Elektrobit

EB tresos® Studio for ACG8

new and noteworthy

product release 8.8.7

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1. Preface

This document describes the highlight changes of EB tresos Studio and gives short examples of their application. This document does not document all changes in the current release but only the ones that need special attention.

A comprehensive list of the customer-visible EB tresos Studio changes can be found in the EB tresos Studio release notes document. The chapters of this document group the changes according to the EB tresos Studio version they are contained.

For information about the Interpretation of version information, see the EB tresos Studio release notes.

2. Changes for product release 8.8 (Studio 27.1/Studio 27.2/Studio 28.0/Studio 28.1/ Studio 28.2/Studio 28.3/Studio 29.0/Studio 29.1)

2.1. Update of Java Runtime Environment

EB tresos Studio 29.1.0 comes with an updated Java Runtime Environment (JRE). It now runs with the Eclipse Adoptium Temurin OpenJDK JRE version 8.0.322.6.

2.2. AUTOSAR R21-11 support for system model and ECU configuration

EB tresos Studio now provides support for the relevant parts of system model and ECU configuration for AUTOSAR R21-11. This includes parameter definitions and module configurations, and the import and export of configuration data.

Former releases of EB tresos Studio supported AUTOSAR releases up to 4.6.0 (AUTOSAR R20-11), which are still fully supported.

2.3. AUTOSAR R20-11 support for system model and ECU configuration

EB tresos Studio now provides support for the relevant parts of system model and ECU configuration for AUTOSAR R20-11. This includes parameter definitions and module configurations, and the import and export of configuration data.

Former releases of EB tresos Studio supported AUTOSAR releases up to 4.5.0, which are still fully supported.

2.4. Creation of a support package via the command line

In earlier releases of EB tresos Studio, there was no command line support for the creation of a support package. Starting with EB tresos Studio 28.2, you can create a support package via the command line with the command `createSupportPackage`. You can specify the output path with parameter `outputFile` in addition to the supported system properties.

3. Changes for product release 8.7 (Studio 26.1/Studio 26.2/Studio 27.0)

3.1. EB tresos Studio now uses FlexNet Publisher 2019 R3 (11.16.5) license protection

The license protection of EB tresos Studio was updated to use a new release of the FlexNet Publisher software from Flexera.

NOTE

Update of EB Server License Administrator tool required

Please note that you have to update the **EB Server License Administrator** tool to at least version 1.4.1 at your FlexNet license server installation, if you are using floating licenses. Otherwise the license checks will fail with an error message which states that the vendor daemon is too old. See the **Product licensing user's guide** which comes with the **EB Server License Administrator** tool for more information about how to configure the EB vendor daemon.

3.2. Message filters in Unattended Wizard result view

EB tresos Studio now provides message filters in the **Unattended Wizard** result view. With this option you can filter out messages based on their severity level.

3.3. List elements without short name are no more overwritten by the AUTOSAR importer

In earlier releases of EB tresos Studio, the AUTOSAR importer overwrote the existing list elements that do not have short names (e.g. a list of integer values) regardless if they were imported by the same importer or a different one. Starting with EB tresos Studio 27.0, the AUTOSAR importer overwrites only the elements that were previously imported by an AUTOSAR importer with the same name.

3.4. AUTOSAR R19-11 support for system model and ECU configuration

EB tresos Studio now provides support for the relevant parts of system model and ECU configuration for AUTOSAR R19-11. This includes parameter definitions and module configurations, and the import and export of configuration data.

Former releases of EB tresos Studio supported AUTOSAR releases up to 4.4.0, which are still fully supported.

4. Changes for product release 8.6 (Studio 26.0)

4.1. AUTOSAR 4.4.0 support for system model and ECU configuration

EB tresos Studio now provides support for the relevant parts of system model and ECU configuration for AUTOSAR 4.4.0. This includes parameter definitions and module configurations, and the import and export of configuration data.

Former releases of EB tresos Studio supported AUTOSAR releases up to 4.3.1, which are still fully supported.

NOTE

Dropped support for attribute `UdpNmCluster.NmUserDataLength`

With the AUTOSAR 4.4.0 metamodel, the attribute `NmUserDataLength` of the system model element `UdpNmCluster` was removed from the AUTOSAR classic platform. It had already been marked as deprecated since AUTOSAR 4.1.3.

Starting with EB tresos Studio 26.0, the attribute is therefore not supported any longer. If you try to import ARXML data, which contains the attribute, EB tresos Studio will ignore the respective XML tag, even if the input file complies to earlier AUTOSAR versions. This also applies to the Java API, where the respective methods to access the attribute were removed, too.

4.2. New VSMD check ruleset for AUTOSAR 4.4.0

EB tresos Studio 26.0 provides the new ruleset `asc:4.4.0` for checking vendor-specific module definitions (VSMD) against the AUTOSAR specification.

The new ruleset covers the following AUTOSAR constraints and requirements: `[TPS_ECUC_06076]`, `[constr_3022]`, `[TPS_ECUC_02015]`, `[constr_3023]`, `[TPS_ECUC_06045]` and `[TPS_ECUC_02084]`.

The new ruleset also includes all rules from the existing `asc:4.3.1` ruleset.

4.3. Documentation for the System Model Access API

EB tresos Studio now includes some documentation for the System Model Access API, which is provided by the `dreisoft.tresos.tresosDB.api.plugin` plug-in. The documentation consists of a chapter in the EB tresos Studio developer's guide, the JavaDoc and a new demo plug-in, which provides some example code. You can find the demo plug-in project under `<tresos-install-loc>/demos/Studio/SystemModelAccessDemo`.

5. Changes for product release 8.5 (Studio 24.0/Studio 25.0/Studio 25.1)

5.1. EB tresos Studio on Linux command line

EB tresos Studio now provides command line support for the Linux platform.

5.2. Support for `UriReferenceDef` elements

The ARXML parser as well as the XDM file format of EB tresos Studio now include support for URI references as introduced by AUTOSAR 4.2.1. The current XDM file revision is now 7.0. Therefore the XDM file header now looks like:

```
'<datamodel'
   'version="7.0"'
   [ 'xmlns="http://www.tresos.de/_projects/DataModel2/16/root.xsd"' ]
   [ 'xmlns:a="http://www.tresos.de/_projects/DataModel2/16/attribute.xsd"' ]
   [ 'xmlns:v="http://www.tresos.de/_projects/DataModel2/06/schema.xsd"' ]
   [ 'xmlns:d="http://www.tresos.de/_projects/DataModel2/06/data.xsd"' ]
   '>'
...

'</datamodel>'
```

5.3. Ignore verification problems during code generation

In command line mode, it is now possible to ignore verification problems. To enable this feature, set the option `-DVerify=false`.

Examples:

```
tresos_cmd.bat -DVerify=false generate myProject
```

```
tresos_cmd.bat -DVerify=false legacy generate myAdc.xdm
```

5.4. Generate specific module configurations only

In command line mode, it is now possible to generate specific module configurations only. To specify these module configurations, set the option `-v` for each of these configurations.

In project mode, you have to specify the names of the module configurations. In legacy mode, you have to specify the `SHORT-NAME` paths of the module configurations.

Examples:

```
tresos_cmd.bat generate myProject -v myAdc -v myCom
```

```
tresos_cmd.bat legacy generate myConfigFile.xdm -v /Adc/Adc -v /Com/Com_1
```

5.5. Unattended wizard for code generation

A new unattended wizard to generate code is now available.

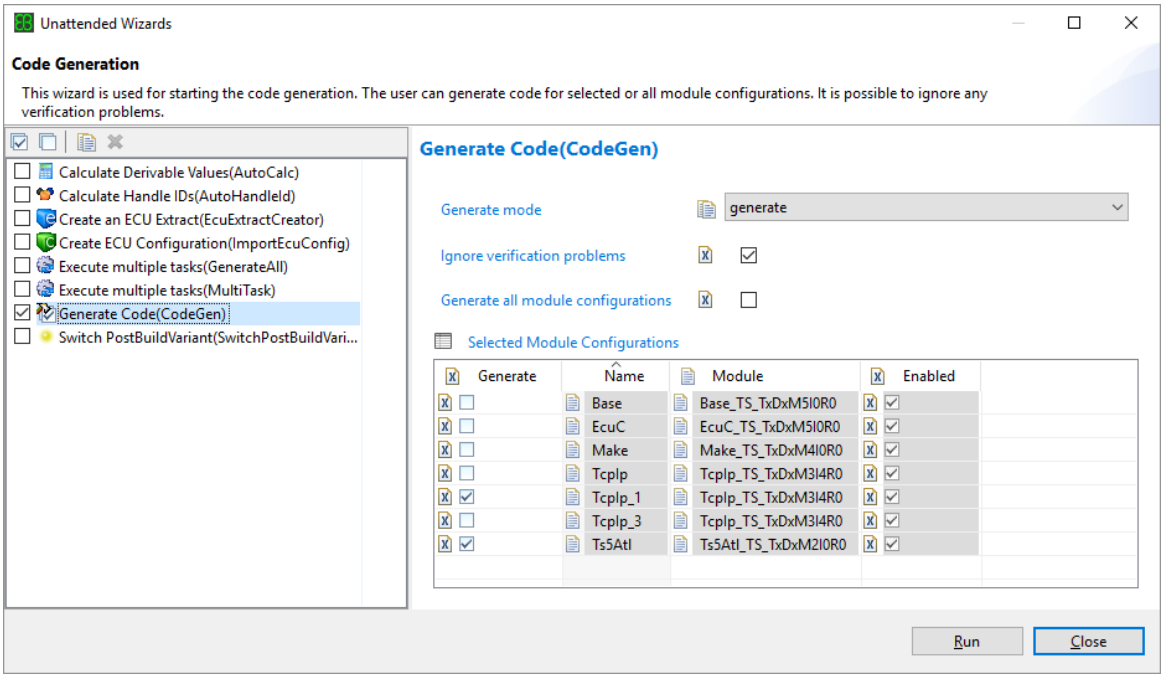

Figure 5.1. Unattended wizard for code generation

In this wizard, you can:

- specify the generator mode to be executed,
- generate code even though there are verification problems in the configuration,
- generate all module configurations, or
- generate only selected module configurations.

