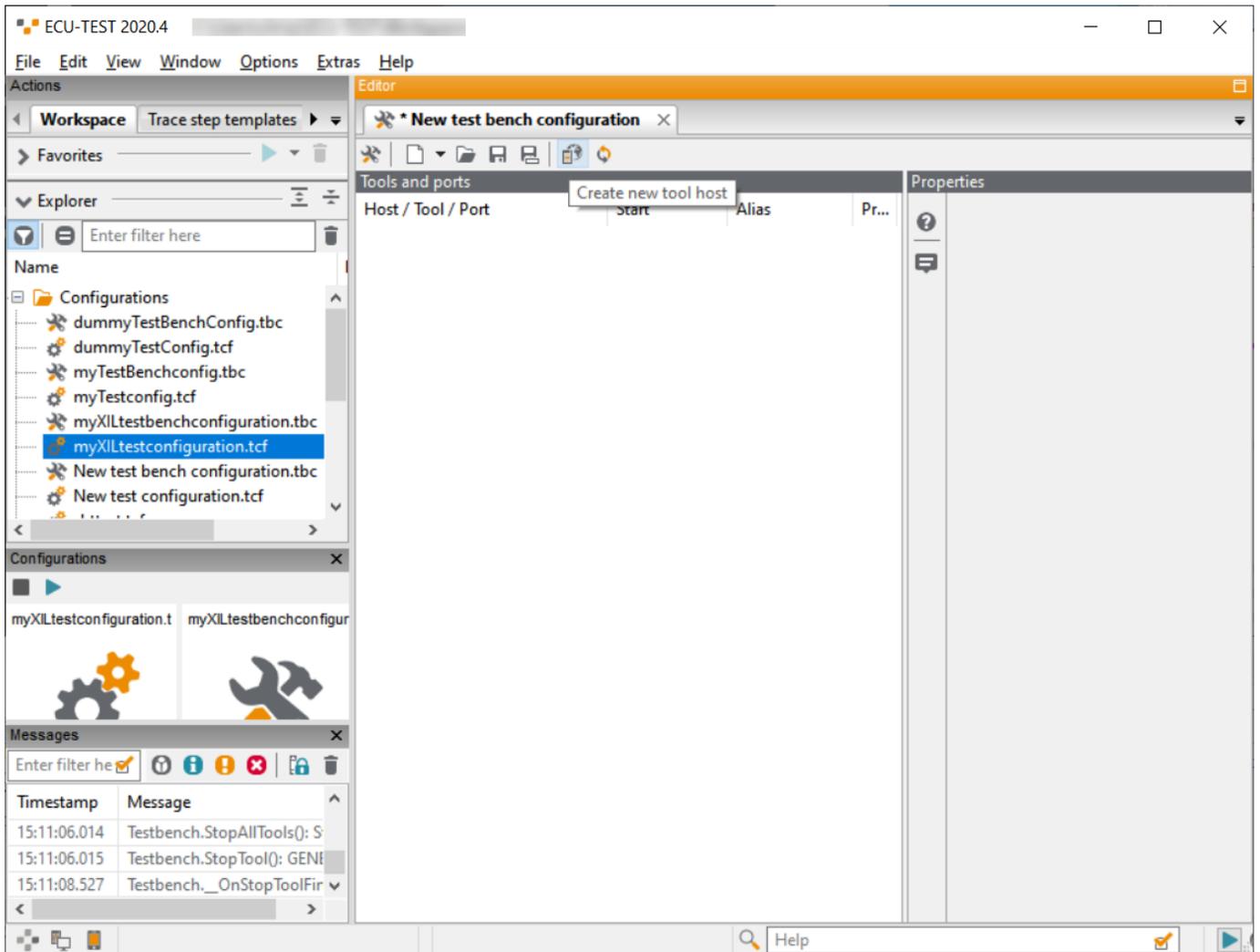
2 To create a model access port for the test bench, right-click **ASAM: XIL** and **New Port > Create Port > Model Access Port**. Populate the port properties:

