

# TIA Portal V15

Technical Slides



// TIA Portal Openness

devices Where(device -> device.Subtype  
Select(device -> device.DeviceItems)  
many(deviceItems -> device  
<= FilterTarget(0)

Totally Integrated Automation  
PORTAL

First steps  
Project: "Project2" was opened successfully. Please select the next step:

- Start
- Devices & networks: Configure a device
- PLC programming: Write PLC program
- Motion & technology: Configure technology objects
- Control devices: Configure/select a device
- Visualization: Configure an HMI screen

Energy Object1  
=MCE1+ABC\_NO2  
+321.089 kW  
+321.089 kWh

out of range  
17/29/2016 2:03 PM

# TIA Portal – Highlights of TIA Portal V15

## Hardware Configuration

- Support for new hardware components
  - CPU 1518(F)-4 PN/DP MFP
  - CPU 1516T(F)
- Automatic hardware detection of PROFINET IO devices



## Startdrive – Innovations

- Support for SINAMICS G130, G150, S150, MV and extensions for S120
- Access of drive parameters via Openness
- Startdrive Advanced: Safety acceptance test for G120



## STEP 7 – Innovations

- Breakpoints for CPU S7-1500
- Motion control – kinematics for handling tasks
- Language innovations: References
- Extended functions in PLC tag tables
- Local project text handling
- Mathematical functions for trace



## System Functions

- Local administration of users/user groups
- Integration of HW documentation in the Help Viewer
- Extended access to TIA Portal Openness (SCL in XML, PLC download)



## WinCC – Innovations

- New SIMATIC HMI PRO device family
- New approach for supported devices
- Scalable vector graphic (SVG support)
- WinCC RT Professional → Communication
- RFID support for panels



## TIA Portal Options

**STEP 7 Safety:** F-arrays (read access), overflow detection

**Multiuser:** Automatic marking, offline working

**OPC UA:** Methods call, companion Spec's

**ProDiag:** Criteria, quantity structures, handling

**PLCSIM Advanced:** Alarms, events, part process images

**Target 1500S for Simulink:** Various extensions

**SiVArc:** Alarms, trend controls, template screens

**Energy Suite:** No PowerTags, S7 EE-Monitor for machines

**TIA User Management Component:** Project-spanning maintenance of users/user groups



New

New



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[Details](#)

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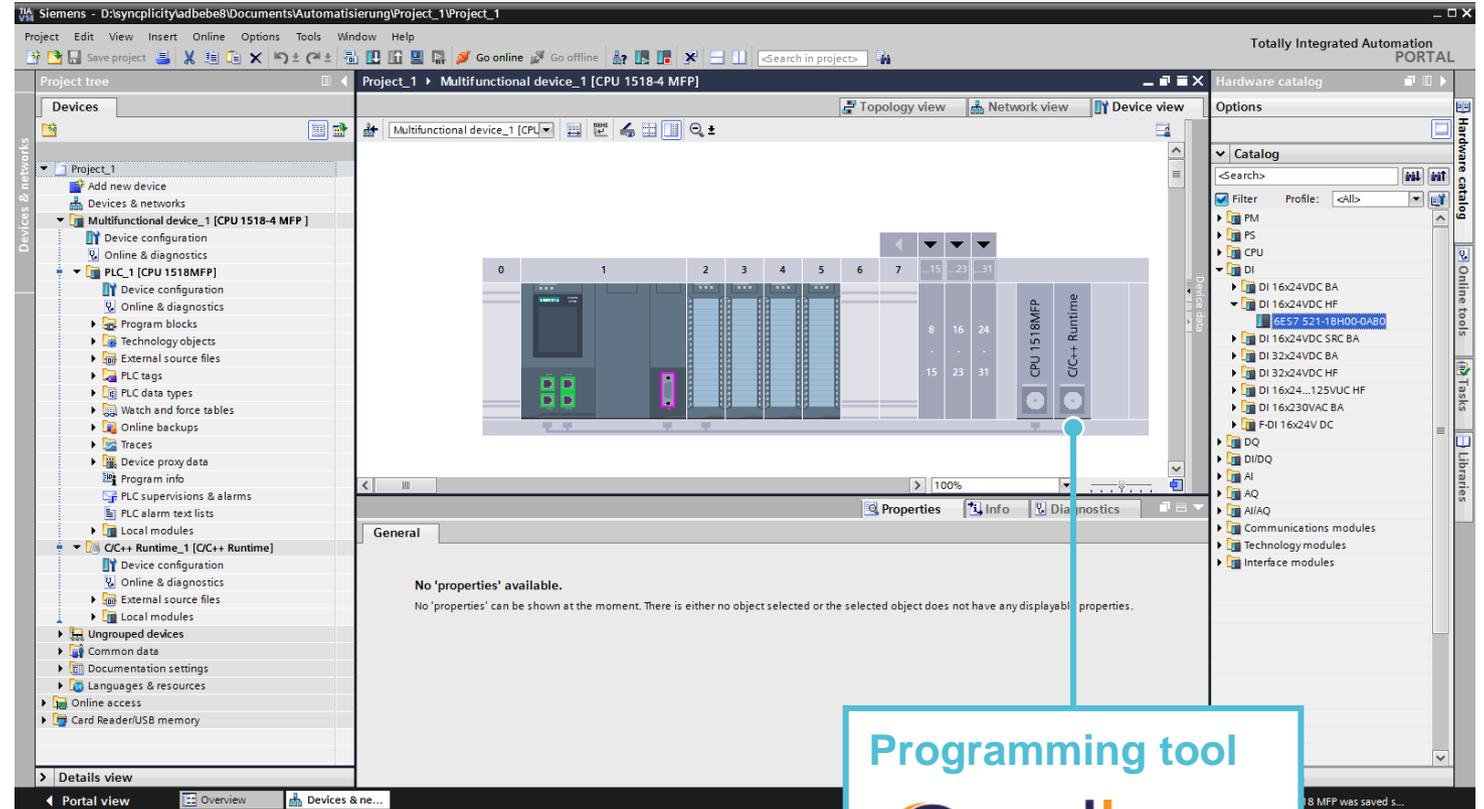
# Hardware Configuration – CPU 1518(F)-4 PN/DP MFP – Configuration of multifunctional platform

