



TIA Portal V17 – Highlights

May 2021

TIA Portal

Highlights of TIA Portal V17

WinCC Unified

- Improved screen engineering with new style
 - Graphics and faceplates (with functional enhancements) in library
 - Extended communication and 1st set of system diagnostic
 - Audit for PC
 - WebClient for panel
- 🔗 **Plant Intelligence Options**

WinCC – Innovations

- WinCC Advanced: Template & Popup screens in the library
- WinCC Professional: Raw data for S7-1500, new system tags

STEP 7 – Innovations

- CEM – Cause Effect Matrix
- CFC – Continuous Function Chart (planned for July 2021)
- Download / Upload of user groups
- Functional enhancements in the cross-reference list
- Openness extensions for project generation

Startdrive – Innovations

- Support of SINAMICS G115D
- S120: Data set switching, manual optimization
- SINAMICS DCC: Know-how-protection

Hardware configuration

- Global Offline/Online comparison
- Offline/Offline comparison at parameter level
- CPU 1518HF-4PN: Safety and redundancy
- Extended quantity structures for S7-1500 and ET200 CPUs
- Extensions for CPU 1518 MFP
- Disable and enable I-Device
- DHCP and DNS for S7-1500 and ET200 CPUs
- Web server innovations
- S7-1200 Highlights with FW4.5 (OPC UA/Webserver)
- CPU 1518T/TF-4 PN/DP: High performance motion control

System functions

- Openness-extensions for libraries and UMAC
- User Management & Access Control (UMAC)
- Library
- Security per Default
- TIA Portal Language Packs
- Last used objects

TIA Portal Options

- 🔗 **STEP 7 Safety**
Fast Commissioning, nested UDTs, Openness-extensions
- 🔗 **SIMATIC Safe Kinematics**
Function, advantages and requirements
- 🔗 **Multuser**
- 🔗 **SIMATIC Robot Library**

TIA Portal Options

- 🔗 **OPC UA**
S7-1200: Diagnostics, methods; S7-1500: Alarms and Conditions, Server modelling, Client: new Compact blocks, GDS – certificate handling
- 🔗 **PLCSIM/PLCSIM Advanced**
Support of S7-1500 R/H CPU, secure communication with OPC UA, OUC und HTTPS
- 🔗 **SIMATIC Target for Simulink**
Code-generation for SIMATIC Edge & LiveTwin
Integrated S-functions for PLCSIM Adv coupling
- 🔗 **Test Suite**
Openness Support of style guide Check and application test
- 🔗 **SiVArc**
Support of WinCC Unified, new expressions, usability enhancements
- 🔗 **Energy Suite**
Improved load management and flexible energy data connections (by Proxy-DBs)
- 🔗 **Central User Management (UMC)**
Single Sign-on, SIMATIC Logon-protocol, licensing
- 🔗 **Modular Application Creator**
- 🔗 **ProDiag**
Monitoring within PLC Data Types, usability improvements
- 🔗 **Teamcenter Gateway**
Single Sign-on, PKI, Linking between Teamcenter and TIA Portal objects

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WinCC Unified V17 Highlights

Efficient Engineering

- **Screen Editor**
 - properties for multi selection
 - Snap to object, ...
- **Faceplates (reuse of objects)**
 - Static and dynamic extensions
 - Rotation of faceplates
 - Workflow in libraries
- **Parameter Control**
 - Complex structures (UDT in UDT)



Modern UI & Standardization

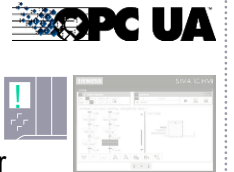
- **UI Enhancements**
 - F(x) for UCP
 - Alarm Hitlist (PC), ...
- **Management of objects in libraries**
 - Versioning and deployment
 - Integration of faceplates and graphics

Adaptability

- **Styles**
 - New additional Styles
 - (dark and bright) as day / night switch

Connectivity

- **Soft PLC**
- **OPC UA**
 - DA (Server, Client)
 - A&C (Server)
- **Diagnostics**
 - Diagnostic-indicator
 - S7-1500 diagnostic buffer
- **Native 3rd Party Connectivity**
 - Modbus, Alan Bradley, Mitsubishi, Omron



Distributed Systems

- **Collaboration**
 - screens
- **Clients**
 - operate (Unified Comfort Panel & PC)
 - monitor (PC)
- **User Management (local)**
 - Custom defined function rights
- **Central UMC**



Archiving and traceability

- **Archiving**
 - new SQL Server Version
- **Audit (PC)**
 - RT Tracing
 - Basis for GMP
- **Reporting (PC) via Excel Plugin**
 - E-Mail distribution
 - Central storage



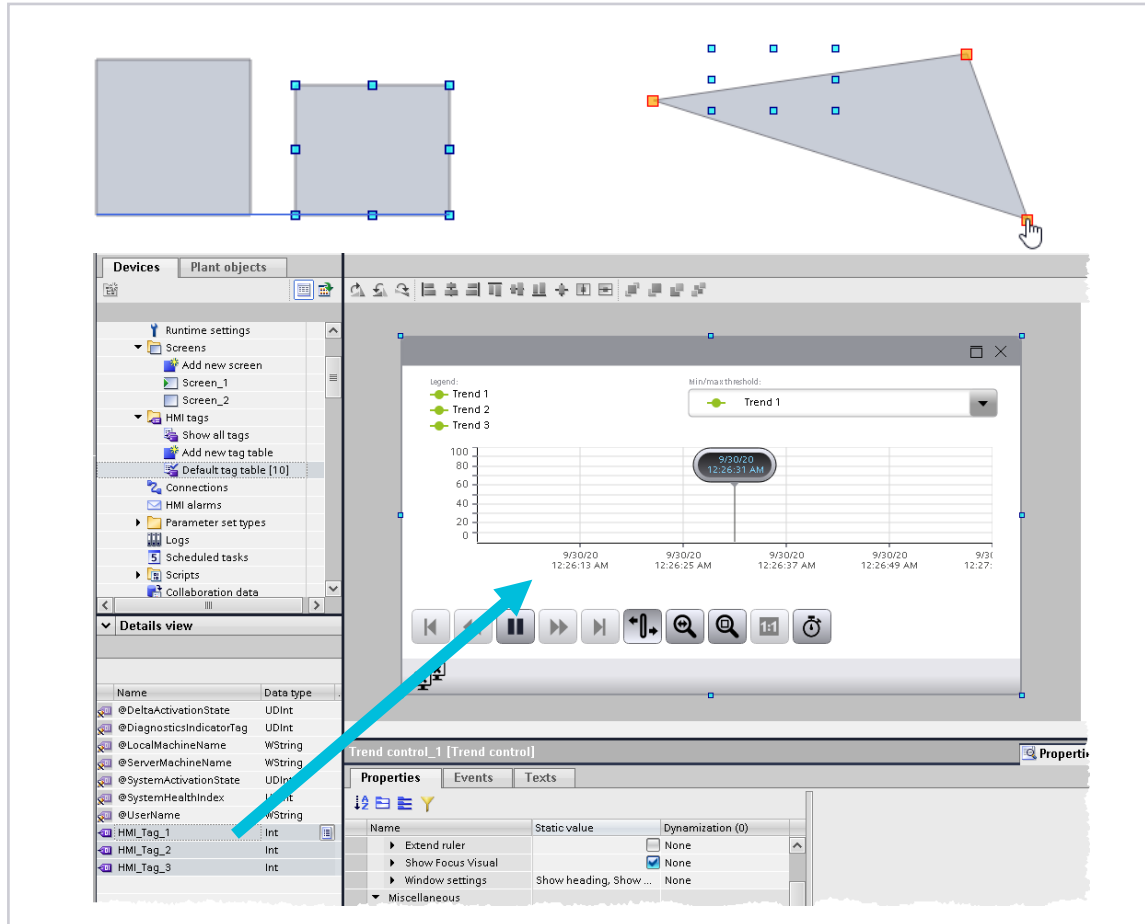
Plant Intelligence Options

- **Calendar**
 - Reporting, Usability
- **Performance Insight**
 - KPI Re-Calculation, Drill down
- **Sequence**
 - Import and Export, Access protection
- **Line Coordination**
 - Recipe scaling, Monitoring act. values



WinCC Unified V17

Efficient engineering - Screen editor improvements



Line handling

- free “drawing” of Polyline & Polygon

Improvement “Snaplines”

- works by adjusting the size of objects
- preview snapline by insert new screen objects

Improvement “Multi-Selection”

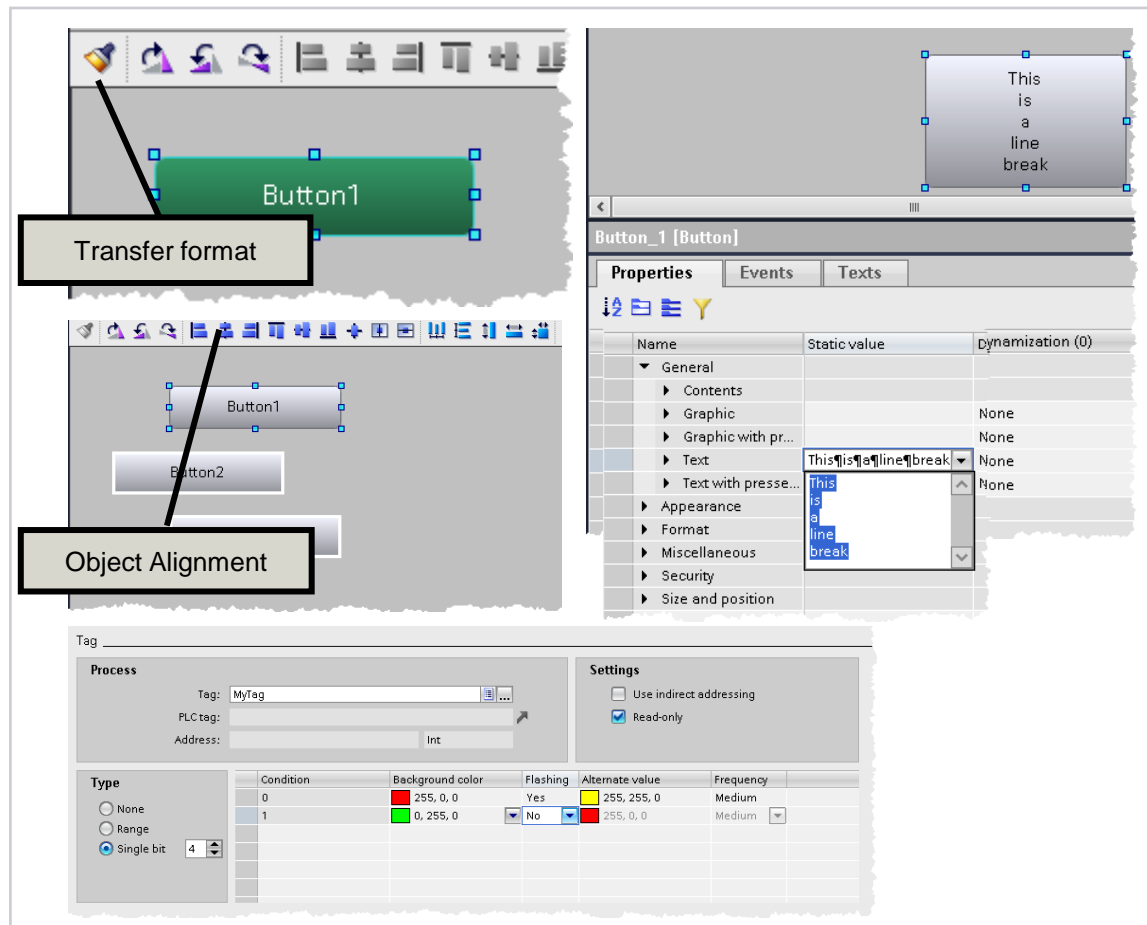
- change the common attributes of multiple objects

Extension of Drag&Drop

- works now on switch and trend control, e.g. select multiple tags and insert to trend control

WinCC Unified V17

Efficient engineering - Screen editor improvements



Transfer Format

- Copying format

Object handling

- Align objects (left, right, top, bottom)
- set select objects to the same height and/or width
- Distribute objects evenly vertically/horizontally

Layer handling

- Move objects one layer up or down

Multi-line text

e.g. for all relevant screen items like

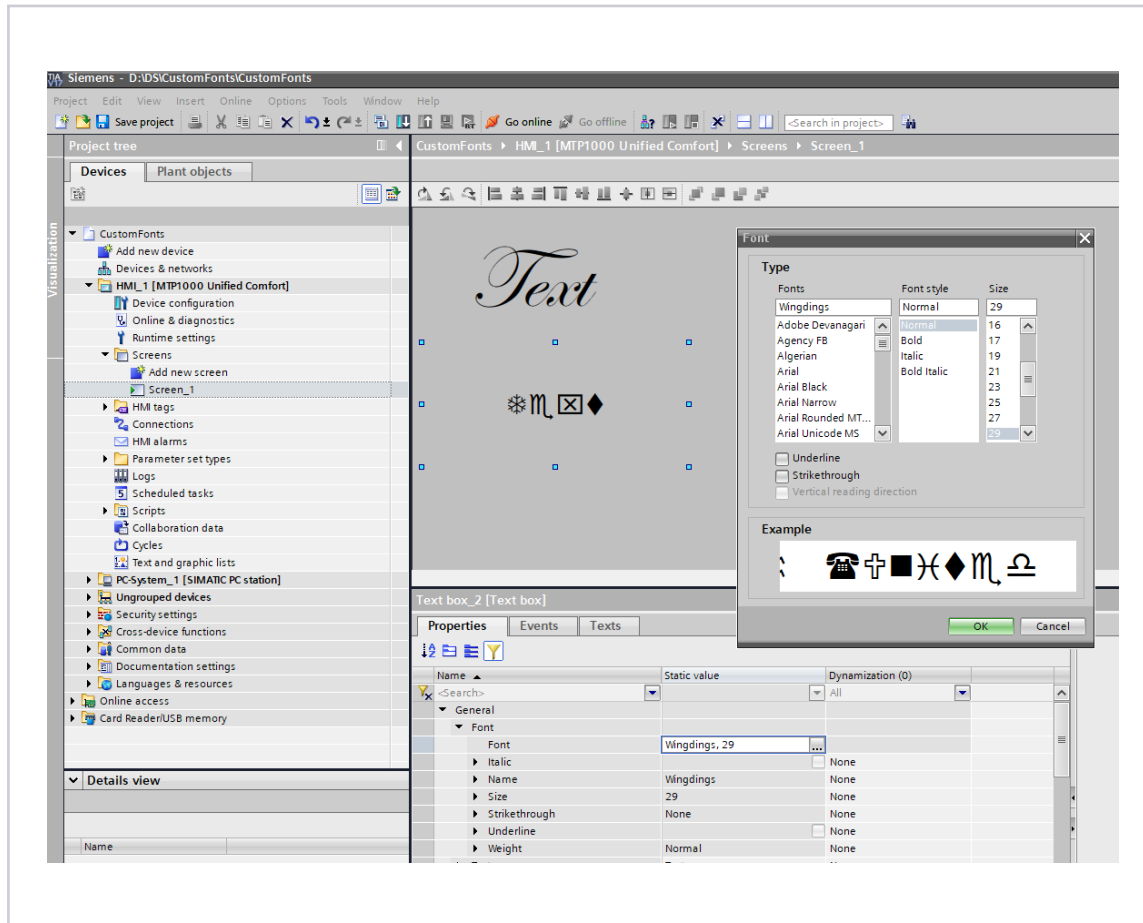
- Text field, button and switch
- Check- and Radio-boxes
- Bar, Pager and Gauge

Extended animation dialog

- Change color of objects and their flashing behavior upon process values

WinCC Unified V17

Efficient Engineering – use of custom defined fonts



Use of additional fonts

- Create Cooperate Design
- Support Design including True Type Fonts (TTF)
- WYSIWYG for Panel and PC

WYSIWYG using True Type Fonts for

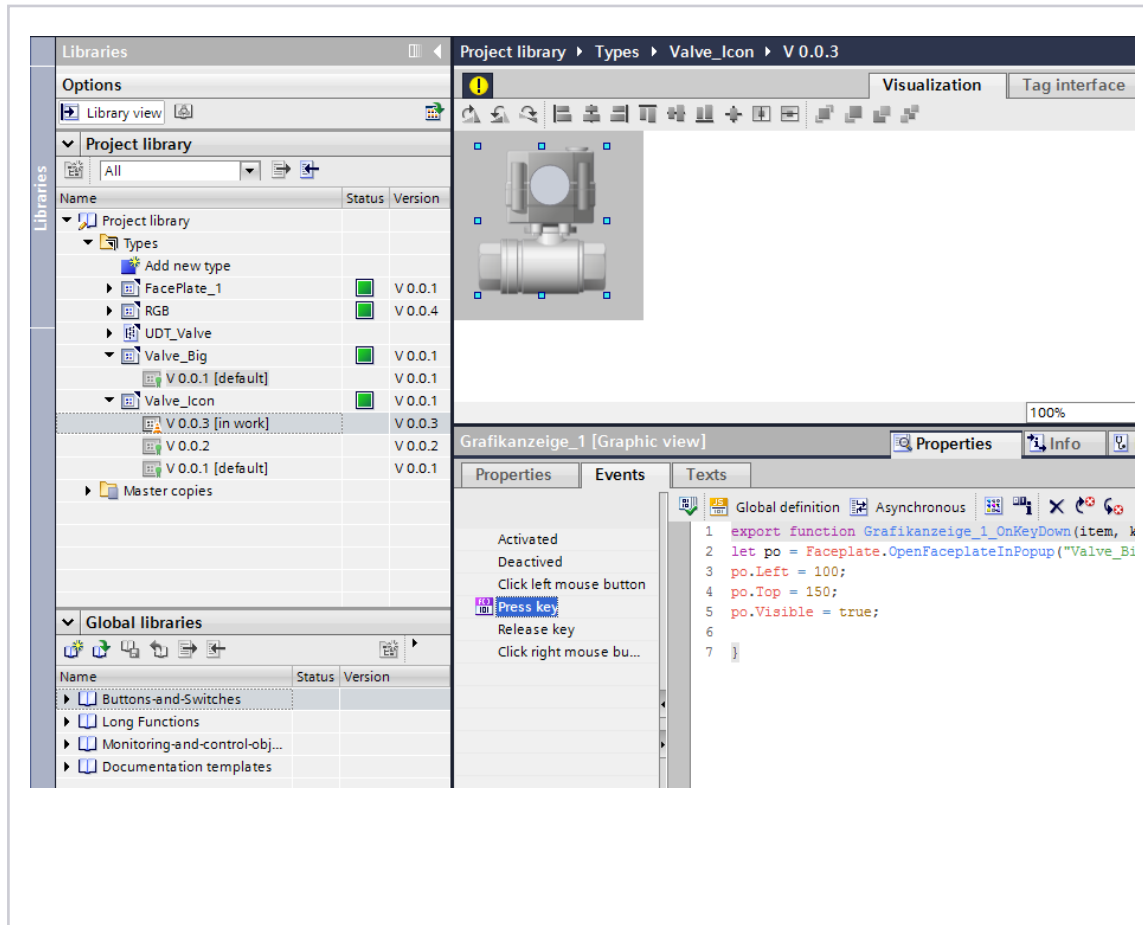
- Fonts with icons
- language or signs support

Ease of use due to integration

- Fonts are included in TIA Portal project
- No extra installation on Runtime device

WinCC Unified V17

Efficient engineering - Unified Faceplate in TIA Portal Library



Typization

- Create Unified Faceplate Types in TIA Portal Library
- Use Faceplates from Library in Unified Devices
- Faceplates type can be used as instances or popups
- Instances and popups get a reference to a type and specific version of the type
- Support of UDTs

Versioning

- Unified Faceplates are handled like simple type versions
- Instances can be rewired to higher or lower version
- Instances can be rewired to other type
- Unified Device can use different versions of one type
- Definition of a „default version“ to be used

Conversion from Common Data

- V16 Unified Faceplates will be moved and converted to TIA Portal Library automatically
- To reuse also an UDT on the interface, put the PLC UDT In V16 as type to the library!

WinCC Unified V17

Efficient engineering - Graphics in TIA Portal Library

The screenshot shows the TIA Portal Library interface. The left pane displays the 'Project library' tree with a table of graphic types:

Name	Status	Version
Project library		
Types		
Add new type		
_Siemens	Green	V 0.0.2
V 0.0.3 [in work]	Yellow	V 0.0.3
V 0.0.2 [default]	Green	V 0.0.2
V 0.0.1	Green	V 0.0.1
A_Graphic	Green	
V 0.0.1 [in work]	Yellow	V 0.0.1

The right pane shows the 'Graphic [Graphic]' properties window. A warning message states: 'This type version is currently in the "in work" state. You can [release the version](#) or [discard the changes and delete the version](#). Before'. Below the warning, a table shows the 'Graphic' type with columns for Name, Default graphic, and Language (German (Germany)). The 'General' tab is active, showing the 'Name' property set to 'Graphic'.

The bottom screenshot shows the 'Graphic view [Graphic view]' Properties window. The 'Properties' tab is active, showing a table with columns for Name, Static value, and Dynamization (0). The 'General' section is expanded, showing the 'Graphic' property set to 'Graphic type'.

Versioning of graphics

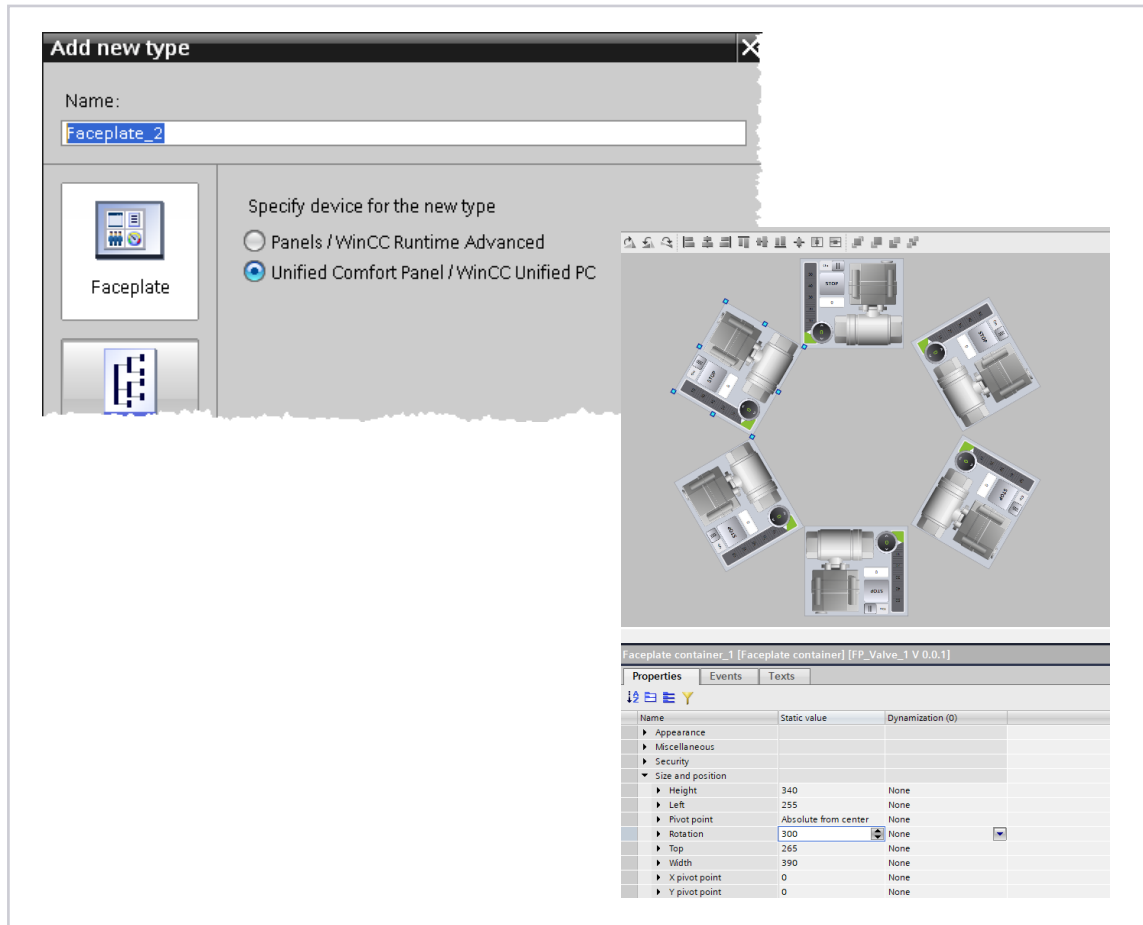
- Create graphic types in TIA Portal Library
- Graphics can be versioned in the library
- Definition of a „default version“ to be used
- Bitmap and SVG files can be used as versioned graphics

Instantiating of graphics

- Use graphic types in a screen of a Unified device

WinCC Unified V17

Efficient Engineering – Unified Faceplate



Rotating faceplate instances

- Faceplate Instances can be rotated like standard screen items
- Rotation and Ration Point can be dynamized via Script or tag

Interface Extensions

- Additional interface properties
 - Configuration String
 - 64 bit integer
 - Boolean
 - unsigned 64 bit integer
 - Real
- Access from type to instance container via Script (e.g. for positions or visibility)

Resource list

- Extension for graphic list

WinCC Unified V17

Efficient Engineering – Script editor improvements

The screenshot shows the WinCC Unified V17 script editor interface. The top navigation pane indicates the current project: `Projekt1 > PC-System_1 [SIMATIC PC station] > HMI_RT_2 [WinCC Unified PC RT] > Scripts > Global module > Function`. The main editor displays a script function:

```

1 export function Function(parameter1, parameter2) {
2   let tag1 = Tags("HMI_Tag_1");
3   let tagValue1 = tag1.Read();
4   HMIRuntime.Trace("value of M
5 }
  
```

An **ObjectPicker** dialog is open, showing a tree view of the project structure. The selected object is `HMI_Tag_1`. The dialog also contains a table with columns: Name, Data type, Address, and Comment.

Name	Data type	Address	Comment
HMI_Tag_1	Array...		

Below the script editor, the `HMIRuntime.GetDetailedErrorDescription` method is highlighted, with an IntelliSense tooltip showing its signature and description:

```

String GetDetailedErrorDescription(Errorcode errorCode)
Returns a detailed error description of the passed error code.
errorCode: Error code received by scripting object model methods.
  
```

Another IntelliSense tooltip is shown for the `Font` property of `item`:

```

Object/HmiFontPart Font get; set;
  
```

The script editor also shows the following code snippet:

```

let fontStyle = item.Font.Italic;
  
```

Insert object references via ObjectPicker

Select objects from a list of available objects in the ObjectPicker dialog (opened via keyboard shortcut Ctrl+J) instead of typing the object names manually

Supported object types:

- Tags
- Connections
- Screen Object Model (V17 Update 1)

Improved IntelliSense & Auto Completion

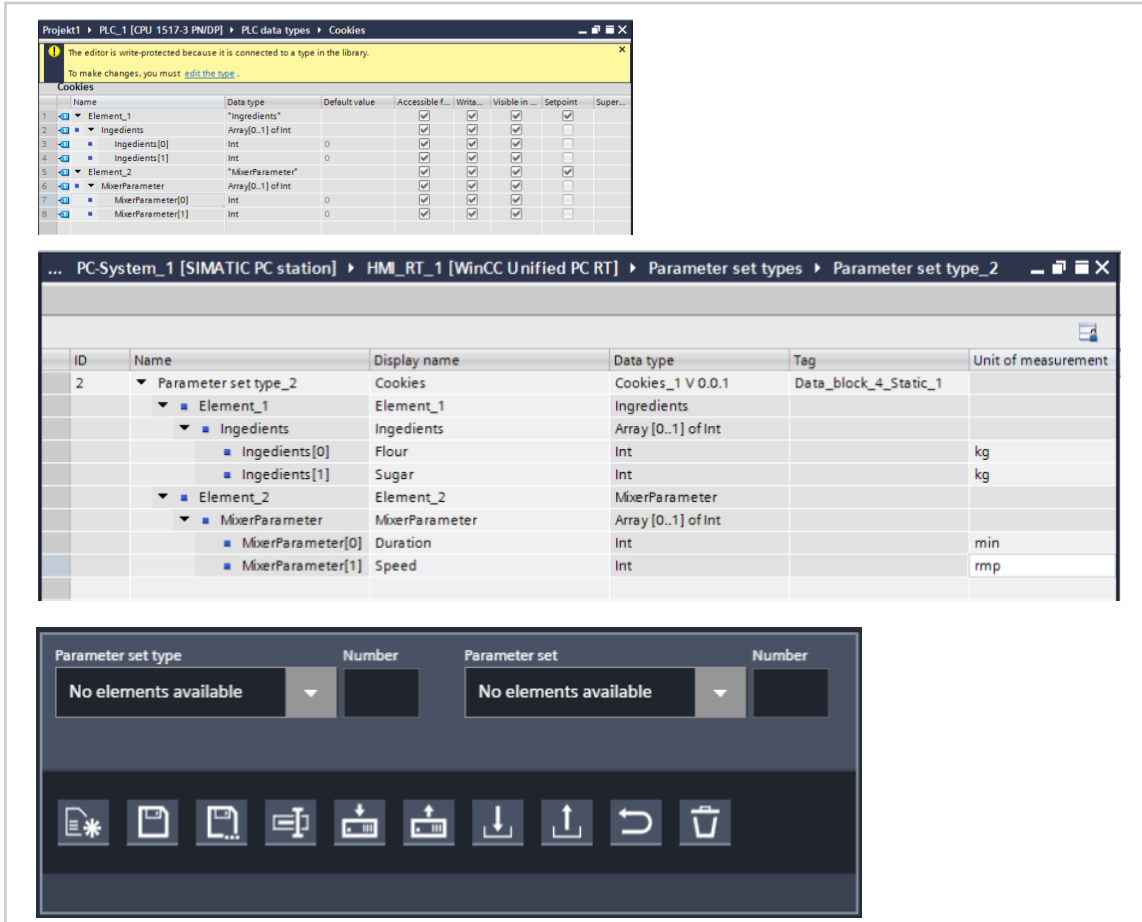
- Function return value shown in Info Tip
- Property Info Tips available on mouse over
- Filtering of auto completion list (contains filter like in VS)

The screenshot shows the WinCC Unified V17 script editor with the `item.Color` property highlighted. An IntelliSense tooltip is displayed, showing a list of color-related properties:

- AlternateBackColor
- AlternateBorderColor
- BackColor
- BorderColor
- ForeColor

WinCC Unified V17

Efficient Engineering – Parameter Control



Reuse of User Data Types

Efficiency due to reuse of structural definition of “User Data Types” (PLC/HMI UDT) for parameter sets

Use of complex UDTs

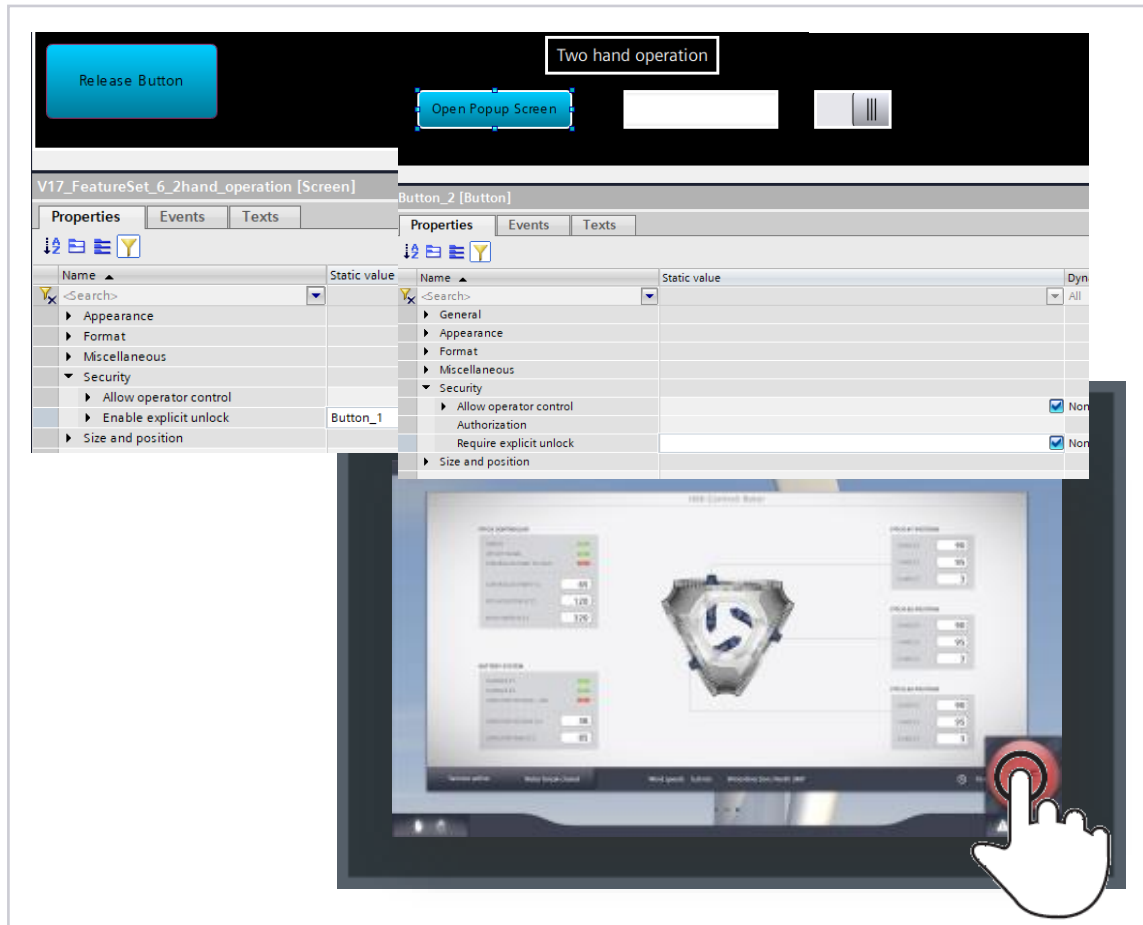
Support of complex UDTs for parameter set types e.g. UDT in UDT, array
Restriction: no UDT of Array, only “flat” array

Extended configuration possibilities

Adjust parameter to set control to operator’s needs by hiding parameter details for a simplified view

WinCC Unified V17

Adaptability – Multitouch - 2 Hand Operation



Fast and easy Engineering

- Set Release button „Explicit unlock“ for HMI screen and select screen items which are relevant for secure operation

Protection against unintended operations

- Secure operation as the operator has to press the “Release” Button for critical tasks e.g. via IO-Field, Pager,..

WinCC Unified V17

Adaptability – New designs and improved behavior



Select style for each Unified device

- Out of 3 predefined styles

New flat style

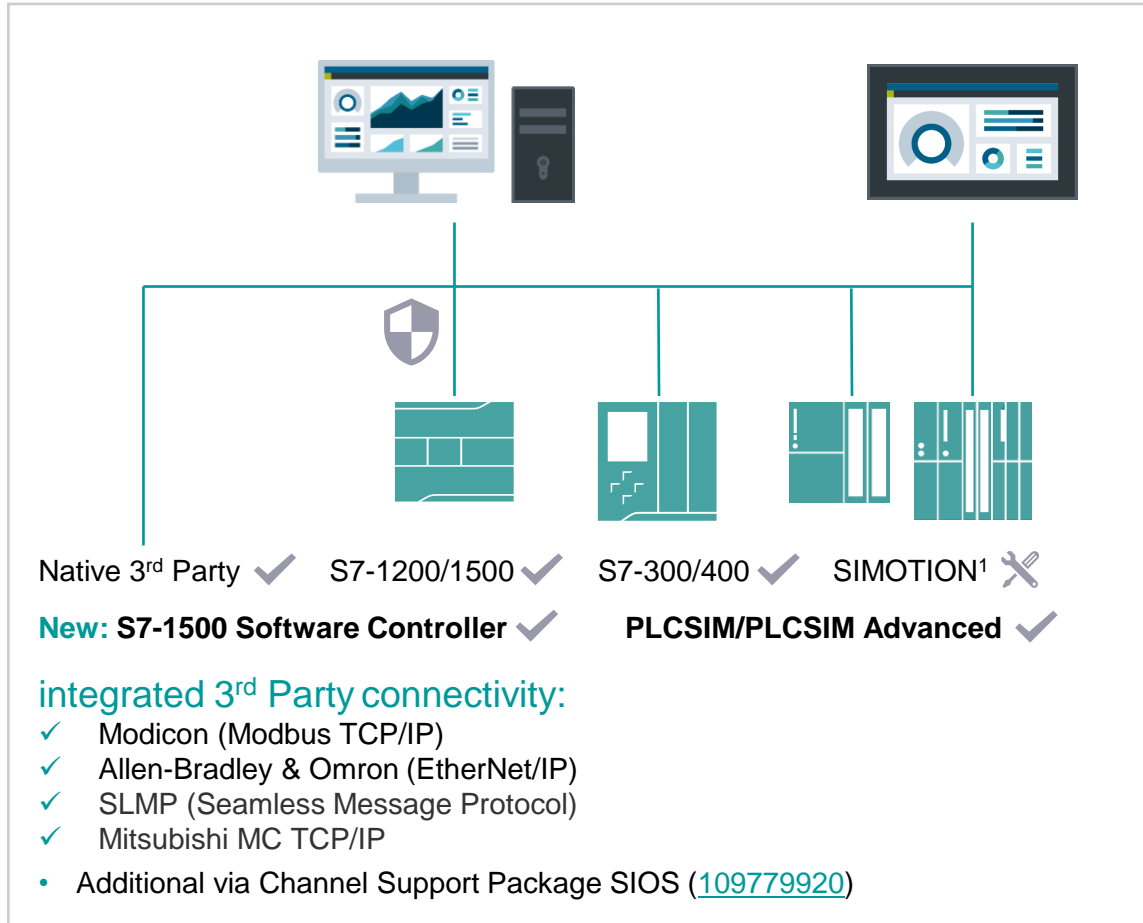
- Flat design in bright and in dark
- Responsive behavior depends of the item size
- Improved behavior, e.g.
 - Knob of the Pager no more over the scale
 - Inverse text color in case of selection

Improve readability e.g. Day/Night

- Change style at Runtime
 - Bright style during daylight
 - Dark style during night

WinCC Unified V17

Connectivity to automation systems



Perfect integration

of SIMATIC PLCs (TIA Portal)

High number of connections

- for Panels up to 16 PLCs
- for PC-Systems up to 128 PLCs (>10 with extra SIMATIC NET license)

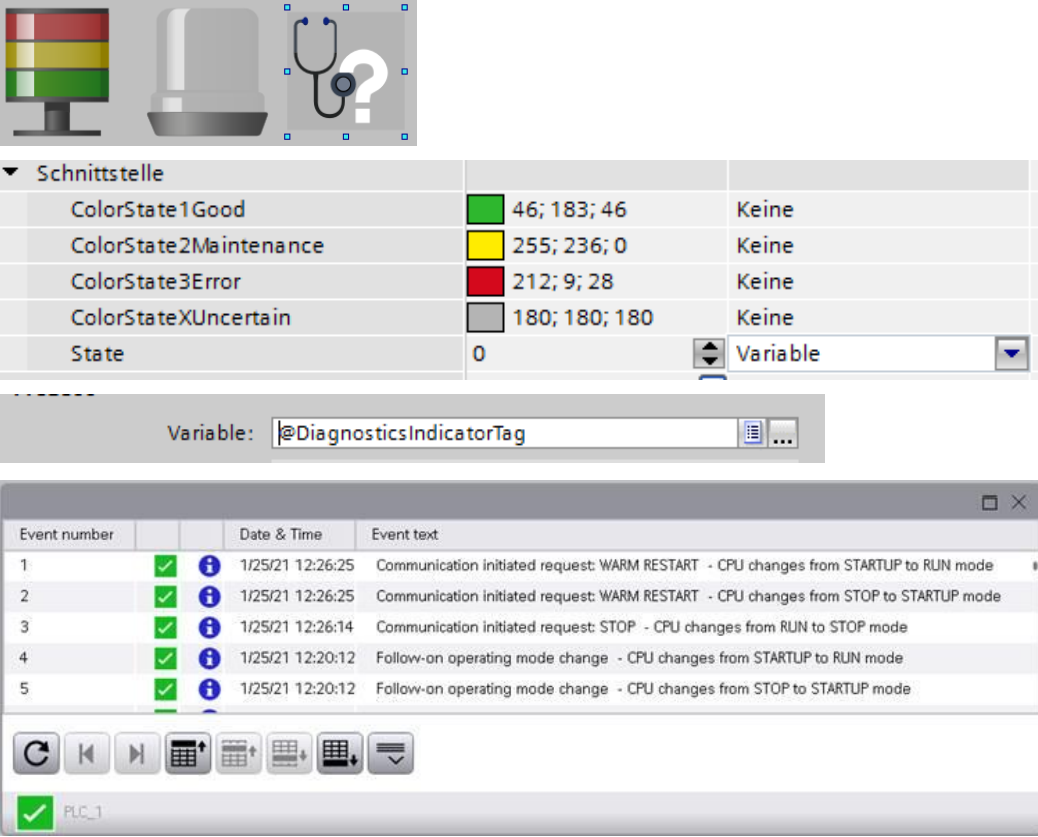
Support of S7-1500 Software Controller

- WinCC Unified PC RT on the same PC
- WinCC Unified PC RT on the OpenController (see SIOS)

¹ only tags (OPC UA DA)

WinCC Unified V17

Connectivity – System diagnostics



Schnittstelle		
ColorState1Good	46; 183; 46	Keine
ColorState2Maintenance	255; 236; 0	Keine
ColorState3Error	212; 9; 28	Keine
ColorStateXUncertain	180; 180; 180	Keine
State	0	Variable

Variable: @DiagnosticsIndicatorTag

Event number	Date & Time	Event text
1	1/25/21 12:26:25	Communication initiated request: WARM RESTART - CPU changes from STARTUP to RUN mode
2	1/25/21 12:26:25	Communication initiated request: WARM RESTART - CPU changes from STOP to STARTUP mode
3	1/25/21 12:26:14	Communication initiated request: STOP - CPU changes from RUN to STOP mode
4	1/25/21 12:20:12	Follow-on operating mode change - CPU changes from STARTUP to RUN mode
5	1/25/21 12:20:12	Follow-on operating mode change - CPU changes from STOP to STARTUP mode

PLC_1

System Diagnosis Indicator

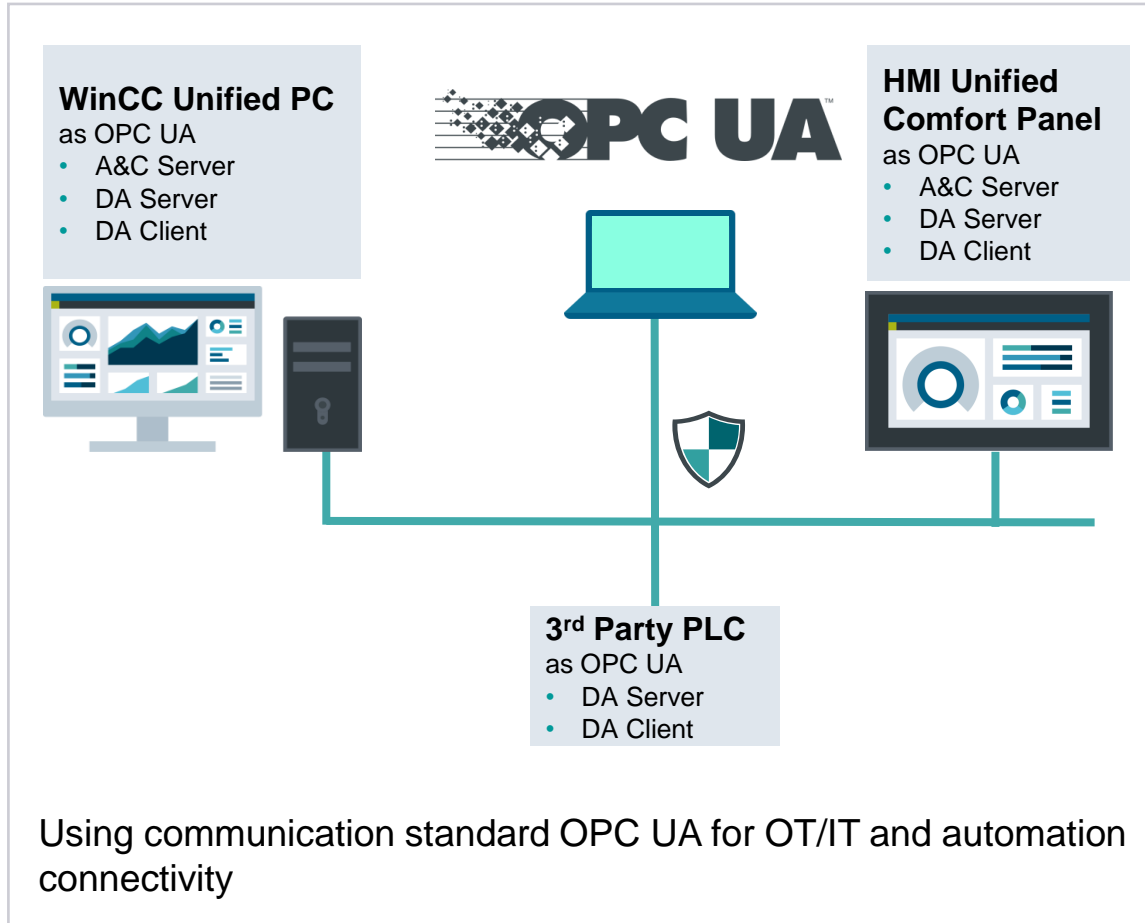
Introduction of a system variable @DiagnosticsIndicatorTag indicating the state of the system

Device Diagnostic Buffer

During maintenance of a machine or in the event of a fault, the diagnostics buffer of a SIMATIC S7 PLC can be scanned on an HMI system without the need for a programming tool.

WinCC Unified V17

Connectivity – Standard Interface OPC UA



Standard Connectivity

- via OPC UA (DA Server & DA Client)
- as A&C Server

Secured OT/IT Connectivity

via OPC UA to forward data to 3rd party applications

Automation Connectivity

via OPC UA to integrated 3rd party PLCs

WinCC Unified V17 Connectivity – Tags

General

Name:

PLC tag:

Connection:

PLC name:

Address:

Access mode:

Synchronization of the name of the PLC tag in the engineering station

Replacement of the character '.' if the sublevel-separator of the HMI tag was created from the connected PLC tag name:

- Use '_' as the replacement character
 Use ';' as the replacement character

Replacement of the characters '[' and ']' if the name of the HMI tag was created from the connected PLC tag name:

- Use '{' and '}' as replacement characters
 Use '(' and ')' as replacement characters

Replace invalid characters, if the name of the HMI tag was created from the connected PLC tag name:

Use as replacement character

Settings for the prefix 'PLC' in the HMI tag name

Connection	PLC name as prefix in the HMI tag name
HMI_Connection_1	<input checked="" type="checkbox"/>

Indirect addressing of absolute address

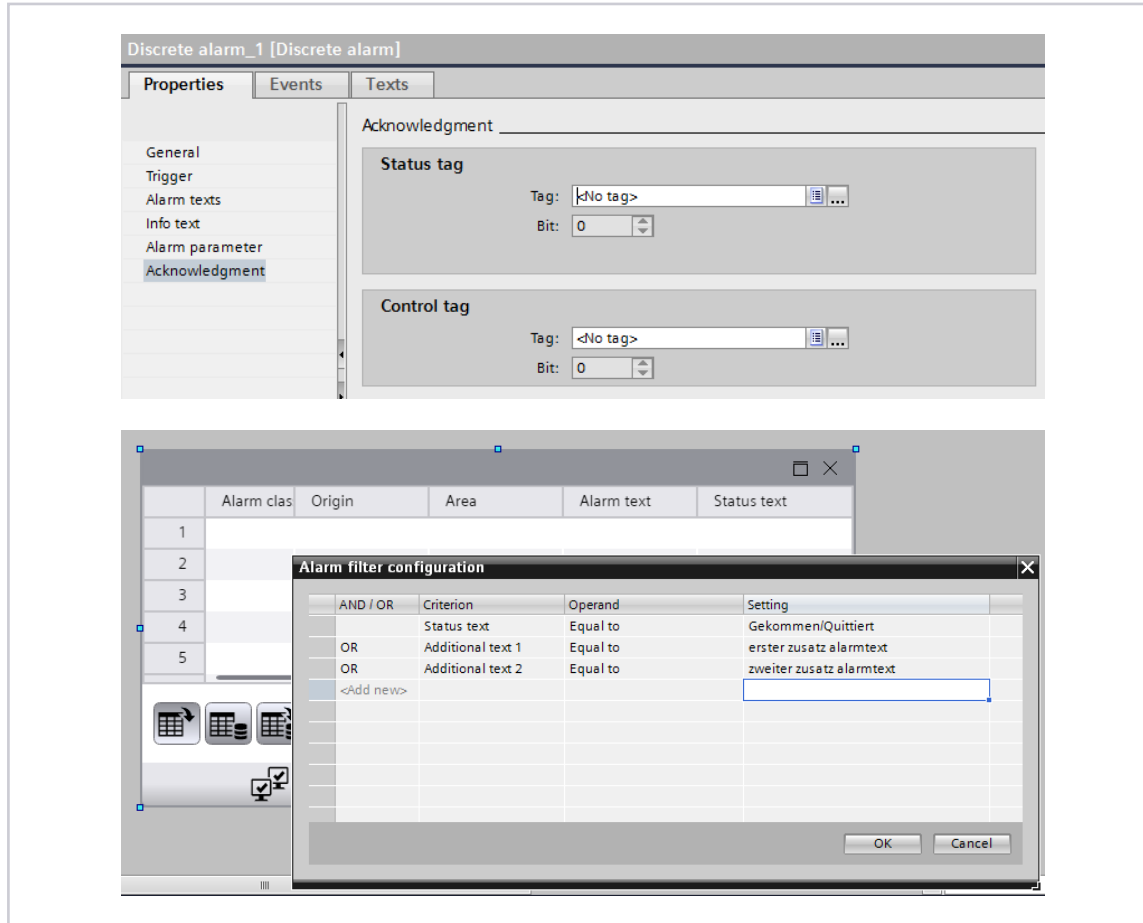
- Multiplex of absolute address for S7-300/S7-400 and for S7-1200/S7-1500

Settings for the synchronization of PLC Tag Name with HMI Tag Name

- Replacement of invalid characters in resulting HMI Tag Name
- Adding of the PLC Name as Prefix to the HMI Tag Name

WinCC Unified V17

Connectivity – HMI Alarms



Acknowledge discrete HMI Alarm via PLC Tag

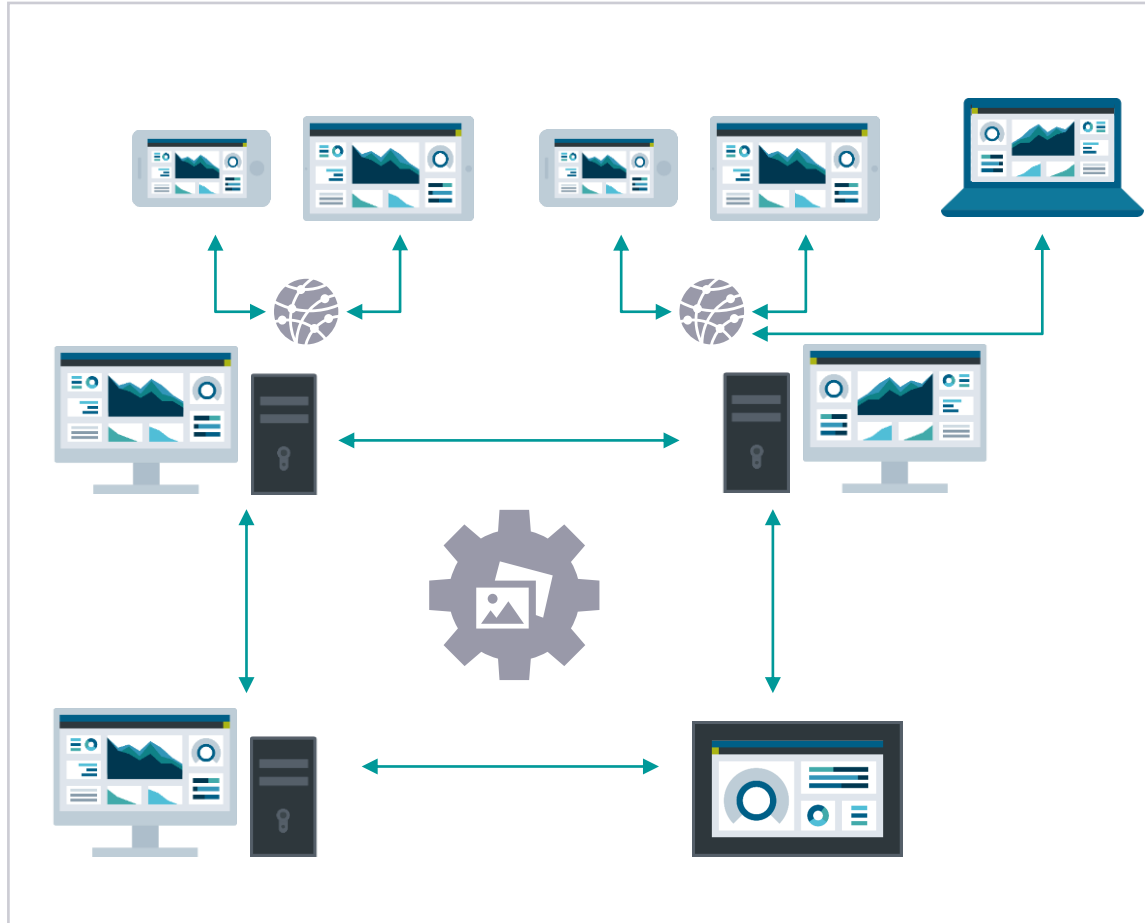
- PLC Tag (Control Tag) for acknowledgement
- PLC Tag (Status Tag) for acknowledgement state

Additional alarm filter in engineering

Filter that was only configurable at Runtime are now also available for pre-configuration in ES.