- **Configuration file** — Path to the `configFile.xml` file
- **Support for online model querying** — Enabled
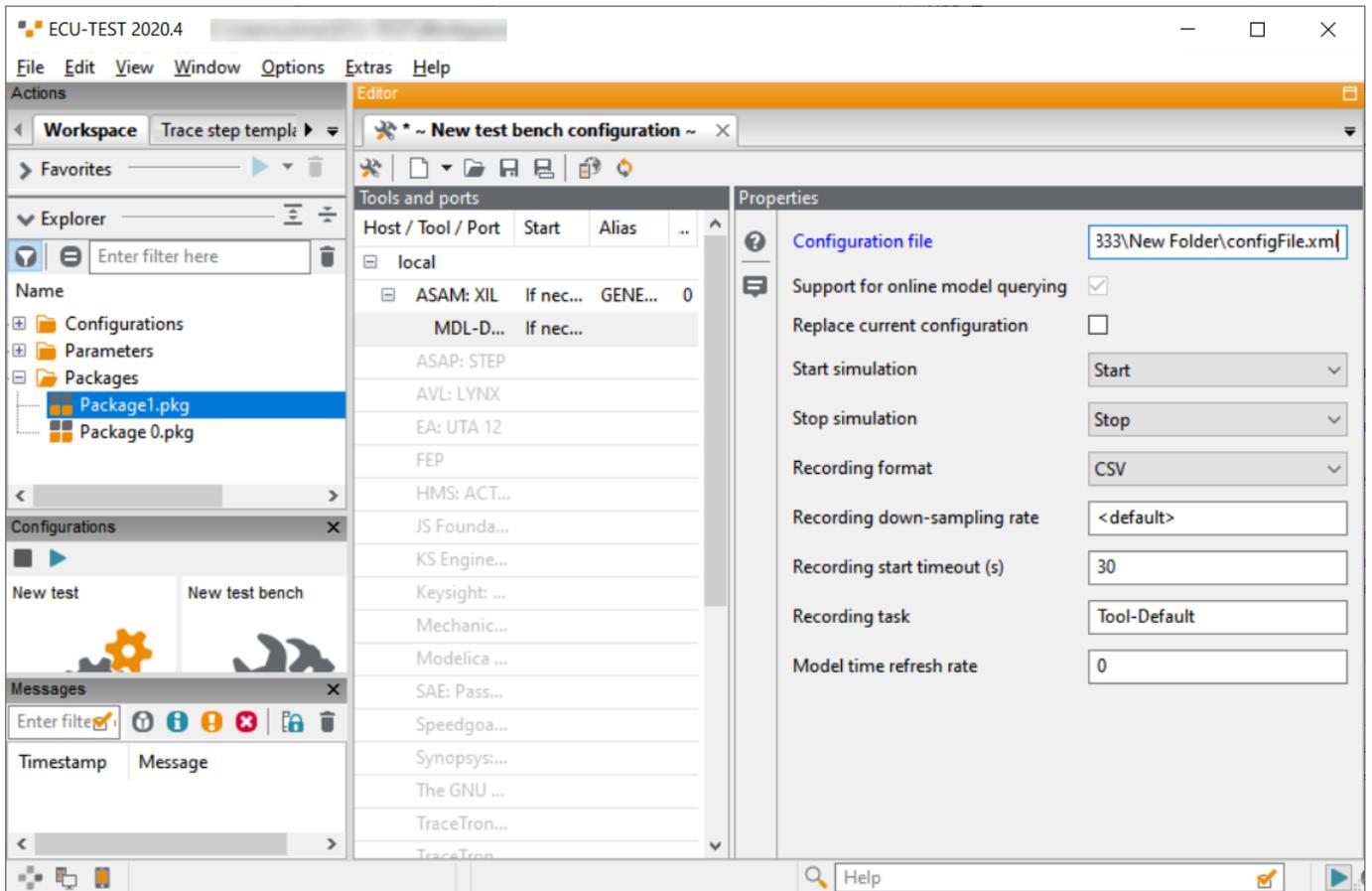
3   To create an application port for the test bench, right-click **ASAM: XIL** and **New Port** > **Create Port** > **Application Port**. Populate the port properties:

- **ECUCPort configuration file** — Path to the `configFile.xml` file
- **ECUMPort configuration file** — Path to the `configFile.xml` file
- **A2L file** — Empty
- **HEX-file** — MLDATX file path
- **Calibration access** — Manual
- **Start of measurement** — Manual
- **Support for online a2l query** — Enabled
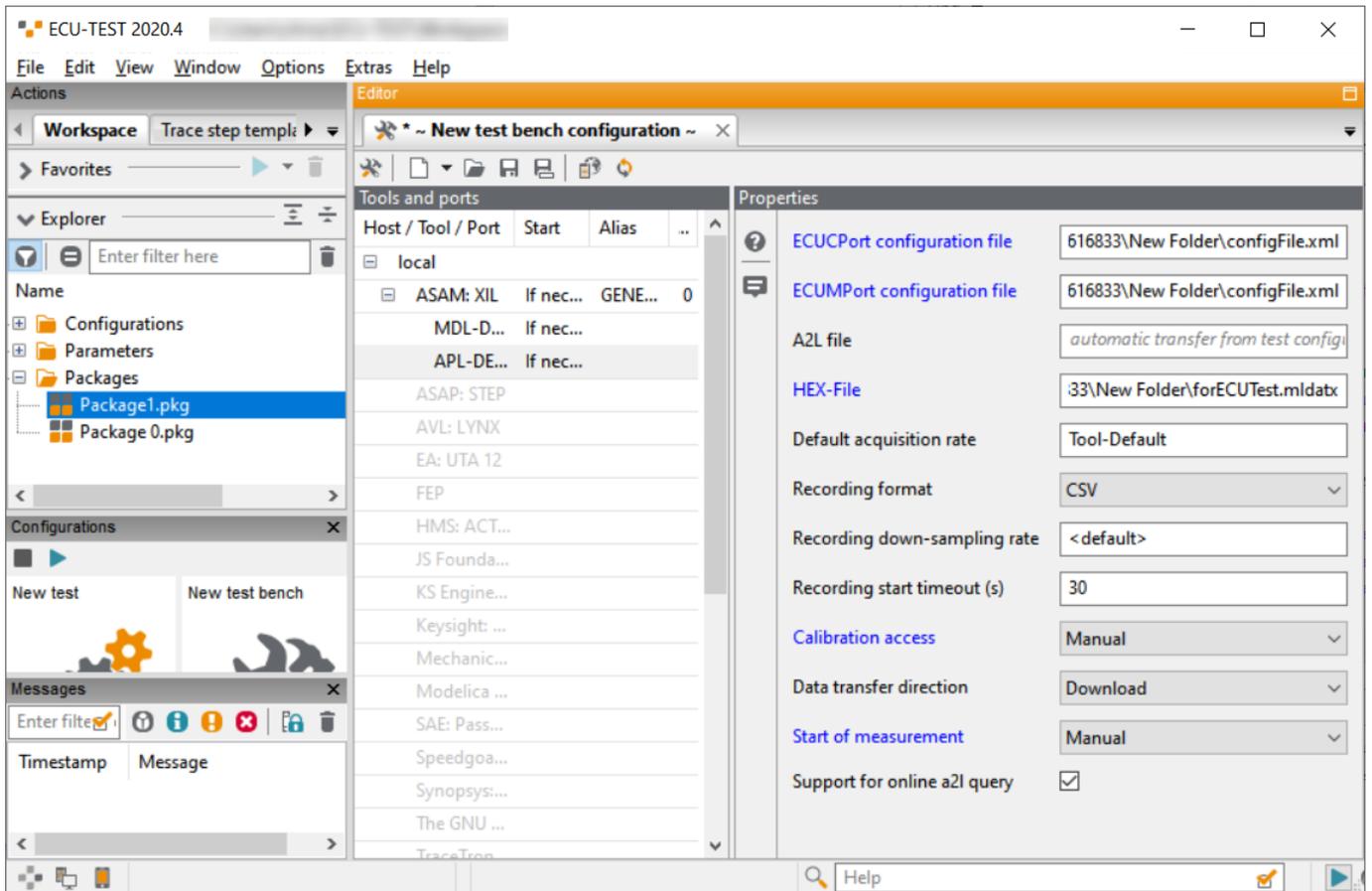
4   To configure the test bench to use Simulink Real-Time ASAM XIL API support, click **ASAM: XIL** and populate the test bench properties:

