TIA-portalen V18

Highlights

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Agenda

- New features in V18
- Symbolic Access, substitute for the Any Pointer
- Multiuser
- Software Units
- Namespaces
- Trace functionality
- Simulation
- New hardware for S7-1500
- Sparepart compatibility
- New Option: SIMATIC AX bringing OT / IT closer together
- Test Suite updates
- Grace offer is still available

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Symbolic Access

```
TYPE AnyPoint
STRUCT
    SyntaxID: BYTE;
    DataType: BYTE;
    DataCount: INT;
    DB_Number: WORD;
    BytePointer: DWORD;
END_STRUCT
END_TYPE

FUNCTION FC1: VOID

VAR
    buffer_source: AnyPoint;
    Source_Any AT buffer_source: ANY;
    buffer_destin: AnyPoint;
    Destin_Any AT buffer_destin: ANY;
    erg: INT;
END_VAR

buffer_source.SyntaxID:= 16#10;
buffer_source.DataType:= 16#2;
buffer_source.DataCount:= 16#0a;
buffer_source.DB_Number:= 16#06;
buffer_source.BytePointer:= dw#16#84000000;

buffer_destin.SyntaxID:= 16#10;
buffer_destin.DataType:= 16#2;
buffer_destin.DataCount:= 16#0a;
buffer_destin.DB_Number:= 16#07;
buffer_destin.BytePointer:= dw#16#84000000;

erg:= SFC20(srcblk:= Source_Any, dstblk:= Destin_Any);
END_FUNCTION
```

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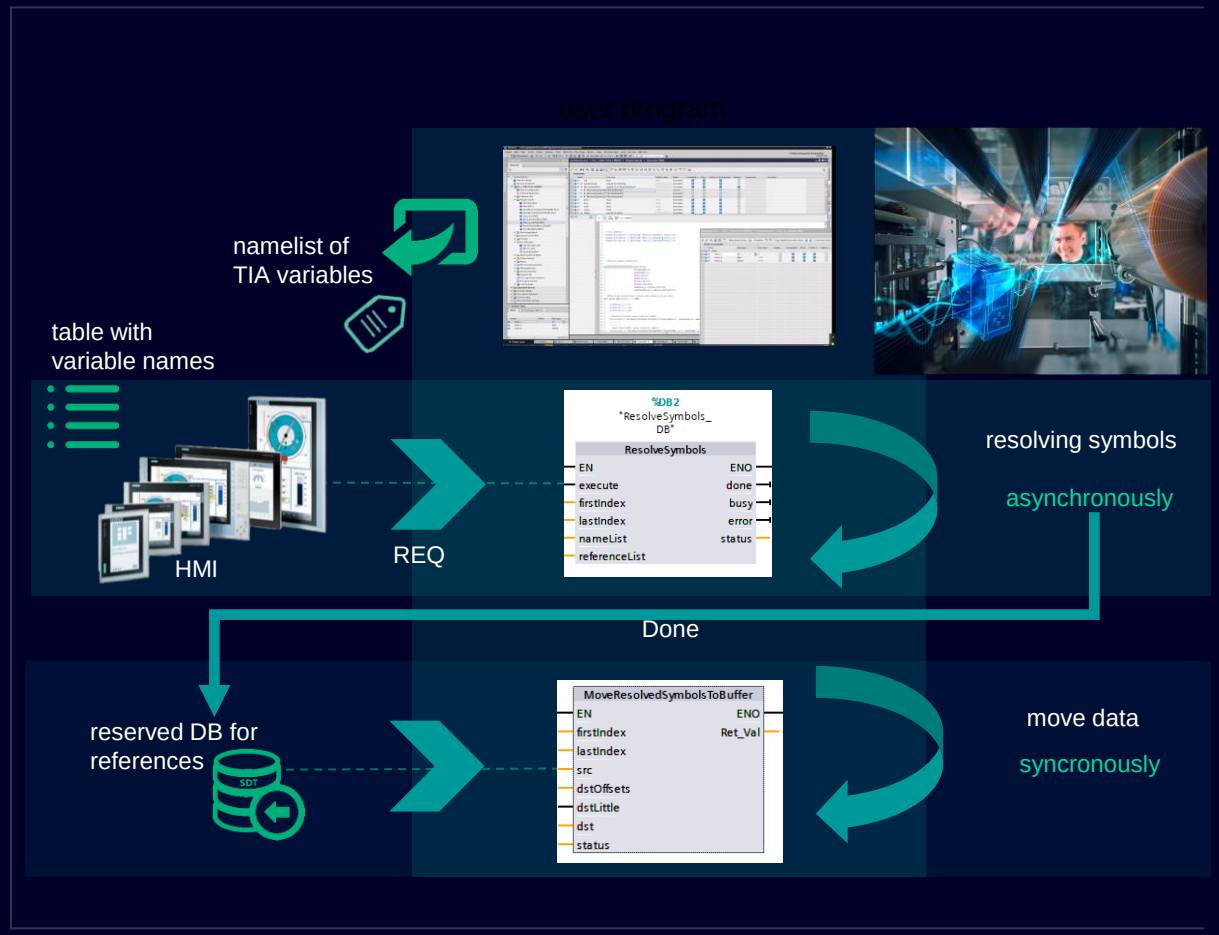
Symbolic Access @ Runtime



SymbolicAccess@Runtime

Tag names (string variables) can be resolved into the corresponding memory addresses at runtime and thus used for reading / writing data

Benefits

- Reading / writing of certain tags by providing their symbol name from an external device (e.g. HMI) as a string
- Migration of ANY-Pointer use cases to symbolic programming
- Possibility to trace any data from a S7-1500 PLC on a 3rd party device

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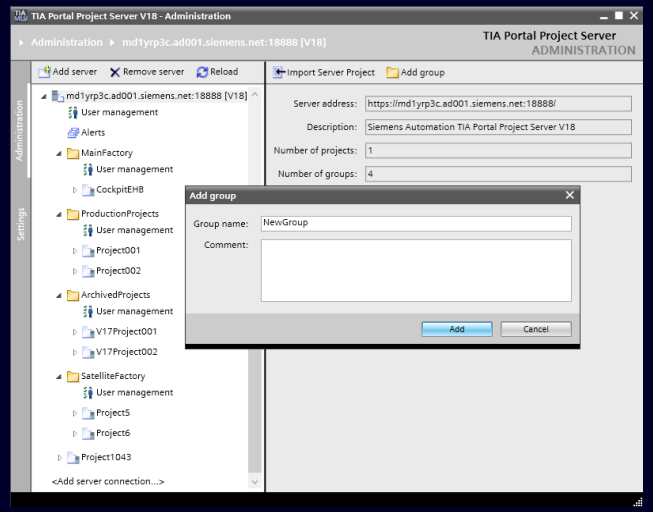
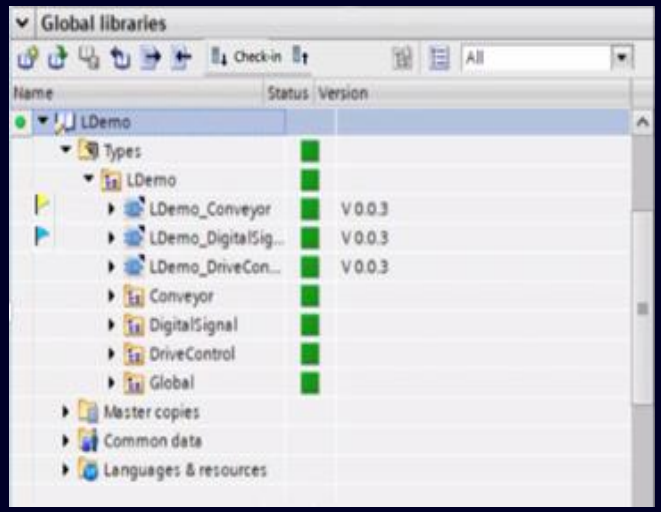
Multiuser





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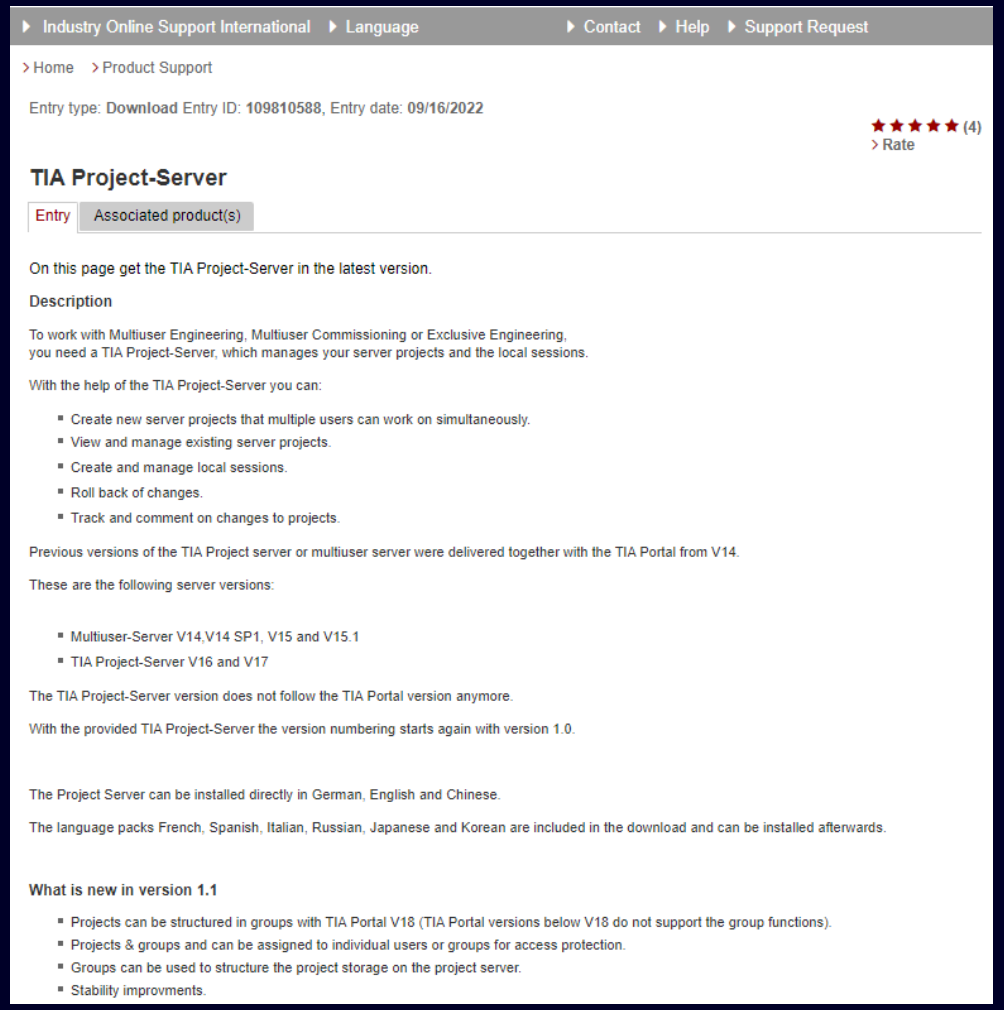
Project-Server – Independent release



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Entry type: **Download** Entry ID: **109810588**, Entry date: **09/16/2022**

★★★★★ (4)
> Rate

TIA Project-Server

Entry | Associated product(s)

On this page get the TIA Project-Server in the latest version.