## High End CPU 1518(F)-4 PN/DP MFP

- Performance of CPU 1518
- Independent runtime environment for C/C++ code on the CPU
- Reuse of existing technological know-how in C/C++ code:  
**Synchronously and asynchronously** with the STEP 7 program
- Automatic generation of PLC code from Simulink® models via Target 1500S

## Application area

Merging of IPC and PLC in an MFP →  
Reduced space requirement, robustness





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

	Compact CPUs				Standard-CPU's				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													
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 <sup>1</sup>
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 <sup>2</sup> • Maximum <sup>2</sup>	5 10	5 10	5 10	5 10	7 30	7 30	70 128	128 128	5 10	7 30	65 80	70 128	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

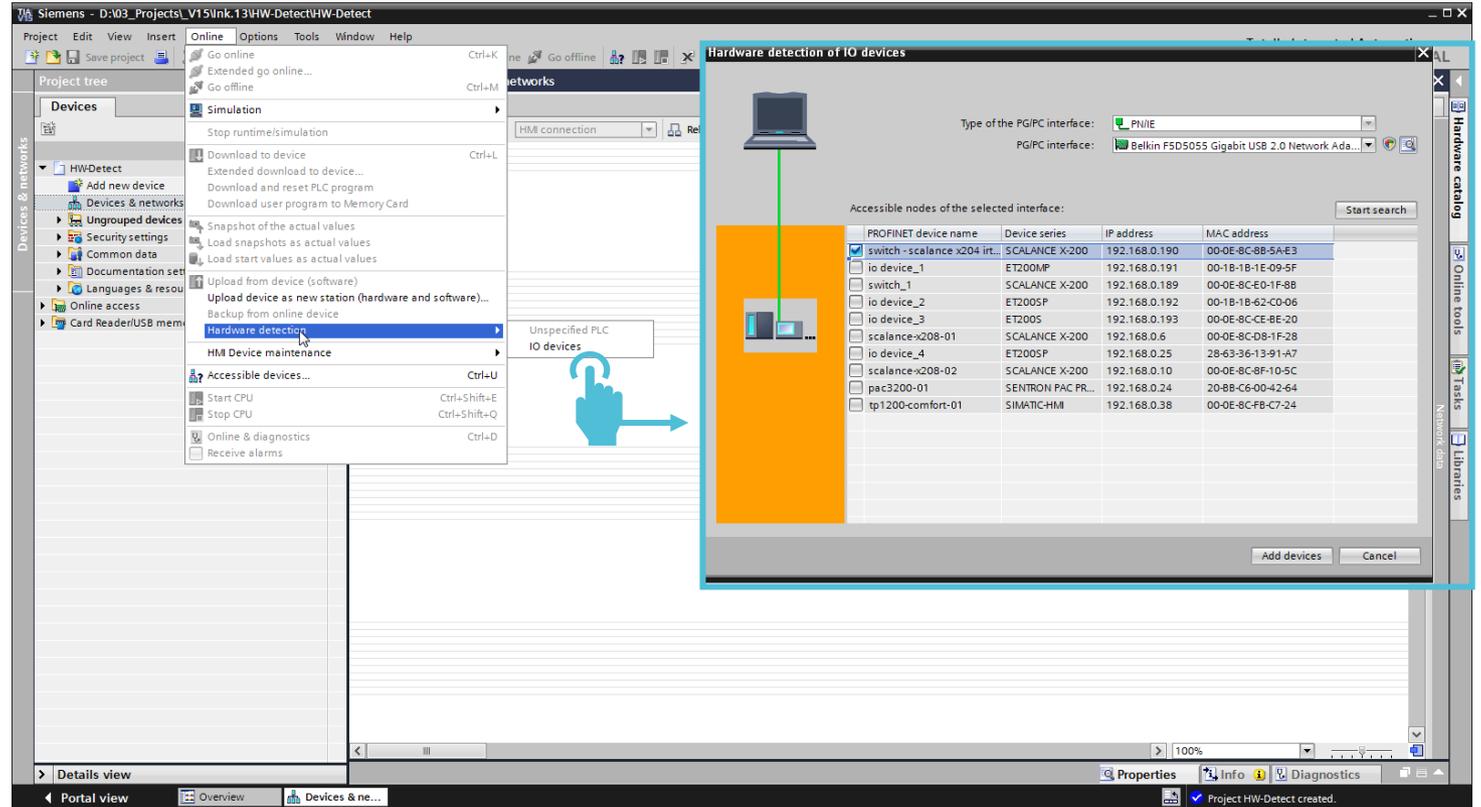
<sup>1</sup> Additional 50 MB memory for ODK applications; <sup>2</sup> For 4ms Servo/IPO cycle