- Additional alarm texts 1..9
- Alarm Status Text (= translatable Alarm State)

WinCC Unified V17 Distributed Systems – Collaboration



Enabler for distributed system architectures
for WinCC Unified Systems

Modular and decentralized

production units collaborate by sharing information between Unified stations

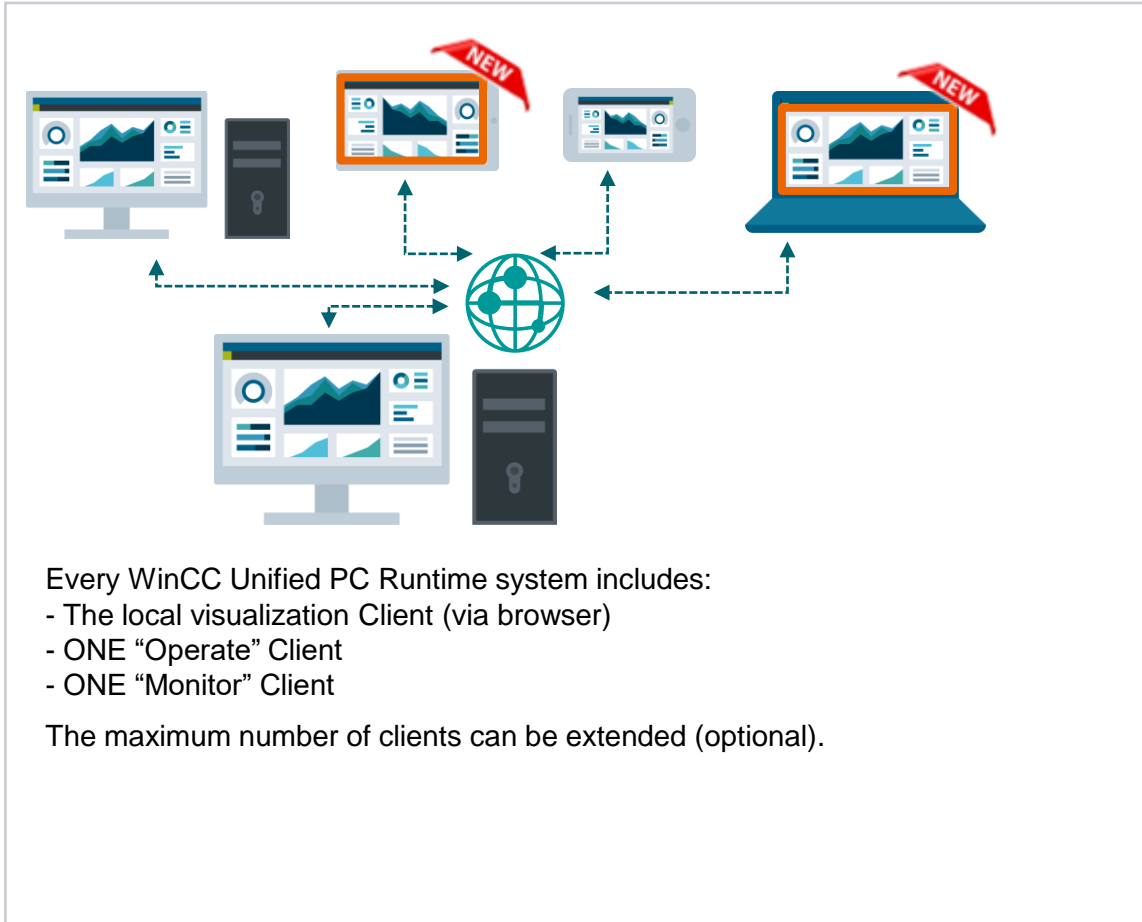
Direct access

to screens of different units e.g. for line supervision

Changes without notice possible

WinCC Unified V17

Distributed Systems – Remote Control of PC RT stations via Clients



Local Operation on the PC station

Realized via browser with further settings are used for typical use cases like auto start or encapsulated HMI Runtime (Kiosk mode)

Different types of Clients

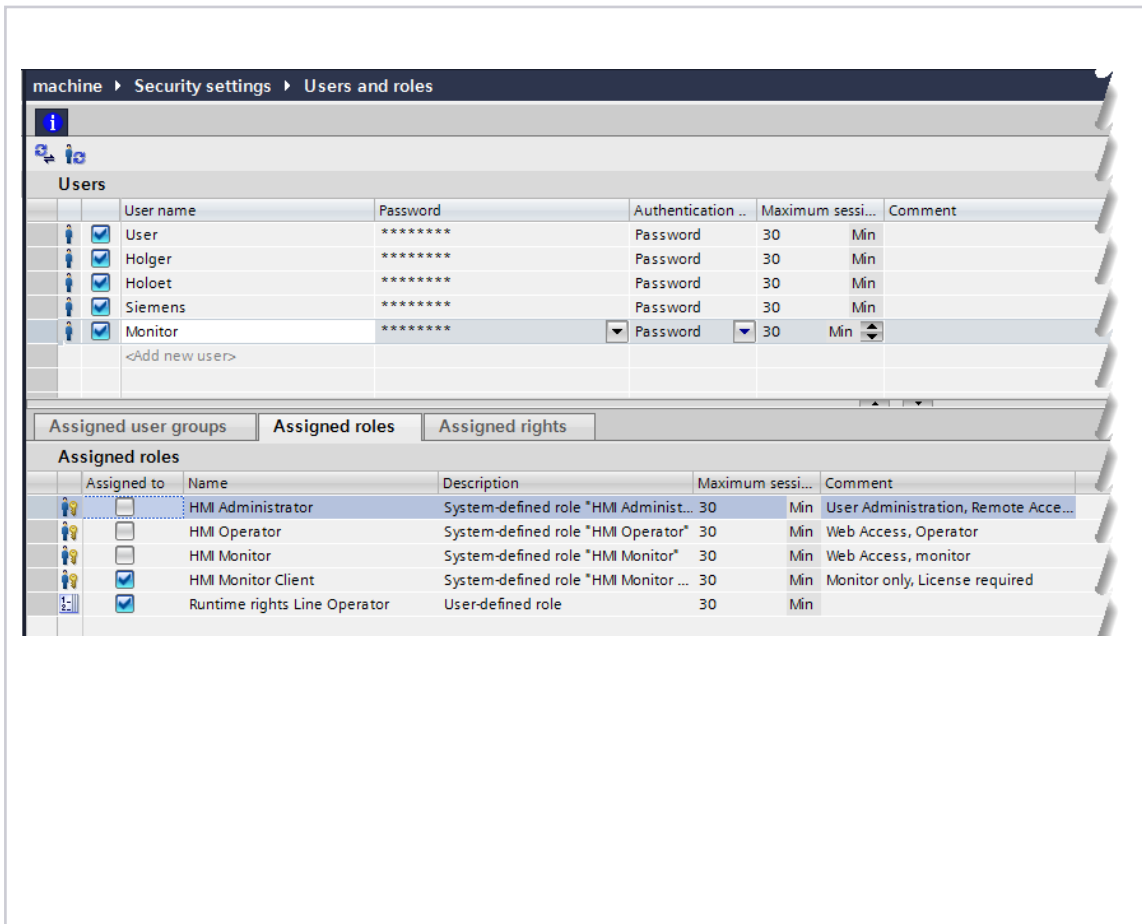
- „Operate“, for a full remote operation
- **New:** „Monitor“ as view-only mode (PC)

Simultaneous independent access of users via Web Clients

- For PC: to access more than 5 clients a Windows Server system is required (Windows 10 Server is mandatory for more than 5 Clients !)

WinCC Unified V17

Distributed Systems – Monitor client



The screenshot shows the 'Users and roles' configuration window in WinCC Unified V17. The 'Users' section lists several users, including 'Monitor'. The 'Assigned roles' section shows the roles assigned to the 'Monitor' user, including 'HMI Monitor Client' and 'Runtime rights Line Operator'.

User name	Password	Authentication ..	Maximum sessi...	Comment
User	*****	Password	30	Min
Holger	*****	Password	30	Min
Holoet	*****	Password	30	Min
Siemens	*****	Password	30	Min
Monitor	*****	Password	30	Min

Assigned to	Name	Description	Maximum sessi...	Comment	
<input type="checkbox"/>	HMI Administrator	System-defined role "HMI Administr...	30	Min	User Administration, Remote Acce...
<input type="checkbox"/>	HMI Operator	System-defined role "HMI Operator"	30	Min	Web Access, Operator
<input type="checkbox"/>	HMI Monitor	System-defined role "HMI Monitor"	30	Min	Web Access, monitor
<input checked="" type="checkbox"/>	HMI Monitor Client	System-defined role "HMI Monitor ..."	30	Min	Monitor only, License required
<input checked="" type="checkbox"/>	Runtime rights Line Operator	User-defined role	30	Min	

User dependent configuration

- New right and role "HMI Monitor only"
- Standard visualization is possible

Blocked "write operation" to the field

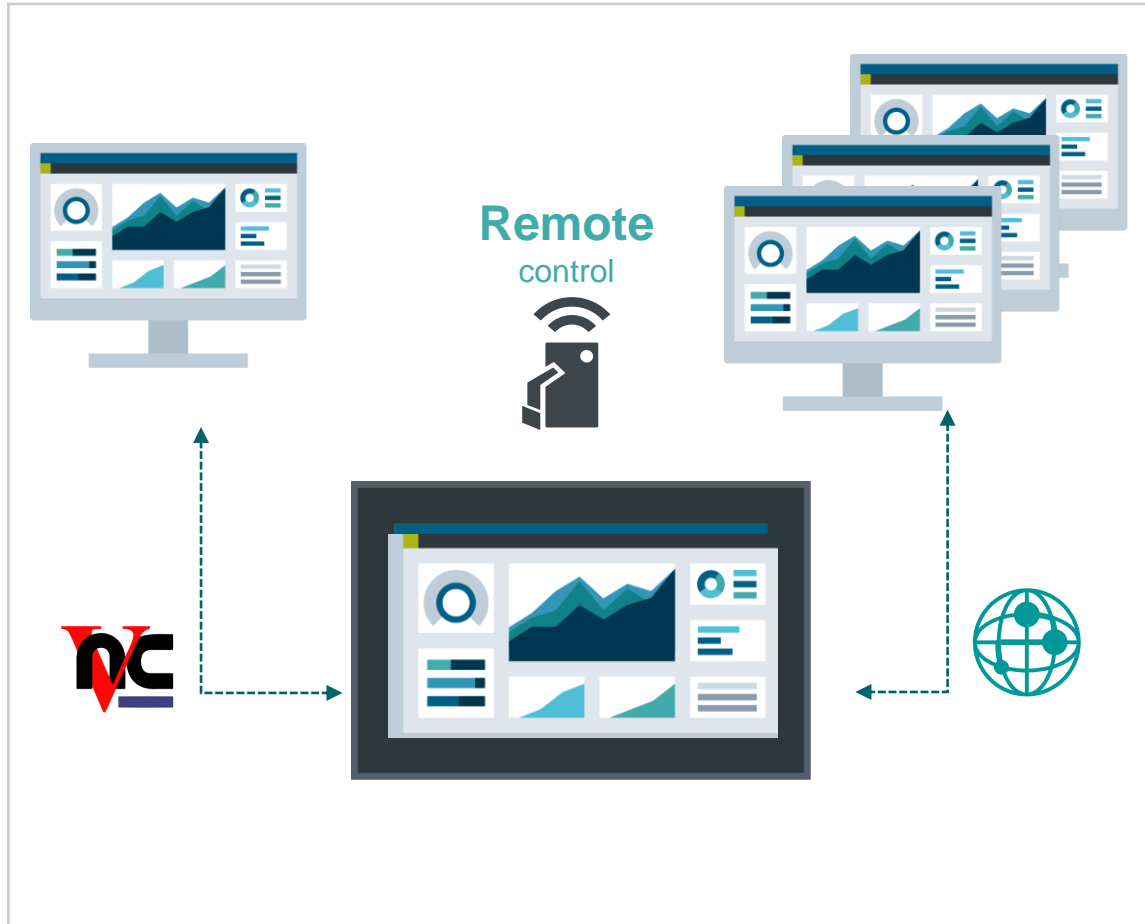
- External tag connections via UI e.g. IO/Field, Bar,..
- Internal Tags are not touched (writeable)

HMI Monitor Client

HMI Monitor client can be combined with Runtime rights and User defined runtime rights

WinCC Unified V17

Distributed Systems PC – Remote Control of Panels via Clients



Asynchronous access

- of up to 3 clients for independent operation
- Remote access via Web Browser
- One "Client Operate" included

Synchronous access

via app (VNC) for parallel operation (all users see the same screen)

WinCC Unified V17

Distributed systems – User Management

Local User Management (Panel/PC)

Configuration in TIAP ES

- Configure user
- Configure rights
- Assign users and rights to roles

Configuration in WinCC Unified RT

- Configure user
- Assign users to roles

Central User Management (Panel/PC)

- Configure connection to central user management in ES or RT
- Import groups from central user management (UMC)
- Assign roles to imported groups
- Download configuration to WinCC Unified runtime
- Use users defined in central user management
- Several WinCC unified RT access the same User management server
- Precondition for Central User Management: TIA Portal User Management Component (UMC)

Predefined Engineering rights for TIA Portal

- | | |
|---------------|----------------------------------|
| • HMImodify | WinCC Unified engineering |
| • HMIdownload | Download to WinCC Unified Device |
| • HMImaintain | maintain WinCC Unified Device |

Central user administration

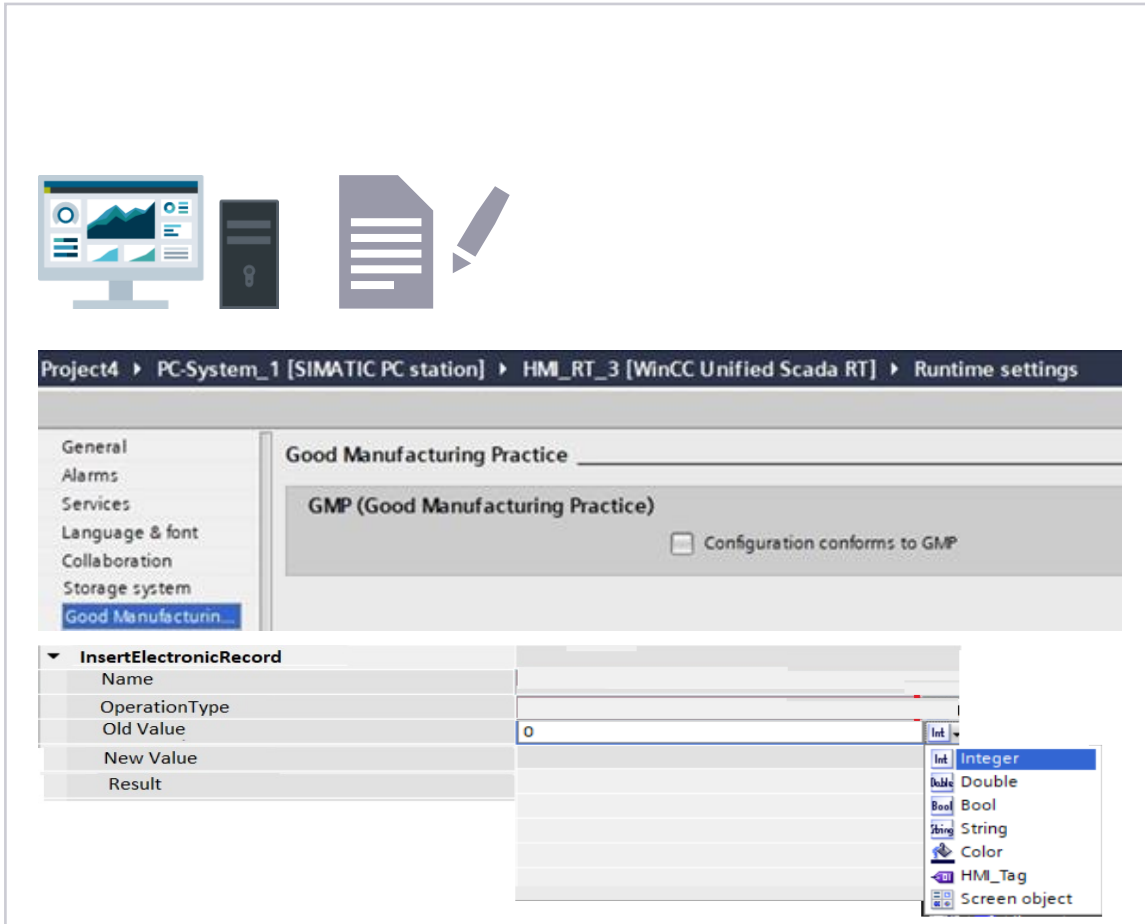
- [See TIA Portal Options](#)
- Central cross-project user management in the system
- Managing user groups
- Import of Windows users and user groups
- Administration of users / user groups in a system
- Fault tolerance through redundant design of a UMC domain

Licensing

- The software is already included in the scope of delivery of your TIA Portal product (STEP 7, WinCC).
- 10 Users or less free, no license needed
- Rental License 100 user und 365 days (6ES7823-1UE30-0YA0)
- Rental License 4000 user und 365 days (6ES7823-1UE10-0YA0)

WinCC Unified V17

Archiving & traceability – Audit



WinCC Unified Audit Base

for validation in order to fulfill the Compliance responses regarding documentation and traceability

GMP for Device and Tags

- Audit Trail storage
- Detection of manipulation
- Electronic Record
- Set GMP for device & Tags
- System & Script Function
- Audit confirmation



System & script functions

- Global scripts
- Scheduler
- Graphic objects incl. faceplates
- Create a Audit record by script

Report Audit Trail

- Support WinCC Unified Report
- Audit Trail Report
- Manipulation detection (detailed, overall)

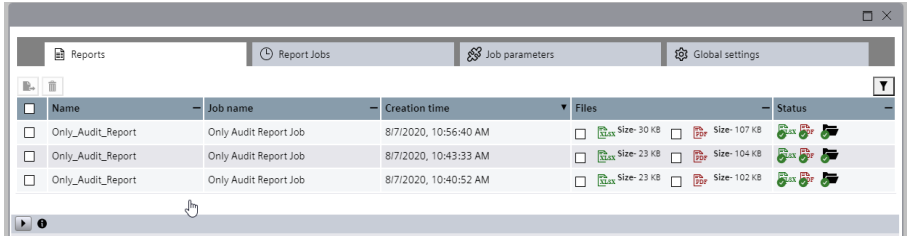
TIME STAMP	VERIFICATION	CHECK DESC.
2020.04.27.10:10	DELETED START	Reason: deleted counts
1 2020.04.27.10:10	EVENT11	
2 2020.04.27.10:11	EVENT12	
3 2020.04.27.10:20	EVENT13	
4 2020.04.27.10:14	EVENT14	
6 2020.04.27.10:19	EVENT15	
2020.04.27.10:20	DELETED END	Reason: deleted counts



WinCC Unified V17

Archiving & traceability – Reporting

Create Report templates in Excel upload, and schedule it in Report Control RT



Mange, execute report manual, time & event driven in runtime with report control

SIEMENS Production Report

Report successful.

Time stamp	Audit	Audit-User	Audit-OperatorSta
vi, 07 ago 2020 10:56:02,098	1.202.1.0.0.0	UMCAAdmin	localhost
vi, 07 ago 2020 10:56:02,116	HMI_RT_1::Pressure set value	System	WccUA
vi, 07 ago 2020 10:56:07,615	1.201.1.0.0.0	UMCAAdmin	localhost
vi, 07 ago 2020 10:56:07,616	HMI_RT_1::Temperature set value	System	WccUA
vi, 07 ago 2020 10:56:12,109	1.200.1.0.0.0	UMCAAdmin	localhost
vi, 07 ago 2020 10:56:12,110	HMI_RT_1::Speed set value	System	WccUA
vi, 07 ago 2020 10:56:18,787	1.206.1.0.0.0	UMCAAdmin	localhost
vi, 07 ago 2020 10:56:18,788	HMI_RT_1::Pressure Current Value	System	WccUA
vi, 07 ago 2020 10:56:24,036	1.204.1.0.0.0	UMCAAdmin	localhost
vi, 07 ago 2020 10:56:24,042	HMI_RT_1::Temperature current value	System	WccUA

Line graph showing pressure and temperature values over time.

E-Mail-distribution

- Own or public Email server
- Authentication: Unsecured, certificate, username / password



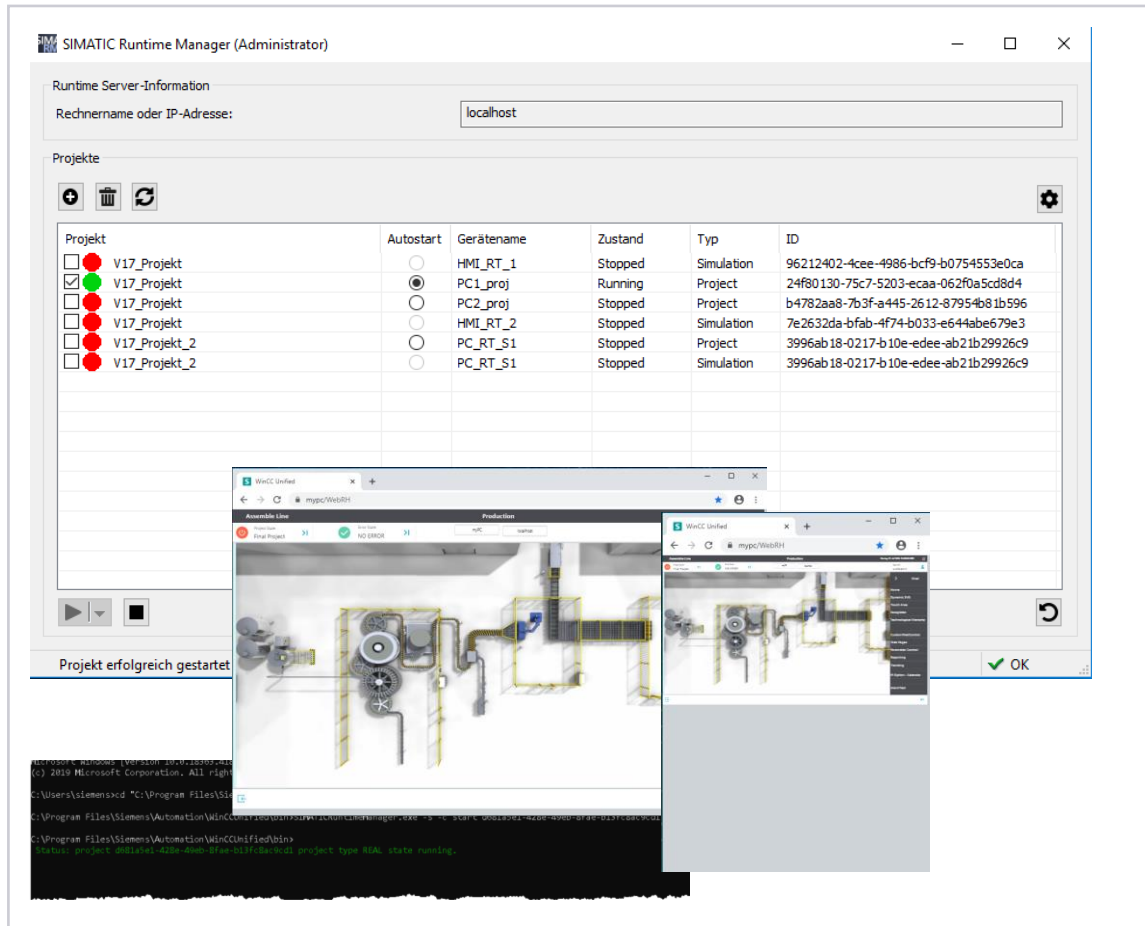
Storage of reports

- Project or configurable local directory
- Matrix view for report storage locations

Report sources

- Audit Trail report & Manipulation detection
- Support Context, value list, execution, set time frame
- Hitlist of Alarms
- Performance Insight
- Line Coordination

WinCC Unified V17 Distributed Systems – Runtime Manager



Manage WinCC Unified projects

- Run, stop or switch projects
- Activate / Deactivate Debugging
- Deletion of RT projects on the RT station
- Enable proportional scaling of WinCC screens with the size of the web browser **New**
- Restore or delete database segments **New**
- Overview on 3rd party certificates (e.g. OPC UA client certificates) **New**
- Different starting modes: “normal”, “with reset of runtime data”, “with reset of logging data” **New**
- Exposed interface to control via command line **New**

TIA Portal

Highlights of TIA Portal V17

WinCC Unified

- Improved screen engineering with new style
- Graphics and faceplates (with functional enhancements) in library
- Extended communication and 1st set of system diagnostic
- Audit for PC
- WebClient for panel

Plant Intelligence Options

WinCC – Innovations

- WinCC Advanced:
Template & Popup screens in the library
- WinCC Professional:
Raw data for S7-1500, new system tags

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- CFC – Continuous Function Chart (planned for July 2021)
- Download / Upload of user groups
- Functional enhancements in the cross-reference list
- Openness extensions for project generation

Startdrive – Innovations

- Support of SINAMICS G115D
- S120: Data set switching, manual optimization
- SINAMICS DCC: Know-how-protection

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- Global Offline/Online comparison
- Offline/Offline comparison at parameter level
- CPU 1518HF-4PN: Safety and redundancy
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- Library
- Security per Default
- TIA Portal Language Packs
- Last used objects

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- **Multuser**
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WinCC Unified V17

Plant Intelligence Options



Kalender



Performance
Insight



Plant Intelligence
Options



Sequence



Line
Coordination

- **Define working time** of machines or lines
- **Planning** the execution of activities relative to a timeline

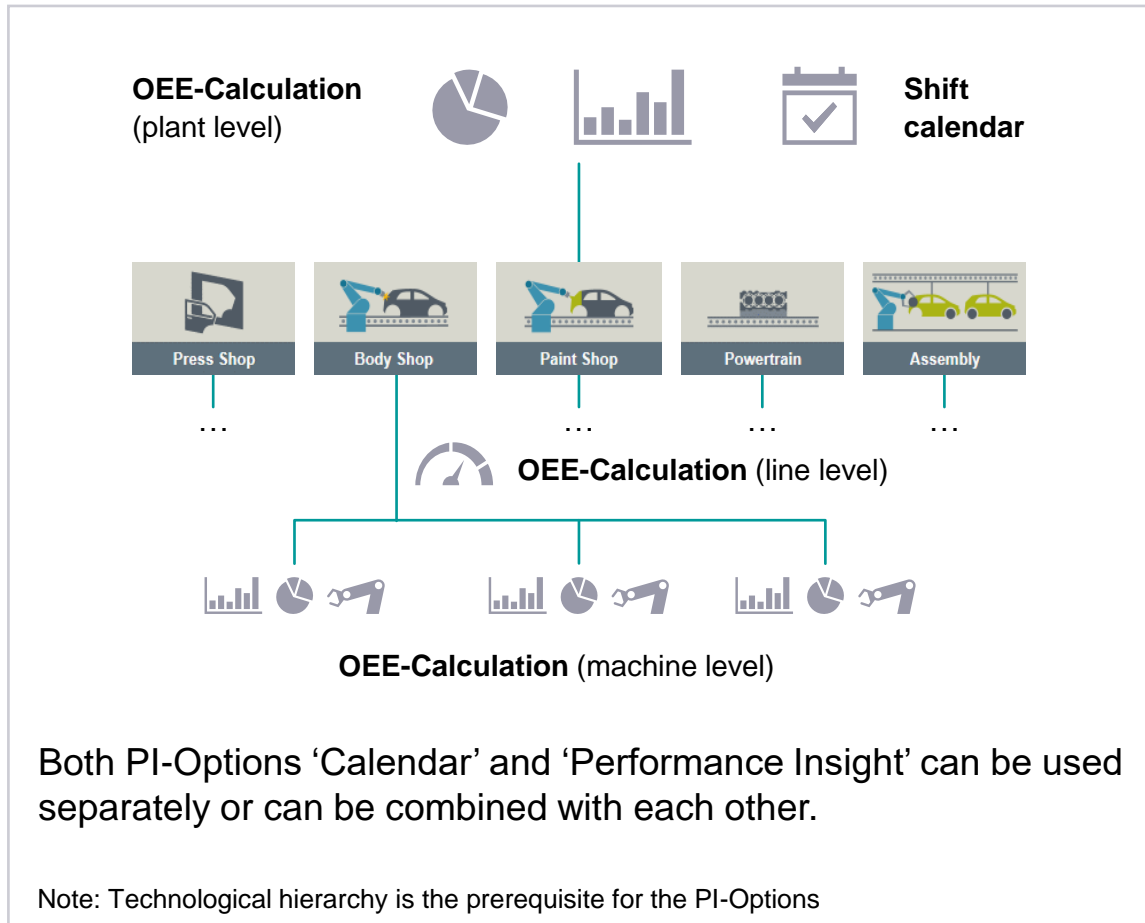
- **Calculation of the performance** of machines/lines/ plants
- **Downtime analysis**

- Fast and simple changeability of **procedures**
- Clear overview of the **manufacturing steps and current status**

- **Orchestration** of production procedures
- Overall definition of **complete procedure and recipe at line level**



WinCC Unified V17 – Plant Intelligence Options Overview – Calendar and Performance Insight



Reduced Engineering effort

due to a modular, object oriented concept based on the technological hierarchy.

Central definition of time categories

(e.g.. operation, planned downtime, unplanned downtime,..)

Planning of calendar based procedures

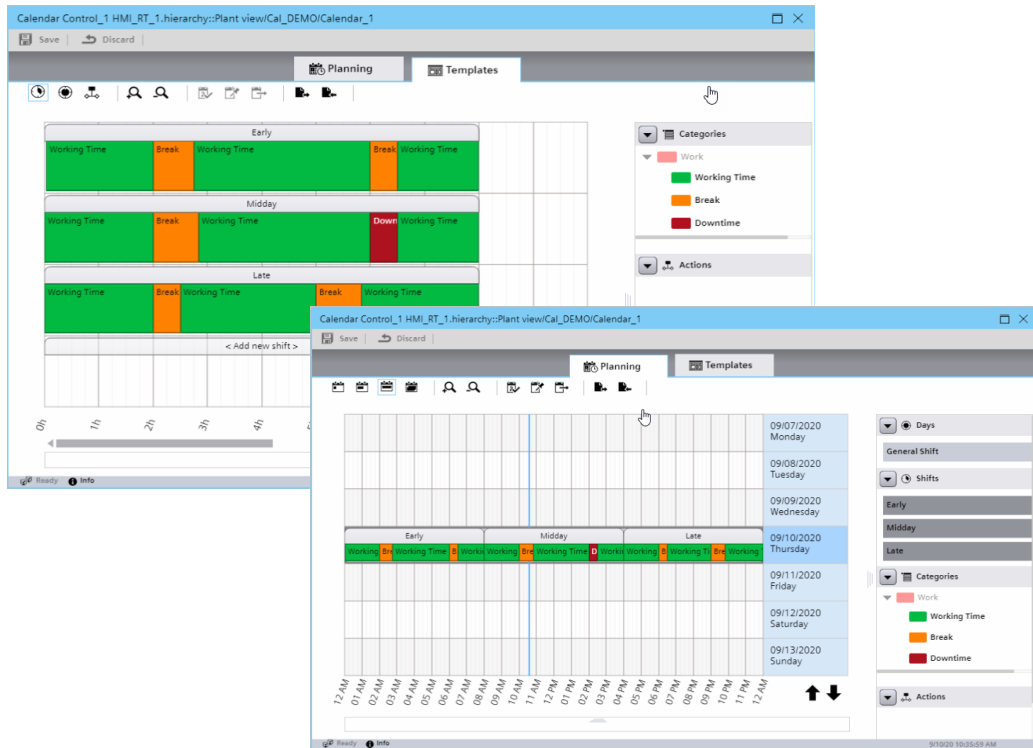
using templates (e.g. for working shifts)

Analysis of production processes

based on individually calculated key performance indicators (e.g. OEE, ..)

WinCC Unified V17 – Plant Intelligence Options Calendar

User Interface in the screens:
Plant View Control using the Calendar Control



Improvements V17

- Improved usability
- Reporting of Calendar
- Delete Calendar data during download
- Create day recurrences and decide to overwrite already existing shifts or not
- Place day templates at the beginning of the day in planning
- “Go-to-date” and “Jump-to-today” functionality inside Calendar
- Easier editing of action items

WinCC Unified V17 – Plant Intelligence Options Performance Insight

The screenshot displays the WinCC Unified V17 Performance Insight interface. On the left is a 'Project tree' with a 'Plant objects' tab. The tree shows a hierarchy for 'PFL_Demo_J26', including 'Battery Production', 'Electrode Production 1', 'Electrode Production 2', and 'Battery Cell Production'. The main area contains a 'GANTT CHART TITLE' for 'Runtime_1 Engine Eq1 + Eq2' with a table of equipment status and a corresponding gantt chart. Below the gantt chart is a pie chart showing the distribution of 'Sum_Count' and 'Sum_Bit' across different categories. At the bottom is a table of KPIs with columns for Name, Display name, Description, and Color.

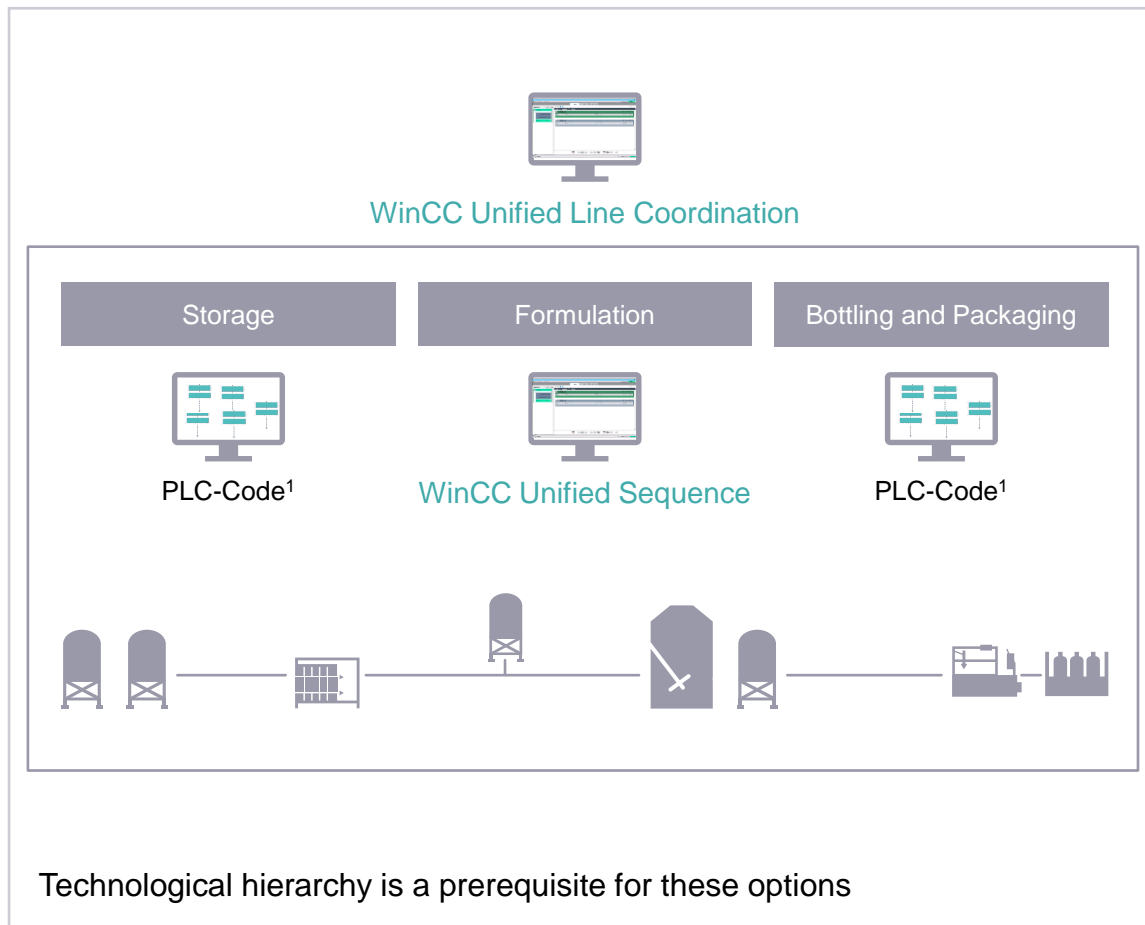
Equipment	Reason	Priority	Period	Freq.
1	RUNTIME_1:Eq1	Running	0	35-48:790 14
2	RUNTIME_1:Eq2	Running	0	35-48:790 14

Name	Display name	Description	Color
PlantOperatingTime	Plant Operating Time		Red
PlannedProductionTime	Planned Production Time		Green
OperatingTime	Operating Time		Magenta
NetOperatingTime	Net Operating Time		Violet
ProductiveTime	Productive Time		Blue
QualityLosses	Quality Losses	Process Defects, Reduced Yield	Light blue
PerformanceLosses	Performance Losses	Idling and Minor Stops, Reduced Speed	Pale blue
AvailabilityLosses	Availability Losses	Equipment Failure, Setup and Adjustments	Rosy red
PlannedDowntime	Planned Downtime		Pink

Improvements V17

- **Recalculation of KPIs**
- **Drill down to the individual value**
- **Addition of missing values**
- **Correction of wrong values**
- **Central management of KPIs**
- **Reset RT-database in download dialogue**
- **Support of Delta compile**
- **Performance improvements in Runtime**

WinCC Unified V17 – Plant Intelligence Options Overview – Sequence & Line Coordination



Sequence (SES)

Option for sequence control of step-based operations for separate units or machines

- **Fast changeability**
of procedures in the production process
- **Clear overview**
of the manufacturing steps and current status

Line Coordination (LCS)

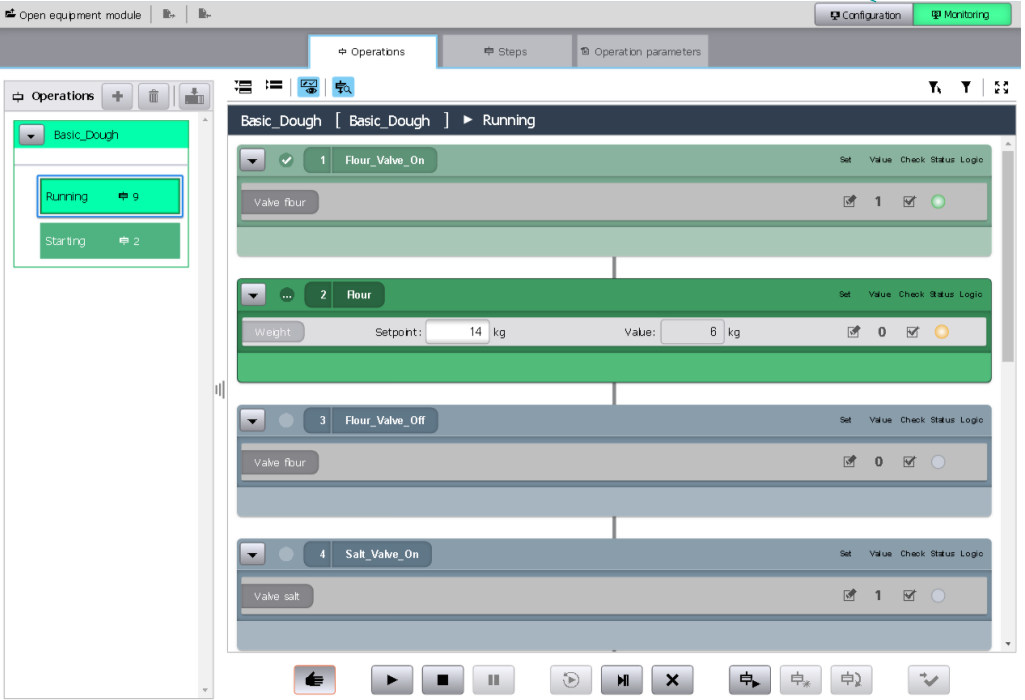
Option for recipe-controlled production processes based on units and operations (SES or own function modules)

- **Coordination and monitoring**
of complex processes in the production line
- **Overall definition**
of complete procedures and recipes at line level

¹ Individual PLC code for control and connection of the units to WinCC Unified Line Coordination

WinCC Unified V17 – Plant Intelligence Options Sequence

Monitoring of sequence execution Switch over to Configuration view



Operations Commands
Start, Pause, Resume, Hold, Restart, Stop, Abort

General

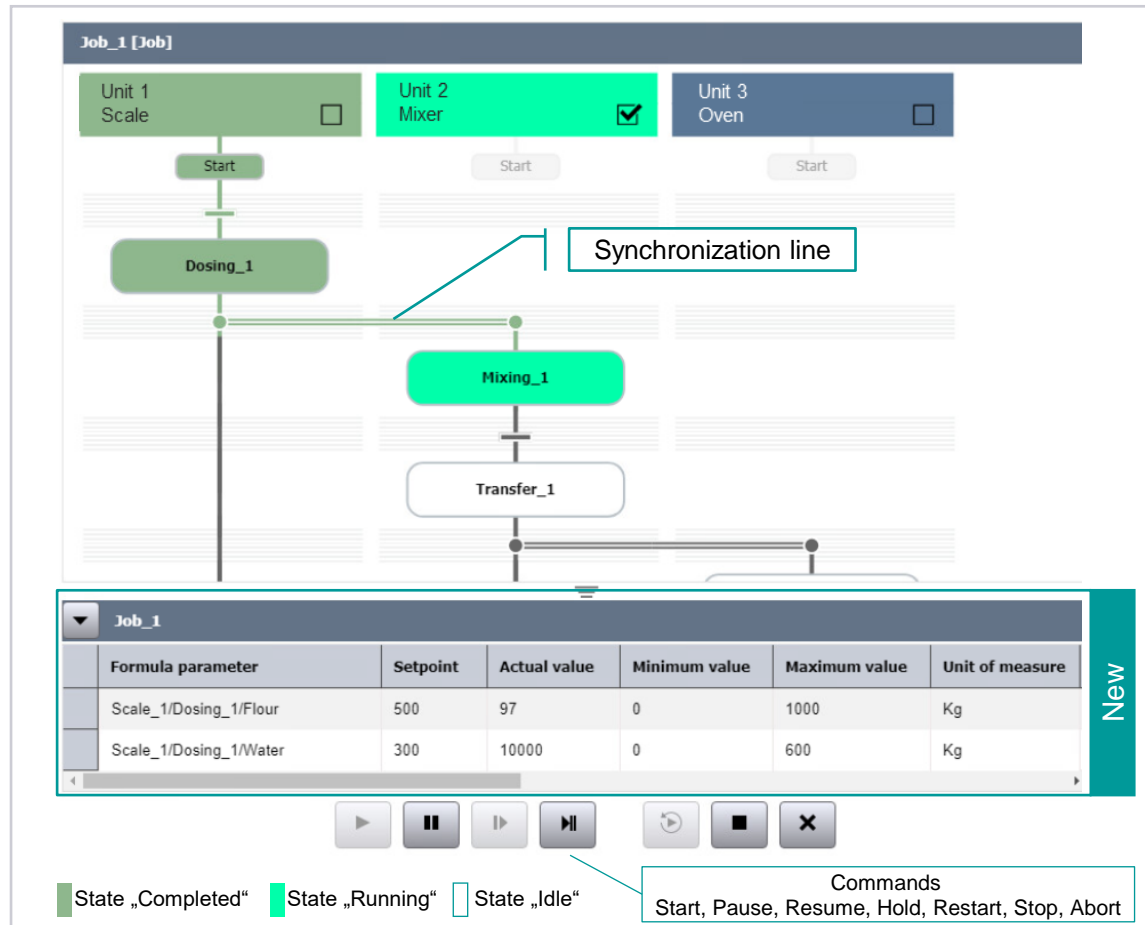
- Adaption of procedures in the production process w/out PLC program changes
- Creation and administration of procedures (sequences) based on operations and steps to interact with Control Modules related to Equipment Modules
- Monitor sequence of manufacturing steps and current status
- Manual interaction within automatic sequence execution possible
- Support of ISA-88 lifecycle and state model

Improvements V17

- Specific access protection by assigning user rights to separate user actions (Operate/Read/Write)
- Import & Export of complete operations incl. steps and set points (e.g. for system backup, move from test environment to production)
- Performance & usability improvements

WinCC Unified V17 – Plant Intelligence Options

Line Coordination



General

Recipe Management

- Creation and administration of recipes and procedures based on units and operations (SES or own function modules)
- Coordination of units via synchronization lines (blocking and non-blocking) according to ISA-88 lifecycle and state model

Job Management

- Creation and scheduling of several jobs for production

Job Execution and Monitoring

- Graphical representation of job details and states with interaction possibilities according to ISA-88 from individual units to operations
- Monitor actual values and change set points of parameters

Reporting

- Job summary reports with details like Job ID, recipe, start/end time based on WinCC Unified Reporting (Excel Add-in)

Improvements V17

- Scaling of formula parameters for different production quantities
- Define "job parameters" to set specific values at job creation only
- Specific access protection by assigning user rights to separate user actions (Operate/Read/Write)
- Hierarchical representation of Reports

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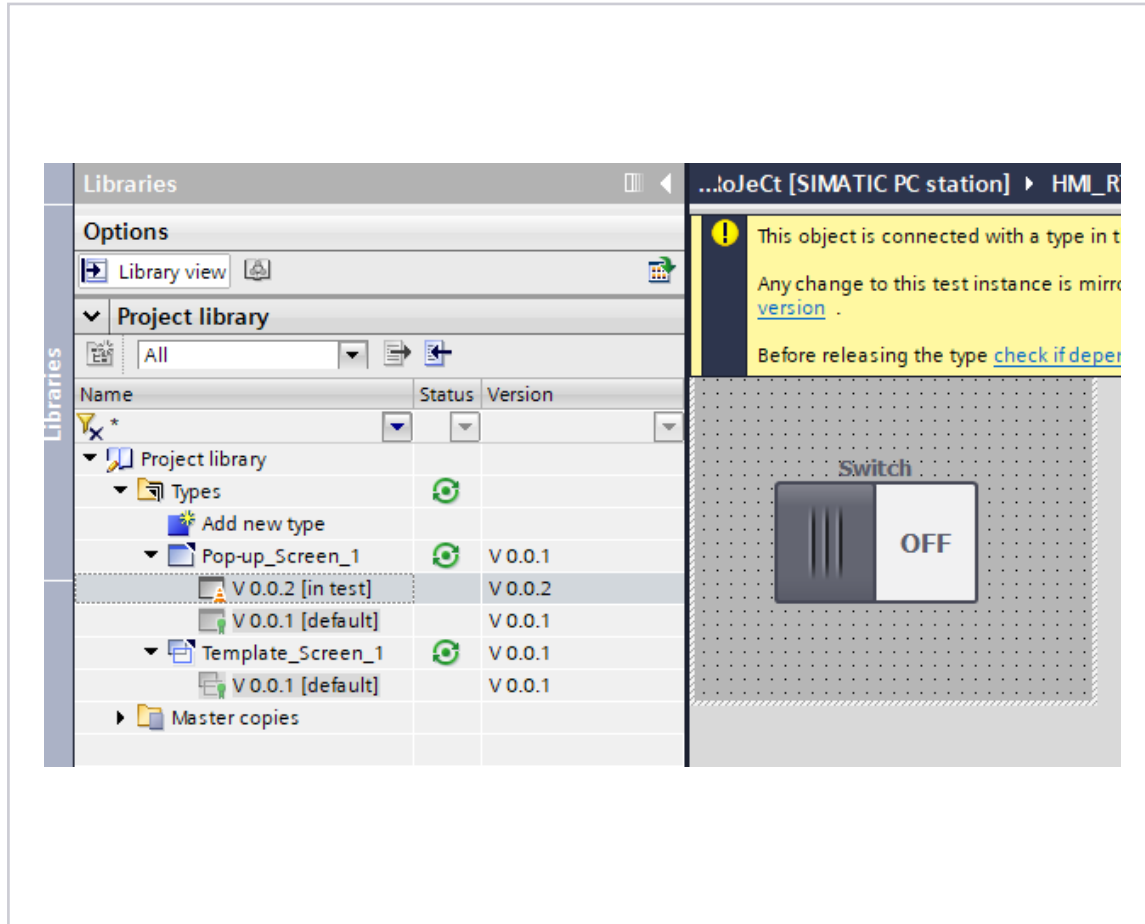
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WinCC – Innovations WinCC Advanced V17



New functions for WinCC RT Advanced

Screen objects

- Template and Popup screens included into library
A versioning of template and popup screens and the managing of these screens in the TIA library is possible.
- Extension of the size limits for Popups screen
The limits of the dimension for Popup screens is extended. The larger popup screen may contain more information, which is accessible via scrolling.

Communication

The combination of PLC connection drivers of S7-1500, Modbus TCP and SIMOTION are possible in TIA and in operation.

WinCC – Innovations WinCC Professional V17

The screenshot displays the WinCC Professional V17 interface. The main window shows the 'HMI tags' configuration for a project named 'HMI_RT_1 [WinCC RT Professional]'. The 'HMI tags' list includes a tag named 'Rawtag_57_1500' with a 'Standard-Variablen-tabelle' data type. The 'Properties' window for this tag shows settings for 'Data type: Raw', 'Length: 10', 'HMI data type: Raw', and 'Codierung: Binary'. Below the main window, a 'Tags simulation - WinCC Configuration Studio' window is open, showing a table of active tags and their properties.

