TIA Portal V15

The digital revolution

www.siemens.be

Installation V15

System functions
Win10-Support for TIA Portal

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Use case

Customer benefits

- Long-term Microsoft Windows support with Windows 10
- One shared operating system platform for TIA Portal and "Classic* products"
- Project upgrade to a single-station computer :
  Vxx → V13 SP2 → V14 SP1 /V15

Supported operating systems

Windows 7 (64-bit)

Windows 7 Home Premium SP1 *

Windows 7 Professional SP1

Windows 7 Enterprise SP1

Windows 7 Ultimate SP1

Windows 10 (64-bit)

Windows 10 Home Version 1703 *

Windows 10 Professional Version 1703

Windows 10 Enterprise Version 1703

Windows 10 Enterprise 2016 LTSB

Windows 10 IoT Enterprise 2015 LTSB

Windows 10 IoT Enterprise 2016 LTSB

Windows Server (64-bit)

Windows Server 2012 R2 StdE (full installation)

Windows Server 2016 Standard (full Installation)

*for Basic edition only

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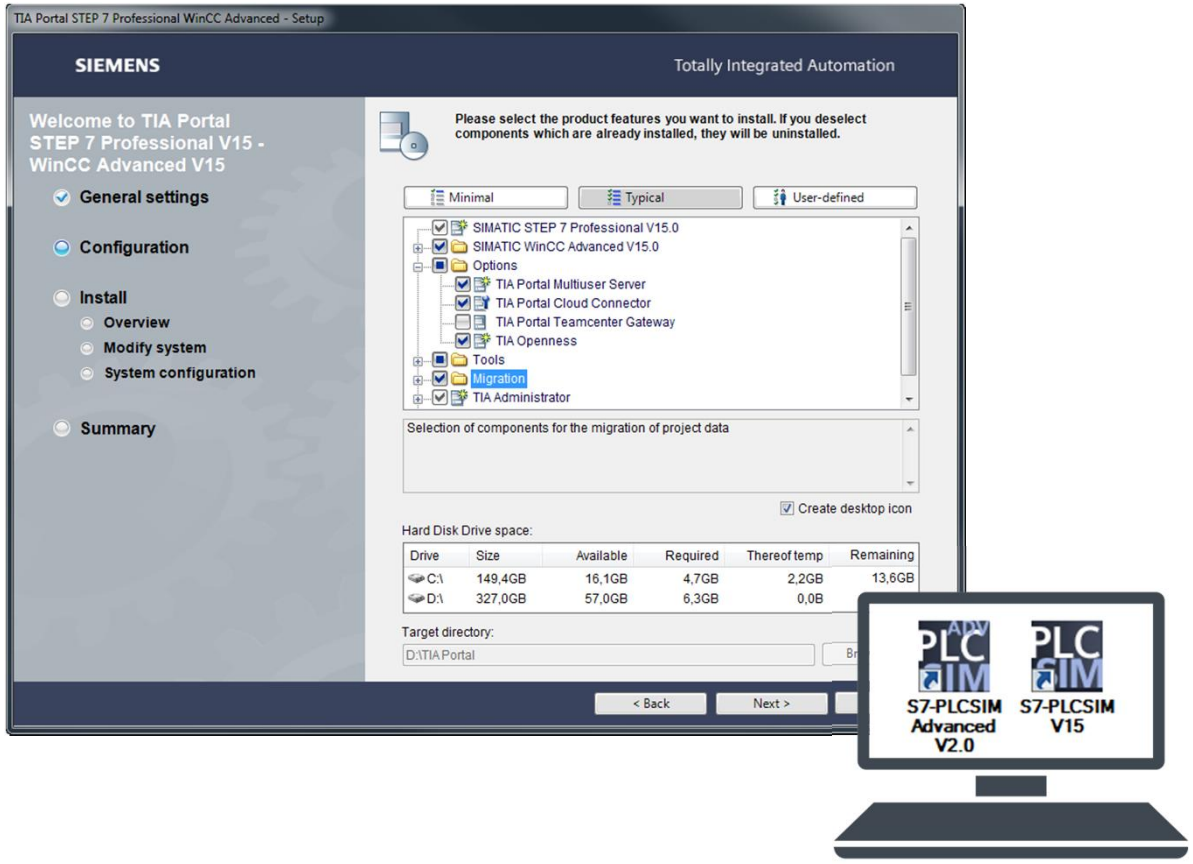
Improvements for installation of TIA Portal V15

- New installation package for Step7/WinCC
  - 2 versions: WinCC Adv. and WinCC Prof.
  - Openness as integral part of default installation
  - User Management Component on DVD2
- Installation in parallel of PLCSIM / PLCSIM Advanced
- Latest TRIAL downloads with Redirect
  www.siemens.com/tia-portal-trial



WinCC Innovations –
New approach for supported devices

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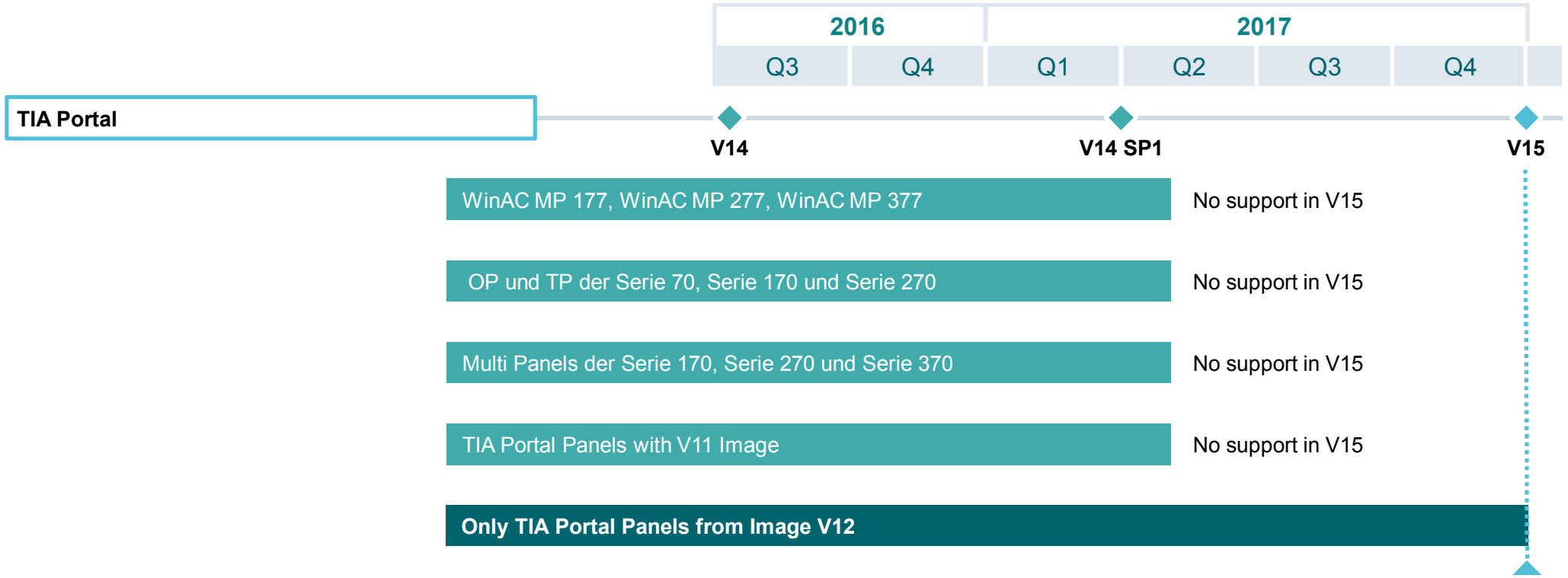

In order to maintain panels with images up to V11 in WinCC V15, they have to be upgraded before.