- **XIL-API Server** — MathWorks; XIL API 1.0
- **Model directory** — MLDATX folder path
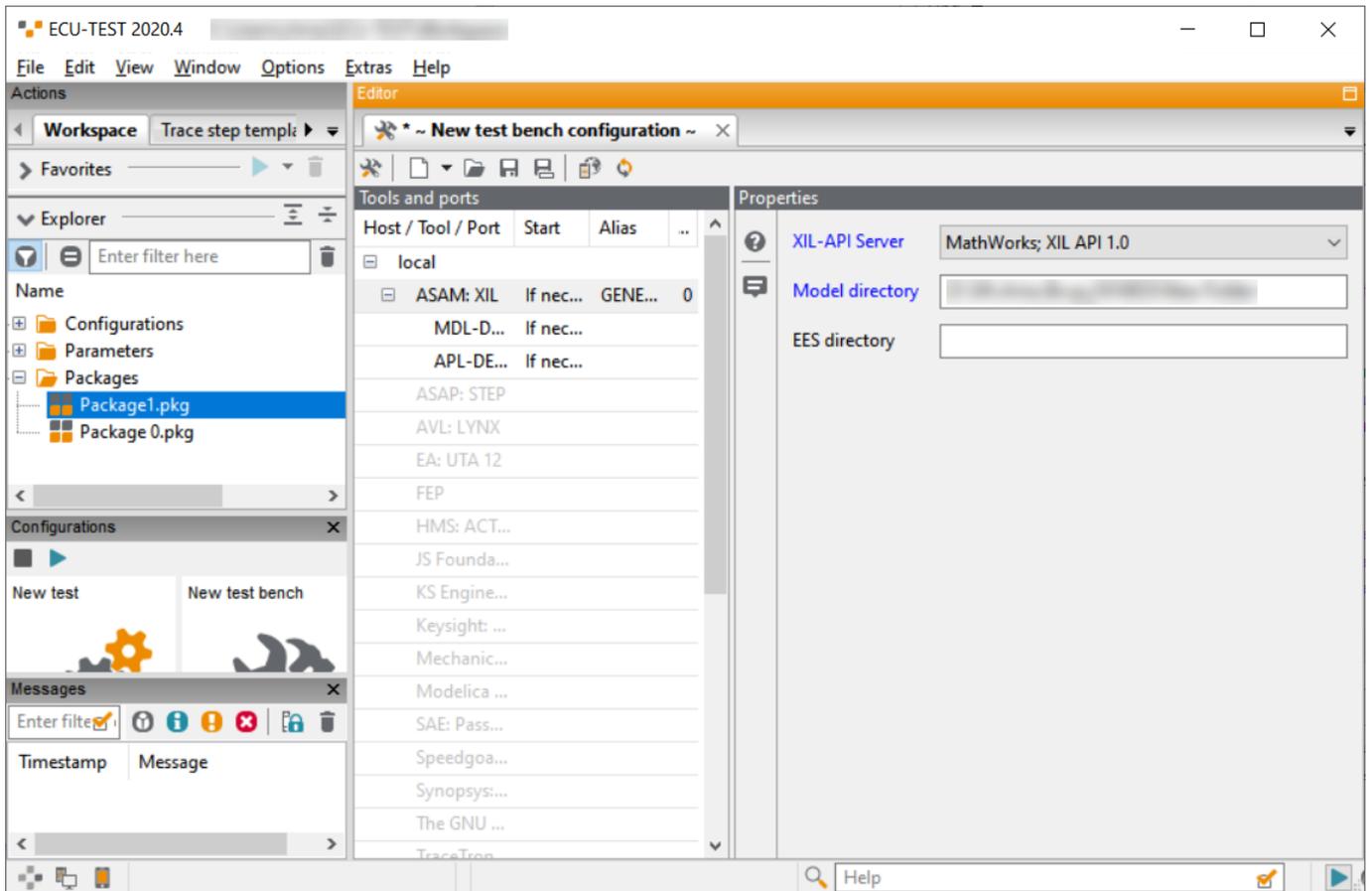
5 Save the test bench configuration.