# Hardware Configuration – Hardware detection of PROFINET IO devices

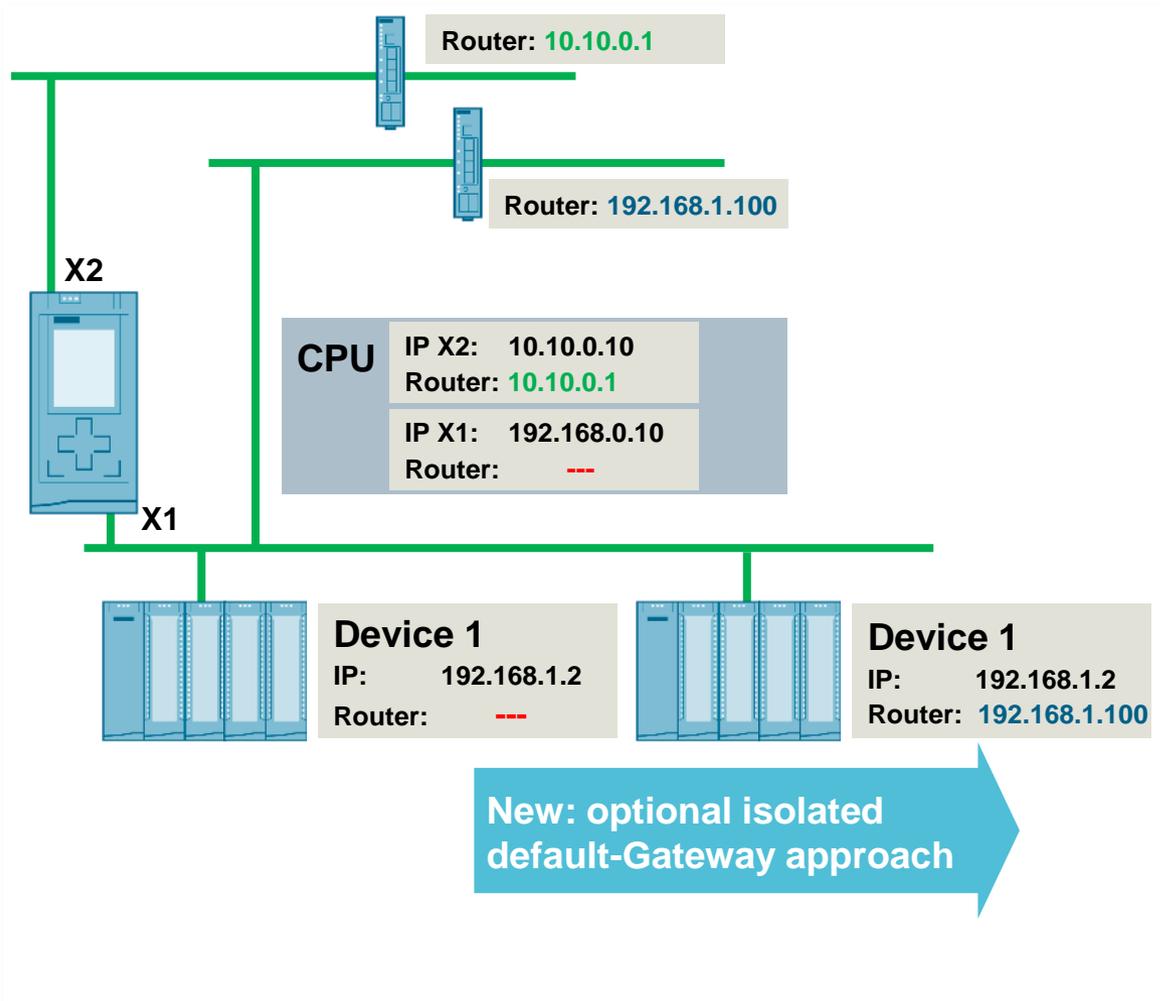
## Hardware detection of PROFINET IO devices

- 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**



# Hardware Configuration

## Default-Gateway for IO-Devices separate from IO-Controller



### Default-Gateway for devices

- Default-Gateway of devices is derived from the controller:  
A default gateway can be used for the interface of CPU (here X1).

**New** Each device can (optional) have their one default-gateway.

**IP-Protokoll**

IP-Adresse:

Subnetzmaske:

Router-Einstellungen mit IO-Controller synchronisieren

Router verwenden

Router-Adresse:

