dSPACE AUTOSAR Compare

Manual

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dSPACE

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How to Contact dSPACE Support

If you encounter a problem when using dSPACE products, contact your local dSPACE representative:

- Local dSPACE companies and distributors: http://www.dspace.com/go/locations
- For countries not listed, contact dSPACE GmbH in Paderborn, Germany.
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You can also use the support request form: http://www.dspace.com/go/supportrequest. If you are logged on to mydSPACE, you are automatically identified and do not need to add your contact details manually.

If possible, always provide the relevant dSPACE License ID or the serial number of the CmContainer in your support request.

Software Updates and Patches

dSPACE strongly recommends that you download and install the most recent patches for your current dSPACE installation. Visit http://www.dspace.com/go/patches for software updates and patches.

Important Notice

Contents

About This Manual

Content

This manual introduces you to ARXML file comparison with dSPACE AUTOSAR Compare.

Symbols

dSPACE user documentation uses the following symbols:

Symbol	Description
DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a hazard that, if not avoided, could result in property damage.
Note	Indicates important information that you should take into account to avoid malfunctions.
Tip	Indicates tips that can make your work easier.
	Indicates a link that refers to a definition in the glossary, which you can find at the end of the document unless stated otherwise.
	Precedes the document title in a link that refers to another document.

Naming conventions

dSPACE user documentation uses the following naming conventions:

%name% Names enclosed in percent signs refer to environment variables for file and path names.

< > Angle brackets contain wildcard characters or placeholders for variable file and path names, etc.

Special folders

Some software products use the following special folders:

Common Program Data folder A standard folder for application-specific configuration data that is used by all users.

`%PROGRAMDATA%\dSPACE\<InstallationGUID>\<ProductName>`

or

`%PROGRAMDATA%\dSPACE\<ProductName>\<VersionNumber>`

Documents folder A standard folder for user-specific documents.

`%USERPROFILE%\Documents\dSPACE\<ProductName>\<VersionNumber>`

Local Program Data folder A standard folder for application-specific configuration data that is used by the current, non-roaming user.

`%USERPROFILE%\AppData\Local\dSPACE\<InstallationGUID>\<ProductName>`

Accessing dSPACE Help and PDF Files

After you install and decrypt dSPACE software, the documentation for the installed products is available in dSPACE Help and as Adobe® PDF files.

dSPACE Help (local) You can open your local installation of dSPACE Help:

- On its home page via Windows Start Menu
- On specific content using context-sensitive help via **F1**

dSPACE Help (Web) You can access the Web version of dSPACE Help at www.dspace.com.

To access the Web version, you must have a *mydSPACE* account.

PDF files You can access PDF files via the icon in dSPACE Help. The PDF opens on the first page.

Introduction

Where to go from here

Information in this section

Basics on dSPACE AUTOSAR Compare

Introduction

dSPACE AUTOSAR Compare lets you compare and merge AUTOSAR files.

SystemDesk-TargetLink round trip

For ECU software development according to AUTOSAR, SystemDesk acts as a *system-level design tool*. For *behavior modeling* according to AUTOSAR, dSPACE provides the TargetLink AUTOSAR Module.

dSPACE AUTOSAR Compare helps you seamlessly integrate both tools into a tool chain by intelligent merging of AUTOSAR files. It lets you copy only the elements that are modeled by TargetLink, such as the internal behavior and implementation of software components, to architecture ARXML files. The AUTOSAR elements and properties that are not supported by TargetLink are preserved in the architecture ARXML files.

Comparison tool for version control systems

Version control systems, such as PTC or Git, let you manage file versions. For AUTOSAR files, you can use dSPACE AUTOSAR Compare to identify changes, such as added or removed elements. You can also find modified elements and skip elements that differ only in the values of specific properties, such as UUID, date, or time.

The intelligent merging of files lets you copy elements from branches to a master file version, including dependent elements that are related by AUTOSAR references, such as the reference of a port prototype to an interface and the data types of the interface elements.

Using dSPACE AUTOSAR Compare

dSPACE AUTOSAR Compare can be used in different ways.

- It provides a user interface that lets you inspect differences and copy elements to merge the files.
- It provides a logical XML language to perform rule-based merging. This is helpful for complex tasks and large AUTOSAR models.
- It provides a command line interface for integration in a tool chain. This lets you use it as a comparison tool in SystemDesk for AUTOSAR master files and in the Container Manager for ARXML files of SWC containers. The command line interface lets you automate workflows in which AUTOSAR files have to be merged.

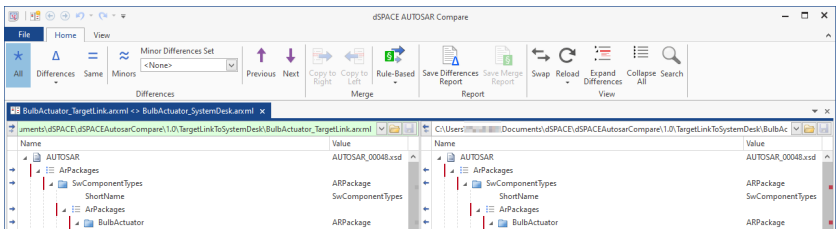
Basics on Comparing AUTOSAR Files

Introduction

dSPACE AUTOSAR Compare compares and copies AUTOSAR elements, in contrast to text-based or binary comparison tools.

Create a session and load files

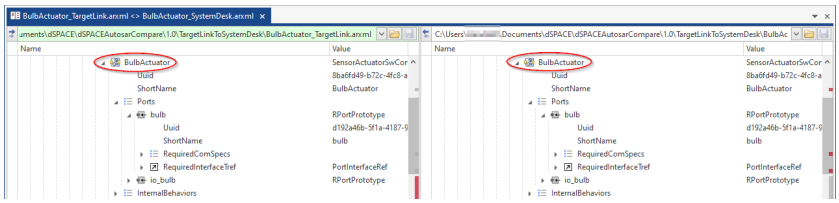
dSPACE AUTOSAR Compare adds a comparison page for a session to the working area. The page lets you load a left-hand file and a right-hand file, and displays the contents of the files.



Align elements

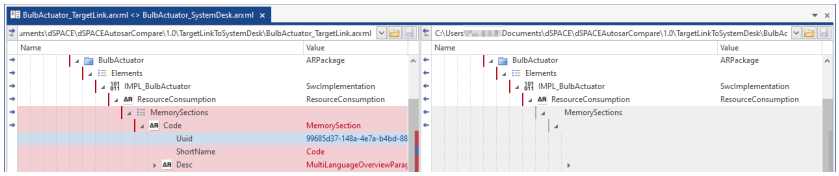
Because the files are compared element-wise, dSPACE AUTOSAR Compare automatically aligns AUTOSAR elements in the loaded files according to the split key of the elements. You can change the automatic alignment and match

AUTOSAR elements that reside in different branches of the AUTOSAR tree, e.g., in different AUTOSAR packages.



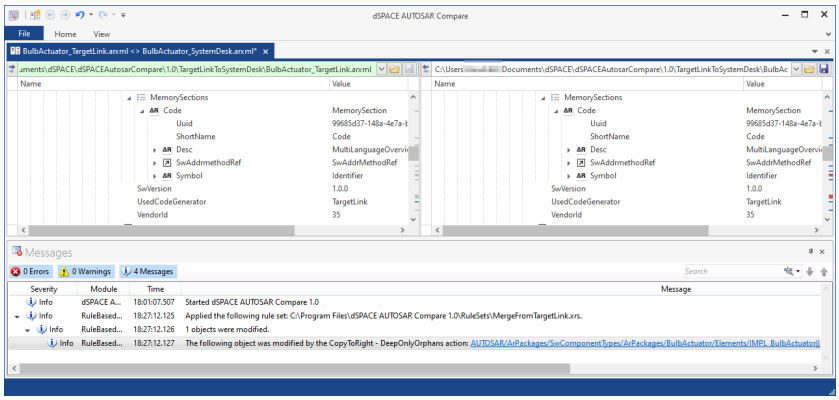
Displaying differences

The user interface of dSPACE AUTOSAR Compare highlights different elements, orphan elements, and elements that differ only in the value of an AUTOSAR property that you specified as a minor difference property. You can also show only the element differences of a specific category, such as, e.g., only orphans of the left-hand file.



Merging differences

For merging, you can copy selected differing elements, including their subelements and AUTOSAR properties, from one file to the other. dSPACE AUTOSAR Compare also provides rule configurations that let you specify and execute a rule-based merge process for differences.



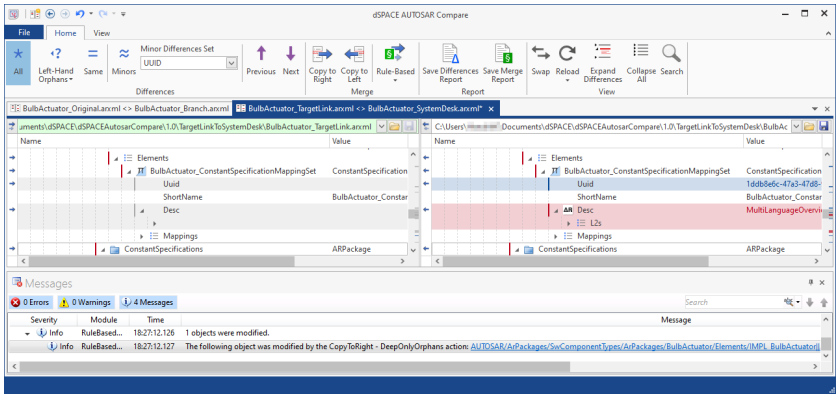
Basics on the User Interface

Introduction

The user interface of dSPACE AUTOSAR Compare lets you view two ARXML files, highlight differences, and merge AUTOSAR elements.

User interface

The following illustration shows the user interface of dSPACE AUTOSAR Compare.



Panes

Comparison page Lets you load, merge, and save two ARXML files.

Messages Provides messages on the actions that you perform and lets you track the actions of rule-based merge processes.

Ribbon

File Lets you access options of dSPACE AUTOSAR Compare and the user documentation.

Home Lets you work with dSPACE AUTOSAR Compare.

View Lets you arrange windows and access the dSPACE Log.

Getting Started

Where to go from here

Information in this section

How to Merge Files from TargetLink

Objective

To merge elements that were added with TargetLink without overwriting unsupported information in an architecture ARXML file.

Basics

The **TargetLink to SystemDesk** demo illustrates a round trip between TargetLink and SystemDesk.

TargetLink is used to model the internal behavior and implementation of software components. However, it does not support the complete AUTOSAR schema like an architecture tool such as SystemDesk.

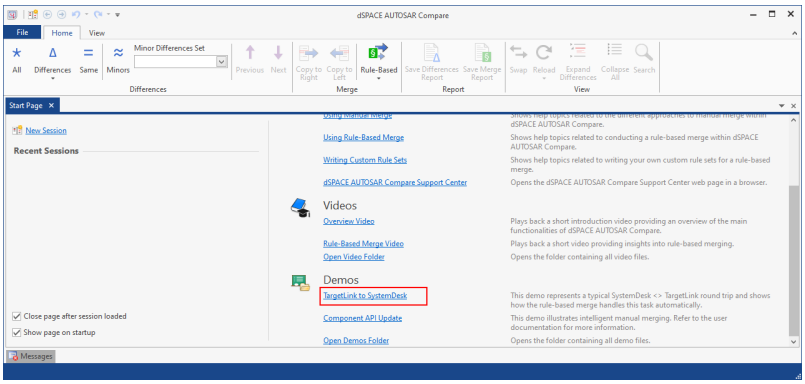
The task is to merge elements that were added with TargetLink without overwriting unsupported information in an architecture ARXML file. In the demo, a memory section is added by TargetLink. The architecture file contains a unit element that is not available in the TargetLink file.

dSPACE AUTOSAR Compare provides the **MergeFromTargetLink.xrs** rule configuration file, which lets you perform a rule-based merging of files in this use case.

Method 1

To manually merge files from TargetLink

1 Start dSPACE AUTOSAR Compare.

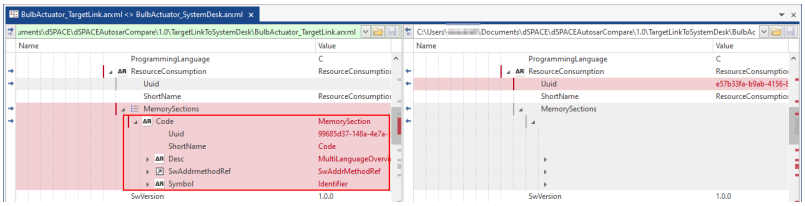


2 From the **Start Page**, select **TargetLink to SystemDesk**.

dSPACE AUTOSAR Compare creates a new session and loads the demo files that are located in your *Documents* folder.

3 On the **Home** ribbon, select **View – Expand Differences**.

4 Navigate to the orphan memory section element in the TargetLink file.



5 On the bar on the left, click the → button on the level of the memory section to copy the element to the other file. The bar indicates the part of the AUTOSAR tree that is copied.

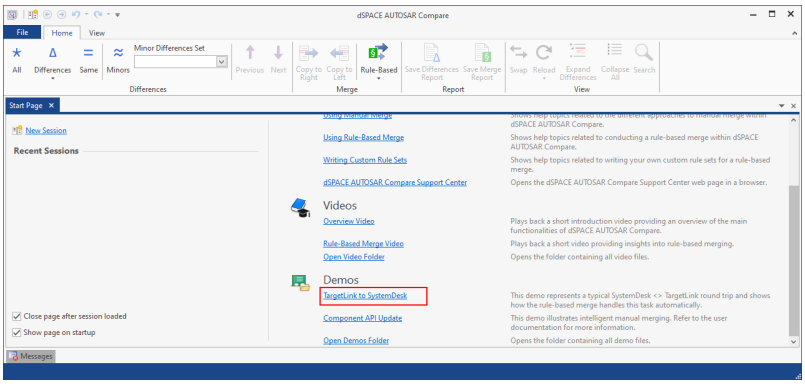
6 Select the file on the right-hand side.