WinCC Innovations – Delivery of Panel Images

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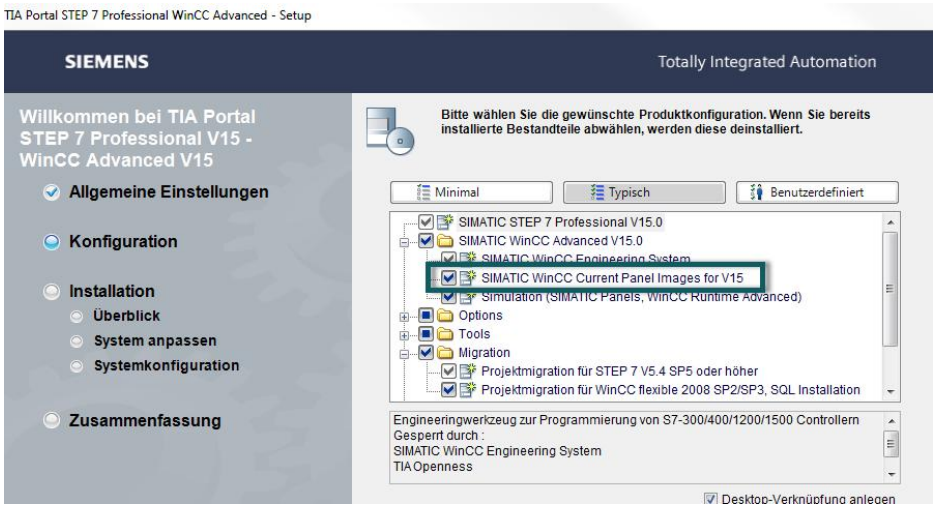
The delivery of Images was changed with TIA Portal V15

DVD1: SIMATIC WinCC / STEP 7 Professional Current Panel Images for V15 **(V12.0, V14.1, V15.0)**



DVD3: SIMATIC WinCC Legacy Panel Images for V15.0 **(V13.0, V13.1 and V14.0)**

also as SIOS download

Note: The Panels can be configured, created and simulated in the TIA Portal even if the Image/Runtime is not installed. These are required however for downloading the device or the ProSave functions

System Functions – Project upgrade

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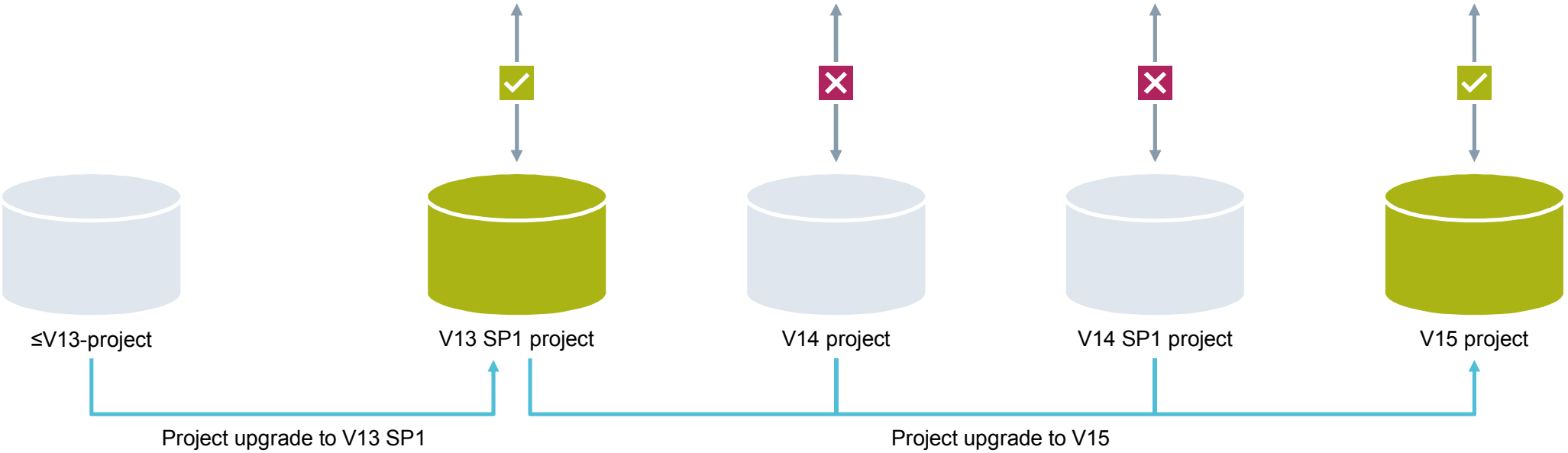
V13 SP1/SP2

(can be used with V15 license)

V15 Engineering Software



Side-by-side installation of V13 SP1/SP2, V14 SP1 and V15 allows access to all project versions

STEP 7 Innovations – Online compatibility

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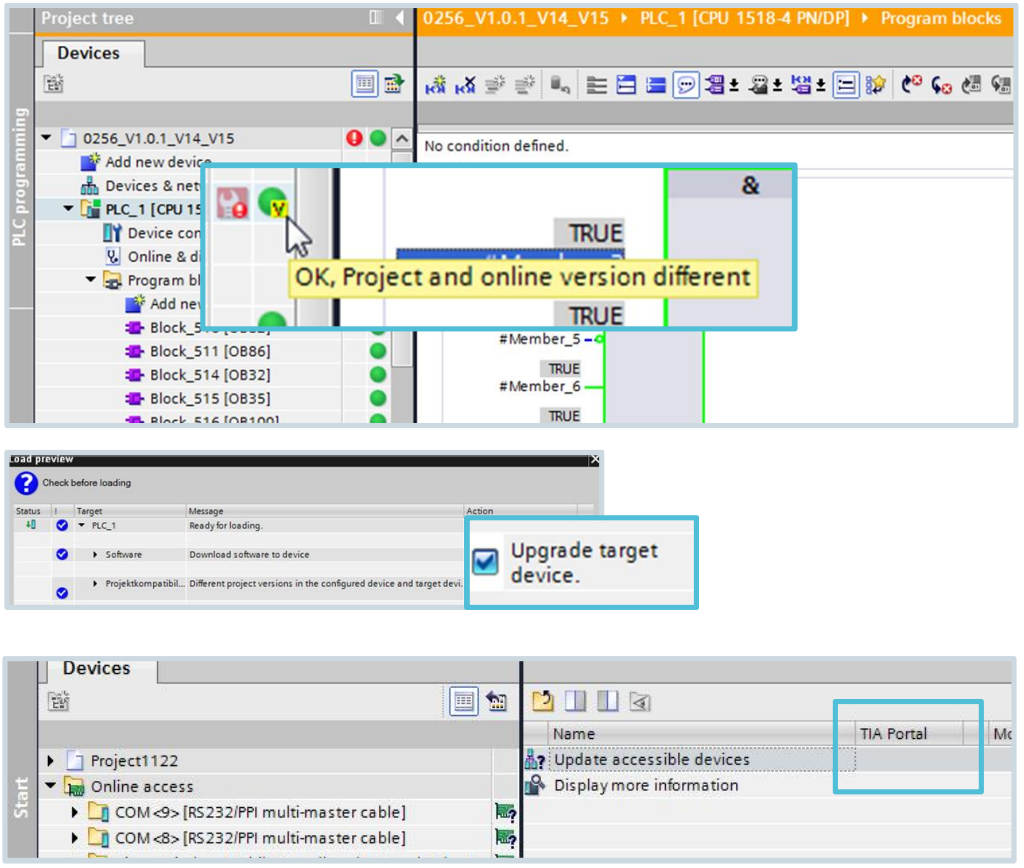
Function

- All online functions (e.g. block supervision, online/offline comparison, ...) directly after upgrading the project
- Display of project version in the life list (details)
- Upgrading of online CPU in **run**
  - For software changes
  - Only if no F program is available
  - Complete download in **run** since all blocks have to be “upgraded”
- Precondition: CPU was loaded with STEP 7 V14 or higher

Customer benefits

- No system downtime following project upgrade
- Troubleshooting possible during operation with new TIA Portal version

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STEP7 V15

Hardware Configuration – Overview of SIMATIC S7-1500 – The right CPU for every application

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	Compact CPUs				Standard-CPUs				Technology CPUs				MFP
CPU types	**1511C-1 PN**	**1512C-1 PN**	**1511F-1 PN**	**1513F-1 PN**	**1515F-2 PN**	**1516F-3 PN/DP**	**1517F-3 PN/DP**	**1518F-4 PN/DP**	**1511TF-1 PN**	**1515TF-2 PN**	**1516TF-3 PN/DP**	**1517TF-3 PN/DP**	**1518F-4 PN/DP MFP**
Interfaces	1 1	1 1	1 1	1 1	1 2 1	1 2 1	1 2 1	1 2 1 3	1 1	1 2 1	1 2 1	1 2 1	1 2 1 3
Program/ data storage	175 KB 1 MB	250 KB 1 MB	150/ 225 KB 1 MB	300/ 450 KB 1.5 MB	500/ 750 KB 3 MB	1/ 1.5 MB 5 MB	2/3 MB 8 MB	4/6 MB 20 MB	225/ 225 KB 1 MB	750/ 750 KB 3 MB	1.5/ 1.5 MB 5 MB	3/3 MB 8 MB	4/6 MB 20 MB 50 MB[1]
Bit-performance	60 ns	48 ns	60 ns	40 ns	30 ns	10 ns	2 ns	1 ns	60 ns	30 ns	10 ns	2 ns	1 ns
Max. number of connections	96	128	96	128	192	256	320	384	96	192	256	320	384
Positioning axes													
• **Typical[2]**	5	5	5	5	7	7	70	128	5	7	65	70	128
• **Maximum[2]**	10	10	10	10	30	30	128	128	10	30	80	128	128
Width	85 mm	110 mm	35 mm	35 mm	70 mm	70 mm	175 mm	175 mm	35 mm	70 mm	175 mm	175 mm	175 mm
											New		New

