TIA Portal V20

Technical slides

Release version 1.4

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TIA Portal V20
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- Support of SIMATIC S7-1500V
- Limited Sales release in USA

new

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- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
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- Process Orchestration (MTP)

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- Online features for named value data types
- Named value types used by safety blocks and in type libraries

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- Kinematics

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- Support of new drive firmware functions

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- **Modular Application Creator**
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- **TIA Portal Safety Validation Assistant** new

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WinCC Unified – V20 Update 3

Technical Slides

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WinCC Unified V20 Update 3 release 04/25

Scalability

- New device version for Unified Basic Panel, Unified Comfort Panel and Unified PC Runtime

Engineering Efficiency / Enhancements

- New Screen Resource overview
- Multilingual default texts for Screen objects
- Improved handling to prevent potential infinite loops in scripting
- Configurable Date-Time Format for Audit and Report controls
- Comprehensive global search
- Precise find and replace capabilities without leaving the screen editor
- Sophisticated dynamization possibilities without scripting

Visualization

- Show Buffer trend in trend control – to show a block of data
- Alarm line control
- IO field – possibility to shift decimal places
- Panels Onscreen keyboard - resizable and RT language specific
- Activate/Deactivate "Interactive Zooming / Panning" centrally
- Make panning switchable

Standardization

- Simplified access to default library types
- Simplified handling of numeric interface tags at Faceplates
- Forward event parameter

Redundancy

- Support of local user management
- Support of System and Process diagnostics

Connectivity

10001011
10010001
00010000

- S7 Routing Profinet(Ethernet) - to - Profibus/MPI
- S7 Routing Profinet(Ethernet) - to - Profinet(Ethernet)
- OPC UA Client DA - Array support

Parameter Control

- Enhanced CSV import compatibility
- Multilanguage support for Parameter Set types and elements
- Multilanguage support for labels

System Functions

- Change Screen next / previous
- Connect to backed up log segments
- Export / Import User administration

Additional Topics

- User Files in RT Folder (Unified PC)
- Support of native RFID for WinCC Unified PC RT
- Corporate Designer: Transfer password protection
- Connect a printer (CUPS driver - Unified Panel)

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WinCC Unified V20 Update 3 release 04/25

Unified Screen Editor (Next Gen.)



- Screen Window Preview for Screens
- Faceplate container Preview – Static interfaces values
- Snap to line
- Direct text input
- Rotation and External rotation point
- Additional screen area for designing
- Scroll, Zoom and Pan for Screen and Screen objects
- Multi-selection and resize of screen object
- Line object handling
- Group Improvement
- Select multiple screen items with SHIFT + lasso functionality
- Line alignment while Dragging (draw straight lines)
- Improve Multiselecting of lines to improve engineering efficiency

SiVArc



- Large expressions (*up to 3000 chars*) in global expressions
- New SiVArc expressions supported: (Connections, Color Palette)
- Central color palette via SiVArc generation
- Changes within Expression types without editing the dependencies
- Unified faceplates as Layout template screens in SiVArc generation
- Custom events parameters of unified faceplates can be connected to Global function parameters via SiVArc generation
- SiVArc support for Next generation screen editor (WBSE).

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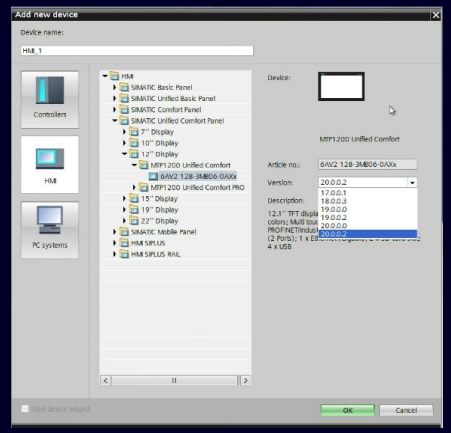
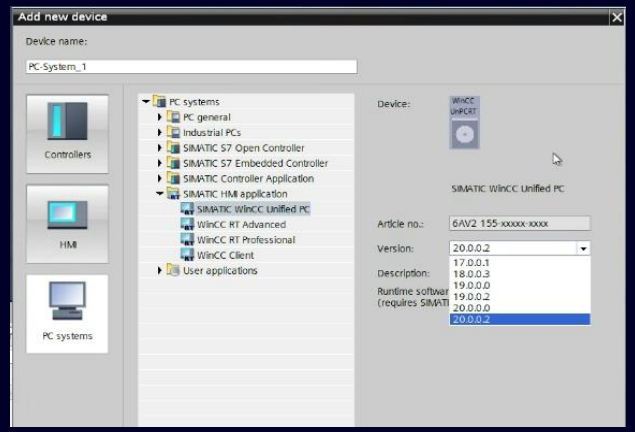
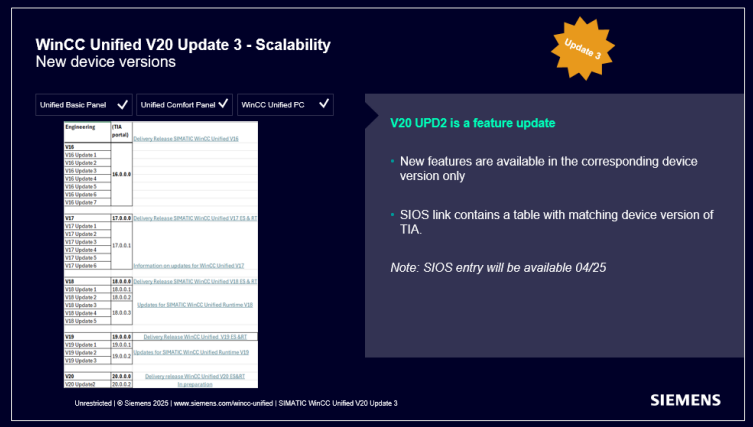
WinCC Unified V20 Update 3 - Scalability
New device versions

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓







New device version for

- **PC Runtime**
- **Unified Comfort Panels**
- **Unified Basic Panels**

New features are available in the corresponding device version only

- Upgrade the Unified devices
- Upgrade Faceplates in library (if necessary)

Note: SIOS entry will be available 04/25

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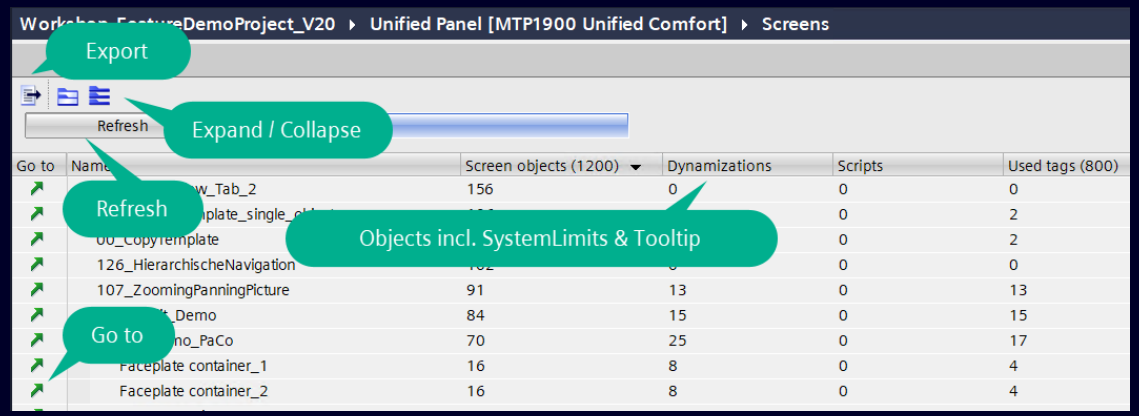
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements

New Screen Resource overview

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



- Overview of screen resources provides detailed insights into:
  - Number of UI elements | dynamizations | scripts | used tags
- Early identification of potential issues during the engineering phase
- Detailed screen metrics for comprehensive analysis
- Ability to analyze faceplates effectively
- Capability to filter and identify critical screens

Customer Value:

- Detailed insights into screen composition allow for better data management and utilization.
- Quickly identify and resolve issues, reducing the time spent on troubleshooting

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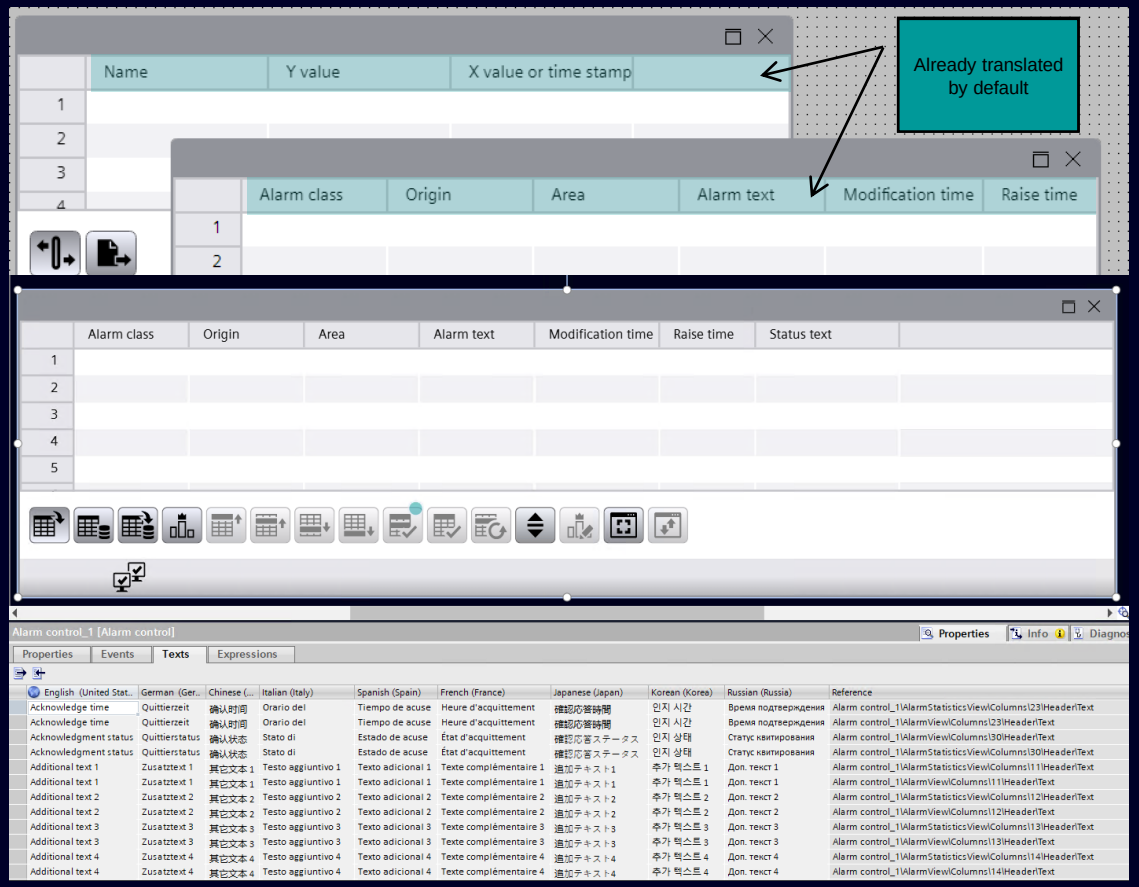
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements

Save effort in the manual translation of default text for screen objects

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



- Automatic translation of default text for screen objects (*e.g., column header text of Alarm control*) in V20 Update 3.
- Project language default text loads automatically when it matches a TIA Portal installed UI language.
- English is used as a fallback language in most cases when the project language is not part of the TIA Portal installed UI languages.

Customer Value:

- **Time Saving**: Reduces the time and effort required for manual translation.

Additional Info / Note:

- Prerequisite: The needed languages must be configured as project language before the creation of the screen objects in V20 Update 3

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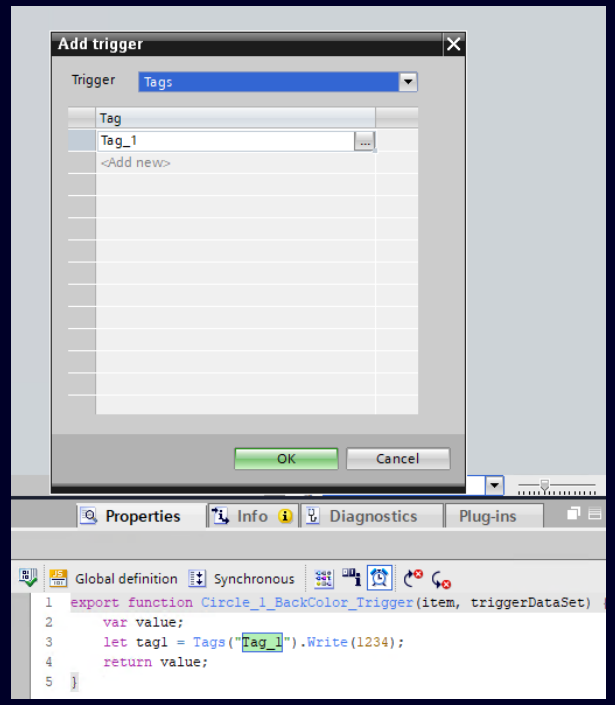
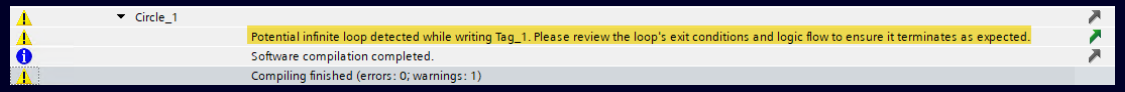
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements

Notification for Potential Infinite Loops in Scripting / Scheduled tasks

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓





- Warning messages issued during the compile step when a write trait* method is used with a tag which also serves as a script trigger.
- Alerts for potential infinite loops at the early engineering stage.

Customer Value:

- **Efficiency Gain:** Early warnings prevent infinite loops and their negative impacts.
- **Time and Resource Saving:** Proactively resolve issues during the engineering phase, avoiding troubleshooting after deployment.

Additional Info / Note:

- *Write trait – e.g.: Write (Tag); SysFct - IncreaseTag, DecreaseTag, etc
- The use of a write trait method to be in the same line of code

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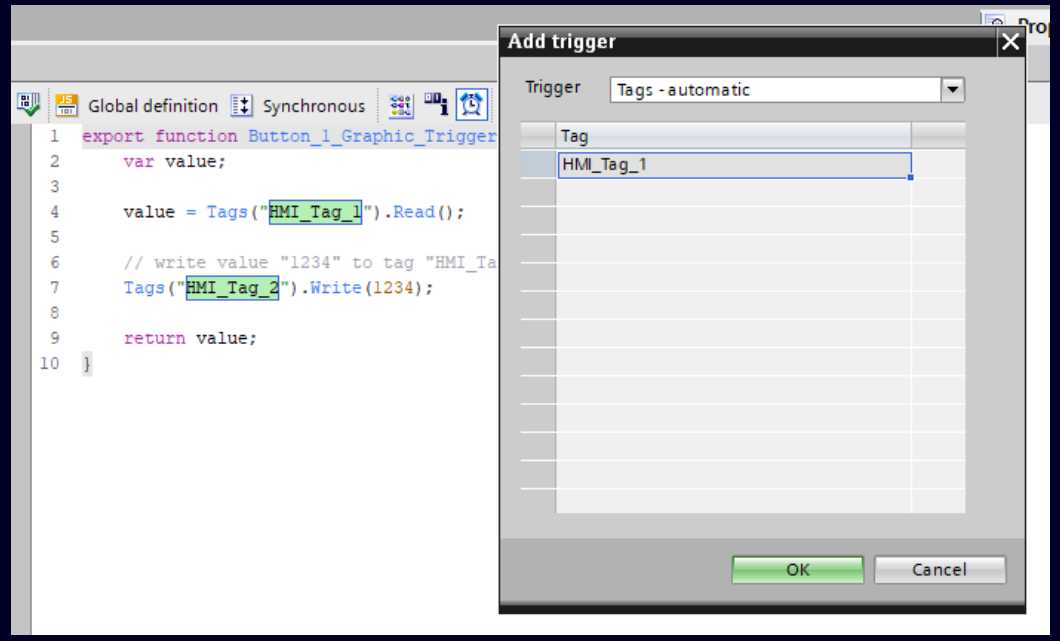
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements

Reduce execution of automatic tag triggers in scripts

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



- only tags for which reading is programmed are added to the automatic tag trigger list
- tags that are only meant to be written in the script will not be added

Customer Value:

- **Prevention of Infinite Loops:** Reduces the risk of accidental infinite loops, ensuring more reliable and stable script execution.
- **Enhanced Performance Efficiency:** By minimizing unnecessary tag triggers, overall script performance is optimized

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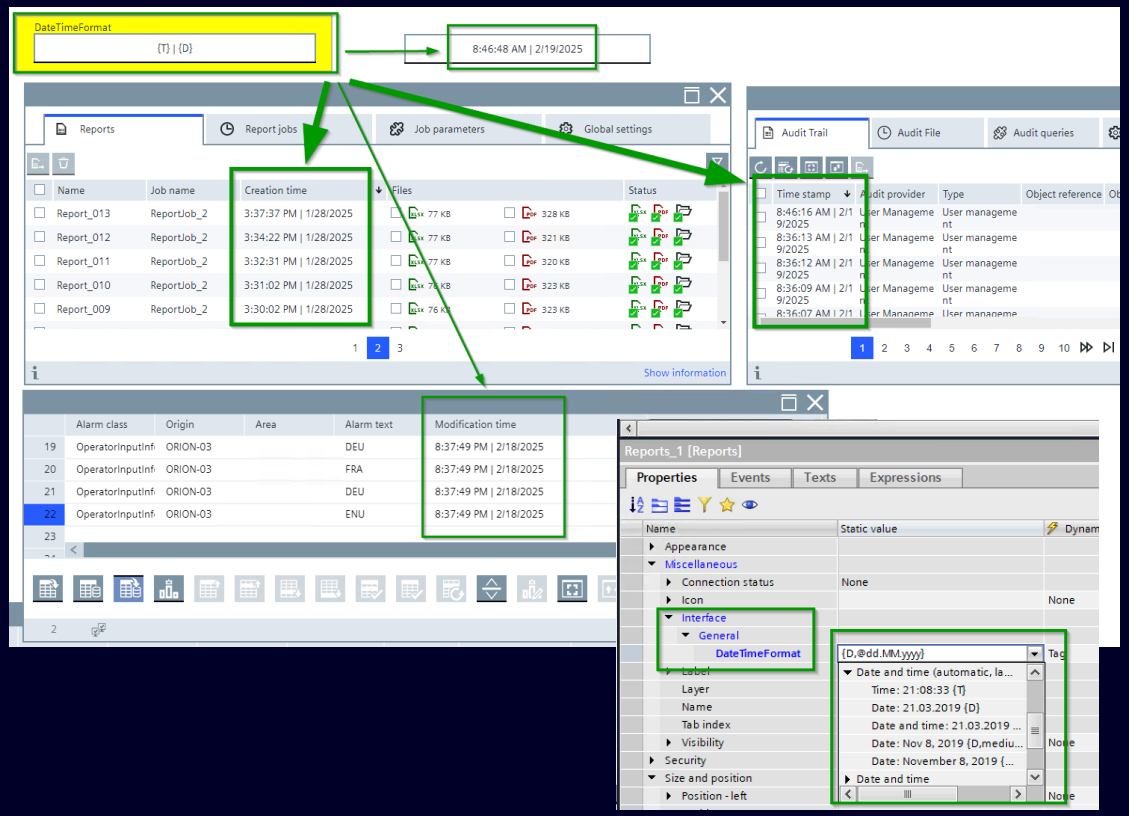
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements

Audit- & Report-Control | Configurable DateTime Format

Update 3

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓



Common Date Time Format

- Date Time Format analogous to IO-Field, …
- Predefined format picker and dynamization in TIAP
- Configuration in TIA Portal during engineering
- Setting in Runtime using Property via Script, System function, Tag

Customer Value:

Uniform visualization of time stamps

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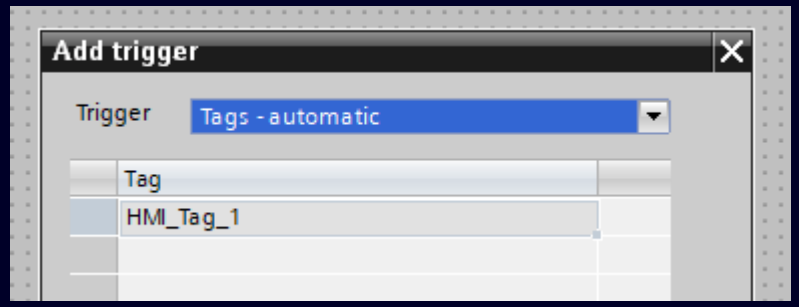
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements

Simplify the usage of "triggerDataSet()" for scripts

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓

```
1  export function Button_1_Graphic_Trigger(item, triggerDataSet) {
2      var value;
3
4      value = triggerDataSet("HMI_Tag_1").Value;
5
6      return value;
7  }
```



- The tag parameter in triggerDataSet(„TagName”) is added as a tag referance instead of just as a string
- Tags used in a triggerDataSet(„TagName”) function are also automatically added to automatic tag trigger list
- The tag name is automatically adapted in the script after a tag rename

Customer Value:

- **Automatic Tag Management:** Tags used in the are automatically included in the automatic tag trigger list, ensuring seamless trigger functionality.
- **Effortless Maintenance:** Automatic rename - reducing manual work and minimizing the risk of errors during tag modifications.

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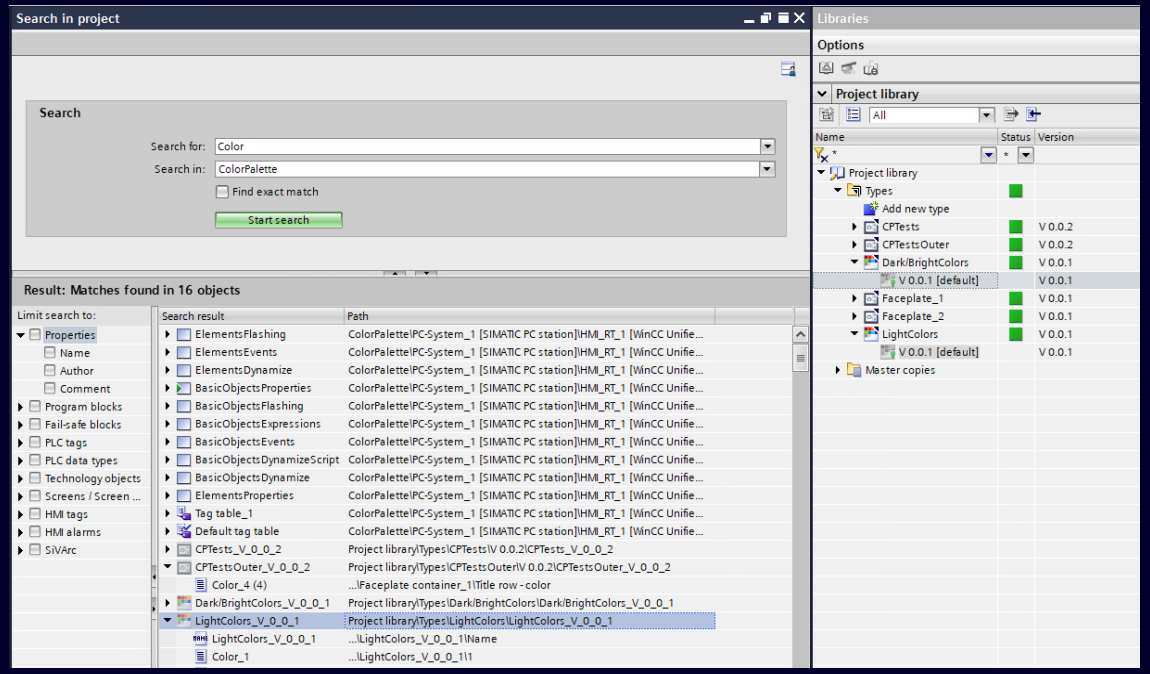
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements
Central Color Palette - Searching Support

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Users can now easily find and replace colors across project with local search support and global search support in the Screen Editor, Faceplate Editor, and Color Palette Editor.

Streamlined Color Management
- Local and global search for colors across editors

Seamless Navigation
- "Go to" functionality for color, color reference and color palettes

Customer Value:

- **Efficient Workflow:** Local and global search functionalities in various editors simplify color replacement and organization.

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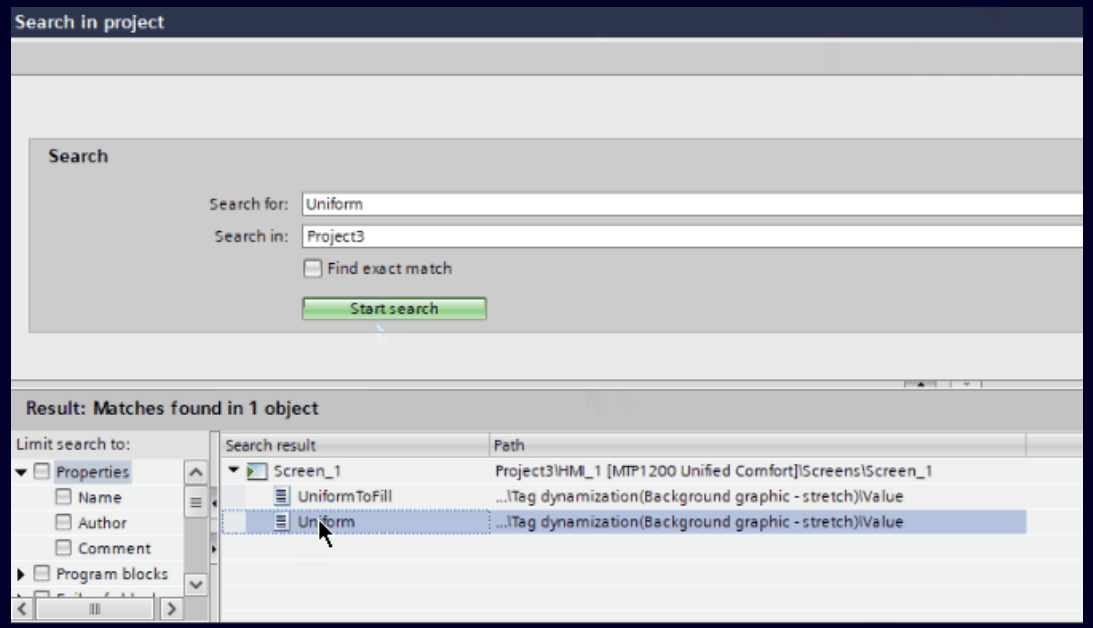
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements
Improved Global Search - Unified Faceplates / Screen / Scripts / TextLists

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Global Search was improved and completed regarding

- Unified Faceplates (Interface Tags/Properties, Interface Events, Local Tags, Visualization Properties and Tag dynamizations)
- Screens (static/dynamic Properties, Events, Texts, and Expressions)
- Faceplate Container
- Scripts and Script Module Types (Library)
- TextLists (Project and Library)

Seamless Navigation with "GoTo" functionality for the search results

Customer Value:

- **Comprehensive Search Capabilities:** Enhanced global search that provides more extensive search coverage.
- **Increased Efficiency:** Allows for quicker identification and access to relevant project components and configurations, streamlining the development process.

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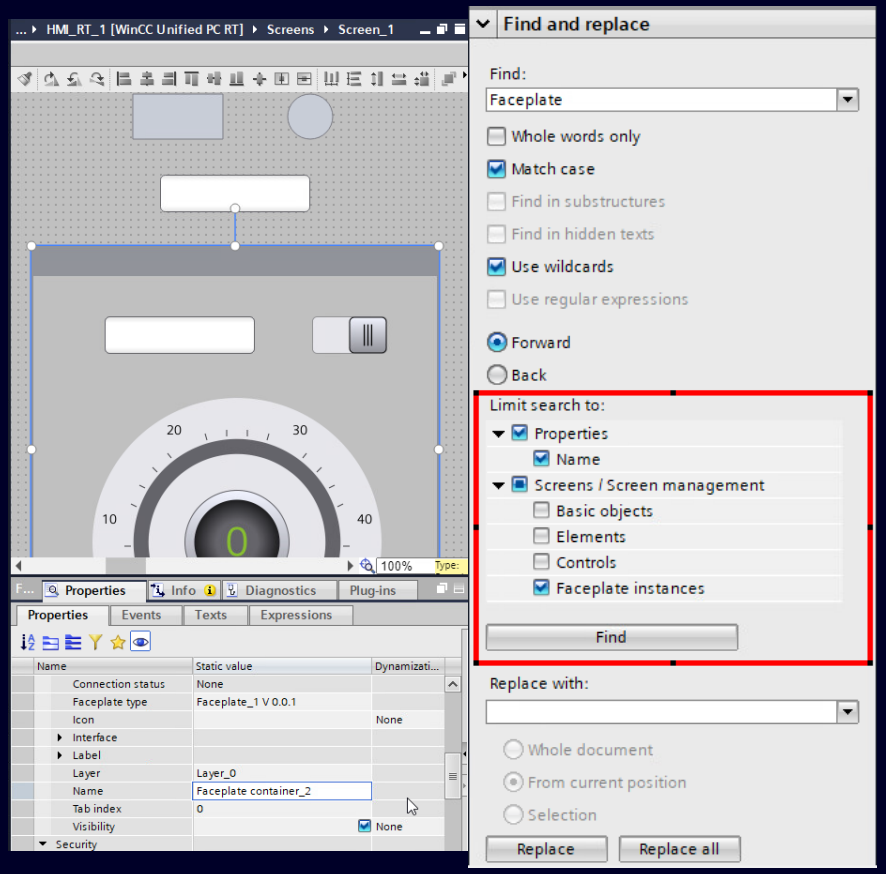
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements

Local search / Find & Replace on HMI Screens - without leaving the editor

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



- Limit search section provides a detailed search mechanism with additional criteria.
- It enhances search capabilities, allowing you as a user or commissioning engineer to access more detailed information about your screen objects without leaving the current screen editor
- This feature ensures quicker results and allows more time to focus on critical tasks at hand.

Customer Value:

- **Enhanced Search Precision:** detailed search mechanism with additional criteria, refining search results to meet specific needs
- **Improved Workflow Efficiency:** Allows find and replace text on HMI screens without leaving the current screen editor.

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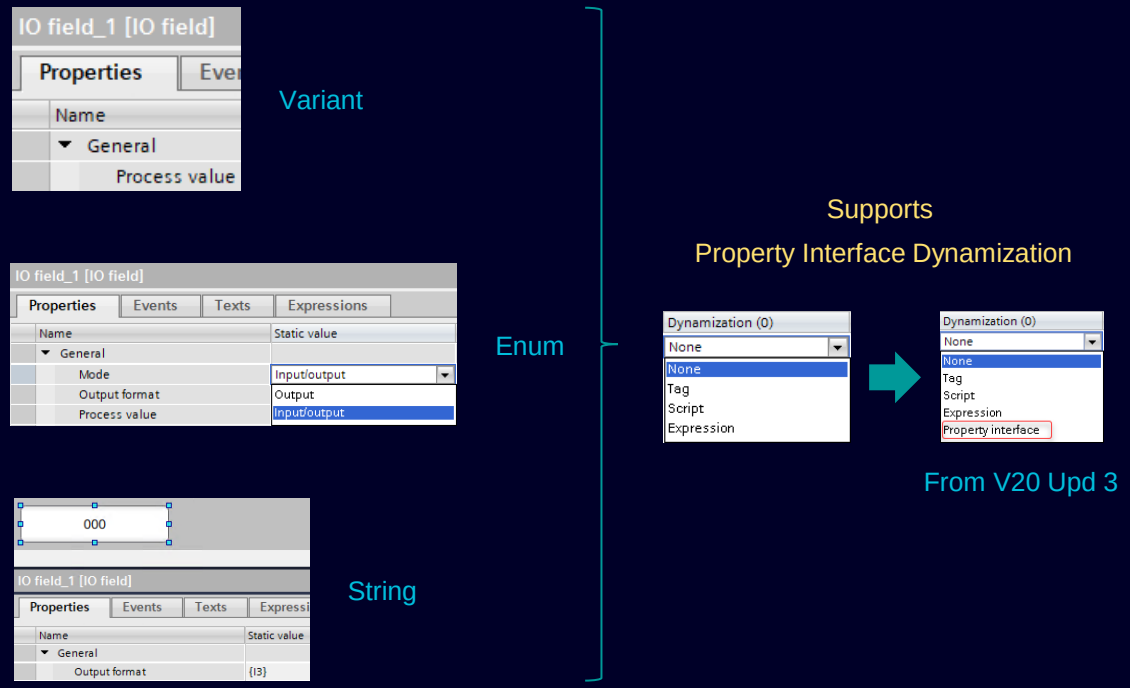
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements

Property Interface Dynamization Extensions

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



- The below type of screen object properties are supported by Property Interface Dynamization in faceplates.
  - **Variant** (like process value in IO Field, slider, gauge, bar, checkbox, radio button, list box, etc)
  - **Enum** (like Alignment - vertical, horizontal, Font Weight, Font Strikethrough, Text trimming, etc)
  - **String** (like output format in IO Field, Font name, etc)

Customer Value:

- **No special scripting know-how** needed as easy configuration possible via UI
- **Optimized performance** for simple calculation scenarios in Dynamization

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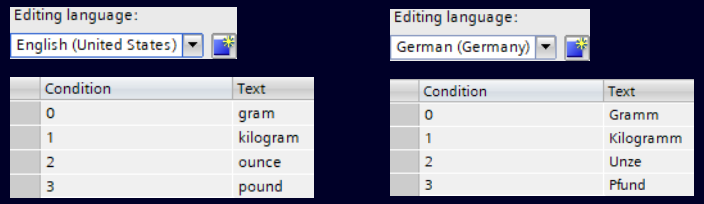
WinCC Unified V20 Update 3 – Engineering Efficiency / Enhancements

Property Interface, Tag, Expression Dynamization Extensions

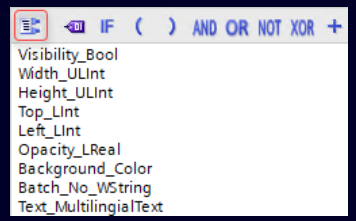
Update 3

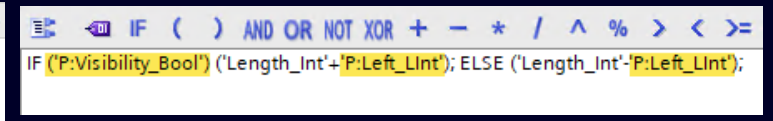
Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Multilingual text

Supports
Mapping Table and Formula
in
Tag and Prop. Interface Dyn





Supports Property interface picker in Formula / Expressions
in Tag and Prop. Interface Dyn / Expression Dyn

- Support **Formula and Mapping table** for **multilingual text** properties (like text, tooltip, text – button pressed, etc) of screen objects in
  - Property Interface Dynamization (for faceplates)
  - Tag Dynamization (for both screens and faceplates)
- In faceplates - **Property interface picker** is supported in formula for Property Interface Dynamization, Tag Dynamization, Expression dynamization - helps users to add multiple property interfaces in formula and optionally multiple tags

Customer Value:

- **Sophisticated possibilities** in property interface, tag dynamization and expression dynamization could be the 1st choice of preference

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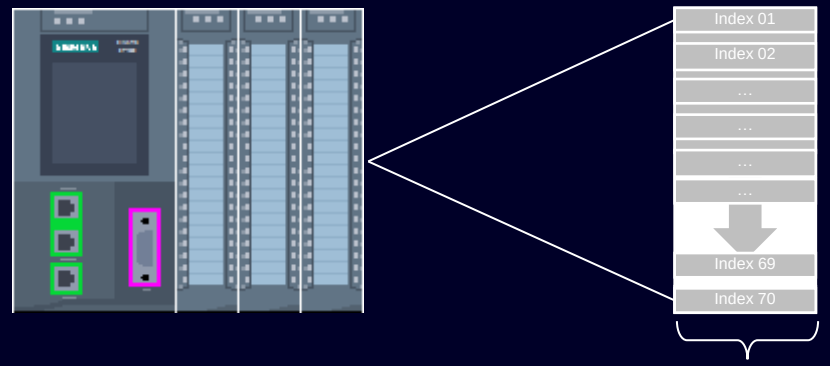
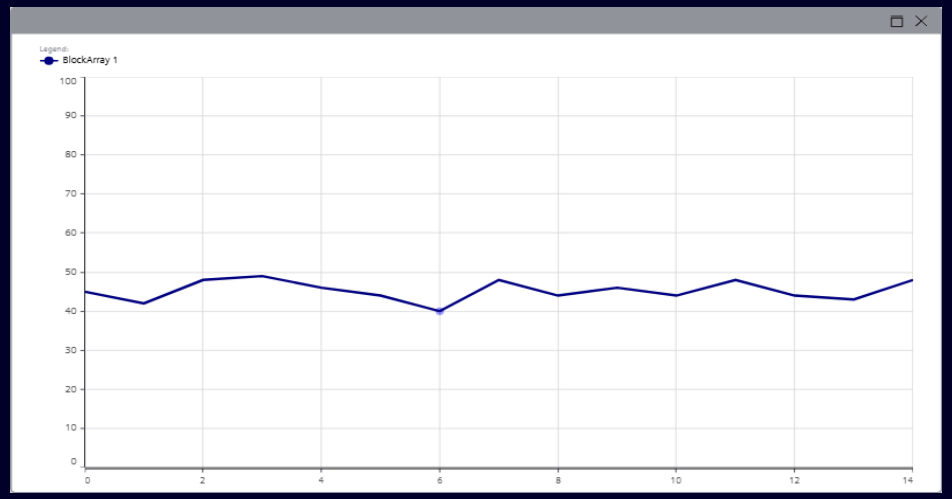
WinCC Unified V20 Update 3 – Visualization

Show Buffer trend in trend control – to show a block of data (buffer trend)

Update 3

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✓	✓	✓





- The values are buffered in the PLC and read in bit-triggered as a block
- Whenever the bit assigned to the trend is set, all the values are read simultaneously from the trend buffer and are displayed as a trend on the HMI device.

Customer Value:

These trends are suitable for displaying rapid changes when the course of the trend is more interesting than the individual values.

Additional Info / Notes

- In V20 Update: handshake by script necessary (how to is documented)
- In V21: automatic handshake is planned

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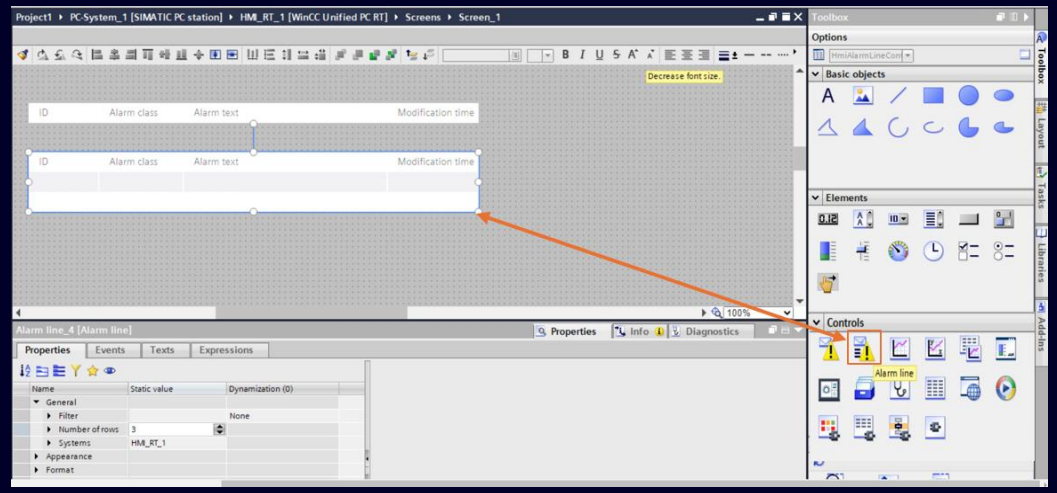
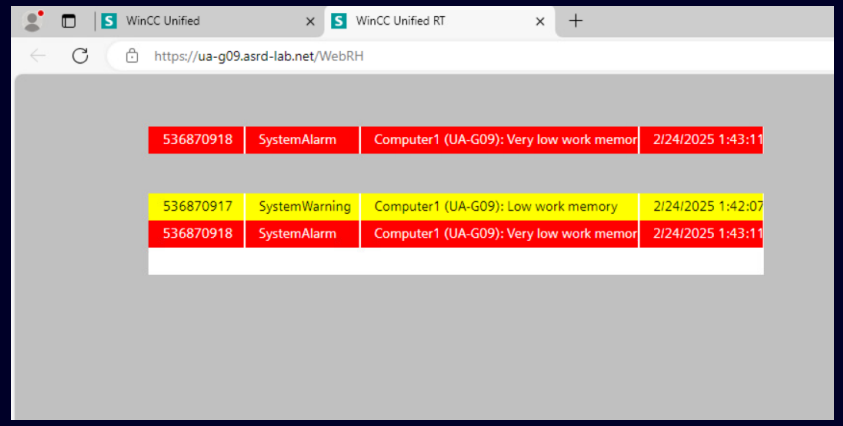
WinCC Unified V20 Update 3 – Visualization
Alarm line control

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





New Alarm Line control can display up to three most recent and high-priority alarms based on certain criteria with minimal engineering effort.

Customer Value:

- Effortless Configuration: With minimal properties and as a subset of the Alarm Control, engineers can quickly configure only the necessary settings with ease
- Optimized Performance: It renders efficiently offering high performance in PC and Panel devices.

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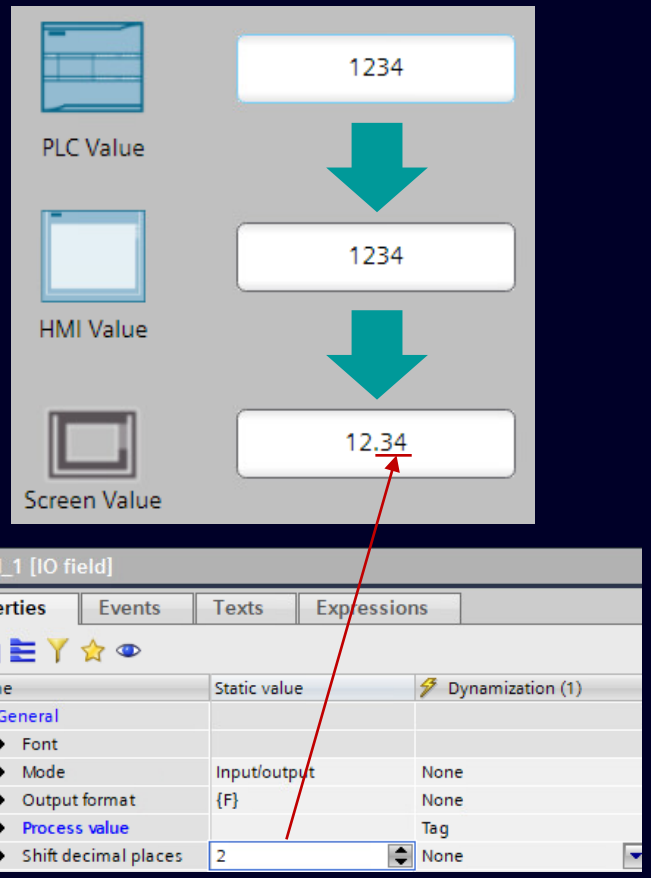
WinCC Unified V20 Update 3 – Visualization
IO field – possibility to shift decimal places

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Shift Decimal Places

- This feature enables you to define the number of decimal places for the process value configured with **integer-based** tags.

Customer Value:

Ability to move the decimal point of a value without the need for scaling or scripting.

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WinCC Unified V20 Update 3 – Visualization
RT Language specific Keyboard support (Unified Panels)

Update 3

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✓	✓	✗



- Language Specific On-screen Keyboard
- Keyboard now always opens with the current selected language of the Runtime. Manual switching is not required.
- Keyboard supports all languages supported by Runtime.
- English is the fallback language if the selected language is not supported by Runtime.

Customer Value:

Enhanced User Experience - Seamless language selection in the Panels Runtime enhances user typing experience by eliminating manual switching and providing English fallback support.

Additional Info / Notes

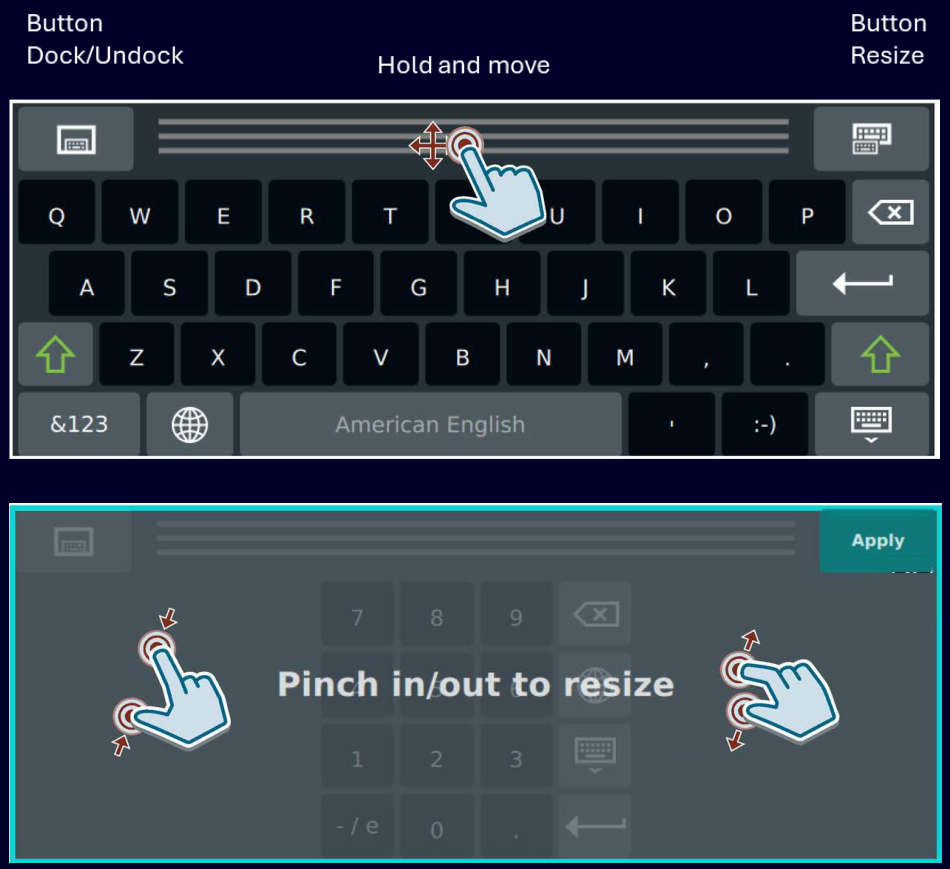
- Manual language selection is still possible.
- Supported only in Panels Runtime.

SIEMENS

WinCC Unified V20 Update 3 – Visualization
Resizable and Movable Keyboard (Unified Panels)

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✗



- The Keyboard is movable and Resizable in Runtime through the options provided in the top bar.
- Dock/Undock: By default, the keyboard appears in dock mode. To move the keyboard, it must be undocked using the Dock/Undock button. You can move the keyboard by holding the top bar.
- Resize: The keyboard can be resized to up to 70% of its default size. Use the pinching option enabled by the Resize button to adjust the size.

Customer Value:
Customizable and flexible keyboard options enhance user comfort and productivity in the Runtime environment.

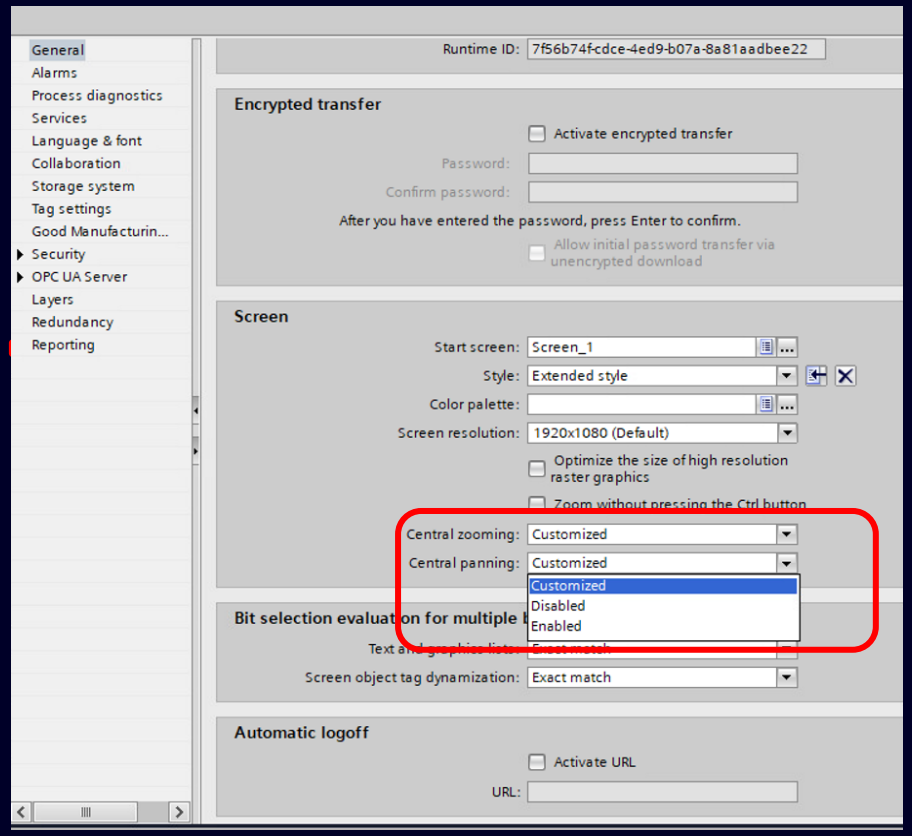
Additional Info / Notes
- Any adjustments made to the keyboard settings will be saved and remain in effect until the runtime is restarted
- This feature is not available for use on 4" UBP devices

SIEMENS

WinCC Unified V20 Update 3 – Visualization
Centralized Activate/Deactivate of Panning and Zooming

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



- Ability to centrally activate or deactivate panning and zooming in runtime settings.
- Centralized control applies to top-level screen windows, screen windows, faceplate containers, and pop-up screens.

Customer Value :

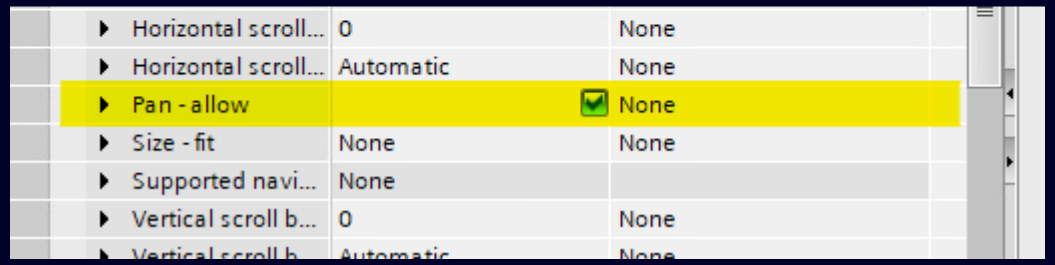
- **Improved Configuration Flexibility:** Offers the ease of centrally enabling or disabling zooming and panning, which enhances flexibility in configuration across multiple screen levels and components.

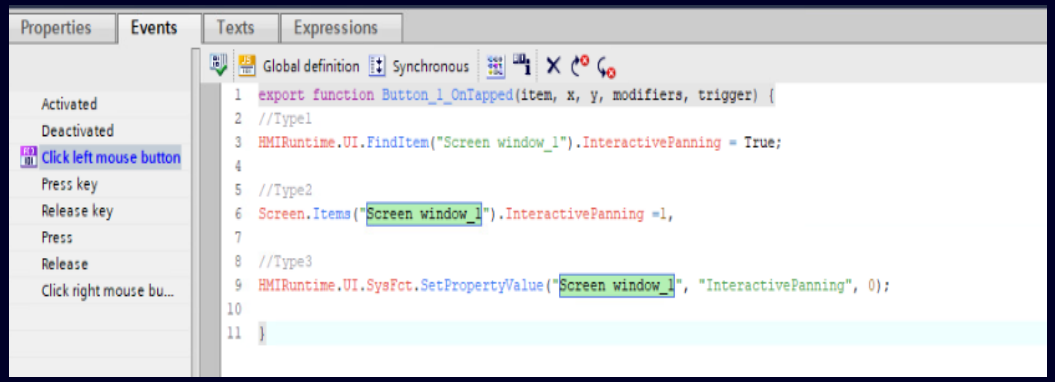
SIEMENS

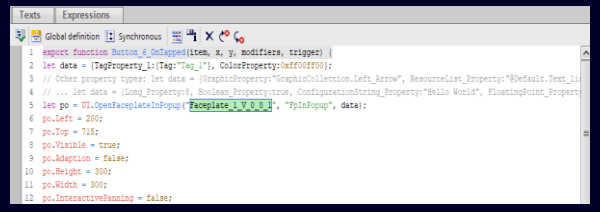
WinCC Unified V20 Update 3 – Visualization
Make panning switchable

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓







Make panning switchable

- Additional property to disable panning for Top level screen windows, Screen windows, Pop-ups and Faceplates.
- Support Enabling/Disabling of Panning Property via UI Checkbox and Scripting

Customer Value:

A possibility to determine granularly in which Windows, Pop-ups and Faceplate panning is allowed. For example, customer can disable panning in Faceplates but still use it in ScreenWindows.

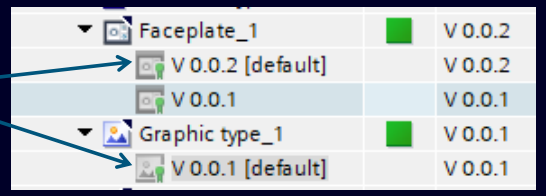
SIEMENS

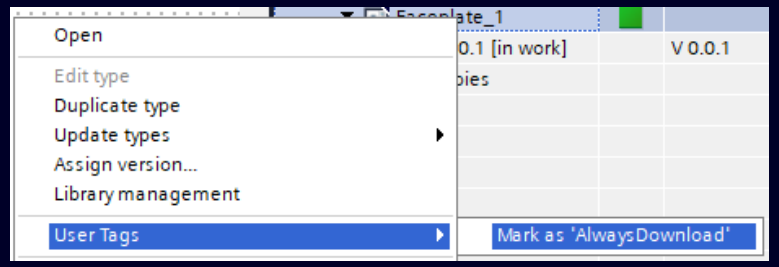
WinCC Unified V20 Update 3 – Standardization
Simplified access to default library types in runtime via scripts

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓

E.g. changing the used graphic type will not create a new version of the faceplate type





- Get the default version of a library object via scripting in RT
  - Faceplate Types, Text List Types, Graphic Types
- Compatible library changes will avoid In-test-propagation of library types
- Specify ‘AlwaysDownload’ so that the current version of this type is always loaded

Customer Value:

- **Dynamic Access:** Provides the ability to access the default version of library objects dynamically via scripting during runtime, enhancing flexibility and usability.

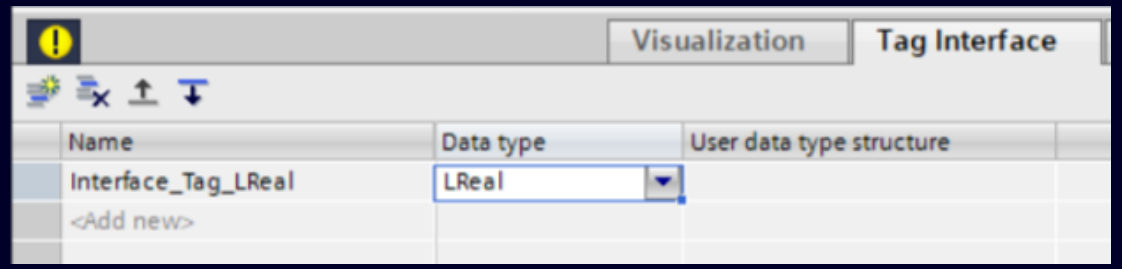
```
let defaultFacePlateName = HMIRuntime.Resources.FaceplateTypes("MyFacePlate").DefaultName;
// will be resolved to "RT::MyFacePlate_V_0_0_1"
let data = {};
let wnd = HMIRuntime.UI.OpenFaceplateInPopup(defaultFacePlateName, "MyPopup", data, UI.ActiveScreen, false, "MyWnd", true, 0, 0);
```

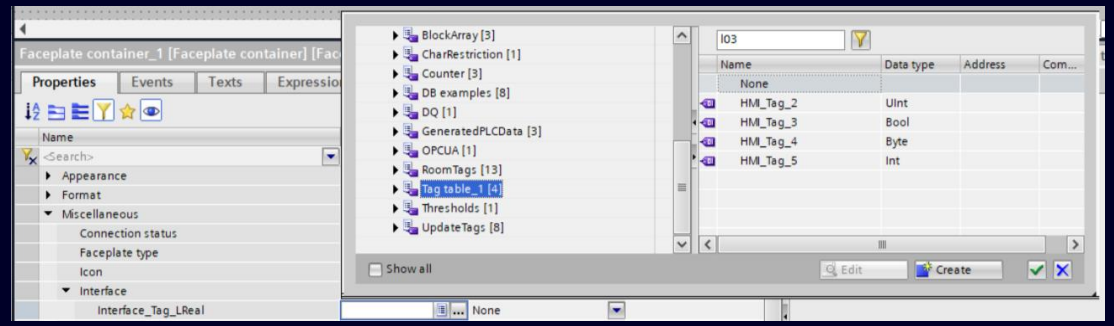

SIEMENS

WinCC Unified V20 Update 3 – Standardization
Simplified handling of numeric interface tags at Faceplates

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Assign tags of any simple data type at an interface tag of type LReal

- At a container configure any simple data type like Bool, Byte, Int, Word
- It is no longer a need to utilize separate faceplate types based on data type

Customer Value:

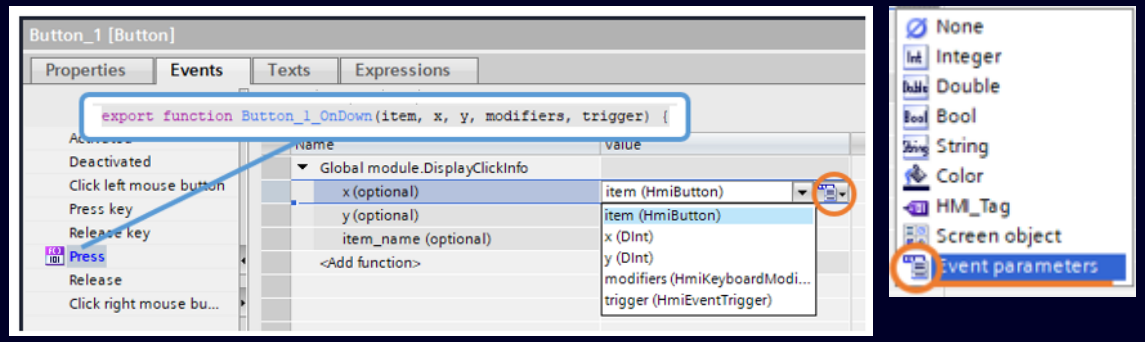
- **Versatile Tag Assignment:** Allows the use of simple data types, resulting in increased flexibility in configuration.

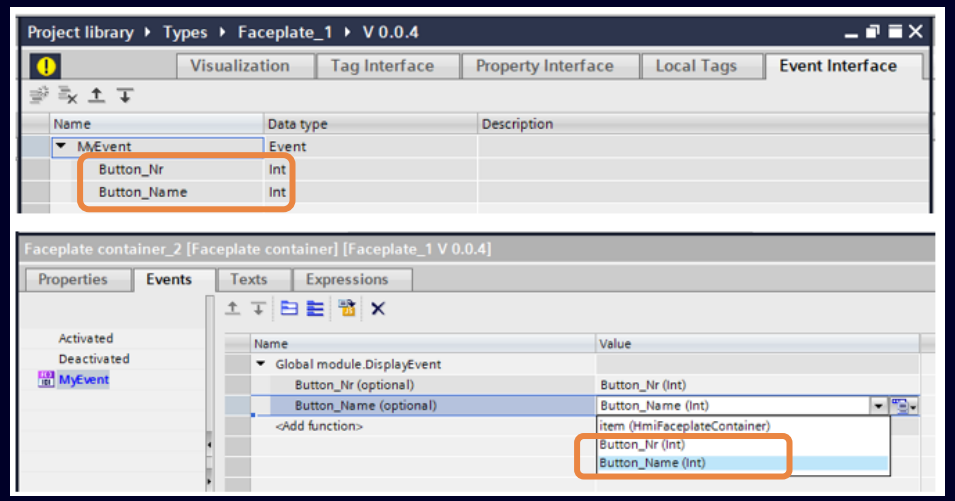
SIEMENS

WinCC Unified V20 Update 3 – Standardization
Forward event parameter

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓





Event parameter are available for selection

- Forward event parameter to Script function in an easy and convenient way in Function list
- Also, for Custom events of Faceplates

Process custom Faceplate event:

- Create custom event interface at Faceplate type
- Create Global script function with same interface parameter to process event data
- Connect event parameters with function parameters at Faceplate instance via Function list

Customer Value:

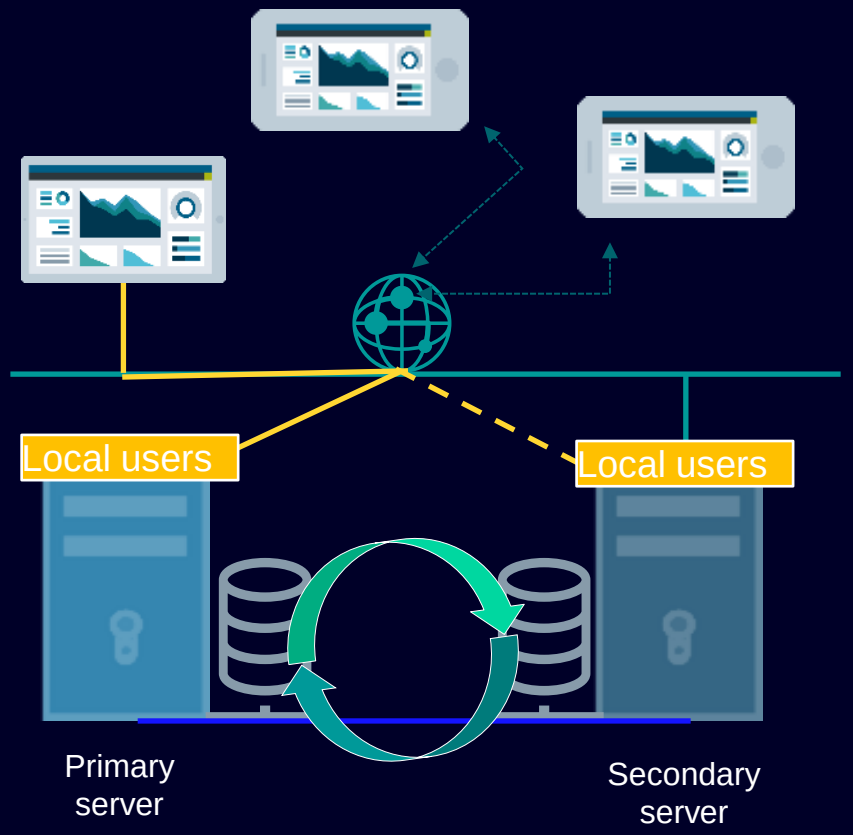
- Provide context information to central logic easily
- Simplified Event Parameter Forwarding, Enhanced Integration

SIEMENS

WinCC Unified V20 Update 3 – Redundancy
Support of local user management

Update 3

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✗	✓



Automatic switch-over of web clients to the partner server with local user management

- Prerequisite: Both servers have the same users and user groups configured
- The web client switches automatically if the server is no longer reachable. The same screen with the same logged in user is shown.
- Restriction: The first switch-over after a full download requires a manual login of the user

Customer Value:

- Using local user management has less costs and footprint

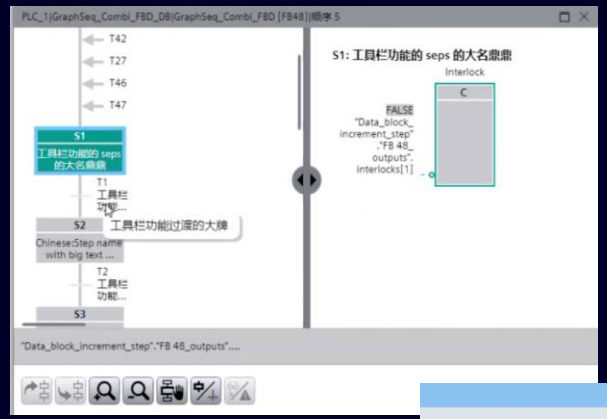
as of V19 Update 2

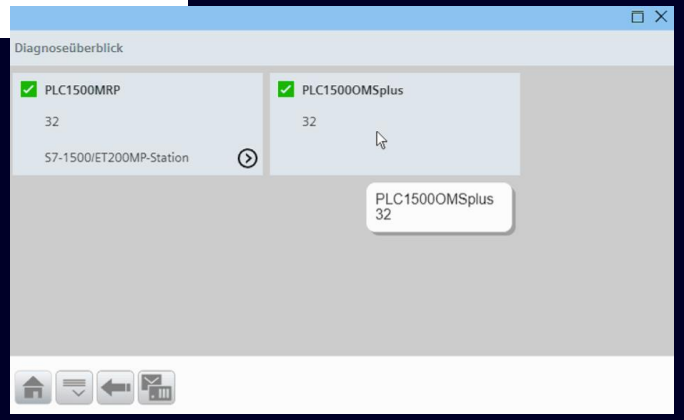
SIEMENS

WinCC Unified V20 Update 3 – Redundancy
Support of System and Process diagnostics

Update 3

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✗	✓





System and Process diagnostics is supported in a redundant scenario

Customer Value:
System and process diagnostic controls show the up-to date data after a server or client switchover

as of V19 Update 2

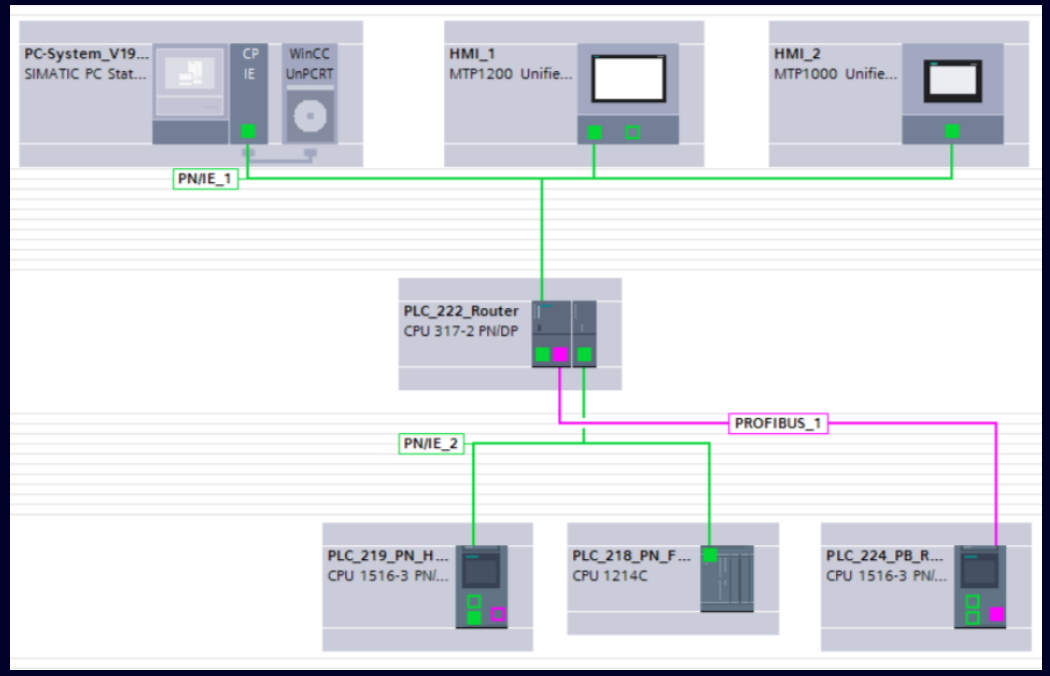
SIEMENS

WinCC Unified V20 Update 3 – Connectivity

S7 PLC Communication | S7-Routing

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



S7-Routing for WinCC Unified devices

- You have the option of setting up a connection from the HMI to a S7-PLC via different subnets
- Can be used with various PLCs such as S7-1200/1500, S7-300/400, virtual PLC, and software controllers, also, in combination with devices such as IE/PB Link or PLC with CP modules as router.

Customer Value:

S7 routing is possible via PROFINET, Industrial Ethernet and PROFIBUS

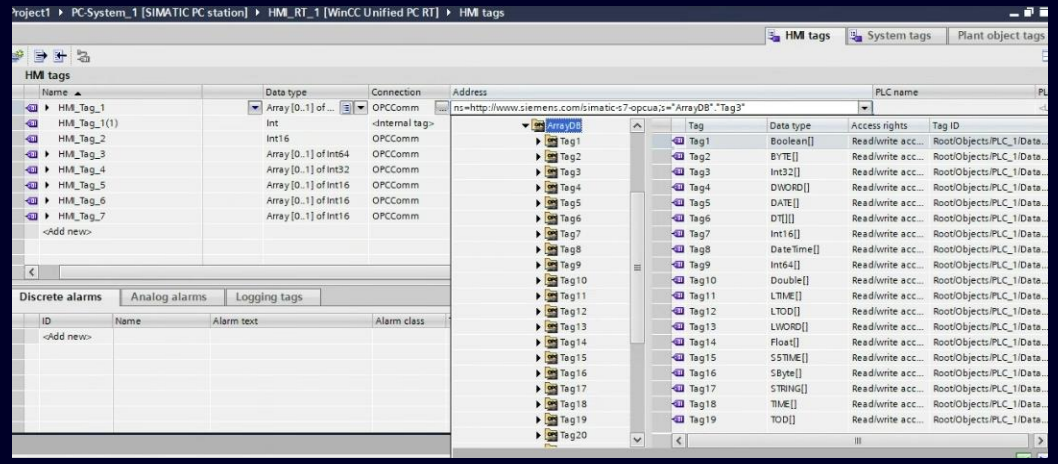
SIEMENS

WinCC Unified V20 Update 3 – Connectivity

Support for Array Datatype in OPC-UA DA from OPC UA Server

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



- Support for Array Data Type in WinCC Unified
- Enables data access to arrays of elementary data types with exposed child elements.
- Allows reading and writing of individual array elements configured in an OPC-UA Server.

Customer Value :

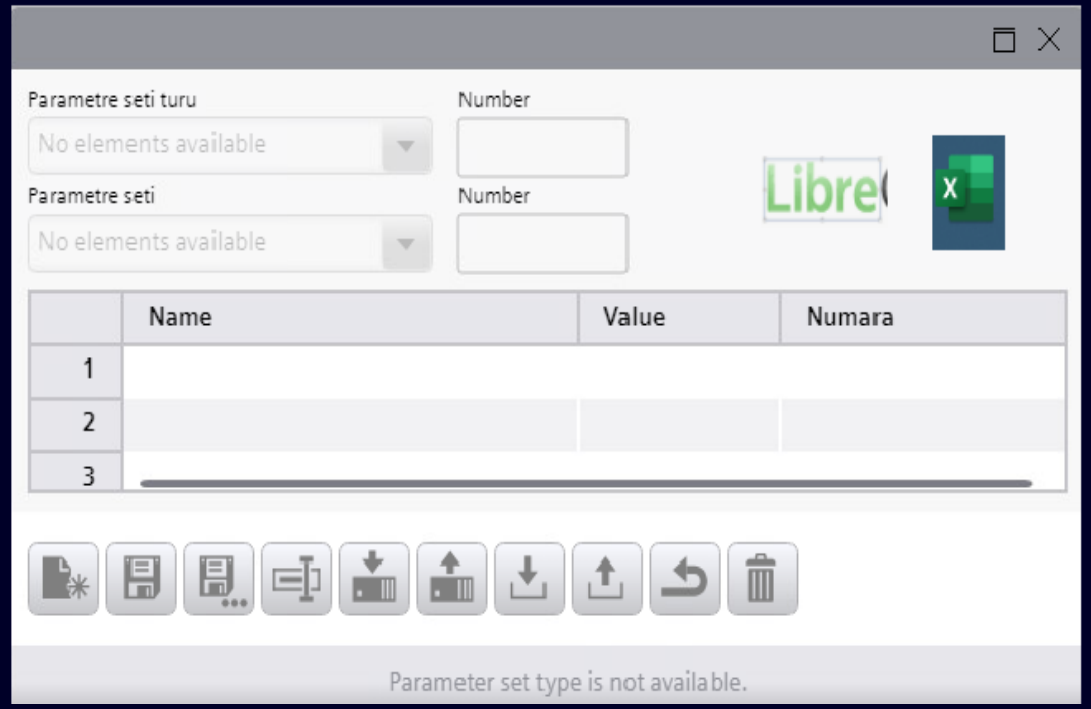
- **Expanded Data Capability:** Provides new datatype support, increasing the system's flexibility and data handling capabilities with OPC-UA Communication Protocol.

SIEMENS

WinCC Unified V20 Update 3 – Parameter Control
Enhanced CSV import compatibility

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



- Supports files modified in different spreadsheet applications.

Customer Value:
Import functionality allowing CSV files that have been adjusted in spreadsheet editors such as Microsoft Excel, LibreOffice Calc, or OpenOffice to be imported without format conflicts.

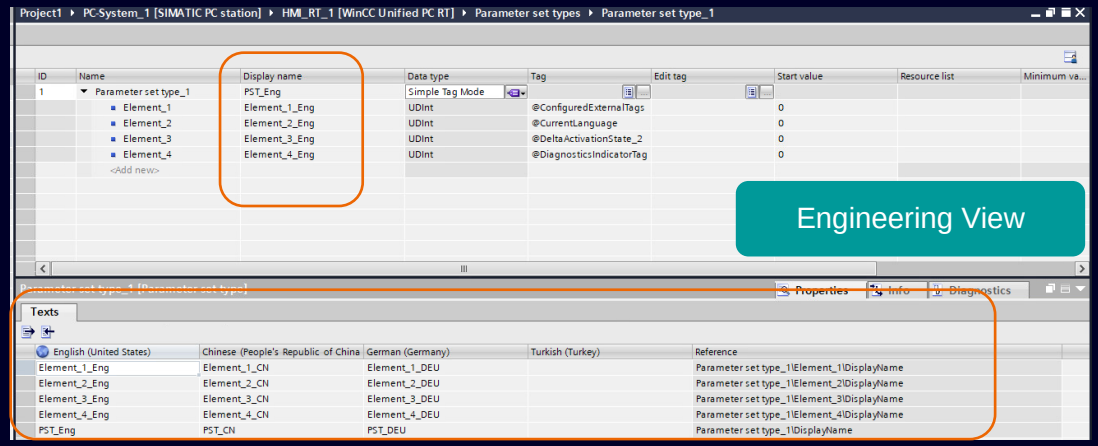
SIEMENS

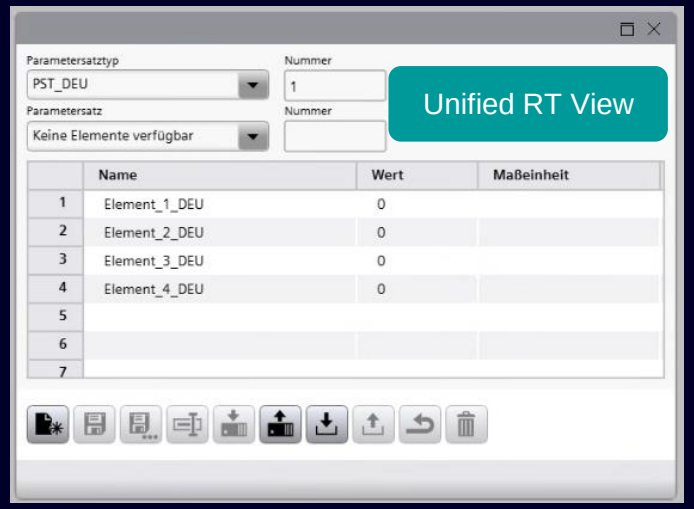
WinCC Unified V20 Update 3 – Parameter Control

Multilanguage Support for Parameter Set Types and Elements

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓





- Provides multilanguage support for parameter set types (PST) and their elements.
- Allows for multilingual text configuration with support for up to 128 characters.

Customer Value:

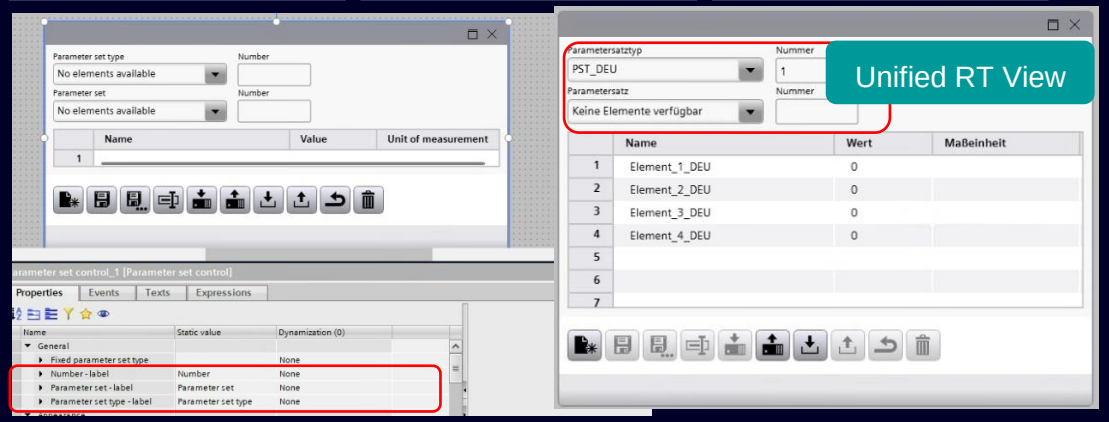
- **Enhanced Language Flexibility:** Users can configure translation strings for PST and its elements in their local languages, enabling customization for diverse user bases.

SIEMENS

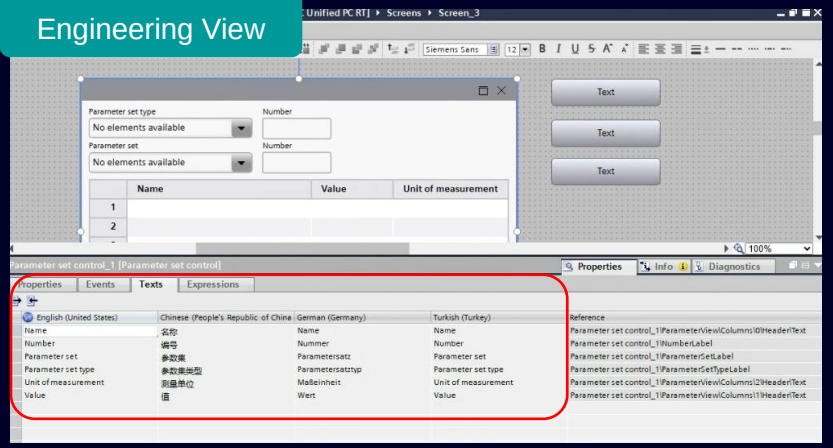
WinCC Unified V20 Update 3 – Parameter Control
Multilanguage Support for Labels

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Engineering View



Customer Value :

- Multilingual Text Configuration Label Support for Parameter Set Type ,Parameter Set and its Number
- Ready Translation of Labels in TIA Portal User Interface Supported Languages
- Customers can configure custom strings for PaCo Label which helps in adaptability and easy localized translation for PaCo.

SIEMENS

WinCC Unified V20 Update 3 – System Functions
Change Screen next / previous

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓

Name	Value
ChangeScreenNextAsync	
Screen window path (optional)	

Name	Value
ChangeScreenPreviousAsync	
Screen window path (optional)	

Name	Value
ClearScreenHistory	
Screen window path (optional)	



System Function to support ScreenNavigation similar to web browser

- Screen Navigation is possible for TopLevelScreenWindow and ScreenWindow
- Supports Screen navigation history up to 24 screens in each screen window
- ScreenWindow property “SupportedNavigation” will denote current Possible Navigation Mode (Forward, Backward or Both).

Customer Value:

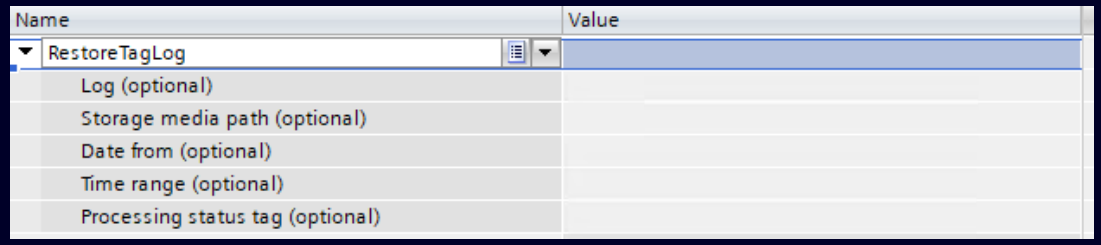
- Intuitive screen navigation like in the web browser

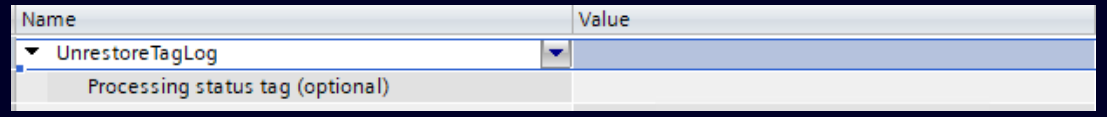
SIEMENS

WinCC Unified V20 Update 3 – System Functions
Connect to backed up log segments

Update 3

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓





System Function to Restore and Unrestore Logs from backup folder

- Restore and Unrestore supported for Tag, Alarm and Audit logs
- Restore and Unrestore operation will continue even after switching to different screen.
- Status of Restore/Unrestore operation can be shown via Status tag

Customer Value:

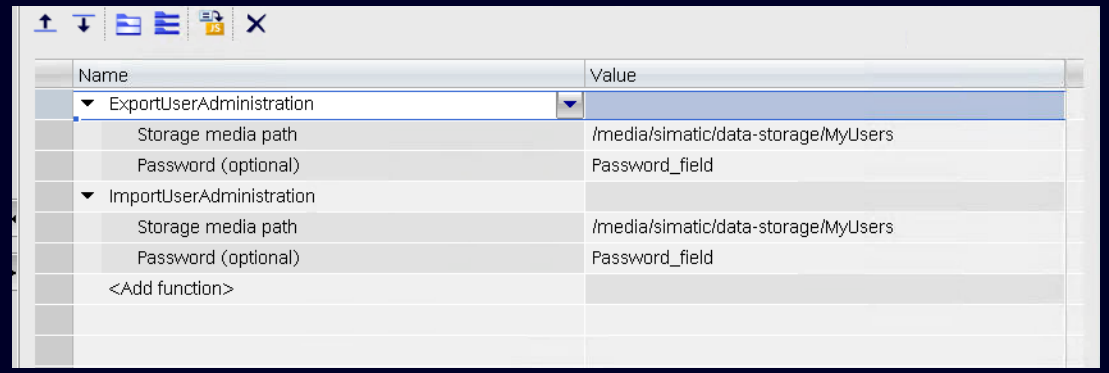
Use case: Analysis of logged data in the backup via RT controls, e.g. trend, alarm, audit

SIEMENS

WinCC Unified V20 Update 3 – System Functions
Export / Import User administration

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Export and Import the User administration of local users via system function on Panels and PCs

Customer Value:

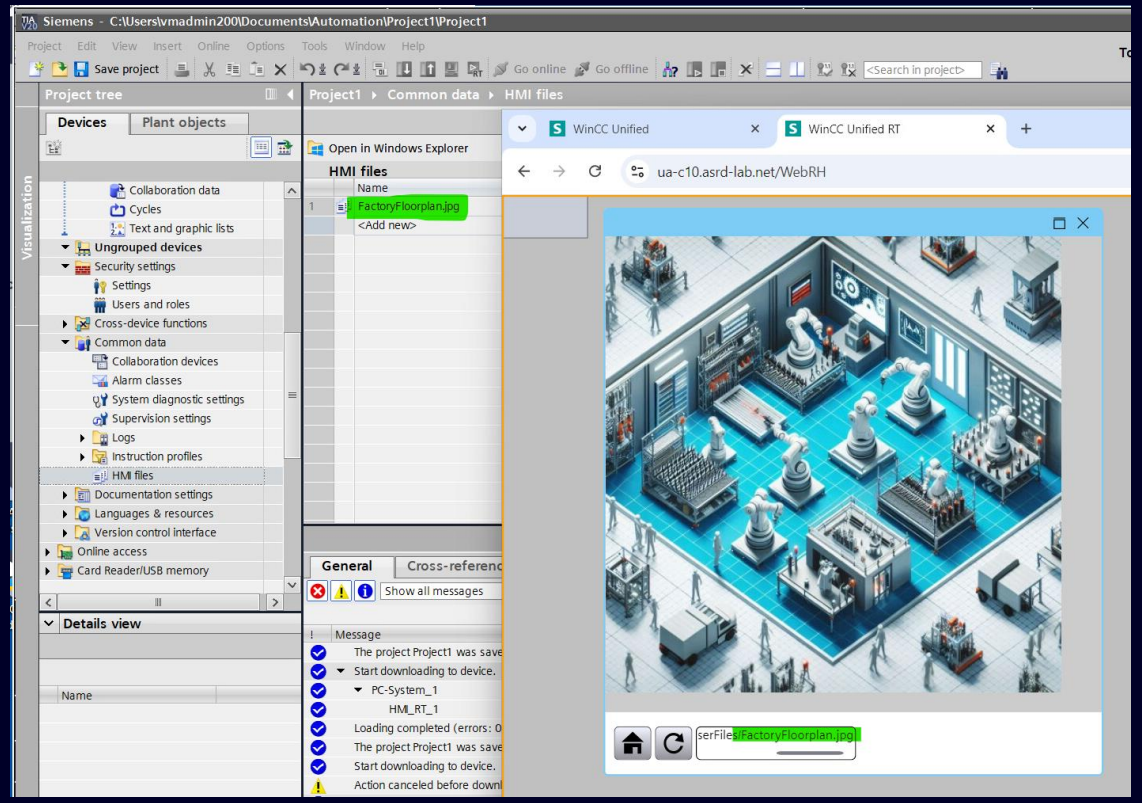
- Configure the users only once and exchange between different devices
- Backup / Restore of user and passwords
- Compatible with the export/import via Control Panel

SIEMENS

WinCC Unified V20 Update 3 – Additional Topics
User Files in RT Folder

Update 3

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✗	✓



Download of Files for Display in Web-Browser

Viewing Options
- Files can be displayed in Web-Browser or RT Web-Control (if format is supported).
- Support for organized storage in nested folder structures.

Security Measures
- Mandatory user login required to view files in browser.
- Files must be verified during download.
- Direct file access is restricted.

Customer Value:

Possibility to download various file types from TIA Engineering station to Runtime station, including help documents, pictures, and videos and to display them in Web-Browser.

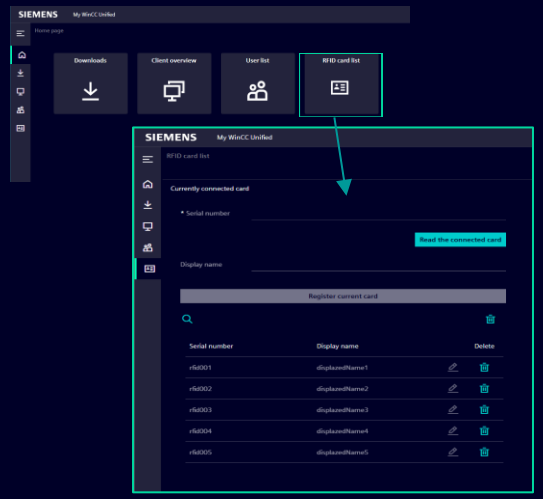
SIEMENS

WinCC Unified V20 Update 3 – Additional Topics
Native RFID support on local PC

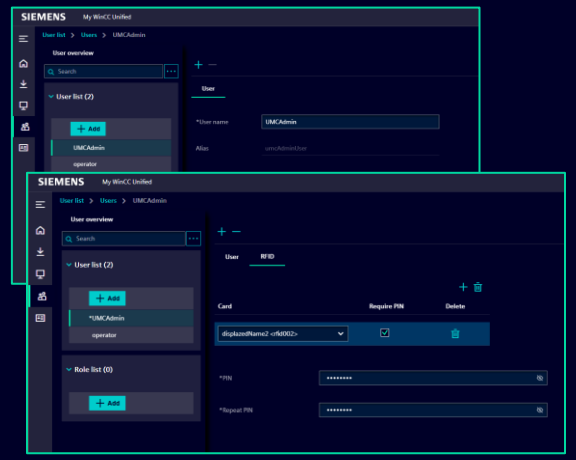
Update 3

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✗	✓

Register RFID cards



Assign registered RFID cards to user



Native RFID support on local PC in V20 Upd2

- Authorized super user can register free RFID cards to system in My WinCC Unified (Function right: User Management is needed)
- Authorized super user can configure users and their RFID cards in the User list of My WinCC Unified (Function right: „My WinCC Unified – read and write access to all user“ and User Management are needed)
- Authorized user can update his own PIN according requirement (Function right: „My WinCC Unified – read and write access to own user‘s settings“ is needed)
- After assignment of RFID card to user, user can log in to Runtime on the local PC using his RFID card

Customer Value: The customer can use SIMATIC RFID readers without using PM-LOGON.

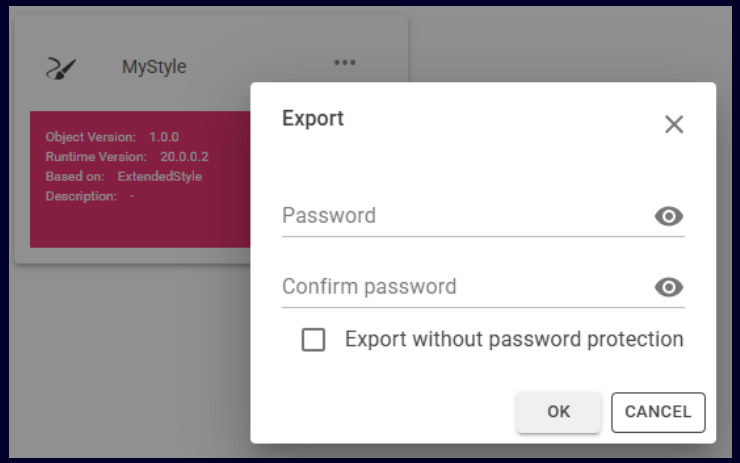
as of V20 Update 3

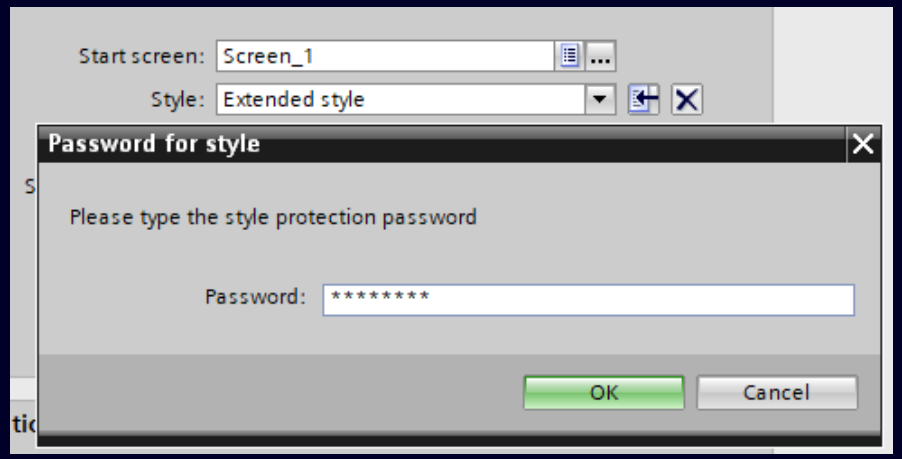
SIEMENS

WinCC Unified V20 Update 3 – Additional Topics
Corporate Designer: Transfer password protection

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Customers can set a password for exported styles with the Corporate Designer to ensure that the content of the file is not modified and is secure.

- The password protection is optional, it is still possible to export a style without password
- The password protected styles are using a new file format: cdx19, cdx19_0_0_2, cdx20 , cdx20_0_0_2
- To import a password protected style, the password needs to be typed in on a password window
- The previous "refresh" button is changed to an "add" button, which makes it possible to browse for a style to import, replacing the use of the previous UserFiles/Styles folder

Customer Value:

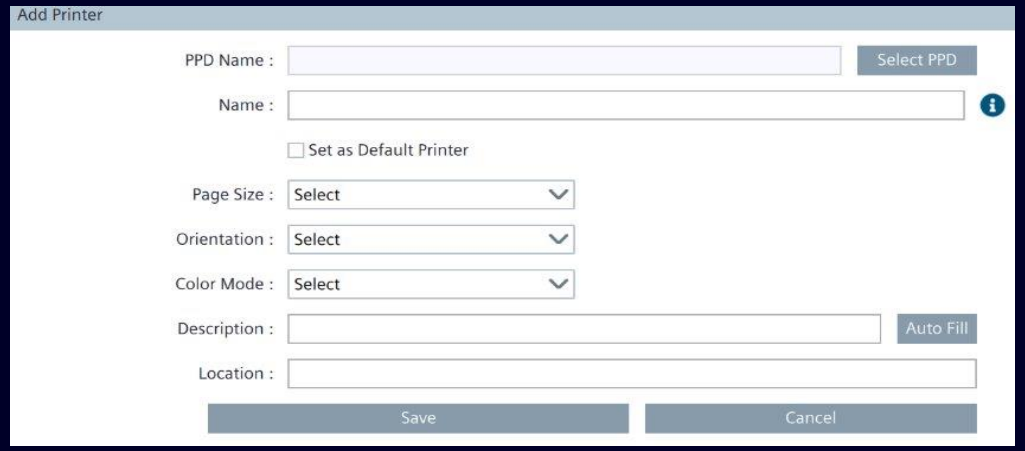
- **Enhanced Security:** Password protection ensures that exported styles are secure and cannot be modified without authorization.

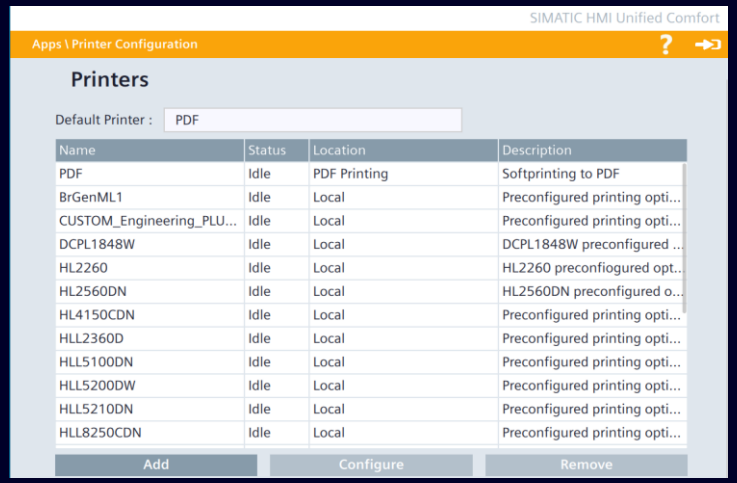
SIEMENS

WinCC Unified V20 Update 3 – Additional Topics
Possibility to add / remove printers

Update 3

Unified Basic Panel ✗	Unified Comfort Panel ✓	WinCC Unified PC ✗





- Capability to add and remove printers using PPD files over Control Panel (CUPS Standard)
- List of default supported printers extended with widely available printers
- Configuration of printer settings like orientation, color mode depending on business needs

Customer Value:

Enhanced Compatibility - The customers can add the support of missing printers themselves.

Seamless Maintenance Experience: Printer settings persist even after maintenance operations like firmware updates and backup/restores.