Configure Test

The test configuration identifies the test object and tool independent settings for the test.

1 To create a test configuration in ECU-Test, select **File > New > Test Configuration**.

Select the **Control units** tab. In the Control units tree, right-click **Control units** and select **New**. Select **GenericECU**. Select **Application > Port** and select the application port that you created in the test bench configuration.
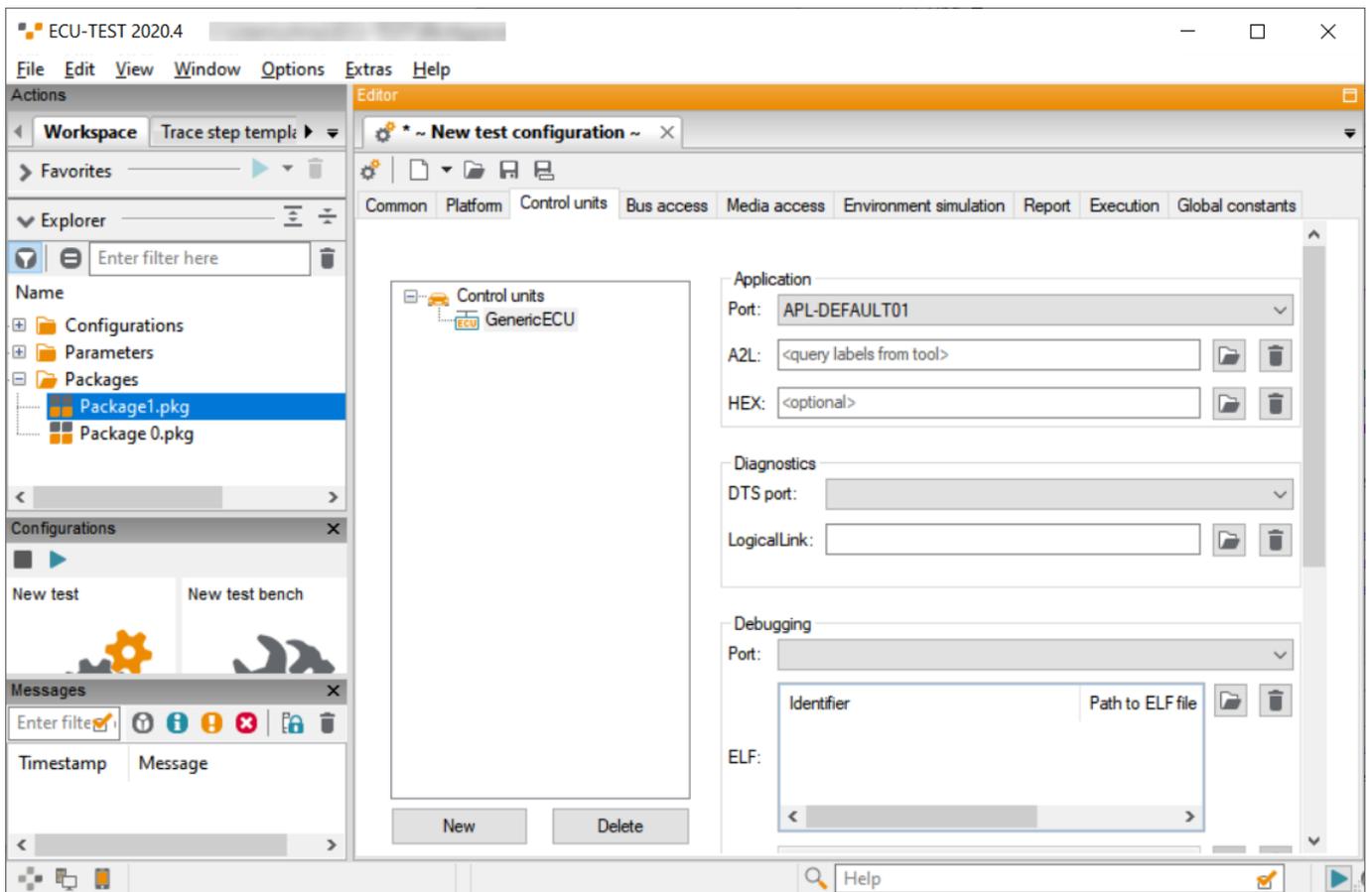
2   Save the test configuration.

3   To use the test bench and test configuration, add the test configuration and the test bench configuration under the configurations windows in ECU-TEST.

4   To use the test bench and test configuration, click the **Activate configuration** button. ECU-Test starts the real-time application on the target computer.

Record Signal from Test

1   To add a package to the test configuration, click **Packages** and select **File > New > Packages > Empty package**.

2   Create a recording group and rename it as `BaseRate`.

3   In ECU-TEST, to record a signal from the real-time application, select a signal in the **Measurement** tab. Signals in a signal group must come from the same task.

4   Select **Recording group for BaseRate** in the **Signal records** tab. Set recording group as **Auto-start/stop without precondition**.

