

TIA Portal V17

Webinar Launch

Your gateway to automation
In the Digital Enterprise



SIEMENS

TIA Portal V17

Webinar Launch

Timetable:

Wednesday, 23 June	9.30am – 10.30am 4.00pm – 5.00pm	TIA Portal V17 Introduction WinCC V17 Innovations & Unified Highlights
Thursday, 24 June	9.30am – 10.30am 4.00pm – 5.00pm	WinCC V17 Innovations & Unified Highlights TIA Portal V17 Introduction
Wednesday, 30 June	9.30am – 10.30am 4.00pm – 5.00pm	Introducing S7-1500RH with Safety TIA Portal V17 Technical Highlights
Thursday, 1 July	9.30am – 10.30am 4.00pm – 5.00pm	TIA Portal V17 Technical Highlights Introducing S7-1500RH with Safety

TIA Portal V17

Webinar Launch

Please be advised that this session is being recorded.

It will be available for later viewing on the Siemens Australia website

<https://new.siemens.com/au/en/company/fairs-events.html>



TIA Portal V17 Technical Highlights

Your gateway to automation
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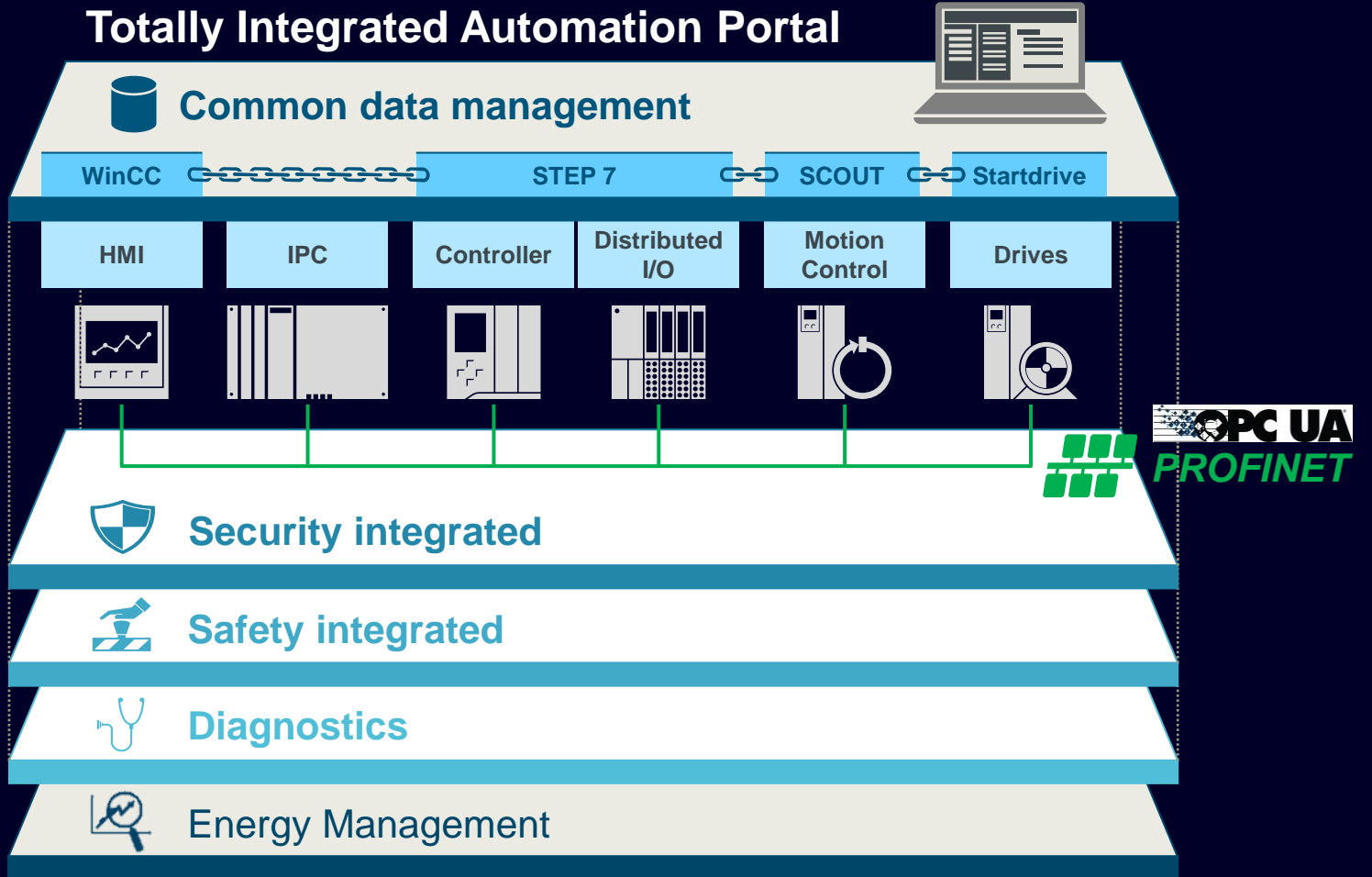
Totally Integrated Automation Portal (TIA Portal)

One for all... The proven basis for innovative solutions

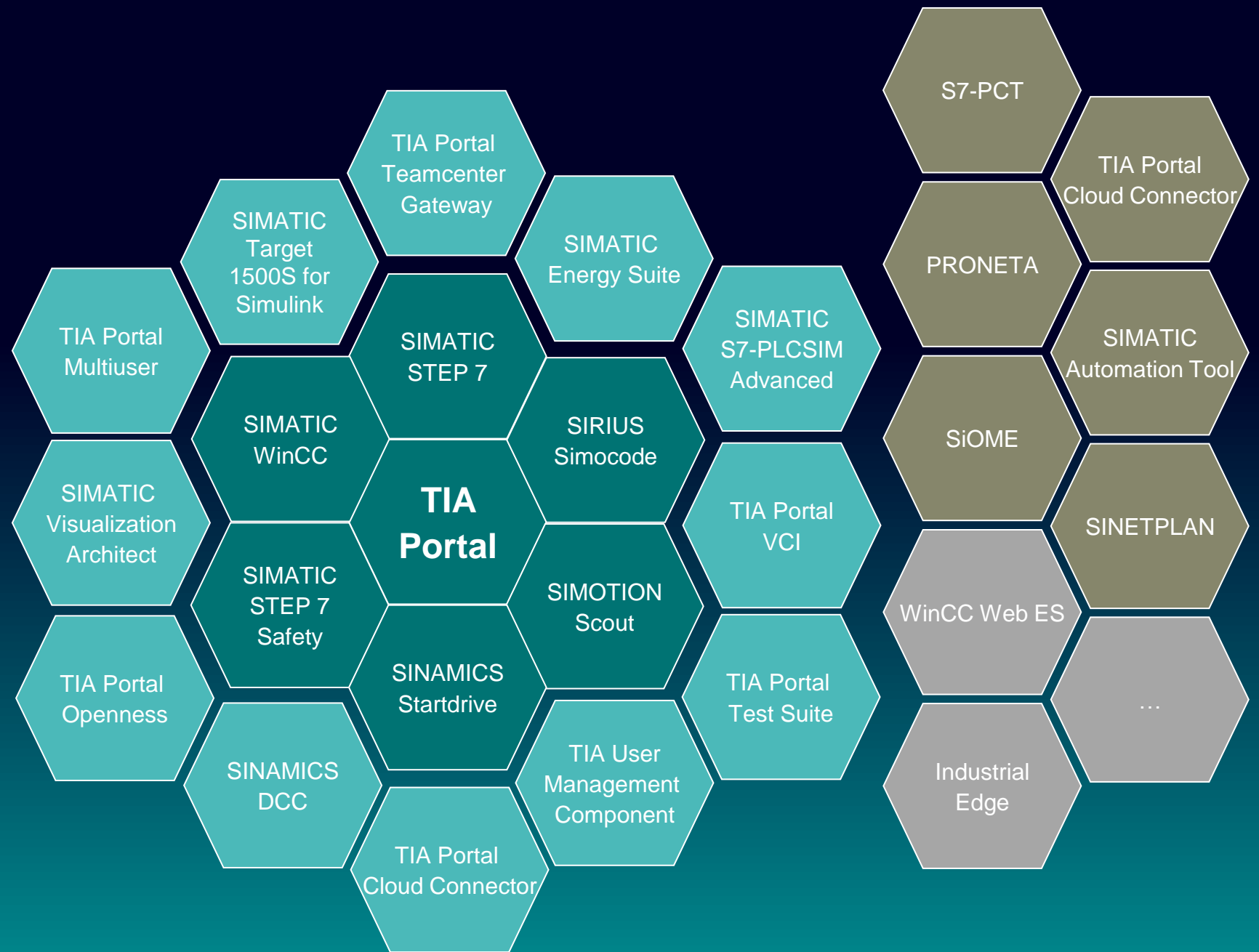
+ One common database

+ Consistent and unified operator concept

+ Common, central services



OUR EXISTING TIA PORTAL ECOSYSTEM FOR MAXIMUM FLEXIBILITY



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
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Code-generation for SIMATIC Edge & LiveTwin
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Openness Support of style guide Check and application test
- 🔗 **SiVArc**
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

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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

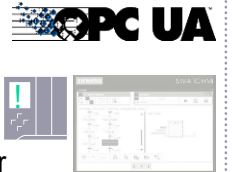
- **UI Enhancements**
 - F(x) for UCP
 - Alarm Hitlist (PC), ...
- **Management of objects in libraries**
 - Versioning and deployment
 - Integration of faceplates and graphics