1 Additional 50 MB memory for ODK applications; **2** For 4ms Servo/IPO cycle

PLC based Multifunctional Platform CPU 1518MFP –
C/C++ Runtime Linux based

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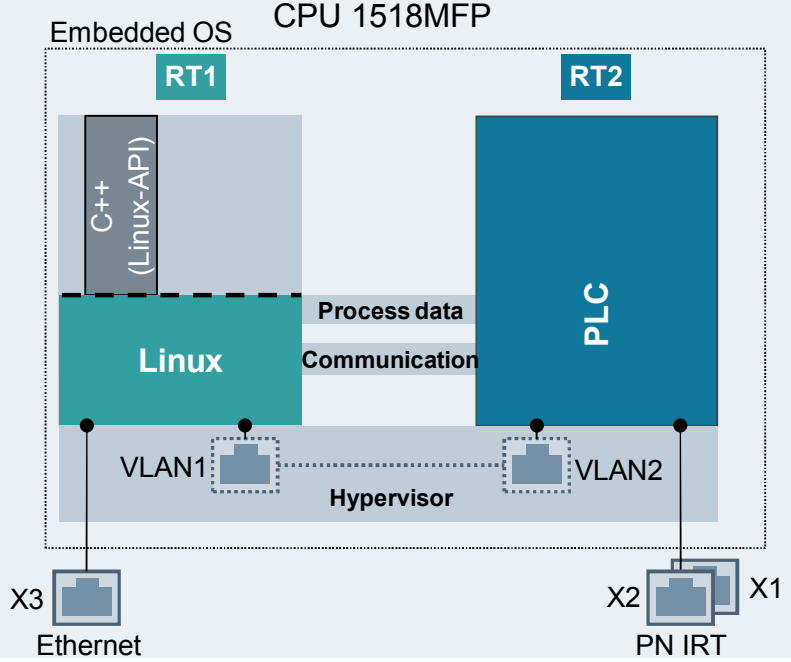
Closed System – PLC extended with more functionality

CPU 1518MFP



V15 solution with S7-1518MFP

- **Standard S7-1518 PLC**
- **Linux distribution based on Yocto Project**
  - **Versatile** functionality
  - **Experience** with IOT2000
  - Long-term **maintaining support** by Siemens CT
  - SDK (cross build tools) support for **application development** with eclipse
- **Communication** and access to process data via virtual Ethernet interface, provided by hypervisor

yocto PROJECT

eclipse

Customer benefit

- Long-term compatibility without reengineering, even for next CPU-generation

Hardware Configuration – Hardware detection of PROFINET IO devices

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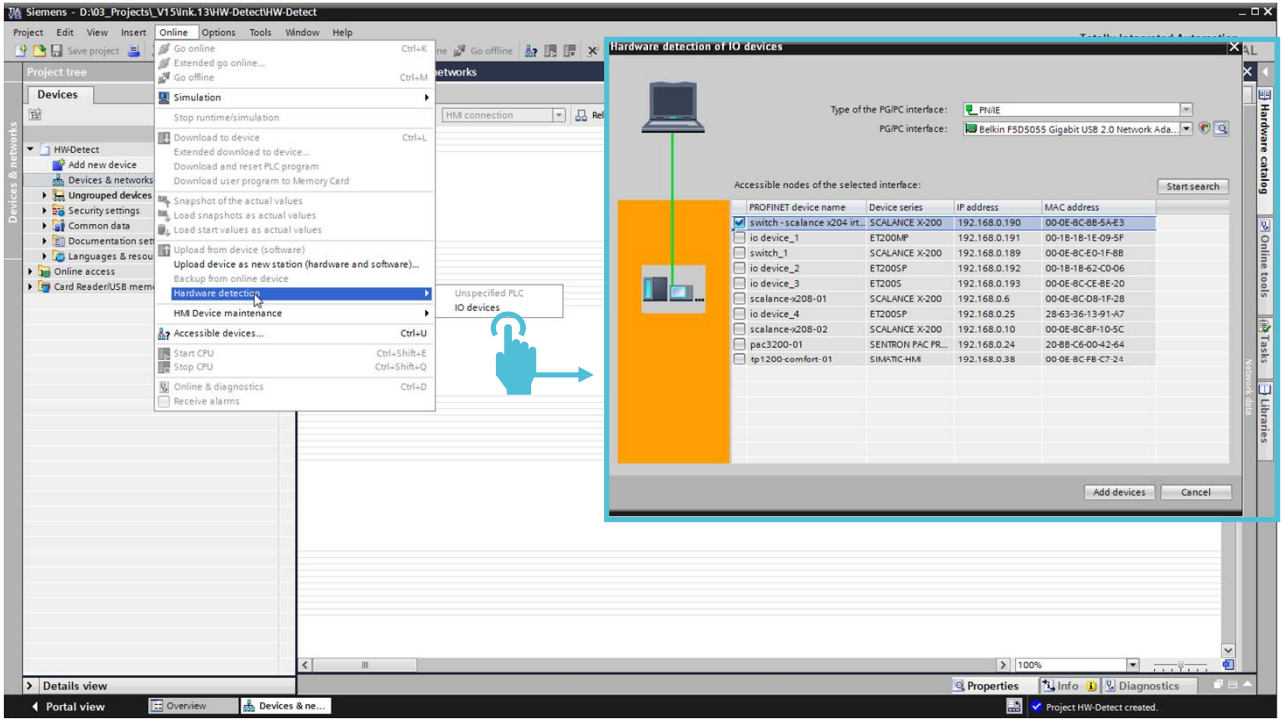
Hardware detection of PROFINET IO devices

- Time savings through automatic detection of IO devices
- Instead of manual configuration from the hardware catalog, insertion of IO devices including modules from the system/machine in the project by means of **hardware detection**



STEP 7 Innovations – Breakpoints on the CPU S7-1500

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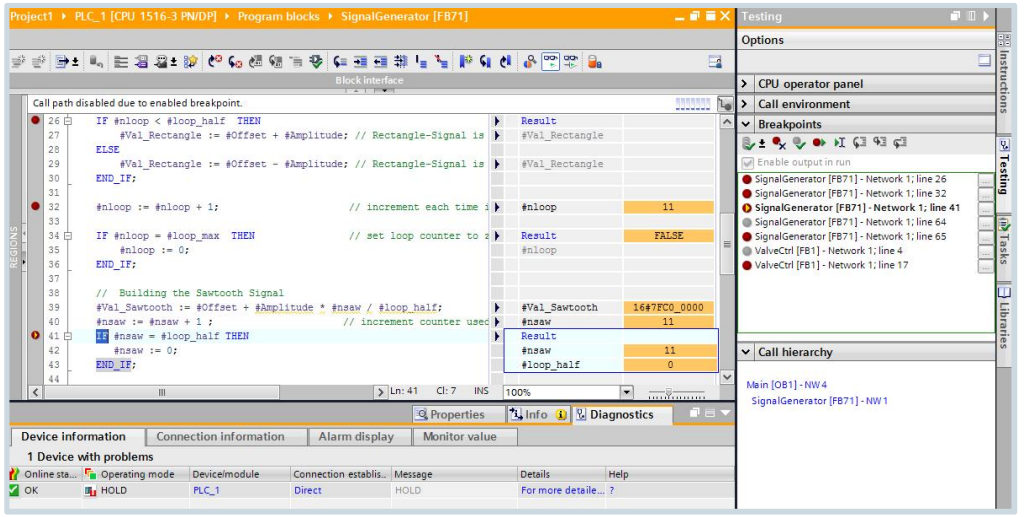
S7-1500 ✓ | S7-1200 ✗ | S7-300/400/WinAC ✓

Function

- Setting of breakpoints in SCL/STL programs (also possible in mixed LAD/FBD blocks)
- Maximum number of active breakpoints per CPU:
  - ≤CPU 1516/CPU 1515SP PC: 8
  - ≥CPU 1517/CPU 1507S/S7-PLCSIM: 20
- From firmware version V2.5 of CPU S7-1500

Customer benefits

- Testing of SCL and STL program code with the aid of breakpoints
- Step-by-step isolation of errors
- Simple and fast analysis of complex programs in the office **before** actual startup