7 On the **File** ribbon, select **Save As** to save the changed file under a new name.

Method 2

To merge files from TargetLink on the basis of rules

1 Start dSPACE AUTOSAR Compare.



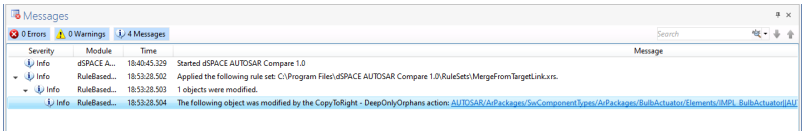
2 From the **Start Page**, select **TargetLink to SystemDesk**.

dSPACE AUTOSAR Compare creates a new session and loads the demo files that are located in the *Documents* folder.

3 On the **Home** ribbon, select **Merge – Rule-Based – MergeFromTargetLink.xrs**.

dSPACE AUTOSAR Compare merges the files based on the selected rule configuration file.

The performed operations are logged in the **Messages** pane.

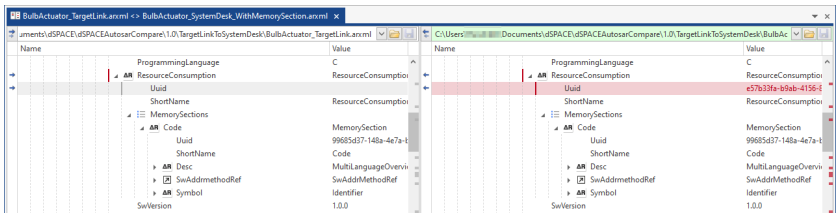


4 Select the file on the right-hand side.

5 On the **File** ribbon, select **Save As** to save the changed file under a new name.

Result

You copied the memory section that was added by TargetLink to the SystemDesk file.



How to Merge File Versions

Objective

To copy selected elements from a branch to a new version of a software component.

Basics

The Component API Update demo shows you how to work with file versions.

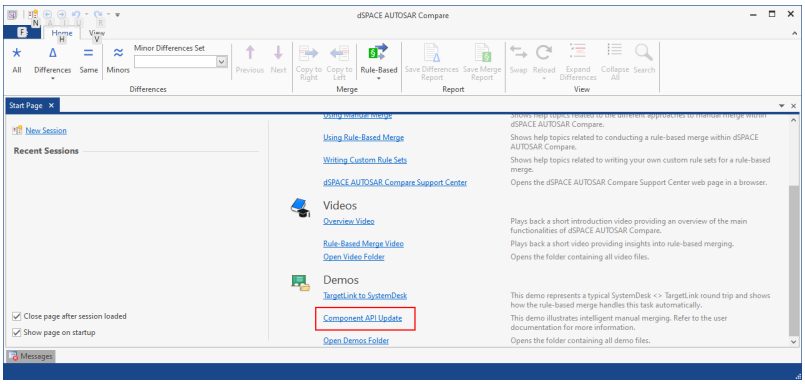
A software architect added a port, an interface, and a data type to the original version of a software component. A data type that is not related to the new port was also added to the branch of the software component.

The task is to add the port and the referenced elements to a new version of the software component.

Method

To merge file versions

1 Start dSPACE AUTOSAR Compare.

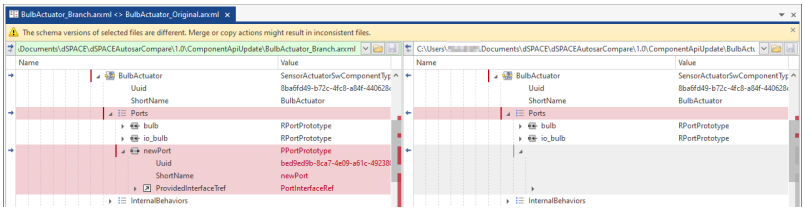


2 From the Start Page, select Component API Update.

dSPACE AUTOSAR Compare creates a new session and loads the demo files that are located in the *Documents* folder.

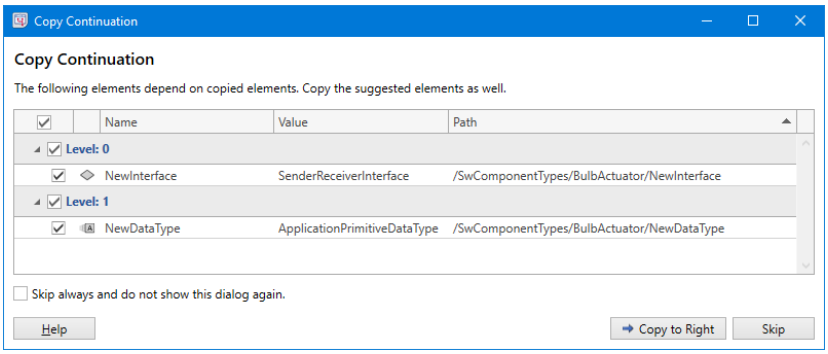
3 On the Home ribbon, select View – Expand Differences.

4 Navigate to the newPort element that is highlighted as an orphan element.



5 On the bar on the left, click the → button on the level of the new port to copy the element to the other file. The bar indicates the part of the AUTOSAR tree that is copied.

dSPACE AUTOSAR Compare opens a dialog that lets you select dependent elements to copy additionally.



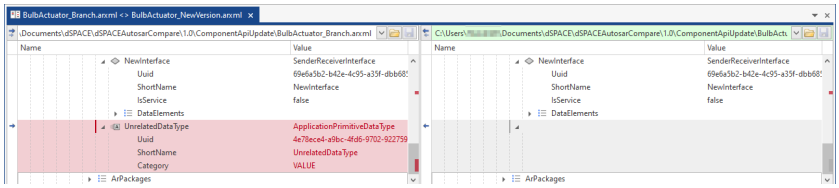
6 In the dialog, select Copy to Right.

7 Select the file on the right-hand side.

8 On the File ribbon, select Save As to save the changed file under a new name.

Result

You copied a new port and dependent elements from a branch to a new file version. The unrelated data type remains as a difference between the branch and the new version of the software component.



Comparing Files

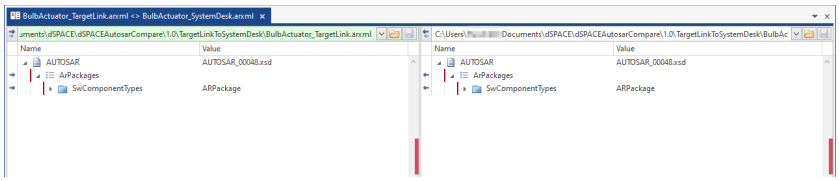
Where to go from here

Information in this section

Basics on Comparison Sessions

Comparison sessions

You have to create a comparison session to work with AUTOSAR files. dSPACE AUTOSAR Compare adds a comparison page to the working area for each session. The page lets you load files, perform merging, and save changed files.

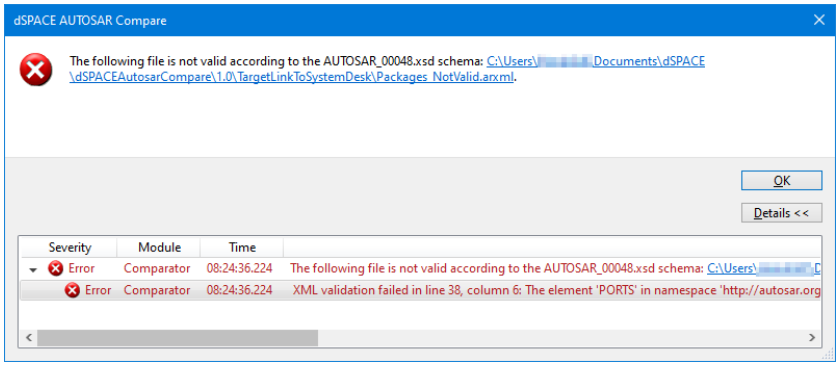


Loading files

You can load files from the file system that comply with the `*.arxml` file extension pattern.

dSPACE AUTOSAR Compare validates files while loading them and provides a warning if you compare different AUTOSAR version files.

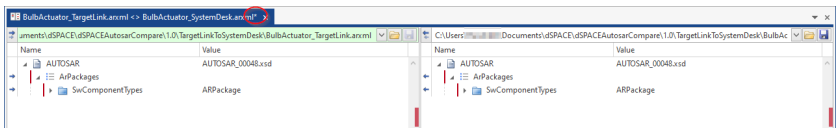
The following illustration shows an error message of a failed validation.



Saving files

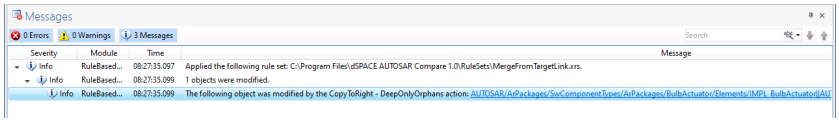
You can save modified files to the file system after merging the files.

dSPACE AUTOSAR Compare indicates modified files with an asterisk as shown in the following illustration.



Logging information

dSPACE AUTOSAR Compare logs information, warning, and error messages. This helps you solve conflicts and follow the rule-based merge processes.



Basics on Element Alignment

Introduction

dSPACE AUTOSAR Compare lets you align AUTOSAR elements of the files to compare.

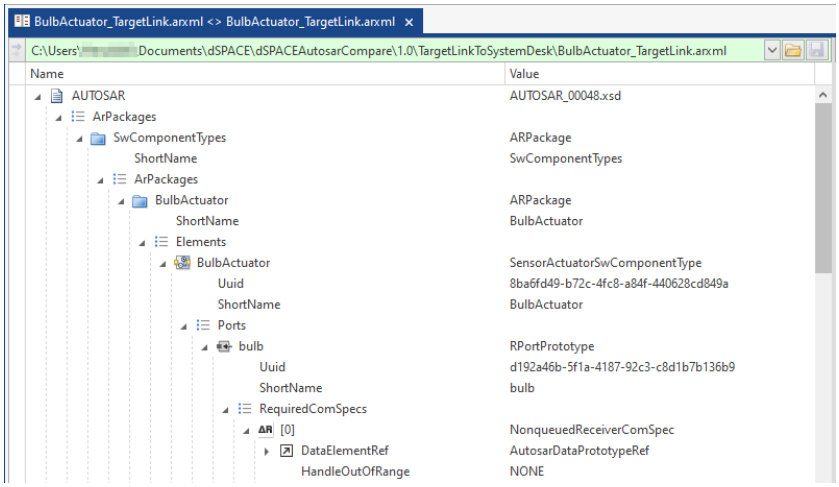
Displaying AUTOSAR files

dSPACE AUTOSAR Compare displays the elements of AUTOSAR files in a tree view with columns for the name and value of AUTOSAR elements and properties.

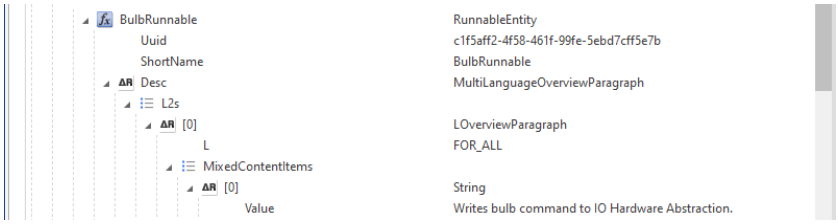
The **Name** column displays property names and indicates the element type by icons. For collection elements, the short name or index of the collection element is displayed. The **Value** column displays the AUTOSAR schema version, the AUTOSAR type of elements, and for properties the property value.

dSPACE AUTOSAR Compare displays a view on AUTOSAR files but it does not simply display its contents. Instead, the elements in a file are sorted to make comparisons possible.

Elements of a collection are ordered according to their name as well as subelements and properties of an element. Refer to the following illustration.



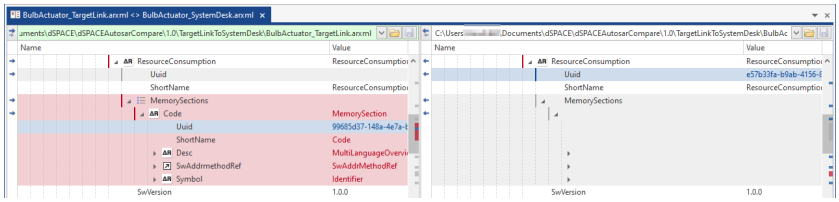
Unlike the SystemDesk Project Manager or the TargetLink Data Dictionary, dSPACE AUTOSAR Compare displays a view of the loaded AUTOSAR file. All the contained information is displayed, except for XML comments and processing instructions. XML elements are not abstracted to specific SystemDesk or TargetLink elements and properties, such as the description property of an element, which is modeled using language paragraphs in the AUTOSAR XML. Refer to the following illustration.



Aligning elements

dSPACE AUTOSAR Compare aligns elements, which are compared by their split key, i.e., in most cases the short name and, if available, variant information. Elements that cannot be aligned are left as orphan elements.

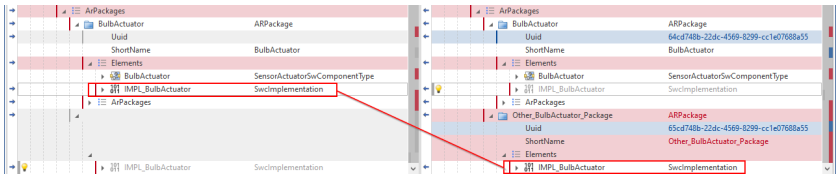
The element context menu provides commands that let you isolate aligned elements and change the alignment of elements in a collection.



Matching elements

Elements that reside in different branches of the AUTOSAR tree are regarded as orphan elements. Refer to the following illustration for an example of an element that resides in different packages.