**New**

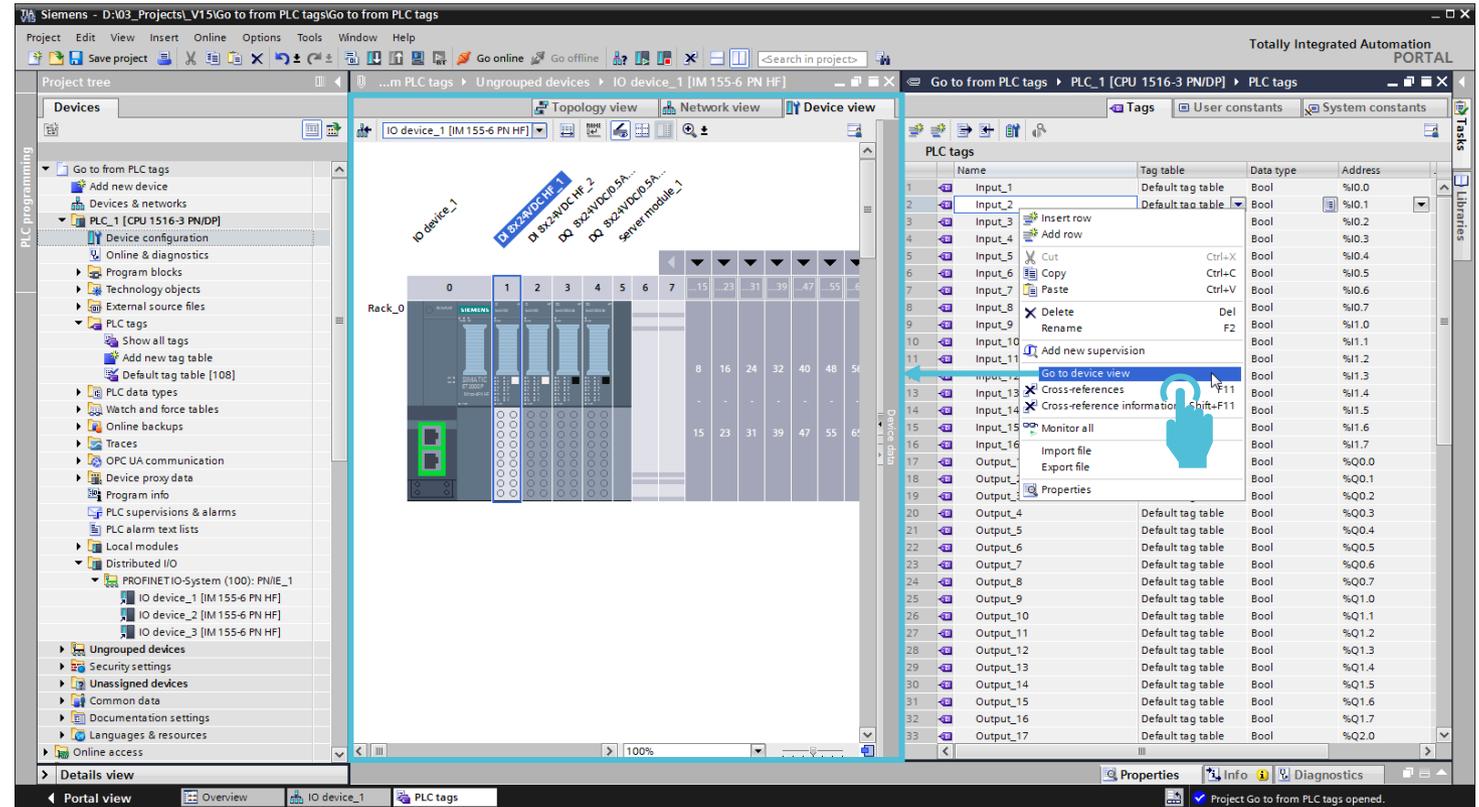
### Area of operations

Isolated integration of devices for remote access, e.g. for diagnosis.

# Hardware Configuration – “Go to device view” for tags in the PLC tag table

## Go to device view of tags from the PLC tag table

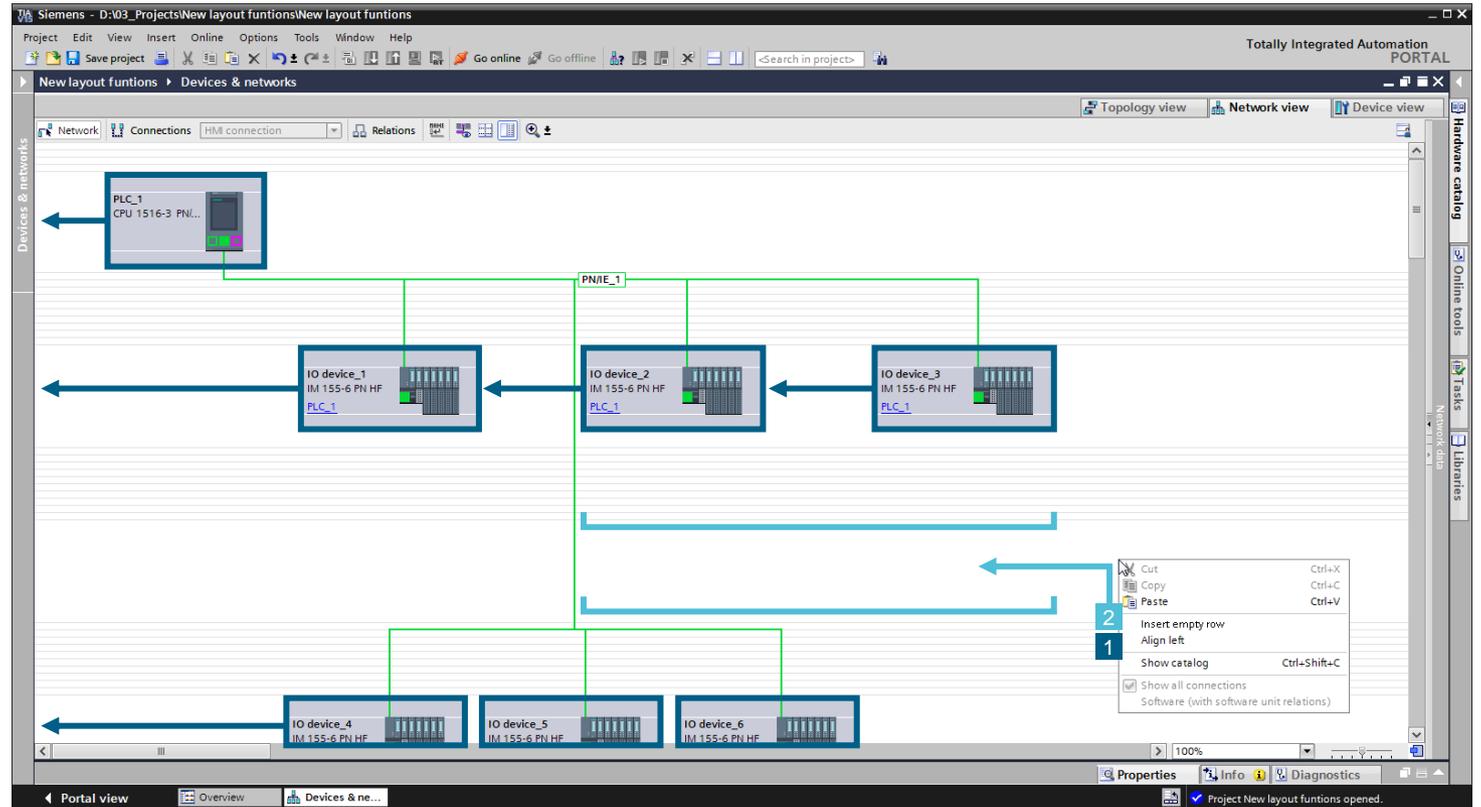
Rapid locating of hardware associated  
with the tag using the **“Go to device view”**  
function in the PLC tag table