When a breakpoint is reached, the CPU enters **hold** mode

STEP 7 Innovations – Motion control – Kinematics for handling tasks

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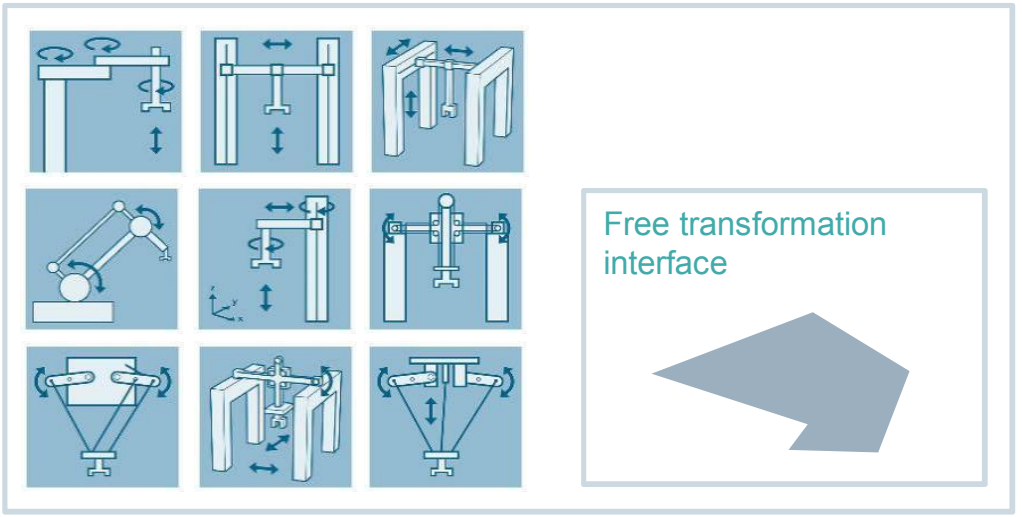
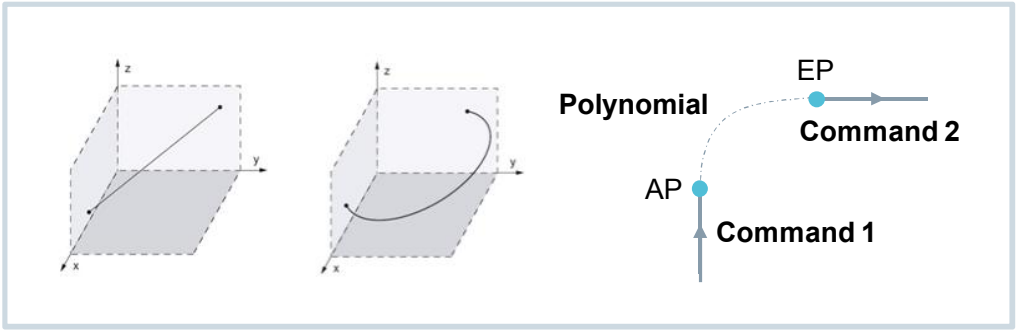
S7-1500T ✓ | S7-1200 ✗ | S7-300/400/WinAC ✗

- Technology object kinematics (TO kinematics) for simple interconnection of positioning axes to form a **kinematic unit**
- Predefined 4D kinematics for simple use of standard kinematics (SCARA, Portal, Articulated Arm, Roll Picker, Delta Picker, Cylindrical Robot, Tripod)
- User transformation as function block for integrating user-defined kinematics



- 4D interpolation, linear and circular movement with geometric blending including **orientation guidance** (e.g. rotation of the gripper)
- **Motion queue programming** for advance motion processing with dynamic adaptation



STEP 7 Language Innovations – New statements – FileReadC/FileWriteC

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S7-1500 ✓ | S7-1200 ✗ | S7-300/400/WinAC ✗

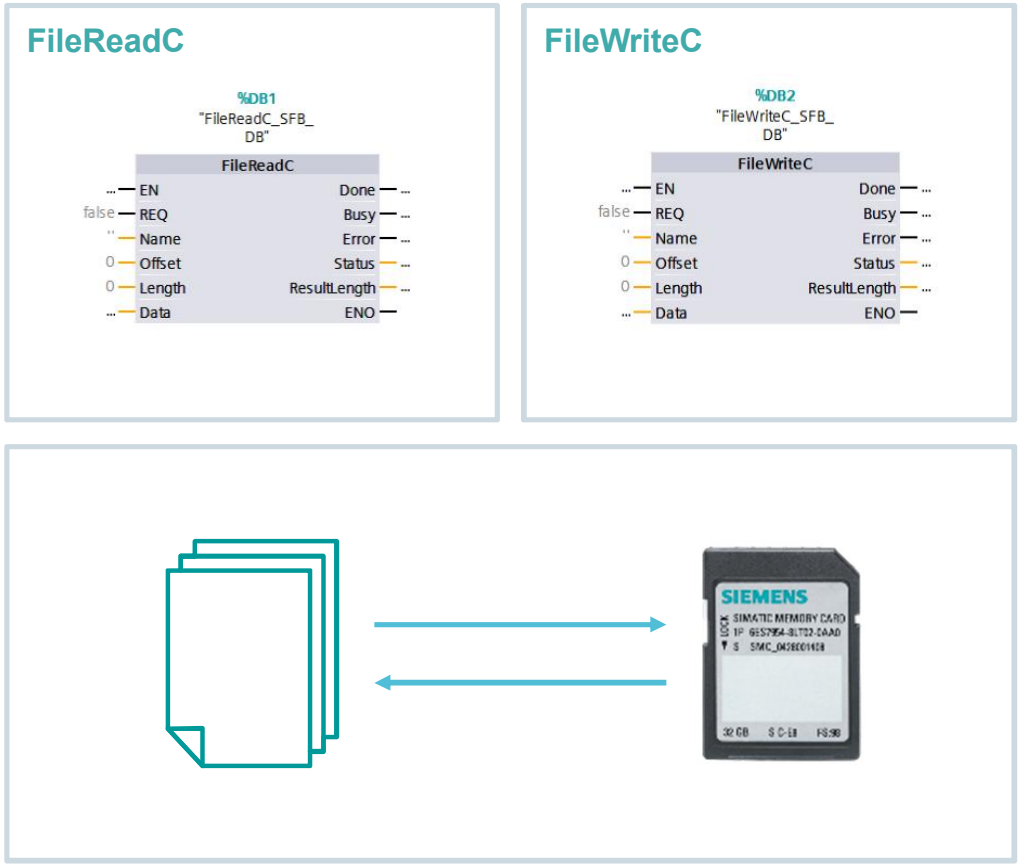
Function

- Read data from an ASCII file from the SIMATIC memory card
- Write data to an ASCII file on the SIMATIC memory card

Customer benefits

Complex file structures are used in free ASCII format on the SIMATIC memory card, for example to

- Import recipes in cases where CSV is not flexible enough
- Import complex parameterizations or configuration files
- Output complex files for documentation



STEP 7 Language Innovations – New statements – Scatter/Gather

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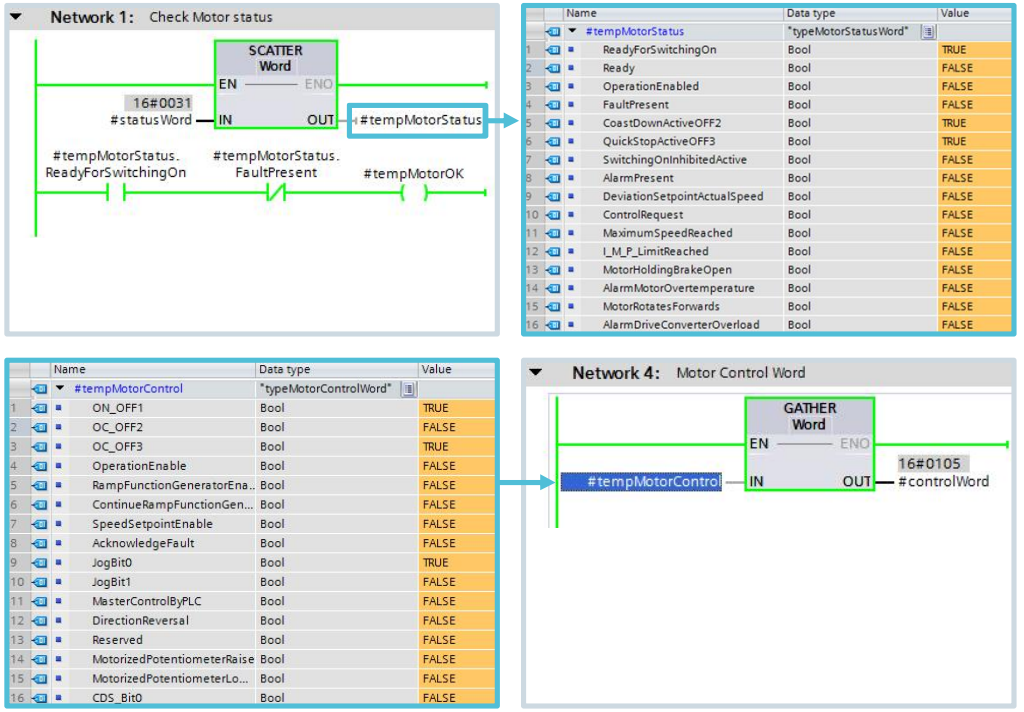
S7-1500[1] ✓ | S7-1200 ✗ | S7-300/400/WinAC ✗