Additional Info / Notes

Note: SIOS entry will be available

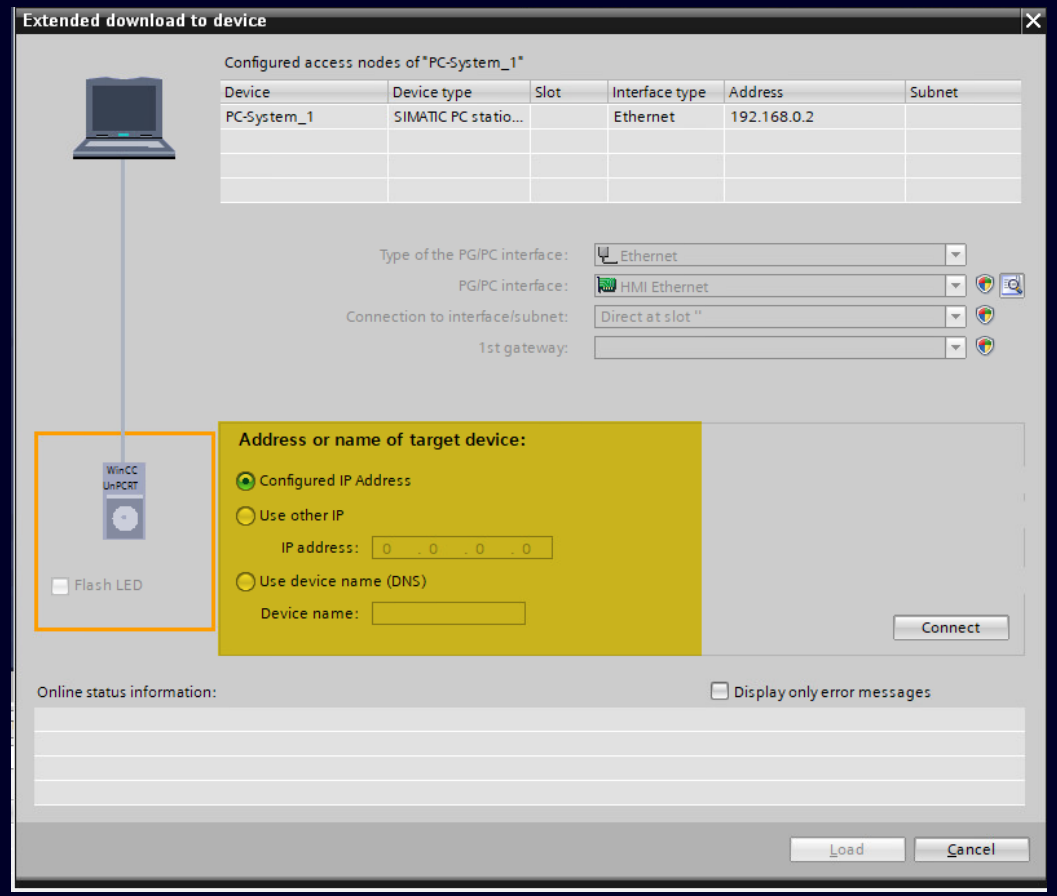
SIEMENS

WinCC Unified V20 Update 3 – Additional Topics

Retain target device settings during extended download to speed up further download procedures

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



- The radio button is automatically set to the previously used mode of connection
- Manually put in IPs are being written in automatically next time the External Download window is used
- In case of DNS, the name field is prefilled with the last used device name

Customer Value:

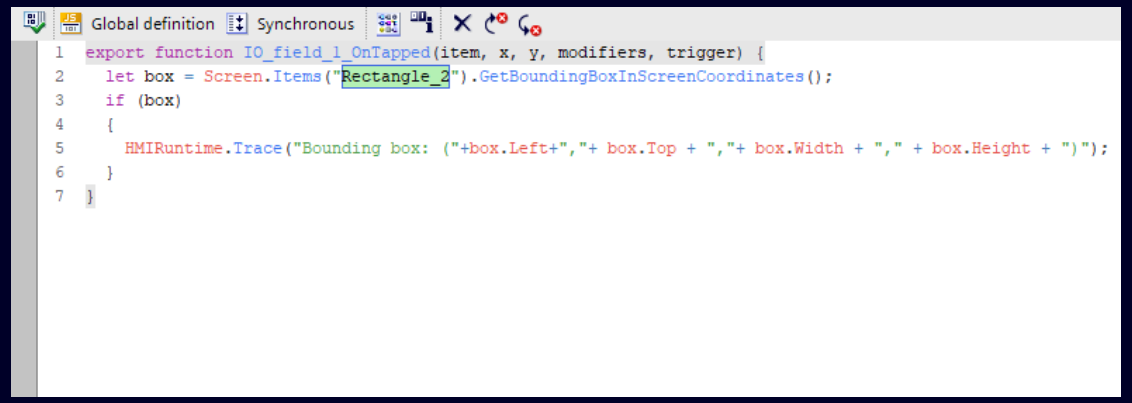
- **Time-Efficient:** Retaining the last used settings speeds up subsequent download processes by reducing setup time.

SIEMENS

WinCC Unified V20 Update 3 – Additional Topics
ObjectModel-Extension: GetBoundingBoxInScreenCoordinates()

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



ObjectModel-Extension to provide bounding box.

- With provided GetBoundingBoxInScreenCoordinates() function user can get the bounding box of Screen Item.

Customer Value:

Bounding boxes provides exact position and dimensions of Items on a Screen also in a case of rotated Items. This can be used for:

- Accurate Element Positioning
- Responsive Design
- Exact calculation of visibility

SIEMENS

WinCC Unified Screen Editor (Next Gen.)

Unlock the Future of Unified Screen Engineering!!!

The next-generation HMI Screen Editor is crafted to facilitate innovative advancements in screen engineering, empowering us to enhance our engineering efficiency like never before.

Key Enhancements:

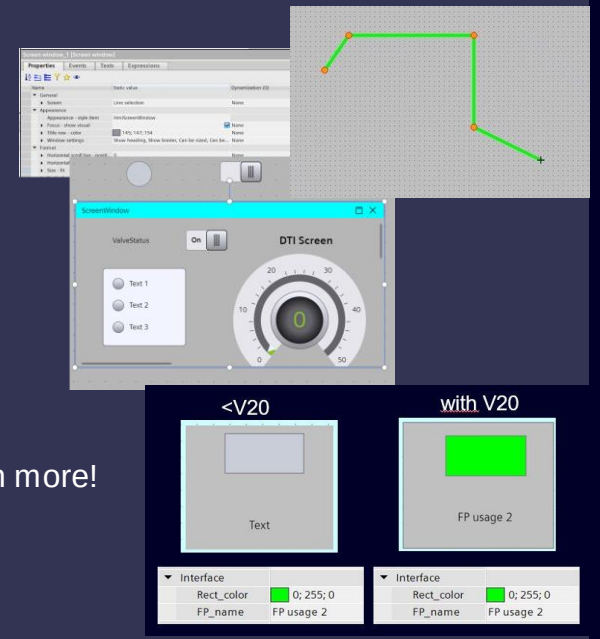
- **Streamlined Simulation Support:**
  - Experience effortless previews that simplify workflows. No need for compile/download or starting the RT Simulation. Utilize dynamic Screen window previews and static Faceplate interface values preview in engineering.

- **Intuitive User Experience:**
  - Effortlessly edit screen objects without digging deep into object properties.
  - Access snap functions, manipulate polylines, and zoom/pan with ease. Shortcuts further enhance your design efficiency.

- **WYSIWYG Environment:**
  - Enjoy a true "What You See Is What You Get" experience, ensuring your designs look exactly as intended in the final product.

- **Future-Ready Capabilities:**
  - Embrace responsive design features, paving the way for streamlined process screen engineering that includes pipes and much more!

Elevate engineering projects with the WinCC Unified Screen Editor and step confidently into the future of design!



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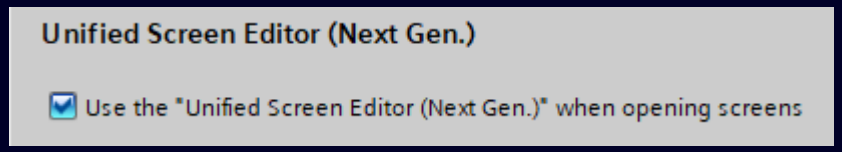
Latest updates – A better Experience is on the way!!

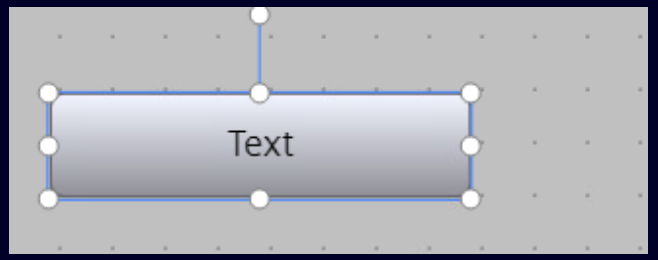
Unified Screen Editor is fully developed and packed with powerful features! However, as it introduces a fresh look and behavioral enhancements, we've decided to release it in our next major version to ensure a smooth experience for you.

We believe in delivering value, and this new product is designed to enhance your workflow significantly. In the meantime, we would like for you to try it and share your valuable feedback. Your insights are invaluable in helping us perfect the experience!

Enhance your engineering projects with the WinCC Unified Screen Editor and embrace the future of intuitive, cutting-edge design with confidence!

Unified Screen Editor (Next Gen.)
Activation of new Screen Editor





Enable Unified Screen Editor :

- TIA Portal -> Options -> Visualization -> Screens -> Unified Screen Editor (Nex Gen.)

Identification of Editor :

- Grab handles and Rotation handle

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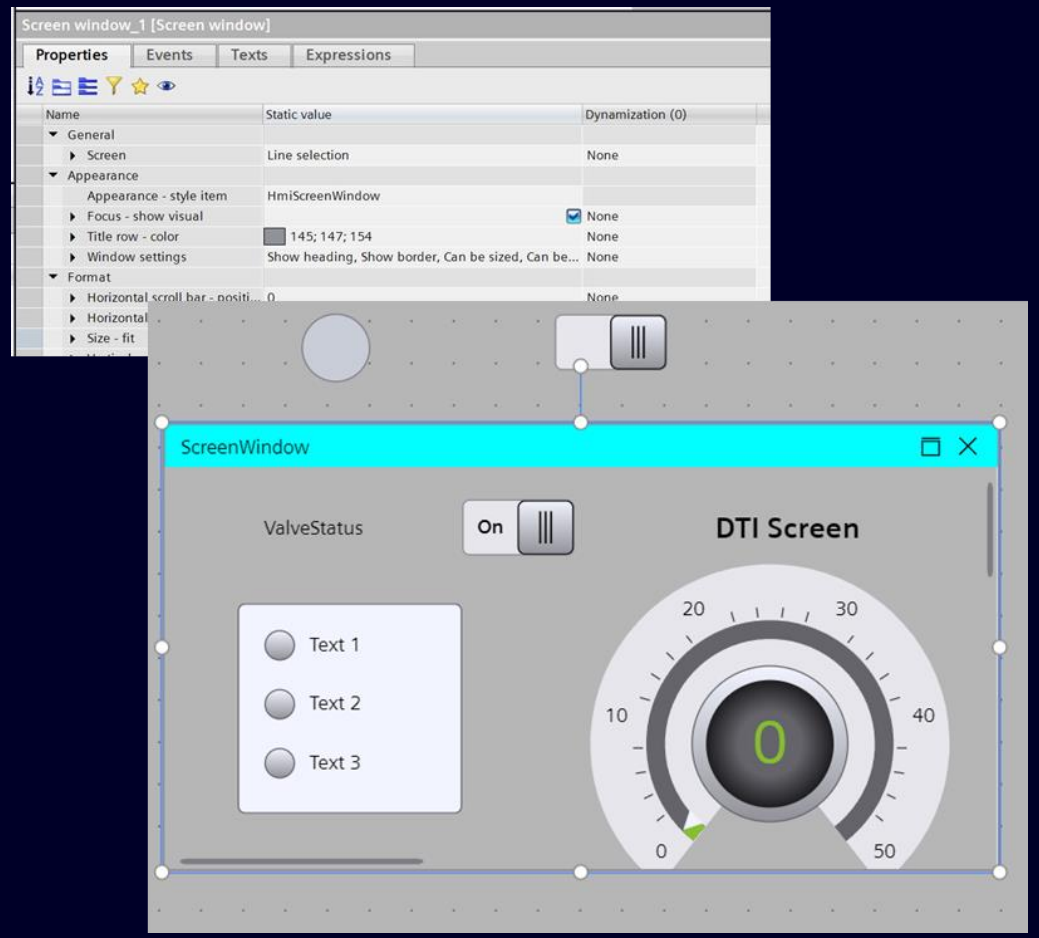
Unified Screen Editor (Next Gen.)
Screen Window Preview for Screens



Extended Support for Screen Window Preview – Enhanced Visualization & Efficiency!

- User can preview screen inside Screen Window
- Update on another screen previewed on Screen Window

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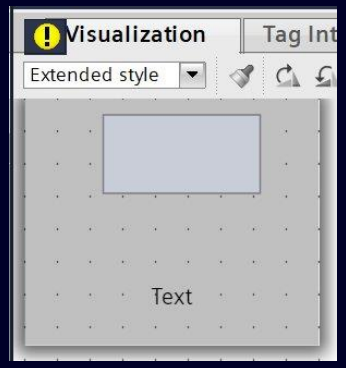
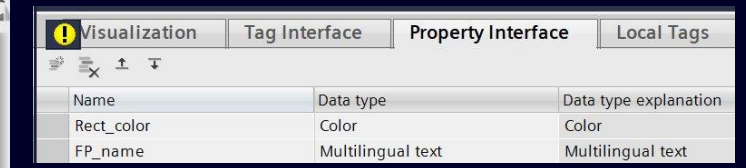
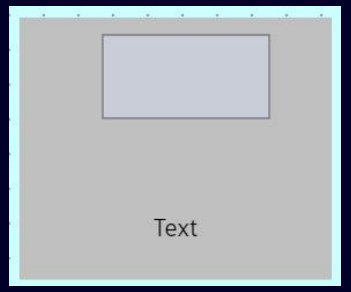
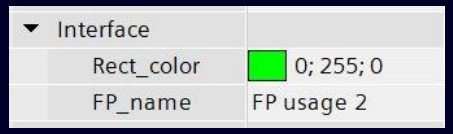
Unified Screen Editor (Next Gen.)
Faceplate container Preview – Static interfaces values





<V20





with V20





WYSIWYG Faceplate Container – Precision in Preview!

- WYSWYG Faceplate container with static values

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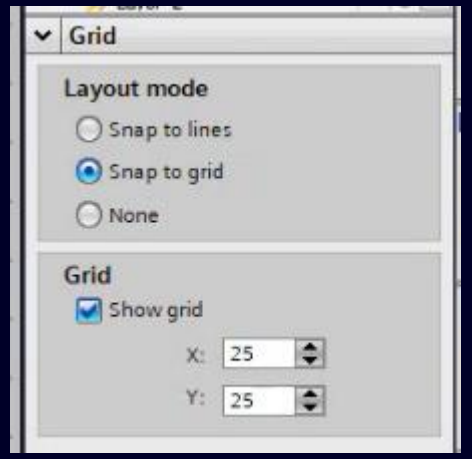
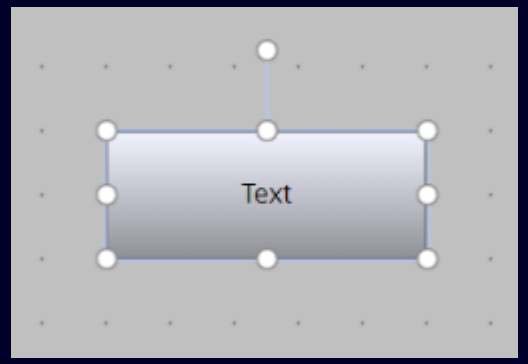
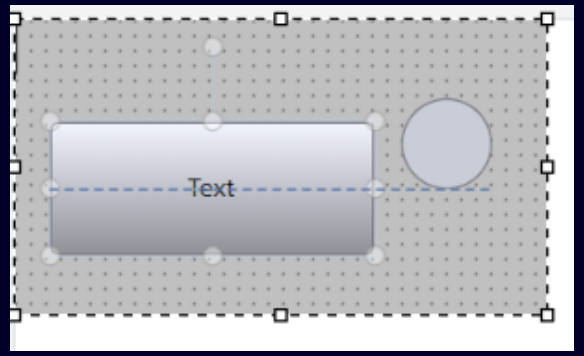
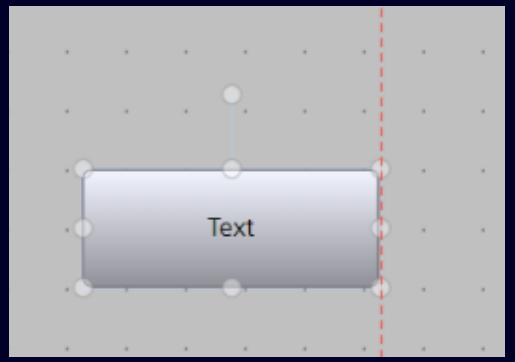
Unified Screen Editor (Next Gen.)
Snap to line









Precision Made Simple – Enhanced Snap-to-Line & Snap-to-Grid!

- Easy placement of objects via Snap to Grid/ Snap to line
- Alt+ Remove Snap to Grid
- Centered snap lines

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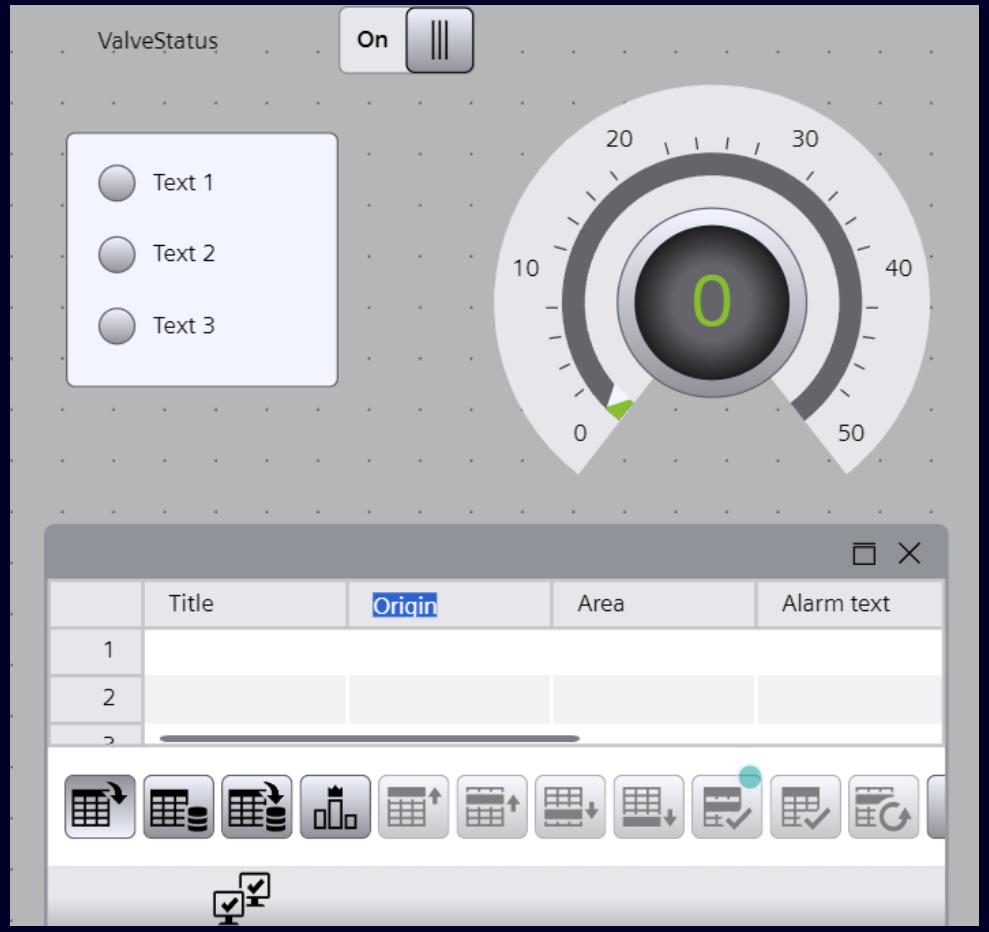
Unified Screen Editor (Next Gen.)
Direct text input



Enhanced Direct Text Input – Faster & More Intuitive Editing!

- Extended support is available for Direct text input for Screen elements.
- Press F2 or double click of text to enter in edit mode for screen element
- Press Tab key in edit mode to next direct text input
- Direct text input for column headers are available for complex columns (Beginning of InControl editing)

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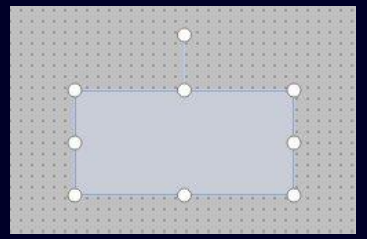
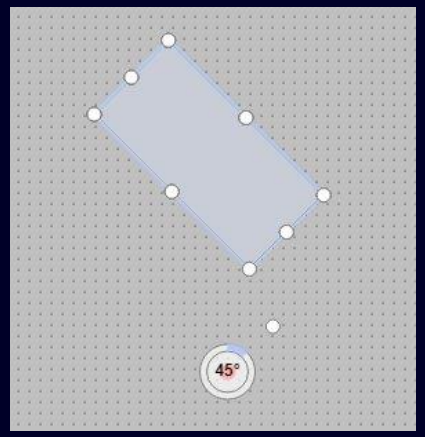
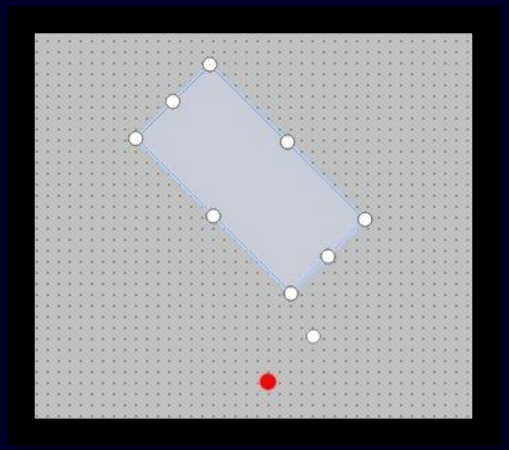
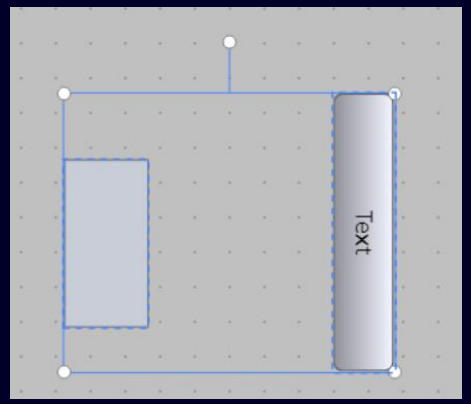
Unified Screen Editor (Next Gen.)
Rotation and External rotation point









Effortless Object Rotation – Precision at Your Fingertips:

- Support of rotation handle to rotate object directly from screen
- Support of Centered rotation, External Rotation
- Centered Rotation : Rotation handle
- External Rotation : Alt + select object to get external rotation point
- Object can be rotated using external rotation point.(Red dot)
- Rotation of the multiselected objects

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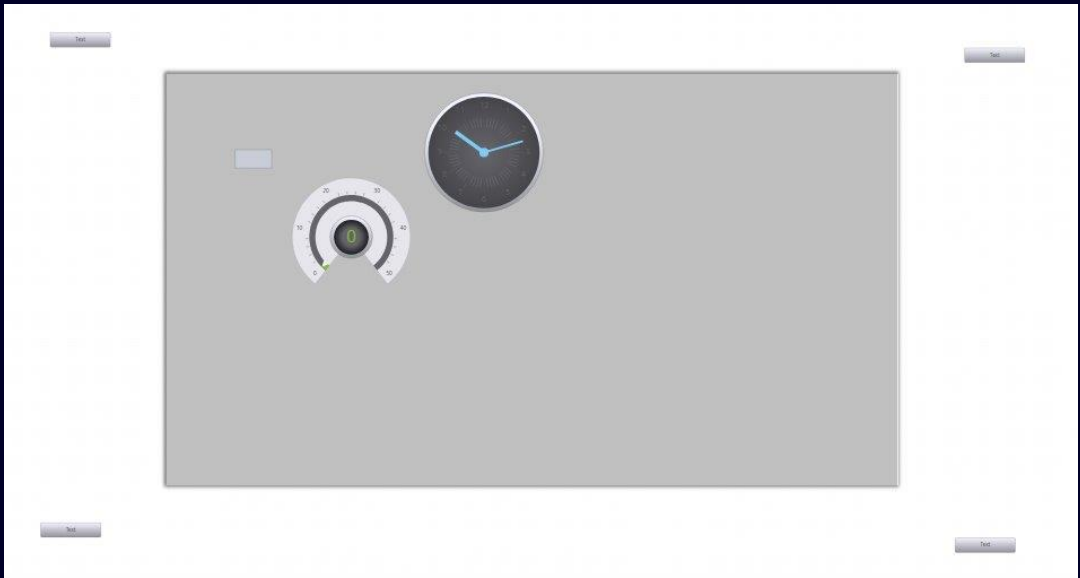
Unified Screen Editor (Next Gen.)
Additional screen area for designing



Expand Your Workspace – More Room for Engineering Precision!

- Add screen item beyond visual area of screen - Top and Left
- Editing is possible beyond top left corner

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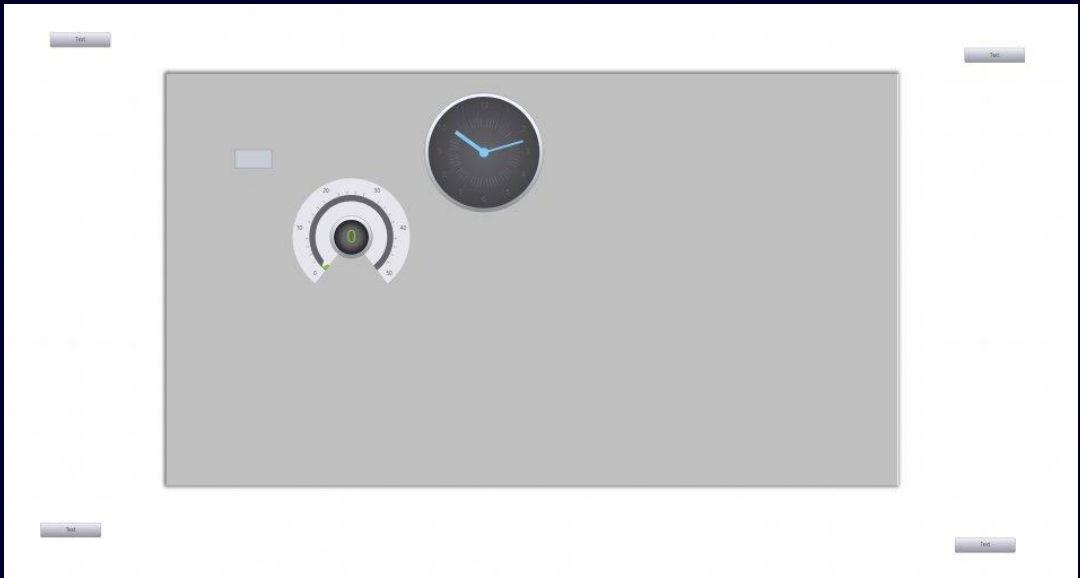
Unified Screen Editor (Next Gen.)
Scroll, Zoom and Pan for Screen and Screen objects



Seamless Navigation – Scroll, Zoom & Pan with Ease!

- Support of Panning using Space + Left Mouse click drag (Middle mouse button click drag)
- Support of Zooming while panning using Ctrl/Space + Mouse scroll
- Keyboard shortcuts for selection of Screen object for
- Panning : Space + drag
- Zooming : Space + mouse wheel

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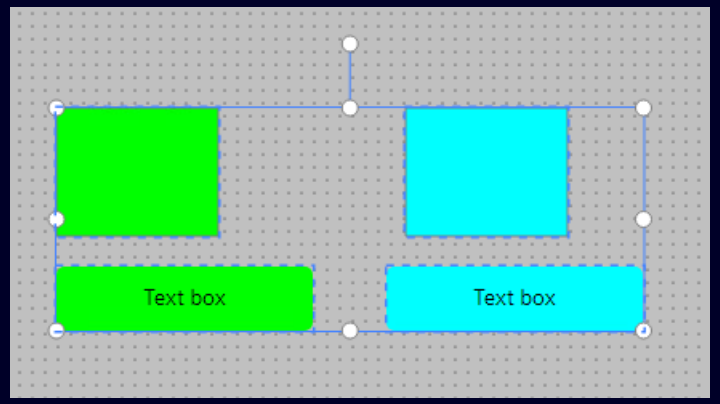
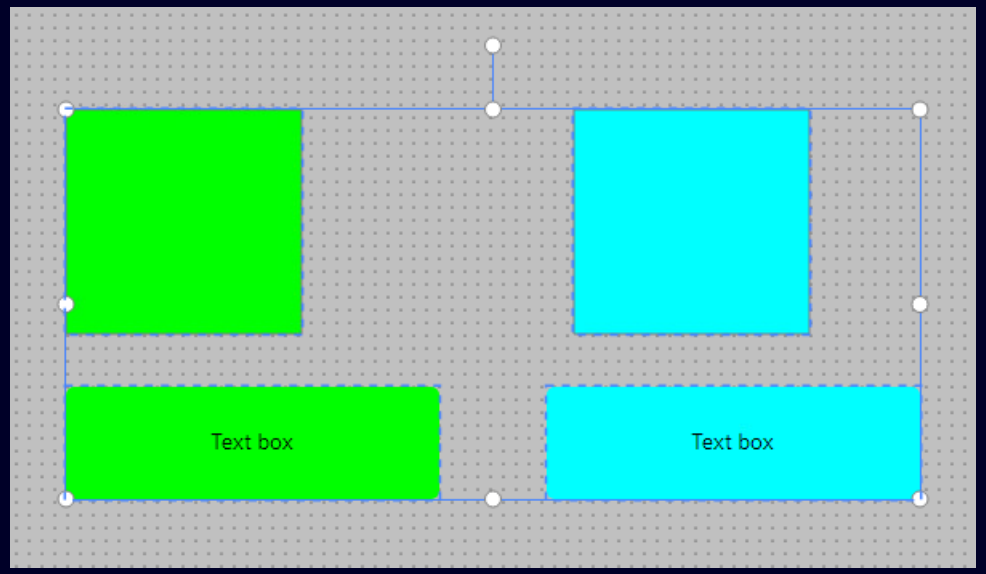
Unified Screen Editor (Next Gen.)
Multi-selection and resize of screen object





Effortless Multiselection & Resizing – Maximize Your Productivity!

- Relative resizing of multiselected screen item

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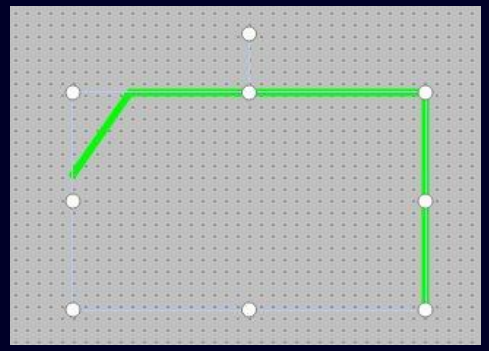
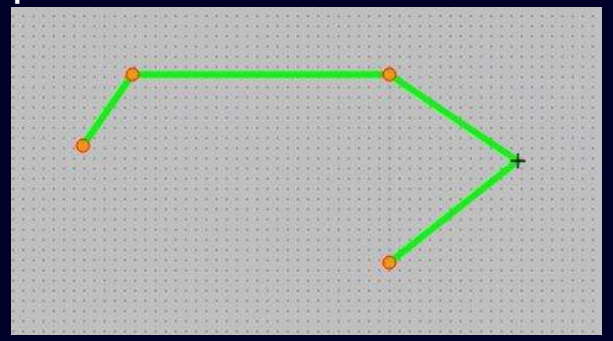
Unified Screen Editor (Next Gen.)
Line object handling

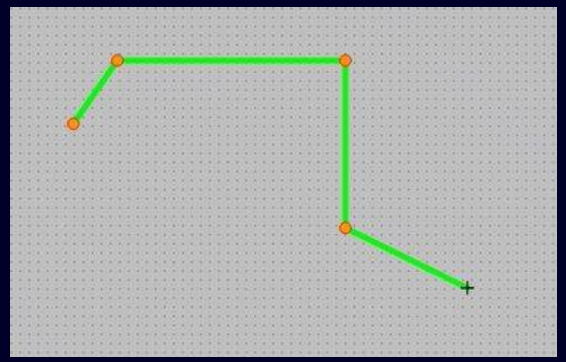
Select mode (click)



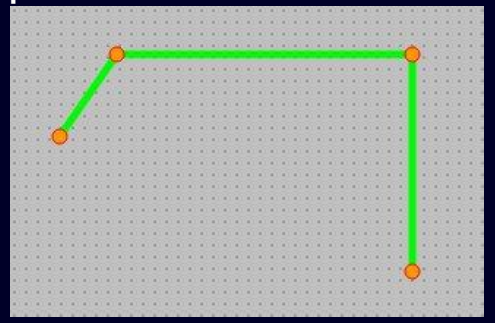
Ctrl => Add new point within polyline with new position



Edit mode (double click)



Alt => Add new point at first/last with new position



Enhanced Line Object Handling – Edit with Precision!

- Edit mode for Line/ Polyline / Polygon
- Double click or F2 key
- Add points at the Start/ End using Alt key for Polyline/ Polygon
- Preview of point to be added using Ctrl key
- Enter key/ Click outside in order to exit Edit mode

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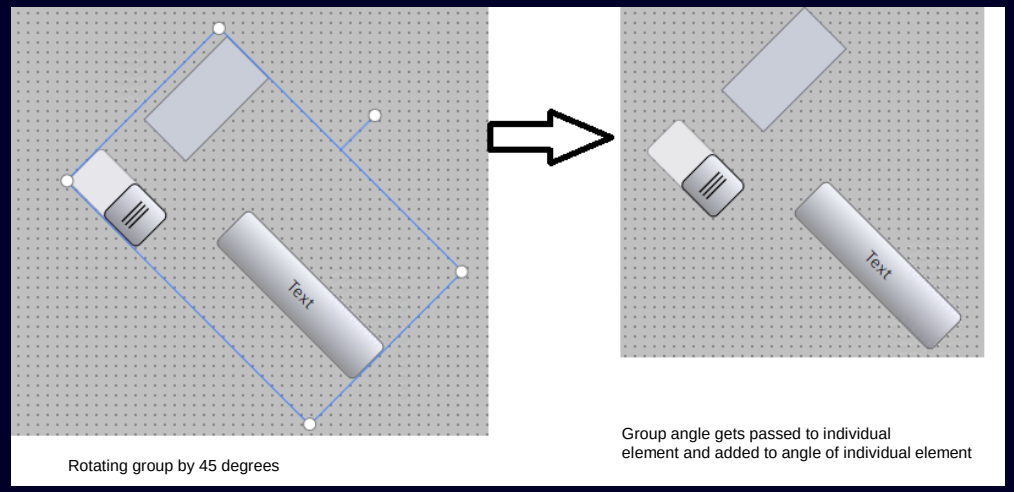
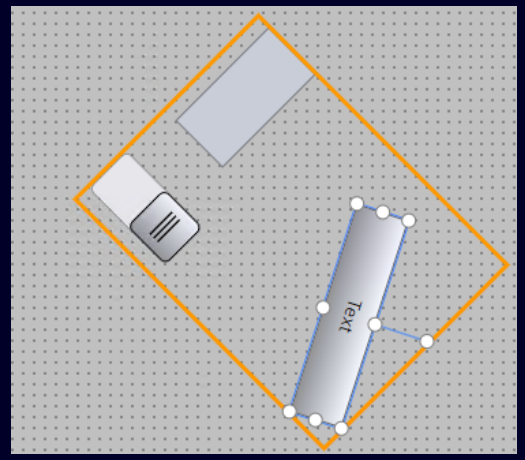
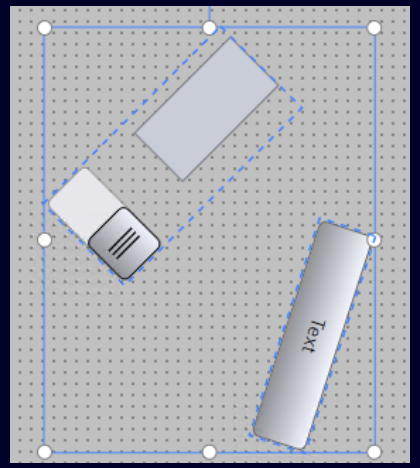
Unified Screen Editor (Next Gen.)
Group Improvement







Enhancing Group Handling for Seamless Workflow:

- Real time resize of the group
- After Ungrouping rotated group, rotation angle of group added to individual element
- No fallback to unrotated position in Edit mode of group. Objects remains in rotated position.
- Objects stays at its original position while adding or removing object from Group

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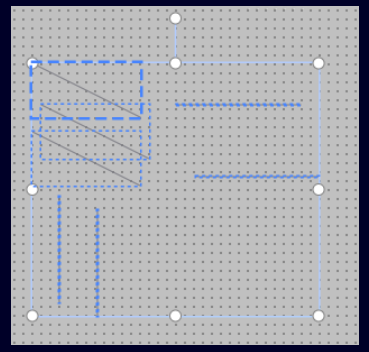
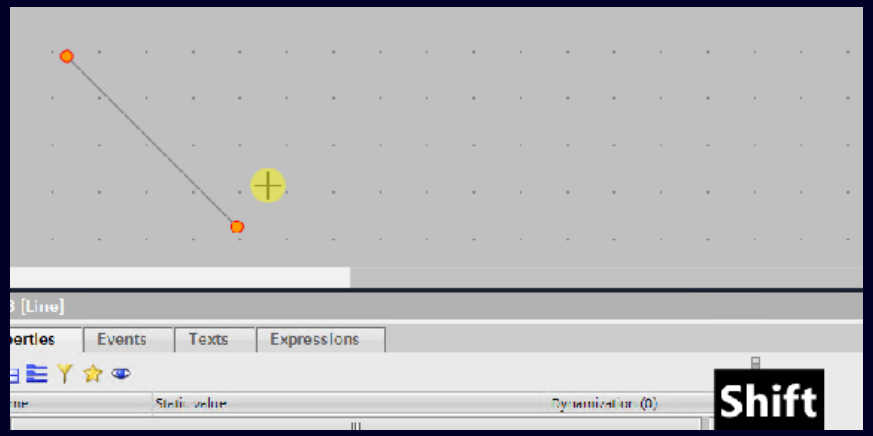
Unified Screen Editor (Next Gen.)
Usability – Multi-selection of lines, Line creation using standard angles





Boost Engineering Efficiency with Advanced Screen Editor Features

- **Improve multiselecting of lines to improve engineering efficiency**:

  Multiselected lines are shown in dotted pattern so that even if they are horizontal or vertical, their selection can be recognized.

- Line alignment while Dragging for improved usability in engineering (draw straight lines):

  Holding "Shift" while drawing lines is aligning the lines in horizontal, vertical or diagonal direction.

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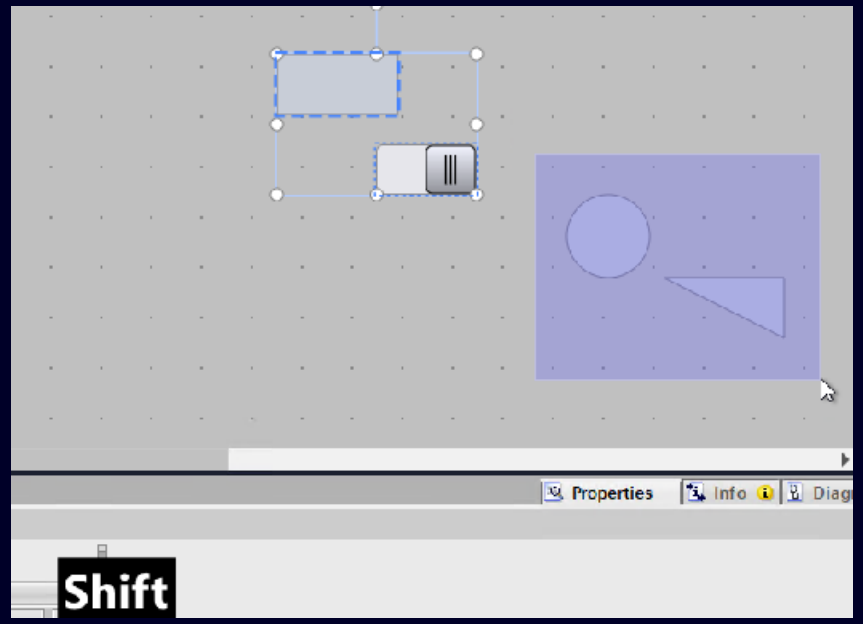
Unified Screen Editor (Next Gen.)
Usability – Multiple items selection (Lasso)



Enhance Productivity with SHIFT + Lasso for Multi-Item Selection in Screen Editor

- Use the lasso functionality together with SHIFT to select more screen items in screen editor.

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WinCC Unified V20

Performance (ES & compile & RT)

- Improve Delta compile capability for connections
- ES Resource Monitor Overview of Multiplex Tags
- Enhanced performance in runtime
- Optimized Tag Multiplexing
- Optimize high resolution graphics in ES

Engineering Enhancements

- Dynamization overview
- Enhanced expressions
- Rename layer on screen/faceplate level
- Activate Control Toolbar Buttons via HMI Screen Item or Script (*)
- Display of value scaling / measurement unit conversion
- Enhanced Screen Item Navigation and Crosshair Button (*)
- System functions
  - Activate / Deactivate event logger
  - Start /stop logging (alarms, tag, audit) (*)
  - change user (via alias, name/pwd) (*)
- Trigger
  - Script is triggered only on tag value change
  - Tag triggers for Screens and Scheduled Tasks (*)

Central Color palette

- Color palettes in library (*)
- Assign color via scripting and via object picker

Engineering Efficiency

- Corporate Designer
  - Version matching custom styles
  - Target device version for custom styles
- Graphic handling
  - Improvements for display dynamic SVG graphics in preview
  - Editing SVG images with external application
  - New set of dynamic widget
- Library
  - Disable use of faceplate types
  - Create library types: Text lists, Graphics & Scripts
  - Identify cross references for PLC UDT in faceplates
  - Identify and filter Unified library types
- Faceplates
  - *Popup events*
  - *Preview static interface values (WBSE)*
  - Formatted Texts for Text Properties in Faceplates
  - Property interface with expression and conversion functions
  - Text list types in Faceplates and Screens (*)
  - Identify and filter Unified library types
- Standardized Engineering
  - SIMATIC Control Function Library (CFL)

Connectivity

- Support nesting depth up to 26
- Native communication channel LOGO!
- Indirect addressing 1200/1500- multiplex DB Name (*)
- Read/Write a block of data via scripting
- Using umlaut in the address of an OPC UA
- OPC UA Client – Methods (*)
- OPC UA Client – LInt64 & ULInt64 Datatype Support

* as of V19 updates

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WinCC Unified V20

Process Diagnostics
- Change Graph sequence of Graph & ProDiag Overview Control during Runtime (*)
- PLC Code View – Tooltip texts for abbreviated texts

Audit
- Audit of Parameter sets
- Audit for alarm operations (shelve, hide)
- Configurable ESig procedure (*)
- Manipulation detection on audit files (*)

Parameter Control
- Extended number of parameter sets (4000 Elements)
- Control Usability
  - Definition of sorting the parameter sets at ES
  - Search parameter set at RT
- Numeric keyboard support for PaCo
- Audit support of PaCo
- Use of single Tags

Alarm Control enhancements
- Multiline display
- Paging for reading of alarm archives
- Filtering for all columns

Others
- Numeric keyboard for Unified UxP
- Limit a zoom level
- Debugging of JavaScript via VS Code (*), Simatic Unified Air app (*)
- New access to online documentation

User Management
- Authentification via system function
  - ChangeUser (Username & PWD)
  - Secure login without password (Alias)
- Support of RFID in Central User Management (PC)
- Global search for RT rights

Specific start screen (PC RT)
- User specific start screen
- Role specific start screen

Runtime persistency (PC RT)
- On demand persistency and auto persistency for global and personalized settings for alarm control, trend controls, f(x)

Redundancy (PC RT)
- Data redundancy of
  - Current and logged process values
  - Pending and logged alarms
  - Audit trail, Parameter sets
- Supporting S7-300, S7-400, S7-1200, S7-1500
- Base UI redundancy

Unified Data Hub (PC RT)
- Access to data from offline UDH clients
- Automatic backup and restore
- **3rd party access via GraphQL**

Module Type Package (MTP)
- SIMATIC MTP Integrator for WinCC Unified

* as of V19 updates

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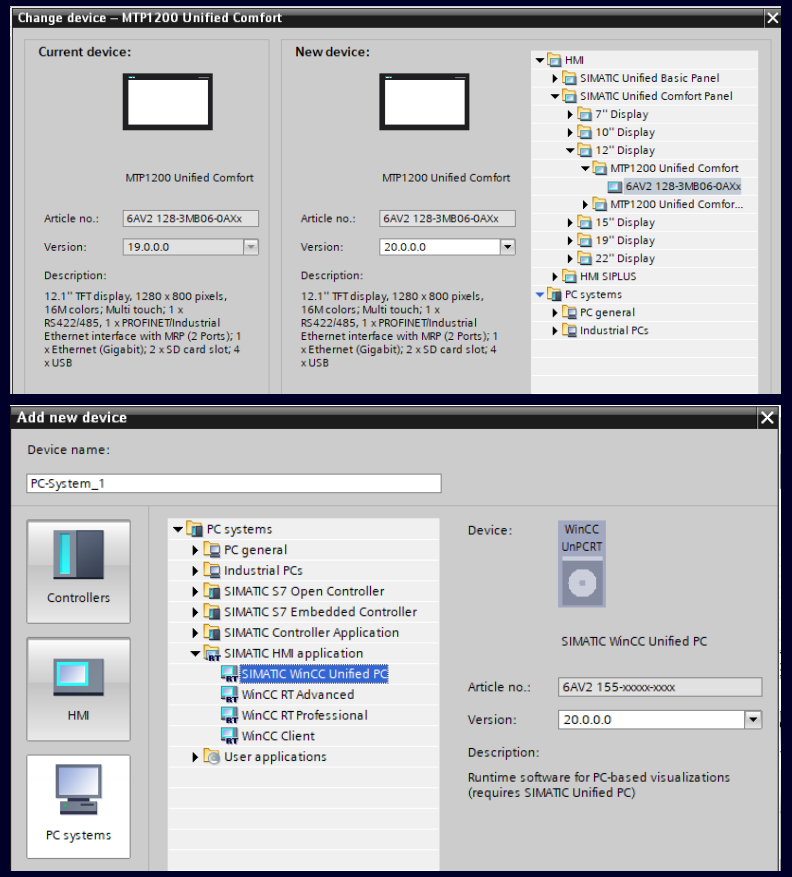
WinCC Unified V20 - Scalability
New device versions

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



New device version for

- ✓ **PC Runtime**
- ✓ **Unified Comfort Panels**
- ✓ **Unified Basic Panels**

New features are available in the corresponding device version only

- ➢ Upgrade the Unified devices
- ➢ Upgrade Faceplates in library (if necessary)
- ➢ Upgrade Custom Web Controls in projects (if necessary)

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WinCC Unified V20 - Performance
Compile Performance

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Compile performance has been improved in certain scenarios

Rebuild should be around 20% - 40% faster compared to V18 depending on the project contents (already V19 Update 1)

Delta Compile improvements are visible when

- Compiling screens
- Compiling small changes in JavaScripts

Delta Compile is the preferable compile method!

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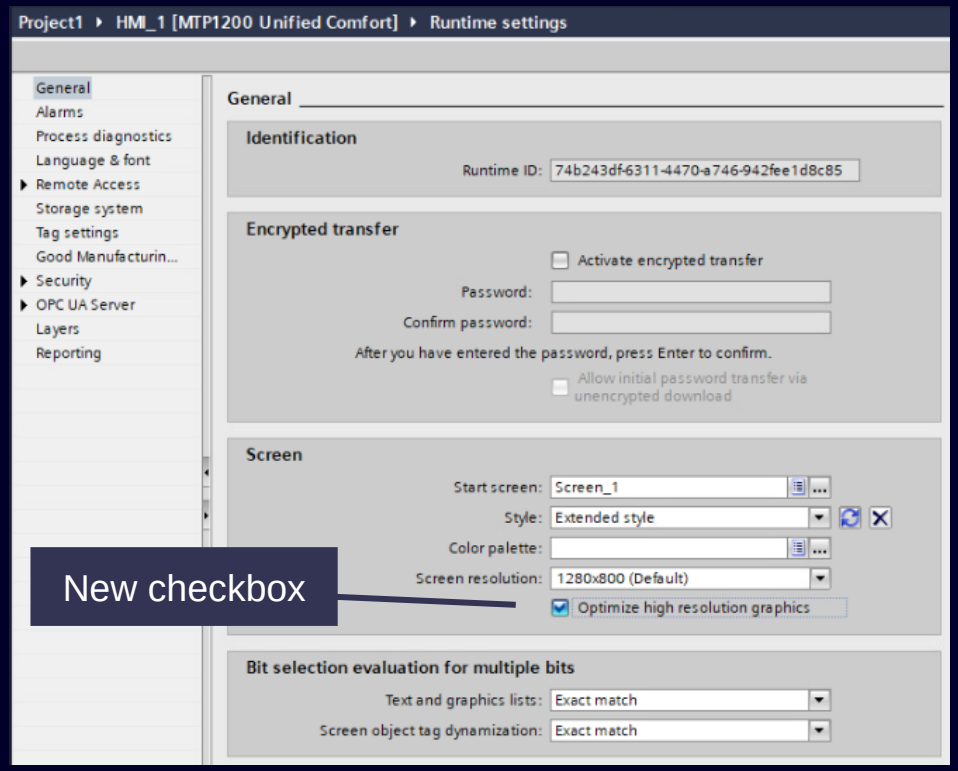
WinCC Unified V20 - Performance
Optimize high resolution graphics in ES during configuration

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Optimize high resolution graphics in ES during configuration

Bitmap images are resized during compilation to improved runtime performance due to optimized graphics

- Resize is based on the usages of the images e.g., high-resolution bitmap used for a button image is resized automatically to the necessary dimension
- No recognizable quality change visible in runtime

SVG-files are not resized, only bitmap graphics can be resized

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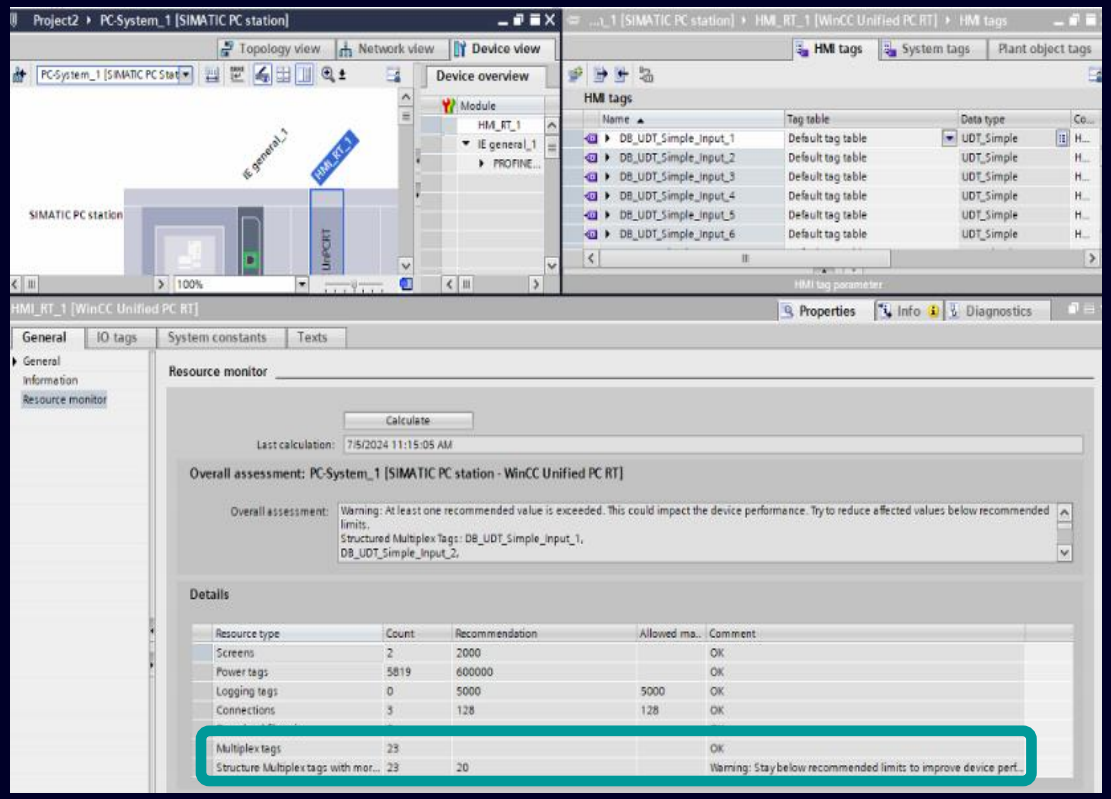
WinCC Unified V20 - Performance
Optimized Tag Multiplexing

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Tag multiplexing is optimized for a reduced screen load time

- Multiplexing only on demand for subscribed tags
- Displaying Warning for count over limits.
- Performance hint in engineering (resource monitor)

  The Resource Monitor can calculate
  - Number of Multiplex Tags (Index and DBName) with more than 200 Child members
  - Warning Message for user in Overview with HMI Tag Names when there are more tags configured than the limit
  - Device Limits : UBP : 5, UCP : 10, UPC : 20

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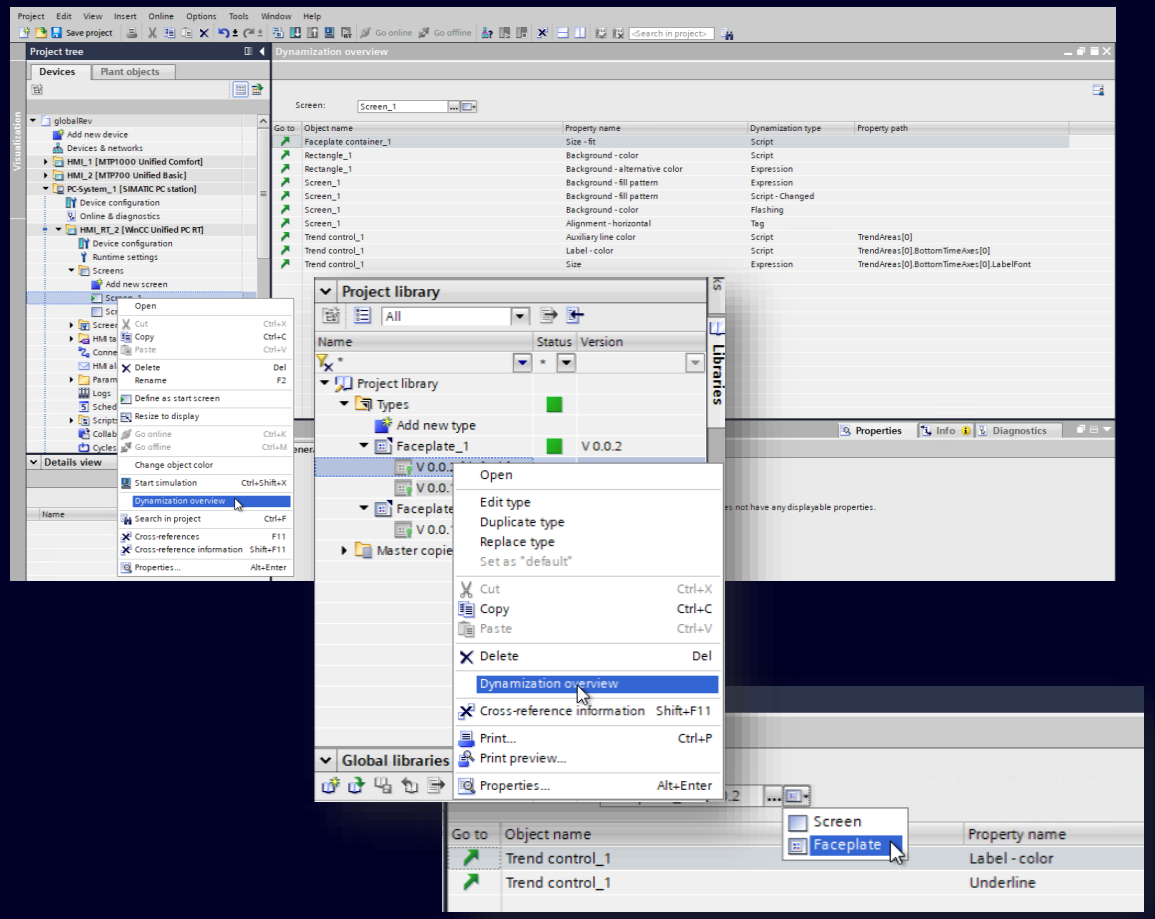
WinCC Unified V20 - Engineering Enhancements
Dynamization overview

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Get a fast overview of dynamized objects on screen or faceplate level

- Display the dynamized objects: Script, expressions, trigger
- Available for screens and faceplates and nested faceplates
- Jump directly to the dynamized object

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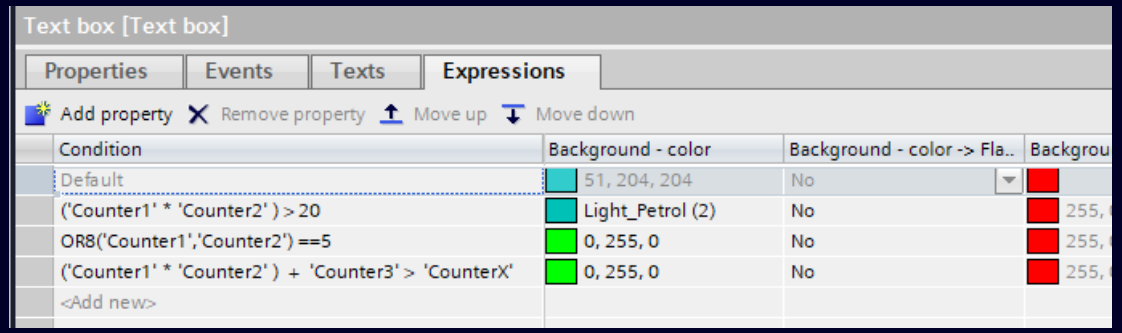
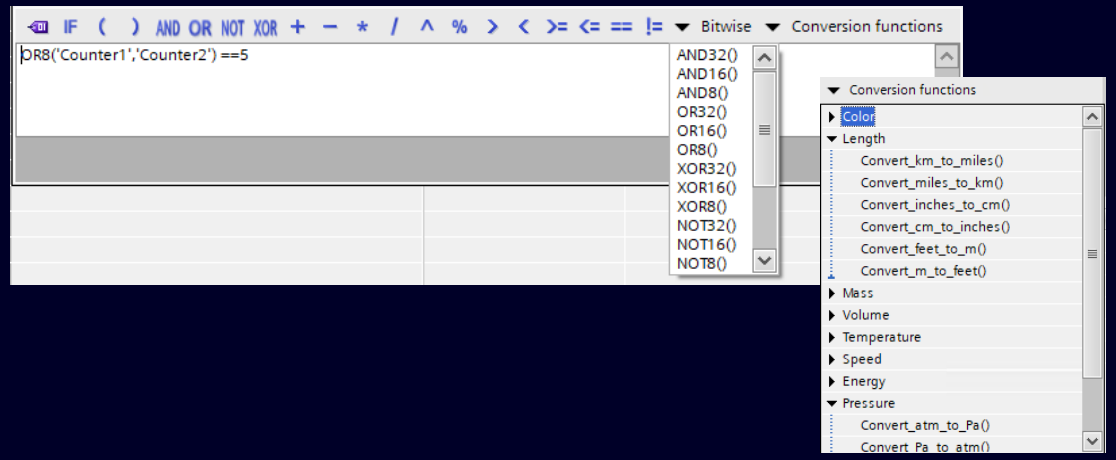
WinCC Unified V20 - Engineering Enhancements
New possibilities with Expression Dynamization

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Functionality of expressions was extended:

- Support of
  - Mathematical operators
  - Relational operators
  - Bitwise functions
  - Text property dynamization in Expressions
- Usability improvements
  - Copy, paste, delete, reorder
  - validation of expression condition during engineering
  - Copy expression from one screen item to another screen item

as of V19 Update 2

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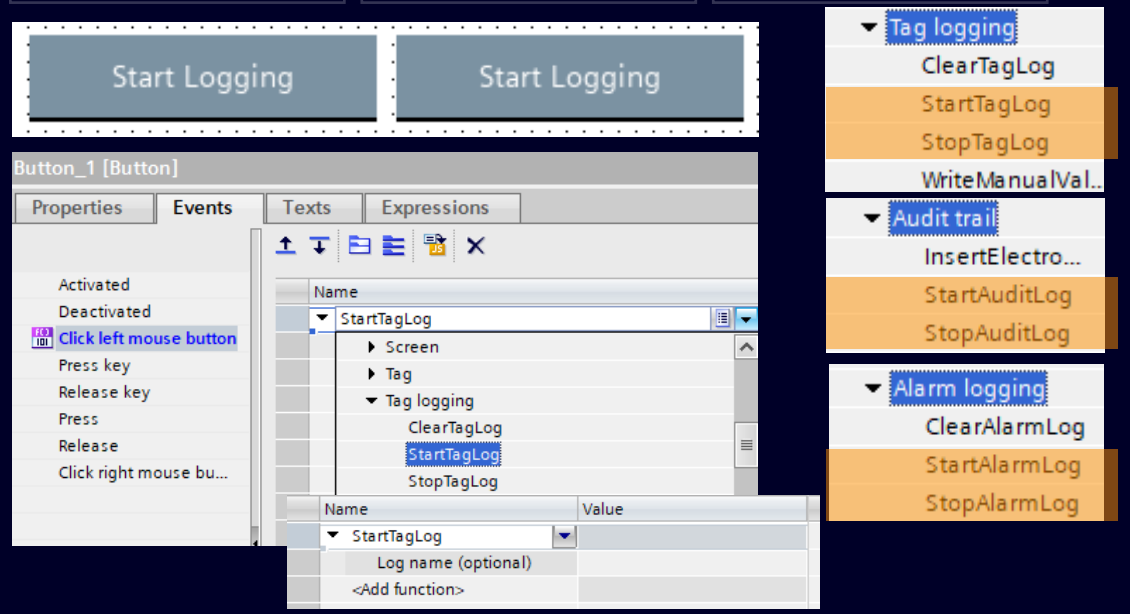
WinCC Unified V20 - Engineering Enhancements
System function for start / stop logging

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓




```
export async function Button_3_OnTapped(item, x, y, modifiers, trigger) {
try {
    await HMIRuntime.TagLogging.SysFct.StartTagLog(undefined);
}
catch (err) { }

}
```

```
export async function Button_4_OnTapped(item, x, y, modifiers, trigger) {
try {
    await HMIRuntime.TagLogging.SysFct.StopTagLog(undefined);
}
catch (err) { }

}
```

Start and stop the logging in WinCC Unified

Stop and start the logging, if necessary, e.g.
- Only log over dedicated time
- Start log on a dedicated occurrence (Error on plant floor, Product category)
- Logging service for different production operation modes (log for Production, log for maintenance)

Start and stop is available for..
- Tag Logging
- Alarm Logging
- Audit Trail

as of V19 Update 2

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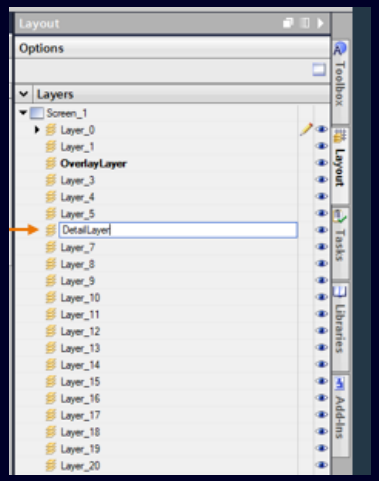
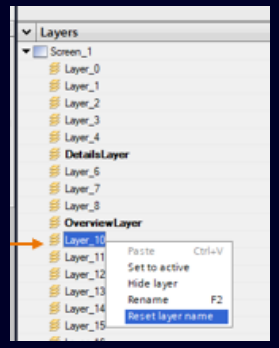
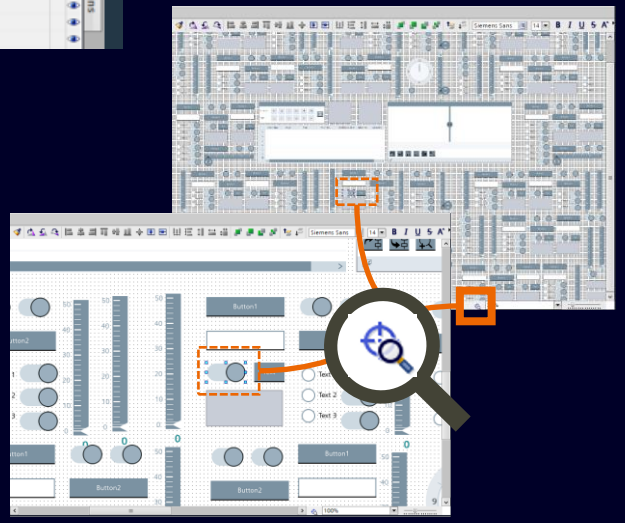
WinCC Unified V20 - Engineering Enhancements

Rename layers at screens and faceplates & Jump to highlighted object in huge screens

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓







Rename layers at screens and at faceplates individually

Individual and central renaming of layers can support the structure of your projects!

- Layers of screens can be central renamed in the runtime settings
- Layers of individual screens or faceplates can be renamed separately
- Full script support accessing renamed layers

Jump to highlighted object in huge screens

Enhanced functionality when navigating screen items on a huge screen

- Crosshair button to center and zoom the selected screen item when working on the editor

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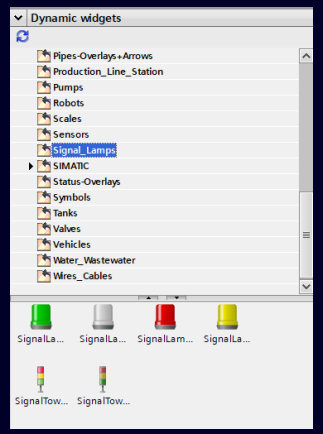
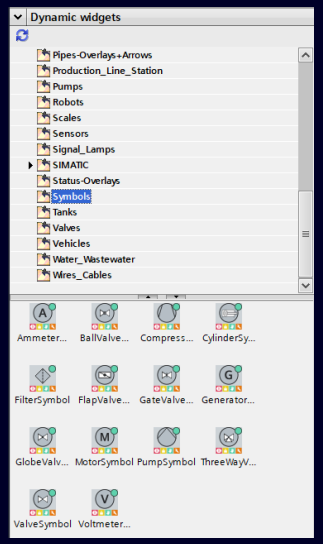
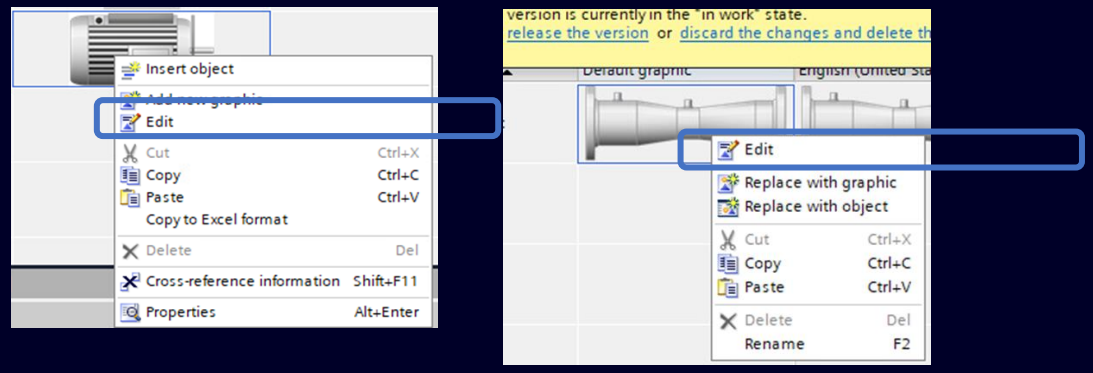
WinCC Unified V20 - Engineering Efficiency
Improvements for dynamic SVG graphics & editing SVG images with external program

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓







Improved thumbnail preview for dynamic widgets

- Dynamic widgets are displayed with the colors predefined in the SVGHMI
  - Same rendering for SVG types in Preview – window for dynamic SVG types as in screen editor
  - Drag & Drop new dynamic widget from the Toolbox into the editor of a dynamic SVG type inside the library

Editing SVG with external program

- External editor for SVG files can be used for editing directly from TIA Portal
- 'Edit' is available on the context menu for SVG objects in Graphics, Graphic Lists, and Graphic types (Library)

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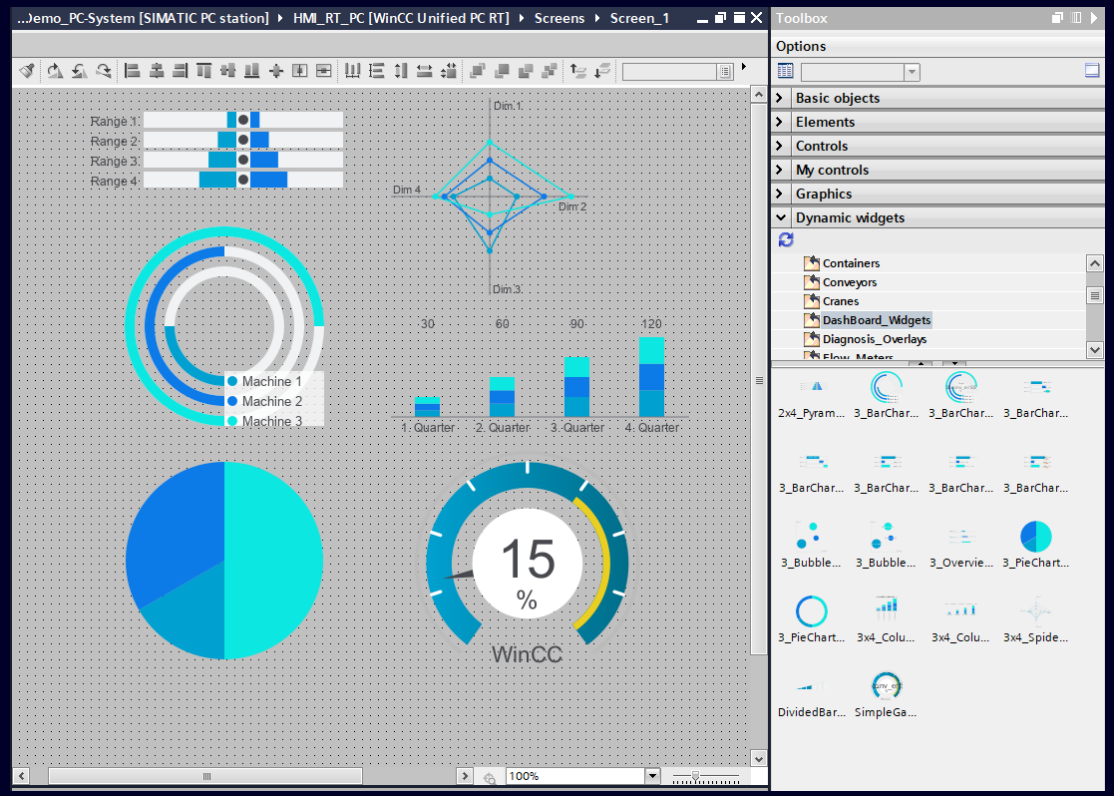
WinCC Unified V20 - Engineering Efficiency
Widgets - new dynamic widgets available

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



New set of Dynamic Widgets (Dynamic SVGs)

- New Dynamic Widgets delivered with TIA V20 to organize, analyze and visualize information by showing relationships and categories
  - Circular bar charts
  - Bar charts
  - Stacked bar charts
  - Bubble charts
  - Pie charts

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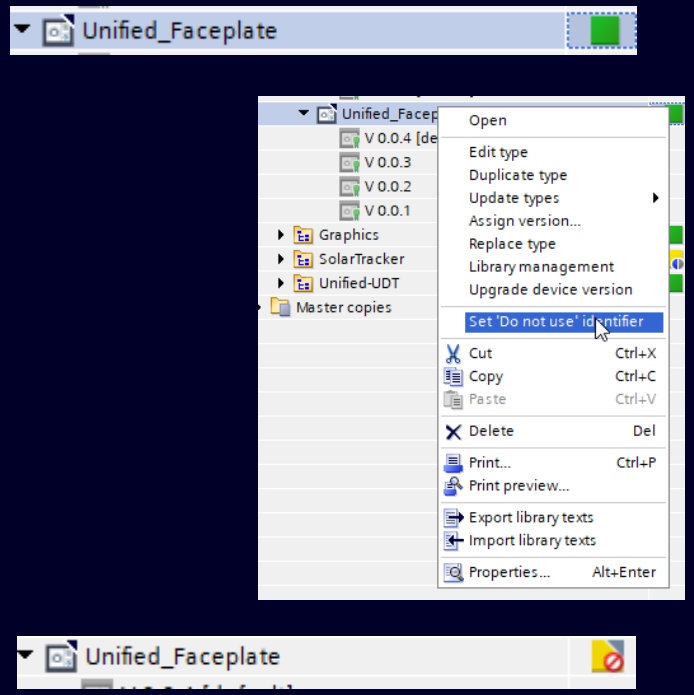
WinCC Unified V20 - Engineering Efficiency
Library – Disable use of Faceplate Types

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Faceplate can be set with a “Do not Use” Flag

Disable the instantiation of faceplates in the Global Library for a further use in a project

Mark a faceplate not to be used as it is “obsolete” or should be a “template” faceplate.

- If flag is set the instantiation of faceplate in screen is not possible
- Only duplicate, modify and instantiate the duplicate

Info:
Valid only for Unified devices

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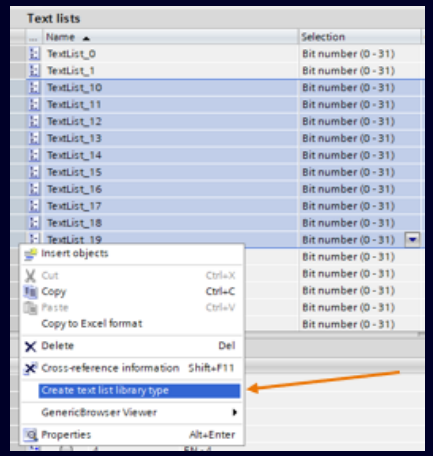
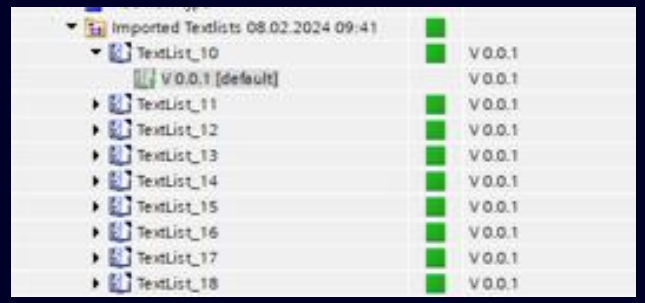
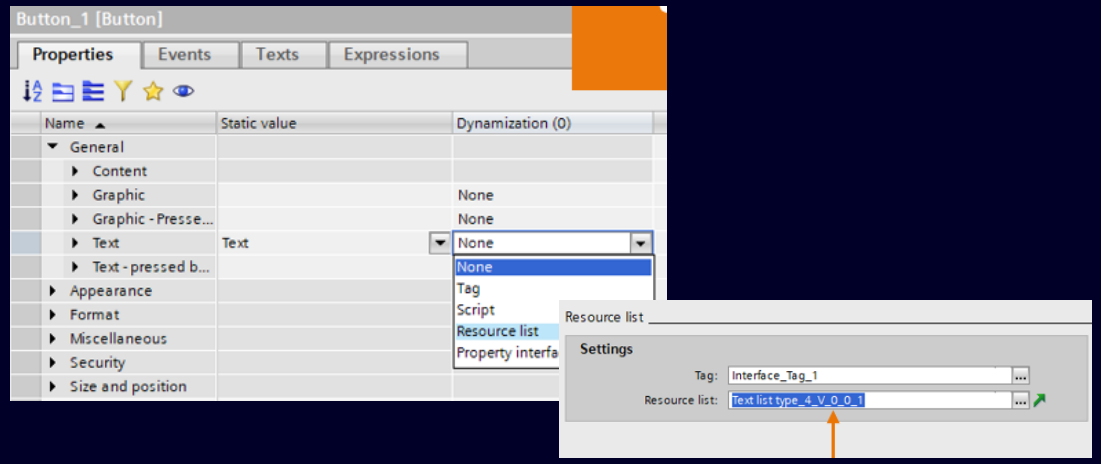
WinCC Unified V20 - Engineering Efficiency

Library – Create library types from project & use text list types in faceplates and screens

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓







Creating library types out of existing project items like text lists to save time and manage a workflow

Create library types from your project via context menu with single- and multi-selection support of

- Text lists
- Graphics
- Script Modules

Configure a text list from your project library in faceplates or screens

Two steps are necessary at a text property:

1. Select Resource list as the Dynamization
2. In the Setting select a Tag as an index and pick the version of the resource list

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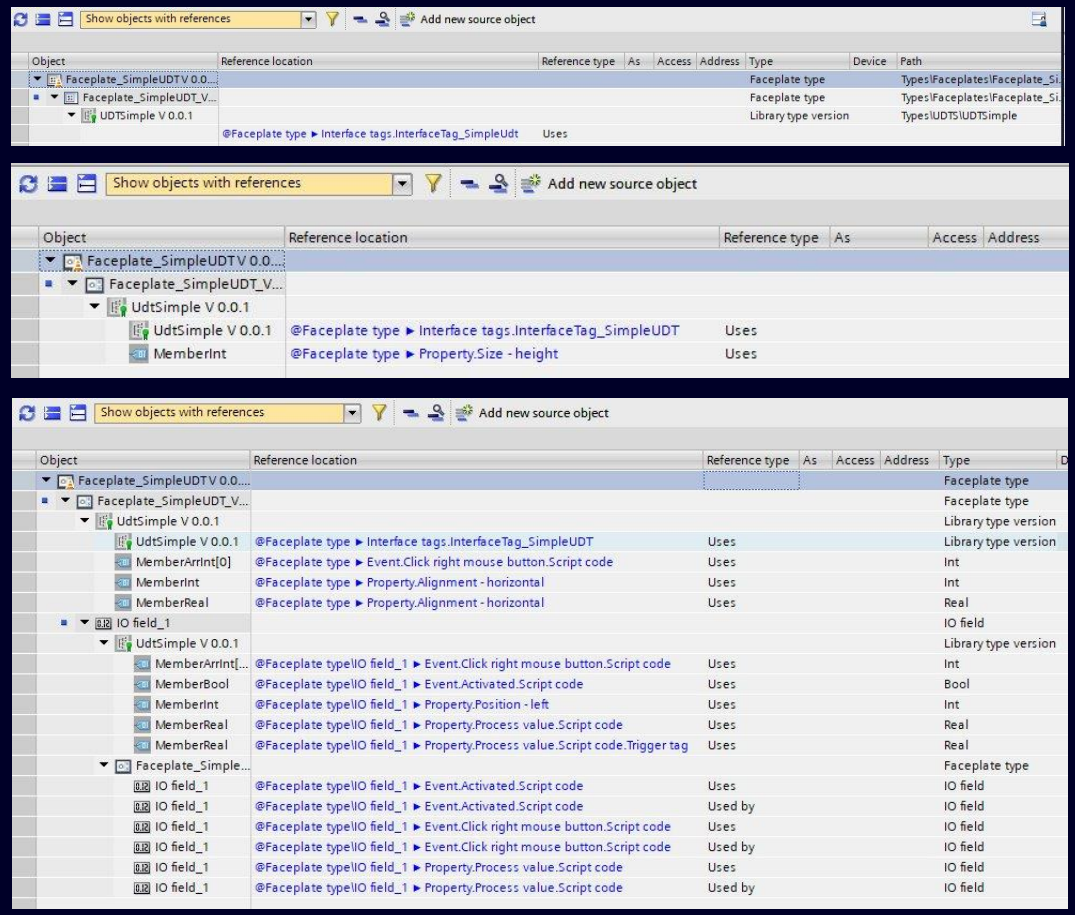
WinCC Unified V20 - Engineering Efficiency
Library - identify cross references

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Cross Reference for PLC UDT in Unified Faceplates

- Cross reference shows PLC UDT used at interface tag in Unified Faceplates
- PLC UDT used in tag or script dynamization, or on at event function lists and event scripts are shown in cross reference views
- Screen items of Unified Faceplates which are using PLC UDT member are shown in cross reference view

→ Using cross reference for PLC UDT and Unified Faceplates saves a lot of time!

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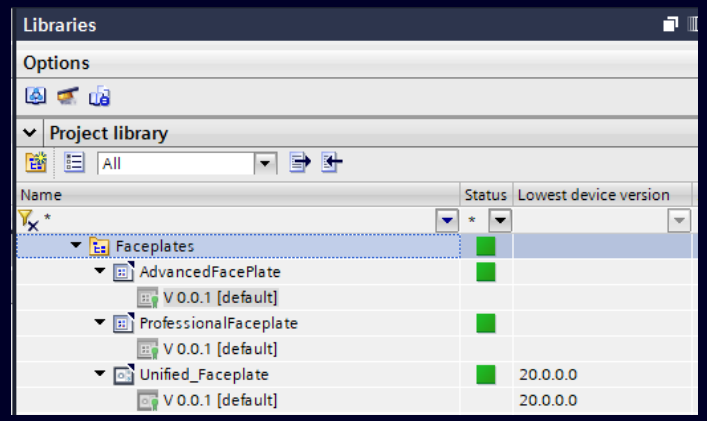
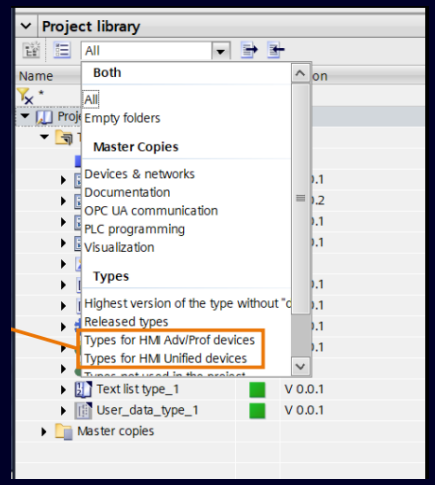
WinCC Unified V20 - Engineering Efficiency
Library - Identify and filter Unified library types (Faceplates)

Unified Basic Panel	Unified Comfort Panel ✓	WinCC Unified PC ✓





Immediately identify Unified Faceplate from non-Unified Faceplates

Fast distinguish between different device types, if you configure or migrate





- Unified Faceplates are displayed with the icon
- Non Unified Faceplates are displayed with the icon

The library view can be filtered between Unified types and Adv/Prof types

- See only types which can be use on a Unified device
- See only types for an Adv/Prof device
- See all

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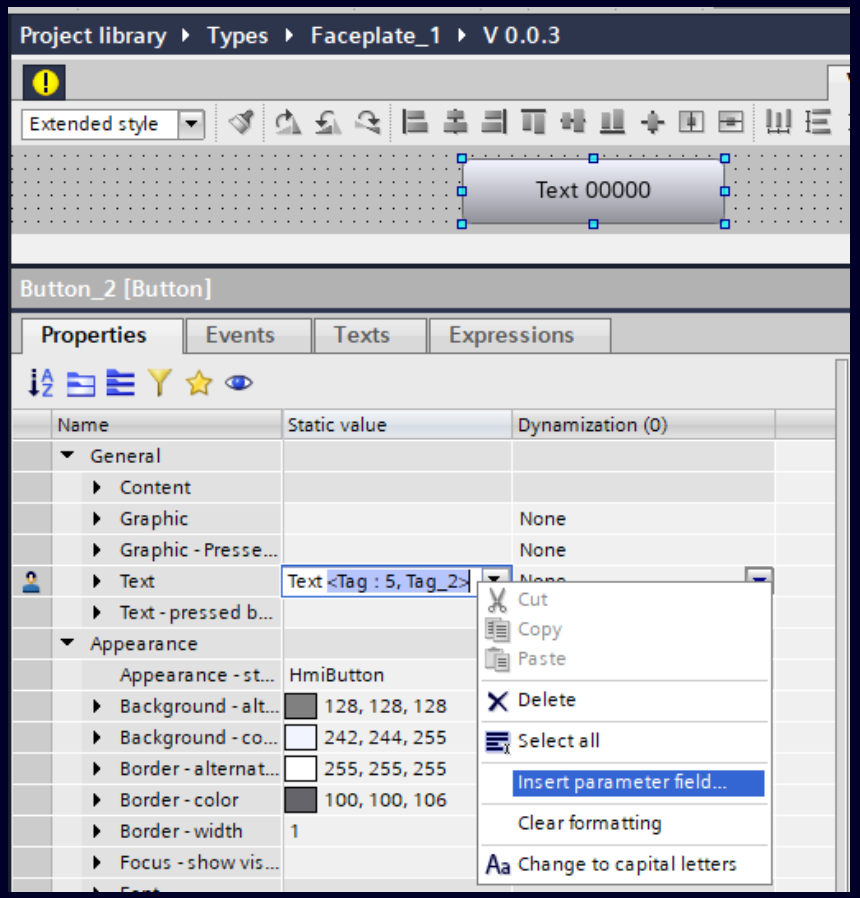
WinCC Unified V20 - Engineering Efficiency
Faceplates - Formatted Texts for Text Properties of Screen Items in Faceplates

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Format Texts inside faceplates with parameter tags via context menu

- Static texts can be formatted now as usual in screens
- Insert parameter fields with Tags value support
- No support for textlist based parameter fields

→ Format texts supports efficient engineering without the need of scripts in faceplates

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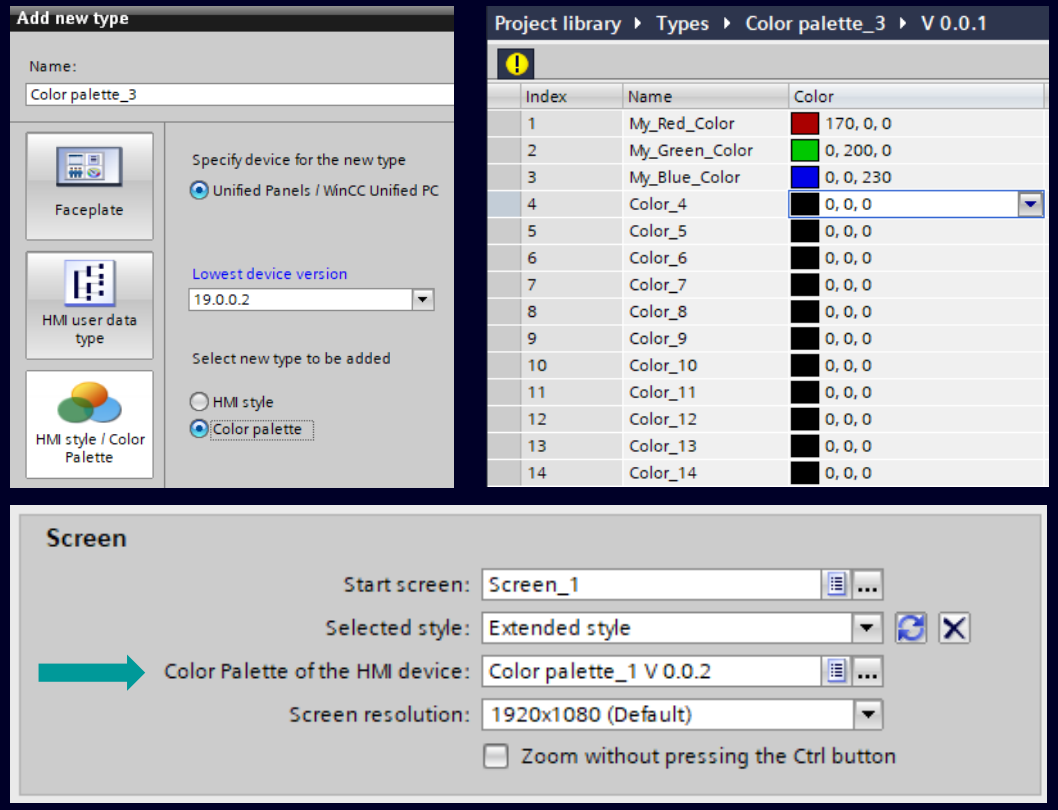
WinCC Unified V20 - Engineering Enhancements
Standardization | Central color palette – as library object

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Define and update colors centrally [1]

Color Palette as new Library type

- 500 named colors can be configured
- Works as a standard library type

Configuration for a device

- Assign to a device in Runtime settings

1 Since V19 Update 2 the feature is available in scripts including faceplates.

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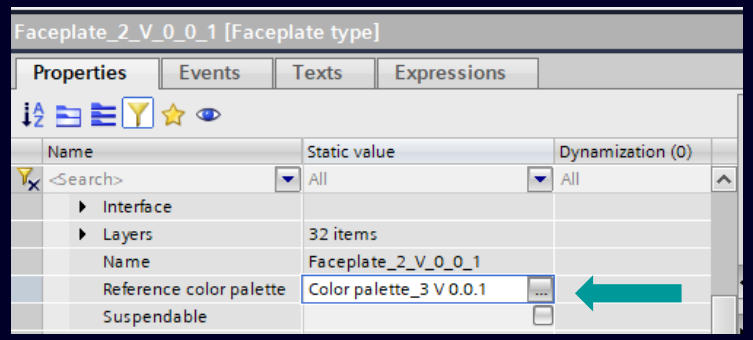
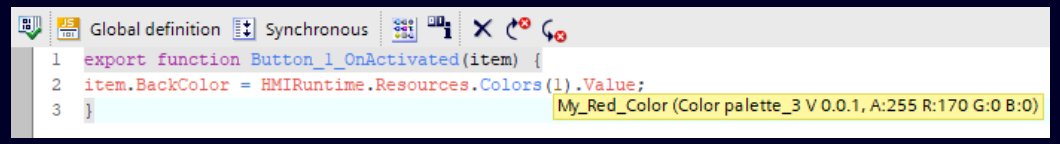
WinCC Unified V20 - Engineering Enhancements
Standardization | Central color palette – usage via scripting including faceplates

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



New with V20





Define and update colors centrally [1]

Configuration for a Faceplate

- Assign to a Faceplate Type ←

  Hint: Works as a preview.

Color Configuration in scripts

- Configure colors by index from the assigned Color Palette via NEW object picker

  Hint: There is a tooltip to display Color Palette and detailed color information as well.

1 Since V19 Update 2 the feature is available in scripts including faceplates.

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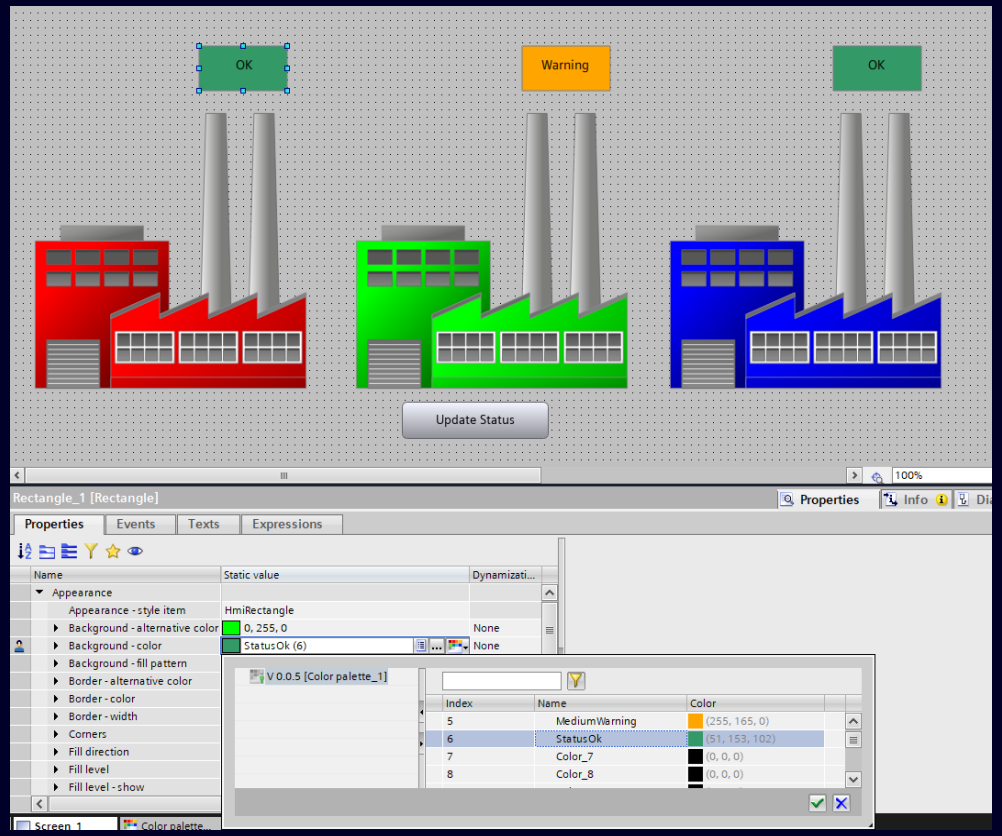
WinCC Unified V20 - Engineering Enhancements

Standardization | Central color palette – usage for screens/screen items including faceplates

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Configure colors via object picker for color properties

- Static properties (Top level and Embedded)
- Dynamics (Tag and Flashing)
- Expressions
- Interface properties
  - Custom properties of Dynamic SVG's (incl. Library)
  - Faceplate interface properties of a Faceplate instance
  - Custom control properties
  - Collected properties of contained items of a Group
- Faceplate properties (All properties from above)

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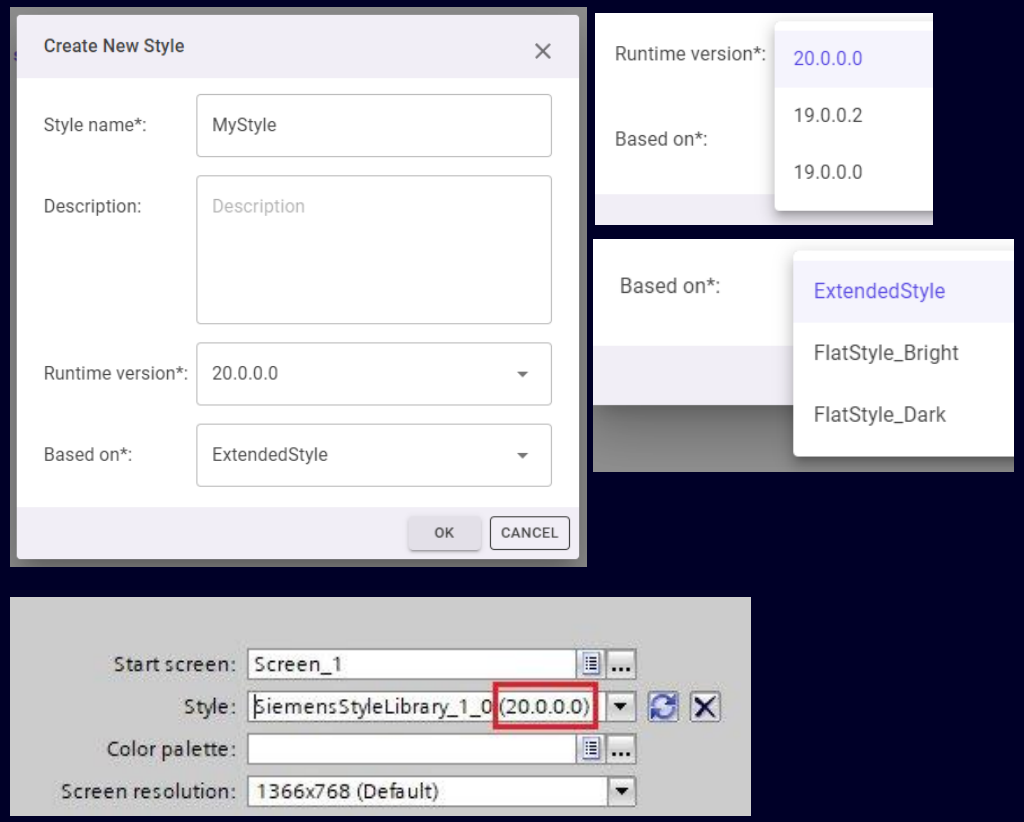
WinCC Unified V20 - Engineering Efficiency
Corporate Designer – Target device version for custom styles

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Corporate Designer – Target device version for custom styles

- Multiple versions of custom styles can be created
  - .cd19 for V19 devices
  - .cd19_0_0_2 for V19 Upd2 devices
  - .cd20 for V20 devices
- The version of existing custom styles can be changed
- If a non-matching style remains selected after a project upgrade, the user is informed by a corresponding compile error
- The version matching custom styles are automatically selected after device change

→ Available via SIOS #109824234

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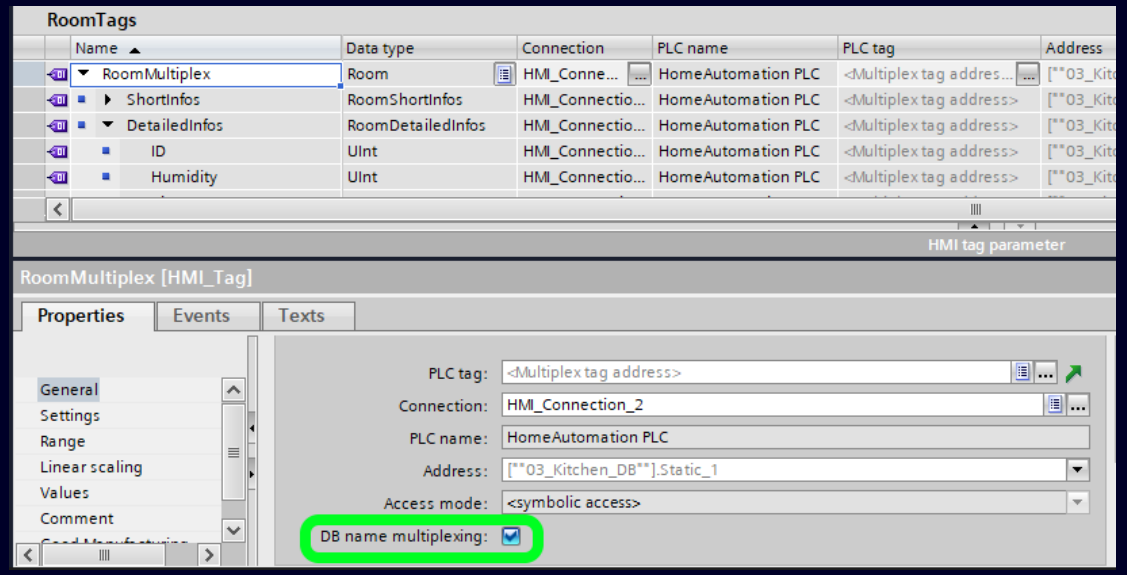
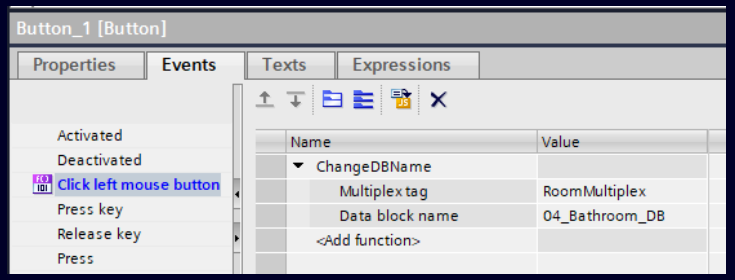
WinCC Unified V20 - Connectivity
Multiplexing - Data Block Name Multiplexing

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓







Extends the Address Multiplexing capabilities by making the Data Block Name selectable

A new way to access identical structured PLC Data

- HMI Tag needs to reference a PLC tag of one Data Block only
- Support for Data Blocks inherited from FBs or PLC UDTs with symbolic access
- Use a System Function to change the Data Block Name of the tag in Runtime
- Additional electronic record for Audit Trail
- Starting from V20 the configuration can be done via Excel or Openness import

as of V19 Update 2

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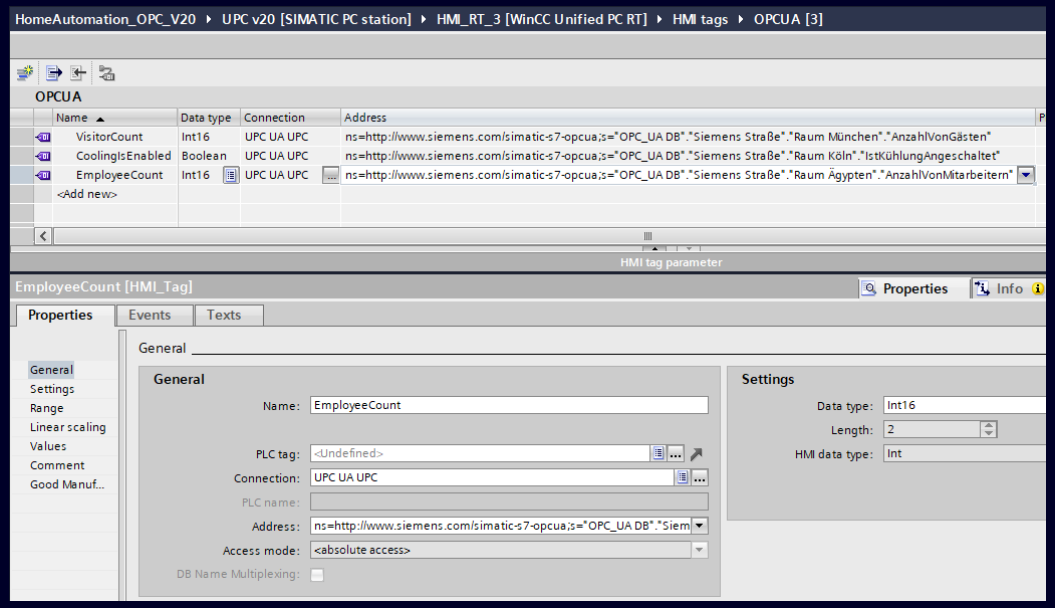
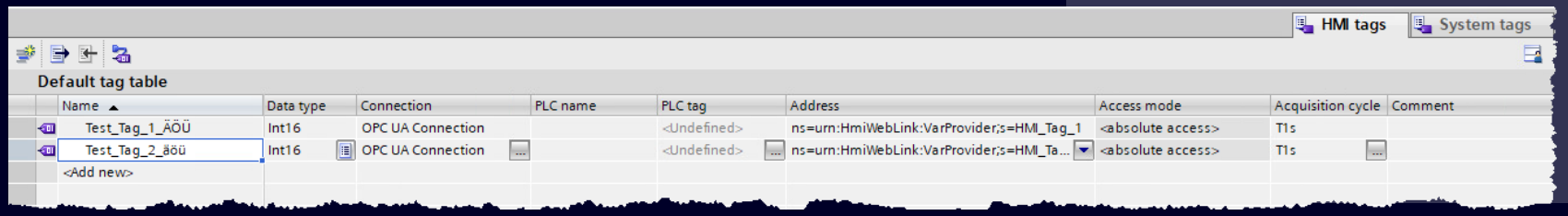
WinCC Unified V20 - Connectivity
OPC UA - Using umlaut in the address of an OPC UA

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Customer can use a Tag with special characters as umlaut (Ä, Ö, Ü) in the address from an OPC UA Server

easily access tags with umlauts in their nodled address names without having to edit the name of each affected tag.