Tag name	Data type	Function	Cycle	Active	Value set	Quality set
1	Binary Tag	None	1	<input checked="" type="checkbox"/>		
2				<input type="checkbox"/>		
3				<input type="checkbox"/>		
4				<input type="checkbox"/>		
5				<input type="checkbox"/>		
6				<input type="checkbox"/>		
7				<input type="checkbox"/>		
8				<input type="checkbox"/>		
9				<input type="checkbox"/>		
10				<input type="checkbox"/>		

The 'Properties - Tag' window shows the following details for the selected tag:

- Object type: Tag
- Object name: @RM_MASTER
- Tag name: @RM_MASTER
- Data type: Binary Tag
- Function: None
- Cycle: 1
- Active:
- New function:
 - Amplitude: 50
 - Offset: 50
 - Overlaid period: 25
 - Resolution:
 - Overlaid: 30
 - Rated value: 50
 - Overlaid period: 50
 - Damping: 1.0
 - Random value:
 - Random minimum value: 0
 - Random maximum value: 1
 - Resetment:
 - Initial value increment: 0
 - End value increment: 1



New functions for WinCC RT Professional

Communication

- Raw Data for S7-1500
- New system tags

Additional

- New SQL Server 2017
- Stop runtime via command line
- TIA Design for tag simulation



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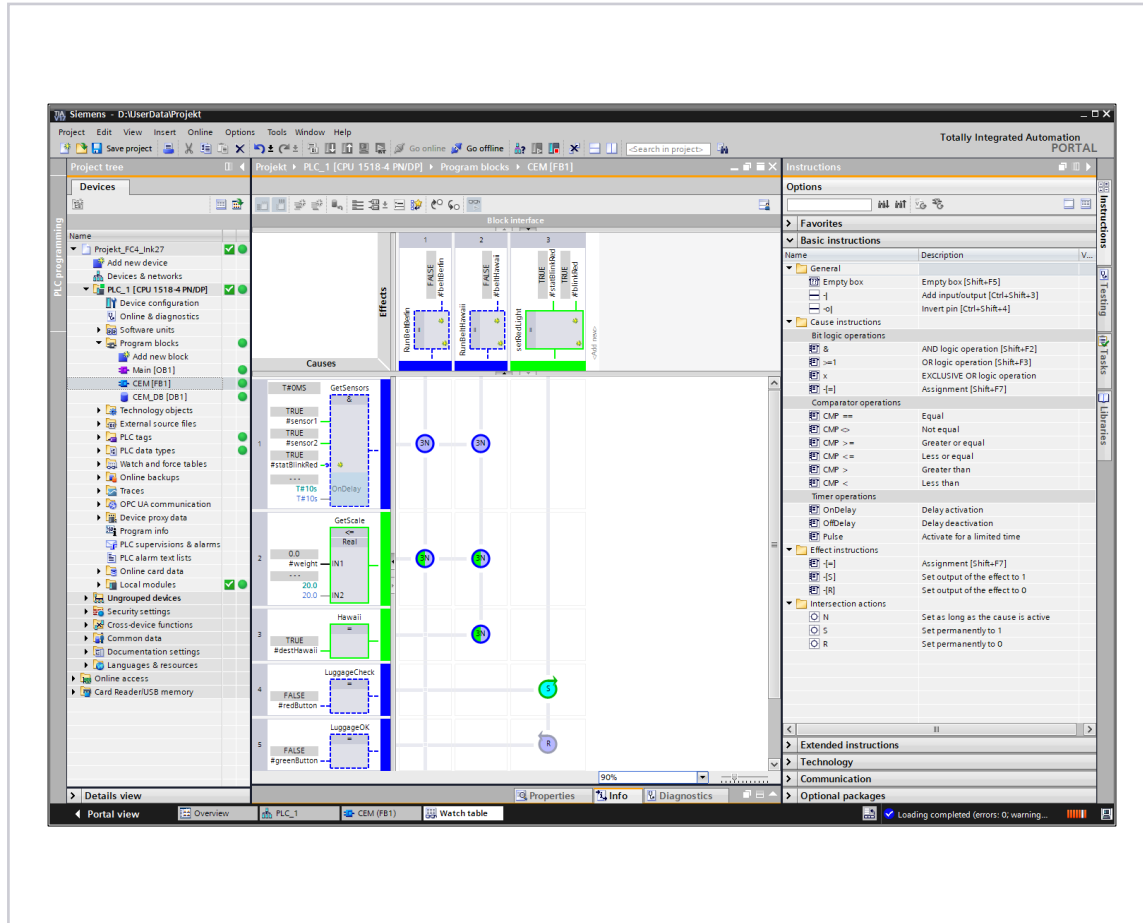
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STEP 7 – innovations

Cause Effect Matrix (CEM)



What are the advantages of the CEM?

Efficient and simple programming

→ No need for high-level language expertise

Programming errors easy to detect

→ Perfect clarity thanks to matrix structure

Can be run on S7-1200 and S7-1500

→ Provides solutions for both small and large installations

Group supervisions

→ Programming of M out of N dependencies

Unique portfolio element

→ CEM, a new innovative programming language in TIA Portal

STEP 7 – innovations

SIMATIC STEP 7 CFC V17

Observe online

Integrated in TIA-Portal

Graphical Program

Use pictures as comments

Connect different charts

Re-use CFC logic

SIMATIC Step7 CFC
Graphical Program Editor

SIMATIC STEP 7 CFC

Graphical programming for SIMATIC S7-1500

Generation of automation programs by drawing a technology chart
→ **Solve automation tasks already in the configuration phase**

Parameterize technology functions by linking function blocks (AND, OR, PID Controllers)
→ **Functions are created much faster than with conventional programming**

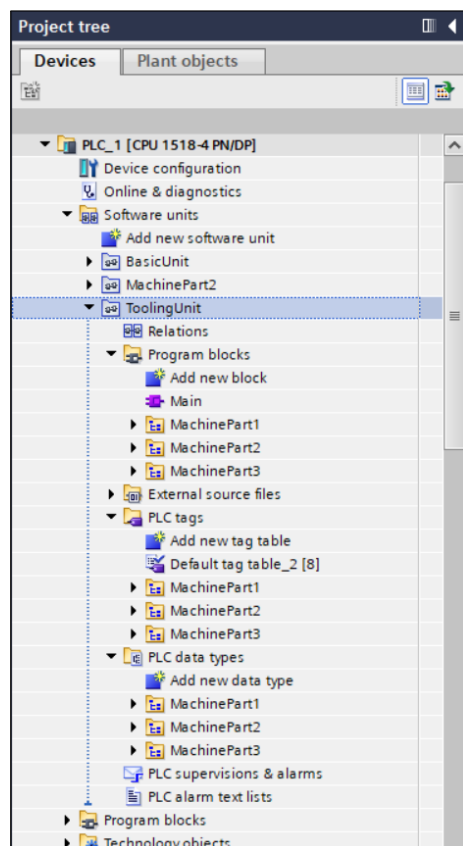
Use of “Chart in Chart” technology for a hierarchical structure
→ **Significantly less possible error sources**

Convert technical requirements into complete, executable automation programs by pressing a button
→ **The configuring data are converted automatically.**

Use the TIA Portal mechanisms for the transfer to the programmable controller
→ **More efficient engineering**

STEP 7 – innovations

Download/upload of group structures



Function

Group structures for the following objects are now downloaded to the CPU - this also applies to groups within Software Units:

- Program blocks
- PLC tags
- PLC data types

Restoration of group structure in offline project during:

- Upload of CPU as new station
- Complete software upload (the offline program and the group structure are deleted and replaced by the online program)

Benefits

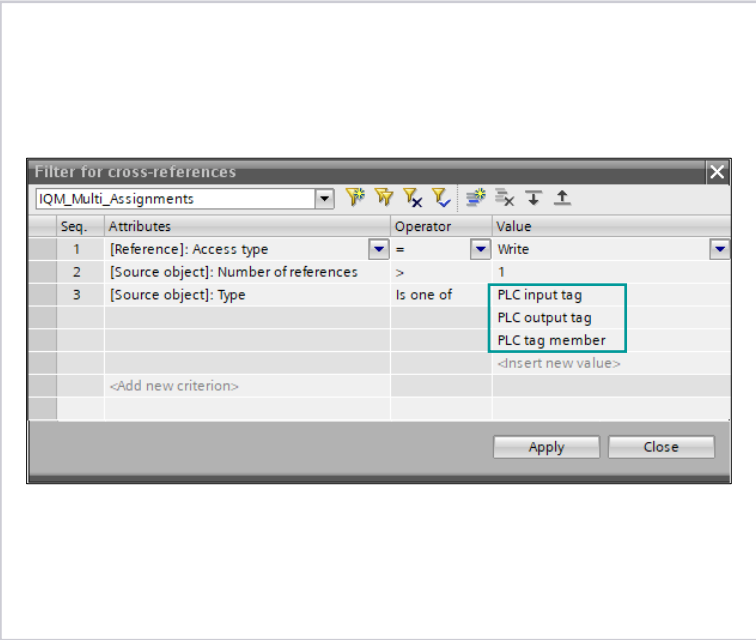
Access to group structure even if the offline program is not available

STEP 7 – innovations

General extended functions

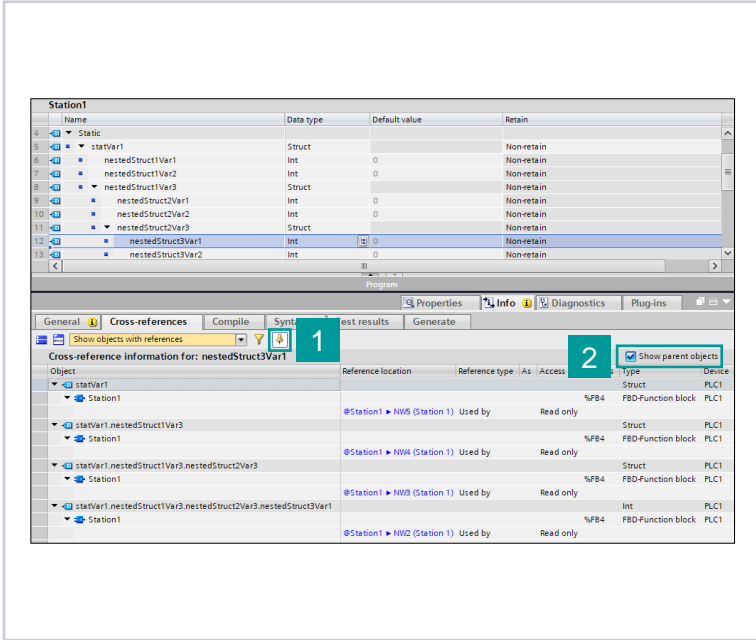
Cross-reference filter

User-defined filter supports inputs, outputs and bit memories.



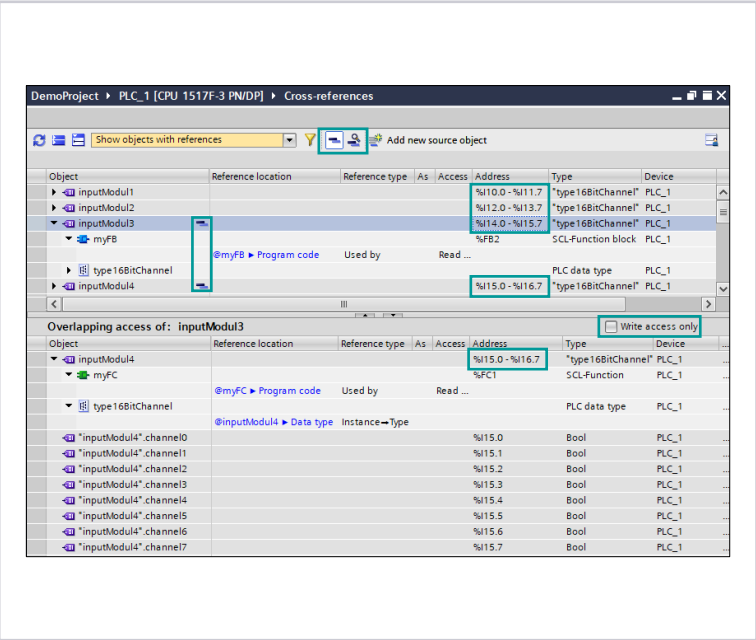
Cross-reference list in the Inspector window

1. Freezing of current cross-reference display
2. Display of high-level accesses with structure tags (struct, UDT)



Cross-reference editor

Improved visualization of overlapping input and output addresses.

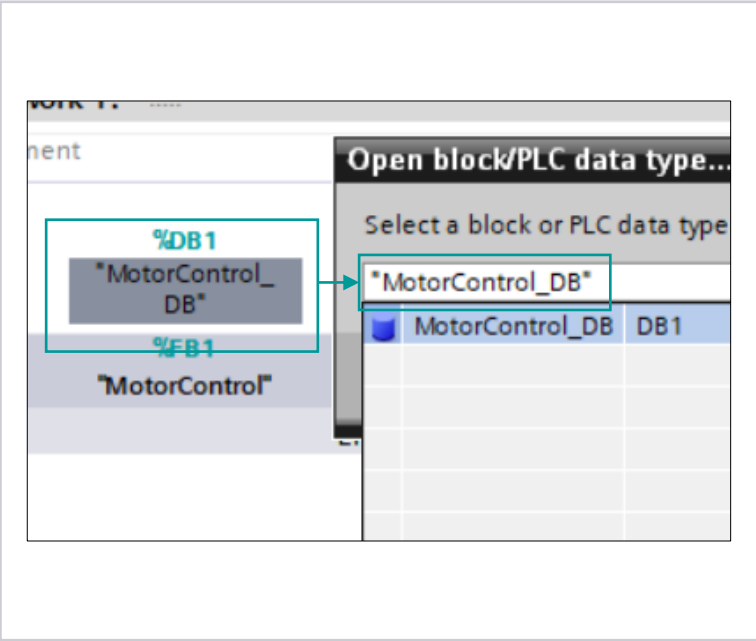


STEP 7 – innovations

General extended functions

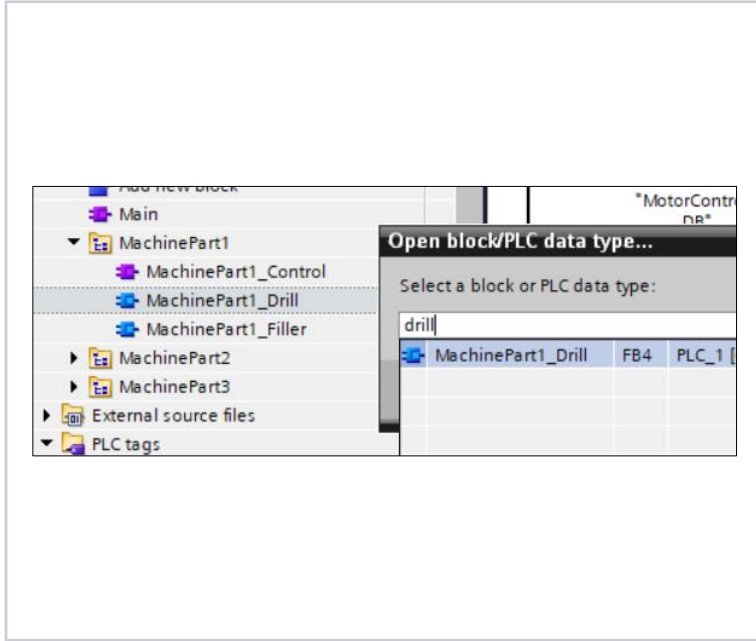
Ignore inverted commas in "Open block" dialog (F7)

This allows block names to be copied straight from an editor to the "Open block" dialog, where they can then be opened.



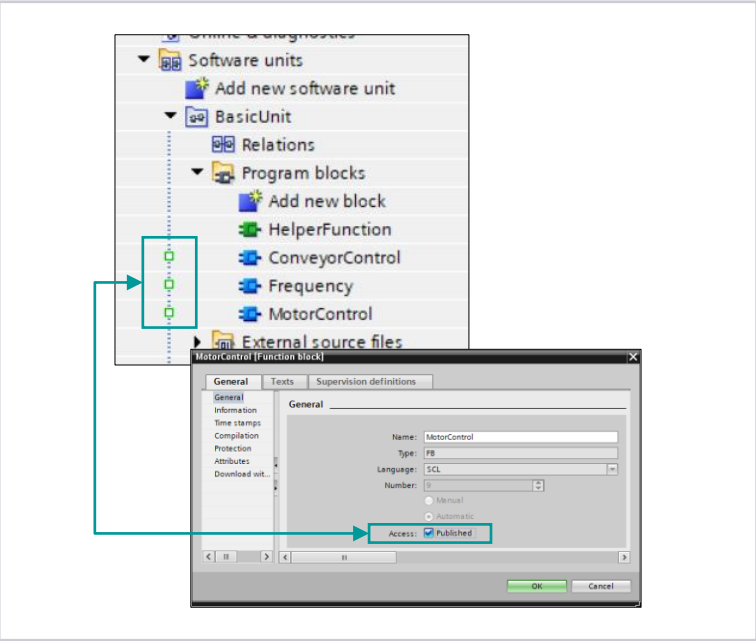
Partial search for block names in "Open block" dialog (F7)

Block search without entering prefix in "Open block" dialog.



Display of "Published" block property in project tree

The "Published" property is visualized in the project tree itself for blocks, PLC data types (UDT) and PLC tag tables within software units.

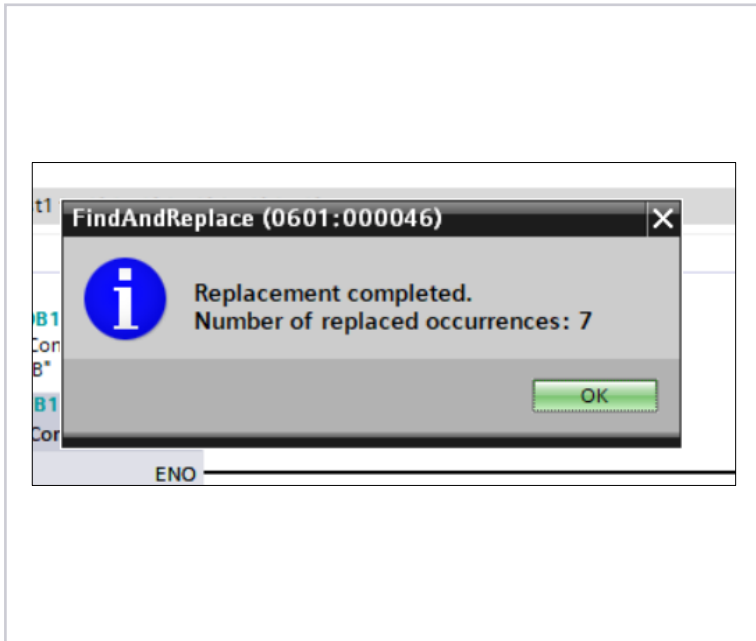


STEP 7 – innovations

General extended functions

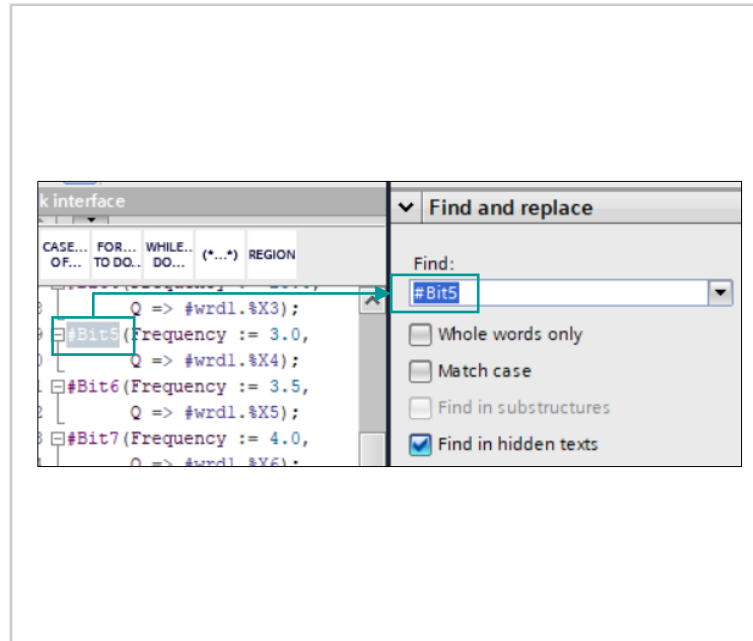
Number of replacements

The total number of replacements is displayed for local Find & Replace.



Simplified search with "Ctrl + F"

In many STEP 7 editors, "Ctrl + F" can be used to copy the marked text straight into the Find box of the local search function. A second "Ctrl + F" copies the search text to the global search.



Downloading data blocks

As of V17, data blocks are not re-initialized during loading until their structure has actually changed (<V17 interface timestamp).

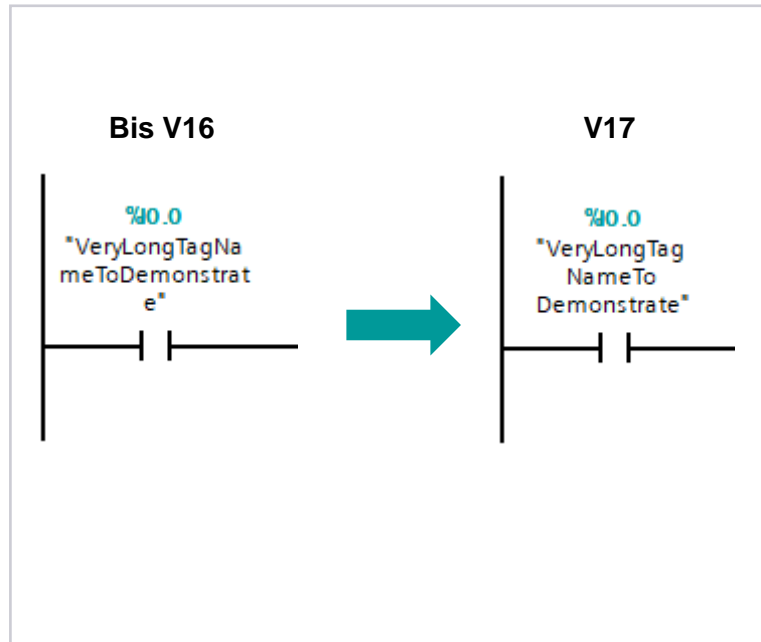
This enables a subsequent download without re-initialization when generating data blocks with an identical structure via Openness/VCI/ASCII sources.

STEP 7 – Innovationen

General extended functions

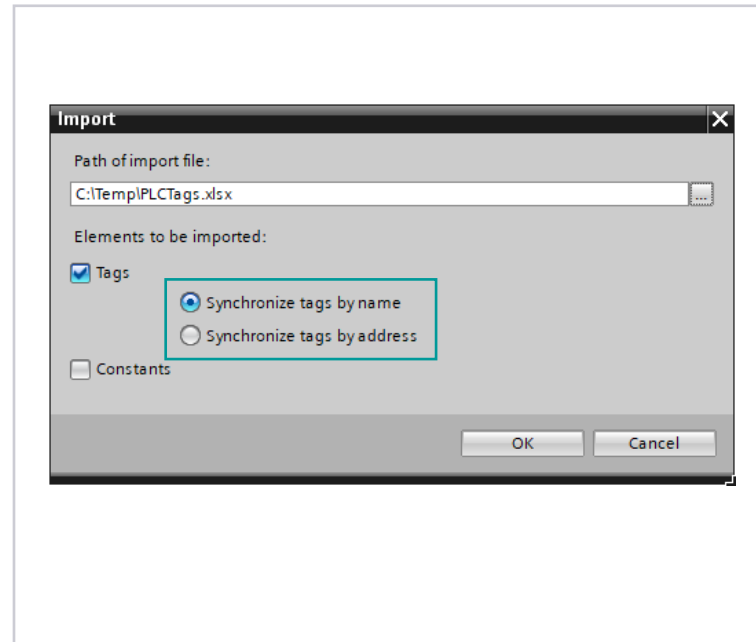
Improved line break at variable names

In LAD, FBD, GRAPH and CEM, at operands written in "camelCasing" or "PascalCasing" a line break is inserted before an uppercase letter if possible.



Synchronisation at tag Import

When importing PLC tag tables, e.g. from Microsoft Excel, it is possible to decide whether to synchronize by name or address. This makes it easy to distinguish between renaming or rewiring.



More one-finger keyboard shortcuts

The keyboard shortcuts for LAD (empty box, normally closed, normally open) and FBD (empty box, AND, OR) can now be operated with one finger (F8, F9, F10).

LAD:

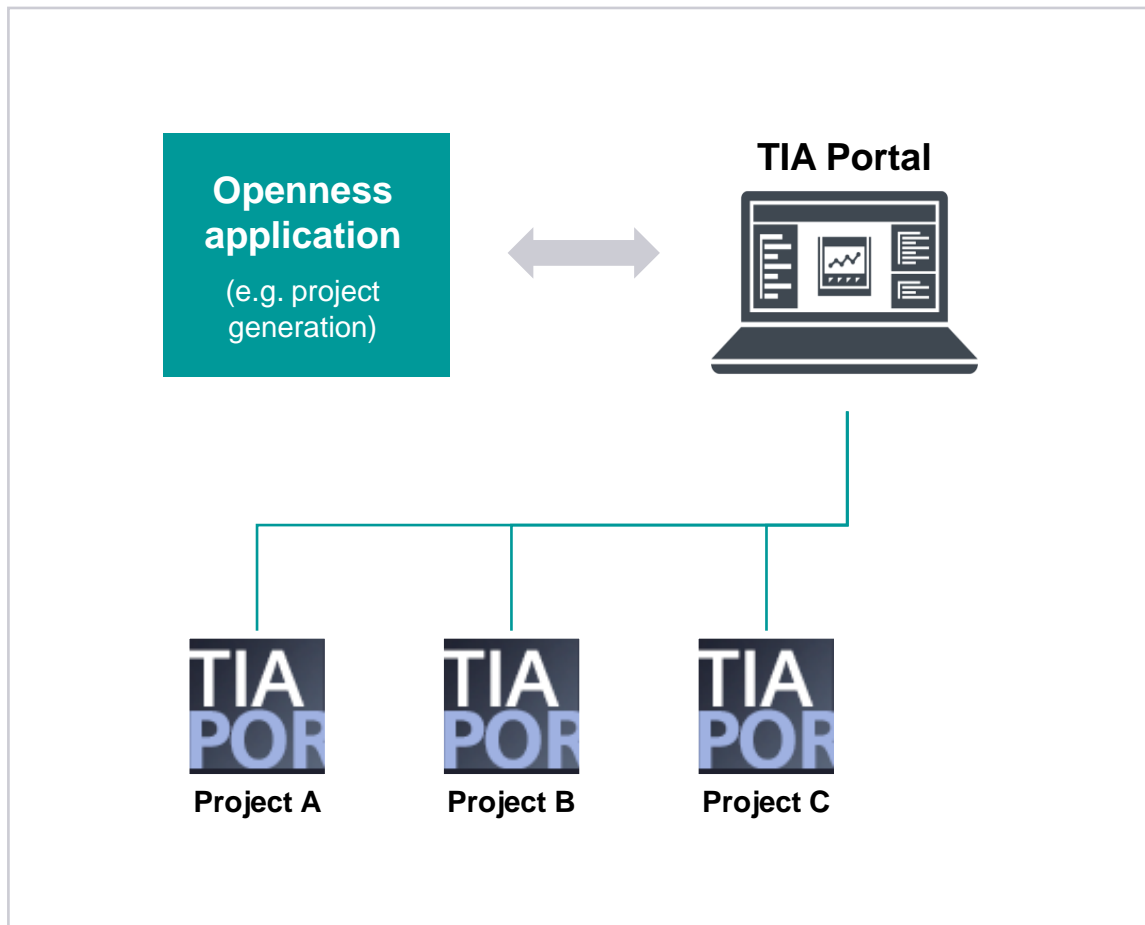
Description LAD Editor Instruction	Existing Shortcuts (up to V16)	New Shortcuts (V17)
Empty box	Shift+F5	F8
Normally open contact	Shift+F2	F9
Normally closed contact	Shift+F3	F10

FBD:

Description FBD Editor Instruction	Existing Shortcuts (up to V16)	New Shortcuts (V17)
Empty box	Shift+F5	F8
AND box	Shift+F2	F9
OR box	Shift+F3	F10

STEP 7 – innovations

TIA Portal Openness



Extensions for project generation

- Creating instance DBs for FBs in the following languages:
 - As of V16: ProDiag
 - As of V17: LAD, FBD, IL/STL, SCL, Graph, Cause Effect Matrix (CEM)
- Write access to the OB attribute "PriorityNumber"
- Blocks or data types from "ExternalSourceGroup" can be generated directly into a subgroup
- Direct read access to DB tags and write access to their "StartValue" attribute

Benefits

Using the new functions, the project generation workflows can be performed with a wider range using the Openness application.

This enables more efficient generation of TIA Portal projects.

TIA Portal

Highlights of TIA Portal V17

WinCC Unified

- Improved screen engineering with new style
- Graphics and faceplates (with functional enhancements) in library
- Extended communication and 1st set of system diagnostic
- Audit for PC
- WebClient for panel
- 🔗 **Plant Intelligence Options**

WinCC – Innovations

- WinCC Advanced: Template & Popup screens in the library
- WinCC Professional: Raw data for S7-1500, new system tags

STEP 7 – Innovations

- CEM – Cause Effect Matrix
- CFC – Continuous Function Chart (planned for July 2021)
- Download / Upload of user groups
- Functional enhancements in the cross-reference list
- Openness extensions for project generation

Startdrive – Innovations

- Support of SINAMICS G115D
- S120: Data set switching, manual optimization
- SINAMICS DCC: Know-how-protection

Hardware configuration

- Global Offline/Online comparison
- Offline/Offline comparison at parameter level
- CPU 1518HF-4PN: Safety and redundancy
- Extended quantity structures for S7-1500 and ET200 CPUs
- Extensions for CPU 1518 MFP
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- DHCP and DNS for S7-1500 and ET200 CPUs
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- S7-1200 Highlights with FW4.5 (OPC UA/Webserver)
- CPU 1518T/TF-4 PN/DP: High performance motion control

System functions

- Openness-extensions for libraries and UMAC
- User Management & Access Control (UMAC)
- Library
- Security per Default
- TIA Portal Language Packs
- Last used objects

TIA Portal Options

- 🔗 **STEP 7 Safety**
Fast Commissioning, nested UDTs, Openness-extensions
- 🔗 **SIMATIC Safe Kinematics**
Function, advantages and requirements
- 🔗 **Multuser**
- 🔗 **SIMATIC Robot Library**

TIA Portal Options

- 🔗 **OPC UA**
S7-1200: Diagnostics, methods; S7-1500: Alarms and Conditions, Server modelling, Client: new Compact blocks, GDS – certificate handling
- 🔗 **PLCSIM/PLCSIM Advanced**
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Code-generation for SIMATIC Edge & LiveTwin
Integrated S-functions for PLCSIM Adv coupling
- 🔗 **Test Suite**
Openness Support of style guide Check and application test
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Support of WinCC Unified, new expressions, usability enhancements
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Improved load management and flexible energy data connections (by Proxy-DBs)
- 🔗 **Central User Management (UMC)**
Single Sign-on, SIMATIC Logon-protocol, licensing
- 🔗 **Modular Application Creator**
- 🔗 **ProDiag**
Monitoring within PLC Data Types, usability improvements
- 🔗 **Teamcenter Gateway**
Single Sign-on, PKI, Linking between Teamcenter and TIA Portal objects

Startdrive – innovations Hardware and functions

The screenshot displays the SINAMICS Startdrive software interface. The main window shows the 'Conveyor technology' configuration, including a diagram of a conveyor with three positions (Pos. 1, Pos. 2, Pos. 3) and associated sensors (Stop sensor, Low speed sensor). The interface is divided into several panels:

- Left Panel:** A tree view showing configuration settings such as 'Basic settings', 'Data sets', 'Units', 'Reference variables', 'I/O configuration', 'Inputs/outputs', 'Setpoint channel', 'Operating mode', 'Drive functions', 'Safety Integrated', 'Application functions', 'Technology controller', 'Free blocks', 'Conveyor technology', 'Communication', and 'Interconnections'.
- Top Panel:** 'Functional view' and 'Parameter' tabs, along with 'Start Safety Integrated commissioning'.
- Bottom Left Panel:** 'Users and roles' configuration window, showing a table of roles and their permissions.
- Bottom Right Panel:** 'Drive Data sets' configuration window, showing a table for mapping drive data sets to motor data sets and encoders.

Name	Description	Maximum sess...	Comment
Engineering administrator	System-defined role "Engineering...	30	Min: Engineering administrator role
Engineering standard	System-defined role "Engineering...	30	Min: Engineering standard role
NET Administrator	System-defined role "NET Adminis...	30	Min:
NET Standard	System-defined role "NET S...	30	Min:
NET Diagnose	System-defined role "NET D...	30	Min:
NET Remote Access	System-defined role "NET R...	30	Min:
NET Administrator Radius	System-defined role "NET A...	30	Min:
NET Radius	System-defined role "NET R...	30	Min:
OnlyDrive	User-defined role		

Drive data set	Motor data set	Motor encoder	External Encoder 1	External Encoder 2
DOS 0	MDS 0: Pump1	EDS 0: Pump1	--	--

SINAMICS Startdrive

- Supports **SINAMICS G115D**
- SINAMICS S120: **Data set switchover** and **manual optimization** with Bode plot and measuring functions (Startdrive Advanced)
- SINAMICS S120: **User-defined** parameter list
- Extended **UMAC** support
- Extension of safety acceptance test with the **Safety Activation Test** (Startdrive Advanced)

SINAMICS DCC

- Know-how protection for DCCs
- Online engineering for DCCs

Miscellaneous

- Example of application: "SINAMICS Serial Drive Commissioner"
- TO "BasicPosControl" with physical units and mechanics input

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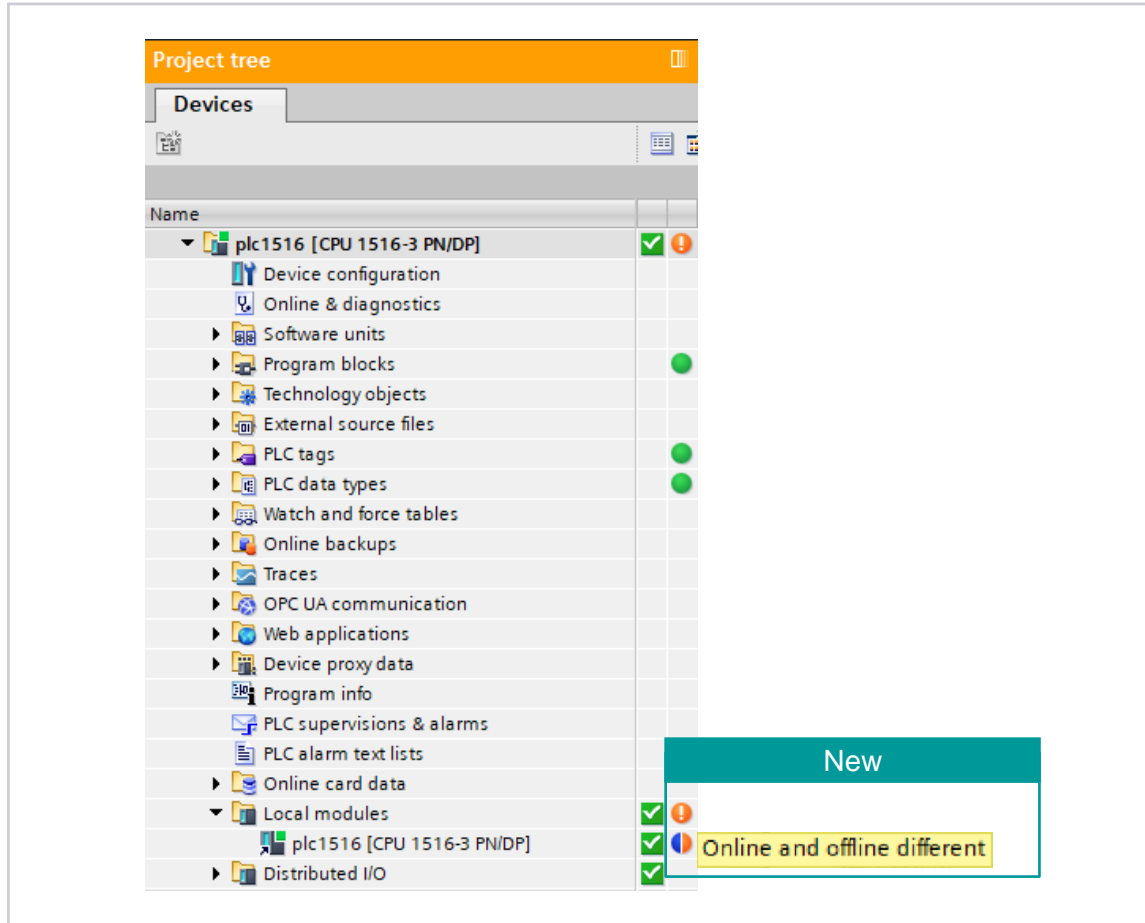
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TIA Portal – hardware configuration

Global offline/online comparison



Function

Comparison of compiled offline hardware configuration in TIA Portal with the online hardware configuration on the device:

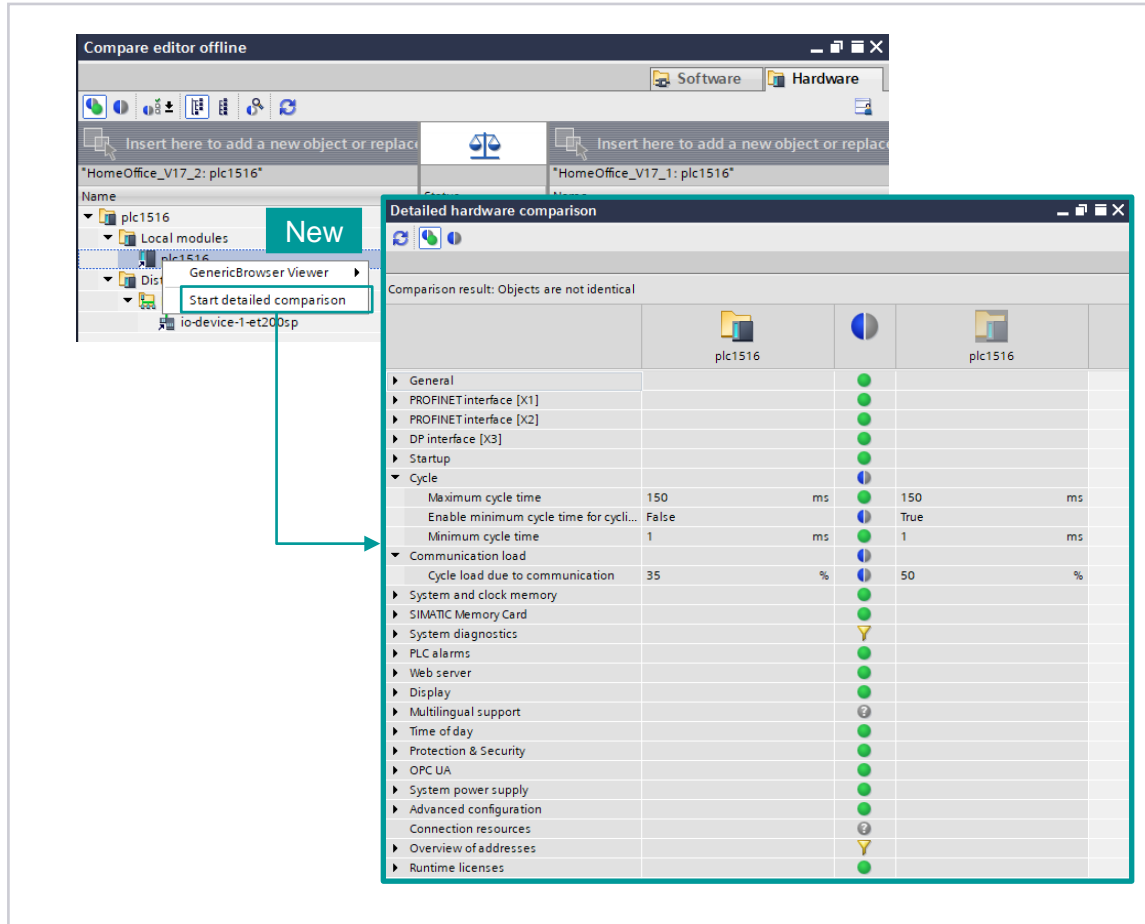
- Quick overview
- Distributed I/O for the PLC is taken into account
- Based on checksums and takes user inputs into account

Application

- Offline and online configurations are identical
- Offline and online configurations differ
- ⊛ User inputs and compiled offline configuration differ:
 - Compiling the hardware configuration to apply changes
 - Unintentional inputs: "Undo" or re-open project

TIA Portal – hardware configuration

Offline/offline comparison at parameter level



Function

Comparison of two offline configurations at parameter level

- Allows the comparison of PLCs including connected centralized/distributed I/O
- Ideal for comparing the current configuration with a reference configuration
- An indirect offline/online comparison of the configuration at parameter level is possible using the intermediate step "Upload"

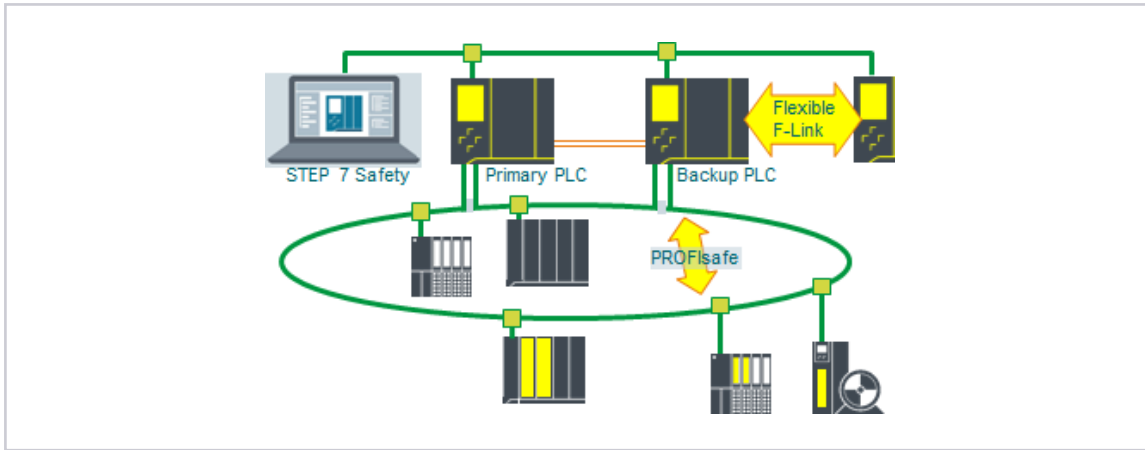
Note

Intended extensions:

- Filter options
- Assignment of parameters
- Supports further modules

Advanced Controller

Redundant controller with Safety: CPU 1518HF-4 PN



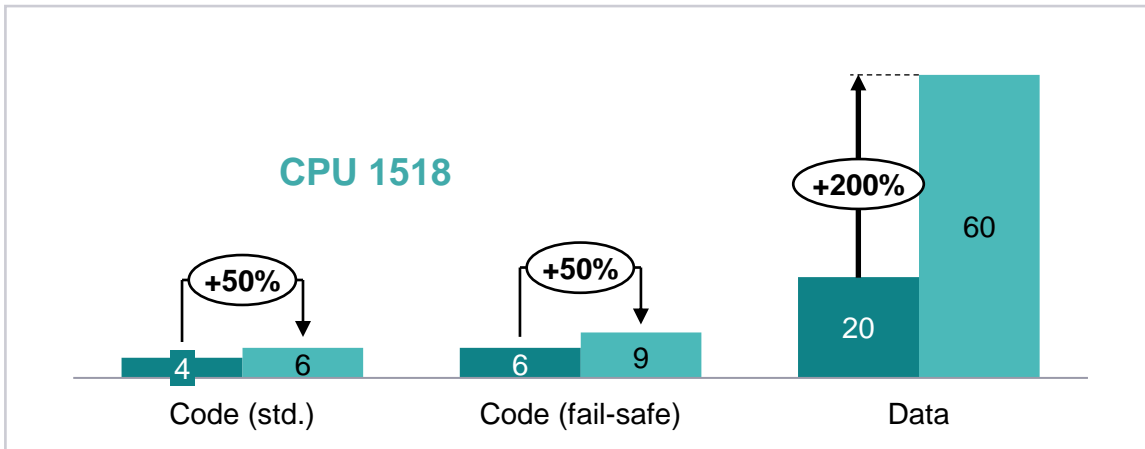
New PLC: CPU 1518HF-4 PN

- Engineering in STEP 7 Professional (TIA Portal) V17 and STEP 7 Safety
- Safety programming similar to non-redundant fail-safe PLC
- Support of PROFIsafe communication
- Supports flexible F-Link for fail-safe controller/controller communication
- 3rd Ethernet interface (X3) for redundant "north-bound" connection

Benefits

- No additional failsafe PLC required
- High level of availability for applications in combination with Safety

Advanced Controller CPU 1518 with extended configuration limits



■ TIA Portal V16 (FW 2.8) ■ TIA Portal V17 (FW 2.9)

CPU 1518 with existing hardware inf TIA Portal V17:

- **+50%** program memory
- **+200%** data memory

for applications with enhanced requirements regarding code memory and data memory

Increase in configuration limits for ET 200 and S7-1500 CPUs:

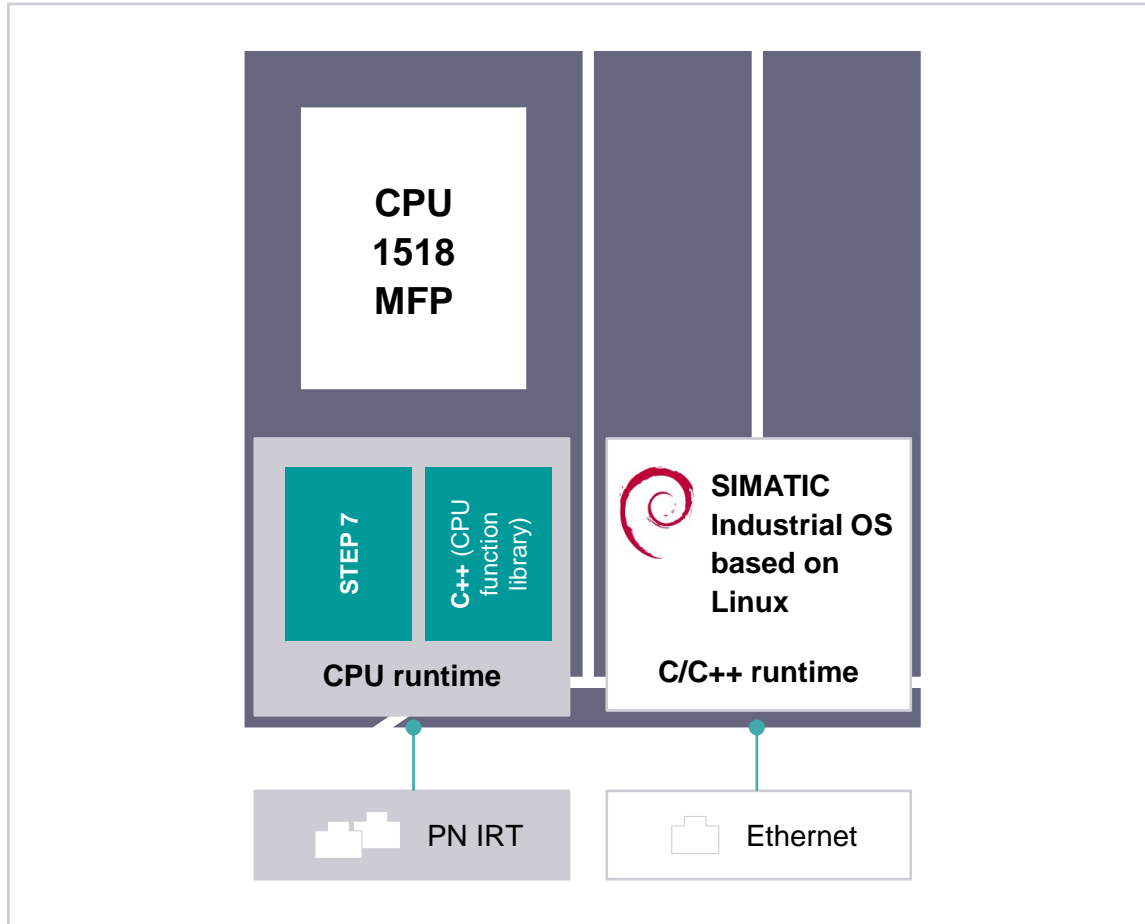
- 128 UDP multicast circuits for the CPUs 1517/1518
- Increase in the number of blocks for the controllers CPU 1510SP up to CPU 1515 (including CPU 1513R/1515R)
Details are described in the technical specifications of each CPU

Benefits

Extensions e.g. for the usage of **structured** programming

Advanced Controller

CPU 1518(F) MFP – extensions for the multifunctional platform



Function

SIMATIC Industrial Linux (based on Debian build by Mentor) as embedded operating system for the C/C++ runtime on CPU 1518 MFP

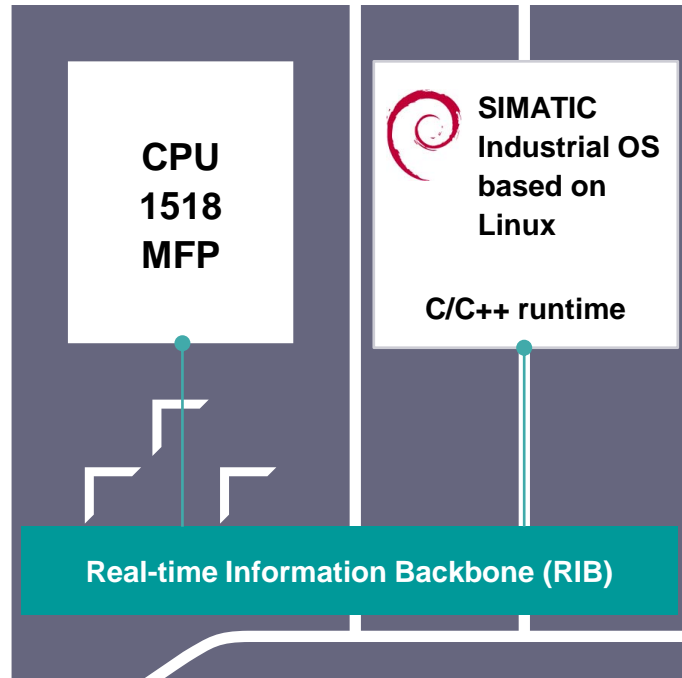
- Real-time capability of the C/CC++ runtime
- Easy porting of C/C++ application between CPU 1518 MFP/open controller/software controller

Advantage of the function

- Siemens-managed Linux distribution, i.e. all necessary Linux updates, including security updates, are verified and provided by Siemens
- Flexible software development in high-level languages for various platforms
- **Spare part compatibility of a SIMATIC S7-1500 CPU**, i.e. if a spare part is required, the memory card only has to be plugged into the new hardware

Advanced Controller

CPU 1518(F) MFP – extensions for the multifunctional platform



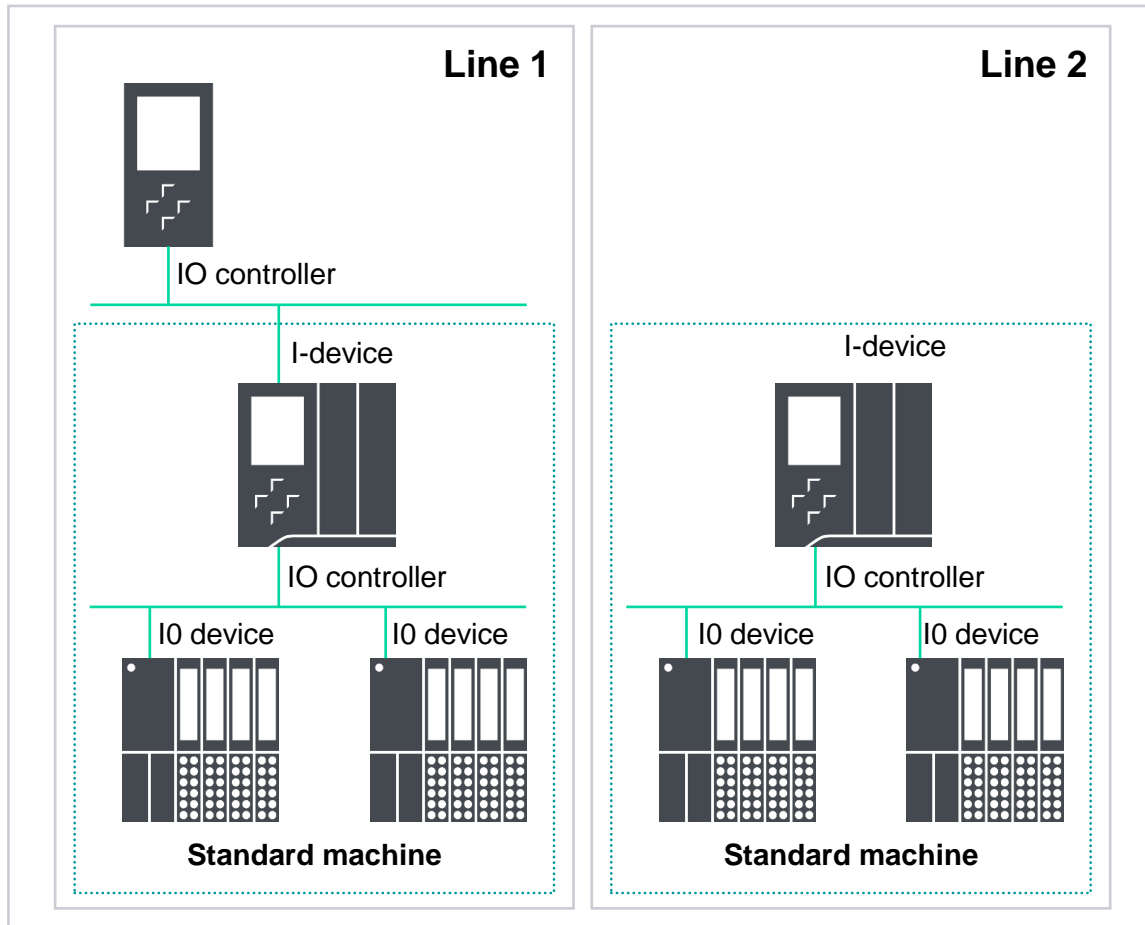
RIB – Real-time Information Backbone

- RIB is a concept concerning exchange of data between two runtimes via an underlying "shared memory"
- RIB provides consistent data exchange using an integrated buffer concept that also ensures minimal latency.
- Data is exchanged symbolically and is configured using familiar language mechanisms:
 - within the CPU Runtime:
Data block and system functions (for TIA Portal V17)
 - within the C/C++ Runtime:
Structure definitions and library functions (available via an SDK and application examples concerning V17)