Convert data for further processing

- SCATTER decomposes bit sequences (Byte, Word, etc.) into a bit array
- GATHER assembles a bit array to form a bit sequence
- SCATTER_BLK/GATHER_BLK for decomposing/assembling bit
- **Support for STRUCT and PLC data types with exclusively boolean elements** — New in V15

Sample application

Decompose, process or also simply assemble control and status words



1 From FW2.1

STEP 7 Innovations – Download/upload for PLC tag tables

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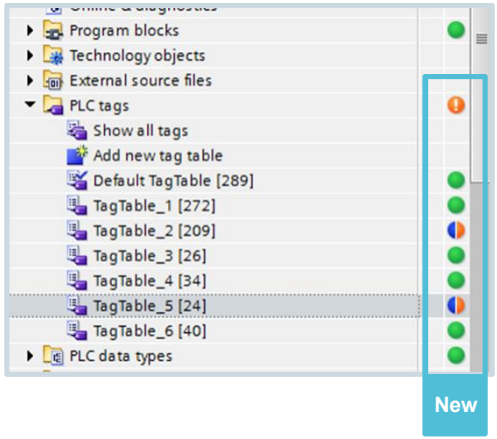
S7-1500 ✓ | S7-1200 ✗ | S7-300/400/WinAC ✗

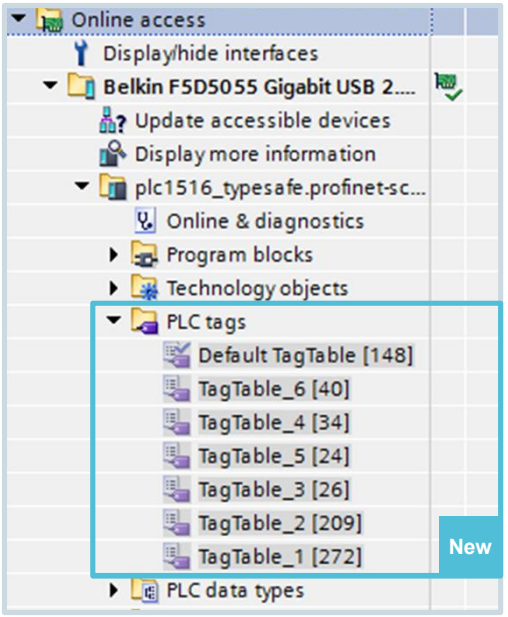
Function

- Download PLC tag tables to the CPU
- Display PLC tag tables also under “Accessible devices” and on the memory card (incl. opening)
- Online status at **granular tag level**
- Uploading of individual or all PLC tag tables into the predefined structure

Customer benefits

- Tracking of changes done by other user on the CPU
- Quick overview of the online status of the CPU
- Improved team engineering on the CPU





STEP 7 Innovations – Online/offline comparison for PLC tag tables

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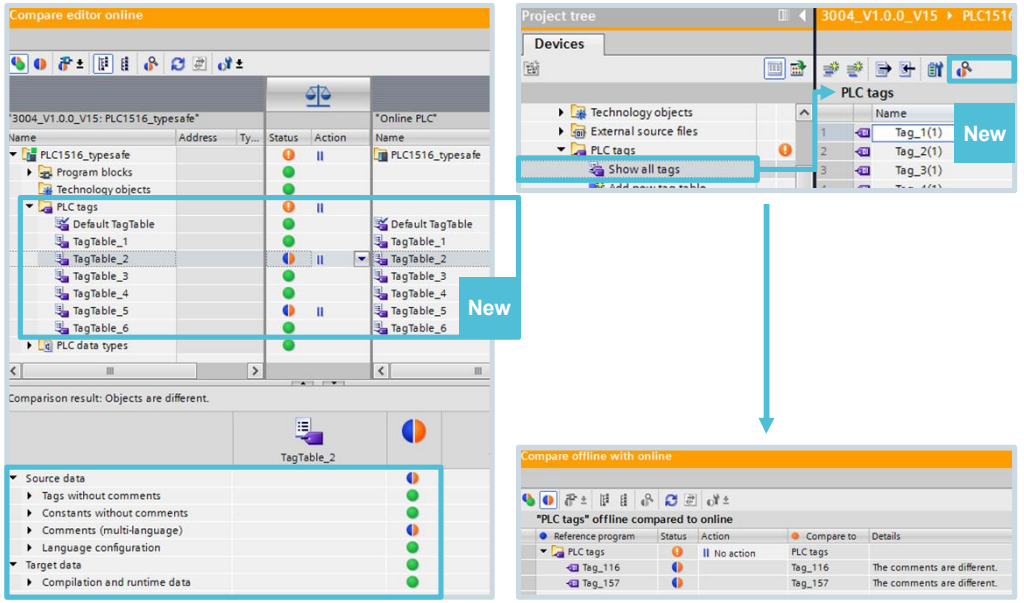
S7-1500 ✓ | S7-1200 ✗ | S7-300/400/WinAC ✗

Function

- Online/offline comparison at tag table level
- Detailed comparison for individual PLC tag tables
- Detailed comparison for all tags
- Checksum-based comparison for
  - Tags
  - Constants
  - Comments
  - Language configuration



Customer benefits

Complete overview of all online/offline information

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Options
TIA-portal V15

System Functions – TIA Portal Openness – SCL in XML

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XML export/import of SCL blocks

New

- Interface for calling the SCL block export
- XML representation in file
- Interface for calling the XML import

Customer benefits

- Completion: All blocks can be processed by machine via XML
- LAD/FUP blocks with SCL networks can now also be exported/imported
- Now possible: XML comparison of SCL blocks in versioning systems

```
#myString := 'Hello world';
```

```
<Access Scope="LiteralConstant">
<Constant>
<ConstantValue>Hello world</ConstantValue>
<ConstantTypeInformative="true">STRING</ConstantType>
</Constant>
</Access>
```

System Functions – TIA Portal Openness – PLC download

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Download PLC

New

- Interface for calling the PLC download
- Download to standard PLC
- Handling of passwords

Customer benefits

- Automatic download to machines is possible
- Development of simple tool interfaces for PLC down-load for persons without knowledge of TIA Portal
- Automated input of protection level and binding passwords

TIA Portal Options – Multiuser Engineering – Overview of new functions

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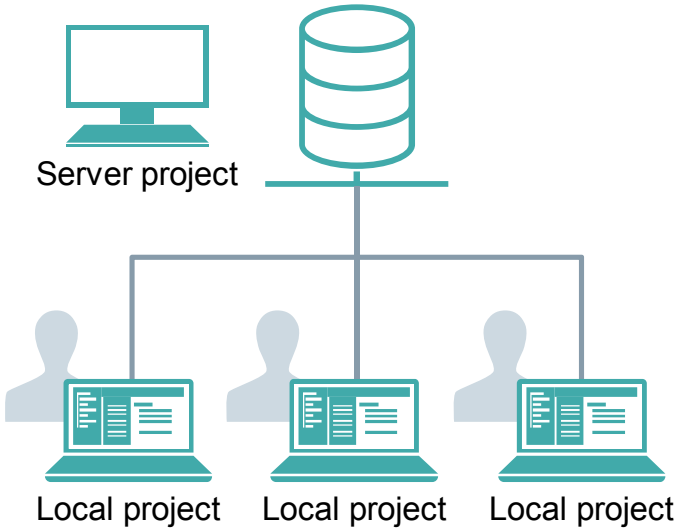
Function

- Automatic marking of multiuser objects
- Offline working possible with multiuser engineering
- Enhanced check-in and comment functions
- Project server with extended revision history and recovery functions

Customer benefits

- Multiuser engineering also possible without active server connection
- Improved usability for quick overview of changed objects and conflict recognition
- Traceability of project progression on the multiuser server (What was changed by whom?)
- Project milestones can be commented and saved
- Project history can be exported for evaluation