Description

To work with Multiuser Engineering, Multiuser Commissioning or Exclusive Engineering, you need a TIA Project-Server, which manages your server projects and the local sessions.

With the help of the TIA Project-Server you can:

- Create new server projects that multiple users can work on simultaneously.
- View and manage existing server projects.
- Create and manage local sessions.
- Roll back of changes.
- Track and comment on changes to projects.

Previous versions of the TIA Project server or multiuser server were delivered together with the TIA Portal from V14.

These are the following server versions:

- Multiuser-Server V14,V14 SP1, V15 and V15.1
- TIA Project-Server V16 and V17

The TIA Project-Server version does not follow the TIA Portal version anymore.

With the provided TIA Project-Server the version numbering starts again with version 1.0.

The Project Server can be installed directly in German, English and Chinese.

The language packs French, Spanish, Italian, Russian, Japanese and Korean are included in the download and can be installed afterwards.

What is new in version 1.1

- Projects can be structured in groups with TIA Portal V18 (TIA Portal versions below V18 do not support the group functions).
- Projects & groups and can be assigned to individual users or groups for access protection.
- Groups can be used to structure the project storage on the project server.
- Stability improvments.

TIA Project-Server

- Delivery via SIOS Download
- Download Entry ID: 109810588
- Compatible with TIA Portal from V14
- No license costs for operation, license concept unchanged (for Multiuser engineering is a license required)
- New function upgrades planned every 6-9 months

Version 1.1

- Access protection at group level for projects & libraries
- Support of Global Libraries
- published in August 2022

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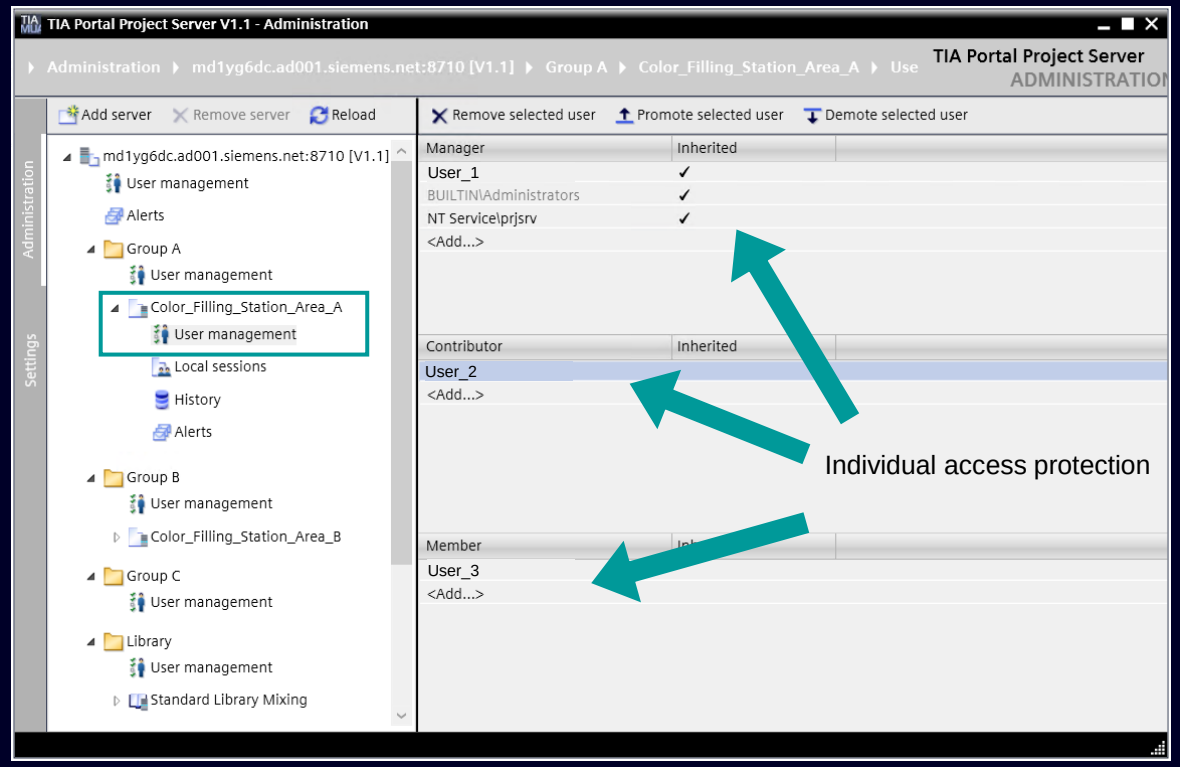
Project-Server – Access & performance



Access protection

- Projects, libraries & groups and can be assigned to individual users or groups for access protection
- Usable from V14 together with the Project-Server V1.0 and newer
- TIA Portal Version <V18 only support access protection in root level

Performance

- Performance improvements …
  - in user administration and repository upgrade
  - during the multiuser refresh in the case that no local changes are available
  - first execution after project open when using async commissioning
  - in cooperation with global search (Indexing, non use)

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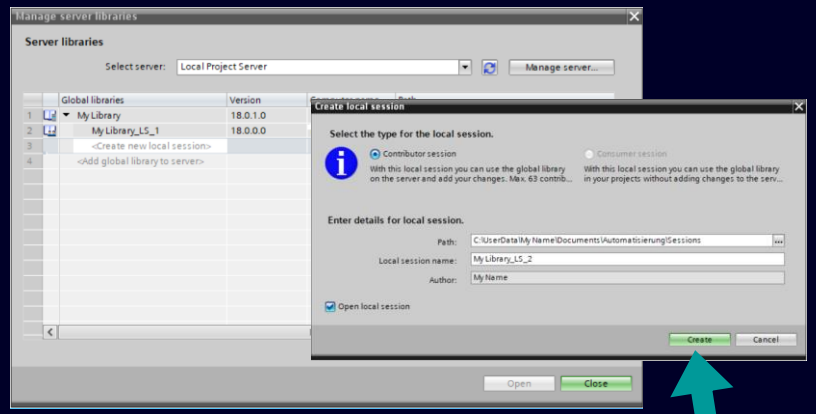
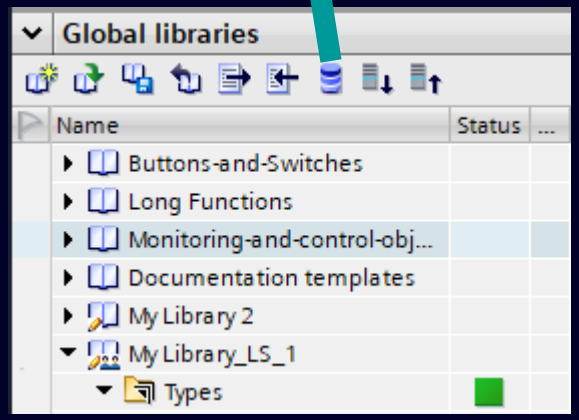
Project-Server – Libraries supported



Create library session

Work with global library local session in the library view.



Develop libraries in teams with Project-Server

Use case

- Team development of global libraries with Project-Server

Feature

- Use local session to develop new revisions of master copy or library types of your global library
- All Multiuser features are supported the same way for projects and libraries

Benefit

- Use the same project server to develop projects and libraries
- Unified workflow to create / manage and check-in changes for projects and libraries together with project server
- Benefit from Multiuser collaboration feature e.g., marking of modified objects, history, change log,..

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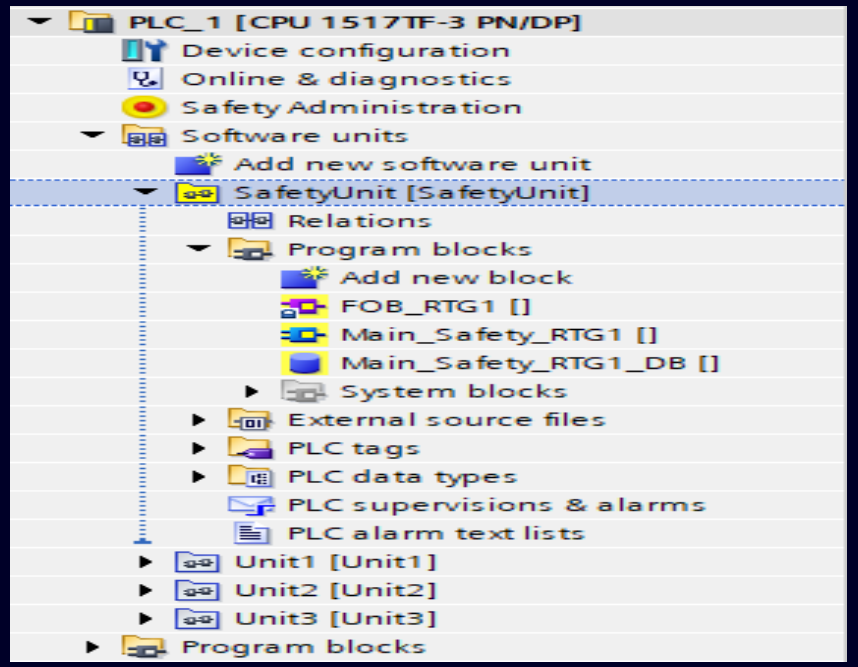
Software units



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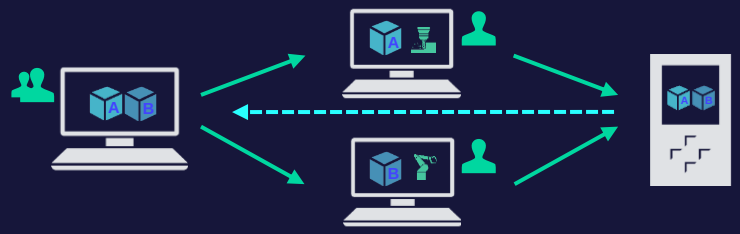
Software units

TIA Portal allows programmers to structure and divide complex PLC code into individual software modules using **Software Units**. Software Units can be edited and loaded independently of each other and are well organized in the project navigation of your TIA Portal project.

- Creation of independently executable program parts
- Definition of standardized interfaces
- Encapsulated, executable functionality
- Namespaces avoid troubles with project-wide duplicated naming
- Support of fail-safe programming (Safety)
- Clear code structuring and accountability supported by user management
- Supported by library and versioning mechanisms

Module based programming



- Multiuser Engineering and Commissioning using Software Units in TIA Portal.