You can match elements of the same AUTOSAR type that reside in different branches with the **Match With** command of the context menu. The elements are then compared. Refer to the following illustration.



You can move elements to the branches they are compares with when you merge files. Refer to Moving elements on page 25.

Basics on Differences

Introduction

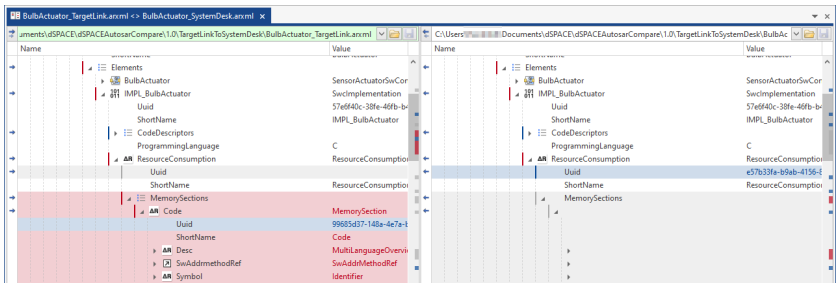
dSPACE AUTOSAR Compare helps you find elements that differ between AUTOSAR files.

Element difference categories

dSPACE AUTOSAR Compare specifies element differences of the following categories:

- Identical elements.
- Orphan elements, which are available in one file and therefore cannot be aligned or matched automatically.
- Elements that are not identical, e.g., elements that have different subelements or property values.
- You can specify AUTOSAR properties as unimportant so that elements that differ only in unimportant properties are considered as elements with minor differences.

dSPACE AUTOSAR Compare highlights differences with colors, indicates elements that have different subelements with bars, and displays the location of differences on the scroll bar. Refer to the following illustration.

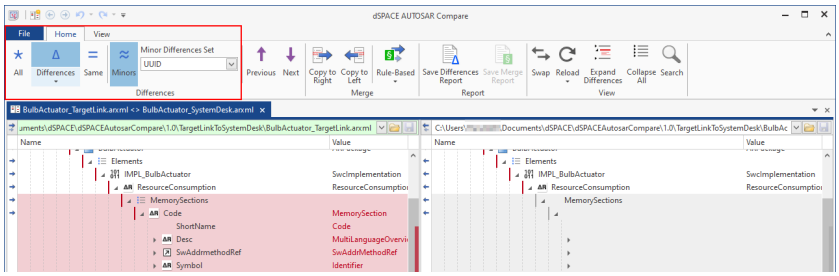


Support for inspecting differences

You can use the following support functions for inspecting differences in addition to highlighting:

- Showing elements that match a specific difference category. All other elements are hidden.
- Navigating to the next or previous difference.
- Expanding elements that have differences.
- Exporting an XML report of different elements.

Refer to the following illustration, where only different elements are displayed.



Basics on Merging Files

Introduction

dSPACE AUTOSAR Compare lets you merge AUTOSAR files, i.e., copy AUTOSAR elements and property values from one file to the other.

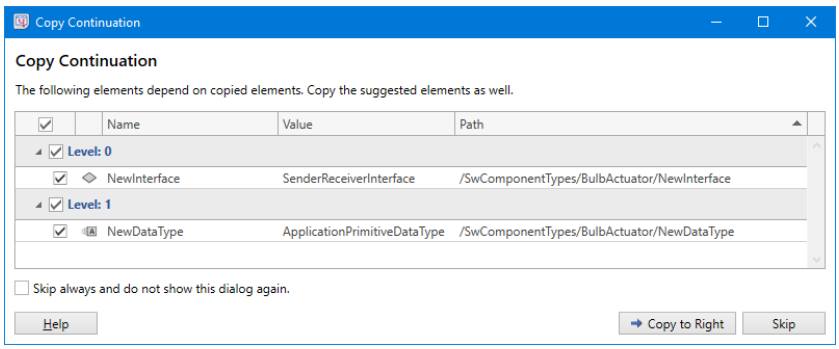
Copying elements and property values

You can copy selected elements that are regarded as differences. dSPACE AUTOSAR Compare copies elements including subelements, e.g., if you select an AUTOSAR package with differences, all the elements of the package are copied. The copy bar to the left of a file indicates the scope of the copy command.

dSPACE AUTOSAR Compare replaces corresponding elements or property values in the target file, leaving the copied element without differences. You can also copy elements in advanced ways and only add elements or only copy orphan subelements.

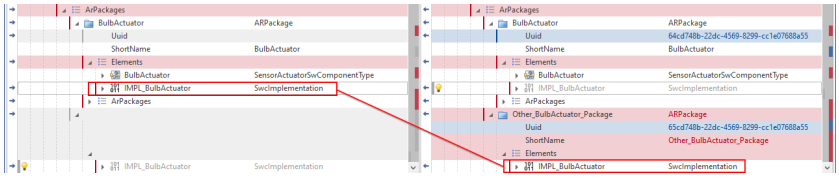
Support for AUTOSAR references

AUTOSAR uses references to model dependencies between elements, such as the dependency of data elements or operation arguments on data types that are used for implementation. When you copy elements, dSPACE AUTOSAR Compare identifies dependent elements and suggests to also copy them. Refer to the following illustration, which shows a dialog with dependent elements when copying an orphan port prototype.



Moving elements

You can match AUTOSAR elements that reside in different branches of the AUTOSAR tree by using the **Match With** context menu command, e.g., if an element is part of different AUTOSAR packages in the compared files. Refer to the following illustration.



You can move the element across the branches to the positions that are indicated by the 💡 icon by using the **Move Element Here** command of the icon's context menu.

Rule-based merging

AUTOSAR files can be large and complex. The task of merging them typically follows specific patterns. dSPACE AUTOSAR Compare provides a language that lets you express merge operations, select specific elements, and define element matching, alignment, and dependencies.

Reference

Where to go from here

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Unmatch..... 59
To unmatch elements that reside in different branches of the AUTOSAR tree.

Advanced Copy

Access

You can access this command via:

Ribbon	None
Context menu of	AUTOSAR elements on a comparison page
Shortcut key	None
Icon	None

Purpose

To copy specific parts of an AUTOSAR element.

Description

dSPACE AUTOSAR Compare lets you copy elements to merge AUTOSAR files. In addition to copying a complete element, you can use advanced copy commands to copy only specific parts of an element or to copy related additional elements. You can use the following advanced copy commands:

Command	Description
Minimal	Copies only the element and required lower-level elements. ▪ Copying a collection, such as a list of memory sections, does not copy anything. ▪ Copying an AUTOSAR element, such as a memory section or an internal behavior, copies only the element and the split key, i.e., the short name. ▪ Copying a property copies the property value.
Deep	Copies the elements of the XML tree. ▪ Copying a collection copies all subelements. Orphan elements of the target remain. ▪ Copying an AUTOSAR element copies all property values. Properties that are specified only in the target remain. ▪ Copying a property copies the property value.
Deep, Only Orphans	Copies the element if it is an orphan element. Elements of the XML tree are copied only if they are orphans. ▪ Copying a collection copies all orphan subelements. Orphan elements of the target remain. ▪ Copying an AUTOSAR element copies all the property values. Properties that are specified only in the target remain. ▪ Copying a property copies the property value.

Command	Description
Deep, Overwrite	Copies the elements of the XML tree. ▪ Copying a collection copies all subelements. Orphan elements of the target are removed. ▪ Copying an AUTOSAR element copies all property values. Properties that are specified only in the target are cleared. ▪ Copying a property copies the property value. This command copies elements in the same way as the general **Copy to Left** and **Copy to Right** commands.
Single Object	Copies an element, including all subelements that cannot be referenced.
Single Object, Only Orphans	Copies an element, including all orphan subelements that cannot be referenced.
Single Object, Overwrite	Copies an element, including all subelements that cannot be referenced. Orphan elements of the target are removed.

Result

The selected element is copied.

Align With

Access

You can access this command via:

Ribbon	None
Context menu of	Element on a comparison page
Shortcut key	**F7**
Icon	None

Purpose

To compare an element with another element of the same branch in the AUTOSAR tree.

Description

dSPACE AUTOSAR Compare aligns the elements and compares them by their split key, which is usually the short name and, if available, variant information. You can use the **Align With** command to change the aligned elements manually.

To compare elements that reside in different branches, you can use the **Match With** command.

Result

The selected elements are compared.

All

Access

You can access this command via:

Ribbon	Home – Differences
Context menu of	None
Shortcut key	None
Icon	

Purpose

To display different and identical AUTOSAR elements of compared AUTOSAR files on a comparison page.

Result

dSPACE AUTOSAR Compare displays all AUTOSAR elements of compared AUTOSAR files on comparison pages in the working area.

Close

Access

You can access this command via:

Ribbon	View – Working Area
Context menu of	None
Shortcut key	None
Icon	

Purpose

To close the active page in the working area.

Result

The active page, such as a comparison page, closes.

Close All

Access

You can access this command via:

Ribbon	View – Working Area
Context menu of	None

Shortcut key	None
Icon	

Purpose To close all pages in the working area.

Result The working area is empty.

Collapse All

Access You can access this command via:

Ribbon	Home – View
Context menu of	None
Shortcut key	None
Icon	

Purpose To collapse all elements that are displayed on the active comparison page.

Result The elements of a comparison page are collapsed.

Compare With

Access You can access this command via:

Ribbon	None
Context menu of	Element of a comparison page
Shortcut key	None
Icon	None

Purpose To compare different branches of AUTOSAR files.

Description

You can compare AUTOSAR elements that reside in different branches of the AUTOSAR tree, e.g., if an element is part of different AUTOSAR packages in the compared files. You an either match the branches or open a new comparison page for this.

Note

On a comparison page that you opened with the **Compare With** command, dSPACE AUTOSAR Compare does *not* open the **Copy Continuation** dialog when you copy elements that have AUTOSAR references to elements which are not available on the target side. Refer to Copy Continuation Dialog on page 37.

Result

dSPACE AUTOSAR Compare opens a new comparison page and aligns the selected branches of the AUTOSAR tree.

Comparison Page

Access

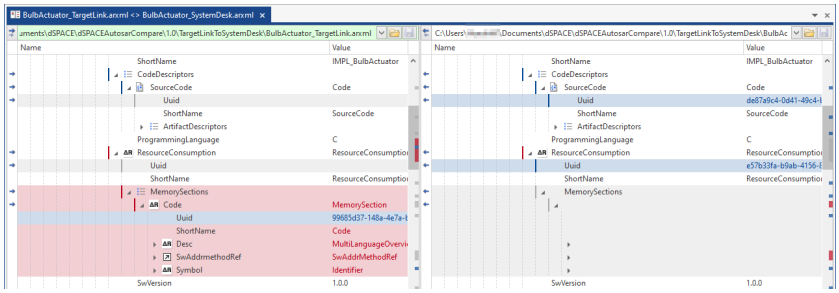
You can open a new comparison page in the working area by clicking **Start Page – New Session** or **File – New Session**.

Purpose

To compare and merge AUTOSAR files.

Description

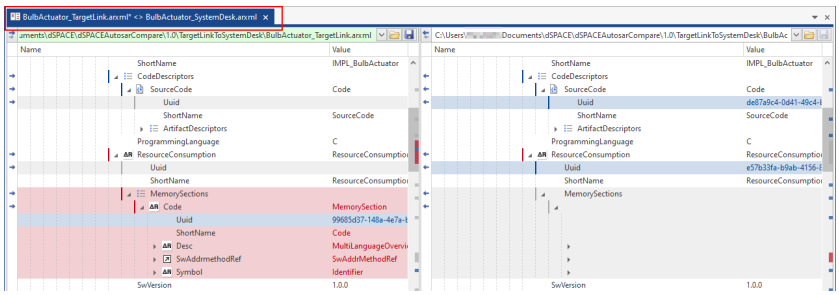
Comparison pages are displayed in the working area and show AUTOSAR elements in the hierarchical structure as they are defined in an ARXML file. The pages support viewing and selecting file differences and provide commands for merging two files.



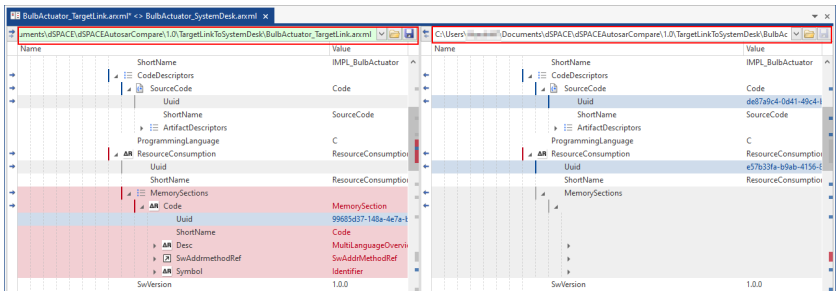
Page layout Comparison pages have a title and a two-column layout. Each column has a menu followed by a two-column table that shows the name and value of a file's AUTOSAR elements. Different elements are highlighted in colors. On the left-hand side of a column, a bar provides copy commands for merging

elements. A scroll bar is displayed on the right-hand side of the column if required.

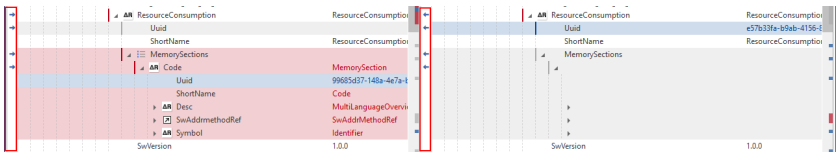
Page title The page title displays the names of the loaded AUTOSAR files and indicates files with unsaved changes with an asterisk.