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



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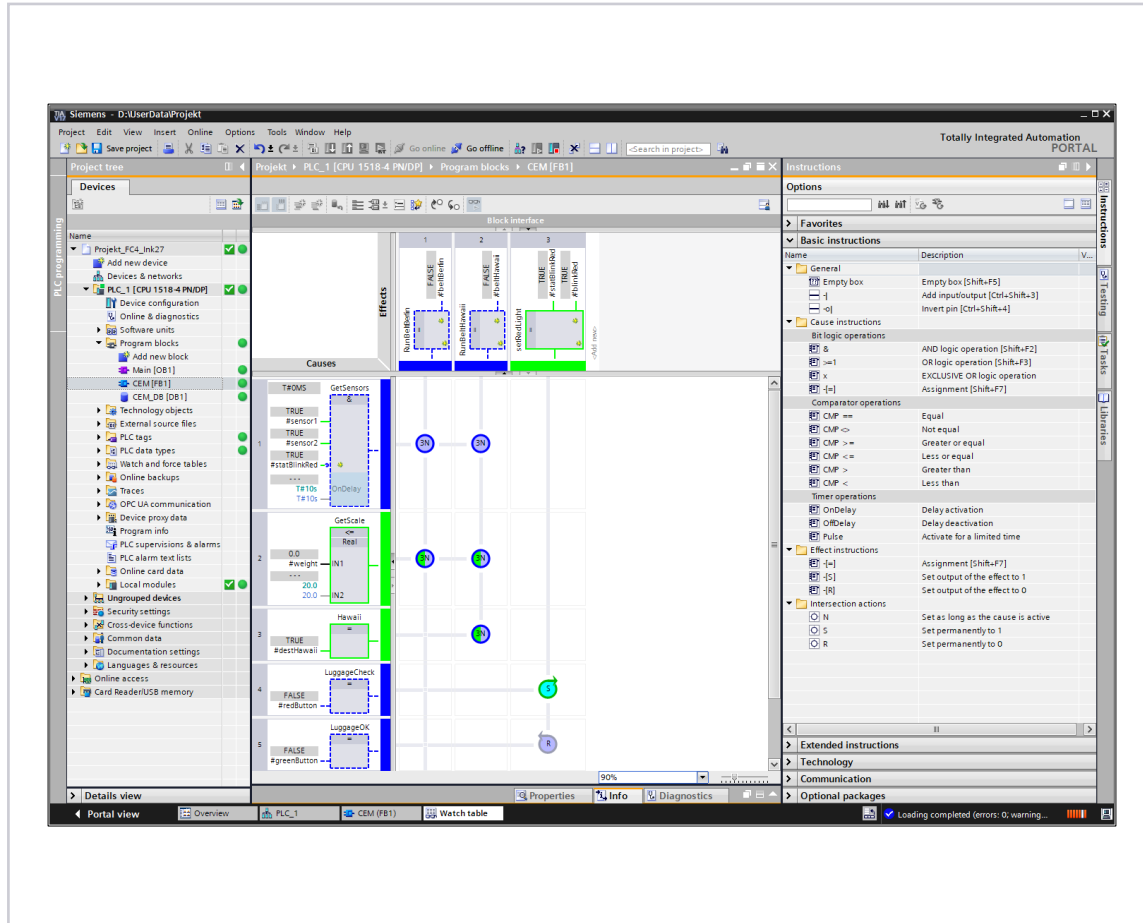
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STEP 7 – innovations

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

Integrated in TIA-Portal

Observe online

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**

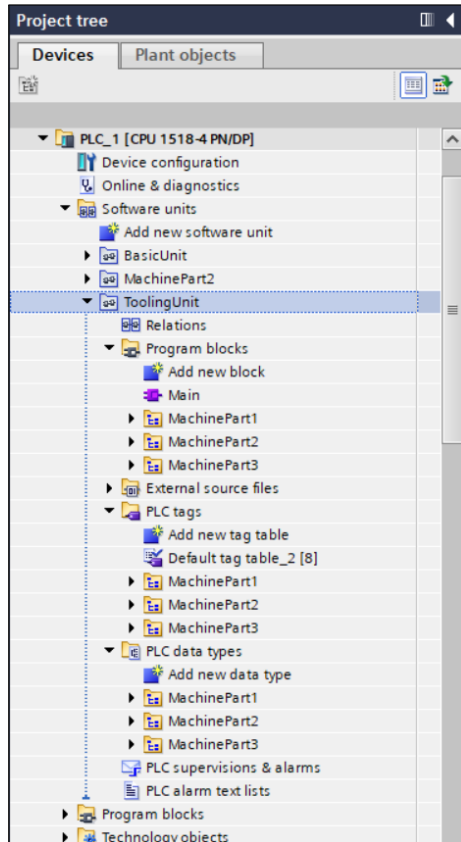
Use of “Chart in Chart” technology for a hierarchical structure
→ **Significantly less possible error sources**

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

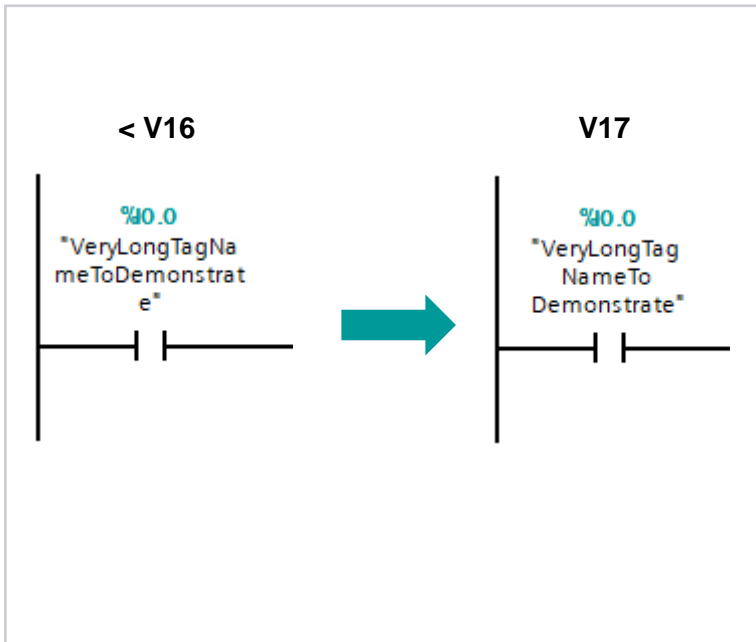
Access to group structure even if the offline program is not available

STEP 7 – innovations

General extended functions

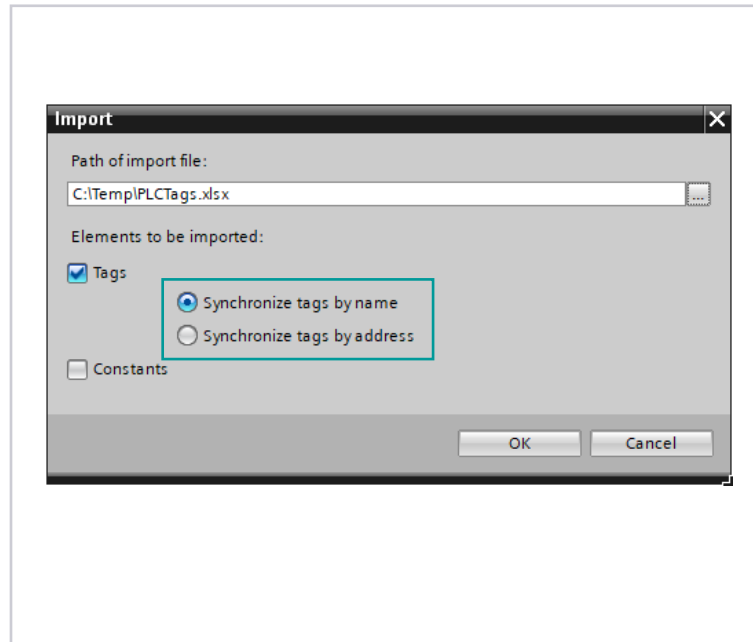
Improved line break at variable names

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

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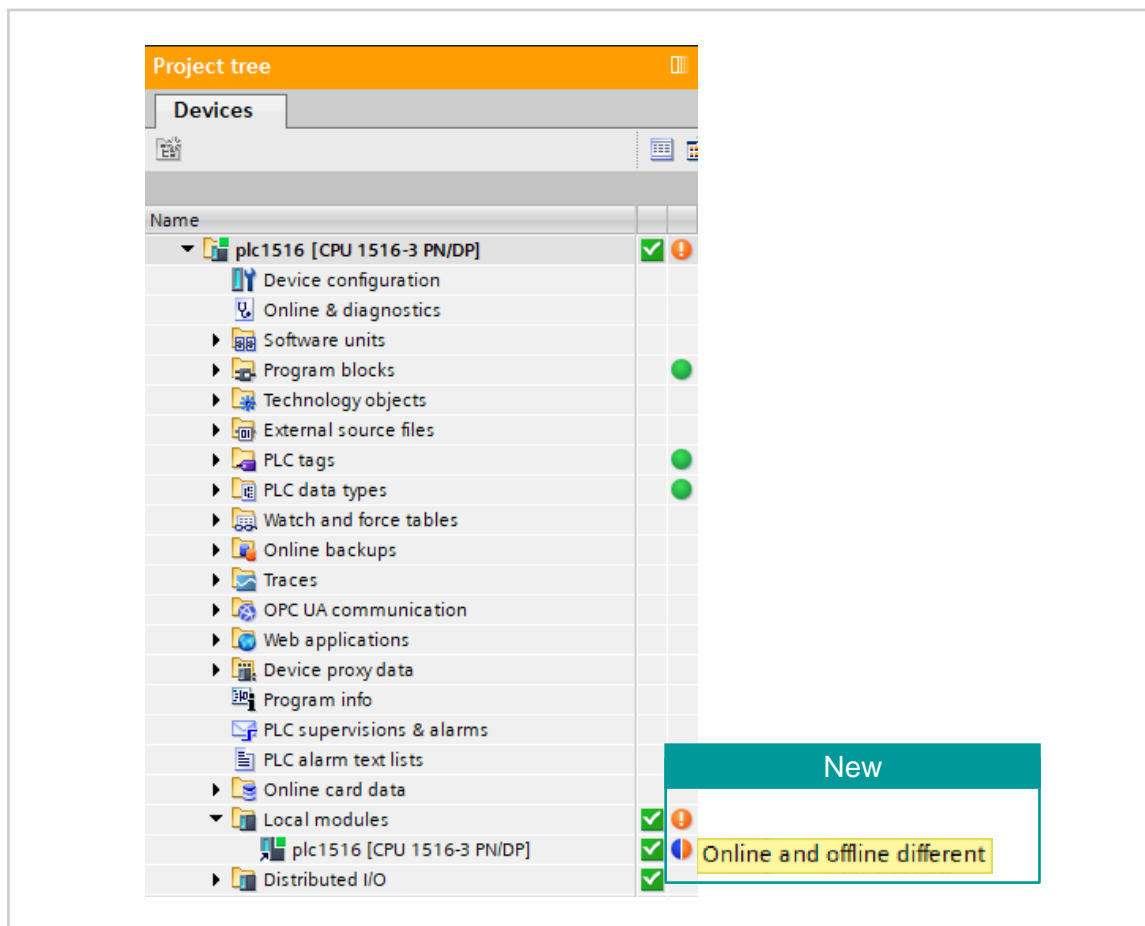
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TIA Portal – hardware configuration