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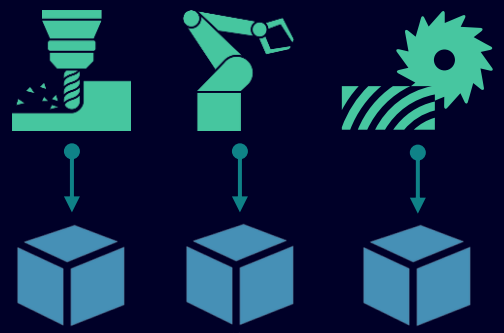
Unit distribution and program structuring

Functional / techno-logical SwUnit



SwUnit Mill

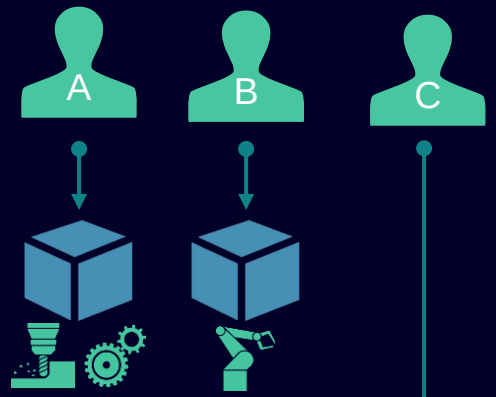
SwUnit Pick&Place

SwUnit Saw

SwUnit library

- External delivery
- Commissioning

Processor SwUnit



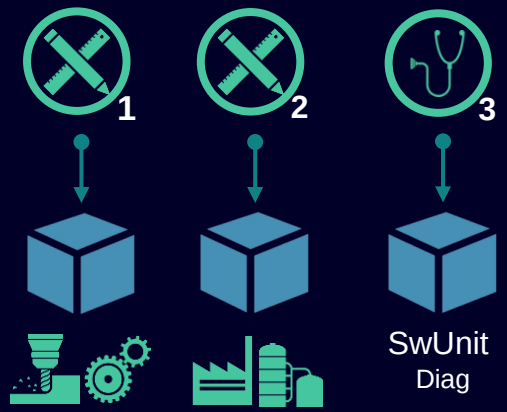
SwUnit Employee A

SwUnit Employee B

SwUnit library

- Clear responsibilities
- Engineering & Commissioning

Application SwUnit



SwUnit Appl A

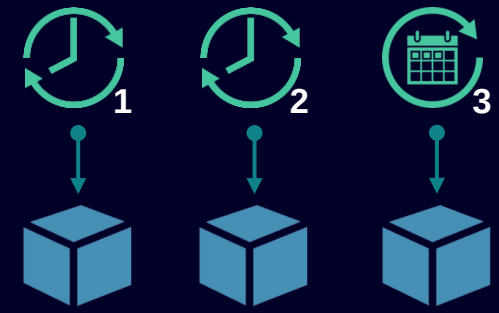
SwUnit Appl B

SwUnit Diag

SwUnit application library

- Independent unit collection

Change frequency SwUnit



SwUnit Function

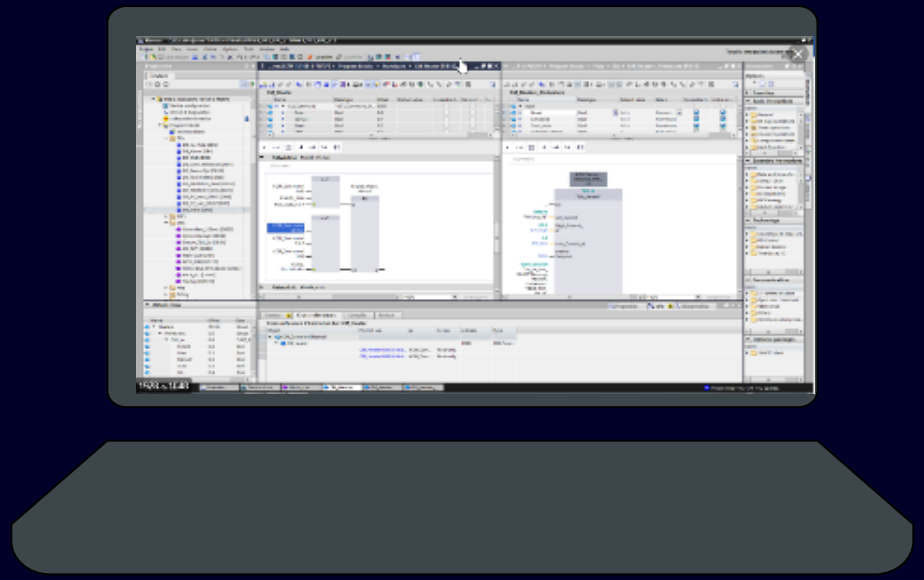
SwUnit Frame

SwUnit Global

SwUnit library

- Interval load-& sync strategy
- Commissioning

Namespaces



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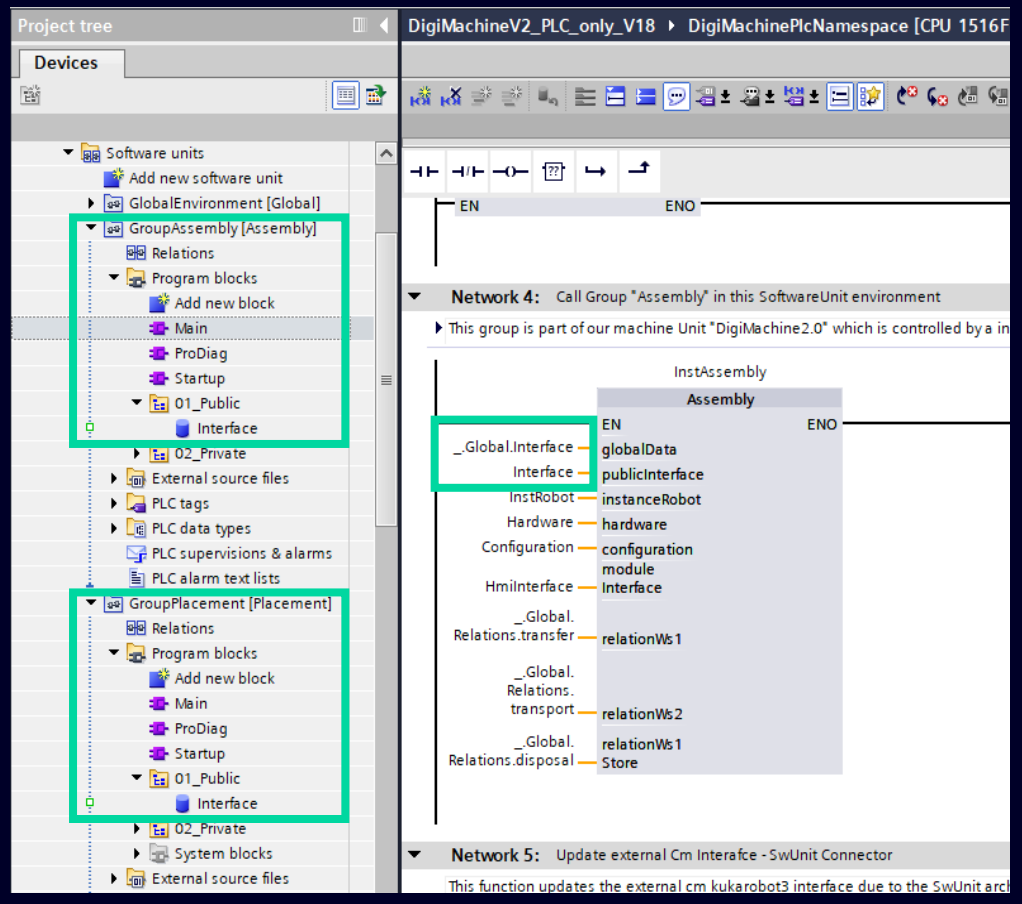
Namespaces for Software units



Concept

- Software Unit provides a “Namespace preset”
- Every Block/UDT has an own “Namespace” property
- In Clients (WinCC, OPC UA) always the full name (incl. namespace: Namepace.BlockName) is displayed
- No namespace for global tags/variables in V18

Benefits

- Block names can be used several times in the PLC program

Improved IEC 61131-3 conformity

- No special characters except “_”
- No quotation marks in the code for block names
- “_.” : Extension of the referencing concept

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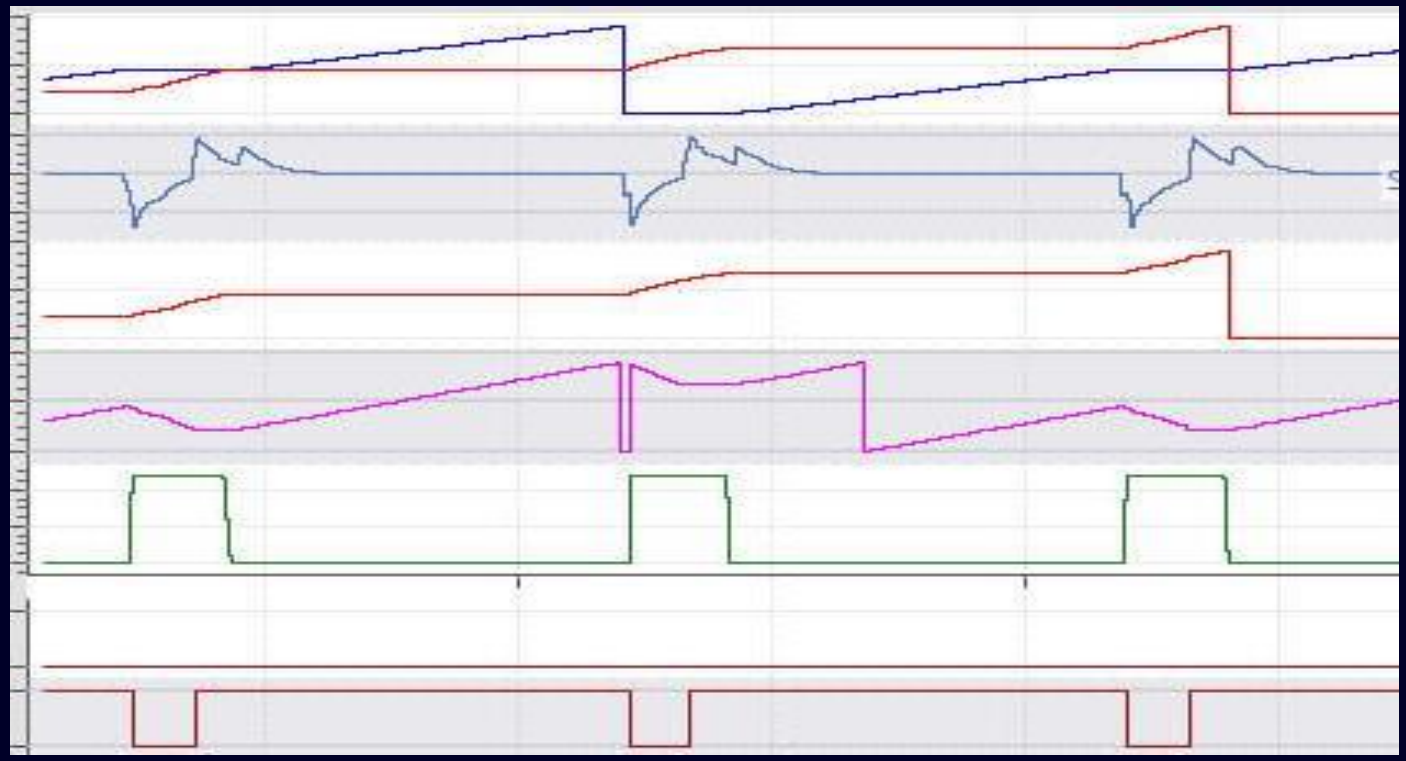
Trace