5   To start signal recording, add **startMeasurement** from jobs to the test tab of the current package.

To record some signal data, wait several seconds as the test runs.
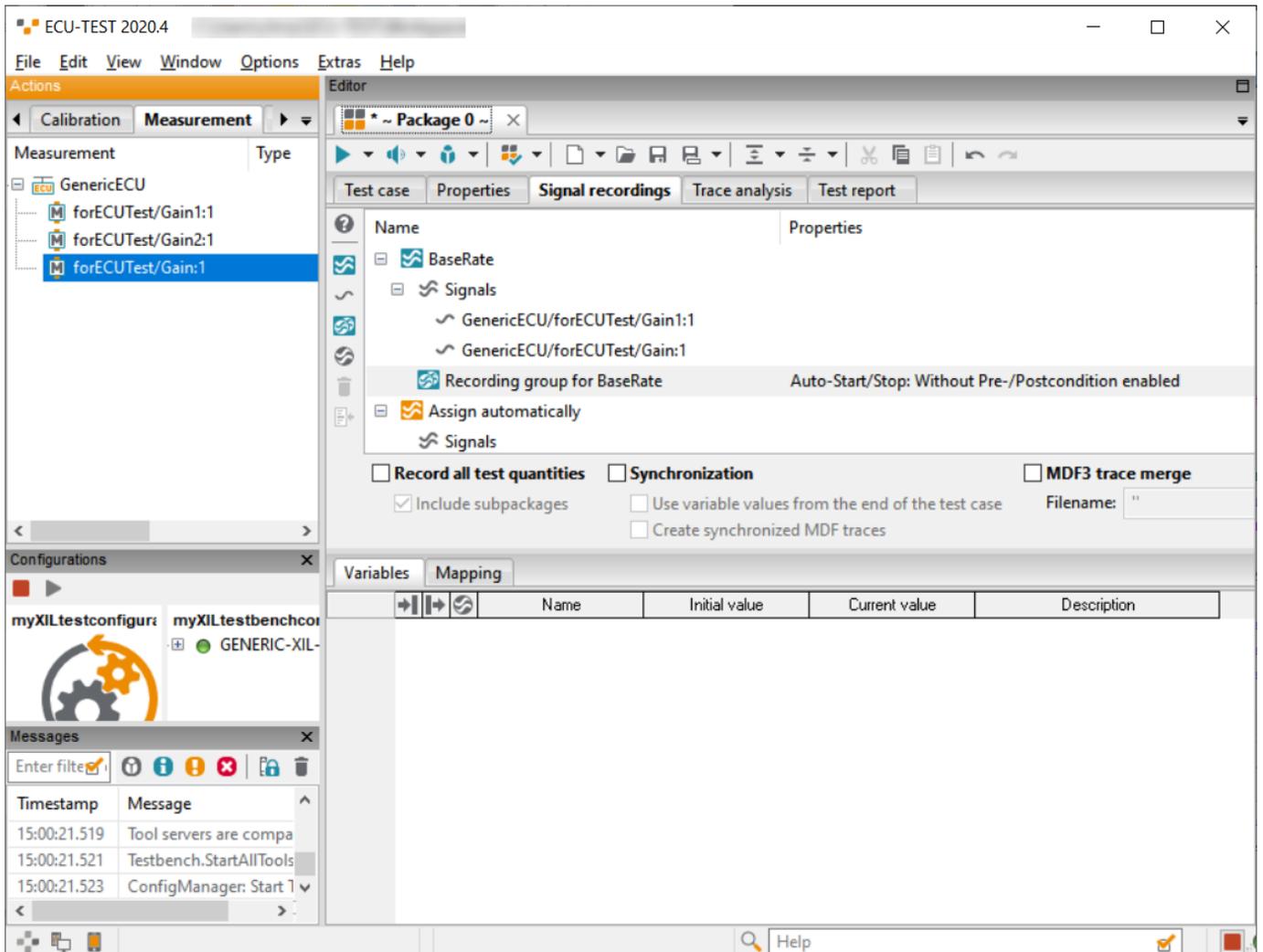
6 To stop the signal measurement, right-click the **StopMeasurement** API from the **Jobs** tab and select **Execute** in the context menu.