As all unattended wizard configurations, this wizard can be executed via the command line as follows:

```
tresos_cmd.bat autoconfigure myProject CodeGen
```

5.6. AUTOSAR 4.3.1 support for system model and ECU configuration

EB tresos Studio now provides support for the relevant parts of system model and ECU configuration for AUTOSAR 4.3.1. This includes parameter definitions and module configurations, as well as the import and export of configuration data.

Prior releases of EB tresos Studio supported AUTOSAR releases up to 4.3.0, which are still fully supported.

5.7. Enhanced Batch Mode

The EB tresos Studio batch mode now allows you to redirect info, warning, and error messages separately for each command in the batch file. Moreover, an additional command line option allows you to continue batch mode processing even if the execution of one of the commands issued an error message.

5.8. Support for exporting all variants from the ECU configuration

When exporting an AUTOSAR ECU configuration until now by either using the **AUTOSAR Im-/Exporter** or the **EPCFileGenerator**, only the configuration of the currently selected variant was exported without any `VARIATION-POINT` information.

EB tresos Studio now introduced an option to decide whether to export only the currently selected variant or to export all variants at once.

The **All variants** option is now available in the **AUTOSAR Im-/Exporter** GUI and for the **EPCFileGenerator**/ **External Generator**.

NOTE

Availability of All variants option

The **All variants** option is only available if there is currently a post-build selectable variant active in the ECU configuration.

For further information about variant handling and how to select a variant, see the EB tresos Studio user's guide chapter 'Configuring variants for a project'.

If the **All variants** option is used but there is no currently selected variant available, then the **All variants** setting is ignored.

In the **AUTOSAR Im-/Exporter** GUI in mode **Export only** or **Import and export** mode, the new option **All variants** is visible for projects with currently selected post-build selectable variant. Per default, the **All variants** option is not selected.

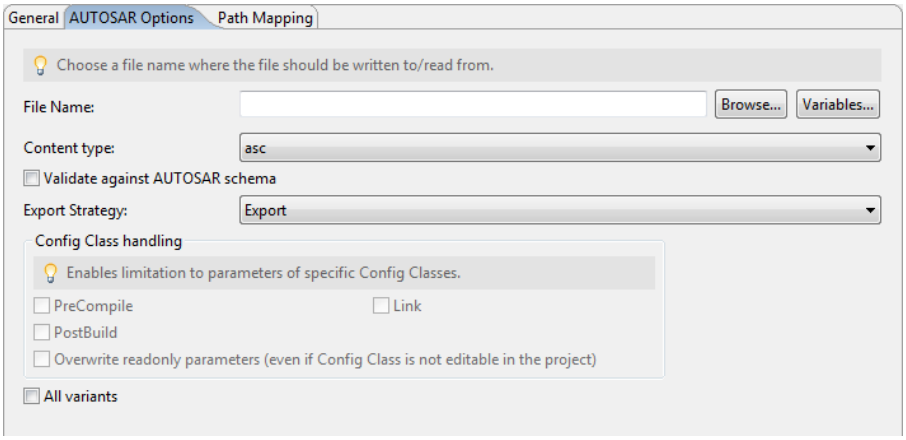

Figure 5.2. AUTOSAR Im-/Exporter with **All variants** option

The **EPCFileGenerator/External Generator** now has the additional option `allVariants`. The default is false.

In addition to writing all variants to the selected file destination, another file is written. This file is named `PostBuildSelectableVariants.arxml` and is stored in the same place. This file contains the definition of all post-build selectable variants and their corresponding elements:

- IPredefinedVariant
- IPostBuildVariantCriterionValueSet
- IPostBuildVariantCriterion
- ICompuMethod

Without these elements it is not possible to use the variant-affected ECU configuration in e.g. another project.

The recommended workflow to import the variant-affected ECU configuration to another project is as follows:

1. Use a System Description Importer to import the `PostBuildSelectableVariants.arxml` file.
2. Configure the variants for the project.

3. Use an AUTOSAR Im-/Exporter to import the variant-affected ECU configuration.

5.9. Support for importing all selectable variants from the ECU configuration

When importing an AUTOSAR ECU configuration until now by using the **AUTOSAR Im-/Exporter**, the ECU configuration was imported only to the currently selected selectable variant.

EB tresos Studio now allows you to import the ECU configuration to all selectable variants configured in the project.

6. Changes for product release 8.4 (Studio 23.1)

6.1. EB tresos Studio is compatible with Microsoft Windows 10

The compatibility of EB tresos Studio with Microsoft Windows 10 Enterprise 2016 (version 10.0.14393, build 14393) was tested.

No issues were found during the tests. Note that various versions of Microsoft Windows 10 are available and compatibility is only assured for the above mentioned version.

6.2. New VSMD check ruleset for AUTOSAR 4.1.3

EB tresos Studio 23.1.0 provides a new ruleset named `asc:4.1.3` for checking vendor-specific module definitions (VSMD) against the AUTOSAR specification.

The new rules cover the following AUTOSAR constraints and requirements: `[TPS_ECUC_06076]`, `[constr_3022]`, `[TPS_ECUC_02015]`, `[constr_3023]`, `[TPS_ECUC_06045]` and `[TPS_ECUC_02084]`.

The new ruleset also includes all rules from the existing `asc:4.0.3.RFCs` ruleset with the exception of `[TPS_ECUC_02132]`, which was removed with AUTOSAR revision 4.1.2. It also covers the changes in `[TPS_ECUC_02039]` and `[TPS_ECUC_02040]`, which now also allow `EcucChoiceContainerDef` elements as reference destinations.

6.3. New VSMD check ruleset for AUTOSAR 4.2.1

EB tresos Studio 23.1.0 provides a new ruleset named `asc:4.2.1` for checking vendor-specific module definitions (VSMD) against the AUTOSAR specification.

The new rules cover the following new or changed AUTOSAR constraints and requirements: `[TPS_ECUC_08005]`, `[TPS_ECUC_08006]`, `[TPS_ECUC_08027]`, `[TPS_ECUC_08032]`, `[TPS_ECUC_08033]`,

[TPS_ECUC_08036], [TPS_ECUC_08037], [TPS_ECUC_08038], [TPS_ECUC_08039], [TPS_ECUC_08041], [Constr_5507], [Constr_5509], [Constr_5510], [Constr_5512], [Constr_5520], [Constr_5521] and [Constr_5522].

The new ruleset also includes all rules from the existing asc:4.1.3 ruleset, but the ones that are no more part of the AUTOSAR 4.2.1 specification: [TPS_ECUC_06050], [TPS_ECUC_06051], [TPS_ECUC_06053], [TPS_ECUC_06054], [TPS_ECUC_08007]. [TPS_ECUC_06046] was mitigated with AUTOSAR 4.2.1 in a way, so that it does not add any constraint any more, and is therefore also not included in the new ruleset.

6.4. New VSMD check ruleset for AUTOSAR 4.2.2

EB tresos Studio 23.1.0 provides a new ruleset named asc:4.2.2 for checking vendor-specific module definitions (VSMD) against the AUTOSAR specification.

The new ruleset includes all rules from the asc:4.2.1 ruleset and additionaly covers the AUTOSAR 4.2.2 requirement [TPS_ECUC_08053].

6.5. New VSMD check ruleset for AUTOSAR 4.3.0

EB tresos Studio 23.1.0 provides a new ruleset named asc:4.3.0 for checking vendor-specific module definitions (VSMD) against the AUTOSAR specification.

AUTOSAR 4.3.0 does not contain any new or changed requirements for deriving VSMD from standard module definitions. Therefore the new ruleset is equal to the asc:4.2.2 ruleset.

6.6. System Description Importer now supports variables and glob wildcards

The **System Description Importer** supports to insert relative and absolute file paths using variables and glob wildcards. For more information, see http://docs.oracle.com/javase/tutorial/essential/io/fileOps.html#glob.