Global offline/online comparison



Function

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

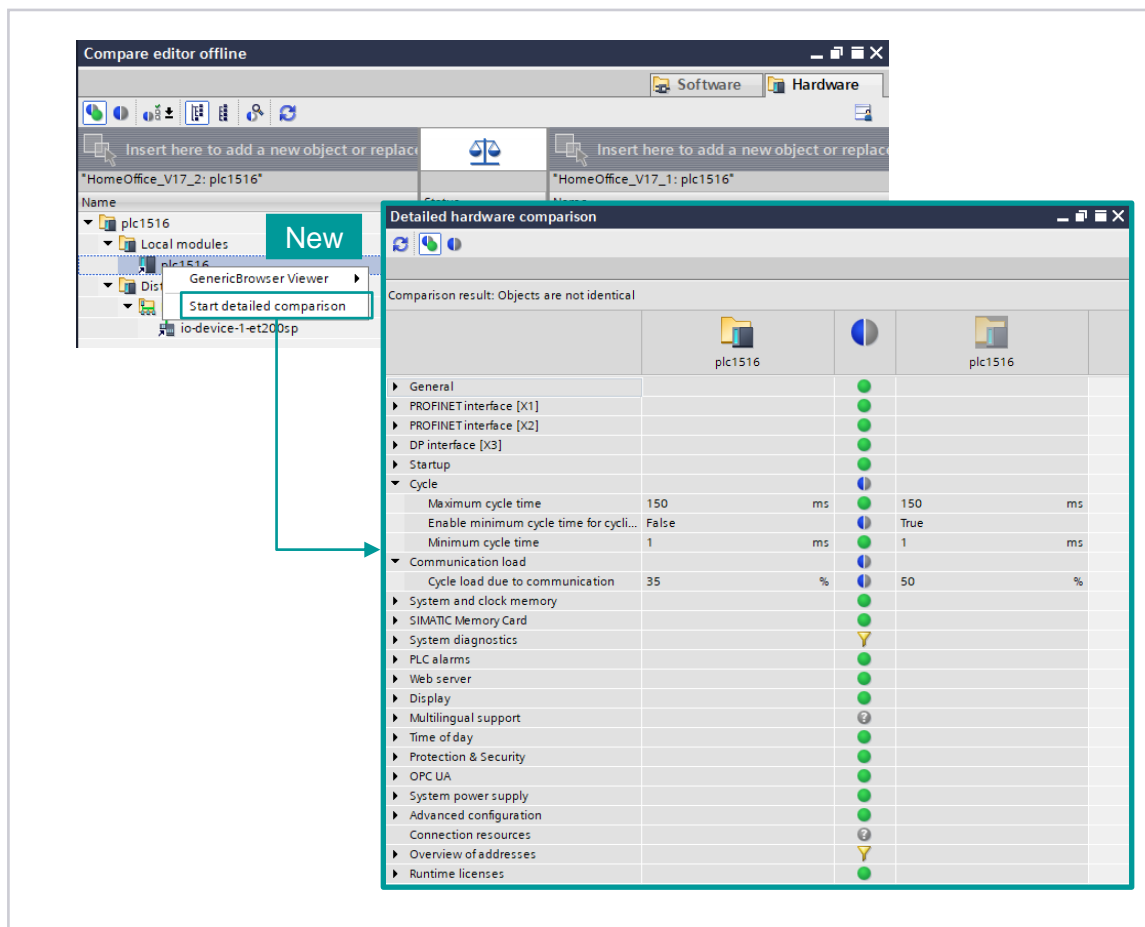
- Quick overview
- Distributed I/O for the PLC is taken into account
- Based on checksums and takes user inputs into account

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"

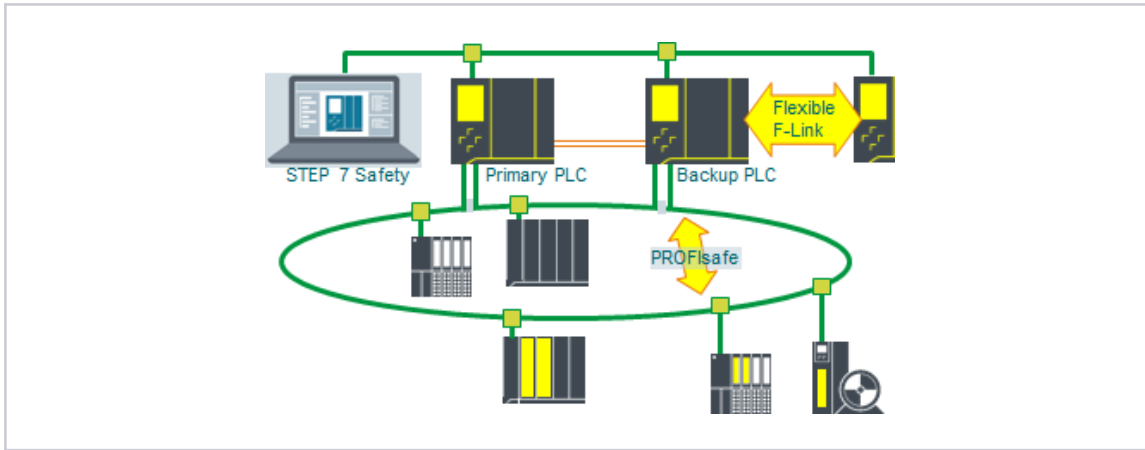
Note

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

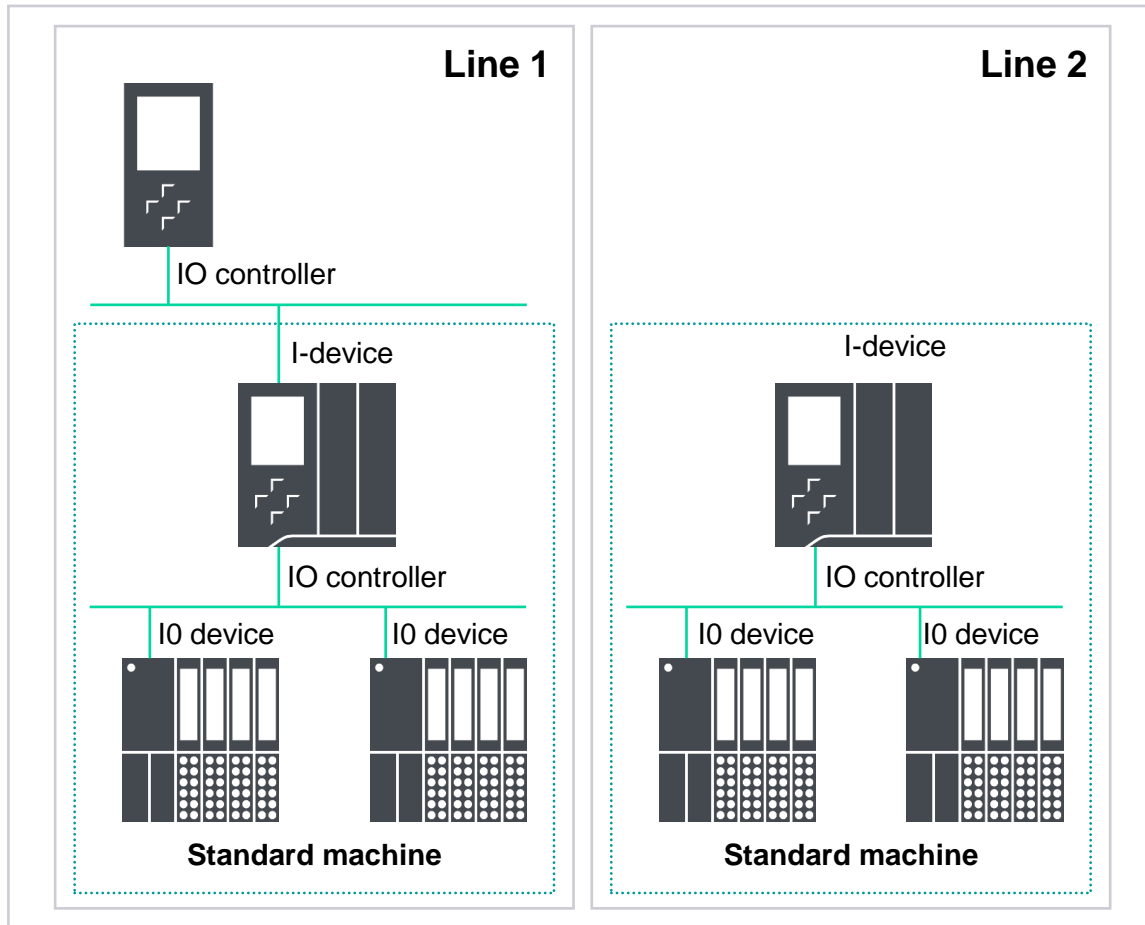
Increase in configuration limits for ET 200 and S7-1500 CPUs:

- 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

Deactivating/activating the I-device in the user program



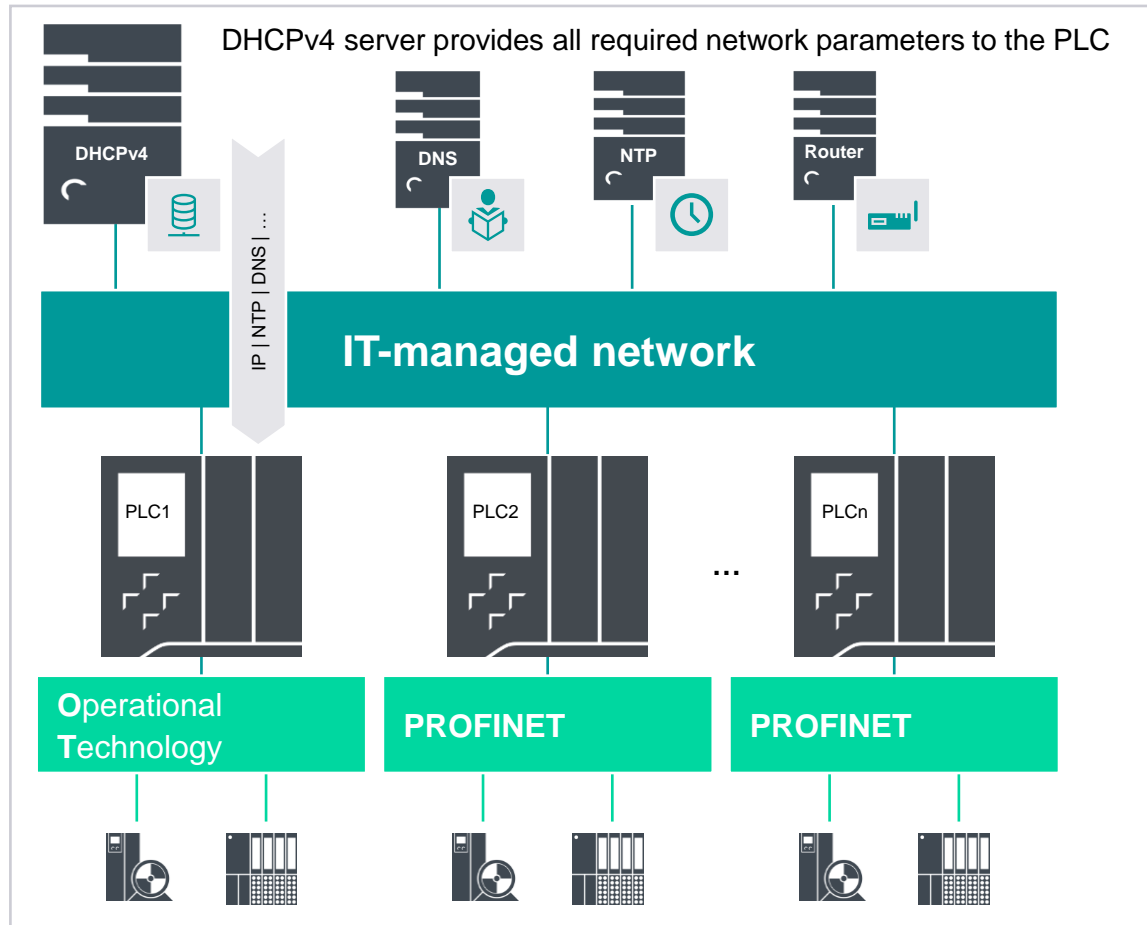
- The I-device configuration of a CPU can be deactivated or re-activated by using the instruction "D_ACT_DP"
- If the IO controller is not available, the I-device CPU no longer indicates an error via its ERROR LEDs (if the I-device function is deactivated by the user program)
- Pre condition: TIA Portal 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's