- Supported are all Unicode Characters, except the Unicode Control Characters.

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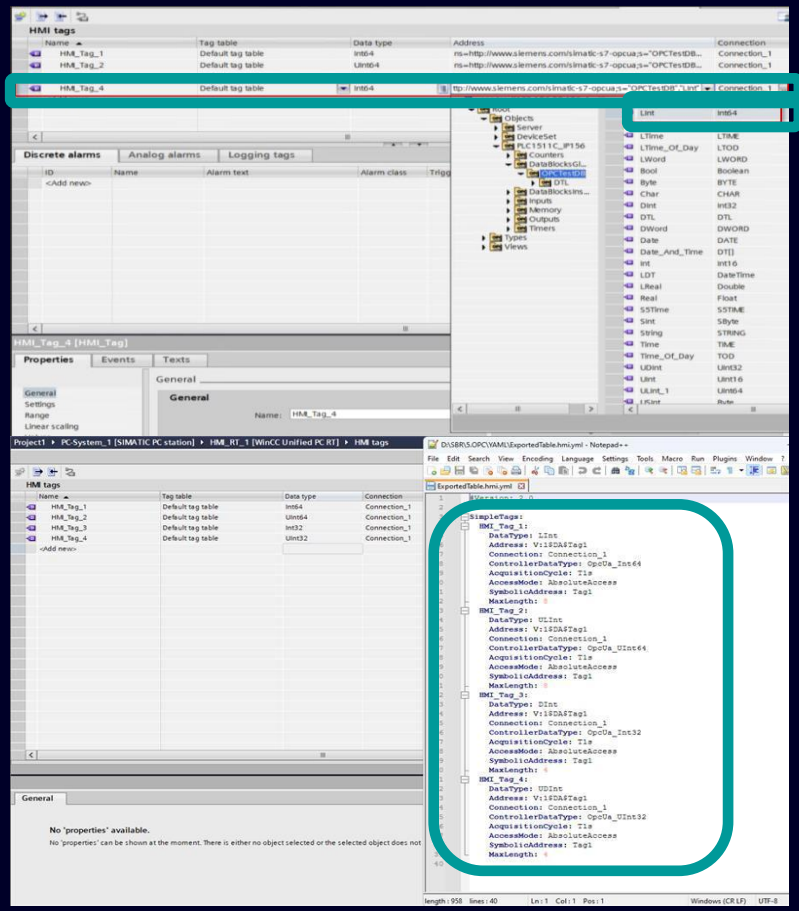
WinCC Unified V20 - Connectivity
OPC UA Client - LInt64 and ULInt64 Datatype Support for OPC-UA

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



OPC UA Client – Data Access

- OPC-UA Client DA now supports LInt64 and ULInt64 datatypes for communication in V20 and above devices only.
- These datatypes can also be imported/exported for OPC-UA Communication Driver via Excel or via Openness for V20 devices

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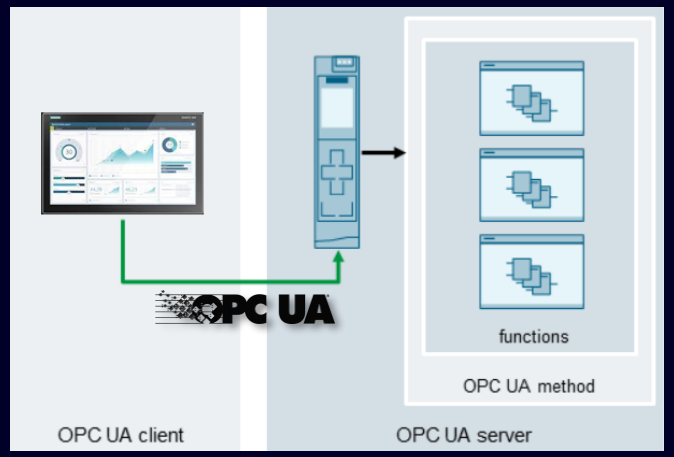
WinCC Unified V20 - Connectivity
OPC UA Client - Methods

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓




```
const methodPath = [{
  "Name": "Objects"
},{
  "Namespace": "urn:MyOpcUaTestServer:TestNodeManager", "Name": "TestMethods"
},{
  "Namespace": "urn:MyOpcUaTestServer:TestNodeManager", "Name": "MethodTwoArgs"
}];
let method = await connection.Session.GetMethod(methodPath)
.catch((error) => {
  let errorMsg = HMIRuntime.GetDetailedErrorDescription(error);
  HMIRuntime.Trace(`Accessing method failed with error: ${errorMsg}`);
  return;
});

if (method.Status != 0)
{
  HMIRuntime.Trace(`Accessing method failed with error: ${method.ErrorDescription}`);
  return;
```

OPC UA Client - Methods

You have the option of reading or writing tags from the OPC UA server, now even complex function sequences can be started via OPC UA

- Method calls are a fundamental part of the OPC UA specification. Methods are comparable to the Remote Procedure Calls (RPC) long known in computer science. They offer the possibility of efficiently executing RPC calls in the automation world and thus reduces the classic handshake patterns for communication between devices.

as of V19 Update 2

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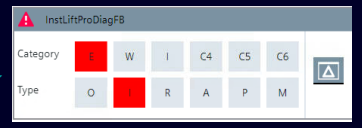
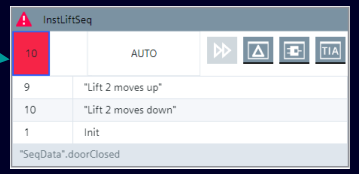
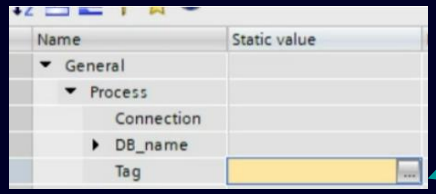
WinCC Unified V20 - Analysis & Operations
Process Diagnostics – change connection of overview controls

Unified Basic Panel ✗	Unified Comfort Panel ✓	WinCC Unified PC ✓

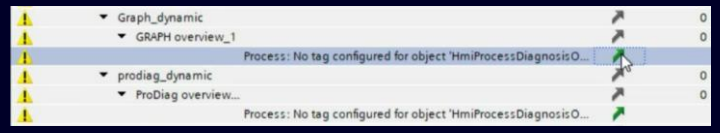
Change connection for ProDiag Overview and GRAPH Overview dynamically in RT.







In ES static connection configuration is no longer enforced.



In RT change connection via Script.

```
HMIRuntime.UI.FindItem('GRAPH overview_1').SetProcessConnection("PLC1_F", "GraphViewer_US079_LAD_DB");
```

SetProcessConnection(String PLCName, String Block)

Change Connection of Process Diagnostic Overview Ctrls

Overview Control connection can be changed at runtime to view information of another PLC / Instance DB instead of static configuration only.

- Supported for Overview Controls
  - Graph overview
  - ProDiag overview
- Dynamize the connection for the overview controls via JavaScript
  - PLC name
  - DB name to be visualized

as of V19 Update 2

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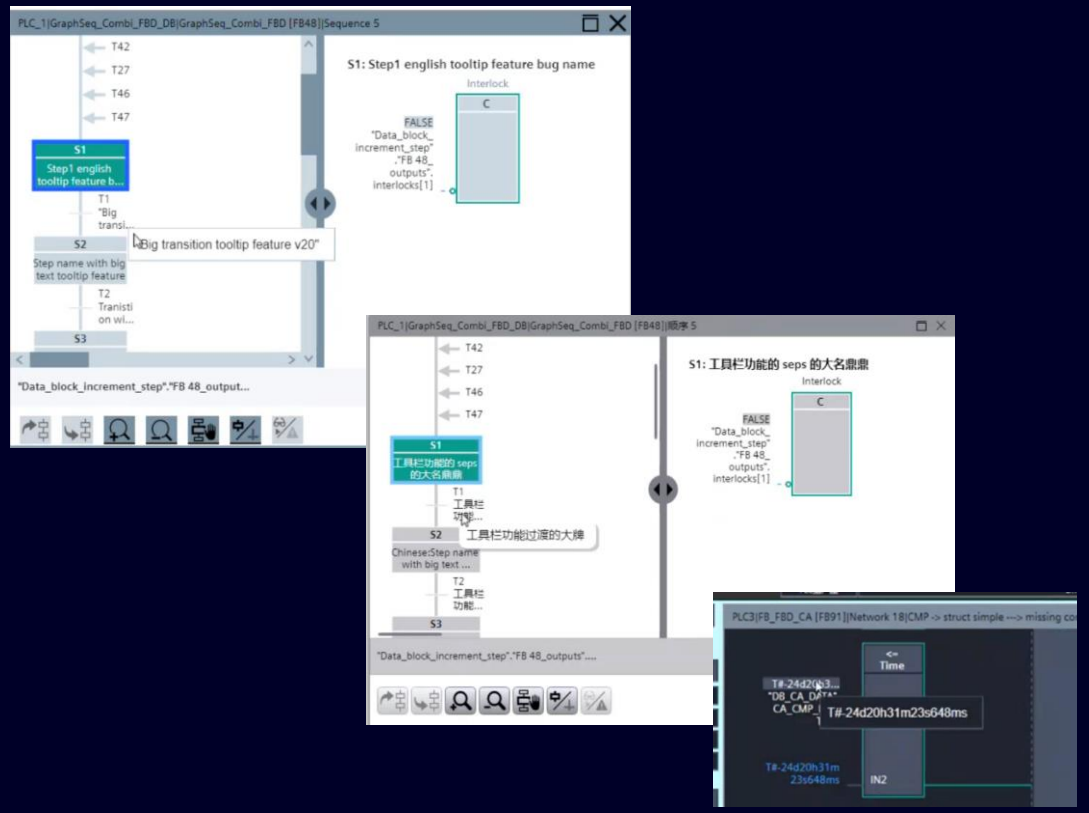
WinCC Unified V20 - Analysis & Operations
Process Diagnostics – PLC Code View – Tooltip texts for abbreviated texts

Unified Basic Panel ✗	Unified Comfort Panel ✓	WinCC Unified PC ✓



Tooltip texts for abbreviated texts in PLC Code View

To see full text of abbreviated texts in PLC Code View, mouse hover and long touch press show full text in a tool tip text.

as of V19 Update 2

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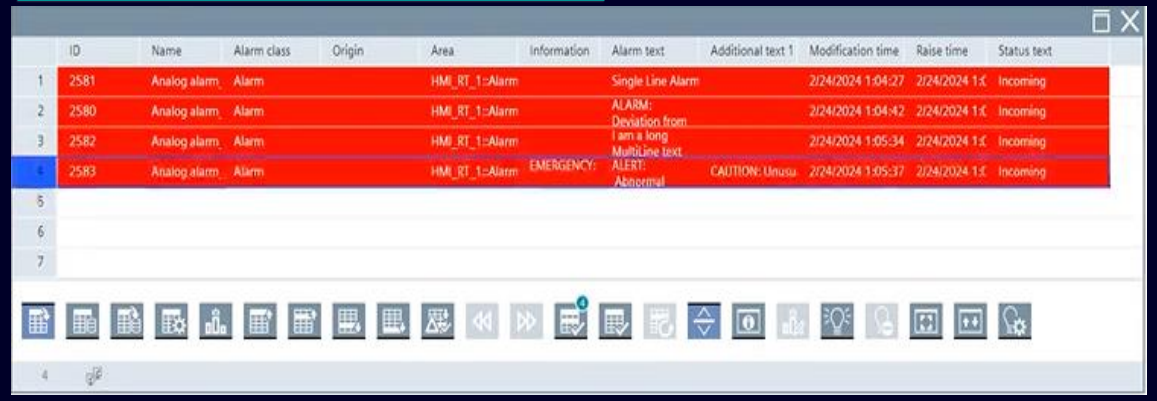
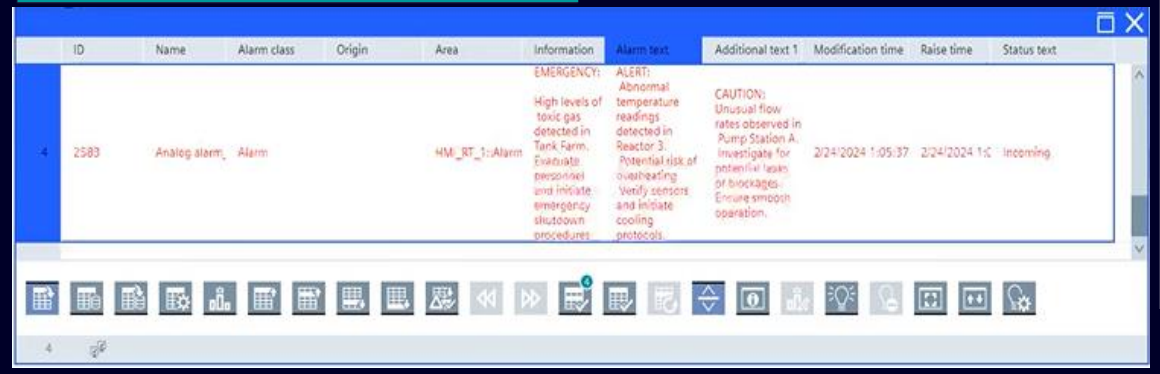
WinCC Unified V20 - Engineering Enhancements
Alarm Control enhancements – multiline of alarms

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓

Alarm control before automatic line break



Alarm control after automatic line break



Alarm Control - support of automatic multiline text

Alarm texts that are too long to be displayed in its column are automatically wrapped, so that the entire text can be read

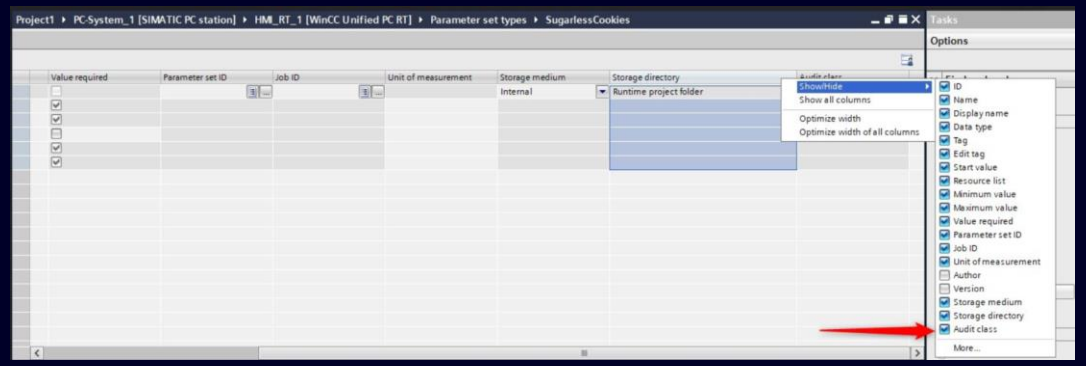
- Text wrapping is supported for the following columns of Alarm - Information, Alarm Text & Additional Text 1 to 9
- In TIA Engineering while selection mode is set to "Single."
- When column with Alarm text configured with lengthy text is selected, Alarm text will be wrapped to fit in the increased row height.

as of V19 Update 2

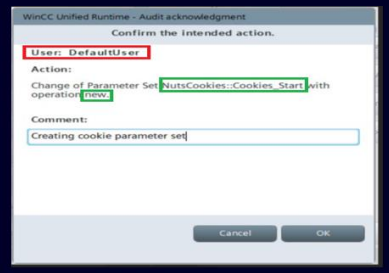
SIEMENS

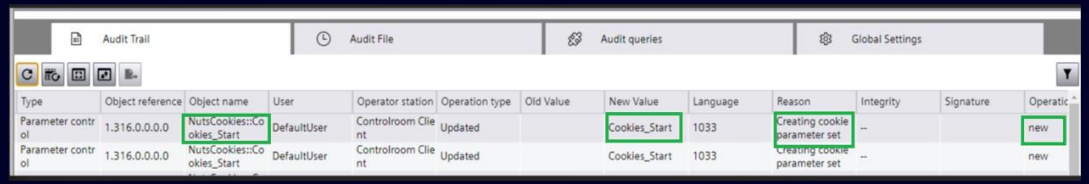
WinCC Unified V20 – Option Audit
Audit – Support for PaCo

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓









Enhanced Parameter Control to support Audit functionality to record all paco operations

Track changes of the parameter control in order to support GMP requirements

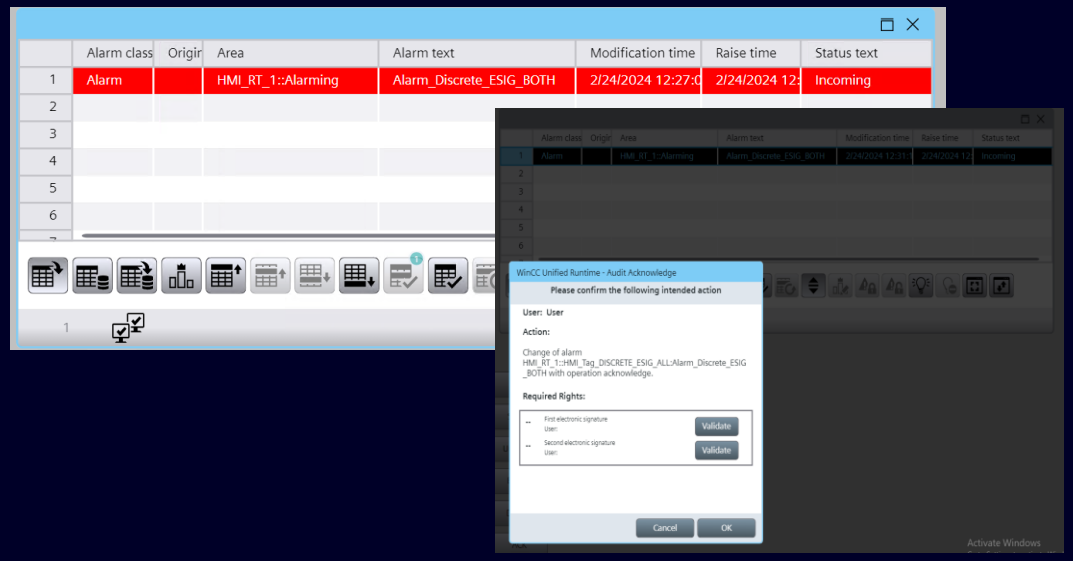
- Control operation being tracked:
  Create **Save** **SaveAs** **Rename** **Delete**
  WritePLC **ReadPLC** **Import** **Export**

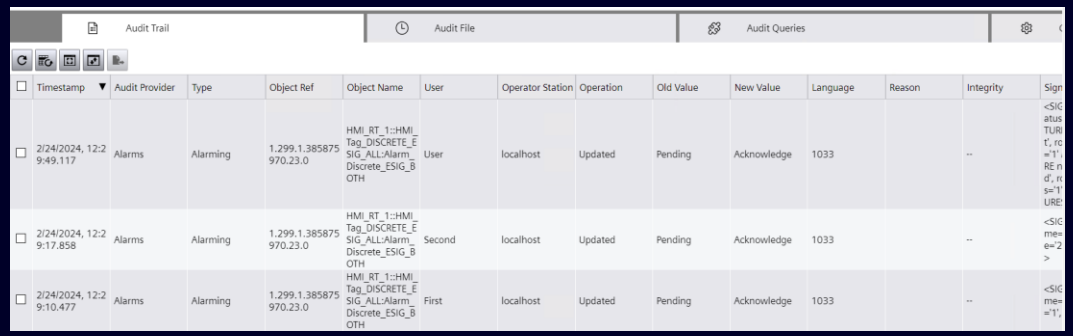
- System functions operation being tracked:
  - ReadAndSaveParameterSet
  - ImportParameterSets
  - ReadParameterSet
  - CreateParameterSet
  - LoadParameterSet
  - RenameParameterSet
  - LoadAndWrite
  - LoadAndWriteParameterSet
  - ExportParameterSets
  - WriteParameterSet
  - SaveParameterSet
  - DeleteParameterSet
  - ReadAndSave

SIEMENS

WinCC Unified V20 – Option Audit
Audit – Electronic records for user related alarm changes

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Generation of electronic records for user related alarm operations

Discrete and Analog alarms can be configured for GMP relevant operation changes: acknowlege, shelve, unshelve.

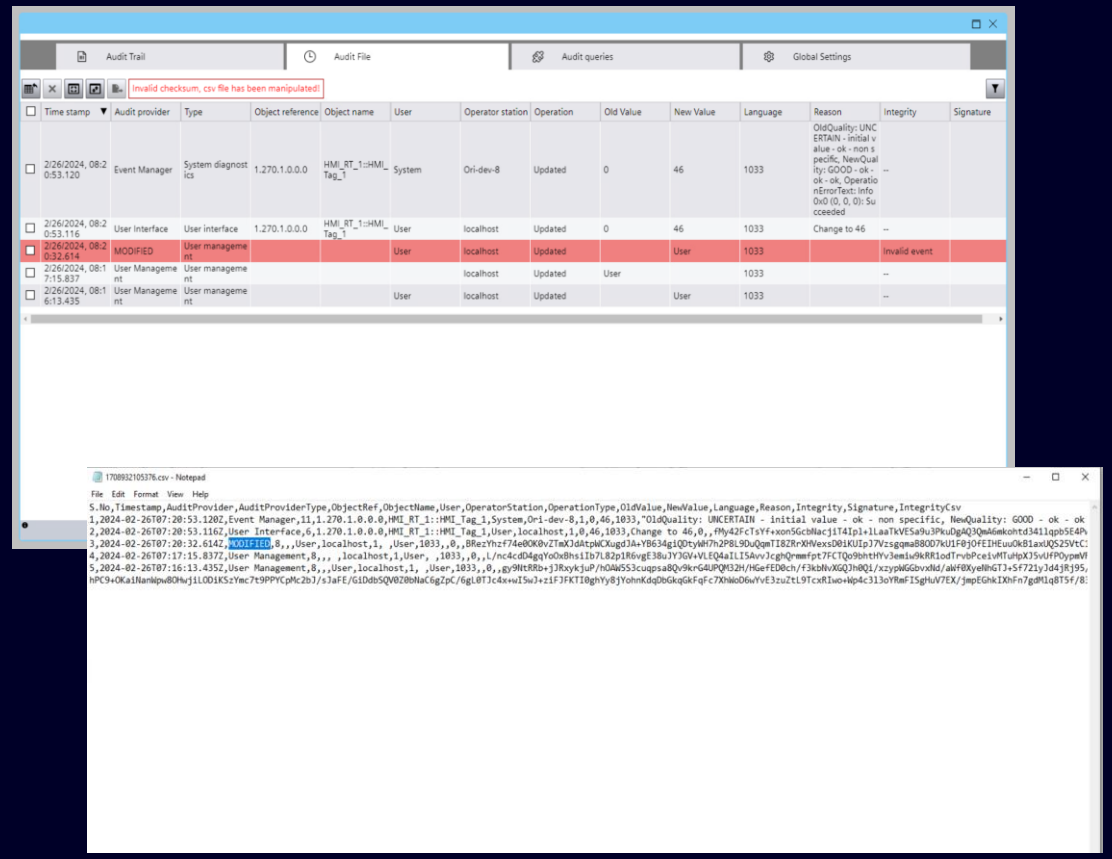
- Configuration based on Audit classes to reduce engineering effort
- Alarm control operations related to GMP relevant alarms are managed by Audit: suporting tracking, confirmation and ESIG.

as of V19 Update 2

SIEMENS

WinCC Unified V20 – Option Audit
Audit – Manipulation detection on audit files

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Export/Import of audit files are checked against manipulation

Exported files from Audit Viewer contains a manipulation check based on generated Audit certificate

- On import audit files into the Audit Viewer, electronic records are validated against the corresponding Audit certificate to identify potential manipulations

as of V19 Update 2

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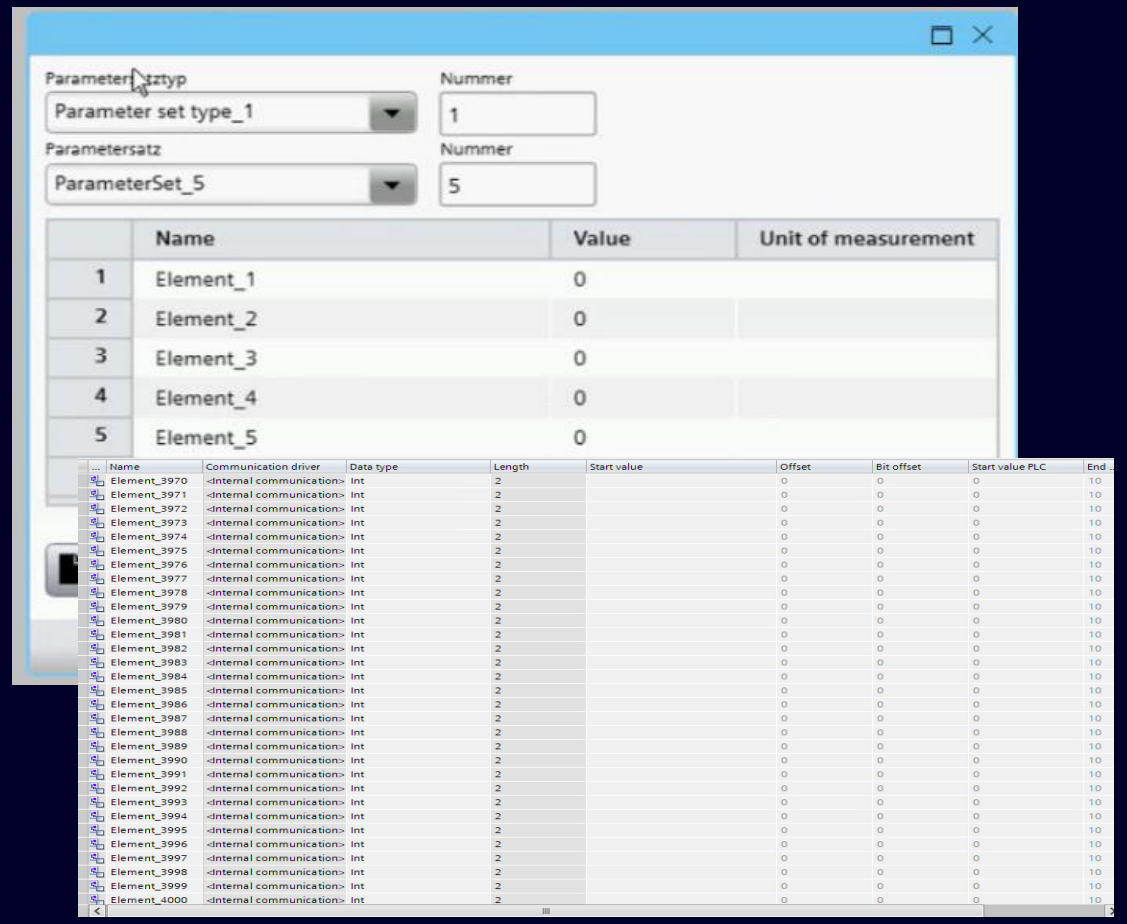
WinCC Unified V20 – Option Parameter Control

Parameter Control – Extended number of Parameter Set Type elements

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Enhanced ParameterSet functionality with support from 1,000 to 4,000 elements

All the PaCo operation are extended to support for 4000 elements

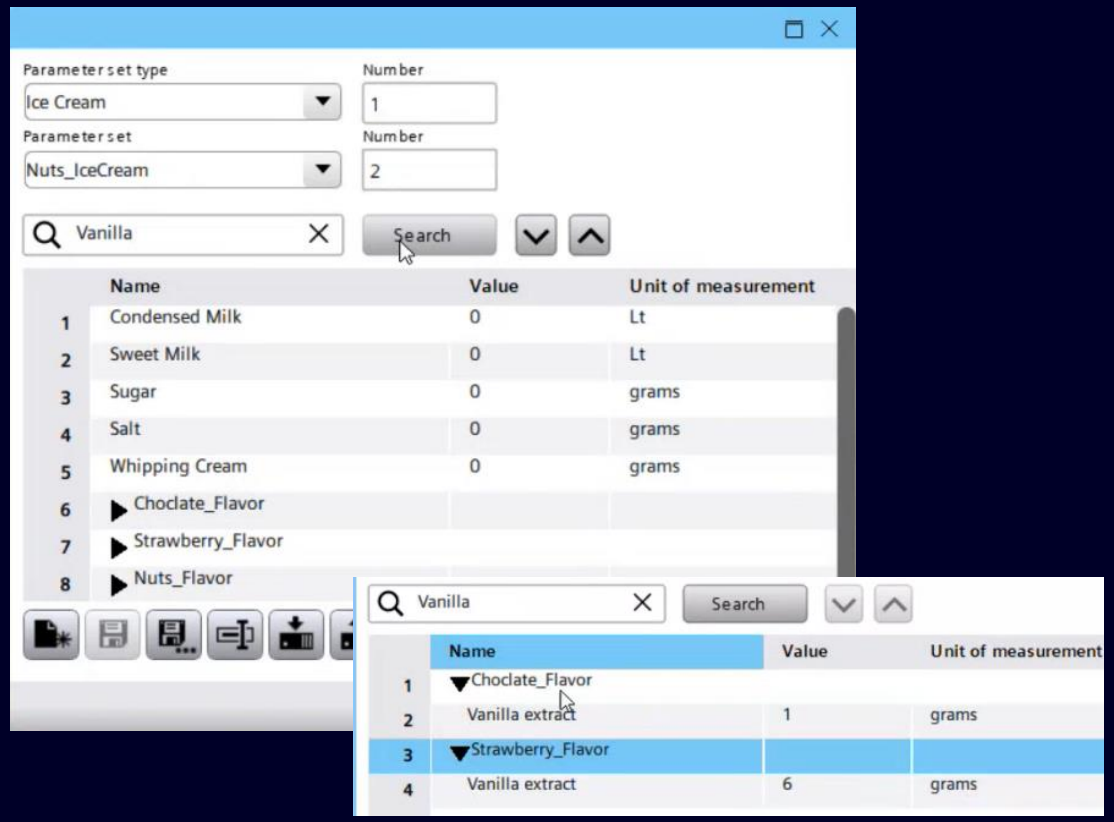
- Parameter control view
- System Function
- Scripting
- Control Tag

as of V19 Update 2

SIEMENS

WinCC Unified V20 – Option Parameter Control
Parameter Control – Search / Filter Support for PaCo Control

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓



Enhanced Parameter Control view to easy user of find elements and performing operation in the view better

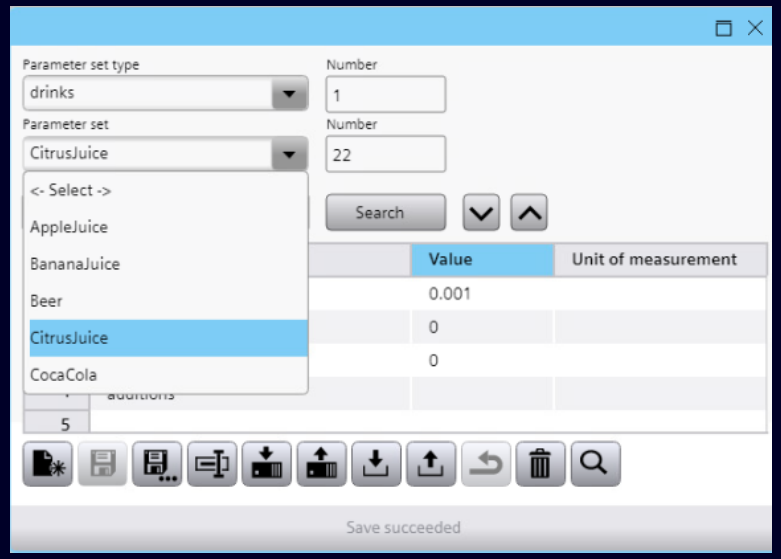
Search parameter set elements of a recipe to find easily specific elements in a huge parameter set

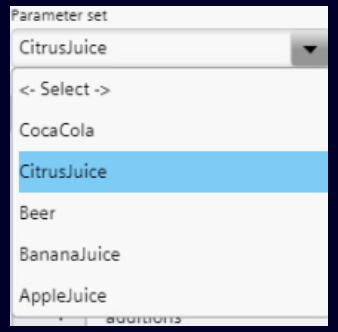
- Display or hide the search field via a separate toolbar button
- Search for elements in nested UDT structures

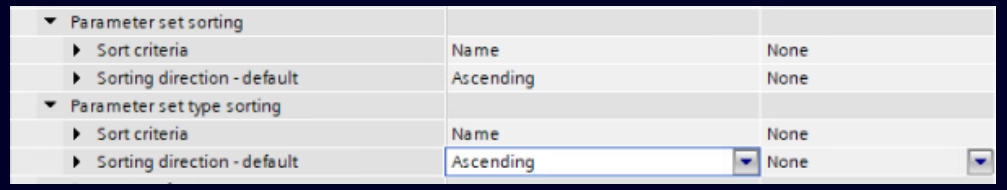
SIEMENS

WinCC Unified V20 – Option Parameter Control
Parameter Control – Sort support for PaCo Control

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓







Enhanced Parameter Control to support Parameter Set Type and Parameter Set level sorting based on the ID and Name

Sort parameter set types or parameter sets

- Pre-defined in Engineering
  - Sort criteria: Name or ID of parameter set / type
  - Sorting direction: Ascending or Descending
- Sorting can be changed at runtime
  - Change sorting during runtime via SystemFct
    "SetPropertyValue" or via Enumeration in Scripting:
    HMIRuntime.UI.Enums.HmiSortDirection.Ascending

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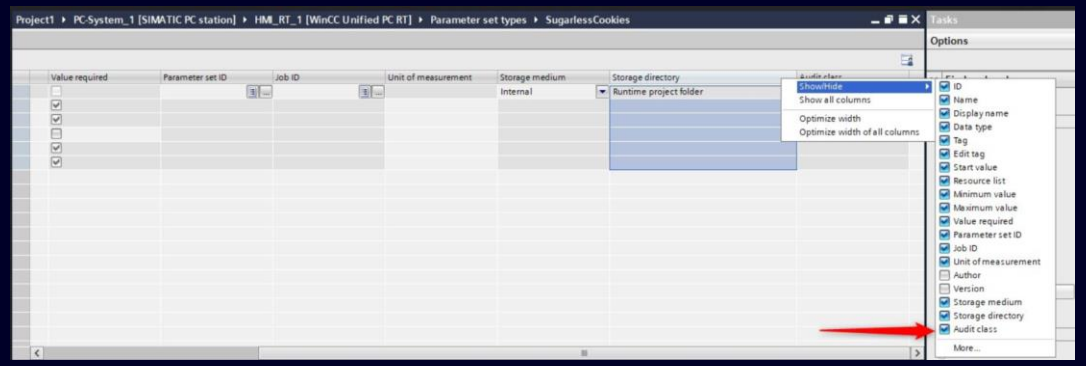
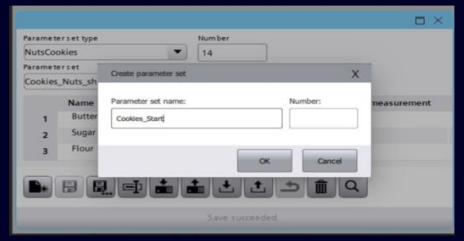
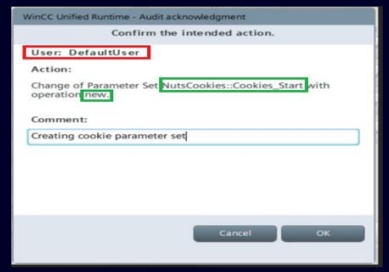
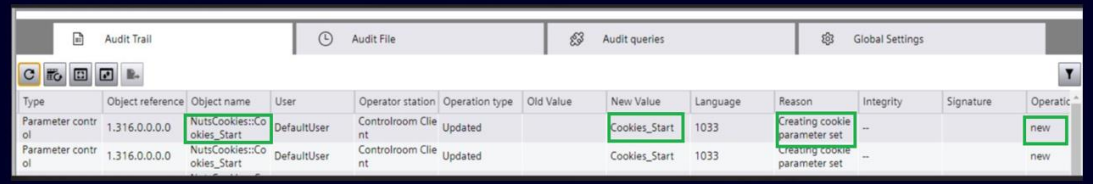
WinCC Unified V20 – Option Parameter Control
Parameter Control – Audit Support for PaCo

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓









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  ExportParameterSets
  WriteParameterSet
  SaveParameterSet
  DeleteParameterSet
  ReadAndSave

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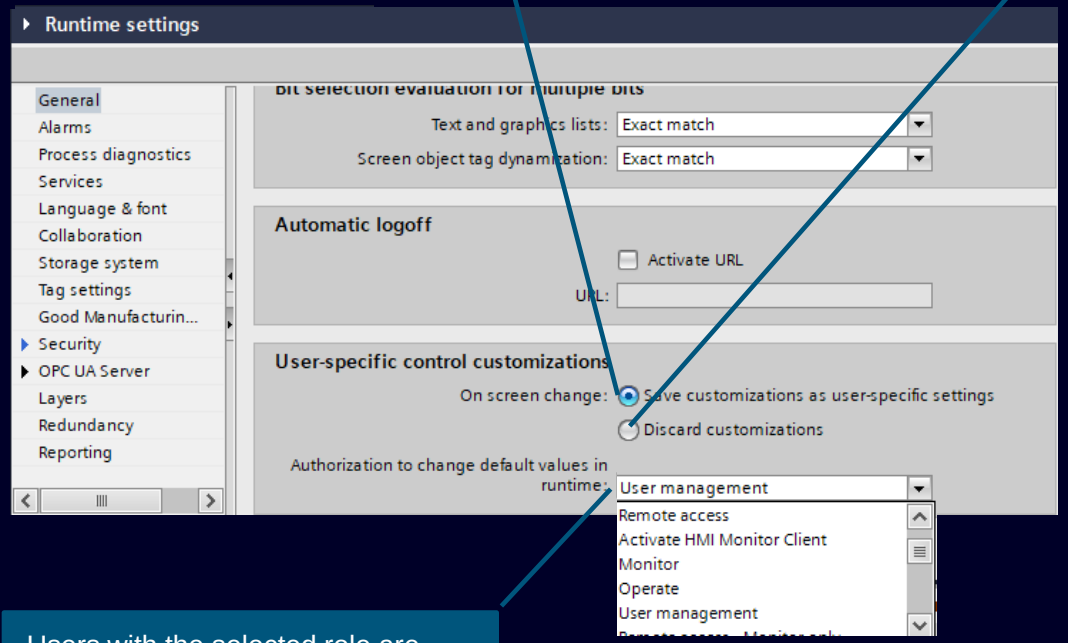
WinCC Unified V20 – Personalized UI
Persistency of control settings

Unified Basic Panel ✗	Unified Comfort Panel 🛠	WinCC Unified PC ✓

On screen change, the control settings are persistent automatically

On screen change, the control settings are withdrawn



Users with the selected role are able to set new default settings for controls

Retain of changed controls settings while switching the screens during runtime and session over spanning

- User specific personalization of controls in a screen
- Enable the persistency of changed Control settings (Alarm Control, Trend Control and Function Trend Control) at TIA portal on device level
- Persistency can be set Automatically
  - Save the current personalized setting on screen change
  - Discard the user settings on screen change
- Persistency can be stored
  - Personalized by every user
  - Globally (as new default) by users with a selectable role
- Persistency can be reset as defined at engineering

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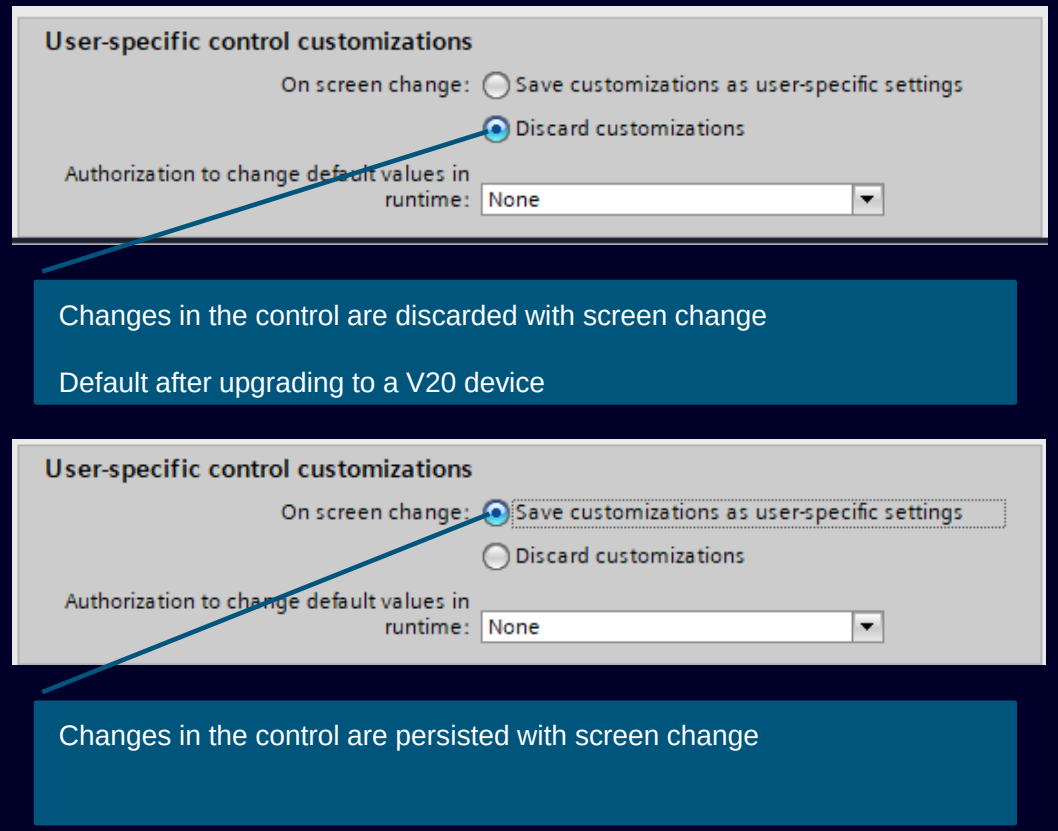
WinCC Unified V20 – Personalized UI

Persistency of control settings at screen change – persistency on screen change

Unified Basic Panel ✗ | Unified Comfort Panel 🛠 | WinCC Unified PC ✓



Enable retain of changed settings while switching the screens during runtime for controls within a screen

- Enable / disable the persistency “on screen change” at TIA portal on device level
- At runtime, a change of a control setting as positioning, size and control specific setting are kept after switching the screens and going back
  - The settings are stored user specific
  - Available for Alarm Control, Trend Control and Function Trend Control
  - The setting is “stored” for the control within this screen

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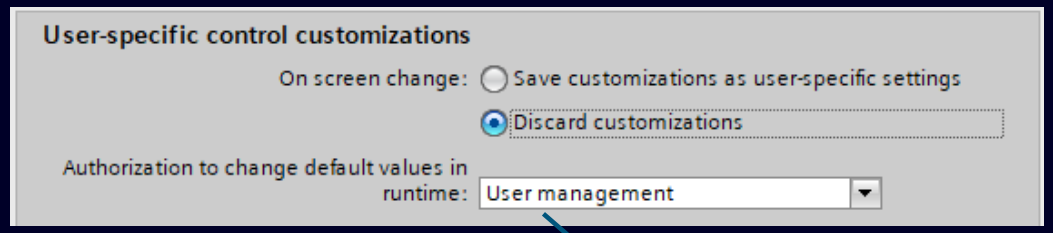
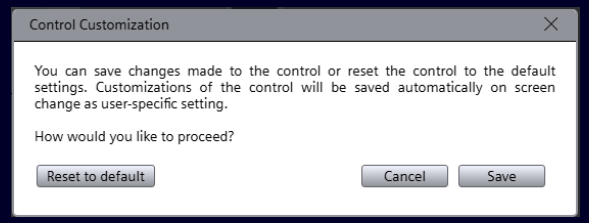
WinCC Unified V20 – Personalized UI

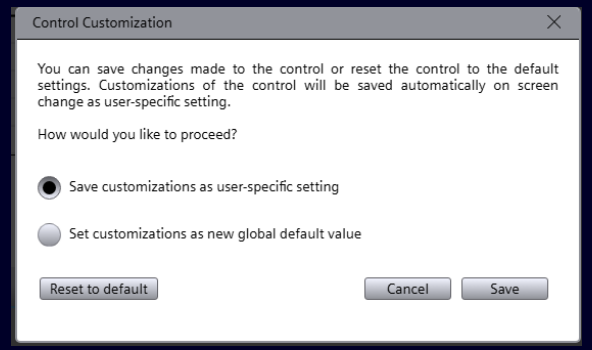
Persistency of control settings at screen change – define a new default setting

Unified Basic Panel ✗	Unified Comfort Panel 🛠	WinCC Unified PC ✓





User without assigned right is able to save a user specific setting by pressing



User with assigned right is able to save a new global or user specific setting by pressing

A reset to default pre-engineered settings is possible

Define new global or user specific control settings

- Manual definition of changed setting of a control (Alarm Control, Trend Control and Function Trend Control) by executing a control function (user profile settings)
- Definition of new user specific control setting available for users without certain rights
- Definition of new global control settings available for users with pre-defined function rights

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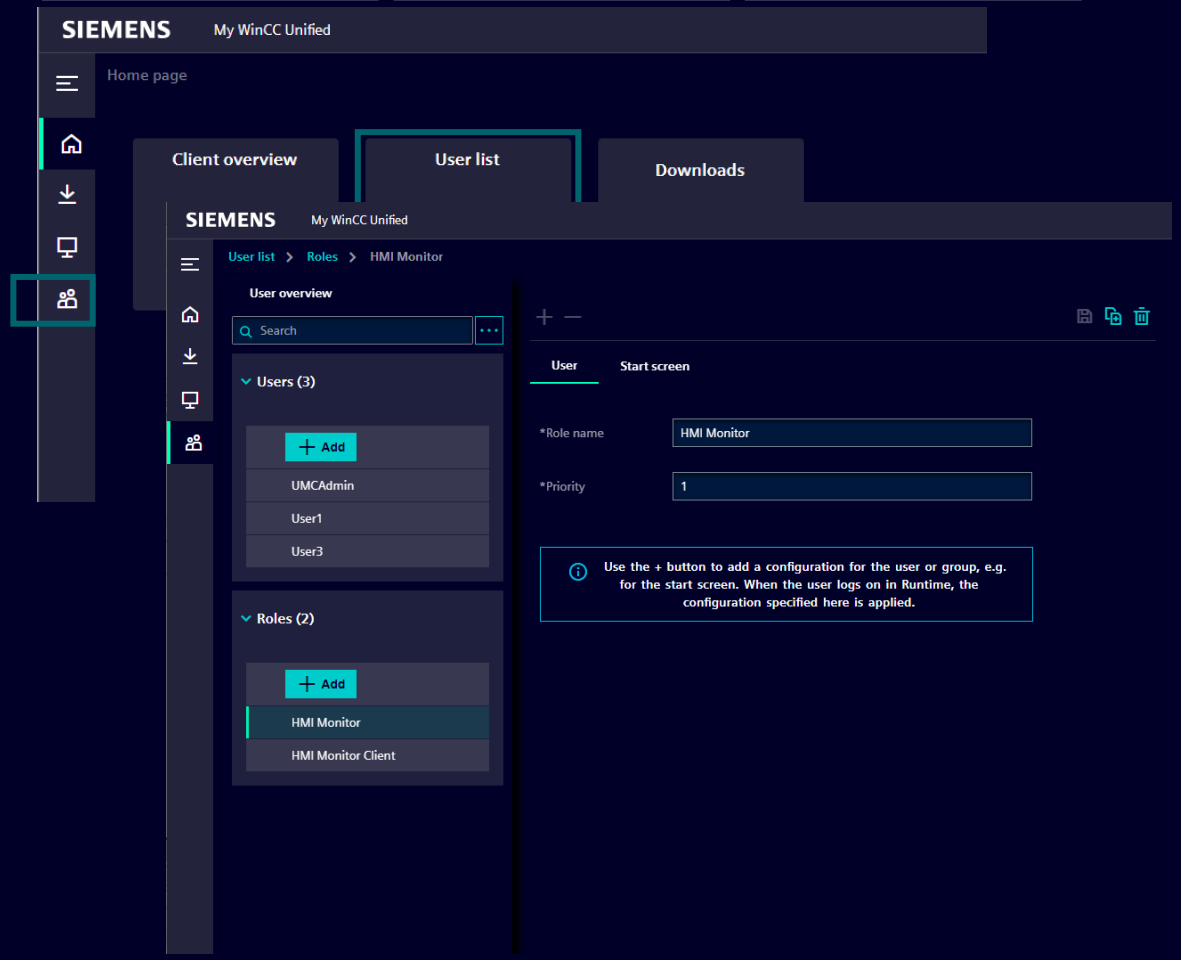
WinCC Unified V20 – Personalized UI
Unified Station Configurator – User and Role specific Start screen

Unified Basic Panel ✗ | Unified Comfort Panel 🛠 | WinCC Unified PC ✓



Define a start screen regarding a user or on a user role

Define a specific start screen to a fast access to the tasks at Runtime
- for dedicated user
- for different user roles

- Different user roles can be prioritized

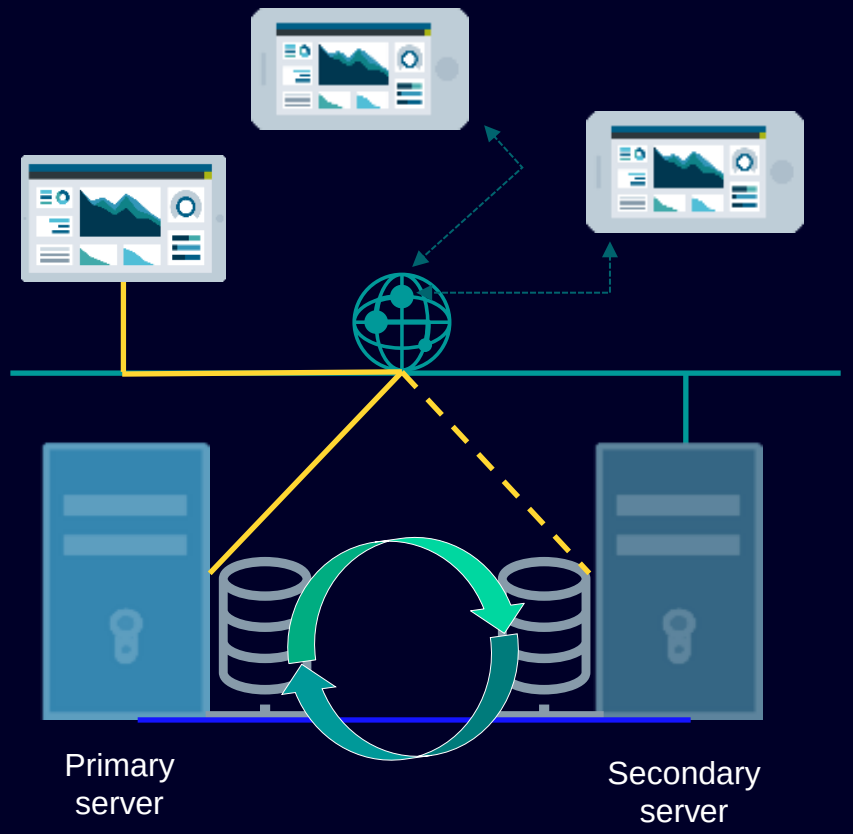
User is logged on
→ is a user specific start screen available?
→ is user assigned to a role with a specific start screen?
Use of start screen with “highest priority”

The definition of start screen is accessible via the “my WinCC Unified” web page or via the Unified Station Configurator

SIEMENS

WinCC Unified V20 - Redundancy

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✗	✓



Keep the operation running even on hardware failure

- Automatic switch-over to a hot stand-by server on failure to enable the continuation of production
- No loss of archived data on switch-over
  - Archived tags
  - Archived alarms
  - Audit trail
  - Paco
- Attached clients switch over to the new primary server in case on server failure

as of V19 Update 2

SIEMENS

WinCC Unified V20 - Redundancy
Functional scope V20

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✗	✓

Data redundancy:

- Logging of process values and alarms
- Pending alarms and current process values (external and internal tags)
- Audit trails
- Parameter Control

Communication:

- S7-1200, S7-1500, S7-300, S7-400

UI Redundancy

- Base UI Redundancy

Status and diagnosis of redundant stations

Secure communication between the redundant partners

Prerequirements

- Database Logging (MS SQL)
- Both PCs
  - need to be time synchronized
  - same hardware and operating system installation
  - configured identical
- Automated client switchover only with central user management available

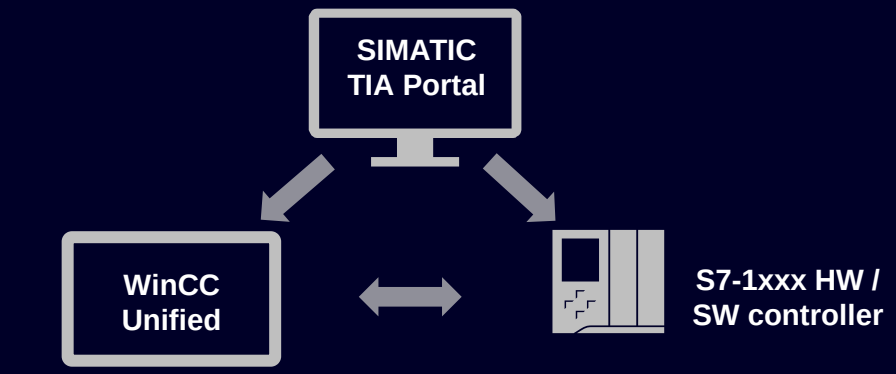
Limitations – what`s not support:

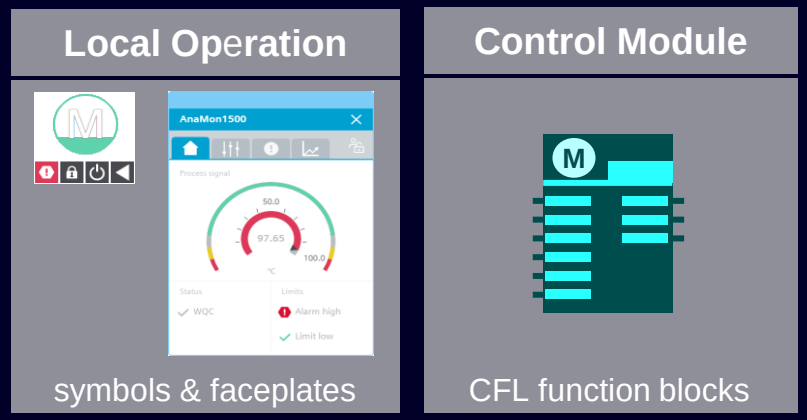
- OPC UA and 3rd party connections
- System and Process Diagnostics
- Options:
  Report Execution, Collaboration, PI Options
- Unified Data Hub must not run in parallel

SIEMENS

WinCC Unified V20 - Engineering Efficiency
SIMATIC Control Function Library (CFL)

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓





Standardized module engineering with a modular and memory optimized library, offering:

- TIA Portal STEP 7 (S7-1xxx HW / SW controller) and WinCC Unified Objects with optimized footprint & performance, (Industry-specific blocks like Aggr8, TimeSwitch, SetCrv, …)
- State of the art TIA Portal Engineering based on PLCOpen
- Supports virtual commissioning based on PLCSIM Advanced and SIMIT with ready to use templates tailored to CFL

Standardized Operation

- Faceplates aligned to WinCC Unified Look & Feel (HMI Design based on HMI Template Suite)
- Corporate Design via SIMATIC WinCC Unified Corporate Designer / TIA Portal

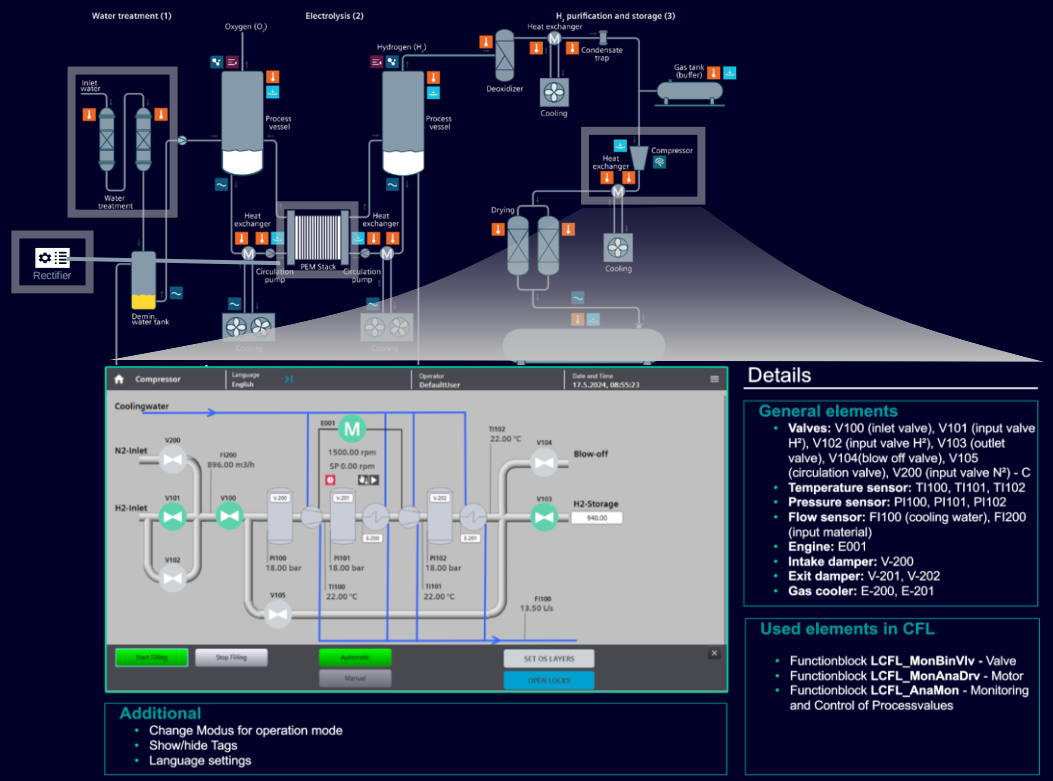
CFL can be used in MTP and Non-MTP Use Cases

Latest Version on : Simatic MTP SIOS Landing Page

SIEMENS

WinCC Unified V20 - Engineering Efficiency
SIMATIC Control Function Library (CFL)

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓



Hydrogen TIA Portal Application Examples based on CFL

CFL - Industry-specific blocks

Optimized footprint & performance for S7-1xxx HW / SW controller & WinCC Unified

Drives

MonBinDrv	FP
MonAnaDrv	FP
MonBinVlv	FP
MonAnaVlv	FP

Monitor

AnaMon	FP
BinMon	FP
DIntMon	FP
StringView	FP

Operate

AnaManInt	FP
BinManInt	FP
DIntManInt	FP

Interlock

LockView4	FP
LockView8	FP

Common Blocks

Maintenance	FP
DriveInterconnector	

Control

PIDCtrl	FP
Aggr8	FP
TimeSwitch8	FP
SetCrv	FP
Polygon	FP

New

MTP Service Framework

- Service
- Procedure
- Config Parameter
- Procedure Parameter

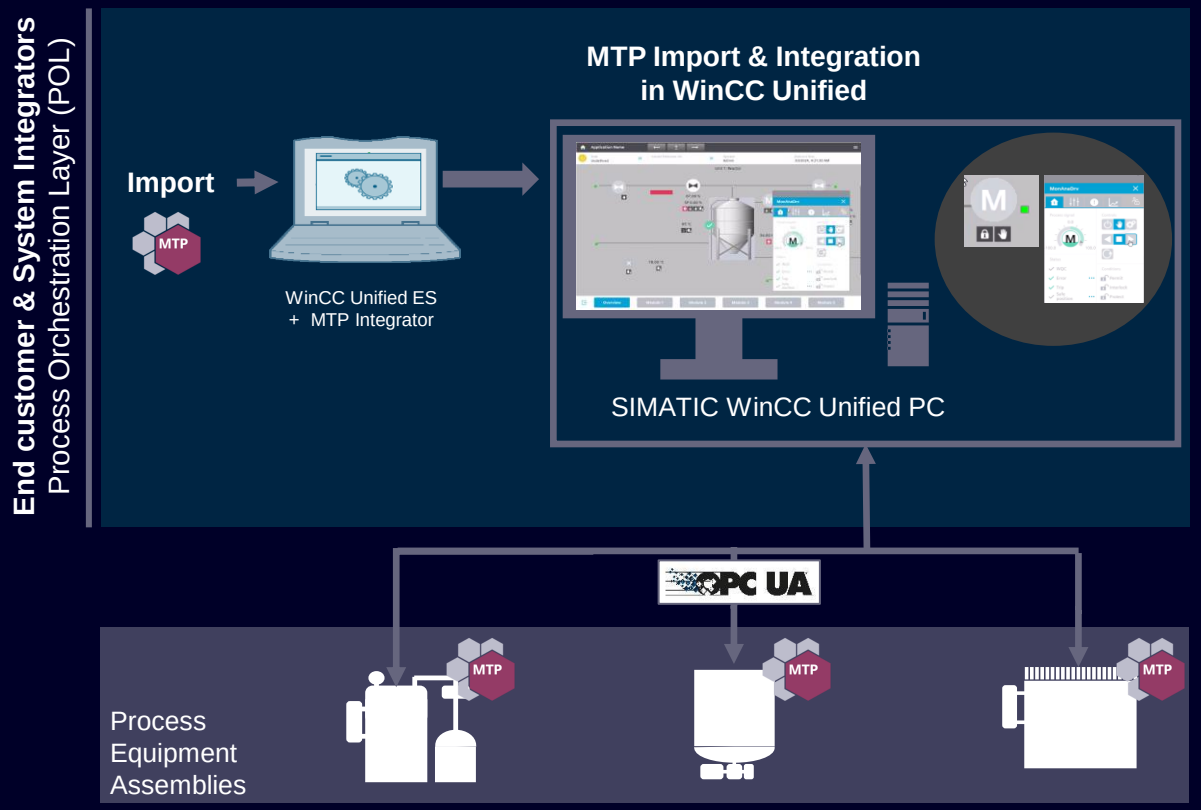
FP

Latest Version on : Simatic MTP SIOS Landing Page

SIEMENS

WinCC Unified V20 - Process Orchestration
Modular automation - MTP Integrator for WinCC Unified

Unified Basic Panel ✗ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Integrate standardized MTP package units / machines in WinCC Unified, including PLC and HMI components

- Standardized, line operation of package units / machines

Use MTP files (Siemens or 3rd party) to integrate (cross- vendor) machines automatically

- By instantiating the machine type within your project, the OPC UA connections, PLC tags and HMI components are created with just one click.

Controlling complete units / machines in an abstract way

- Operators can focus on the production without needing to understand details of each multi-vendor machine.
- Maximized operational efficiency, reduced training effort and consistency regarding operation, even if new modules are added modified due to changing market demands.

No. of Package Units / Machines : Unified PC RT: 10 // Unified Comfort Panel: 3

Latest Version on : Simatic MTP SIOS Landing Page | Control and Operate for Discrete Industries | Module Type Package (MTP)

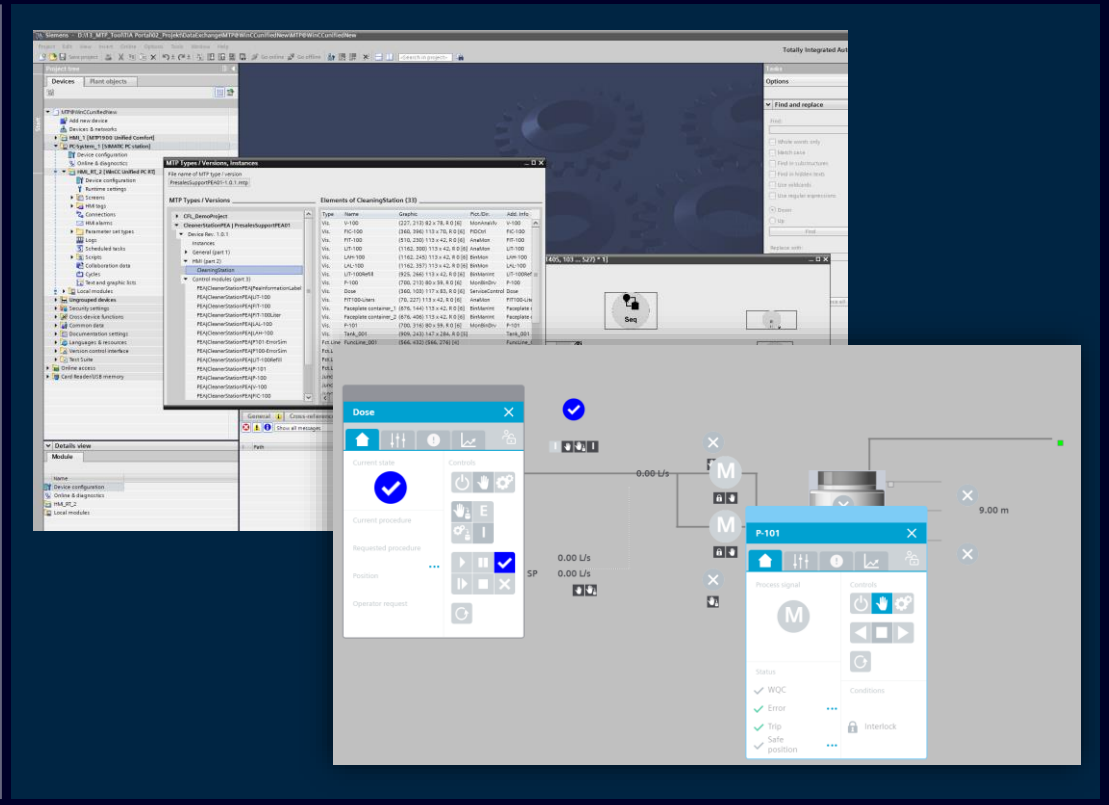
SIEMENS

WinCC Unified V20 - Process Orchestration

Reduce engineering effort by -70% [1] and Increase flexibility by +80% [1]

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓

End customer & System Integrators
Process Orchestration Layer (POL)



- MTP Import in WinCC Unified Engineering[2]
- Type management incl. full versioning for your MTP files
- PEA instance management
- Static and dynamic HMI Integration (MTP Part 2 + 3)
- Monitoring and control via Faceplate (blockicons and detailed views) Orchestration of plantwide HMI (part 3)
- Manual operation of MTP Services via HMI (part 4) — New
- MTP Multilanguage Support — New
- Native OPC UA communication with configurable levels of security mechanisms (draft part 5/5.1) [3]
- POL-based alarms (draft part 6/7) [3]

[1] Source: ZVEI, 2022
[2] Implementation compliant to the noted parts of the MTP Specification (VDI/VDE/NAMUR 2658)
[3] Concepts for runtime interoperability (part 5/5.1) and alarming (part 6/7) are not fully specified, yet

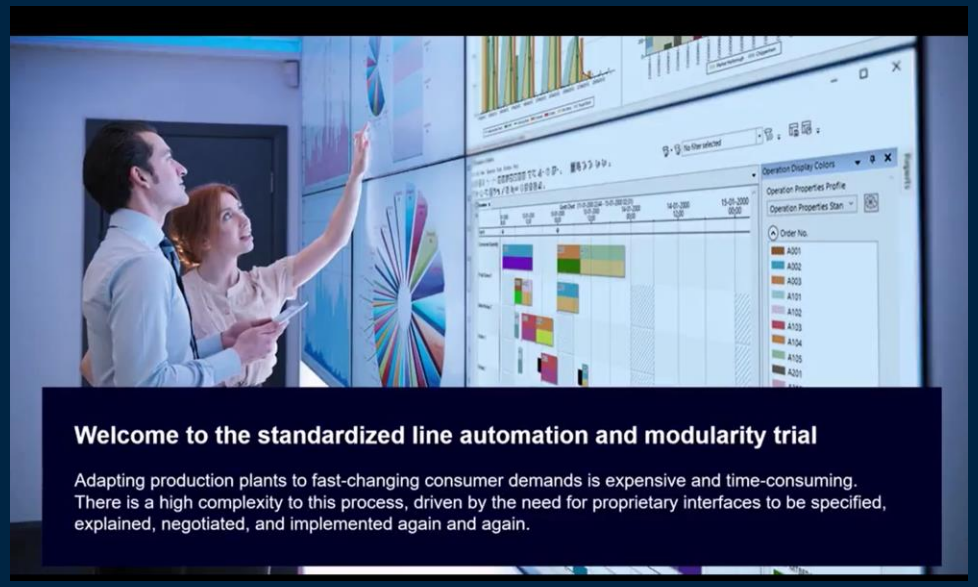
Latest Version on : Simatic MTP SIOS Landing Page | Control and Operate for Discrete Industries | Module Type Package (MTP)

SIEMENS

WinCC Unified V20 - Process Orchestration
SIMATIC MTP Integrator for WinCC Unified Trial – Simply try it out

Unified Basic Panel ✗	Unified Comfort Panel ✓	WinCC Unified PC ✓

End customer & System Integrators
Process Orchestration Layer (POL)



MTP trial – Simply try it out

Try our 30-day rapid line automation engineering with MTP trial.
No installation is required. Start exploring in minutes.
(Chrome/Firefox/Edge/Safari recommended)

Easily adapt production lines to fast-changing consumer demands with a module based standardized approach

- Adding new equipment or modifying an existing and running production line is typically complex, time consuming and risky
- Cell or line visualization required for better overview and central operation needs, if manually engineered, consumes substantial time and effort and is error prone
- With the standardized Module Type Package (MTP) approach, you can reduce risk, engineering effort and downtime, as well as shorten the time to easily integrate new equipment into an existing production line
- MTP is a widely standardized and market-proven technology that can be purchased off-the-shelf

Module Type Package (MTP)

SIEMENS

TIA Portal V20
Table of contents

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V
- Limited Sales release in USA

new

SIMATIC WinCC Unified – Innovations

Update

- Enhanced compile time and RT performance
- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
- User and role specific start screens
- Redundancy
- Process Orchestration (MTP)

SIMATIC WinCC – Innovations

- Engineering of Professional, Advanced and Unified on one PC
- WinCC Advanced: no new RT Advanced V20 Version
- WinCC Professional: Support of dynamic SVG, WebUX (deep link, recipe control),..

SIMATIC STEP 7 – Innovations

Update

- Continuous Integration: new LAD export/import format
- Online features for named value data types
- Named value types used by safety blocks and in type libraries

SIMATIC Motion Control – Innovations

- New Hardware S7-1500 T/TF
- New Single Axis Operations / New Synchronous Operations
- Support of second PROFINET IRT interface
- Cross-PLC synchronous operation using PN/PN Coupler
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SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

Update

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Simulation Cloud *new*
- TIA Project-Server Cloud

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- S7-1200 G2
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- CAx: AutomationML & Publication Tools
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- TIA Portal Library Workflows
- TIA Portal Usability

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WinCC Innovations V20
Highlights WinCC RT Advanced

WinCC ES

- WinCC RT Advanced can be engineered with TIA V20
- Library enhancement filter library types for RT Advanced

No new RT Advanced version

Ensured Compatibility of WinCC Advanced

- Newest update of stable V17 version of RT Advanced available
- No new licenses necessary for WinCC RT Advanced V17 necessary

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WinCC Innovations V20
Highlights WinCC RT Professional

Maintainabilty
Support of MS SQL 2022

Communication
UDT support - Max char 127 (depth 26)
Up to 10 S7 connections are included in the WinCC RT prof basic license

WebUX – Deep link
Direct access to specific screens or functions within the application

WebUX – Recipe
Support of recipe control

TIA Library
Enhancement filter library types for RT Professional

SVGHMI Library
Embedding SVGHMI Graphics in WinCC RT Professional Screens
Same Library as WinCC V8 or WinCC Unified

WebUX – AR APP
Support for SIMATIC Unified AR App for iOS

WebUX – License
New licenses for WebUX max clients

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TIA Portal V20
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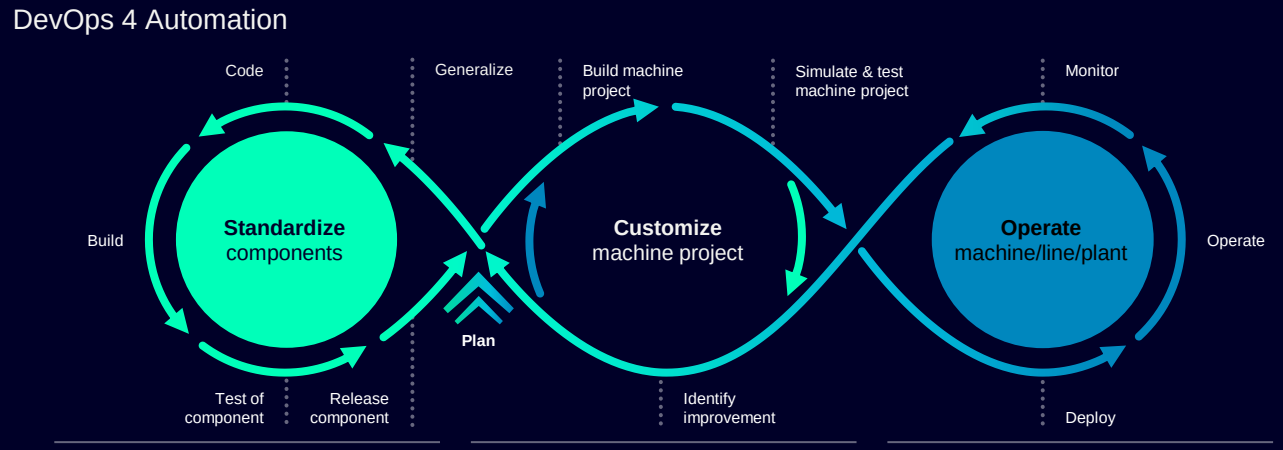
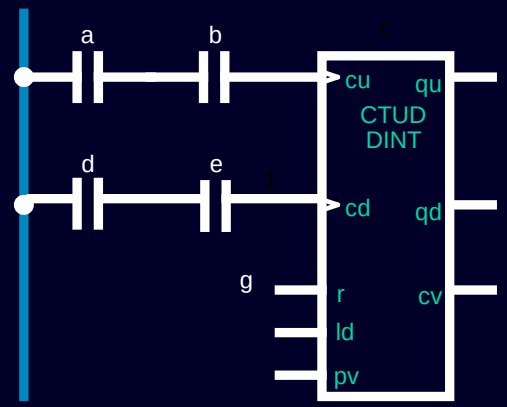
STEP 7 – Innovations
SIMATIC Source Documents: New export format for LAD blocks, DBs & UDTs






```
RUNG wire#powerrail
    Contact( a )
    Contact( b )
    c.Ctud( dint )( cd := wire#w1
        , r := g
        , ld :=
        , pv :=
        , qd :=
        , cv := )
END_RUNG
RUNG wire#powerrail
    Contact( d )
    contact( e )
END_RUNG wire#w1
```

Features

- **Human readable** representation of graphical code
- Source code only - no internal meta information
- Version independent syntax
- Including multilingual comments
- Works for LAD and F-LAD & DBs & UDTs
- Accessible via Openness and VCI

Update 3

Benefits

- Human-readable representation ensures **easy use with external tools** (e.g. GIT, Beyond Compare, …) and code generators
- Version-independent syntax **simplifies** compatibility when **sharing source code across various TIA Portal versions**
- Easy **tracking of safety block changes** in external code repositories

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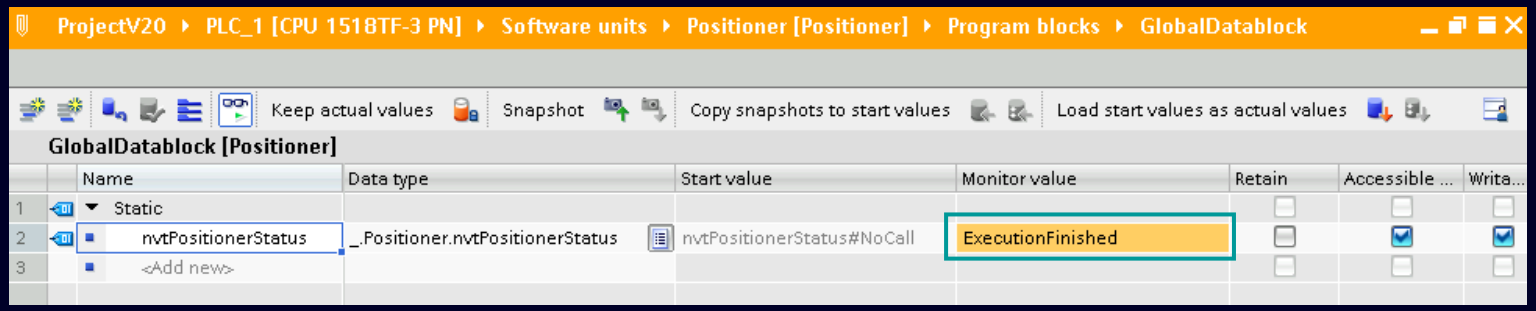
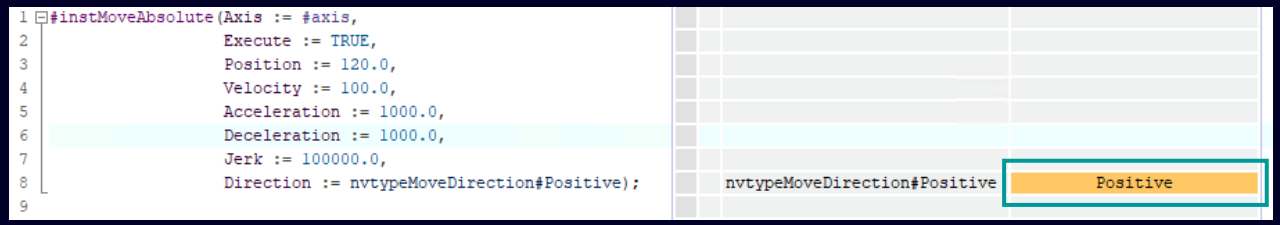
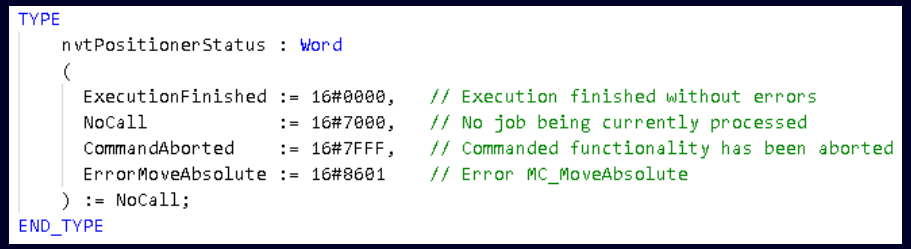
STEP 7 – Innovations
Named value data types within Software Units – Online improvements







Speaking names for named values

Since V19 user can create within Software Units data types with named values (NVTs). Now during online actions like monitoring and trace, we display the values such as the defined and meaningful names.

New Features

- **Online displaying speaking names** for NVTs at
  - Code block editor (SCL, LAD/FBD, Graph)
  - DB interface editor
  - Watch- and force table editor
  - Trace
- **Applying Namespace** of Software Unit to underlying NVTs
- **Openness Import/Export** of NVTs

Improved commissioning and maintenance efficiency

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STEP 7 – Innovations
Named value data types – Textual Interface & Library improvements

```
1  FUNCTION_BLOCK "SCLBlock"
2
3  VAR_INPUT
4    NVTDecl : Simatic.Colors := Simatic.Colors#RED;  //NV Constant as datatype
5
6    ArrayNVT: Array[_.Boundary#MIN .._.Boundary#MAX] OF Int;  //NV Constants as array boundary
7
8    stringVar : String[_.Length#MAX]; //NV Constants as string length
9
10 END_VAR
11
```

The block is read-only because it is know-how protected.

2/2

Block_1

	Name	Data type	Default value	Retain	Accessible f...	Writa...	Visible in ...
1	Input				☐	☐	☐
2	Input_1	Simatic.Colors	Simatic.Colors#RED	Non-retain	☑	☑	☑
3	Input_2	DInt	Simatic.Colors#GREEN	Non-retain	☑	☑	☑
4	Output				☐	☐	☐
5	Output_1	Array[0..1] of Bool		Non-retain	☑	☑	☑
6	InOut				☐	☐	☐
7	Static				☐	☐	☐

Colors.nvt		V 0.0.5
V 0.0.5 [default]		V 0.0.5
V 0.0.4		V 0.0.4
V 0.0.3		V 0.0.3
V 0.0.2		V 0.0.2
NVT_Library.nvt		V 0.0.1
V 0.0.1 [default]		V 0.0.1

New Features

- **Textual interfaces** are supporting NVTs
- NVTs as **library types**
- Safety blocks in type library can utilize NVTs
- NVTs can be part of typed knowhow protected blocks

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STEP 7 – Innovations
Named value data types – tracing with PLC Trace



Tracing Named Value Tags

The trace recognizes NVTs directly in trace definition. Recorded values in the diagram are automatically resolved to NVT definition and displayed accordingly.

Benefits

- **Automatic representation of tag names**, instead of numerical representation
- **Tags can be used as trigger**
- Undefined states are also visible in diagram
- NVTs are supported in all traces ((long-term) trace, (long-term) project trace)

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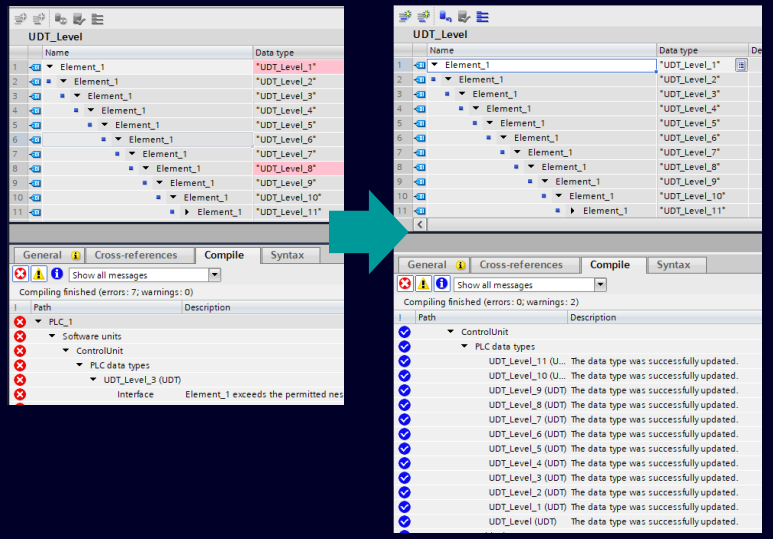
STEP 7 – Innovations
General Improvements

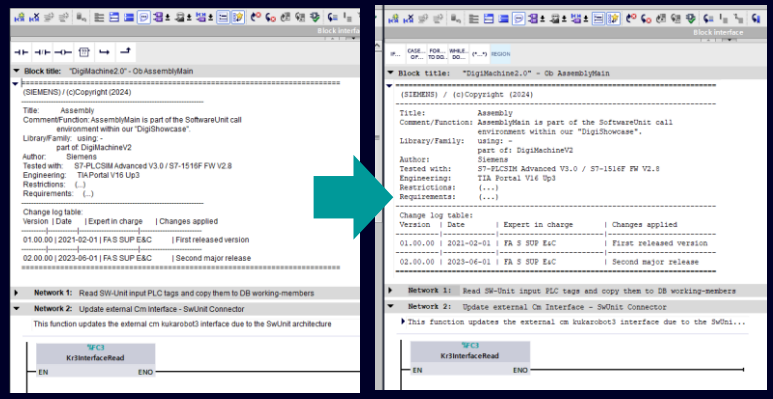
Increased nesting depth for structures

- For S7-1500 >= 4.0 the nesting depth for PLC data types, STRUCT tags, and ARRAY of STRUCT/UDT tags has been increased from 8 to max. 26 elements
- Using an ARRAY of STRUCT/UDT, which requires 3 hierarchical levels each, reduces the maximum nesting depth accordingly



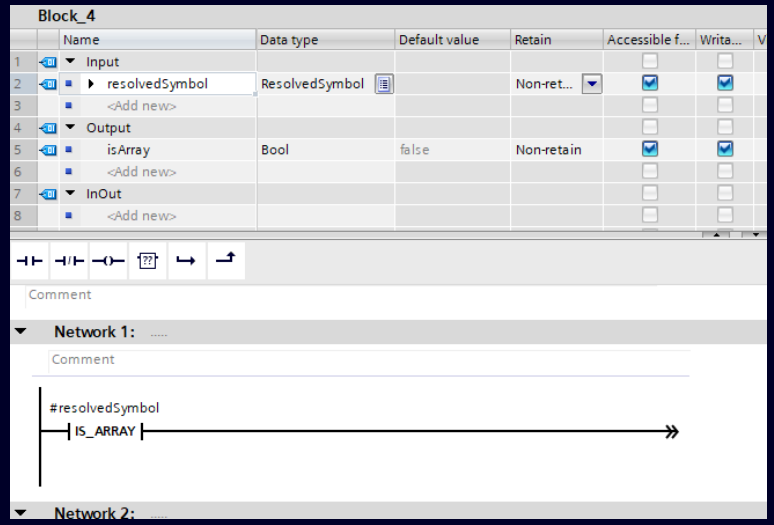
Font adoption for title & comments

- Font type can be changed for block and network title and comments via Global setting
- Using monospace fonts comments can be easier structured
- Network titles & comments can be zoomed in / out



Is_Array / Count- & TypeOfElements for ResolvedSymbol

- These functions can now also be used for resolved symbols:
  - Is_Array
  - CountOfElements
  - TypeOfElements
- Allows appropriately handling of arrays from a resolved symbol



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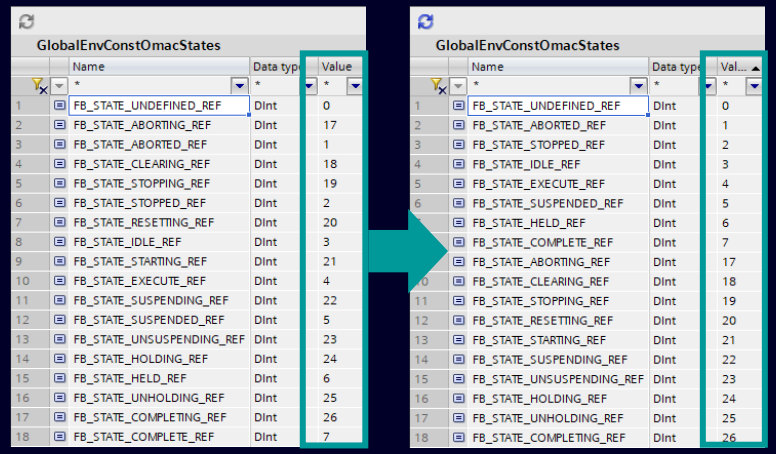
STEP 7 – Innovations
General Improvements

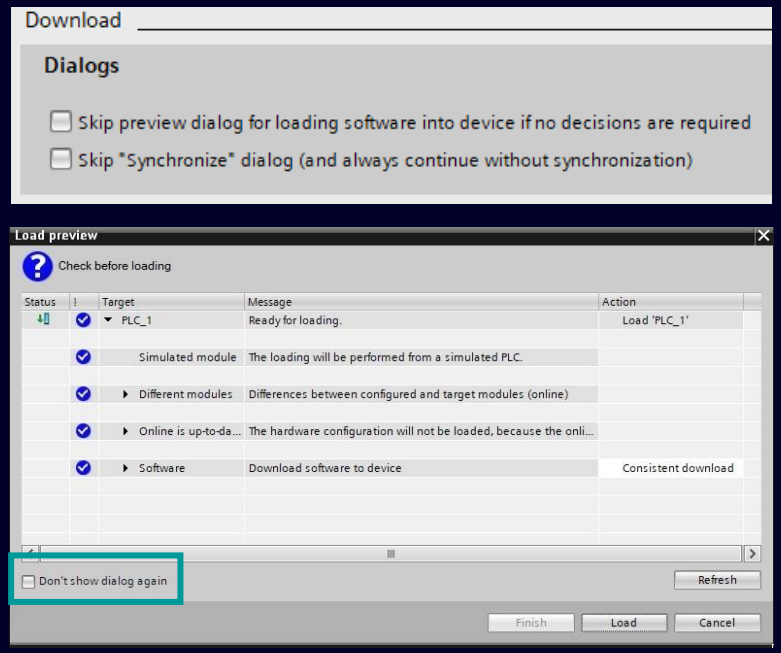
Tagtable: Sort by value

- Natural sorting of user and system constants in the filter view of the tag table editor



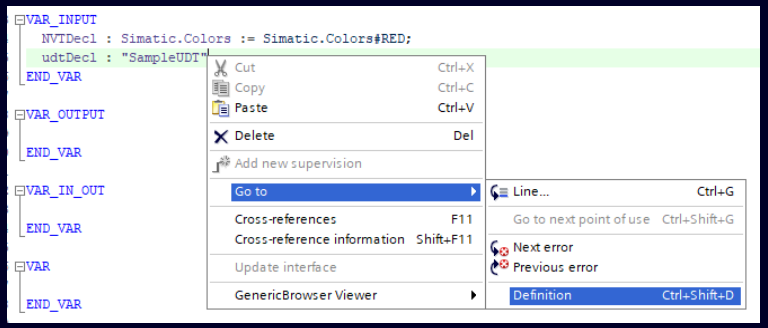
Hide Download Preview & Sync Dialog

- Hide Download Preview / Finished & Synchronize before loading dialogs
- Only shown, when user interaction necessary



Go To Definition – Improved behavior in Textual Interface Editor

- Enhanced the Textual Interface Editor (SCL only) for improved navigation to complex declarations of UDTs, Blocks, and NVTs.



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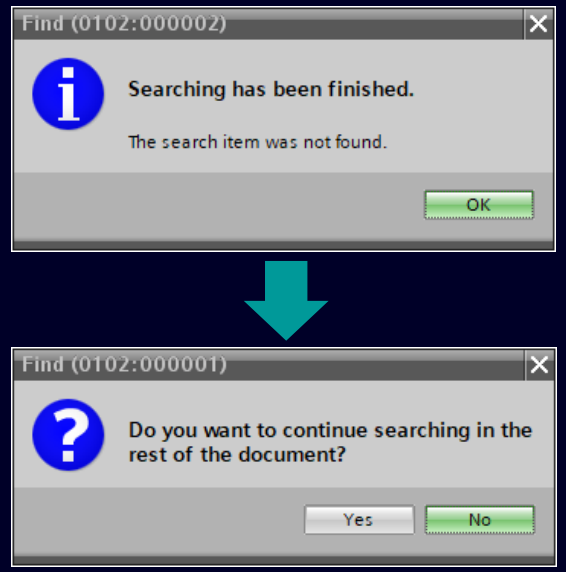
STEP 7 – Innovations
General Improvements

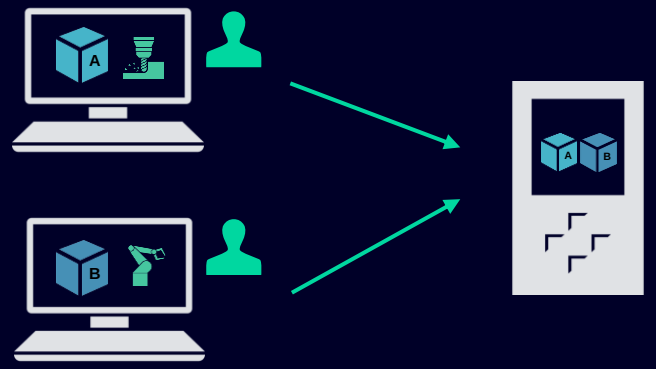
Search Replace improvements

- In the Project Navigator Overview now search & replace in the details view is possible
- Local search can now be directly continued for the rest of the block.