Advantage of the function

For applications requiring consistent, high-performance data exchange between the CPU runtime and the SIMATIC Industrial OS runtime

Deactivating/activating the I-device in the user program



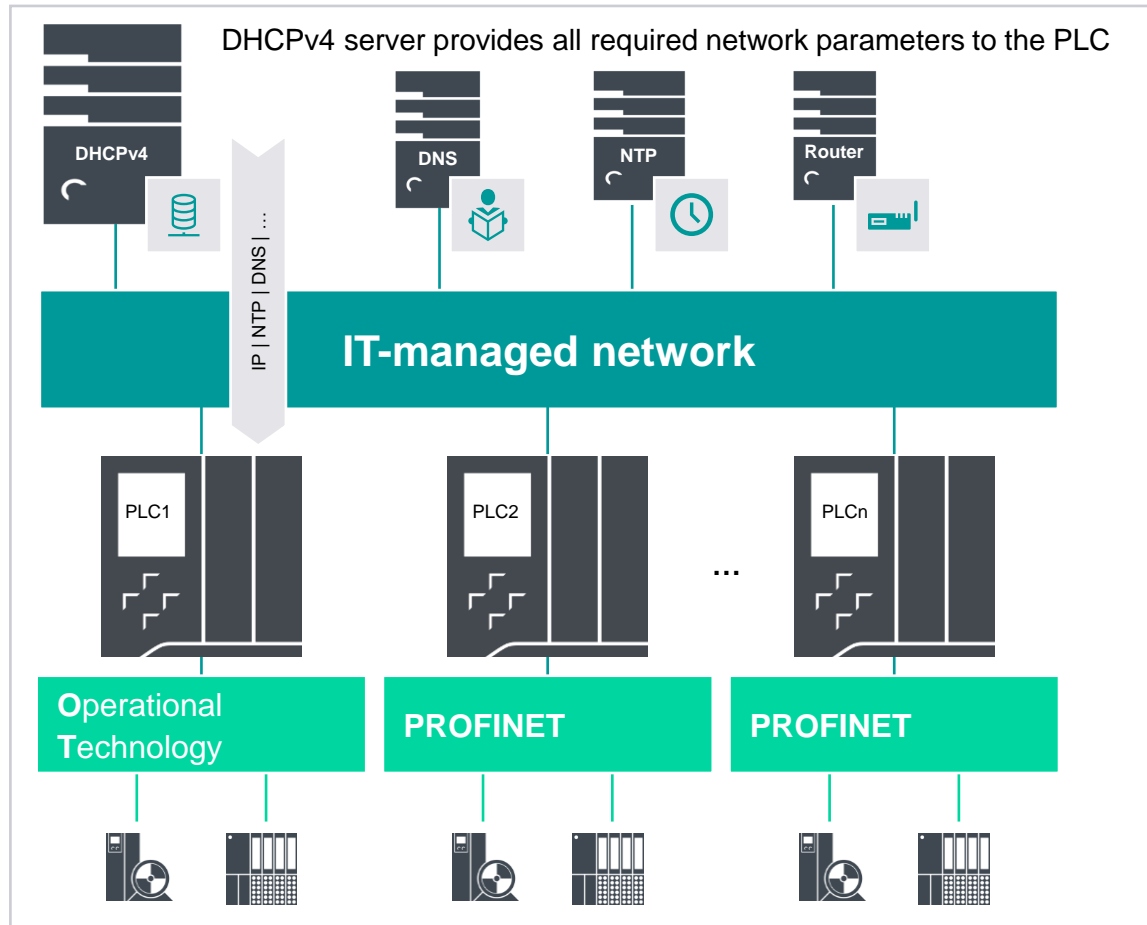
- The I-device configuration of a CPU can be deactivated or re-activated by using the instruction "D_ACT_DP"
- If the IO controller is not available, the I-device CPU does not longer indicate an error via its ERROR LEDs (if the I-device function is deactivated by the user program)
- Pre condition: TIA Portal V17, CPU FW V2.9, CM 1542-1 FW V3.0

Customer benefits

- All standard machines have a uniform user program, regardless of whether there is an IO controller at the deployment site
- No annoying/confusing ERROR LED display

DHCP for SIMATIC S7-1500- and ET 200-CPU

Dynamic assignment of the network configuration



DHCP – Dynamic Host Configuration Protocol

- **New:** The CPU can be connected to an existing network without additional manual configuration of the CPU's network interface.
- **New:** The CPU can request network parameters from a DHCPv4 server according to RFC2131:
 - IP address and subnet mask
 - Default IP router address
- Optional:
 - DNS server addresses
 - NTP server addresses
 - Host and/or domain name¹

Possible application areas

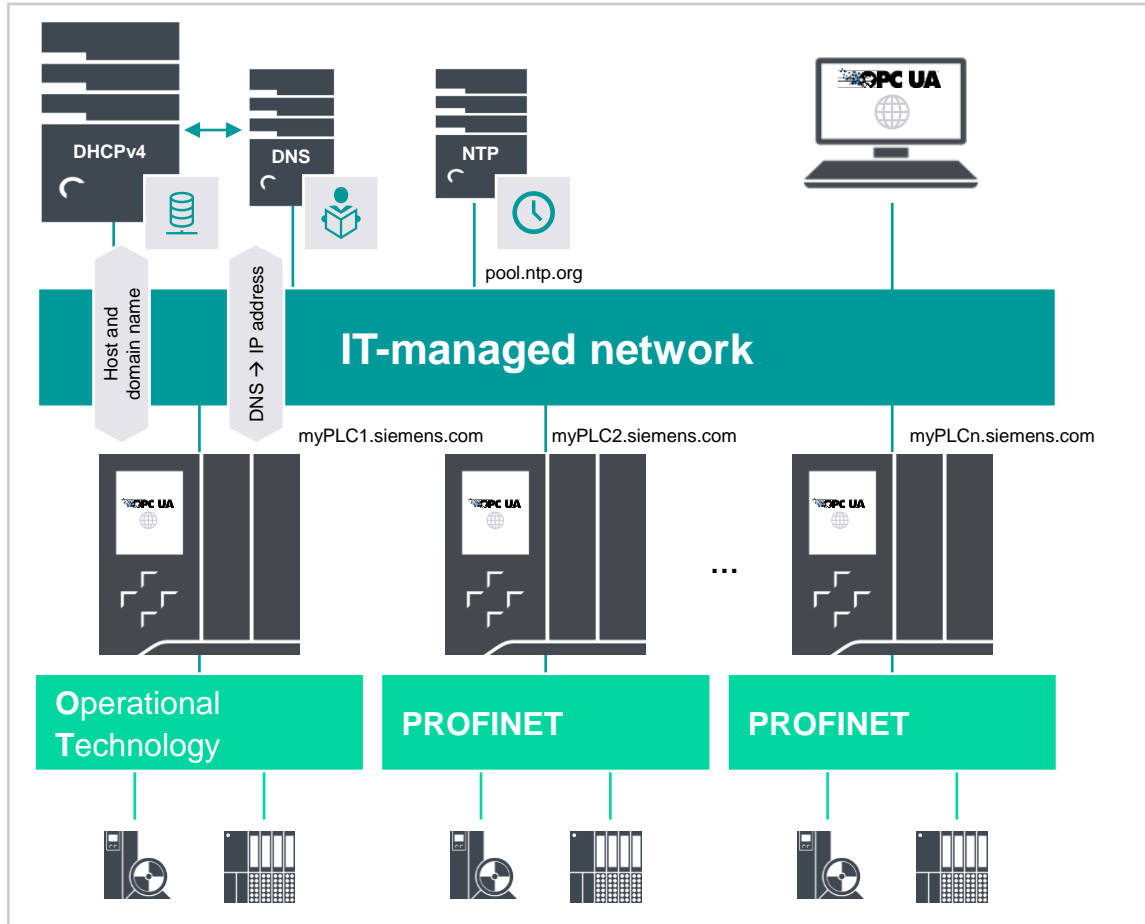
- Use of the CPU in IT-managed networks.
- Modular design of production plant (plug & produce)

Requirement: TIA Portal V17, CPU FW V2.9

¹ Parameters can also be supplied to the DHCP server by the CPU

DNS for SIMATIC S7-1500- and ET 200-CPUs

Name-based addressing



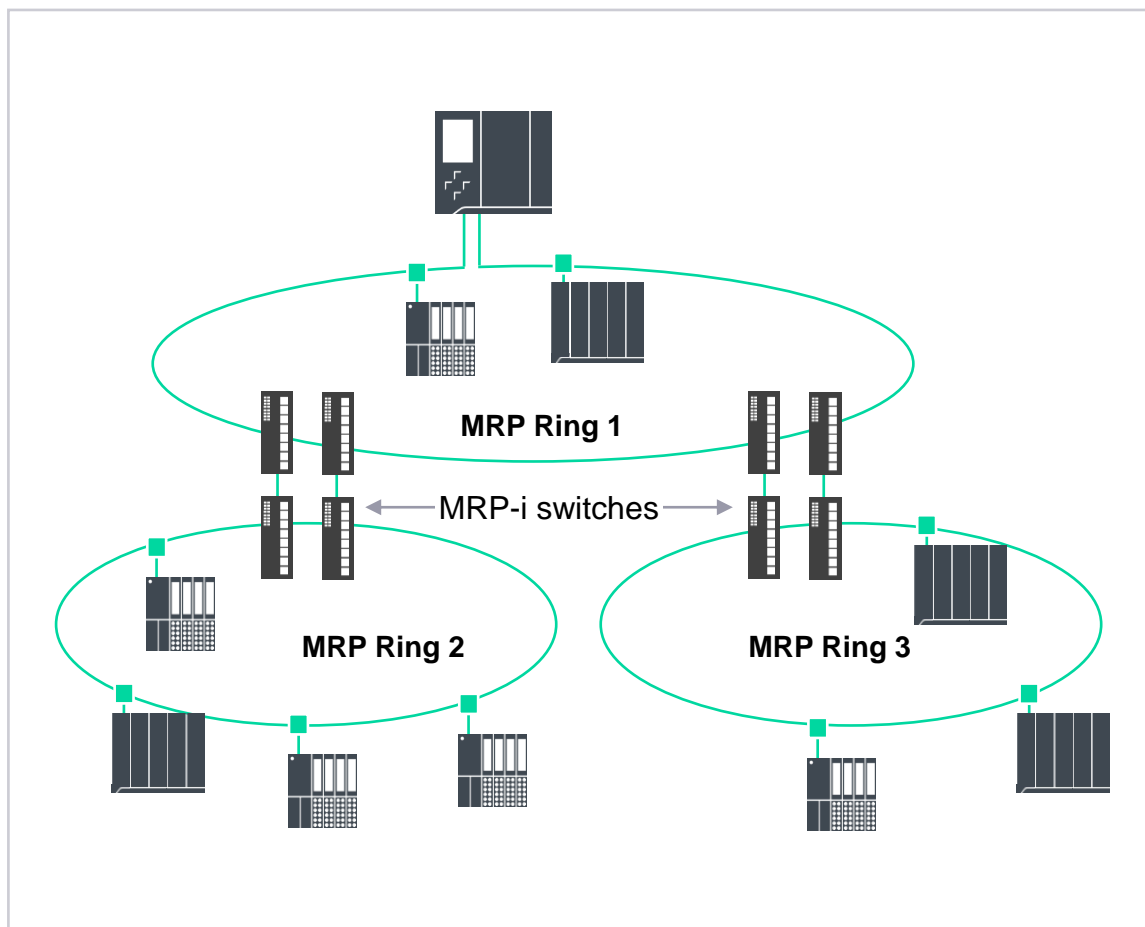
DNS – Domain Name System

- **New:** The DNS server addresses can be obtained from the CPU via DHCP.
- **New:** The CPU can obtain host and domain names from a DHCP server for applications realized with OPC UA or (secure) OUC.
- **New:** The CPU can transfer configured host or domain names to DHCP servers coupled with DNS servers for dynamic alignment (dynamic DNS).
- **New:** The CPU's NTP client can address NTP servers by name.
- **New:** New "CommConfig" instruction allows network parameters to be written or read, such as IP suite, DNS server, host and domain name.

Requirement: TIA Portal V17, CPU FW V2.9

SIMATIC S7-1500- and ET 200-CPU's – highlights with FW 2.9

Supports MRP Interconnect



MRP (Media Redundancy Protocol) Interconnect switches enable the coupling of multiple MRP rings

- Thanks to the redundant switch architecture, the coupled network is still able to function even if a switch fails.
- Coupling of up to 11 MRP rings.
- Can be used with the following SCALANCE switches: XR500, XM400, XC200, XF204-2BA, XP200

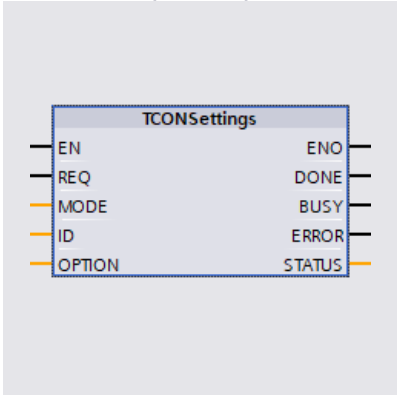
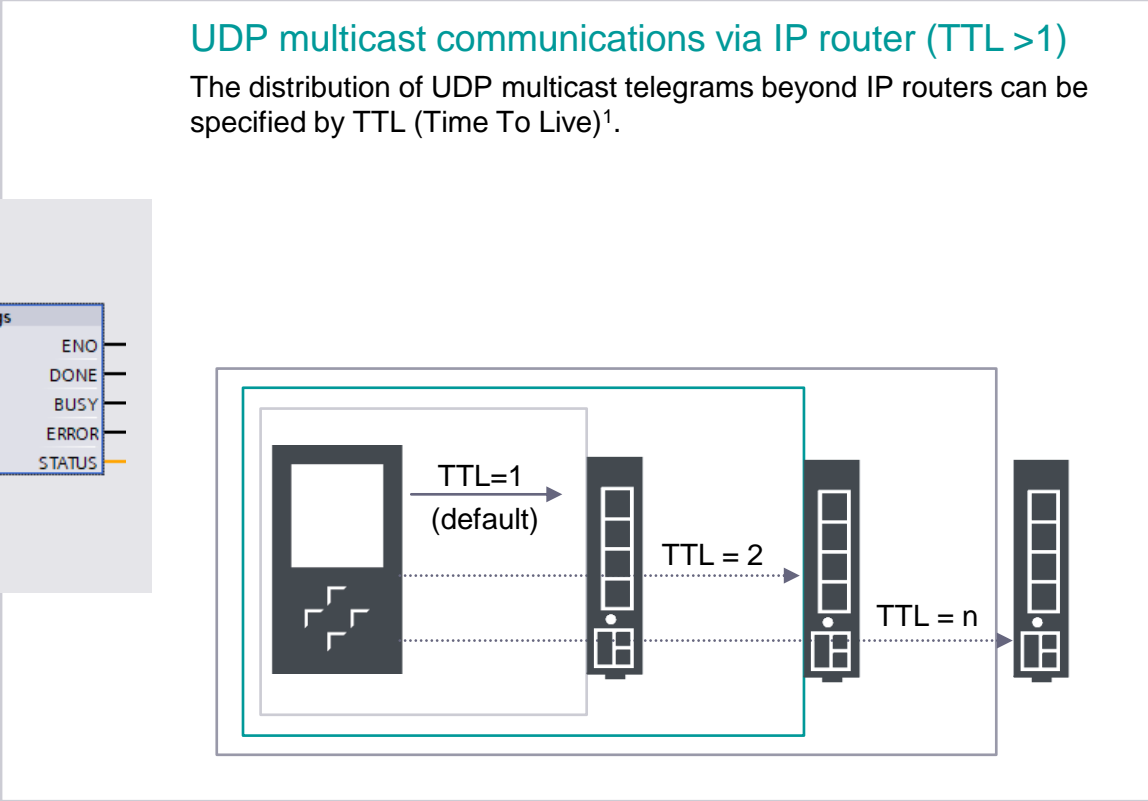
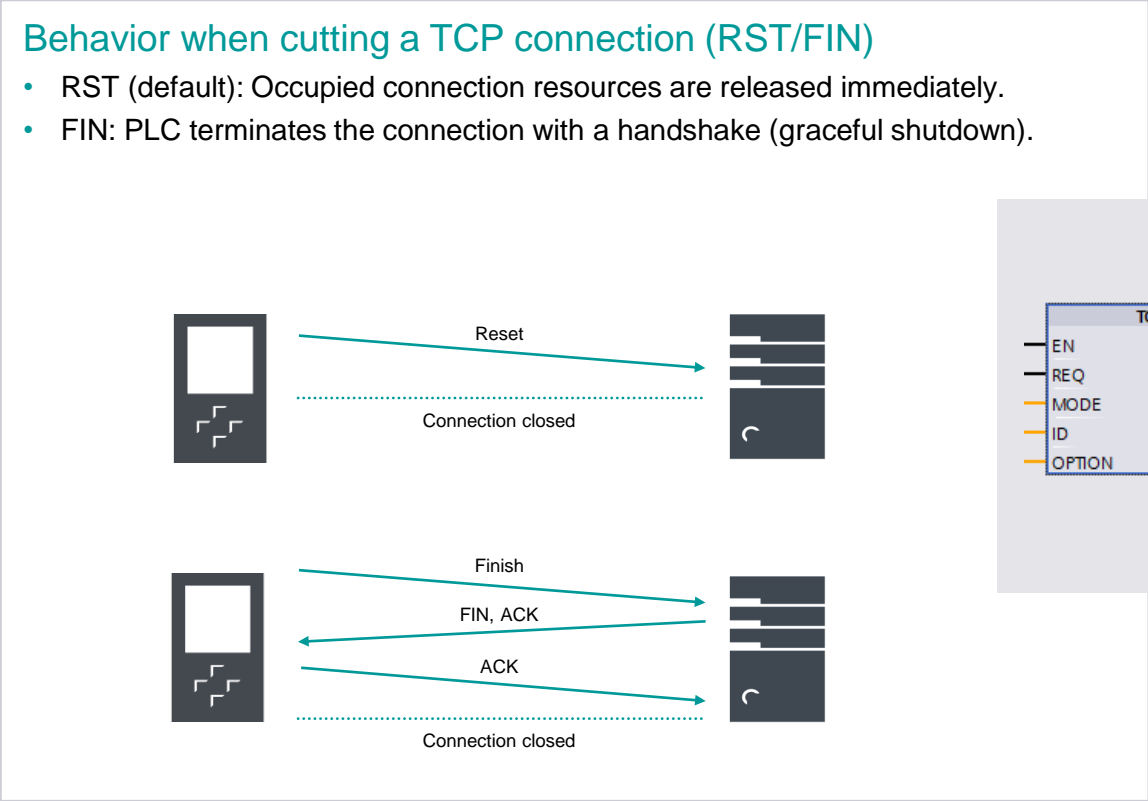
Advantage

In total, more accessible devices can be operated on MRP rings.

SIMATIC S7-1500-/ET 200-CPU and SIMATIC S7-1200-CPU

New "TCONSettings" system function

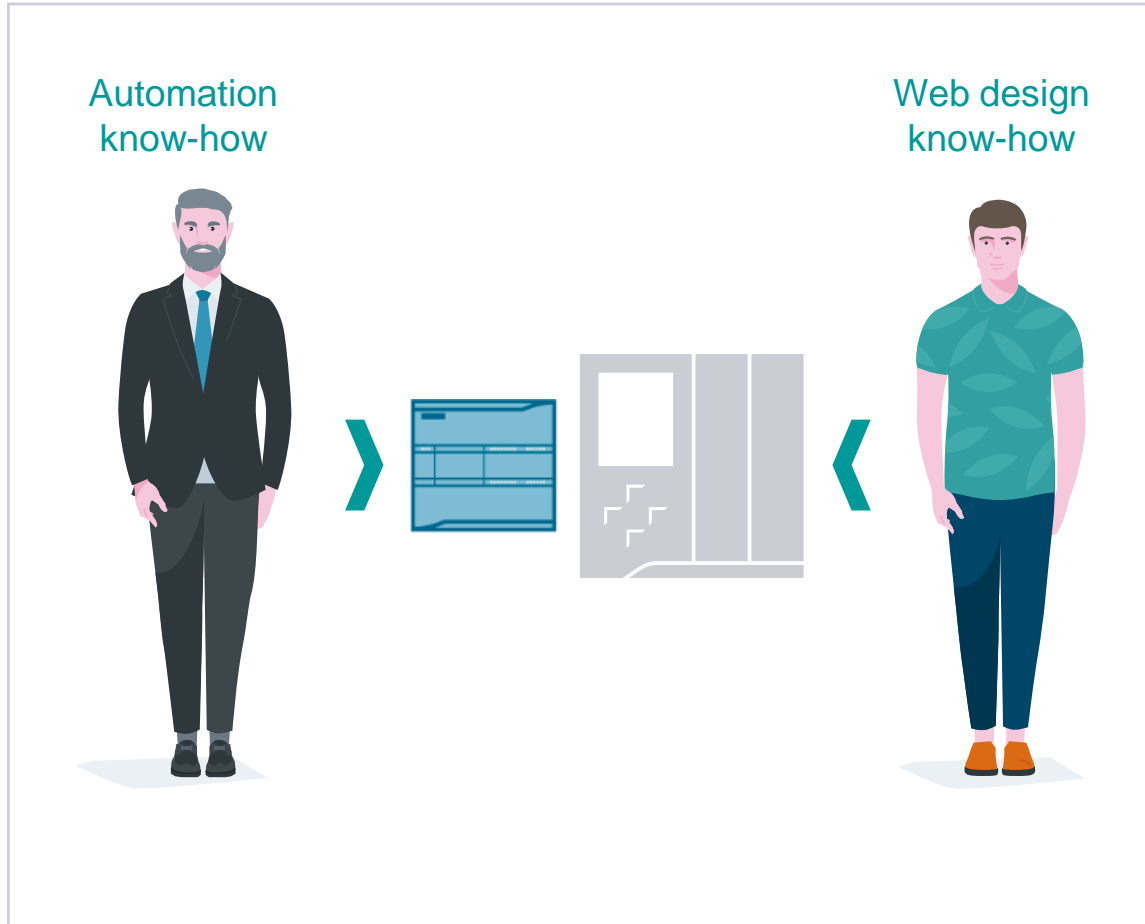
TCONSettings determines a free connection ID for a new OUC connection and allows properties of an OUC connection to be configured/read.



¹ The IP routers have to support the function (S7-1500 only).

SIMATIC S7-1500-/ET 200- and SIMATIC S7-1200-CPUs

Web server innovations



Function

Loading user-defined web pages to the PLC without TIA Portal:

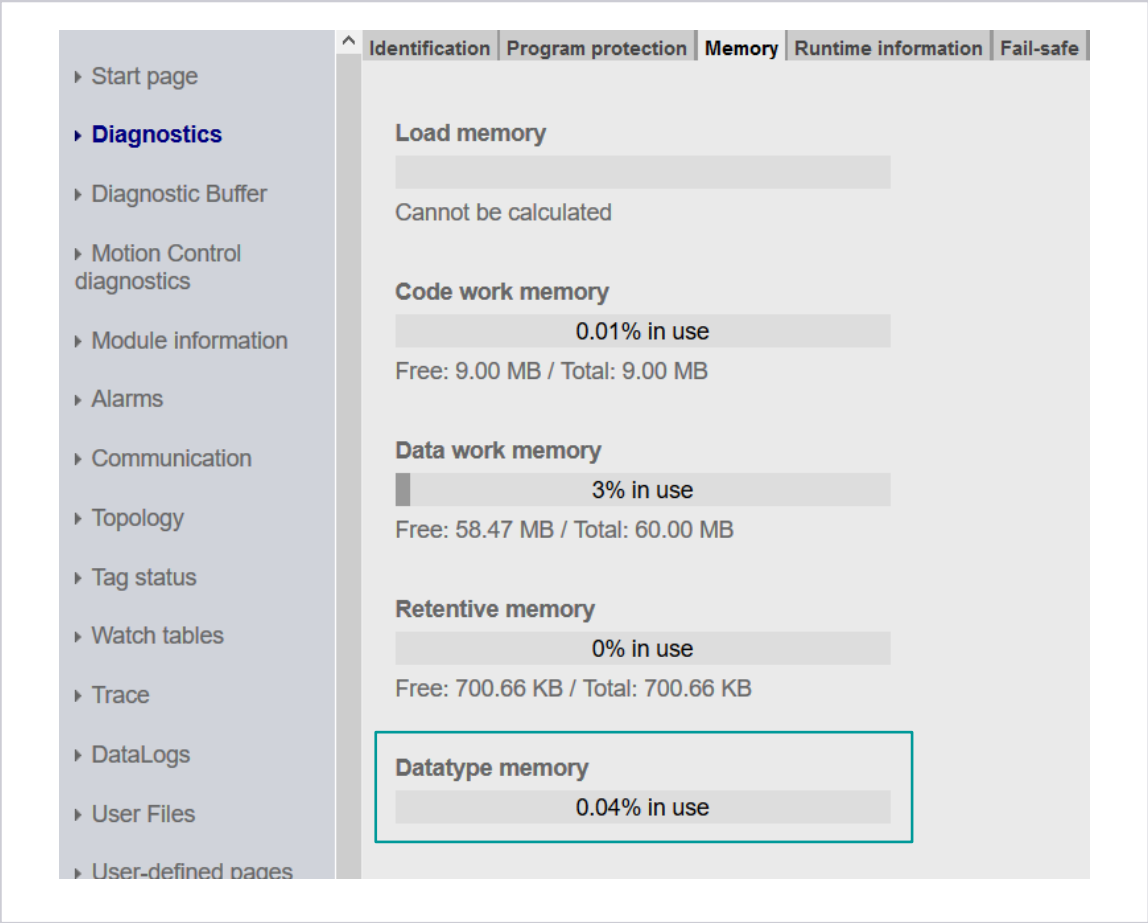
- New "Handle user-defined web pages" function right in the PLC's hardware properties register in TIA Portal
- Files can be transferred via the new JSON RPC 2.0 API
- Creating user-defined web pages without DB generation in TIA Portal
- User-defined web pages are stored on the PLC's load memory

Benefits of the function

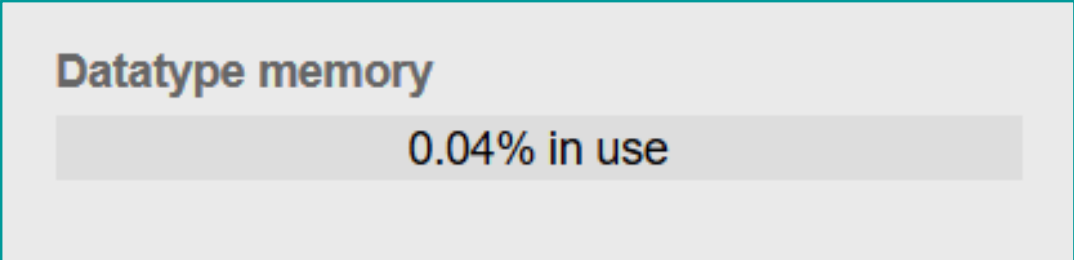
- File transfer and update of user-defined web pages **without STOP → RUN**
- Better separation of domains Automation and web design
- Enables more wide ranging and technically sophisticated user-defined web pages The memory size of the application is only limited by the size of the memory card in the S7-1500 or by the load memory of the S7-1200
- Compatibility of spare parts is ensured as all previous mechanisms are still supported

SIMATIC S7-1500-/ET 200-CPU's

General web server extensions



Memory display for data types



Benefits of the function

Data types occupy resources in the CPU's memory. Displaying data type resource consumption prevents the situation where the user program can no longer be loaded onto the controller because of insufficient memory capacity.

Hardware configuration S7-1200 highlights



Key data concerning firmware V4.5

- New web server
- OPC UA
 - Methods
 - Diagnostics
- Compact read/write ASCII files
- GetSMCInfo
- Timestampformat
- MRP master functionality for CPU 1215 and 1217
- Configured OUC connections
- 14k retentive memory
- S7-1200 motion control axis control panel
 - Jogging in non-position-controlled mode
 - Speed specification in non-position-controlled mode
- Service Data via Data Record (TIA Portal)
- Configuring/programming with STEP 7 V17

Web server innovations

S7-1200 V4.5



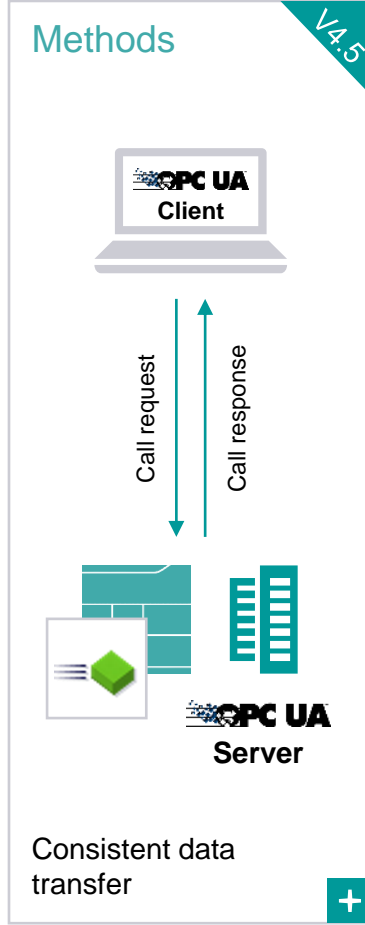
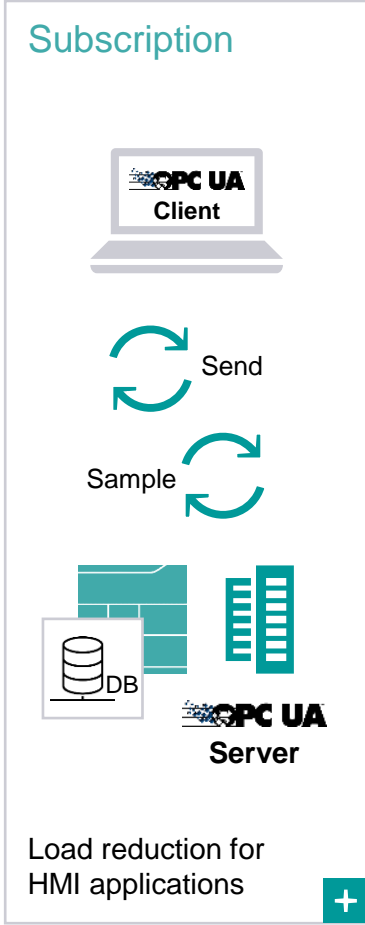
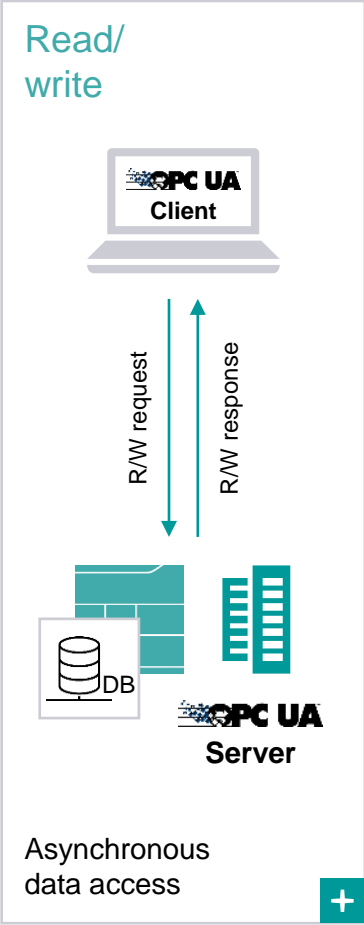
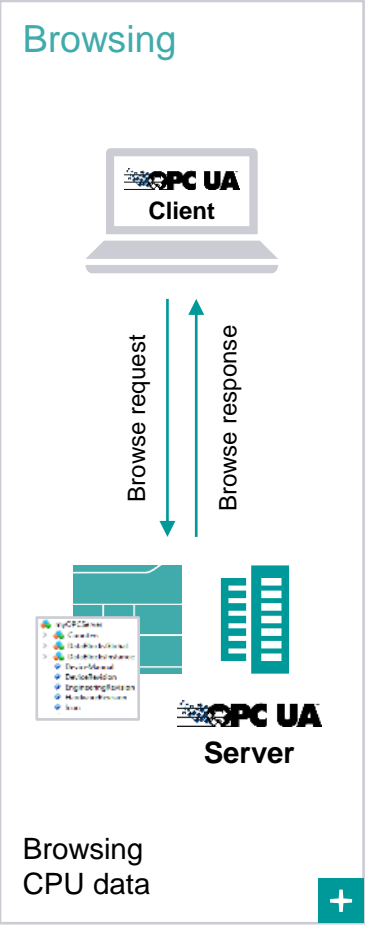
Function

- Web server with JSON RPC2.0 as new "web data interface" for access to web server data such as
 - Process values (tag values)
 - CPU status and diagnostics data (in some cases)
- CPU web server response in JSON format

Advantages of the function

- Future basis for "state-of-the-art" creation of user-defined web pages
- JSON as web-compliant data format for simple linking to web data consumers, e.g. MES systems, SCADA systems
- JSON as a stable data format for accessing web server data, i.e. no adjustment of web client code (e.g. Java Script code) needed after firmware update
- Spare part compatibility as the new web data interface can be used in addition to the current options

OPC UA – extended range of functions S7-1200 V4.5



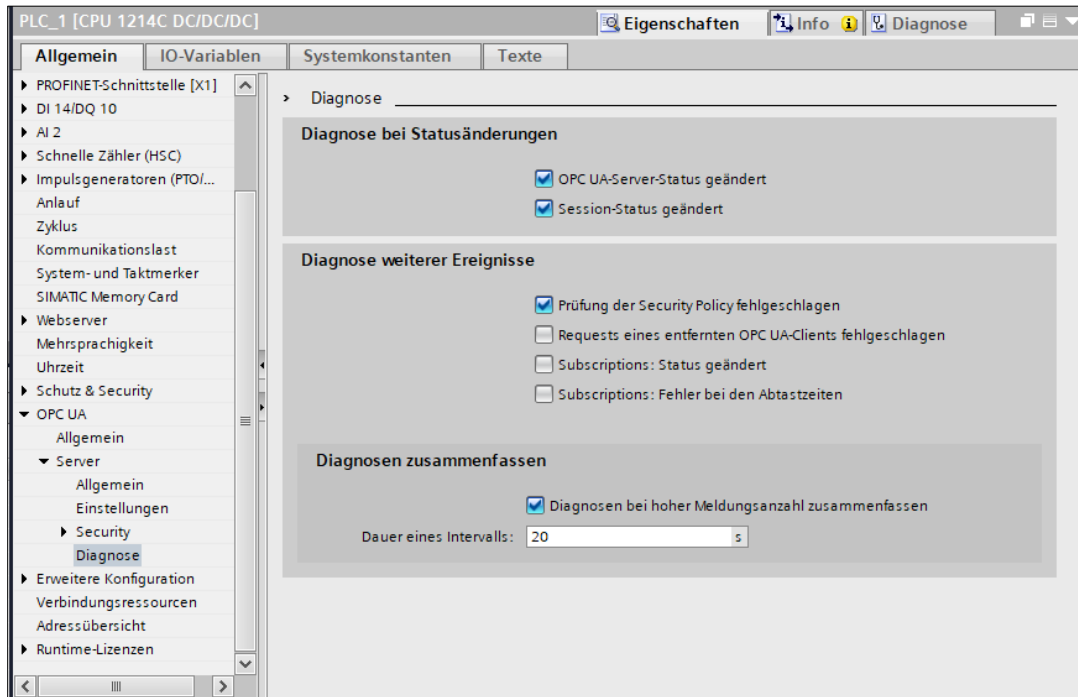
V4.5

Supports

- Structured data types and arrays

OPC UA

S7-1200 V4.5 – OPC UA server diagnostics in TIA Portal



Additional diagnostic buffer entries for OPC UA server

- Activation/deactivation of the OPC UA diagnostic information by user in the CPU properties
- Summary possible in the event of message burst of diagnostic messages relevant to OPC UA and just one appearance in diagnostics buffer

Benefits

Faster analysis of information relevant to OPC UA in the event of an error

OPC UA

S7-1200 V4.5 – OPC UA server diagnostics in TIA Portal

Session/subscription diagnostics

Id	Name	Endpoint URL	Subscriptions	Monitored Items	Timeout	Last conta...
1880316684	urn:mmd2b0e6c:UnifiedAutomatio...	opc.tcp://192.168.2.11:4840	2	9	472 of 3000ms	2011-Dec...
2447554996	Subscription_2447554996			1	14 of 300	
2447554999	Subscription_2447554999			8	0 of 300	
472389832	urn:mmd2b0e6c:UnifiedAutomatio...	opc.tcp://192.168.2.11:4840	2	9	451 of 3000ms	2011-Dec...
2447554997	Subscription_2447554997			1	25 of 300	
2447554998	Subscription_2447554998			8	0 of 300	
352949163	urn:mmd2b0e6c:UnifiedAutomatio...	opc.tcp://192.168.2.11:4840	2	9	427 of 3000ms	2011-Dec...
2447555000	Subscription_2447555000			1	4 of 300	
2447555001	Subscription_2447555001			8	0 of 300	

Connection resources

	Station resources				Module resources			
	Reserved		Dynamic		CPU 1215C D0DQDC (R0...		CPU 1215C D0DQDC (R0...	
Maximum number of resources:	34	34	34	34	68	68	68	68
	Maximum	Configured	Used	Configured	Used	Configured	Used	Used
PG communication:	4	-	1	-	0	-	1	1
HMI communication:	12	0	0	0	0	0	0	0
S7 communication:	8	0	0	0	0	0	0	0
Open user communication:	8	0	0	0	0	0	0	0
Web communication:	2	-	0	-	0	-	0	0
OPC UA Client/Server communication:	0	-	0	-	1	-	1	1
Other communication:	-	-	0	-	0	-	0	0
Total resources used:		0	1	0	1	0	2	2
Available resources:		34	33	34	33	68	66	66

OPC UA diagnostic information in TIA Portal

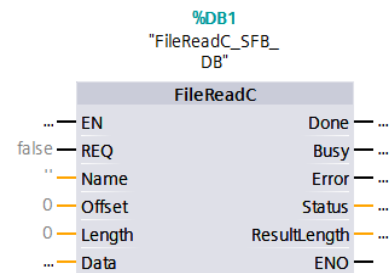
- Display of additional information concerning the OPC UA server via "Online & Diagnostics" on the CPU
- Provision of information on session and monitored items via "Sessions"
- Visualization of the number of OPC UA resources used in "Connection resources" in TIA Portal

Benefits

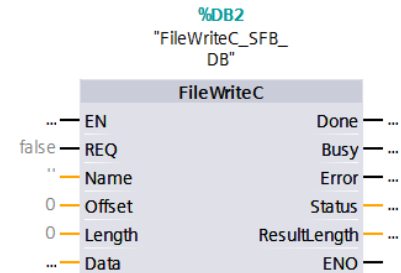
Additional diagnostic information available for fast and efficient error detection concerning OPC UA

Import and export of ASCII files (files in binary format) S7-1200 V4.5 in TIA Portal V17

FileReadC



FileWriteC



Function

- Read data from an ASCII file of the SIMATIC memory card, for example
- Write data to an ASCII file onto the SIMATIC memory card, for example
- Deletes a file – "FileDelete"

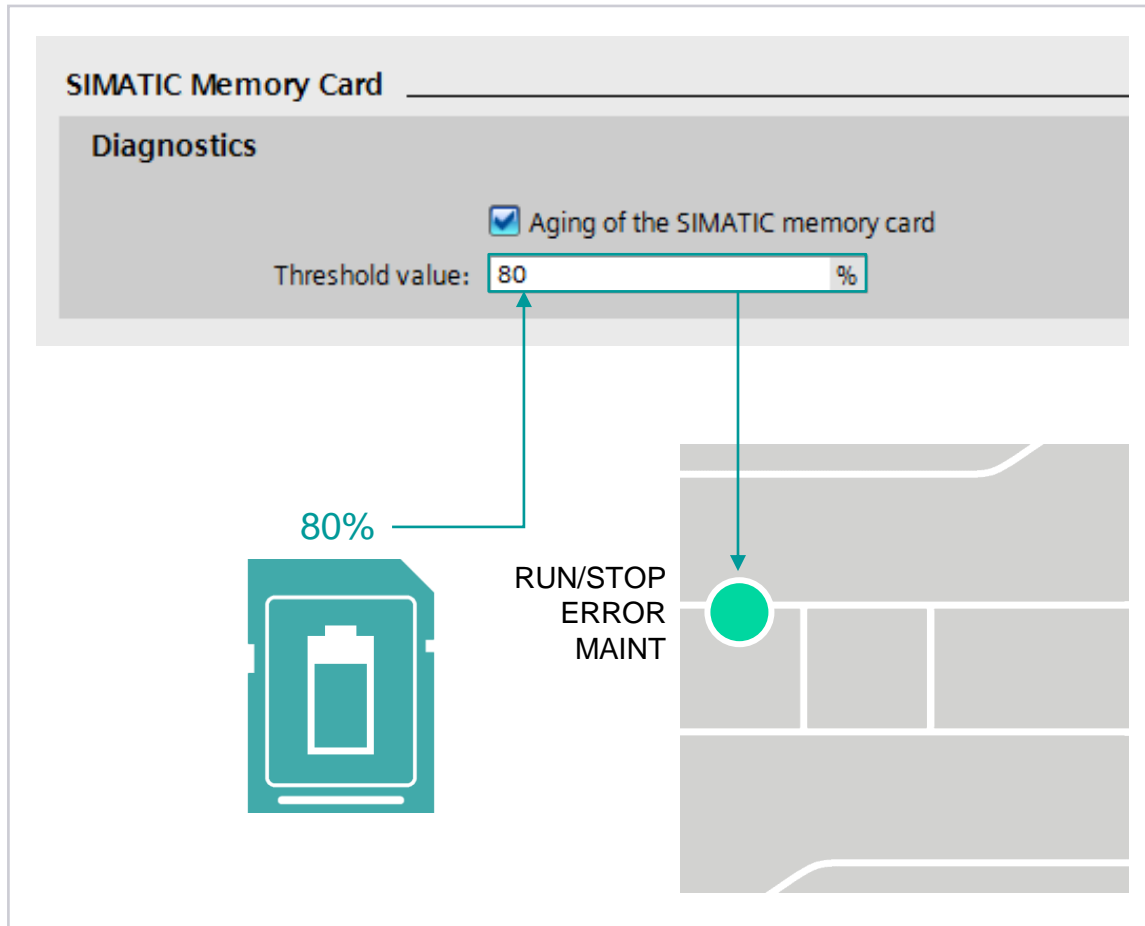
Customer benefits

Complex file structures are used in the free ASCII format on the SIMATIC memory card, e.g. to

- read in recipes for which CSV is not flexible enough
- read in complex parameter assignments or configuration files
- output complex files for documentation

GetSMCInfo

S7-1200 V4.5 – information concerning SIMATIC memory card



Aging of the SIMATIC memory card

- Generation of a diagnostic entry if a user-definable lifetime is exceeded (in percent of the guaranteed write/read cycles)
- Visual display on the CPU via maintenance LED

Customer benefits

Evaluation of card "lifetime" information possible when recipes and archives are used intensively; precautionary replacement of the SMC card when necessary.

Time stamping of DataLogs – format standardization

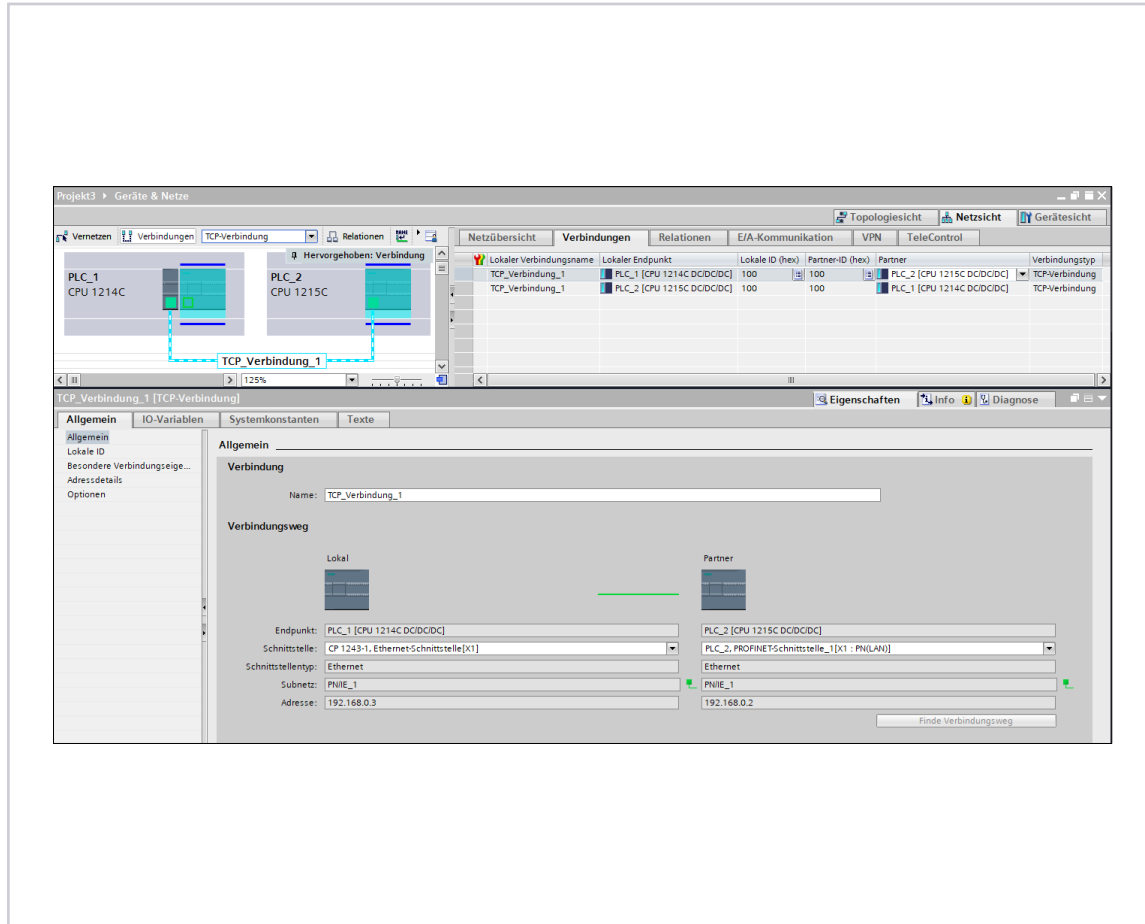
S7-1200 V4.5

Previously

Use of different formats for the TIMESTAMP field of DataLogs with S7-1200 and S7-1500

S7-1200		S7-1500	
<V4.5	≥V4.5	<V2.6	≥V2.6
yyyy-mm-dd		dd-mm-yyyy	
	dd-mm-yyyy		yyyy-mm-dd

Configured OUC connections S7-1200 V4.5



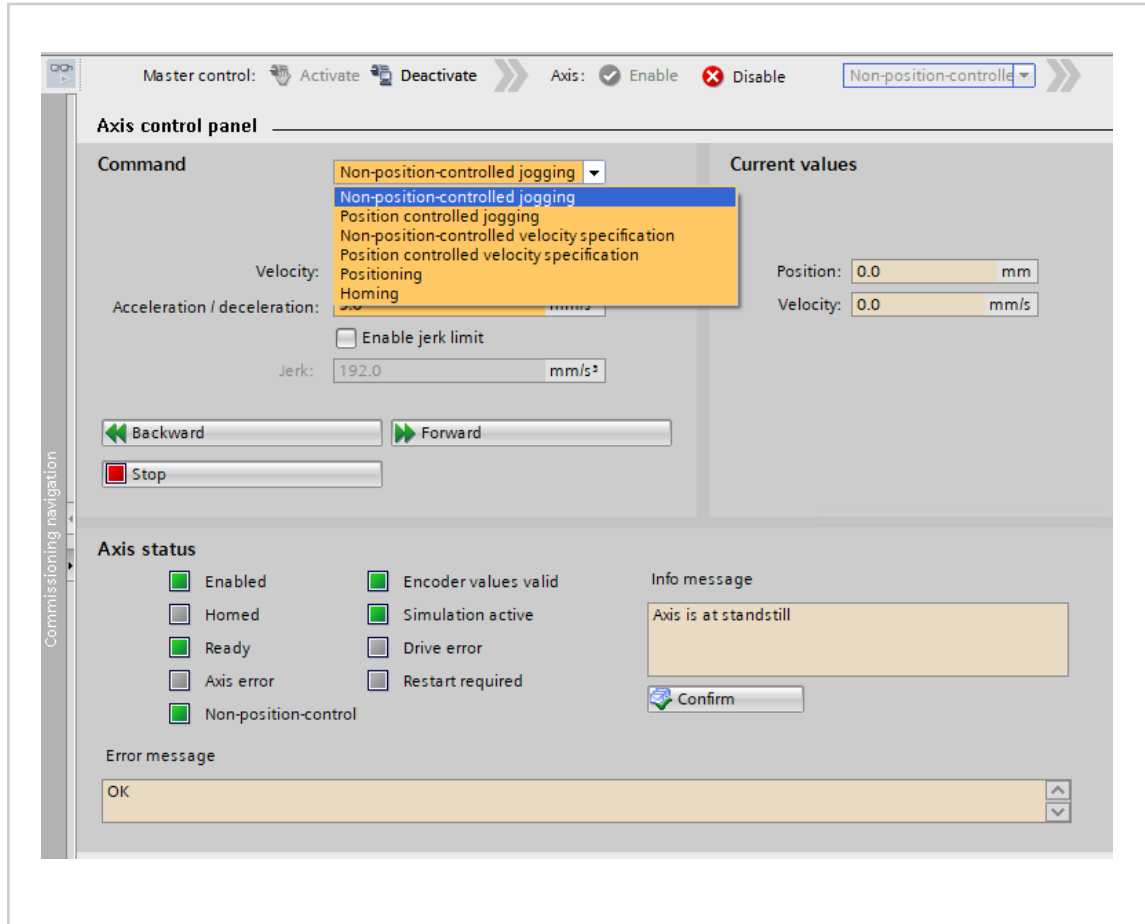
Connection configuration in HWCN for

- TCP
- UDP
- Iso-on-TCP

Enables connection to be established in RUN without TCON or T_DISCON

Motion Control

S7-1200 V4.5



For PROFIdrive or analog drives

Non-position-controlled mode in axis control panel

- Jog in Non-position-controlled mode
- Speed specification in Non-position-controlled mode

For PTO drives

Speed specification in axis control panel

Support of TM PTO2

Benefit

- Enhanced safety during first commissioning, if encoder connection is faulty
- Easy possibility to check encoder configuration and electrical connections at low speed
- Additional traversing option during commissioning
- Automatically apply drive values during configuration (offline)

SIMATIC is motion control – for sophisticated applications

The scalable SIMATIC Motion Controller portfolio

SIMATIC CPU 1518T/TF-4 PN/DP | Motion control extensions | Handling



Feature/function

SIMATIC CPU 1518T & CPU 1518TF

High-performance SIMATIC controller portfolio extension for the high-end motion control market

Motion control enhancements

- Leading-value-coupled correction profiles on the following axis
- Targeted desynchronization of synchronous operation and cam profile synchronization to position
- New type of cam profile (10,000 points) and extended cam profile diagnostics
 - Backlash compensation

Trace: Bode plot

Handling

Controlling kinematics with up to 4 interpolating axes incl. synchronization on moving belts

Benefits

- Improvements in performance (up to 192 axes) for sophisticated motion control applications
- Extended configuration limits for memory: 9 MB program memory/60 MB data memory

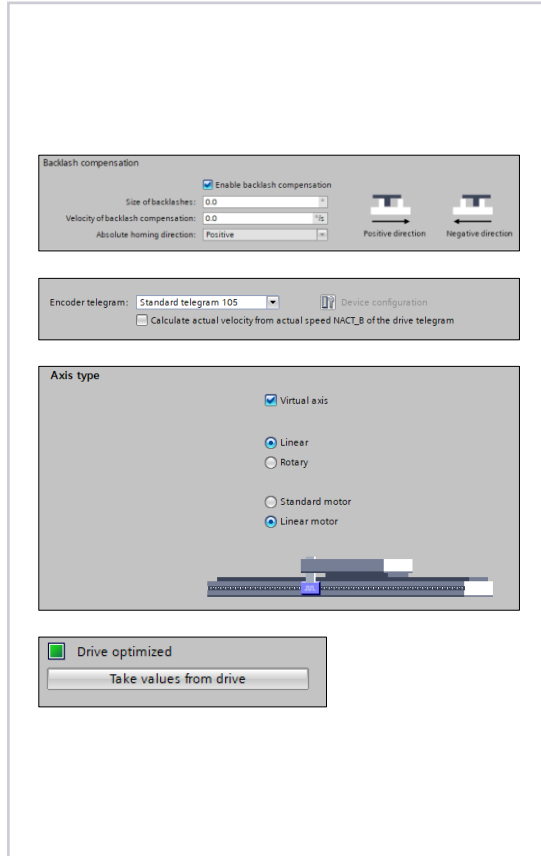
Simple realization of complex motion control applications including wide ranging diagnostics

Simple programming of pick and place, assembly or handling tasks based on PLCopen

Motion control innovations – TIA Portal V17/FW V2.9

Extended functions on technology object axis

S7-1500 and S7-1500 T-CPU



Feature/function

Backlash compensation – compensate backlash in mechanics

Apply actual speed (NIST) from PROFIdrive telegram

Connection and configuration of linear motors

Automatic optimization of the axis

Extended functions of the drive and encoder connection via data blocks

Benefits

Increase in motion precision without additional programming effort

The speed determined in the drive is used for control. This helps achieve better control quality, especially for encoders with low resolution.