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

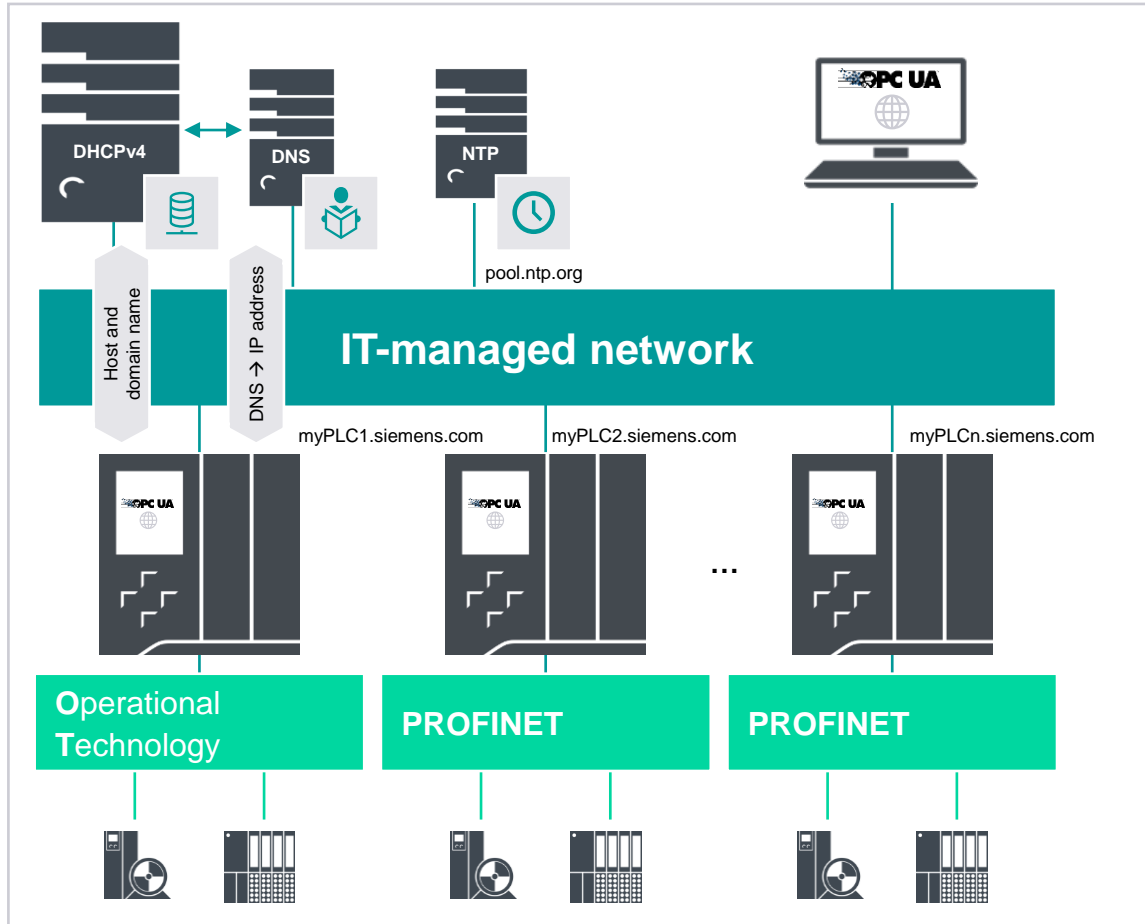
- Use of the CPU in IT-managed networks.
- Modular design of production plant (plug & produce)

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



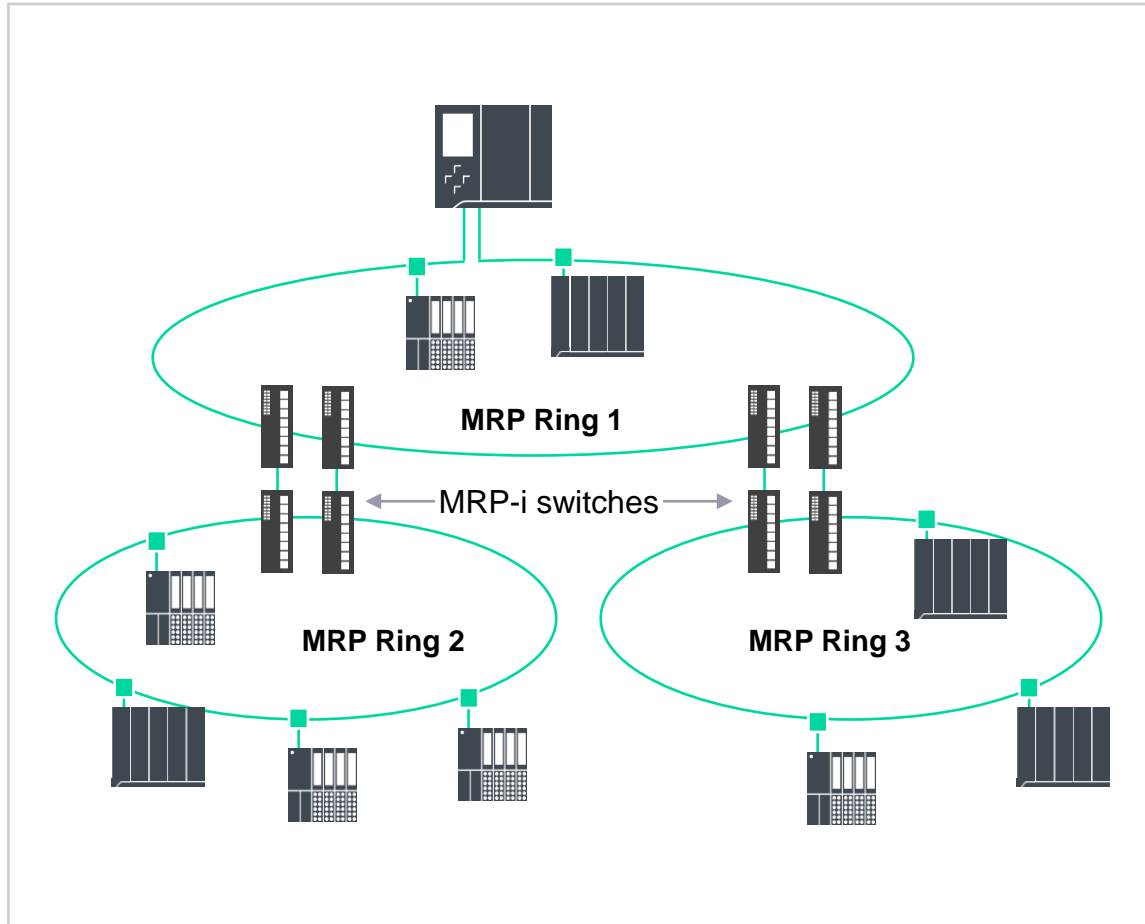
DNS – Domain Name System

- **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 – 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.

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

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

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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

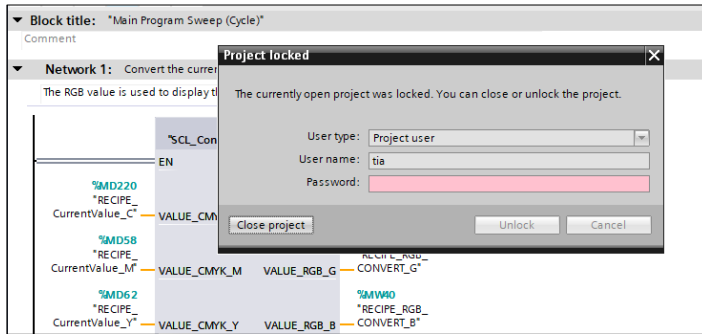
The previous access protection for the TIA Portal project differentiated between read and write access.

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

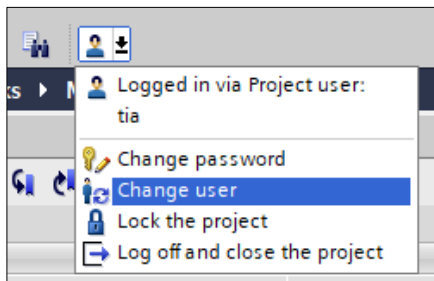
In engineering, this protects numerous actions and workflows against unauthorized users.

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.