TIA Portal Options – OPC UA – Overview of new functions

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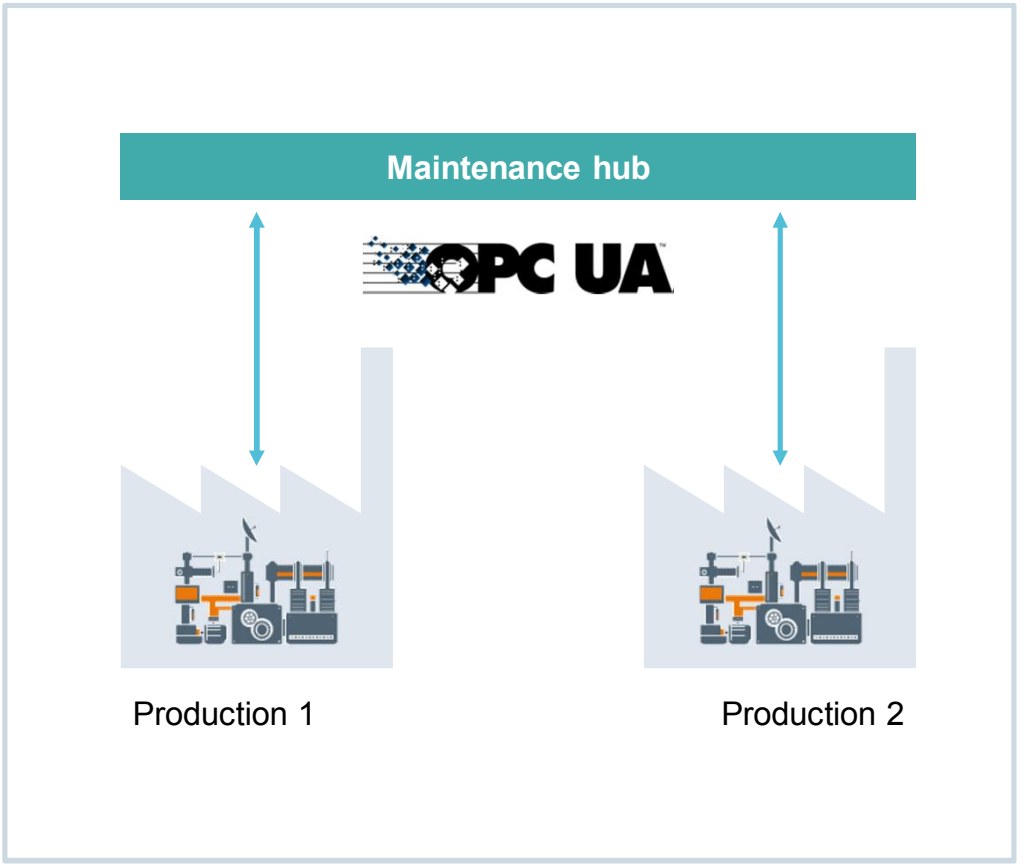
Function

- OPC UA Server
  - Method call
- Support for companion specifications

Customer benefits

- Simple and safe exchange of data between client and server
- Apart from the up-to-date data and symbolic names, additional attributes can also be exchanged
- Remote Procedure Calls (RPC → call for a remote procedure) are enabled efficiently based on methods
  - Eliminates the need for manually created handshaking
  - Ensures data consistency
- Companion specifications allow plug&play with standardized interfaces



User Management and Access Control UMAC and Option UMC – Cooperation

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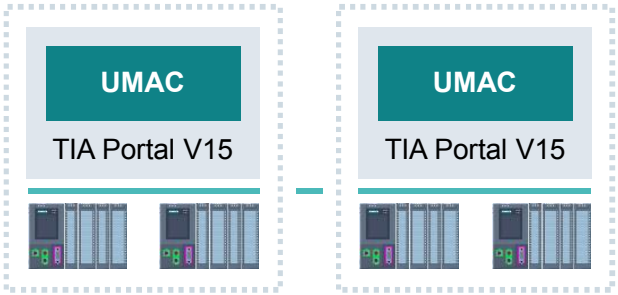
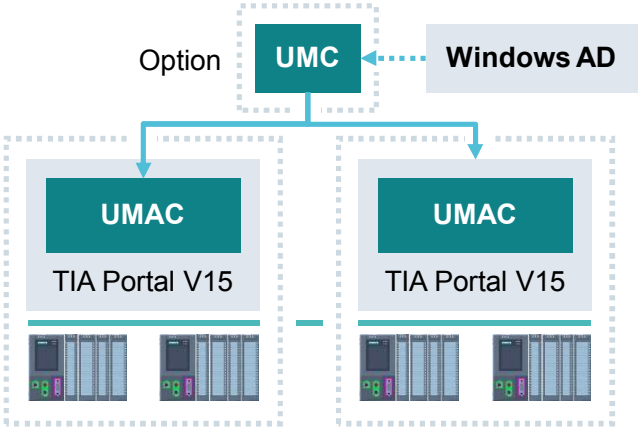
UMAC: User Management and Access Control

- Built-in functionality in TIA Portal
- Allows personalized access to TIA Portal projects
- Define project users, roles and assign them



UMC: User Management Component

- Extends UMAC by optional use
- Manages users/groups outside TIA Portal projects
- Import of needed UMC users/groups into TIA Portal projects
- Assigning project roles to them
- Authenticates UMC users' logins afterwards



Live-Demo

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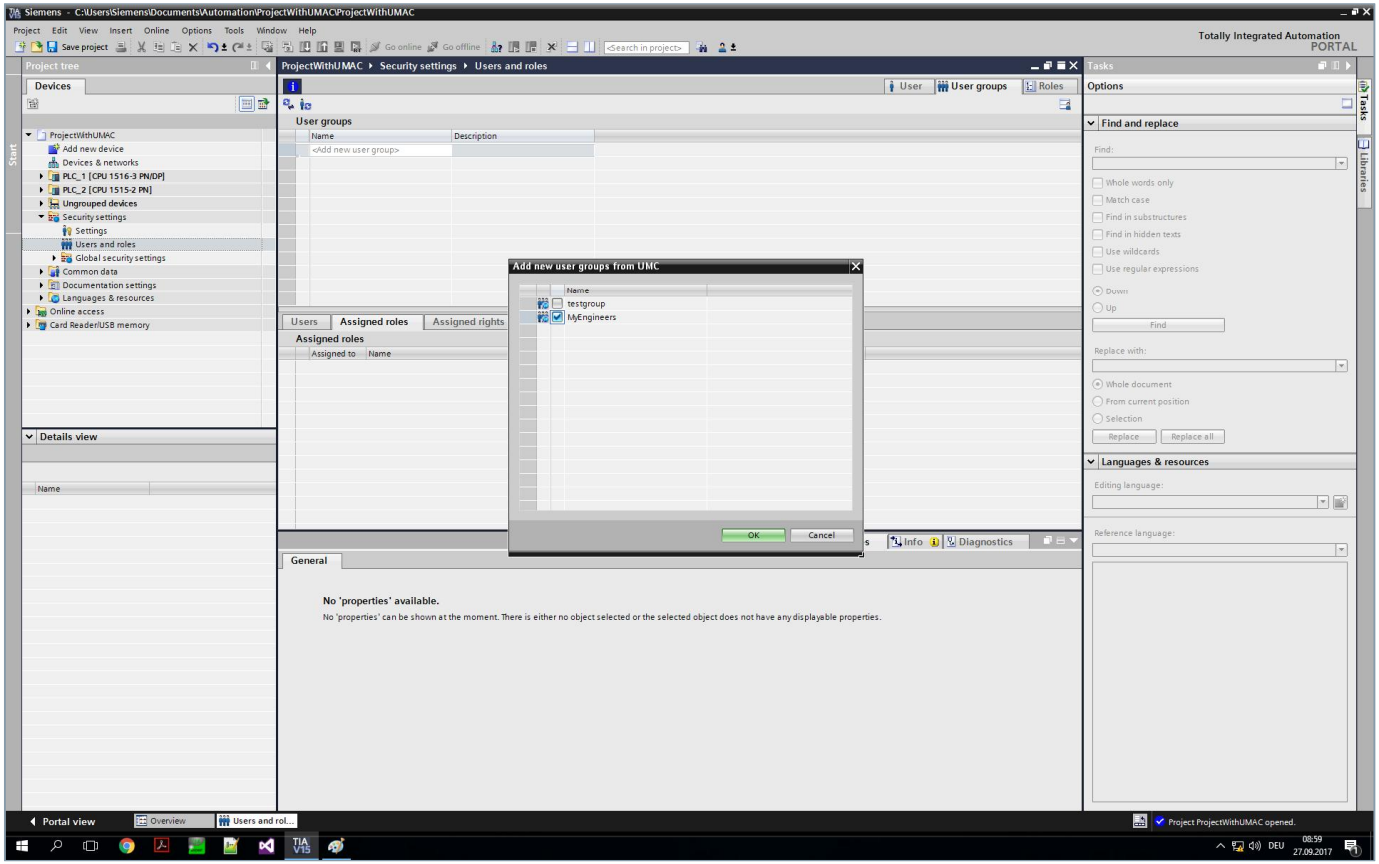