# Hardware Configuration – Layout function for network and topology view

## Layout functions for network and topology view

- Layout adjustment based on left-justified alignment of all devices via the context menu (1)
- Simple expansion of project by inserting an empty row via the context menu (2)



# Hardware Configuration – Innovated alarm display with filter function

## Optimized alarm display user interface with filter function

Rapid locating of alarms in the alarm  
display with new filter function and  
optimized user interface

The screenshot displays the Siemens TIA Portal interface. The top-left pane shows the 'Project tree' with a hierarchy for 'Alarm display' and 'Devices & networks'. The main workspace shows a network diagram with three PLC units: 'PLC\_1 CPU 1516-3 PN...', 'io device\_1 IM 155-5 PN ST', and 'io device\_2 IM 155-6 PN HF'. Below the diagram, the 'Alarm display' tab is active, showing a table of current alarms.

Source	Date	Time	Status	Acknowledge	Alarm class name	ID	Event text	Help	Info text	Additional te...
PLC_1 [CPU ...	1/16/2012	12:54:21:776 AM	Incoming	—	NA	34	Error: IO device failure - Data transfer fault (no fra...		Short name: IM ...	
PLC_1 [CPU ...	1/16/2012	12:54:24:278 AM	Outgoing	—	NA	34	Error: IO device failure - Data transfer fault (no fra...		Short name: IM ...	
PLC_1 [CPU ...	1/16/2012	12:54:24:278 AM	Incoming	—	NA	34	Error: IO device failure - IO device not found io d...		Short name: IM ...	
PLC_1 [CPU ...	1/16/2012	12:54:28:925 AM	Outgoing	—	NA	34	Error: IO device failure - io device_1		Short name: IM ...	
PLC_1 [CPU ...	1/16/2012	12:56:03:700 AM	Incoming	—	NA	34	Error: IO device failure - Device abort reason io de...		Short name: IM ...	
PLC_1 [CPU ...	1/16/2012	12:56:08:331 AM	Outgoing	—	NA	34	Error: IO device failure - (missing/incorrect HW co...		Short name: IM ...	
PLC_1 [CPU ...	1/23/2012	11:58:13:292 PM	Incoming	—	NA	34	Error: IO device failure -IO device not found io d...		Short name: IM ...	



# Hardware Configuration – Consistent display of HW identifiers in the device properties

## Consistent display of system constants in the device properties

- All hardware IDs are now shown consistently on the “Properties” > “System constants” tab
- Filtering of system constants on the basis of the selected objects in the graphic view (station, IO device, interface, etc.)

The screenshot displays the Siemens TIA Portal interface. The main workspace shows a network diagram with a PLC\_1 (CPU 1516-3 PN) connected to three IO devices (IM 155-6 PN HF). A blue hand cursor points to the 'IO device\_1' in the graphic view, with an arrow pointing to the 'Properties' window. The 'Properties' window is open to the 'System constants' tab, showing a table of hardware identifiers. Below the table, the 'PROFINET interface [X1]' configuration is visible, with the 'Hardware identifier' field highlighted in blue.