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

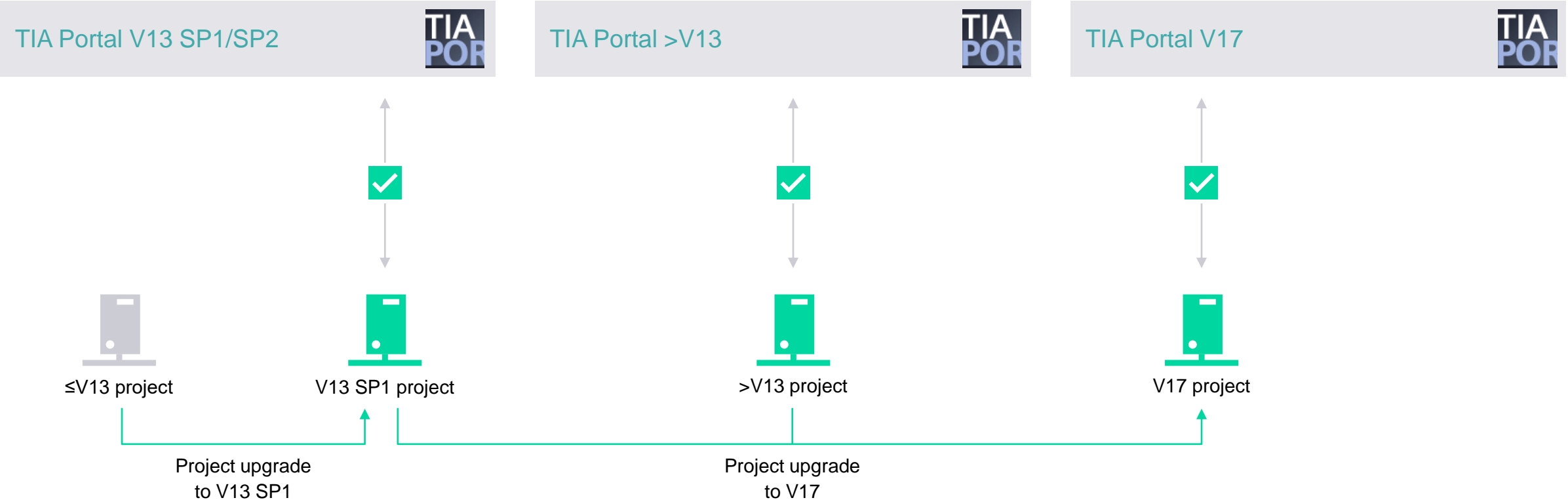
- When importing the translated types, a new version is created

Extended functions for creating copy templates

- When creating copy templates, the folder structures are retained

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

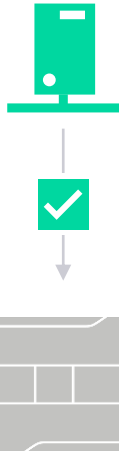


Firmware V4.5


TIA Portal V17



V17 project
with FW 4.5



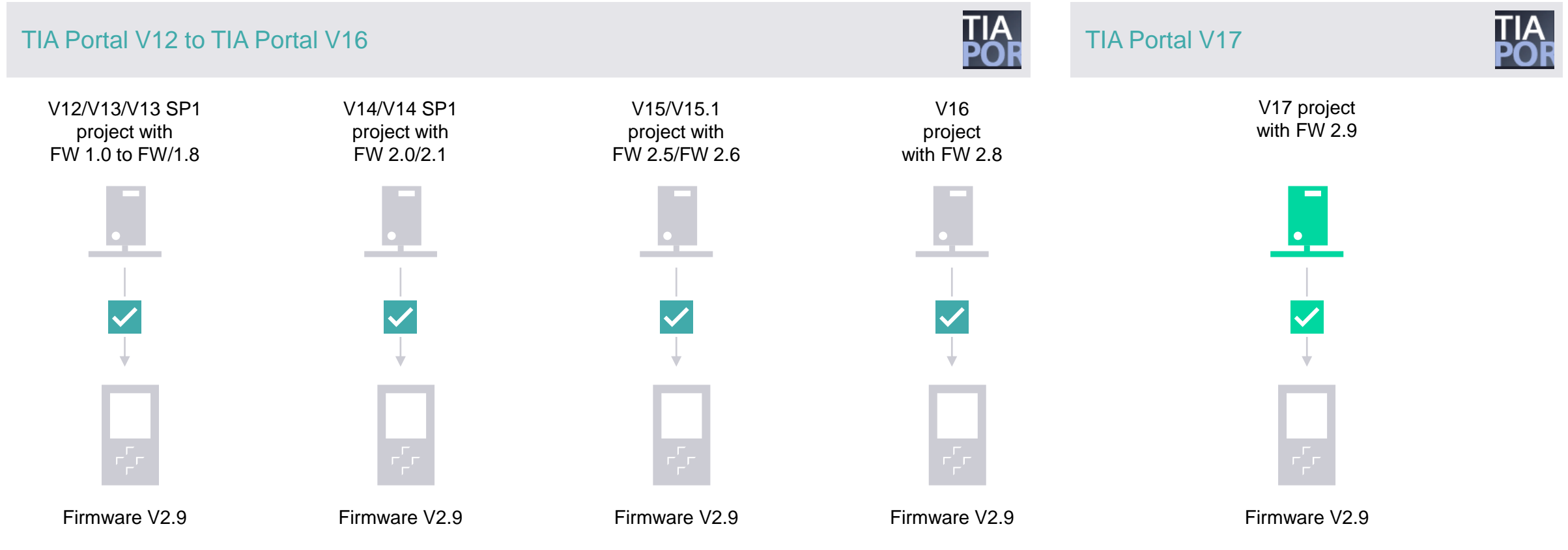
Firmware V4.5


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

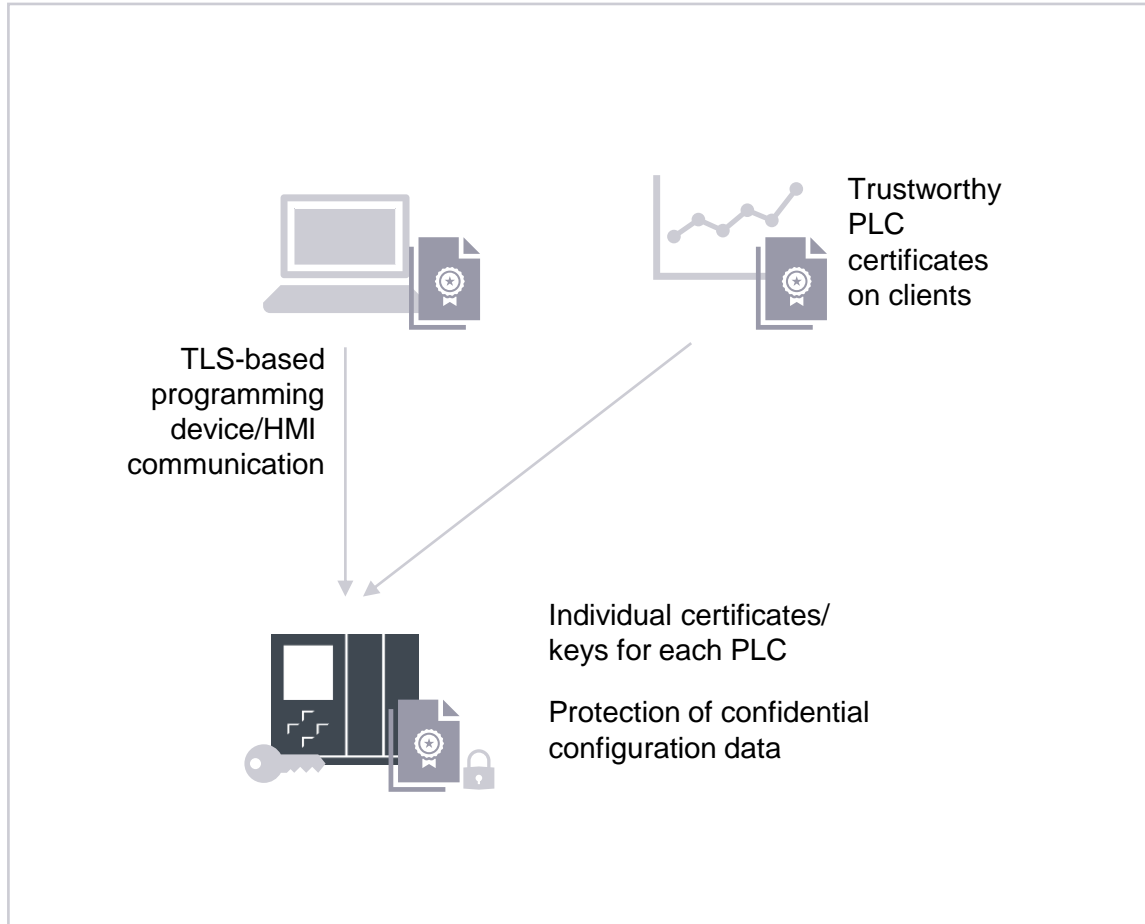


Full spare part functionality: Online support: ID 109744163 

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

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)

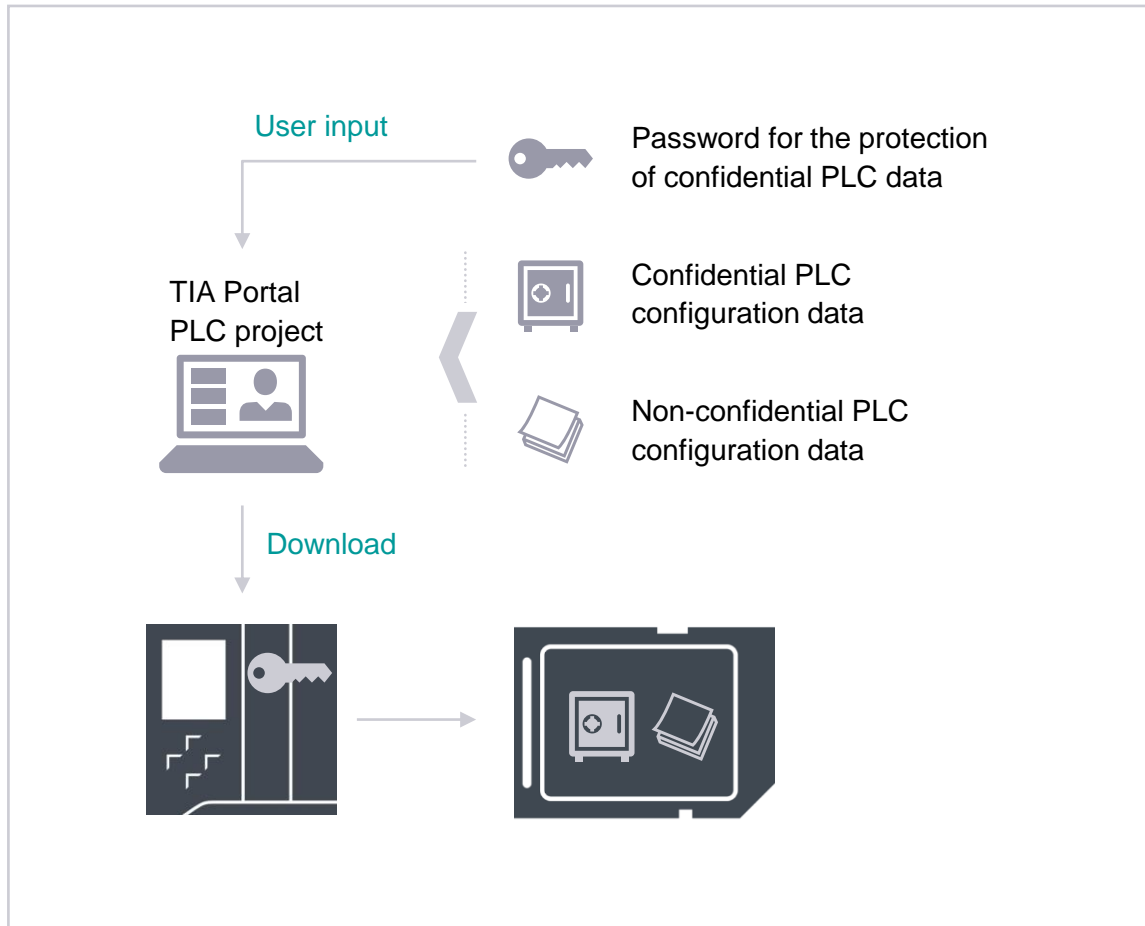
Benefits

- 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

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

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- 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
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- S7-1200 Highlights with FW4.5 (OPC UA/Webserver)
- CPU 1518T/TF-4 PN/DP: High performance motion control