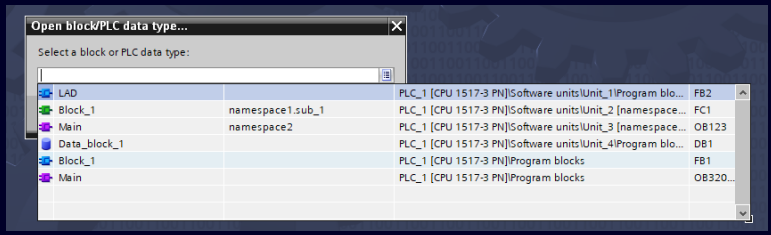
Improved Software Unit download behavior

- Before download, the relations between the Software Units are checked more thoroughly.
- Loading dependent Software Units is only necessary if components of the other Software Unit are actually used



F7 block open improvements

- Search scope of dialog is now always the complete PLC (context independent)
- Increased size of drop-down box for better readability
- Adjusted size of drop-down box is stored



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New Hardware S7-1500 T/TF with FW V4.0

- CPU S7-1516T-3 PN
- CPU S7-1516TF-3 PN
- CPU S7-1517T-3 PN
- CPU S7-1517TF-3 PN
- CPU S7-1518T-3 PN
- CPU S7-1518TF-3 PN

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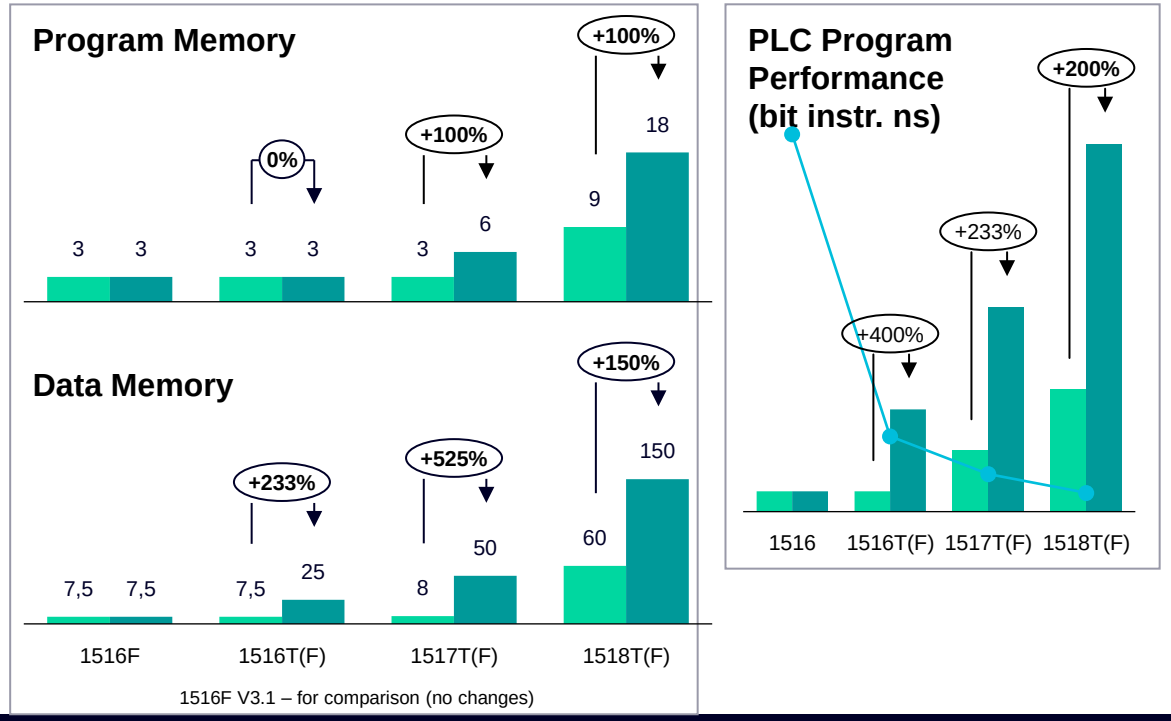
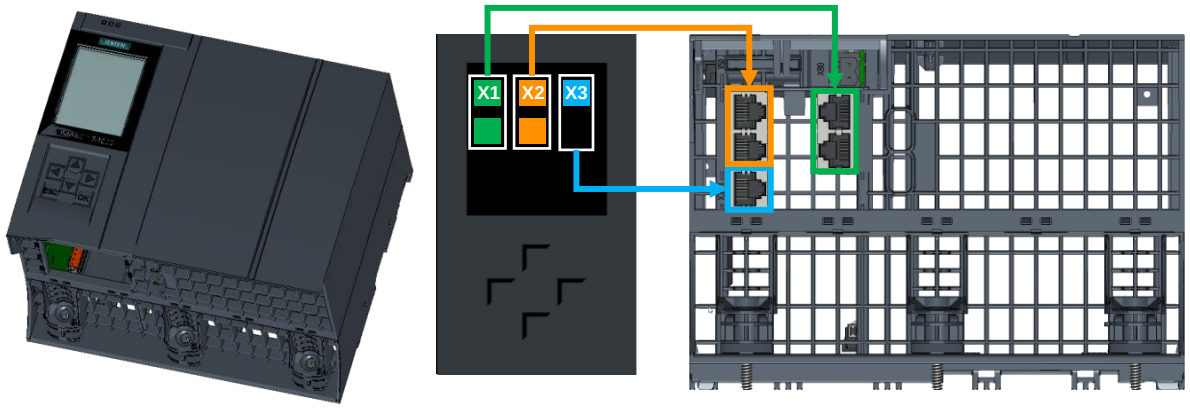
New Hardware S7-1500 T/TF
S7-1500 1516T / 1517 / 1518 CPUs





- **New hardware for S7-1500 1516T(F) / 1517T(F) / 1518T(F) CPUs**: More memory, More Performance, Higher communication performance, second IRT Interface, 64 IO-Devices per IRT Interface or 256 IO-Devices per IRT Interface with DFP, G-Bit Interface, secure boot, functional compatible to previous CPU generation

- **Support for standardization** that requires more memory for more code and the reliability on performance to new amount of code
- **Higher communication performance** to address the IT/OT communication use case
- **More Motion Control Performance** to meet high end applications

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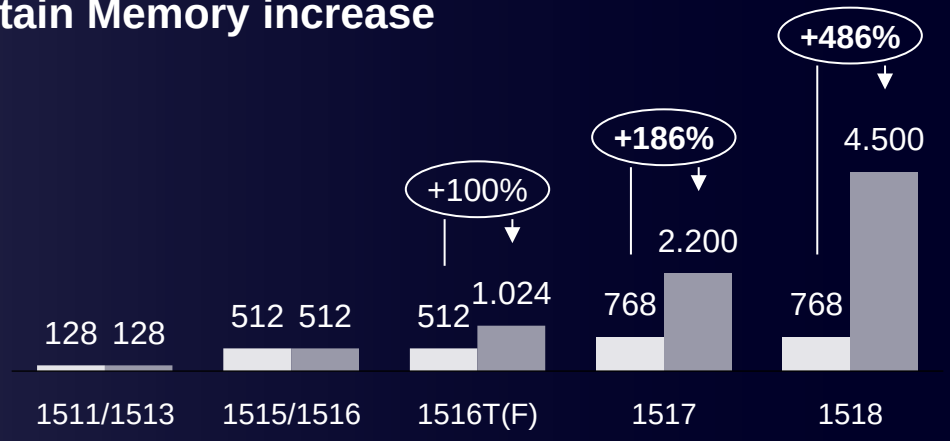
New Hardware S7-1500 T/TF
S7-1500 1516T / 1517 / 1518 CPUs

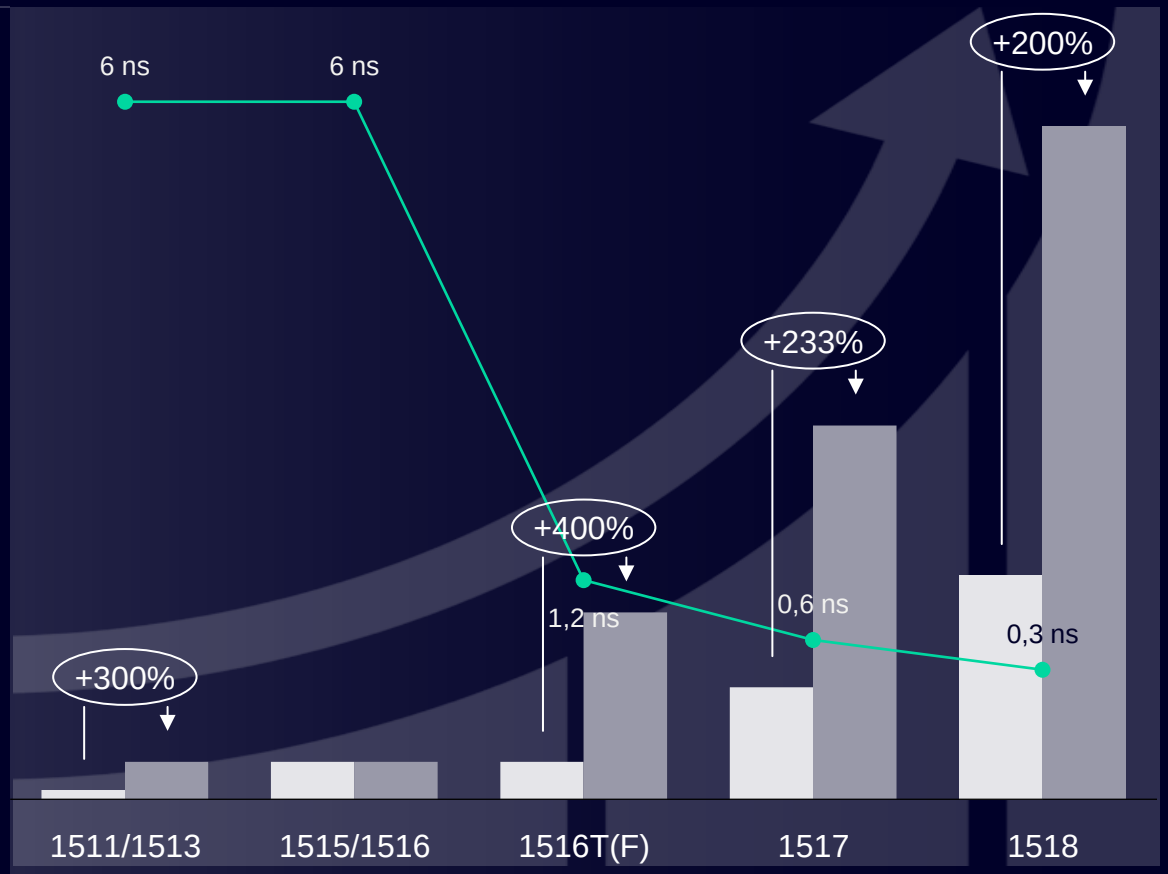
- **Significant PLC program performance increase**

➢ **Easier controller selection**
➢ **More customer use cases can be realized**

- **Retain Memory increase**



Retain memory in kByte



PLC Program performance

■ FW V3.1 (current article no.) ■ FW V4.0 (current + new article no.) —● Bit performance

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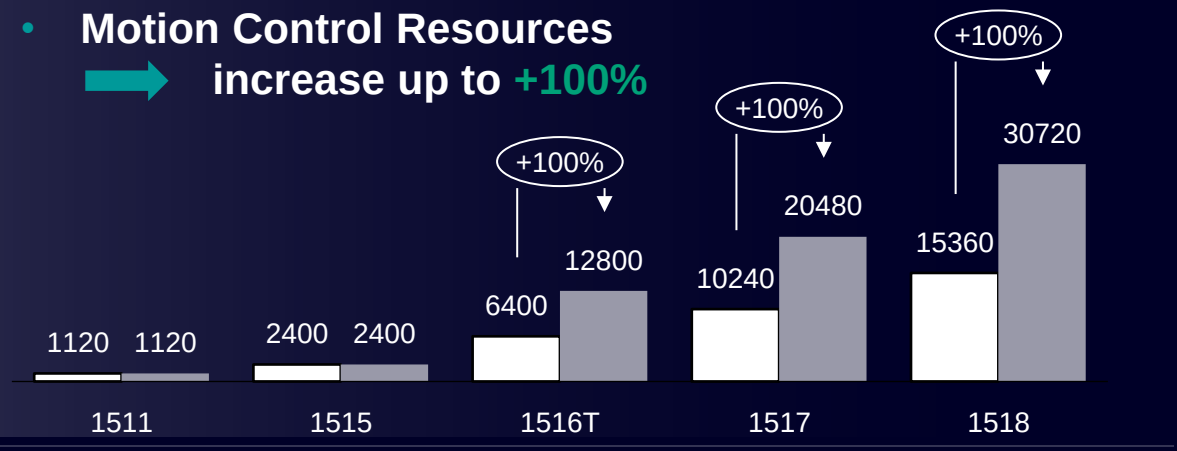
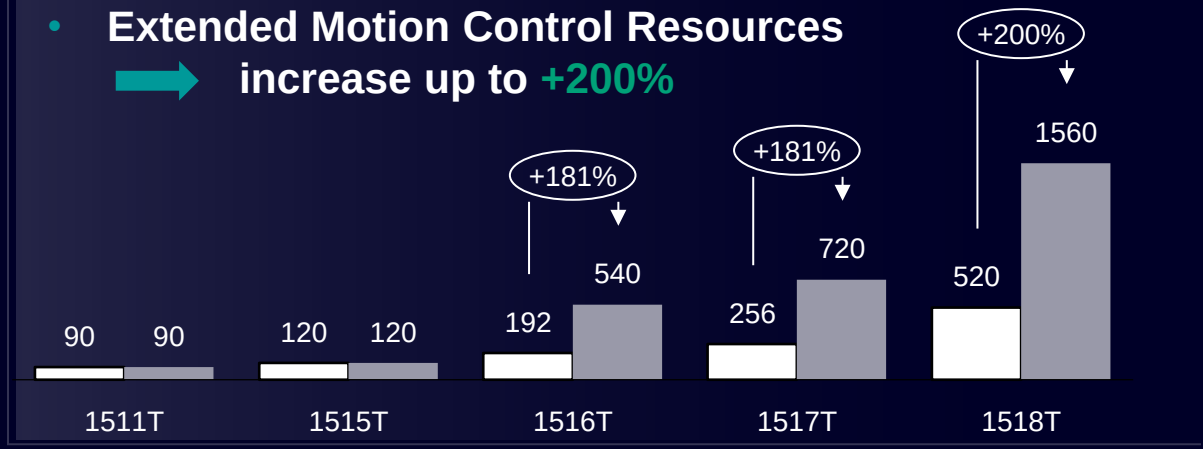
New Hardware S7-1500 T/TF
S7-1500 1516T / 1517 / 1518 CPUs

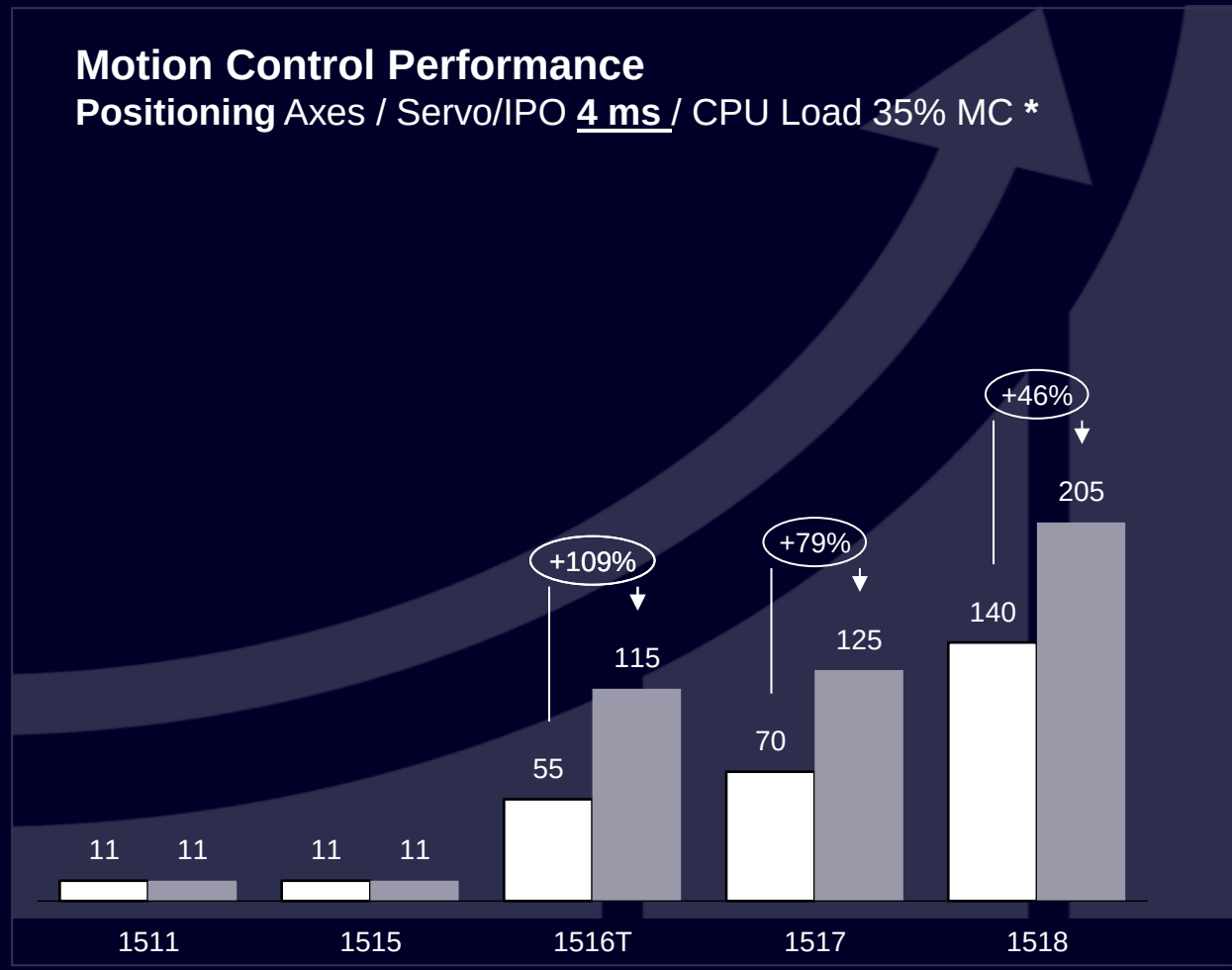
- **Motion Control Resources**
  increase up to +100%



- **Extended Motion Control Resources**
  increase up to +200%



Motion Control Performance
Positioning Axes / Servo/IPO **4 ms** / CPU Load 35% MC *



■ FW V3.1 (current article no.) ■ FW V4.0 (new article no.)

1511T / 1515T V3.1 – for comparison (no changes with FW V4.0)
* Depending on the application

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New Hardware S7-1500 T/TF
S7-1500 1516T / 1517 / 1518 CPUs

New mechanical design

- The display is now integrated into the CPU like in the new 1515/1516 CPUs
- Installation dimensions remain identical
- RUN/STOP switch is replaced with RUN/STOP buttons
  - No more "cancelling" of the RUN/STOP switch
  - "STOP ACTIVE" indicates that the CPU was switched to STOP via the STOP button
  - Memory reset/Reset operation: Identical as before
- Display can now be read – even when the cover is open
- Mechanical manipulation protection is retained
- New Display implementation
    - No separate Display FW needed



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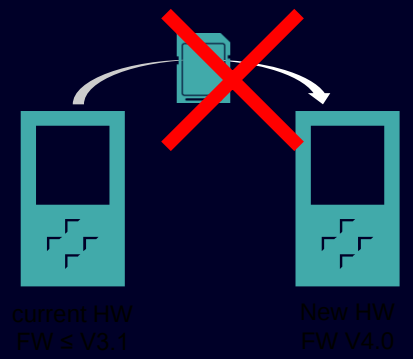
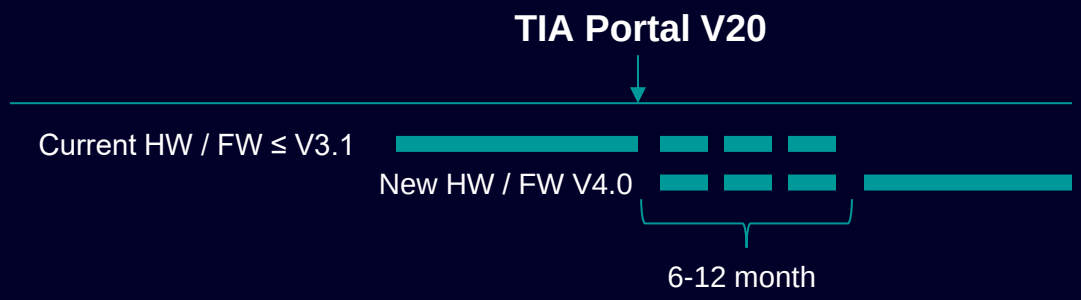
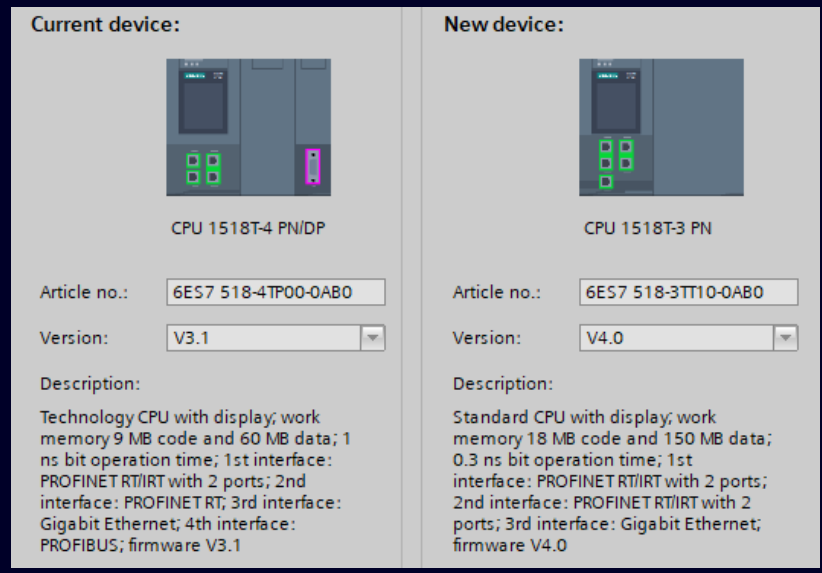
New Hardware S7-1500 T/TF
Compatibility of CPU 1516T / 1517 / 1518 with new HW

- FW V4.0 only for new article numbers
- No PROFIBUS Interface on board → No spare part compatibility
- Fully functional compatible (except PROFIBUS DP). STEP 7 project can be used in the new CPU after “change device” in HW config.



- Parallel delivery of the old and new HW for 6-12 month:





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Motion Control Innovations

FW V4.0 (TIA Portal V20)

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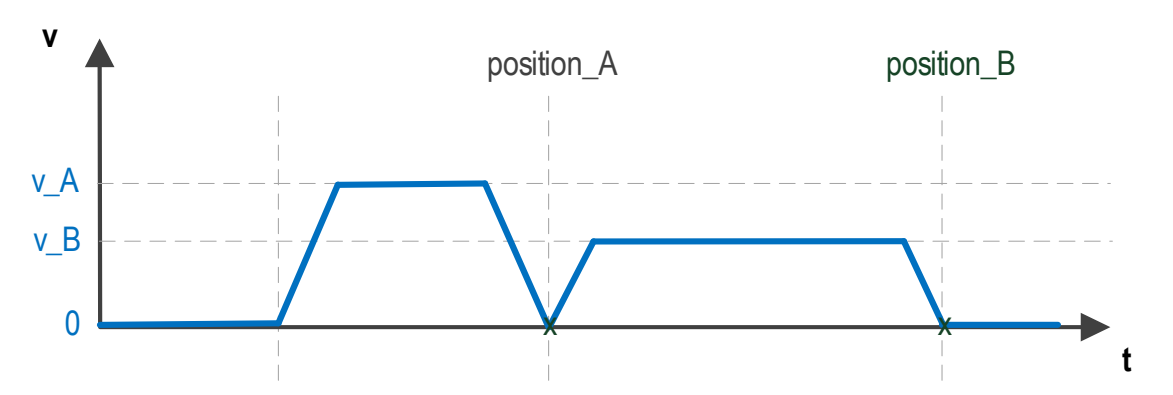
Motion Control – Innovations
New Single Axis Operations

Axis

- Improved FB MC_Halt: New mode to halt only the basic movement.
  The superimposed movement is continued.
- Change effectiveness of TO-DB tag “<TO>.Actor.RemoveEnableReaction”
- Improved FBs MC_MoveAbsolute / MC_MoveRelative: Append movement without blending (step 1)



Execution system / Acyclic tasks

- Improvement of reaction time for acyclic tasks (e.g. MC_InterpolateCam)

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Motion Control – Innovations
New Synchronous Operations

Cams
- New TO types TO Cam_6kSeg / TO Cam_600Seg with 6000 / 600 polynomial segments and 50 points
- New TO-DB tags at TOs Cam_* for the following values at start and end of a cam
- Improvement of FBs MC_GetCamFollowingValue(Cyclic): Select mode and read third derivative from a cam

Synchronizing
- Improvement of FB MC_CamIn: Direct synchronous setting at specified leading value position
- Improvement of FB MC_GearInPos: Subsequent synchronization with specified MasterSyncDistance
- New TO-DB tags at TO SynchronousAxis for the actual gear ratio numerator and denominator
- Toleration of a leading value reversal during synchronization and desynchronization

Cross-Project synchronous operation
- Distributed synchronous operation between several CPUs programmed in different projects using new PN/PN-Coupler that synchronize two IRT domains and support isochronous data transfer between domains.

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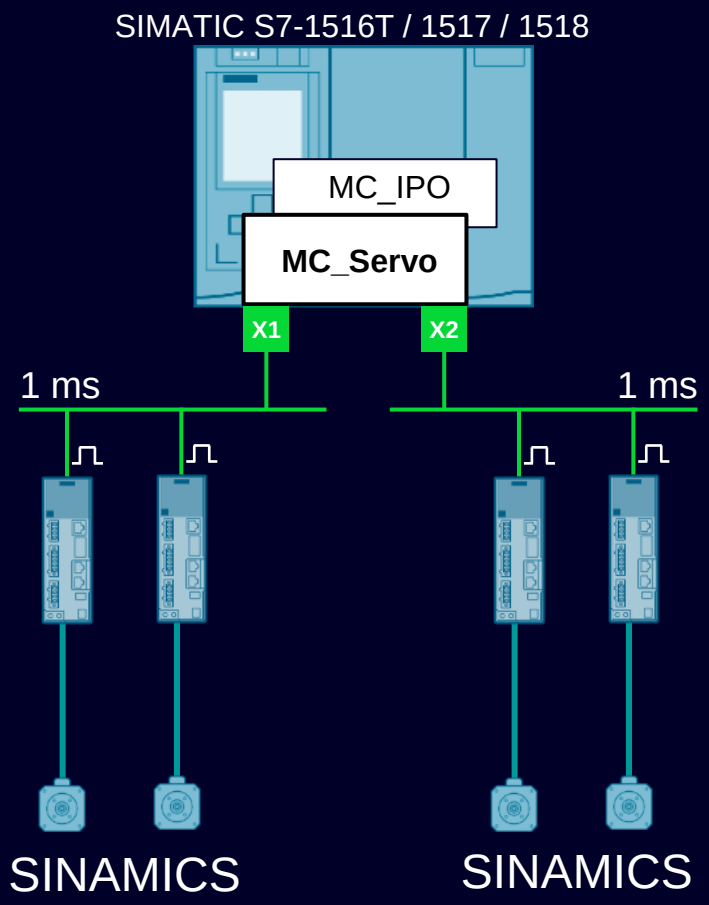
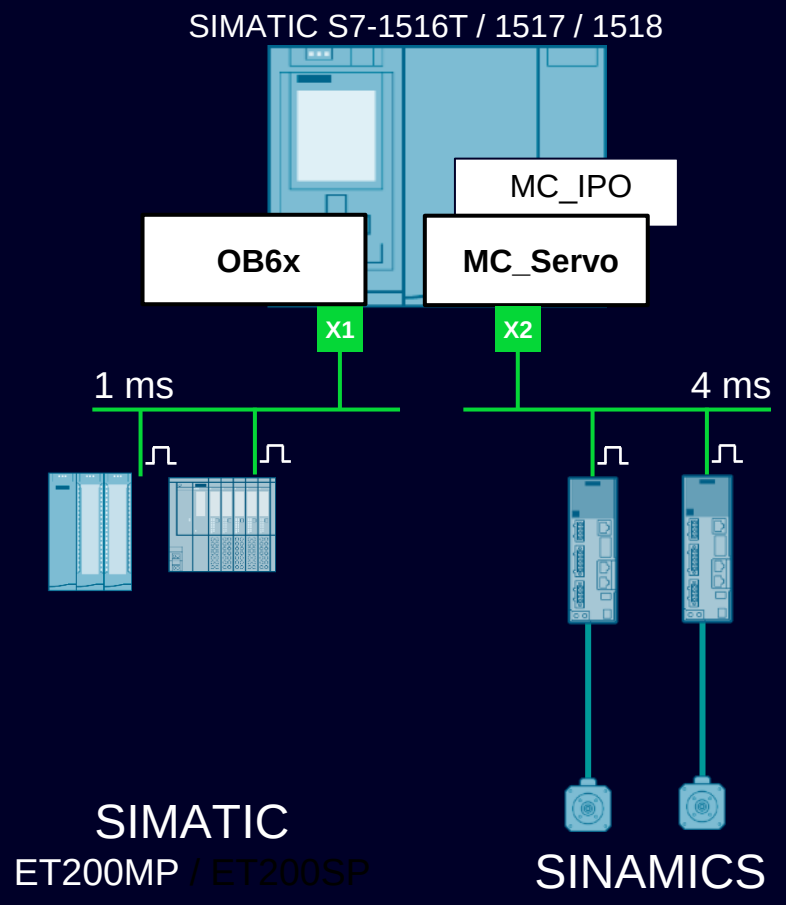
Motion Control – Innovations
Support of second PROFINET IRT Interface

Interfaces in “Coupled” mode



Interfaces in “Synchronized” mode



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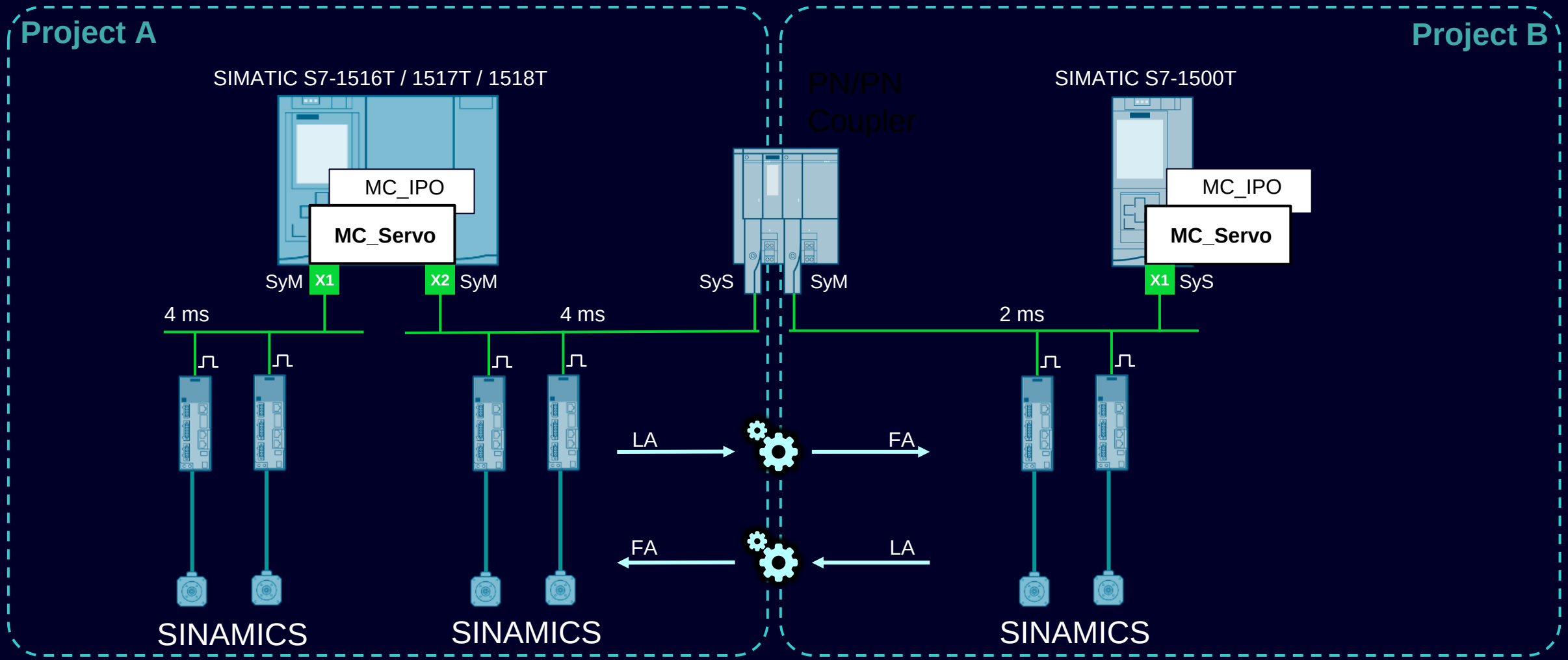
Motion Control – Innovations
Cross-PLC synchronous operation using PN/PN Coupler



SyM = Sync master
SyS = Sync slave

LA = Leading axis
FA = Following axis

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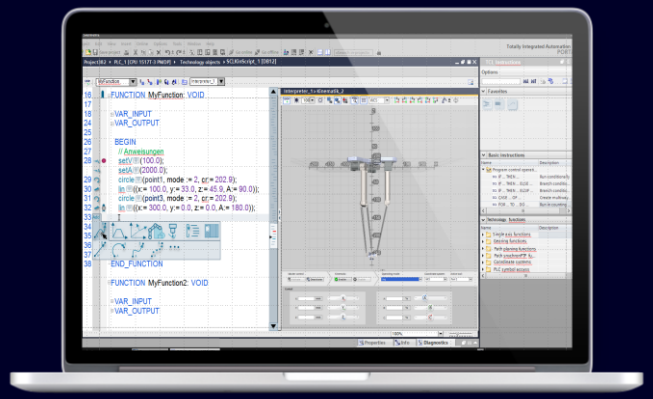
Motion Control – Innovations
Kinematics & SIMATIC Motion Interpreter



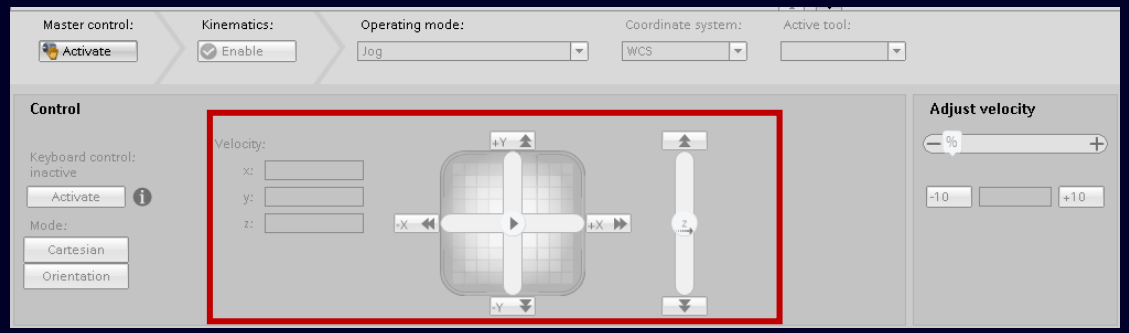
Debugging of MCL programs

- Breakpoint in Interpreter program editor
- Toolbar extensions for debugging
- Debug extensions in the basic online view

MCL Language Extensions

- waitEvent() instruction supports expressions

SIMATIC Motion Interpreter

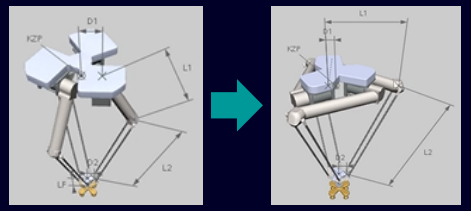


Commissioning

- Improved usability by adjusting control elements in commissioning panel
- Efficient dynamic optimization by Status.Path.DynamicLimit TO-DB tag

Deltapicker 3D / 4D

- Support of deviating mechanical design (compact mechanical structure with negative D1 parameter)



TO Kinematics

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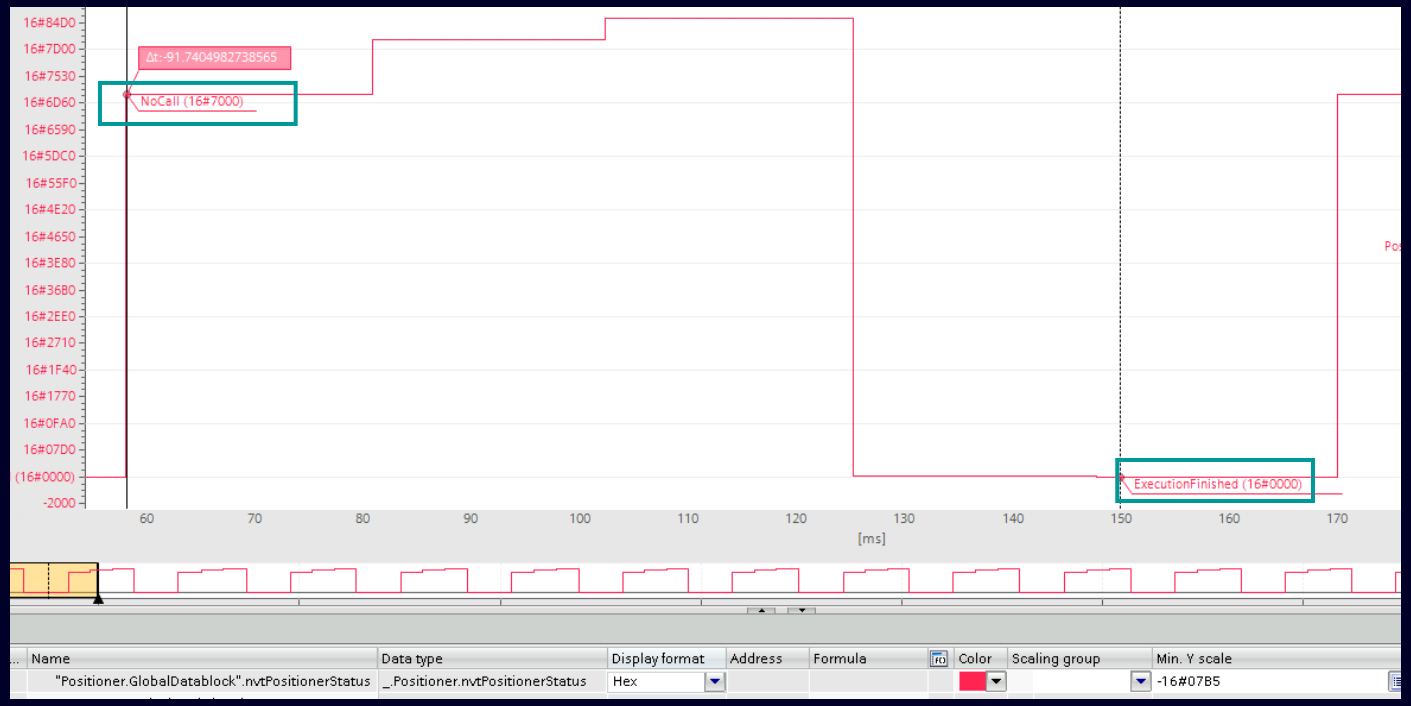
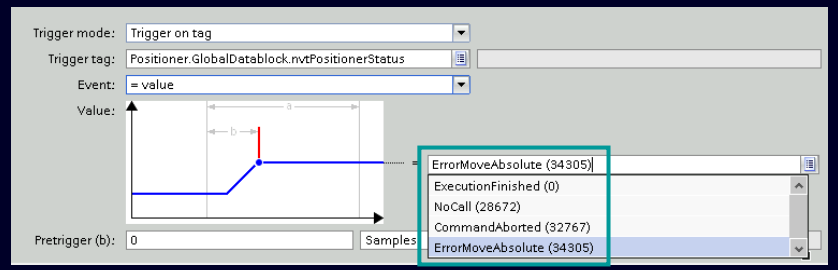
Motion Control – Innovations
Named value data types – tracing with PLC Trace





Tracing Named Value Tags

The trace recognizes NVTs directly in trace definition. Recorded values in the diagram are automatically resolved to NVT definition and displayed accordingly.

Benefits

- **Automatic representation of tag names**, instead of numerical representation
- **Tags can be used as trigger**
- Undefined states are also visible in diagram
- NVTs are supported in all traces ((long-term) trace, (long-term) project trace)

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TIA Portal V20
Table of contents

SIMATIC WinCC Unified – Innovations

- Enhanced compile time and RT performance
- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
- User and role specific start screens
- Redundancy
- Process Orchestration (MTP)

SIMATIC WinCC – Innovations

- Engineering of Professional, Advanced and Unified on one PC
- WinCC Advanced: no new RT Advanced V20 Version
- WinCC Professional: Support of dynamic SVG, WebUX (deep link, recipe control),..

SIMATIC STEP 7 – Innovations

- Continuous Integration: new LAD export/import format
- Online features for named value data types
- Named value types used by safety blocks and in type libraries

SIMATIC Motion Control – Innovations

- New Hardware S7-1500 T/TF
- New Single Axis Operations / New Synchronous Operations
- Support of second PROFINET IRT interface
- Cross-PLC synchronous operation using PN/PN Coupler
- Kinematics

SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Simulation Cloud *new*
- TIA Project-Server Cloud

SIMATIC Hardware

- S7-1200 G2
- SIMATIC Controller S7-1500 Standard & F
- Redundant Controller S7-1500 R/H
- SIMATIC ET 200SP Open Controller 3
- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

System functions

- Upgrading TIA Portal projects
- PROFINET IRT features
- TIA Portal Documentation
- TIA Portal Openness
- TIA Portal Add-Ins
- Version Control Interface (VCI)
- CAx: AutomationML & Publication Tools
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- TIA Portal Library Workflows
- TIA Portal Usability

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V
- Limited Sales release in USA

TIA Portal Options

- **SIMATIC STEP 7 Safety**
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- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager**
- **TIA Portal Safety Validation Assistant**

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SINAMICS Startdrive & DCC – Innovations
Highlight overview

New engineering efficiency features
+ Export backup file
+ Trace templates
+ Drive parameter compare
+ Extended signal (BiCo) handling
+ Filter parameters
+ Synchronized parameter / function view
+ Improved topology error diagnosis
+ Openness extensions



New SINAMICS features
+ OPC UA server
+ EPOS extensions
+ Unit switching
+ System Component Trace and Trace at fault

Safety Validation Assistant
- Test Safety functions from sensor to actor on TIA Portal project level
- Successor for Safety Activation Test

SINAMICS DCC
+ Support of DCC for G220
+ Indexing of publish PINs for G220
+ Up to 250µs cycle time for G220

SIEMENS

SINAMICS Startdrive Innovations
Export backup file

Export backup file – new in V20

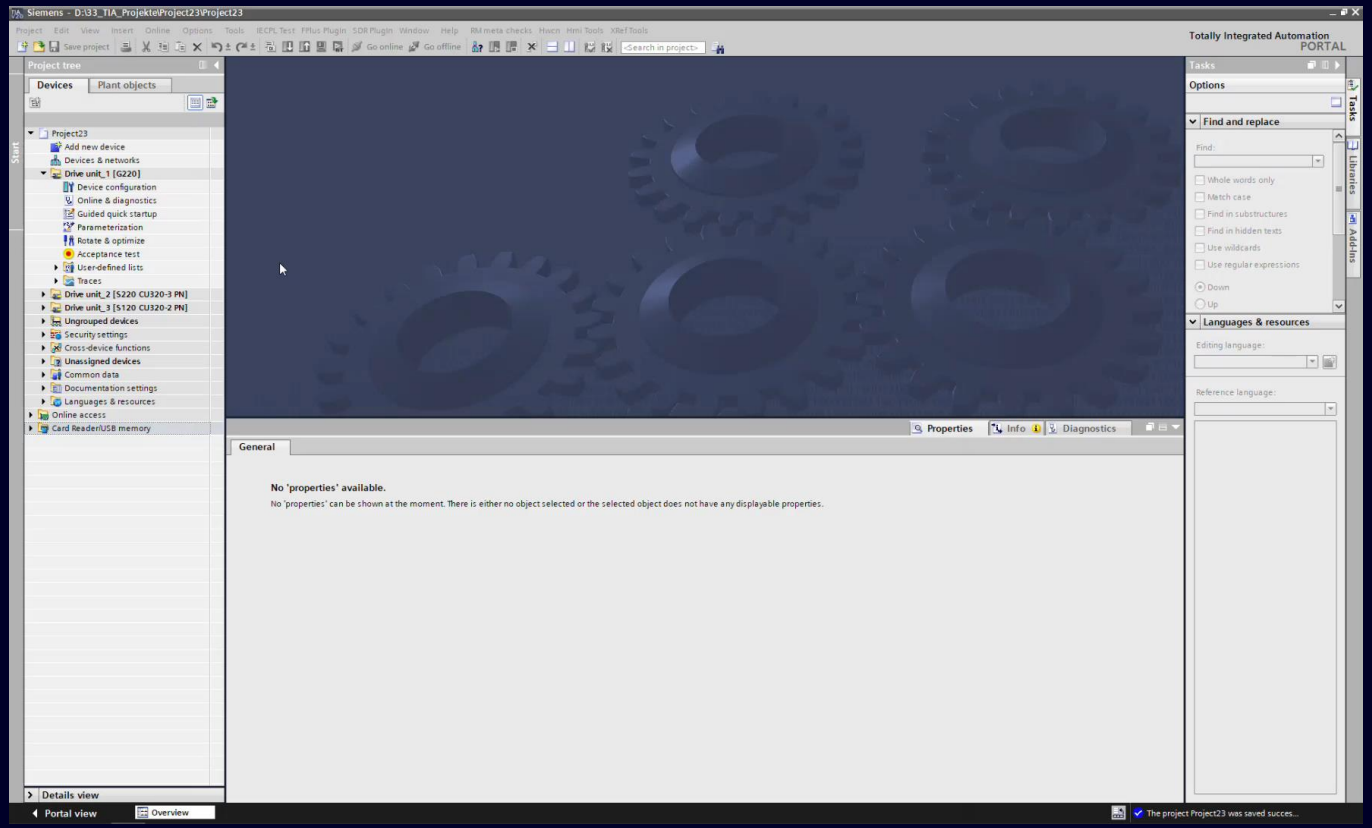
- Available for all drives as of V6.x
- Uses Card Reader function of TIA Portal
- “download” drive configuration directly to SD card or to local storage location on your PC for later reuse

Same backup file format – doesn’t matter if it was created…

- ✓ via backup function of online drive configuration (Webserver / Startdrive)
- ✓ via export backup function of offline drive configuration (Startdrive)

Can be restored…

- ✓ via Webserver / Startdrive restore function
- ✓ via SD card plugged to the drive



Export backup file functionality is part of the SINAMICS Startdrive Advanced license.

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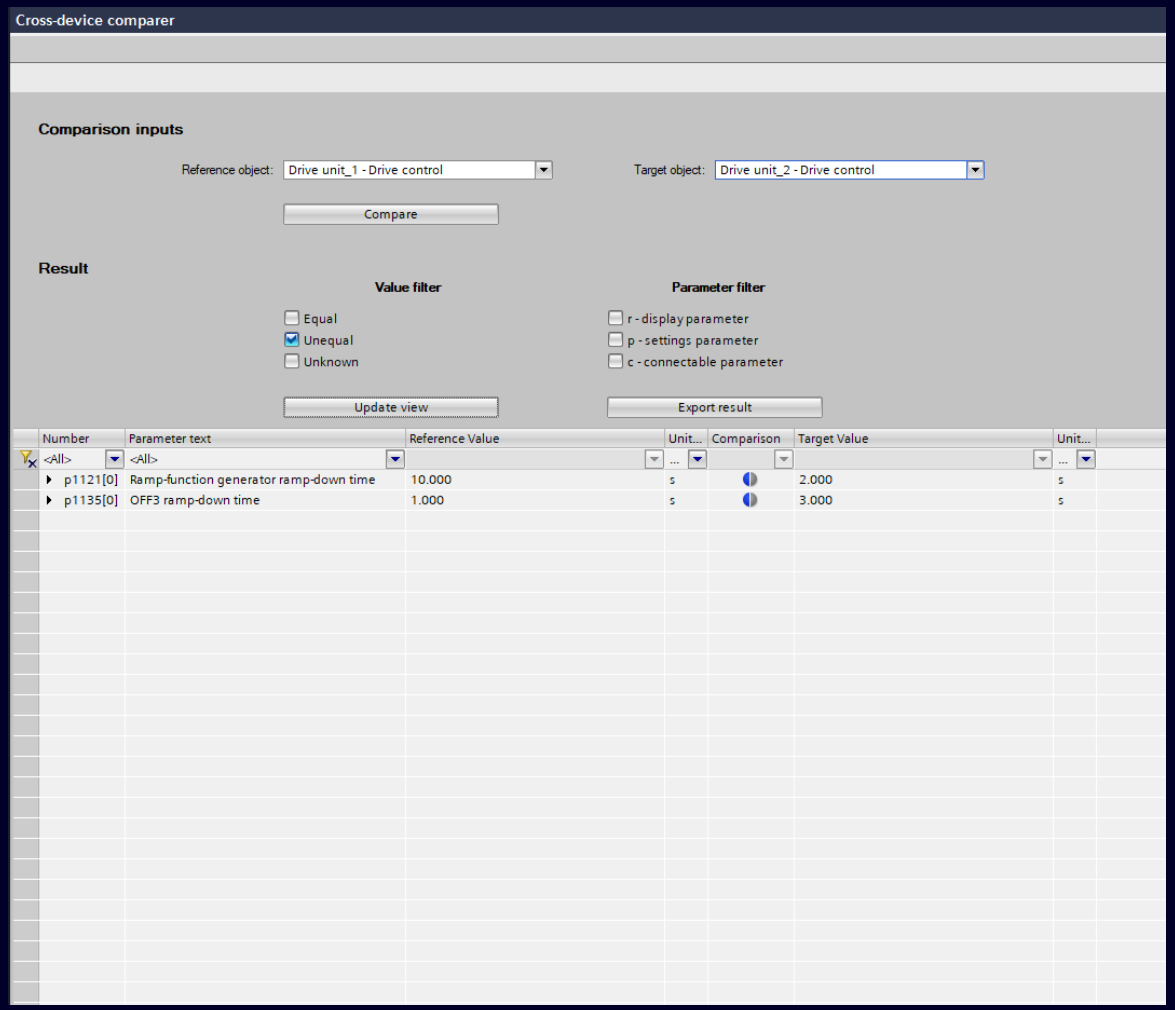
SINAMICS Startdrive Innovations
Compare drives

Compare drives – new in V20

- Available for all drives as of V6.x and CU3x0-2 based drives
- Comparison of single axis drives or drive objects of multi axes devices
- “Compare” action creates snapshot of current values
- Compare online or offline configurations
- Filter for equal/unequal and r-/p-/c-parameters
- Change parameter values directly within compare result
- “Update view” for new filters or after parameter was changed by user (e.g. to make it equal)
- Export compare result as .csv file or User-defined list (UDL – with or without values from target or reference object)



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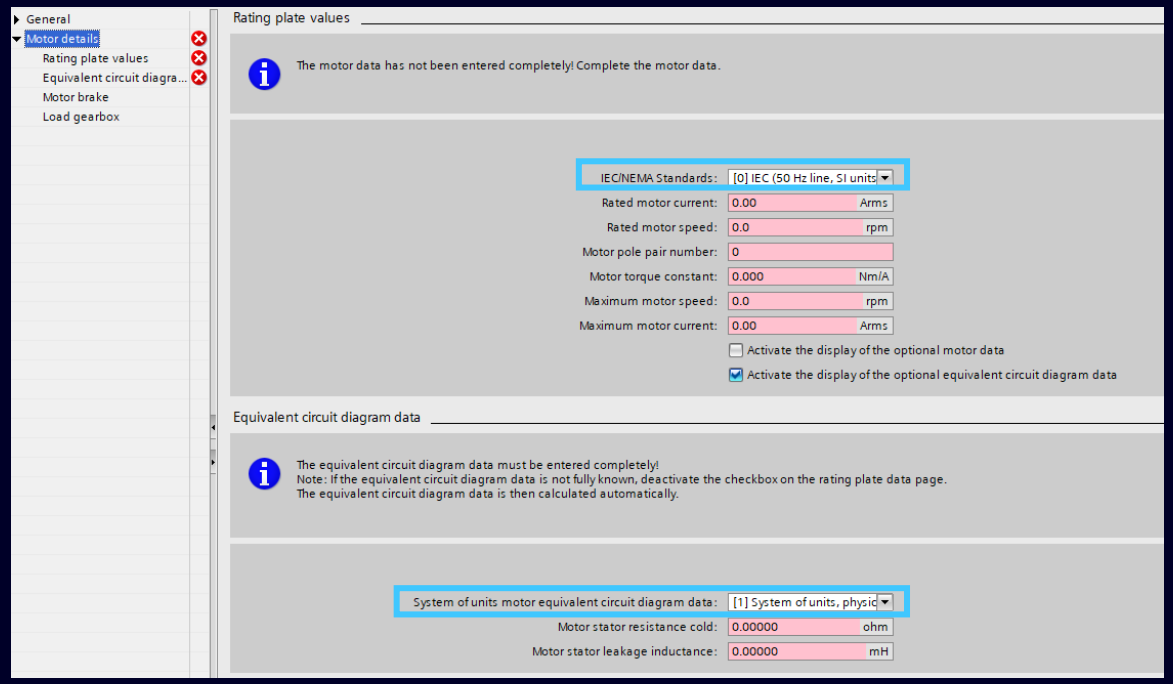
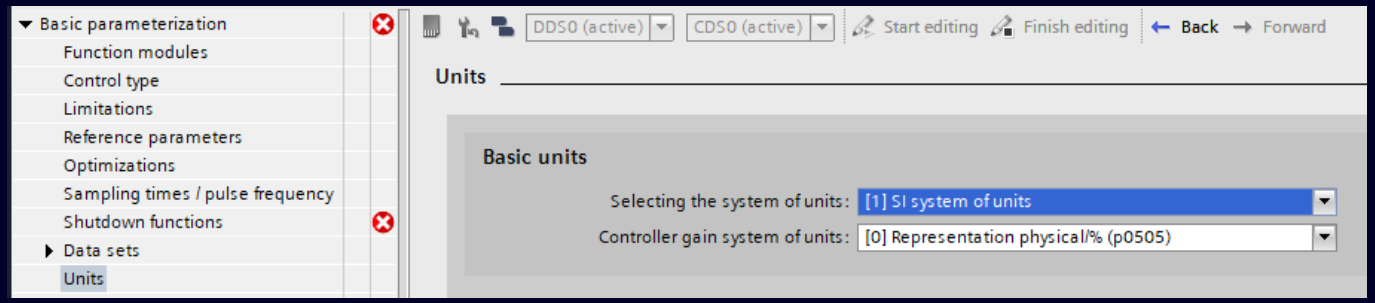
SINAMICS Startdrive Innovations
Unit switching

Unit switching SI/US units – new in V20

- Available for
  - ✓ CU3x0-2 based drives
  - ✓ G220





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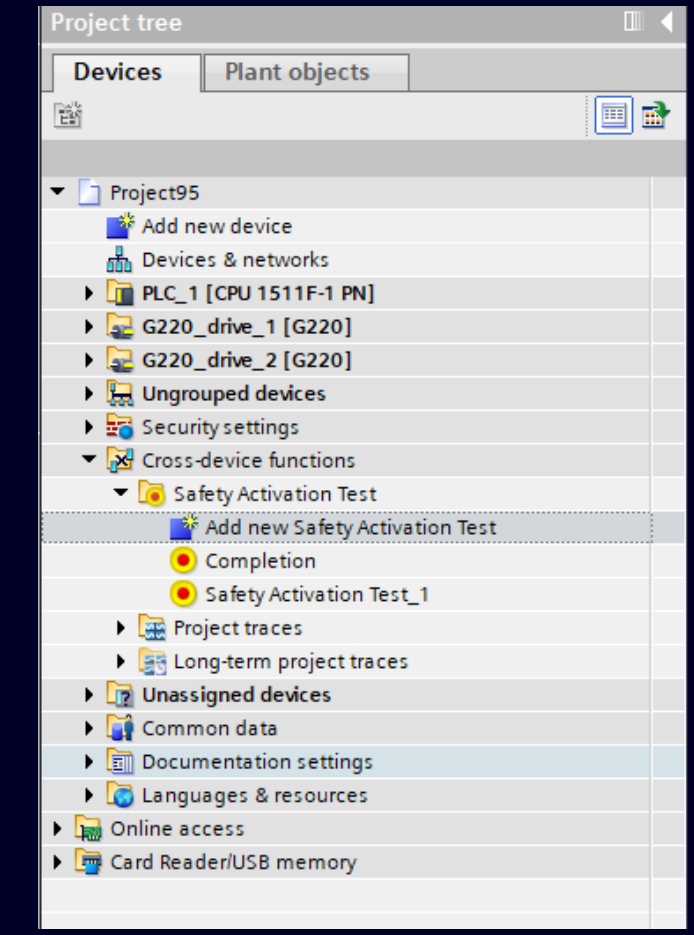
SINAMICS Startdrive Innovations
NEW Safety Validation Assistant

Safety Activation Test on project level – NEW in V20

- Safety Activation Test was introduced in V17 to test and document the Safety control chain from sensor through PLC program to actuator. It had to be performed separately for each drive
- NEW in V20: Test on project level
- Advantage: Only one test case needed to check one Safety function for all devices in the project



Safety Activation Test on project level is available with the newly introduced Engineering license **Safety Validation Assistant**.

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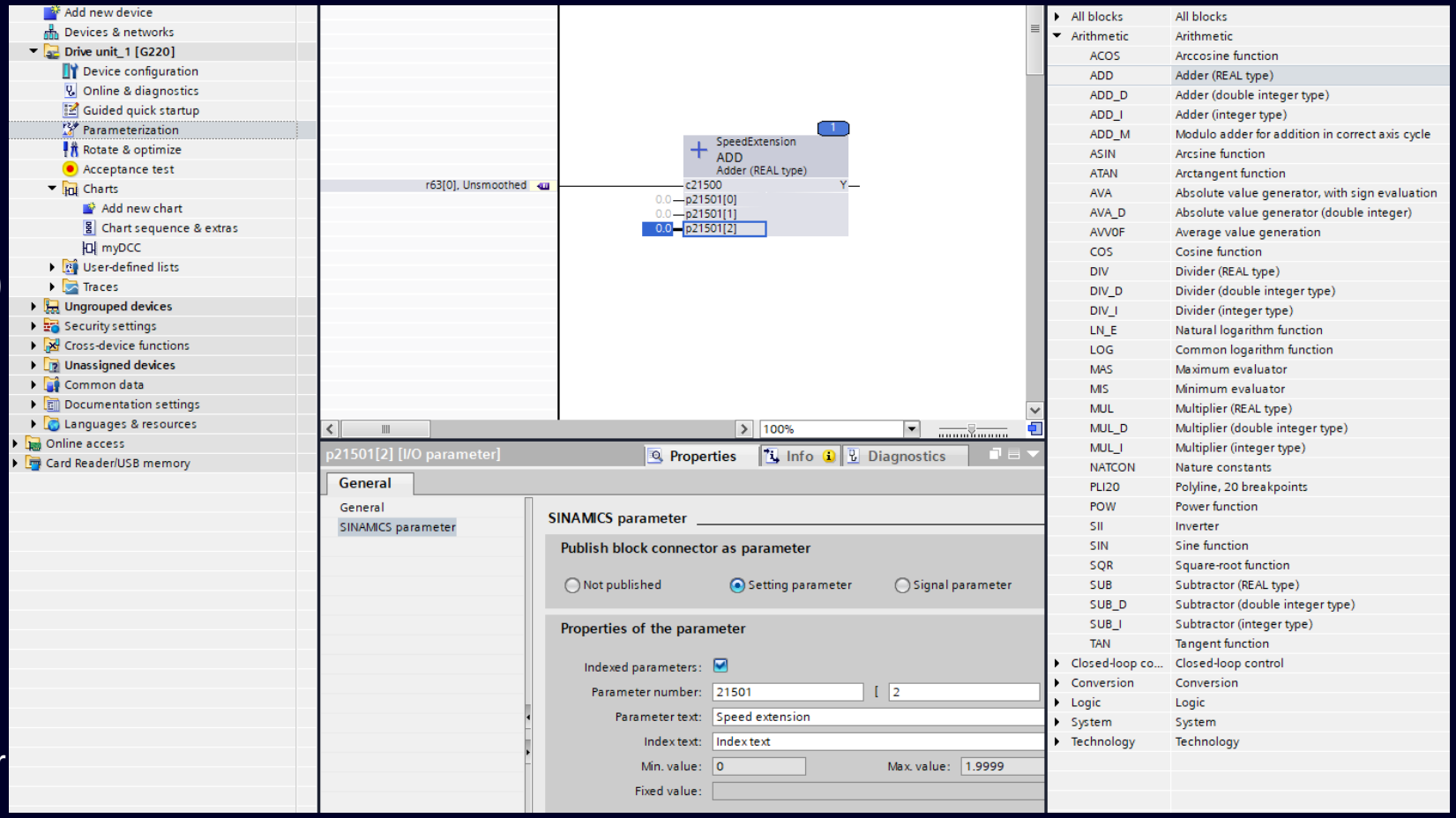
SINAMICS DCC Innovations
Support of DCC for G220

SINAMICS Drive Control Chart (DCC) now available for G220 as of V6.4.

- Support of indexed parameters
- Up to 250µs cycle time for G220
- Additional block type available

Note:
For drives as of V6.x there is no DCC engineering license needed anymore for programming.
DCC functionality will be licensed as Runtime licenses depending on number of blocks and used functionality.



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- **SIMATIC ProDiag / SysDiag**
- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager** new
- **TIA Portal Safety Validation Assistant** new

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TIA Cloud Services
Overview

New



TIA Cloud Services



TIA Portal Cloud

TIA Portal as a Service with demand-oriented licensing



TIA Simulation Cloud

Hardware independent high-performance simulation



TIA Project-Server Cloud

Central project storage with versioning and world-wide collaboration

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TIA Cloud Services
How to get a license…

New

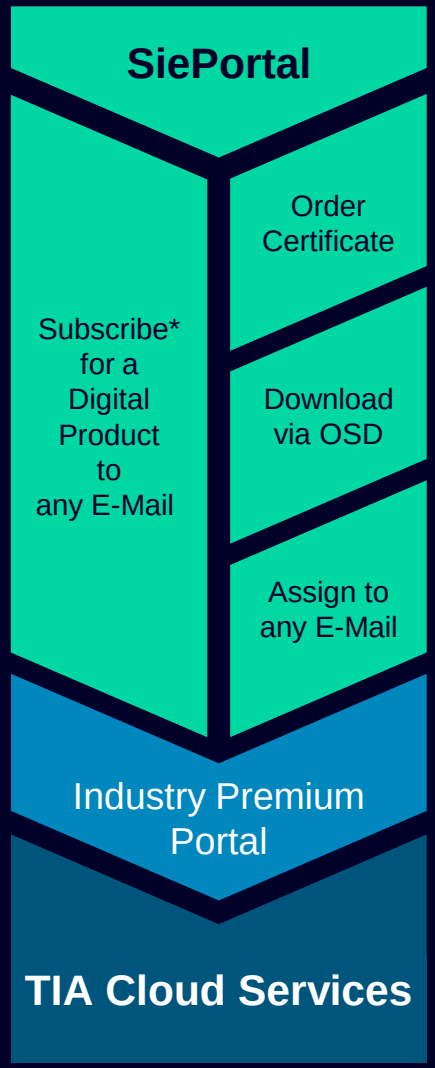
Subscribe for …

Pay per use
Pay only for session time
No basic change

Monthly subscriptions
Fixed price + unlimited access
Can be cancelled monthly

Annual subscriptions
Fixed price + unlimited access
Including additional value

Direct activation & carefree usage



Order a certificate for …

Hourly credit
Pay only for session time
Credit based access

31 days
Fixed price + unlimited access
Solid time range

365 days
Fixed price + unlimited access
No auto-renewal

Easy to order & flexible usage

* Digital Offering Store has limited country availability

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TIA Cloud Services
Offerings and Ordering Information

New

	TIA Portal Cloud	TIA Simulation Cloud	TIA Project-Server Cloud	SiePortal
Pre-paid Credits				
TIA Portal Cloud	100 hours			6ES7804-0CP41-3YA8
2D Simulation Engineering		50 hours		6ES7804-0VP41-3AA8
3D Simulation Player		50 hours		6ES7804-0VP41-3BA8
TIA Project-Server Cloud			10 hours	6ES7804-0PP01-3YA8
Certificates				
TIA Portal Cloud	365 days			6ES7804-0CP41-1YA8
TIA Project-Server Cloud			365 days	6ES7804-0PP01-1YA8
TIA Project-Server Cloud			31 days	6ES7804-0PP01-2YA8
Subscriptions				
TIA Portal Cloud	Monthly			6ES7804-0CP41-2YA0
TIA Project-Server Cloud			Monthly	6ES7804-0PP01-2YA0
TIA Portal Cloud	Annual			6ES7804-0CP41-1YA0
TIA Project-Server Cloud			Annual	6ES7804-0PP01-1YA0
Pay-per-use				
TIA Portal Cloud	Hourly			6ES7804-0CP41-3YA0

Digital Offering Store

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TIA Cloud Services
TIA Portal Cloud

Update

TIA Portal Cloud V5.1

Package

- STEP 7 Professional
- WinCC BCA / Unified
- STEP 7 Safety
- PLCSIM Advanced
- StartDrive Advanced
- SiVArc
- SINUMERIK STEP 7 Toolbox
- SINAMICS DCC
- SINETPLAN
- Test Suite
- Energy Suite
- New: SIMIT Player S
- SIMATIC SCADA Export



License models

Trial – 21 days
- 21 days limited use

Subscription pay per use
- pay only for session time

Subscription monthly
- fixed price, unlimited access

Subscription annually
- fixed price, unlimited access
- including SITRAIN access learning membership

Certificate for 365 days
- get activation code for user assignment
- full access for 365 days, no auto-renewal

New: Certificate for 100 hours
- get activation code for user assignment
- full access with 100 hours of usage credit

More information about TIA Portal Cloud is available at Industry Support page ID 109794456.

TIA Portal Cloud is an efficient SaaS offering, that enables you to work anywhere at any time!

What is new?

TIA Portal Cloud V5.1 (02/2025)
- Integration of SIMIT Player S

TIA Portal Cloud V5.0 (12/2024)
- Integration of TIA Portal V20
- Keep TIA Portal V15.1 and V16 as legacy versions

TIA Portal Cloud V4.6 (08/2024)
- Extended hibernation support for your instances

TIA Portal Cloud V4.3 (05/2024)
- Improved WebUI
- Basic hibernation support

TIA Portal Cloud V4.2 (03/2024)
- Support of TIA Project-Server Cloud

TIA Portal Cloud V4.1 (01/2024)
- Authentication via Siemens ID
- Updated instance toolbar design

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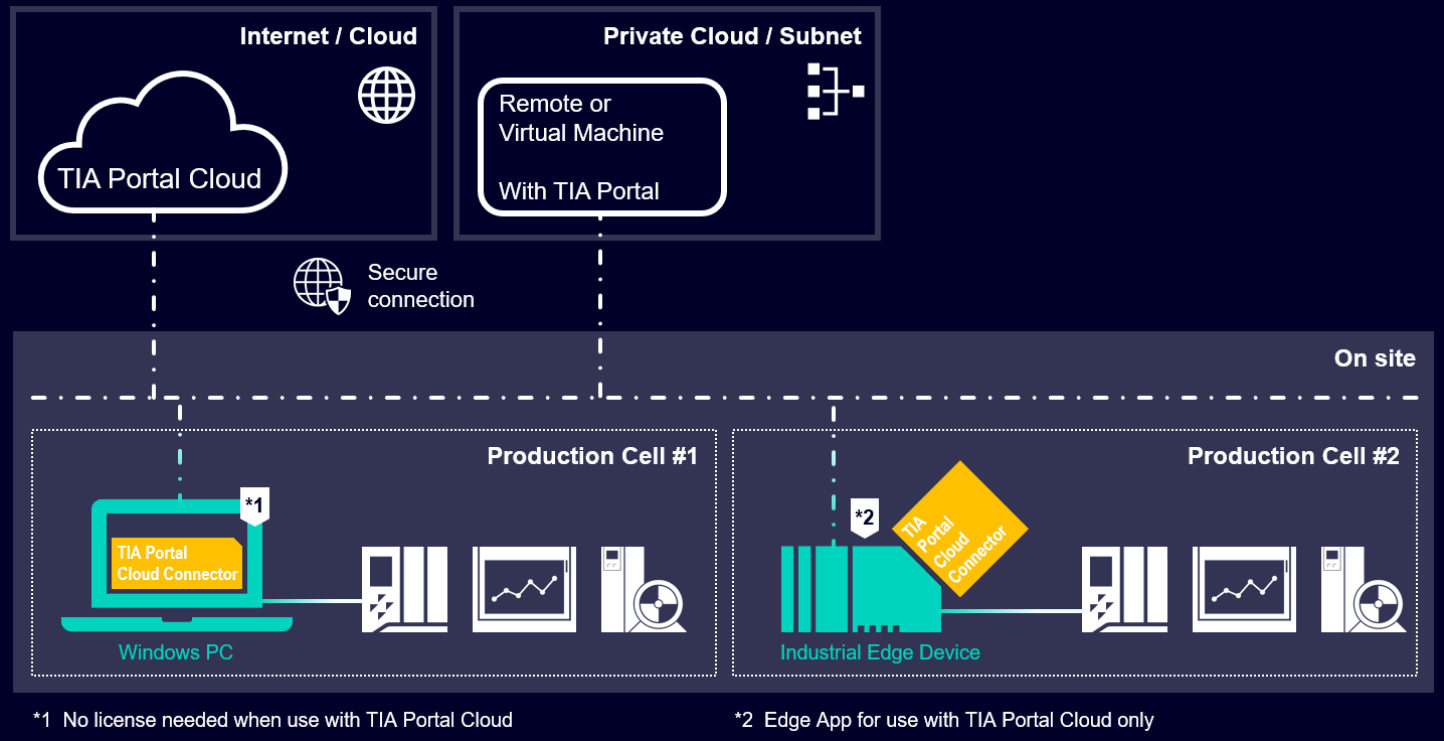
TIA Cloud Services
TIA Portal Cloud Connector



The TIA Portal Cloud Connector enables full access to SIMATIC hardware, if the TIA Portal is located in a different subnet or in a cloud environment.

Features

- Access to all online functionalities
- High-performant download to devices
- Secure connection via https
- Easy integration as Industrial Edge App
- Integrated access management for TIA Portal Cloud users

More information and the setup of the latest version are available at Industry Support page ID 109780755.

TIA Cloud Services
TIA Simulation Cloud

New

TIA

TIA SIM



Access from any device
via web browser

2D Simulation Engineering

Cost-efficient 2D Engineering and Simulation

50 hours certificate
MLFB: 6ES7804-0VP41-3AA8

3D Simulation Player

2D Engineering and Simulation with performant 3D Visualization

50 hours certificate
MLFB: 6ES7804-0VP41-3BA8

		2D Simulation Engineering	3D Simulation Player
3D Visualization capability	e.g. UNITY		●
Simulation Software	SIMIT CONTEC Library	●	●
	SIMIT M	●	●
	S7-PLCSIM Advanced	●	●
Engineering Software	**TIA Portal V17, V18, V19 including**		
	STEP 7 Professional	●	●
	STEP 7 Safety Advanced		
	WinCC Advanced / Unified		
	SINAMICS Startdrive Advanced		
Cloud Instance	GPU-powered machine (AMD)		●
	CPU-powered machine	●	

More information about TIA Simulation Cloud is available at Industry Support page ID 109983775.

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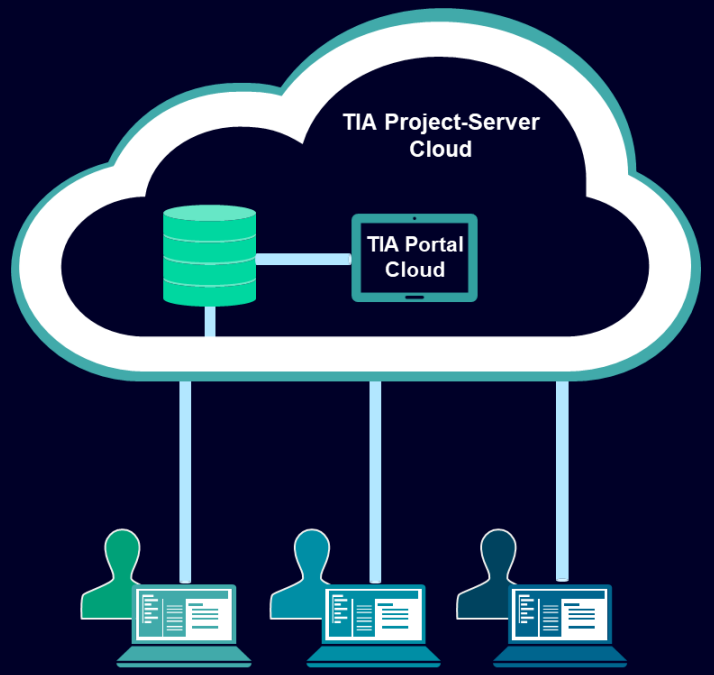
TIA Cloud Services
TIA Project-Server Cloud

Make your TIA Portal projects available in the cloud.
Enables efficient team engineering of projects with the TIA Portal or TIA Portal Cloud - anywhere, anytime.

With the **TIA Project-Server Cloud** you have access to your TIA Portal projects and libraries from different locations for collaborative work across company boundaries.

Benefit

- Project storage and user management provided by the TIA Project-Server in the Industry Premium Portal.
- Direct access to data storage from the TIA Portal, no time-consuming sending of data or coordination of changes.
- Access from TIA Portal engineering stations as well as from the TIA Portal Cloud.
- Dedicated resources for performance and data security.
- Easy integration of suppliers, without opening the own IT structures.
- Management of the Server and the TIA Portal projects via a comfortable web interface.



Cooperative engineering for TIA Portal Projects and Libraries in the TIA Portal Cloud

For more information on TIA Project-Server Cloud, please follow the link: TIA Project-Server Cloud

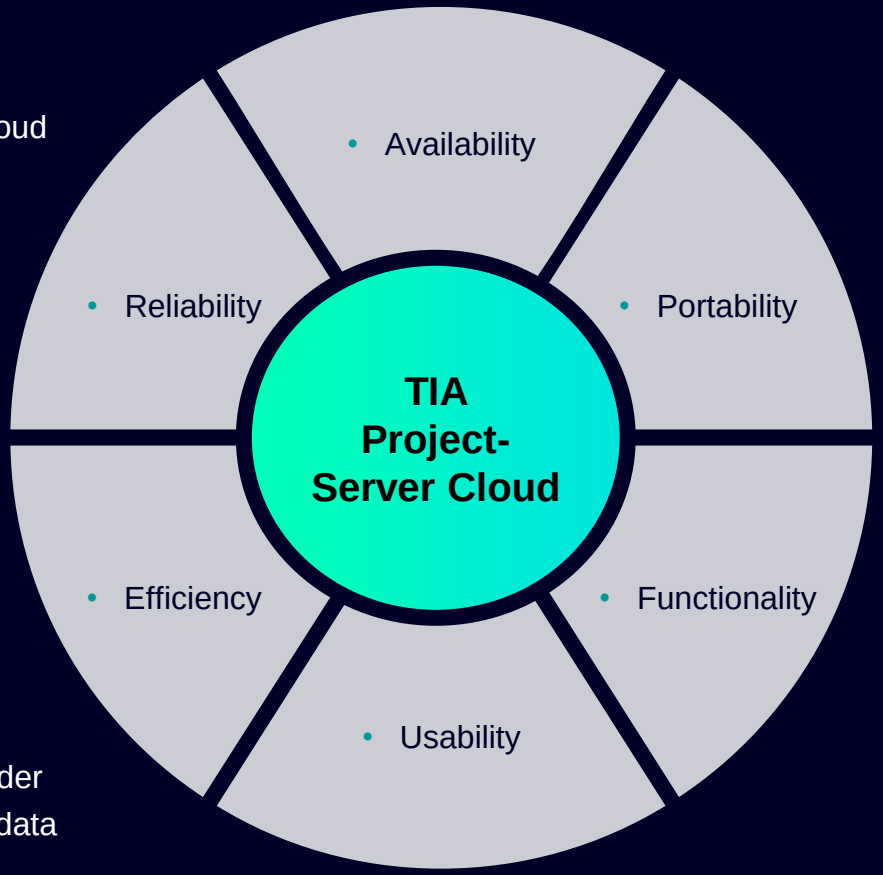
TIA Cloud Services
Added values from TIA Project-Server Cloud

Use Case: Work together effortlessly, regardless of company boundaries.

Availability
Available from everywhere at any time
- use with on-premise TIA Portal and TIA Portal cloud
- Stable accessibility of the colocation center
- High giga bit network bandwidth

Reliability
Guaranteed service level
- Average annual availability of at least 99.9%
- 24/7 monitoring service

Efficiency
Secure and fast environment
- Dedicated server with own resources for each order
- High level of data security with full control of the data



Portability
Zero IT effort and easy entry
- no installation, maintenance or update effort
- no hardware, no Windows server license needed

Functionality
Managed service
- Server fully managed by Siemens
- No shared virtual machines, each user gets their own virtual machine.
- Virtual machines with the latest security patches ensures that system software and server services function properly

Usability
User experience
- Simple administration via Web GUI
- Same known experience for the users from TIA Portal point of view with seamless integration

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TIA Project-Server Cloud
How to get access

Different offerings for different demands

10-hours certificate
Non-self-extended 10-hours credit with 100 GB project memory.
Interruptible can be combined into one credit period term (e.g. 4x10h = 40h).

→ As Certificate of License via Industry Mall: 6ES7804-0PP01-3YA8 (in preparation)

31-days certificate
Non-self-extended 31-day certificate with 100GB project memory.

→ As Certificate of License via Industry Mall: 6ES7804-0PP01-2YA8 (in preparation)

365-day certificate
365-day certificate with 250GB project Memory. No auto-renewal.

→ As Certificate of Contract via Industry Mall: 6ES7804-0PP01-1YA8

Monthly subscription
Self-renewing monthly subscription with unlimited access and 100GB project storage.

→ As Certificate of License via Industry Mall: 6ES7804-0PP01-2YA0

Annual subscription
Self-renewing annual subscription with unlimited access and 250GB project storage.

→ As Certificate of Contract via Industry Mall: 6ES7804-0PP01-1YA0

TIA Portal V20
Table of contents

SIMATIC WinCC Unified – Innovations

- Enhanced compile time and RT performance
- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
- User and role specific start screens
- Redundancy
- Process Orchestration (MTP)

SIMATIC WinCC – Innovations

- Engineering of Professional, Advanced and Unified on one PC
- WinCC Advanced: no new RT Advanced V20 Version
- WinCC Professional: Support of dynamic SVG, WebUX (deep link, recipe control),..

SIMATIC STEP 7 – Innovations

- Continuous Integration: new LAD export/import format
- Online features for named value data types
- Named value types used by safety blocks and in type libraries

SIMATIC Motion Control – Innovations

- New Hardware S7-1500 T/TF
- New Single Axis Operations / New Synchronous Operations
- Support of second PROFINET IRT interface
- Cross-PLC synchronous operation using PN/PN Coupler
- Kinematics

SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Simulation Cloud *new*
- TIA Project-Server Cloud

SIMATIC Hardware

- S7-1200 G2
- SIMATIC Controller S7-1500 Standard & F
- Redundant Controller S7-1500 R/H
- SIMATIC ET 200SP Open Controller 3
- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

System functions

- Upgrading TIA Portal projects
- PROFINET IRT features
- TIA Portal Documentation
- TIA Portal Openness
- TIA Portal Add-Ins
- Version Control Interface (VCI)
- CAx: AutomationML & Publication Tools
- TIA Portal User Management & Access Control (UMAC)
- TIA Portal Library Workflows
- TIA Portal Usability

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V
- Limited Sales release in USA

TIA Portal Options

- **SIMATIC STEP 7 Safety**
- **SIMATIC Safe Kinematics**
- **TIA Portal Multiuser**
- **SIMATIC Robot Library**
- **OPC UA**
- **SIMATIC S7-PLCSIM / S7-PLCSIM Advanced**
- **SIMATIC Target for Simulink**
- **TIA Portal Test Suite**
- **SIMATIC Visualization Architect (SiVArc)**
- **SIMATIC Modular Automation (MTP)**
- **Central User Management (UMC)**
- **Modular Application Creator**
- **SIMATIC ProDiag / SysDiag**
- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager**
- **TIA Portal Safety Validation Assistant**

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S7-1200 G2

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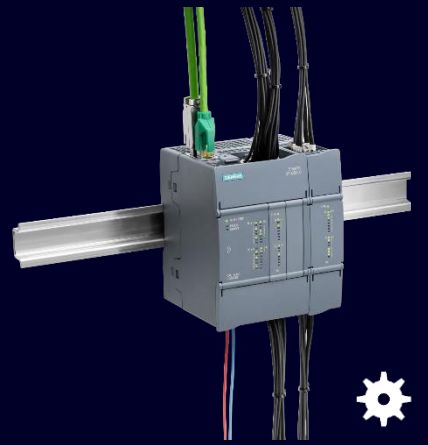
S7-1200 G2
Overview









Seamless Scalability

- Cost-optimized standard and fail-safe hardware portfolio
- HW: ~25% space reduction
- Fail-safe integrated
- Memory expansion

Flexible Machine Safety

- Integrated in the complete range
- Improved F-IO Portfolio with F-SBs and mixed I/O modules
- Integrated in STEP 7 Basic

Increased Performance

- PROFINET:
  31 devices with IRT
- 8 High-Speed-Counter
- Near Field Communication (NFC) and App

Efficient Motion Control

Kinematics, Multi Axis Control, and Single Axis Control

Scalable, powerful portfolio for the basic automation segment

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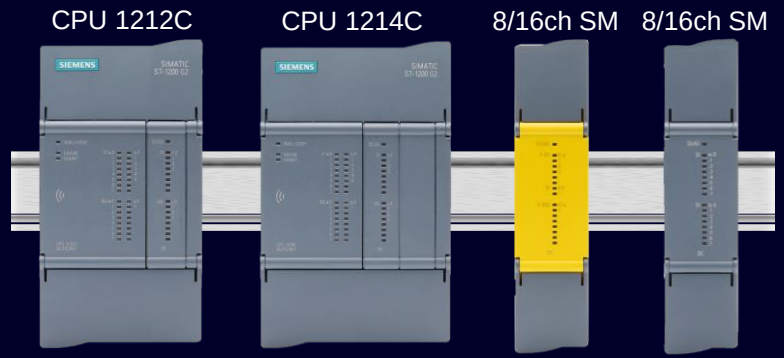
S7-1200 G2
Overview

New HW design



Increased performance and seamless scalability

- Enhanced processing power, dedicated communication performance and more memory
- Up to 31 PROFINET devices and synchronized program execution with PROFINET IRT
- Near Field Communication (NFC) for commissioning and diagnostics support
- Optimized scalable hardware portfolio and seamless scalability across all SIMATIC controllers

Flexible Machine Safety

- Fail-safe integrated in the complete range (PROFIsafe communication, I/Os)
- Improved F-I/O portfolio (fail-safe signal boards, fail-safe signal modules with mixed I/Os)
- Fail-safe & Motion Engineering integrated in TIA Portal Basic

Efficient motion control

- Kinematics
- Multi Axis control
- Single Axis control



Expansion

	EM	RAM Data	RAM Program
CPU 1212C	6 in total therein 3 CM/CP	500 k	150 k
CPU 1212FC		500 k	200 k
CPU 1214C	10 in total therein 3 CM/CP	750 k	250 k
CPU 1214FC		750 k	300 k

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Fail-safe SIMATIC S7-1200 (G2): No more separate Safety license from V20 onwards
STEP 7 Safety Basic will be discontinued from V20 onwards

Until TIA Portal V19

Hardware:
S7-1200 F-CPU/F-DI/F-DQ

Software:
- STEP 7 V19 Basic (or Advanced)
- STEP 7 V19 Safety Basic

Starting with TIA Portal V20

Hardware:
S7-1200 (G2) F-CPU/F-DI/F-DQ

Software:
STEP 7 V20 Basic (or Advanced)



SIMATIC S7-1200



SIMATIC S7-1200 G2

Scalable automation solutions

Scalable portfolio for standard and machine safety functions.

Seamless system integration

Seamlessly integrated in STEP 7 without need for separate license.

Reduce license costs

- Reduce entry costs
- Especially customers requiring just few F-PLCs

Hints

- V18/V19 Safety Basic licenses will still be available
- Future S7-1200 (G2) Hardware will use similar principles
- SUS contracts for Safety Basic will be discontinued end of 2024

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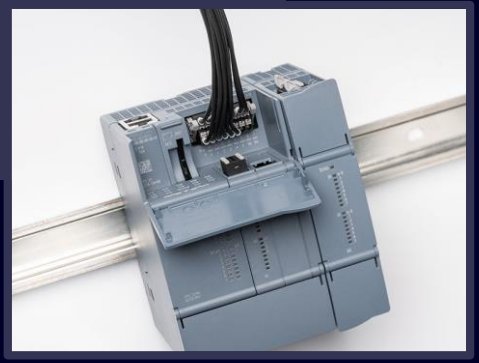
S7-1200 G2
Design and Handling





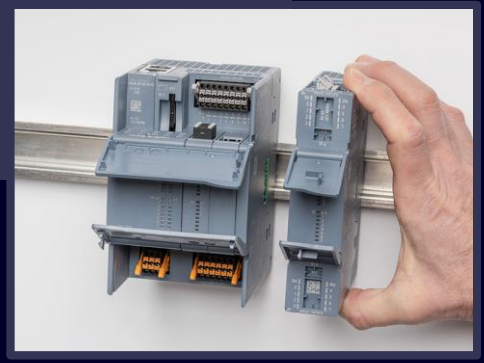
Memory Card access, 2xPN Ports and improved signal board concept (up to two SBs).





Removable high(er) density terminal blocks with push-in wiring for ease of use → non-contact pre-wiring position.





DIN rail footprint reduced by ~ 25%. Single, reliable bus connection system for both SMs and CMs.

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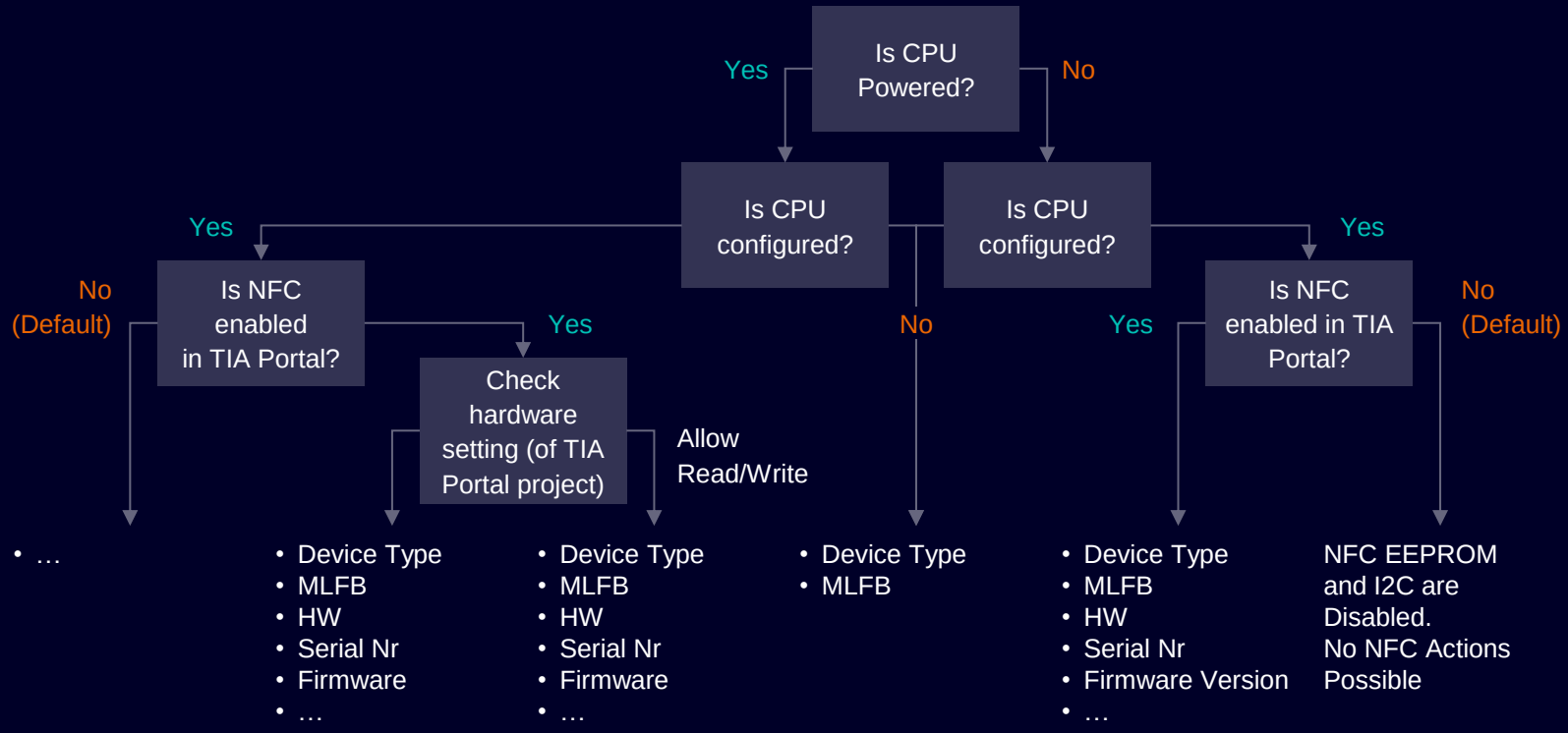
S7-1200 G2
NFC function



Near Field Communication (NFC)

- Gather Information without having to power the Device
- Read/Write Application and Diagnostic Data (based on configuration)



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SIMATIC Controller S7-1500 standard & F

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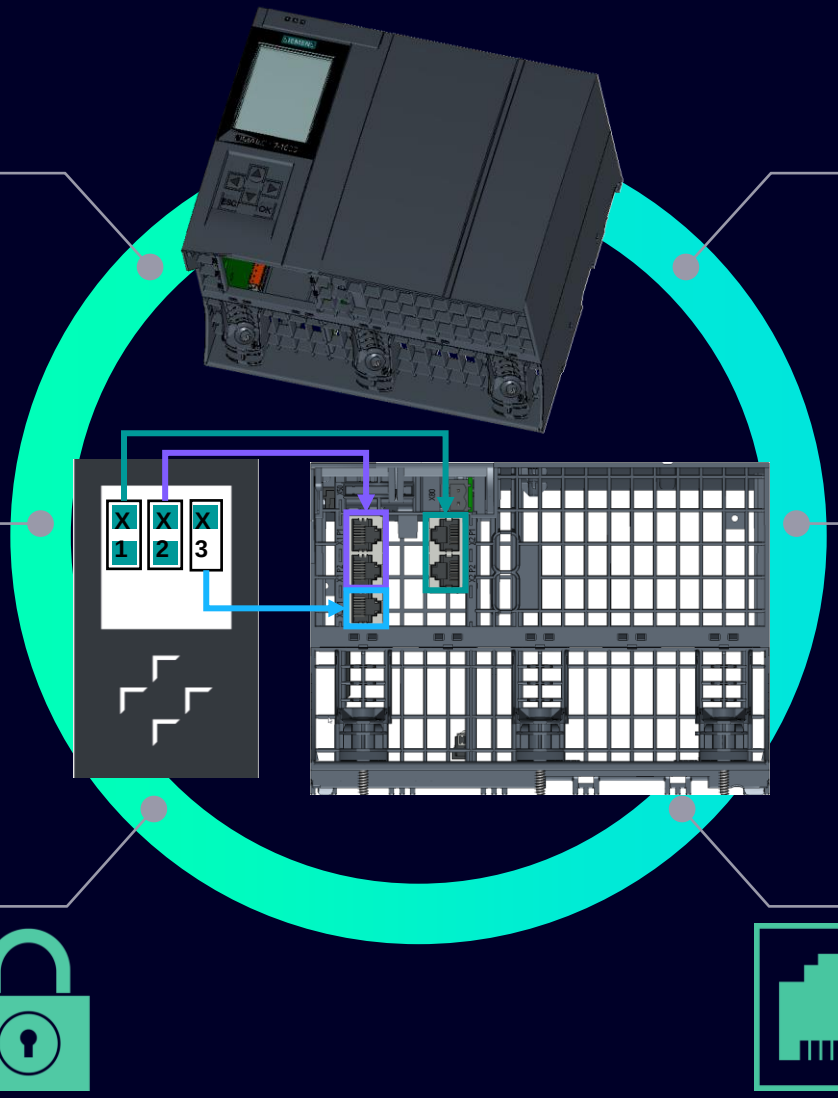
SIMATIC S7-1500 1517(F)/1518(F) CPUs
New Hardware, Performance & Memory with FW V4.0 and TIA Portal V20



Program Memory (Mbyte)
- 100% more program memory

Data Memory (Mbyte)
- 150% more data memory for 1518 CPU
- 500% more data memory for 1517 CPU

Security Integrated
- Secure boot
- User management and access control
- Recording Security events (Syslog)
- Protection functions
- Secure communication
- Certificate management

Program Performance
- More than 200% performance increase

Communication Performance
- Up to 200% higher communication performance

Interfaces
- Two PROFINET IRT Interfaces (X1 & X2), each with two RJ45 Ports *
- 512 RT or 64 IRT IO-Devices or 256 IRT IO-Devices with DFP via each interface *
- G-Bit Interface (X3) for both CPUs

*except H and HF CPUs

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SIMATIC Hardware
New Hardware for S7-1500 1517(F)/1518(F) CPUs

New mechanical design

- The display is now integrated into the CPU like in the new 1515/1516 CPUs
- Installation dimensions remain identical
- RUN/STOP switch is replaced with RUN/STOP buttons
  - No more "cancelling" of the RUN/STOP switch
  - "STOP ACTIVE" indicates that the CPU was switched to STOP via the STOP button
  - Memory reset/Reset operation: Identical as before
- Display can now be read – even when the cover is open
- Mechanical manipulation protection is retained
- New Display implementation
    - No separate Display FW needed



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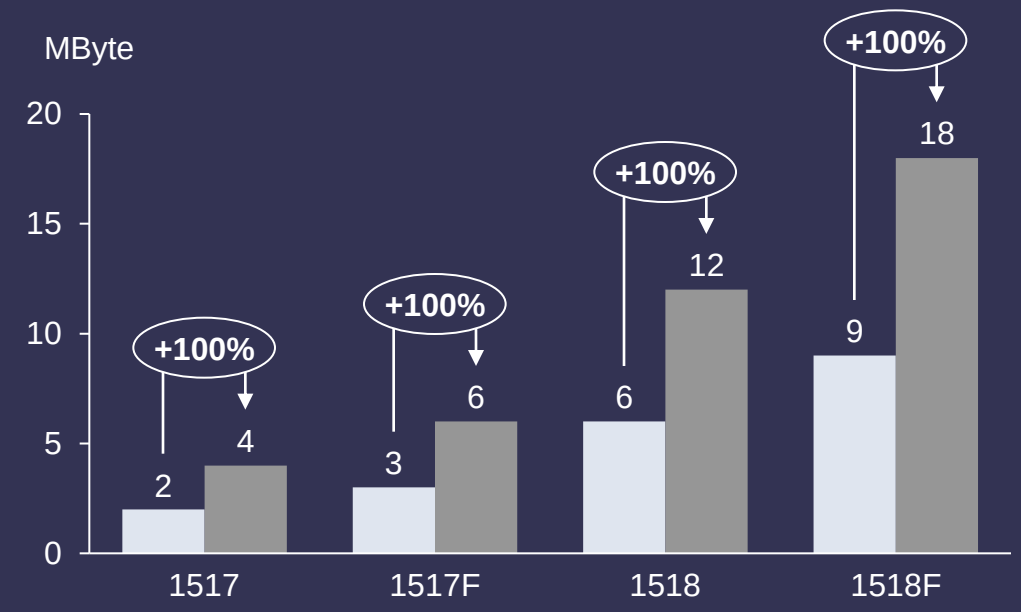
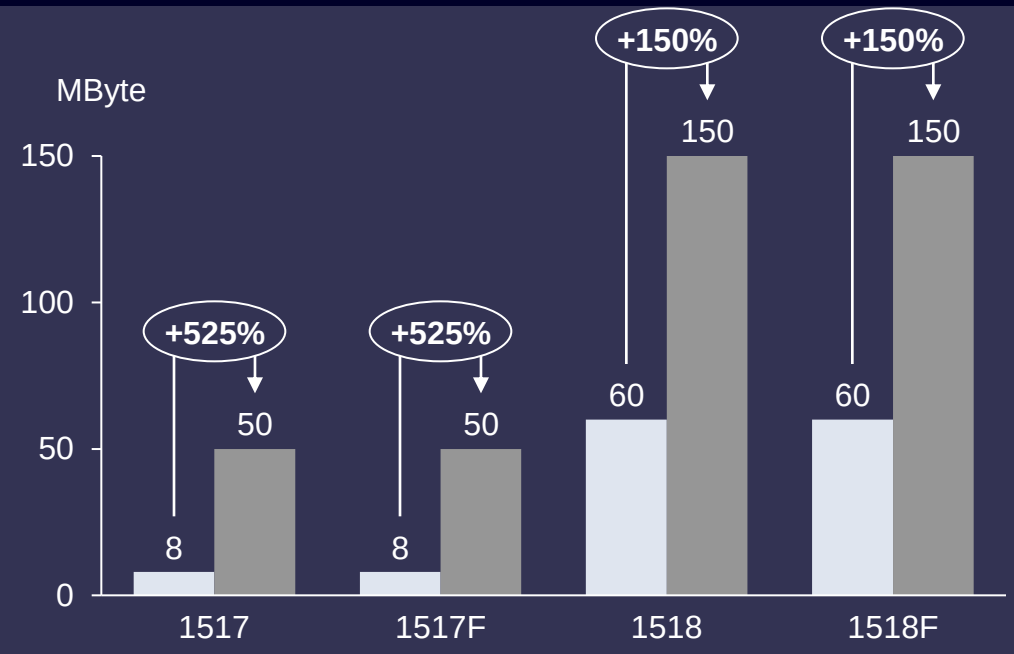
SIMATIC Hardware
New Hardware for S7-1500 1517(F)/1518(F) CPUs

+100% more program- and data memory



Program memory

- **more resources for future customer application extensions**



Data memory

FW V3.1 (current article no.) FW V4.0 (new article no.)