Name	Type	Hardware identi.	Used by	Comment
IO_device_1-PROFINET_interface-Port_1	Hw_Interface	281	PLC_1	
IO_device_1-PROFINET_interface-Port_2	Hw_Interface	282	PLC_1	
IO_device_1-PROFINET_interface	Hw_Interface	280	PLC_1	
IO_device_1-Proxy	Hw_SubModule	278	PLC_1	
IO_device_1-Head	Hw_SubModule	279	PLC_1	



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New

New



# STEP 7 Innovations – Breakpoints on the CPU S7-1500

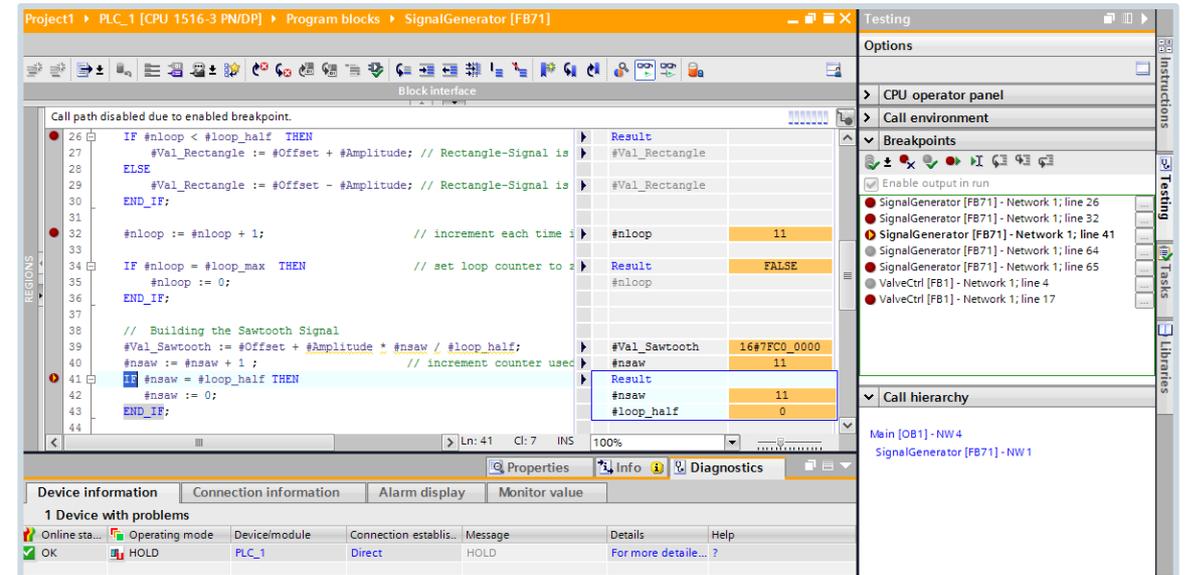
S7-1500 ✓ S7-1200 ✗ S7-300/400/WinAC ✓

## Function

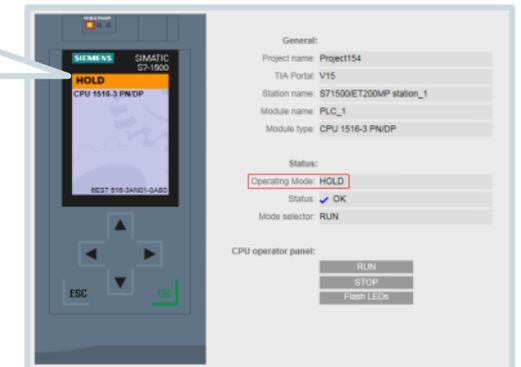
- Setting of breakpoints in SCL/STL programs (also possible in mixed LAD/FBD blocks)
- Maximum number of active breakpoints per CPU:
  - ≤CPU 1516/CPU 1515SP PC: 8
  - ≥CPU 1517/CPU 1507S/S7-PLCSIM: 20
- From firmware version V2.5 of CPU S7-1500

## 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 1/2

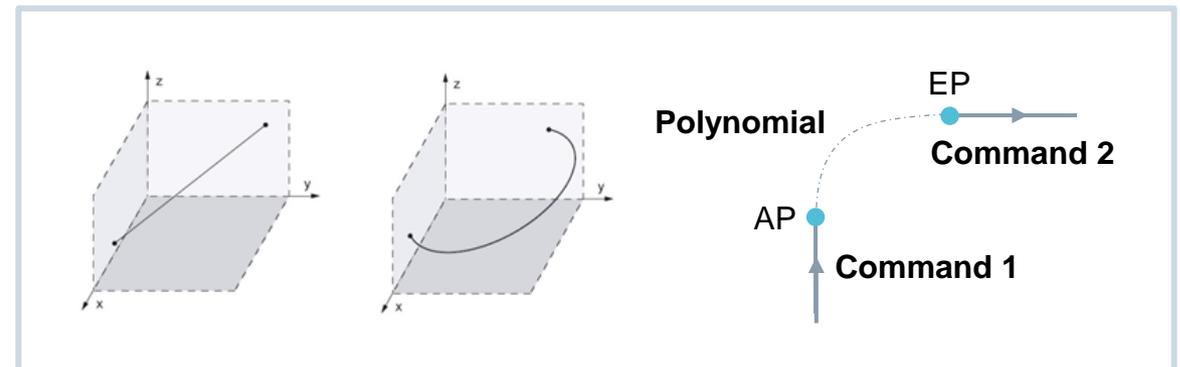
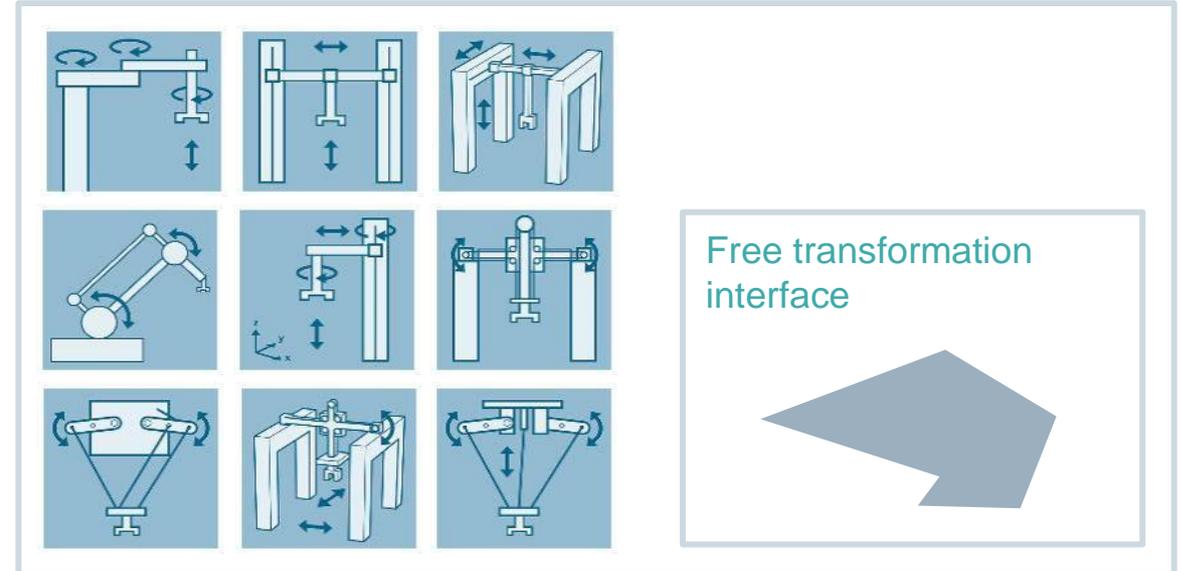
S7-1500T ✓