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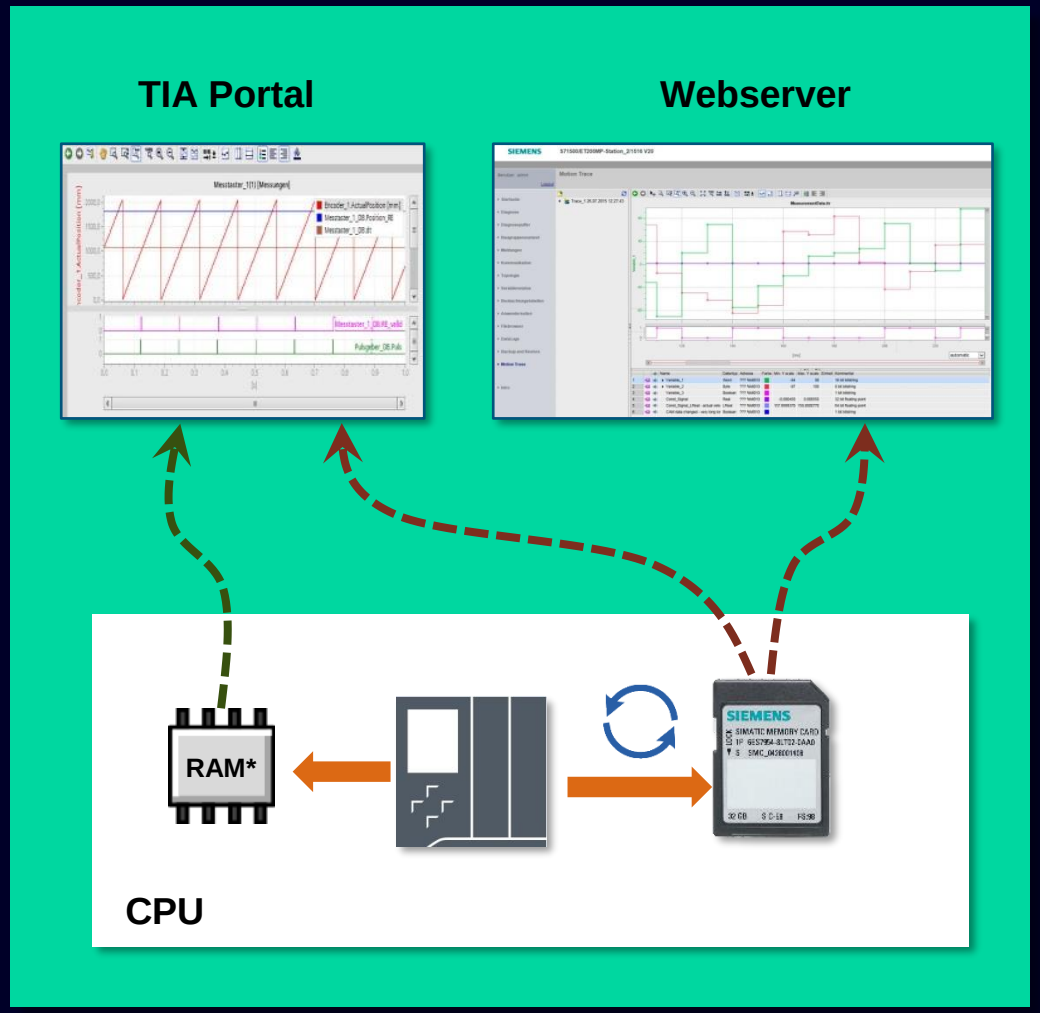
Trace - Repeated measurements stored on memory card



Measurements stored on SMC

- Repeated measurement
- Record N measurements according trigger conditions
- Activate the trace after completing a measurement
- Option: overwrite the oldest measurement
- Up to 1000 measurements on card

Customer benefit

- Persistent storage of measurements
- Significantly more Trace Data for established Analysis

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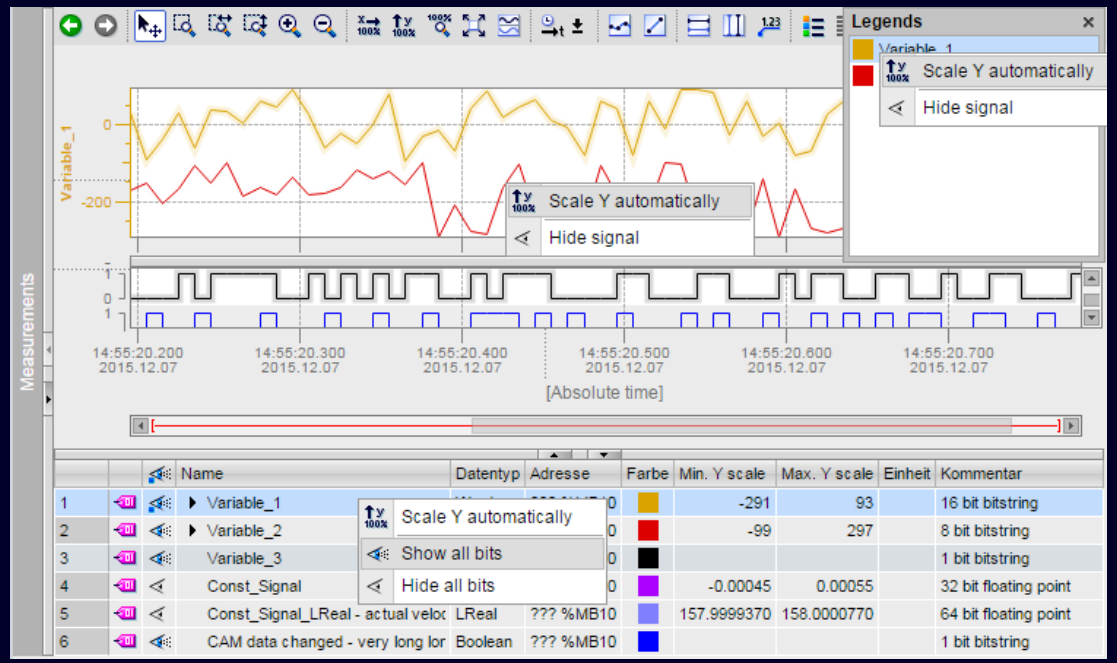
Trace view directly on the Webserver



Trace view on the webserver

- Completed traces can be fetched via the webserver (available as a csv-file on the webserver)
- Completed traces can be graphically viewed directly on the webserver of the CPU

Customer Benefit

- Saving time during error detection
- Signal sequence, plant and project information for diagnosis and machine maintenance **without** TIA Portal knowledge possible.

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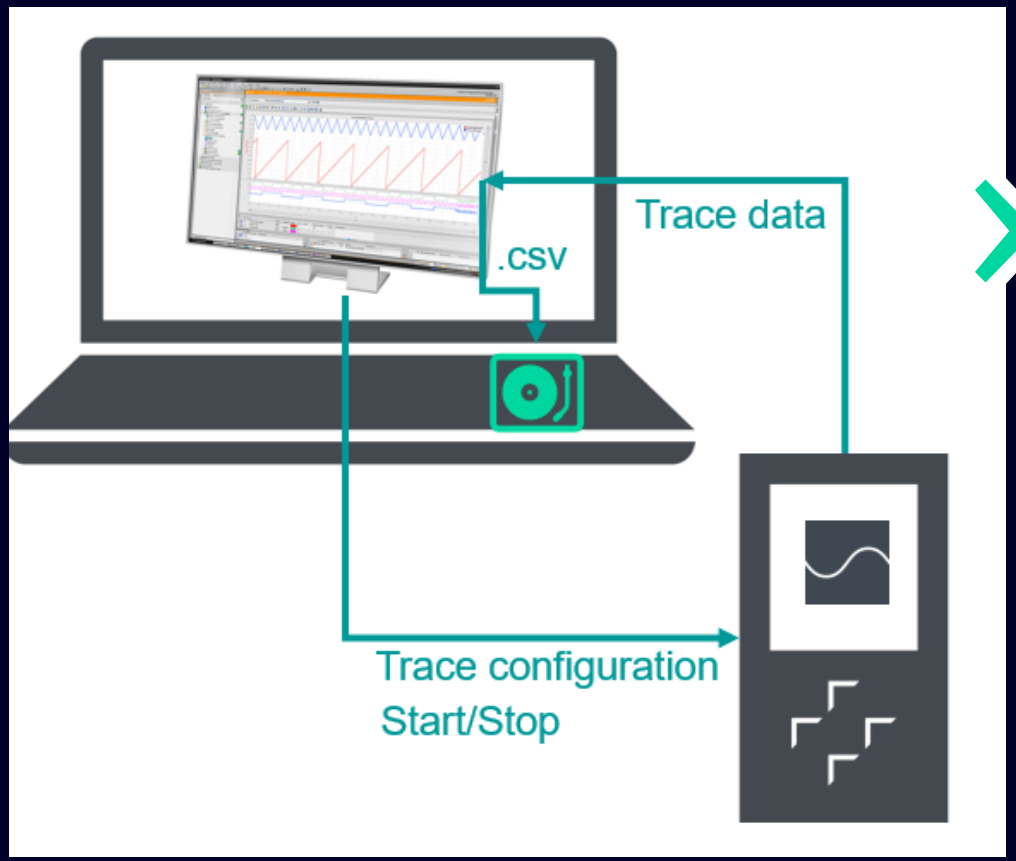
STEP 7 – Innovations
Long-term Trace



Long-term Trace for better analyzing sporadic errors or optimize machinery parameterization

- Recording of up to 64 different signals in “csv”-files for a long time (days, weeks, months ….)
- Limitation only thru available hard disk memory on PC
- Motion-Cycle-synchronous (e.g. MC-Servo) recording ensures qualified analyzes of the signals
- Configuration/Start/Stop of the Long-term Trace job via Trace-Editor
- The recorded values can be shown and analyzed in the Trace-Editor
- The recorded “csv”-files can be exported and analyzed via third party tools also

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SIMATIC S7-1500 / ET 200SP CPUs
Structure of the .csv file

Header

Trace name & timestamp
(Recording start time)

Symbolic Address

	A	B	C	D	E	F
	PLC_1_Long-term Trace_1	20220919_150910_070	FreqGen_DB.Val_Rectangle	FreqGen_DB.Val_Sawtooth	FreqGen_DB.Val_Sinus	FreqGen_DB.Val_Triangle
2	112	2022-09-19-15:09:10.185621496	-100	180	-5877857	-44
3	113	2022-09-19-15:09:10.186713600	-100	182	-5358269	-40
4	114	2022-09-19-15:09:10.187730952	-100	184	-4817537	-36
5	115	2022-09-19-15:09:10.188769616	-100	186	-4257797	-32
6	116	2022-09-19-15:09:10.189755776	-100	188	-368125	-28
7	117	2022-09-19-15:09:10.190776016	-100	190	-3090169	-24
8	118	2022-09-19-15:09:10.191811208	-100	192	-2486898	-20
9	119	2022-09-19-15:09:10.192838816	-100	194	-1873817	-16
10	120	2022-09-19-15:09:10.193867656	-100	196	-1253336	-12