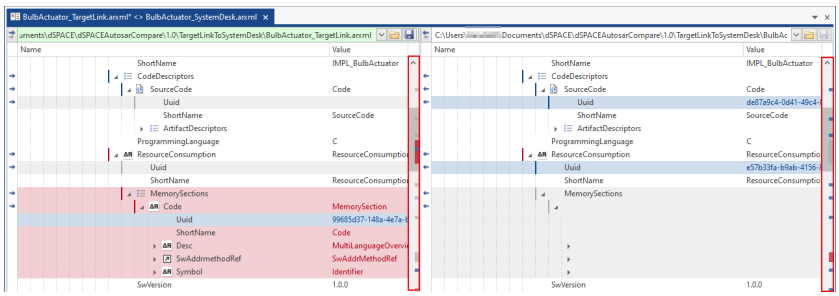
Column menu The column menu displays the path of a loaded file and provides commands for selecting recent files, loading files, and saving modified files.



Copy bar On the level of the column menu, the copy bar lets you copy the complete file to the other column file. Below, the copy bar lets you copy each differing AUTOSAR element of the file. If you hover over an ➔, the bar highlights the part of the file that is to be copied.



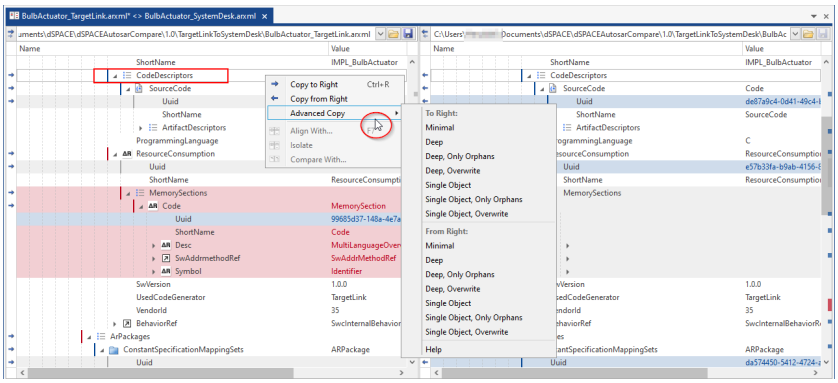
Scroll bar The scroll bar indicates the file position that is shown and the position of differences in the file.



Compare colors dSPACE AUTOSAR Compare uses colors to highlight differences.

You can configure the colors that are used for differing elements, missing orphan elements of a file, and minor differences. Use File – Options to open the Options dialog and select the Compare Colors page.

Context menu You can select an AUTOSAR element and right-click it to open its context menu. The menu provides additional commands to control the alignment of items and advanced commands for copying items.



Context menu commands

Copy To Lets you copy the selected element to the other file, where it replaces the corresponding element.

Copy From Lets you copy the corresponding element from the other file. The selected element is replaced.

Advanced Copy Lets you copy elements in a specific way.

Align With Lets you change the alignment of an element manually.

Isolate Lets you cancel the alignment of elements, leaving them as orphan elements.

Match With Lets you align an orphan element with an orphan element of another branch of the AUTOSAR tree.

Compare With Lets you compare a branch of the AUTOSAR tree with a different branch of the other file. You can select elements to compare with a matching AUTOSAR type. dSPACE AUTOSAR Compare opens a new comparison page with the elements and all subelements, i.e., the branch.

Copy AUTOSAR Path Lets you copy the AUTOSAR path, i.e., the location of the element in the AUTOSAR file, to the Clipboard.

Example: `/SwComponentTypes/BulbActuator`

Refresh References Lets you refresh the displayed target AUTOSAR path of references. This is useful if you copied elements with different short names or if you moved elements across branches.

Locate Target Lets you locate the target of a reference.

Copy Continuation Dialog

Access

dSPACE AUTOSAR Compare opens the dialog when you copy elements that have AUTOSAR references to elements which are not available on the target side.

Purpose

To select elements that have references from copied elements and also copy them.

Dialog options

The dialog shows a list of AUTOSAR elements with references to or from a copied element.

Level Displays the hierarchy level of references. 0 indicates a direct dependency on the copied element. 1 indicates that the listed element depends on another element which itself directly depends on the copied element.

Name Displays the value of the element's short name.

Value Displays the AUTOSAR type of the listed element.

Path Displays the AUTOSAR package path of the listed element.

Skip Closes the dialog without copying any additional elements. The element that initiated opening the Copy Continuation dialog was already copied.

Copy to Left/Copy to Right Copies the selected elements.

Copy to Left

Access

You can access this command via:

Ribbon	Home – Merge
Context menu of	None
Shortcut key	`Ctrl+L`
Icon	

Purpose

To copy the selected element, including all subelements, to the left-hand file.

Description

The comparison page provides additional commands to copy elements:

- You can copy all differences of a file at once.
- You can copy only specific parts of an element by using advanced copy commands.

The **Copy to Left** command copies elements in the same way as the **Deep, Overwrite** command of the **Advanced Copy** command group. Refer to Advanced Copy on page 30.

dSPACE AUTOSAR Compare opens the **Copy Continuation** dialog if the element has references to other AUTOSAR elements. Refer to Copy Continuation Dialog on page 37.

Result

The difference is resolved.

Copy to Right

Access

You can access this command via:

Ribbon	Home – Merge
Context menu of	None
Shortcut key	`Ctrl+R`
Icon	

Purpose

To copy the selected element, including all subelements, to the right-hand file.

Description

The comparison page provides additional commands to copy elements:

- You can copy all differences of a file at once.
- You can copy only specific parts of an element by using advanced copy commands.

  The **Copy to Right** command copies elements in the same way as the **Deep, Overwrite** command of the **Advanced Copy** command group. Refer to Advanced Copy on page 30.

dSPACE AUTOSAR Compare opens the **Copy Continuation** dialog if the element has references to other AUTOSAR elements. Refer to Copy Continuation Dialog on page 37.

Result

The difference is resolved.

Differences

Access

You can access this command via:

Ribbon	Home – Differences
Context menu of	None
Shortcut key	None
Icon	

Purpose

To display only AUTOSAR elements that differ.

Description

You can display all differing AUTOSAR elements or use the following split commands to display only elements of a specific difference kind.

-  : Differing elements but no orphan elements.
-  : Orphan elements only.
-  : No orphan elements.
-  : Orphan elements of the left-hand file.
-  : Orphan elements of the right-hand file.

Result

Elements that do not differ or are not of the specified difference kind are hidden.

Dock in Working Area

Access

You can access this command via:

Ribbon	View – Working Area
Context menu of	None
Shortcut key	None
Icon	

Purpose

To dock a pane, such as the Messages pane, in the working area.

Result

The selected pane is docked in the working area.

dSPACE Log

Access

You can access this command via:

Ribbon	View – Show
Context menu of	None
Shortcut key	None
Icon	

Purpose

To show a log of all dSPACE products in the working area.

Result

The dSPACE Log, which displays info, warning, and error messages of all dSPACE products on your PC, opens.

Exit

Access

You can access this command via:

Ribbon	File
Context menu of	None
Shortcut key	None
Icon	None

Purpose

To close dSPACE AUTOSAR Compare.

Result

The application closes.

Expand Differences

Access

You can access this command via:

Ribbon	Home – View
Context menu of	None
Shortcut key	None
Icon	

Purpose To view all differing elements.

Result The differing elements of the active comparison page are expanded.

Float

Access You can access this command via:

Ribbon	View – Working Area
Context menu of	None
Shortcut key	None
Icon	

Purpose To undock a page of the working area.

Result The active page can be moved.

Full-Screen Mode

Access You can access this command via:

Ribbon	View – Show
Context menu of	None
Shortcut key	**`Shift+Alt+Return`**
Icon	None

Purpose To view dSPACE AUTOSAR Compare in full-screen mode.

Result The active page in the working area, such as a comparison page, is shown on the complete screen. The ribbon, the Windows taskbar, and all other graphical elements are hidden.

Help

Access

You can access this command via:

Ribbon	File
Context menu of	None
Shortcut key	None
Icon	None

Purpose

To open the user documentation of dSPACE AUTOSAR Compare.

Result

The Help group is displayed, which lets you open the *dSPACE AUTOSAR Compare Manual* or instructions on using dSPACE Help.

Isolate

Access

You can access this command via:

Ribbon	None
Context menu of	Element on a comparison page
Shortcut key	None
Icon	None

Purpose

To cancel the alignment of AUTOSAR elements in compared files.

Description

dSPACE AUTOSAR Compare aligns the elements, which are compared by their split key, which is usually the short name and, if available, variant information. You can also align elements that reside in the same branches of the AUTOSAR tree manually. To compare elements that reside in different branches, you can use the **Match With** command.

Result

The elements are orphan elements.

Locate Match

Access

You can access this command via:

Ribbon	None
Context menu of	Tip (💡)
Shortcut key	None
Icon	None

Purpose

Lets you locate the element that is matched with the indicated element.

Description

You can match AUTOSAR elements that reside in different branches of the AUTOSAR tree, e.g., if an element is part of different AUTOSAR packages in the compared files. When you match elements, a 💡 icon indicates additional commands for the matched element. The **Locate Match** command lets you select the matched element in its branch.

Result

The matched element is selected.

Match With

Access

You can access this command via:

Ribbon	None
Context menu of	Element on a comparison page
Shortcut key	`Ctrl+F7`
Icon	None

Purpose

To compare orphan elements of AUTOSAR files that reside in different branches of the AUTOSAR tree.

Description

You can match AUTOSAR elements that reside in different branches of the AUTOSAR tree, e.g., if an element is part of different AUTOSAR packages in the compared files. When you match elements, a 💡 icon indicates additional commands for the matched element.

Result

The matched elements are compared.

Messages

Access

You can access this command via:

Ribbon	View – Show
Context menu of	None
Shortcut key	None
Icon	

Purpose

To show the Messages pane.

Result

The **Messages** pane, which provides info, warning, and error messages, is shown.

Messages Pane

Access

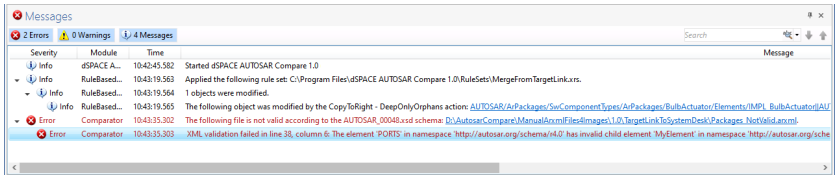
The Messages pane is shown by default. You can show or hide it by clicking **View – Pane – Show Pages**.

Purpose

To show info, warning, and error messages that log actions.

Description

The Messages pane shows logging information of the actions in dSPACE AUTOSAR Compare. The messages can have three severity levels.

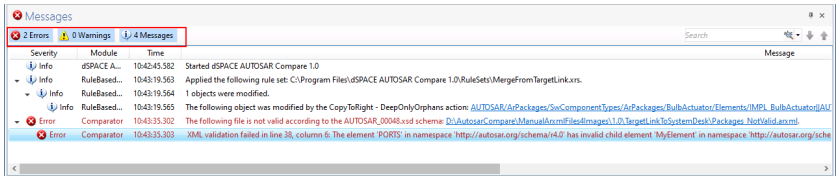


Pane layout The pane provides a list of messages with columns that display message properties. The messages have a context menu with commands that let you configure the appearance of the list, copy the message text, and open messages in a dialog. You can use filter buttons and a search field to get specific messages.

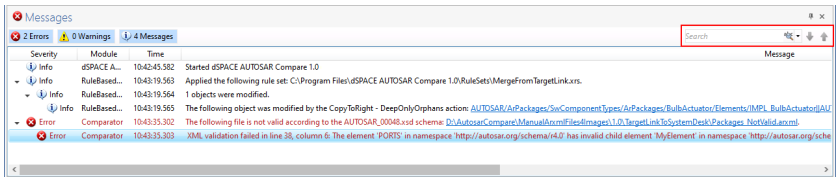
Messages list The list provides the following information for each message:

Message Property	Description
Date	The date when the message was written.
Main Module Number	Internal information that specifies a component of dSPACE AUTOSAR Compare.
Message	The message text.
Message Code	Internal information that specifies a specific message of a submodule.
Module	The part of dSPACE AUTOSAR Compare that printed the message, such as dSPACE AUTOSAR Compare, i.e., the user interface or RuleBasedMerger, if you execute a rule configuration.
Severity	One of the following values: Error, Warning, Information. The filter buttons let you filter for messages a specific severity.
Submodule Number	Internal information that specifies a subcomponent of dSPACE AUTOSAR Compare.
Time	The time when the message was written.

Filter buttons Let you show or hide each severity level in the list.



Search field Lets you search the message text.



Context menu commands

The header of the messages list and each message provide the following context menu commands:

Clear Messages Lets you clear the messages list.

Collapse Lets you collapse messages that are displayed in a tree view.

Copy Lets you copy all properties of selected messages to the Clipboard.

Expand Lets you expand messages that are displayed in a tree view.

Fit Column Width Lets you adjust the selected column in the messages list so that nothing is hidden.

Fit All Columns Lets you adjust the columns in the messages list so that nothing is hidden.

Lock Scrolling Lets you configure the scrolling behavior of the messages list. If disabled, the messages list automatically scrolls to new messages. Otherwise, the messages list does not scroll when new messages are added.

Reset Columns Lets you reset the layout of the messages list.

Show Columns Lets you show or hide columns in the messages list.

Show Filter Panel Lets you show or hide the filter panel with the filter buttons and the search field.

Show Message Lets you show the selected message in a dialog.

Tree View Lets you display messages in a tree view or a list without hierarchy levels.

Minors

Access

You can access this command via:

Ribbon	Home – Differences
Context menu of	None
Shortcut key	None
Icon	≈

Purpose

To determine whether to consider specific minor differences as differences.

Description

You can specify sets of minor differences with specific AUTOSAR properties that are to be considered as minor differences of compared AUTOSAR elements.

Use File – Options to open the Options dialog and select the Minor Differences page. The options also let you select a default minor differences set, which is selected for each new comparison session.