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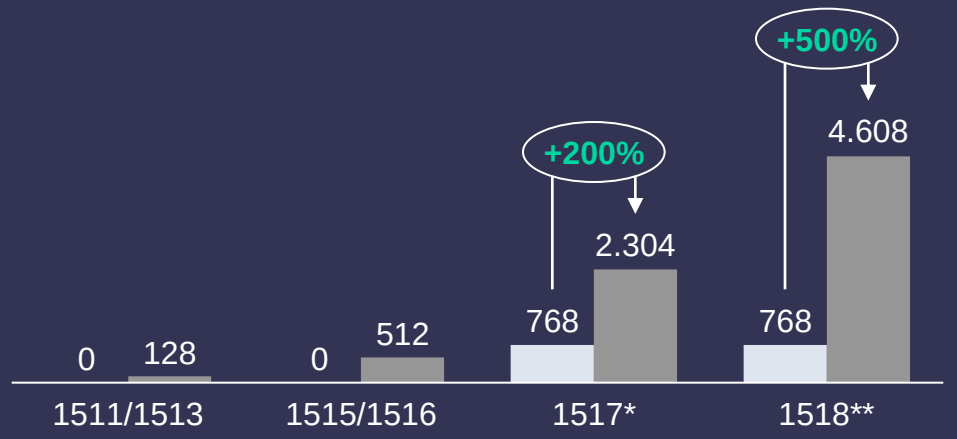
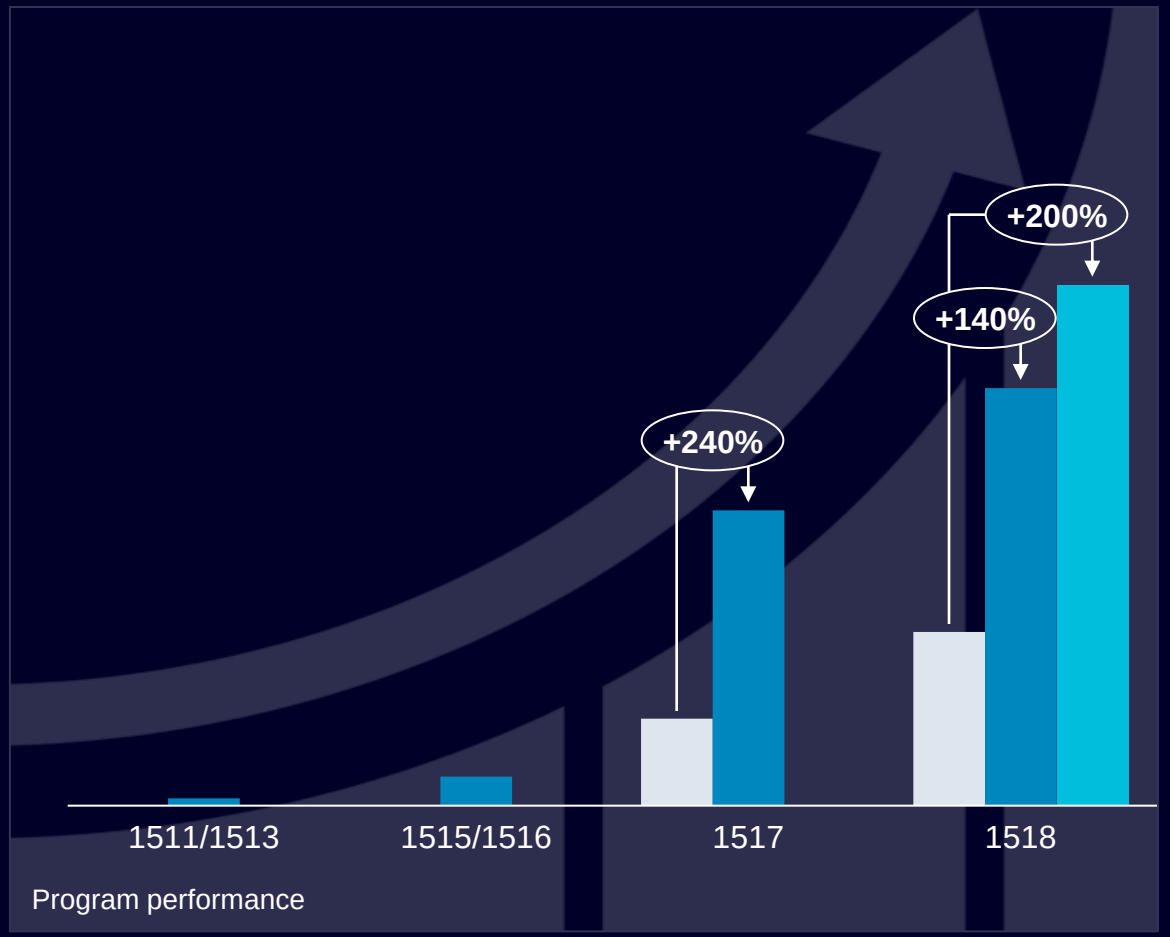
SIMATIC Hardware
New Hardware for S7-1500 1517(F)/1518(F) CPUs

- **Program performance increase up to +200%**
  - Easier controller selection
  - More customer use cases can be realized

- **Retain Memory increase**



Retain memory in kByte



Program performance

FW V3.1 (current article no.) Boost Mode (<=50°C)
FW V4.0 (new article no.) ***

* 50 MB with PS 60W 24/48/60V DC HF
** 100 MB with PS 60W 24/48/60V DC HF
*** measured values

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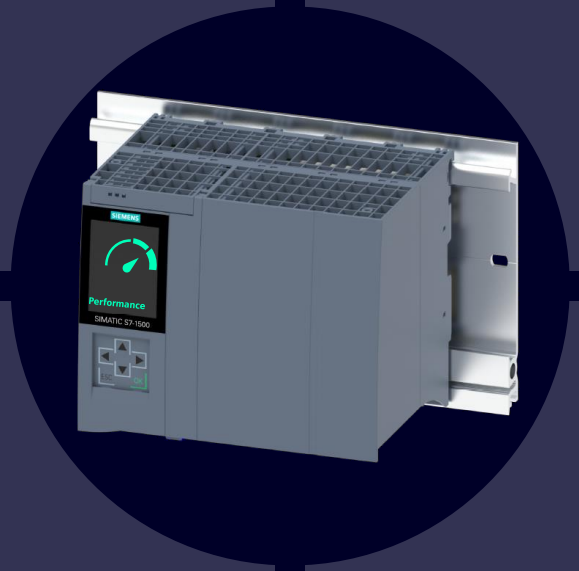
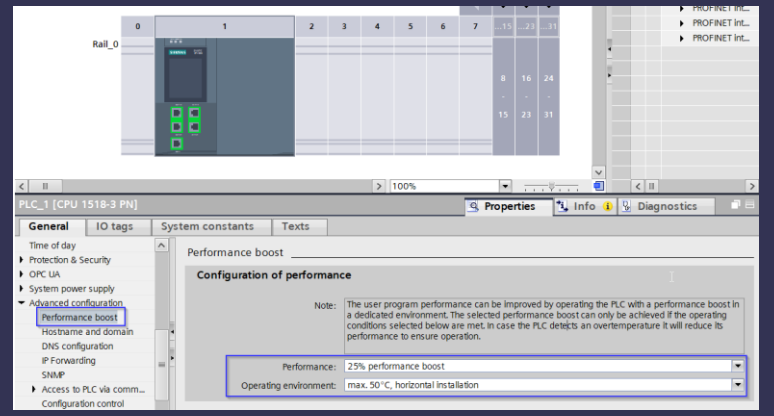
SIMATIC Hardware
Additional performance boost for 1518(F, T, TF)-3 PN CPU

Performance boost

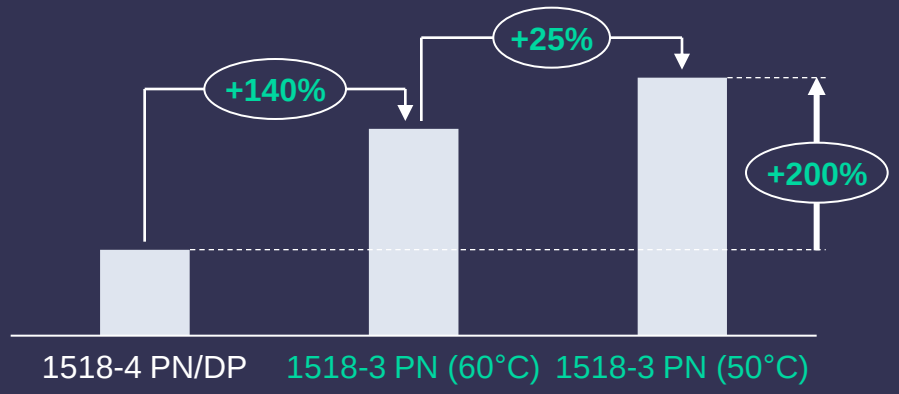
- 25% additional performance increase
- At ≤ 50°C ambient temperature
- Configurable in TIA Portal
- Horizontal mounting only



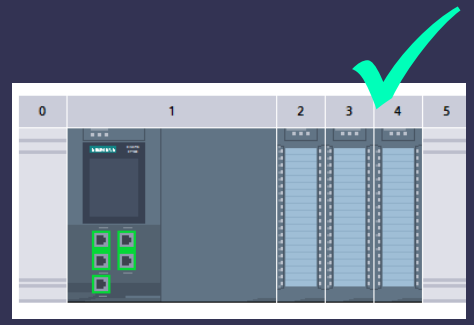
Configuration in HW Config

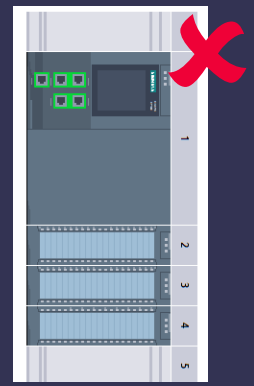


User Program performance



Mounting





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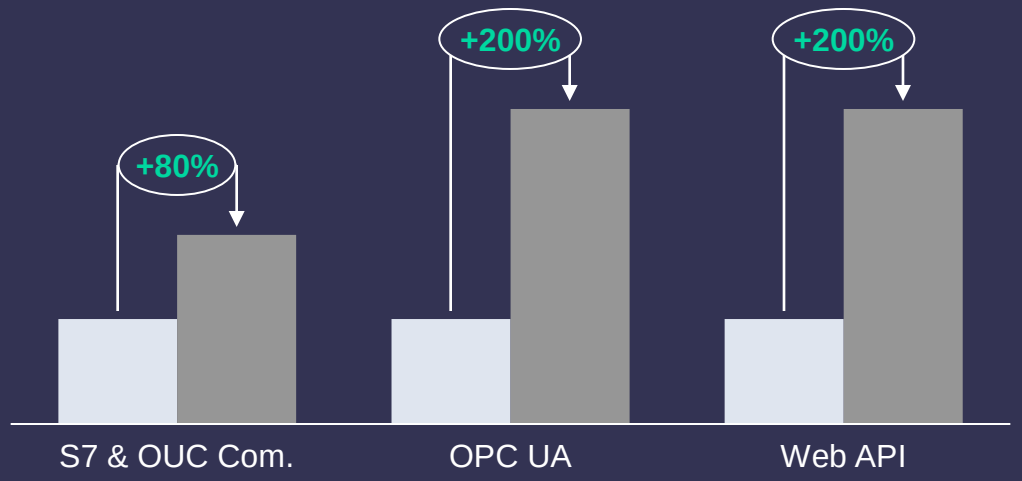
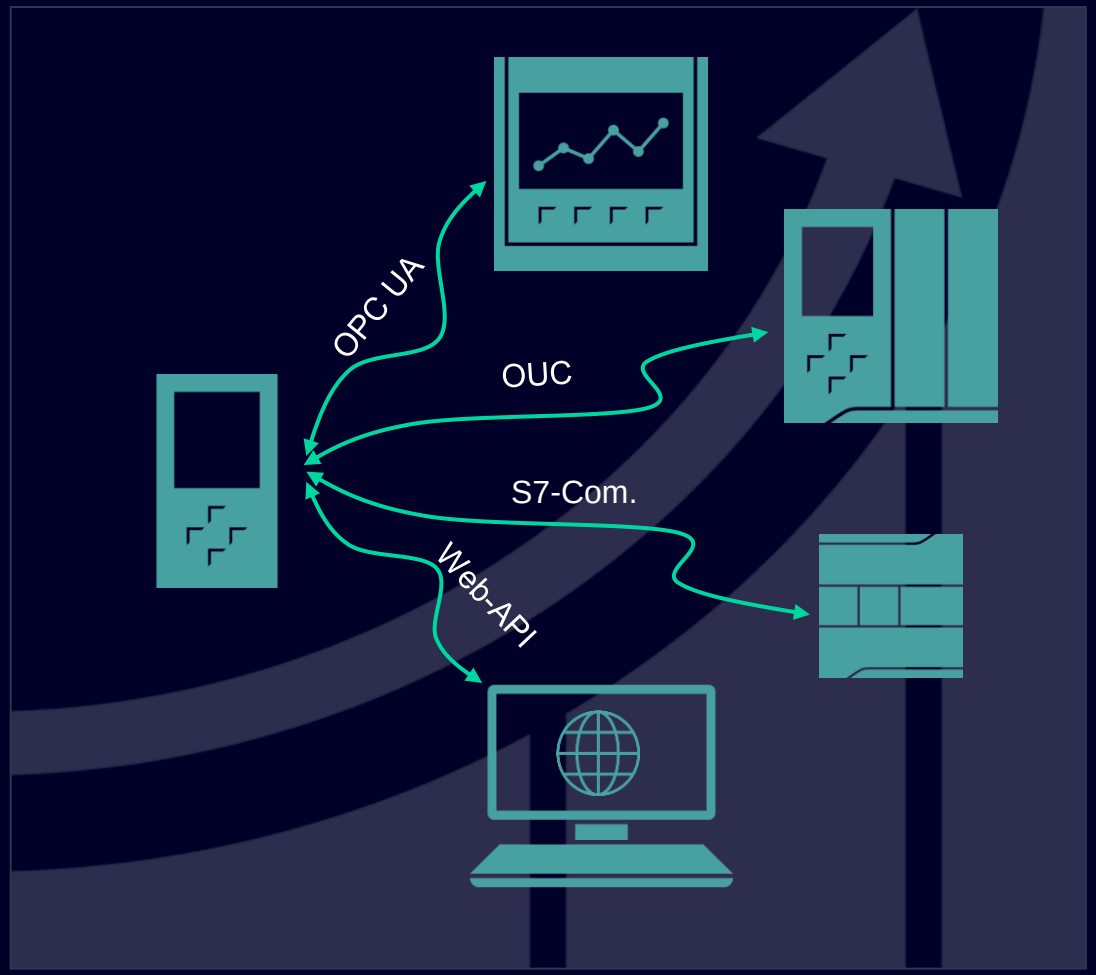
SIMATIC Hardware
Communication performance of the new 1517(F)/1518(F) CPUs

S7 & (secure) OUC communication performance
- **up to +80% performance increase**

OPC UA
- **Up to +200% performance increase**

Web-API (Read/Write)
- **Up to +200% performance increase**





FW V3.0 (current article no.) FW V4.0 (new article no.)

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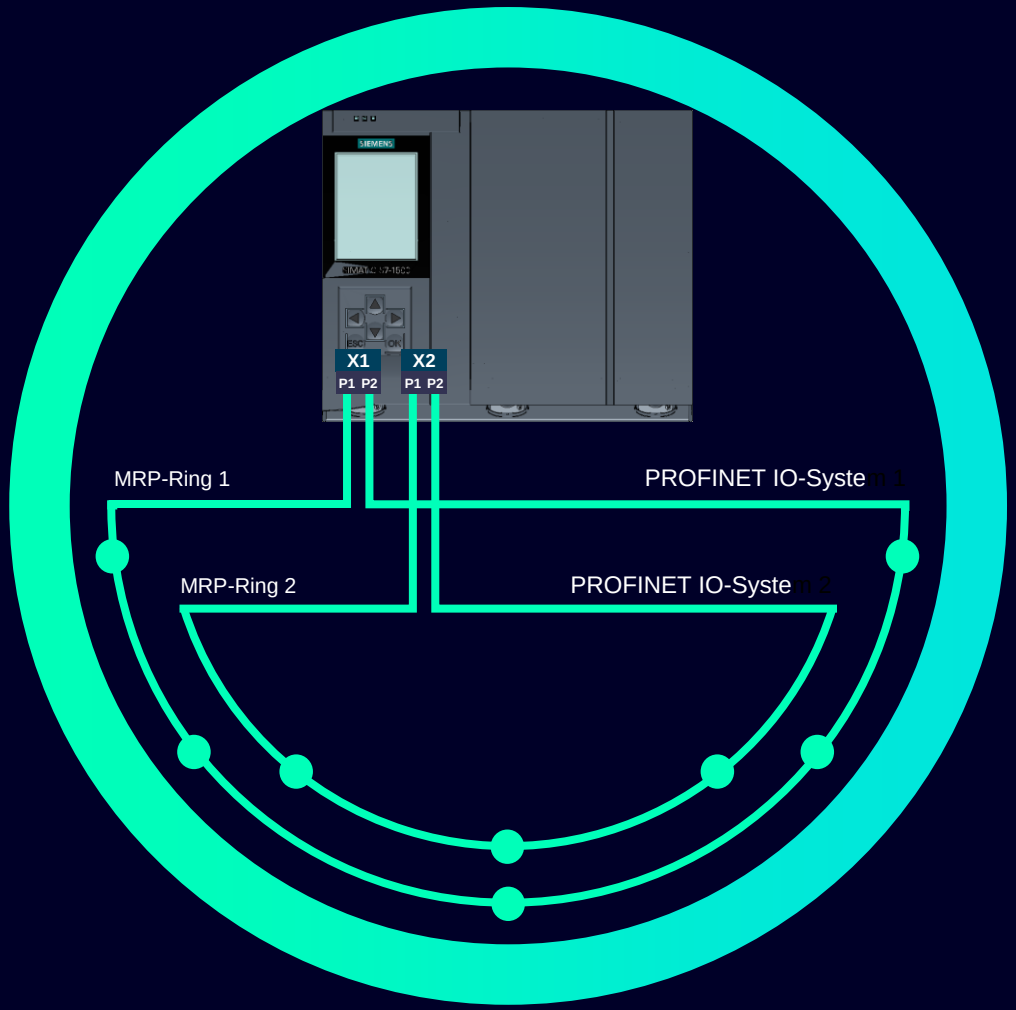
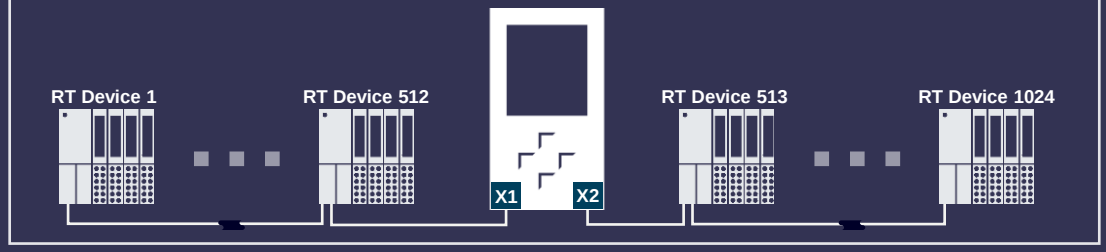
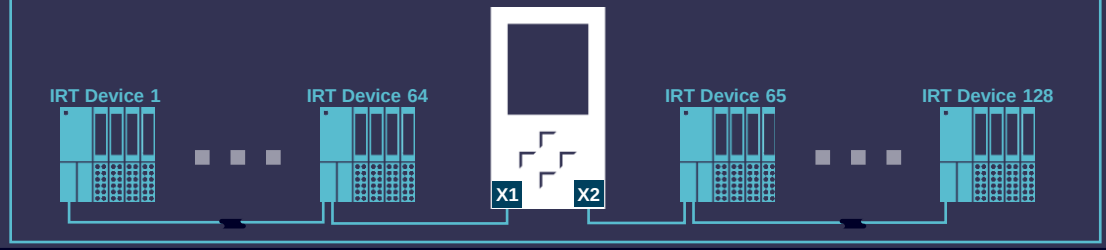
SIMATIC Hardware
Usable IO-Devices with the new 1517(F)/1518(F)



Max. count of RT IO-Devices: 1024 (512 on X1 + 512 on X2)



Max. count of IRT IO-Devices: 128 (64 on X1 + 64 on X2)



Max. count of IRT IO-Devices with DFP: 512 (256 on X1 + 256 on X2)



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SIMATIC Hardware
Increase of quantity structure

Max. number of blocks (DB+OB+FC+FB) • CPU 1517 from 12.000 → 20.000 • CPU 1518 from 20.000 → 40.000	• Better modularization of customer projects • Efficient use of increased program memory
Max alarming instances loadable in RUN • CPU 1517/1518 from 10.000 to 20.000	• Higher number of alarms can be configured and loaded in RUN of the CPU
Size of the Textlist Container (Mbyte) • CPU 1517/1518 from 7,5 (10*) to 50	• Higher amount of alarm messages in three languages can be loaded in the CPU
Number of available Motion Control resources for technology objects • CPU 1517 from 10.240 → 20.480 • CPU 1518 from 10.240 → 30.720	• More axes can be controlled by the CPU with high performance • More complex motion applications can be realized

* With FW V3.1

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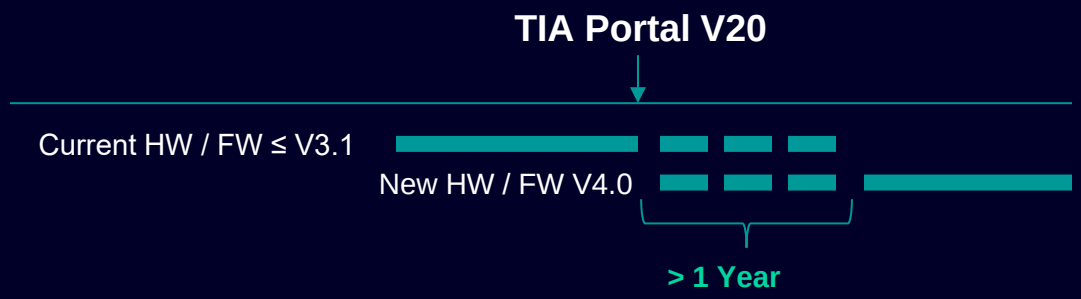
SIMATIC Hardware
Compatibility of CPU 1517(F)/1518(F) with new HW

- FW V4.0 only for new article numbers
- No PROFIBUS Interface on board, additional PROFINET Interfaces (Second RJ45 port for X2 and G-Bit X3) → No spare part compatibility
  - To connect PROFIBUS devices a CM 1542-5 or CP 1542-5 can be used
- Fully functional compatible (except PROFIBUS DP). Step7 project can be used in the new CPU after “change device” in HW config.

- Parallel delivery of the old and new HW for more as 1 Year:





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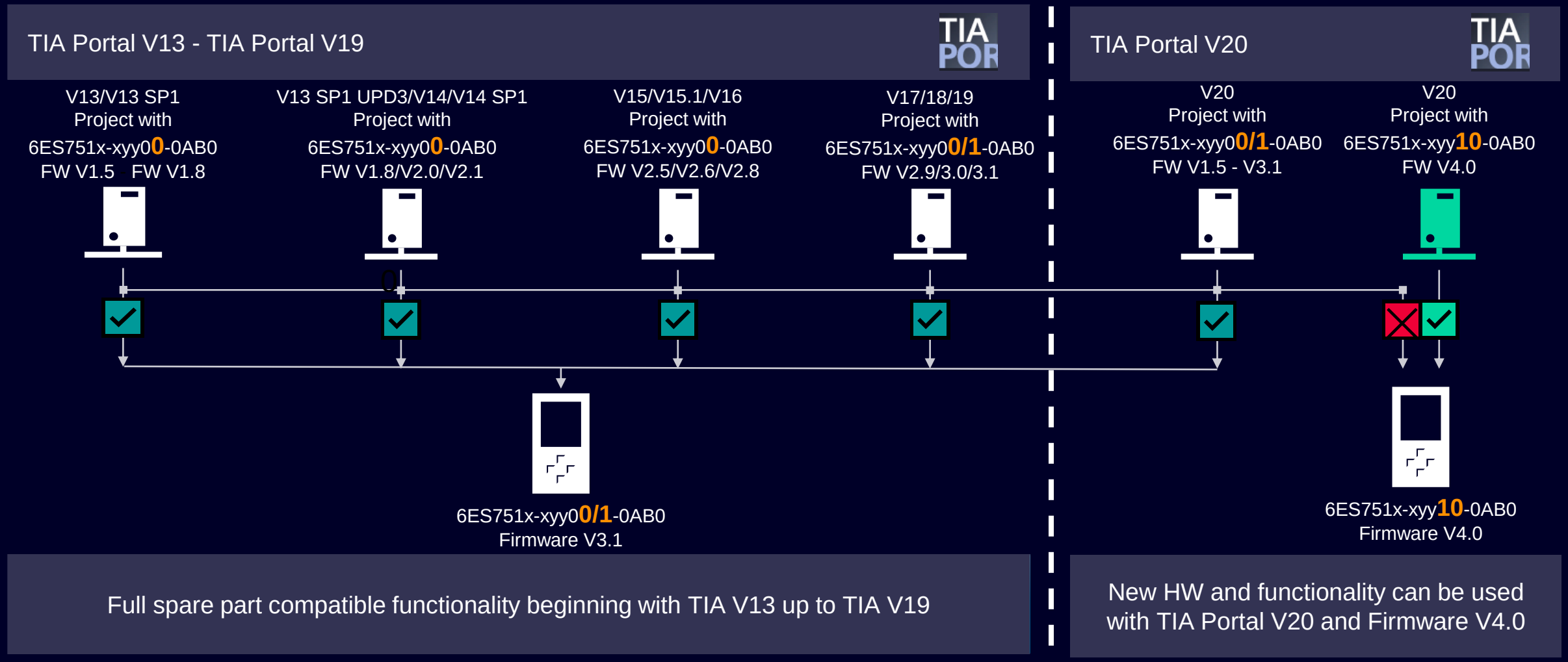
SIMATIC Hardware
Spare parts compatibility S7-1500 (>= 1517(F)) – FW 4.0 with older TIA Portal versions



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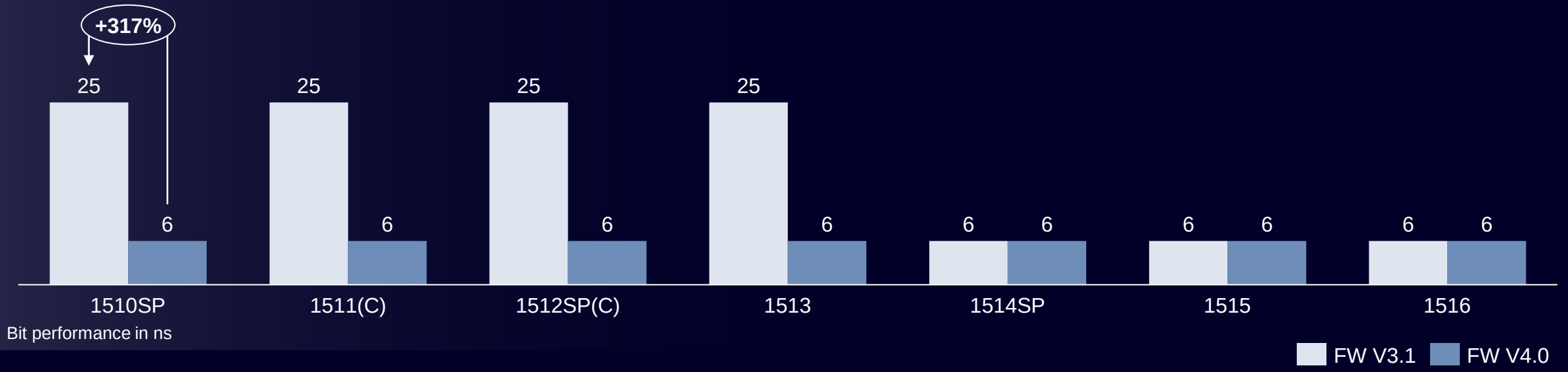
SIMATIC Hardware
S7-1500 1510SP(F) – 1513(F) CPUs – Performance increase with FW V4.0

- TIA V18 and new HW for S7-1500 CPUs ≤ 1516: Increase of the performance with simultaneous reduction of performance levels from 6 to 2
- TIA V20 and new FW V4.0 : performance increase for S7-1500 CPUs ≤ 1513
  - No new Article number (MLFB)!
  - Performance increase after FW update to V4.0

- One Performance – Level for all S7-1500 CPUs ≤ 1516
- Positioning via memory, interfaces, quantity structure …



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Redundant Controller S7-1500R/H

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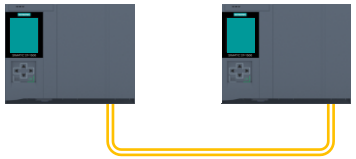
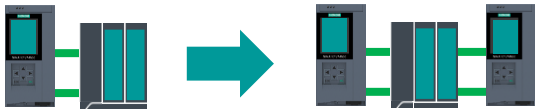
Redundant Controller S7-1500R/H
What's new with Firmware Version 4.0

Hardware Update for H-CPUs



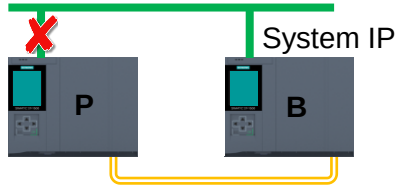
Increased Performance / More Memory / Additional Interface for CPU 1517H / Integrated Display

Scalable availability



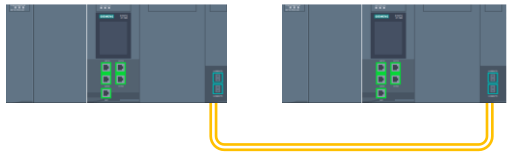
Single Mode for R-CPUs for easy upgrade from a Single- to a Redundant System

Avoid communication loss



Move System-IP address to Backup PLC in case of network interrupt to Primary Controller

Extended retentive data



Support of HF System Power Supply allows extension of retentive memory of R/H CPUs

Additional standard features



Missing features of standard CPUs can now also be used on R/H controller:

- Profiling
- Additional System Functions
- Extension of Web-API



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SIMATIC ET 200SP Open Controller 3

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The new SIMATIC ET 200SP Open Controller 3 (OC3) - the new features at a glance!

Higher Performance
for Windows/Industrial OS and Software Controller (F/T/TF)

USB 3.2 Interfaces
for faster transfer rates

Additional IE/PN-RT interface
can be assigned to OS or Software Controller (F/T/TF)



Bundles with WinCC Unified
together with Software Controller (F)

Wider temperature range
enables new areas of application: -30°C..60°C

SIMATIC Industrial Edge
together with Software Controller (F)

ET 200SP Open Controller 3 – Open for your applications!

Configurable with TIA Portal V20. Release planned for Q2/2025.

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SIMATIC ET 200SP Open Controller 3 (OC3)
Variants

With TIA V20
Planned Q2-2025

Open Controller 3 variants





Software Controller
CPU 1505SP
(V40.0)



General Purpose
Operating Systems



WinCC Unified

Bundle Version – Windows LTSC 2021
CPU 1515SP PC3
CPU 1515SP PC3 F
CPU 1515SP PC3 T
CPU 1515SP PC3 TF

Bundle Version – Windows LTSC 2021
CPU 1515SP PC3 + WinCC Unified PC RT
CPU 1515SP PC3 F + WinCC Unified PC RT

Bundle Version – Industrial OS V4.x
CPU 1515SP PC3 - IndOS
CPU 1515SP PC3 F - IndOS

Bundle Version - Industrial Edge
CPU 1515SP PC3 - IndEdge
CPU 1515SP PC3 F - IndEdge

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SIMATIC ET 200SP Open Controller 3 (OC3)
Comparison with OC2





new

	CPU 1515SP PC2 (OC2)	CPU 1515SP PC3 (OC3)
Processor	Intel Atom® E3940, 1,6 GHz, 4 Cores	Intel Atom® x6416RE, 1,7 GHz, 4 Cores
Mass storage	128 GB CFast Card (changeable)	128 GB SSD (changeable)
Working Memory	8 Gigabyte RAM	8 Gigabyte RAM
Graphic interface	1x DisplayPort DPP	1x DisplayPort DPP
USB interfaces	2x USB 3.0; 2x USB 2.0	3x USB 3.2 (type A)
PN-Interfaces for Software-Controller (RT/IRT)	1x SIMATIC BusAdapter; 2 Ports (RJ45, SCRJ, LC)	1x SIMATIC BusAdapter; 2 Ports (RJ45, SCRJ, LC, LD-LC*)
IE-Interfaces for OS	1x 1000 Mbps Ethernet interface	1x 2500 Mbps Ethernet interface
Interfaces configurable for OS or Software-Controller	-	1 x Ethernet-Interface RJ45 (Gbit for OS, PN-RT support for Software-Controller)
Central SP Bus for usage of ET 200SP I/O modules directly with Software-Controller	✓	✓
Pre-installed operating system	Windows 10 Enterprise IoT 2021 LTSC Industrial OS V3.x	Windows 10 Enterprise IoT 2021 LTSC Industrial OS V4.x Industrial Edge
Available S7-1500 Software-Controller (pre-installed)	Windows: Standard/F/T/TF; Industrial OS: Standard/F	Windows: Standard/F/T/TF; Industrial OS: Standard/F Industrial Edge: Standard/F
Ambient temperature during operation	-20°C … 55°C / 60°C with restrictions	-30 .. 60°C
Dimensions (w/h/d)	160/117/75	160/117/75

*LD-LC: Support via later firmware update

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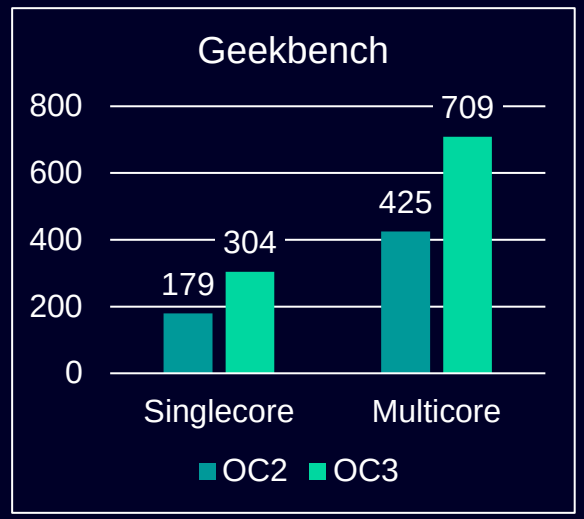
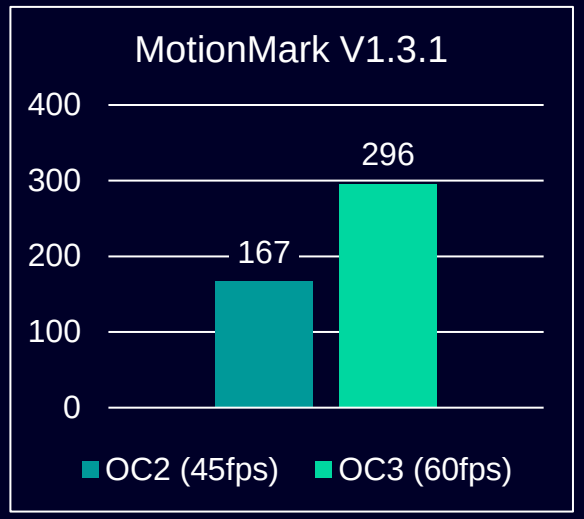
SIMATIC ET 200SP Open Controller 3 (OC3)
performance and quantity structures



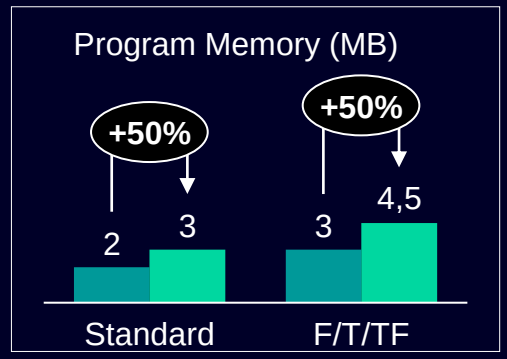
Benchmarks (executed under Microsoft Windows 10 IoT Enterprise LTSC 2021)

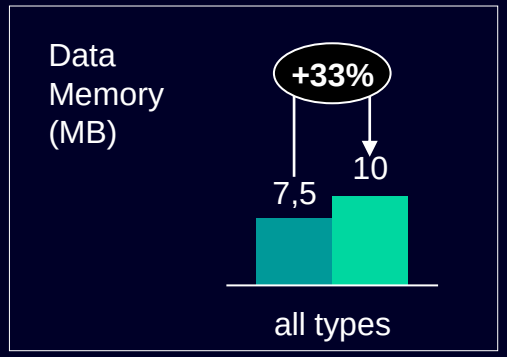




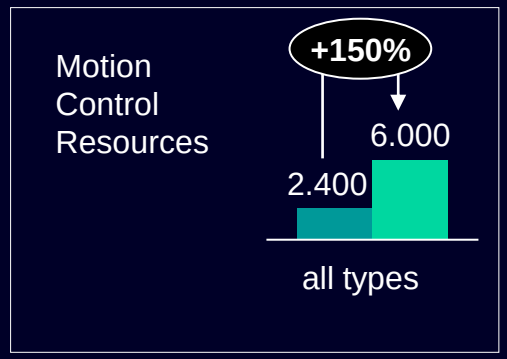
Test	Focus
Geekbench	generic Benchmark
MotionMark V1.3.1	measures a browser's capability to animate complex scenes at a target frame rate → WinCC Unified relevant
Note: At the time of creation (10/2024), no measured values were available for the Software Controller on OC3	

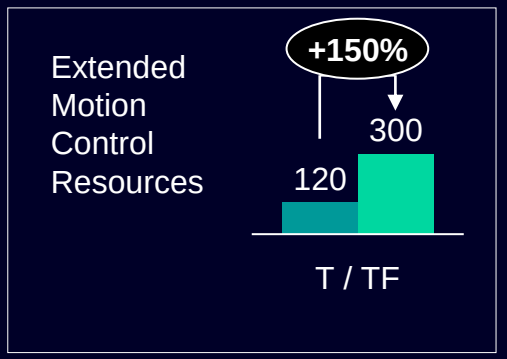
Quantity structures of the Software Controller (F/T/TF)





OC2 OC3





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SIMATIC S7-1500V

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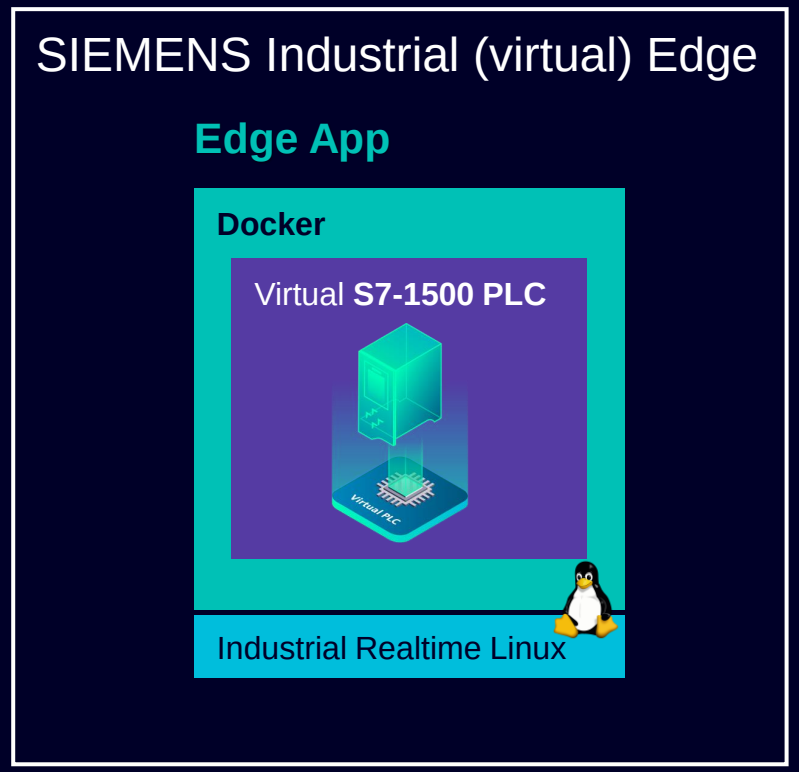
SIMATIC S7-1500V
Virtual controller



Highlights TIA V20

- Release of Version 2.0
- Failsafe Support for vPLC
- AX - “IT Like” Engineering
- Improved communication
- Licensing

The basic idea … we bring **SIMATIC** on the Industrial Edge!

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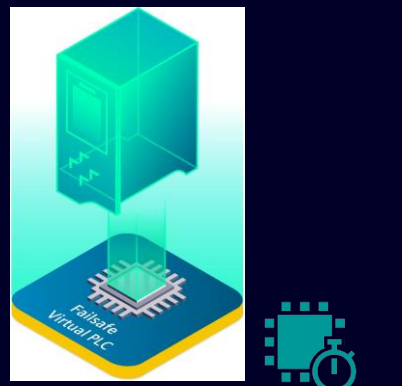
SIMATIC S7-1500V F
Safety Virtual controller

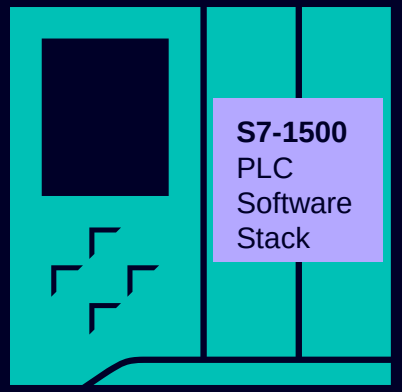
S7-1500V F

- **Virtual Failsafe SIMATIC S7-1500 PLC**
- Hardware independence
- TIA Portal compatible
- App Management over IT/Edge

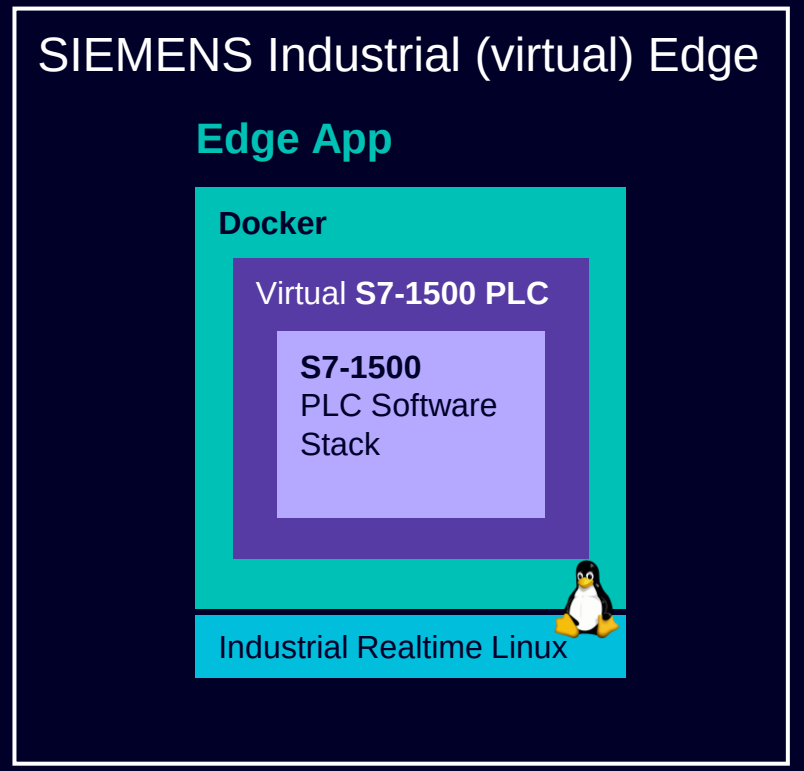


Time Service App

S7-1500 PLC



Virtual SIMATIC PLC



The basic idea … we bring **SIMATIC** on the Industrial Edge!

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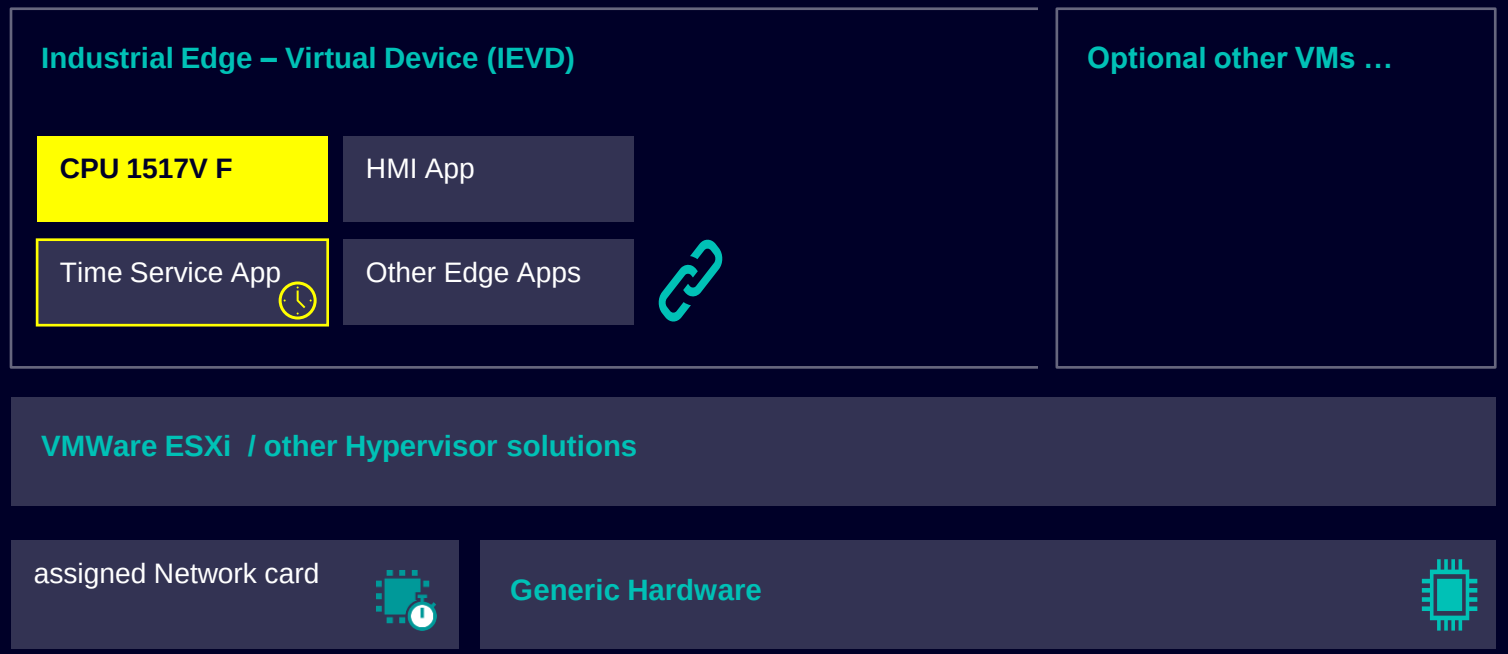
SIMATIC S7-1500V
Big picture virtual Edge Device Failsafe



Failsafe requires Time redundancy

- 2nd independent Timer, distributed via Time Service App
- Utilizing PTP from Network Infrastructure
- Time Service-App is using at least one NIC / PN-Interface (For Maintenance more than one PN-Interface configurable)
- Time Service-App is providing the 2nd Timer to various F-vPLC

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S7-Web Server

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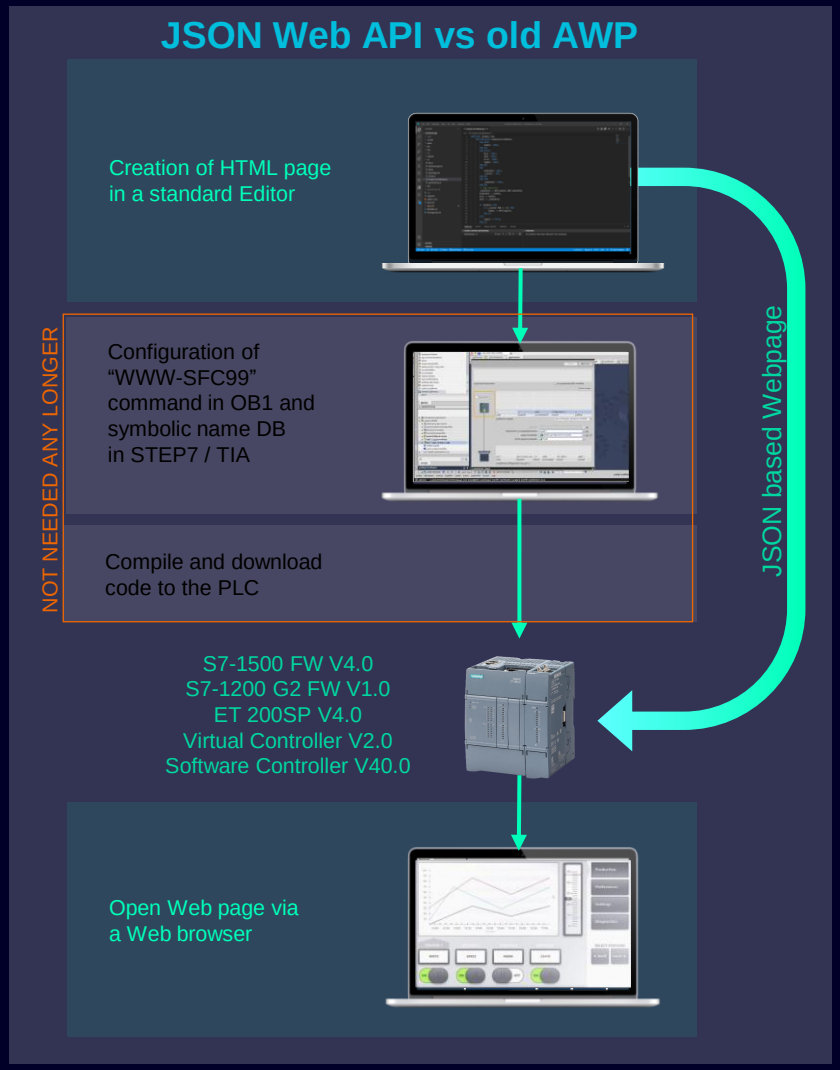
S7-Web Server – Development of Custom Web Pages
New state of the art technology (JSON Web API) replace AWP

NEW



IMPROVEMENTS

- ✓ **Fast & easy creation of Web Pages using JSON Web API**
- ✓ **Reduction of development complexity**
  - No longer use of "WWW" (SFC99) and System DBs for storage
  - No need to compile and download code to the PLC (STOP-RUN)
  - Complete independence from web development and PLC Logic
- ✓ **Web pages editing and testing without process interruption**
- ✓ **Access to more data types and parameters of the PLC than only process variables**
- ✓ **Higher S7-CPU performance due to lower memory consumption and communication load**
- ✓ **Faster Web browser response time due to improved caching**
- ✓ **Embed PLC Web Pages in an HTML Frames with new Trusted Client (e.g. in WinCC Unified Screens)**
- ✓ **Secure encrypted communication via "https://"**

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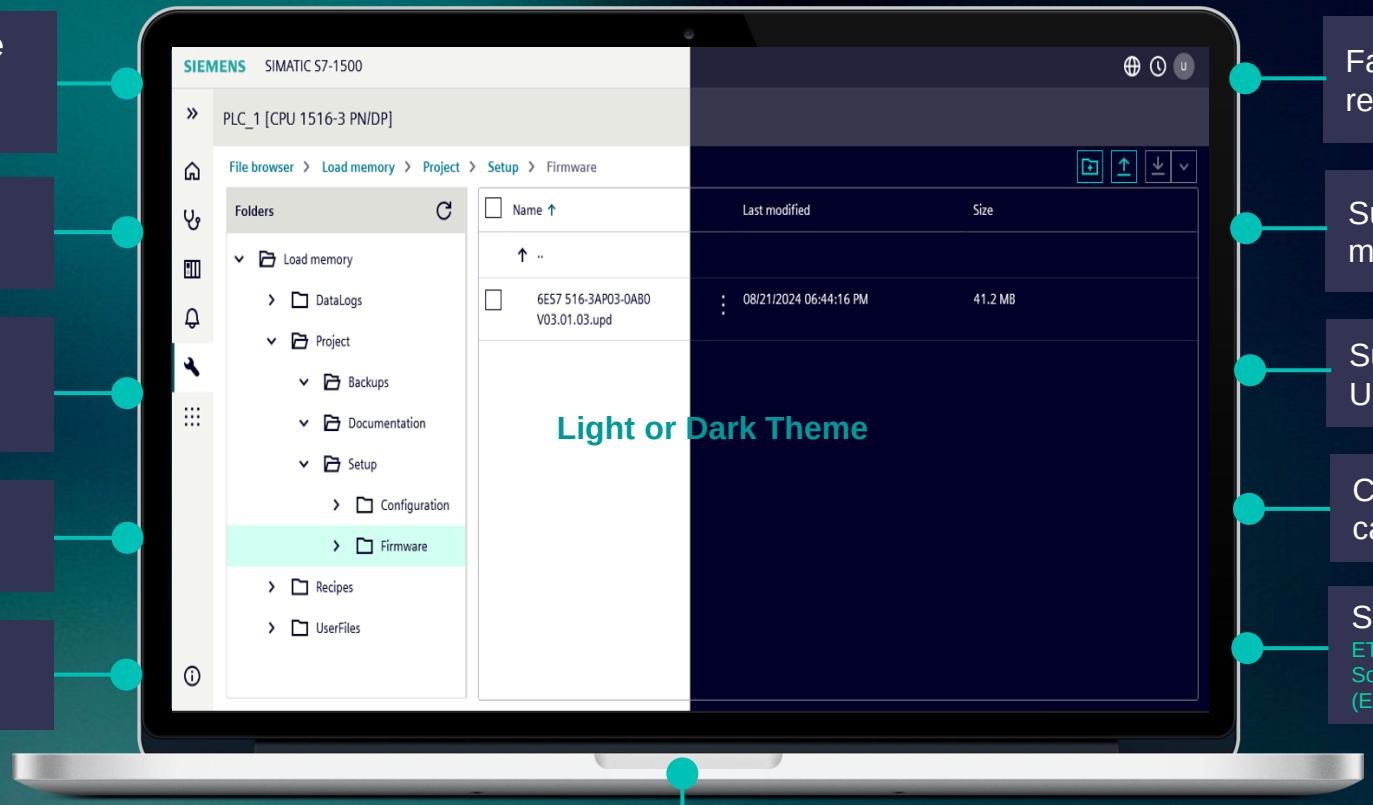
S7-Web Server – New Standard System Web Pages
Modern System Web Pages based on HTML5 / JSON Web API

NEW

- HTML5 File Browser and tree view for an easy navigation through folders
- User friendly alarms control and diagnostic buffer viewer
- Context sensitive options for download, rename, move, or delete files
- Status Information on every page (e.g. alarms)
- Easy access to Data Logs, User Files and Recipes



- Faster Web page loading and reduction in communication load
- Support of trusted client methods for Unified Panels
- Support of Local and Central User Management (UMC)
- Client-side password change capability
- Support for S7 Product Family:
  ET 200SP V4.0, Virtual Controller V2.0
  Software Controller V40.0, S7-1500 FW V4.0
  (Except R/H)

Interoperability with custom Web pages for consistent session handling, time, language, and theme definition

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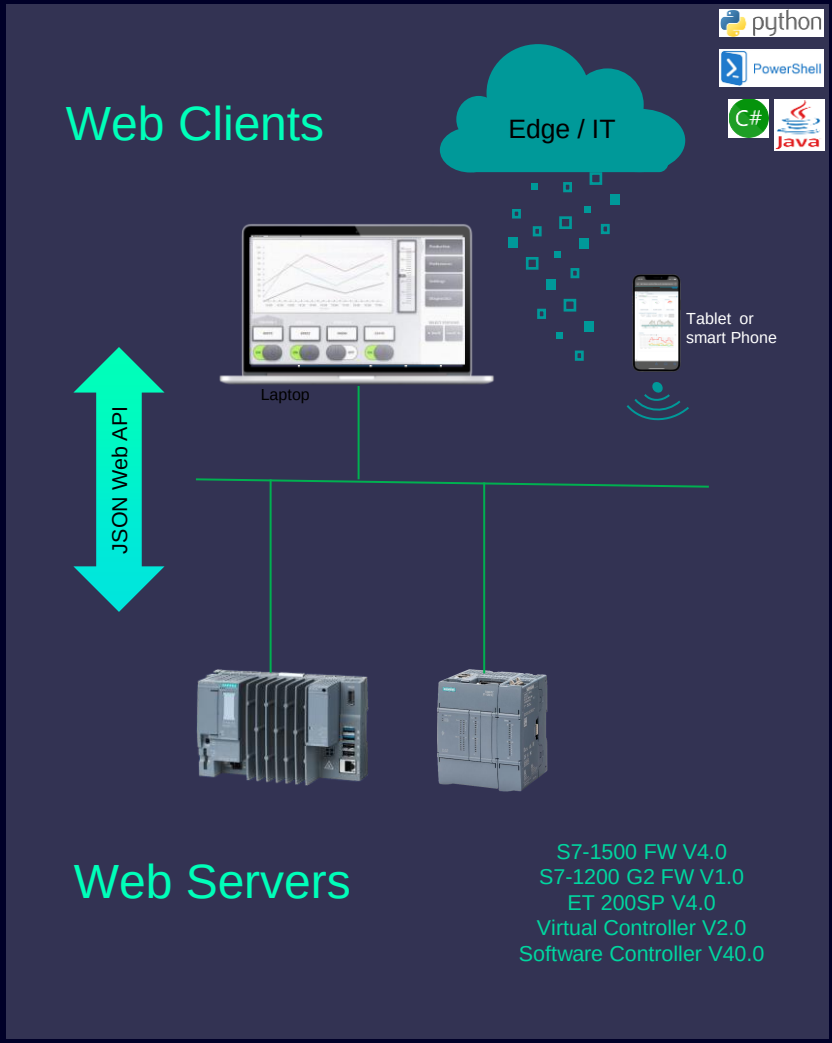
S7-Web Server – Development of IT Applications using JSON Web API
Access to a wide range of OT information

NEW



OT / IT Link access via JSON-RPC Web API

Standard lightweight data-interchange format, easy to read and write, supported by many standard programming languages (Phyton, C++, JavaScript, HTML)

Access to a wide range of OT information

Access to the complete JSON Web API library on the S7-CPU

- User program (reading & writing of process data, profiling, data logs)
- Diagnostic information (alarms, diagnostic buffer, syslog)
- Monitoring of safety status, parameter and runtime groups
- Maintenance (File Management)

Web API

Commissioning Support via Scripts

Support of commissioning activities without need of using TIA

- Monitoring and change of operating mode
- Backup and restore

Secure OT / IT Communication

Support of security mechanisms like encrypted communication

- Trusted client configuration
- Password change

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Safety Integrated

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SIMATIC F-IOs

ET 200SP

- F-DI 8x24VDC HF
- New Firmware V3.0 – only with new FS
- Compatible successor
- New Feature 1x24V Counter SIL3
  - Standstill monitoring
  - Overspeed detection
  - Counting up and down
  - 500Hz counting frequence
  - 32bit signed value - +/- 2 000 000 000
  - High counting limit, low counting limit and start value are parameterizable
- Planned release: Q1/2025 with HSP for V20



- F-DQ 4x24VDC/2A PM HF
- New article number: 6ES7136-6DB01-0CA0
- Compatible successor
- Reduction of power consumption up to 50%
- Less self operation temperature
- New function LVV acc. EN 54
- Planned release: Q1/2025 with HSP for V20



ET 200MP

- F-AI 8x 0(4)..20mA HF
- New Firmware V2.0 – only with new FS
- New Feature:
  - HART communication support acc. Rev 5 up to 7 for HART field devices
  - Support MSI
- Planned release: Q3/2024 with HSP for V19



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ET 200ecoPN M12-L Fail-safe
F-DI 4x/F-DQ 2x/DIQ 4x/IO-Link Class B



4x F-DI channels, 2x F-DQ channels, 4x DIQ channel, 1x IO-Link Class B port

- Separate sensor supply for each F-DI channel, allows parallel use of electronic and electro mechanical sensors. Support of safety mats.
- Each F-DQ channels (2A) with additional Us: 1L+ and 1M as power power supply for ,e.g. ET 200AL. F-DQ channels operates as 2L+/2M for safety shutdown (SIL2) of ET 200AL outputs.
- 4x DIQ standard channels, that can be assigned individually as DI or DQ (0.5-2A)
- 1x IO-Link Class B port, incl. safety shutdown of 2L+/2M (2A) (SIL2) on pin 2 and 5 for , e.g., valve islands. Note: Pin 2 and 5, can be used as third F-DQ in SIL3/PLe quality as well.
- Embedded E-Stop and Enabling functions, assignable in HW configuration of TIA Portal.
- Market Entry Q1 2025 / TIA V20 HSP

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Fail-safe SIMATIC S7-1200 (G2): No more separate Safety license from V20 onwards
STEP 7 Safety Basic will be discontinued from V20 onwards

Until TIA Portal V19

Hardware:
S7-1200 F-CPU/F-DI/F-DQ

Software:
- STEP 7 V19 Basic (or Advanced)
- STEP 7 V19 Safety Basic

Starting with TIA Portal V20

Hardware:
S7-1200 (G2) F-CPU/F-DI/F-DQ

Software:
STEP 7 V20 Basic (or Advanced)



SIMATIC S7-1200



SIMATIC S7-1200 G2

Scalable automation solutions

Scalable portfolio for standard and machine safety functions.

Seamless system integration

Seamlessly integrated in STEP 7 without need for separate license.

Reduce license costs

- Reduce entry costs
- Especially customers requiring just few F-PLCs

Hints

- V18/V19 Safety Basic licenses will still be available
- Future S7-1200 (G2) Hardware will use similar principles
- SUS contracts for Safety Basic will be discontinued end of 2024

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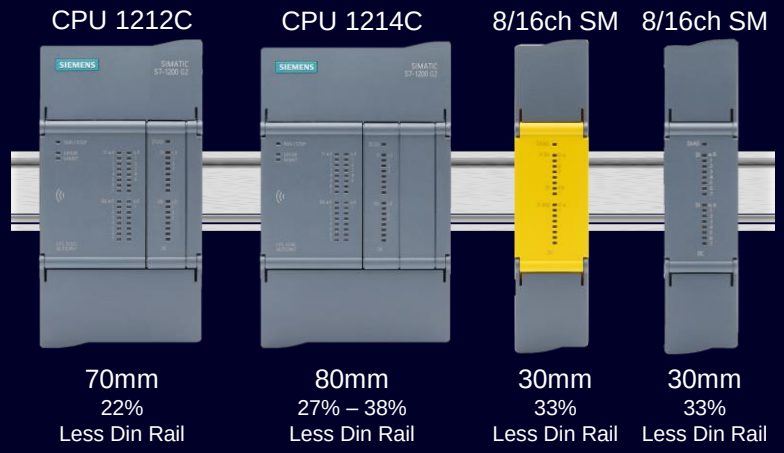
Overview
Higher competence

New HW design



Increased performance and seamless scalability

- Enhanced processing power, dedicated communication performance and more memory
- Up to 31 PROFINET devices and synchronized program execution with PROFINET IRT
- Near Field Communication (NFC) for commissioning and diagnostics support
- Optimized scalable hardware portfolio and seamless scalability across all SIMATIC controllers

Flexible Machine Safety

- Fail-safe integrated in the complete range (PROFIsafe communication, I/Os)
- Improved F-I/O portfolio (fail-safe signal boards, fail-safe signal modules with mixed I/Os)
- Fail-safe & Motion Engineering integrated in TIA Portal Basic

Efficient motion control

- Kinematics
- Multi Axis control
- Single Axis control



Expansion

	EM	RAM Data	RAM Program
CPU 1212C	6 in total therein 3 CM/CP	500 k	150 k
CPU 1212FC		500 k	200 k
CPU 1214C	10 in total therein 3 CM/CP	750 k	250 k
CPU 1214FC		750 k	300 k

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Overview
Fail-safe: signal boards and signal modules

SBs	SMs
4x F-DI(1oo1) / 2x F-DI(1oo2), 4-Vs*	8x F-DI(1oo1) / 4x F-DI(1oo2), 8-Vs*
2x F-DQ, PP-PM*	4x F-DQ, PP-PM*
2x F-DI(1oo1) / 1x F-DI (1oo2), 1x F-DQ. PP-PM*	4x F-DI(1oo1) / 2x F-DI (1oo2), 2x F-DQ. PP-PM, 2x DI

*Not within initial failsafe Portfolio release



1oo1 (One out of One):
1oo1 as simple redundancy, a single input connected to a fail-safe digital input

1oo2 (One out of Two):
Redundancy with cross-diagnosis: There are two independent sensors, each connected to an F-DI. Both sensors provide signals to the F-DI. The F-DI monitors the signals and makes decisions based on both inputs. This configuration is normally used in safety-critical applications

Vs: Integrated Sensor supply,
allows to detect short-circuit or overload scenarios, and react accordingly

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TIA Portal V20
Table of contents

SIMATIC WinCC Unified – Innovations

- Enhanced compile time and RT performance
- Engineering enhancements (system functions, dynamization overview, control toolbar buttons available via scripting,..)
- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
- Improvements in options (PaCo, Audit)
- User and role specific start screens
- Redundancy
- Process Orchestration (MTP)

SIMATIC WinCC – Innovations

- Engineering of Professional, Advanced and Unified on one PC
- WinCC Advanced: no new RT Advanced V20 Version
- WinCC Professional: Support of dynamic SVG, WebUX (deep link, recipe control),..

SIMATIC STEP 7 – Innovations

- Continuous Integration: new LAD export/import format
- Online features for named value data types
- Named value types used by safety blocks and in type libraries

SIMATIC Motion Control – Innovations

- New Hardware S7-1500 T/TF
- New Single Axis Operations / New Synchronous Operations
- Support of second PROFINET IRT interface
- Cross-PLC synchronous operation using PN/PN Coupler
- Kinematics

SINAMICS Startdrive & DCC – Innovations

- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Simulation Cloud *new*
- TIA Project-Server Cloud

SIMATIC Hardware

- S7-1200 G2
- SIMATIC Controller S7-1500 Standard & F
- Redundant Controller S7-1500 R/H
- SIMATIC ET 200SP Open Controller 3
- SIMATIC S7-1500V
- S7-Web Server
- Safety Integrated

System functions

- Upgrading TIA Portal projects
- PROFINET IRT features
- TIA Portal Documentation
- TIA Portal Openness
- TIA Portal Add-Ins
- Version Control Interface (VCI)
- CAx: AutomationML & Publication Tools
- TIA Portal User Management & Access Control (UMAC)
- TIA Portal Library Workflows
- TIA Portal Usability

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V
- Limited Sales release in USA

TIA Portal Options

- **SIMATIC STEP 7 Safety**
- **SIMATIC Safe Kinematics**
- **TIA Portal Multiuser**
- **SIMATIC Robot Library**
- **OPC UA**
- **SIMATIC S7-PLCSIM / S7-PLCSIM Advanced**
- **SIMATIC Target for Simulink**
- **TIA Portal Test Suite**
- **SIMATIC Visualization Architect (SiVArc)**
- **SIMATIC Modular Automation (MTP)**
- **Central User Management (UMC)**
- **Modular Application Creator**
- **SIMATIC ProDiag / SysDiag**
- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager**
- **TIA Portal Safety Validation Assistant**

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Upgrading TIA Portal projects

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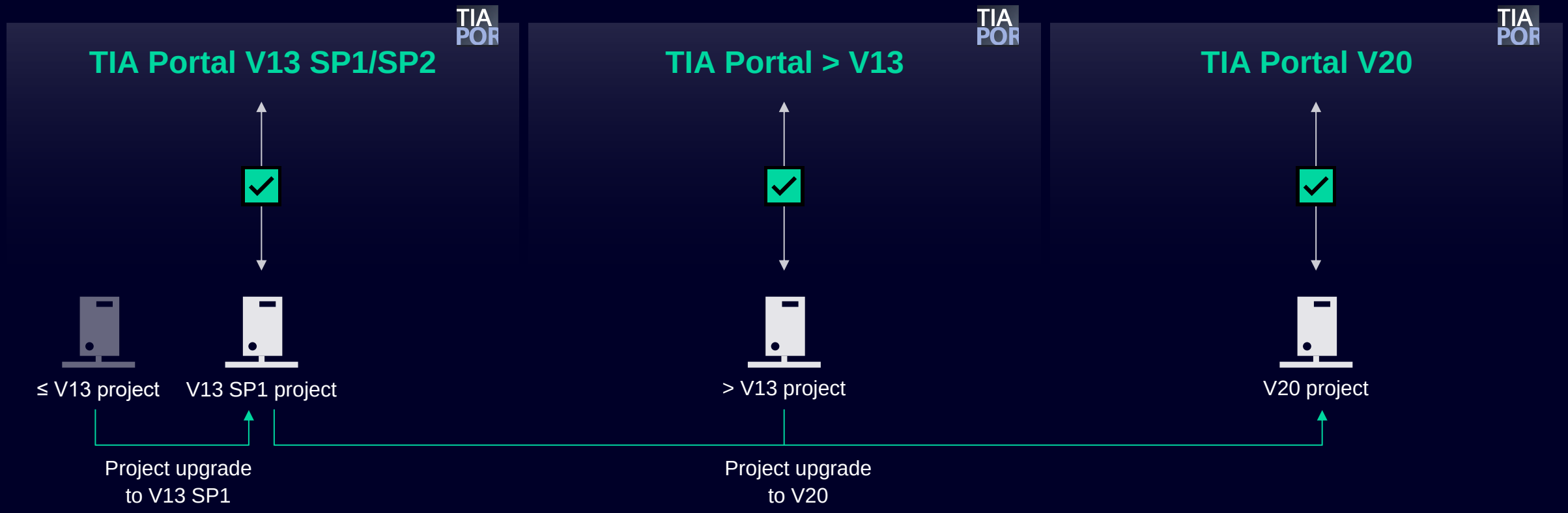
Upgrading TIA Portal projects



Side-by-side installation of **V13 SP1/SP2** up to **V20** allows access to all project versions.
The **V20** license can be used for all available versions from **V11**.

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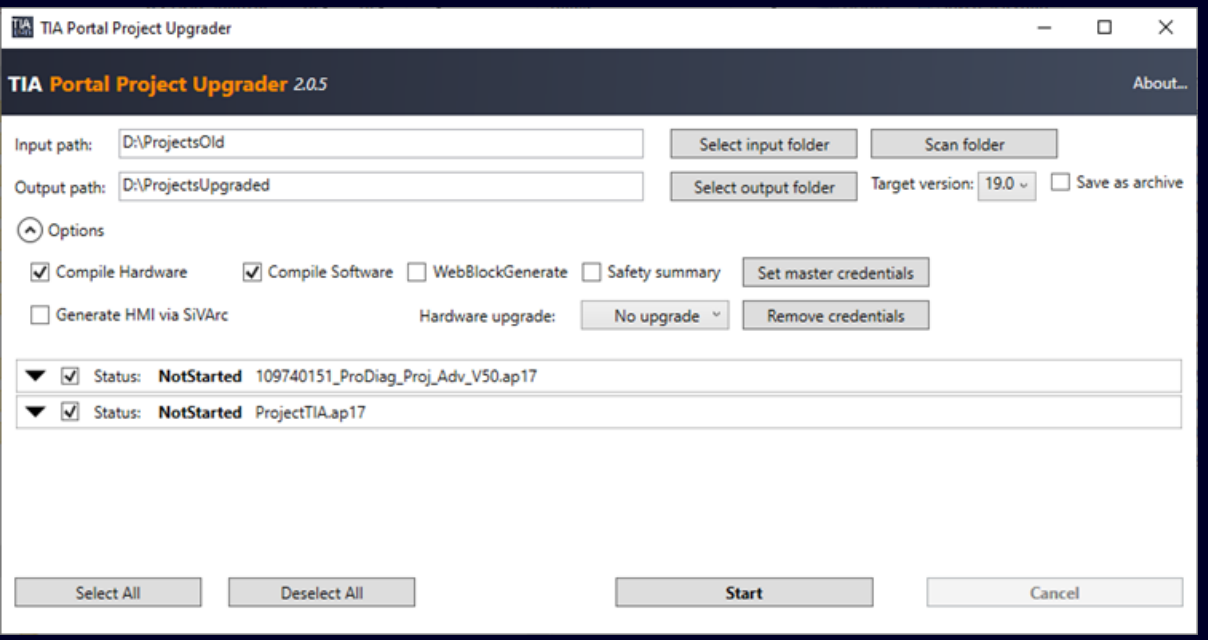
Upgrading TIA Portal projects



TIA Portal Project Upgrader

based on TIA Portal Openness

- Upgrade multiple TIA Portal projects from previous versions (> V13) to the current TIA Portal version at once
- Fully automate the upgrade process
- Options to automatically upgrade hardware and firmware
- Options to automatically compile project and to start SiVArc generation after upgrade
- Generate Safety documentation (Safety printout)

Free download at SiePortal: 109811744

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Enhanced PROFINET IRT features

(for advanced motion control)

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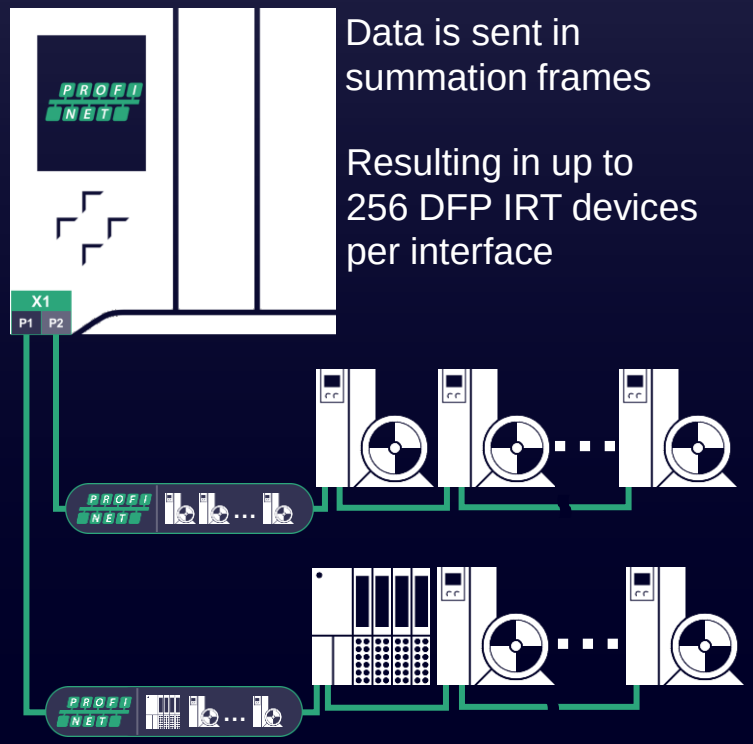
TIA Portal V20 - Enhanced PROFINET IRT features for advanced motion control

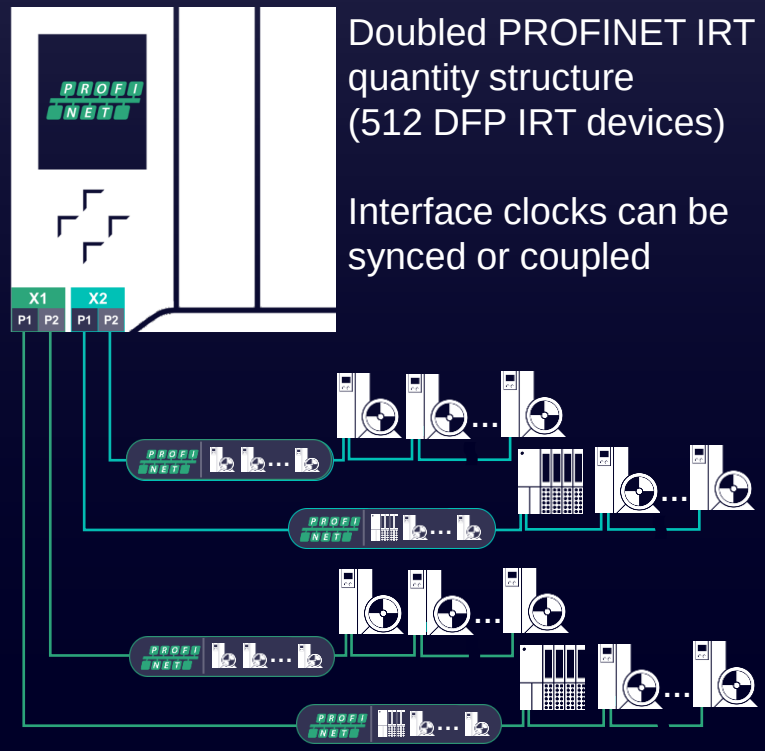
Increased amount of devices/axis with Dynamic Frame Packing (DFP)



Data is sent in summation frames

Resulting in up to 256 DFP IRT devices per interface

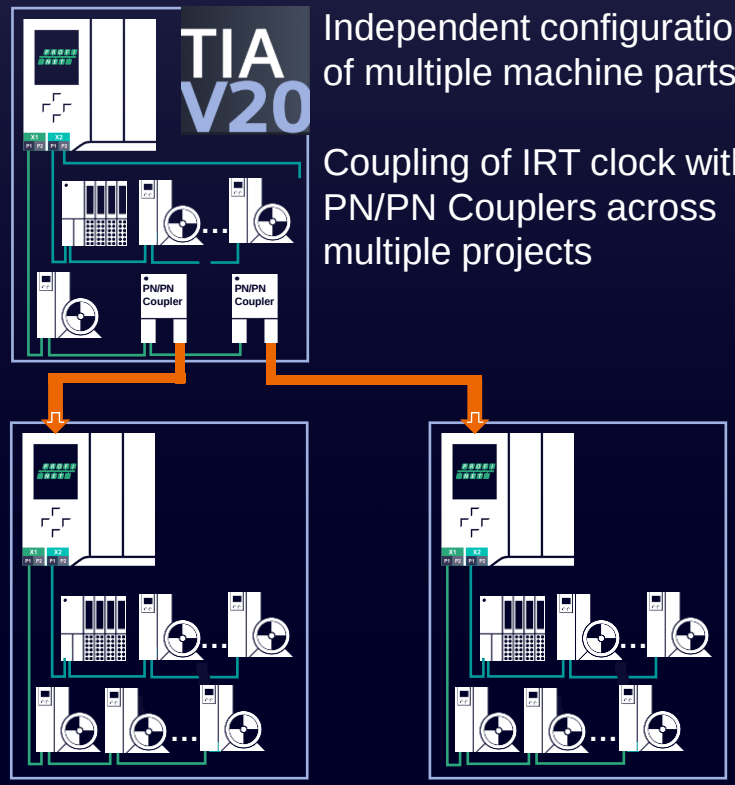
Even more devices/axis with secondary PROFINET IRT Interface



Doubled PROFINET IRT quantity structure (512 DFP IRT devices)

Interface clocks can be synced or coupled

Multi project motion applications to create modular machine units



Independent configuration of multiple machine parts

Coupling of IRT clock with PN/PN Couplers across multiple projects

These three features enable limitless quantity structures in PROFINET IRT

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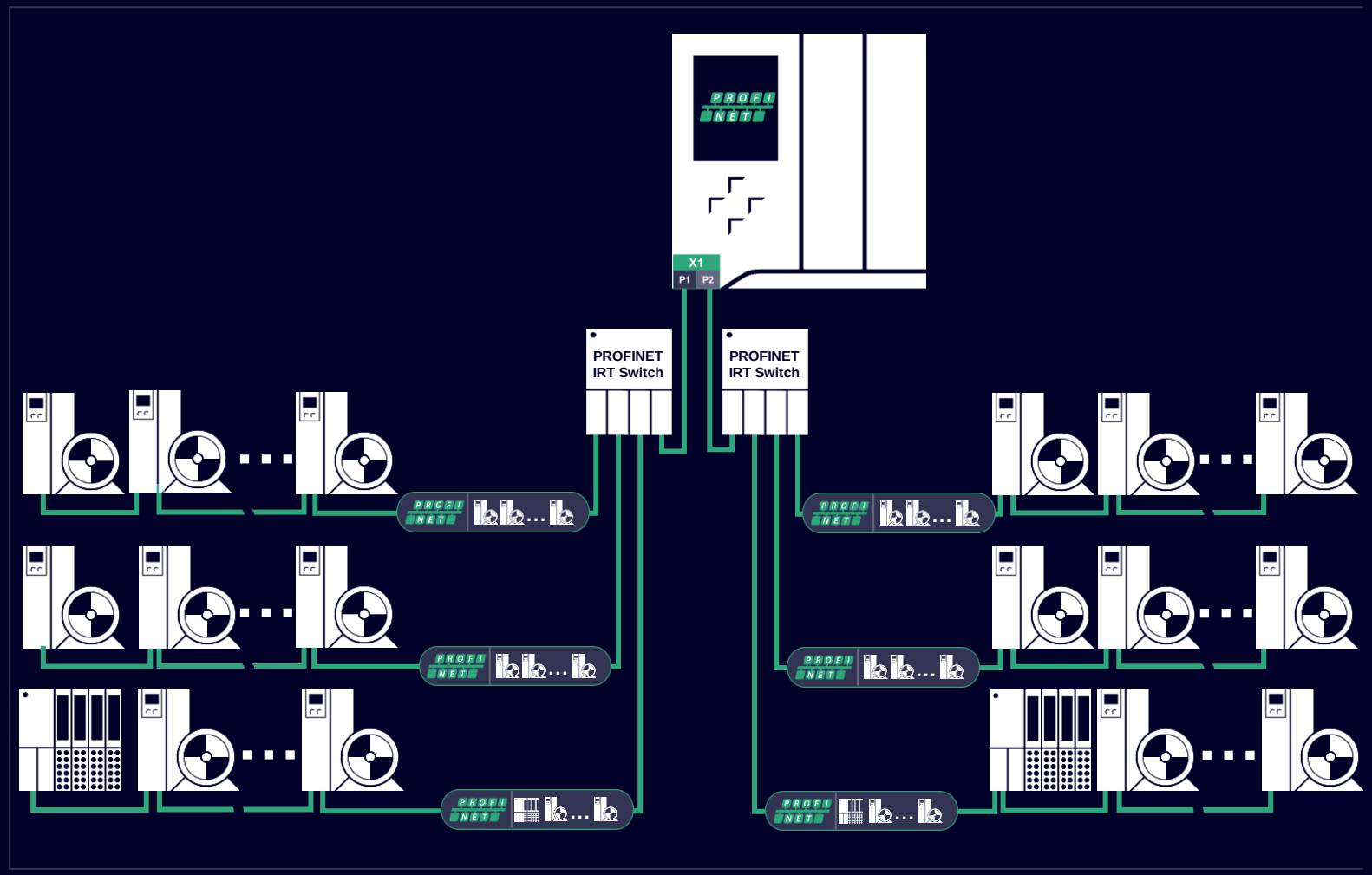
*: *simplified illustrations*

TIA Portal V20 - Enhanced PROFINET IRT features for advanced motion control

Increased amount of devices/axis with Dynamic Frame Packing (DFP)



Features

PROFINET Dynamic Frame Packing (DFP) can now also be used for high quantity structure applications with low cycle times

Benefits

The maximum amount of PROFINET IRT devices increases from 64 to 256 (per PN IRT interface)

Target markets

Machines with high performance motion tasks

Supported hardware

- SIMATIC S7-1500
  CPU 1517-3 PN, CPU 1518-3 PN,
  CPU 1517F-3 PN, CPU 1518F-3 PN
  CPU 1516T-3 PN, CPU 1517T-3 PN, CPU 1518T-3 PN
  CPU 1516TF-3 PN, CPU 1517TF-3 PN, CPU 1518TF-3 PN
  Software Controllers + CP 1625
- SIMATIC ET 200SP HS
- SINAMICS G220, S200, S210
- Several third-party PROFINET IRT devices

*: *simplified illustrations*

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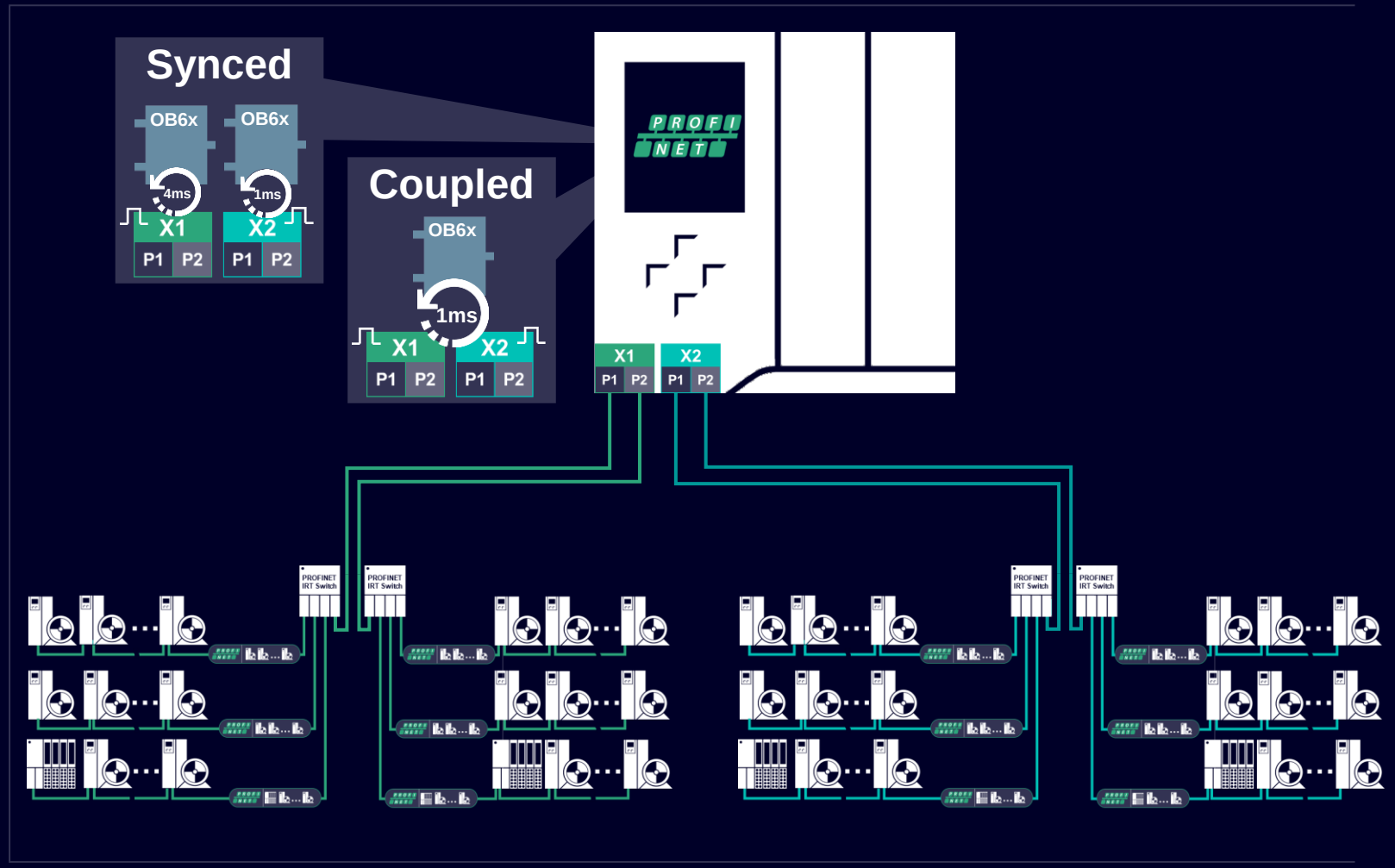
TIA Portal V20 - Enhanced PROFINET IRT features for advanced motion control

Even more devices/axis with secondary PROFINET IRT Interface



Features

A secondary PROFINET IRT Interface doubles the PLCs capabilities

Benefits

The maximum amount of PROFINET IRT devices increases from 64 to 128 (with only DFP device up to 512)

The PLC can operate two PROFINET IRT systems with synchronized or coupled bus cycles

Target markets

- Machines with high performance motion tasks
- Machines which require multiple bus cycles (e.g. out of efficiency or device capability reasons)

Supported controllers

- SIMATIC S7-1500

  CPU 1517-3 PN, CPU 1518-3 PN,
  CPU 1517F-3 PN, CPU 1518F-3 PN
  CPU 1516T-3 PN, CPU 1517T-3 PN, CPU 1518T-3 PN
  CPU 1516TF-3 PN, CPU 1517TF-3 PN, CPU 1518TF-3 PN
  Software Controllers + CP 1625-2

*: *simplified illustrations*

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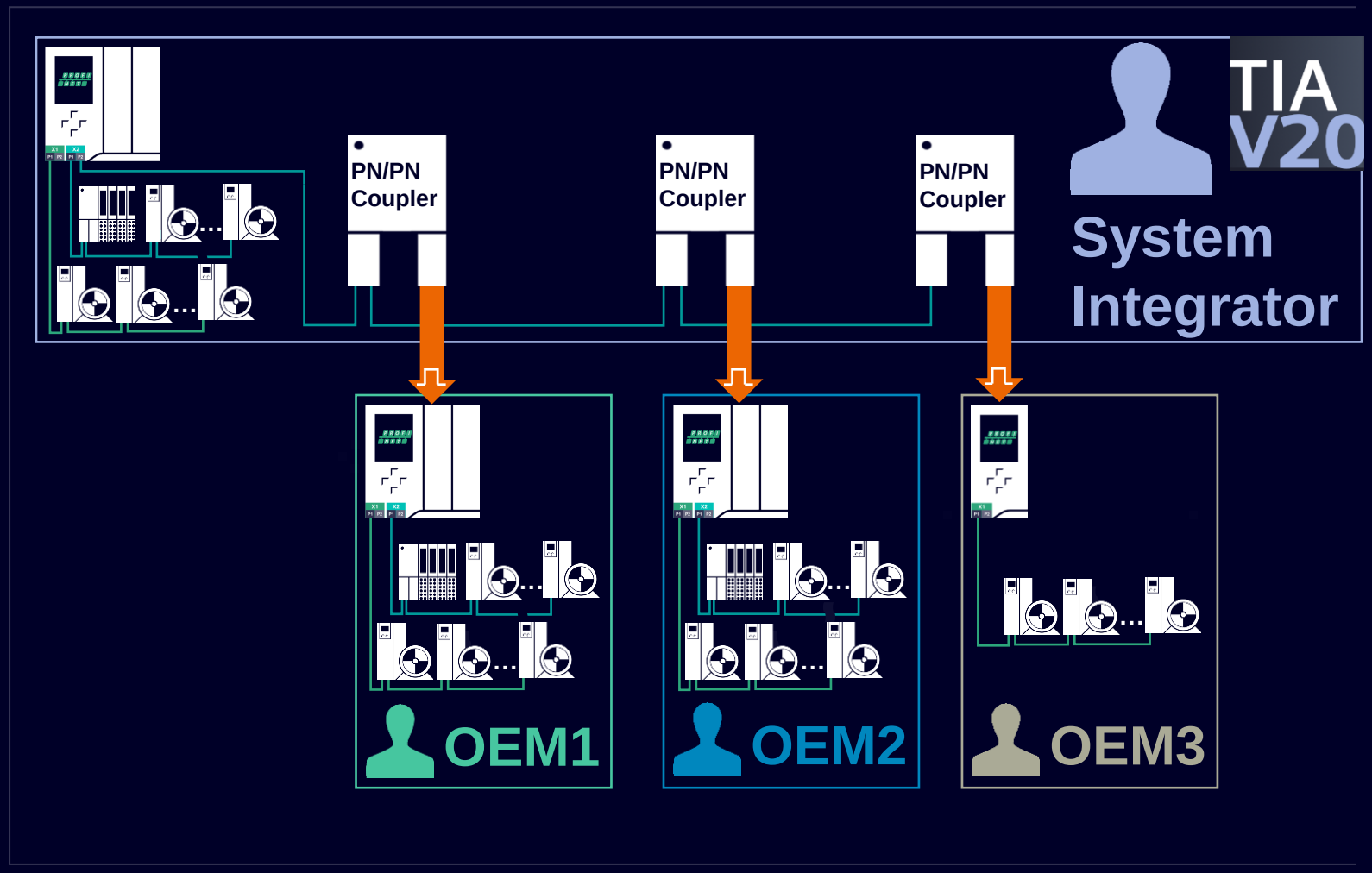
TIA Portal V20 - Enhanced PROFINET IRT features for advanced motion control

Multi project motion applications to create modular machine units



Features

Clock synchronization across multiple TIA Portal projects by use of PN/PN Couplers

Benefits

Independently engineer machine units by multiple OEMs

Increase quantity structure with multi controller applications

Target markets

- Machines with high performance motion tasks
- Machines with independently engineered units

Supported hardware

- **System Integrator:**
  PN/PN Coupler with FW V6.0 and TIA V20
  (6ES7 158-3AD10-0XA0)
- **OEM:**
  Any PN IRT Controller with any TIA Portal version

*: *simplified illustrations*

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TIA Portal Documentation

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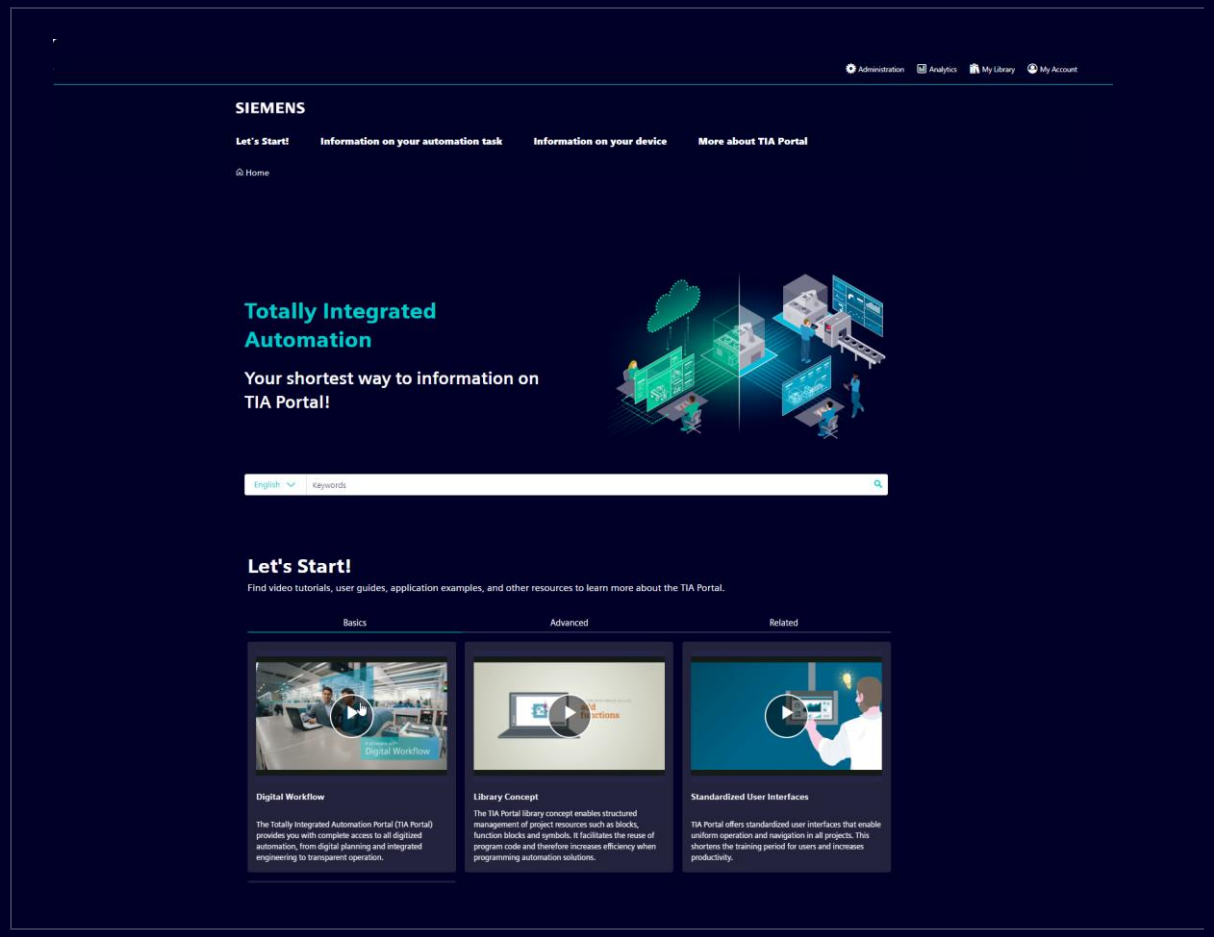
TIA Portal Documentation (Online view)



Everything you want to know about V20 - and more!

The web-hosted TIA Documentation Portal provides central access to information on Totally Integrated Automation:

- Software documentation
- Hardware documentation
- Additional video tutorials, user guides, application examples, and other resources to learn more about the TIA Portal.

Easy to find – Easy to use

- Accessible without TIA Portal installation on your PC.
- High-performance search allows you to find topics in just a few moments.
- Content can easily be shared using URLs

Start the TIA documentation portal here - and remember to set a bookmark in your browser:

docs.tia.siemens.cloud

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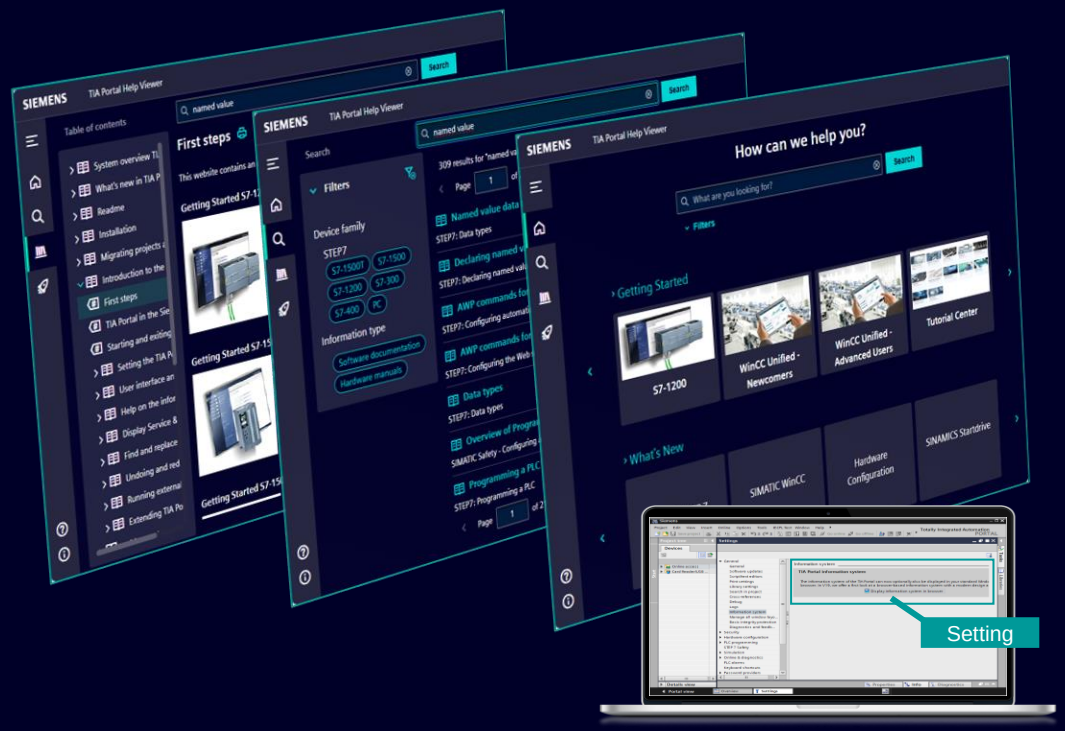
TIA Portal Documentation (Offline view)



TIA Portal information system

Users who want to work offline with the locally installed TIA Portal information system, can continue to do so.