Signal number

Timestamp of signal

Values

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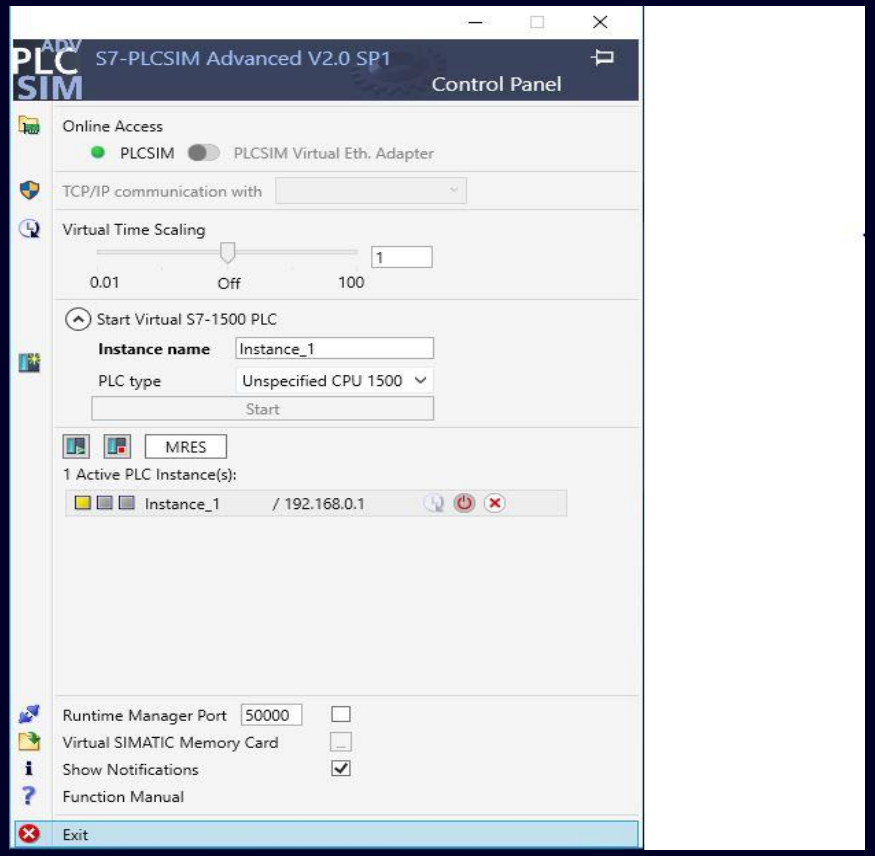
PLCSIM samt PLCSIM Advanced



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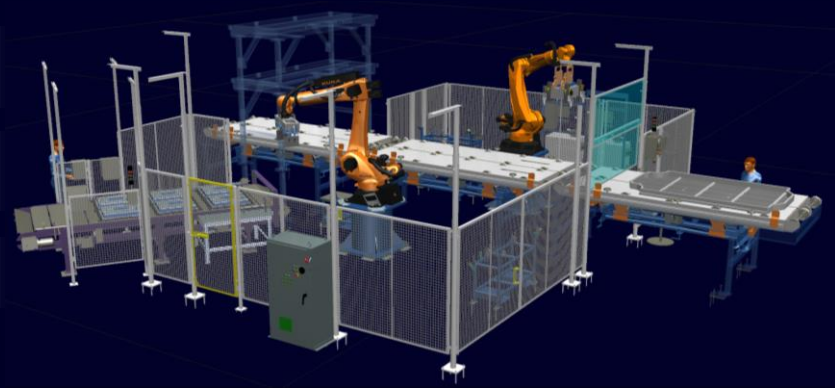
Simulation for Industrial Systems
Planning, Validation and Optimization



Production Line Level

Production Cell Level

Production Machine Level

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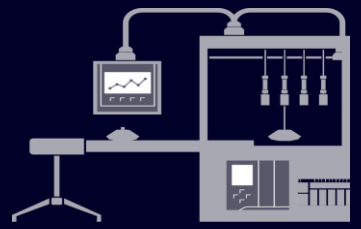
Validate the PLC program
The solution in detail

Digital Twin

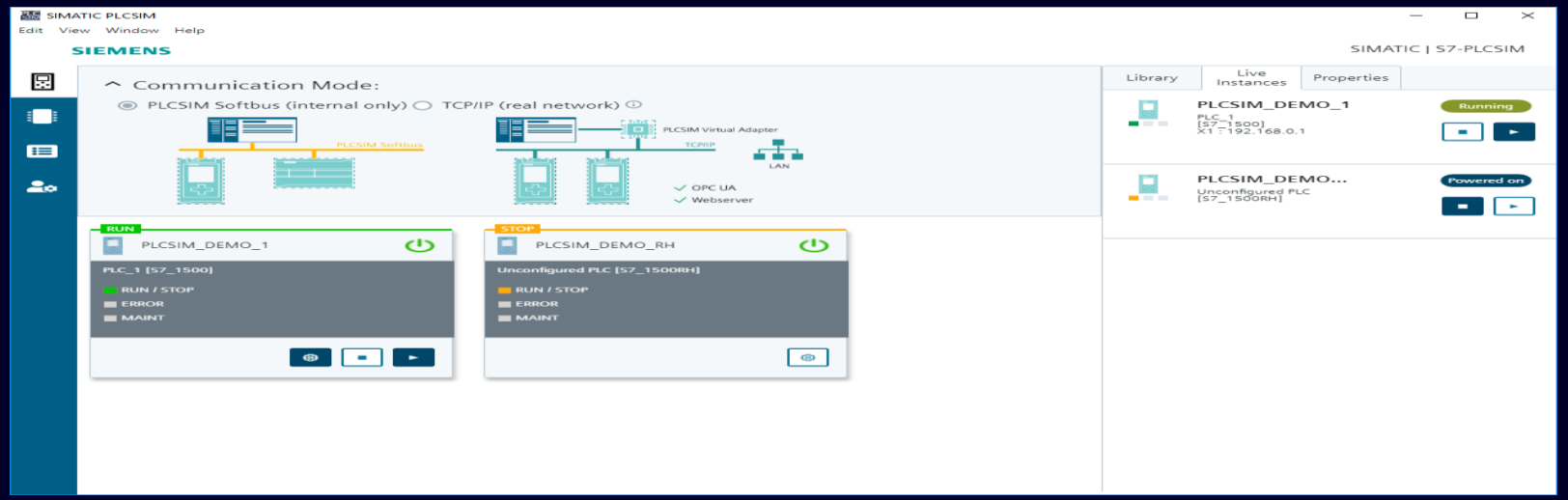


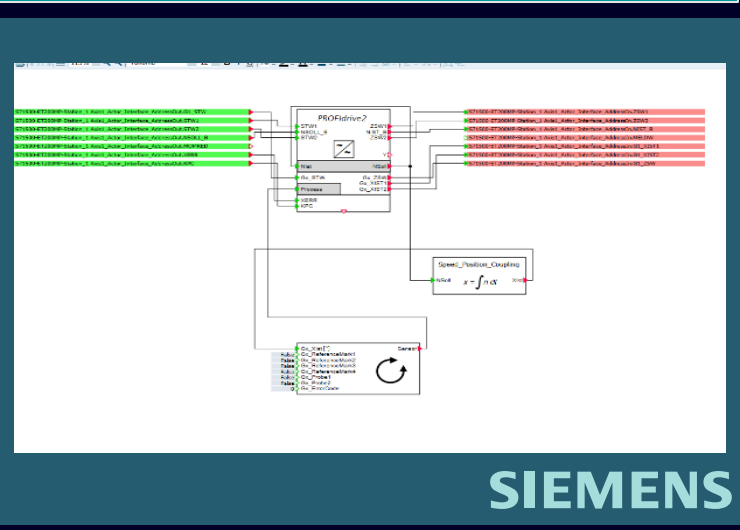
Automation model

SIMATIC
S7-PLCSIM Advanced

Electrical and behavior model

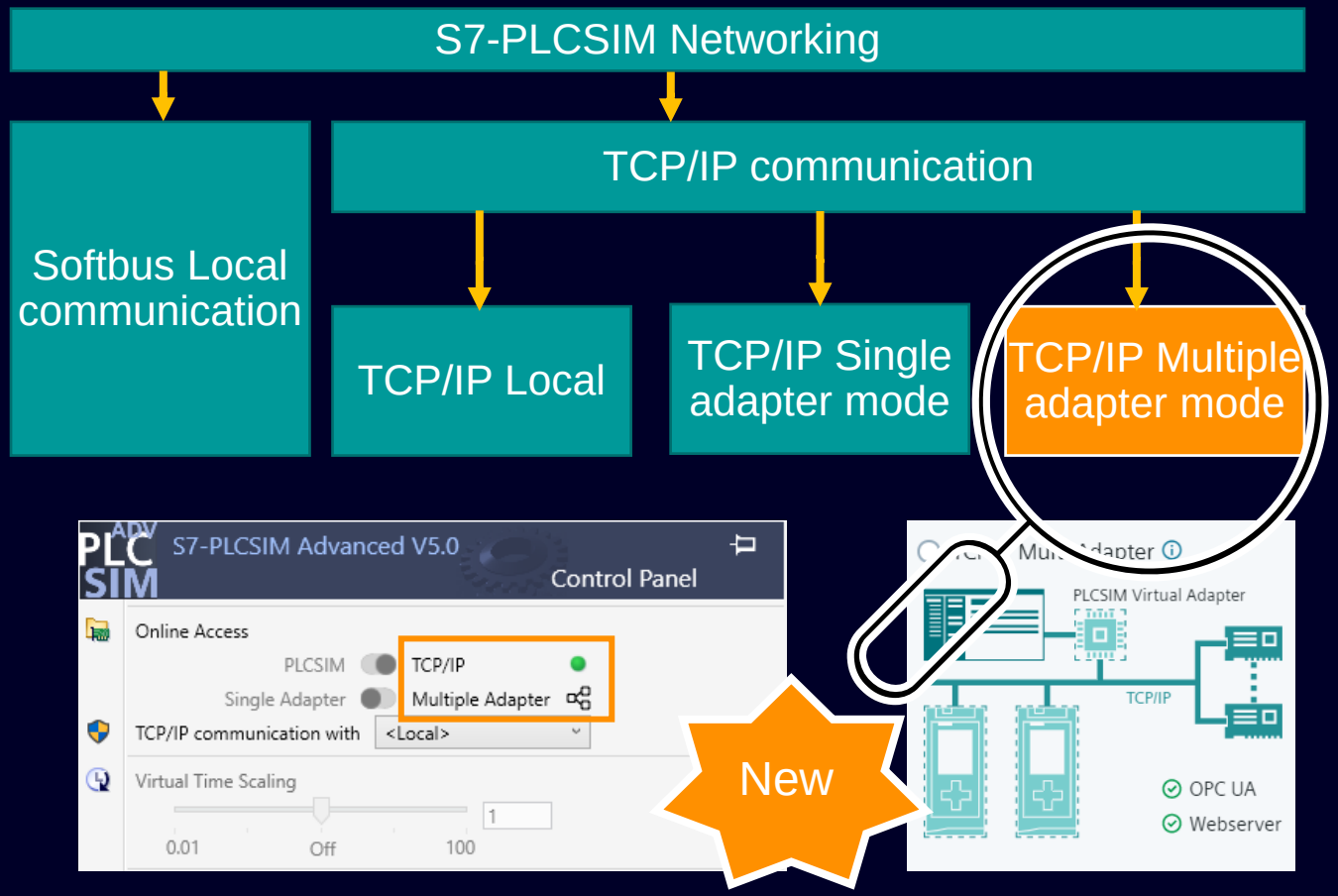
SIMIT





S7-PLCSIM Advanced V5.0

New communication mode “TCP/IP - Multiple Adapter” leads to Cloud readiness



With the new “**Multiple Adapter Mode**” S7-PLCSIM Advanced can be operated also in IT Infrastructure scenarios where the “Network Promiscuous Mode” is prohibited as in public cloud infrastructures like Azure Cloud or AWS.