7 Click the **Run test case and trace analysis** button.
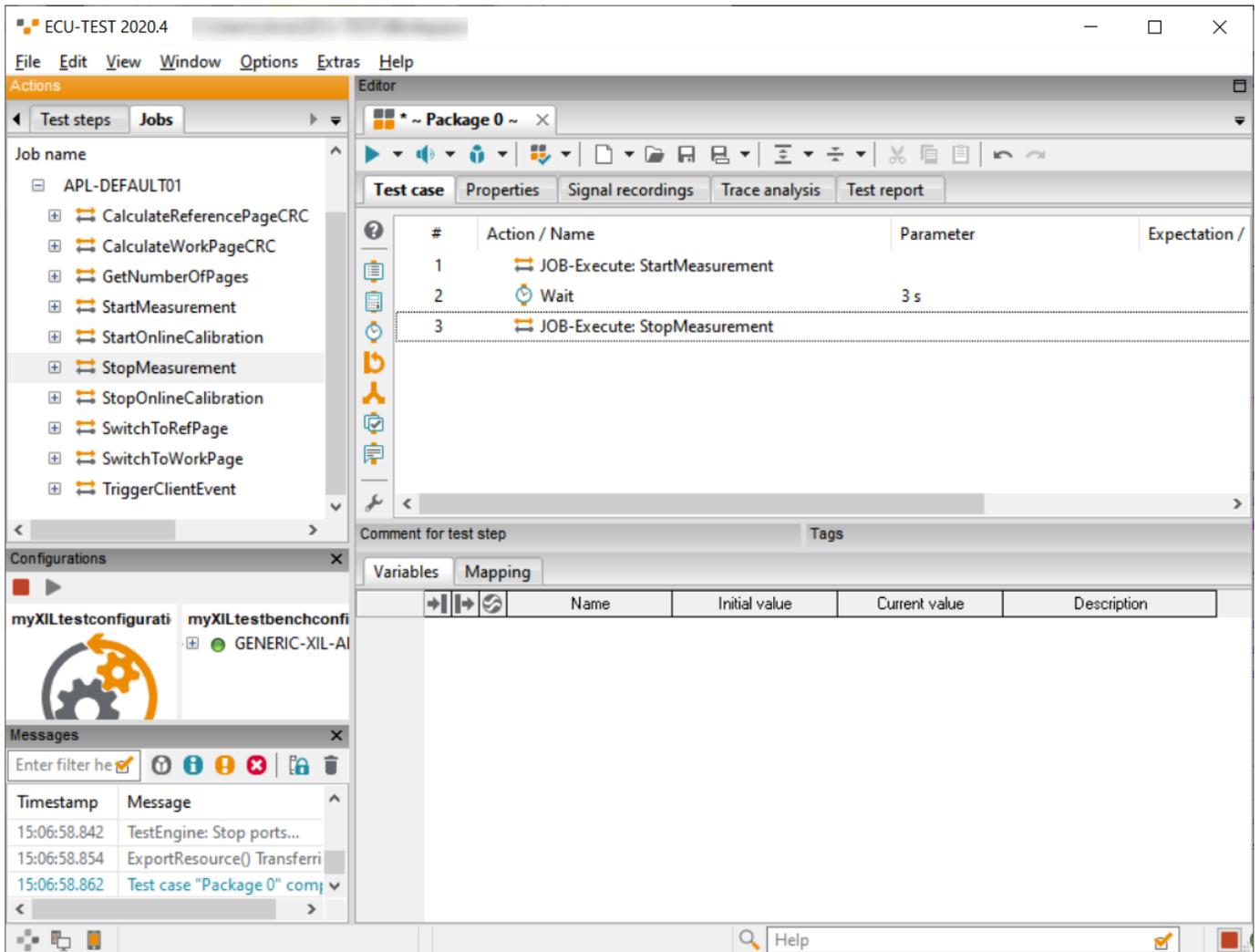
8 To display the recorded signal, click the **Test report** tab and select **Recordings**. Select the recording to display.