They will benefit from an innovated design of the offline information system

Modern design and improved navigation

The web view offers modern functionality, such as:

- Modern web design
- Modern search function and filters
- Bookmarks and tab handling in the web browser

Switch between web view and legacy view

Switch between the new offline view and the legacy offline view with the setting:

"Tools > Settings > General > Information System"

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TIA Portal Openness

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TIA Portal Openness is our API for automating your engineering workflows

SiePortal: 109792902

Highlighted API innovations in TIA Portal Openness V20:

- Long-term support and compatibility
- APIs for Continuous Integration support such as new document-based formats for import/export, library type management/creation, Multiuser workflows and Continuous Testing (option package Test Suite Advanced)
- Extended access to hardware configuration and module parameters
- Innovations in additional option packages:
  SiVArc, SINAMICS Startdrive, SINAMICS DCC and WinCC Unified

For a list of all new features, refer to the TIA Portal Openness system manual, chapter “What’s new”.



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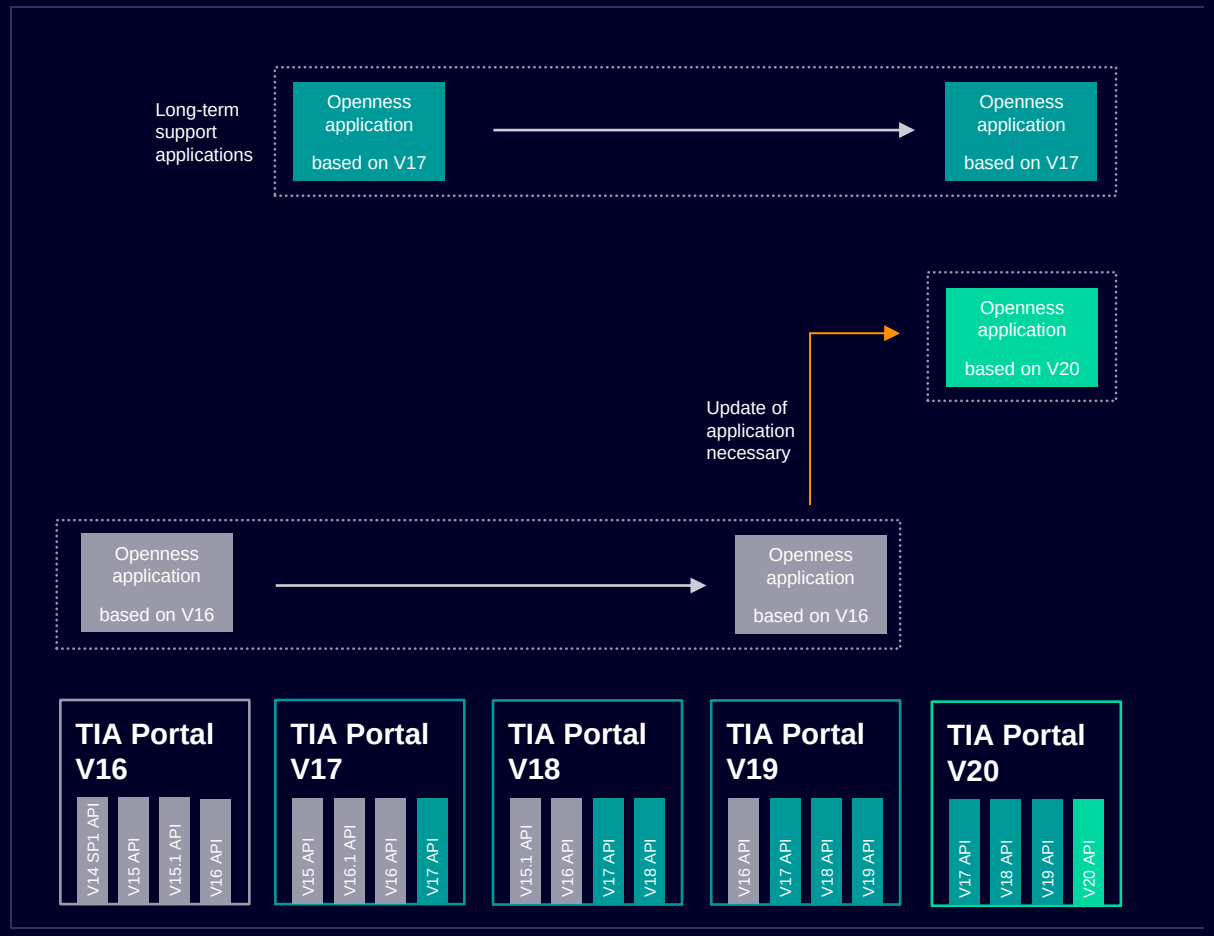
TIA Portal Openness
Long-term support and compatibility



Long-term support (LTS)
- Existing Openness applications since V17 will continue working.
- TIA Portal V20 delivers the LTS APIs for V17, V18 and V19.

New API version
- TIA Portal V20 delivers the new API version V20 to use the latest Openness features.

Discontinuation of oldest API version
- TIA Portal V20 no longer delivers the oldest API version V16.
- An update of applications using this version is necessary.

SimaticML file format compatibility
- New stable ordering of multilingual texts in SimaticML for comparing/versioning use-cases.
- Each API version in TIA Portal V20 creates SimaticML files of engineering version V20.
- Each API version in TIA Portal V20 supports importing SimaticML files from engineering versions V17, V18, V19 and V20.

.NET SDK version
- TIA Portal and TIA Portal Openness rely on .NET Framework 4.8 as a mature software framework as part of the operating system to build long-running enterprise-grade industrial-suited applications complying the needed long-term support.

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TIA Portal Openness
New general features

```
Device stationDevice = project.Devices.Find("S7-1500R/H system_1");

// Find all PLCs of a nesting level by classification (CPU)
IList<DeviceItem> plcs = stationDevice.DeviceItems.Find(DeviceItemClassifications.CPU);

// Find second PLC by name (Rail_1, PLC_2)
DeviceItem plcByName = stationDevice.Items.Find("Rail_1").Items.Find("PLC_2");

// Find first PLC by position number (Rack 0, Slot 1)
DeviceItem plcByPosition = stationDevice.Items.Find(0).Items.Find(1);
```

```
// Get name and value of all attributes with Read & Write access:
IReadOnlyList<KeyValuePair<string, object>> attributes =
    plc.GetAttributes(AttributeAccessOptions.ReadWrite);
```

```
// Get the identifier of an object:
PlcBlock currentPlcBlock = ...;
ObjectIdentifierProvider objectIdentifier = project.GetService<ObjectIdentifierProvider>();
string identifier = objectIdentifier.GetIdentifier(currentPlcBlock);

// Find the same object later again:
string identifier = "w1WdYM/ppEi6iPW1sFJmHQ==";
ObjectIdentifierProvider objectIdentifier = project.GetService<ObjectIdentifierProvider>();
PlcBlock foundPlcBlock = objectIdentifier.Find(identifier) as PlcBlock;
```

General

- Find device items faster by classification, name or position number
  - Multiple ways for different use-cases for fast navigation through the hardware
- Get all attributes of any object faster by access option
  - No need to first call GetAttributeInfos() and/or to iterate through individual attributes
- Unique object identifiers for objects in a project
  - Supported by these classes: Device, DeviceItem, PlcUnit, PlcSafetyUnit, PlcBlock, PlcType, TechnologicalInstanceDB, PlcTagTable, PlcTag, PlcUserConstant, PlcSystemConstant
  - The unique identifier is stable within the same project
  - No need to recursively scan the full project tree twice
  - Use the unique identifier to find the same object again when reopening a project at a later point of time
  - Use the unique identifier to hand over and find objects across process boundaries, e.g. between Openness applications and Add-Ins

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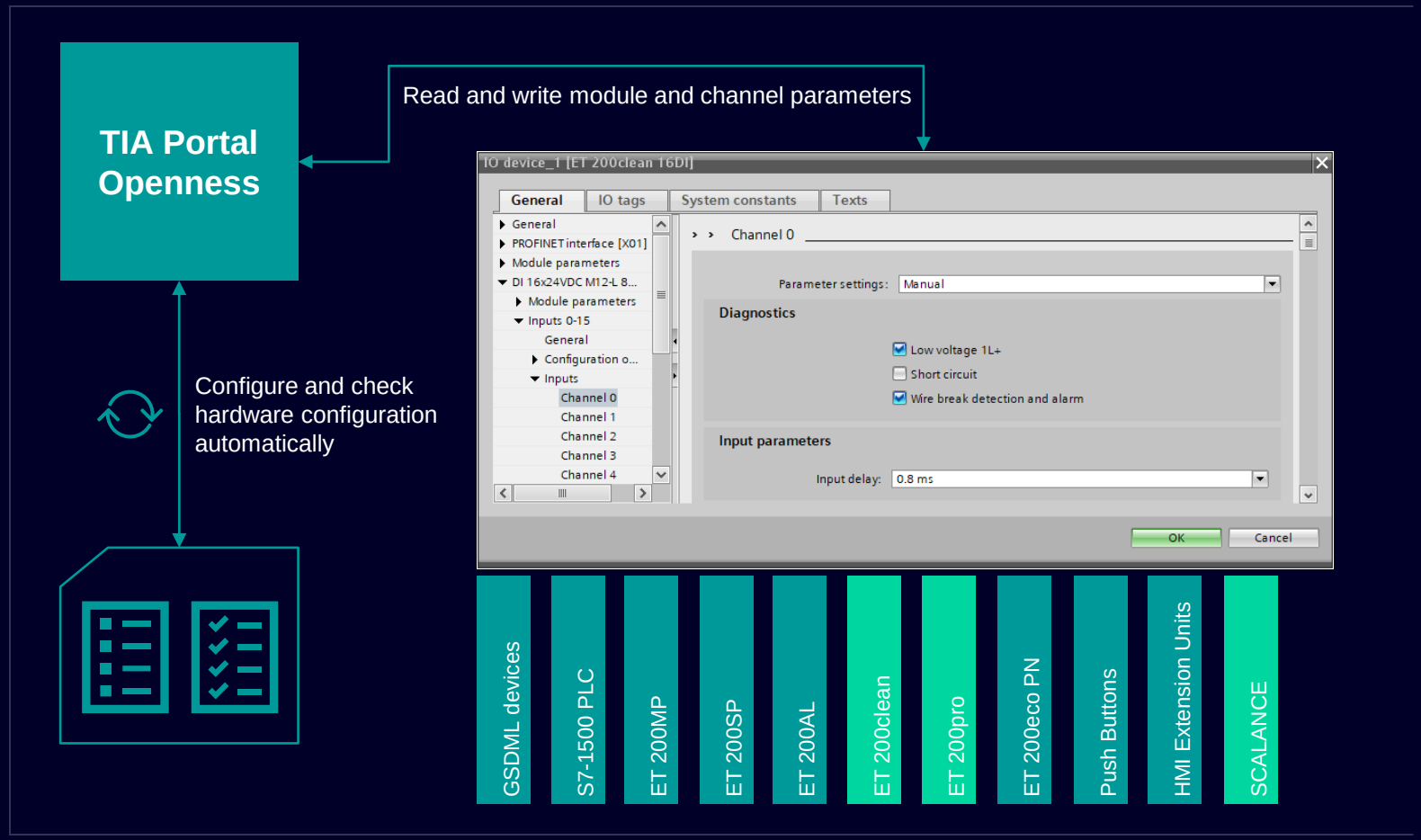
TIA Portal Openness
Extended access to hardware devices



Additional parameters support

Read and write hardware parameters* for additional module families for automated hardware configuration or checks:

- ET 200pro TM
- ET 200clean
- SCALANCE XC-200 (>= V.4.2), XP-200 (>= V4.3), SC-600 (>= V2.3), S615 (>= V7.1), XM-400 (>= V6.2)

Parameters* support for the following module families is already provided with previous TIA Portal versions:

- GSDML devices (generic approach for all)
- S7-1500 PLC (Standard + Safety)
- ET 200MP (Standard + Safety, except communication modules)
- ET 200SP (Standard + Safety)
- ET 200AL (Standard + Safety)
- ET 200pro (Standard + Safety)
- ET 200eco PN (Standard + Safety)
- Push Buttons
- HMI Extension Units (Standard)
- SCALANCE XC-200 / XP-200 (≥ V4.3), SC-600 (≥ V2.3)

Existing New/Extended in V20

The detailed list of supported modules, channels and parameters is part of the system manual (appendix**) and next to the API: C:\Program Files\Siemens\Automation\Portal V20\PublicAPI\V20\HW Parameter description*

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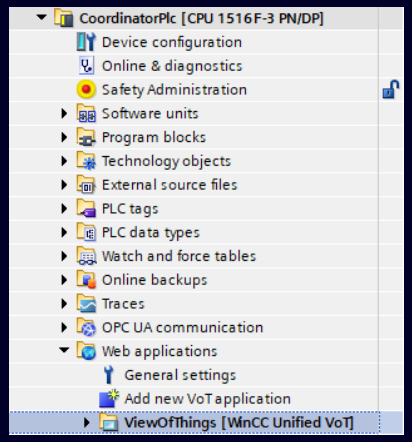
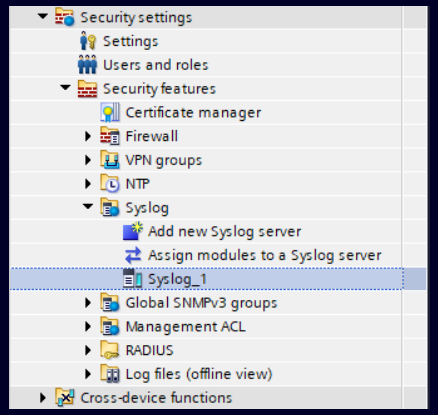
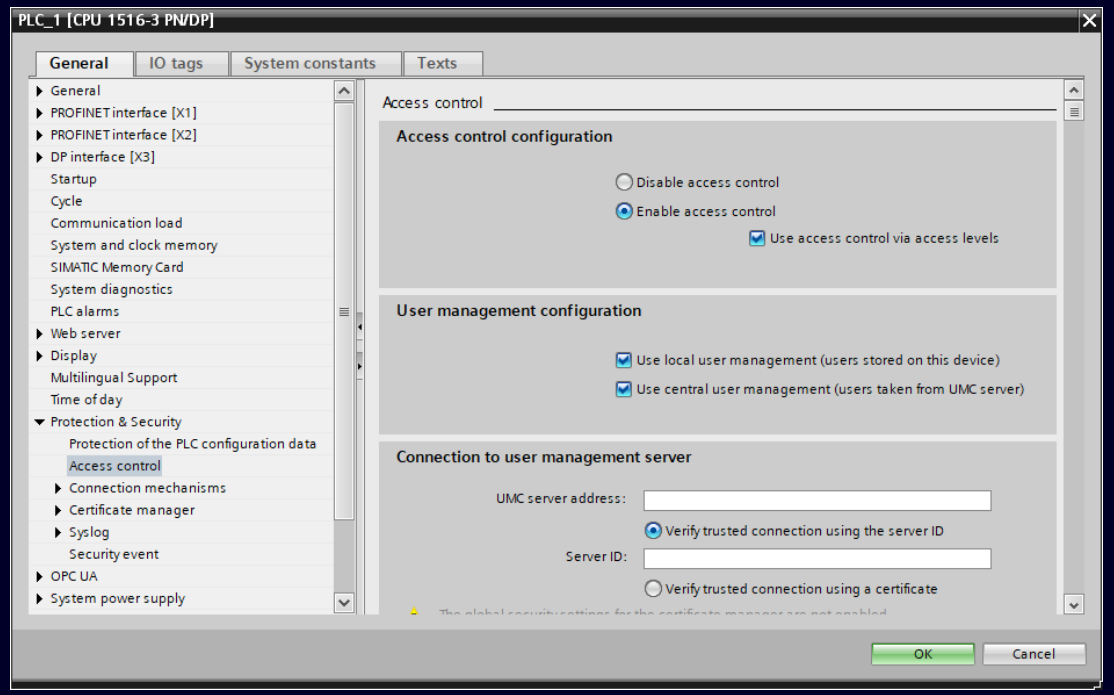
TIA Portal Openness
Extended access to hardware configuration & networks and security settings







PLC configuration

- New PLC access control configuration for central user management (UMAC)
- New PLC account locking at runtime (UMAC)
- New system web pages configuration for web server
- New advanced multilingual support configuration for project texts being downloaded to PLC
- Download View of Things (VoT) applications to PLC

Module configuration

- Uniformed port label without whitespace
- Read PROFINET (sub)slot number attribute of modules
- MRP ring configuration for SCALANCE
- Import/export Telecontrol configuration (CP IRC / TIM IRC)

Security & UMAC

- New syslog server configuration on project level
- Create and manage device function rights, UMC users and user groups

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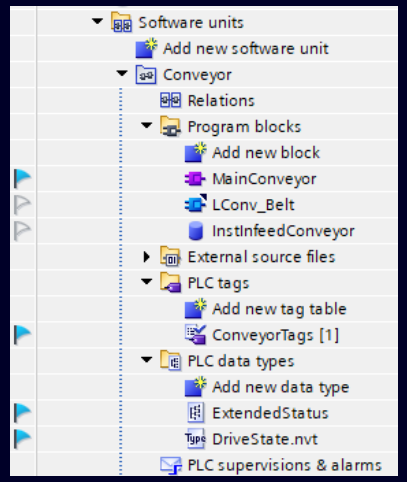
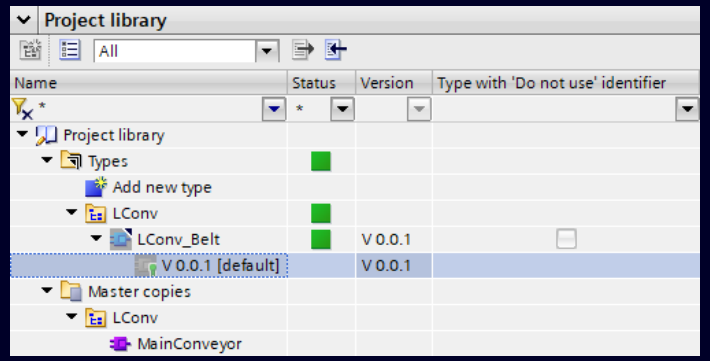
TIA Portal Openness
New APIs for PLC user program generation and Continuous Integration support

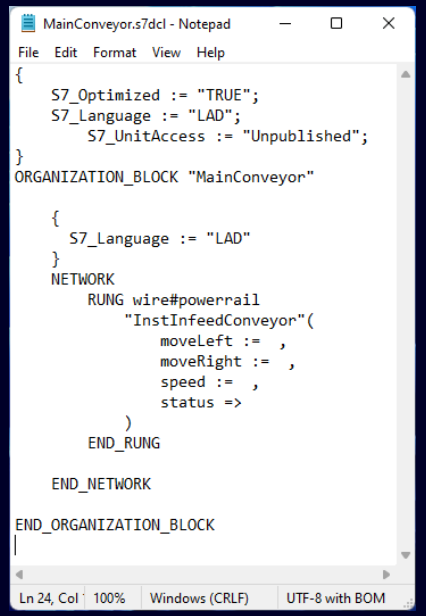
PLC user program and Multiuser features



Project library and Global library features



New SIMATIC documents format



TIA Portal libraries

- Get all information from libraries, types and versions
- Create new library types and versions from files
- Export library type versions as files
- Set into edit mode, release and discard library type versions
- Handle conflicts when inserting library type versions or master copies into project

PLC user programs

- New text-based file exchange format for PLC blocks for programming language LAD and Safety-LAD:
  Easy external text-based editing and comparison
- Browse PLC documents (e.g. named value types)
- Export and import PLC blocks, technology objects, PLC types and PLC documents in new SIMATIC documents
- Rename PLC tags and PLC tag tables
- Read checksums of PLC software and text lists

Multiuser engineering

- Mark and unmark objects via marking service
- Access groups for server projects on TIA Project-Server

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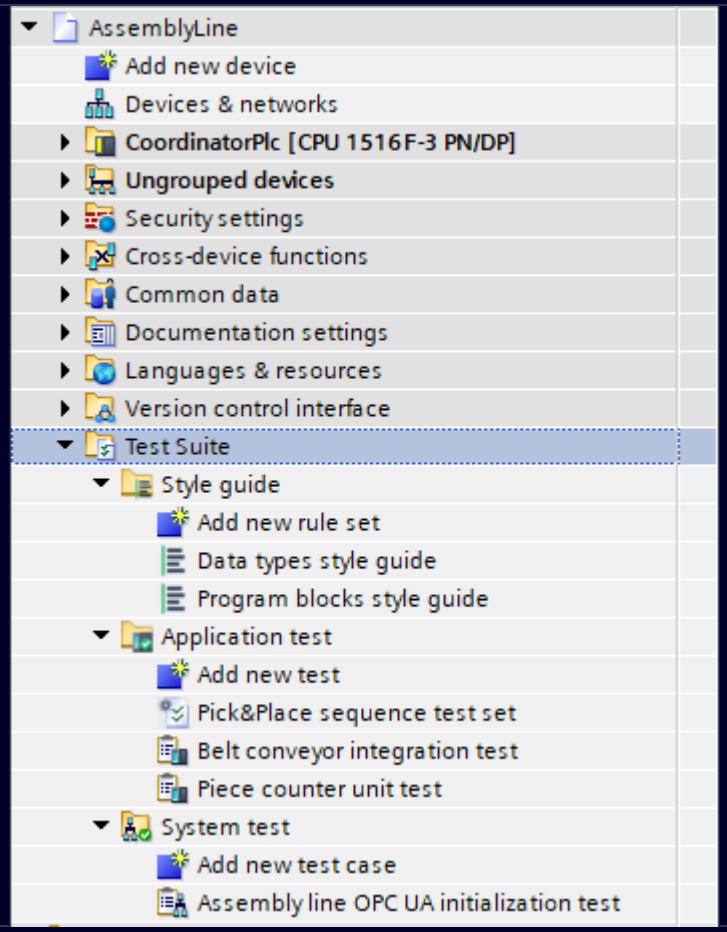
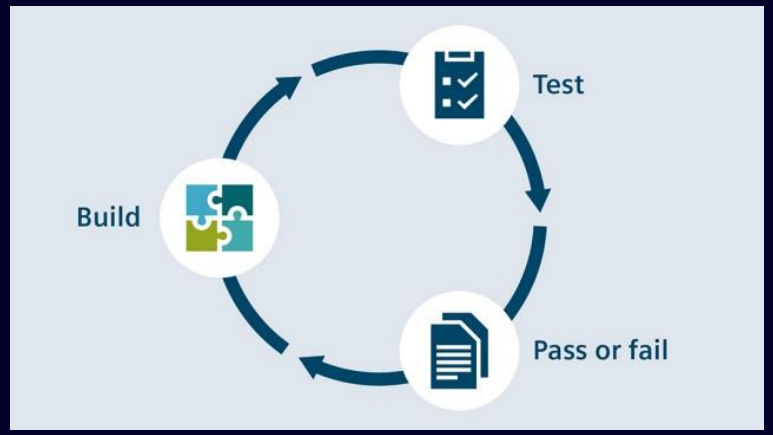
TIA Portal Openness
New API features in additional option packages: **Test Suite Advanced**



Automated Build and Test via TIA Portal Openness



Test Suite Advanced

Programming style checks, application tests and system tests can be automatically created, configured, and executed periodically and reports created for Standard PLCs and Safety PLCs via TIA Portal Openness.

For automated project verification

- Extended TIA Portal Openness support for configuration of system test cases.
- New application test sets configuration and execution.

Continuous Testing & Integration

Rapid program changes require Continuous Testing. This is one essential part of Continuous Integration.

Benefits of Continuous Testing and Continuous Integration:

- Accelerate the development process
- Lower risk of faults
- Increase transparency of processes
- Save time through automated processes

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TIA Portal Openness
New API features in additional option packages

WinCC Unified

TIA Portal Openness innovations:
- Configure further dynamizations, expressions for dynamizations
- Configure further HMI runtime settings
- Support DB name multiplexing on HMI tags
- Support central color palette
- Import/Export of text lists (without formatted text)

SINAMICS Startdrive / DCC

TIA Portal Openness innovations:
- Activate/Deactivate “functions in use” for 3rd generation drives (EPOS / PID)
- Read all parameters on drives
- Get telegram size in bytes
- Get drive object number
- Support Edge telegram

SIMATIC Visualization Architect

TIA Portal Openness innovations:
- Advanced tags rules
- SiVArc expression resolver

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TIA Portal Add-Ins

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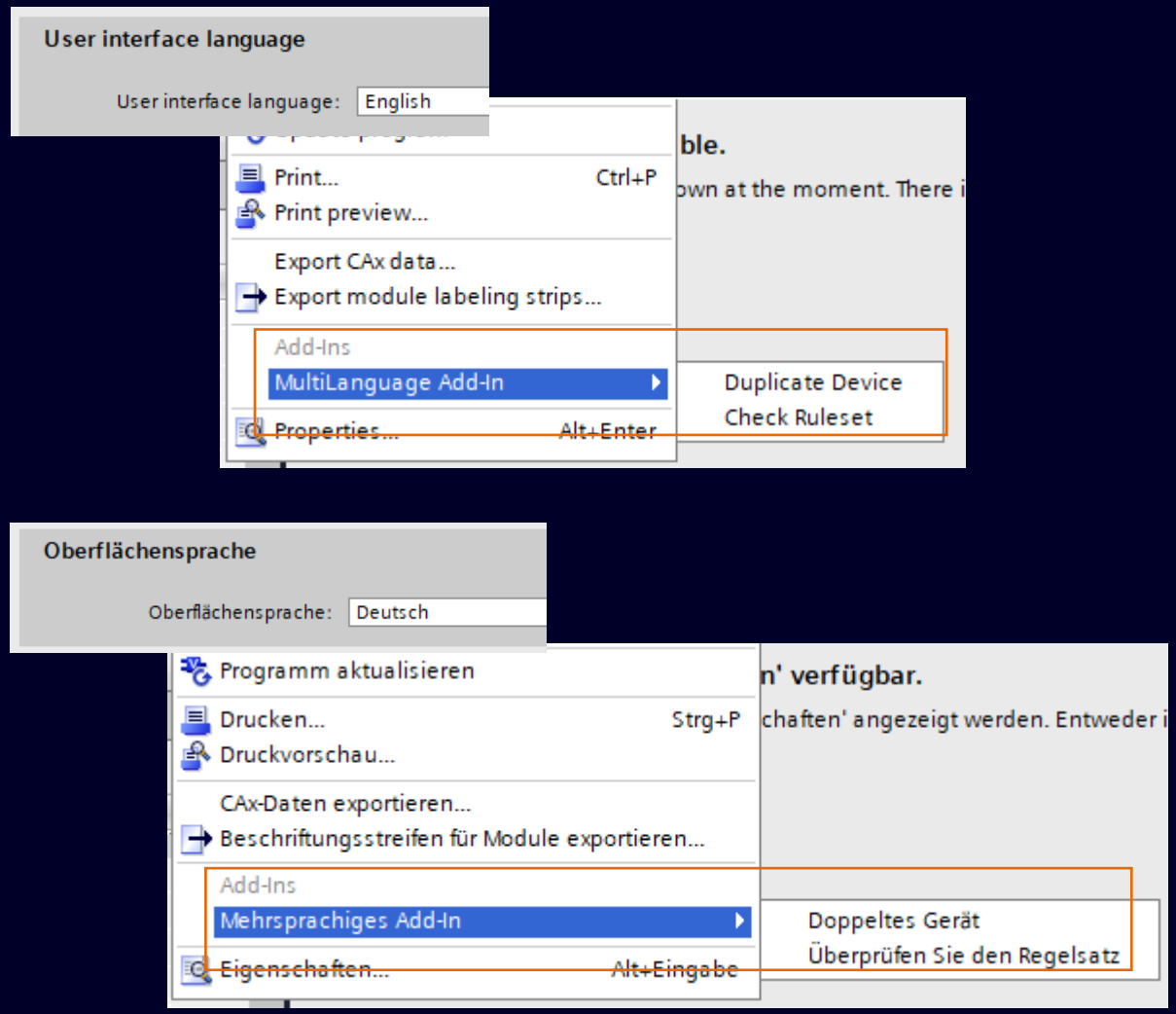
TIA Portal Add-Ins
Language-aware Add-Ins



TIA Portal User interface language-aware Add-Ins

- Add-In authors can create multilingual Add-Ins which follow the TIA Portal User interface language.
- Multilanguage texts can be provided for a context menu entry of an Add-In, Add-In UI and for feedback messages logged from Add-In to TIA Portal output view.
- If the TIA Portal language is changed after activation of the Add-In, then the Add-In needs to be reactivated to adapt to this new language.

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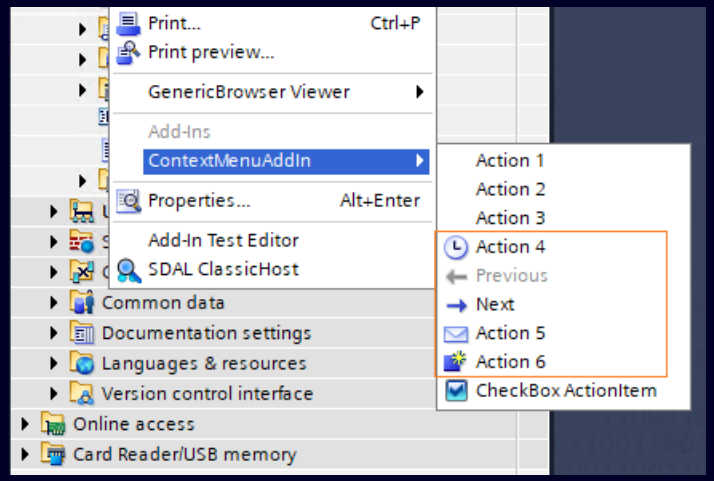
TIA Portal Add-Ins
Icon support for Add-Ins



Icon support for context menu Add-Ins

- Add-In authors can show their own custom icons for context menu entries of Add-Ins.
- Icons can be shown for all kinds of context menu entries except checkbox and radio button style context menus.
- This enables users with clear and faster recognition of menu entries. It enhances the user experience of Add-Ins, aligning it with TIA Portal UI standards.

Performance Improvement in Add-Ins

- Improved performance of context menu Add-In display, no display timeout issues.
- Add-Ins are stateful from V20 onwards.

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Version Control Interface (VCI)

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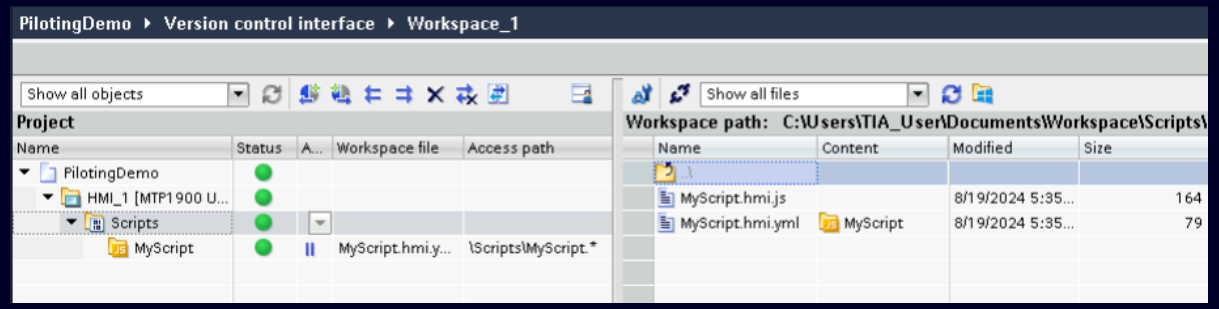
Version Control Interface (VCI)
HMI Global Script Modules available in VCI



Export/Import of HMI Global Script Modules through VCI

- Possible to export and import HMI Global Script Modules using VCI.
- User can now export/import JavaScript files via VCI, thus allowing better mergeability and easy exchange with source control.
- HMI Global Script Modules exports as multiple documents, thus allowing clear segregation of master module file and individual JavaScript files.
- User can source control HMI Global Script Modules through VCI.

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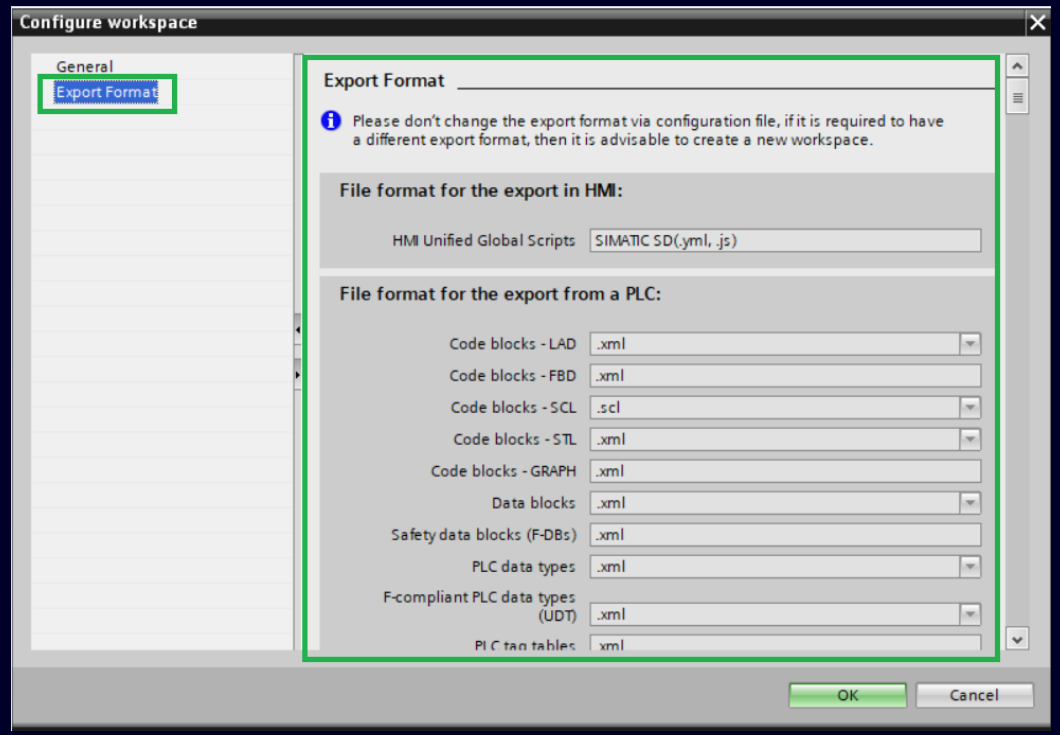
Version Control Interface (VCI)
Workspace specific export formats in VCI

Update 3



Workspace specific export formats in VCI

- In addition to configuring VCI export formats in TIA Portal Settings, user can now also configuration export formats at workspace level.
- The export formats configuration used in the VCI workspace is also saved in workspace path.

Benefits:

- Multiple workspaces can have different export formats.
- Now changing export format in global setting does not affect existing workspaces, it just acts as default setting for new workspaces.
- Export configuration can be shared across users along with the workspace.
- No need for manually toggling the setting for exporting an object in different formats.

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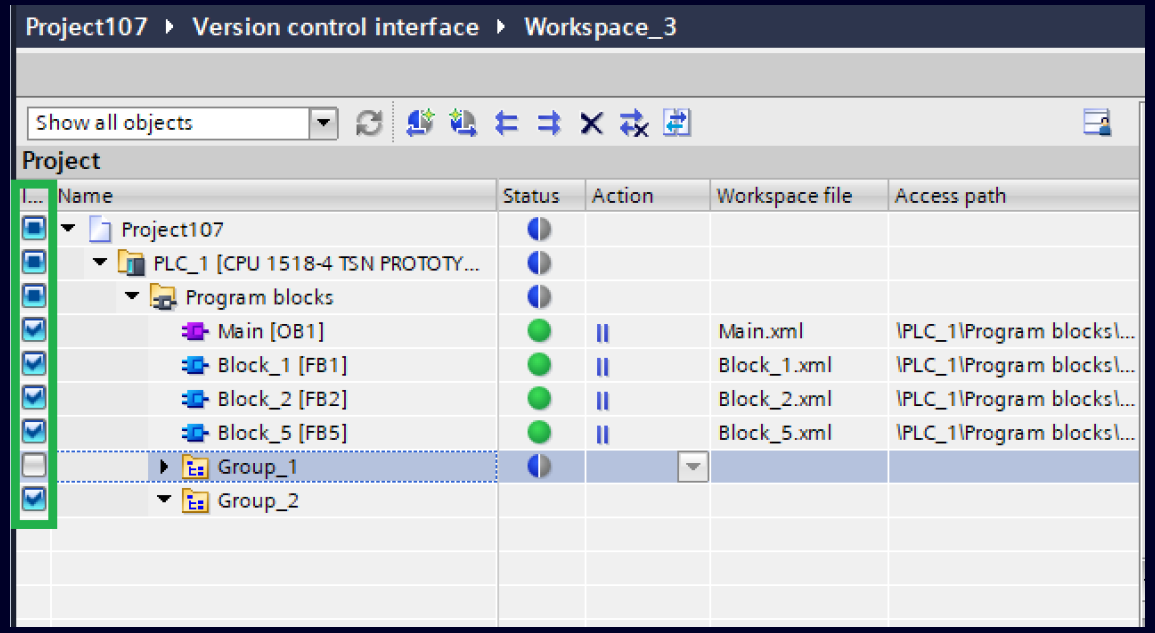
Version Control Interface (VCI)
Scope/Descope objects from VCI Operations

Update 3



Scope/Descope objects from VCI Operations

- A new checkbox column in project view of the VCI editor is introduced. It is to specify the scope that should be part of import/export operations of VCI.
- This checkbox must be checked to enable corresponding object's export/import in VCI. Default state is checked, user needs to uncheck objects that are not supposed to participate in export/import workflows.

Benefits:

- More granular control over objects that participate in VCI export/import workflows.

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CAx: AutomationML & Publication Tools

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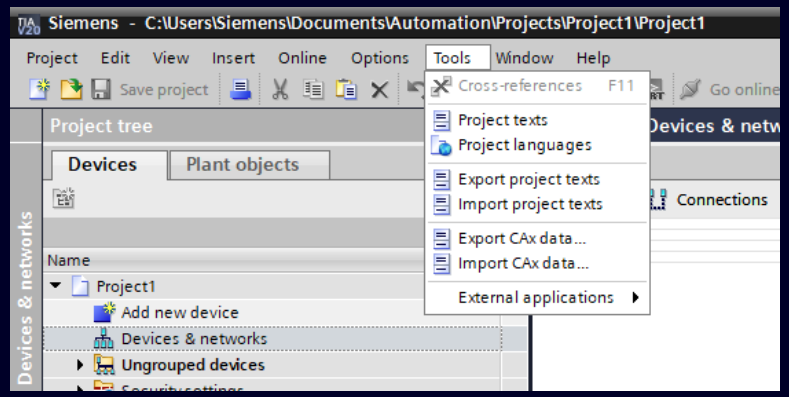
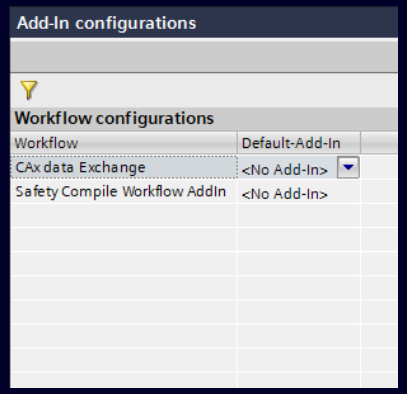
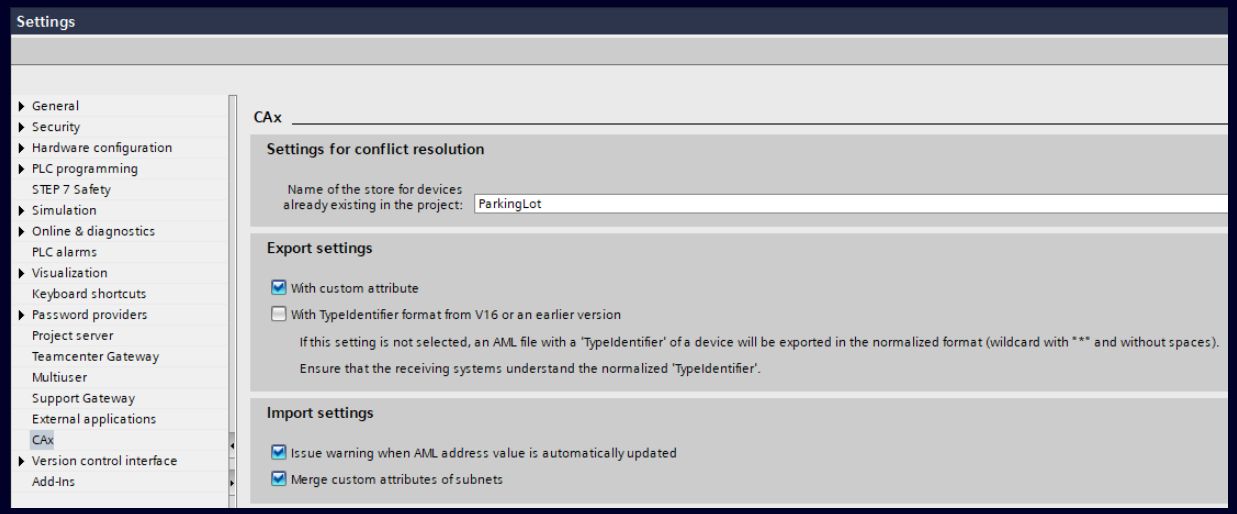
CAx
AutomationML data exchange in TIA Portal V20







TIA Portal CAx

- The CAx interface provides you with the option of exchanging hardware information in AutomationML format between TIA Portal and ECAD systems in accordance with the Application Recommendation Automation Project Configuration (AR APC) standard.
- In addition to exchanging devices, modules and networks, selected parameters can also be exchanged with ECAD systems.
- The definitions of the available parameters can be easily determined using the CAx Publication Tools and can then be imported into other tools.

Innovations in V20

- CAx Import supports automatic opening of referred global libraries if the AutomationML file contains library references which are in ‘preview’ state in TIA Portal.
- Import of AutomationML files containing library references which are created from modules connected to master controller is supported with some limitations.
- For communication objects (interfaces, ports), the exchange of multilingual comment attributes is available using AutomationML.
- Support for CAx Add-In template is available which allows the users to create their own Add-Ins to perform custom actions during CAx Export/Import.

Benefits

- Consistent data exchange for hardware configuration across systems, e.g. from TIA Selection Tool to EPLAN Electric P8 to TIA Portal
- Extended reuse of hardware configuration created outside TIA Portal
- Optional exchange of module and channel parameters by enabling “custom attributes”

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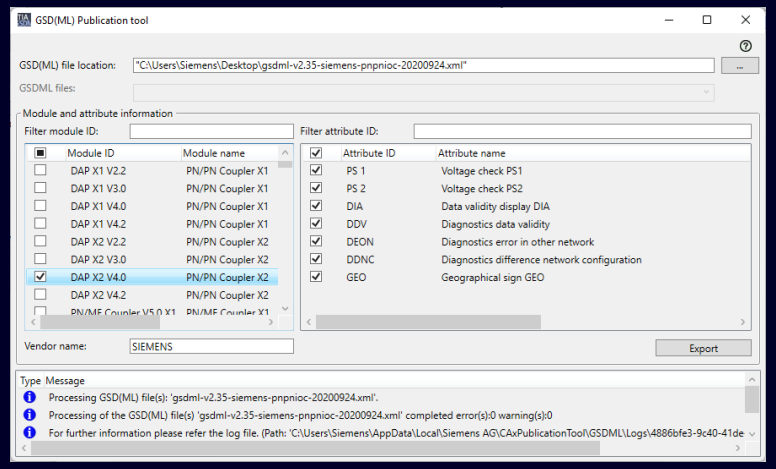
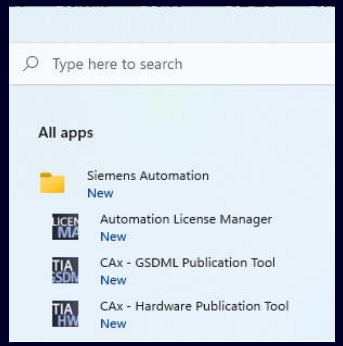
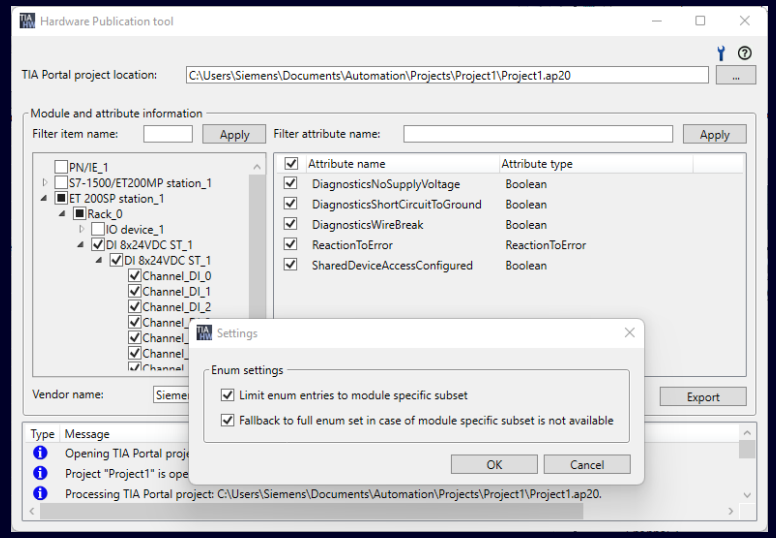
CAx
TIA Portal CAx Publication Tools V3.0







TIA Portal CAx Publication Tools

- The **GSD(ML) Publication Tool** can be used via GUI or Command Line to open device description files, display the device data they contain and select device attributes. These attributes can be exported with the tool as metadata.
- The **Hardware Publication Tool** can be used via GUI or Command Line to open TIA Portal projects, display the module data they contain and select module attributes. Module and channel attributes can be selected separately. These attributes can be exported with the tool as metadata.

Innovations in Version 3.0

- The exchangeable attributes can be determined for modules that are described using GSD or GSDX and made available for partner systems such as ECAD systems.
- An option to filter possible values for hardware parameters is available (preview feature)

Benefits

- Easy retrieval of available custom attributes via CAx Publication Tools
- Reuse the definition of available hardware parameter data for
  - EPLAN master data base (for custom attributes in EPLAN macros)
  - Openness applications (e.g. hardware project generators)
  - further more tools using the “Neutral” or “PcPm” formats

Order details

- The tools are part of the TIA Portal V20 installation and require an own license:
  - Version 3.0: 6ES7823-1JE03-0EA5
  - Upgrade to version V3.0: 6ES7823-1JE03-0EE5
  - Software Update Service (SUS): 6ES7823-1JE03-0EL5

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User Management & Access Control (UMAC)

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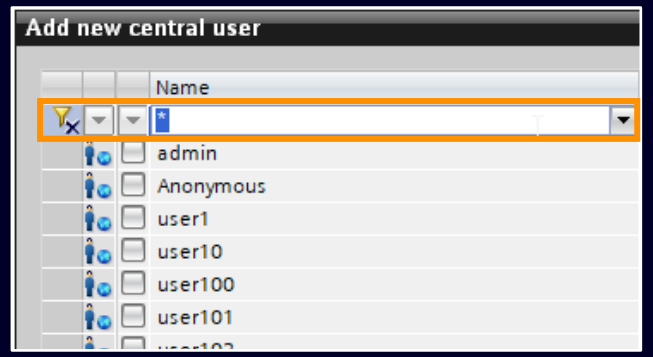
System functions
User Management & Access Control (UMAC)

The TIA Portal project offers integrated **user administration and access protection**. For consistent access protection, **user roles** can be configured with **function rights** for engineering and runtime. Users and user groups can also be managed **centrally** by connecting TIA Portal to a **UMC domain**.

New Filter central users and groups

At the import dialog for central users and groups a filter header is added.

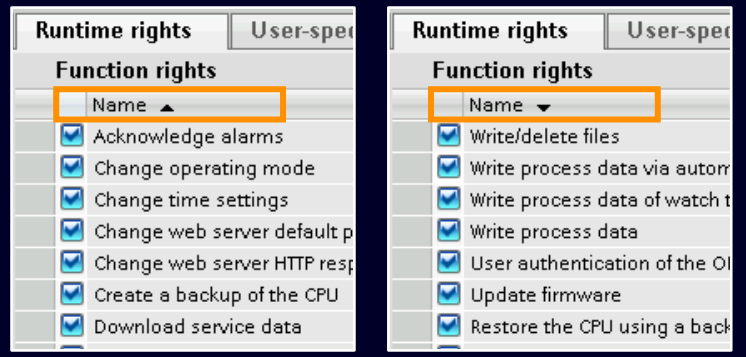
→ This helps finding specific users and groups much faster.



New Sort runtime function rights

In the table header of runtime rights, the sort order can be defined as ascending or descending.

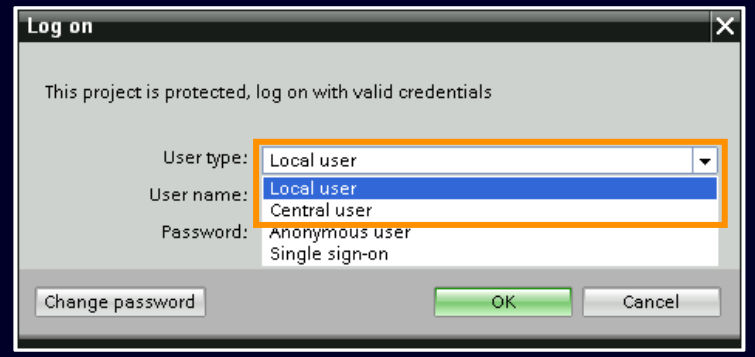
→ Sorting the list of function rights increase clearness when choosing the required entries.



New Adapted user type terminology

Rename of <Project user> to <Local user> and <Global user> to <Central user>.

→ Consistent user terminology with UMC and UMAC supported devices.



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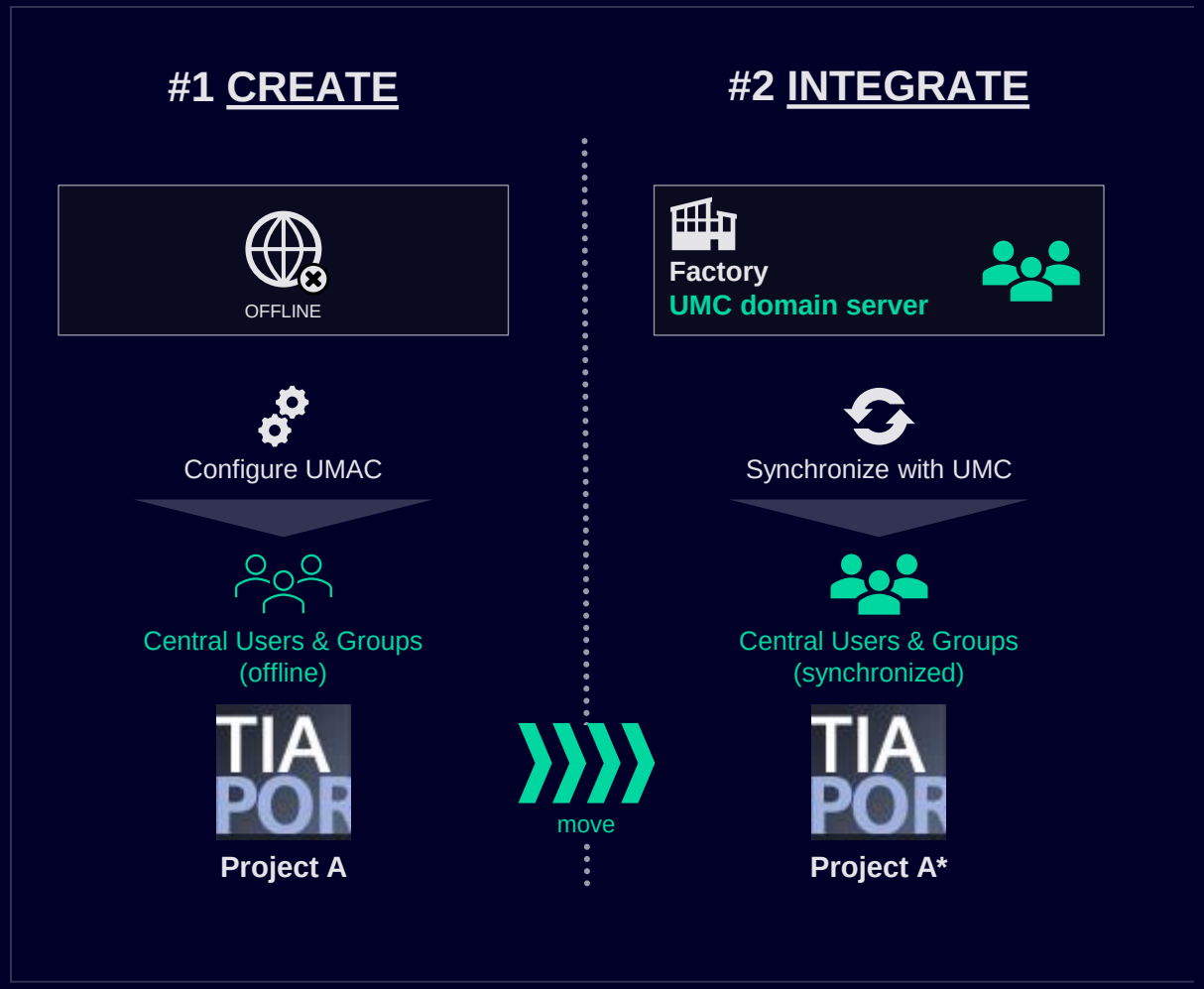
System functions
User Management & Access Control (UMAC)



Configure UMAC without UMC connection

Use case

- Create and manage UMC users and groups without the need to connect to a UMC domain.

Feature workflow

1. <Add new user> creates now by default a local user.
2. Now able to change user type from local user to central user (offline).
3. Configure access control by assigning roles for this user.
4. [Move project to place of use]
5. Use the UMC synchronize function to merge central users and groups in the TIA Portal project with the connected UMC domain.
6. Users and groups that are not available in the UMC domain stay in the TIA Portal project as disabled users.

Benefit

- Able to completely preconfigure TIA Portal projects and the UMAC configuration without a connection to a UMC domain server. This reduces the integration and commissioning effort dramatically.

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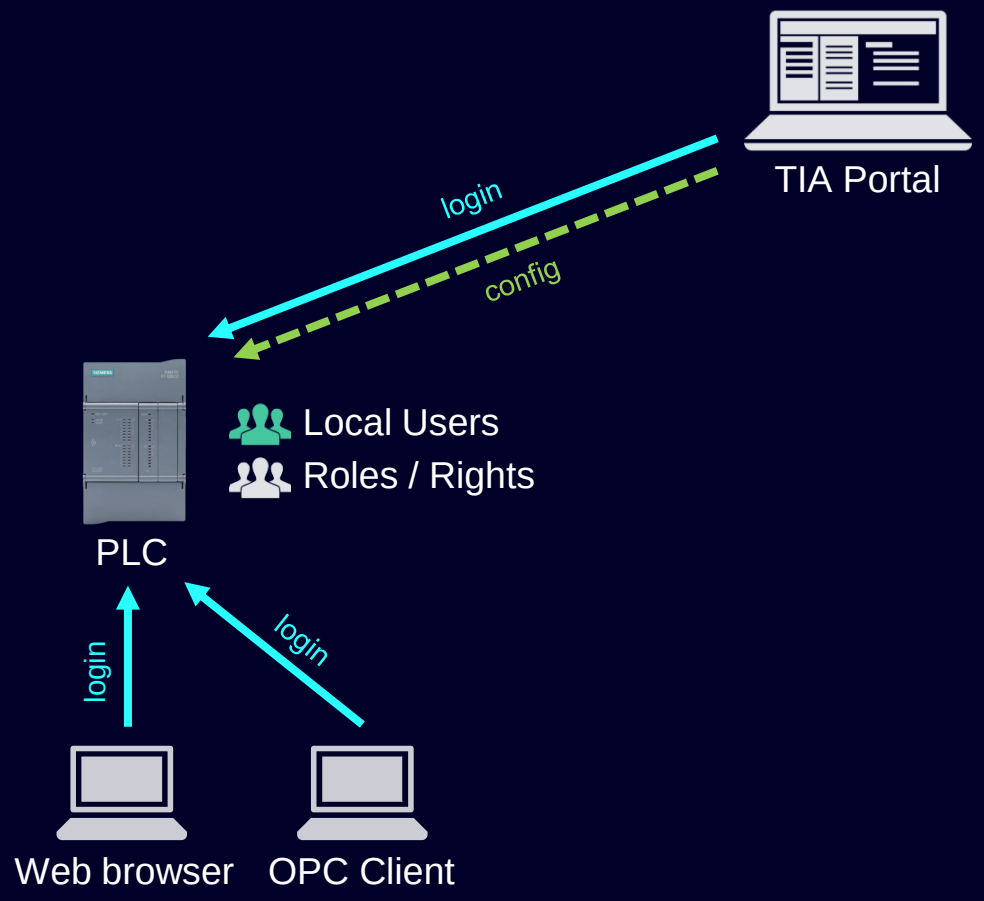
New UMAC for SIMATIC PLCs for S7-1200 / S7-1200 G2 CPUs



Flexible access control for multiple users, based on individual rights with unified user management:

- Unique user accounts with individual access rights for suitable access configuration according to user's tasks
- Single user account usable for different PLC services (e.g. engineering access, Webserver, OPC UA access)
- Roles / Rights concept for different PLC functionality integrated into existing TIA Portal UMAC configuration
- System defined PLC roles for easy configuration
- Improved security wizard for quick UMAC setup

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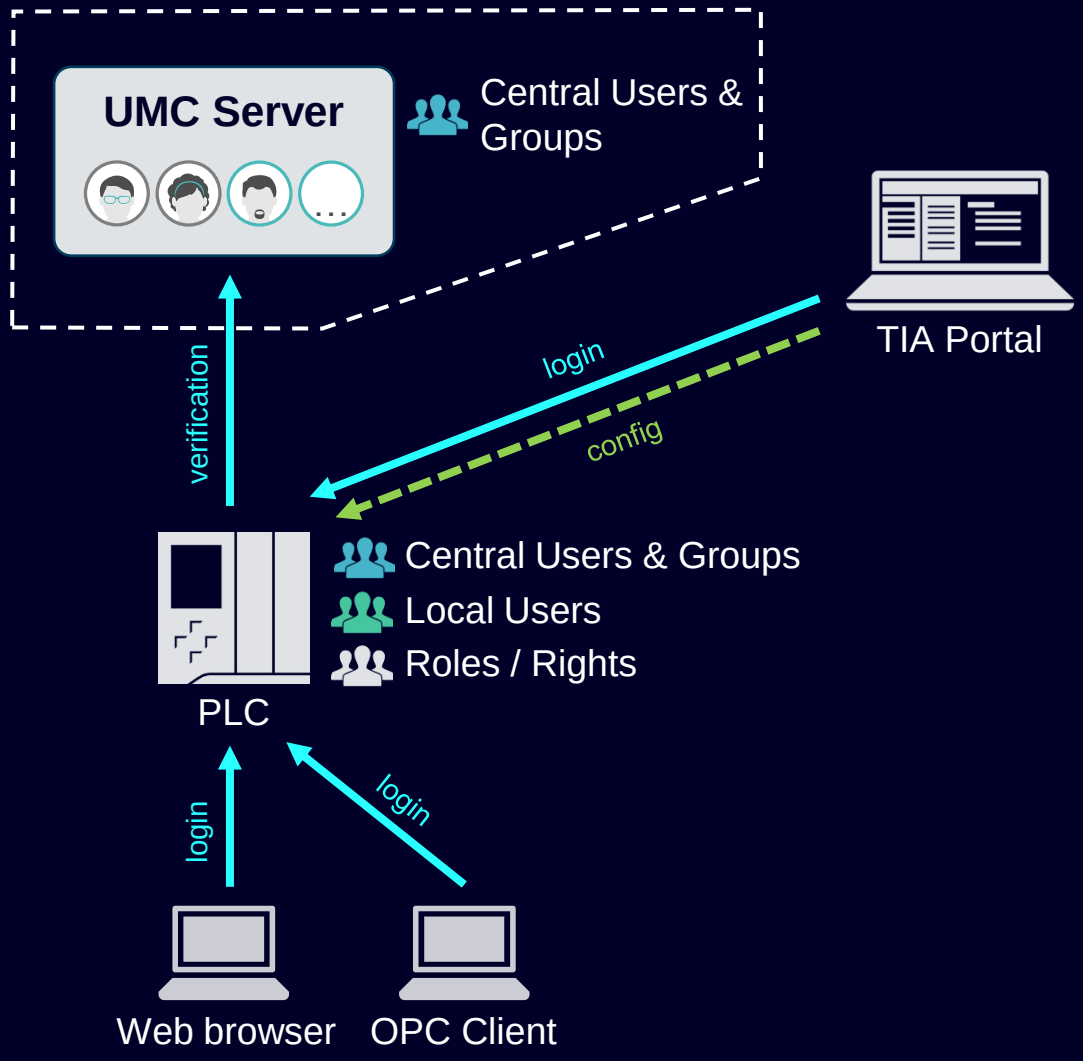
Central UMAC support for SIMATIC PLCs for S7-1500 CPUs



Flexible access control for multiple users, based on individual rights now also for larger environments:

- Unique user accounts with individual access rights for suitable access configuration according to user's tasks
- Roles / Rights concept for different PLC functionality integrated into existing TIA Portal UMAC configuration
- Support of UMC for Central User Management
- System defined PLC roles for easy configuration
- Improved security wizard for quick UMAC setup
- Available for S7-1500 CPUs incl. F, T, TF, R and H variants

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TIA Portal Library Workflows

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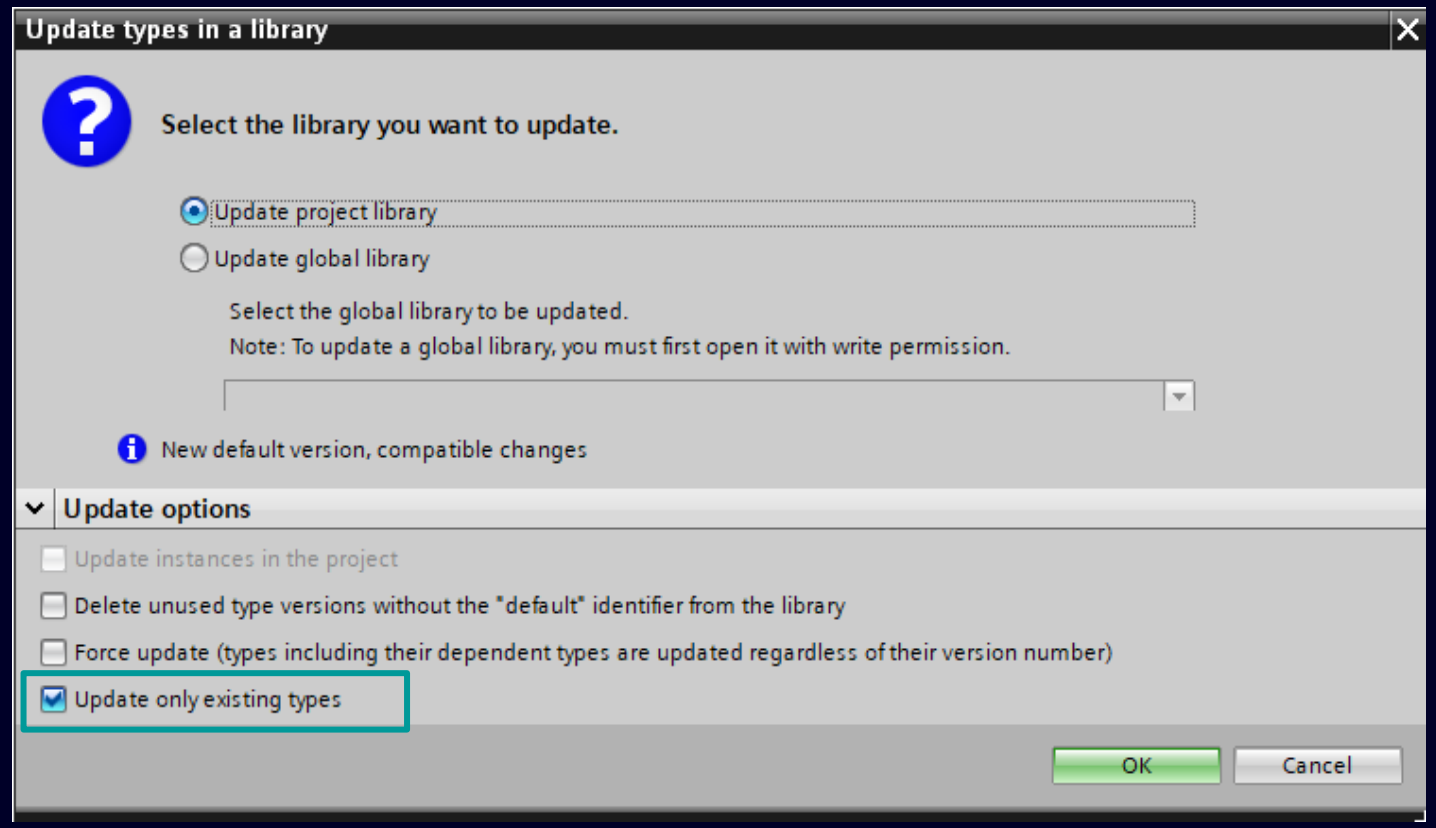
Update only existing types from a TIA Portal global library



Update only existing types from a TIA Portal global library

- User can perform update operation which will update only types which exist in target (project library or global library).
- This option can be accessed in update library and update project from global library dialog box.

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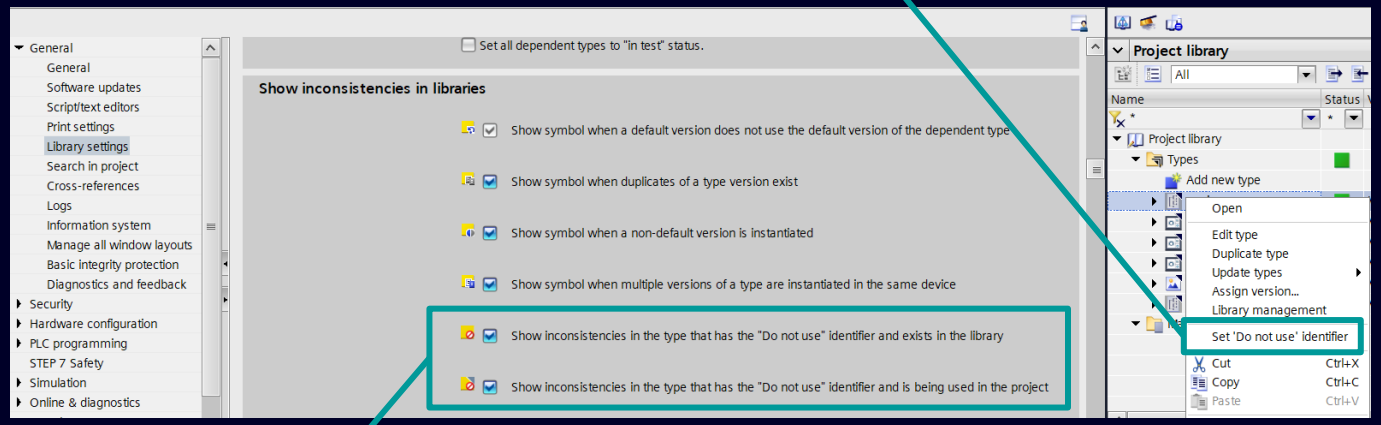
TIA Portal Library types marking “Do not use”

Mark type as “Do not use”



Adjust setting for library type consistency state.

TIA Portal Library types support “Do not use” marking

- New marking can be used to indicate e.g. a template usage of the type or mark a type as obsolete.
- Users can set “Do not use” via the context menu to apply the marking to library types.
- There are two additional library consistency settings to specify the consistency result when “Do not use” types are used in the library and / or the project.
- It is possible to filter types by using the status column.

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TIA Portal Usability

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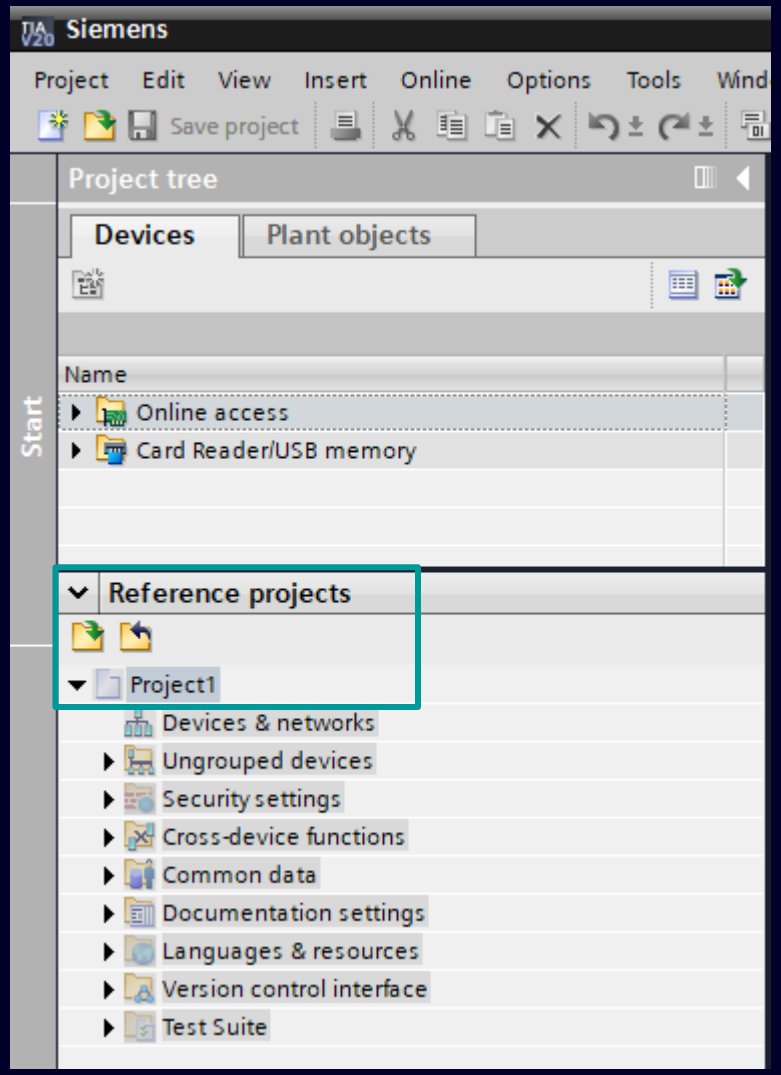
Open read-only TIA Portal projects



Open read-only TIA Portal projects

- If a project folder (and its contents) is read-only in Windows file system, TIA Portal will now open the project as a reference project.
- Before TIA Portal V20, the opening was canceled.

- Such TIA Portal projects can be opened
  - via “Open reference project”
  - via “Project” → “Open…” menu (new)
  - via Windows file explorer (new)

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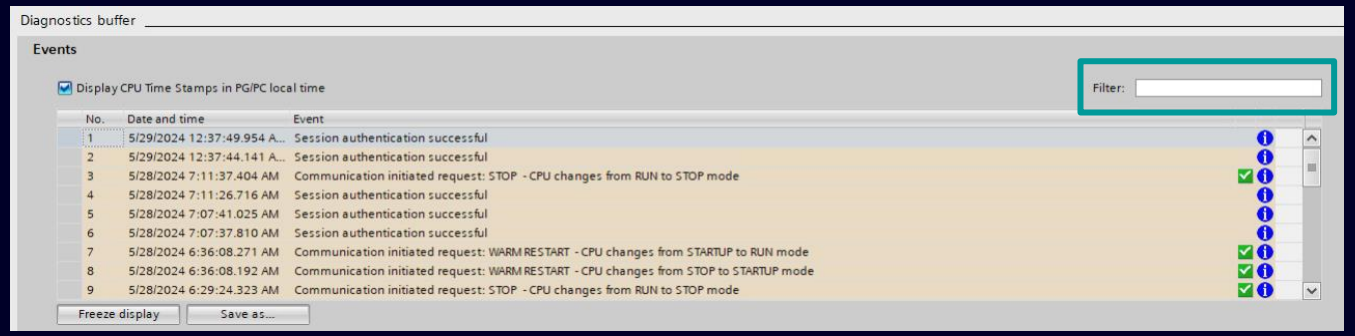
Filter for PLC diagnostics buffer



Filter for PLC diagnostics buffer

- Filter diagnostics buffer entries to simplify finding relevant events
- Filter for free text

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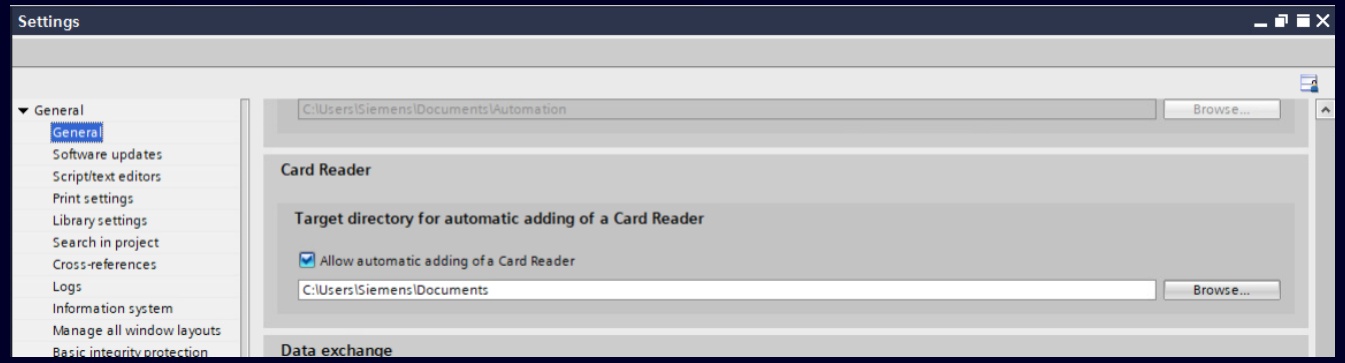
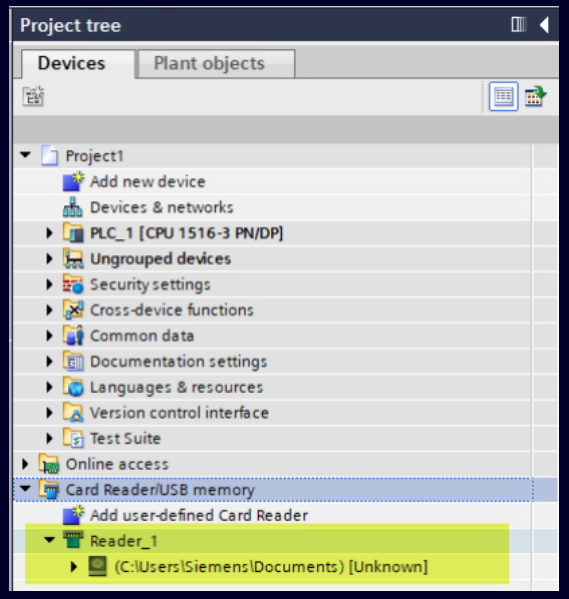
Persistent configuration of user-defined card reader





Persistent configuration of user-defined card reader

- The card reader configuration is saved under TIA Portal Settings “General”.
- The configured card reader will be automatically shown in the project tree after a TIA Portal restart.

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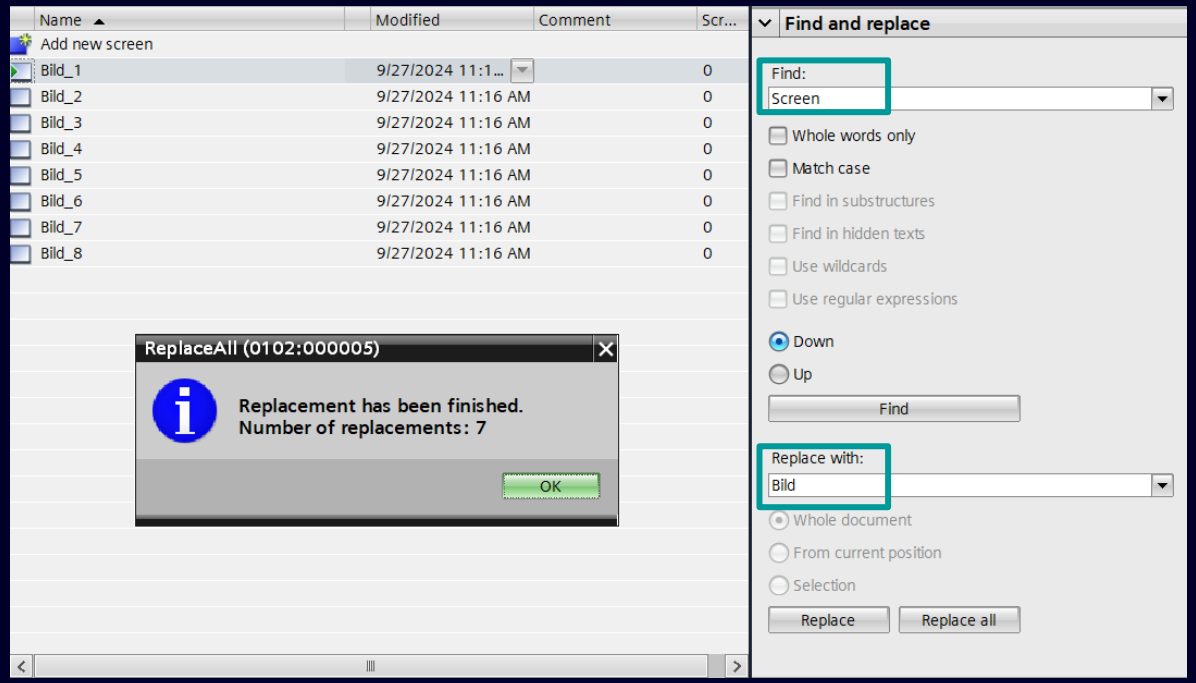
Project Navigator Overview – Search in Details View



Find & Replace in Overview Editor – Details View

- Local “Find and Replace” functionality is available in Overview Editor – Details View for all columns.
- Search options “Whole Word” and “Match Case” are supported.
- “Replace” and “Replace all” is possible.

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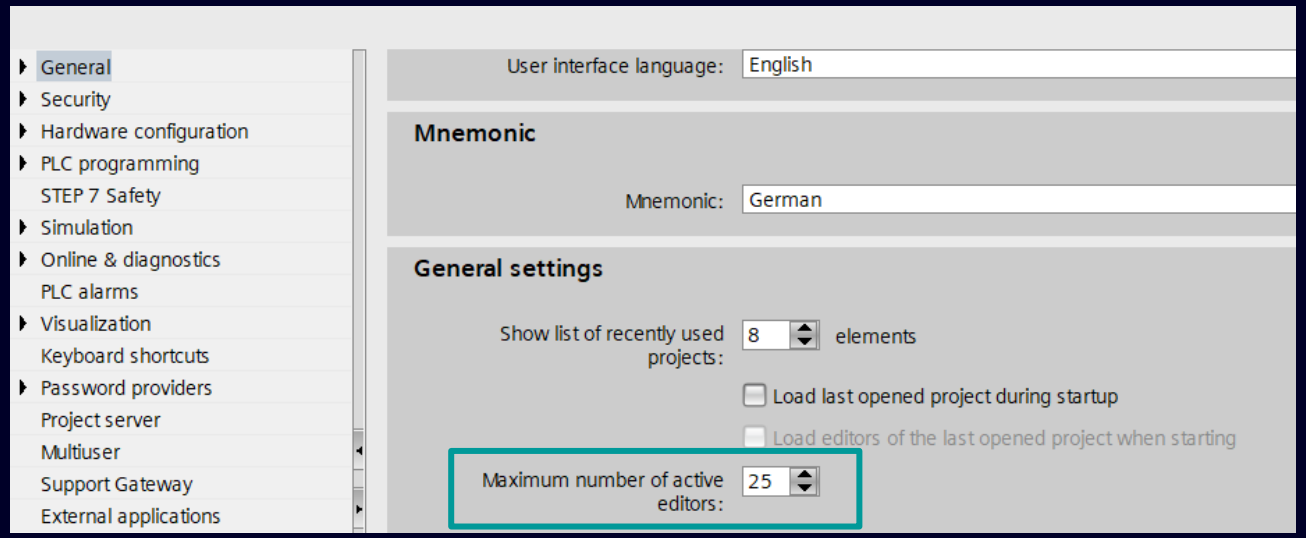
TIA Portal Editor Handling – Resource Management



TIA Portal improved editor resource management

- The improved editor resource management allows the user to open more editors in TIA Portal without any restrictions.
- The setting “Maximum number of active editors” defines the number of latest editors kept in active state during a TIA Portal session. The editors that have not been used recently, go into a hibernated state.
- Changing the value of the setting will affect the number of active editors.
- Accessing a hibernated editor can take the same time as opening it.

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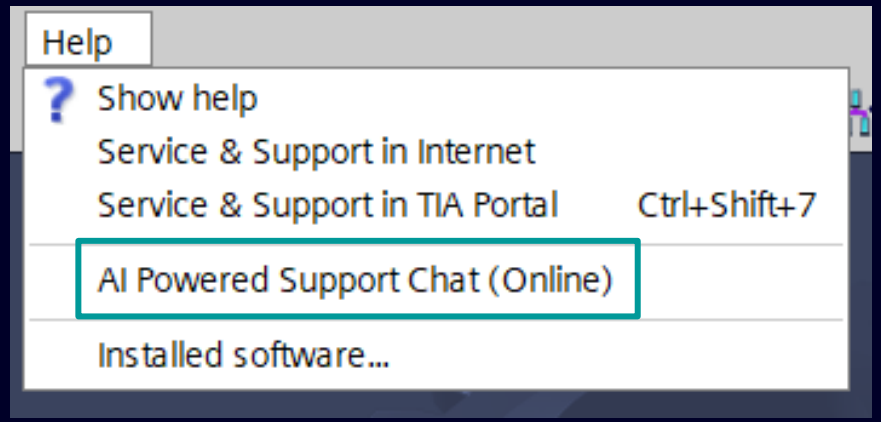
Link to AI Powered Support Chat (Online)



New help menu entry to start AI Powered Support Chat

- By pressing the button you will be directly linked to the SiePortal web page
- Multilingual Query Capability
- Comprehensive Response Delivery
  - Receive a detailed answer
  - Get a direct link to the specific file containing the information you need

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TIA Portal V20
Table of contents

SIMATIC AX - Automation Xpansion

- IT-like PLC engineering workflow (without TIA Portal): Textual hardware configuration
- Support of SIMATIC S7-1500V
- Limited Sales release in USA

new

SIMATIC WinCC Unified – Innovations

Update

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- Improved Engineering efficiency (Corporate Designer, Graphic handling, library, faceplates, CFL, …)
- Connectivity (LOGO!, multiplex DB-Name, ..)
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- Process Orchestration (MTP)

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- Online features for named value data types
- Named value types used by safety blocks and in type libraries

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- Export backup file
- Drive parameter compare
- Unit switching
- Support of new drive firmware functions

TIA Cloud Services

Update

- TIA Portal Cloud & TIA Portal Cloud Connector
- TIA Simulation Cloud *new*
- TIA Project-Server Cloud

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System functions

- Upgrading TIA Portal projects
- PROFINET IRT features
- TIA Portal Documentation
- TIA Portal Openness
- TIA Portal Add-Ins
- Version Control Interface (VCI)

Update

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- **TIA Portal Teamcenter Gateway**
- **TIA Package Manager** new
- **TIA Portal Safety Validation Assistant** new

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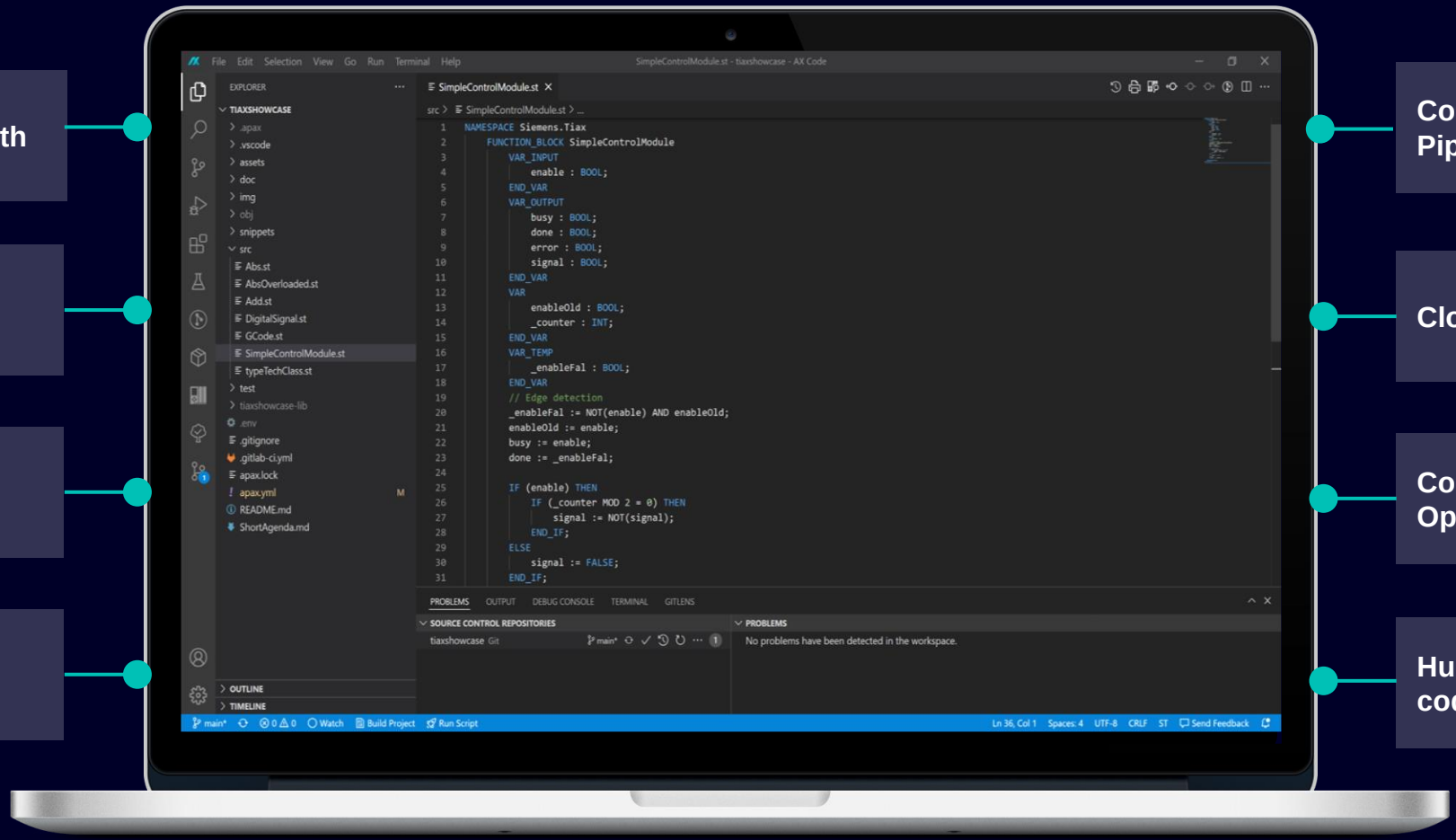
SIMATIC AX in a nutshell

- Object-Oriented Programming (OOP) with Structured Text
- Unit Testing
- Source Control Management via GIT
- Package Management



- Continuous Integration Pipelines
- Cloud Connection
- Community approach with Open Source
- Human-readable plain-text code

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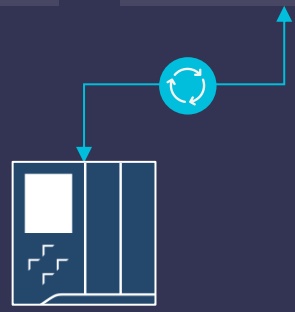
SIMATIC AX Engineering Workflows
From TIAX to IT-like PLC engineering

NEW

TIAX library development

SIMATIC AX
- Library development
- Library testing
- Library conversion into TIAP

STEP 7 TIAP
- Technology objects
- Hardware configuration
- Safety
- User-program
- HW & SW download

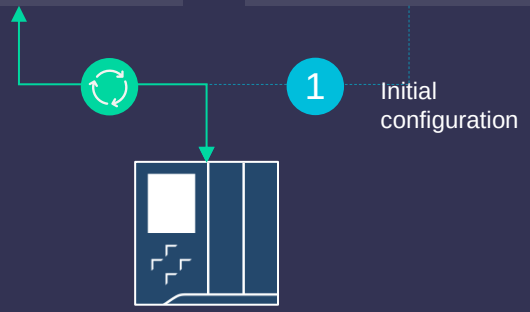


11/2022

TIAX direct application loading

SIMATIC AX
- User-program development
- Library usage
- Software download
- Monitor & Debug

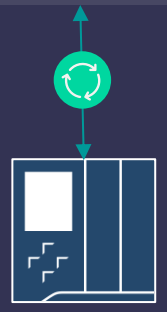
STEP 7 TIAP
- Technology objects
- Hardware configuration
- Hardware download



11/2023

IT-like PLC engineering

SIMATIC AX
- First PLC configuration + download
- User-program development
- Library usage
- Software download
- Monitor & Debug



06/2024

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Supported Hardware (as of 11/2024)

Supported Hardware
CPU 1511-1 PN (6ES7 511-1AL03-0AB0, V3.0 and V3.1)
CPU 1513-1 PN (6ES7 513-1AM03-0AB0, V3.0 and V3.1)
CPU 1515-2 PN (6ES7 515-2AN03-0AB0, V3.0 and V3.1)
CPU 1516-3 PN/DP (6ES7 516-3AP03-0AB0, V3.0 and V3.1)
CPU 1517-3 PN/DP (6ES7 517-3AP00-0AB0, V3.0 and V3.1)
CPU 1518-4 PN/DP (6ES7 518-4AP00-0AB0, V3.0 and V3.1)
all PROFINET-devices (incl. drives) for which GSDML files are provided, regardless of manufacturer
this includes the complete SIEMENS ET200SP, ET200MP and even legacy systems
S7-1500V NEW

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Rollout & Availability
Limited Sales Release[1]

Europe

- Germany
- France
- Netherlands
- Belgium
- Italy
- Spain
- Portugal
- UK
- Austria
- Ireland
- Bulgaria
- Czech Republic
- Poland
- Sweden
- Switzerland
- Denmark
- Finland
- Norway
- Croatia
- Hungary

America

- USA

Asia

- China (mainland)

1 No free market access of SIMATIC AX. All SIMATIC AX projects must be aligned with DI FA according to the defined process. Please contact your local DI FA SSP.