To make S7-PLCSIM Advanced V5.0 ready to use with no limitations in a Cloud environment, we built-in the new “**Multiple Adapter Mode**”.
Any interface of a simulated PLC can be separately configured.

This enables the following use cases:

- Visibility to external networks for any interface
- Communication over 2 or more virtual machines and their running PLC instances to any of their interface
- Addressing from outside PLC interfaces from different networks.
- A network separation is possible while the mapping isn’t done.

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New hardware

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Portfolio enhancement with SIMATIC S7-1514SP T/TF

SIMATIC S7-1514 SP T/TF
for midrange Motion Control

Extendable and economic solution for the midrange Motion Control market

Powerful SIMATIC ET200SP Controller especially designed for the requirements of the midrange Motion Control applications

Same performance in comparison to newly CPU 1515T

Provides access to the extensive range of the ET200 SP IO modules including newly designed PTO2 modules for stepper drives

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Motion with SIMATIC S7-1514SP T/TF

Components

	Distributed Controller
CPU Type	CPU 1514SP T/TF-2 PN
Interfaces	 1 PROFINET IO with IRT 2 PROFINET IO with RT
Bit performance	6 ns
Program memory Data memory	900 kB 3,5 MB
Motion Control Resources Ext. Motion Control Res.	2.400 120
Positioning axes: Maximum	30
Performance estimates	
Positioning axes: Typical	11 in 4 ms

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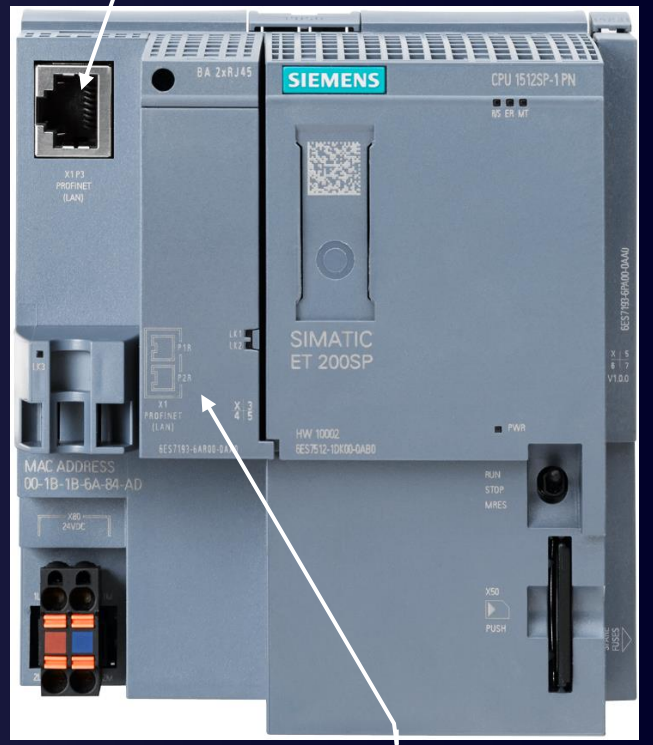
ET 200SP CPU 1514SP (F/T/TF)-2 PN

- Comparable with memory concept, quantity structure and features of a SIMATIC S7-1500 CPU 1515(F) - 2 PN CPU
- Work memory
  - Program: **600/900 kByte**,
  - Data: **3,5 MByte**
- Performance: Bit instruction time**: 6 ns**
- **2 PROFINET IO interfaces**
  - PN IO interface X1
    - PROFINET RT/IRT
    - 2 ports RJ45 interface or FastConnect
  - PN IO interface X2
    - PROFINET RT

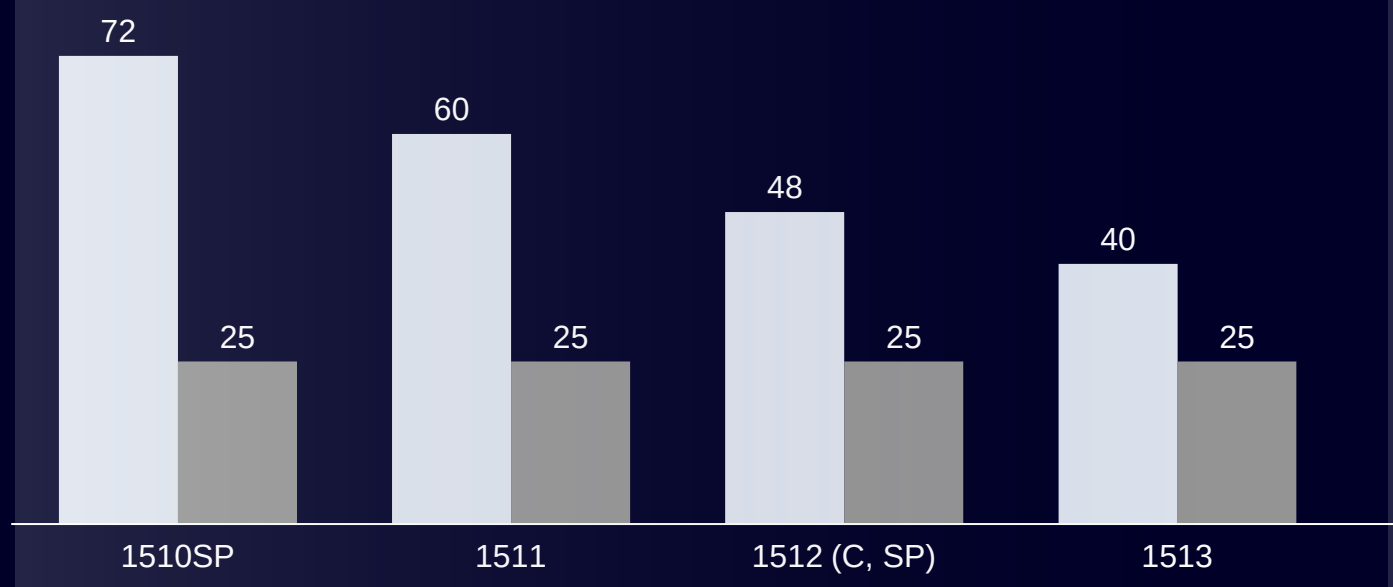


New Hardware for CPUs ≤ 1516 starts with FW V3.0 & TIA Portal V18

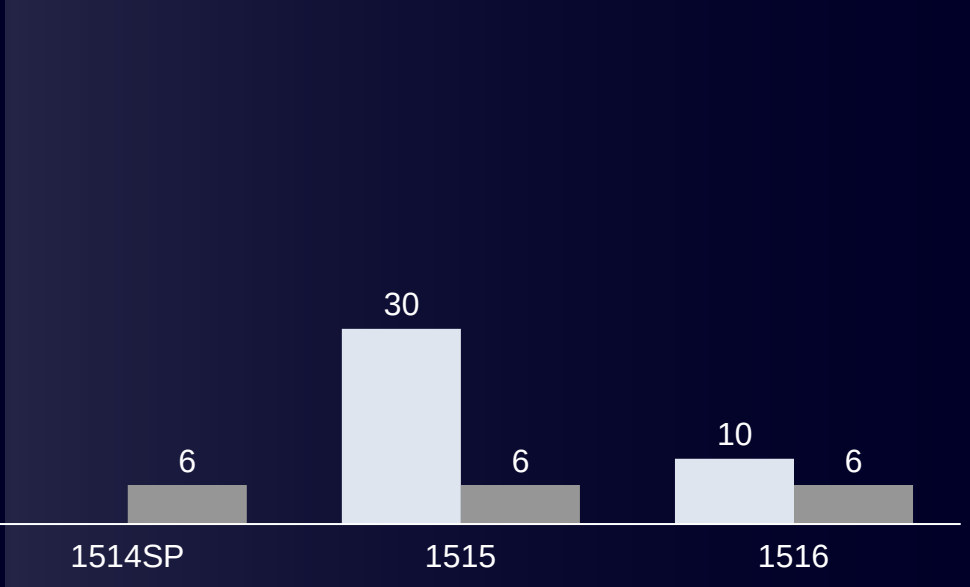
- **2 performance levels**
- **up to +400% performance increase**

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

Performance – Level 1 (Small)



Performance – Level 2 (Middle)



FW V2.9 (current article no.) FW V3.0 (new article no.)

Sparepart compatibility

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Excisting CPU exchanged with a new one

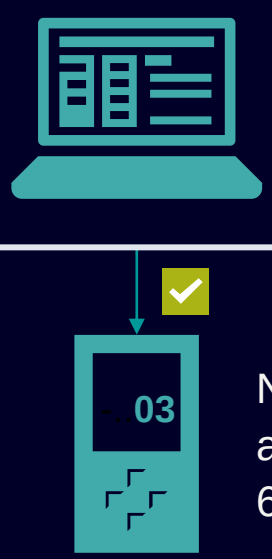




Pull and plug of the SIMATIC Memory Card inclusive fixing of the SIMATIC Memory Card

Sparepart compatibility

Configuration with older TIA Portal software versions (< TIA Portal V17)

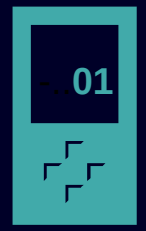


Configuration of the CPU as predecessor version (with the previous article number, e.g. 6ES7515-2AM**01**-0AB0)

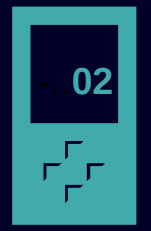
New hardware with new article number, e.g. 6ES7515-2AM**03**-0AB0

- The modules with the new article numbers can still be configured in the TIA Portal as predecessor version with the old article number

Spare part use case



CPU with "old" article number e.g. 6ES7515-2AM**02**-0AB0



Spare part with new article number e.g. 6ES7515-2AM**03**-0AB0

Full spare part functionality

- When replacing the CPU, e.g. 6ES7515-2AM**01**-0AB0, with the compatible successor type, e.g. 6ES7515-2AM**03**-0AB0, **only** the memory card needs to be inserted in the new CPU

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Sparepart compatibility, look out when changing CPU

- The new controller will be faster than the old !
  - Sensors and activators have to be readjusted
  - PID controllers have to be overviewed and readjusted
  - Programs in the OBx have to be reinitialized
  - Check your communication - its a lot faster ☺