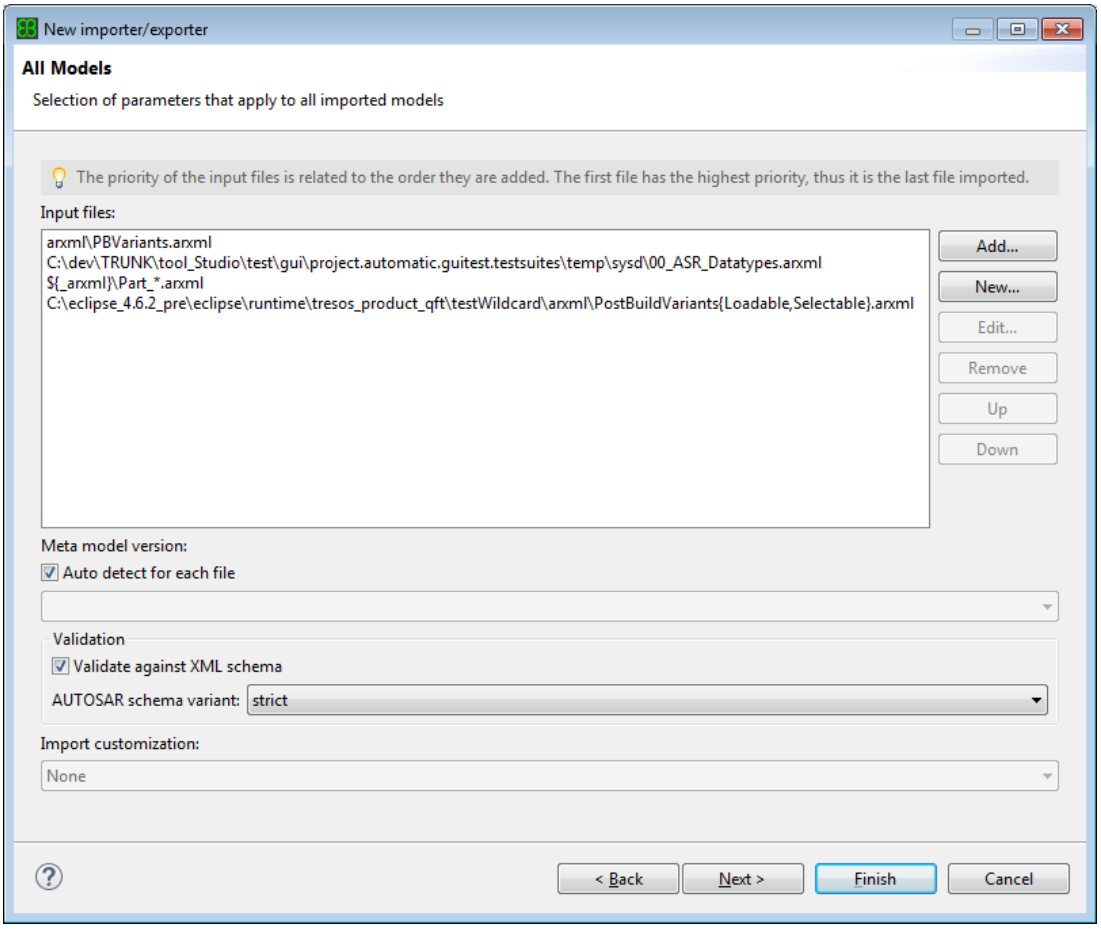

Figure 6.1. The **All Models** page

You may create and edit entries in the file list by clicking the **New...** or **Edit...** button on the right of the **Input Files** text box. A dialog opens where you can enter an absolute or relative file path using variables and glob wildcards.

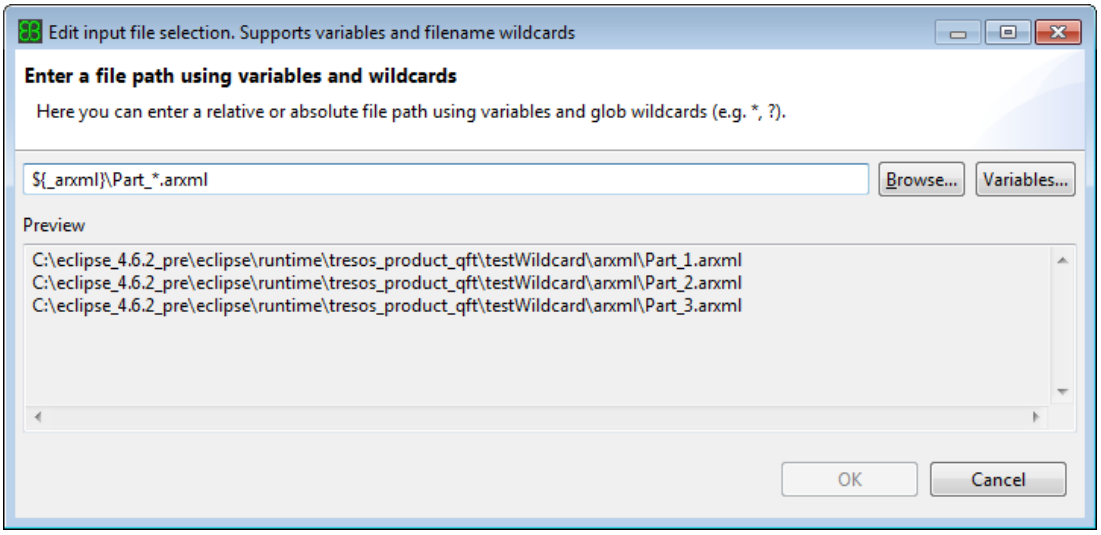

Figure 6.2. The **Input file selection** dialog supporting variables and glob wildcards

In the preview you can see which files match the given file path.

To insert a file path you can

- directly type an absolute or relative path in the text box
- browse to an existing file using the **Browse...** button
- adding a variable by using the **Variables...** button. When you click the **Variables...** button, the standard Eclipse **Select Variable** dialog appears that lets you choose either a predefined variable or an own defined variable.

NOTE **Relative paths**

Relative paths are always resolved to the project location.

6.7. Separate preference files for importers and exporters

In earlier releases of EB tresos Studio sharing a workflow file between projects was difficult when the projects had importers and exporters associated with them. This issue required manual merging of importer-related and exporter-related information between `preferences.xdm` files. It was difficult due to the fact that the preferences for the various importers and exporters were saved in one `preferences.xdm` file along with other non-importer and non-exporter preferences. Starting with EB tresos Studio 23.1.0, the preferences for every

importer and exporter instance are saved in a separate file. If you import a project from an earlier version of EB tresos Studio the preferences related to importers and exporters are now automatically saved to individual preference files. Now you can share workflows between projects easily just by copying these individual importer preference files to the other project with which you want to share the workflow.

6.8. Possibility to cache calculations

If e.g. your custom XPath function contains time-consuming or often called calculations, it is often required to have the possibility to cache the results in a thread-safe way and automatically trigger a re-calculation after a model change. For this purpose, the class `dreisoft.tresos.datamodel2.api.model.Cache<T>` was introduced which provides an easy way to do so.

For more details, see the JavaDoc of the class.

6.9. EPC File Generator can now generate files for specific module types

The EPC File Generator is mainly used to provide the `*.epc` configuration files as input for external code generators in `ARXML` format. Until now, an EPC File Generator as well as an External Generator could only be registered in the `plugin.xml` to allow either all module configurations to be written to the `*.epc` files, or just the one configuration of the module for which the generator was registered.

Starting with EB tresos Studio 23.1.0, a new `generateModuleTypes` parameter is available for the code generator extension point. It enables module developers to define one or more module types, for which the configuration data shall be output to the `*.epc` files when the code generator runs.

For example:

```
<extension point="dreisoft.tresos.launcher2.plugin.generator"
       id="MyExternalDetGeneratorExtensionId"
       name="MyExternalDetGenerator">
  <generator id="MyExternalDetGeneratorId"
             moduleId="Det_TS_TxDxM1I2R3"
             class="dreisoft.tresos.autosar2.generator.ExternalGenerator">
      <parameter name="generateAllModules" value="false"/>
      <parameter name="generateIntoOneFile" value="true"/>
      <parameter name="generateModuleTypes" value="EcuC,Dem,Det"/>
      ...
  </generator>
```

```
</extension>
```

In this example, the external code generator will get one input file which contains the configuration data for modules of the types EcuC, Dem, and Det. Note that you need to set the `generateAllModules` parameter to `false` if you use the `generateModuleTypes` parameter.

For details, see the EB tresos Studio developer's guide, chapter *Registering an External Generator*.

6.10. Support for ECUC condition specification

You can define an ECUC condition specification for an ECUC definition element to define the existence of ECUC parameters based on the other ECUC parameter values. For this purpose, the `ENABLE` automatic attribute of the `EcucCond` type is introduced.

When the `ARXML` schema files are converted to the `XDM` format, the ECUC condition specification in the `ARXML` files are converted to an `ENABLE` data attribute of the `EcucCond` type. The AUTOSAR formula and the ECUC query expressions are stored as part of the `ENABLE` attribute. A parameter with this `ENABLE` attribute is only enabled if the condition formula evaluates to true.

You can also define ECUC condition specification directly in the `XDM` schema file using the `ENABLE` attribute of the `EcucCond` type. When the `XDM` files are converted to `ARXML` files, the `ENABLE` data attribute of the `EcucCond` type is converted back to the corresponding `ARXML` element.

See the EB tresos Studio developers guide for more information on the `ENABLE` attribute of the `EcucCond` type.

6.11. Support for ECUC validation conditions

You can define ECUC validation conditions for an ECUC definition element to describe the validity constrains on a configuration. For this purpose, the `INVALID` automatic attribute of type `EcucValidCond` is introduced.