You can select one of the available minor differences sets on the ribbon to be used when Minors is enabled.

Result

The specified minor differences are not considered as differences if you enable minor differences.

Move Element Here

Access

You can access this command via:

Ribbon	None
Context menu of	Tip (💡)
Shortcut key	None
Icon	None

Purpose

To move an element you matched to the branch of its match.

Description

You can match AUTOSAR elements that reside in different branches of the AUTOSAR tree, e.g., if an element is part of different AUTOSAR packages in the compared files. When you match elements, a 💡 icon indicates additional commands for the matched element. The **Move Element Here** command lets you move the matched element to the indicated location.

Result

The element is moved to the location that is indicated by the 💡 icon.

New Session

Access

You can access this command via:

Ribbon	File
Context menu of	None
Shortcut key	None
Icon	

Purpose

To open a new comparison page in the working area.

Result

dSPACE AUTOSAR Compare opens a new comparison page for loading and comparing AUTOSAR files.

Next

Access

You can access this command via:

Ribbon	Home – Differences
Context menu of	None
Shortcut key	`Ctrl+N`
Icon	

Purpose

To navigate to the next difference found on the active comparison page.

Result

The next difference is selected.

Options Dialog

Access

You can access this command via:

Ribbon	File
Context menu of	None
Shortcut key	None
Icon	

Purpose

To specify options for using dSPACE AUTOSAR Compare.

Result

The Options dialog opens.

User Settings page

To share settings and to copy demo files.

Export Settings Lets you export the user settings to a UCD file.
You can exchange the file with other users or use it on other PCs to work with consistent settings. The user settings comprise the layout of the main window, the Message pane, etc.

Import Settings Lets you import a UCD file to use the user settings of another user or from another PC.

You have to restart dSPACE AUTOSAR Compare to apply the imported user settings.

Note

Any changes you made to the user settings since the last startup are discarded.

Reset All Settings Lets you reset the user settings to the default values.
You have to restart dSPACE AUTOSAR Compare for the changes to take effect.

Note

Any changes you made to the user settings are discarded.

Copy Demos Lets you copy the product demos to the Documents folder.
The product demos are copied to the Documents folder during installation. You can use the command to restore demo files in case you modified or deleted them.

Minor Differences

Minor Differences Sets Lets you manage minor differences sets and select a minor differences set for editing.

Command	Description
	Lets you select a minor differences set from the list of available sets. You can view and edit selected sets.
	Lets you create a new minor differences set. The created set is selected and you can edit it.
	Lets you remove the selected minor differences set.
	Lets you import minor differences sets from an XML file. The imported sets are added to the available sets.
	Lets you export all available minor differences sets to an XML file.

Configuration of the selected minor differences set Lets you specify which AUTOSAR element property to treat as minor differences.

Configuration	Description
Name	Lets you specify a name for the selected minor differences set.
Description	Lets you specify a description for the selected minor differences set.
Properties	Lets you specify a list of AUTOSAR properties to treat as minor differences when the selected minor differences set is active. The Add command adds a row to the Properties list. You can select from all properties that are defined according to AUTOSAR. The Remove command lets you remove a row from the list.

Default Minor Differences Set Lets you select one of the available minor differences sets as the default set.

The default set is active when you start new comparison sessions with dSPACE AUTOSAR Compare. However, it is not activated if the command line is used to compare files.

General

Lets you specify options for the general behavior of dSPACE AUTOSAR Compare.

Start Page Lets you select whether the Start Page is shown when dSPACE AUTOSAR Compare opens.

The Start Page lets you access recent comparison sessions, dSPACE Help, videos, the support center, and the product demos.

Tip

You can view the Start Page if dSPACE AUTOSAR Compare is open and you select View – Show – Start Page on the ribbon.

Copy Continuation Lets you select whether a dialog is shown if you copy elements that reference other elements.

If selected, copy continuation is always skipped and no dialog is displayed.

If not selected, a dialog asks you if you want to copy referenced elements as well.

Compare Colors

Lets you select individual colors for displaying differences in the UI.

dSPACE AUTOSAR Compare marks differences with colored change bars and scroll bars. The text of names and values is colored as well as the background of the session page. The selected colors are used with different levels of opacity.

Compare Colors You can select colors for the following differences:

Kind	Description
Differences	To highlight elements that differ or are orphans in the compared files.
Missing	To highlight parts where orphan elements of the other file are missing.
Minor differences	To highlight properties that are regarded as minor differences according to the active minor differences set.

Rule-Based Merge

Lets you specify settings for merging files with rule configurations.

Rule-Based Merge Directory Lets you select a directory with rule configuration files (XRS). You can select each file for rule-based merging from the ribbon at Home – Merge – Rule-Based – <Filename>.

Previous

Access

You can access this command via:

Ribbon	Home – Differences
Context menu of	None
Shortcut key	`Ctrl+P`
Icon	

Purpose

To navigate to the previous difference found on the active comparison page.

Result

The previous difference is selected.

Refresh References

Access

You can access this command via:

Ribbon	None
Context menu of	AUTOSAR root node on a comparison page
Shortcut key	None
Icon	None

Purpose

To refresh the displayed target AUTOSAR path of references after copying elements with different short names or moving elements across branches.

Result

dSPACE AUTOSAR Compare displays the updated target AUTOSAR path of references.

Reload

Access

You can access this command via:

Ribbon	Home – View
Context menu of	None

Shortcut key	F5
Icon	

Purpose

To reload AUTOSAR files of a comparison session.

Description

The ribbon provides split buttons that let you reload only the left-hand or the right-hand AUTOSAR file.

Result

All unsaved changes are discarded.

Rule-Based

Access

You can access this command via:

Ribbon	Home – Merge
Context menu of	None
Shortcut key	None
Icon	

Purpose

To merge AUTOSAR files using a rule configuration file.

Description

Rule configuration files let you merge AUTOSAR files in a rule-based process.

The command provides the following split-buttons:

- **Select and Run File**: Lets you select a rule configuration file from the file system.
- **<File Name>**: Lets you select a rule configuration from a specific directory, which you can configure in the **Options** dialog.

  To specify the directory, use **File – Options** to open the **Options** dialog and select the **Rule-Based Merge** page.

Result

The files are merged.

Same

Access

You can access this command via:

Ribbon	Home – Differences
Context menu of	None
Shortcut key	None
Icon	

Purpose

To view only identical AUTOSAR elements on a comparison page.

Result

Different elements on a comparison page in the working area are hidden.

Save

Access

You can access this command via:

Ribbon	File
Context menu of	Comparison page
Shortcut key	`Ctrl+S`
Icon	

Purpose

To save the active file of a comparison session.

Result

The AUTOSAR file is saved to disk.

Save As

Access

You can access this command via:

Ribbon	File
Context menu of	None
Shortcut key	None
Icon	None

Purpose To save the active file of a comparison session under a new name.

Result The file is saved under the specified name.

Save Difference Report

Access You can access this command via:

Ribbon	Home – Report
Context menu of	None
Shortcut key	None
Icon	

Purpose To save an XML report of a comparison session.

Description The report file contains information on the location of the compared AUTOSAR files and a hierarchical structure of the differences.

Result A report file is saved.

Save Merge Report

Access You can access this command via:

Ribbon	Home – Report
Context menu of	None
Shortcut key	None
Icon	

Purpose To save an XML report of a rule-based merge process.

Description

The report file contains information on the involved files, applied rule configuration file items, performed actions, and the number of AUTOSAR elements that were found by queries of the rule configuration.

Result

A report file is saved.

Search

Access

You can access this command via:

Ribbon	Home – View
Context menu of	None
Shortcut key	`Ctrl+F`
Icon	

Purpose

To find AUTOSAR elements on a comparison page.

Description

dSPACE AUTOSAR Compare displays a search field that lets you enter a string to search for. You can limit the results to one of the AUTOSAR files.

Result

dSPACE AUTOSAR Compare highlights all occurrences of the search string on the active comparison page.

Show Pages

Access

You can access this command via:

Ribbon	View – Working Area
Context menu of	None
Shortcut key	None
Icon	

Purpose

To activate a page in the working area.

Description You can select one of the available pages in the working area to activate it.

Result The selected page is activated in the working area.

Show Panes

Access You can access this command via:

Ribbon	View – Panes
Context menu of	None
Shortcut key	None
Icon	

Purpose To show or hide panes, such as the Messages pane.

Result The selected pane is shown or hidden.

Show Start Page

Access You can access this command via:

Ribbon	View – Show
Context menu of	None
Shortcut key	None
Icon	

Purpose To show the Start page in the working area.

Description

The **Start Page** lets you access recent comparison sessions, dSPACE Help, videos, the support center, and the product demos.

Tip

You can configure dSPACE AUTOSAR Compare to show the Start page when it is opened. Use **File – Options** to open the **Options** dialog and select the **General** page.

Result

The Start page is shown in the working area.

Split Horizontally

Access

You can access this command via:

Ribbon	View – Working Area
Context menu of	None
Shortcut key	None
Icon	

Purpose

To view multiple pages at the same time.

Result

The active page is split horizontally and displays two pages at the same time in the upper and lower parts.

Split Vertically

Access

You can access this command via:

Ribbon	View – Working Area
Context menu of	None
Shortcut key	None
Icon	

Purpose To view multiple pages at the same time.

Result The active page is split vertically and displays two pages at the same time on the left-hand and on the right-hand side.

Status Bar

Access You can access this command via:

Ribbon	View – Show
Context menu of	None
Shortcut key	None
Icon	None

Purpose To show or hide a status bar.

Result A status bar is shown or hidden.

Swap

Access You can access this command via:

Ribbon	Home – View
Context menu of	None
Shortcut key	None
Icon	

Purpose To swap the AUTOSAR files on a comparison page.

Result The compared files swap sides.

Unmatch

Access

You can access this command via:

Ribbon	None
Context menu of	Tip (💡)
Shortcut key	None
Icon	None

Purpose

To unmatch elements that reside in different branches of the AUTOSAR tree.

Description

You can match AUTOSAR elements that reside in different branches of the AUTOSAR tree, e.g., if an element is part of different AUTOSAR packages in the compared files. When you match elements, a 💡 icon indicates additional commands for the matched element. The **Unmatch** command lets you cancel the matching of elements.

Result

The elements are orphan elements.

Using Rule Configuration Files

Where to go from here

Information in this section

Basics on Rule-Based Merging

Introduction

dSPACE AUTOSAR Compare lets you merge AUTOSAR files automatically based on rules, which you can specify in rule configuration files.

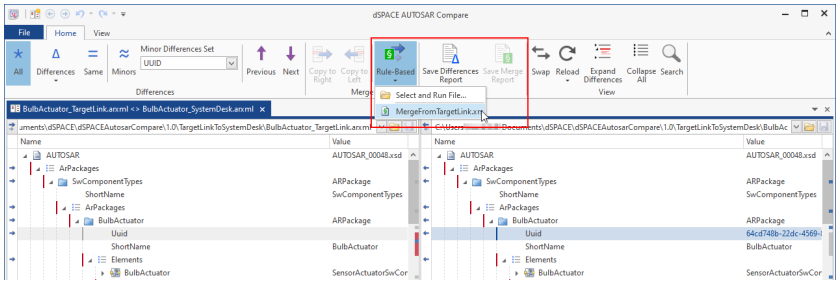
Creating rule configuration files

To create and edit rule configuration files, it is recommended to use an XML editor that provides syntax highlighting, support for adding XML elements and attributes, and that lets you validate files according to the provided XSD schema.

To create a rule configuration file, you can use the `MergeFromTargetLink.xrs` demo file as a template. You can find it in the `RuleSets` subfolder of the dSPACE AUTOSAR Compare installation folder. The `RuleSet_1-0-0.xsd` schema file for rule configurations is located in the `Schemas` subfolder of the dSPACE AUTOSAR Compare installation folder.

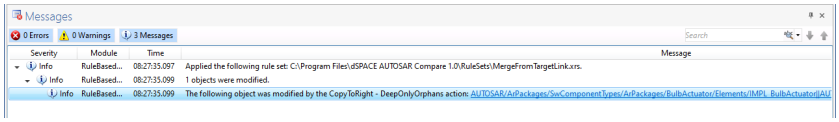
Executing rule-based merging

You can select a rule configuration file from the ribbon after creating a comparison session and loading AUTOSAR files.



dSPACE AUTOSAR Compare searches for rule configuration files in the `RuleSets` subfolder of the installation folder by default. You can select a folder using **File – Options – Rule-Based Merge**.

The selected rule configuration is executed and the files are merged as specified in the rule configuration. dSPACE AUTOSAR Compare writes information on the performed actions to the **Messages** pane. You can save an XML report of the rule-based merge using **Home – Save – Save Merge Report**. Refer to the following illustration, which shows messages allowing you to track the rule-based merge process.



Related topics

References

Save Difference Report 54

Basics on Rule Configuration File Structure

Introduction

Rule configuration files contain XML elements that let you search for AUTOSAR elements, copy elements, and perform other tasks that are required for the rule-based merging of AUTOSAR files.

RuleSet

A **RuleSet** is the root element of a rule configuration file. It contains a collection of **WorkItem** elements that are processed in the order in which they are defined.

A **RuleSet** also lets you define the following elements:

- Global queries to for search for elements. You can reference the queries in multiple **WorkItem** elements.
- Match rules, which let you specify conditions for matching orphan elements of different branches of the AUTOSAR tree.
- Dependency definitions, which let you specify dependencies between AUTOSAR elements that are taken into account when they are merged.

Refer to the following example:

```
<RuleSet >
    <GlobalQueries/>
    <MatchRules/>
    <DependencyDefinitions/>
    <WorkItems>
        ...
    </WorkItems>
</RuleSet>
```

WorkItem

You can use **WorkItem** elements to specify tasks to perform. The **WorkItem** elements let you select elements with queries and specify an action that is performed on the selected AUTOSAR elements.