- Can be used for electric linear or hydraulic drives
- Unit of measurement "Force (N)" can be configured on the axis

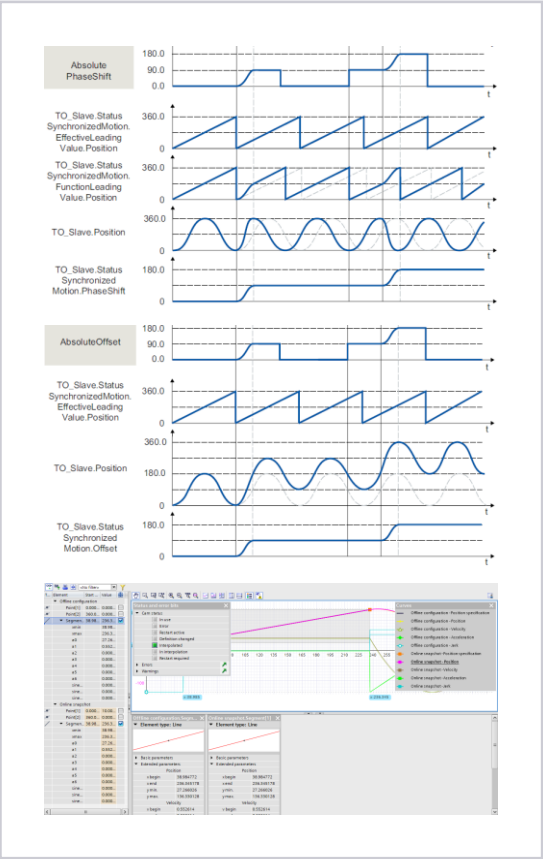
- Automatic optimization of the axis with just a few clicks
- Optimization of the drive can be initiated in Startdrive and the parameters that are determined can be adopted automatically for the position controller.

Extension of programming options by using arrays and structures for connection via DBs

Motion control innovations – TIA Portal V17/FW V2.9

Extended functions for synchronous axes

S7-1500 T-CPU



Feature/function

Targeted desynchronization of synchronous operation and cam profile synchronization to position of the following axis (MC_GearOut, MC_CamOut)

Leading-value-coupled correction profiles on the following axis (MC_PhasingAbsolute/Relative, MC_OffsetAbsolute/Relative)

Introduction or scaling of a cam profile at the end of an active cam profile

New type of cam profiles with 10,000 points and 50 polynomial segments

Innovative cam profile diagnostics

Benefits

Simple programming of the desynchronization functions with no further effort (e.g. in OB1)

Simple programming of the synchronous compensation/correction movements with no further effort (e.g. in OB1)

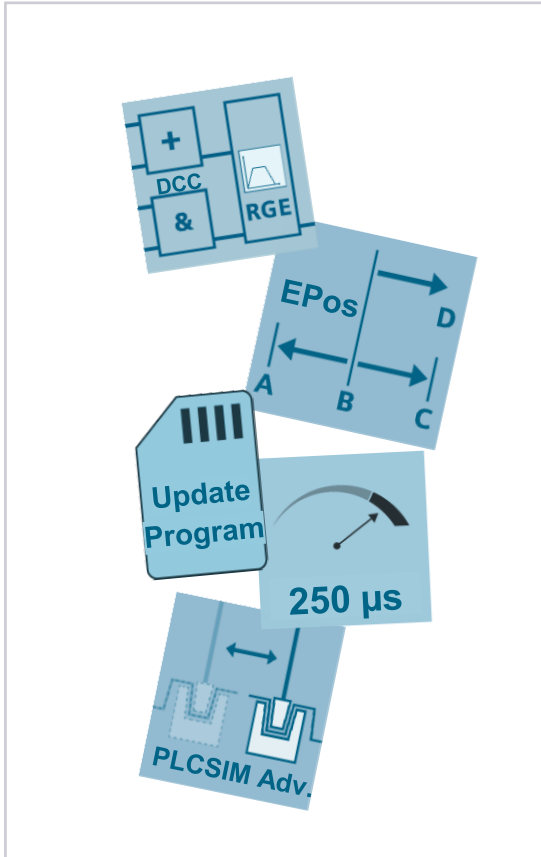
Simple programming of cam disk changes with no further effort (e.g. OB1)

Higher precision with complex cam profiles

Simple comparison of several cam profiles/cam elements in online and offline mode for diagnostics, validation and documentation of cam profiles

Motion control innovations – TIA Portal V17/FW V2.9 Extension with SIMATIC Drive Controller

CPU 1504D TF and CPU 1507D TF



Feature/function

New firmware

- PLC FW V2.9
- SINAMICS Integrated FW V5.2 SP3

Extended functionality of SINAMICS Integrated

- DCC/DCB
- EPos
- Additionally supported SINAMICS licenses
 - Cogging torque compensation
 - Advanced Position Control (APC)
 - SERVCOUPL (Servo Coupling)

Setting the card type using the FUNCT key
(without ES and without card reader)

CPU 1507D TF: Reduction of minimum application cycle
time from 500 μs to 250 μs

PLCSIM Advanced with Drive Controller

Benefits

- Extended functions, see PLC FW V2.9 and SINAMICS S120 FW V5.2 SP3
- PLC and SINAMICS FW can be changed over independently of one another
- DCC/DCB: Freely available control, computing and logic blocks to extend drive functionality; e.g. for changing/adjusting the controller setpoint channel at a very fast cycle rate
- EPos: Realize positioning tasks in the drive itself
- Additional licenses for extended application options
 - Compensation of periodic cogging torque
 - Active suppression of vibration in the drive system.
 - Coupling of multiple motor modules with one encoder

Memory card can be used as both a program card and firmware card;
simplifies replacement of modules, for example

Higher machine cycle rates, enhanced machine behavior for demanding
motion control applications

A realistic function test of the user program allows early fault detection and
validation of functionality

TIA Portal

Highlights of TIA Portal V17

WinCC Unified

- Improved screen engineering with new style
- Graphics and faceplates (with functional enhancements) in library
- Extended communication and 1st set of system diagnostic
- Audit for PC
- WebClient for panel

Plant Intelligence Options

WinCC – Innovations

- WinCC Advanced:
Template & Popup screens in the library
- WinCC Professional:
Raw data for S7-1500, new system tags

STEP 7 – Innovations

- CEM – Cause Effect Matrix
- CFC – Continuous Function Chart (planned for July 2021)
- Download / Upload of user groups
- Functional enhancements in the cross-reference list
- Openness extensions for project generation

Startdrive – Innovations

- Support of SINAMICS G115D
- S120: Data set switching, manual optimization
- SINAMICS DCC: Know-how-protection

Hardware configuration

- Global Offline/Online comparison
- Offline/Offline comparison at parameter level
- CPU 1518HF-4PN: Safety and redundancy
- Extended quantity structures for S7-1500 and ET200 CPUs
- Extensions for CPU 1518 MFP
- Disable and enable I-Device
- DHCP and DNS for S7-1500 and ET200 CPUs
- Web server innovations
- S7-1200 Highlights with FW4.5 (OPC UA/Webserver)
- CPU 1518T/TF-4 PN/DP: High performance motion control

System functions

- Openness-extensions for libraries and UMAC
- User Management & Access Control (UMAC)
- Library
- Security per Default
- TIA Portal Language Packs
- Last used objects

TIA Portal Options

- **STEP 7 Safety**
Fast Commissioning, nested UDTs, Openness-extensions
- **SIMATIC Safe Kinematics**
Function, advantages and requirements
- **Multuser**
- **SIMATIC Robot Library**

TIA Portal Options

- **OPC UA**
S7-1200: Diagnostics, methods; S7-1500: Alarms and Conditions, Server modelling, Client: new Compact blocks, GDS – certificate handling
- **PLCSIM/PLCSIM Advanced**
Support of S7-1500 R/H CPU, secure communication with OPC UA, OUC und HTTPS
- **SIMATIC Target for Simulink**
Code-generation for SIMATIC Edge & LiveTwin
Integrated S-functions for PLCSIM Adv coupling
- **Test Suite**
Openness Support of style guide Check and application test
- **SiVArc**
Support of WinCC Unified, new expressions, usability enhancements
- **Energy Suite**
Improved load management and flexible energy data connections (by Proxy-DBs)
- **Central User Management (UMC)**
Single Sign-on, SIMATIC Logon-protocol, licensing
- **Modular Application Creator**
- **ProDiag**
Monitoring within PLC Data Types, usability improvements
- **Teamcenter Gateway**
Single Sign-on, PKI, Linking between Teamcenter and TIA Portal objects

TIA Portal – system functions

Extended library functions – overview

The screenshot shows the 'Libraries' window in TIA Portal. The 'Project library' is expanded, showing a tree view of types. A table below the tree lists the types and their details.

Name	Status	Version	Author	Comment	Last change	Original library
Project library						
Types						
Add new type						
LAnyAxis						
LAxisCtrl						
LBC						
LBC_AnalogInput		V 1.0.0				
LBC_AnalogOutput		V 1.0.0				
LBC_AnalogScale		V 1.0.0				
LBC_Description		V 1.0.0				
LBC_DigitalSignal		V 1.0.0				
LBC_DriveControl_StdPlc		V 1.0.0				
V 1.0.0 [default]		V 1.0.0	Siemens Simat...	First Release	2/16/2021 5:24:39.201 PM	Standardization_Library_LBC
V 0.9.13		V 0.9.13	ConradM	adapted docu	2/16/2021 11:15:31.435 PM	Standardization_Library_LBC
V 0.9.12		V 0.9.12	ConradM	correct spelling mistakes	2/15/2021 10:01:58.367 PM	Standardization_Library_LBC
LBC_DriveControl_TecPlc		V 1.0.0				
LBC_MotorStarter		V 1.0.0				
LBC_StarDeltaStarter		V 1.0.0				
LBC_ThreeWayActuator		V 1.0.0				
LBC_TwoHandControl		V 1.0.0				
LBC_TwoWayActuator		V 1.0.0				
LBC_typeDiagnostics		V 1.0.0				
LBC_typeInterfaceCommands		V 1.0.0				
AnalogSignals						
DigitalSignal						
DriveControl						
LBC_typeDriveControlConfiguration		V 1.0.0				
LBC_typeDriveControlInterface		V 1.0.0				
V 1.0.0 [default]		V 1.0.0	Siemens Simat...	First Release	2/16/2021 5:24:39.478 PM	Standardization_Library_LBC
V 0.9.21		V 0.9.21	ConradM	correct spelling mistakes	2/15/2021 10:01:56.274 PM	Standardization_Library_LBC
LBC_typeDriveControlProcessValues		V 1.0.0				
V 1.0.0 [default]		V 1.0.0	Siemens Simat...	First Release	2/16/2021 5:24:39.493 PM	Standardization_Library_LBC
V 0.9.20		V 0.9.20	GeierB	Update UDTs	2/12/2021 11:53:00.288 AM	Standardization_Library_LBC

New functions

Easy development and maintenance of library types

- New filter functions for project library and global libraries
- Logic changes in the control program and comment changes do not require version adjustment of dependent types
- Change of type version behavior
 - The user can define a "default" type version for library types
 - The highest type version is thus no longer mandatory for library actions
 - The library functions (e.g. updating, ...) are executed on the "default" version
- Easy overview of the library status via status display
- Simple updating of selected types via the Global Library

Translating global libraries

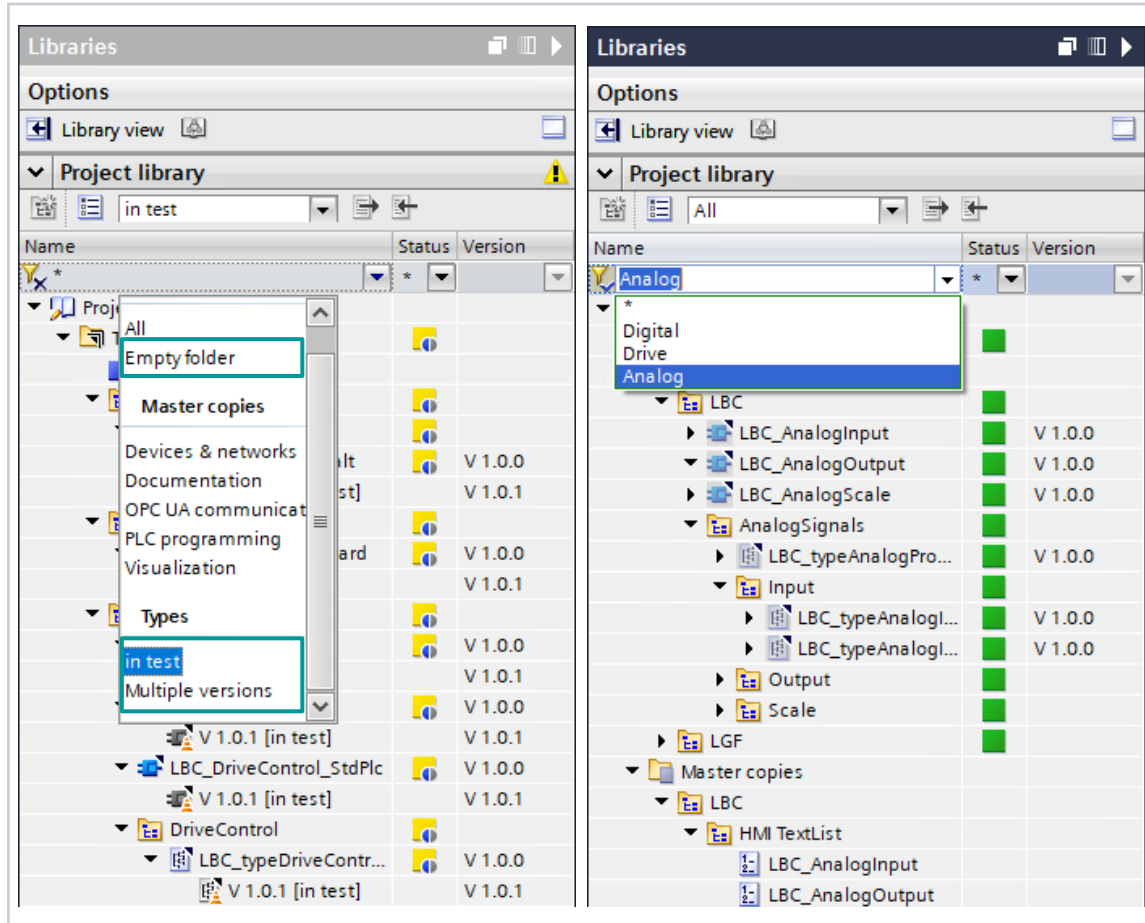
- When importing the translated types, a new version is created

Extended functions for creating copy templates

- When creating copy templates, the folder structures are retained

TIA Portal – system functions

Extended library functions – new filter functions

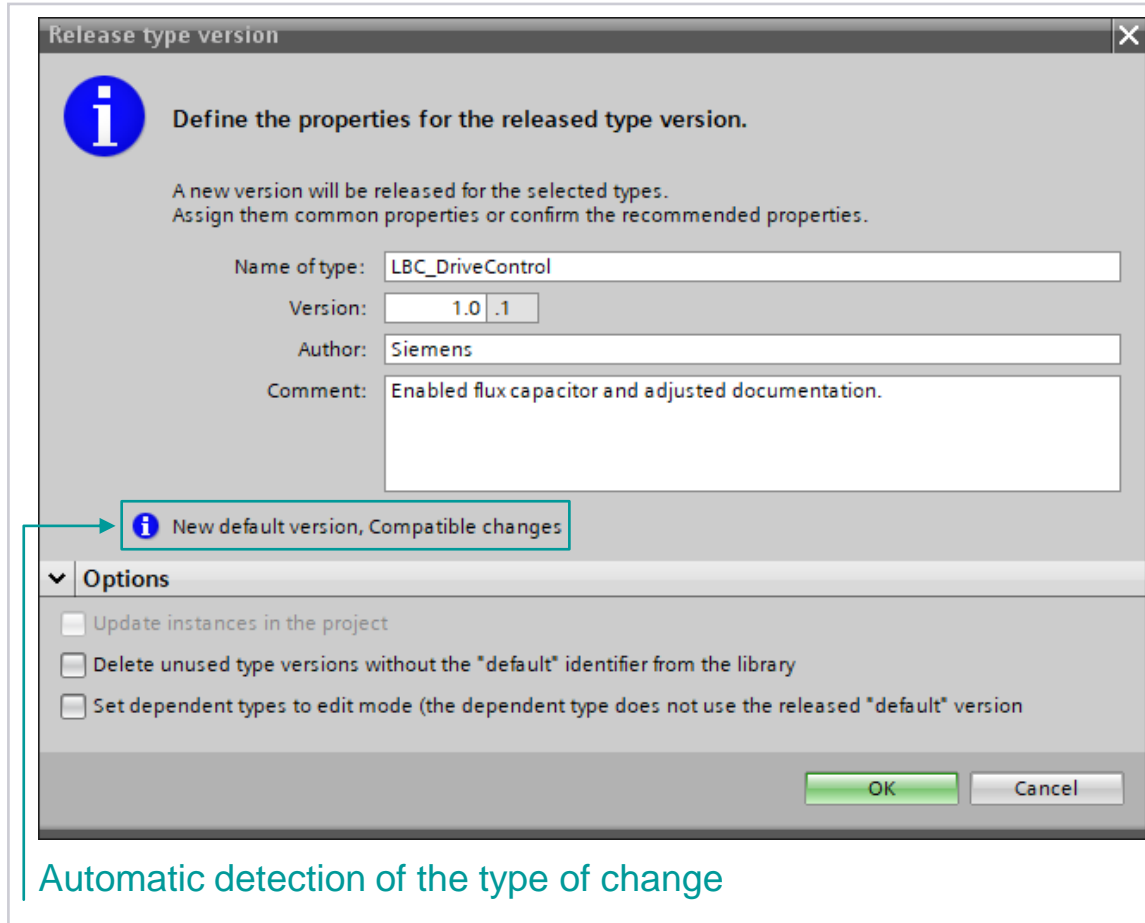


New filter functions for libraries

- New predefined library filters
 - Empty folder
 - "In test" types
 - Types with multiple versions
- Filter by text in entire library content
- All filter functions can be combined
- "Expand all" function for quick view of the filter result

TIA Portal – system functions

Extended library functions – edit types



Changes to logic and comments without changing dependent types

- The typification of elements ensures their consistency
- When editing, only the selected type is edited, dependent types are not adjusted (e.g. FB, UDT, ...)
- When releasing the changes to the type, the effect of these changes on dependent types is checked:
 - In case of a logic and comment change, only the edited type gets a new version
 - In case of a structural change the dependent types must be adapted
- The new behavior is valid for PLC objects

TIA Portal – system functions

Extended library functions – use types

Updating a minor library number into the project

The screenshot shows the TIA Portal interface. On the left, the 'Project tree' displays a project structure with 'LBC' types. A dialog box titled 'Update types in the project' is open, prompting the user to select devices to update. The 'Libraries' window on the right shows a list of types and their versions. The 'Global libraries' window at the bottom shows a list of global libraries and their versions. A red box highlights the 'LBC_DigitalSignal' type in the 'Project library' window, which is set to version V 1.0.0 [default].

Default version

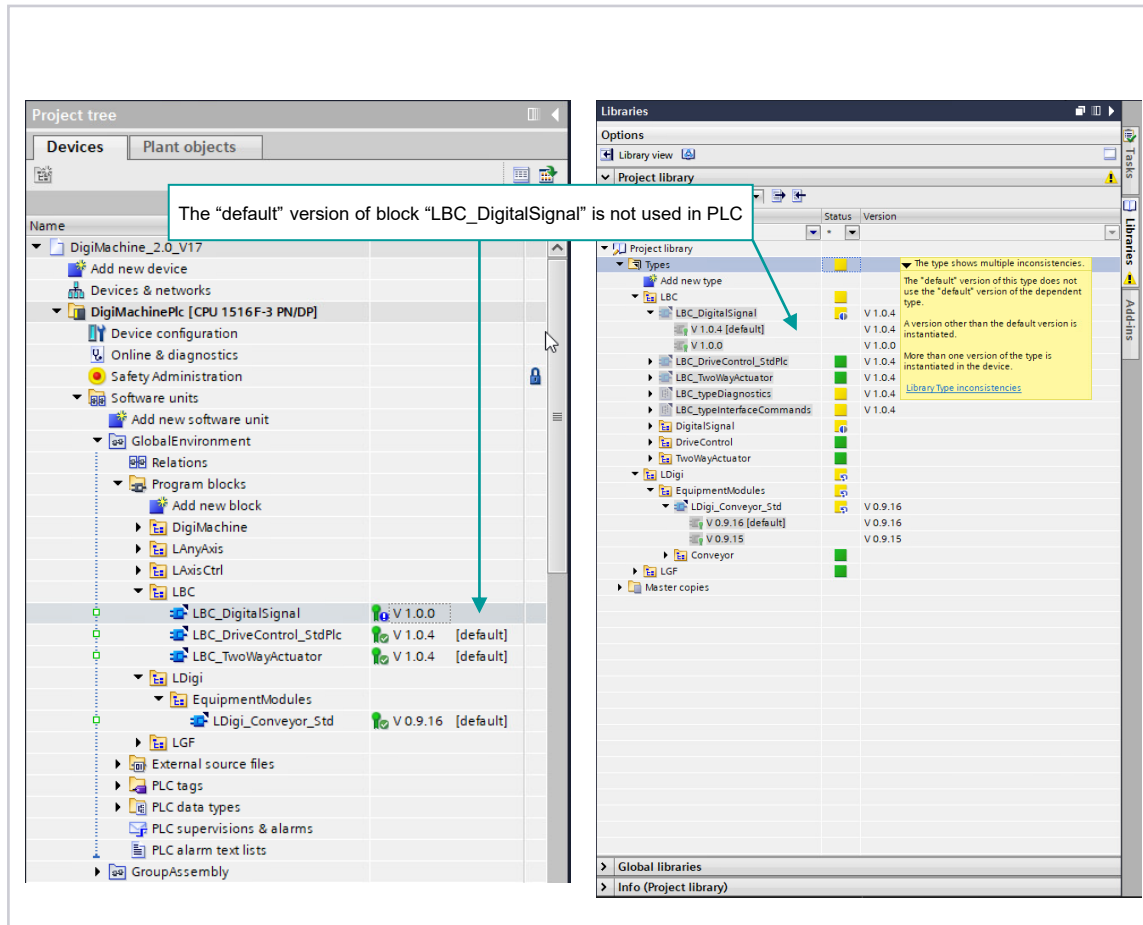
- The highest version number is no longer leading
- The user can define any version as default version
- The default version is used when executing library functions
- By setting the default version and following update also older versions can be used in the project

Library update

- With the option "Force update" the user can perform a library update independent from the version number
- Older or new versions can be deleted, so that only one version of a type is still contained in the project
- The user can define which types / versions should be updated from the Global Library
- This allows to..
 - undo changes in the project
 - set library objects in the project to a defined version
 - use older versions from a global library
 - use preconfigured global libraries for the project update

TIA Portal – system functions

Extended library functions – status of library type



Overview of library types

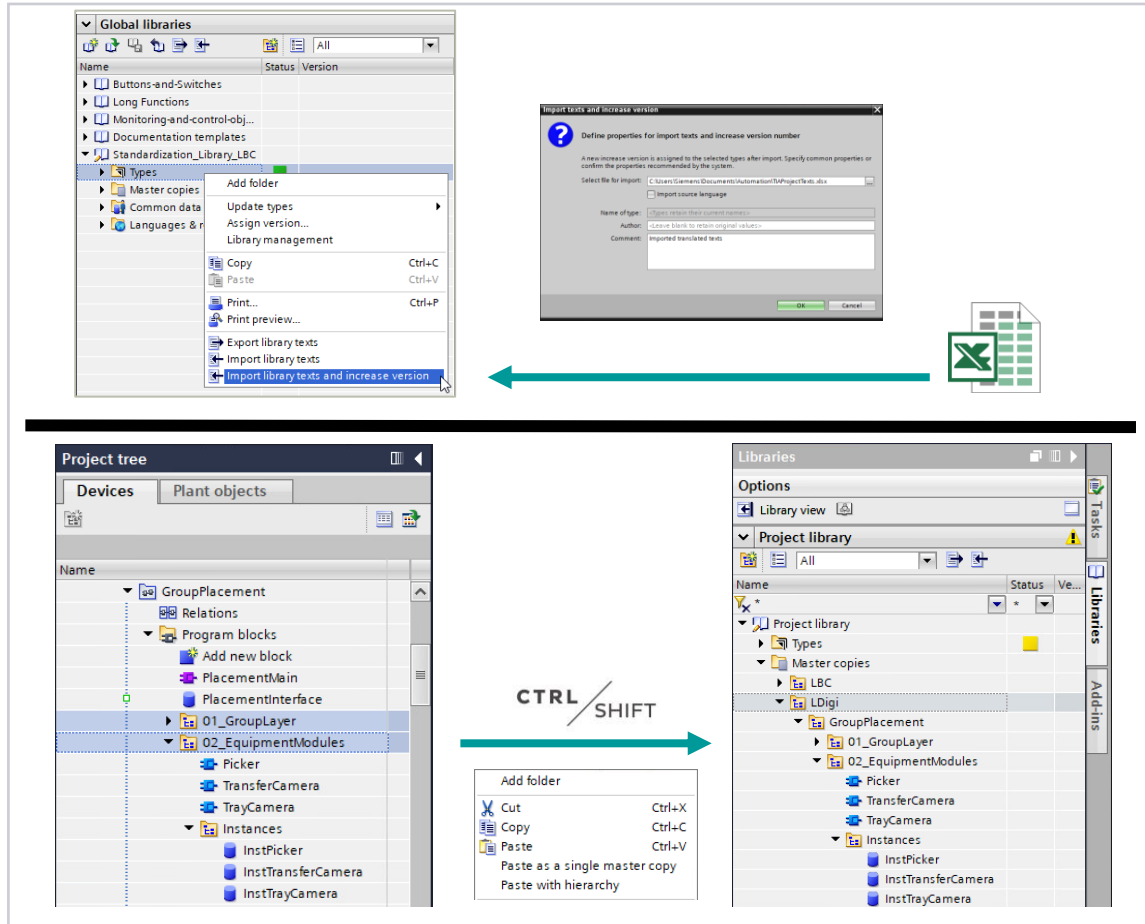
- To display the state and usage of library types within a project, each library type has a status icon.
- This allows the user a quick overview of types ...
 - which do not use the default version of another type
 - for which the same version numbers are available
 - of which another version than the default version is instantiated
 - of which several versions are instantiated in one device
- The status icon of a library type is propagated through the folder levels
- The status information to be displayed can be configured in the settings of the TIA Portal

Show inconsistencies in libraries

- Show symbol when a default version does not use the default version of the dependent type
- Show symbol when duplicates of a type version exist
- Show symbol when multiple versions of a type are instantiated in the same device
- Show symbol when a non-default version is instantiated

TIA Portal – Systemfunktionen

Extended library functions - Translating libraries and creating copy templates



Translating libraries

- When importing library texts into the Global Library, the version number of types with modified texts can be increased
- An option for this is available in the import dialog
- Thus, the translated texts can be transferred to the project by using library update

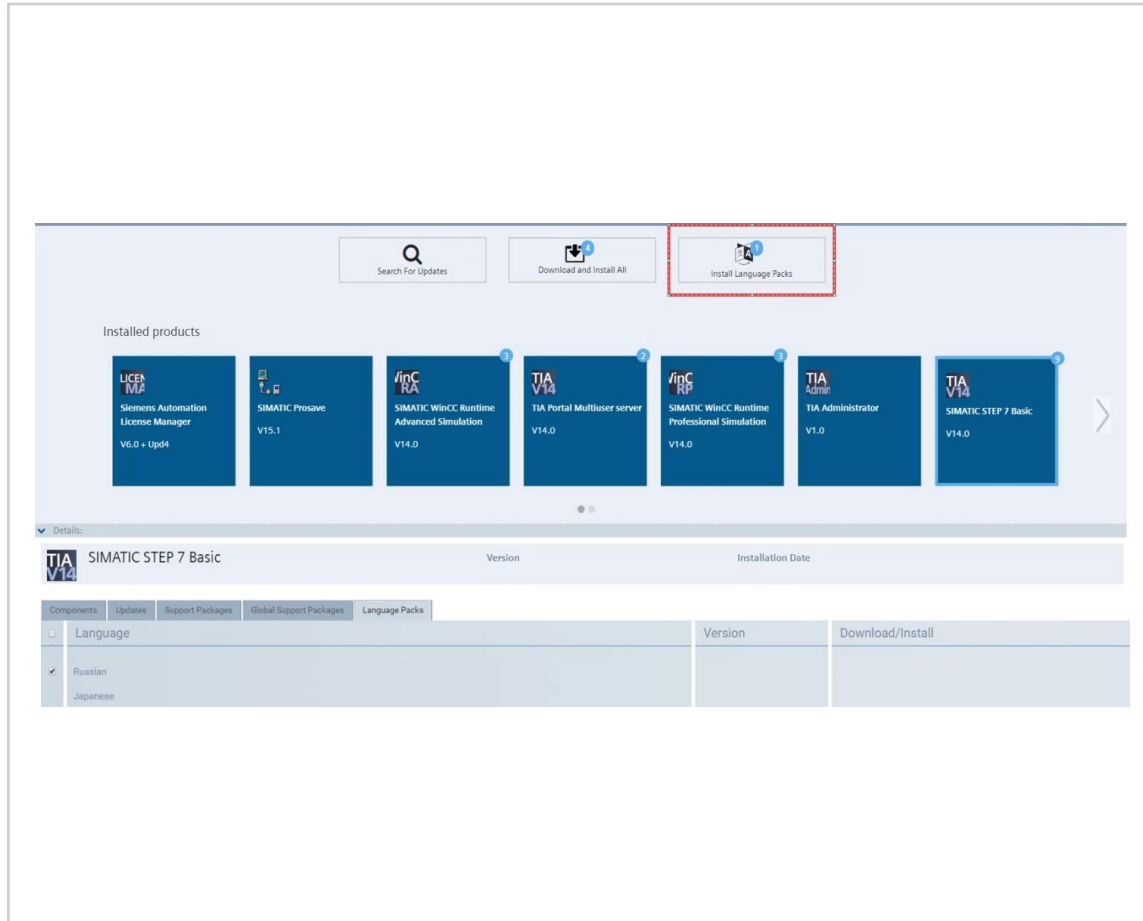
Creating copy templates

- Copy templates can be stored in the library with the folder structure
- The context menu entry " Paste with hierarchy" or the mouse action with the key combination "CTRL+SHIFT" during the creation process is available for this purpose.
- This enables complex copy templates to be distributed via a global library.

System functions

TIA Portal language packs

Language
Packs



In TIA Portal from Version 17, the following user interface languages are available via the TIA Administrator:

- French
- Italian
- Spanish

- Japanese¹
- Korean¹
- Russian¹

The languages

German – English – Chinese

are made available immediately during installation of the TIA Portal.

¹ online help in English

System functions

Supported ES – user interface languages

Language Packs



SIMATIC TIA Portal	6	3	STEP 7 Safety Basic/Advanced	2	SIMOTION SCOUT TIA	6	PCS neo	+ Russian + Japanese	6
TIA Administrator	6	3	TIA Portal Test Suite Advanced and Chinese	2	SIMOCODE ES	6	CFC		6
License Manager and Japanese	6		PLCSim	6	3	SINUMERIK STEP 7 Toolbox	6	SICAM	2
			SIMATIC Energy Suite	6		SINUMERIK Integrate MyHMI	6	SystemOne ABT	2
			SiVArc	6		SIRIUS ES Plus Platform	6	DIGSI 5 and Russian	6
			SINAMICS DCC	6		SIRIUS Soft Starter	6		
			SINAMICS Startdrive G120 + S120	6		SIRIUS Safety ES	2		

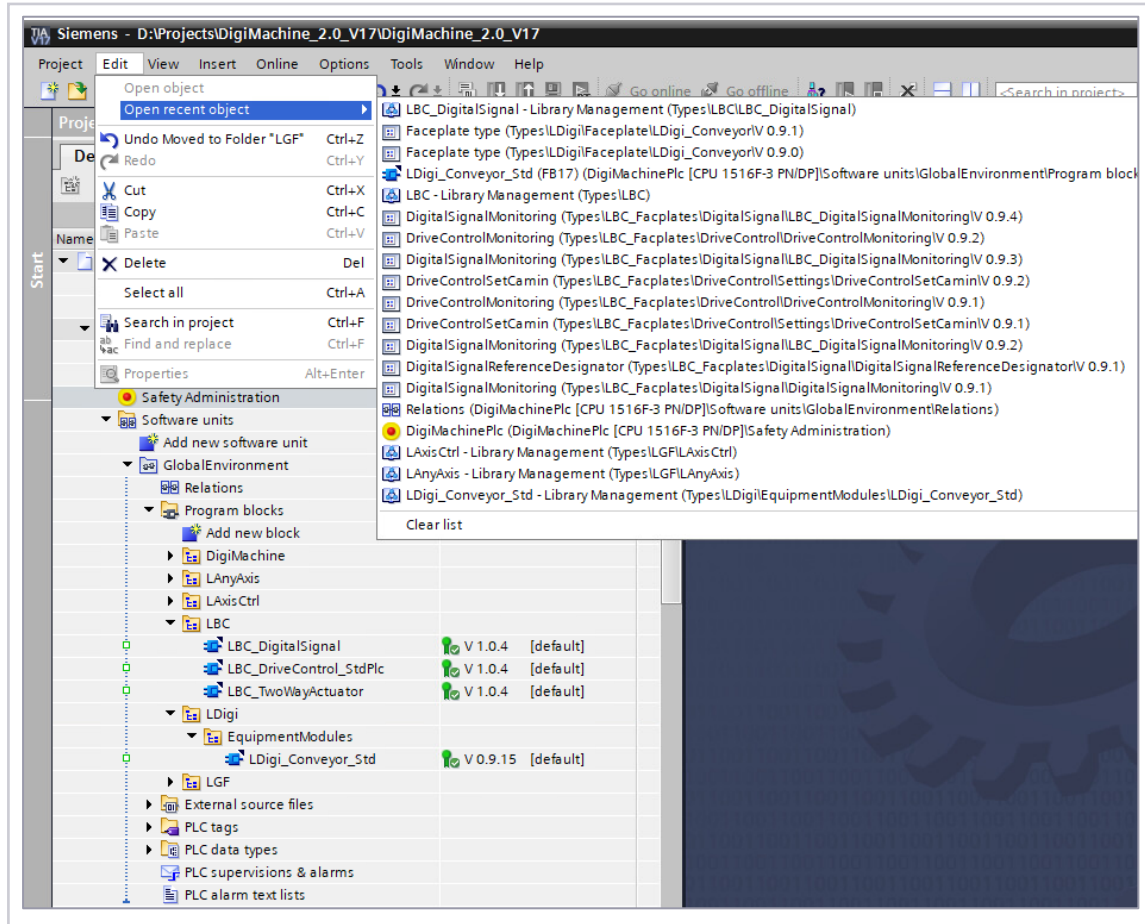
6 Chinese-English-French-German-Italian-Spanish

3 Japanese-Korean-Russian

2 English-German

TIA Portal – System functions

Recently used objects



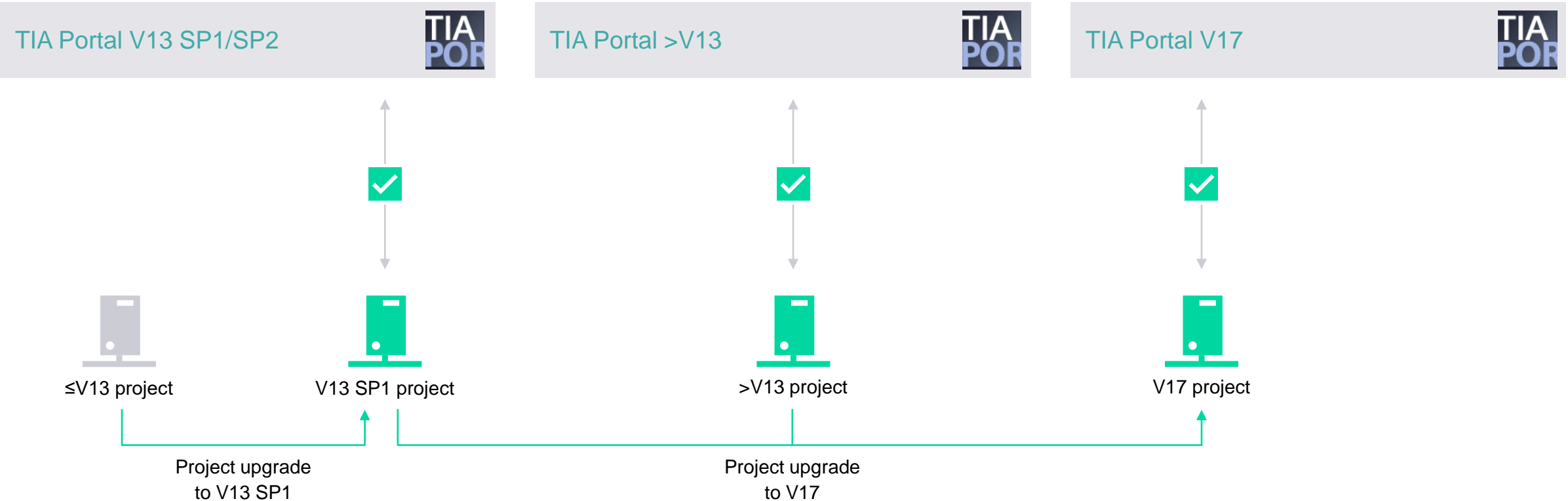
New functions

Open recently used objects

- The menu command "Edit > Open recent object" shows the 20 last used objects in the order of their last use in TIA Portal
- The view of the list is related to the currently active scope, e.g. to a navigation view or the editor used
- The lists are available for the following areas:
 - Projects and Project Libraries
 - Global Libraries
 - Multiuser local sessions and server view
 - Reference projects
- The menu command "Clear list" removes all entries from the list
- The list of recently used objects is linked to the Windows user profile. Thus, the list is retained even after the TIA Portal has been closed

System functions

Upgrading projects




Side-by-side installation of V13 SP1/SP2 up to V17 allows access to all project versions.
The V17 license can be used for all available versions from V11.

Spare Parts Compatibility

S7-1200 – FW 4.5 with older TIA Portal versions

TIA Portal V12 to TIA Portal V16



V12/V13/V13 SP1
project with
FW 1.0 to FW3.0



Firmware V4.5

V14/V14 SP1
project with
FW 4.0/4.1



Firmware V4.5

V15/V15.1
project with
FW 4.2/FW 4.3




Firmware V4.5

V16
project
with FW 4.4

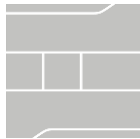


Firmware V4.5

TIA Portal V17




V17 project
with FW 4.5



Firmware V4.5

Latest firmware version release: [Online support: ID 109771672](#)



New functions can be used with TIA Portal V17 and firmware V4.5

System functions

Spare parts compatibility S7-1500 and ET 200 CPUs – FW 2.9 with older TIA Portal versions

TIA Portal V12 to TIA Portal V16



V12/V13/V13 SP1 project with FW 1.0 to FW/1.8



Firmware V2.9

V14/V14 SP1 project with FW 2.0/2.1



Firmware V2.9

V15/V15.1 project with FW 2.5/FW 2.6



Firmware V2.9

V16 project with FW 2.8



Firmware V2.9

TIA Portal V17



V17 project with FW 2.9



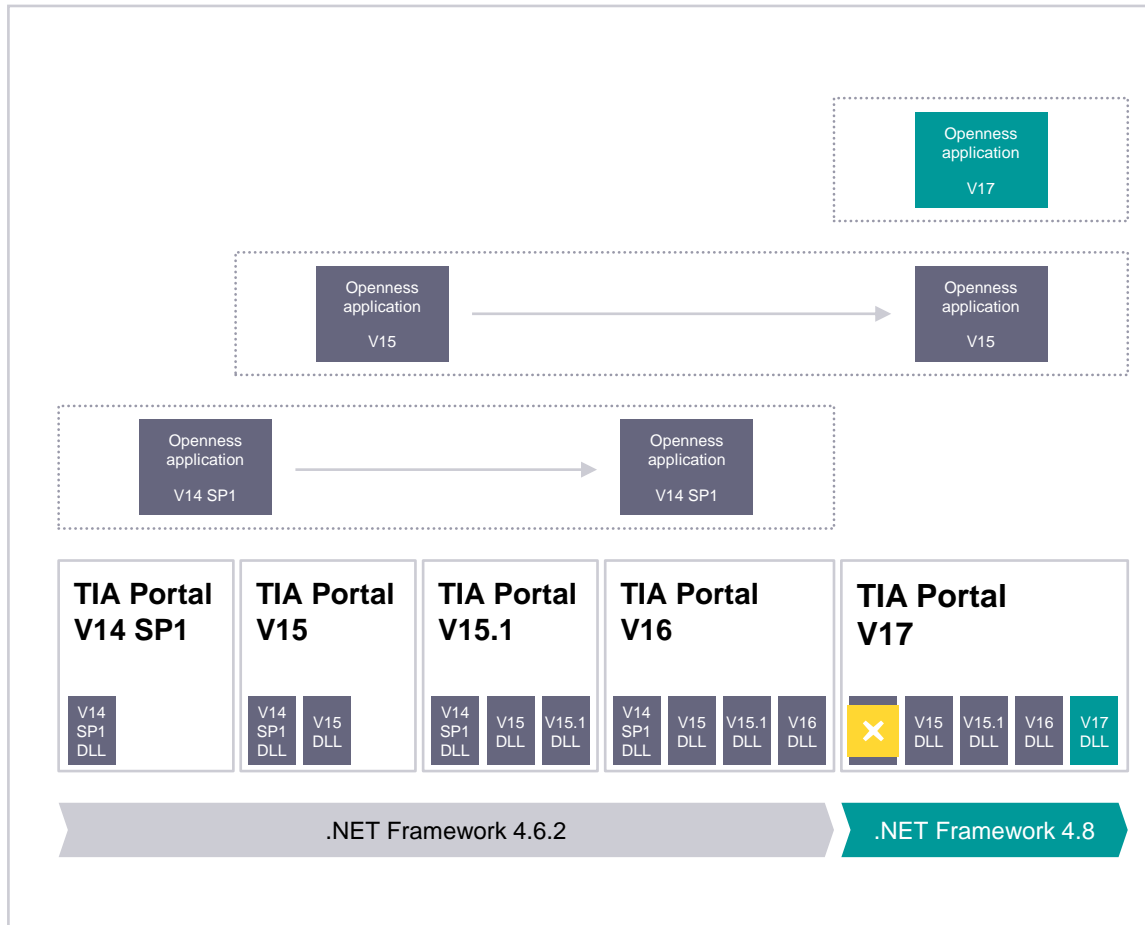
Firmware V2.9

Full spare part functionality: Online support: ID 109744163

New functions can be used with TIA Portal V17 and firmware V2.9

System functions

TIA Portal Openness – compatibility



Compatibility with predecessor versions

- The Openness DLLs from V15, V15.1 and V16 are supplied with TIA Portal V17 in addition to the new V17 DLL
- This allows use in the new TIA Portal environment of Openness applications created on the basis of an older version of TIA Portal
- The new Openness functions are only available in the most recent DLL
- Openness applications based on V14 SP1 are no longer supported with V17

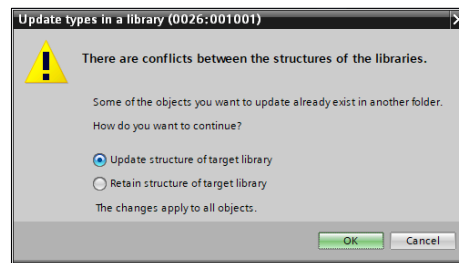
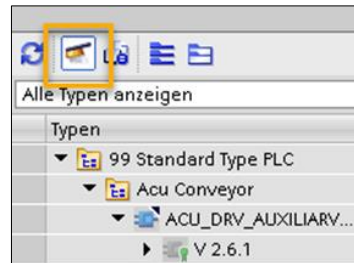
.NET Framework 4.8

- With TIA Portal V17, the .Net Framework is upgraded to 4.8
- Existing, compiled Openness applications based on .NET Framework 4.6.x still run with .NET Framework 4.8

System functions

TIA Portal Openness – library

TIA Portal Openness



Automated library workflows

The following library functions can now be controlled using an Openness application:

- Apply the structure when updating the library
- Clean up library
- Harmonize project

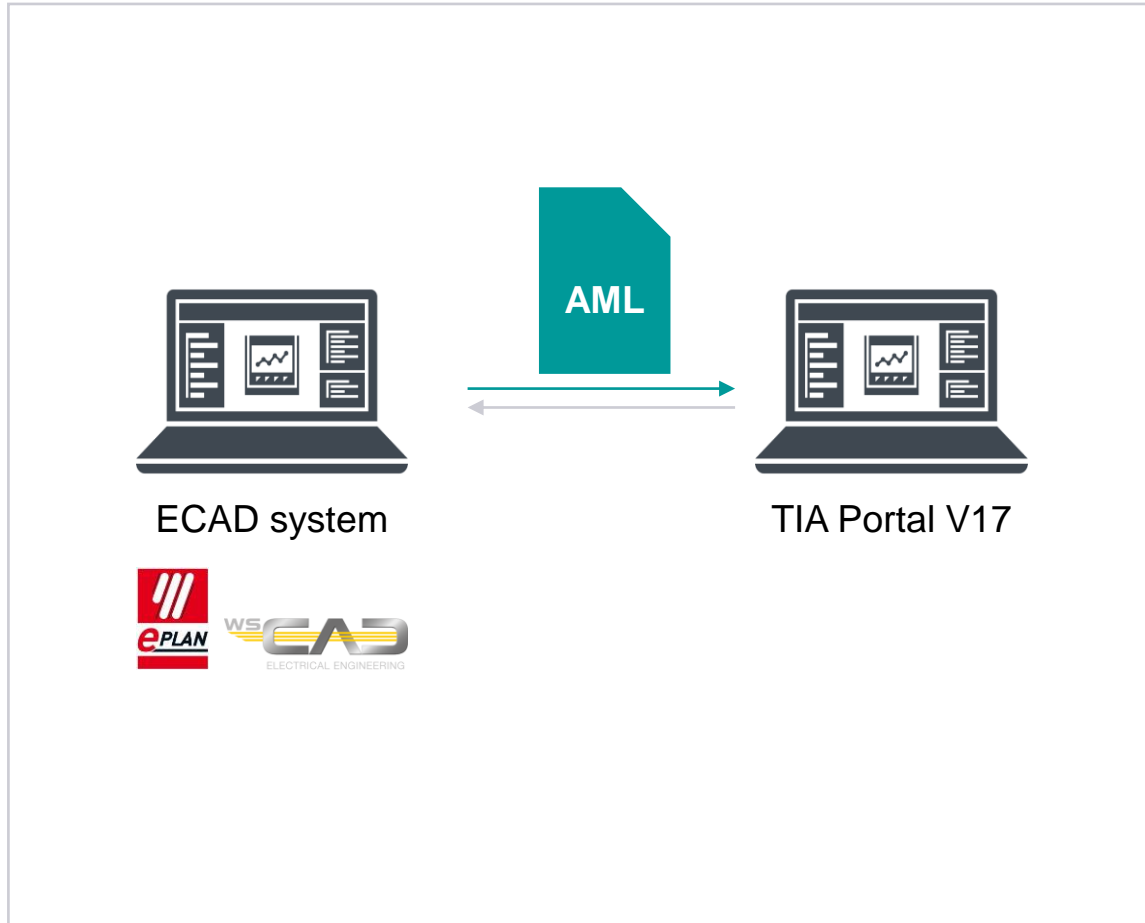
Benefits

The complete range of workflows for library and project updates can be performed using an Openness application with the new library Openness function.

This enables the efficient, automated rollout of an updated library to TIA Portal projects.

System functions

CAX export/import



Extension of the CAX export and import

- Supports AML specification AR APC v1.2
- Supports Safety Base Units for ET 200SP modules
- Exchange of manufacturer-specific hardware parameters for GSD/GSDML-based device
- Option to export normalized article numbers
- Tolerant import of article numbers

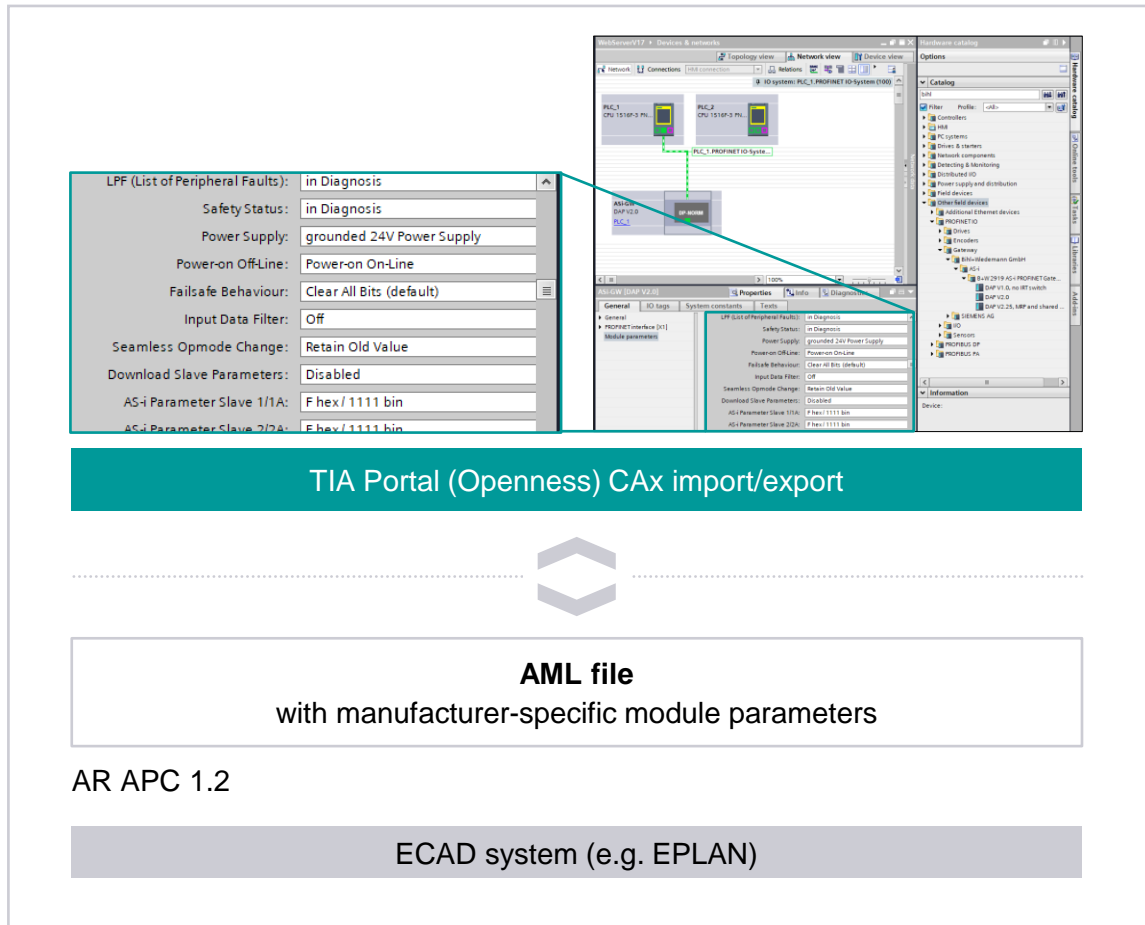
Benefits

Increased flexibility for preventing incompatibilities during data exchange between ECAD system and the TIA Portal.