When the `ARXML` schema files are converted to the `XDM` format, the ECUC validation conditions in the `ARXML` files are converted to an `INVALID` data attribute of the `EcucValidCond` type. The AUTOSAR formula and the ECUC query expressions are stored as part of the `INVALID` attribute. A parameter with this `INVALID` attribute is only valid if all validation formulas evaluate to true.

You can also define ECUC validation conditions directly in the `XDM` schema file using the `INVALID` attribute of the `EcucValidCond` type. When the `XDM` files are converted to `ARXML` files, the `INVALID` data attribute of the `EcucValidCond` type is converted back to the corresponding `ARXML` element.

See the EB tresos Studio developers guide for more information on the `INVALID` attribute of the `EcucValid-Cond` type.

6.12. Upgrading module configurations for a project

Apart from the GUI interface, you can now upgrade module configurations for an existing EB tresos Studio project on the command line with the *upgradeModuleConfigs* command. It accepts a number of optional parameters to select the module configurations or specify target module IDs.

Example:

```
tresos_cmd.bat upgradeModuleConfigs myproject -onlyEnabled -type Can;EcuC
```

This example updates all enabled configurations of the *myproject* project for modules of the types Can and EcuC to their latest versions. For more information, see the EB tresos Studio developer's guide, chapter *Upgrading module configurations for a project*.

7. Changes for product release 8.3 (Studio 23.0)

7.1. Eclipse platform updated from Luna to Neon

The platform on which EB tresos Studio is built upon was updated with this release from Luna (3.8.0) to Neon (4.6.2).

To migrate your EB tresos Studio extension plug-ins, see the release notes document, section *2.4. Incompatibilities to previous releases*.

7.2. Changes in importing ECU configurations from AUTOSAR system descriptions

In previous releases of EB tresos Studio the creation of ECU Configuration was part of an importer run. But this had some disadvantages. If your system data was spread over several files in different file formats (dbc, fibex, etc...) it was not possible to first import all system data and afterwards create the ECU Configuration based on the system data. For each importer run you had to select the System and EcuInstance for which to create the ECU Configuration. And it was only possible to select a System and EcuInstance which was contained in the file selected for importer run.

Now the step to create an ECU Configuration is not part of an importer run anymore. To create an ECU Configuration you can now use the unattended wizard **Create ECU Configuration** instead.

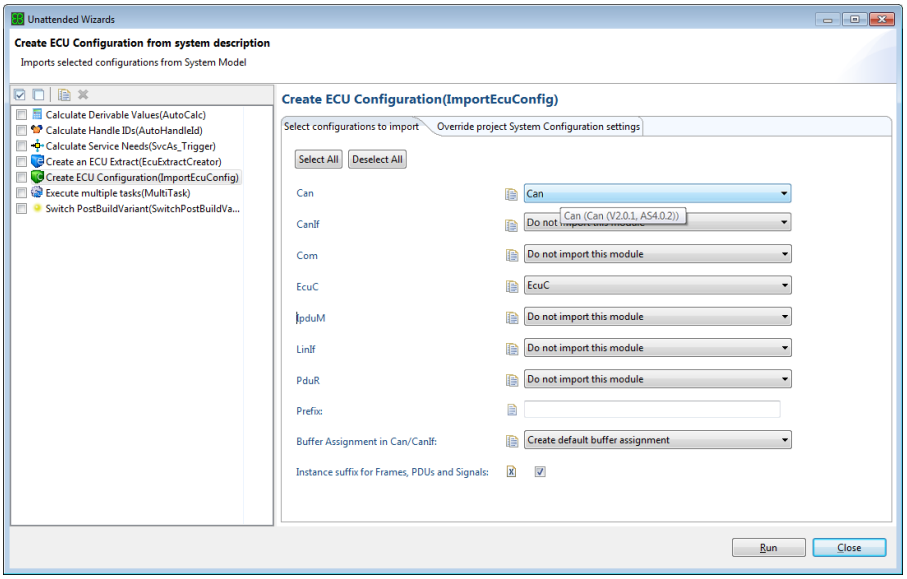

Figure 7.1. The unattended wizard to **Create ECU Configuration**

This offers several advantages:

- With this wizard it is possible to first import all system data from several files in different files formats and create the ECU Configuration based on the whole system model afterwards.
- The step to create the ECU Configuration can now be started also from the commandline.
- The creation of the ECU Configuration can now be triggered from a workflow.
- The creation of the ECU Configuration can be integrated into an **Execute multiple tasks** wizard.
- You do not need to select the System and EcuInstance each time again, but the unattended wizard takes the settings from the project properties, configured at the **System Configuration** page.

The **Create ECU Configuration** wizard can only be used if:

- the project contains system data, which contains at least one TopLevelComposition.
- the project contains module configurations for which an ECU Configuration import is possible.

If you did not already select the System and EcuInstance in the project System Configuration settings in the project properties dialog, then when selecting the **Create ECU Configuration** wizard in the **Unattended Wizards** dialog, a selection dialog appears.

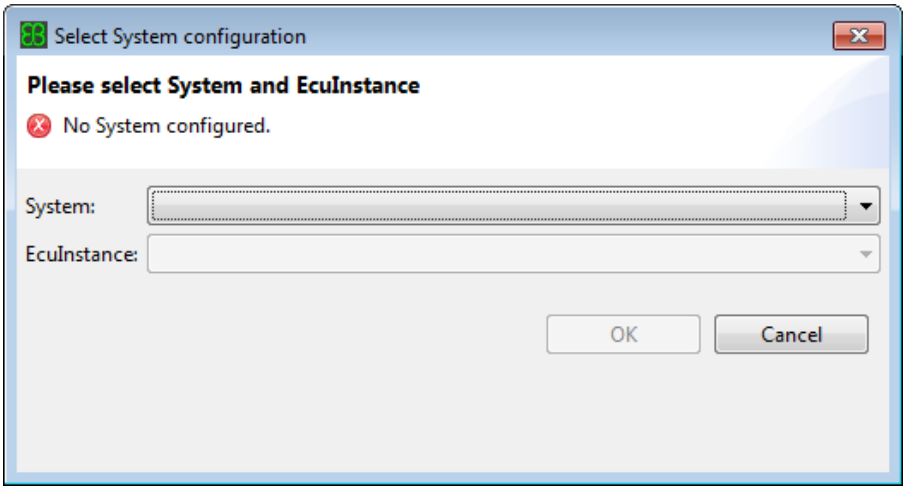

Figure 7.2. The **Select System and EcuInstance** dialog

Your selection is persisted in the project settings and can be changed in the project properties dialog on the **System Configuration** page.

If there is no System available in your system model, but only a TopLevelComposition, then the following dialog will appear:

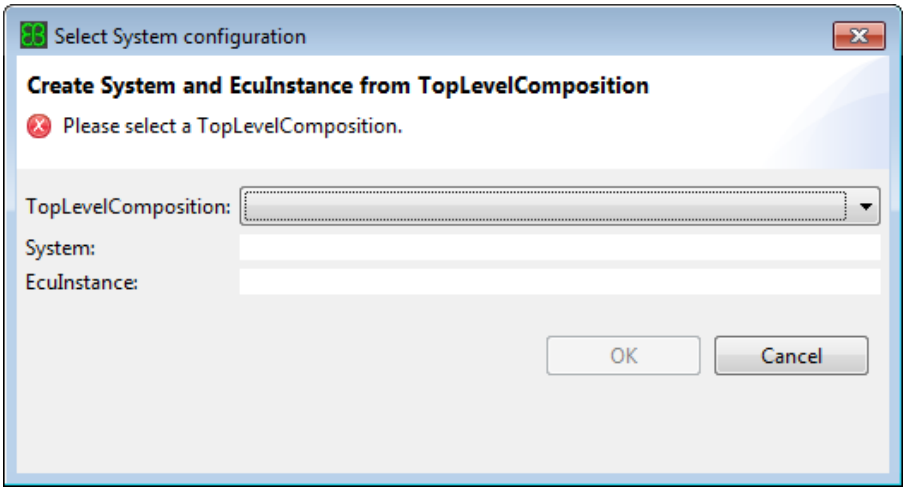

Figure 7.3. The **Create System and EcuInstance from TopLevelComposition** dialog

Here you can select one TopLevelComposition from which EB tresos Studio shall create one System and EcuInstance. You can specify the names in the dialog. The paths to the newly created System and EcuInstance are stored in the project properties.

It is also possible to open and use the **Create ECU Configuration** wizard without specifying System and EcuInstance in the project properties (e.g. by canceling the selection dialogs).

The wizard consists of two pages:

- Select configurations to import
- Override project System Configuration settings

The **Select configurations to import** page looks exactly like the ECU Config import page previously used in the importers. The only difference is that only for those module types a combobox appears where at least one module configuration is available for the current project.