Refer to the following example:

```
<WorkItem Name="CopyOrphans">
    <Description>To copy orphan elements to the other
file.</Description>
    <Query>
        ...
    </Query>
    <Action>
        ...
    </Action>
</WorkItem>
```

Query

A query is a condition that is applied to the AUTOSAR tree of each file and selects the elements that fulfill the condition. Conditions can be nested.

You can use the following kinds of conditions:

- Conditions that only check elements for a specific characteristic, e.g., if the element is part of a collection.
- Conditions that check if the characteristic of an element has a specific value, e.g., if the value of a property is included in a specified list of strings. The conditions have specific names that indicate the type of value that is checked. Conditions that check for Boolean values start with **Is**. Conditions that check if a value is included in a specified list of strings start with **With**.
- Conditions that check for relations to other elements, e.g., if an element has child elements of a specific type or if an element is referenced by specific properties of other elements. These conditions are nested, i.e., they can have subconditions that are applied to related elements.

- Conditions that act as logical operators, such as the logical AND operator. These conditions let you combine other conditions.

Refer to the following example:

```
<AND>
    <IsOrphan/>
    <HasParent>
        <Where>
            <NOT>
                <IsOrphan/>
            </NOT>
        </Where>
    </HasParent>
    <WithRole>
        <PossibleValues>
            <Value>Uuid</Value>
            <Value>Desc</Value>
            <Value>AdminData</Value>
        </PossibleValues>
    </WithRole>
</AND>
```

Action

You can specify actions to resolve the differences that you find in AUTOSAR files.

You can use the following kinds of actions:

- Copy or move selected elements, e.g., you can copy specific elements from the right-hand file to the left-hand file.
- Ignore elements.
- Delete orphan elements.
- Report errors or unsolved differences.

Refer to the following example:

```
<Action>
    <CopyOrphan CopyKind="Deep"/>
</Action>
```

Using the RuleSet reference

The dSPACE AUTOSAR Compare documentation provides a reference part with a representation of the rule configuration file schema. It provides descriptions of all the elements and attributes that you can use to specify rule-based AUTOSAR file merging.

Refer to Elements of Rule Configuration Files on page 71.

Writing Rule Configuration Files

Where to go from here

Information in this section

Selecting TargetLink Files

Introduction

To merge AUTOSAR elements that were edited with TargetLink, you have to identify the file of a comparison session that was exported from TargetLink.

Root comments

The dSPACE tools TargetLink and SystemDesk write an XML comment to the root of exported files. Refer to the following example.

```
<?xml version="1.0" encoding="utf-8"?>
<!--Created with dSPACE TargetLink 5.1-->
<AUTOSAR xsi:schemaLocation="http://autosar.org/schema/r4.0 AUTOSAR_00048.xsd" ...>
  <AR-PACKAGES>
    <AR-PACKAGE>
      <SHORT-NAME>SwComponentTypes</SHORT-NAME>
      <AR-PACKAGES>
        <AR-PACKAGE>
          <SHORT-NAME>BulbActuator</SHORT-NAME>
          <ELEMENTS>
          </ELEMENTS>
      </AR.PACKAGE>
  </AR-PACKAGES>
</AUTOSAR>
```

Query for root comments

You can use a query to determine the file authoring tool with the help of root comments. Refer to the following listing.

```
<GlobalQuery Name="SelectTargetLink">
  <Description>Query to determine TargetLink files.</Description>
  <Query>
    <WithRootComment Side="ExclusiveOne">
      <PossibleValues IsRegEx="true">
        <Value>Created with dSPACE TargetLink</Value>
      </PossibleValues>
    </WithRootComment>
  </Query>
</GlobalQuery>
```

Selecting elements in a TargetLink file

You can add the condition that the elements must reside in a file created by TargetLink to the query of each WorkItem that copies elements. Refer to the following listing.

```
<Query>
    <AND>
      <IsSatisfyingGlobalQuery InheritSelectedSide="true">
        <Name>SelectTargetLink</Name>
      </IsSatisfyingGlobalQuery>
      ...
  </AND>
</Query>
```

Reporting errors

If both files that are selected in a comparison session were created with TargetLink or no file was created with TargetLink, you can have dSPACE AUTOSAR Compare display an error message. Refer to the following listing.

```
<WorkItem Name="CheckOneSideIsTargetLink">
  <Description>Displays an error message if no or both sides were created by
TargetLink (i.e., merge direction is unknown).</Description>
  <Query>
    <NOT>
      <IsSatisfyingGlobalQuery>
        <Name>SelectTargetLink</Name>
      </IsSatisfyingGlobalQuery>
    </NOT>
  </Query>
  <Action>
    <ReportCritical>
      <Message>Could not determine the merge direction. Make sure that one file
was created by dSPACE TargetLink and the other file is not.</Message>
    </ReportCritical>
  </Action>
</WorkItem>
```

Copying Specific Elements

Introduction

To write a WorkItem that copies specific elements.

Merge implementations from TargetLink

TargetLink is the dSPACE authoring tool for SWC implementations. Therefore, one task for merging ARXML files in round-trip between TargetLink and SystemDesk, is to merge TargetLink implementation elements with SystemDesk architecture ARXML files.

```
<WorkItem Name="Implementations">
  <Description>Merges created SwcImplementation objects.</Description>
  <Query>
    <AND>
      <IsSatisfyingGlobalQuery InheritSelectedSide="true">
        <Name>SelectTargetLink</Name>
      </IsSatisfyingGlobalQuery>
      <WithType>
        <PossibleValues>
          <Value>SwcImplementation</Value>
        </PossibleValues>
      </WithType>
      <NOT>
        <IsOrphan Side="AtLeastOther" />
      </NOT>
    </AND>
  </Query>
  <Action>
    <CopyFromSelected CopyKind="DeepOnlyOrphans" />
  </Action>
</WorkItem>
```

Copying referenced elements

You can recursively copy elements that are referenced by elements which were already copied. This lets you copy all elements referenced by a copied

implementation, such as an internal behavior and the elements it references. Refer to the following listing.

```
<WorkItem Name="RequiredObjects" RepeatWhileChanged="true">
  <Description>Merges all objects that are required by any of the
merged objects.</Description>
  <Query>
    <AND>
      <IsSatisfyingGlobalQuery InheritSelectedSide="true">
        <Name>SelectTargetLink</Name>
      </IsSatisfyingGlobalQuery>
      <IsOrphan Side="AtLeastSelected" />
      <HasReferenceFromProperty>
        <Where>
          <AND>
            <NOT>
              <IsAnyDifference />
            </NOT>
            <HasParent Depth="-1">
              <Where>
                <IsResolvedDifference />
              </Where>
            </HasParent>
          </AND>
        </Where>
      </HasReferenceFromProperty>
    </AND>
  </Query>
  <Action>
    <CopyFromSelected CopyKind="Deep" />
  </Action>
</WorkItem>
```

Matching Elements

Introduction

You can match orphan elements that reside in different branches of the AUTOSAR tree to compare them. In rule configurations, DirectMatchRule and IndirectMatchRule elements let you specify conditions for matching elements.

Direct matching

In the following example, constant specification mappings are directly matched according to the referenced application data type constants.

```
<DirectMatchRule Name="MatchConstantSpecificationMappings">
  <Description>Matches ConstantSpecificationMapping objects that reference the
same ConstantSpecification objects in the applConstant role.</Description>
  <Type>ConstantSpecificationMapping</Type>
  <Property>ApplConstantRef/TargetPath</Property>
</DirectMatchRule>
```

Indirect matching

In the following example, constant specifications are indirectly mapped. The mapping is performed according to a reference of constant specification mappings.

```
<IndirectMatchRule Name="AlignImplConstants">
  <Description>Aligns ConstantSpecification objects that are referenced in the
implConstant role of aligned ConstantSpecificationMapping objects.</Description>
  <Query>
    <AND>
      <WithRole>
        <PossibleValues>
          <Value>ImplConstantRef</Value>
        </PossibleValues>
      </WithRole>
      <HasParent>
        <Where>
          <WithType>
            <PossibleValues>
              <Value>ConstantSpecificationMapping</Value>
            </PossibleValues>
          </WithType>
        </Where>
      </HasParent>
    </AND>
  </Query>
</IndirectMatchRule>
```

Comparison example Consider the following comparison example:

Left-Hand File	Right-Hand File
PackageA ConstantSpecificationMapping	
PackageB ImplConstRef = PackageA/ConstantSpecificationMapping	PackageB ImplConstRef = PackageC/ConstantSpecificationMapping
	PackageC ConstantSpecificationMapping

The `AlignImplConstants` query searches the referenced constant specification mappings and matches them.

Elements of Rule Configuration Files

Where to go from here

Information in this section

RuleSet

Short description

Defines the rules for the automatic synchronization of two ARXML files.

Attributes

Name	Short Description	Type	Required
Version	Version of the RuleSet file. Required for the upgrade mechanism.	String	✓

Child elements

Name	Short Description	Multiplicity
GlobalQueries	List of queries that can be reused by other queries.	1
GlobalQuery	Specifies an identifiable condition for matching elements that can be used, e.g., in WorkItems. Refer to GlobalQuery on page 73.	0-*
MatchRules	Rules for aligning and matching AUTOSAR objects that are not aligned by the default comparison behavior.	1
AbstractMatchRuleGroup	Specifies match rules: ▪ DirectMatchRule ▪ IndirectMatchRule Refer to AbstractMatchRuleGroup on page 80.	0-*
DependencyDefinitions	List of dependencies that the automatic synchronization must consider to ensure data integrity.	1
DependencyDefinition	Specifies a dependency. Refer to DependencyDefinition on page 81.	0-*
WorkItems	List of items that define how the automatic synchronization finds and resolves differences.	1
WorkItem	Specifies a WorkItem. Refer to WorkItem on page 73.	0-*

GlobalQuery

Short description

Identifiable element to select matching elements.

Attributes

Name	Short Description	Type	Required
Name	Lets you specify an identifier for the GlobalQuery. Names must be unique in a RuleSets.	String	✓

Child elements

Name	Short Description	Multiplicity
Description	Lets you specify text that describes the purpose of the GlobalQuery.	1
Query	Specifies a condition for matching elements. Refer to AbstractConditionGroup on page 74.	1

WorkItem

Short description

Defines how the automatic synchronization finds and resolves differences.

Attributes

Name	Short Description	Type	Required
Name	Lets you specify an identifier for the WorkItem. Names must be unique in a RuleSets.	String	✓
RepeatWhileChanged	If set to true, this item must be repeated until the result is stable (no new matching differences are discovered).	Boolean	- Default: false

Child elements

Name	Short Description	Multiplicity
Description	Lets you specify text that describes the purpose of the WorkItem.	1
Query	Specifies a condition for matching elements. Refer to AbstractConditionGroup on page 74.	1
Action	Specifies an action for matching elements. Refer to AbstractActionGroup on page 78.	1

AbstractConditionGroup

Short description

Group of all possible conditions.

GenericBoolCondition

Group of Boolean conditions. They return true or false. Conditions have no further constraints.

The group has the following members:

IsAnyDifference Returns true if a difference is found in this object or its low-level objects.

IsCollection Returns true if the element is a collection.

IsCollectionElement Returns true if the element is a child of a collection.

IsDifference Returns true if the element differs from the comparison element.

IsIndirectDifference Returns true if the element itself is the same but differences exist in its lower-level objects.

IsMinorDifference Returns true if the element is defined as a minor difference.

IsOrderedCollection Returns true if the element is an ordered collection.

IsOrderedCollectionElement Returns true if the element is a child of an ordered collection.

IsOrphan Returns true if one side of the element does not exist. Constraints can be used to restrict the result.

The element has the following attributes:

- The Side attribute of the ConditionSideEnum type with the default value AtLeastOne. For more information, refer to ConditionSideEnum on page 82.

IsReferenceProperty Returns true if the element is a property of Ref kind.

IsResolvedDifference Returns true if the element was resolved before by this automatic synchronization.

The element has the following child elements:

Name	Short Description	Multiplicity
ResolvedBy	Constraint for the WorkItem name that was used to resolve the element. The element is of the PossibleValues type. Refer to PossibleValues on page 81.	0-1
ResolvedWith	Constraint for the action that was used to resolve the element. See AbstractActionGroup for all possible actions. The element is of the PossibleValues type. Refer to PossibleValues on page 81.	0-1

IsSatisfyingGlobalQuery Returns true if the referenced GlobalQuery returns true.

The element has the following attributes:

- The **InjectSelectedSide** attribute of the Boolean type with the following short description: If set to 'true', the referenced GlobalQuery uses the selected side defined in this query.
- The **InheritSelectedSide** attribute of the Boolean type with the following short description: If set to 'true', this query uses the side selected in the referenced GlobalQuery if the GlobalQuery returns true.

The element has the following child elements:

Name	Short Description	Multiplicity
Name	Lets you specify the name of a global query that is defined in the **RuleSet**. Refer to RuleSet on page 72.	1

IsSplittable Returns true if the element is a splittable AUTOSAR object (i.e., the atpSplitable stereotype exists).

IsValueType Returns true if the element is a primitive value type (e.g., string, enum, Boolean, numerical types).

GenericNavigationQuery

All elements of the **GenericNavigationQuery** group have the following attributes:

- The **Depth** attribute of Integer type with the following short description: Defines how many times the navigation is repeated until a valid target is found (e.g., the parent of parent). A value smaller than 1 implies infinity.
- The **Side** attribute of the ConditionSideEnum type with the default value **AtLeastOne**. For more information, refer to ConditionSideEnum on page 82.

All elements of the **GenericNavigationQuery** have the following child elements:

Name	Short Description	Multiplicity
Where	Lets you specify a condition of the **AbstractConditionGroup** that must be fulfilled. Refer to SubCondition on page 78.	0-1

See the following entries for specific descriptions of the members of the **GenericNavigationQuery** group.