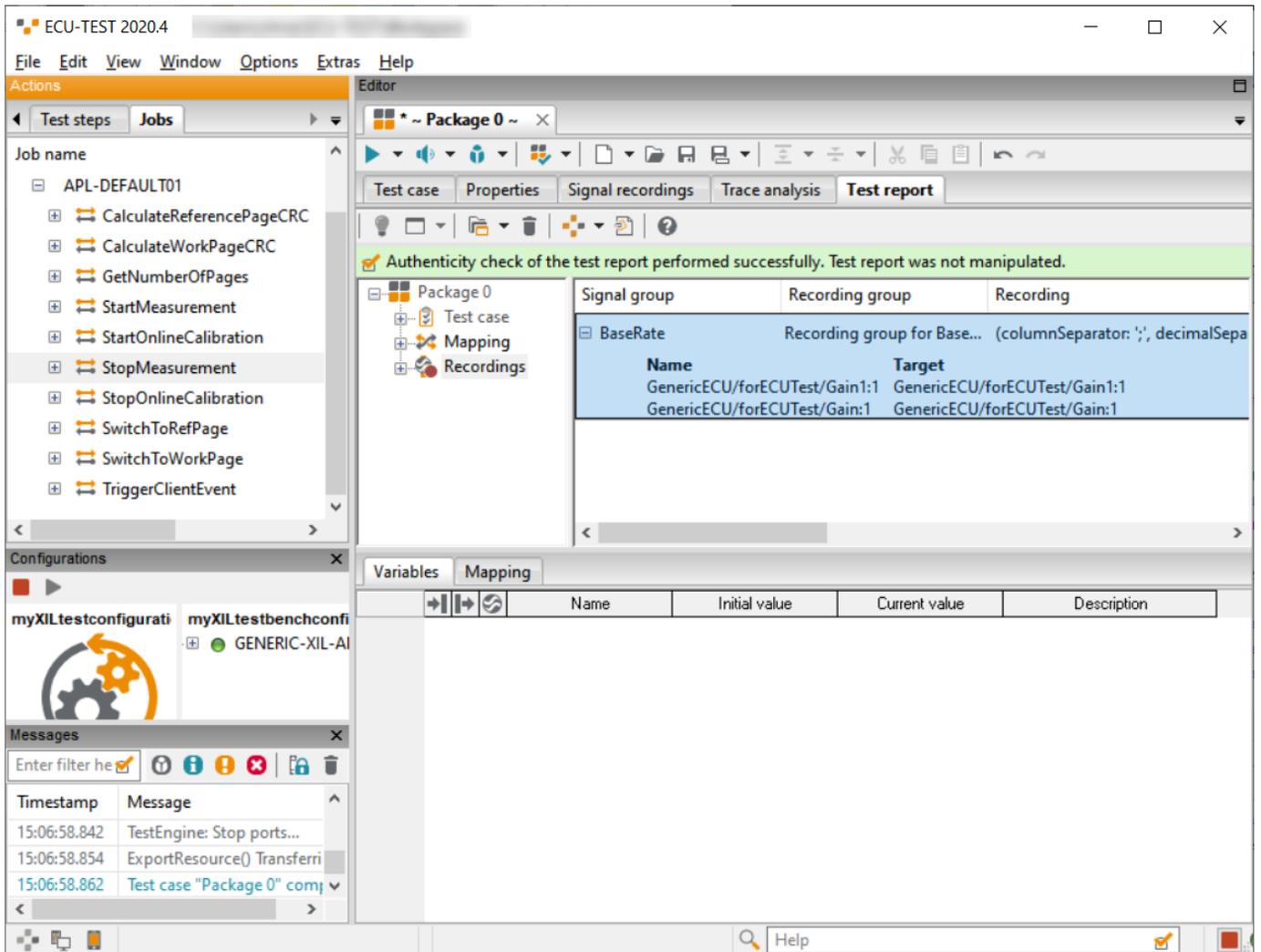
9 ECU-Test displays the recording of the signal.
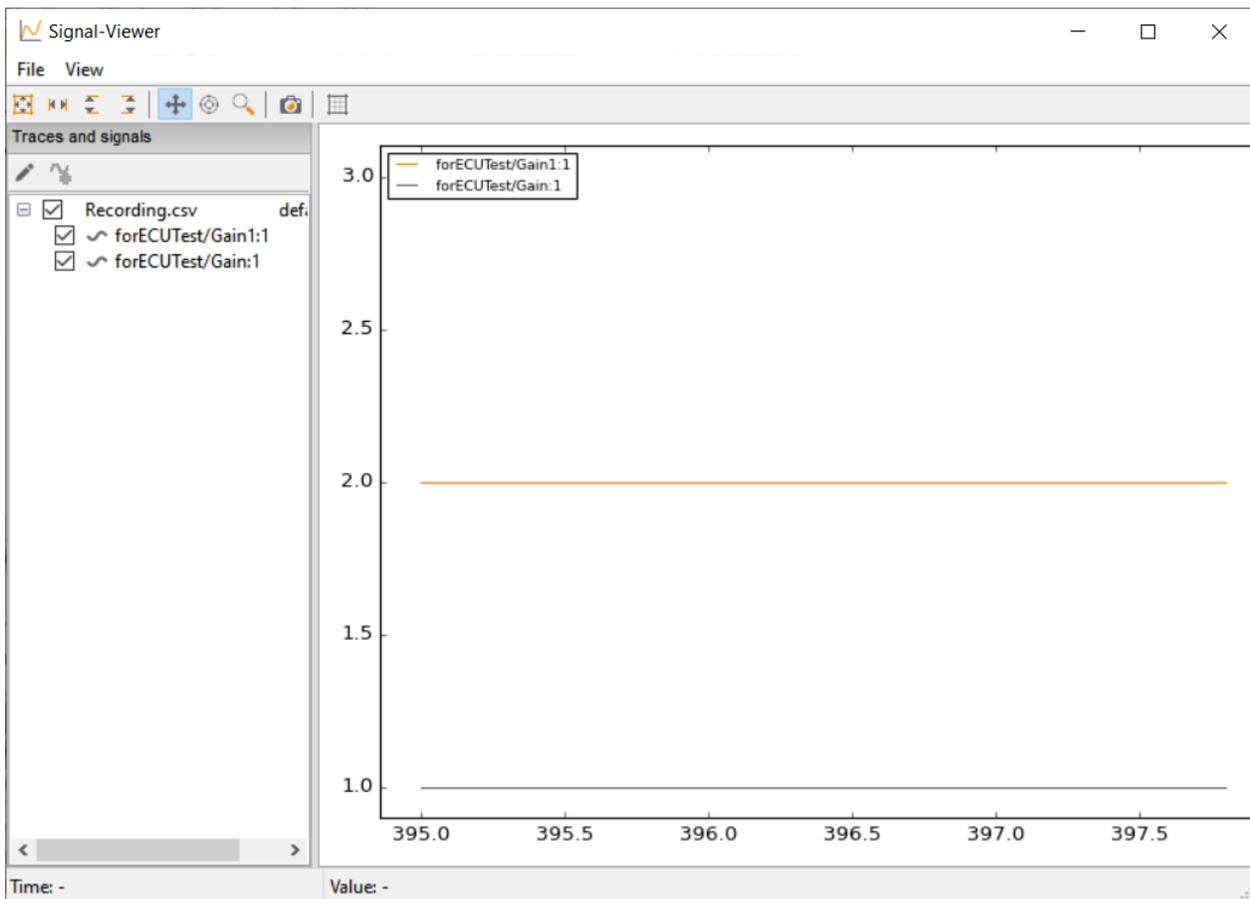
See in Simulink Real-Time Documentation