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

TIA Portal Options

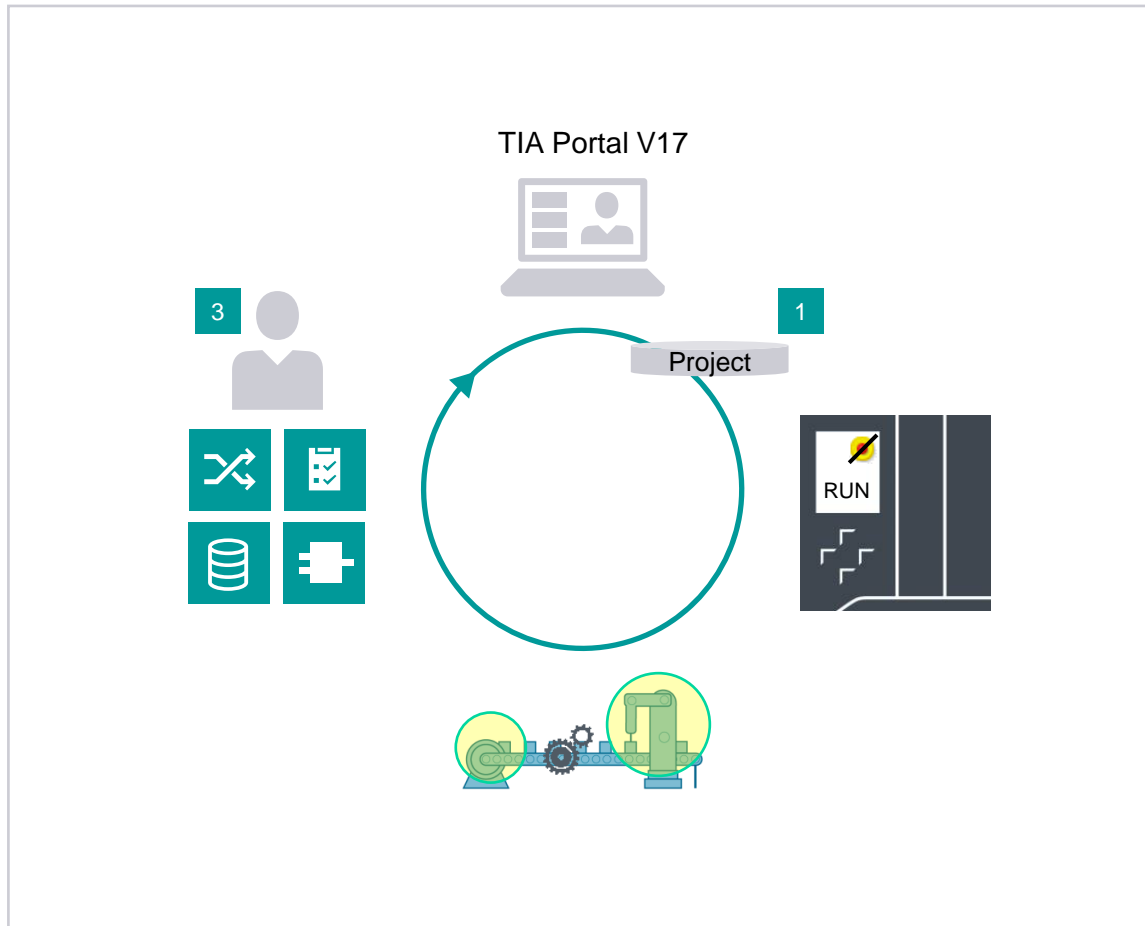
- **STEP 7 Safety**
Fast Commissioning, nested UDTs, Openness-extensions
- **SIMATIC Safe Kinematics**
Function, advantages and requirements
- **Multuser**
- **SIMATIC Robot Library**

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SIMATIC STEP 7 Safety V17

Fast Commissioning



Fast Commissioning workflow

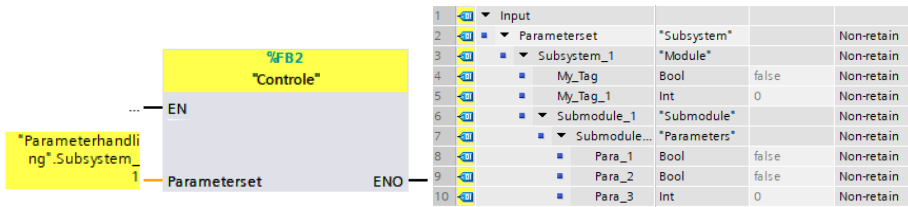
1. Download prepared project to controller.
2. Deactivate Safety mode and activate Fast Commissioning mode
3. Perform adjustments in safety program during operation
4. Finalize project by full compile
5. Final download of the safety program
6. Activation of Safety mode and re-initialization by STOP –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

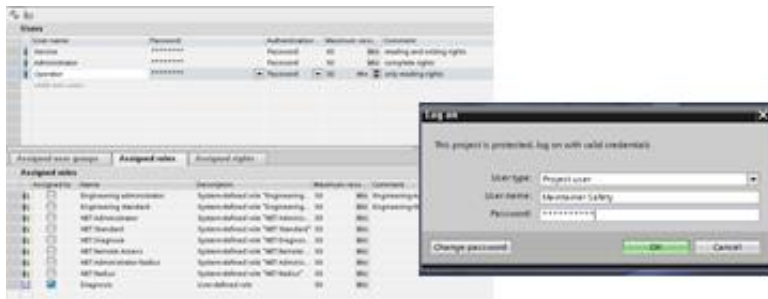
1.



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.

TIA Portal

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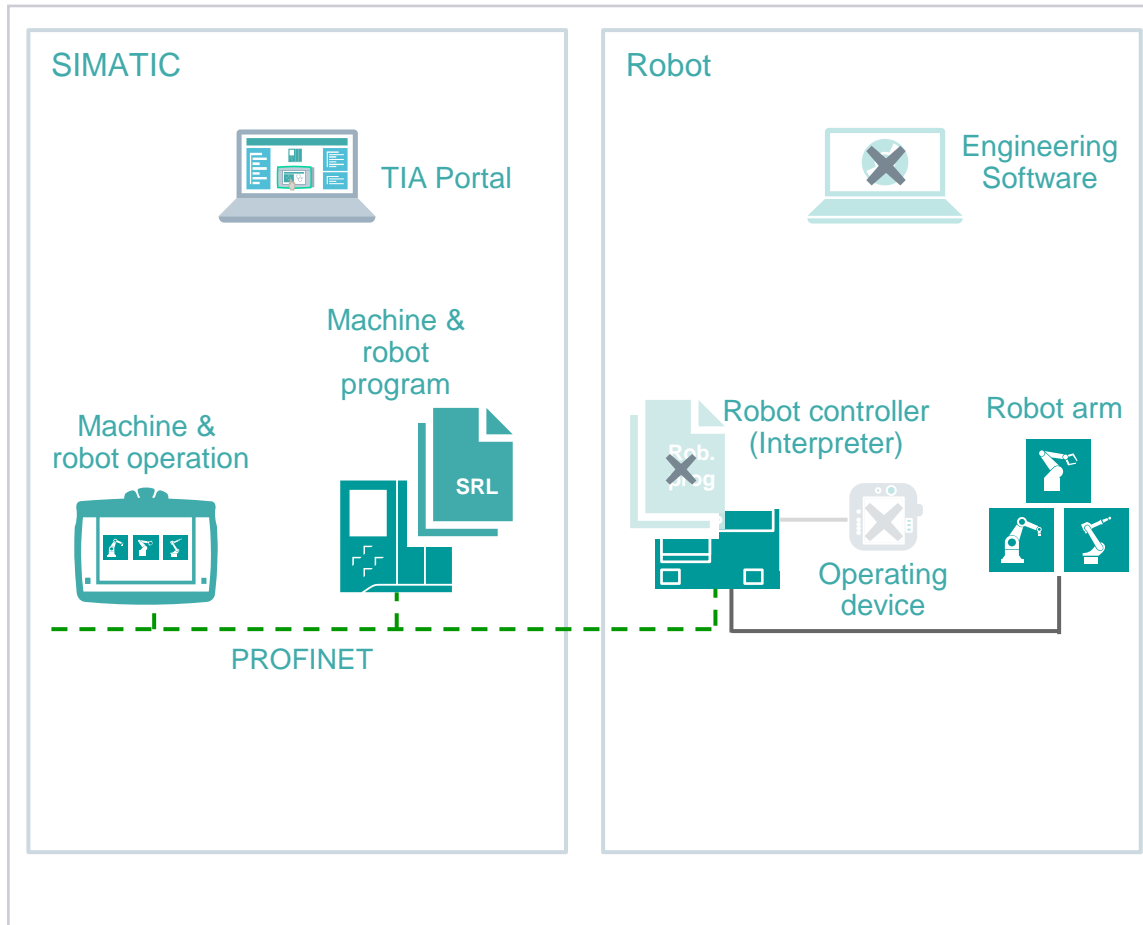
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SIMATIC Robot Library