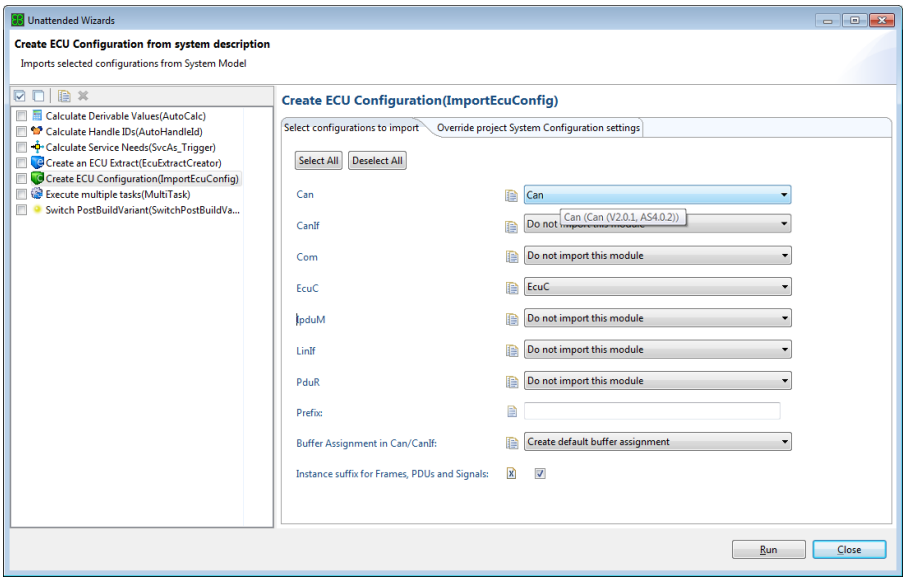

Figure 7.4. The **Select configurations to import** page

The **Override project System Configuration settings** page may only be applicable if you imported system data from legacy file formats (e.g. dbc, fibex). Most users will not need to specify these settings, therefore those settings are displayed on a second page and the override checkbox is deselected by default.

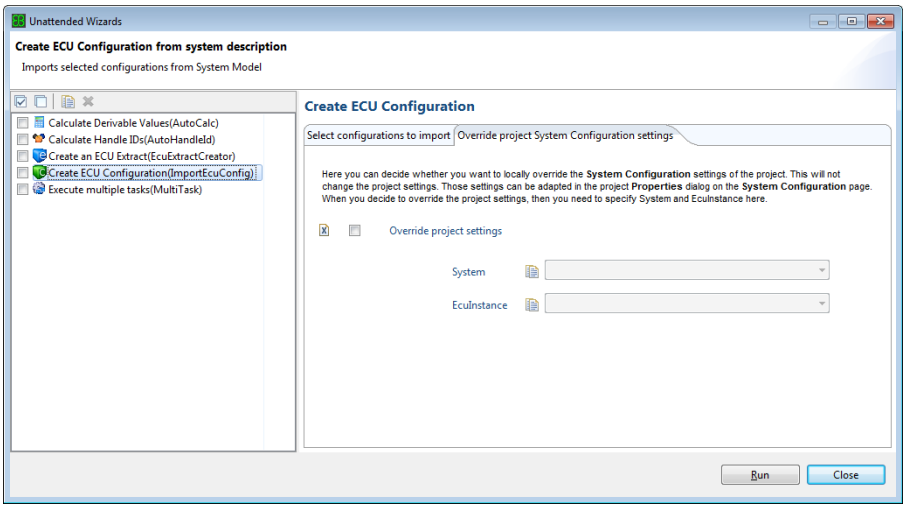

Figure 7.5. The **Override project System Configuration settings** page

NOTE **Does not change the project System Configuration properties**

The decision to override the project System Configuration settings and the selected System and EcuInstance are only valid for this instance of the unattended wizard. It will NOT change the global project settings!

NOTE **No System and EcuInstance specified**

If you neither specify System and EcuInstance in the project properties nor select to override the project settings, it is not possible to run the wizard.

NOTE **Selected module configuration not available**

If a previously selected module configuration is not available anymore (e.g. was removed from the project in the meantime), then this module configuration will be silently removed from the wizard configuration.

7.2.1. How to migrate existing project configurations

If you want to reuse projects created with a previous EB tresos Studio release, then you need to check all importer configurations of the following Importer types:

- DBC Importer
- FIBEX Importer
- LDF Importer
- TresosDB Importer
- System Description Importer

In previous EB tresos Studio versions those importers had two functions:

- Import system model data
- Import ECU configuration data

Now they only import system model data.

NOTE **Not affected importers**

If the importer configured with a previous EB tresos Studio version only used the system model import then you do not need to change anything.

Importers with system model import *ONLY* will work as before!

Use cases that need to be adapted:

- Importers with ECU configuration import only.

  Those importers would now automatically import the content of the selected file into the hierarchical system model. Therefore those importers should be deleted.

  As replacement you have to create and configure one instance of the unattended wizard **Import ECU configuration**.

- Importers with system model import AND ECU configuration import.

  The importer with the system model import can remain unchanged.

  As replacement for the ECU configuration importer you have to create and configure one instance of the unattended wizard **Import ECU configuration**.

NOTE

Simplify execution of system model import and ECU configuration import

To be able to perform both steps with one click, you can configure an unattended wizard **Execute multiple tasks**. There you can configure the execution of multiple tasks in a specific order. An unattended wizard can be executed with one click from the GUI and can also be started from the commandline.

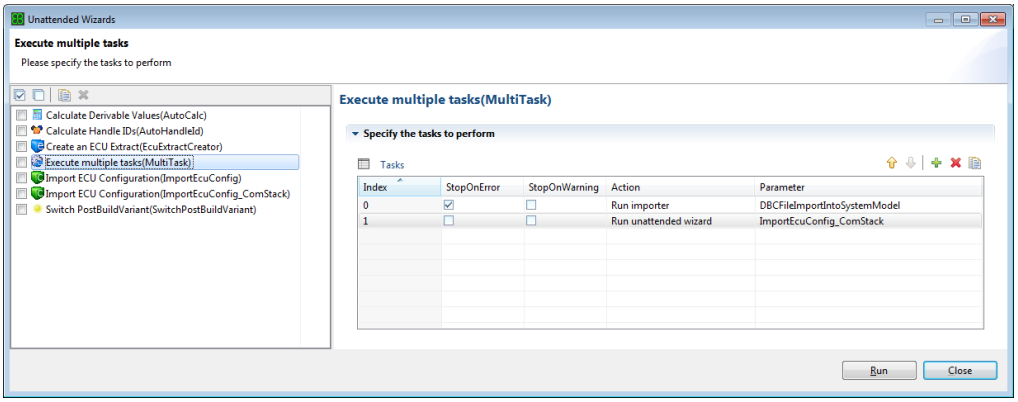

Figure 7.6. The MultiTask wizard configuration to combine system model import and ECU configuration import

7.3. Changes in Create Support Package dialog

In previous releases of EB tresos Studio you had only less influence on the content of the .TSP file when you create a support package. Now the **Create Support Package** dialog was improved.

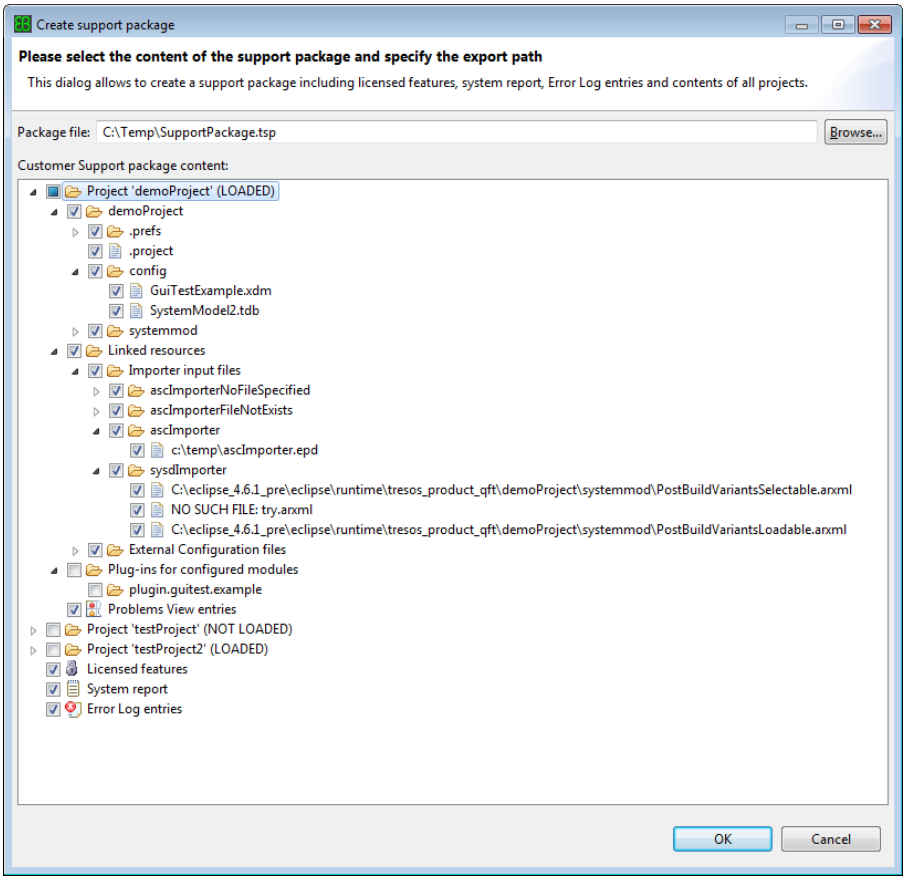

Figure 7.7. The **Create support package** dialog

Important changes:

- The menu bar entry to **Create Support Package...** is now always available, no matter if a project exists or not.
- The **Create support package** dialog always shows all available projects of the workspace that are not closed.
- You can select the items to be part of the support package on fine granular basis.
- The dialog also shows linked resources of the project, that are not located inside the project but are used in it.
  - Importer input files
  - External configuration files
  - External generation files
- Plug-ins for configured modules that are used in several projects are only contained once in the resulting .-TSP file.