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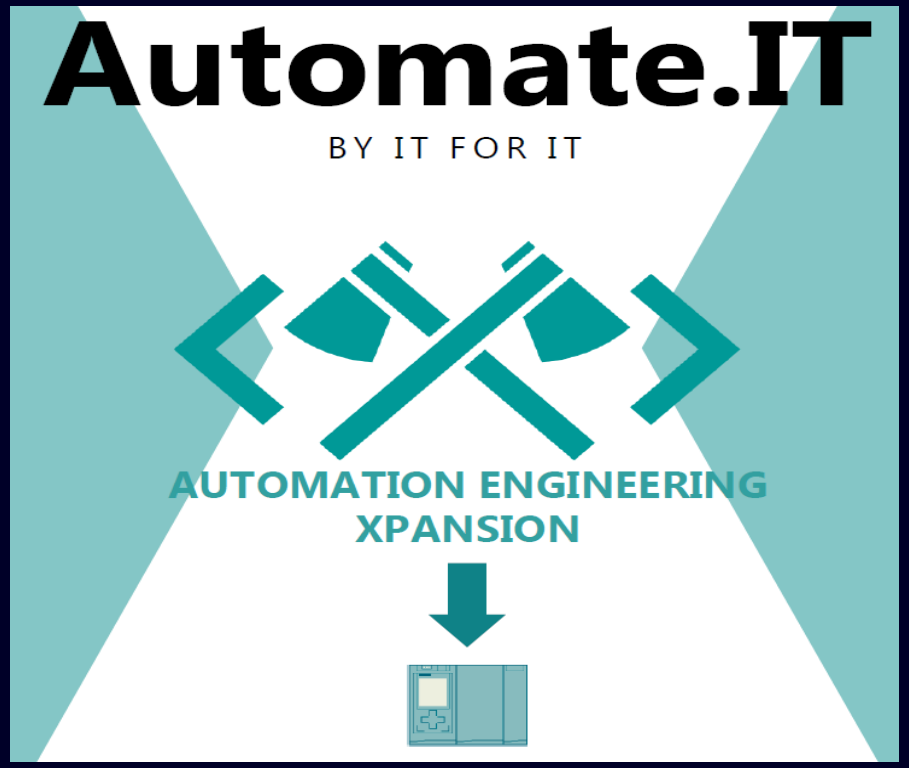
SIMATIC AX



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SIMATIC Automation Xpansion (AX)

Information Technology (IT)

- Object-Oriented Programming (OOP)
- Unit Testing
- Source Control Management via GIT
- Continuous Integration
- Package Management

Operational Technology (OT)

- Motion Control
- Industrial Communication
- Safety
- Industrial Standards
  e.g. IEC 61131
- Variant Management

BRINGING IT & OT CLOSER TOGETHER

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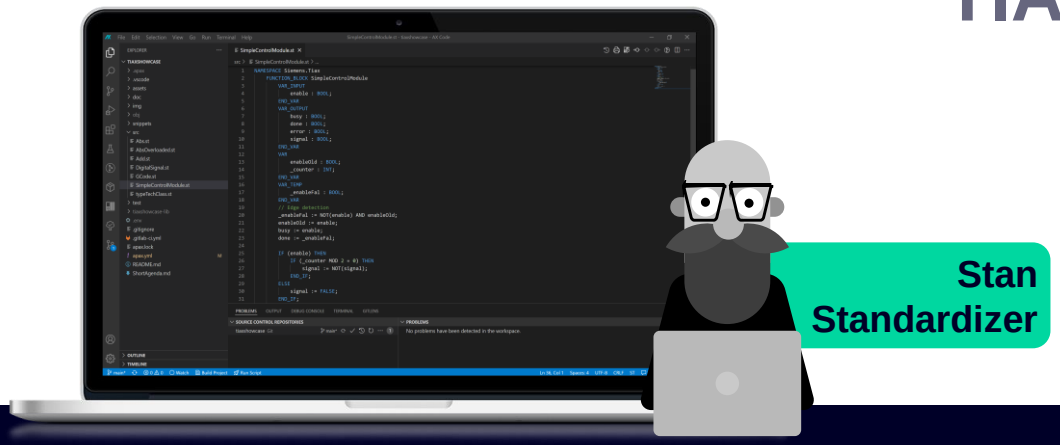
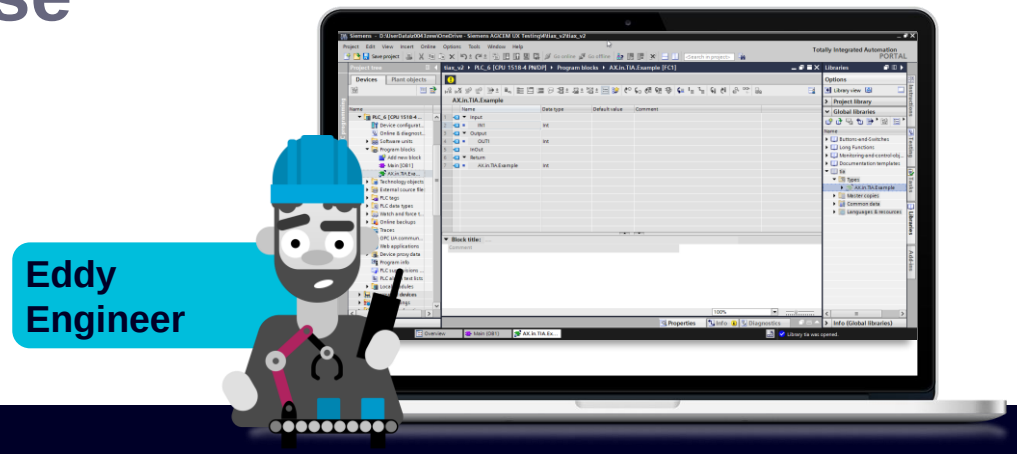
SIMATIC AX

TIAX use case



Stan Standardizer



Eddy Engineer

SIMATIC AX

- Program library functionality
- Test library
- Generate/update Global TIA Portal Library

AX2TIA

New version of TIA Portal library

STEP 7 TIA Portal

- Create hardware configuration
- Open and update library
- Create machine application
- Download HW config & code to PLC
- Monitor & debug variables

Debug library on PLC: Monitoring and tracing of variables (simultaneously with TIA Portal)

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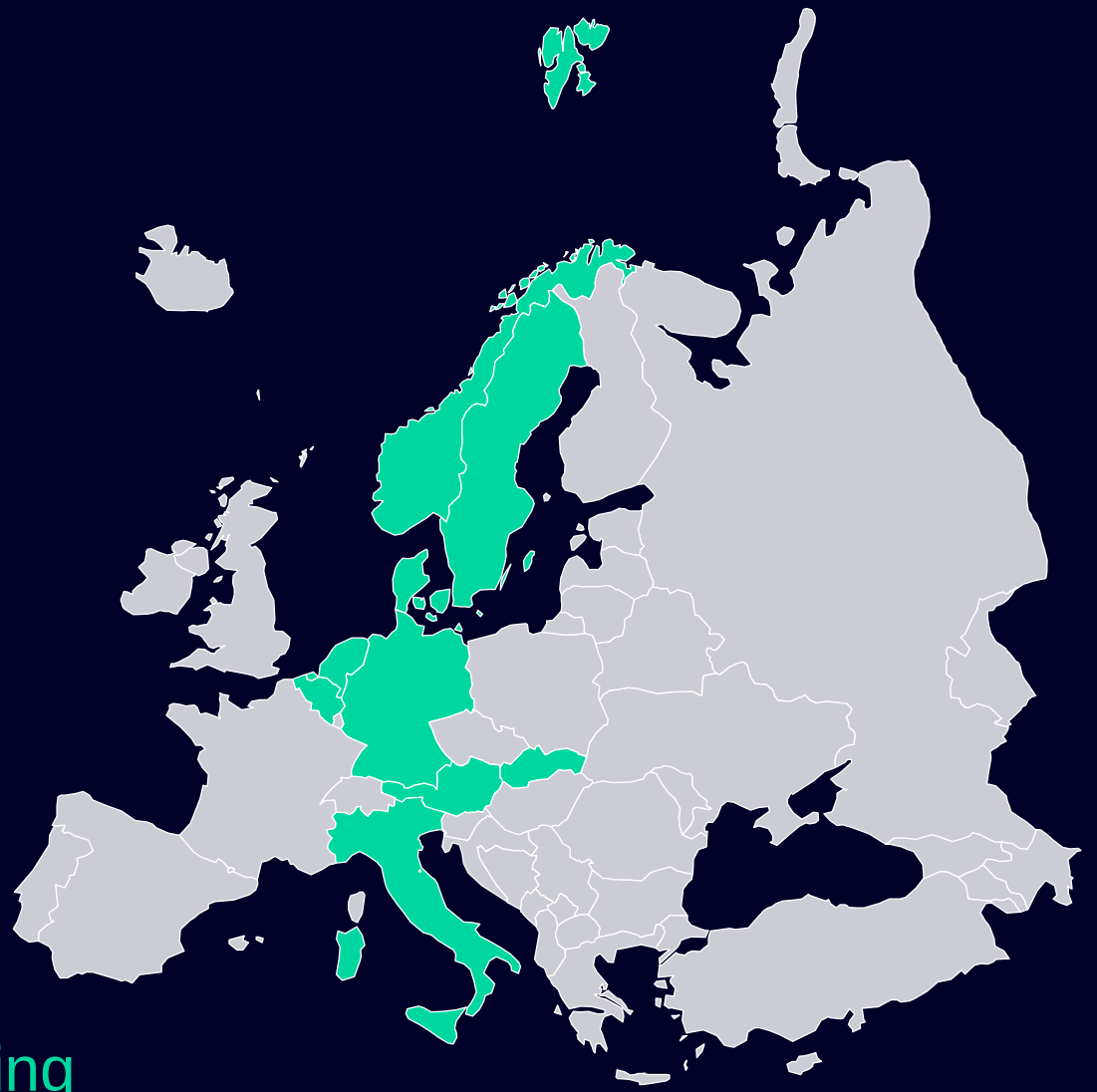
SIMATIC AX

Rollout Countries

Rollout in

- Belgium
- Netherlands
- Norway
- Germany
- Italy
- Austria
- Slovakia
- Denmark
- Sweden