HasChild Returns true if the element has at least one child element. Constraints can be used to restrict the result.

HasDependencyFrom Returns true if another object depends on this object due to a DependencyDefintion. Constraints can be used to restrict the result.

The element has the following child elements:

Name	Short Description	Multiplicity
AccordingTo	Constraint for DependencyDefintion name.	0-1

HasDependencyTo Returns true if this object depends on another object due to a DependencyDefintion. Constraints can be used to restrict the result.

The element has the following child elements:

Name	Short Description	Multiplicity
AccordingTo	Constraint for DependencyDefintion name.	0-1

HasMatch Returns true if the element is matched with another element, with different parent elements, due to a defined MatchRule. Constraints can be used to restrict the result.

The element has the following child elements:

Name	Short Description	Multiplicity
AccordingTo	Constraint for the MatchRule name.	0-1

HasParent Returns true if a parent element exists. Constraints can be used to restrict the result.

HasReferenceFromObject Returns true if the element is referenced by another AUTOSAR object. Constraints can be used to restrict the result. The Where condition is checked on the object with the reference property.

The element has the following child elements:

Name	Short Description	Multiplicity
ByProperty	Constraint for the AUTOSAR role.	0-1

HasReferenceFromProperty Returns true if the element is referenced by another AUTOSAR object. Constraints can be used to restrict the result. The Where condition is checked on the reference property.

HasReferenceTo Returns true if the element has a reference property that references another AUTOSAR object. Constraints can be used to restrict the result.

The element has the following child elements:

Name	Short Description	Multiplicity
ByProperty	Constraint for the AUTOSAR role.	0-1

HasSibling Returns true if any elements exist on the same hierarchy level. Constraints can be used to restrict the result.

HasTarget Returns true if the element is an AUTOSAR reference property and a referenced AUTOSAR object exists. Constraints can be used to restrict the result.

GenericValueCondition

Group of value conditions. They check certain properties for valid or invalid values.

All elements of the GenericValueCondition group have the following attributes:

- The Side attribute of the ConditionSideEnum type with the default value AtLeastOne. For more information, refer to ConditionSideEnum on page 82.

All elements of the GenericValueCondition group have the following child elements:

Name	Short Description	Multiplicity
PossibleValues	Defines a list of valid or invalid values. Refer to PossibleValues on page 81.	1

See the following entries for specific descriptions of the members of the GenericValueCondition group.

WithRootComment Returns true if the element belongs to an AUTOSAR file that has at least one XML comment above the AUTOSAR root element. Constraints can be used to define valid and invalid content of the XML comment.

WithName Returns true if a name exists for the element. The name of an AUTOSAR Referrable object is defined by its shortName. For elements of a collection, the name is defined as their index in the collection (e.g., [1]). Otherwise, the name is defined as the ARXML XML element (i.e., the role). For collections, the role name might be extended with an 's'. Constraints can be used to define valid and invalid names.

WithRole Returns true if the AUTOSAR role exists. Constraints can be used to define valid and invalid roles.

WithType Returns true if the AUTOSAR type exists. Also checks inherited types based on the AUTOSAR metamodel. Constraints can be used to define valid and invalid types.

WithValue Returns true if the value exists. For nonValueType objects the type name is used as the value. The value of the root is the AUTOSAR schema version. Constraints can be used to define valid and invalid values.

Logical condition

Group of logical conditions that let you specify expressions to combine conditions.

The group has the following members:

AND Logical And operator. Returns true if all subconditions are true.

The element has the following child elements:

Name	Short Description	Multiplicity
AbstractConditionGroup	Lets you specify a condition of the AbstractConditionGroup that must be fulfilled. The conditions are listed in this topic.	1-*

NOT Logical Not operator. Inverts the result of the subcondition.

The element has the following child elements:

Name	Short Description	Multiplicity
AbstractConditionGroup	Lets you specify a condition of the AbstractConditionGroup that must be fulfilled. The conditions are listed in this topic.	1

OR Logical Not operator. Inverts the result of the subcondition.

The element has the following child elements:

Name	Short Description	Multiplicity
AbstractConditionGroup	Lets you specify a condition of the AbstractConditionGroup that must be fulfilled. The conditions are listed in this topic.	1-*

SubCondition

Short description

Additional checks that a found object must pass.

Child elements

Refer to AbstractConditionGroup on page 74.

AbstractActionGroup

Short description

Group of all possible actions.

Group elements

The group has the following members:

CopyLeft Copies from right to left.

The element can have the following attributes:

- The CopyKind attribute of the CopyKindEnum type with the default value Minimal. For more information, refer to CopyKindEnum on page 83.

CopyFromSelected Copies from the selected side to the opposite side. A side must already have been selected, e.g., based on a Side attribute that is set to 'ExclusiveOne'.

The element can have the following attributes:

- The CopyKind attribute of the CopyKindEnum type with the default value Minimal. For more information, refer to CopyKindEnum on page 83.

CopyOrphan Copies from the side with an element to the side without any element. If this is applied on a non orphan difference an error occurs.

The element can have the following attributes:

- The CopyKind attribute of the CopyKindEnum type with the default value Minimal. For more information, refer to CopyKindEnum on page 83.

CopyRight Copies from left to right.

The element can have the following attributes:

- The CopyKind attribute of the CopyKindEnum type with the default value Minimal. For more information, refer to CopyKindEnum on page 83.

CopyToSelected Copies to the selected side from the opposite side. A side must already have been selected, e.g., based on a Side attribute that is set to 'ExclusiveOne'.

The element can have the following attributes:

- The CopyKind attribute of the CopyKindEnum type with the default value Minimal. For more information, refer to CopyKindEnum on page 83.

Ignore Keeps the difference and marks it as 'not to resolve'.

MoveFromSelected Can be executed only on matched objects. Moves the object on the unselected side to a new parent in its tree so it is aligned with the selected side. A side must already have been selected, e.g., based on a Side attribute that is set to 'ExclusiveOne'.

MoveToLeft Can be executed only on matched objects. Moves the object on the left-hand side to a new parent in its tree so it is aligned with the right-hand side.

MoveToRight Can be executed only on matched objects. Moves the object on the right-hand side to a new parent in its tree so it is aligned with the left-hand side.

MoveToSelected Can be executed only on matched objects. Moves the object on the selected side to a new parent in its tree so it is aligned with the other side. A side must already have been selected, e.g., based on a Side attribute that is set to 'ExclusiveOne'.

DeleteOrphan Copies from the empty side to the side with elements (i.e., deletes the orphaned element on the other side). If this is applied on a non-orphaned difference, an error occurs.

RepeatPreviousAction Repeats a previously executed action. The action must be selected by a IsResolvedDifference condition. If the previous action chooses a dynamic side, the same side is used and not re-evaluated.

ReportCritical Aborts the automatic synchronization.

The element has the following child elements:

Name	Short Description	Multiplicity
ReturnValue	Defines the return value of the console application. Pattern: 1[0-9]{4}	0-1

Name	Short Description	Multiplicity
Message	Defines the message stating why the automatic synchronization was aborted.	0-1

ReportUnsolved Creates a message for this difference in the generated report file and marks it as 'not to resolve'.

AbstractMatchRuleGroup

Short description

Group of all possible match rules.

Group elements

The group has the following members:

DirectMatchRule Defines how two objects with the same type are matched on the basis of their properties.

The element must have the following attribute:

- The Name attribute of the string type.

The element has the following child elements:

Name	Short Description	Multiplicity
Description	Lets you specify text that describes the purpose of the DirectMatchRule.	1
Type	AUTOSAR type, e.g., ConstantSpecificationMapping or InvalidationPolicy.	1
Property	AUTOSAR property name. Can be a path if nested, e.g., Uuid or ApplConstantRef/TargetPath.	1-*

IndirectMatchRule Defines how two objects are matched if they are referenced by a common source.

The element must have the following attribute:

- The Name attribute of the string type.

The element has the following child elements:

Name	Short Description	Multiplicity
Description	Lets you specify text that describes the purpose of the IndirectMatchRule.	1
Query	Lets you specify a match rule. Refer to AbstractMatchRuleGroup.	1

DependencyDefinition

Short description

Defines dependencies for two orphaned AUTOSAR objects that are connected by an AUTOSAR reference property. The automatic synchronization considers dependencies to ensure data integrity.

You can define dependencies only for referrable elements, i.e., between an element with a reference property and the element of the target AUTOSAR path.

Attributes

Name	Short Description	Type	Required
Name	Lets you specify a name for the dependency definition.	String	✓
Direction	Defines the direction of the dependency relation with respect to the defining AUTOSAR reference property.	DependencyDirectionEnum on page 83	- Default: SourceToDest.

Child elements

Name	Short Description	Multiplicity
Description	Lets you specify a description for the dependency definition.	1
Query	Specifies a query that has to return the AUTOSAR reference property for the dependency definition. Refer to AbstractConditionGroup on page 74.	1

PossibleValues

Short description

Defines a list of valid or invalid values.

Attributes

Name	Short Description	Type	Required
Kind	Defines whether the provided values are valid or invalid candidates.	ValueListKindEnum on page 84	- Default: WhiteList

Name	Short Description	Type	Required
IsRegEx	If set to 'true', the values are interpreted as regular expressions. Otherwise, the values are compared as is.	Boolean	- Default: false
IsCaseSensitive	If set to 'true', the string comparison or regular expression evaluation is case-sensitive. Otherwise, it is case-insensitive.	Boolean	- Default: true

Child elements

Name	Short Description	Multiplicity
Value	Lets you specify a possible value.	1-*

Enumerations

ConditionSideEnum

Defines on which side of a comparison a condition is evaluated.

The following enumeration values are defined:

Name	Short Description
AtLeastLeft	The condition must be fulfilled on the left-hand side.
AtLeastOne	The condition must be fulfilled on at least one side.
AtLeastRight	The condition must be fulfilled on the right-hand side.
AtLeastSelected	The condition must be fulfilled on the selected side. A side must already have been selected, e.g., based on a Side attribute that is set to 'ExclusiveOne'.
BothSides	The condition must be fulfilled on both sides.
ExclusiveLeft	The condition must be fulfilled on the left-hand side and must not be fulfilled on the right-hand side.
ExclusiveRight	The condition must be fulfilled on the right-hand side and must not be fulfilled on the left-hand side.
None	The condition must not be fulfilled on either side.
ExclusiveOne	The condition must be fulfilled on one side and not on the other. The side on which it is fulfilled is considered the selected side.
AtLeastOther	The condition must be fulfilled on the unselected side. A side must already be selected, e.g., based on a Side attribute that is set to 'ExclusiveOne'.

Name	Short Description
ExclusiveOther	The condition must be fulfilled on the unselected side and must not be fulfilled on the selected side. A side must already have been selected, e.g., based on a Side attribute that is set to 'ExclusiveOne'.
ExclusiveSelected	The condition must be fulfilled on the selected side and must not be fulfilled on the unselected side. A side must already have been selected, e.g., based on a Side attribute that is set to 'ExclusiveOne'.

CopyKindEnum

Defines how to apply the Copy operation.

Value	Short Description
Deep	Copies the object and its descendants.
DeepOnlyOrphans	Copies the object and its orphan lower-level objects.
DeepOverwrite	Copies the object and its lower-level objects. Delete orphaned objects in the target.
Minimal	Copies only the object and the required lower-level objects.
SingleObject	Copies the object and all lower-level AUTOSAR Non-Referrable objects.
SingleObjectOnlyOrphans	Copies the object and all orphaned lower-level AUTOSAR Non-Referrable objects.
SingleObjectOverwrite	Copies the object and all lower-level AUTOSAR Non-Referrable objects. Deletes orphaned elements in the target.

Tip

The CopyKindEnum values correspond to the commands of the advanced copy command group. Refer to Advanced Copy on page 30.

DependencyDirectionEnum

Defines the direction of the dependency relation with respect to the defining AUTOSAR reference property.

Name	Short Description
DestToSource	If the destination object of the AUTOSAR reference property is copied, its source must also be copied. Ensure that all sources of an AUTOSAR Referrable object are copied.
SourceToDest	If the source object of the AUTOSAR reference property is copied, its destination must also be copied. Ensures that the reference keeps a valid target.

ValueListKindEnum

Defines whether the provided values are valid or invalid candidates.

Name	Short Description
Blacklist	Applies only to objects that do not match a value from this list.
Whitelist	Apply only to objects that match any value from this list.

Using the Command Line Interface

Where to go from here

Information in this section

Basics on the Command Line Interface

Introduction

You can use dSPACE AUTOSAR Compare in the Command window to compare and merge files in conjunction with other tools, such as SystemDesk, or in fully automated scenarios.

Executing dSPACEAutosarCompare.exe

The `dSPACEAutosarCompare.exe` file is located in the `Bin` folder of the installation. You can execute it in the Windows Command window to provide command line parameters. This lets you specify files to compare or with which to execute a rule-based merge process. As a result, the user interface of dSPACE AUTOSAR Compare opens. If the application is already running, dSPACE AUTOSAR Compare opens a new comparison session in the running application.

The command line interface (CLI) of the application is typically used in scenarios in which you want to compare or merge AUTOSAR files in another tool.

Executing dSPACEAutosarCompare.Console.exe

The `dSPACEAutosarCompare.Console.exe` file is located in the `Bin` folder of the installation. You can execute it in the Windows Command window to provide command line parameters. This lets you specify files to compare or with which to execute a rule-based merge process. As a result, dSPACE AUTOSAR Compare opens without displaying the user interface, performs the requested operations, and terminates. The console application returns an exit code that provides information on the execution. Messages of the console application are written to `stdout`. The console application supports running multiple instances simultaneously.