Thanks to the extensions, relevant data remains within the tool chain and increases efficiency on account of there being less manual reconfiguration.

System functions

TIA Portal Openness – workflow support1/CAX



Manufacturer-specific hardware parameters for GSD/GSDML-based devices can be exchanged with the TIA Portal via AML.

Enables the coupling of ECAD systems with AML data exchange to the TIA Portal and therefore more efficient, digital data exchange when creating the configuration for automation hardware. Component-specific detailed parameters can be transported within the AML file with corresponding data sets to enable configuration-capability in the ECAD system itself of hardware from any manufacturer.

Benefits

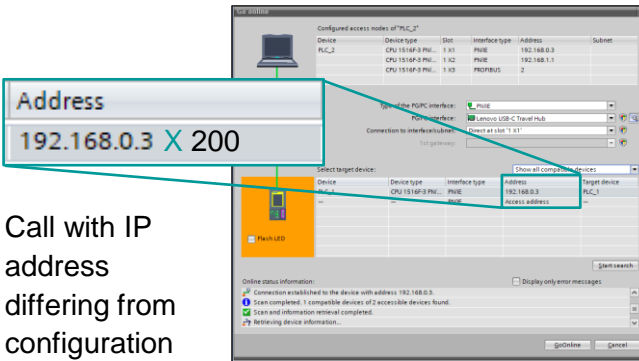
- Dramatic reduction in transfer errors between ECAD and TIA Portal
- Additional options for the automatic generation of the hardware configuration from an ECAD system
- Enables stricter separation of the software developers' and hardware designers' specialist domains

1 E.g. for standard machine building with SINUMERIK ONE

System functions

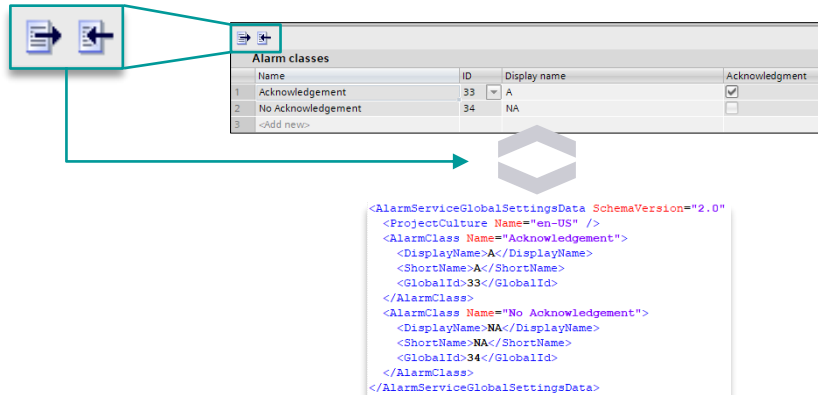
TIA Portal Openness – workflow support¹

Openness_Download
(parameter: 192.168.0.200)



Downloading projects in S7 controllers whose IP addresses need not be known beforehand to the TIA Portal hardware configuration.

Allows the flexible, mass rollout of projects in both real and simulated hardware (e.g. for creating machine clones or controlling test environments (also simulated in the same network), etc.).



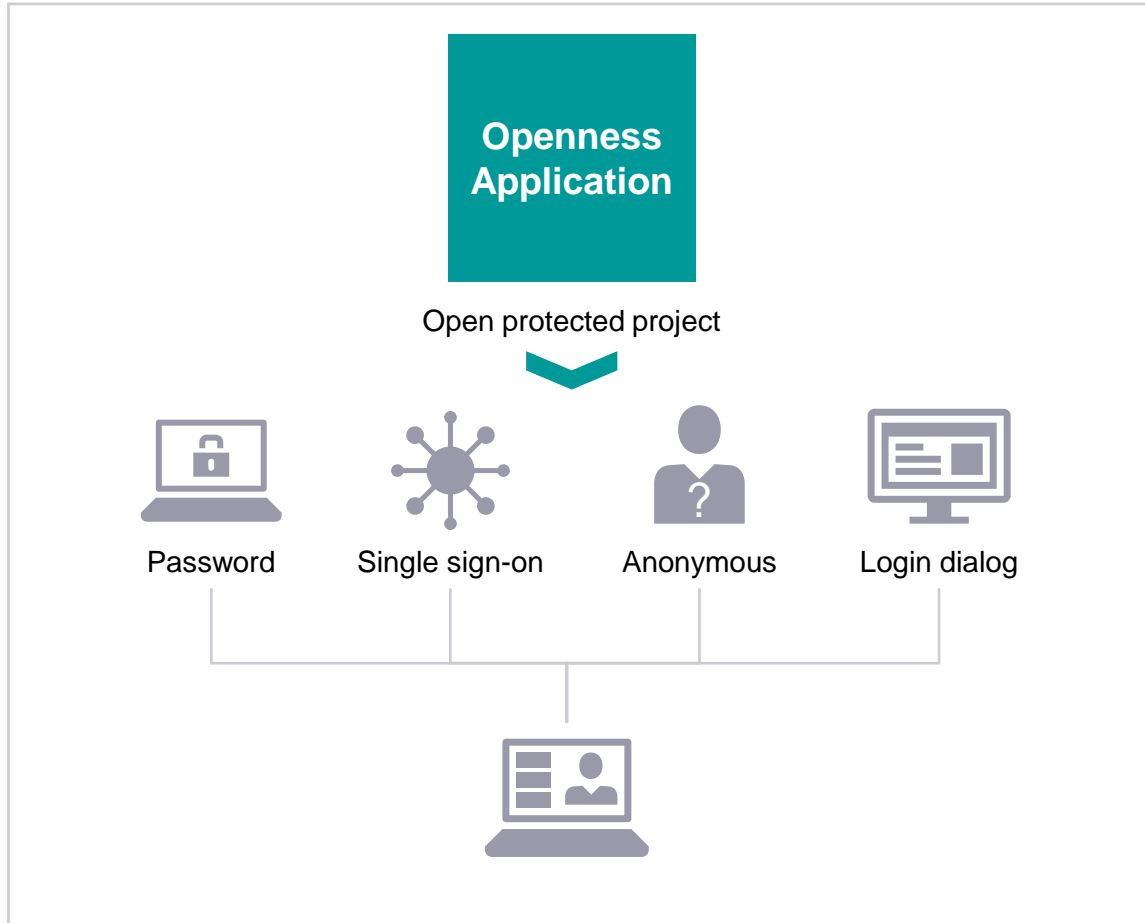
Import/export of alarm classes/ProDiag supervisions/configuration of system diagnostics

Enables automated creation of alarm/diagnostic configurations as well as ProDiag supervisions in a new TIA Portal project based on external data sources. Export as text file also enables external archiving (e.g. version management)

¹ E.g. for standard machine building with SINUMERIK ONE

System functions

TIA Portal Openness – UMAC



Project.Open method extension

For opening a protected project, the Project.Open method has the following new options in addition to the previous transfer of user name and password:

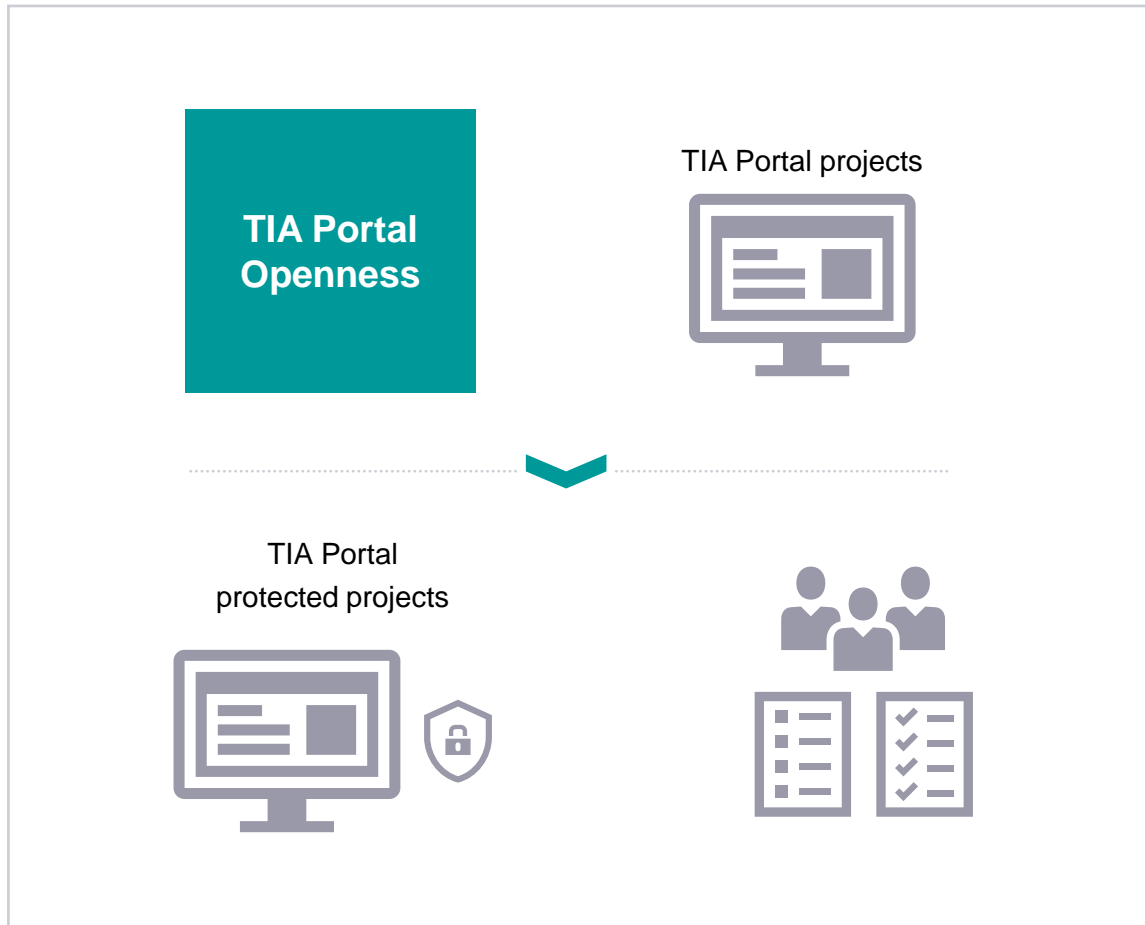
- Authentication by means of single sign-on
- Login as anonymous user
- Login by means of TIA Portal login dialog

Benefits

User name and password therefore need not be queried/transferred via the Openness application.

System functions

TIA Portal Openness – UMAC



Configuration of a protected project

The following functions are provided for configuration of a protected project via the Openness API:

- Activate project protection
- Create and delete project-local users
- Import and remove global users and user groups from UMC
- Create and delete user-defined roles and assign engineering and runtime function rights
- Assign roles to users and user groups
- Activate/deactivate users and user groups

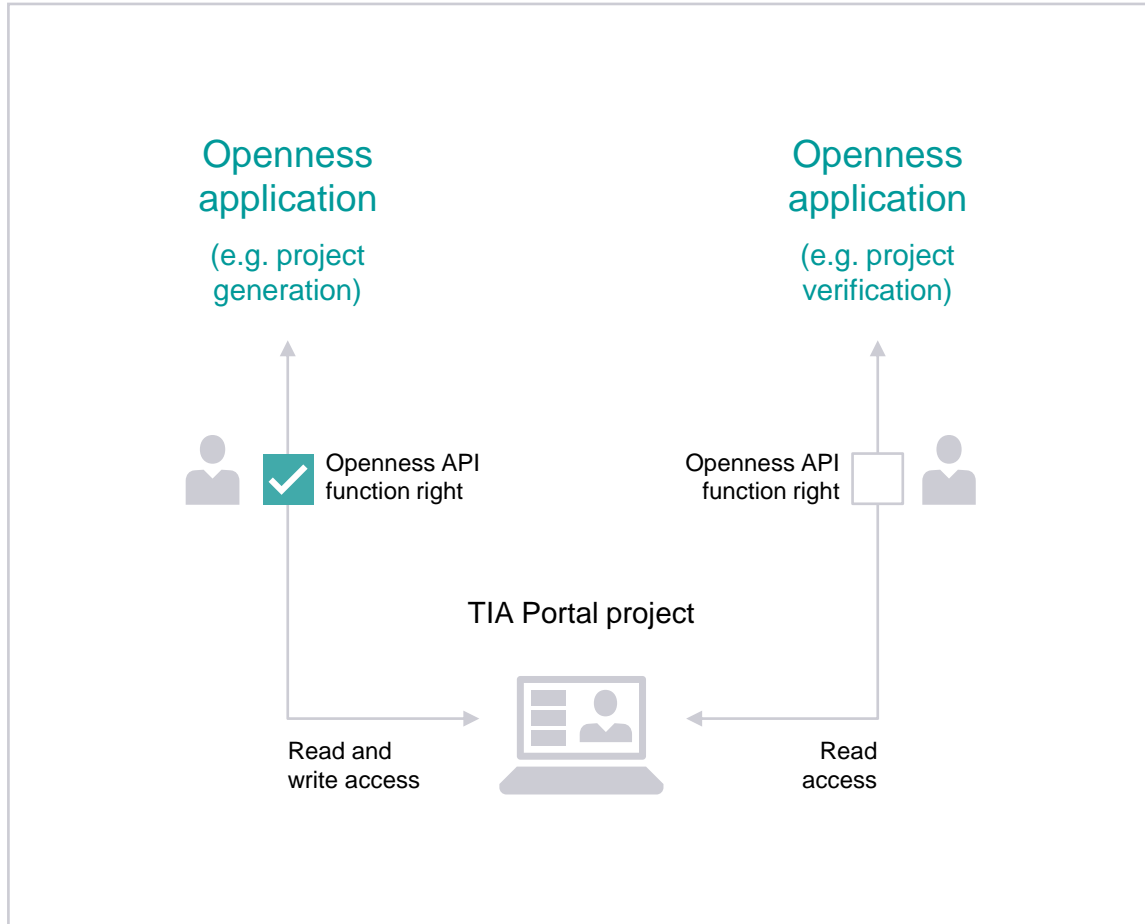
Benefits

These extensions enable the automated generation and verification of users in the project as well as the corresponding configuration with user roles and function rights.

They can also be used to automate the efficient migration of unprotected projects to protected projects.

System functions

TIA Portal Openness – UMAC



Openness API engineering function right

- The Openness engineering function right is intended for changes to a protected project via the Openness API
- This function right also protects user interface functions such as CAx import, VCI and Add-Ins because they are based on Openness API

Benefits

The engineering function rights primarily protect actions and workflows on the TIA Portal user interface.

The Openness engineering function right can therefore generally prevent modification of a protected project via the Openness API.

All read Openness functions are possible without the Openness engineering function right.

System functions

TIA Portal User Management & Access Control (UMAC)

Configuration of user-roles

Restricts actions and changes in editors

Engineering rights	
Name	Group
<input checked="" type="checkbox"/> Open the project read-only	General
<input checked="" type="checkbox"/> Open and edit the project	General
<input checked="" type="checkbox"/> Monitor PLC program	PLC
<input checked="" type="checkbox"/> Modify PLC program online	PLC
<input checked="" type="checkbox"/> Download PLC	PLC
<input checked="" type="checkbox"/> Edit PLC program	PLC
<input type="checkbox"/> Modify safety PLC program	PLC
<input type="checkbox"/> Edit security device configuration	Security
<input type="checkbox"/> View security device configuration	Security
<input checked="" type="checkbox"/> Edit hardware configuration	General
<input checked="" type="checkbox"/> Modify	HMI
<input checked="" type="checkbox"/> Maintenance	HMI
<input checked="" type="checkbox"/> Download	HMI
<input type="checkbox"/> Manage users and roles	General
<input type="checkbox"/> Upgrade project	General
<input checked="" type="checkbox"/> Edit project via Openness API	General
<input checked="" type="checkbox"/> Import project texts	General
<input checked="" type="checkbox"/> Download to other devices	General
<input checked="" type="checkbox"/> Change library type versions	General

New engineering function rights

The following user actions can be restricted by the new function rights:

- **General function rights:** Edit library types, edit hardware configuration, edit project via Openness API, import project texts, upgrade project
- **PLC:** Download, edit program, edit safety, monitor, modify online
- **HMI:** Download, configure, perform device maintenance
- **Drives:** Download, edit drive configuration

Benefits

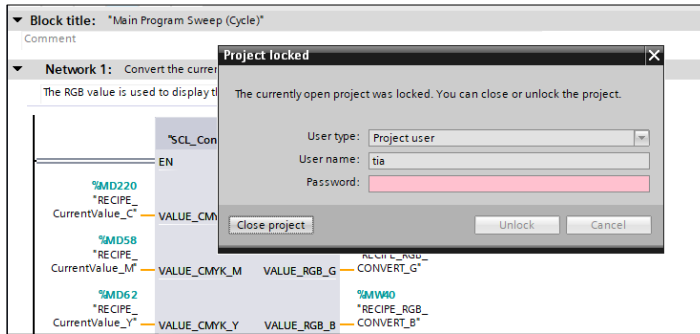
The previous access protection for the TIA Portal project differentiated between read and write access.

With the new function rights, user roles can now be adjusted even more specifically to responsibilities.

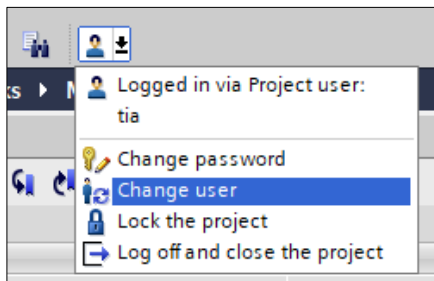
In engineering, this protects numerous actions and workflows against unauthorized users.

System functions

TIA Portal User Management & Access Control (UMAC)



You leave the station – project gets locked!



You need elevated rights – change the user!

Locking a project

- An open project can be protected against editing by locking it
- Locking a project can be activated manually or automatically after a configurable period of inactivity

Benefits

When an operator temporarily leaves the engineering station, locking the project prevents editing without having to close it.

Changing the user

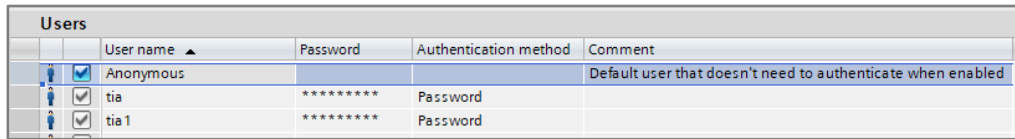
- Menu entry for changing the user in an open project

Benefits

The "Change user" function allows work on the project to continue in the same place in the project after a change of user.

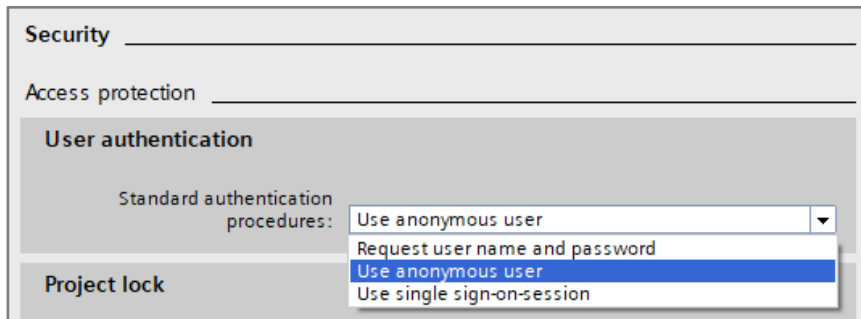
System functions

TIA Portal User Management & Access Control (UMAC)



	User name ▲	Password	Authentication method	Comment
<input checked="" type="checkbox"/>	Anonymous			Default user that doesn't need to authenticate when enabled
<input checked="" type="checkbox"/>	tia	*****	Password	
<input checked="" type="checkbox"/>	tia 1	*****	Password	

You want to open a protected project without authentication – activate the Anonymous user!



You want to open a protected project without login dialog – preselect authentication method!

Anonymous user

- This specific type of user requires no authentication
- It can be explicitly activated/deactivated
- Roles/function rights can be assigned

Benefits

A protected project can be opened with the assigned rights by activating the anonymous user without entering a password.

Standard login procedure

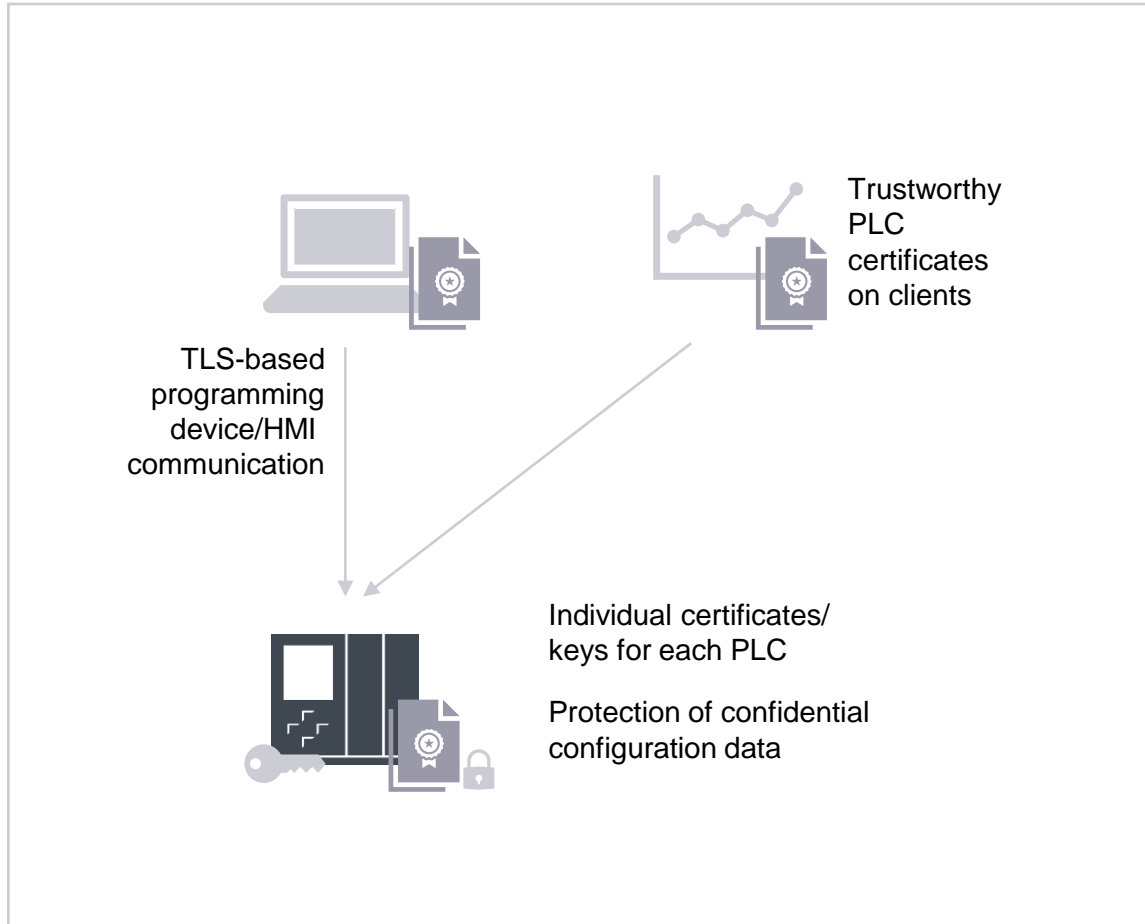
- The login procedure to be used when opening a protected project can be selected in the TIA Portal settings
- You can choose from: Login via the TIA Portal login dialog for user name and password, login as anonymous user and login using the single sign-on session

Benefits

Using the login procedure for anonymous users or single sign-on, a protected project can be opened without explicit user authentication.

System functions

Enhanced security for SIMATIC programming device/HMI communication



Security improvements for programming device/HMI communication between TIA Portal / HMIs and S7-1200/1500 CPUs

- Communication security based on Internet-standard TLS¹
- PLCs use certificates to identify or authenticate themselves to engineering or HMI systems
- Certificates are generated automatically via TIA Portal or can be imported from external sources
- A compatibility mode can be activated for the previous and the new TLS-based communication at the same time
- Protection of sensitive configuration data in TIA Portal and the CPU is possible by means of a user-defined password (optional)

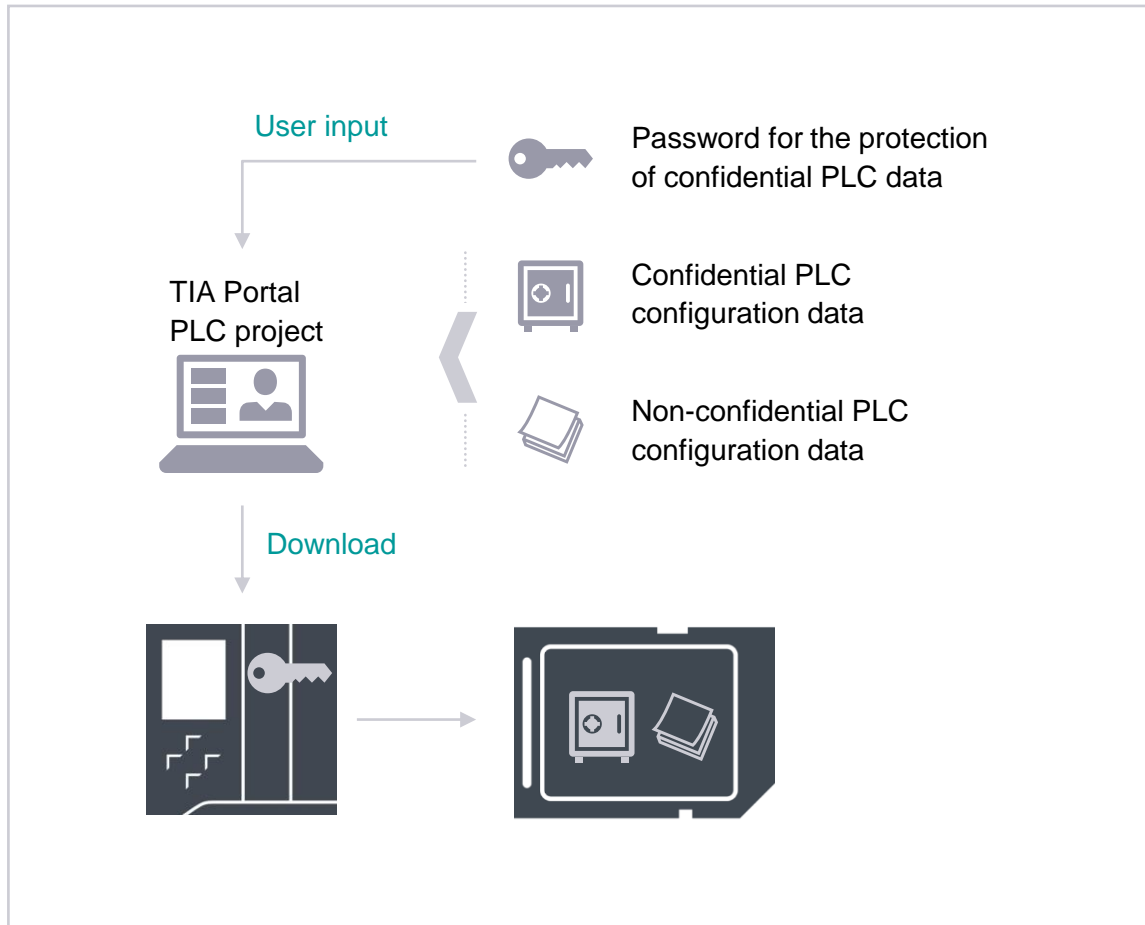
Benefits

- Enables unique identification of every PLC based on individual certificates
- Provides additional confidentiality protection by means of encrypted communication
- Protection of configuration data by means of individual passwords

¹ TLS – Transport Layer Security

System functions

New mechanism to protect confidential PLC configuration data



User-defined protection of configuration data

- Confidential PLC configuration data must be protected against unauthorized access in accordance with the deployment environment
- In this context, confidential configuration data specifically refers to private keys of certificates for programming device/HMI communication, web servers, OPC UA, etc. – but this has nothing to do with know-how protection
- The data is protected based on a user defined password
- The configuration of the protection is optional but it impacts handling when replacing devices as the password must also be configured for the replacement CPU:
 - Setup via initial download
 - Online configuration via TIA Portal
 - Configuration via separate SIMATIC memory card

Benefits

Protection of configuration data by means of individual passwords

System functions

Security Wizard for new PLC Security Mechanisms



Security Wizard

- The new Security Mechanisms are activated by default (Security-by-Default) in new PLC Firmware versions.
- When inserting a new CPU (S7-1500 FW v2.9, S7-1200 FW v4.5) a new Security Wizard appears automatically to configure the security mechanisms.
- Following configuration is done via the Security Wizard:
 - Protection of confidential PLC configuration data
 - Mode for secure PG/PC and HMI Communication
 - PLC Access Protection
- The Security Wizard can also be called again later from the Hardware Configuration.

Benefits

- Quick and easy configuration of the new PLC Security mechanisms in a single process step
- Supporting information to select suitable settings for own use case

TIA Portal

Highlights of TIA Portal V17

WinCC Unified

- Improved screen engineering with new style
- Graphics and faceplates (with functional enhancements) in library
- Extended communication and 1st set of system diagnostic
- Audit for PC
- WebClient for panel

Plant Intelligence Options

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- CFC – Continuous Function Chart (planned for July 2021)
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- S120: Data set switching, manual optimization
- SINAMICS DCC: Know-how-protection

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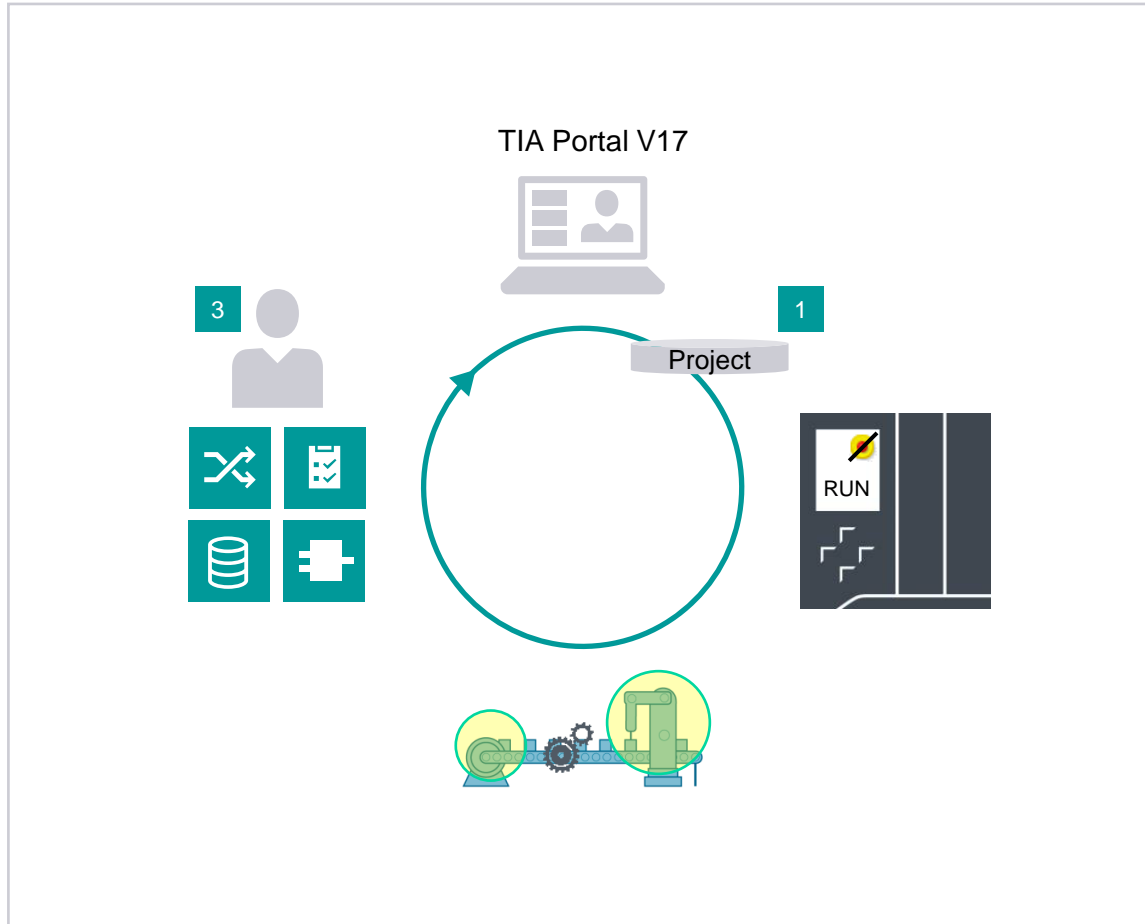
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SIMATIC STEP 7 Safety V17

Fast Commissioning



Fast Commissioning workflow

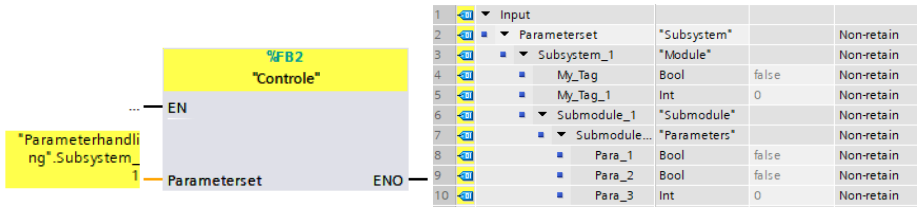
1. Download prepared project to controller.
2. Deactivate Safety mode and activate Fast Commissioning mode
3. Perform adjustments in safety program during operation
4. Finalize project by full compile
5. Final download of the safety program
6. Activation of Safety mode and re-initialization by STOP – START transition of CPU

Benefits

- Increased efficiency when commissioning the safety program
- Shorter compile times during commissioning
- Adjustments of safety program during deactivated safety mode
- More control due to time limitation of deactivated Safety mode

SIMATIC STEP 7 Safety V17

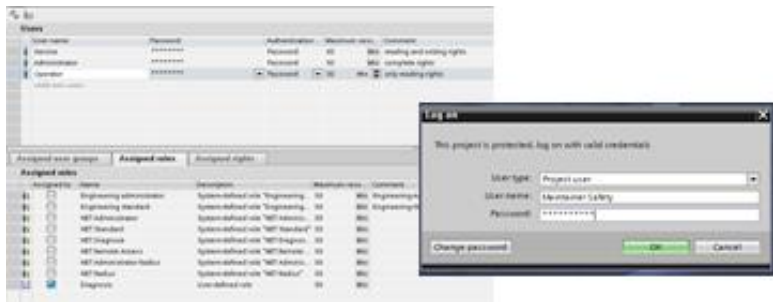
1.



2.

Description	Used and compiled	Function in safety program	Offline signature
Program blocks			
FOB_RTG1 [OB123]	Yes	F-OB	0xA7482493
Main_Safety_RTG1 [FB1]	Yes	F-FB	0xF308B915
FFB_used_DB [DB3]	Yes	I-DB for F-FB	0x27E959F6
Main_Safety_RTG1_DB [DB1]	Yes	I-DB for F-FB	0x27E959F6
tmp			Not available.
unused			0x7B3E1951
FFC_unused [FC1]	Yes	F-FC	0xD379BA50
FDB_unused [DB2]	Yes	F-DB	0x27E959F6
used			0x9896C7CD
FFC_unused_5 [FC7]	No	F-FC	Not available.

3.



1. Nested F-compliant PLC data types

Optimum structuring of data in the safety program can now be achieved by creating F-compliant data types up to a nesting depth of 8. All data types allowed in the safety program can be used as F-PLC data.

2. Group signature

Changes in structure of safety program can be localized more quickly. Acceptance procedures can do more efficiently by comparing the group signature of the changed and the already accepted safety program.

3. UMAC

It's possible to realize access protection for the F-program based on user-specific/role-specific UMAC rights.

Acknowledgment of failsafe warn cycle time

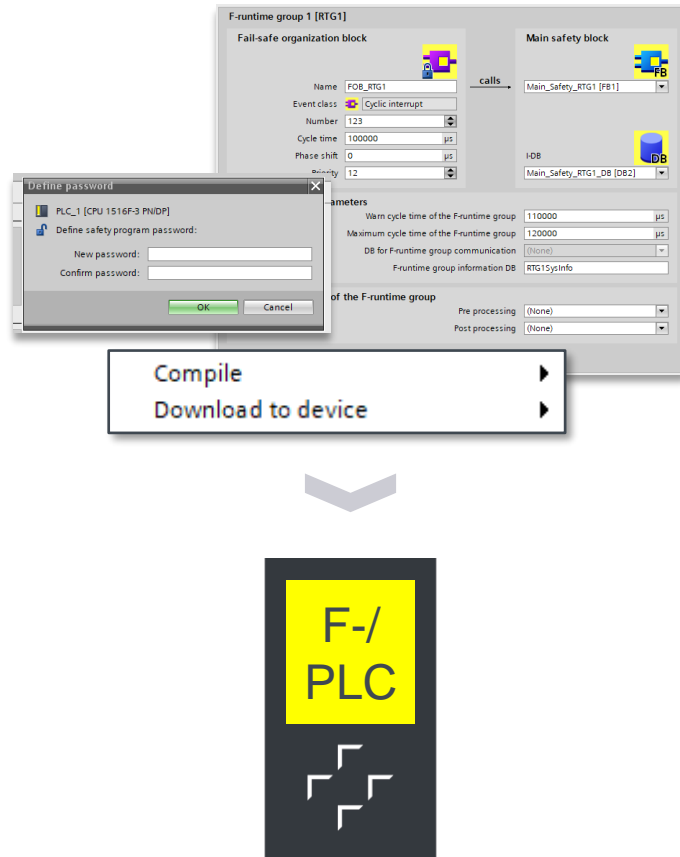
With block ACK_FCT_WARN it's possible to acknowledge the message for exceeding failsafe warn cycle time.

Think green – paperless safety printout

The requirement concerning handling the safety printout has been modified in the manual and now allows paperless storage and archiving – which means a paper printout is no longer necessary.

STEP 7 Safety TIA Portal Openness

TIA Portal
Openness



Extensions for automated safety workflows

- Write access for most attributes of the Safety Administration Editor (SAE)
- Configuration of the safety engineering password (setting, resetting, locking, unlocking)
- Compilation of the safety hardware and safety software
- Documentation can be generated (safety printout)
- Loading of changes in the standard software or standard hardware configuration onto an F-PLC if the safety program/safety hardware configuration is unchanged

Benefits

Thanks to the extended support for safety via Openness API, automated workflows from configuration and validation through to the automated test or direct update can also be performed when using an F-PLC.¹

¹ If the F-program is unchanged

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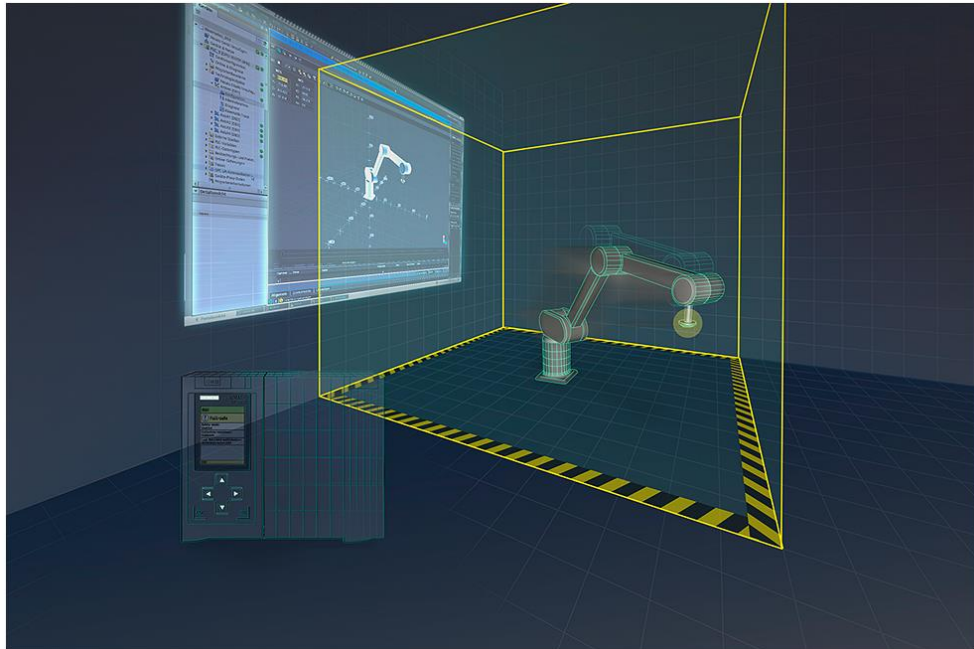
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SIMATIC Safe Kinematics



Function

SIMATIC Safe Kinematics enables fail-safe monitoring of the movement of kinematics with up to 12 interpolating axes in cartesian space. The following monitoring functions are supported

- Safe velocity monitoring
- Safe zone monitoring
- Safe orientation monitoring

Supported kinematics

- Cartesian portal
- Delta picker
- Articulated arm
- Roller picker
- SCARA
- User-defined serial kinematics

Benefits

- Modern and future-proof solution for kinematic/robotic applications
- Compact and flexible machine design
 - Reduced space requirement for machine
 - No more costly and inflexible safety fences
- Fulfills safety requirements for industrial robots according to EN ISO 10218

Hardware requirements

- CPU 1517F-3, CPU 1518F-4, CPU 1517TF-3 or CPU 1515SP PC2 TF
- SINAMICS S120 drive system

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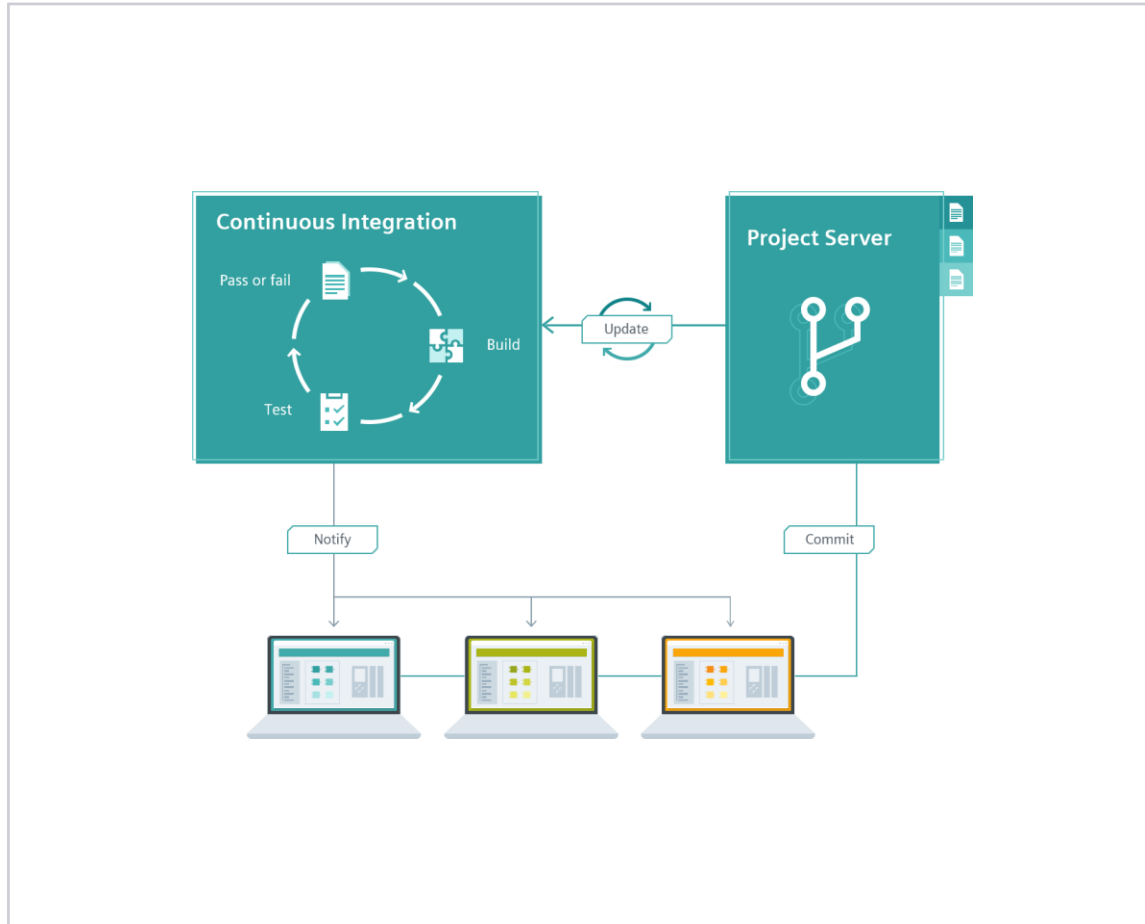
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Project server and Multiuser Engineering New functions



Multiuser

- Local sessions can be saved on network drives and additionally as TIA Portal archive (single project)

TIA Portal project server

- All user IDs are now saved during check-in
- Export and import of projects is possible directly via the Administration Tool

Multiuser Openness

- Openness functions can be used in a Multiuser session. This allows the use of existing Openness applications within Multiuser Engineering
- With TIA Portal V17, new Multiuser Openness APIs are available for integrating multiuser workflows into your own automation processes
- Combining Openness functions and the new Multiuser Openness APIs enables efficient, automated Multiuser operations via own applications or in TIA Portal add-ins. For example this can be used for automated library comparison and update of plant projects

Multiuser commissioning

- With V17, the asynchronous Commissioning mode supports the loading of controllers with activated access protection and of program changes to the F program part in the background and thus reduces the downloading time

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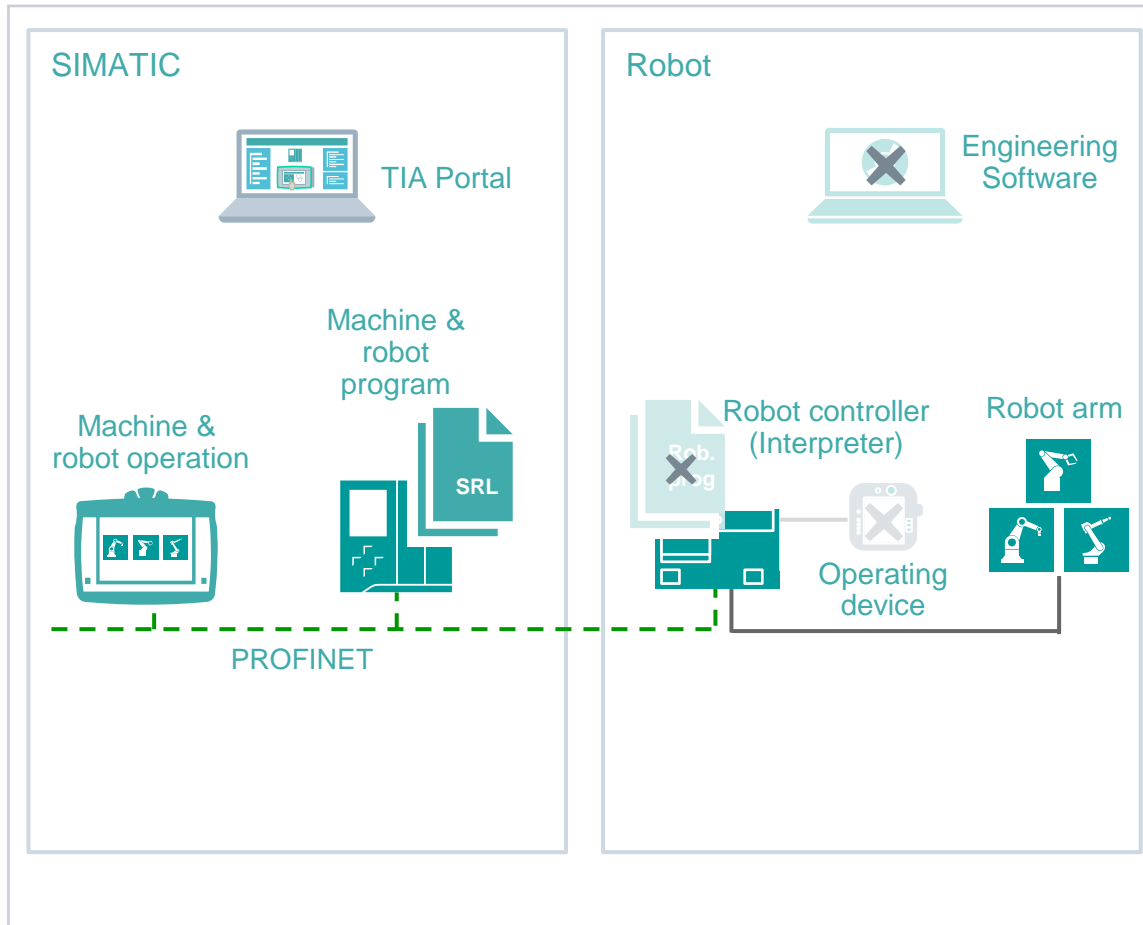
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SIMATIC Robot Library