Limited Sales Release together with TIA Portal V18 starting



9
countries
& expanding

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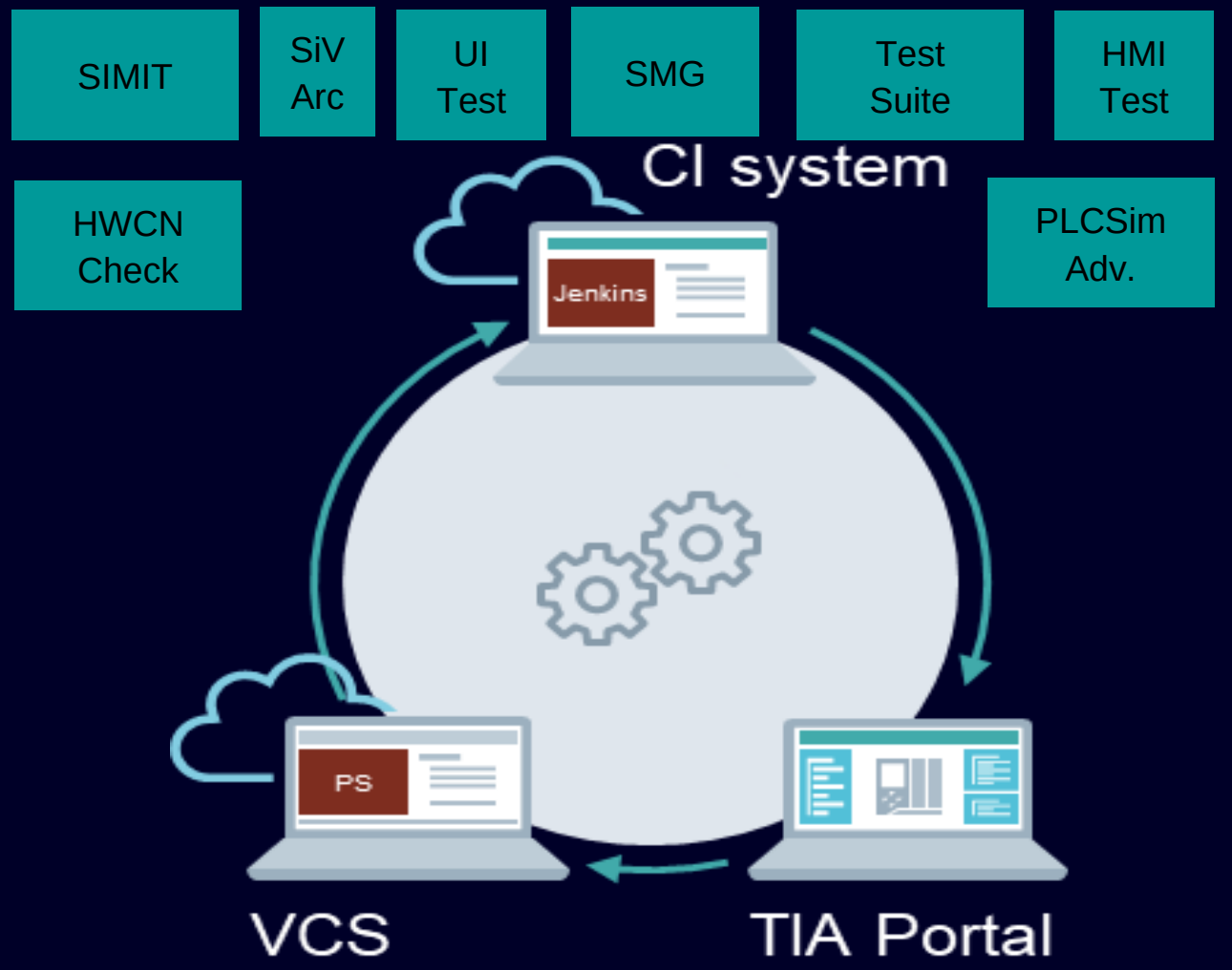
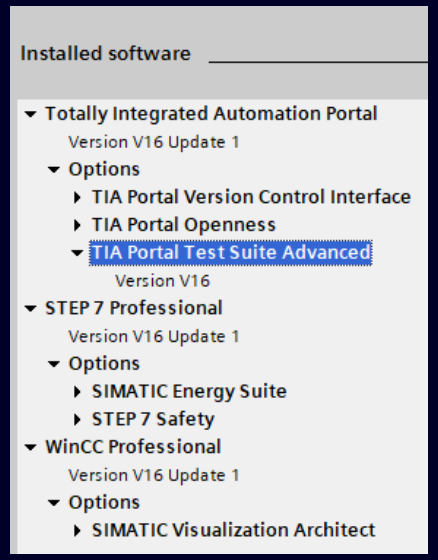
Test Suite

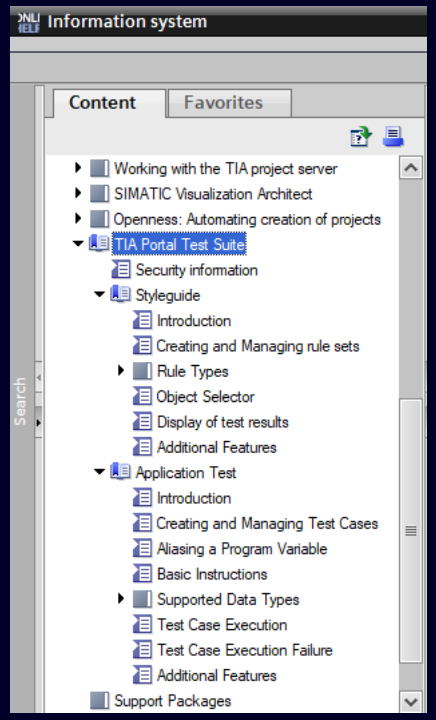

SIMIT
SiV Arc
UI Test
SMG
Test Suite
HMI Test
HWCN Check
PLCSim Adv.
CI system
Jenkins
PS
VCS
TIA Portal

TIA Portal Test Suite

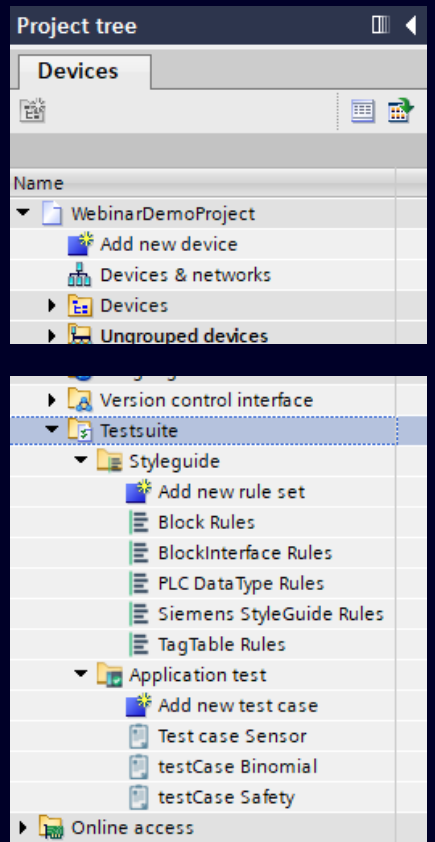
TIA Portal option package



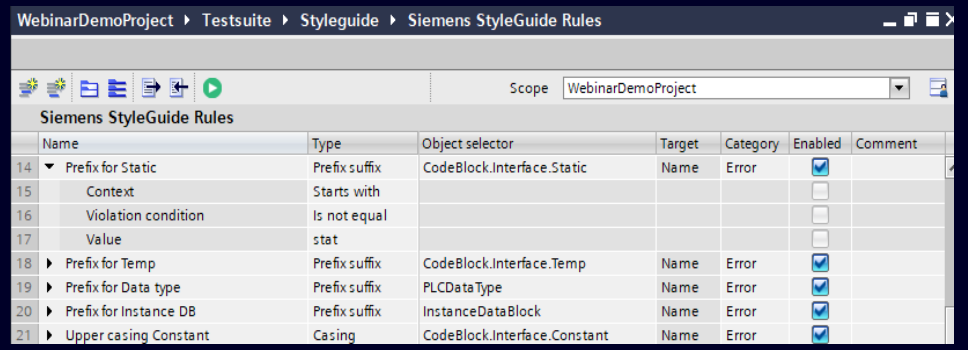
Test Suite online help



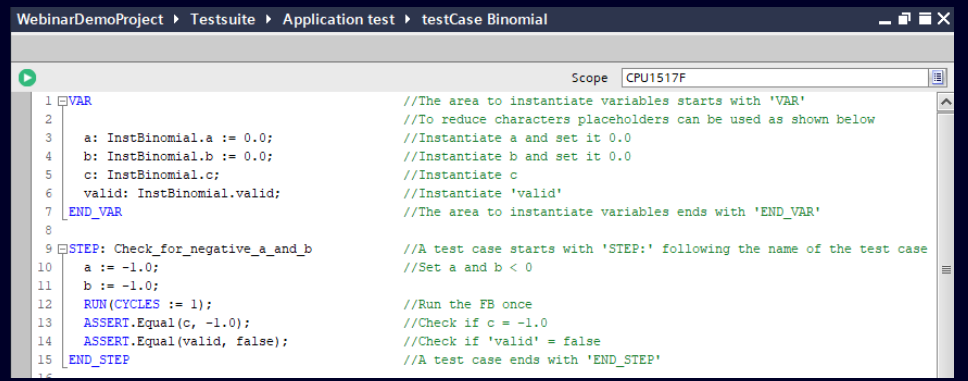
Test Suite project tree



Test Suite editors rule set



Application test

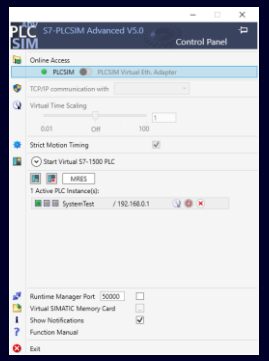


Test Suite – System test via OPC UA

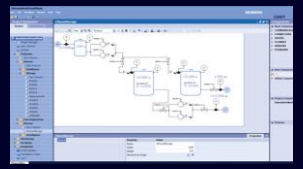
Client

Server

Digital Twin & Behavior Models



S7-PLCSIM Adv. API



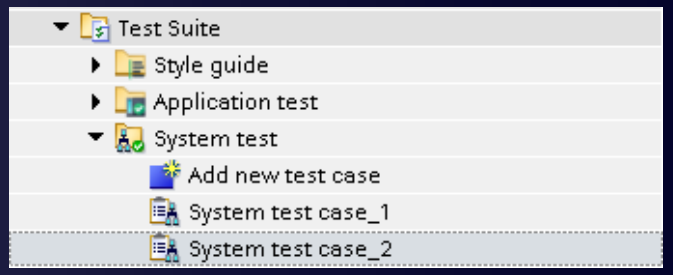
Tools like: Simit, NX MCD

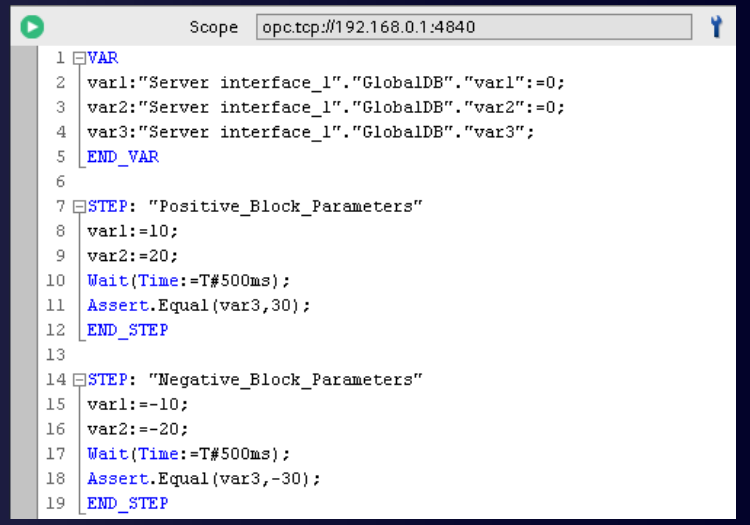
Test Suite V18

SiL Tests with S7-PLCSIM Adv.

HiL Tests with S7-1200 / S7-1500

Engineering in TIA Portal:





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TIA Portal V18 Grace Period Offer

SUS Download grace period offer – valid until February 28, 2023

We want to make it as easy as possible for you to switch from TIA Portal V1x to V18.

Keep YOUR engineering and runtime software up-to-date.

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