Robot programming in TIA Portal



Robot programming in TIA Portal with the SIMATIC Robot Library

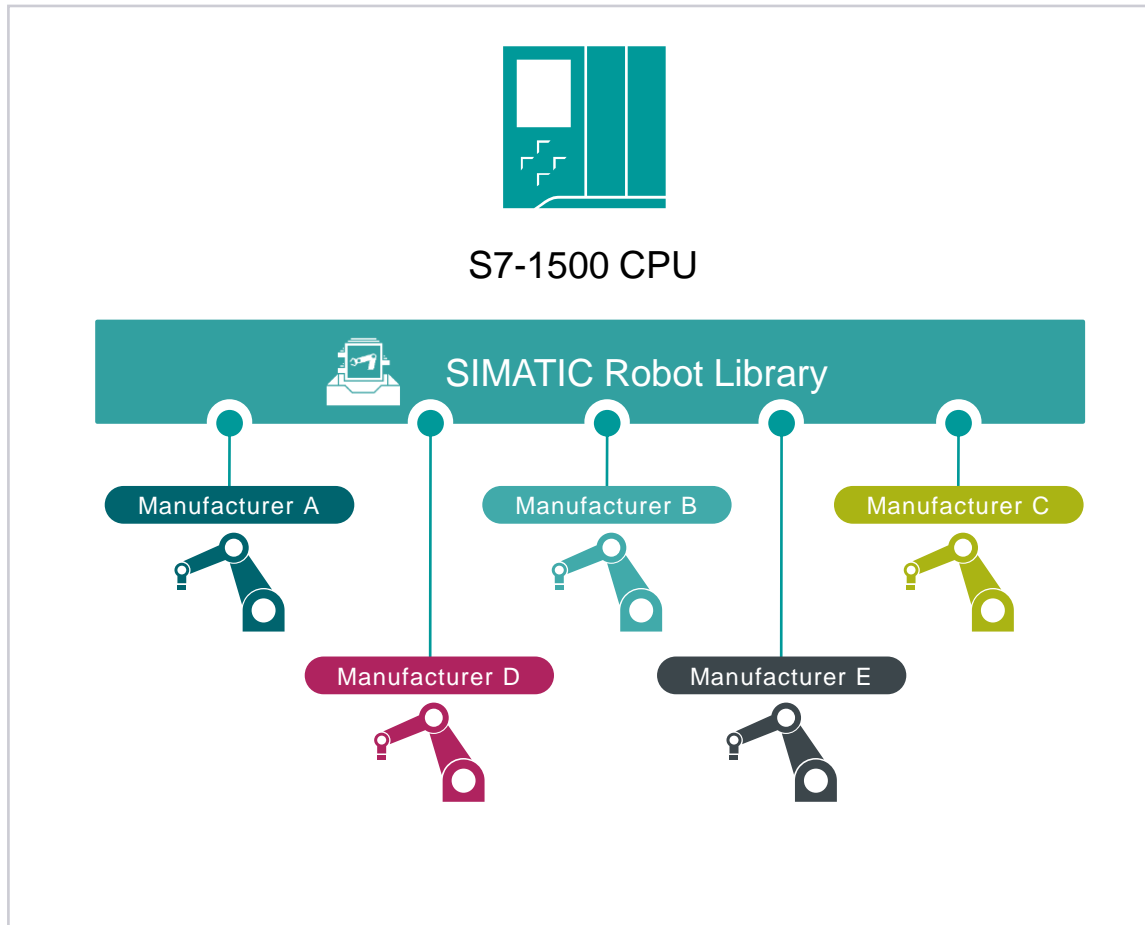
- One library to program robots of various brands within TIA Portal
- Will be based on a coming PNO Standard for robotics.
- Will be based on coming PLCopen certification for robotics
- Functions range from basic move commands (e.g. “MoveLinear”) to advanced commands (e.g. “ForceControl”)
- Library communicates 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

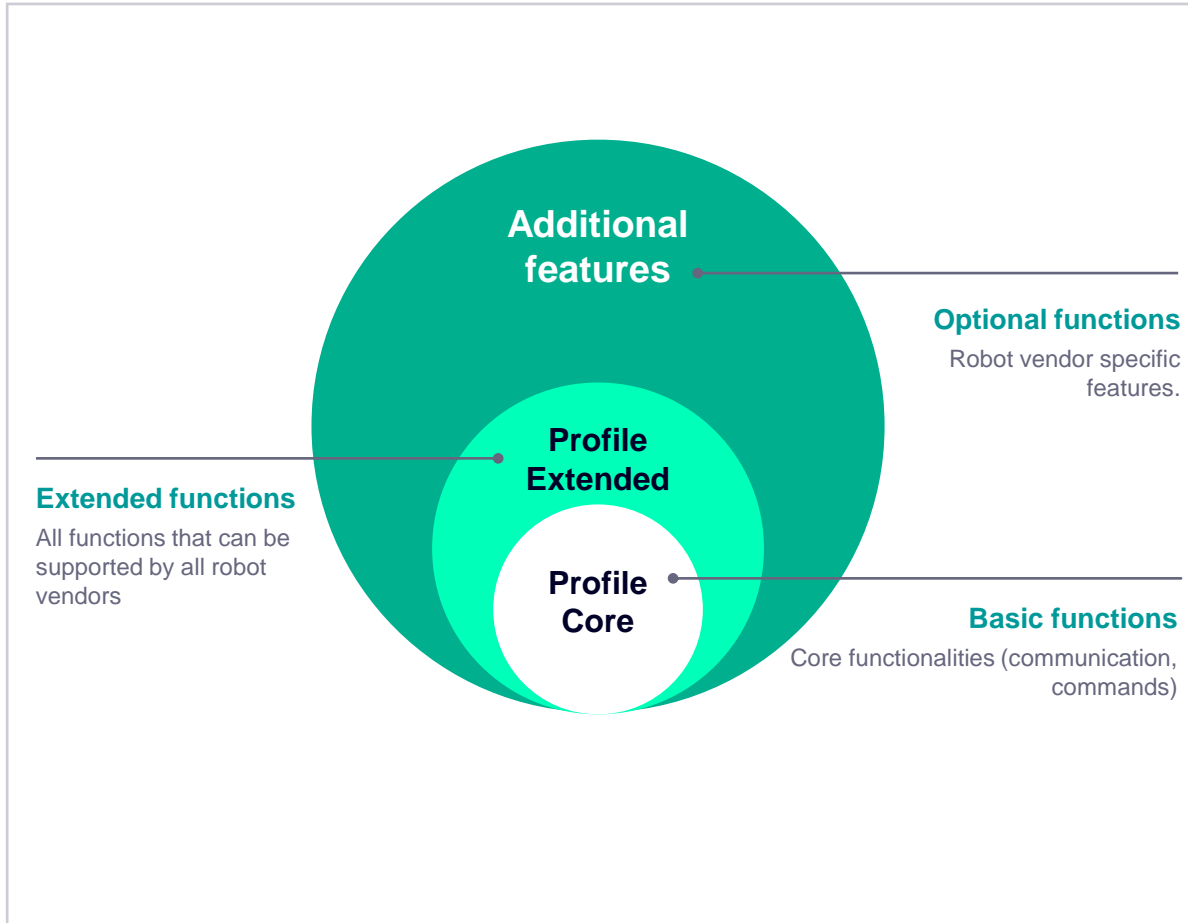


Unified programming of robots of various brands

- 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!*

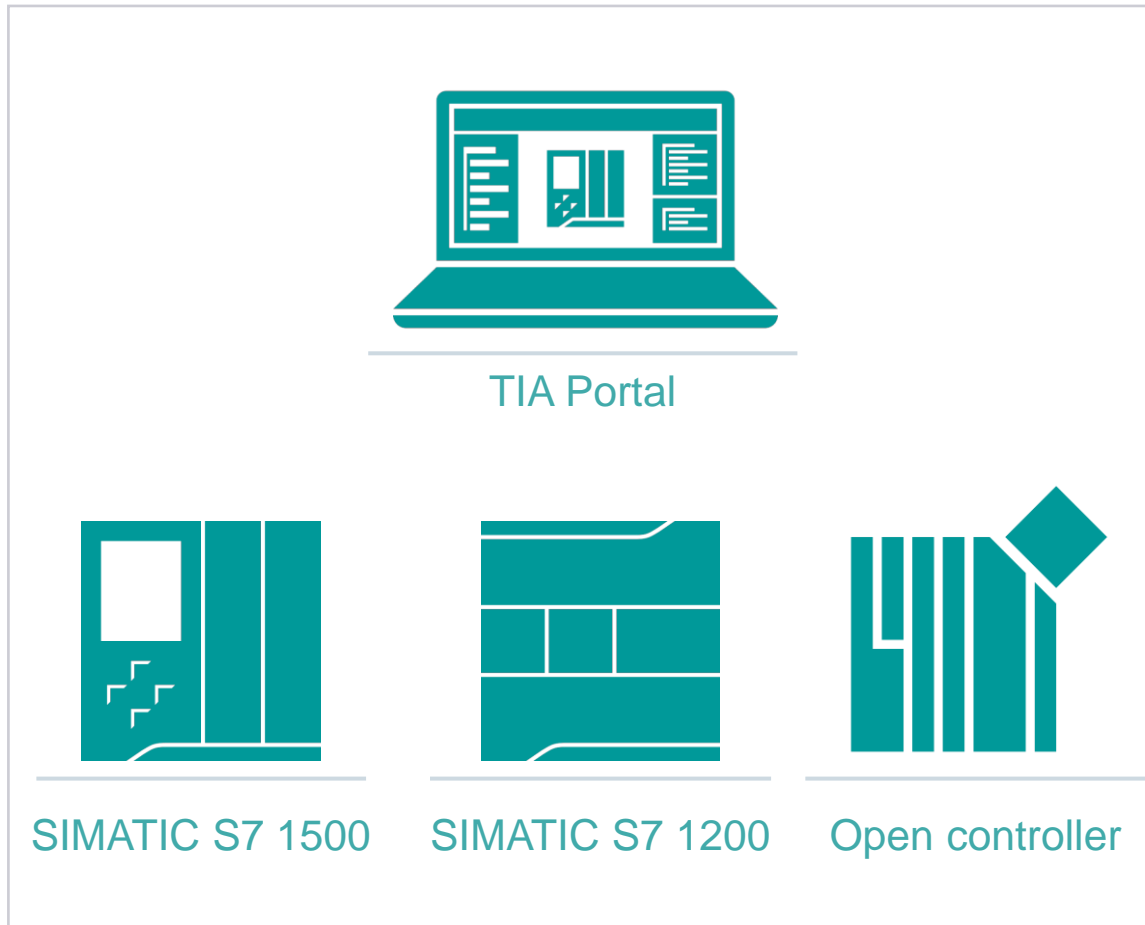
SIMATIC Robot Library Functionalities



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 product owned by SIEMENS AG
- The license must be purchased