Robot programming in TIA Portal



Robot programming in TIA Portal with the SIMATIC Robot Library

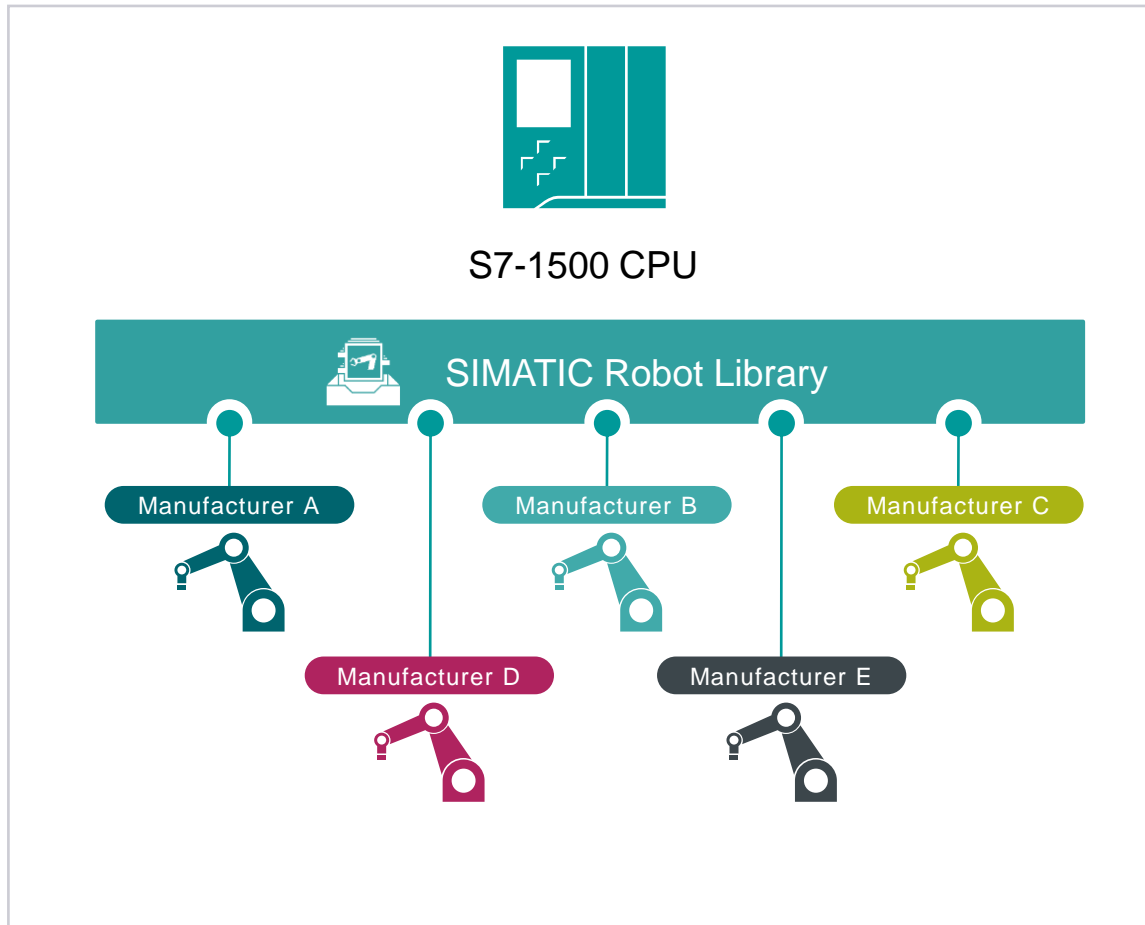
- One library to program robots of various brands within TIA Portal
- Will be based on a coming PNO Standard for robotics.
- Will be based on coming PLCopen certification for robotics
- Functions range from basic move commands (e.g. “MoveLinear”) to advanced commands (e.g. “ForceControl”)
- Library communicates with an interpreter on the robot controller
- Library is developed by Siemens while interpreter is developed by respective robot manufacturer

Customer Benefits

- Standardization for the robotics market
- Seamless programming auf robot and machine, no additional integration
- Uniform operation and engineering environment for PLC and robots
- Manufacturer-independent robot programming
 - No robot-specific programming experience required
 - Robot program is reusable for different robot vendors by just exchanging the connected robot
- Gateway for various, manufacturer-independent robotics solutions for all branches

SIMATIC Robot Library

One interface for all robot manufacturers

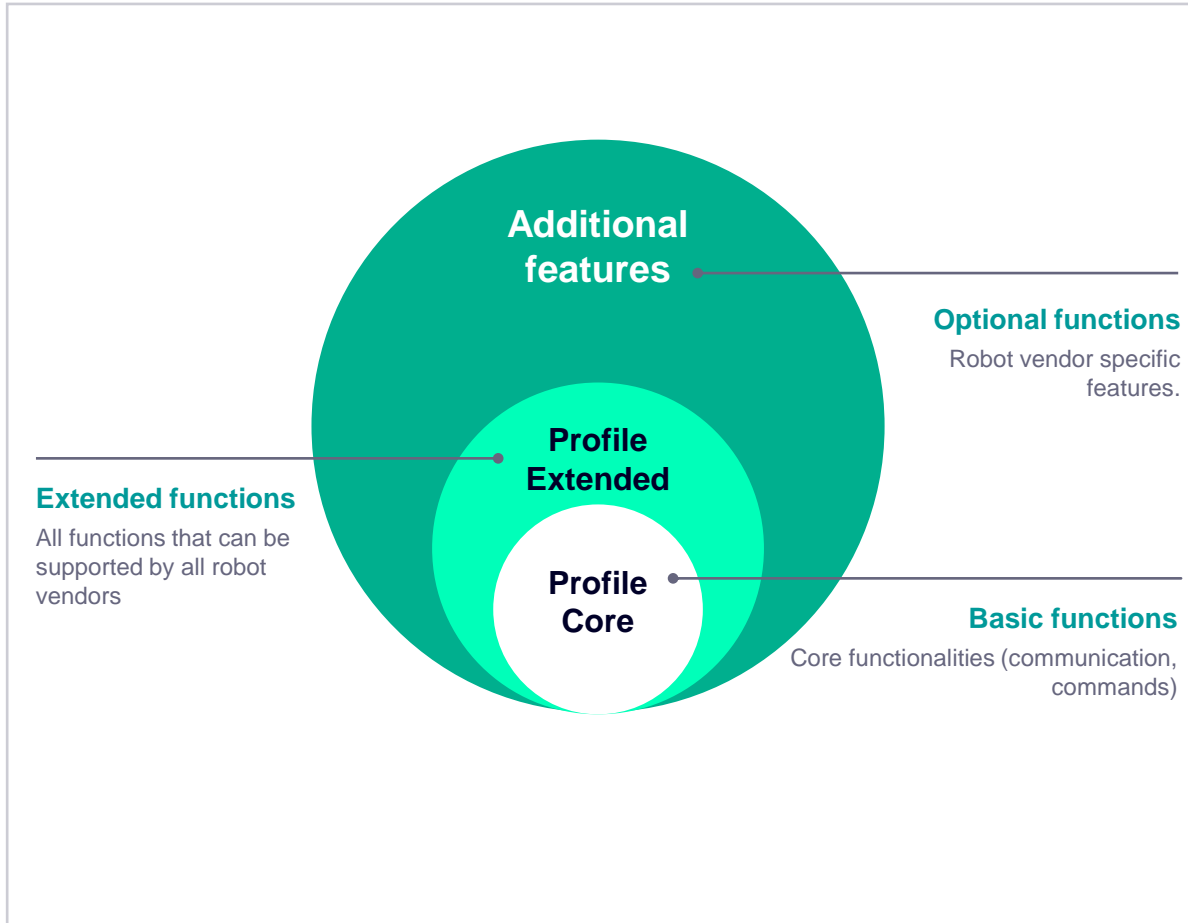


Unified programming of robots of various brands

- All functions of the library were designed in close cooperation with multiple robot manufacturers
- Several of them have already confirmed the release date for their interpreter
- Currently* confirmed robot manufacturers
 - COMAU (Release: 05/2021)
 - STÄUBLI (Release: 07/2021)
 - UNIVERSAL ROBOT (Release: 10/2021)
 - KAWASAKI (Release: 10/2021)
 - KUKA (Release: 12/2021)
 - ABB (Release: 12/2021)
- Not yet confirmed robot manufacturers
 - EPSON
 - FANUC
 - PANASONIC
 - TECHMAN
 - YAMAHA
 - YASKAWA

** These confirmations are based on robot manufacturer statements!*

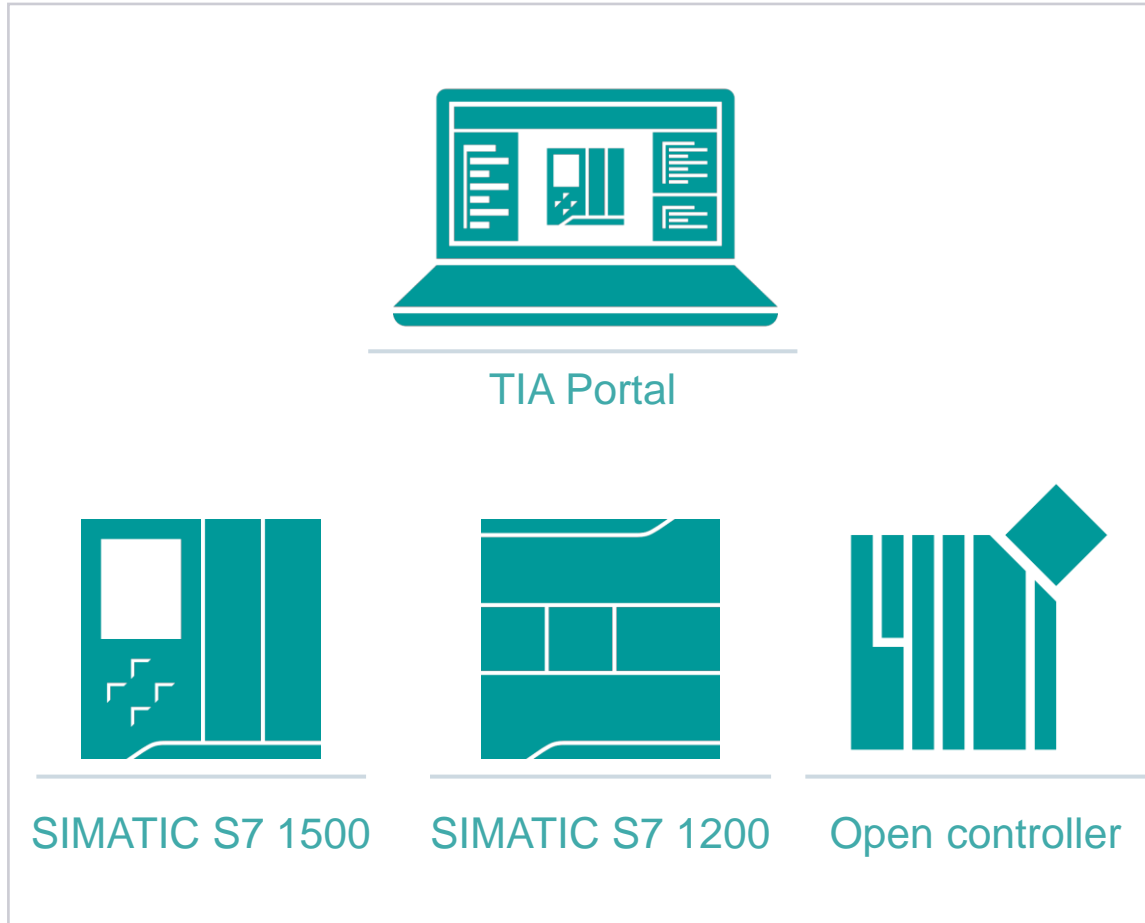
SIMATIC Robot Library Functionalities



Functionality and versioning of the SIMATIC Robot Library

- Over 110 functions are defined in the specification
- The functions will be released as part of profiles
 - Profiles are lists of functions
 - If a manufacturer claims compliance with a profile they support all functions assigned to the list of that profile
 - The profile Core will provide the communication mechanism of the library and basic commands (26 functions): Library release (SIEMENS) 04/2021
 - The profile Advanced will provide with its additional 37 functions all features that can be supported by all robot manufacturers:
 - Additional features that may vary between the robot manufacturers will be provided by the respective vendor if supported:
- The profiles Core and Advanced provide over 60 functions that will be supported by all robot manufacturers releasing the corresponding profile
- Only features that are not provided by all robot manufacturers conventionally (independent of library) cannot be implemented by all manufacturers
 - These functions may vary between the different robot manufacturers

SIMATIC Robot Library Requirements and licensing



Requirements

- Hardware:
 - SIMATIC S7 1500
 - SIMATIC S7 1200
 - Open controller
- Software:
 - TIA Portal V16 and newer

Licensing

- The library will be an official produce owned by SIEMENS AG
- The license must be purchased
- List price 490€ per Robot arm

TIA Portal

Highlights of TIA Portal V17

WinCC Unified

- Improved screen engineering with new style
- Graphics and faceplates (with functional enhancements) in library
- Extended communication and 1st set of system diagnostic
- Audit for PC
- WebClients for panel

Plant Intelligence Options

WinCC – Innovations

- WinCC Advanced:
Template & Popup screens in the library
- WinCC Professional:
Raw data for S7-1500, new system tags

STEP 7 – Innovations

- CEM – Cause Effect Matrix
- CFC – Continuous Function Chart (planned for July 2021)
- Download / Upload of user groups
- Functional enhancements in the cross-reference list
- Openness extensions for project generation

Startdrive – Innovations

- Support of SINAMICS G115D
- S120: Data set switching, manual optimization
- SINAMICS DCC: Know-how-protection

Hardware configuration

- Global Offline/Online comparison
- Offline/Offline comparison at parameter level
- CPU 1518HF-4PN: Safety and redundancy
- Extended quantity structures for S7-1500 and ET200 CPUs
- Extensions for CPU 1518 MFP
- Disable and enable I-Device
- DHCP and DNS for S7-1500 and ET200 CPUs
- Web server innovations
- S7-1200 Highlights with FW4.5 (OPC UA/Webserver)
- CPU 1518T/TF-4 PN/DP: High performance motion control

System functions

- Openness-extensions for libraries and UMAC
- User Management & Access Control (UMAC)
- Library
- Security per Default
- TIA Portal Language Packs
- Last used objects

TIA Portal Options

- **STEP 7 Safety**
Fast Commissioning, nested UDTs, Openness-extensions
- **SIMATIC Safe Kinematics**
Function, advantages and requirements
- **Multuser**
- **SIMATIC Robot Library**

TIA Portal Options

OPC UA

S7-1200: Diagnostics, methods; S7-1500: Alarms and Conditions, Server modelling, Client: new Compact blocks, GDS – certificate handling

PLCSIM/PLCSIM Advanced

Support of S7-1500 R/H CPU, secure communication with OPC UA, OUC und HTTPS

SIMATIC Target for Simulink

Code-generation for SIMATIC Edge & LiveTwin
Integrated S-functions for PLCSIM Adv coupling

Test Suite

Openness Support of style guide Check and application test

SiVArc

Support of WinCC Unified, new expressions, usability enhancements

Energy Suite

Improved load management and flexible energy data connections (by Proxy-DBs)

Central User Management (UMC)

Single Sign-on, SIMATIC Logon-protocol, licensing

Modular Application Creator

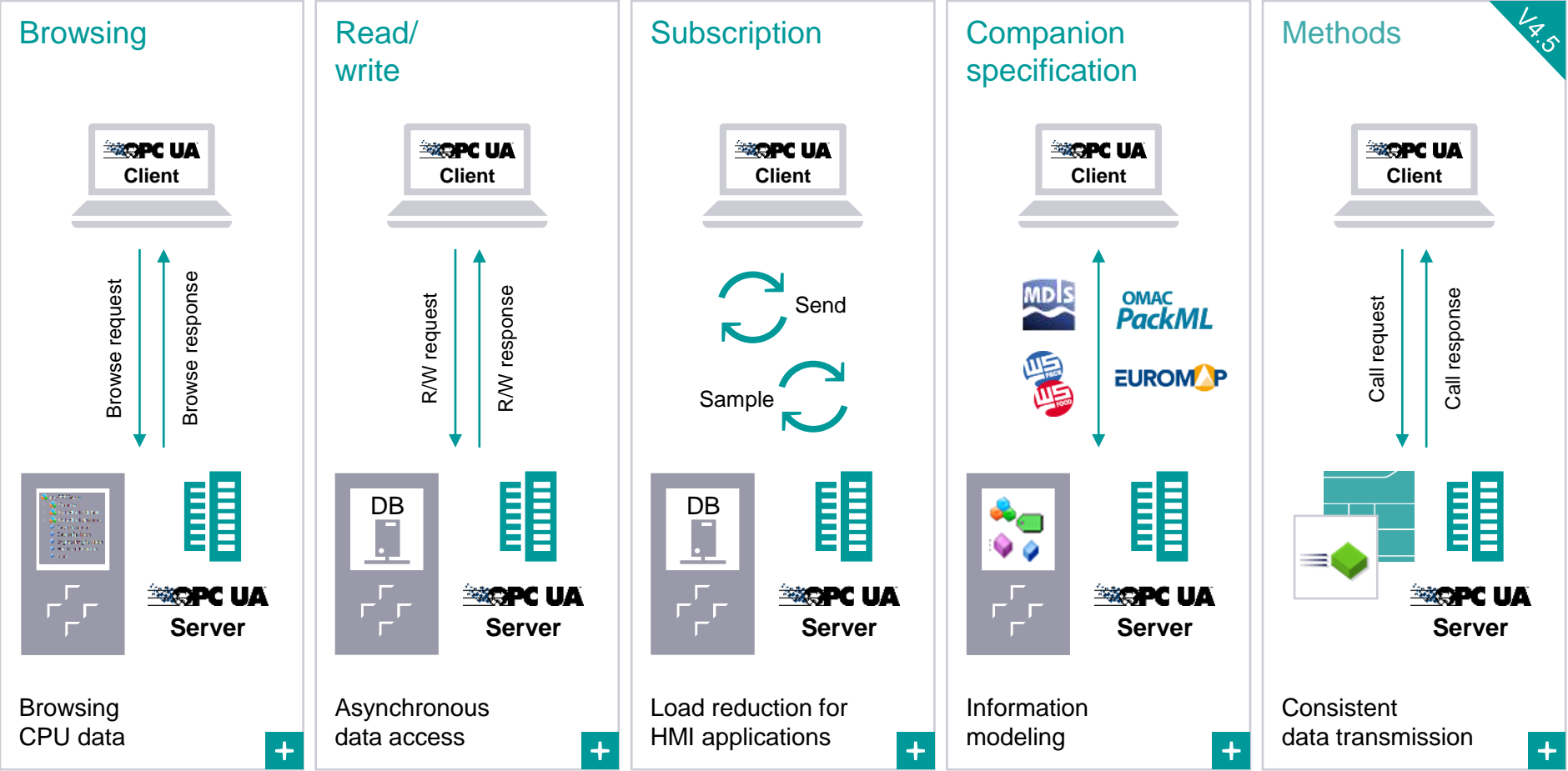
ProDiag

Monitoring within PLC Data Types, usability improvements

Teamcenter Gateway

Single Sign-on, PKI, Linking between Teamcenter and TIA Portal objects

OPC UA - Extended range of functions S7-1200 V4.5



- ### Support of
- OPC UA Server diagnostics in TIA Portal
 - Structured data types and arrays

OPC UA highlights for SIMATIC S7-1500 and ET 200 CPUs

OPC UA server – Alarms & Conditions

The top screenshot shows the 'Properties' dialog for 'PLC_4 [CPU 1516-3 PN/DP]' with the 'OPC UA' section expanded to 'Server' > 'General'. The 'Accessibility of the server' section has 'Activate OPC UA server' checked. The 'Alarms And Conditions' section has 'Enable 'Alarms And Conditions' on the OPC UA server' checked and 'Allow message acknowledgment by OPC UA client.' unchecked.

The bottom screenshot shows the 'Events' window with the 'Alarms' tab selected. It displays a table of active alarms:

A	C	Time	Severity	Server/Object	SourceName	Message	EventType	Active
		14:14:55.884	500	Quickstart Alar...	Internal	Events Raised	AuditEventType	
▲	▲	14:14:55.884	500	Quickstart Alar...	EastTank	The alarm severity has increased.	NonExclusiveLevelAlarmType	LowActive
▲	▲	14:14:55.884	500	Quickstart Alar...	NorthMotor	The alarm severity has increased.	ExclusiveDeviationAlarmType	High
▲	▲	14:14:55.884	500	Quickstart Alar...	SouthMotor	The alarm severity has increased.	TripAlarmType	Active
		14:14:56.898	500	Quickstart Alar...	Internal	Raising Events	SystemEventType	
		14:14:56.898	500	Quickstart Alar...	Internal	Events Raised	AuditEventType	
		14:14:57.912	500	Quickstart Alar...	Internal	Raising Events	SystemEventType	
		14:14:57.912	500	Quickstart Alar...	Internal	Events Raised	AuditEventType	
▲	▲	14:14:57.912	900	Quickstart Alar...	EastTank	The alarm severity has increased.	ExclusiveDeviationAlarmType	High
▲	▲	14:14:57.912	900	Quickstart Alar...	WestTank	The alarm severity has increased.	TripAlarmType	Active
▲	▲	14:14:57.912	900	Quickstart Alar...	SouthMotor	The alarm severity has increased.	NonExclusiveLevelAlarmType	LowLowActive

The 'Details' section below the table shows the following values:

Name	Value
Identifier	1-Metals/SouthMotor?Silver
AckedState/Id	False
ActiveState	"en-US", "Active"
ActiveState/EffectiveDisplayName	"en-US", "LowActive"
ActiveState/Id	True
ConditionName	Silver
ConfirmedState/Id	False
EventId	len=16, 0xf43d7759d2d0f4438a08baf449d7583f
EventTypeId	NodeId
Message	"", "The alarm severity has increased."
Retain	True
Severity	500
SourceName	SouthMotor
Time	14:14:41.682

CPU messages can be transferred to OPC UA clients

Supported SIMATIC alarm types

- Programmed alarms/messages
- ProDiag messages
- System events

Per subscriptions Alarms, Conditions & Events can be subscribed by the client.

Program messages incl. associated values are provided by the OPC UA server.

Alarms requiring acknowledgement can be acknowledged from the OPC UA client (can be deactivated).

A "message burst" is displayed as "overload" and messages can be refreshed from the client.

Number of simultaneous messages:

	PLC Type	Small	Middle	Big
System Diagnostics		50	100	200
Program Alarms		100	200	400

OPC UA

S7-1500 – server interface modeling in TIA Portal

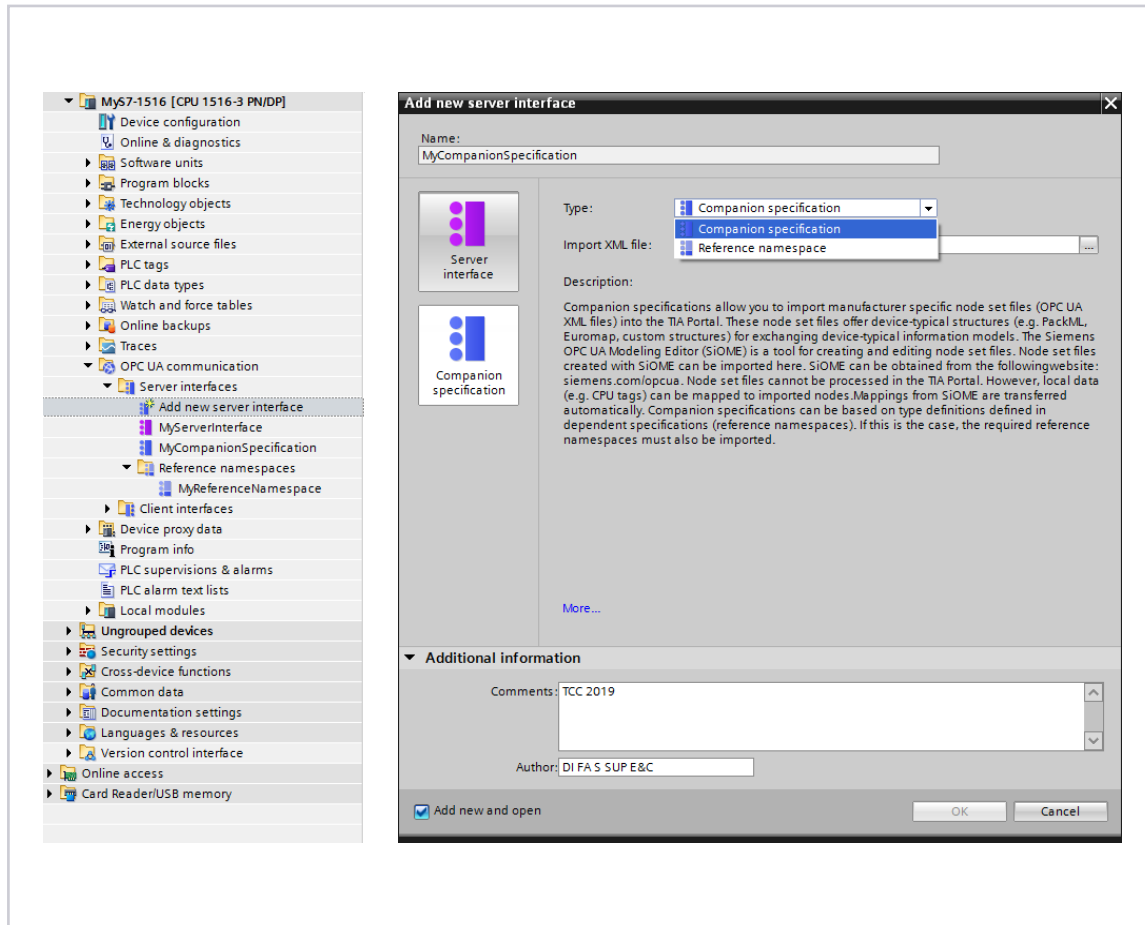
The screenshot displays the TIA Portal interface for modeling an OPC UA server interface. On the left, the 'OPC UA server interface' table is shown with the following data:

Name	Node type	Access level	Local data
1 Server interface_1	Interface	---	
2 Robot_Object	Object	---	
3 Robot_Type	Byte	RD	"Robot"."Jobs"."Type"
4 Robot_Reference	Byte	RD	"Robot"."Jobs"."Reference"
5 Robot_Jobs	RobotJob	RD	"Robot"."Jobs"
6 Used	Bool	RD	"Robot"."Jobs"."Used"
7 Type	Byte	RD	"Robot"."Jobs"."Type"
8 Reference	Byte	RD	
9 Started	Bool	RD	
10 Error	Bool	RD	
11 Done	Bool	RD	
12 <Add new>			

On the right, the 'OPC UA Elements' tree structure is shown, listing project data elements such as Software units, Program blocks, Robot [DB1], RobotName, MoveEnable, ReleaseProd, Jobs, Used, Type, Reference, Started, Error, Done, Screw [DB2], Valve [DB3], and Technology objects. A blue arrow points from the 'Reference' node in the table to the 'Reference' element in the tree. A central icon with four arrows indicates a drag-and-drop action.

1. Creating objects and folders
2. Using drag-and-drop with PLC elements
3. Using drag-and-drop with entire nodes

OPC UA S7-1500 server – supports further PLC data types



Companion specifications

Node sets that can be imported into TIA Portal and mapped

- Improvement in the use of companion specifications and for customized information models
- Supports further PLC data types for mapping to OPC UA
 - Localized text
 - Byte strings



OPC UA

S7-1500 server – Companion specifications as reference

Neue Server-Schnittstelle hinzufügen

Name: Opc.Ua.Di

Typ: Referenz-Namensraum

XML-Datei importieren: C:\Euromapl3_Opc.Ua.Di.NodeSet2.xml

Beschreibung:
Companion Spezifikationen geben die Möglichkeit, herstellerspezifische OPC UA XML-Dateien zu importieren. Diese OPC UA XML-Dateien bieten gerätetypische Strukturen (z.B. PackML, Euromap). Companion Spezifikationen können nicht geändert oder erweitert werden. Es ist nur möglich, Mappings auf lokale Daten (z.B. CPU-Variablen, Datenbausteine) des Geräts zu erzeugen. Diese Companion Spezifikationen können auf Typdefinitionen beruhen, die in abhängigen Spezifikationen definiert wurden, auch bekannt als Referenz-Namensräume. Wenn dies der Fall ist, müssen die erforderlichen Referenz-Namensräume ebenfalls importiert werden.

OPC UA-Server-Schnittstelle

Browse Name	Lokaldaten
My new Server Interface	
OPC http://opcfoundation.org/UA/DII	
FetchResultDataType	
TransferResultErrorDataType	
Status	*Anwenderdatentyp_1.*Status*
Diagnostics	*Anwenderdatentyp_1.*Diagnostics*

Specifications as reference

NodeSets which can be imported & mapped as reference into TIA Portal



- Import of specifications as reference of OPC UA object types (e.g. Companion Specs)
- Mapping of the data types of an OPC UA reference namespace to an FB or UDT
- With each new instance the new nodes are automatically created in the OPC UA Server Interface

OPC UA

S7-1500 client – compact blocks

Communication		
Name	Description	Version
<ul style="list-style-type: none"> OPC UA <ul style="list-style-type: none"> OPC UA client (V2.1) <ul style="list-style-type: none"> Establish session OPC-UA-Connect (Create connection) V1.0 OPC-UA-NamespacGe... (Read namespace indexe) V1.0 OPC-UA-NodeGetHand... (Get handles for read an..) V1.0 OPC-UA-MethodGetHa... (Get handles for metho...) V1.0 OPC-UA-TranslatePathL... (Get actual NodeIds) V1.0 Data Access (DA) <ul style="list-style-type: none"> OPC-UA-ReadList (Read tags) V1.0 OPC-UA-WriteList (Write tags) V1.0 OPC-UA-MethodCall (Call method) V1.0 Clear session OPC-UA-NodeReleaseH... (Release handles for rea..) V1.0 OPC-UA-MethodReleas... (Release handles for me..) V1.0 OPC-UA-Disconnect (Close connection) V1.0 Diagnostics <ul style="list-style-type: none"> OPC-UA-ConnectionGe... (Read connection status) V1.0 		

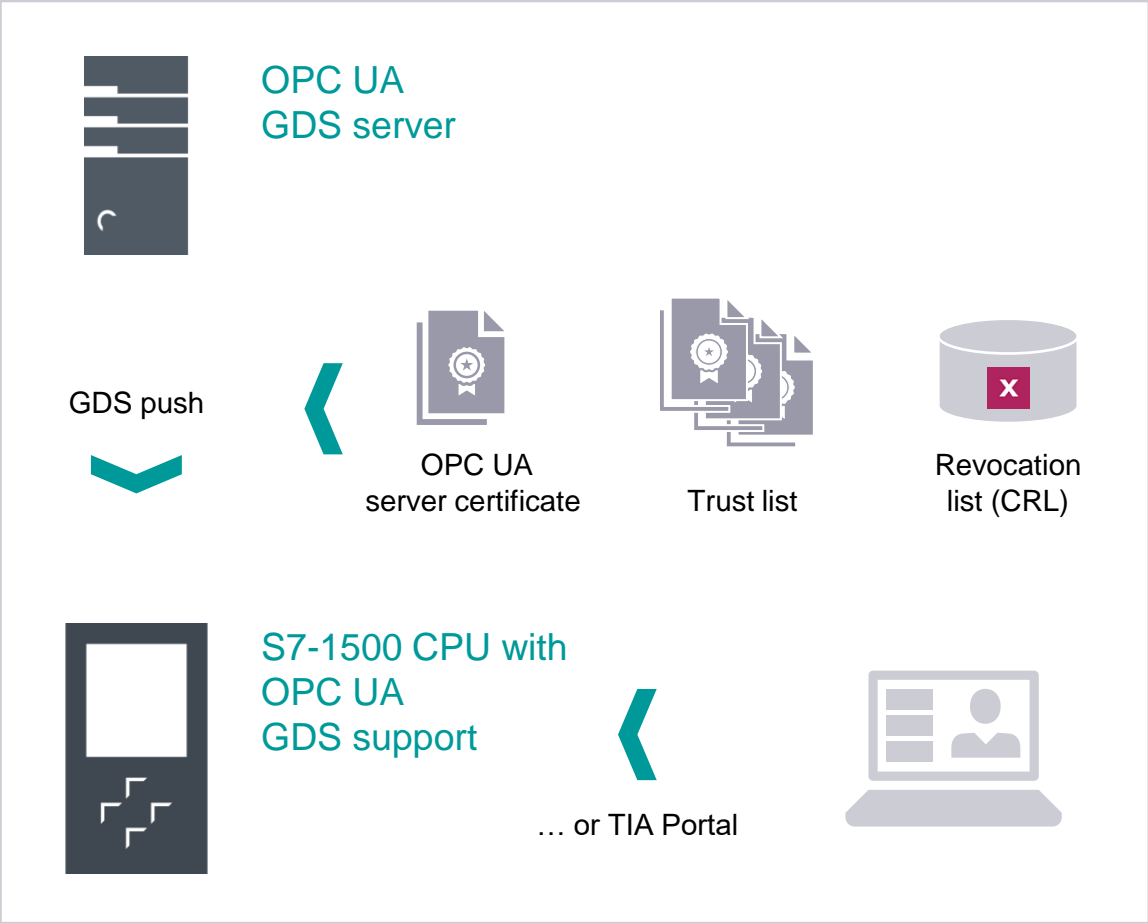
New, simplified blocks for handling

- Read
- Write
- Methods

Communication		
Name	Description	Version
<ul style="list-style-type: none"> S7 communication (V1.3) Open user communication (V7.0) OPC UA <ul style="list-style-type: none"> OPC UA client (V3.0) <ul style="list-style-type: none"> Compact blocks <ul style="list-style-type: none"> OPC-UA-ReadList_C (Create Connection and read Tags) V1.0 OPC-UA-WriteList_C (Create Connection and write tags) V1.0 OPC-UA-MethodCall_C (Create Connection and call method) V1.0 		

OPC UA for Advanced and Distributed Controller

Certificate management via OPC UA



- ✓ Certificate update during running
- ✓ Supports CRLs (revocation lists)
- ✓ Access protection for certificate management
- ✓ Commissioning mode

- Currently only for OPC UA and internal CPU interfaces, later also for other services and CP/CMs

TIA Portal

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- **SIMATIC Safe Kinematics**
Function, advantages an requirements
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- **Modular Application Creator**
- **ProDiag**
Monitoring within PLC Data Types, usability improvements
- **Teamcenter Gateway**
Single Sign-on, PKI, Linking between Teamcenter and TIA Portal objects

PLCSIM V17

Improvements in the new version



Compatibility maintained

- Compatible with TIA Portal V17 and projects from versions V14 to V17
- Support of user-defined protection of configuration data from TIA Portal
- Supports S7-1500 CPU firmware versions V1.8 – V2.9
- Supports S7-1200 CPU firmware versions up to V4.5

Functionality extended

PLCSIM now supports the TIA Portal multilingual concept thanks to the subsequent loading of additional languages

CPU support extended

The control code for the following SIMATIC PLCs can now be loaded directly and simulated with PLCSIM

- SIMATIC Drive Controller 1504 D TF and 1507 D TF
- SIMATIC ET 200pro CPUs
- SIMATIC S7-1500 H(F)/R CPUs
- SIMATIC CPU 1518 T/TF
- SIMATIC S7-SIPLUS CPUs
 - Equivalents of the supported standard CPU types

Performance improved

Improvements in user performance and memory usage thanks to removal of the redundant device view in PLCSIM. Customers use the device view in TIA Portal.

S7-PLCSIM Advanced V4.0

Supports SIMATIC S7-1500 R/H systems

Redundant – S7-1500R



CPU 1513R

CPU 1515R



6ES7513-1RL00-0AB0

6ES7515-2RM00-0AB0

Highly available – S7-1500H/HF



CPU 1517H

CPU 1518 H/F

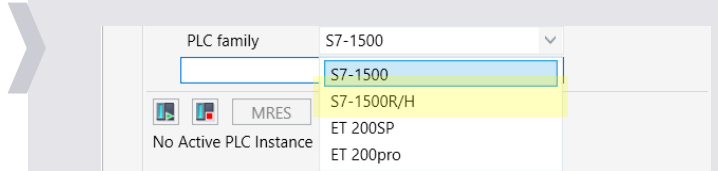


6ES7517-3HP00-0AB0

6ES7518-4JP00-0AB0

Consistent concept – Identical simulation mode

- Using **the original project** allows the simulation to be performed in RUN solo mode **without**
- The "ECPUType" API function has been expanded to include the new PLC family S7-1500 R/H and the order numbers.
- The control panel has been expanded to include the new "S7-1500R/H" PLC family.



CPU type

Primary (RUN solo)

Safety

Article numbers

S7-PLCSIM Advanced V4.0

Enhanced PLC Support SIMATIC ET 200pro



Function

S7-PLCSIM Advanced V4.0 support from now on also the simulation of the PLCs side of SIMATIC ET 200pro PLC based on S7-1500.

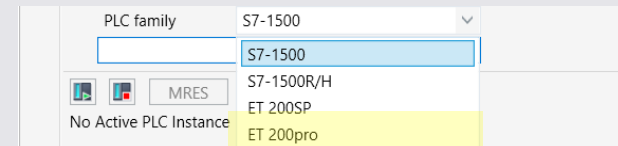
Supported PLCs

S7-PLCSIM Advanced V4.0 supports now the following SIMATIC ET200 pro Controller:

- **CPU 1513pro-2 PN** | 6ES7513-2PL00-0AB0
- **CPU 1516pro F-2 PN** | 6ES7516-2PN00-0AB0
- **CPU 1516pro-2 PN** | 6ES7513-2GL00-0AB0
- **CPU 1516pro F-2 PN** | 6ES7516-2GN00-0AB0

Details

- By using the original project, the simulation can be carried out without changing the program.
- The "ECPUType" API function has been expanded to include the "ET 200pro" PLC family and the order numbers.
- The control panel has been expanded to include the new "ET 200pro" PLC family.



S7-PLCSIM Advanced V4.0

Extended CPU support of SIMATIC Drive Controller



Function

S7-PLCSIM Advanced V4.0 now supports simulation of the CPU component of SIMATIC Drive Controllers. The control programs created in the TIA Portal can therefore be loaded and tested directly without changes on the virtual controllers.

Supported CPUs

S7-PLCSIM Advanced V4.0 now supports the following SIMATIC Drive Controllers

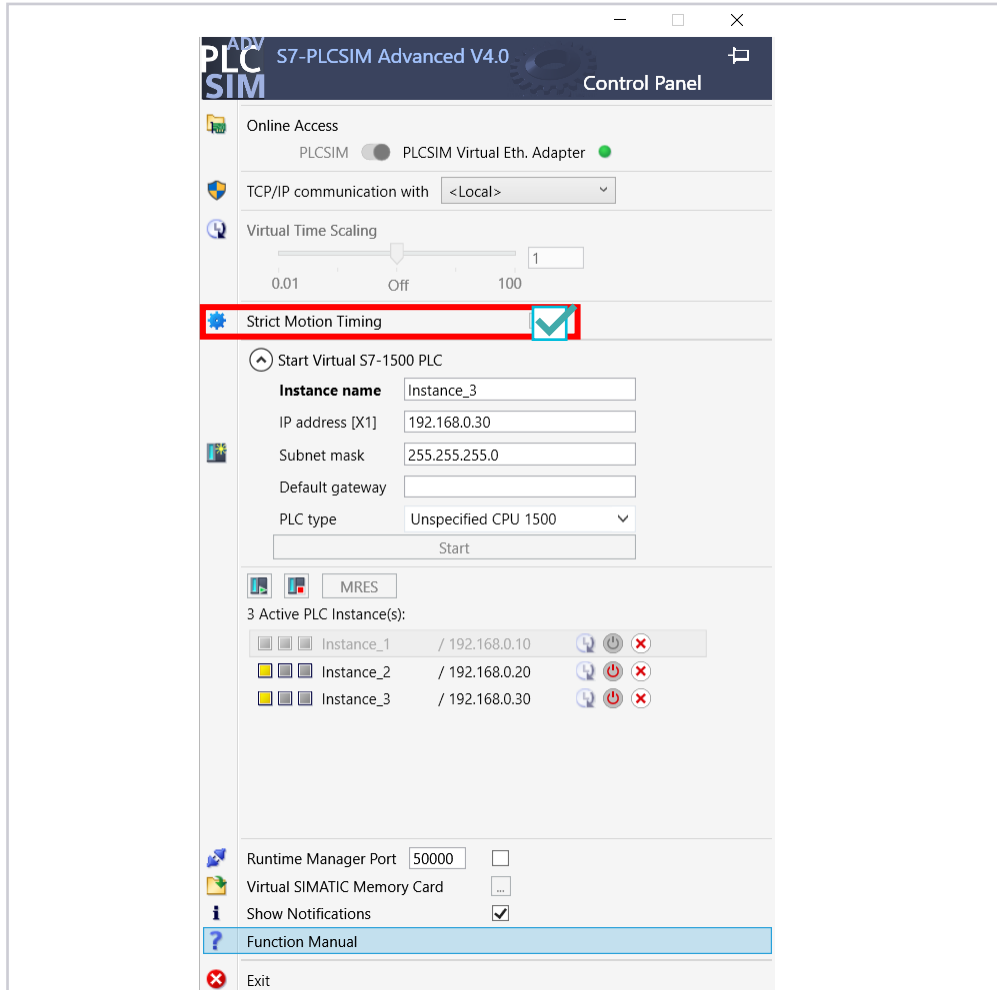
- SIMATIC S7-1500 T-CPU **CPU 1504D TF** | MLFB: 6ES7615-4DF10-0AB0
- SIMATIC S7-1500 T-CPU **CPU 1507D TF** | MLFB: 6ES7615-7DF10-0AB0

Details

- The comparable T-CPU function of the Drive Controller as well as the onboard I/Os are supported in the simulation
- S7-PLCSIM Advanced is not designed to simulate the drive control of the integrated SINAMICS S120
- The integrated PROFIBUS and PROFINET interfaces cannot be simulated, as with the standard S7-1500 CPUs

S7-PLCSIM Advanced V4.0

New operating mode “Strict Motion Timing”



New Function

To simulate the Motion Control Functions for S7-1500 / S7-1500T CPUs precise and identical to the real hardware a new operating mode has been implemented.

„Strict Motion Timing“

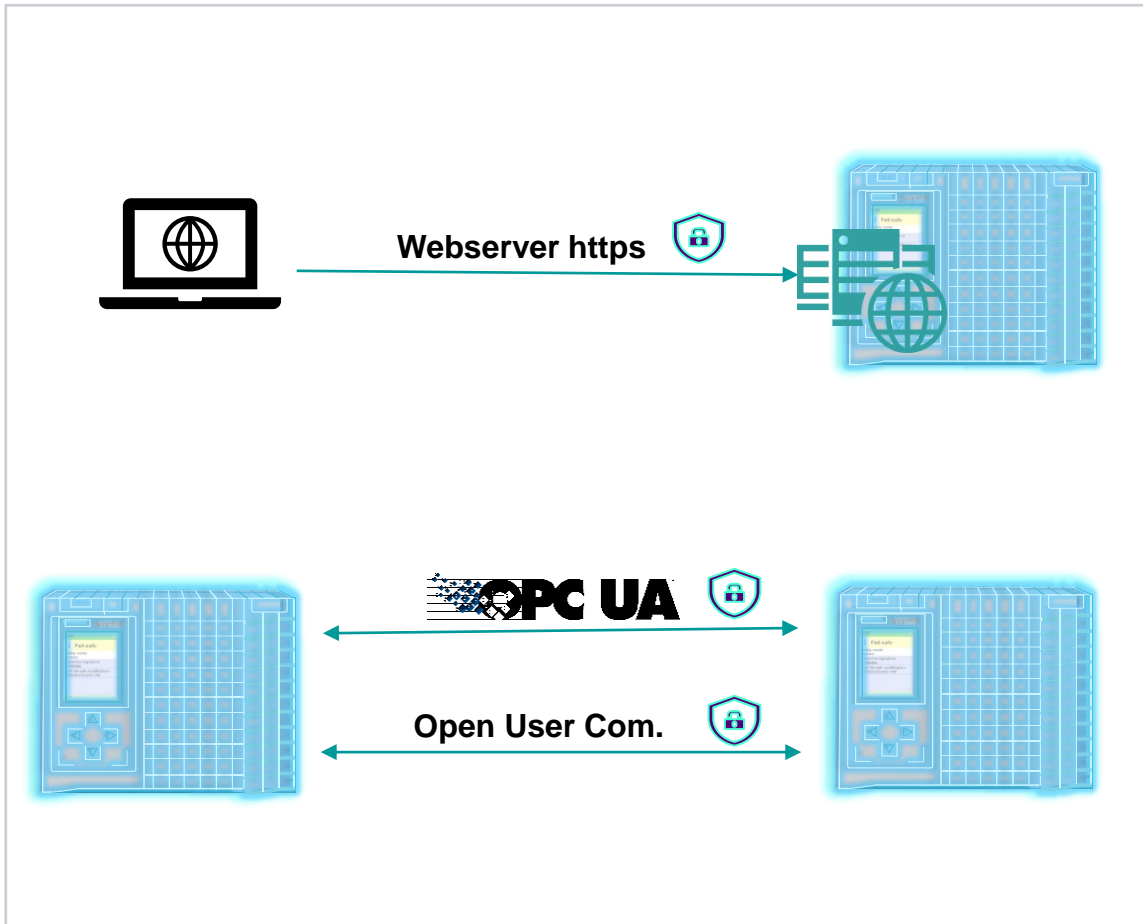
Strict Motion Timing “True” switches the buffer overflow detection "ON" (V3 behavior). The motion OBs are processed in each interval they called (e.g. 4 ms in cyclic mode). If the "Strict Motion Timing" mode is selected, the MC servo clock is synchronized with the PLC cycle in order to ensure the correct calculation analogous to the HW PLC including the original message behavior in the diagnostic buffer. The function can be specified globally via the GUI or via the configuration file and globally via the API and per running instance. With the virtual time, the running speed can be adapted to the PC performance in order to avoid a STOP of the virtual PLC.

Default Mode:

Strict Motion Timing "False" switches the buffer overflow detection "OFF" (V2 behavior). The Motion OBs are called in every interval (e.g. 4 ms), but may not be processed because they were overtaken by the PLC cycle. The simulation is high-performance, which is helpful for co-simulations, but can be imprecise in detail because movements may still be calculated after they have already been stopped. The virtual time scale can be used to accelerate or decrease, and the PLC instance does not switch to STOP due to buffer overflows.

S7-PLCSIM Advanced V4.0

Simulation of secured communication connections



Function

Expansion of the communication options to include secure connections analogous to the hardware CPU with firmware version V2.9 and STEP 7 V17

OPC UA

- Secured OPC UA connections

Webserver

- https – now also simulation of projected https connections
- Webserver User Management is supported

„**open user communication**“ (secured TCP communication)

- New instructions TSEND_C / TRCV_C and secured TCON

Details

Secure communication

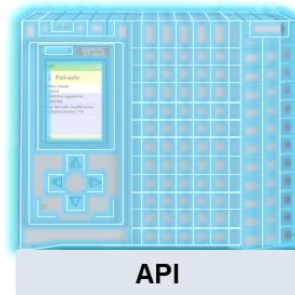
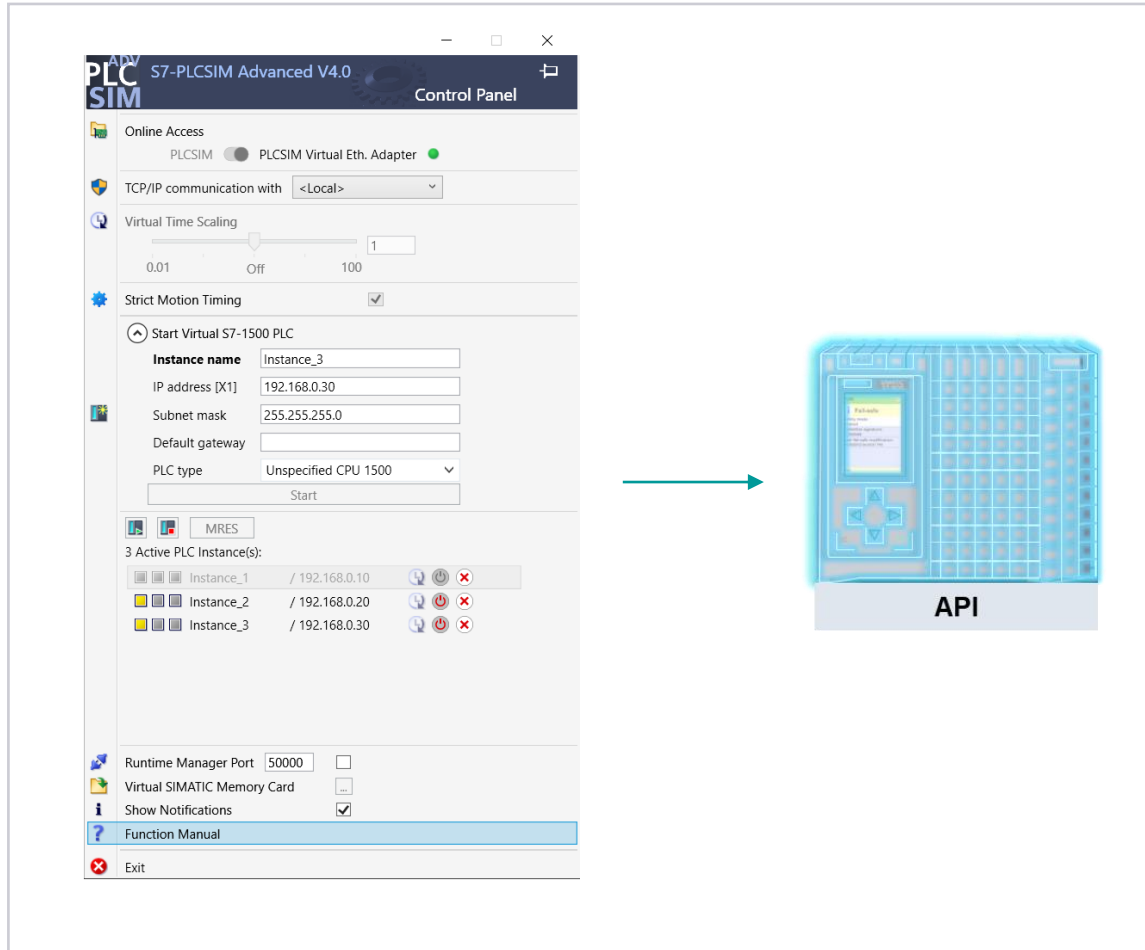
TIA Portal V17 projects with V17 CPU firmware version V2.9 can also be loaded and executed on the S7-PLCSIM Advanced in secure, encrypted mode. This means that safe communication can be tested in the virtual controller without making changes to the automation project.

Compatibility mode

TIA Portal V17 projects with firmware versions V1.8-V2.8x can still be simulated in the previous mode.

S7-PLCSIM Advanced V4.0

New functions and compatibility



New functions

1. Extension of the communication capabilities

Supports up to 128 UDP multicast connections, DNS and DHCP functions as with the specific hardware CPU with firmware version V2.9

2. Co-simulation – bus synchronous coupling

- With the new "Single Step Bus" mode, synchronous operation of co-simulation tools such as SIMIT¹ is now also possible in reduced Time Slice mode
- The synchronization of multiple PLC instances via a co-simulation tool such as SIMIT¹ is now possible with PROFINET timestamps

3. TCP/IP communication with NpCap

The WinPcab TCP/IP driver has been replaced by the current NpCap version, which is now automatically included in installation via the setup.

4. Support of new SIMATIC S7-1518 T/TF and SIPLUS CPUs

The MLFBs and types of the SIMATIC S7-1518 T/TF and S7-1500 SIPLUS CPU family can now also be selected in the API function.

5. Support of user-defined protection of configuration data from TIA Portal

Protection of configuration data by means of individual passwords

Compatibility

- Compatible with TIA Portal projects from versions V14 to V17
- Supports S7-1500 CPU firmware versions V1.8 – V2.9

¹ Available from SIMIT version 10.3 and higher

S7-PLCSIM Advanced V4.0

State of the art API documentation

The screenshot shows the API documentation for the `ApiEntry_Initialize` function. The page is titled "Native" and includes a navigation menu on the left with categories like "Application Programming Interface", "Data types for native C++", "DLL import functions", "Event callback functions", "Unions", "Structures", "Enumerations", and "API commands for native C++". The main content area is divided into sections: "Description" (stating it's the type of the API DLL main entry point), "Signatures" (showing a C++ typedef for `ERuntimeErrorCode`), "Arguments" (listing `ISimulationRuntimeManager** out_SimulationRuntimeManagerInterface` and `UINT32 in_InterfaceVersion`), and "Return Value" (a table of runtime error codes).

Runtime error code	Condition
SREC_OK	The function is successful.
SREC_WRONG_ARGUMENT	The pointer to the Runtime Manager interface is NULL.
SREC_WRONG_VERSION	The version of the interface in use does not match the version of the API library (DLL).
SREC_CONNECTION_ERROR	Unable to establish a connection to the Runtime Manager.

Funktion

S7-PLCSIM Advanced V4.0 now provides the API documentation as a website in addition to the manual as a PDF.