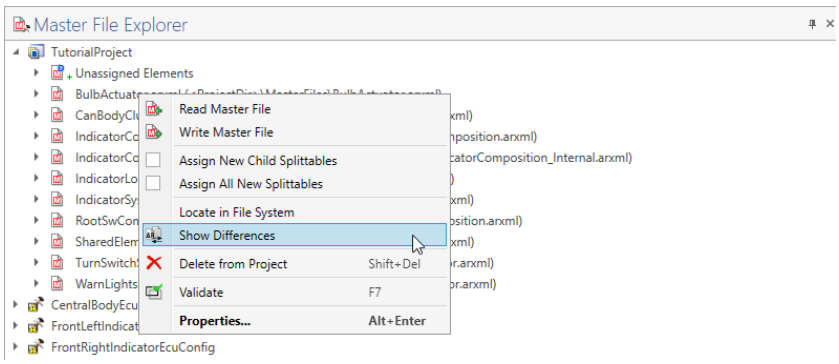
The command line interface (CLI) of the console application is typically used in fully automated scenarios in which AUTOSAR files are exchanged between tools.

Using dSPACE AUTOSAR Compare with SystemDesk

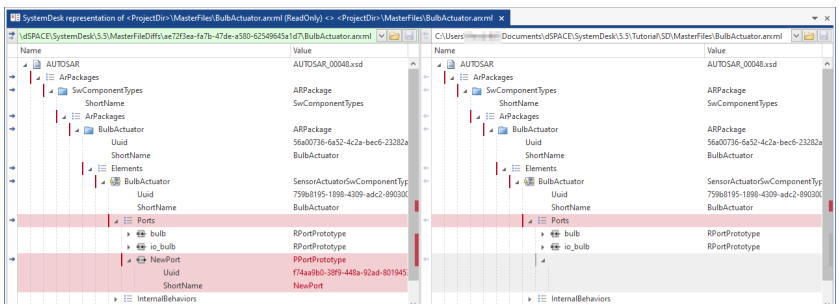
SystemDesk lets you store a project's AUTOSAR elements in AUTOSAR master files. Reading/writing a master file means exchanging a project's elements that are assigned to the master file with the file contents. This is useful for collaboration, version control, or standardization of elements.

The SystemDesk Master File Explorer lets you compare the contents of master files with the content of active SystemDesk projects. You can use dSPACE AUTOSAR Compare to perform the comparison.

The following illustration shows the Master File Explorer of SystemDesk with the master files of the Tutorial project.

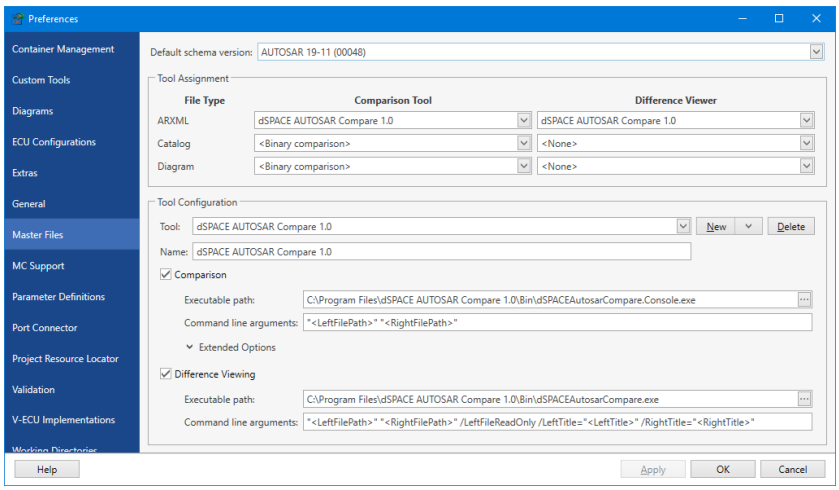


You can use the Show Differences command to compare the contents of the `BulbActuator.arxml` master file with the Tutorial project. The following illustration shows the ARXML files in dSPACE AUTOSAR Compare.



A new port was added to the BulbActuator SWC.

The preferences of SystemDesk let you specify the required command line parameters to use the command line interface of dSPACE AUTOSAR Compare.

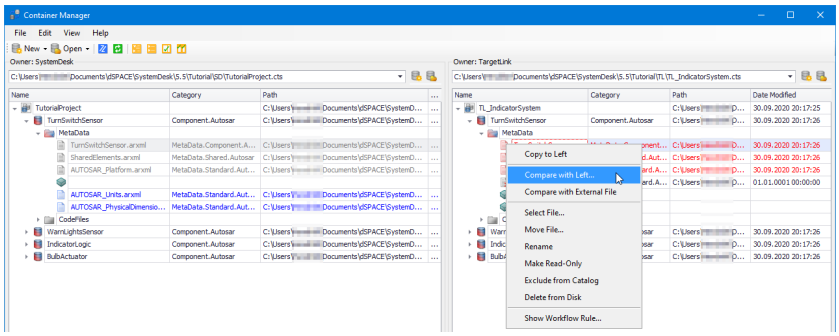


Using dSPACE AUTOSAR Compare with the Container Manager

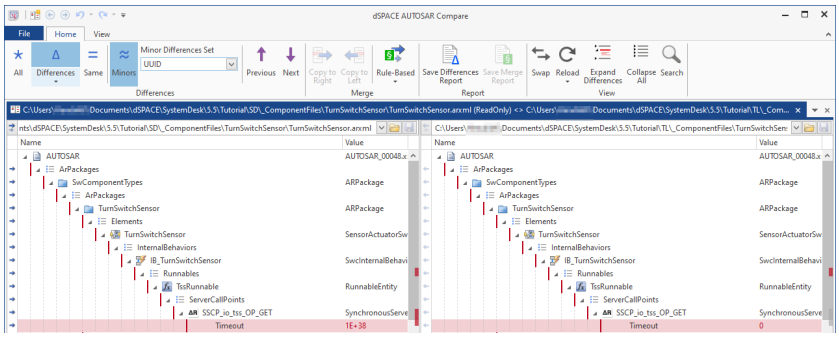
You can exchange software components (SWCs) between SystemDesk and TargetLink via SWC containers, which are a bundle of SWC-related files. The Container Manager lets you specify rules to perform file-based merging of SWC containers, e.g., which files are overwritten when you export an SWC container from TargetLink.

You can specify dSPACE AUTOSAR Compare to be used as a comparison tool for ARXML files of SWC containers. This lets you compare and merge SWC ARXML files in a round trip between SystemDesk and TargetLink.

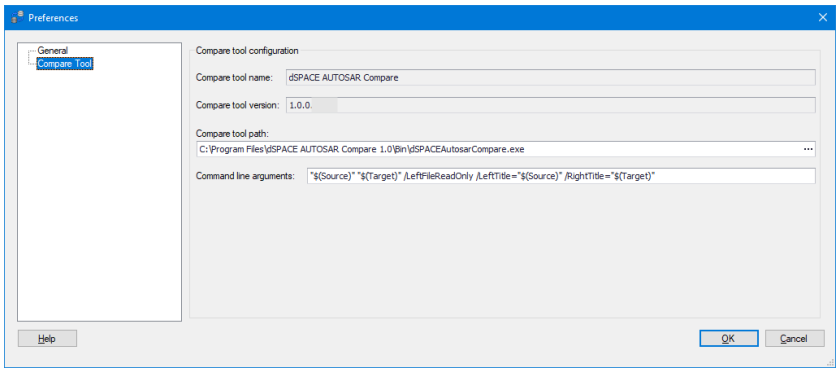
The following illustration shows SWC containers of the AR_PosControl demo in the Container Manager.



The **Compare with Left** command opens dSPACE AUTOSAR Compare to compare the ARXML files of the SWC containers.



The preferences of the Container Manager let you specify command line arguments for the comparison session. Refer to the documentation of the Container Manager, 🕮 Container Management Manual.



Comparing files (CLI)

Purpose

To compare AUTOSAR files using the command line interface of dSPACE AUTOSAR Compare.

Description

You can start dSPACE AUTOSAR Compare via the Command window to open a comparison session of the specified files. Optional arguments let you protect files, specify the minor differences set to apply, and save difference reports.

You can start dSPACE AUTOSAR Compare via the Command window with one file only. The optional arguments that are related to comparing and merging files are not supported in this case.

You can also use the Console application of dSPACE AUTOSAR Compare to compare files, save a report, and close the application without displaying the user interface. An exit code provides information on the outcome.

Command syntax	`dSPACEAutosarCompare.exe <left file> <right file>`
Optional arguments	You can use the following optional arguments: **/LeftTitle="<title>"** Lets you specify the left-hand title of the comparison page. The name of the left-hand file is the default title. **/RightTitle="<title>"** Lets you specify the right-hand title of the comparison page. The name of the right-hand file is the default title. **/LeftReadOnly** Lets you protect the left-hand file from changes. **/RightReadOnly** Lets you protect the right-hand file from changes. **/DiffReport="<file path>"** Lets you save a difference report to the specified file. **/MinorDifferencesName="<name>"** Lets you specify the name of the minor differences set to apply. The name of the differences set must be available in the options of dSPACE AUTOSAR Compare unless a difference configuration file is provided with the `/DiffConfig` argument. **/DiffConfig="<file path>"** Lets you specify a difference configuration file as an alternative to the specifications in the options of dSPACE AUTOSAR Compare.
Result	The user interface of dSPACE AUTOSAR Compare opens and displays a comparison page that shows the specified files. A difference report is stored if specified.

Command syntax (one file only)	`dSPACEAutosarCompare.exe <left file>`
	`dSPACEAutosarCompare.exe <left file> ""`
	`dSPACEAutosarCompare.exe "" <right file>`

Optional arguments	You can use the following optional arguments: **/LeftTitle="<title>"** (supported only if left-hand file is specified) Lets you specify the left-hand title of the comparison page. The name of the left-hand file is the default title. **/RightTitle="<title>"** (supported only if right-hand file is specified) Lets you specify the right-hand title of the comparison page. The name of the right-hand file is the default title. **/LeftReadOnly** (supported only if left file-hand file is specified) Lets you protect the left-hand file from changes. **/RightReadOnly** (supported only if right-hand file is specified) Lets you protect the right-hand file from changes.

Result

The user interface of dSPACE AUTOSAR Compare opens and displays a comparison page that shows the specified file.

Console syntax

```
dSPACEAutosarCompare.Console.exe <left file> <right file>
```

Optional arguments

You can use the following optional arguments:

/DiffReport="<file path>" Lets you save a difference report to the specified file.

/MinorDifferencesName="<name>" Lets you specify the name of the minor differences set to apply. The name of the differences set must be available in the options of dSPACE AUTOSAR Compare unless a difference configuration file is provided with the `/DiffConfig` argument.

/DiffConfig="<file path>" Lets you specify a difference configuration file as an alternative to the specifications in the options.

Result

dSPACE AUTOSAR Compare is started without displaying the user interface. The specified files are compared and a difference report is stored. The application terminates and an exit code is returned.

Exit codes

The following exit codes provide information on the application result.

Code	Description
General	
0	Successful execution. No differences found.
1	Fatal error during execution.
2	Not enough arguments specified.
3	No valid license found.
Compare	
100	Differences found.
101	Only minor differences found.
102	Invalid name of minor differences set specified.
Merge	
201	Failed merge.
202	Selected side invalid.
Files	
300	Error while accessing left-hand file.
301	Error while accessing right-hand file.
302	Left-hand file not found.

Code	Description
303	Right-hand file not found.
304	Cannot read left-hand file.
305	Cannot read right-hand file.
Configuration file	
400	Error while accessing configuration file.
401	Configuration file not found.
402	Cannot read configuration file.
Report files	
500	Difference report file path not valid.
501	Cannot create difference report file.
502	Merge report file path not valid.
503	Cannot create merge report file.
504	Difference report after merge file path not valid.
505	Cannot create difference report after merge file.
Output files	
600	Left-hand output file path not valid.
601	Right-hand output file path not valid.
602	Cannot create left-hand output file.
603	Cannot create right-hand output file.
Rule configuration file	
700	Error while accessing rule configuration file.
701	Rule configuration file not found.
702	Schema validation of rule configuration file failed.
User defined codes	
10000-19999	User-defined error.

Merging Files (CLI)

Purpose

To merge AUTOSAR files using the command line interface of dSPACE AUTOSAR Compare.

Description

You can start dSPACE AUTOSAR Compare via the Command window to open a comparison session and merge the specified files. Optional arguments let you save files and reports.

You can also use the Console application of dSPACE AUTOSAR Compare to merge and save files, and close the application without displaying the user interface. An exit code provides information on the outcome.

Command syntax

```
dSPACEAutosarCompare.exe <left file> <right file> /Rules="<file path>"
```

Required argument

The following argument must be specified:

/Rules="<file path>" Lets you specify the rule configuration file to be used for the rule-based merge.

Optional arguments

You can use the following optional arguments:

/DiffReport="<file path>" Lets you save a difference report to the specified file.

/MergeReport="<file path>" Lets you save a merge report to the specified file path.

/DiffReportAfterMerge="<file path>" Lets you save a difference report to the specified file path after the rule-based merge.

/SaveLeftFile Lets you save the left-hand file after the rule-based merge.

/SaveRightFile Lets you save the right-hand file after the rule-based merge.

/SaveLeftFileAs="<file path>" Lets you save the left-hand file under a different name after the rule-based merge.

/SaveRightFileAs="<file path>" Lets you save the right-hand file under a different name after the rule-based merge.

/DefaultSelectedSide="<left/right>" Lets you select the default side for the rule-based merge.

Result

The user interface of dSPACE AUTOSAR Compare opens and merges the specified files. A merge report is stored if specified. You can also store a difference report of the merged files.

Console syntax

```
dSPACEAutosarCompare.Console.exe <left file> <right file> /Rules="<file path>"
```

Arguments

The arguments are identical to the execution of `dSPACEAutosarCompare.exe`

Result	dSPACE AUTOSAR Compare is started without displaying the user interface. The specified files are merged and reports are stored as specified. The application terminates and an exit code is returned.
Exit codes	Refer to Exit codes on page 90.