For further information about the **Create Support Package** dialog, see chapter `Creating a customer support package` in the EB tresos Studio user's guide.

7.4. EcuExtractCreator: Texttable Value Mapping

Now the unattended wizard **Create an ECU Extract** supports the merge of `TextTableMappings` with `DataPrototypeMappings`.

Note that the merge of `TextTableMappings` that are part of `SubElementMappings` is not supported.

7.5. AUTOSAR 4.3.0 support for system model and ECU configuration

EB tresos Studio now provides support for the relevant parts of system model and ECU configuration for the AUTOSAR release 4.3.0. This includes parameter definitions and module configurations, as well as the import and export of configuration data.

Prior releases of EB tresos Studio supported AUTOSAR releases up to revision 4.2.2, which are still fully supported.

7.6. EcuExtractCreator: Client ID definitions

In earlier releases of EB tresos Studio the **EcuExtractCreator** ignored the ClientIdDefinitions specified in the hierarchical system model. Now the **EcuExtractCreator** copies the ClientIdDefinitions from the hierarchical system model to the ECU Extract flattened model and adapts the references to point to the flattened model.

8. Changes for product release 8.2 (Studio 22.0)

8.1. Improved performance of the configuration verification

EB tresos Studio's configuration verification now also uses multiple CPU cores if it operates in non-continous mode, i.e. if you disable the preference option **Enable continuous verification**.

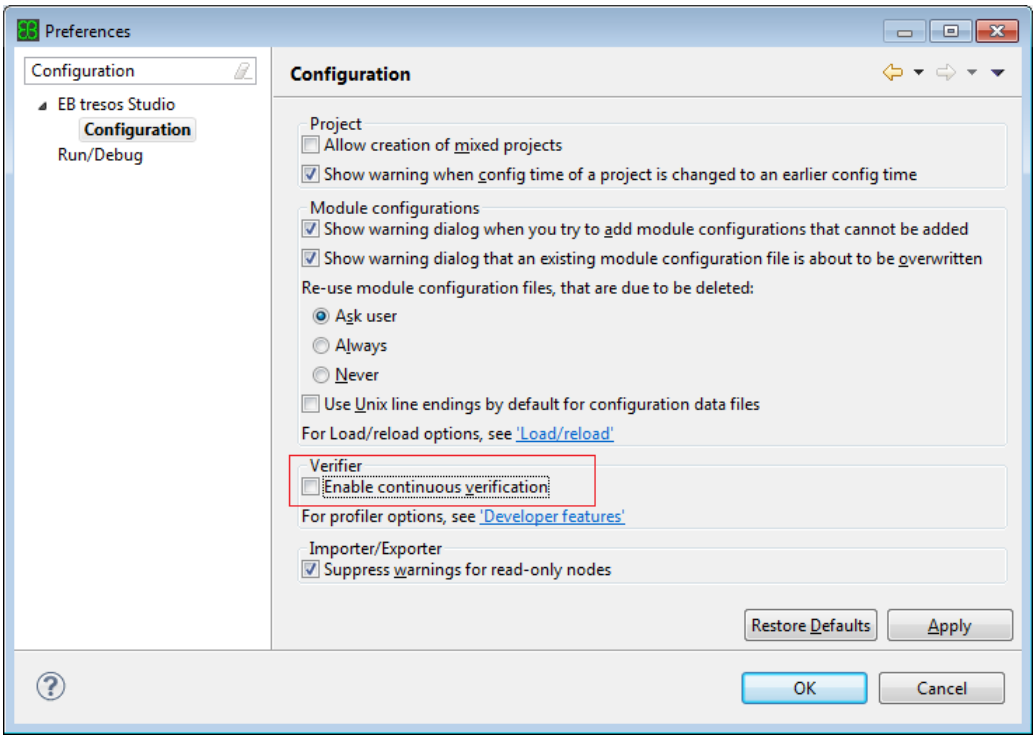

Figure 8.1. Disabled continuous verification

Besides that, this release contains several optimizations which improve the overall performance of the configuration verification. Since the verification is a mandatory part of the code generation, these improvements reduce the time for code generation as well.

8.2. Fixed AUTOSAR Importer strategy Replace

Prior to this release, the AUTOSAR Importer did not replace the project configuration with the input file although setting import strategy Replace.

Now the Replace importer strategy will really replace the current configuration with the imported file.

NOTE

The result of AUTOSAR Importer with strategy Replace changes

When running the AUTOSAR Importer with import strategy Replace the result will now differ from the one from previous EB tresos Studio releases.

8.3. Importers now support relative file paths

The importers (AUTOSAR, DBC, LDF, Fibex, TDB and Oil Importer) now support absolute and relative paths that may contain variables. Relative paths are resolved based on the project location. When you select a file via browse dialog that is located inside the project, the path is automatically converted into a project-relative path.

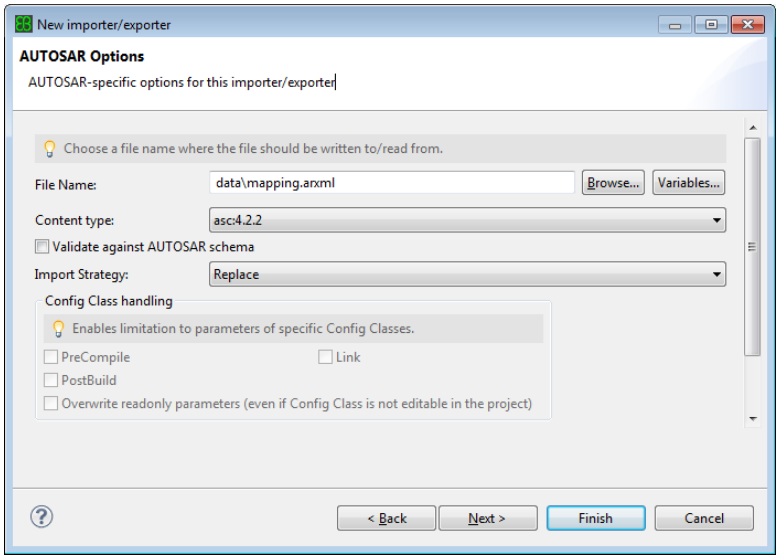

Figure 8.2. Project-relative paths in importers

8.4. Executing multiple commands in batch mode

Each time you want to execute a command line command, you must restart EB tresos Studio. When you execute multiple commands, this may be very time consuming. Therefore, the `batch` command was introduced to execute any number of commands at the command line while you start EB tresos Studio just once.

The `batch` command has the following syntax:

```
tresos_cmd.bat batch <batch file>
```

Such a `batch file` supports comments and line breaks and may look like this:

```
legacy convert -DValidate=true input.epc output.xdm  # line comment
legacy convert -DValidate=false input1.epc\n
                                input2.epc\n
                                output2.xdm

# comment line
legacy generate -n Com\n
                -g Com_TS_T16D4M2I0R0\n
                -g Custom\n
                -u All.epc@asc:4.2.1
```

All commands inside such a `batch file` are executed within the same EB tresos Studio instance which is started only once.

8.5. Added wildcard support for legacy command line

Now you can use wildcards for input files of the commands `legacy convert` and `legacy generate` to match multiple files with one specified wildcard file name.

Such a command line wildcard may now look like this:

```
legacy convert *.epc output.xdm
```

8.6. If you rename a container, references to this container are also updated

Prior to this release, if an AUTOSAR container is renamed, the references referencing this container are not adapted.

Now, when you rename a container, you automatically adapt the references too. You can also change this behavior by saving your decision in the **Preferences EB tresos Studio** window.

You can save now one of the following decisions:

- Always adapt the references when you rename a container
- Never adapt the references when you rename a container
- Always ask to confirm the decision

8.7. Support for custom attributes

Now you can register custom attributes for data nodes through the extension point `dreisoft.tresos.datamodel2.api.plugin.customattribute`. You can set and get values for these attributes through XPath functions and DCtxt APIs for any data nodes. For more information about the custom attribute API, see the EB tresos Studio developer's guide, as well as the extension point description and the JavaDoc of the DCtxt API class `Any`.

In the GUI you can edit custom attributes like **Labels** within the **Properties** view for a selected node in the editor.

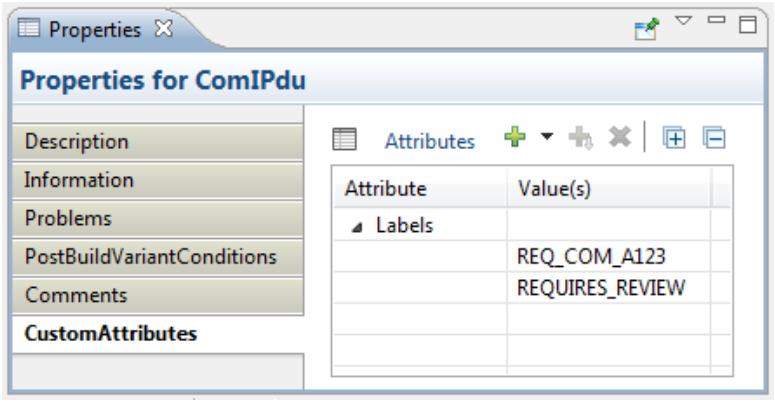

Figure 8.3. Edit custom attributes

Use the **ECU Configuration Search** to search for nodes with custom attributes.