Access

via SIOS article

<https://support.industry.siemens.com/cs/ww/de/view/109780964>

Details

- State of the art API documentation design
- Improved clarity and searchability
- Opportunities to improve and expand the API documentation outside of product releases
- Introducing code examples

S7-PLCSIM Advanced V4.0

New delivery form and new helpful SIOS articles



New

Yearly Software Subscription Service

- New Order number 6ES7823-1FE00-0YN5 (SW-Download)
- List price: 1050€/Year / monthly billed / automatic extended
- Also within SISW Sales channel orderable and to combine with DI SW Products
- Pricebook #: **PLCSIM365** 1 Year Subscription
- List price: 87€ per Month / monthly billed / not extended automatically

Advantages

- Can be canceled annually
- Automatic contract renewal
- Software update service
- Easy start for new customers
- Low entry barrier



New helpful SIOS articles

- [How can you communicate with S7-PLCSIM Advanced in the cloud?](#)
- [SIMATIC Virtual Commissioning of the Multi-Carrier-System](#)
- [How many PLC instances can you simulate with S7-PLCSIM Advanced on an ESXi CPU core?](#)
- [Digitalization with TIA Portal: Virtual Commissioning with SIMATIC and Simulink](#)
- [How to simulate a S7-1200 PLC with TIA Portal S7-PLCSIM & SIMIT in Co-Simulation](#)

Advantages

- Always new tips and tricks about virtual commissioning

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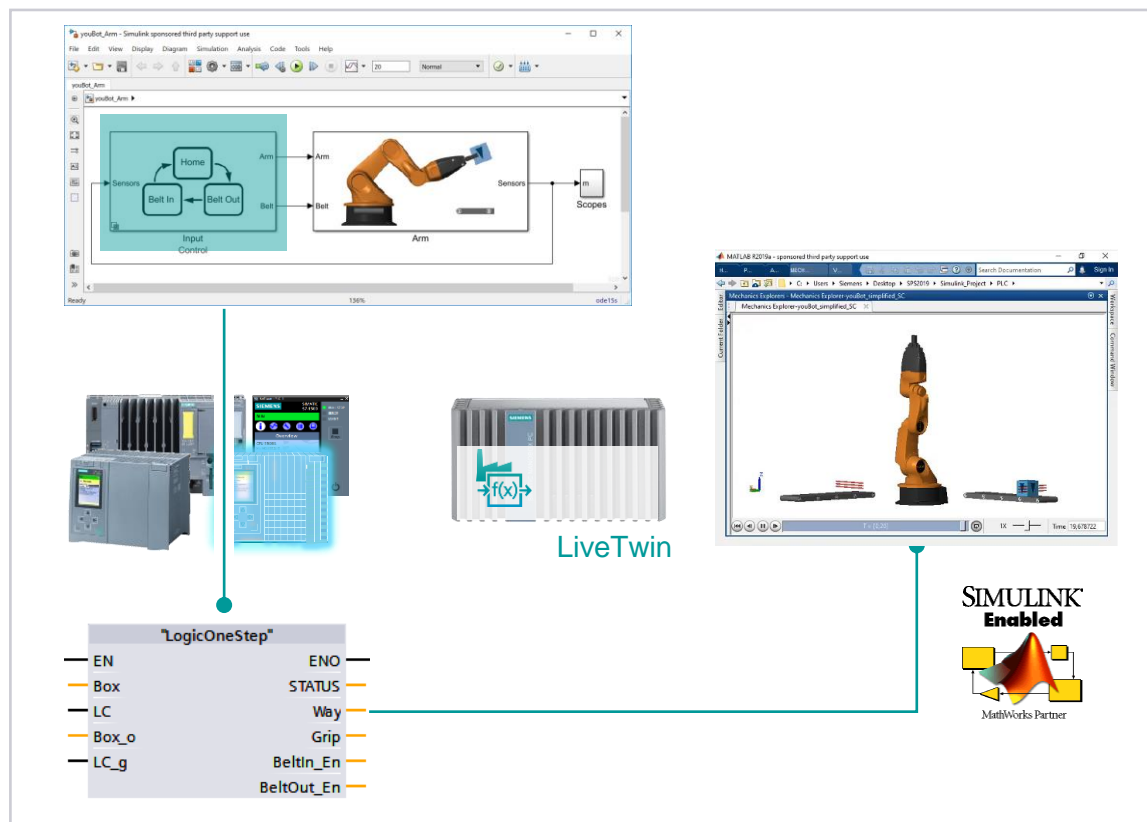
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SIMATIC Target™ for Simulink® V5.0

Code generation for S7-1500 and LiveTwin Edge app



Function

- Code generation for LiveTwin on Siemens Industrial Edge
- Supports Simulink Embedded Coder
- Integrated S-functions for S7-PLCSIM Advanced coupling (for S7-1500 Runtime)

Customer benefits

- S7-1500 Runtime for real-time requirements
- Industrial Edge Runtime for Edge applications such as virtual sensors, complex calculations, ...
- Simpler virtual commissioning with Simulink & S7-PLCSIM Advanced

Supports two Runtimes: S7-1500 & LiveTwin Edge app
 Therefore renaming: SIMATIC Target 1500S for Simulink → SIMATIC Target for Simulink

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TIA Portal Test Suite Advanced V17 Openness support

The screenshot displays the TIA Portal interface with three main windows:

- Code Editor:** Shows a test case named 'testCase Binomial' with C++-like code for testing a binomial function. Comments describe the test steps and variable initialization.
- Style Guide Rules:** A table of 'Siemens StyleGuide Rules' with columns for Name, Type, Object selector, Target, Category, Disabled, and Comment. Rules include checks for prefixes, casing, and naming conventions.
- Test Results:** A table showing the execution of test cases. The results are as follows:

Path	Description	Go to	Errors	Warnings	Time
Application test	testCase Binomial: CPU1517F	3	0	0	8:37:13 PM
Check_for_negative_a_and_b	Pass				
Check_for_a_and_b_equal_to_zero	Fail		2		
testBinomial.c	Actual: -1.000000E+000, Expected: 0.000000E+000				
testBinomial.valid	Actual: True, Expected: True				
Check_a_equal_to_3_and_b_equal_to_4	Pass				
Check_a_equal_to_0_and_b_equal_to_1	Pass				

A central teal box contains the text **TIA Portal Openness**. Below the screenshots is a diagram of the CI/CD pipeline:

```

    graph LR
      subgraph Engineering_System [Engineering System]
        Alice[Alice]
        Bob[Bob]
        Carol[Carol]
        Dan[Dan]
      end
      subgraph Source [Source]
        V110[V 1.1.0 V.2.0.0]
        V131[V 1.3.1 V.2.0.0]
        V141[V 1.4.1 V.2.0.0]
        V121[V 1.2.1 V.2.0.0]
      end
      subgraph Build_Test [Build & Test]
        Build((Build))
        Test((Test))
        PassFail[Pass or fail]
      end
      Alice --> Commit[Commit]
      Bob --> Commit
      Carol --> Commit
      Dan --> Commit
      Commit --> Source
      Source --> Build
      Build --> Test
      Test --> PassFail
      PassFail --> Notify[Notify]
      Notify --> Alice
      Notify --> Bob
      Notify --> Carol
      Notify --> Dan
  
```

Function

Openness support for the following functions

- XML/ASCII file export and import for rule sets and test cases
- Export and import from libraries (master copies)
- Running of style guide checker and application test
- Test results are provided as .NET objects in the Openness application and can thus be exported with a user-defined export format.

Customer benefits

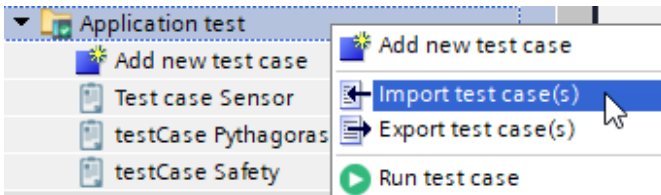
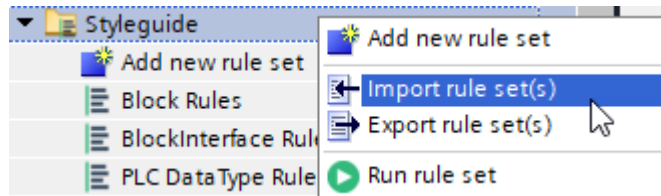
- Supports continuous integration workflows
- Export of test results in customized file reports

TIA Portal Test Suite Advanced V17

Extended functions

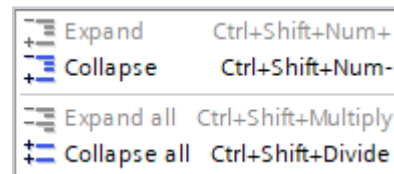
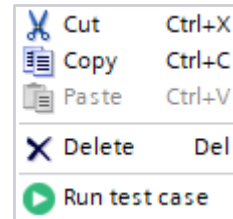
Export/import of rule sets/test cases

Export/import of rules sets and test cases using the shortcut menu in the PNV editor.



Shortcut menu in the application test editor

Shortcut menu for copying, cutting and collapsing test cases in the test case editor.



Further improvements

Style guide:

- Author, version number and comment can be added to a rule set
- New rule for checking, whether a comment exists for variables and block parameters

Application test:

- Application test supports now ET 200pro, S7-1500 R/H and SIMATIC Drive Controller
- New "Assert.InRange (variable, lowerBound, upperBound)" instruction for integer and real variables
- Commenting out of single/multiple lines in the test case editor using the toolbar.



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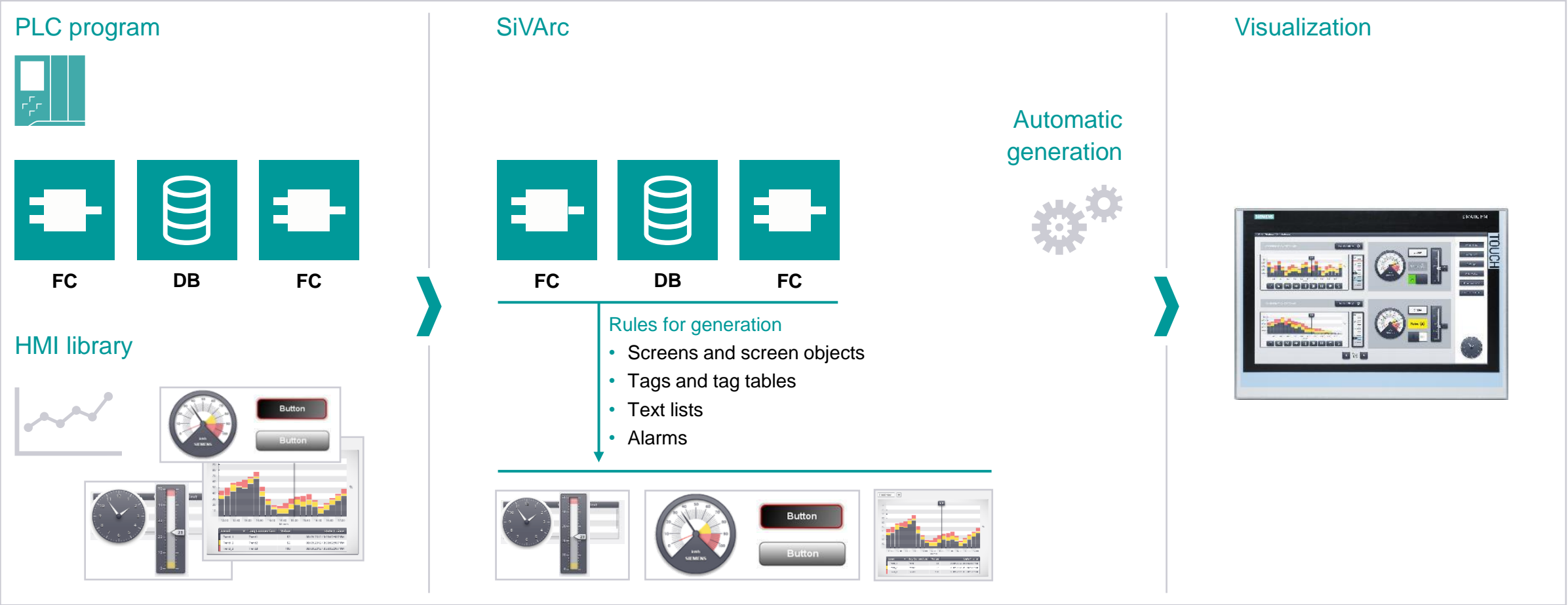
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SIMATIC Visualization Architect (SiVArc)

Simple, quick and flexible creation of HMI projects in the TIA Portal



SIMATIC Visualization Architect (SiVArc) V17

Overview of new functions

- Supports WinCC Unified
- Improvements to "copy rules"
- Extensions to SiVArc expression
- Support of Screen types
- Openness support for FBs/FCs
- Supports "Default Type" in the library
- Improvements in usability
- Improvements of Mastercopies handling
- Introduction of test tool for SiVArc Expressions

SiVArc – SIMATIC Visualization Architect HMI projects in the TIA Portal

 simple

 fast

 flexible

TIA Portal

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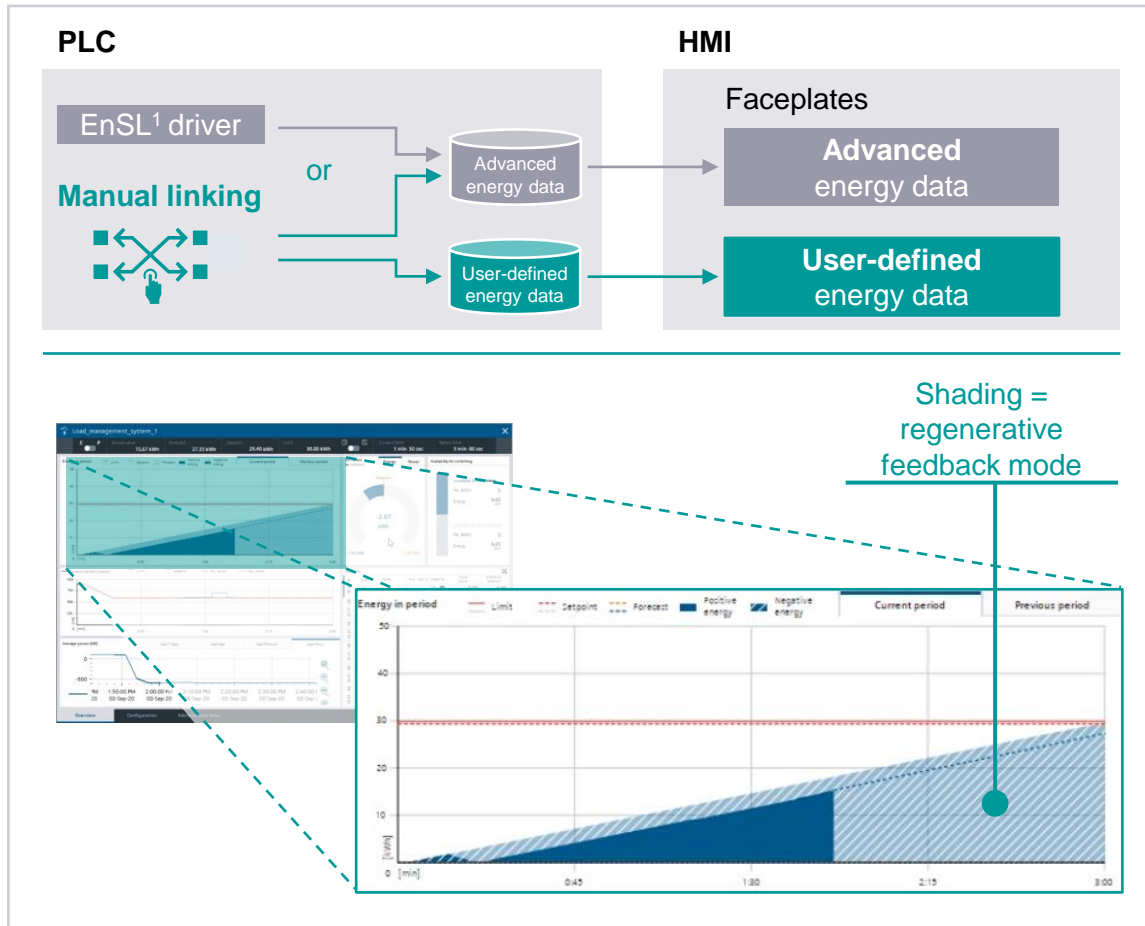
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SIMATIC Energy Suite V17

Overview of new functions



Flexible energy data connection thanks to integrated interface blocks

Individual interconnection of advanced and user-defined energy data enables manual connection²

- Measuring instruments supported by 3rd party or not by the EnSL
- By means of alternative communication channels (e.g. OPC UA, Modbus, cyclic process image)

Intelligent load management

- **Avoidance of expensive peak loads** and optimization of the energy supply through priority-based disconnection/connection of consumers and producers
- **PLC-based load management** – offers considerably greater flexibility and availability as a purely PC-based solution
- **Intuitive and simplified engineering of the actors** (consumers and producers) with automatic generation of the S7 program
- Screens included in scope of delivery (for WinCC Professional)
- **New in V17**
Support and visualization of the **regenerative feedback mode to the infeed** (= negative power consumption)

¹ EnSL – Energy Support Library | ² Connected energy tags are not counted as HMI power tags requiring a license

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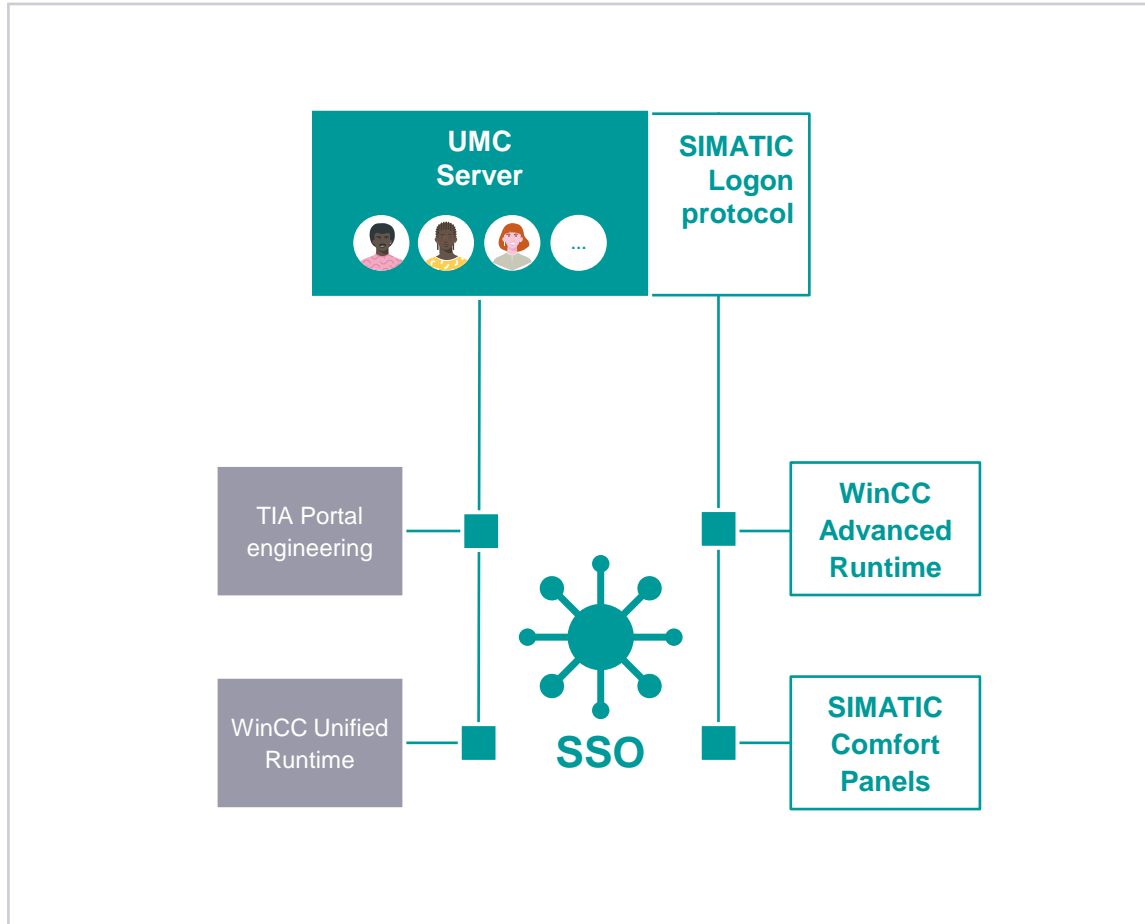
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Central user management (UMC)

Overview of new functions (from UMC V2.9 SP3)



SIMATIC Logon support

- The UMC server supports the SIMATIC Logon protocol
- This enables central user management for WinCC Runtime Advanced and Comfort Panels via UMC

Benefits

Integration of the SIMATIC Logon protocol enables use of an existing HMI Runtime system within a UMC domain.

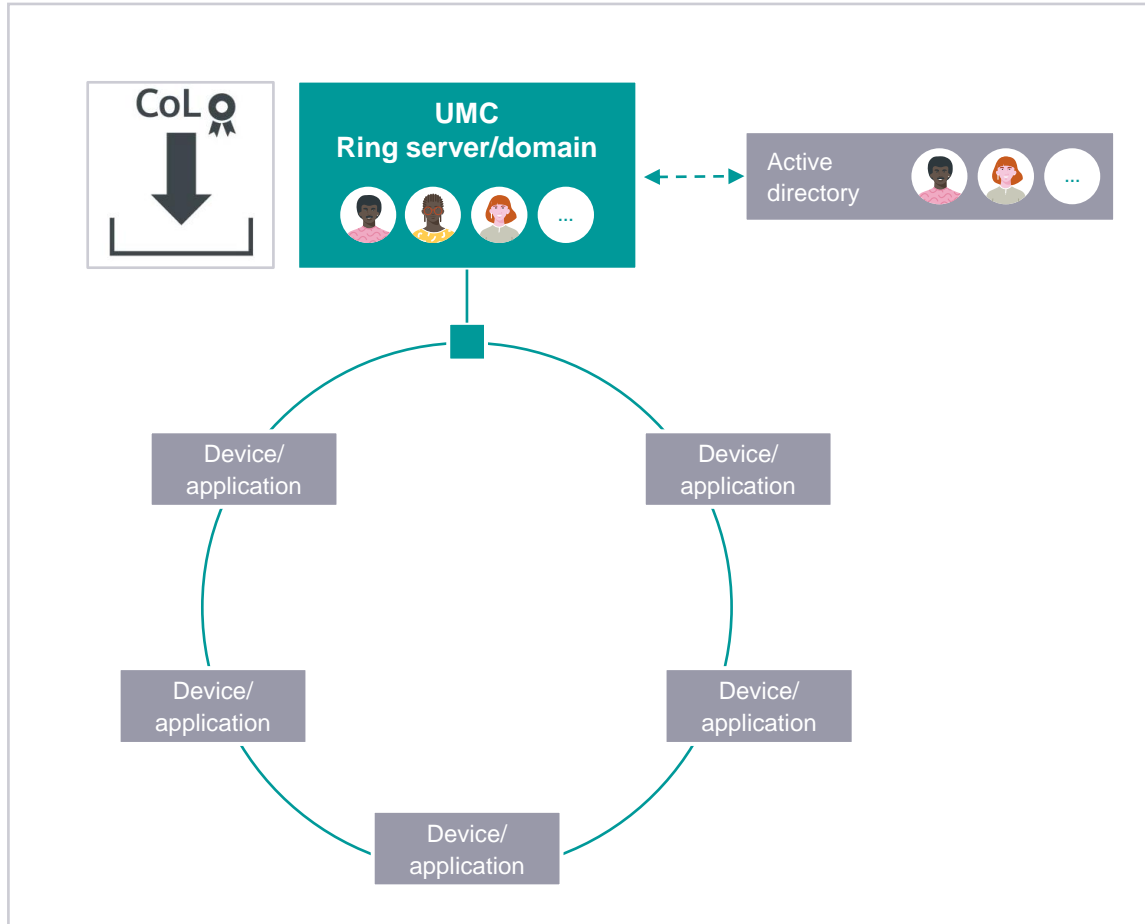
Single sign-on (SSO)

- TIA Portal and HMI Runtimes support the connection to single sign-on

Benefits

Single sign-on enables seamless authentication between a protected TIA Portal project and an HMI Runtime on the same operator station. Once authenticated, the application can take over the existing single sign-on user session.

Central user management (UMC) Licensing



License model

- The User Management Component (UMC) is included in the products' scope of supply
- The license model depends on the number of user accounts per UMC domain
- Up to ten user accounts can be created without a license
- Additional 100 user accounts as 365-day license
 - Article number: 6ES7823-1UE30-0YA0
- Additional 4000 user accounts as 365-day license
 - Article number: 6ES7823-1UE10-0YA0
- The licenses can be accumulated

Benefits

- First steps possible without license costs
- Appropriate license for low number of user accounts
- Flexible expandability with accumulative licenses
- Flexible adjustment thanks to limited license period

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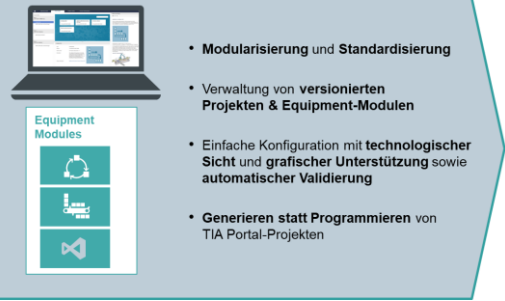
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Modular Application Creator V2.0 (MAC)

S7-1500 and S7-1500 T-CPU

Modular Application Creator



- **Modularisierung und Standardisierung**
- Verwaltung von **versionierten Projekten & Equipment-Modulen**
- Einfache Konfiguration mit **technologischer Sicht und grafischer Unterstützung** sowie **automatischer Validierung**
- **Generieren statt Programmieren** von TIA Portal-Projekten

Weihenstephan	OMAC ¹	Intelligent Belt	Demo Modules	Printing Standards

1 Organization for Machine Automation and Control

Feature/function

Modularization and standardization

Management of versioned projects and equipment modules

Simple configuration with technological view and graphical support

Generating instead of programming TIA Portal projects.

5 modules available.

Benefits

Supports the user when organizing his software for re-use

Version assignment for modules ensures re-use for specific applications
Version assignment for projects ensures specific module versions can be found quickly in combination with specific hardware and firmware.

Ensures the efficient configuration of all required parameters in a technological view and not in a programming tool.

Generating the project only takes a few minutes instead of copying manual program blocks and configuring all the data.
The generation process also ensures that all parameters and settings are error-free and complete, and the project can be put into operation immediately.

3 modules available for packaging.
One module for operating printing standards.
Creation of customer's own modules currently being prepared.

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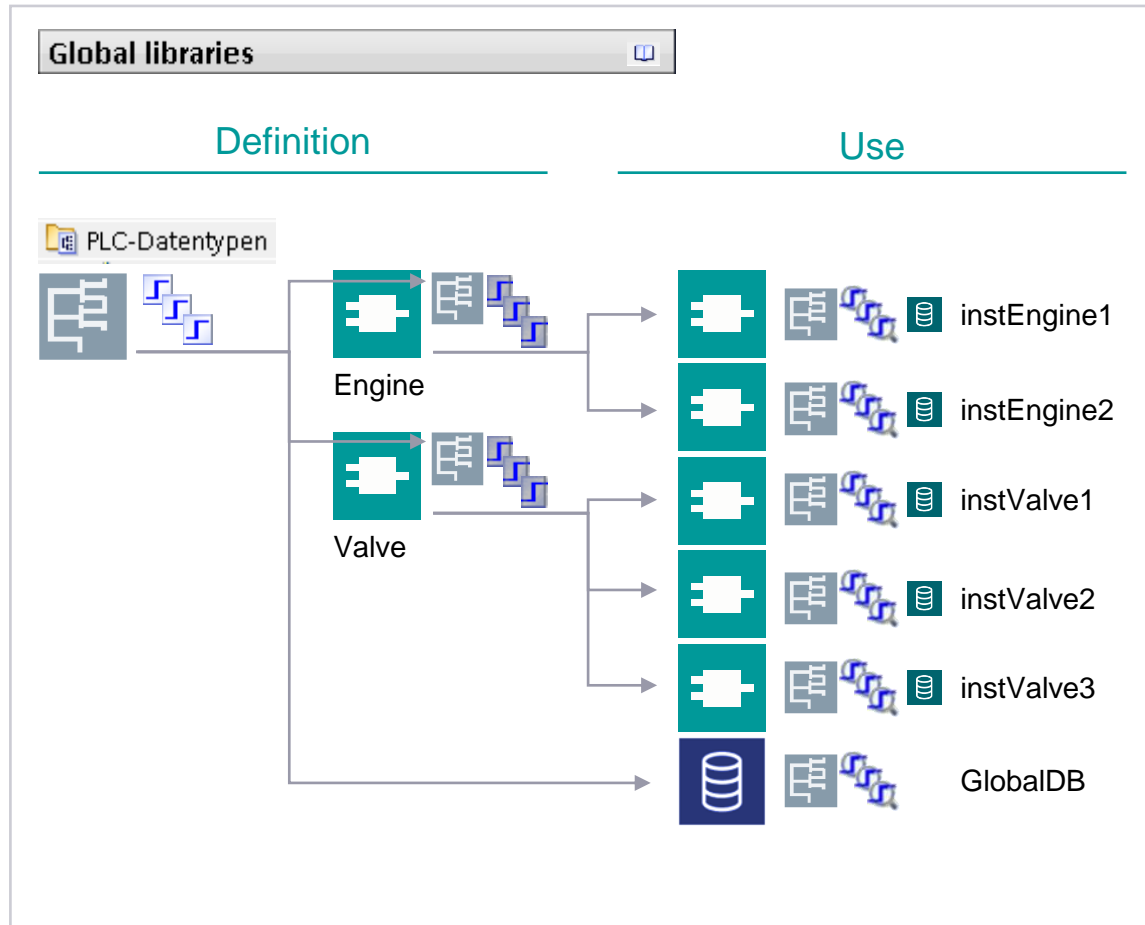
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S7-1200: Diagnostics, methods; S7-1500: Alarms and Conditions, Server modelling, Client: new Compact blocks, GDS – certificate handling
- **PLCSIM/PLCSIM Advanced**
Support of S7-1500 R/H CPU, secure communication with OPC UA, OUC und HTTPS
- **SIMATIC Target for Simulink**
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Openness Support of style guide Check and application test
- **SiVArc**
Support of WinCC Unified, new expressions, usability enhancements
- **Energy Suite**
Improved load management and flexible energy data connections (by Proxy-DBs)
- **Central User Management (UMC)**
Single Sign-on, SIMATIC Logon-protocol, licensing
- **Modular Application Creator**
- **ProDiag**
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TIA Portal options – ProDiag

Comprehensive extension of functions – supervisions in PLC data types




Function

- Supervisions within the PLC data types now enable a comprehensive type instance concept for process diagnostics
- Changes now only necessary in one place!
- A ProDiag supervision does not necessarily need to be assigned to instances of PLC data types (then no diagnostic function available)
- Additional supervisions are possible at the point of use for the PLC data type so that further diagnostics are available for instance-specific needs.

Customer benefits

- Time-saving possible thanks to central management of supervisions, e.g. in the library
- Fewer sources of error as there is no manual definition of supervisions at the places where data types are used.

 = editable supervision function at the type

 = supervision function is in a subordinate object

 = actual supervision instance (with supervision code)

TIA Portal options – ProDiag

Extended functions – usability – new icons for better orientation

UDT TYPE WITHOUT SV			
Name	Data type	Supervision	
UDT TAG 1	Bool		
UDT TAG 2	Bool		
UDT TAG 3	Bool		

UDT TYPE WITH SV			
Name	Data type	Supervision	
UDT TAG 1 SV	Bool		
UDT TAG 2 SV	Bool		
UDT TAG 3 SV	Bool		

Default tag table

	Name	Data type	
1	TAG 1	"UDT TYPE WITHOUT SV"	
5	TAG 2	"UDT TYPE WITH SV"	
9	<Add new>		

Default tag table

	Name	Data type	Supervision
1	▼ TAG 1	"UDT TYPE WITHOUT SV"	
2	UDT TAG 1	Bool	
3	UDT TAG 2	Bool	
4	UDT TAG 3	Bool	
5	▼ TAG 2	"UDT TYPE WITH SV"	
6	UDT TAG 1 SV	Bool	
7	UDT TAG 2 SV	Bool	
8	UDT TAG 3 SV	Bool	
9	<Add new>		

local definitions

Function

- With the introduction of the supervisions in PLC data types in particular, the new icons' purpose is to improve orientation
- The supervisions are now also marked with icons in the instances; the properties of the supervisions themselves on the Property page
- In contrast to the previous version, it quickly becomes apparent whether blocks called within the multi-instance contain supervisions. This is especially true with multi-instances.

Customer benefits

Improved overview compared to previous version of the places where ProDiag supervisions are used



Supervision definition
(PLC data type, FB)



Nested supervision
(defined in subordinate object)



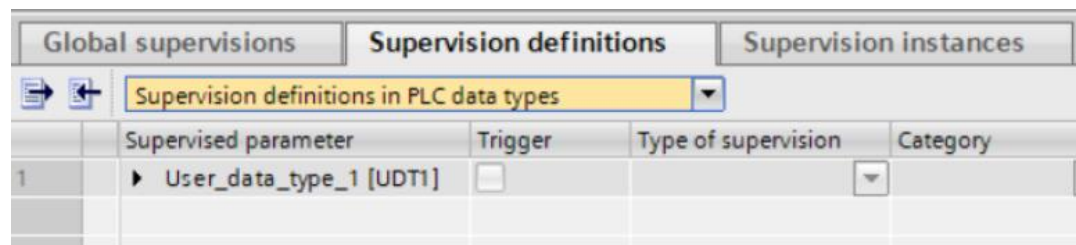
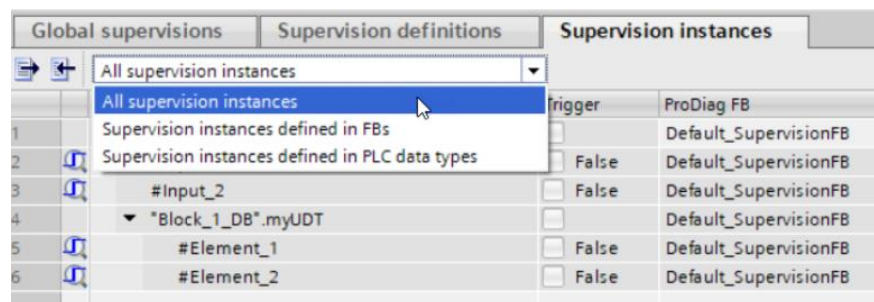
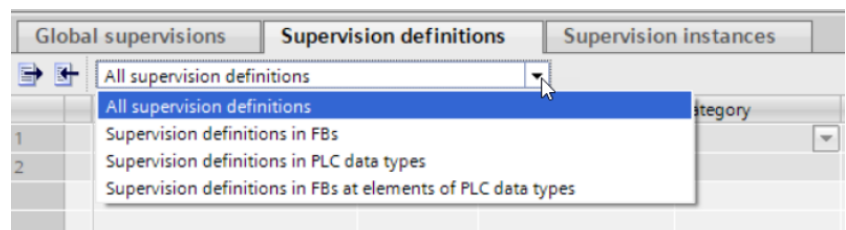
Supervision instance
(tag table, shared DB, I-DB)



TAG supervision
(tag table, global DB)

TIA Portal options – ProDiag

Extended functions – usability – ProDiag filters



Function

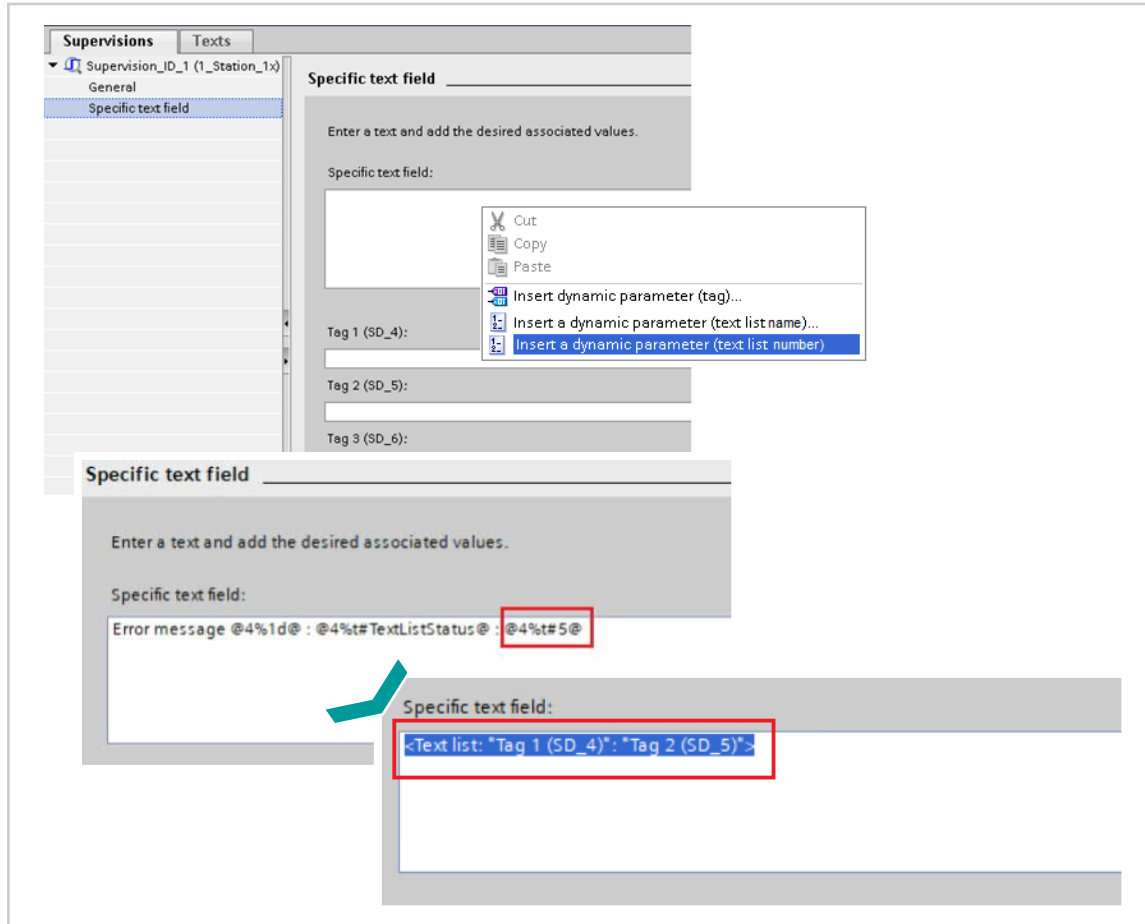
- From version 17 and higher, filters are available in the ProDiag editors to enable a better overview
- The filters on supervisions in PLC data types in particular make it easier for the user to differentiate between supervisions at the type or at the instance

Customer benefits

When migrating from the predecessor project, the customer can use the filter options to quickly limit the supervisions used at data structures so that they can then be defined in the PLC data type at a point in the future.

TIA Portal options – ProDiag

Extended functions – usability – easily editable specific text box



Function

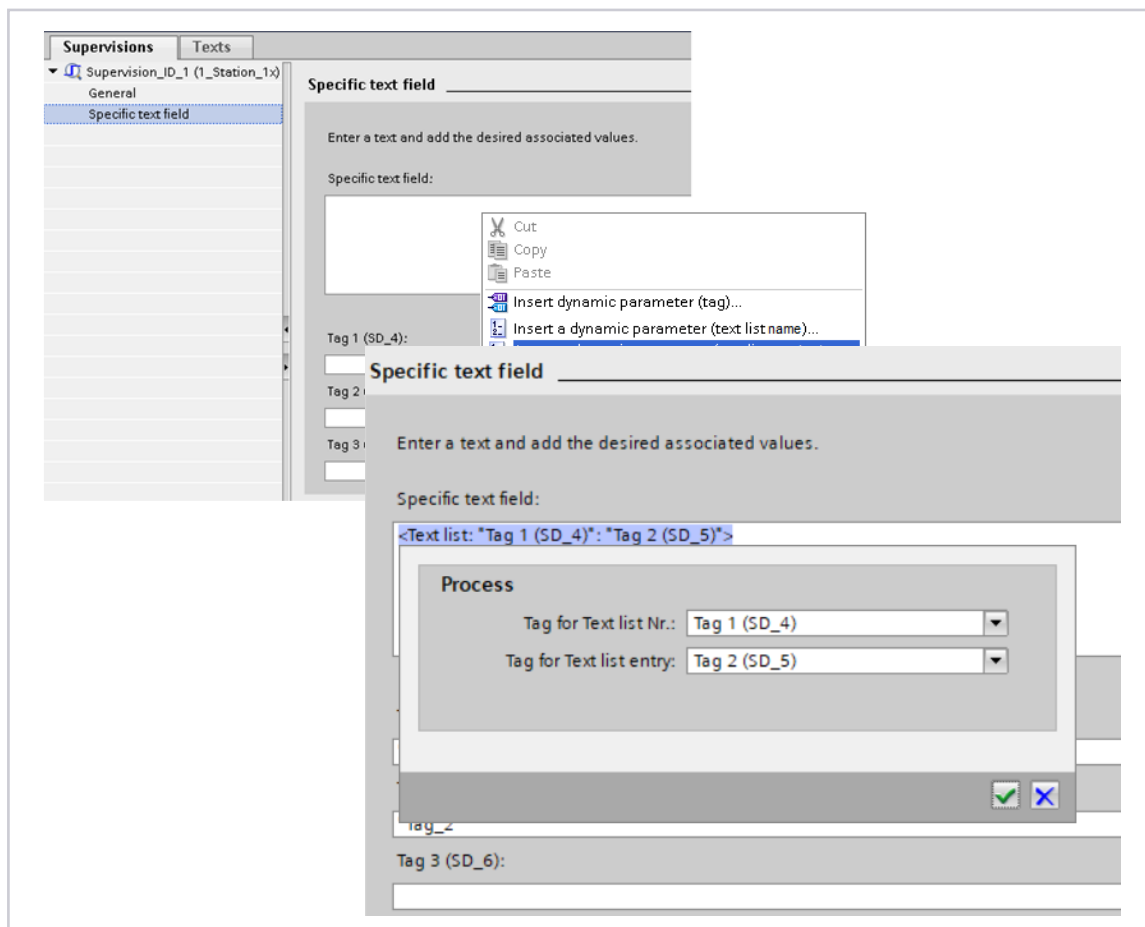
- Simple parameter assignment of the associated values by means of guided operation steps including syntax check
- Compatibility to previous versions is ensured: The @-syntax can continue to be used if needed. Previous inputs remain unchanged
- A new form of input has been added accordingly to the export/import file, which means that an external adjustment can be made at any time

Customer benefits

- No import required in the online help regarding use of the @-syntax
- Immediate implementation of the required parameter assignment without previous knowledge thanks to simple usability

TIA Portal options – ProDiag

Extended functions – text list can be addressed in user program



Function

- In the user program, text lists can now be addressed on the basis of a number and by citing an associated value¹
- The fixed reference via the name of a text list is no longer needed: In the user program, the text lists can be used with some degree of flexibility for messages, depending on the process conditions

Customer benefits

- Library blocks can now be used with an even higher degree of flexibility
- Text lists are multilingual and therefore more advantageous for message-associated values than fixed strings in the user program

¹ S7-1500 PLC with firmware version 2.9 or higher is required (central message management in the PLC)

TIA Portal

Highlights of TIA Portal V17

WinCC Unified

- Improved screen engineering with new style
- Graphics and faceplates (with functional enhancements) in library
- Extended communication and 1st set of system diagnostic
- Audit for PC
- WebClient for panel

Plant Intelligence Options

WinCC – Innovations

- WinCC Advanced:
Template & Popup screens in the library
- WinCC Professional:
Raw data for S7-1500, new system tags

STEP 7 – Innovations

- CEM – Cause Effect Matrix
- CFC – Continuous Function Chart (planned for July 2021)
- Download / Upload of user groups
- Functional enhancements in the cross-reference list
- Openness extensions for project generation

Startdrive – Innovations

- Support of SINAMICS G115D
- S120: Data set switching, manual optimization
- SINAMICS DCC: Know-how-protection

Hardware configuration

- Global Offline/Online comparison
- Offline/Offline comparison at parameter level
- CPU 1518HF-4PN: Safety and redundancy
- Extended quantity structures for S7-1500 and ET200 CPUs
- Extensions for CPU 1518 MFP
- Disable and enable I-Device
- DHCP and DNS for S7-1500 and ET200 CPUs
- Web server innovations
- S7-1200 Highlights with FW4.5 (OPC UA/Webserver)
- CPU 1518T/TF-4 PN/DP: High performance motion control

System functions

- Openness-extensions for libraries and UMAC
- User Management & Access Control (UMAC)
- Library
- Security per Default
- TIA Portal Language Packs
- Last used objects

TIA Portal Options

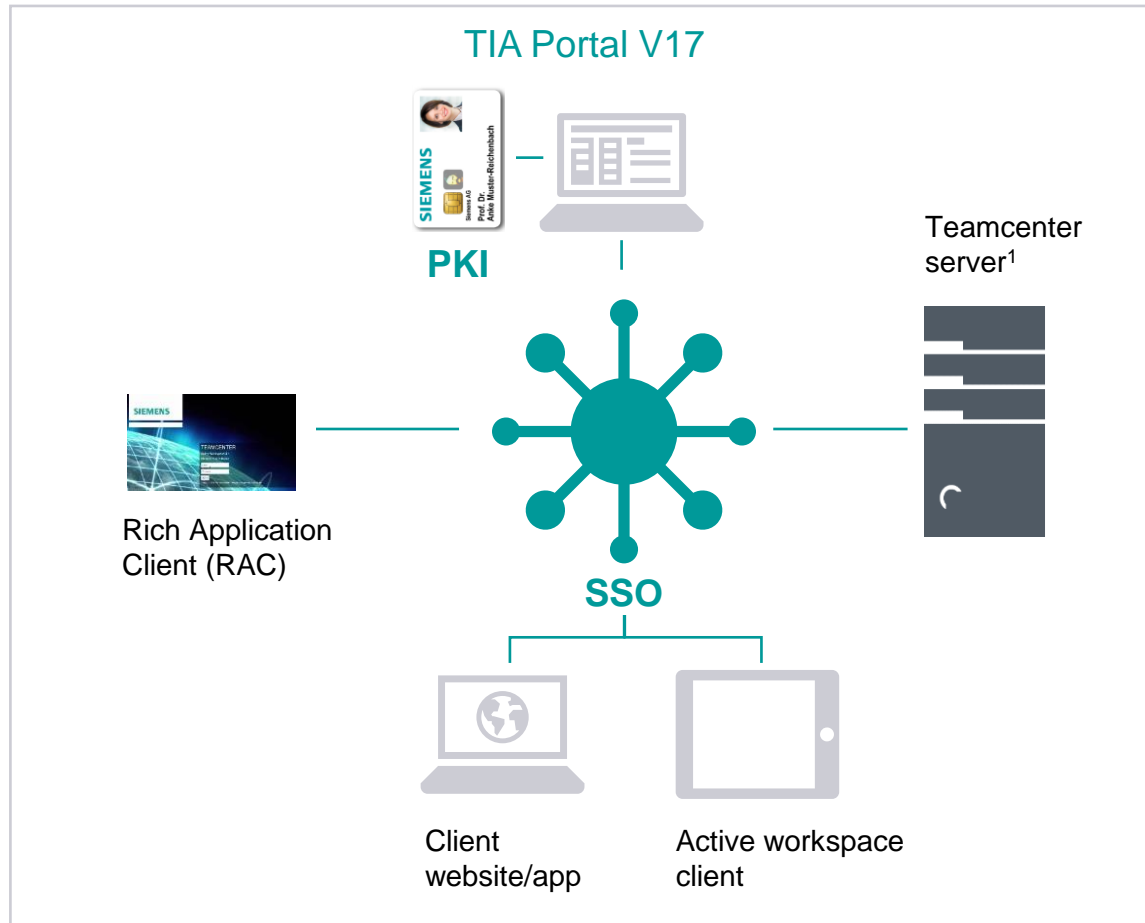
- **STEP 7 Safety**
Fast Commissioning, nested UDTs, Openness-extensions
- **SIMATIC Safe Kinematics**
Function, advantages and requirements
- **Multuser**
- **SIMATIC Robot Library**

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Teamcenter Gateway

Single sign-on and smart card (PKI) support



Single sign-on and smart card (PKI) support

- Supports a secure connection between TIA Portal and Teamcenter via "single sign-on" (SSO)
- Authentication by means of customized smart card (PKI)

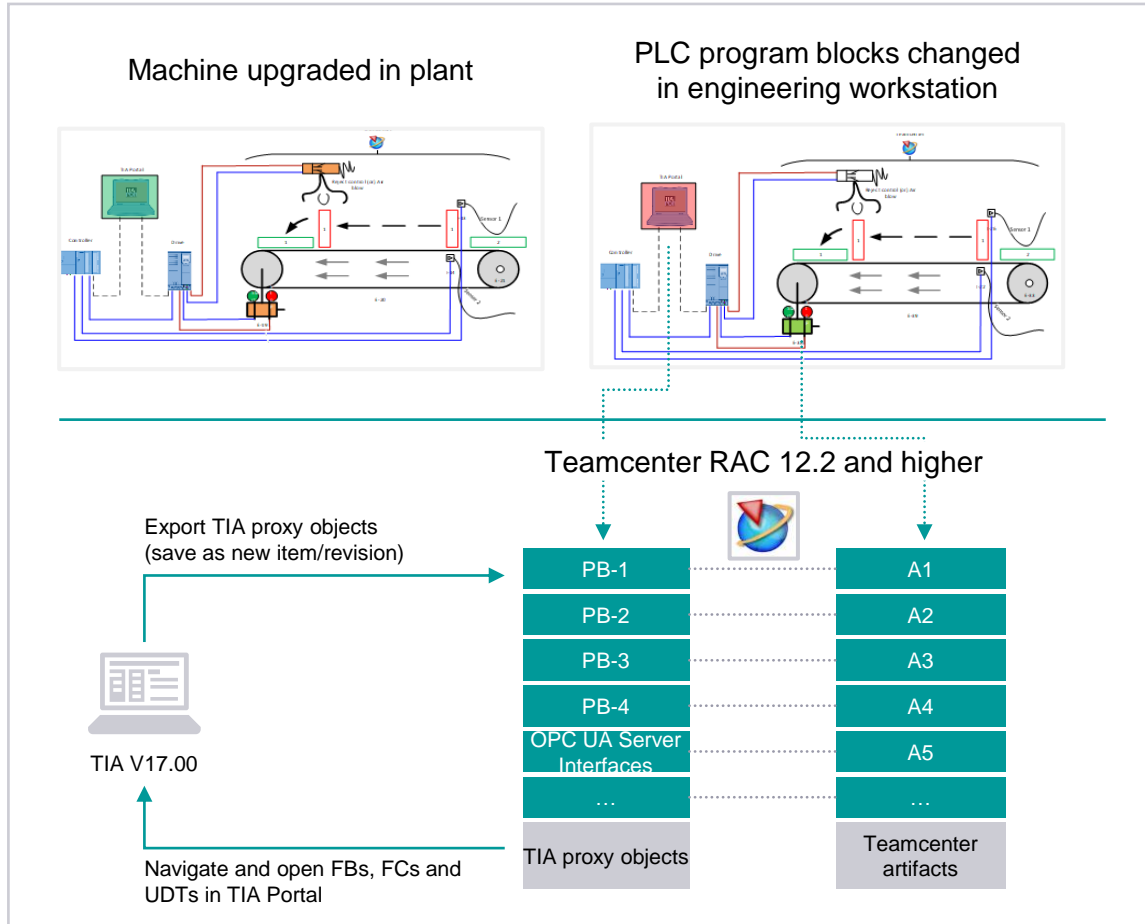
Benefits

- Secure connection between TIA Portal and Teamcenter
- High level of usability thanks to SSO authentication of the Teamcenter clients¹ on the Teamcenter server
- Use of company's own smart cards with PKI simplifies password handling and increases security

¹ With SSO support

Teamcenter Gateway

Link between Teamcenter and TIA Portal objects



Link between Teamcenter and TIA Portal objects (Program blocks, UDTs and OPC UA server interfaces)

- Central activation/deactivation of the export of TIA Portal objects (as proxy objects) to Teamcenter
- Joint export of the TIA Portal project together with the proxy objects as new Teamcenter elements
- Creation of proxy object revisions
- Navigating and opening TIA Portal blocks and UDTs directly from Teamcenter
- Customizable tool to perform bulk linking of TIA Portal proxy objects and Teamcenter elements. The tool is available in SIOS (Siemens Information Online System)

Benefits

- Teamcenter artefacts (such as a motor) can be directly linked to the associated function blocks or UDTs thus supporting consistent project management
- Fast and simple tracking of changes
- Fast and secure navigation of Teamcenter artefacts to the associated TIA Portal objects
- Reduction of engineering time through automated linking of TIA Portal proxy objects and Teamcenter elements

| Contact

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