Hardware detection

OPC UA

UMAC-UMC

Multi-user

WinCC V15

WinCC Innovations –
Functional improvements (graphic elements)

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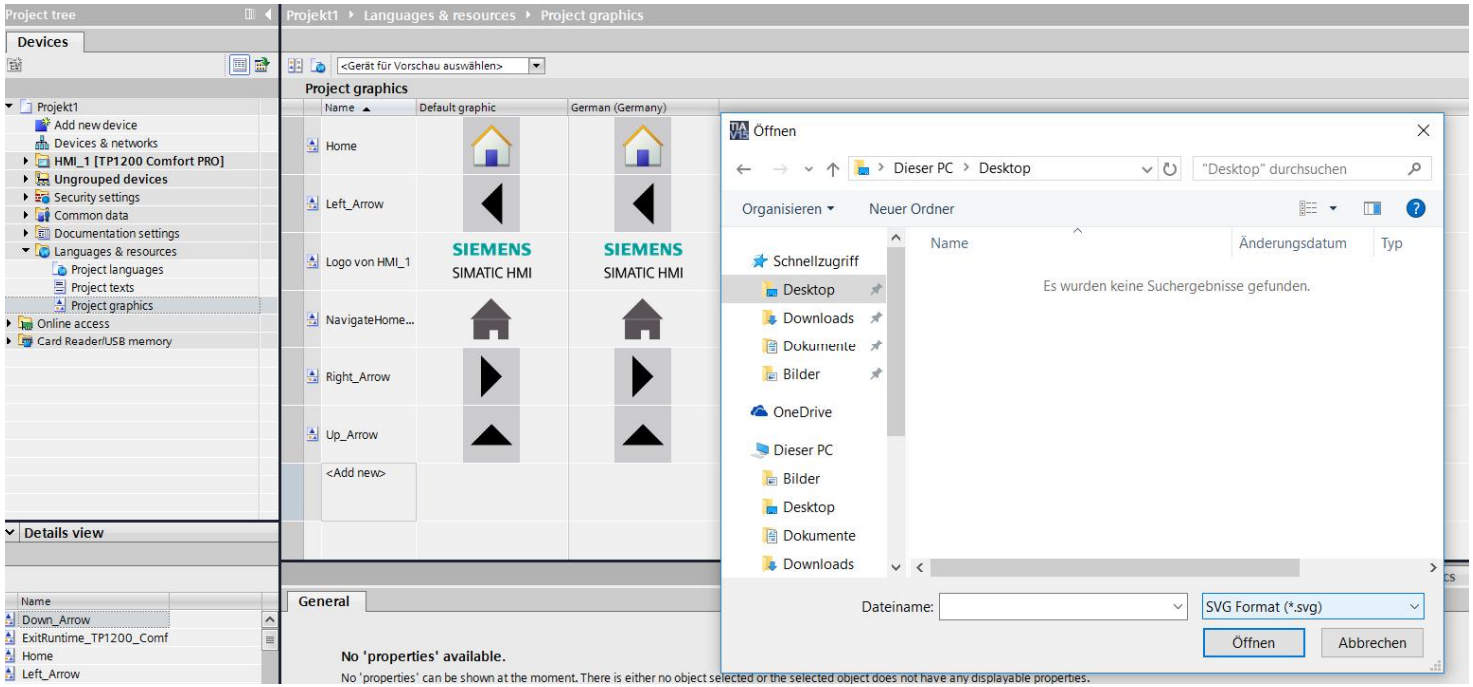
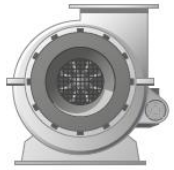
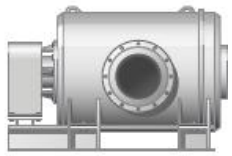
Support for static SVG (Scalable Vector Graphic)

Scalability without losing the image quality







WinCC Innovations – Communication connections with WinCC RT Professional

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Larger number of connections to S7-1500/S7-1200 PLCs

- Runtime Professional supports up to 128 connections
- Max. 128 S7-1500/S7-1200 can communicate with a RT Professional
- Max. 64 S7-300/400 can communicate with a RT Professional
- Sample configurations
  - 128x S7-1500s
  - 70x S7-1500s and 58x S7-1200s
  - 64x S7-300s and 64xS7-1500s
  - 100x S7-1500s and 28x OPC UA Clients


WinCC Innovations –
Communication connections with WinCC RT Professional

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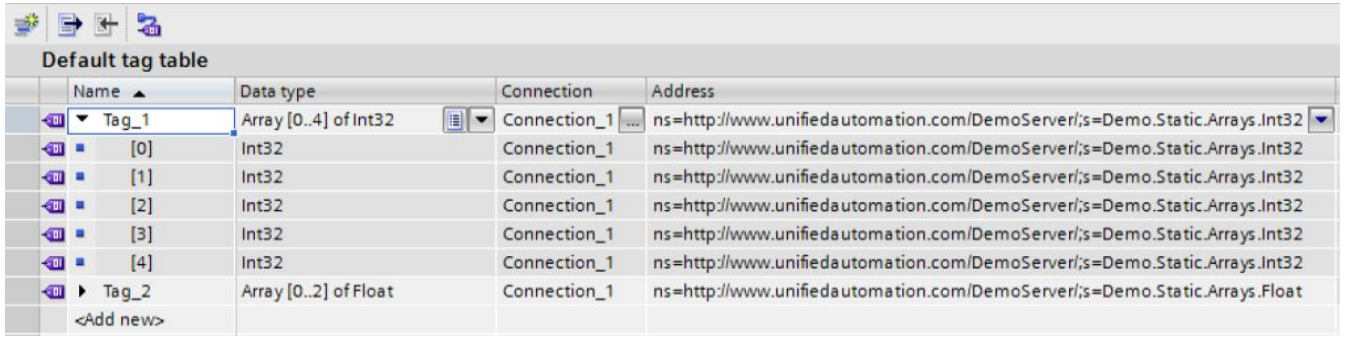
Functional enhancement of OPC UA Client

- Security improvements through support for authorization parameters (user and password)
- Support for array data types



Safety V15

TIA Portal Options – STEP 7 Safety – Overview of new functions

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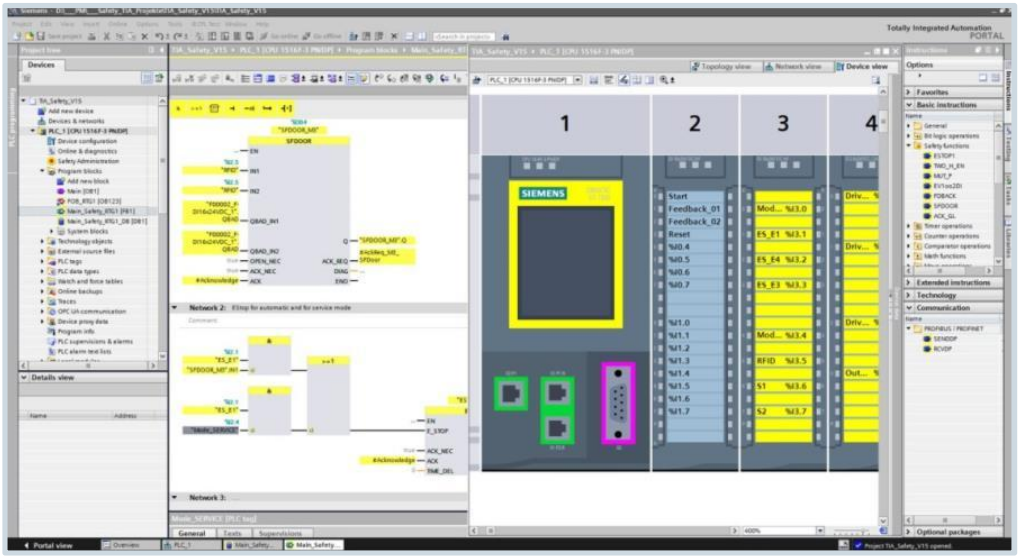
Function

- Failsafe arrays (read access) for data types INT and DINT
- Separate F-signature for hardware and software
- Overflow handling
- Usability improvements and more new functions
  - Read back of fail-safe F-FB Out parameters
  - Writing of F-FB input parameters as for STEP 7 Standard
  - Start values of instance DBs can be changed
  - Synchronous failsafe OB
  - DINT → INT converter (S7-1200, S7-1500)
  - ABS: Create absolute value (S7-1200, S7-1500)