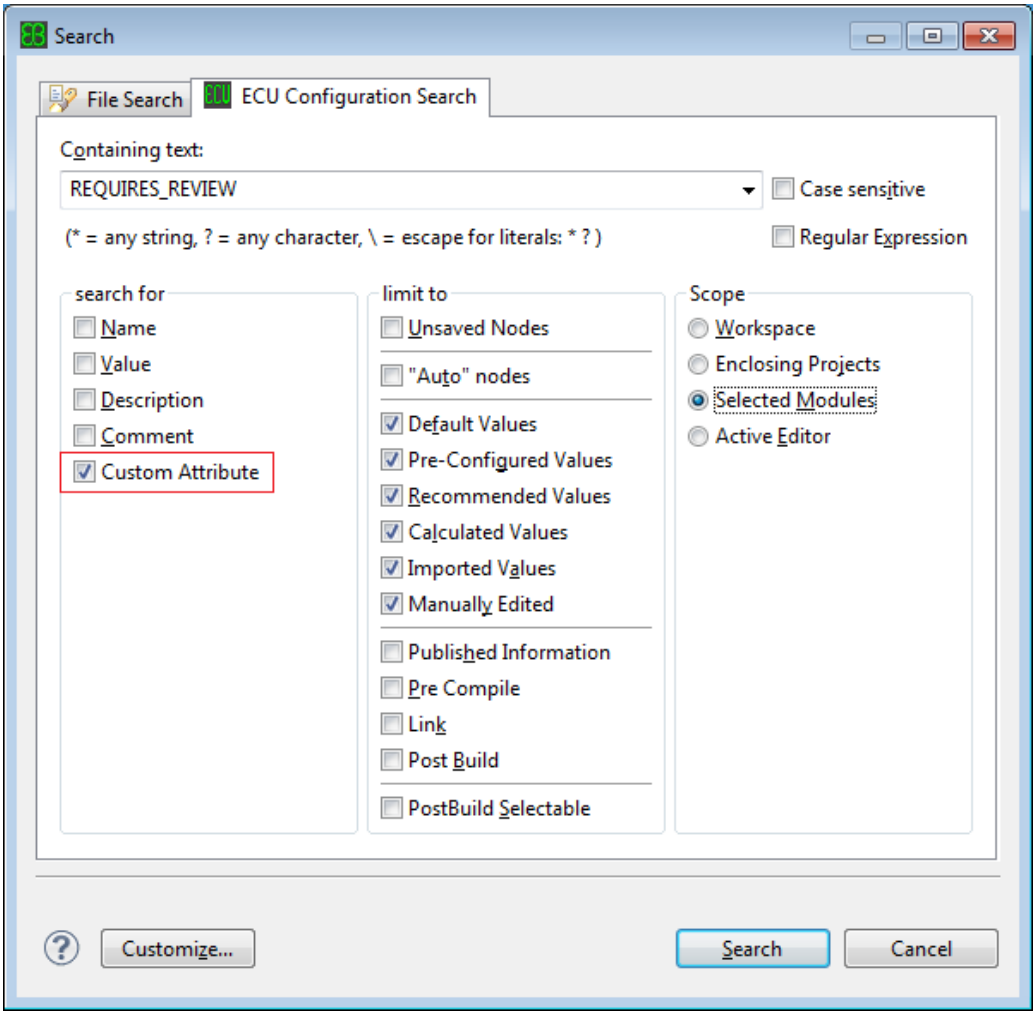

Figure 8.4. Search for custom attributes

8.8. Importer behavior improved

In earlier releases, EB tresos Studio did not overwrite existing list entries when you used the **AUTOSAR Importer** with **Import Strategy: Replace**. Only those entries were removed which were imported with the same importer. In fact, this was the same behavior as with **Import Strategy: Merge**. This bug is fixed now.

In earlier releases, EB tresos Studio resetted the value of a parameter to its default value if you imported this parameter once and it was not contained in the files of a second import with the same importer. These parameters now remain unchanged during the import.

8.9. Export generated ECU Extract

When you use the **Create an ECU Extract** unattended wizard you now can choose to export the generated ECU Extract into the `EcuExtract.arxml` file in the `systemmod` directory of the current project. This option is enabled by default.

8.10. Comments tab is available in the Properties view

When you select a configuration element the **Comments** tab is now available in the **Properties** view. In the **Comments** tab you can view or edit comments for the current selected node.

8.11. Changes in Edit PostBuildVariants wizards

The **Edit PostBuildVariants** wizard was released in the last product release. This wizard was improved and provides more functionality now. To better distinguish between loadable and selectable concept, you can use now two wizards to edit predefined variants:

Edit Loadable PostBuildVariants
Use this wizard to create and configure loadable variants and criterions.

Edit Selectable PostBuildVariants
Use this wizard to create and configure selectable variants and criterions.

With the improved **Edit PostBuildVariants** wizards you can:

- Create, rename, and delete variants
- Create, rename, and delete criterions
- Configure textual representations
- Configure references between criterions and variants

You can see all variant configurations at a glance in the variant configuration matrix.

The wizard now supports undo/redo functionality. Changes done in the wizard are not directly saved to the system model. Saving is performed when you close the wizard.

Every time you close the wizard the part of the EB package which belongs to the type of wizard (loadable or selectable) is exported as `.arxml` file to the location `<projectName>/systemmod/PostBuildVariants<type>.arxml`.

The previous EB tresos Studio version had only one wizard that exported the data to the `<projectName>/systemmod/PostBuildVariants.arxml` file. If a file with such a name exists, it is renamed to prevent you from re-importing outdated data.

NOTE

Detailed information for Edit PostBuildVariants wizards available in the EB tresos Studio user's guide

For more detailed information, see the EB tresos Studio user's guide chapter *Using the Edit PostBuildVariants wizards*.

9. Changes for product release 8.1 (Studio 21.0)

9.1. Improved support for post-build selectables

The ECU Configuration search was improved so you can now search for post-build selectable parameters.

You can now find demos for projects and modules using the post-build selectable feature in the folder `demos/Studio/VariantsDemo` of your EB tresos Studio installation.

The EB tresos Studio developer's guide was expanded to explain more about the post-build selectable support in EB tresos Studio.

9.2. Improved support for data mappings in the `EcuExtractCreator`

The `EcuExtractCreator` now supports merging of nested subelement mappings of composite data types as well as mappings between `ApplicationCompositeDataType` and `ImplementationDataType`.

9.3. Connection Editor and Signal Mapping Editor show compositions and components that are implicitly mapped to the current ECU

Compositions that are not mapped to the current ECU but contain components that are mapped to the current ECU are considered implicitly mapped to the current ECU. These types of components are now shown in the Connection Editor and the Signal Mapping Editor.

10. Changes for product release 8.0 (Studio 20.0/Studio 20.1)

10.1. Support for variant handling

Starting with this release, EB tresos Studio supports variant handling for ECU configuration.

Predefined variants may be imported via the System Description Importer or created with the **Edit PostBuild-Variants** wizard.

You select the available selectables and set the current selectable and/or loadable variant with the EcuC module.

Several views in EB tresos Studio support you with configuring your variants, see Section 10.1.1, “Support for variant handling in the EB tresos Studio GUI”.

NOTE

Detailed information for variant handling available in the EB tresos Studio user's guide

For more detailed information, see the EB tresos Studio user's guide chapter *Variant handling*.

There you also find information about the recommended workflow for how to work with variants in EB tresos Studio.

10.1.1. Support for variant handling in the EB tresos Studio GUI

This chapter provides a short overview over changes in the EB tresos Studio GUI for variant handling.

10.1.1.1. Node Outline

The **Node Outline** view in EB tresos Studio shows whether a parameter or container is variant-affected or not. The state icon shown for each node provides an U overlay icon on the left bottom corner if the parameter or container can have variants.

In addition, the **Node Outline** view provides new actions to handle variant-affected nodes and edit variant conditions. Editing variant conditions is possible with the **PostBuildVariantConditions** dialog. For more infor-

mation on how to edit the variant conditions for a variant-affected parameter, see the EB tresos Studio user's guide chapter *Editing variant conditions*.

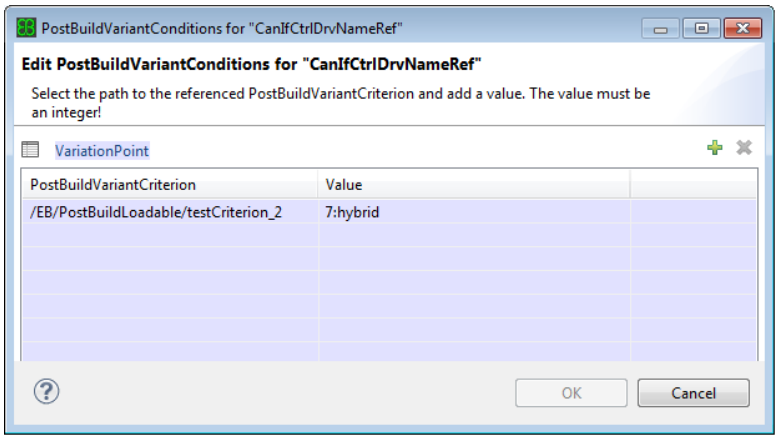

Figure 10.1. Editing variant conditions

Additionally two new filters are available for the **Node Outline** view to ease managing variants in EB tresos Studio.