S7-1200 ✗

S7-300/400/WinAC ✗

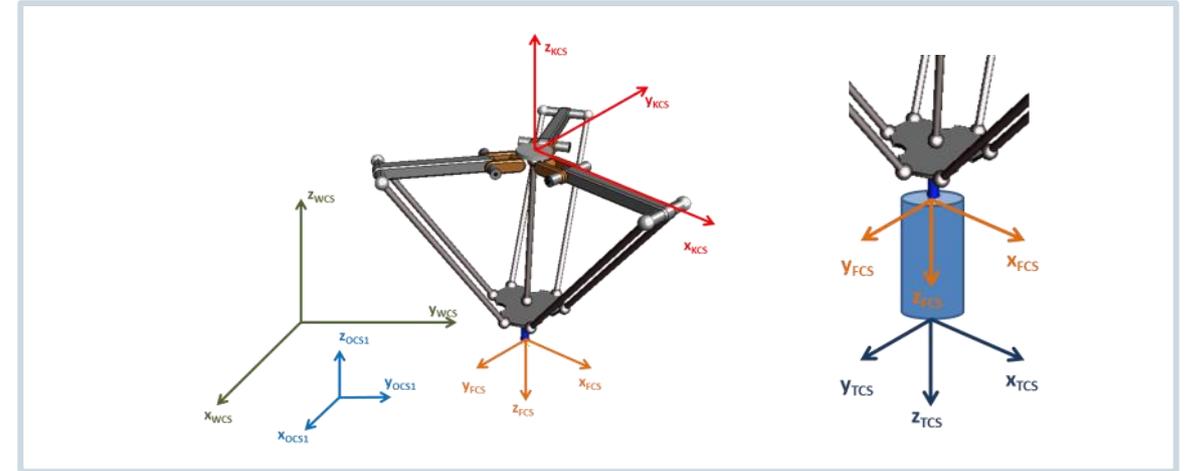
- Technology object kinematics (TO kinematics) for simple interconnection of positioning axes to form a **kinematic unit**
- Predefined 4D kinematics for simple use of standard kinematics (SCARA, Portal, Articulated Arm, Roll Picker, Delta Picker, Cylindrical Robot, Tripod)
- User transformation as function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

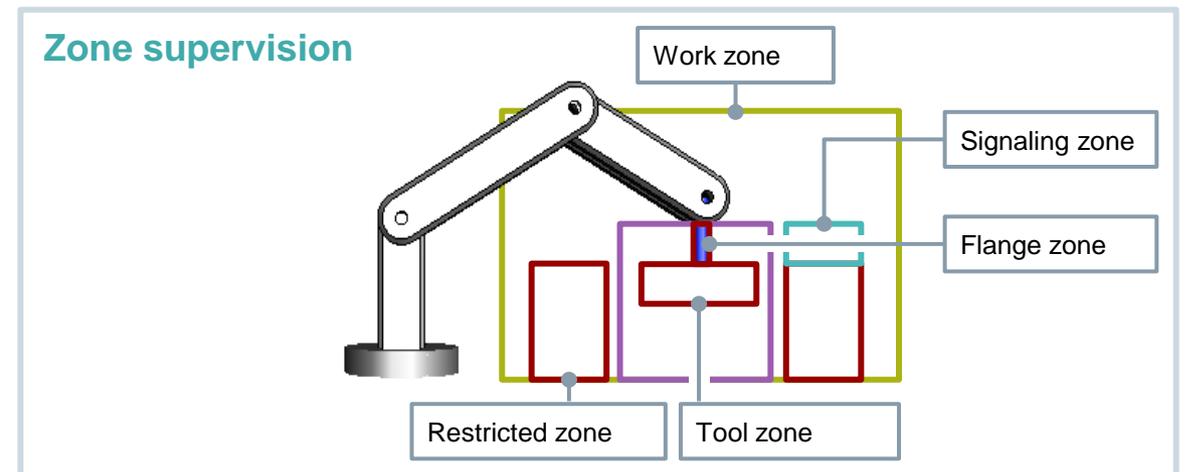


# STEP 7 Innovations – Motion control – Kinematics for handling tasks 2/2

- Different coordinate systems for describing the position of kinematics and objects in the work zone
- Tool frame to allow for expansion of the tool (description of the position of the tool relative to the flange)