- `createPortConfigureFile` (Simulink Real-Time)
- Control Real-Time Application by Using C# Code (Simulink Real-Time)

See Also
Classes and Methods of ASAM XIL API with ECU-TEST Usage

External Websites

- TraceTronic GmbH
- ASAM XIL

Classes and Methods of ASAM XIL API with ECU-TEST Usage

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To interface with ECU-TEST, the Simulink Real-Time XIL API support package supports a subset of the ASAM XIL API. The tables include API methods that you can use with the support package.

MAPort Class

Class	Method	ECU-TEST Usage	Introduced in Support Package Version
MAPort	CheckVariableNames(variableNames :A_UNICODE2STRING[]) :A_UNICODE2STRING[]	None	1.0
MAPort	Configure(config :MAPortConfig, forceConfig :A_BOOLEAN) :void	Configuration start	1.0
MAPort	GetDataType(variableName :A_UNICODE2STRING) :DataType	Signal read/write	1.0
MAPort	GetVariableInfo(variableName :A_UNICODE2STRING) :MAPortVariableInfo	Model query	1.0
MAPort	IsReadable(variableName :A_UNICODE2STRING) :A_BOOLEAN	Signal recording	1.0
MAPort	IsWritable(variableName :A_UNICODE2STRING) :A_BOOLEAN	Model query	1.0
MAPort	LoadConfiguration(filepath :A_UNICODE2STRING) :MAPortConfig	Configuration start	1.0
MAPort	StartSimulation() :void	Job or start of test case	1.0
MAPort	StopSimulation() :void	Job or stop of test case	1.0
MAPort	getConfiguration() :MAPortConfig	None	1.0
MAPort	getState() :MAPortState	Configuration start and stop	1.0
MAPort	getTaskInfos() :TaskInfo[]	None	1.0
MAPort	getTaskNames() :A_UNICODE2STRING[]	Signal recording	1.0
MAPort	getVariableNames() :A_UNICODE2STRING[]	Model query	1.0

Class	Method	ECU-TEST Usage	Introduced in Support Package Version
MAPort	Dispose	N/A	1.0
MAPort	Disconnect	N/A	1.0

ECUMPort Class

Class	Method	ECU-TEST Usage	Introduced in Support Package Version
ECUMPort	CheckVariableNames	None	1.0
ECUMPort	Configure	Configuration start	1.0
ECUMPort	CreateCapture	Signal recording	1.0
ECUMPort	GetDataType	None	1.0
ECUMPort	GetMeasuringVariables	Signal read	1.0
ECUMPort	GetVariableInfo	None	1.0
ECUMPort	IsReadable	Signal recording	1.0
ECUMPort	LoadConfiguration	Configuration start	1.0
ECUMPort	Read	Signal read	1.0
ECUMPort	SetMeasuringVariables	Signal read	1.0
ECUMPort	StartMeasurement	Signal read	1.0
ECUMPort	StopMeasurement	Signal read	1.0
ECUMPort	getConfiguration	None	1.0
ECUMPort	getState	None	1.0
ECUMPort	getTaskInfos	None	1.0
ECUMPort	getTaskNames	Signal read	1.0
ECUMPort	getVariableNames	None	1.0
ECUMPort	Disconnect	N/A	1.0
ECUMPort	Dispose	N/A	1.0

ECUCPort Class

Class	Method	ECU-TEST Usage	Introduced in Support Package Version
ECUCPort	CalculateRefPageCRC	Tool job	1.0

Class	Method	ECU-TEST Usage	Introduced in Support Package Version
ECUCPort	CalculateWorkPageCRC	Tool job	1.0
ECUCPort	CheckVariableNames	None	1.0
ECUCPort	Configure	Configuration start	1.0
ECUCPort	GetDataType	Signal write	1.0
ECUCPort	GetVariableInfo	None	1.0
ECUCPort	IsReadable	Signal recording	1.0
ECUCPort	IsWriteable	Signal recording	1.0
ECUCPort	LoadConfiguration	Configuration start	1.0
ECUCPort	NumberOfPages	Tool job	1.0
ECUCPort	Read	Signal read	1.0
ECUCPort	StartOnlineCalibration	Tool job, configuration start	1.0
ECUCPort	StopOnlineCalibration	Tool job, configuration start	1.0
ECUCPort	SwitchToRefPage	Tool job	1.0
ECUCPort	SwitchToWorkPage	Tool job	1.0
ECUCPort	Write	Signal write	1.0
ECUCPort	getConfiguration	None	1.0
ECUCPort	getState	None	1.0
ECUCPort	getVariableNames	None	1.0
ECUCPort	Disconnect	N/A	1.0
ECUCPort	Dispose	N/A	1.0

Capture Class

Class	Method	ECU-TEST Usage	Introduced in Support Package Version
Capture	Fetch(whenFinished :A_BOOLEAN) :CaptureResult	None	1.0
Capture	Start(writer :CaptureResultWriter) :void	Signal recording	1.0
Capture	getCaptureResult() :CaptureResult	Signal recording	1.0
Capture	getState() :CaptureState	Signal recording	1.0

Class	Method	ECU-TEST Usage	Introduced in Support Package Version
Capture	setVariables(variableNames :A_UNICODE2STRING[]) :void	Signal recording	1.0

CapturingFactory Class

Class	Method	ECU-TEST Usage	Introduced in Support Package Version
CapturingFactory	CreateCaptureResult	None	1.0

MAPORTFactory Class

Class	Method	ECU-TEST Usage	Introduced in Support Package Version
MAPortFactory	CreateMAPort	Yes	1.0
MAPortFactory	CreateMAPortBreakpoint	None	See note.
MAPortFactory	CreateMAPortBreakpoint2	Yes	See note.

Note The signature for the CreateMAPortBreakpoint method is incorrect in ASAM XIL v2.1.0. The signature for the CreateMAPortBreakpoint2 is the corrected version of the method and is contained in ASAM XIL v2.1.1.

See in Simulink Real-Time Documentation

- `createPortConfigureFile` (Simulink Real-Time)
- Control Real-Time Application by Using C# Code (Simulink Real-Time)

See Also

More About

- Install Support Package and Create Real-Time Application Test Case in ECU-TEST

External Websites

- TraceTronic GmbH
- ASAM XIL