Customer benefits

Increased efficiency for programming failsafe S7 controllers

TIA Portal Options – STEP 7 Safety – Read access to failsafe arrays of data type INT/DINT

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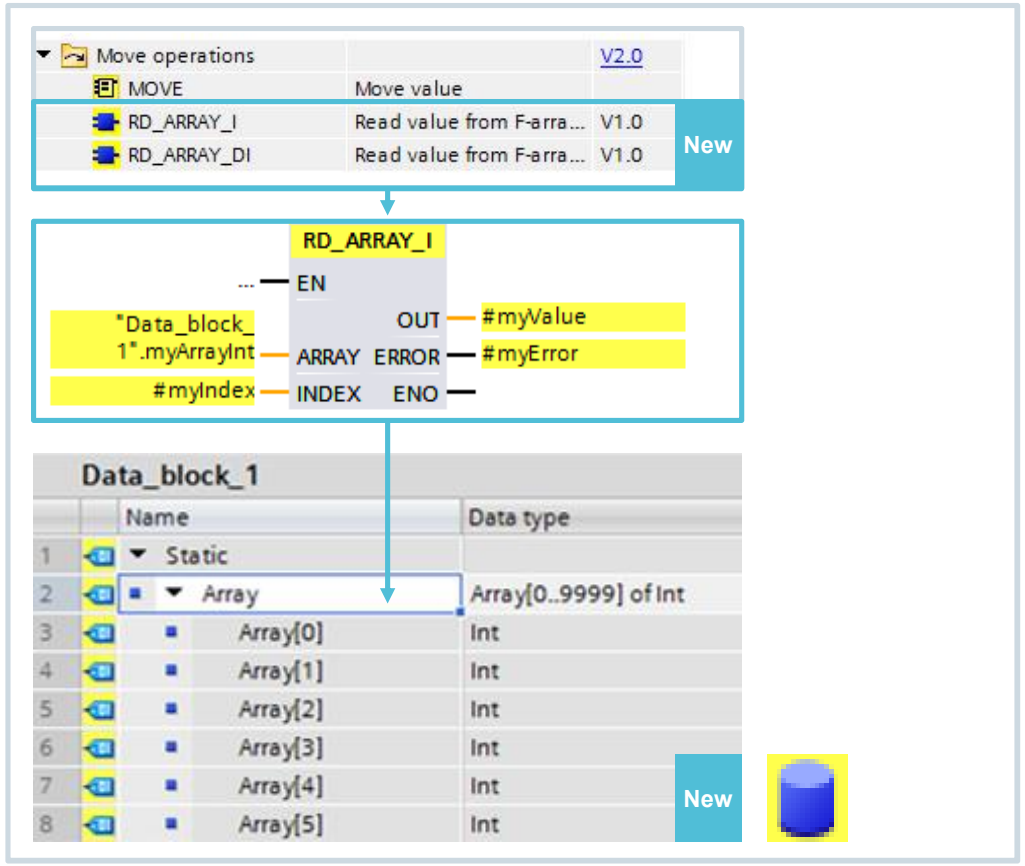
S7-1500

Function

- F data blocks support failsafe arrays of **data type INT/DINT**
- Read access to failsafe system blocks **RD_ARRAY_I** and **RD_ARRAY_DI**
- Up to **10,001** (0 … 10,000) **elements per array** are supported



TIA Portal Options – STEP 7 Safety – Separate F-signature for hardware and software

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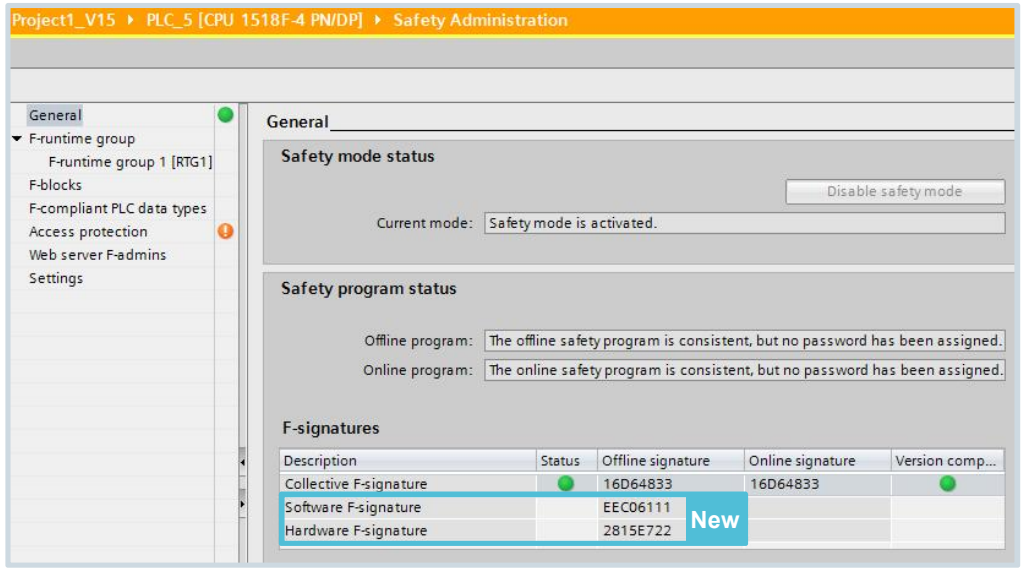
S7-1200 ✓ S7-1500 ✓

Function

- Differentiability between **hardware** and **software-**related changes
- **Documentation** in safety print-out



TIA Portal Options – STEP 7 Safety – Overflow Handling

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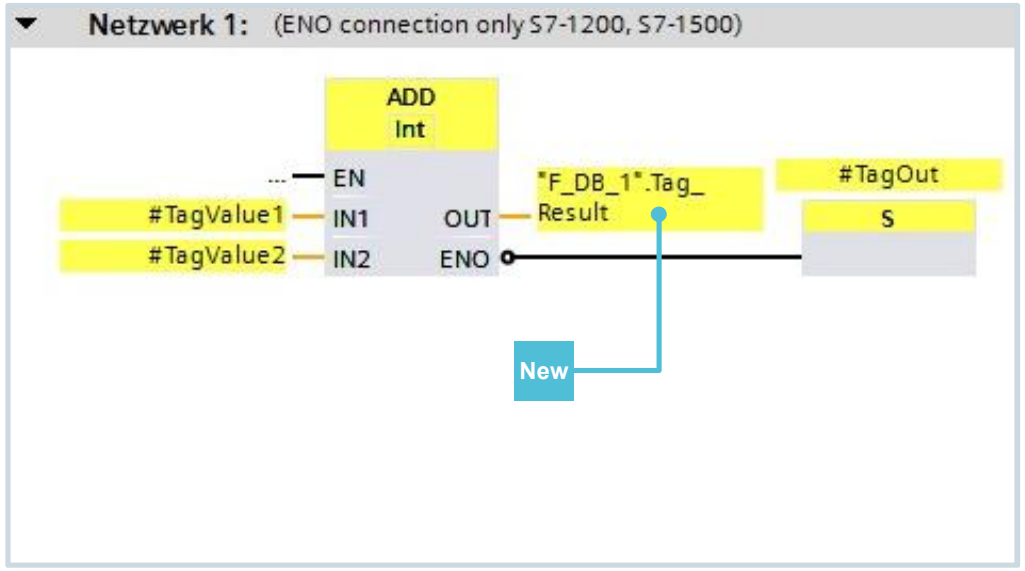
Ingenuity for life

S7-1200 ✓ S7-1500 ✓

Function

- As with standard operations, failsafe uses the **ENO output** (enable output) **to signal overflows** (according to IEC61131)
- The following **statements** are supported for the data types INT/DINT: **ADD, SUB, MUL, DIV, NEG, ABS, Converter DINT → INT**
- Overflow processing is **activated** by **interconnecting the ENO output**



TIA Portal Options – STEP 7 Safety – Usability improvements and new functions

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Ingenuity for life

S7-1200 ✓ S7-1500 ✓

Usability improvements and other new safety functions

- **Read back of Out parameters with F-FBs** enables a simplified program structure and enhanced clarity
- **Writing of F-FB input parameters** as for STEP 7 Standard/Distributed Safety
- **Start values of instance DBs** can be changed
- **Synchronous F-OB** for connection of synchronous PROFIsafe-Devices (S7-1500)
- **DINT → INT converter** (S7-1200, S7-1500)
- New **"ABS" statement – Absolute value** for INT and DINT (S7-1200, S7-1500)

Thank You!