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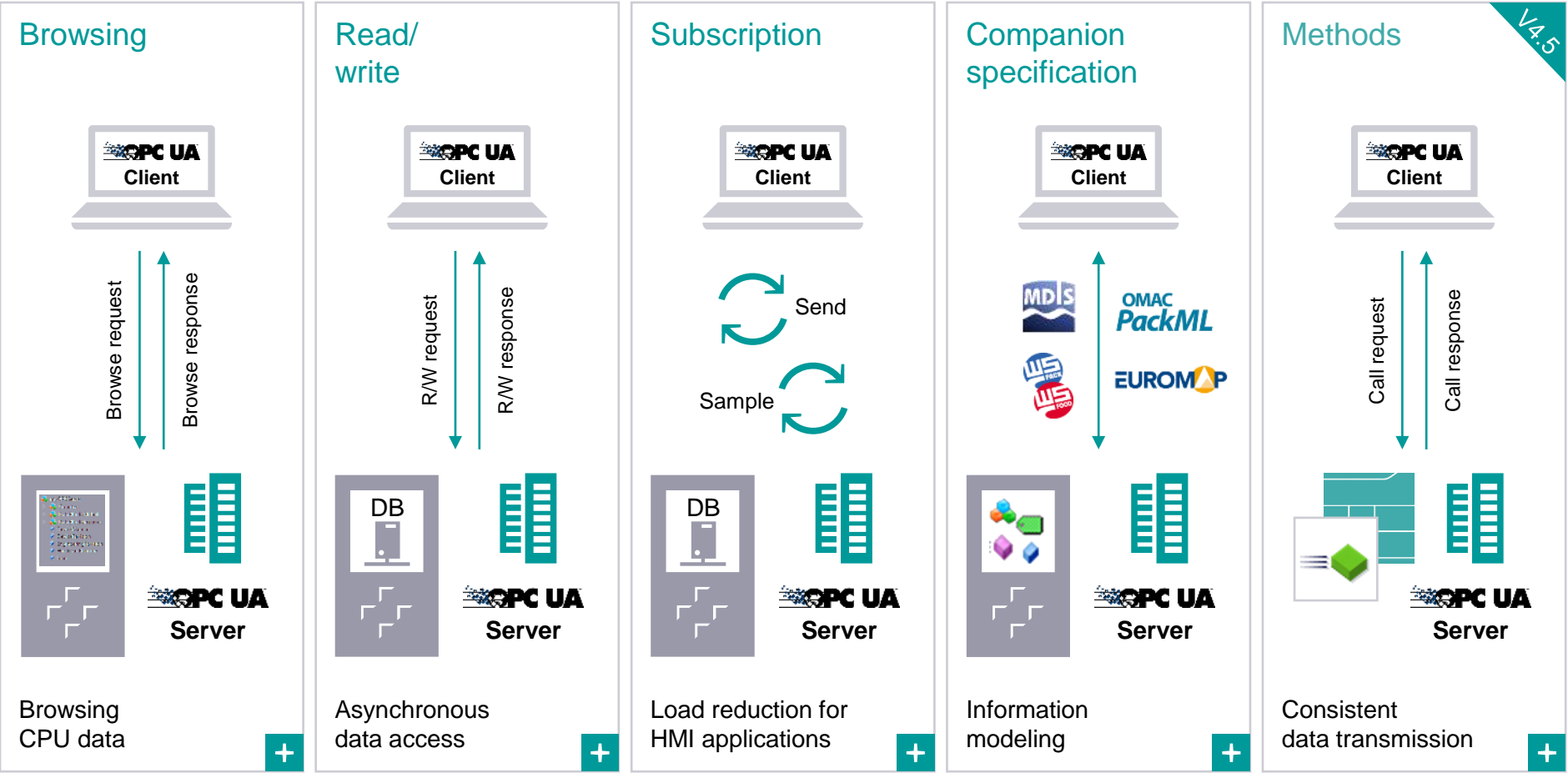
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OPC UA - Extended range of functions S7-1200 V4.5



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 'General' tab selected. Under 'OPC UA' > '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 active. It displays a table of alarm events:

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

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

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

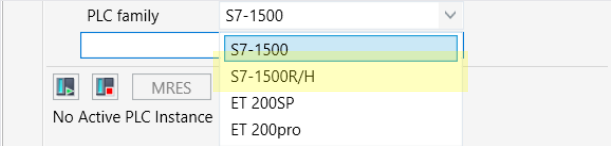


6ES7517-3HP00-0AB0

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

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

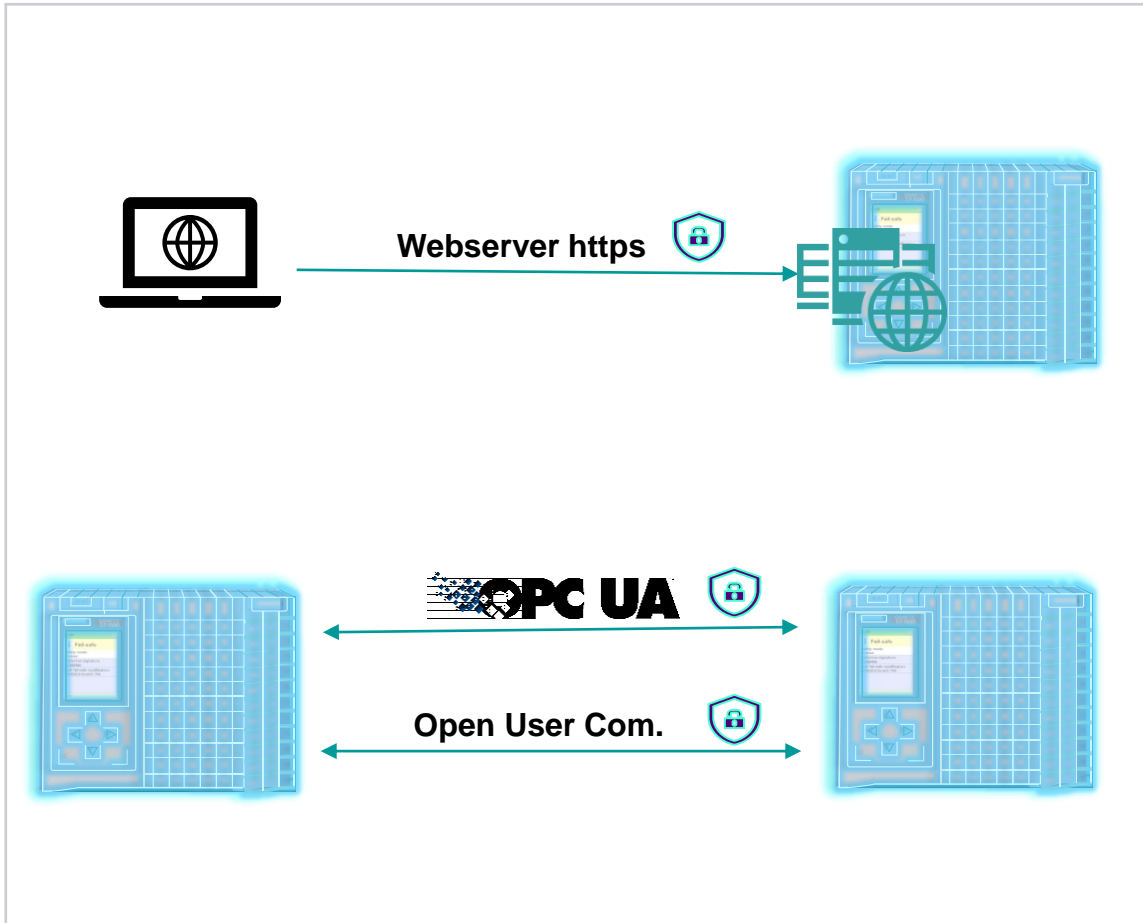
- SIMATIC S7-1500 T-CPU **CPU 1504D TF** | MLFB: 6ES7615-4DF10-0AB0
- SIMATIC S7-1500 T-CPU **CPU 1507D TF** | MLFB: 6ES7615-7DF10-0AB0

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

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

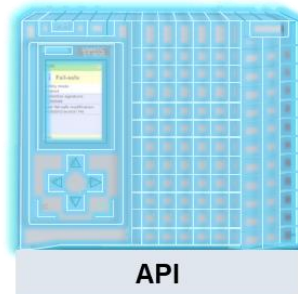
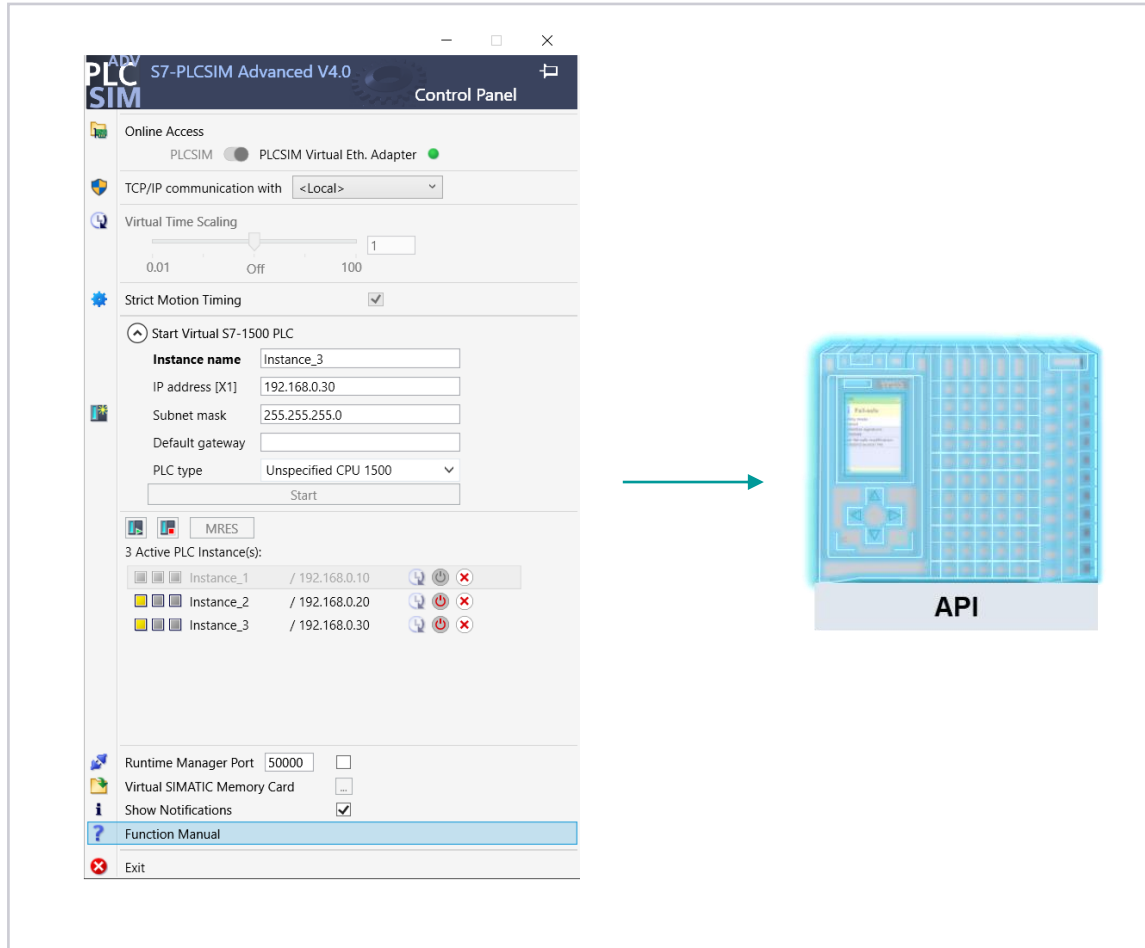
TIA Portal V17 projects with V17 CPU firmware version V2.9 can also be loaded and executed on the S7-PLCSIM Advanced in secure, encrypted mode. This means that safe communication can be tested in the virtual controller without making changes to the automation project.

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



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