For more information about changes in the **Node Outline** view, see the EB tresos Studio user's guide chapter ***Node Outline*** *view*.

10.1.1.2. Properties view

There is a new tab which shows all variant conditions for the currently selected parameter. Here it is not possible to edit the variant conditions, but it is possible to copy one row to the clipboard.

For more information, see the EB tresos Studio user's guide chapter ***Properties*** *view*.

10.1.1.3. Fast access tool bar

If one or more available selectables are specified in the EcuC module, a combo box appears in the tool bar of EB tresos Studio where you can quickly switch between these selectable variants.

Switching between loadable variants is only possible in the EcuC module.

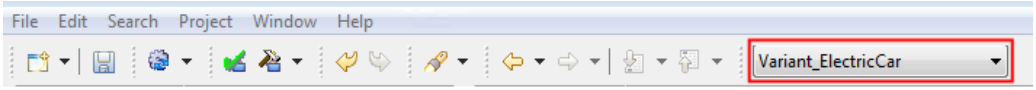

Figure 10.2. The fast access tool bar to switch between selectable variants

For more information on the fast access tool bar, see the EB tresos Studio user's guide chapter *Menu bar and tool bar*.

10.1.1.4. Unattended wizard Switch PostBuildVariant

EB tresos Studio provides a new unattended wizard with which it is possible to change the selected selectable variant. This might be useful when you use a MultiTask wizard to perform several steps for different selectable variants. For this you may configure several instances of the unattended wizard **Switch PostBuildVariant**, one for each selectable variant.

For more information, see EB tresos Studio user's guide chapter *Configuring the Switch PostBuildVariant wizard*.

10.1.1.5. Sidebar wizard Edit PostBuildVariants

A new wizard is available in the **Sidebar** view to create and edit predefined variants.

For more information, see the EB tresos Studio user's guide chapter *Using the Edit PostBuildVariants wizard*.

10.2. Update of references inside duplicated elements

When you duplicate an element that has references inside which point inside the copied element, the duplicated references are updated to point to the duplicated reference-target inside the duplicated element.

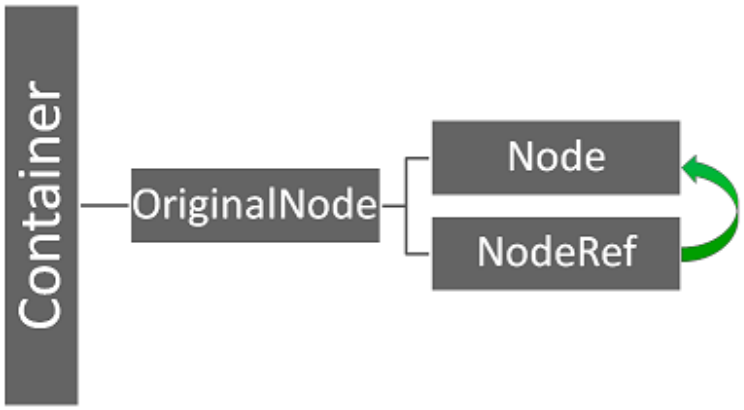

Figure 10.3. Original element

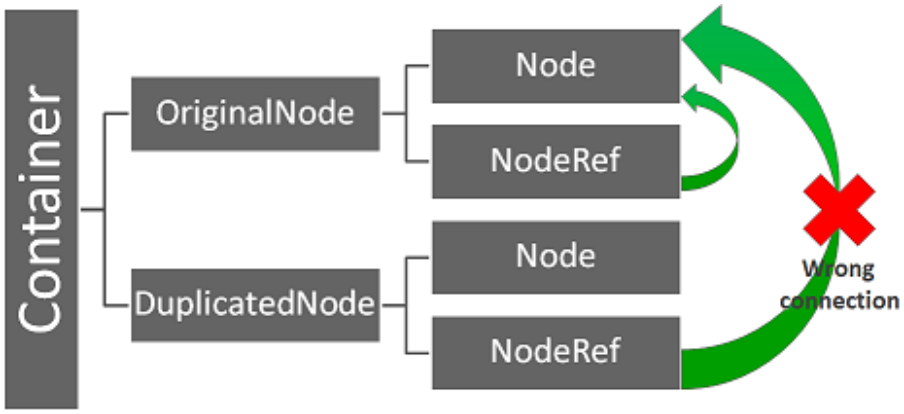

Figure 10.4. Old duplicated references

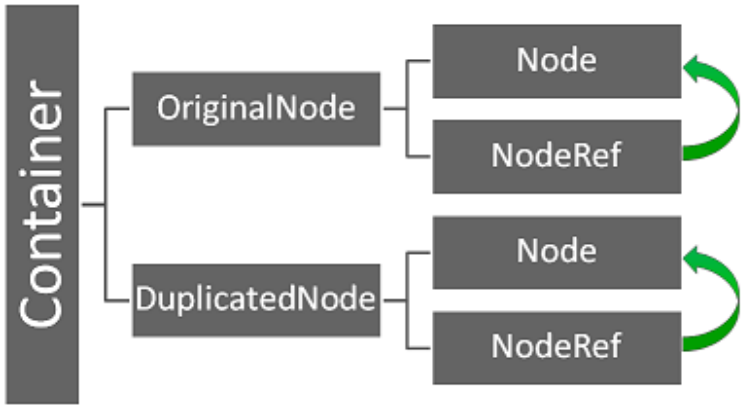

Figure 10.5. New duplicated references

10.3. Profiler introduced for the verifier

Now you can locate performance problems during the verification of the configuration with a simple profiler. To enable the profiler, select the preference **Enable profiler for the verifier**.

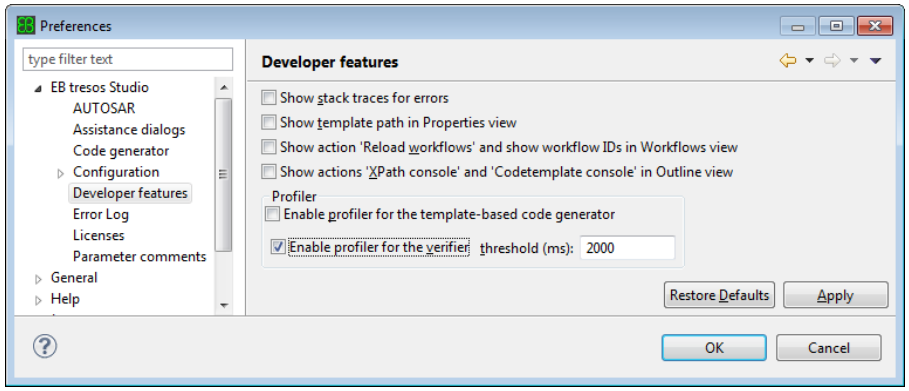

Figure 10.6. Profiler preferences

Once the profiler is enabled, EB tresos Studio collects profiling information during the verification process. If there are parameters where the verification takes more than the time configured in the **threshold (ms)**, then the profiling information is written to a logfile when the verification process finishes. A logfile entry is created in this case, which mentions the amount of written entries and the location of this logfile.

The file might look like this:

```
4606 ms for 28 nodes of ASPath:/TS_TxDxM6I1R0/Rte/RteBswModuleInstance/ImplementationRef
3446 ms for 5 nodes of ASPath:/TS_TxDxM5I3R0/PduR/PduRBswModules
2083 ms for 30 nodes of ASPath:/TS_TxDxM6I1R0/Rte/RteBswModuleInstance/ExclusiveAreaRef
2037 ms for 718 nodes of ASPath:/TS_TxDxM6I1R0/Rte/RteSwComponentInstance/RteEventRef
```

Each entry written to the logfile represents the summed up timing information for all configuration parameters, which belong to the same parameter definition. Each entry also mentions the amount of these configuration parameters and the path to the parameter definition where the verification rules are usually configured.

10.4. Auto delegation of ports in ECU Extract creator

When you use use the **Create an ECU Extract** unattended wizard, port prototypes which are not completely delegated up to the top level composition of the selected system are now automatically delegated. This delegation only affects the ECU Extract and not the hierarchical system model.

Only port prototypes that are referenced by a data mapping are automatically delegated by the ECU Extract creator. This behavior is enabled by default. You can switch off this feature in the configuration page for the **Create an ECU Extract** unattended wizard.

10.5. AUTOSAR 4.2.2 support for ECU Configuration

EB tresos Studio now provides support for the relevant parts of the ECU Configuration for AUTOSAR release 4.2.2. This support includes parameter definitions and module configurations, as well as the import and export of configuration data.

Prior releases of EB tresos Studio supported AUTOSAR releases up to revision 4.2.1, which are still fully supported.

10.6. Multiple selection of elements in Connection Editor and Signal Mapping Editor

Now you can select multiple elements in Connection Editor and Signal Mapping Editor. When you select multiple elements, the **Delete** and **Delegate** actions are enabled in Connection Editor and the **Delete** action is enabled in Signal Mapping Editor.