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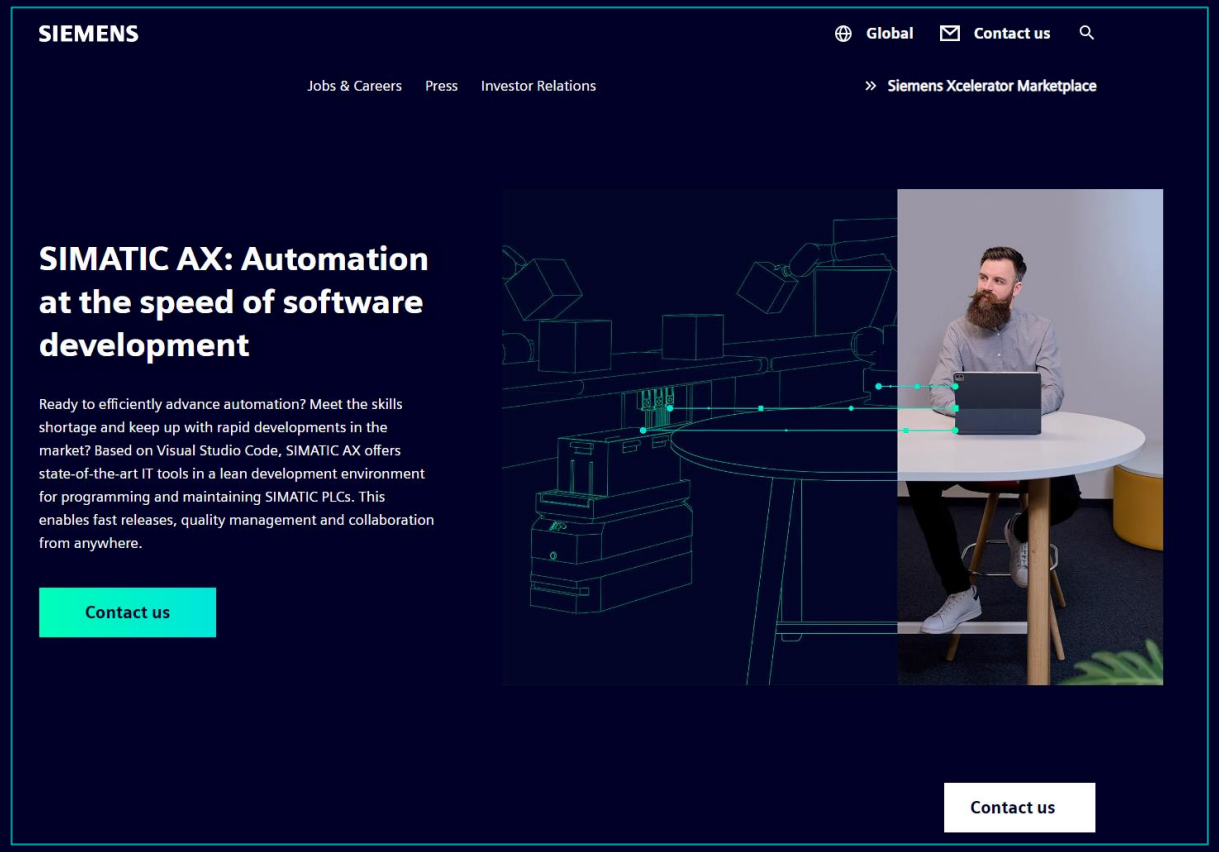
Want to know more?
Visit the SIMATIC AX website on Siemens.com

Visit SIMATIC AX

www.siemens.com/simatic-ax

Click here



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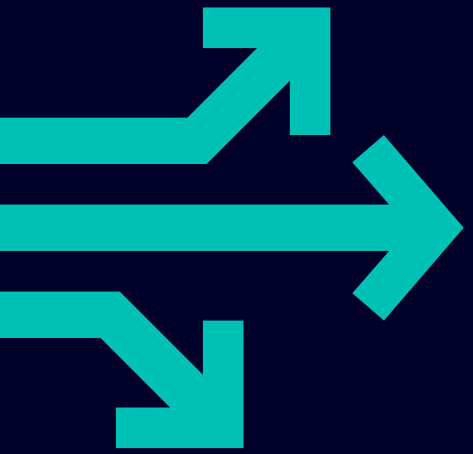
TIA Portal V20
TIA Portal Options

Content



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TIA Portal V20
TIA Portal Options

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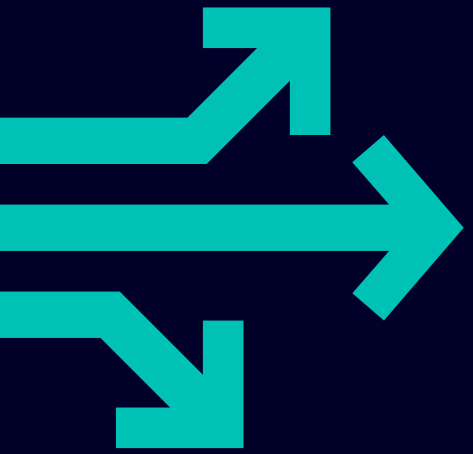

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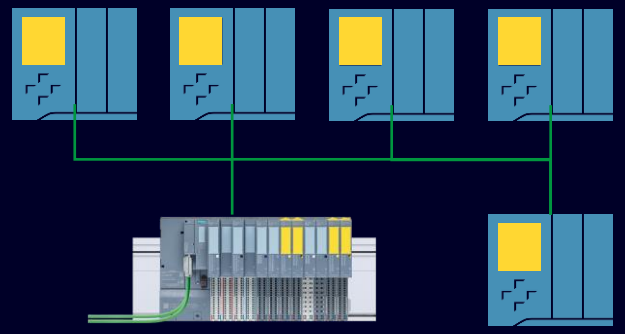
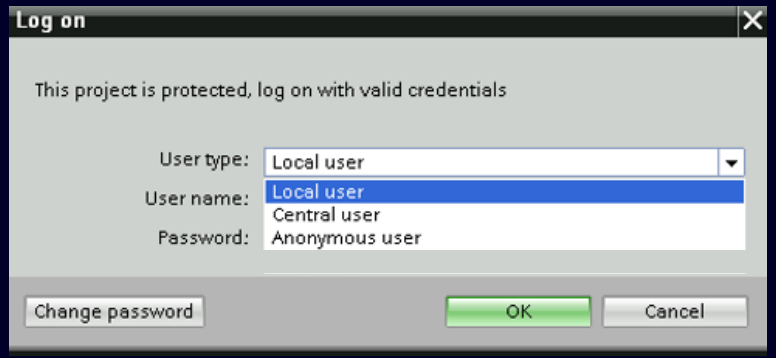
SIMATIC STEP 7 Safety

Integrated shared (I-) device



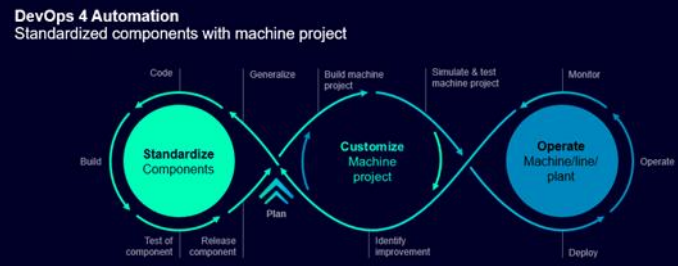
- Configuring of maximum 4 IO-Controller in one TIA-Project possible (instead of 2 based on V19)
- Upload in one TIA-Project possible for shared device & shared I-device
- The communication module CM1542-1 can be used as IO-Controller in Shared Device configurations

User management access control



- Support for runtime authentication via UMC server for all S7-1500 Failsafe PLCs
- Support for local UMAC authentication for S7-1200 Failsafe PLCs
- With UMC user groups changes of runtime failsafe user configuration without download are possible
- Active directory integration via UMC possible for runtime authentication on S7-1500

CI-Support for F-LAD



- Human readable representation of graphical code
- Source code only – no internal meta information
- Version independent syntax
- Works for F-LAD, LAD & DBs & UDTs
- Accessible via Openness

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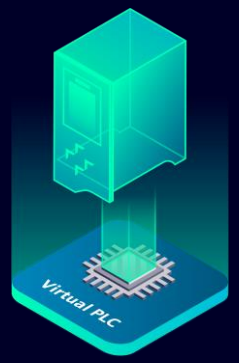
SIMATIC STEP 7 Safety

New PLCs
(151xVF and 1200G2)



Time Service App

Virtual Failsafe SIMATIC S7-1500F PLC

- Hardware independence
- TIA Portal compatible
- App Management over IT/Edge

S7-1200F G2

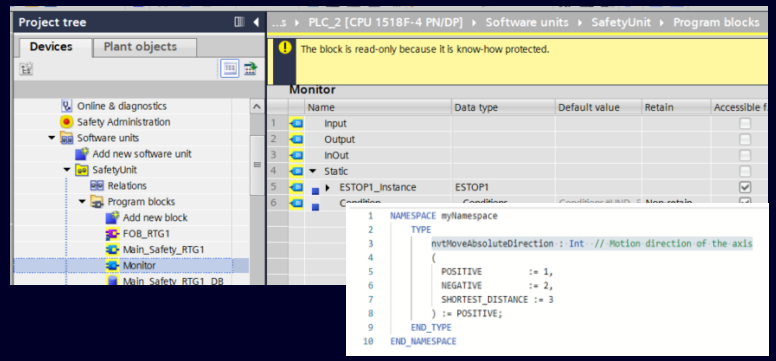
- Integrated in the complete range
- Improved F-IO Portfolio with F-SBs and mixed F-I/O modules
- Integrated in STEP 7 Basic

STEP 7 Safety Basic license



- S7-1200F seamlessly integrated in STEP 7
- No separate Safety license required from V20 onwards for S7-1200F
- Reduce entry costs
- STEP 7 Safety Basic will be discontinued from V20 onwards

Named value types
(NVT)-support for safety



- Know-how protection for Safety blocks utilizing NVTs
- Safety blocks utilizing NVTs may be used in type library (when not know-how protected)

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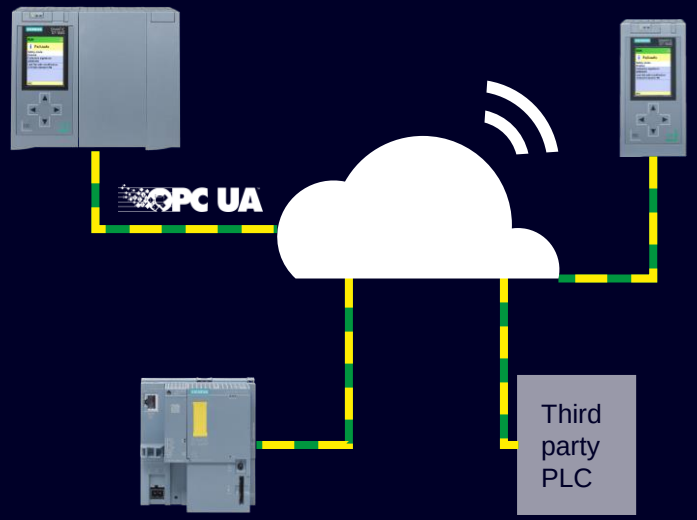
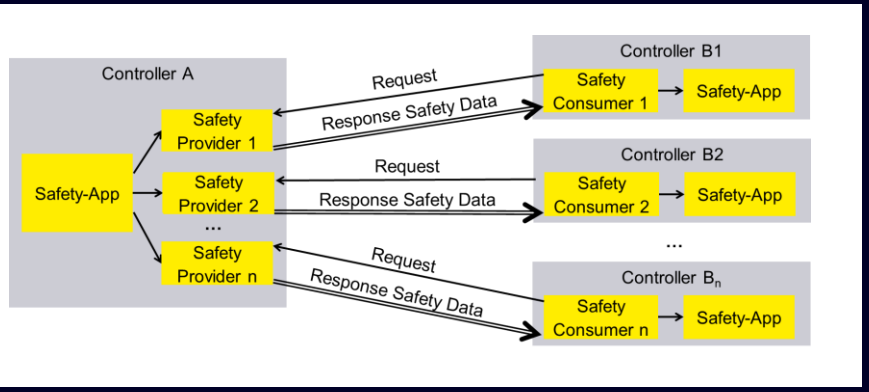
OPC UA Safety
Applications requiring a peer-to-peer safety communication





Delivered with V20 Update 3

NEW

- **Fail-safe Controller-to-Controller (C2C) communication based on OPC UA for S7-1500F CPUs**
- **Vendor independent failsafe communication**
- **Flexible failsafe communication:**
  - Changing communication partners during runtime
  - Not limited to layer 2 networks
  - Global Unique Identifier (BaseID) for safety addressing
- **Dedicated application example for OPC UA Safety will be provided**
- **Focus applications:**
  - Infrastructure / AGVs / Remote control / Oil&Gas / Chemical
- **Limitations due to non deterministic nature of OPC UA**
  - Varying response times of typically >= ~500ms (increased safety timeout necessary)
  - Response times are CPU dependent and influenced by encryption and other communication

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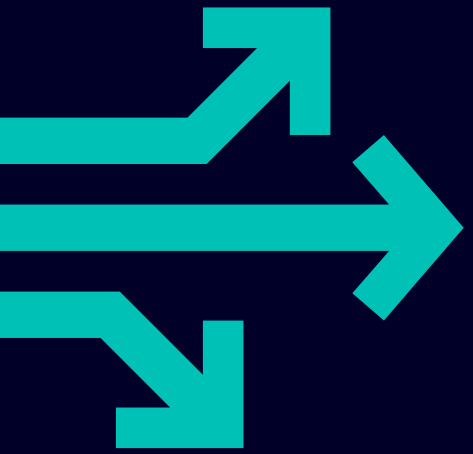
TIA Portal V20
TIA Portal Options

Content



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06	SIMATIC S7-PLCSIM / S7-PLCSIM Advanced
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15	TIA Package Manager
16	TIA Portal Safety Validation Assistant

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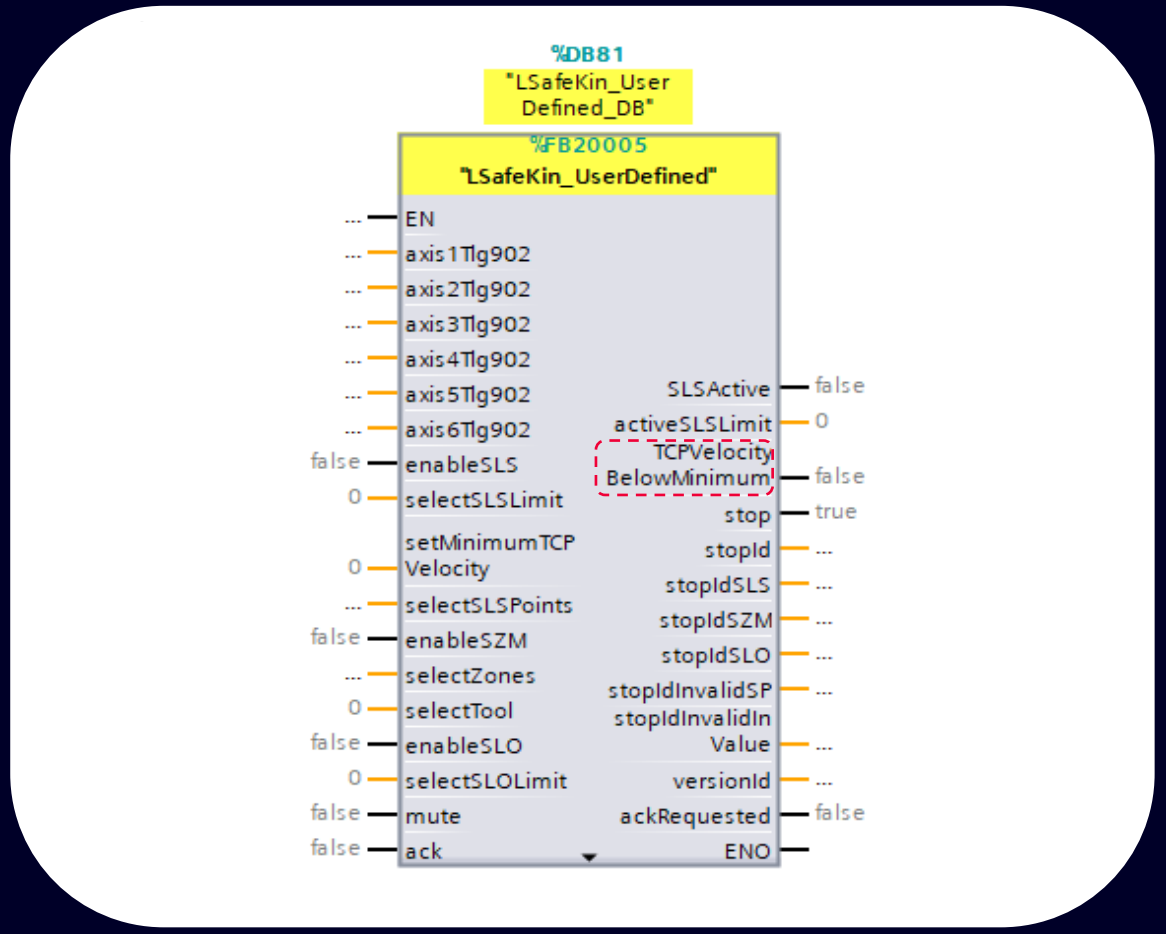
SIMATIC Safe Kinematics and SIMATIC Safe Kinematics for SPU
New Safety function for User-defined Kinematics



Monitor too fast and too slow

- The Function block **LSafeKin_UserDefined** monitors not only if a velocity limit was exceeded but now additionally, if a minimum velocity is maintained at the TCP
- In case the velocity is below the limit, the user program can react accordingly

Benefit

- In applications like laser cutting, a violation of minimum velocity can be handled safely in the User program for example by turning off the laser.

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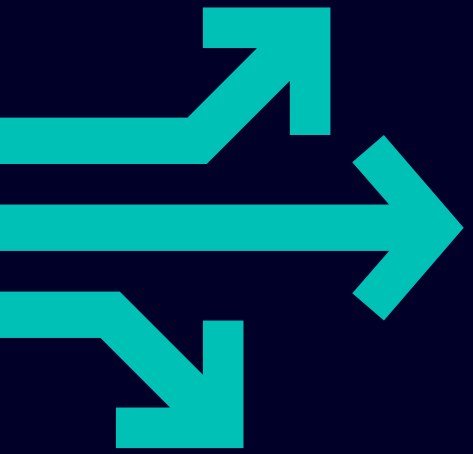
TIA Portal V20
TIA Portal Options

Content



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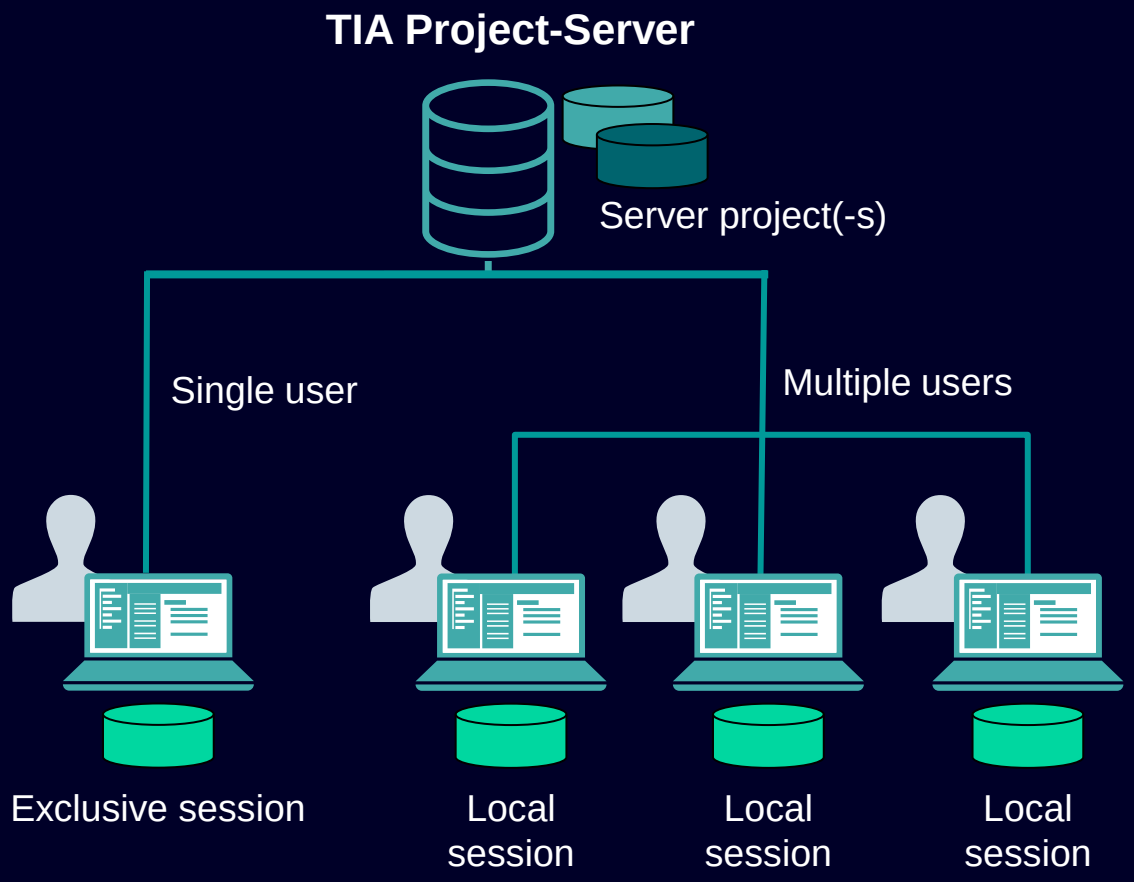
TIA Portal Multiuser Engineering
Enhanced functions and improved workflows



Multiuser engineering in TIA Portal enables simple collaboration on TIA Portal projects or libraries in engineering and commissioning.

Working together on TIA Portal projects significantly shortens configuration times and enables faster commissioning. You avoid time-consuming sending of data or coordination of changes.

Benefit in V20

- Integration of the Kerberos network authentication.
- Expansion of the Synchronous Commissioning Mode to include both Exclusive Session and Exclusive Multiuser Mode within the Multiuser Session.
- Enhancement of Openness functions to allow marking and unmarking of Multiuser objects and to facilitate collaboration with project server groups.
- Improved performance for project server connections, as well as during the creation and check-in of workflows.
- Automatic return to online mode following a successful check-in and refresh.
- Overall performance enhancements.

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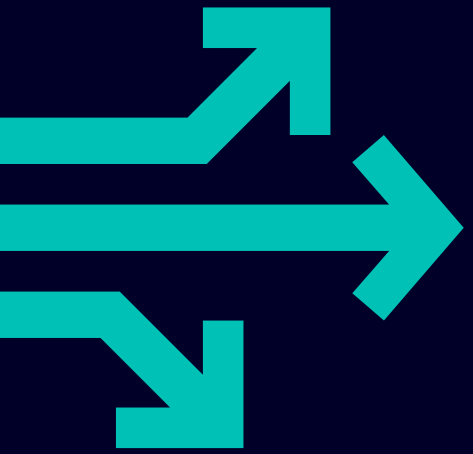
TIA Portal V20
TIA Portal Options

Content



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SIMATIC Robot Library
Supporting manufacturers



Available In progress Pending

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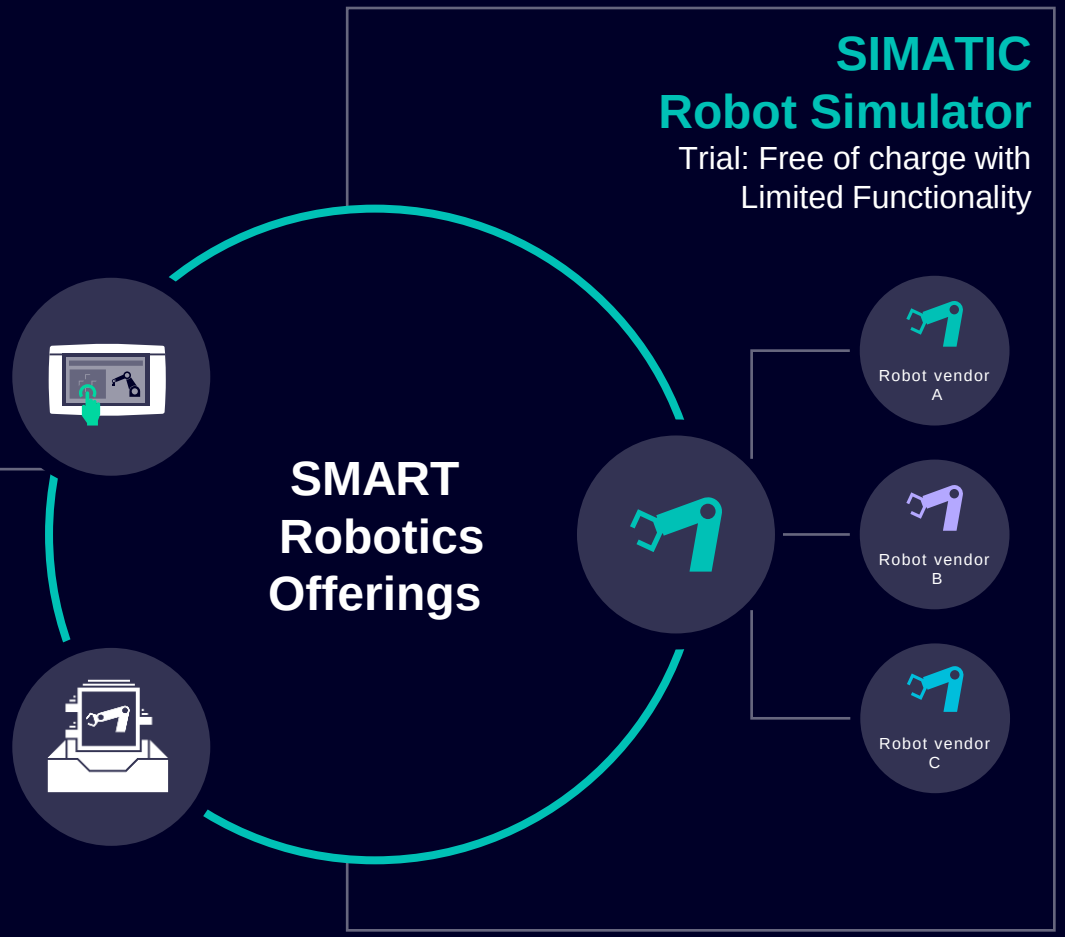
Siemens Smart Robotics
Now making robot simulation more accessible

SIMATIC
Robot Integrator

Free of charge

SIMATIC
Robot Library

- Trial: Free of charge for 8h
- Single Runtime license
- One license per robot arm



The **Robot Simulator** helps you to start with the **Robot Library** in the easiest way possible while enabling you to set up your entire cell virtually

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SIMATIC Robot Simulator
Functions

SIMATIC Robot Simulator



Use the SIMATIC Robot Simulator to increase the value of the SIMATIC Robot Library significantly

Functions

- SRCI based, cross vendor, virtual robot controller
- Seamless integration with existing SIMATIC portfolio
- Validation of robot paths incl. their sequence in early stage of the project regarding
  - Cycle time analysis
  - Singularity detection
  - Reachability analysis

Products & Solutions

- SIMATIC Robot Simulator
- SIMATIC Robot Library
- SIMATIC S7-PLCSIM Advanced
- SIMATIC Robot Integrator

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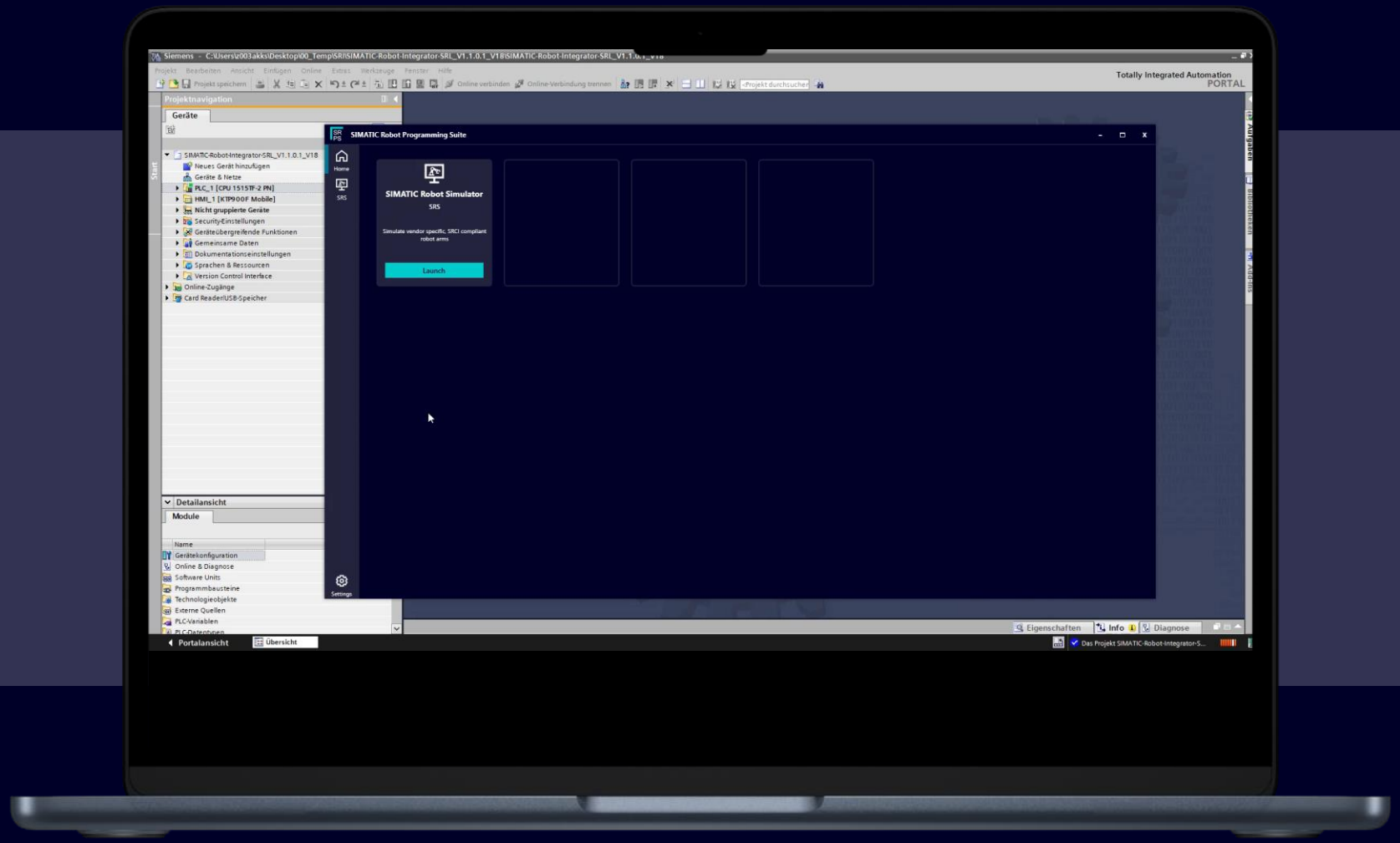
Demonstration of SIMATIC Robot Simulator

Discover how easy and quick the setup with SRS is



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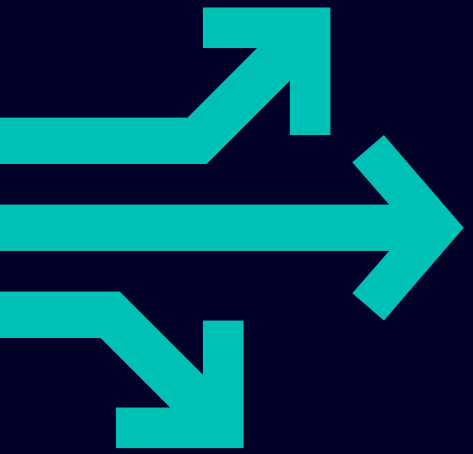
TIA Portal V20
TIA Portal Options

Content



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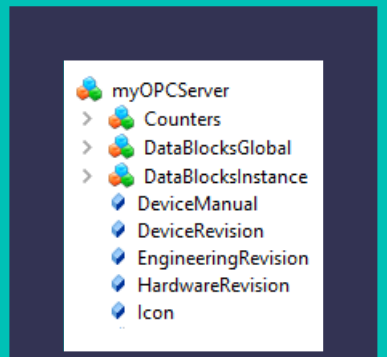
OPC UA – improvement with V20 / FW V4.0
Overview of all new OPC UA features for S7-1500 PLCs

OPC UA Highlights



Quantity structures & Performance *)
- Increased number of nodes for user-defined server interfaces
- Increased number of possible server methods
- Higher performance for Read, Write and Subscriptions

Access control
- Support of access rights for individual OPC UA user
- High flexibility to make data available to authorized users only

Alarms & Conditions
- Alarms & events in individual language by different OPC UA users
- subscribe to 1 out of 3 languages, selectable by the OPC UA client
- subscribe all 3 languages at ones in parallel (to be consistent)

Subscription Handling
- Load balancing between different clients
- Subscription can be transferred to other available OPC UA clients

Interface modeling
- TIA Portal Add-In for fast & easy creation of user-defined interfaces
- Replacement of generic SIMATIC server interface with user-defined interfaces

*) new S7-1517/1518 HW only

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OPC UA improvements V20 / FW 4.0
Higher performance & increased quantity structures

	CPU 1517	CPU 1517 (new)	CPU 1518	CPU 1518 (new)
Improvements quantity structures				
User-defined server Interface				
No. of server interfaces	10	10	10	10
No. of nodes for user-defined server interfaces	30,000	**100,000**	30,000 / 50,000 (V19)	**200,000**
Subscriptions				
No. of subscriptions per session	50	50	50	50
No. of monitored items, total	50,000	50,000	50,000	**60,000**
Methods				
No. of server methods	100	**4,000**	100	**8,000**
No. of parallel running server methods, max	20	***100***	20	**200**
No. of in/outputs per server method	20	20	20	20
Improvements performance				
Read, Write		**up to factor 4 faster**		**up to factor 3 faster**
No. of monitored items (with 1s sampling/publish interval)	10,000	**50,000**	10,000 / 24,000 (V18)	**60,000**

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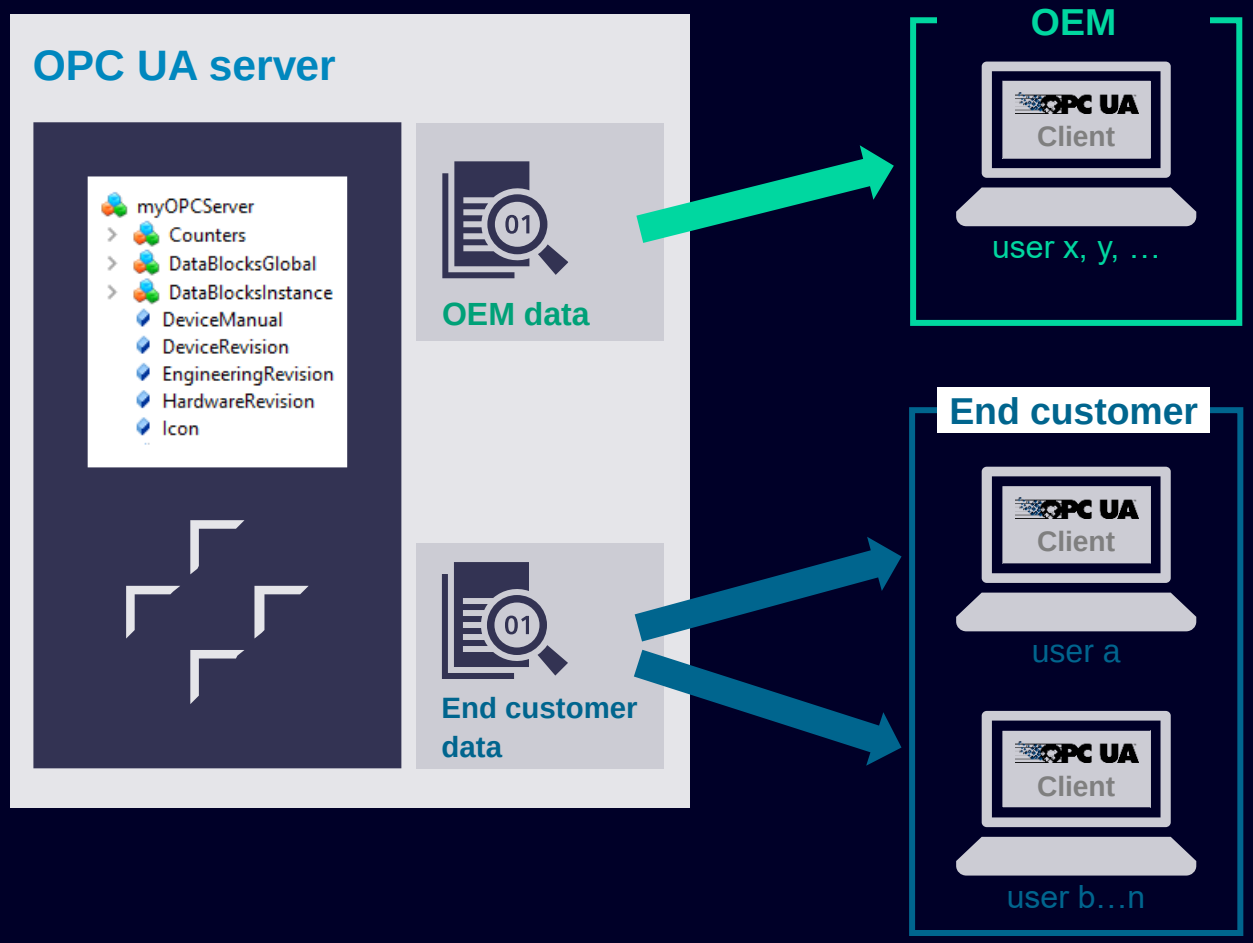
OPC UA – User & Roles
Defined access to variables by different OPC UA users



Support of access rights for individual OPC UA user

Definition of access rights at the OPC UA server

- for each OPC UA client / role individual
- based on node set or interfaces
- pre-defined in user information model (e.g. Companion specs, using SiOME)

Benefits

- High flexibility to make data available to authorized users only
- Quick & easy engineering within TIA Portal
- Access management based on UMAC concept (local and central user management)

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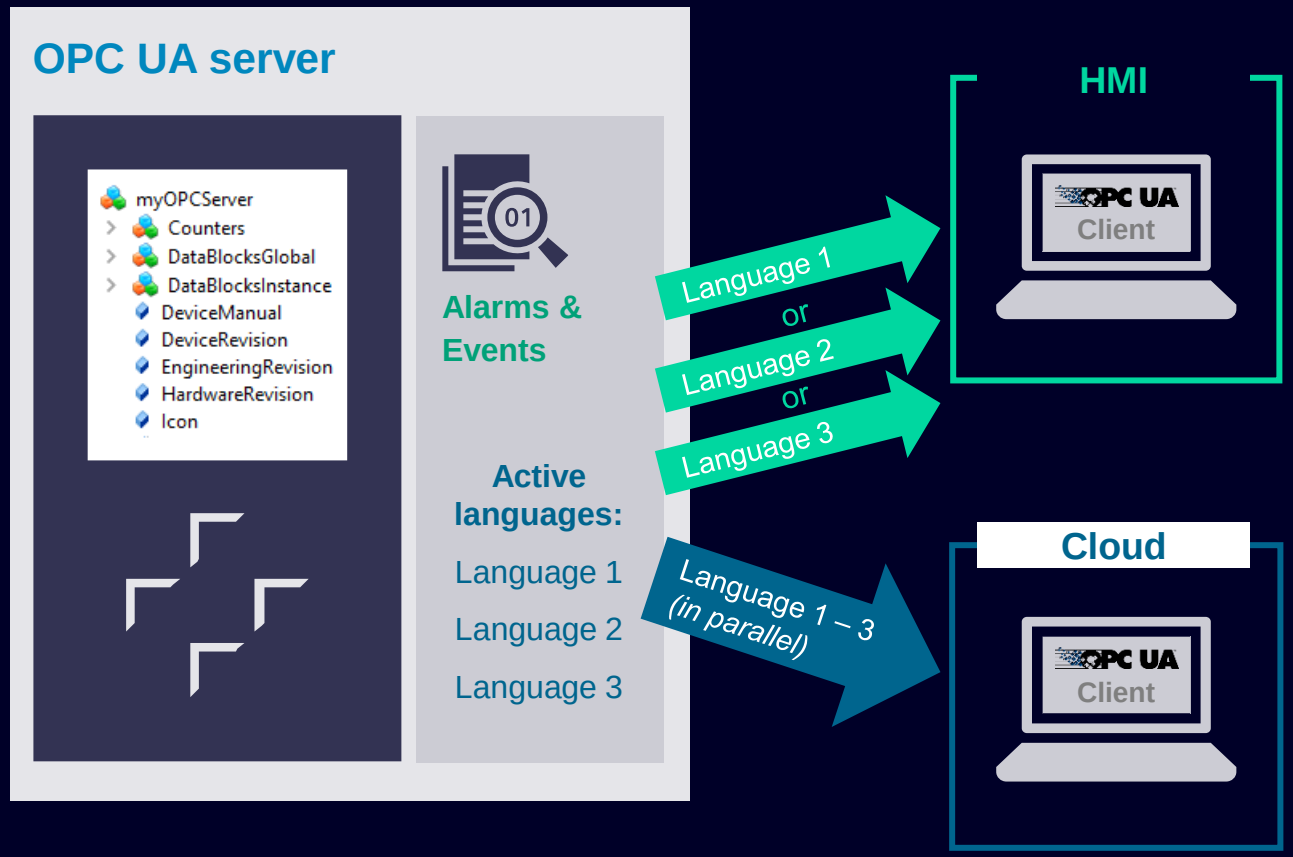
OPC UA – A&C multi language support
Alarms & events in individual language by different OPC UA users



Use Cases

A) plant & machine control

get information about any issues and production stops or periodical alarms and maintenance

- subscribe to 1 out of 3 languages, selectable by the OPC UA client

B) predictive maintenance

user would like to collect all alarms & events in a central data system for investigations

- subscribe all 3 languages at ones in parallel (to be consistent)

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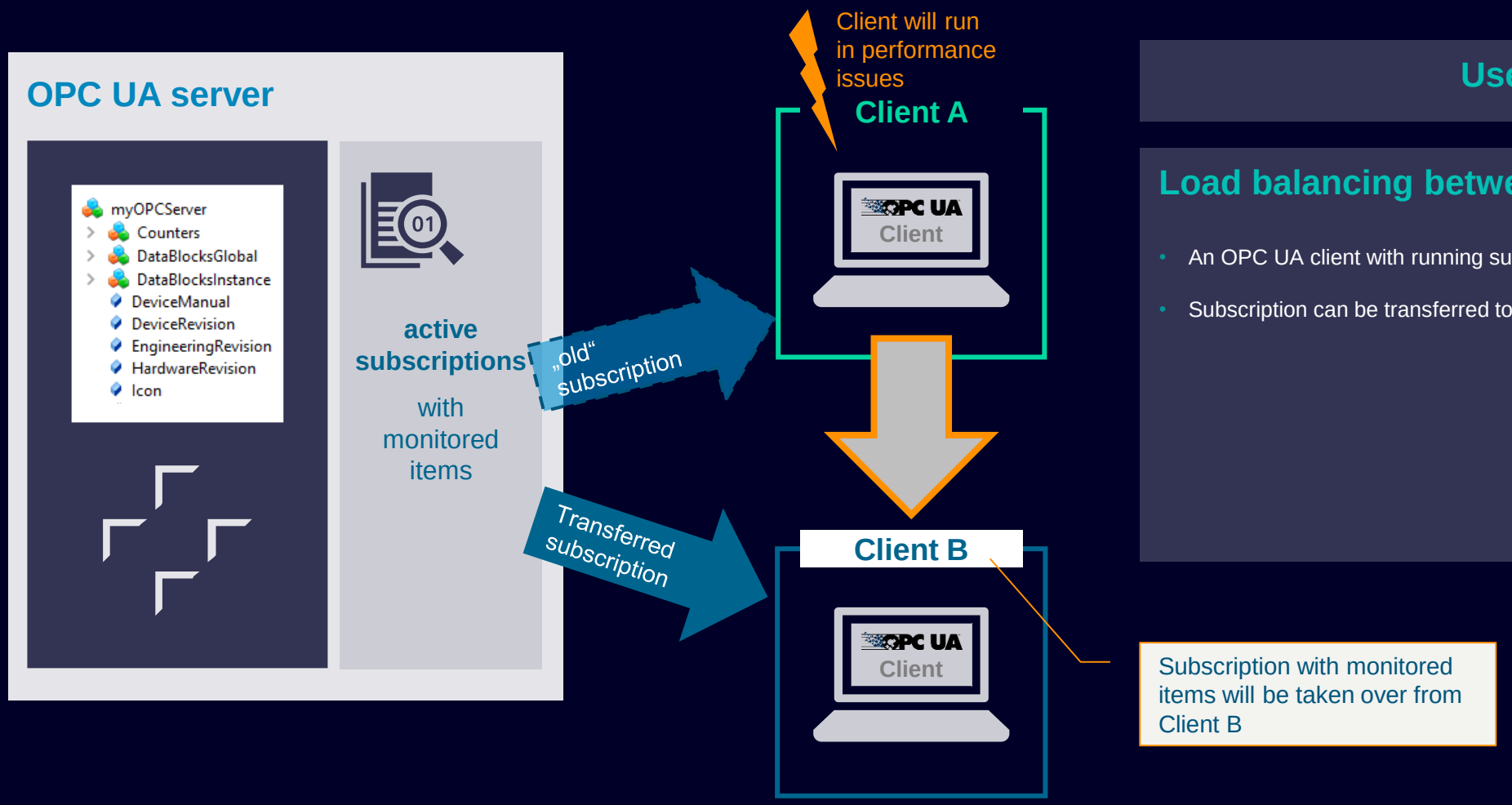
OPC UA – Transfer Subscription
Handling of subscription by the external clients



Use Cases

Load balancing between different clients

- An OPC UA client with running subscription gets performance issues
- Subscription can be transferred to other available OPC UA clients

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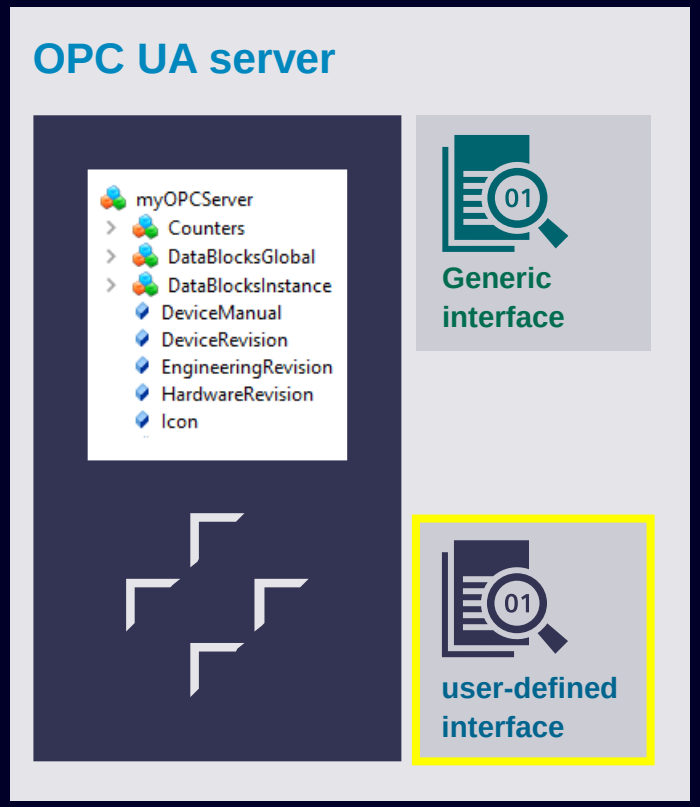
OPC UA – TIA Portal Add-In for user-defined interfaces
Fast & easy creation of user-defined interfaces



New TIA Portal Add-In creates a user-defined interface for OPC UA server

Enhanced performance
- Replacement of generic SIMATIC server interface with user-defined interfaces that offers improved performance

Automatic interface generation
- Create server interfaces for S7-1200 and S7-1500 R/H PLCs which do not support the generic SIMATIC server interface

Customization to fit project needs
- Provide flexibility by allowing customization of the server interface to meet specific project requirements

Download

TIA Portal Add-In has been published on GitHub:

https://github.com/tia-portal-applications/tia-addin-opc-ua-modelled-interface

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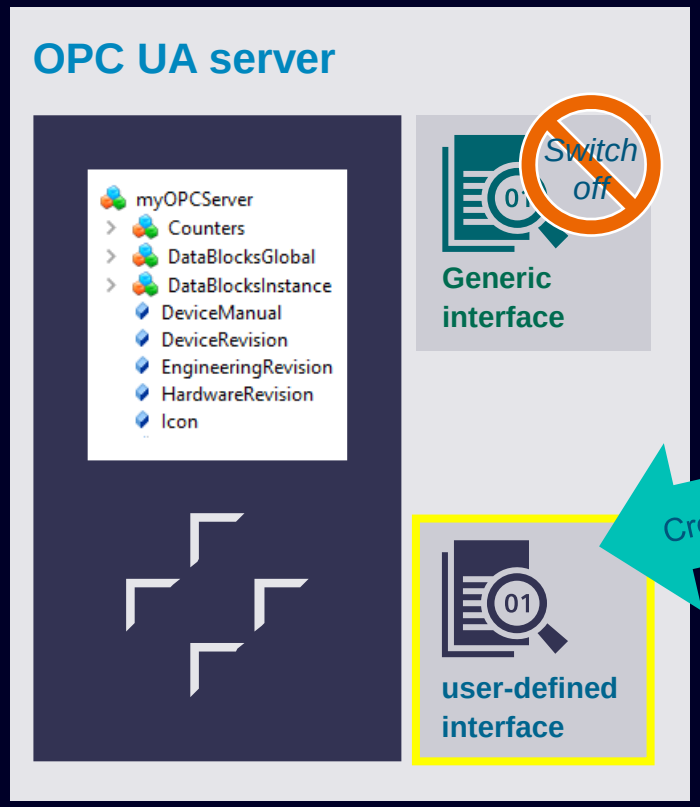
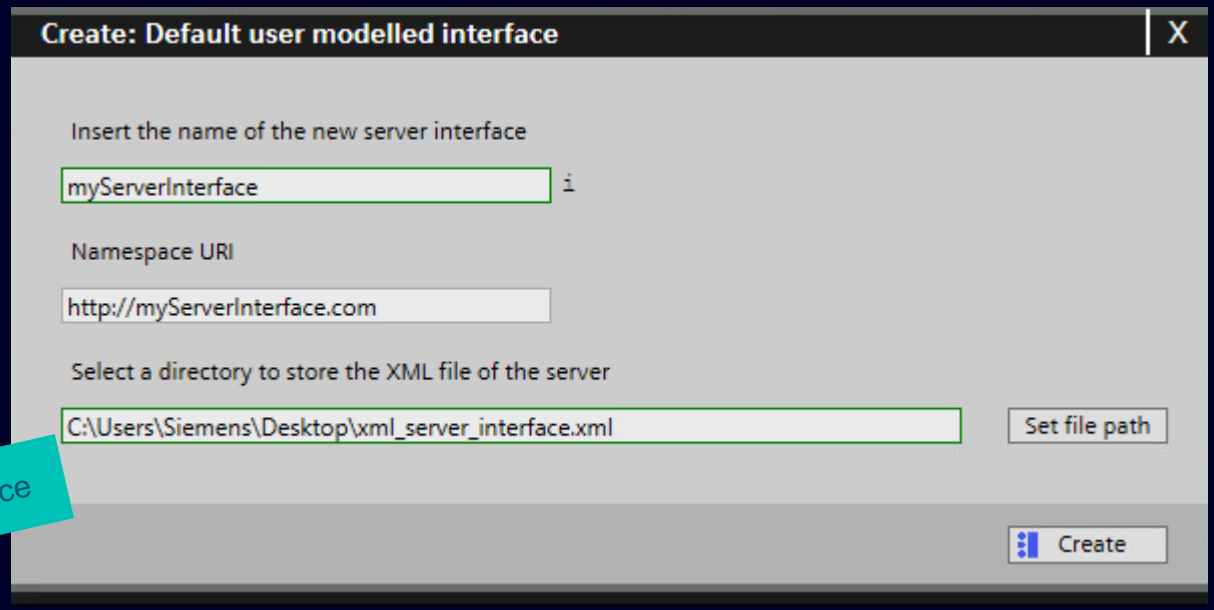
OPC UA – TIA Portal Add-In for user-defined interfaces (2)
Fast & easy creation of user-defined interfaces





New TIA Portal Add-In creates a user-defined interfaces for OPC UA servers, based on all variables that are accessible via OPC UA

- arranges nodes in a structured manner
- eliminating the need for manual configuration
- significantly reducing time and effort

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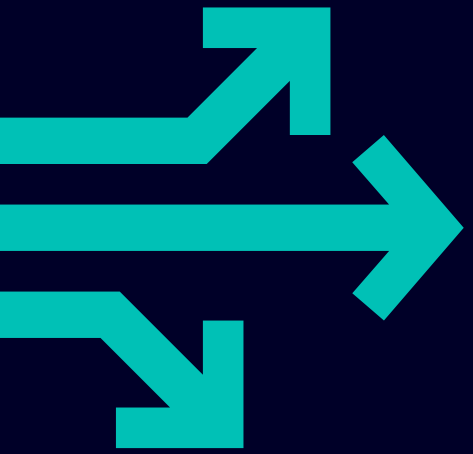
TIA Portal V20
TIA Portal Options

Content



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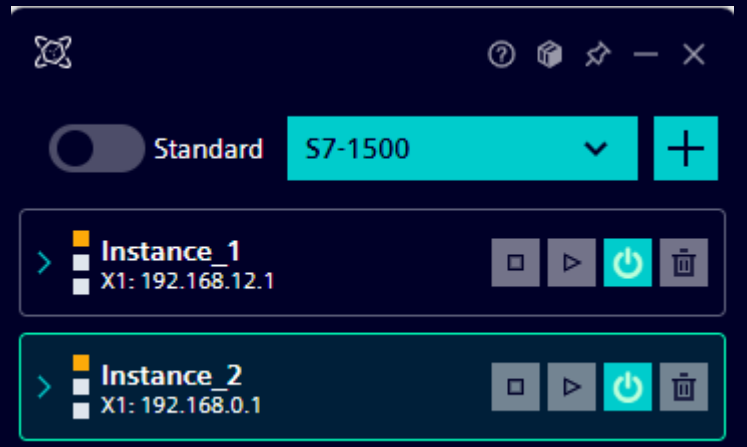
S7-PLCSIM V20
Enhanced new User Interface support Standard and Advanced Customers

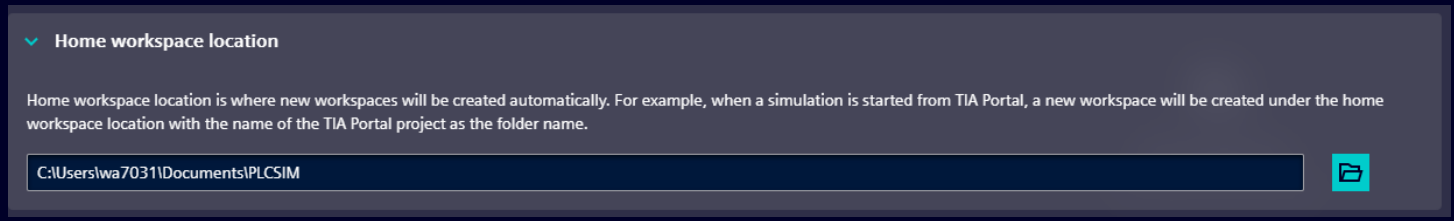
Key Enhancements SIMATIC S7-PLCSIM V20:

- Expanded Hardware Support:
  Now compatible with the latest **S7-1200 G2** and **new S7-1500 PLC** variants, ensuring seamless integration with the most recent hardware.
- Updated Firmware Compatibility:
  Full support for the latest firmware versions in both S7-1200 and S7-1500 controllers.
- Improved Migration:
  Easily import sequences from older PLCSIM versions to maintain continuity in your projects.
- Efficiency with Shortcuts:
  Boost your productivity with newly introduced keyboard shortcuts for faster navigation and control.
- Improved User Interface:
  A refreshed interface provides a more intuitive experience, with both S7-PLCSIM Standard and Advanced* functionalities integrated.

Essentials View: Focus on what matters most with the new Essentials View. Minimize the UI to display only the list of PLC instances, and keep it pinned for quick access. Creation of new instances can be done here directly.
This new view can be used as PLCSIM Advanced Control Panel. Even, once a PLC instance in Advanced mode is started, this instance is shown on the Essential View.



Improved Workflow: Save time with a more streamlined startup process. PLCSIM can now be launched directly without the need to create or save a workspace, simplifying your workflow.



* S7-PLCSIM Advanced license required

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S7-PLCSIM-Advanced V7.0
Key enhancements

With SIMATIC S7-PLCSIM Advanced, virtual controllers for simulating S7-1500 based controllers can be created and used for extensive simulation of functions.

Key Enhancements SIMATIC S7-PLCSIM Advanced V7.0

- Expanded Hardware Support:
  Compatible with the latest innovated S7-1500 Hardware PLCs 1516T / 1517 / 1518 CPUs with their bigger quantity structures in program and data memory - ensuring seamless integration with the most recent hardware.
- More precise simulation through feature configuration support.
  Any new PLC instance behaves after the first project download in terms of PLC memory and other specific resources like tags as the corresponding real PLC. No bigger program can be downloaded anymore to the simulation as to a real PLC. Behaving as a real PLC includes that overloading with another PLC type is not possible.
- Extended Compatibility:
  TIA Portal projects from versions V14 to V20 as well as CPU firmware versions V1.8 to V4.0 are now supported.
- Streamline API Versions:
  Supporting the API versions from V3.0 to V7.0 by carving out the earliest legacy variants.



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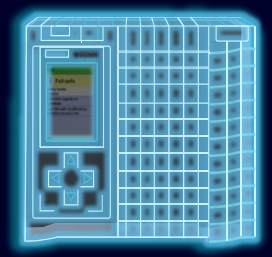
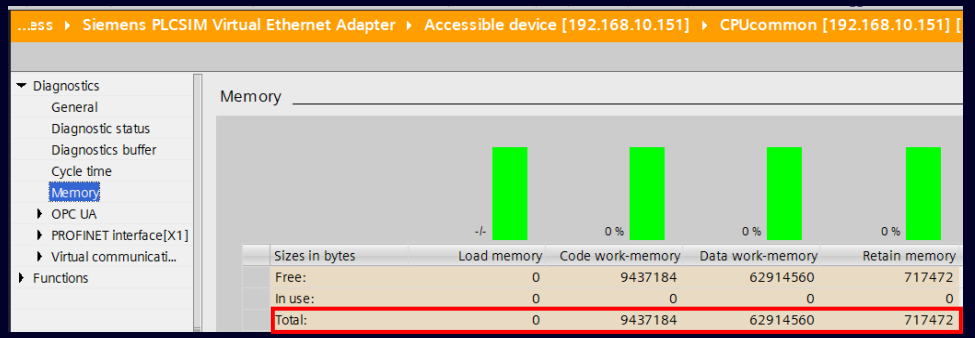
S7-PLCSIM-Advanced V7.0
More precise simulation 1/2

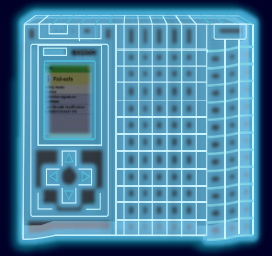
Previous behavior
Start PLCSIM specific instance
S7-1511 6ES7511-1AL03-0AB0



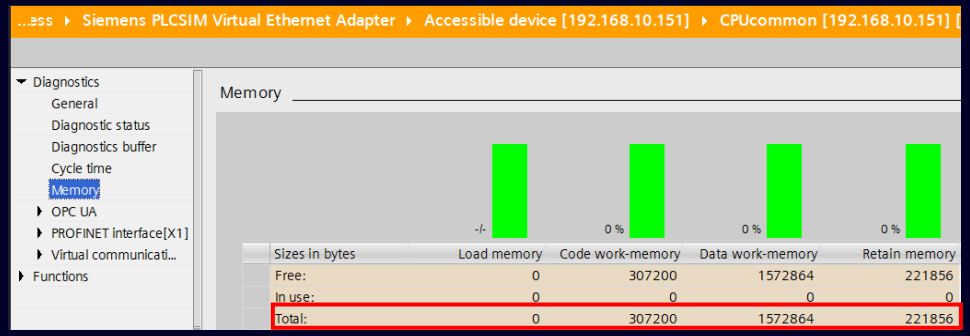
Always Maximum memory allocated



New behavior
Start PLCSIM specific instance
S7-1511 6ES7511-1AL03-0AB0



Exact memory allocated for selected CPU



Previous behavior
S7-PLCSIM Advanced allocates for any PLC type the maximum quantity structure. Means starting up a new instance reserves more memory of the PC as needed and a download to a to smaller PLC type was possible despite of a to big project size.

New behavior
The original quantity structure is adjusted during download of any PLC type.
Means that the PLC instance using less memory on a PC if downloaded PLC is smaller than the previous biggest PLC.
A download is only possible if the project is within defined resources for that specific PLC type.

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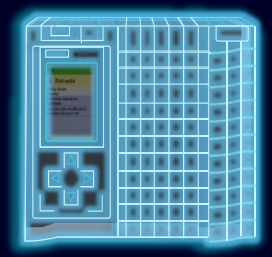
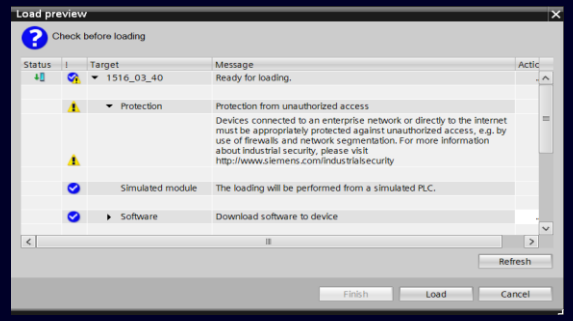
S7-PLCSIM-Advanced V7.0
More precise simulation 2/2

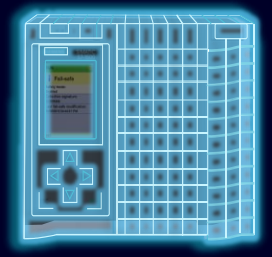
Previous behavior
Start PLCSIM specific instance
S7-1511 6ES7511-1AL03-0AB0



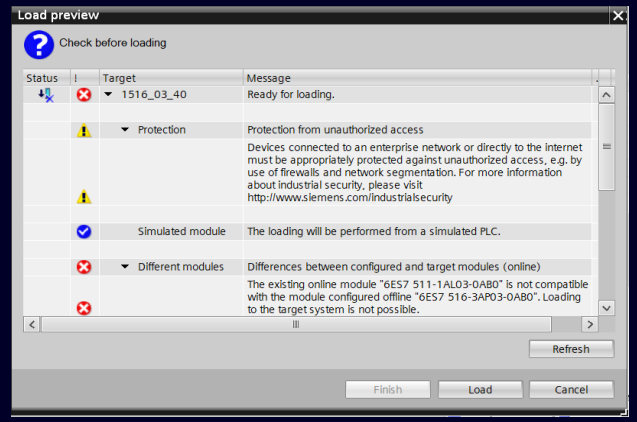
Download of incompatible PLC is **possible**
e.g. 1516 6ES7516-3AP03-0AB0



New behavior
Start PLCSIM specific instance
S7-1511 6ES7511-1AL03-0AB0



Download of incompatible PLC is **forbidden**
e.g. 1516 6ES7 516-3AP03-0AB0



Previous behavior

S7-PLCSIM Advanced always accepts the overloading of different PLC types in a long existing simulation instance in case the PLC family is the same. This is not the behavior of a real PLC and this of course can run in trouble scenarios over time.

New behavior

Overloading with compatible PLC is possible but not with different PLC types anymore. The instance is after first download PLC type specific and behaves like real PLC in all download scenarios.

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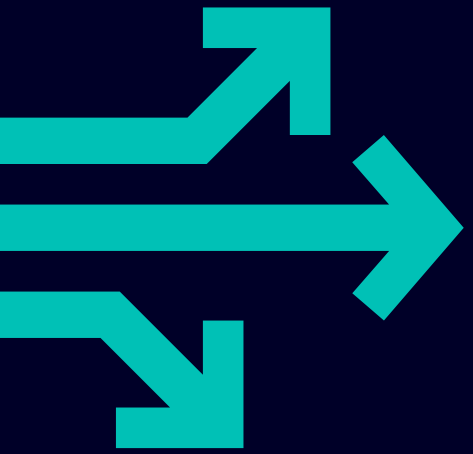
TIA Portal V20
TIA Portal Options

Content



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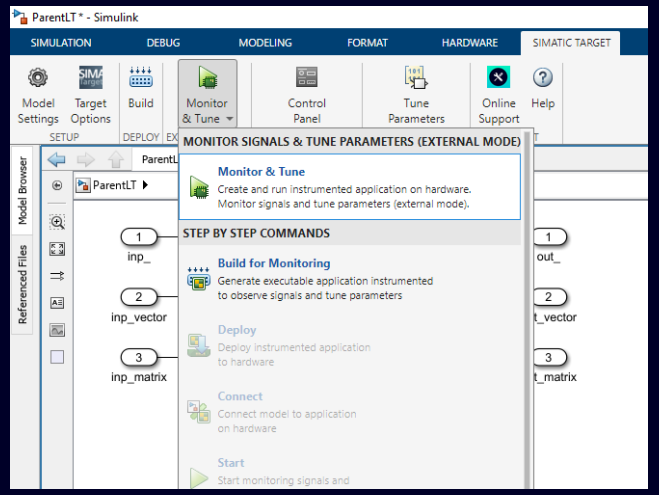
SIMATIC Target™ for Simulink® V6.0 SP2
General Improvements

Enabled by SIMULINK® MathWorks

Improvements to Simulink Target Toolstrip

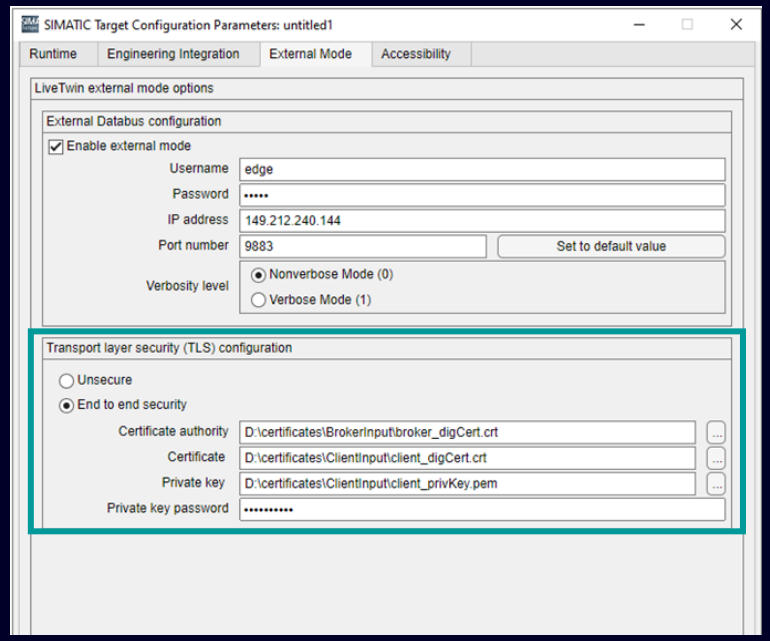
New controls in the Target Toolstrip:

- Control Panel: Navigates to External Mode Control Panel
- Tune Parameters: Navigates to Model Data Editor to inspect and edit data items like 6202 signals and parameters



Secure External Mode for LiveTwin Target

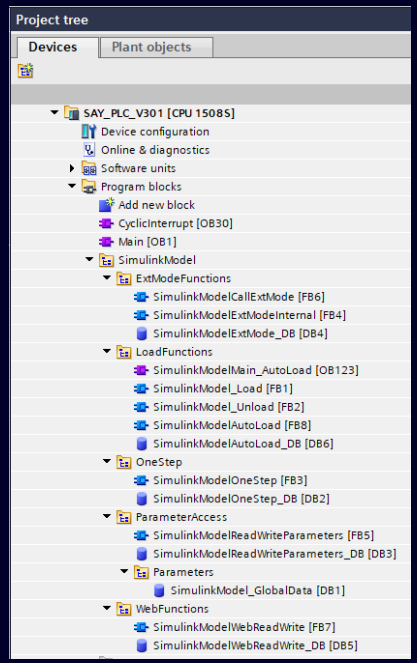
- All external mode communication between LiveTwin Runtime and Simulink is now encrypted



User group handling for generated blocks

Proper handling of user groups in the TIA Portal PLC program:

- All re-generated program blocks will be stored in their original location



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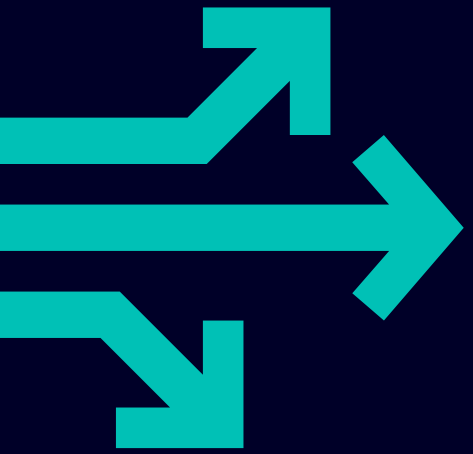
TIA Portal V20
TIA Portal Options

Content



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16	TIA Portal Safety Validation Assistant

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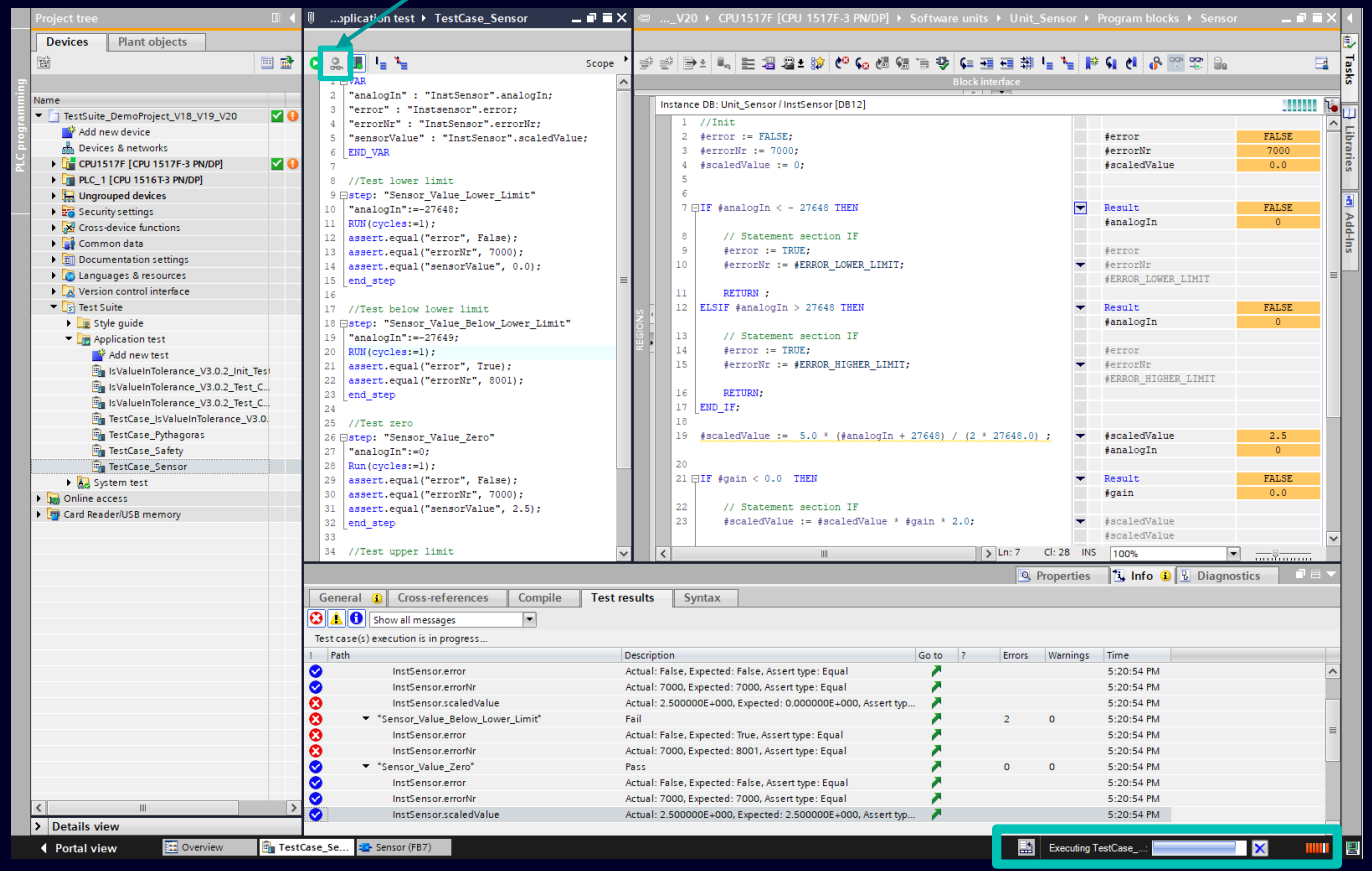
Test Suite V20
Application Test improvements



Run test case and debug PLC program in parallel

If a test case fails, the “Execute test case in background” option helps with troubleshooting during test execution by using debugging mechanisms of TIA Portal, such as:

- Block monitoring and watch tables
- Breakpoints in SCL / STL code
- Signal traces

Benefits

- Identifying programming errors becomes easier as the user can now monitor blocks, set breakpoints or watch trace records during test execution.
- During test execution, the user can proceed with other engineering tasks, such as e.g. HMI engineering.



S7-PLCSIM Adv.

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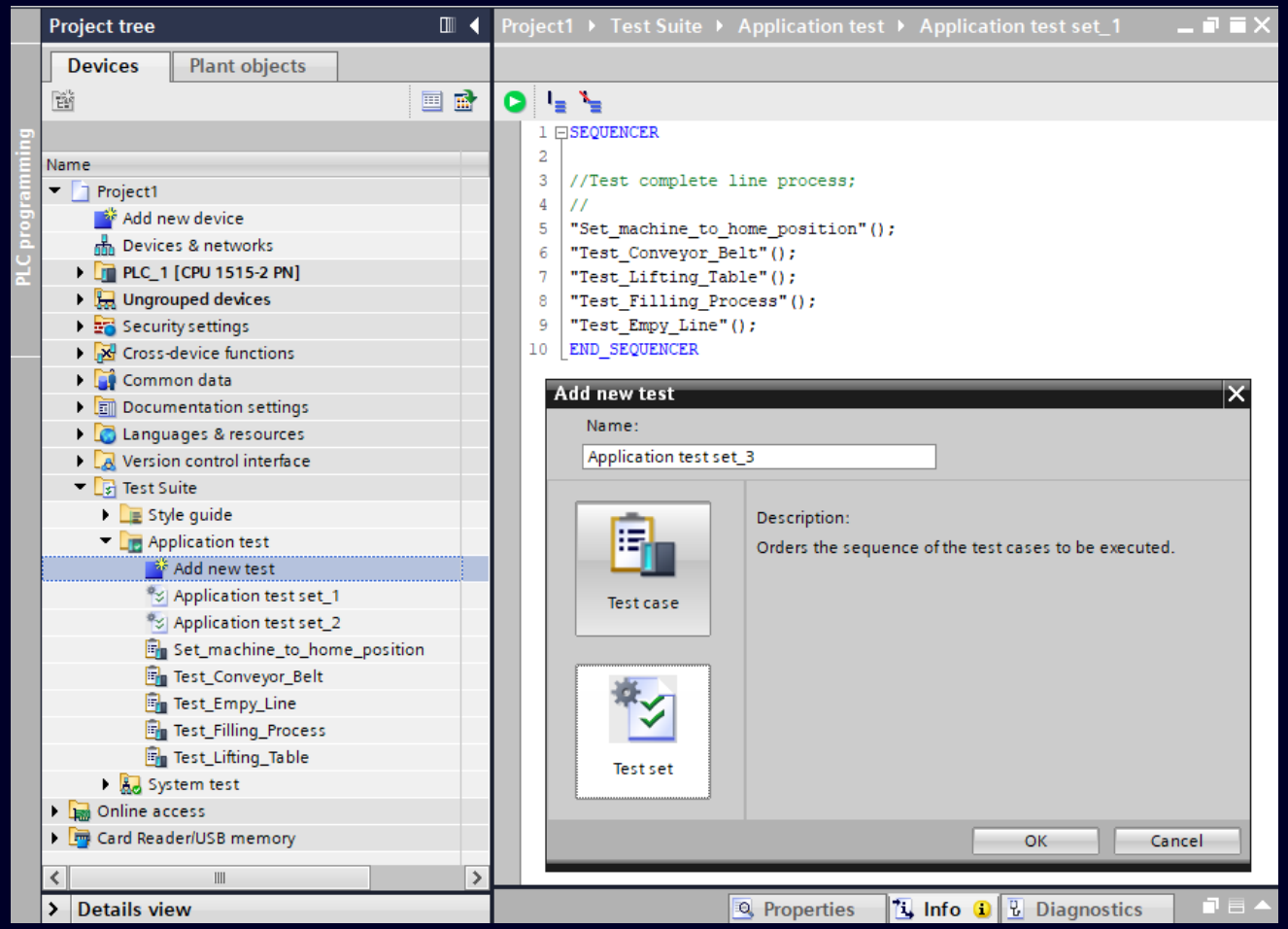
Test Suite V20
Application Test improvements

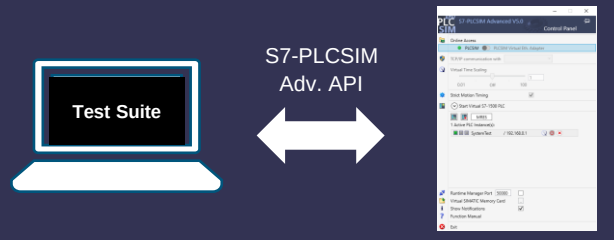


Test Set – Organize test cases

- Arrange and specify the execution sequence of test cases using the new "Test Set" concept.
- Import and export of test sets in a text format.
- Automate the execution of test sets within pipelines using the provided Openness APIs.

Benefits

- Provide quick feedback by executing only the relevant test cases.
- Minimize redundancy.
- Enhance test coverage and ensure traceability between the program and tests.
- Categorize test cases based on their relevance.



S7-PLCSIM Adv.

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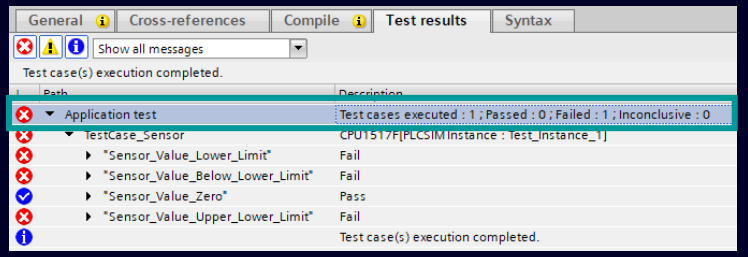
Test Suite V20
General Improvements

Application test

- Support of SIPLUS S7-1500 PLCs
- Verification of data types **DATE , TOD , LTOD** and **LTIME** signals are supported now
- Summary of Passed/Failed/Inconclusive test cases



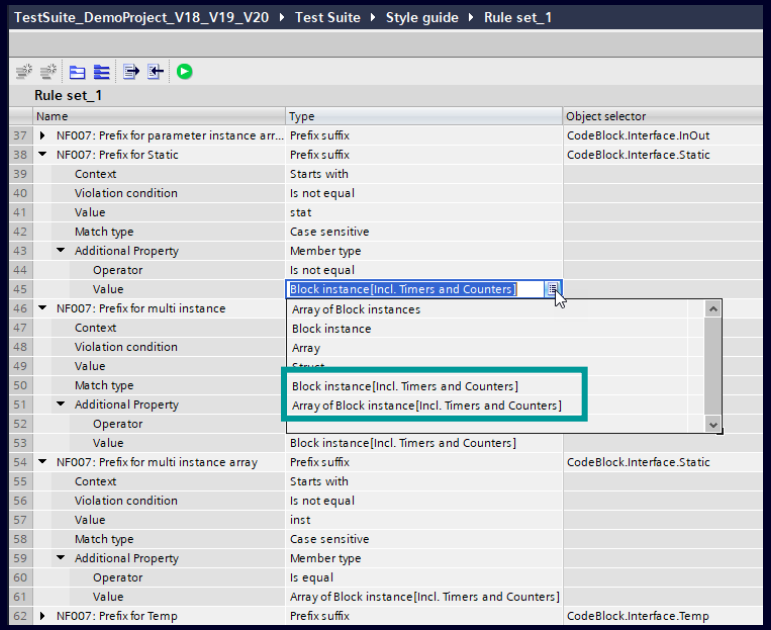
System test

- Openness APIs to delete and rename a test cases
- Summary of Passed/Failed/Inconclusive test cases
- Optional parameter for Wait statement to specify condition (Equal or In range):
  - Supported data types : Binary numbers and Integers
  - Intuitive feedback message about test completion is based condition met or time out specified

```
7  STEP: "Test_Conveyor1"
8  //Trigger the job
9  "TriggerMode" := TRUE;
10 "ConveyorUnit1_DB"."Inputs"."Timer1_in" := TRUE;  // Perform the action
11 // Wait for the job to be completed
12 WAIT(Time := T#1s,"ConveyorUnit1_DB"."Outputs"."Conveyor1MotorStatus" = TRUE);
13 //Verify the action
14 ASSERT.Equal("Conveyor1Out",TRUE);
15
16 END_STEP
```

Style guide check

- **Timers and Counters can be considered as block instances**
  - Common rules for block instance rules inclusive Timers and Counters can be used



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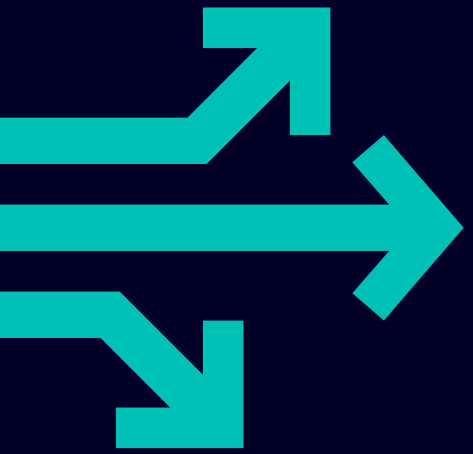
TIA Portal Options

Content



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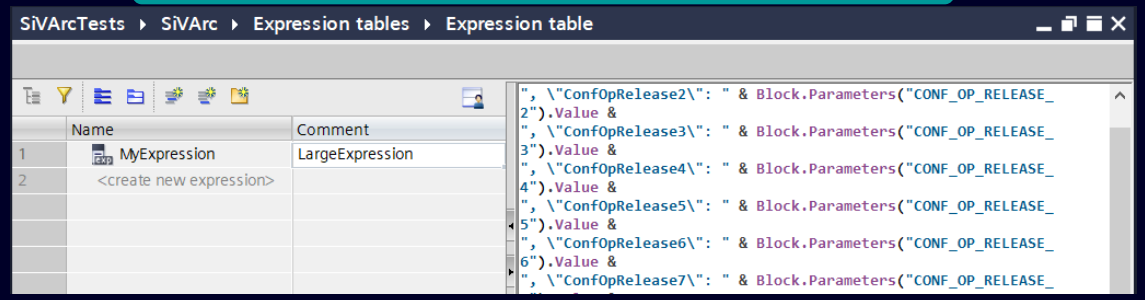
SIMATIC Visualization Architect V20 Update 1

Extended char length for Global expressions and a new SiVArc expression to read HMI Connections

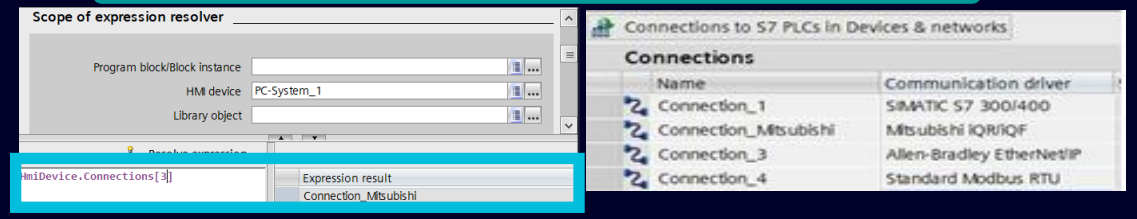
Update 1

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓
Panels ✓	RT Advanced ✓	RT Professional ✓

Global expressions can be extended up to 3000 characters



New expression can be used to read HMI Connection Names



- It is possible for user to use larger expressions (up to 3000 chars) in global expressions.
- It is now possible to read HMI connections via new SiVArc expression **HmiDevice.Connections[0]**

Customer Value:

- Possibility for the customer to have SiVArc expressions with extended length as needed
- User can access the HMI connection name & generate an object on the screen displaying the PLC state by connecting the HMI system tag @ConnectionName_PLC_OpState

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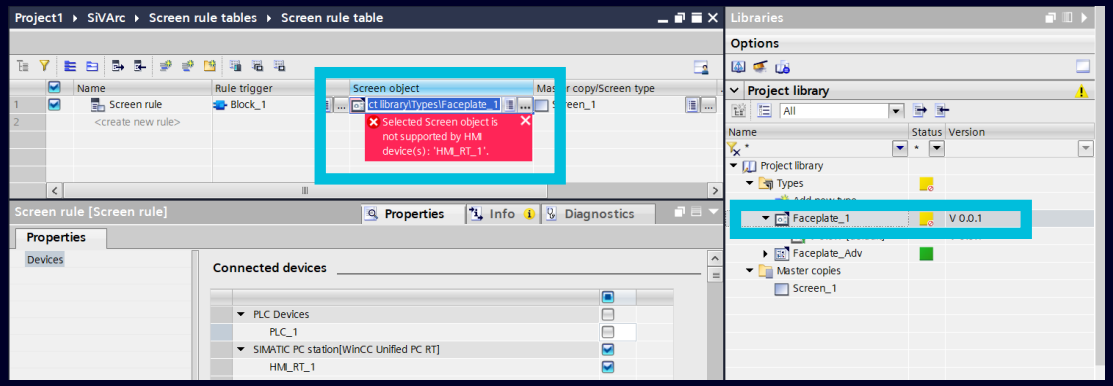
SIMATIC Visualization Architect V20 Update 1

Unified faceplates with "Do not use" identifier are restricted via SiVArc generation

Update 1

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓

Restricted Unified faceplates are now restricted in SiVArc rules



- Unified faceplates with "Do not use" identifier are restricted for SiVArc generation.
- The naming convention for HMI Tags for PLC I/O are made like PLC DBs in SiVArc generation.

Customer Value:
Homogeneous Naming convention for Hmi Tags for target HMIs

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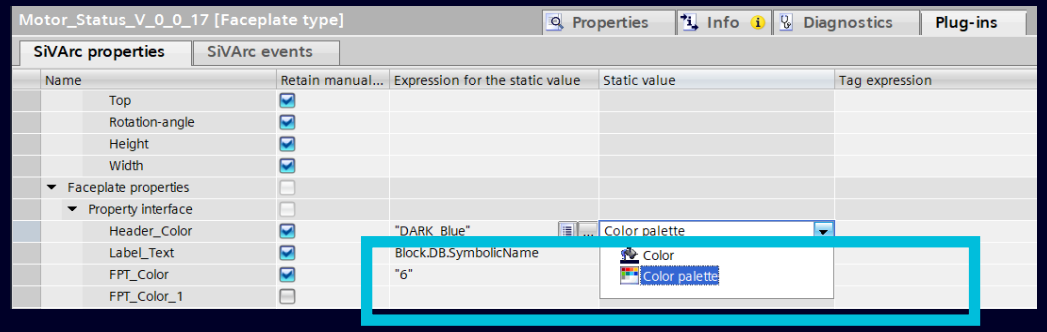
SIMATIC Visualization Architect V20 Update 3
Color palette support via SiVArc generation

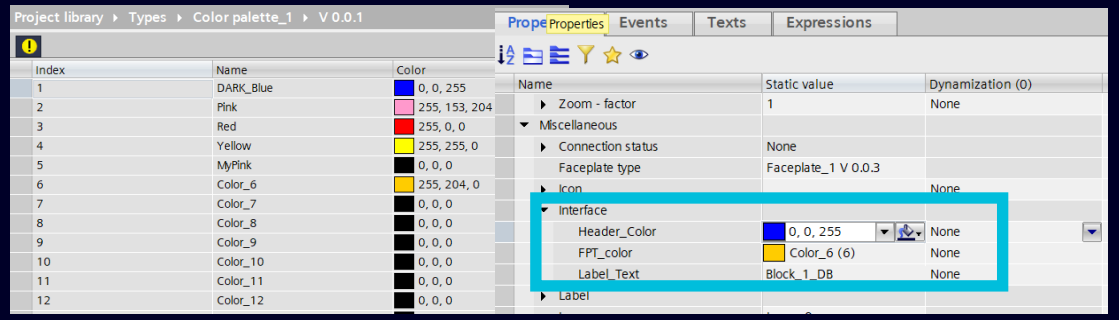
Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓

Colors from color palette configuration via SiVArc Plug-in



Managed color configurations via SiVArc generation



Central color palette via SiVArc generation:

- It is possible for user to define colors from Central color palette in SiVArc plug-in for all Screen objects and Faceplates.
- Colors can be configured based on “Name” or “Index” from Color palette.
- SiVArc generation takes care of color property for all configured Screen, screen objects & Faceplates.
- For an HMI device, it is possible for user to read the flag if color palette is configured via SiVArc expression: **HmiDevice.ColorPalette.IsAssigned** . & Name via expression: **HmiDevice.ColorPalette.Name**

Customer Value:

Customer can manage color changes for HMI Objects using Color Palette centrally via SiVArc.

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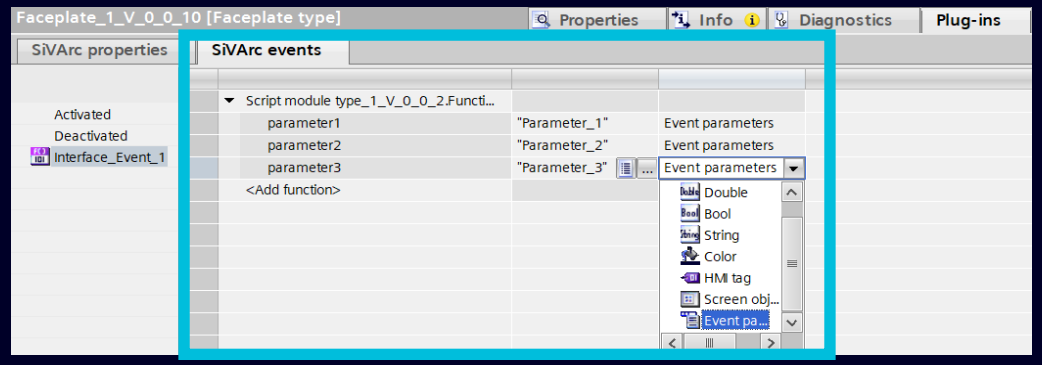
SIMATIC Visualization Architect V20 Update 3

Custom event parameters of unified faceplates can be connected to global function parameters

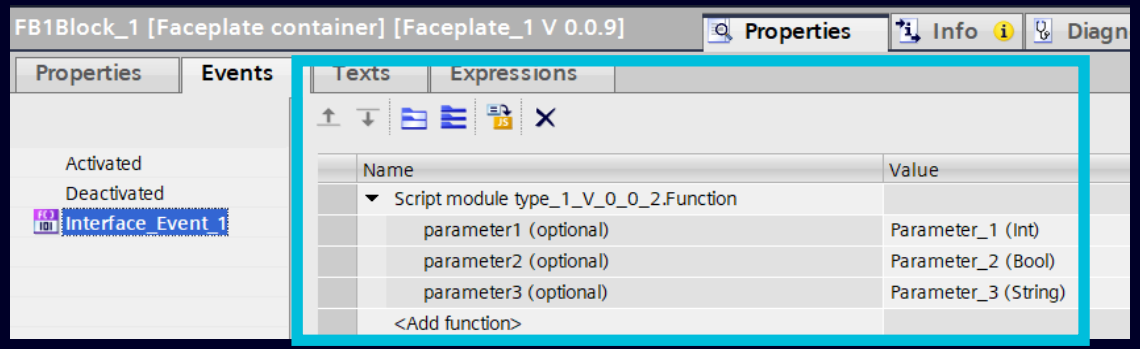
Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓

SiVArc plug-in: Enabled with custom event parameters



SiVArc generated custom events connected to function parameters



- Custom events parameters of unified faceplates can be connected to Global function parameters via SiVArc generation.
- SiVArc generation is supported for screens engineered in Next generation screen editor (WBSE).

Customer Value:
Enhanced Integration for customers.

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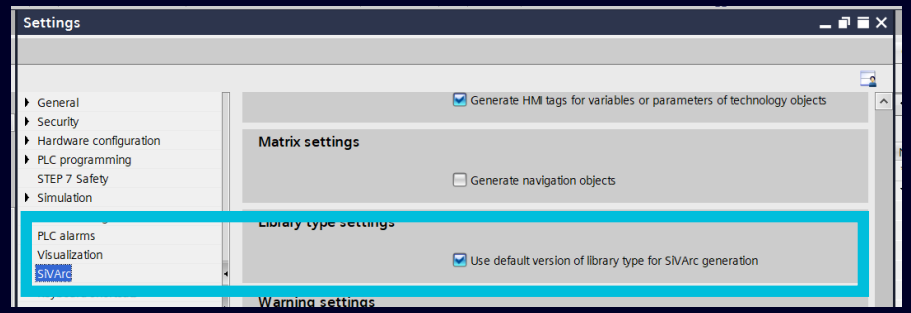
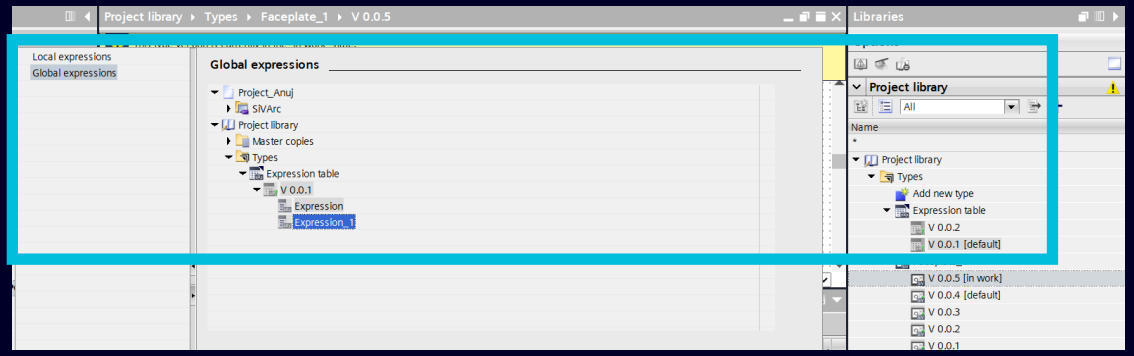
SIMATIC Visualization Architect V20 Update 3
Changes within Expression types without editing the dependencies

Update 3

Unified Basic Panel ✓ | Unified Comfort Panel ✓ | WinCC Unified PC ✓

SiVArc plug-in: Usability enhancement for expression type configuration





- Expression type changes in library are propagated with out the need for dependent faceplates to go in work mode.
- SiVArc generation will be based on project settings (Default- / Max version) for Expression types.
- During configuration, user will know which version of expression type is being configured in HMI Objects

Customer Value:
Engineering workflow is fast without need for manual adaption in dependent Objects
Usability improvements for configuration

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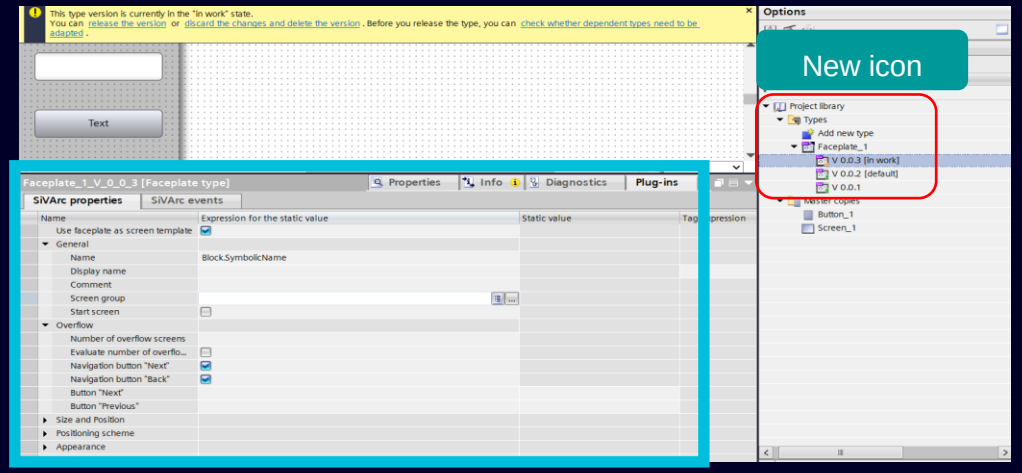
SIMATIC Visualization Architect V20 Update 3
Unified faceplates as Layout template screens in SiVArc generation

Update 3

Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓

Unified faceplate as screen type – Screen properties in SiVArc plug-in



- User can define unified faceplate as Layout Screen template & Configure their properties under SiVArc plug-in
- The overlay icon changes to depict this configuration in library
- This Layouts template is used in SiVArc generation.

Customer Value:

This functionality enables user fast & easy update of screen Layouts templates as any other library types in their workflows.

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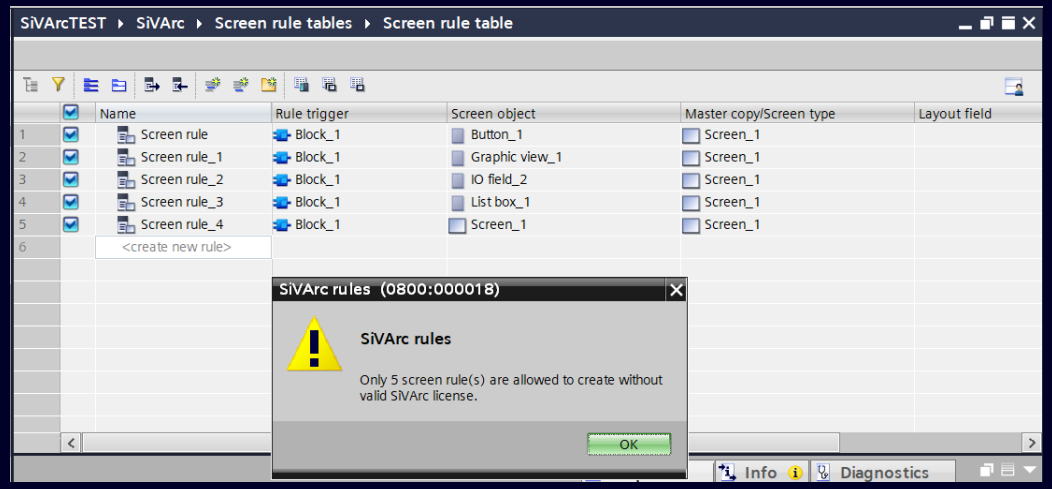
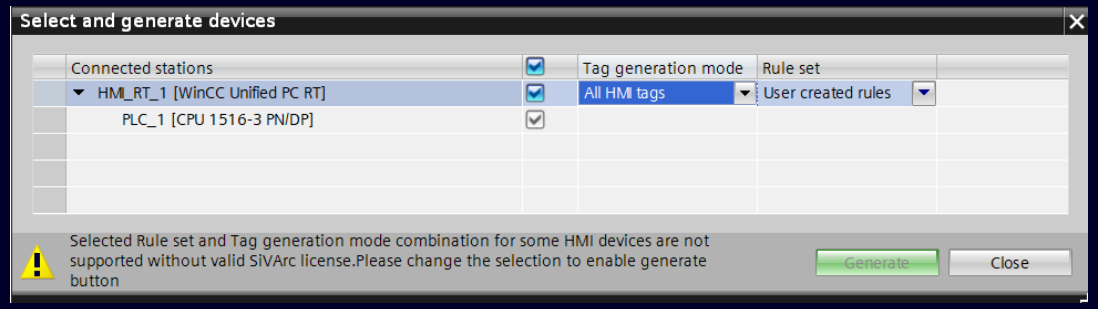
SIMATIC Visualization Architect V20
SiVArc with enhanced Trial mode (without license)

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Limited functionality without license

- The Trial mode is no longer limited to 21 days
- SiVArc can be used with limited number of rules without purchasing a license:

Rule table	Maximum Number of rules configurable
Screen rule table	5
Text list rule table	3
Alarm rule table	1
Tag rule table	1
Advanced tag rule table	Not allowed in Trial mode
Copy rule table	Not allowed in Trial mode

- Generate function will be enabled for supported mode & rule set
- Corresponding warning is provided, if mode and rule requirements are not met

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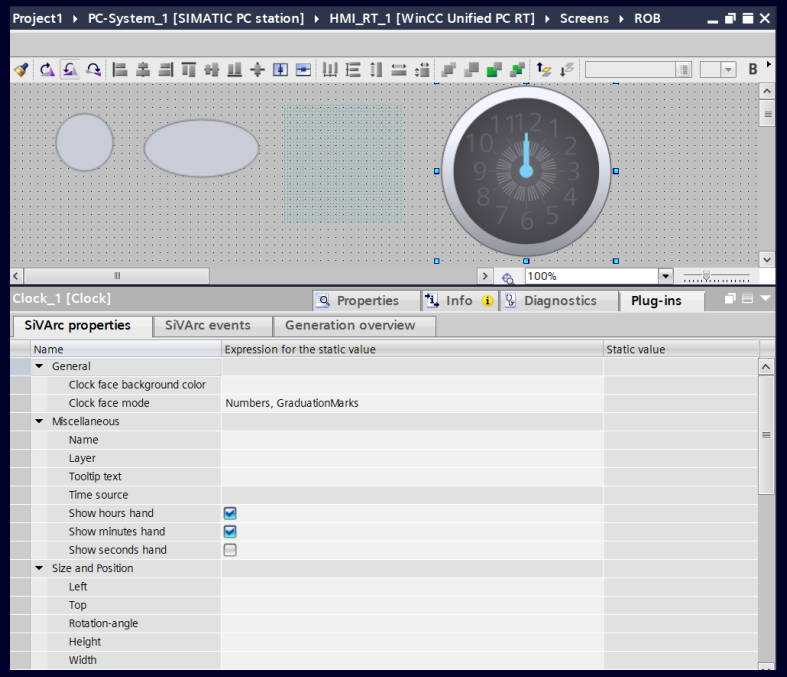
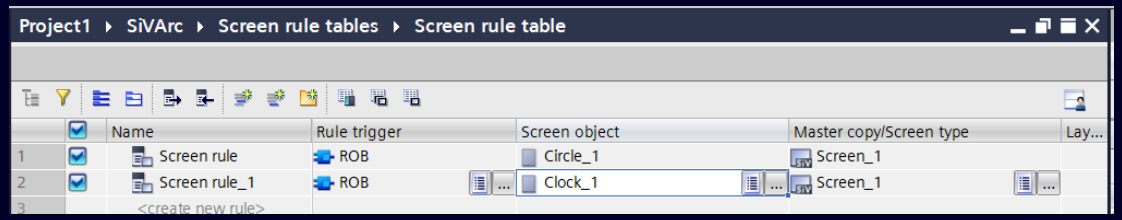
SIMATIC Visualization Architect V20

SiVArc supported all standard Unified Screen Objects

Panel ✗	RT Advanced ✗	RT Professional ✗
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Following additional screen Objects can be generated via SiVArc on Unified HMIs

Basic Objects:

- Circle, Ellipse, Line, Polyline, Polygon, Circular arc, Elliptical arc, Circle Segment & Ellipse Segment

Elements

- Check box, Radio button, List box, Touch area & Clock

Controls

- Screen window, Faceplate container, Trend companion, Alarm control, Parameter set control, System diagnostic control, Criteria analysis control Web control & Media player

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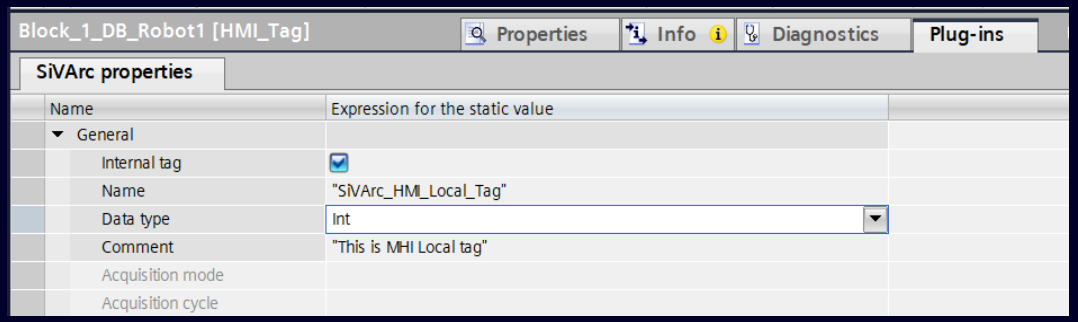
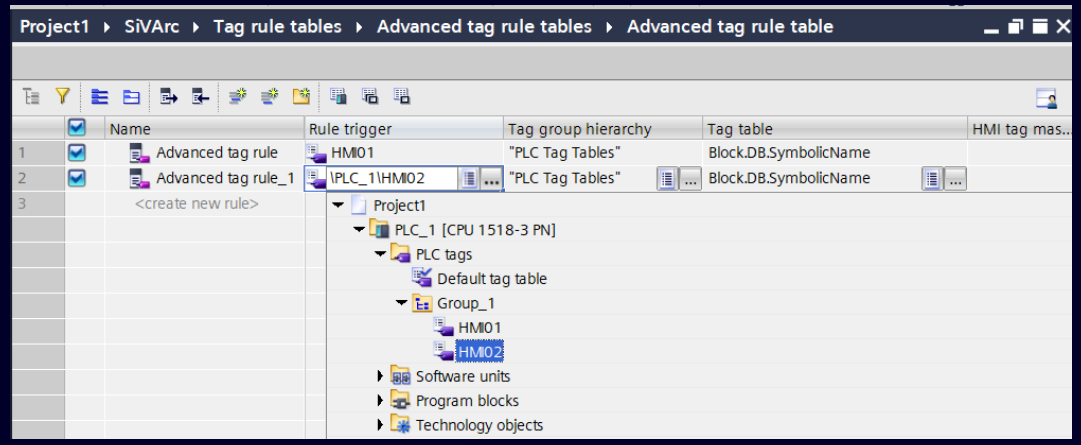
SIMATIC Visualization Architect V20
Advanced tag rule enhancements

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Advanced tag rule-based generation supports following

- Acquisition cycle & Acquisition mode properties can be set via tag template
- HMI internal (Local) tags can be generated via advanced tag rules
- User can generate only used tags on target HMI devices
- HMI tags based on PLC Tag tables can be generated

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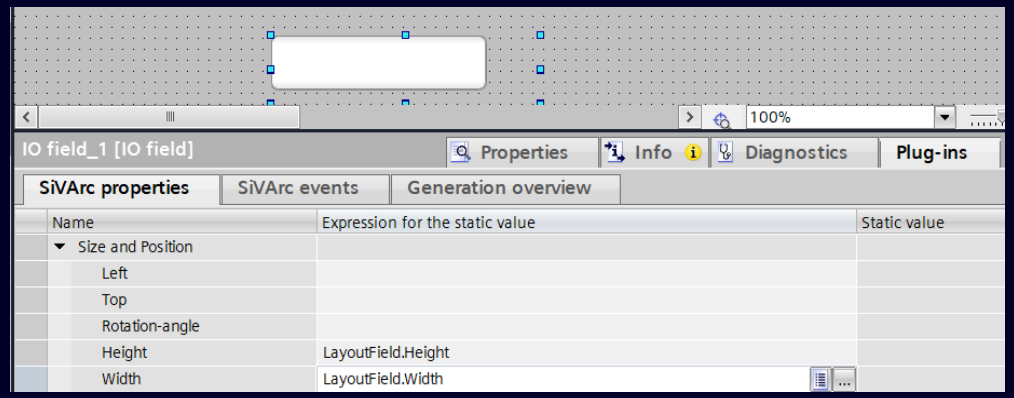
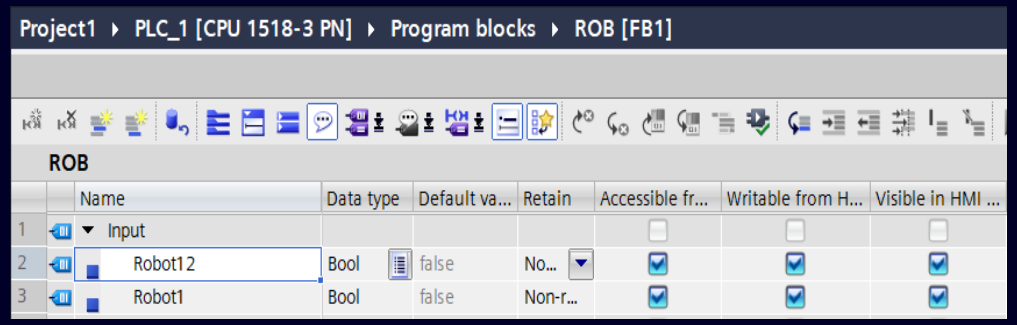
SIMATIC Visualization Architect V20
New SiVArc expressions

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





New SiVArc expressions

- The expressions “LayoutField.Width” and “LayoutField.Height” can be used to generate image objects based on the size of the layout fields
- With the following expressions, the user can read the PLC variable columns “Accessible…”, “Visible…” and “Writable…”:
  - S7Variable.HmiAccessible
  - S7Variable.HmiWritable
  - S7Variable.HmiVisible

e.g.: To control the generation of the HMI variables via the Visible setting in HMI engineering

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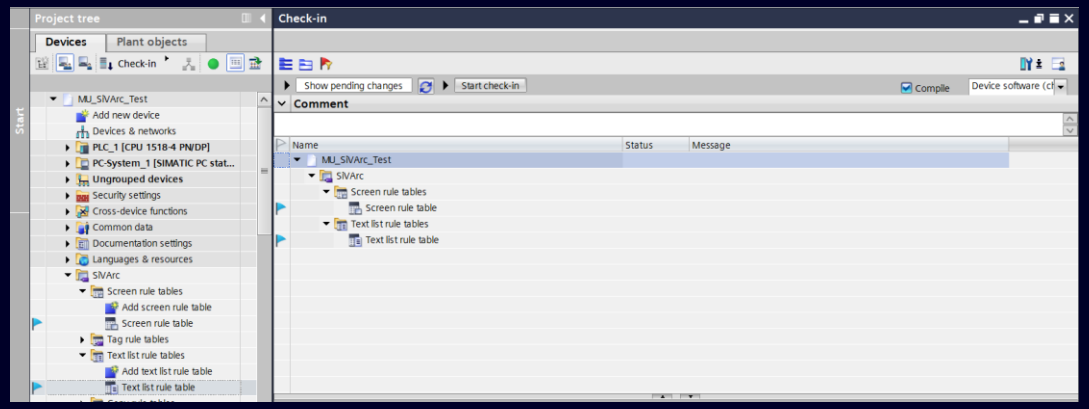
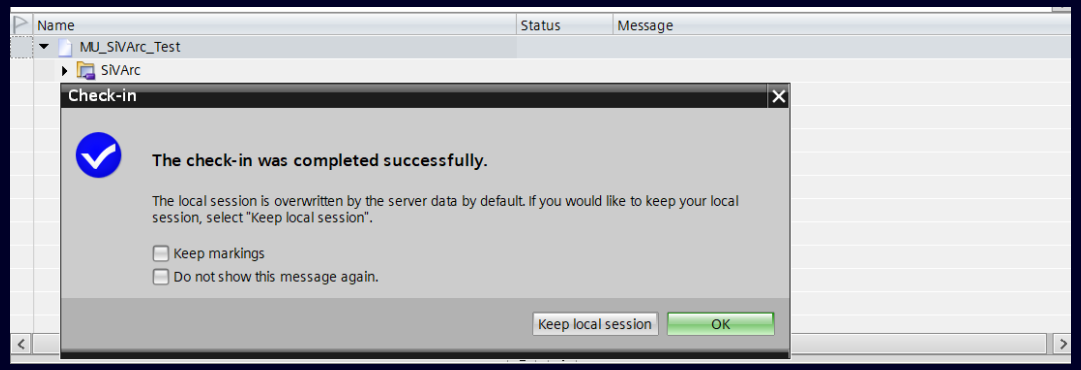
SIMATIC Visualization Architect V20
Multi user engineering support

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





SiVArc rule tables as multiuser objects

- SiVArc rule tables can be used in Multiuser Engineering, there by significantly reducing the configuration time

The rule tables supported are:

- Screen rule table
- Tag rule table
- Alarm rule table
- Text list rule table
- Copy rule table
- Expression tale

- On inconsistency respective messages are displayed to user

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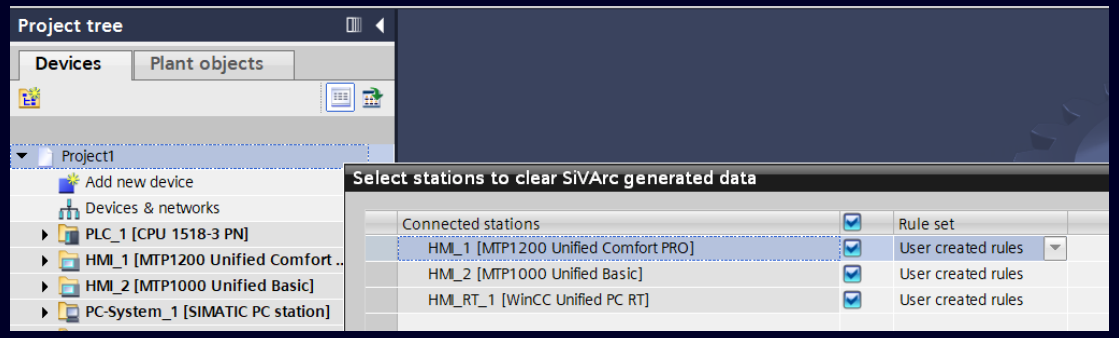
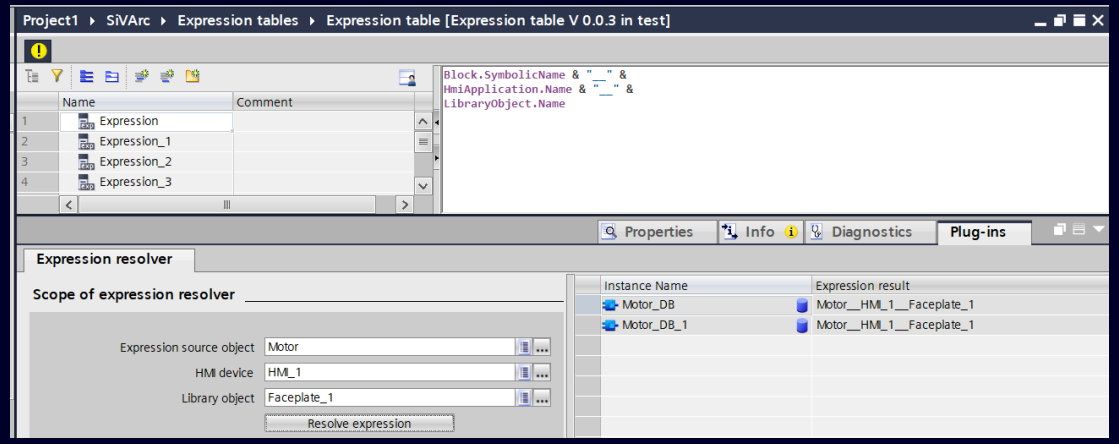
SIMATIC Visualization Architect V20
Usability improvements

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓





Improvements in usability

- Clearing the generation data for multiple devices is possible
- Troubleshooting SiVArc expressions is possible at expression tables
- Layout screens are automatically generated from user configured screens, reducing the effort for manual engineering
- SiVArc log is enhanced to display HMI tags by name

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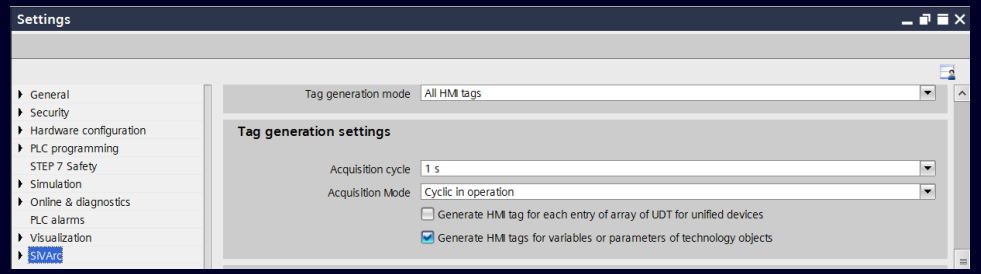
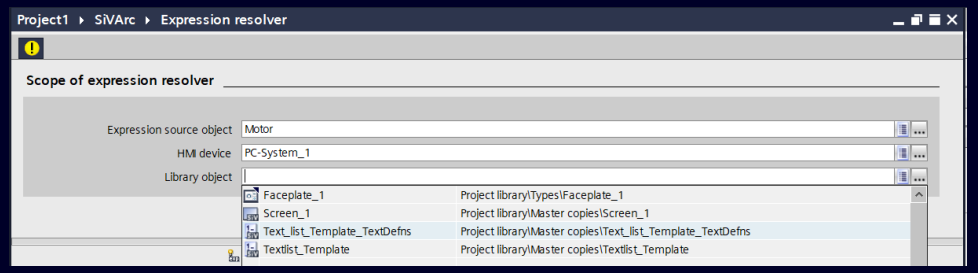
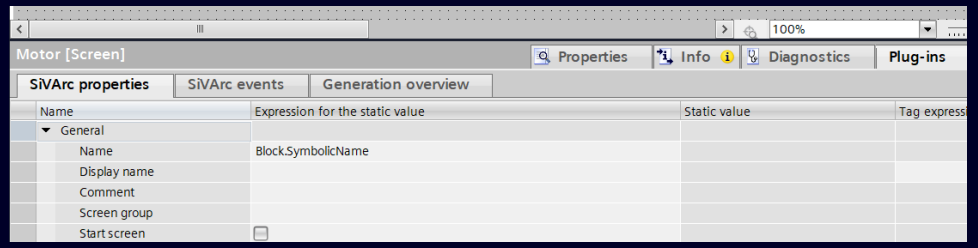
SIMATIC Visualization Architect V20
General improvements

Panel ✓	RT Advanced ✓	RT Professional ✓
Unified Basic Panel ✓	Unified Comfort Panel ✓	WinCC Unified PC ✓







General improvements

- User can decide to generate HMI tags for variables or parameters of technology objects via Project setting
- Expression resolver additionally supports Program block/block instance, HMI device, Library object as source object
- Configuring the Start screen in Runtime settings via SiVArc generation
- Generation support of alarm logs via copy rules and alarm rules

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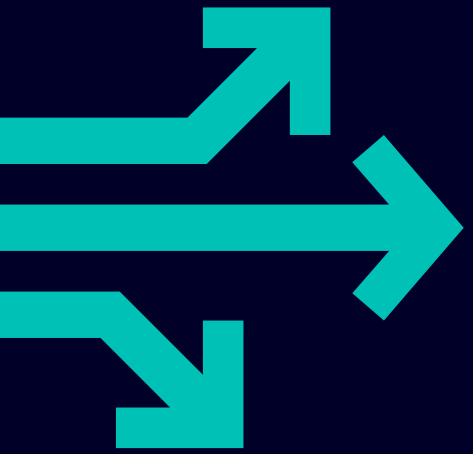
TIA Portal V20
TIA Portal Options

Content



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MTP as driver for **flexible production** and **package unit integration**
Core concepts: Standardized interfaces and application-level description

Module Type Package (MTP)

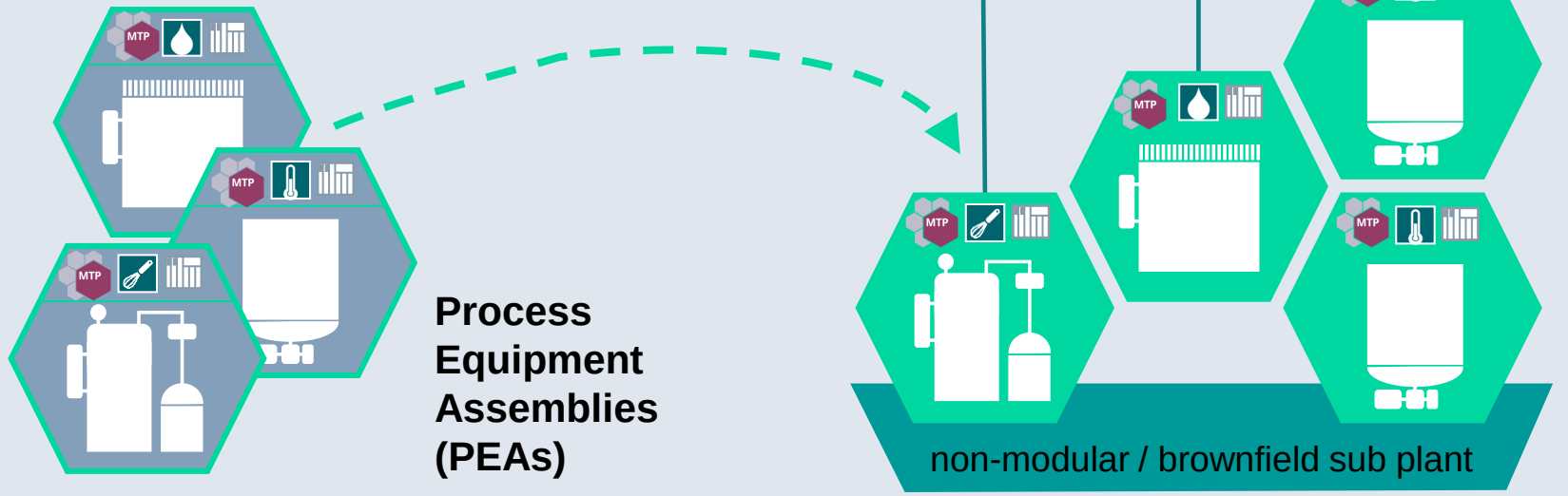
MTP is a standardized, non-proprietary, application-level description of autonomous equipment assemblies



hosted by: PI PROFIBUS • PROFINET

Based on: OPC UA

Flexible, modular plants are built out of intelligent, autonomous **Process Equipment Assemblies (PEAs)** with **standardized[1)] interfaces** described in **Module Type Package (MTP)**



[1)] MTP standard 2658 hosted by PI

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Modular Automation is a cross-industry trend:
with our existing MTP-portfolio we can actively address the market!


Chemicals


Pharma


F&B

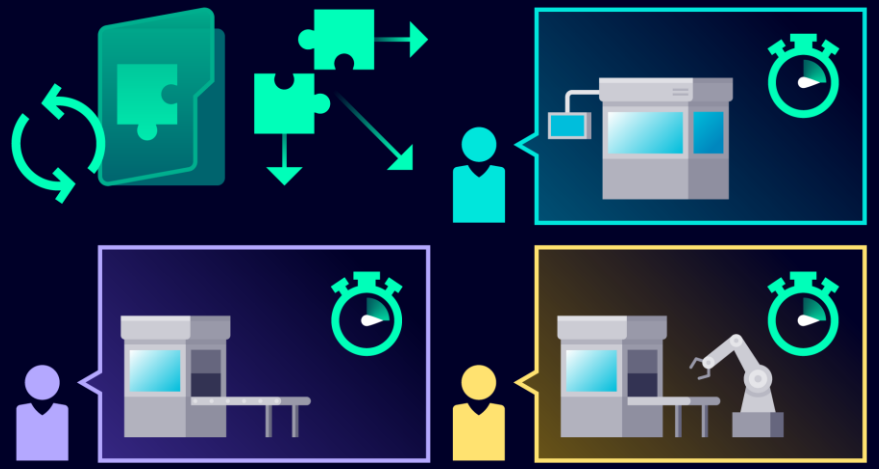

Batteries


Hydrogen


Marine


W&WW


Intralogistics



No reprogramming or new installation, just plug & produce

We enable our customers to implement MTP based on our standard portfolio (PLCs, HMIs, TIA Portal, …):

- Benefit for OEMs:
  Completion of our portfolio to enable the delivery of MTP-compliant module / process equipment



- Benefit for End customers & System Integrators:
  Completion of our HMI and SCADA portfolio to monitor and control modular plants (Process Orchestration)



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TIA Portal - MTP Portfolio
Modular automation

End customer & System Integrators
Process Orchestration Layer (POL)

PEA Orchestration

SCADA
Supervisory Control and Data Acquisition

WinCC Unified
SIMATIC MTP Integrator for WinCC Unified



OPC UA

OPC UA

OEM
Process Equipment Assembly (PEA)



MTP

SIMATIC MTP Creator

TIA Portal libraries:
Control Function Library (CFL)
Process Function Library (PFL)
OEM's Libraries

OR

MTP

Machine Proxy

SIMATIC S7

Option 1: MTP based on SIMATIC PLC and HMI

Option 2: MTP based on Edge for brownfield

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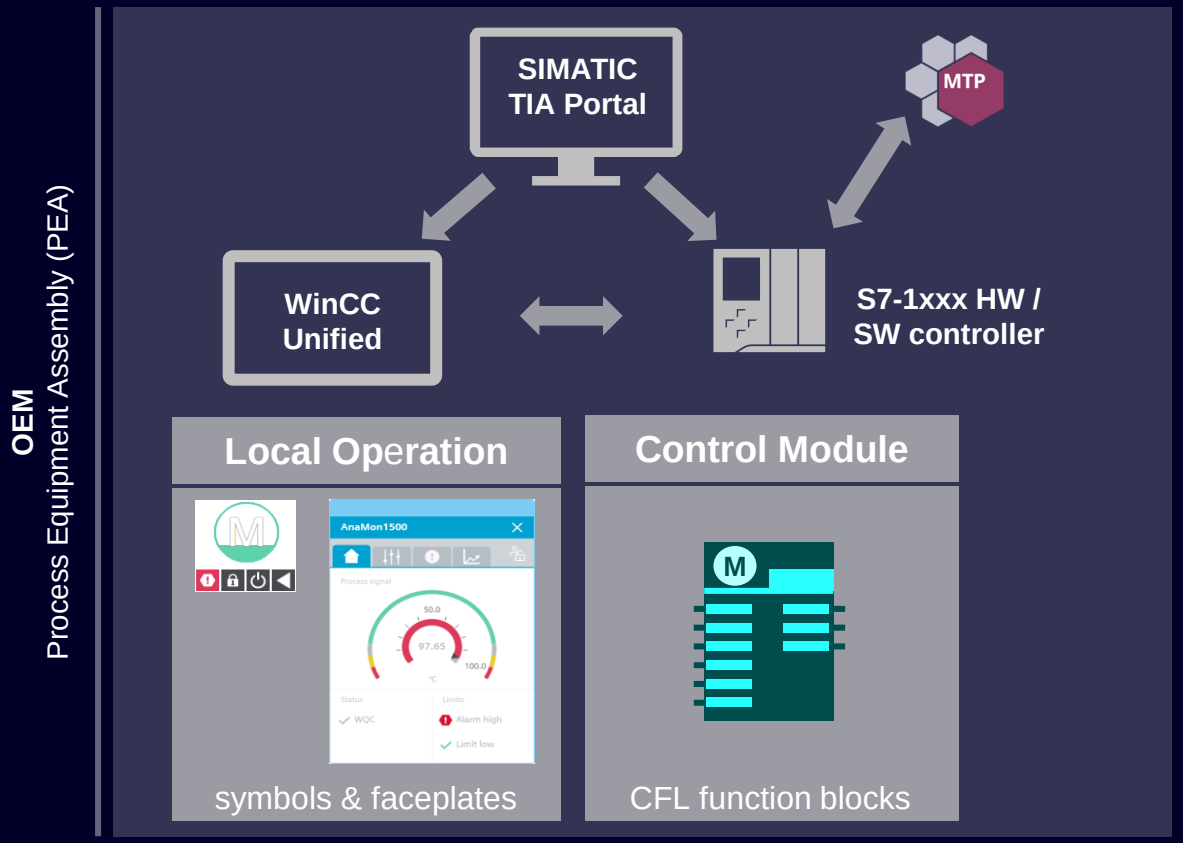
TIA Portal - Engineering Efficiency for Modules
Modular automation – SIMATIC Control Function Library (CFL)

Unified Basic Panel ✗ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Standardized module engineering with a modular and memory optimized library, offering:

- TIA Portal Step 7 (S7-1xxx HW / SW controller) and WinCC Unified Objects with optimized footprint & performance, (Industry-specific blocks like Aggr8, TimeSwitch, SetCrv, …)
- State of the art TIA Portal Engineering based on PLCOpen
- Supports virtual commissioning based on PLCSIM Advanced and SIMIT with ready to use templates tailored to CFL

Standardized Operation

- Faceplates aligned to WinCC Unified Look & Feel (HMI Design based on HMI Template Suite)
- Corporate Design via SIMATIC WinCC Unified Corporate Designer / TIA Portal

CFL can be used in MTP and Non-MTP Use Cases

Latest Version on : Simatic MTP SIOS Landing Page

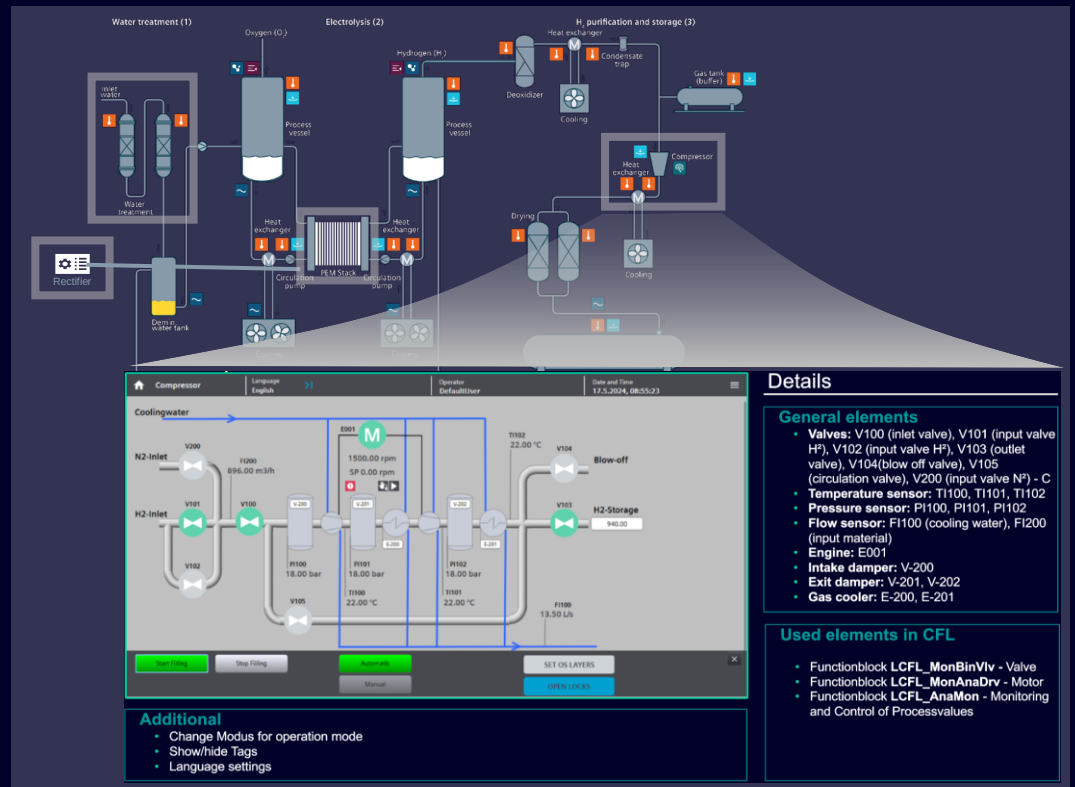
MTP Module Type Package (MTP)

SIEMENS

TIA Portal - Engineering Efficiency for Modules
Modular automation – SIMATIC Control Function Library (CFL)

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓

OEM
Process Equipment Assembly (PEA)



Hydrogen TIA Portal Application Examples based on CFL

CFL - Industry-specific blocks

Optimized footprint & performance for S7-1xxx HW / SW controller & WinCC Unified

Drives
- MonBinDrv FP
- MonAnaDrv FP
- MonBinVlv FP
- MonAnaVlv FP

Monitor
- AnaMon FP
- BinMon FP
- DIntMon FP
- StringView FP

Operate
- AnaManInt FP
- BinManInt FP
- DIntManInt FP

Interlock
- LockView4 FP
- LockView8 FP

Common Blocks
- Maintenance FP
- DriveInterconnector

Control
- PIDCtrl FP
- Aggr8 FP
- TimeSwitch8 FP
- SetCrv FP
- Polygon FP

New

MTP Service Framework FP
- Service
- Procedure
- Config Parameter
- Procedure Parameter

Latest Version on : Simatic MTP SIOS Landing Page

Module Type Package (MTP)

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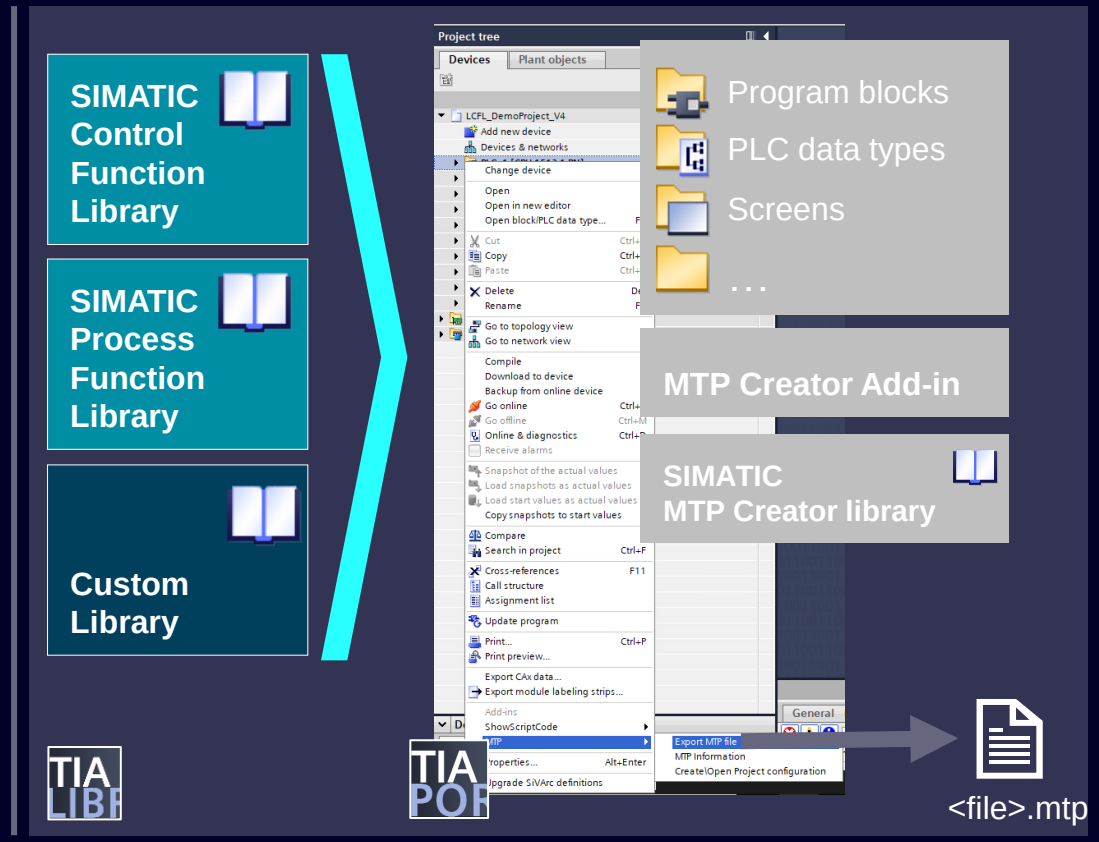
TIA Portal goes MTP - Engineering Efficiency for Modules
Modular automation – SIMATIC MTP Creator



SIMATIC MTP Creator for exporting an MTP-conform file from an existing TIA project, by only one-click!

- The MTP file contains MTP relevant Contents like control modules, services, OPC UA configuration and the pictures based on the STEP 7 (TIA Portal) and WinCC Unified engineering.
- Supports VDI/VDE/NAMUR 2658 Part 1 / 2 / 3 / 4
- Supports SIMATIC Process Function Library (PFL), SIMATIC Control Function Library (CFL) and Customer Libraries

New

Latest Version on : Simatic MTP SIOS Landing Page

Module Type Package (MTP)

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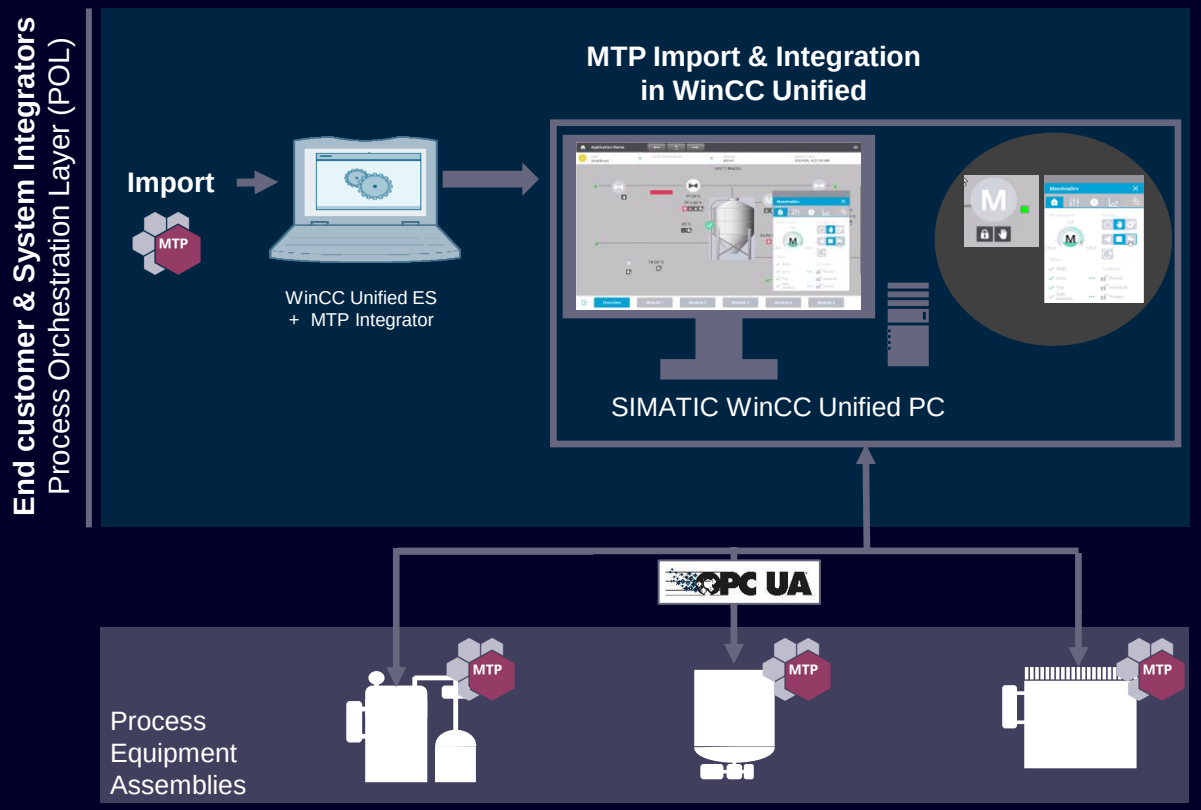
TIA Portal - Process Orchestration
Modular automation - MTP Integrator for WinCC Unified

Unified Basic Panel ✗ | Unified Comfort Panel ✓ | WinCC Unified PC ✓



Integrate standardized MTP package units / machines in WinCC Unified, including PLC and HMI components

- Standardized, line operation of package units / machines

Use MTP files (Siemens or 3rd party) to integrate (cross- vendor) machines automatically

- By instantiating the machine type within your project, the OPC UA connections, PLC tags and HMI components are created with just one click.

Controlling complete units / machines in an abstract way

- Operators can focus on the production without needing to understand details of each multi-vendor machine.
- Maximized operational efficiency, reduced training effort and consistency regarding operation, even if new modules are added modified due to changing market demands.

No. of Package Units / Machines : Unified PC RT: 10 // Unified Comfort Panel: 3

Latest Version on : Simatic MTP SIOS Landing Page | Control and Operate for Discrete Industries | Module Type Package (MTP)

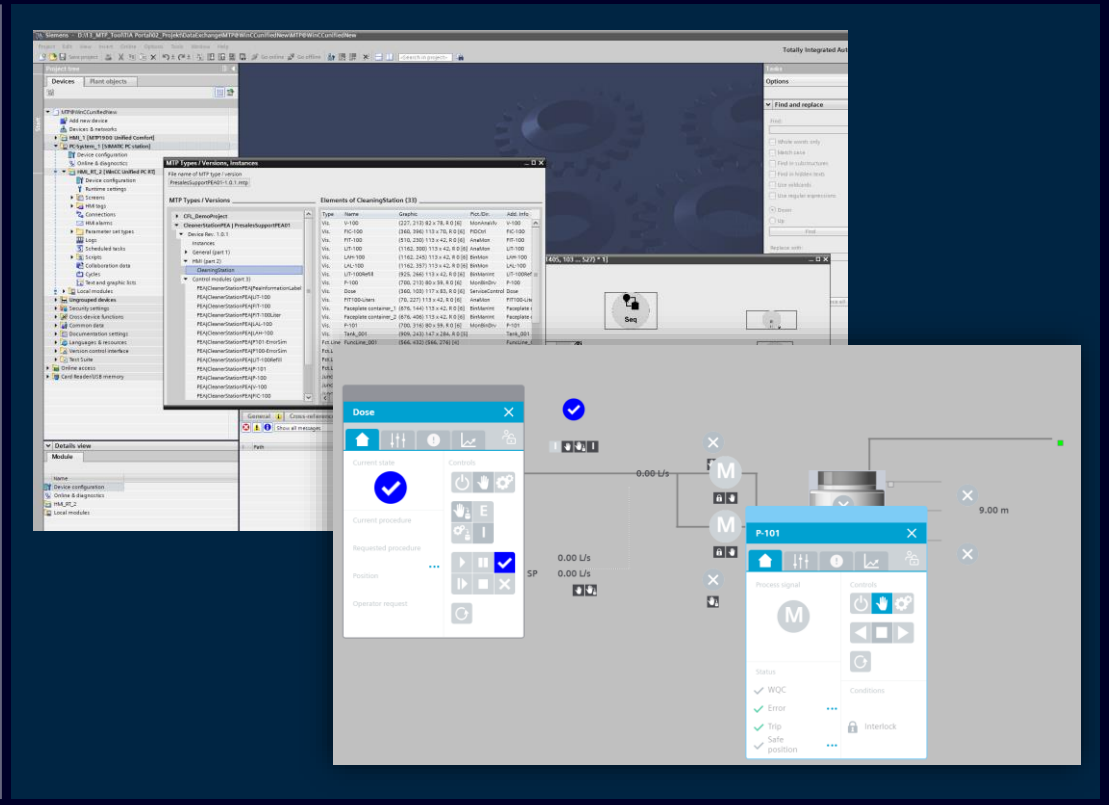
SIEMENS

TIA Portal - Process Orchestration

Reduce engineering effort by -70% [1] and Increase flexibility by +80% [1]

Unified Basic Panel	Unified Comfort Panel	WinCC Unified PC
✗	✓	✓

End customer & System Integrators
Process Orchestration Layer (POL)



- MTP Import in WinCC Unified Engineering [2]
- Type management incl. full versioning for your MTP files
- PEA instance management
- Static and dynamic HMI Integration (MTP Part 2 + 3)
- Monitoring and control via Faceplate (block icons and detailed views) Orchestration of plantwide HMI (part 3)
- Manual operation of MTP Services via HMI (part 4) — New
- MTP Multilanguage Support — New
- Native OPC UA communication with configurable levels of security mechanisms (draft part 5/5.1) [3]
- POL-based alarms (draft part 6/7) [3]

[1] Source: ZVEI, 2022
[2] Implementation compliant to the noted parts of the MTP Specification (VDI/VDE/NAMUR 2658)
[3] Concepts for runtime interoperability (part 5/5.1) and alarming (part 6/7) are not fully specified, yet

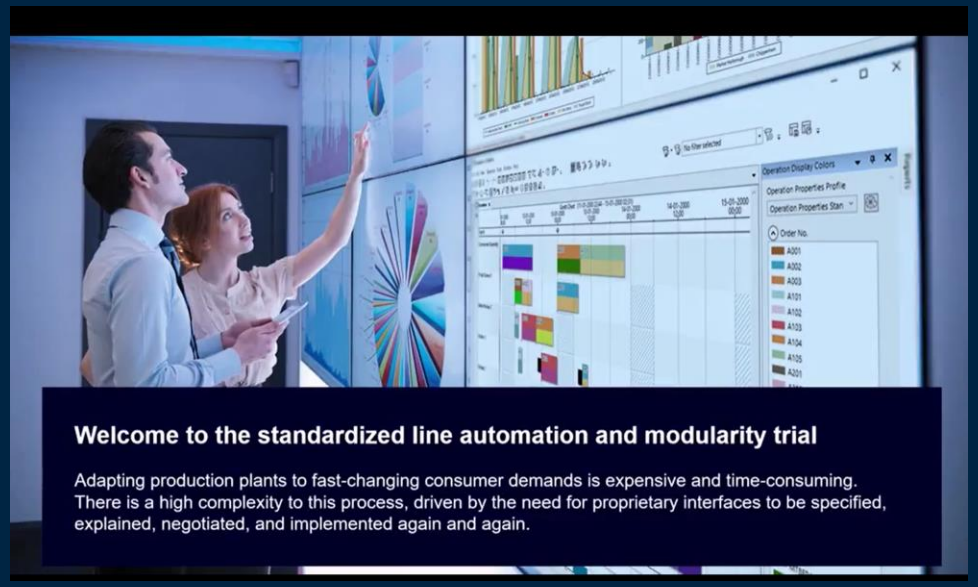
Latest Version on : Simatic MTP SIOS Landing Page | Control and Operate for Discrete Industries | Module Type Package (MTP)

SIEMENS

TIA Portal - Process Orchestration
SIMATIC MTP Integrator for WinCC Unified Trial – Simply try it out

Unified Basic Panel ✗	Unified Comfort Panel ✓	WinCC Unified PC ✓

End customer & System Integrators
Process Orchestration Layer (POL)



MTP trial – Simply try it out

Try our 30-day rapid line automation engineering with MTP trial.
No installation is required. Start exploring in minutes.
(Chrome/Firefox/Edge/Safari recommended)

Easily adapt production lines to fast-changing consumer demands with a module based standardized approach

- Adding new equipment or modifying an existing and running production line is typically complex, time consuming and risky
- Cell or line visualization required for better overview and central operation needs, if manually engineered, consumes substantial time and effort and is error prone
- With the standardized Module Type Package (MTP) approach, you can reduce risk, engineering effort and downtime, as well as shorten the time to easily integrate new equipment into an existing production line
- MTP is a widely standardized and market-proven technology that can be purchased off-the-shelf

Module Type Package (MTP)

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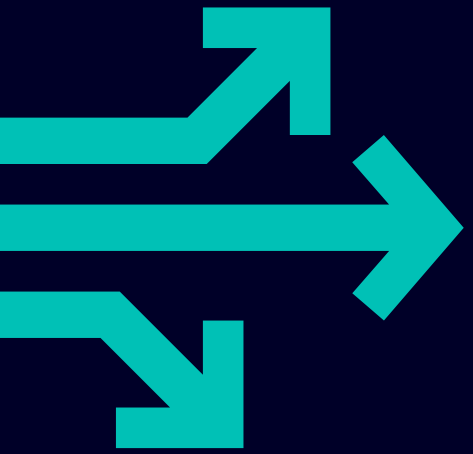
TIA Portal V20
TIA Portal Options

Content



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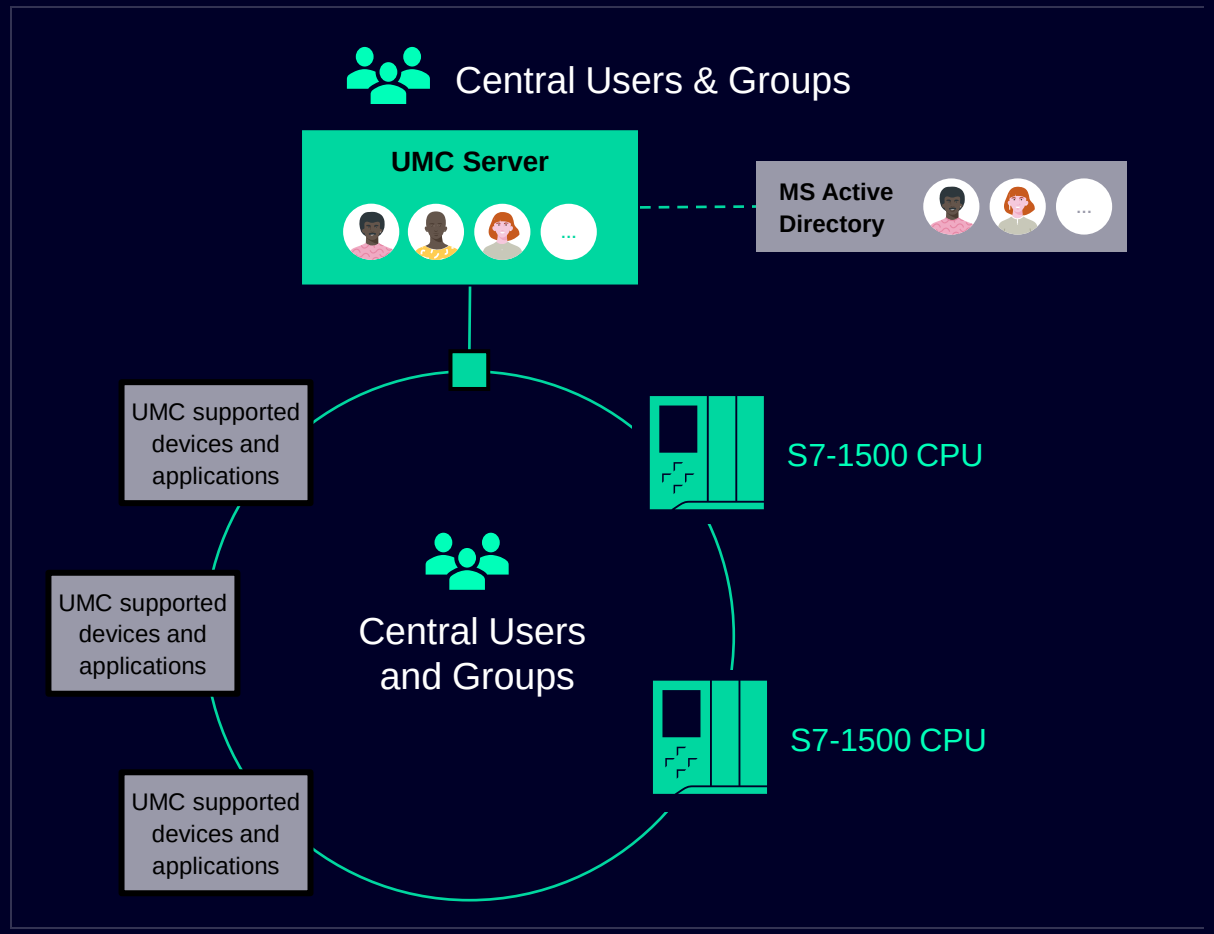
Central User Management (UMC)
Support of SIMATIC S7-1500 CPU for Central User Management



SIMATIC S7-1500 UMAC can connect to UMC to use centrally managed users and groups

- CPU services can now be used by centrally managed users and user groups from UMC and a connected Microsoft Active Directory.
- The central user data can be changed directly in the central user administration or the MS Active Directory without changes to the CPU configuration.

Benefit

- Central user management (UMC) is available for a growing supported product portfolio, allowing an efficient user management within the OT
- Further supported products are:

  TIA Portal Engineering | Sinumerik One | WinCC Unified WinCC Advanced | SINEMA RC | SINEC NMS | SINEC INS

  SIMATIC PCS neo (*) | OpCenter Execution (*)

  (*) with separate configuration

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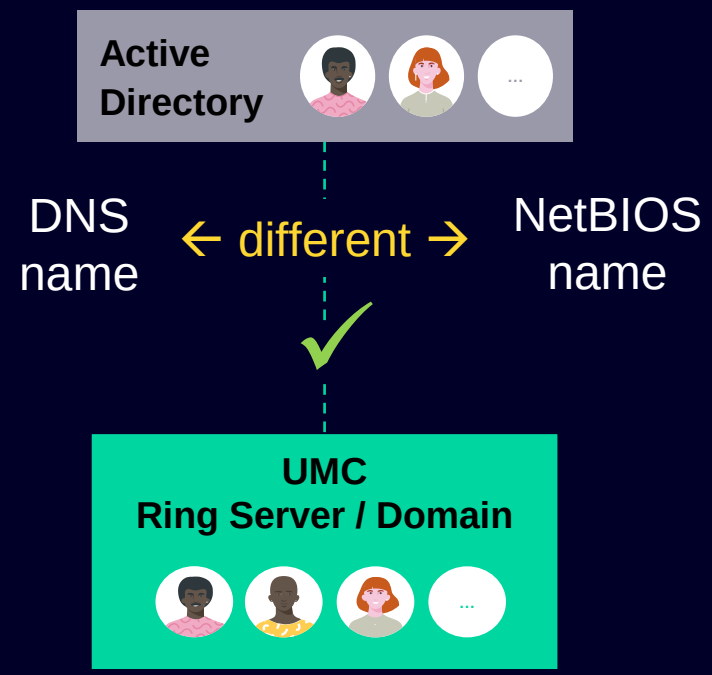
Central User Management (UMC)
Support for MS Active Directory configurations with different FQDN and NetBIOS name



Support of unconventional AD configuration

- UMC now supports Active Directory configurations that deviate from Microsoft recommendations but are frequently used by customers.
- UMC can now connect to Active Directory even if the DNS and NetBIOS names are different.

Benefit

- This enables a better integration of UMC into existing customer infrastructures and a more flexible deployment.

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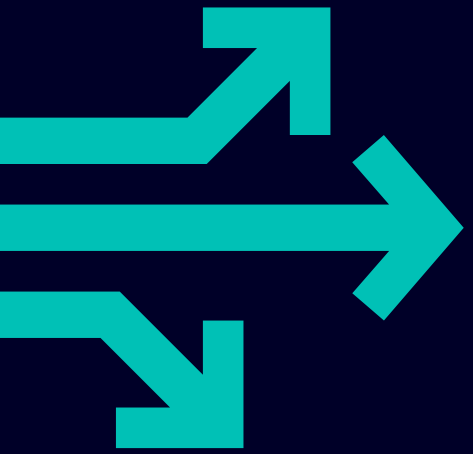
TIA Portal Options

Content



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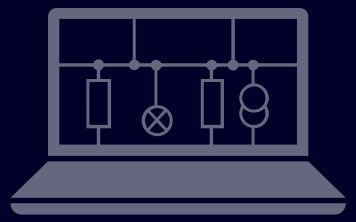
Modular Application Creator – Generating instead of programming

HW Config in TIA Portal



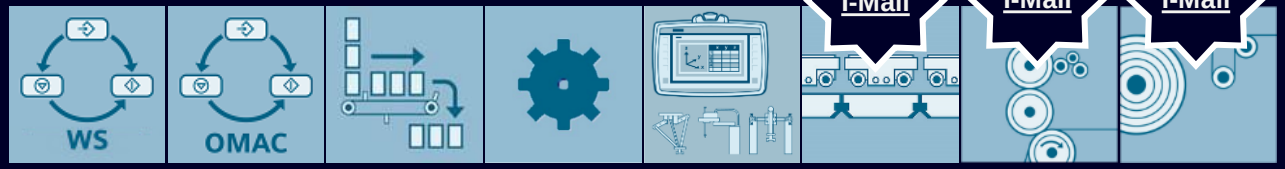
ECAD/HWCN

Modular Application Creator 19.1 Update!



- Generating instead of programming TIA Portal projects
- Easy configuration with technological view and graphical guided assistance as well as automatic validation
- Management of projects and versioned/signed equipment modules

Equipment Modules



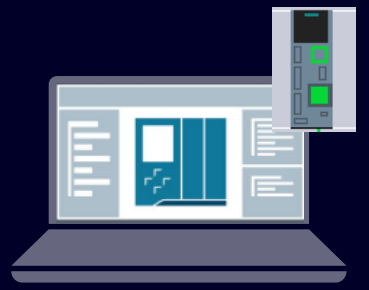
Weihen-stephan | OMAC | Intel. Belt | TO Gen. | Robotics | MCS Update! | Printing | Converting Update!

Module Builder



Visual Studio Extension to create your own **custom modules**

Generation of the TIA Portal project incl. drives:



TIA Portal project

SIMIT **HMI (Openness)**





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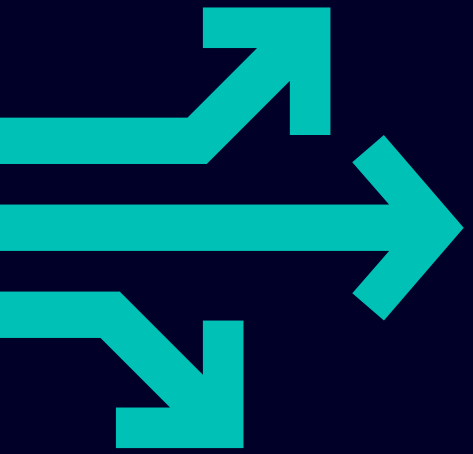
TIA Portal Options

Content



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ProDiag
Customer Benefits: Key questions to make decisions

> You are faced with the task of adapting your process diagnostics very often and do not want to change your library function blocks every time?

> You want to cycles granularly record all process errors in order to identify causalities?

> You want to reliably identify sporadic errors and display them on the HMI?

> You want to handle your supervisions centrally in a separate view, independent of your user program?



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ProDiag
Availability

+ SIMTIC S7-1500 family



+ SIMATIC HMI WinCC Unified/Unified Comfort Panels

WinCC Adv.



+ SIMATIC HMI WinCC Advanced/Comfort Panels

WinCC Adv.



+ SIMATIC HMI WinCC Professional/WinCC Scada (V.8 or higher)



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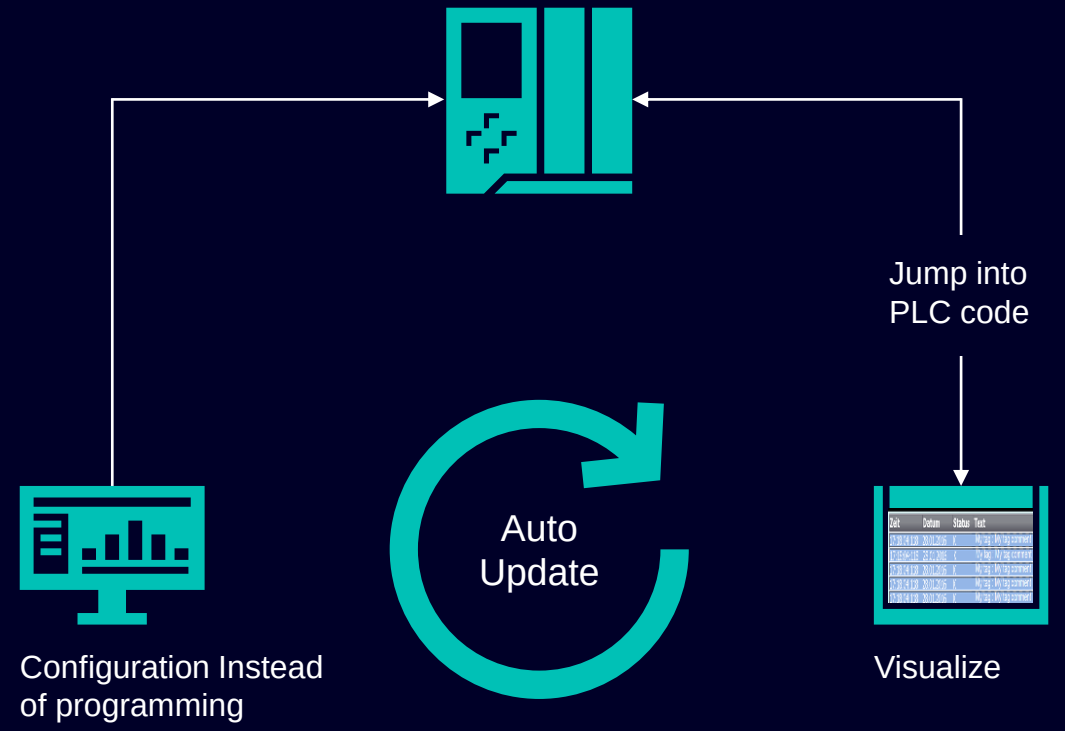
System advantage: Automatic Update of the HMI during runtime

- PLC is available as a central alarm server for 3 languages
- System ensure the data consistency
- No consideration of different engineering steps required
  → Download to PLC → ready
- Easy maintenance
  → No specialist staff for HMI required
- Changing alarms during operation



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TIA Portal Options

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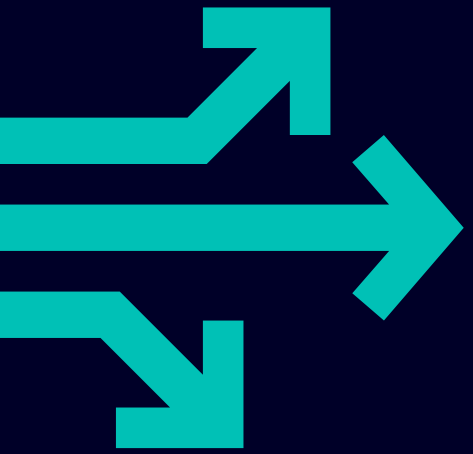

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TIA Portal Teamcenter Gateway

Teamcenter Version support

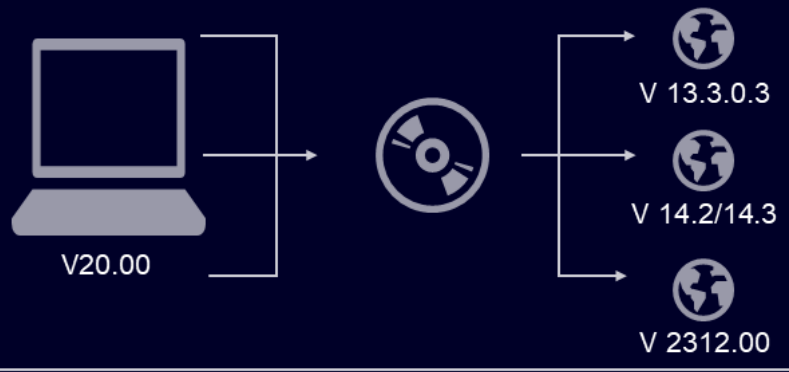
Support

TIA Teamcenter Gateway provides different version of Teamcenter support (i.e. 13.3.0.3, 14.2, 14.3 and 2312.00) in TIA Poral V20.

Benefits

- Digital Enterprise requires a connection of TIA Portal and Teamcenter
- Existing customers can use different version of TIA Portal and Teamcenter
- Managing various TIA Portal engineering project also part of PLM system

	TIA Portal Version
Teamcenter (Server + Client)	V20.00
13.3.0.3	X
14.2	X
14.3	X
2312.0	X



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TIA Portal V20
TIA Portal Options

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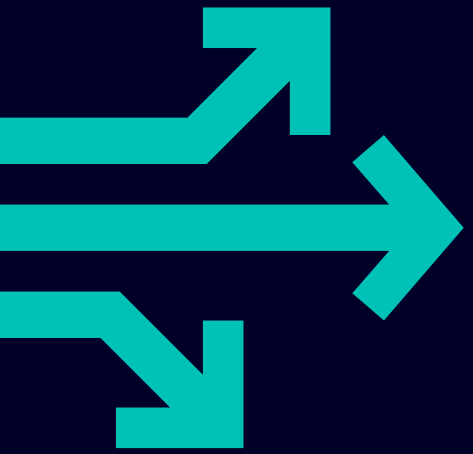

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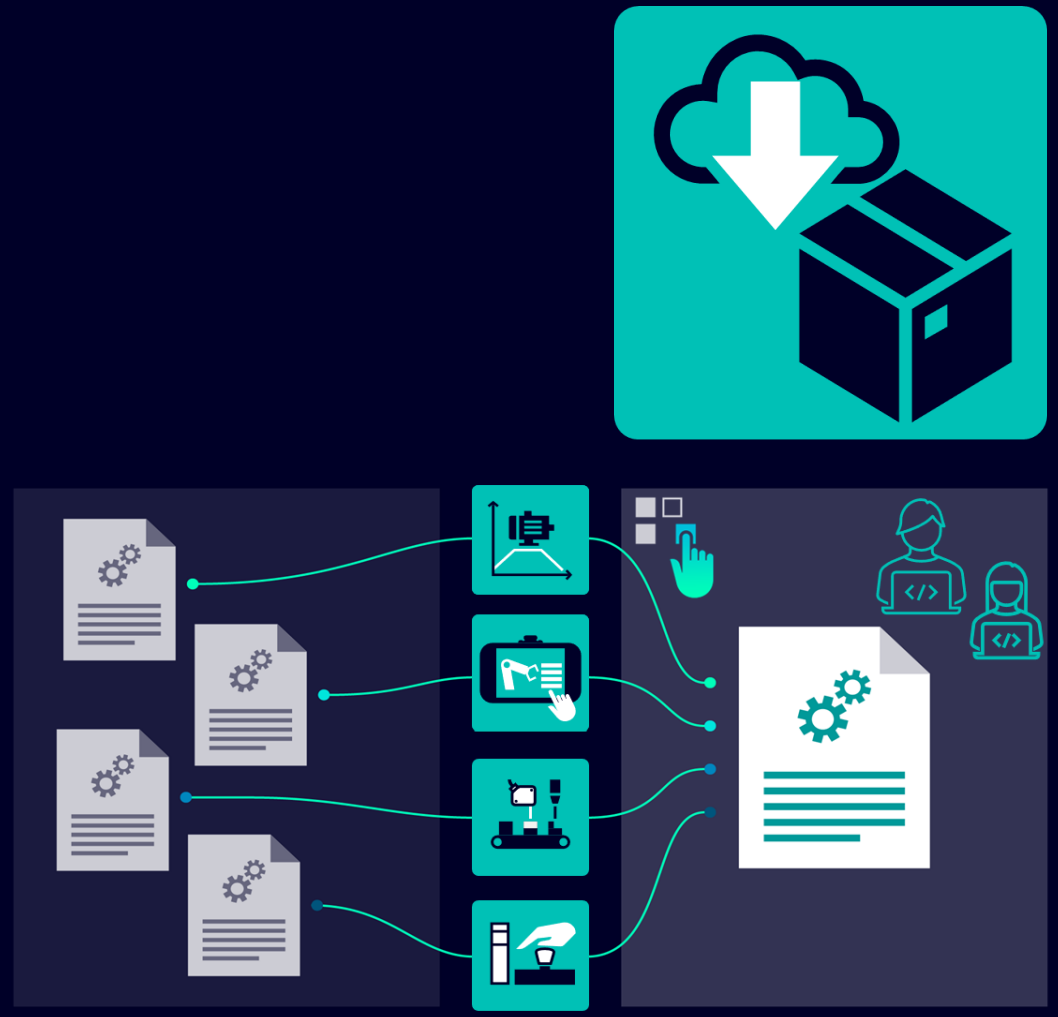
TIA Package Manager

Download libraries and application examples
with one click



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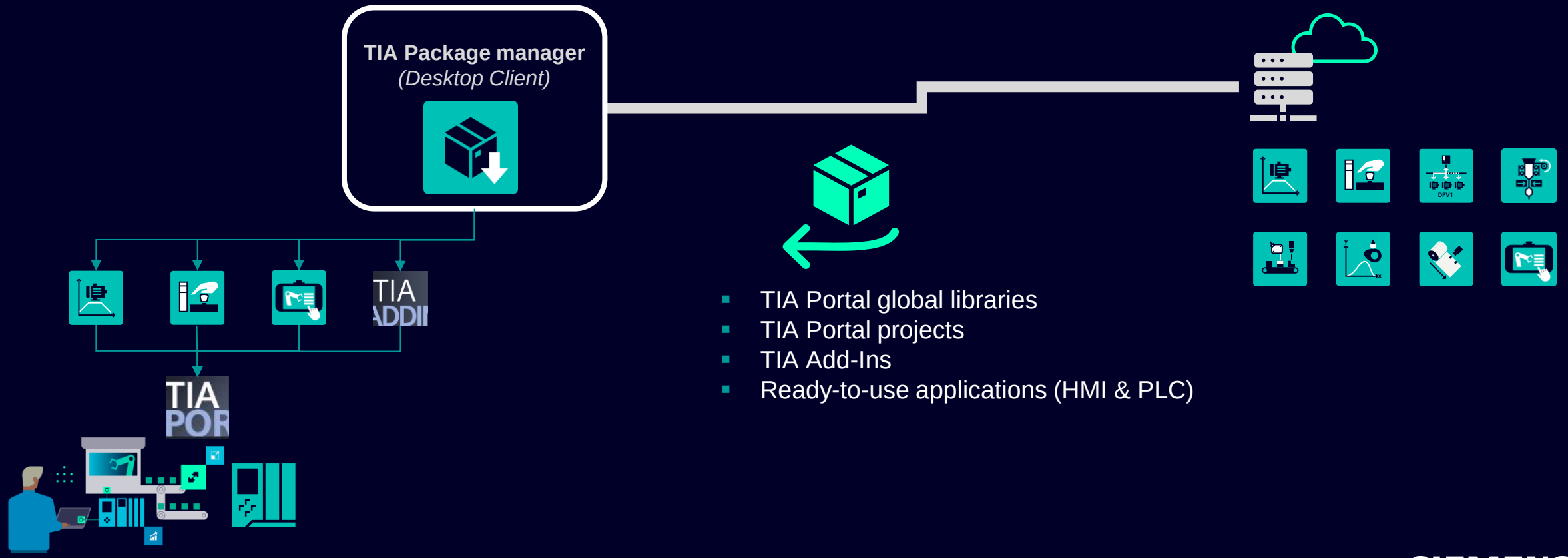
TIA Package Manager - Introduction

The **TIA Package Manager** is a tool designed to streamline the process of downloading, and managing application packages – *global libraries, TIA Add-Ins and example projects.*

It enhances productivity by simplifying the process of searching, installing and managing libraries - and TIA Add-Ins - for TIA Portal



- TIA Portal global libraries
- TIA Portal projects
- TIA Add-Ins
- Ready-to-use applications (HMI & PLC)

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TIA Package Manager – User Interface



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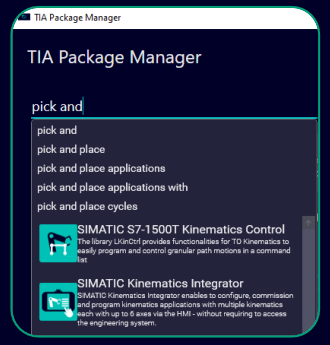
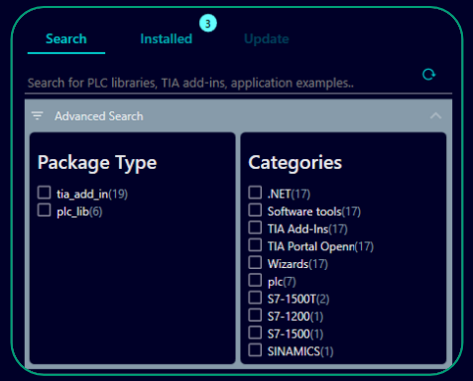
TIA Package Manager - Main features

Powerful search engine

Real-time results and suggestions



Advanced search filters

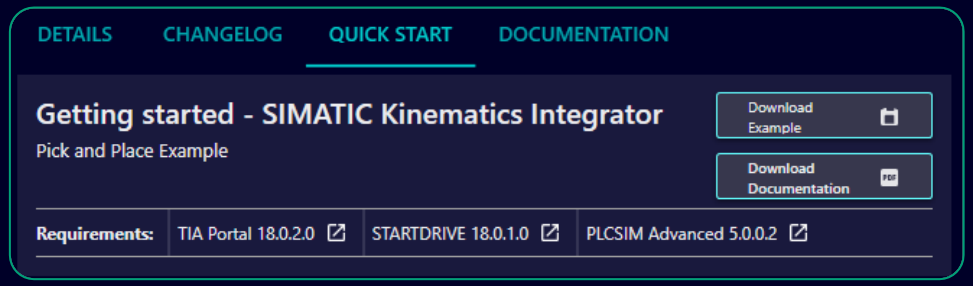


Compatibility check

Verify which TIA Portal version is required for the package

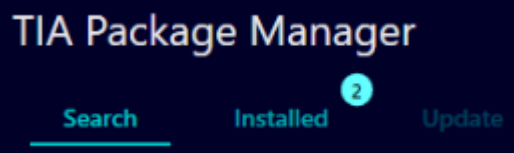


Direct links to SIOS
Access major software requirements directly.

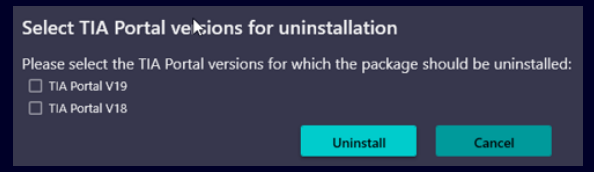


Installation tracking

Monitor which libraries and TIA Add-Ins were installed.



Uninstall or update:
Manage installed libraries and TIA Add-Ins.



TIA PKG

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TIA Package Manager – SIOS release

TIA Package manager
*(***Desktop Client)**



V 1.0.0
SIOS release

8+ Apps

- LSKI
- LAxisCtrl
- LCamHdl
- LLnCtrl
- LCalcMC
- LDrvSafe
- ....

20 + TIA Add-Ins

October / 2024

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How to get the TIA Package Manager

TIA Package manager
*(***Desktop Client)**



www.siemens.com/tia-package-manager

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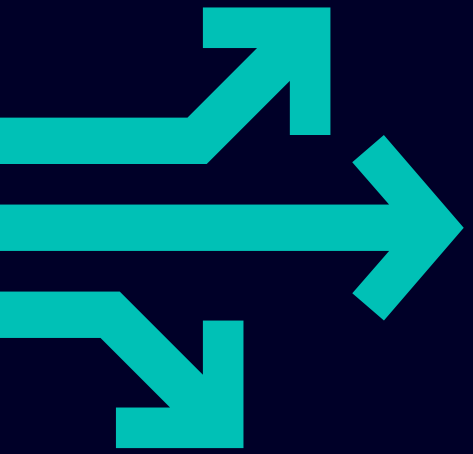
TIA Portal V20
TIA Portal Options

Content



01	SIMATIC STEP 7 Safety
02	SIMATIC Safe Kinematics
03	TIA Portal Multiuser
04	SIMATIC Robot Library
05	OPC UA
06	SIMATIC S7-PLCSIM / S7-PLCSIM Advanced
07	SIMATIC Target for Simulink
08	TIA Portal Test Suite
09	SIMATIC Visualization Architect (SiVArc)
10	SIMATIC Modular Automation (MTP)
11	Central User Management (UMC)
12	Modular Application Creator
13	SIMATIC ProDiag / SysDiag
14	TIA Portal Teamcenter Gateway
15	TIA Package Manager
16	TIA Portal Safety Validation Assistant

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TIA Portal Safety Validation Assistant
Obligation of verification and validation is stated in the standards

Machinery Directive

EN ISO 13849-2 Section 8 | EN ISO 62061 Section 9

“[…] function test of the safety functions in all operating modes of the machine to determine whether they comply with the specified characteristics […]”



Road to CE marking of a machine …

One important step:
Verification & validation

Time-consuming function test

→ Test and document whether the safety functions are implemented as previously specified

CE label

Each machine needs to have the CE label which confirms that all of the relevant directives have been complied



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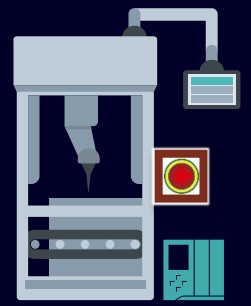
TIA Portal Safety Validation Assistant
Overview of machine validation

Safety concept, design and engineering

Validation

Documentation

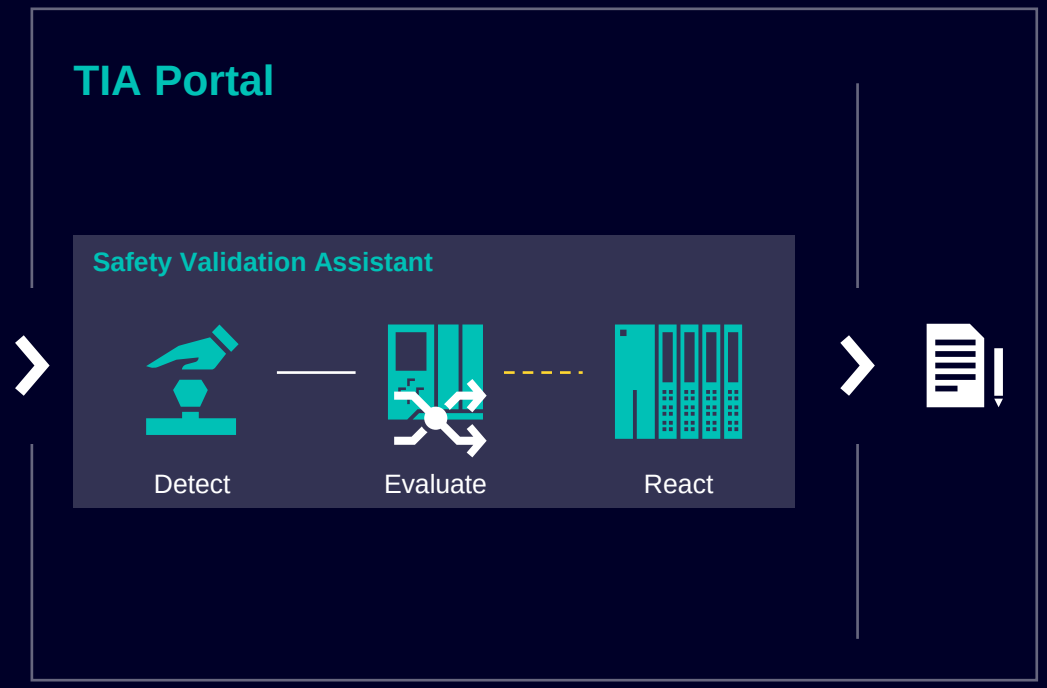


Safety Concept

Safety Design

Engineering

Validation



Solution

Guided validation of the machine safety functions

Easily validate the parametrization of the entire chain of a safety function by using software-guided test wizards.

The Safety Activation Test in TIA Portal Safety Validation Assistant validates the safety function of the entire chain from sensor to actuator. It supports SIMATIC as well as SINAMICS products.

The results can be exported afterwards in a single test report to proof the correct function of the entire safety function chain. The test report is an integral part of the machine documentation.

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TIA Portal Safety Validation Assistant
Delivery forms



	TIA Portal Safety Validation Assistant V20	Software Update Service
Article number for DVD	**–**	**–**
Article number for license download (OSD)	6SL3072-5LA05-0XG5	6SL3072-5AA05-0XY8
Delivery with STEP 7 Prof.	X[1]	X[1]
Updates in TIA Portal Updater	X	X

1 No installation required

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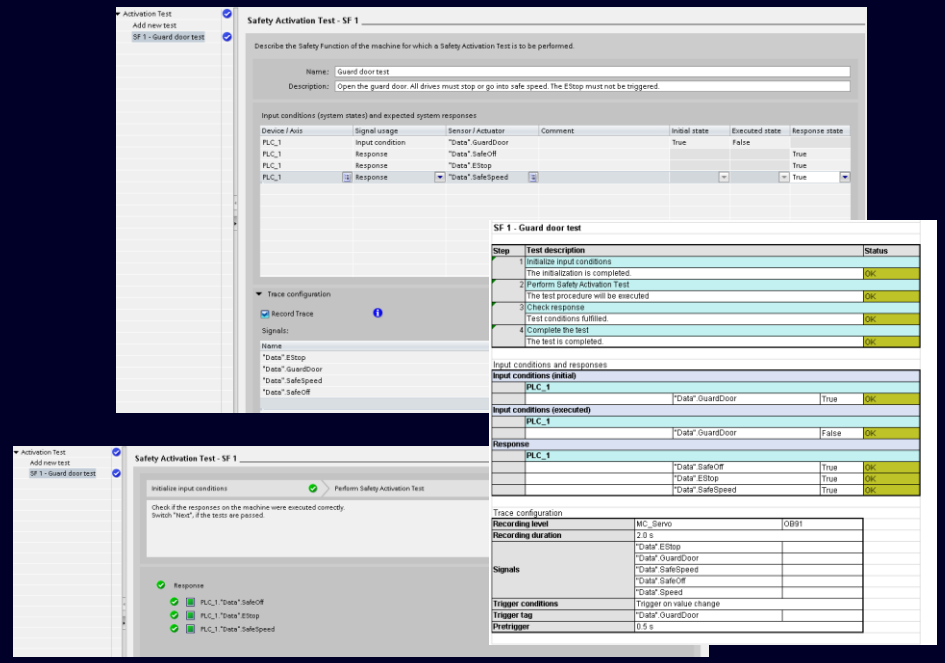
TIA Portal Safety Validation Assistant
Safety Activation Test workflow & required license

Workflow

01 **Definition:** All safety functions via the **wizard:**
Operating mode, input conditions, expected response
(this step can be initiated by the configuration engineer before Commissioning phase are executed)

02 After machine commissioning: **Performing the tests** and run through all defined safety functions via the **guided step-by-step wizard**

03 **Automatic** creation of the **test report** with all necessary information



Safety **Validation** is an important step on the way to the required **CE marking** of the machine!

Safety Activation Test is part of the Safety Validation Assistant and thus also part of the TIA Portal **Safety Validation Assistant license**.

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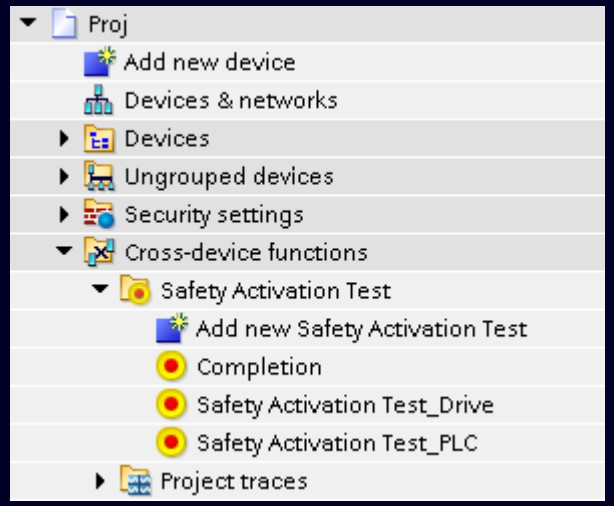
TIA Portal Safety Validation Assistant
How to start

Location in TIA Portal

The Safety Activation Test is located under **Cross-device functions**



Supported Hardware

Depending on the installed software, the following devices are supported:

With **STEP 7**:

- SIMATIC PLC (Standard and Failsafe)
- Distributed IOs (Standard and Failsafe)

With **Startdrive**:

- SINAMICS Drives (With enabled Safety Integrated Functions)

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TIA Portal Safety Validation Assistant
Possible evaluation devices

Every Safety Activation Test needs a device that acts as **evaluation device**. The following devices are supported:

- SIMATIC PLCs
- SINAMICS Drives

The evaluation device contains the logic of the Safety function. The Safety Activation Tests supports the **trace functionality** on the evaluation device.



SIMATIC as evaluation device

- For **any** SIMATIC in TIA Portal
- Access boolean tags for test
- Access all tags for trace
- Access networked devices (periphery, SINAMICS, …) for test

SINAMICS as evaluation device

- For any SINAMICS with **more than 1 F-DI**
- Access Safety Integrated Function status and F-DI status for test
- Access all parameters for trace

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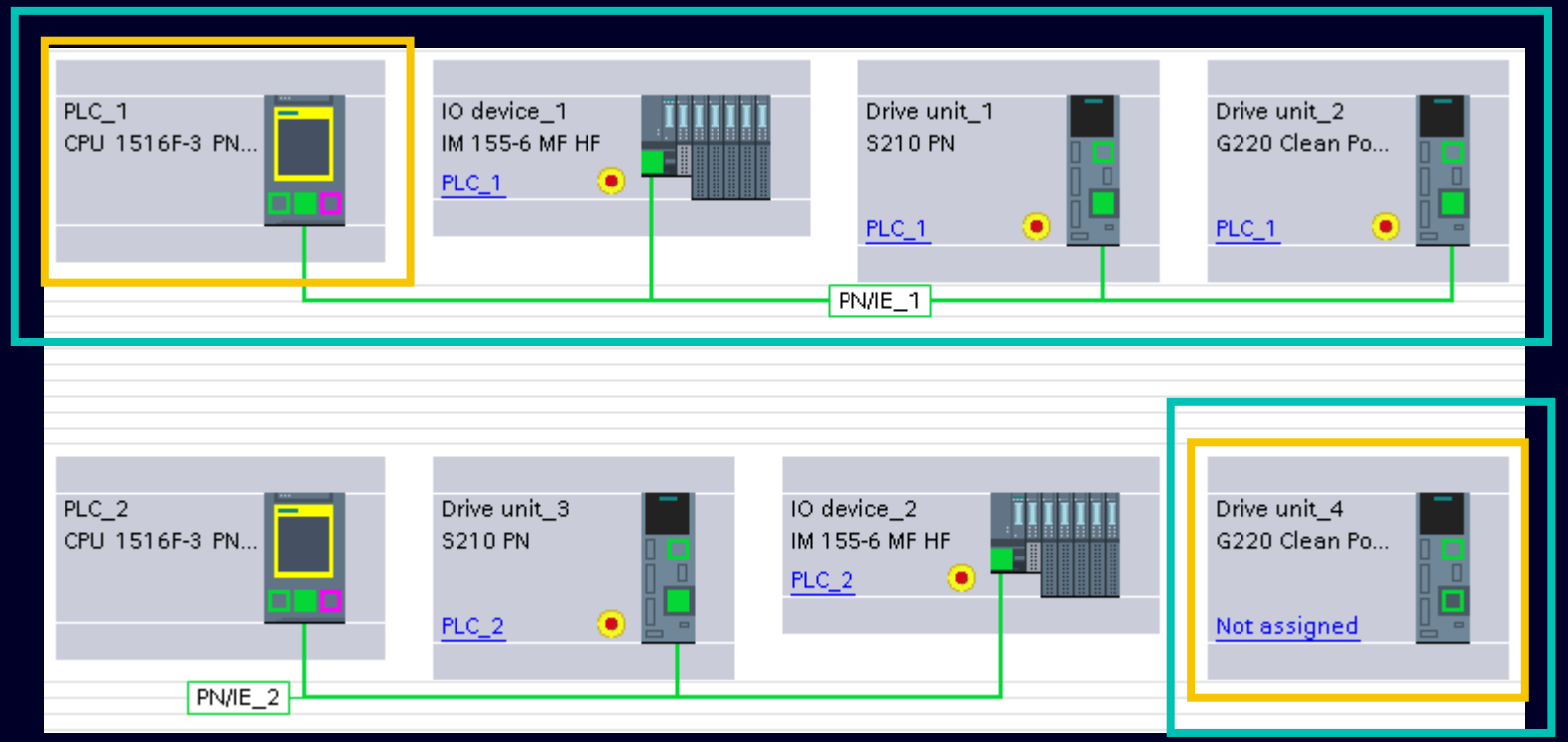
TIA Portal Safety Validation Assistant
Intelligent network analysis

PLC as evaluation device – Access all networked devices in Safety Activation Test



Drive as evaluation device – Access only the drive

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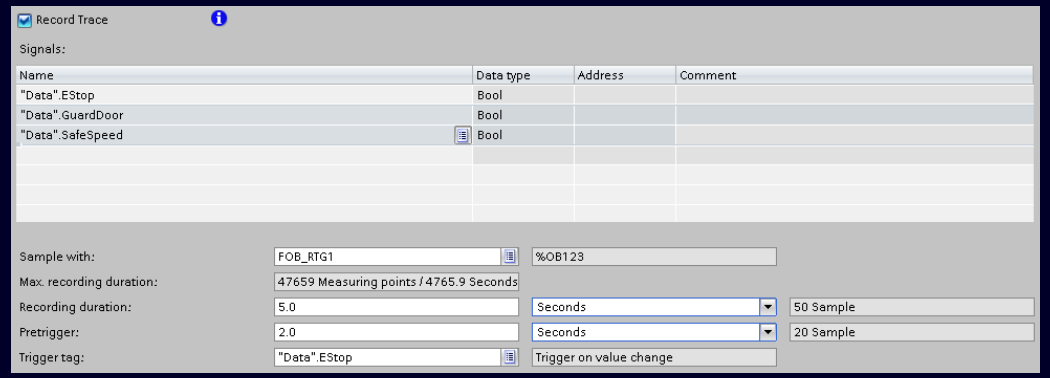
TIA Portal Safety Validation Assistant
Trace functionality

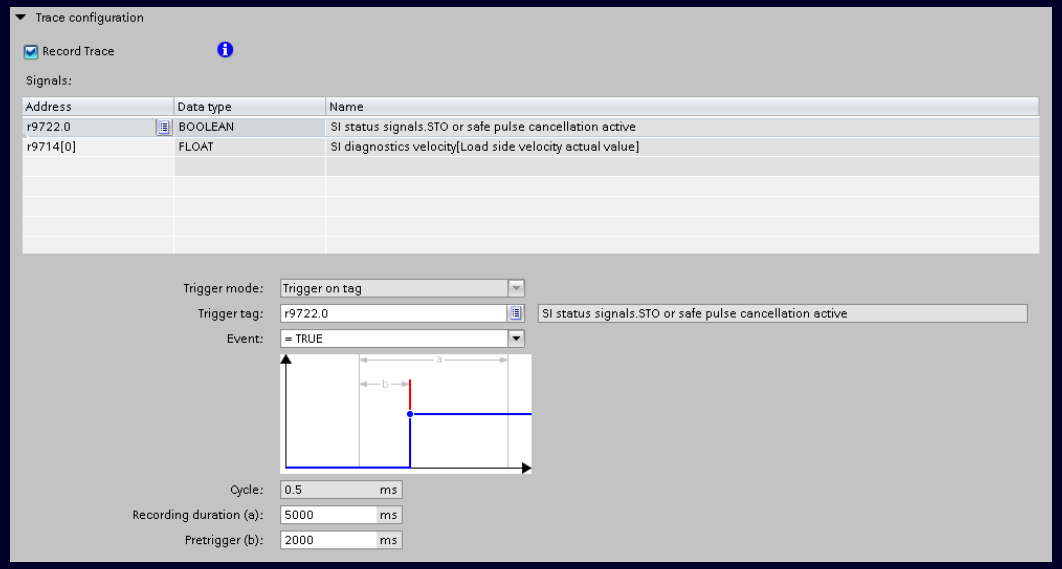
PLC as evaluation device

- 1 trace instance can be used
- All PLC tags available
- Trigger „on value change“



Drive as evaluation device

- 1 trace instance can be used
- All drive parameters available
- Trigger on Boolean signals
- Automatic cycle time calculation



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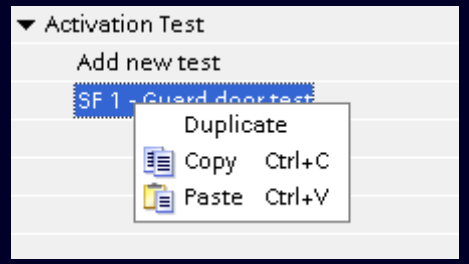
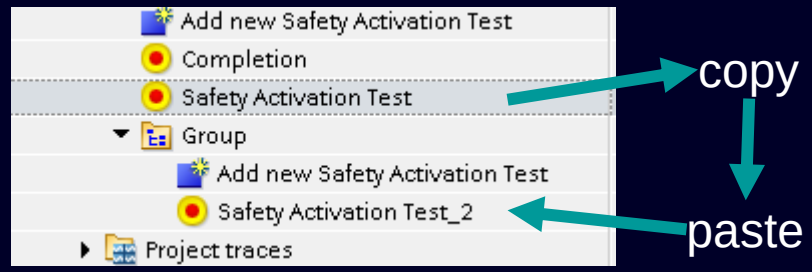
TIA Portal Safety Validation Assistant
Reusing the Safety Activation Test

Copy functionality

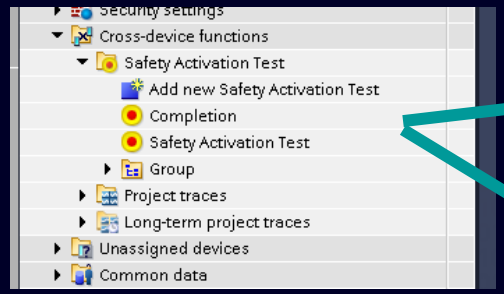
- Duplicate or copy & paste test cases
- Copy & paste a whole Safety Activation Test

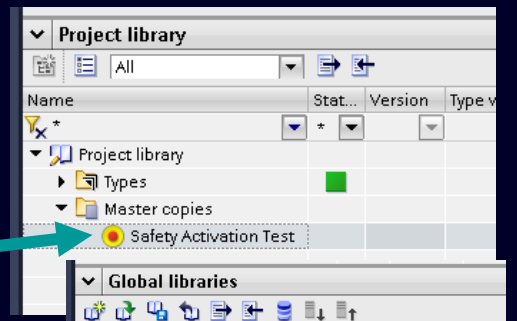


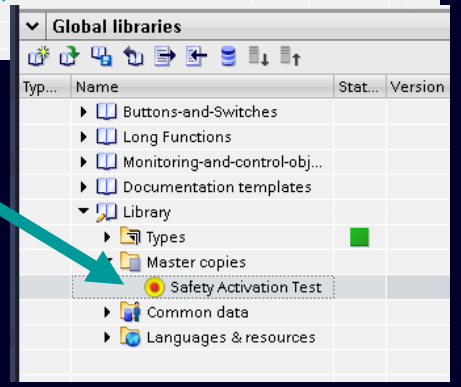


Library support

- Use project and global libraries with Safety Activation Test
- Storage as **Master copy**







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TIA Portal Safety Validation Assistant
Accessing the TIA help

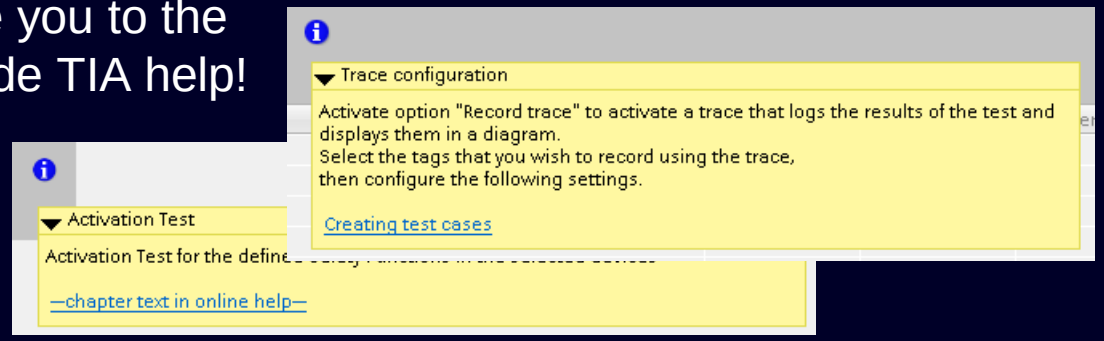
Having a question regarding the Safety Activation Test?



Access TIA help directly by following the 



The link will guide you to the **correct place** inside TIA help!



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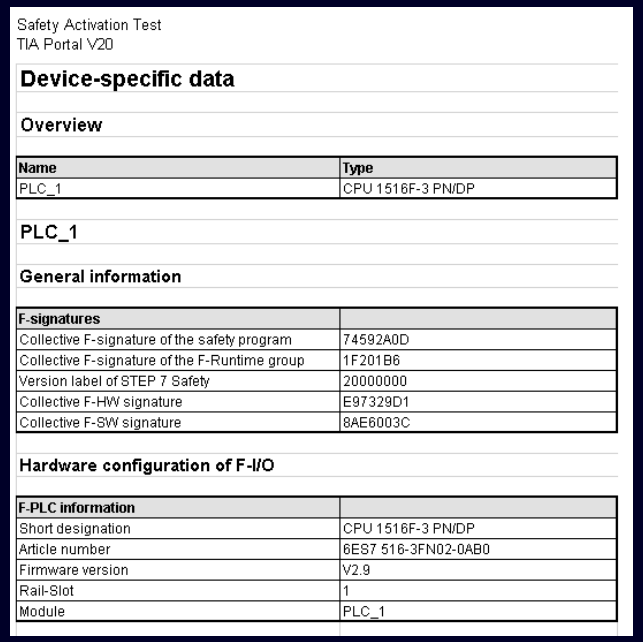
TIA Portal Safety Validation Assistant
Test report



Safety Activation Test
TIA Portal V20

Device-specific data

Overview

Name	Type
PLC_1	CPU 1516F-3 PN/DP

PLC_1

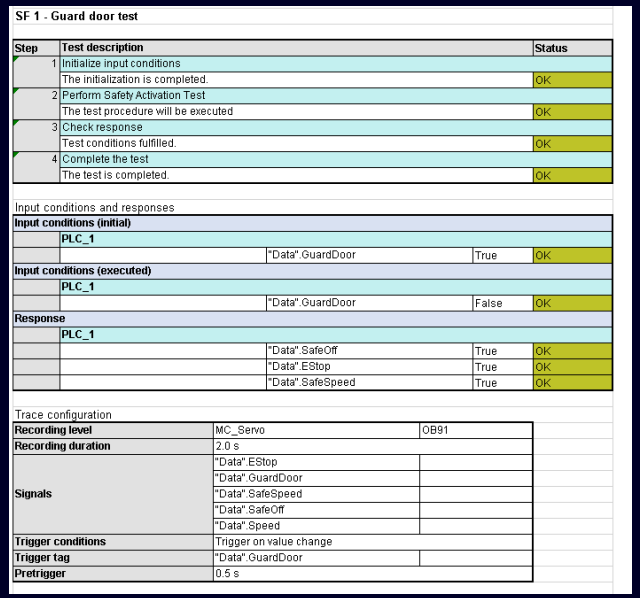
General information

F-signatures	
Collective F-signature of the safety program	74592A0D
Collective F-signature of the F-Runtime group	1F201B6
Version label of STEP 7 Safety	20000000
Collective F-HW signature	E97329D1
Collective F-SW signature	8AE6003C

Hardware configuration of F-I/O

F-PLC information	
Short designation	CPU 1516F-3 PN/DP
Article number	6ES7 516-3FN02-0AB0
Firmware version	V2.9
Rail-Slot	1
Module	PLC_1

Overview all relevant data
(firmware version, safety parameters)
→ **Time savings** compared
to manual documentation



SF 1 - Guard door test

Step	Test description			Status
1	Initialize input conditions			
	The initialization is completed.			OK
2	Perform Safety Activation Test			
	The test procedure will be executed			OK
3	Check response			
	Test conditions fulfilled.			OK
4	Complete the test			
	The test is completed.			OK

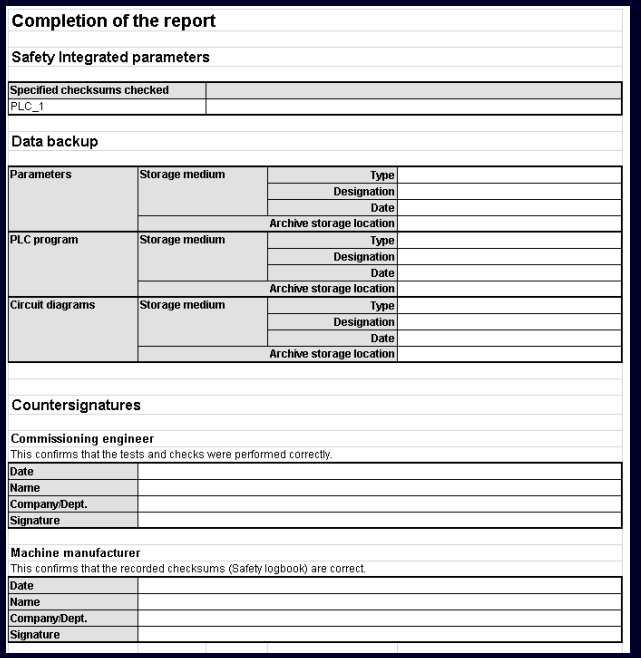
Input conditions and responses

Input conditions (initial)				
	PLC_1			
		"Data".GuardDoor	True	OK
Input conditions (executed)				
	PLC_1			
		"Data".GuardDoor	False	OK
Response				
	PLC_1			
		"Data".SafeOff	True	OK
		"Data".EStop	True	OK
		"Data".SafeSpeed	True	OK

Trace configuration

Recording level	MC_Servo	OB91
Recording duration	2.0 s	
Signals	"Data".EStop	
	"Data".GuardDoor	
	"Data".SafeSpeed	
	"Data".SafeOff	
	"Data".Speed	
Trigger conditions	Trigger on value change	
Trigger tag	"Data".GuardDoor	
Pretrigger	0.5 s	

All test results of the **Activation Test**
(incl. trace images)



Completion of the report

Safety Integrated parameters

Specified checksums checked	
PLC_1	

Data backup

Parameters	**Storage medium**	**Type**	
		Designation	
		Date	
		Archive storage location	
PLC program	**Storage medium**	**Type**	
		Designation	
		Date	
		Archive storage location	
Circuit diagrams	**Storage medium**	**Type**	
		Designation	
		Date	
		Archive storage location	

Countersignatures

Commissioning engineer
This confirms that the tests and checks were performed correctly.

Date	
Name	
Company/Dept.	
Signature	

Machine manufacturer
This confirms that the recorded checksums (Safety logbook) are correct.

Date	
Name	
Company/Dept.	
Signature	

Separate sheet for signatures

Same look and feel as the report from Startdrive **Safety Acceptance Test** for SINAMICS
A **perfect match**!

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Download and Trial

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