- Avoidance of mechanical kinematics parts (flange, tool) colliding with installations in the work zone
- Signaling zone for triggering actions (e.g. open/close gripper) depending on the spatial position of the tool and/or flange



# STEP 7 Language Innovations – References 1/2

S7-1500<sup>1</sup> ✓

S7-1200 ✗

S7-300/400/WinAC ✗

## References – Pointer to tags of the same data type

- REF\_TO: Declaration of references in FCs and FBs<sup>2</sup> to a specific data type<sup>3</sup>
- REF(<tag>): Creates a reference to a tag/array of the same data type. Prerequisite: Referenced tag is in an optimized storage area
- <Reference>^ : Access to the value of the referenced tag
- Assignment attempt (?=): Assign reference to a parameter of data type VARIANT
- Comparison with NULL to check whether a reference is assigned to a tag

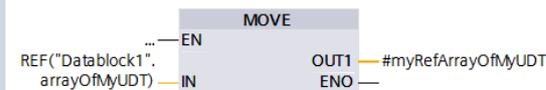
<sup>1</sup> From FW2.5

<sup>2</sup> Permitted sections in FCs: In, Out, Temp, Return; permitted sections in FBs: Temp; Array\_Of References is not permitted; <sup>3</sup> UDTs, SDTs, basic data types with the exception of bools

### Declare references

myReferences		
	Name	Data type
4	Static	
5	Temp	
6	myRefByte	REF_TO Byte
7	myRefInt	REF_TO Int
8	myRefLReal	REF_TO LReal
9	myRefString	REF_TO String
10	myRefDateTime	REF_TO Date_And_Time
11	myRefType	REF_TO *myUDT*
12	myRefArrayOfMyUDT	REF_TO Array[0..3] of *myUDT*

### Reference



### Dereference



### Transfer reference as parameter



### Assignment attempt

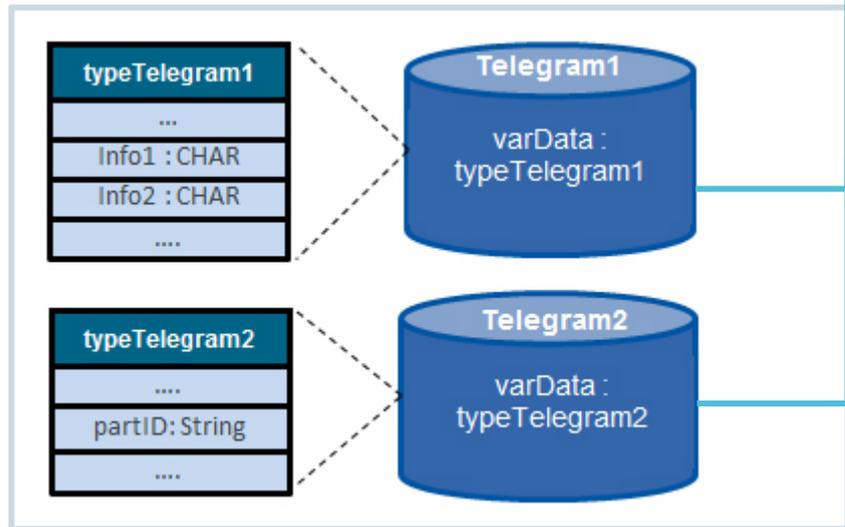


# STEP 7 Language Innovations – References 2/2

S7-1500  S7-1200  S7-300/400/WinAC

## Sample application

- Generic access to different data records
- Fully symbolic access to referenced tags without prior recopying to intermediate tag



Example without references		
	Name	Data type
1	Input	
2	Output	
3	InOut	
4	telegram	Variant
5	Static	
6	Temp	
7	tempTelegram1	"typeTelegram1"
8	tempTelegram2	"typeTelegram2"
9	Constant	

```

1
2 CASE TypeOf(#telegram) OF
3   typeTelegram1:
4     VariantGet(SRC := #telegram, // copy data to "Temp"
5               DST => #tempTelegram1);
6
7     #tempTelegram1.Info1 := 'T';
8     #tempTelegram1.Info2 := 'W';
9
10    VariantPut(SRC := #tempTelegram1, // copy back to "Inout"
11              DST := #telegram);
12
13   typeTelegram2:
14     VariantGet(SRC := #telegram, // copy data to "Temp"
15               DST => #tempTelegram2);
16
17     #tempTelegram2.partID := 'RE2346';
18
19    VariantPut(SRC := #tempTelegram2, // copy back to "Inout"
20              DST := #telegram);
21 END_CASE;

```

Example with references		
	Name	Data type
1	Input	
2	Output	
3	InOut	
4	telegram	Variant
5	Static	
6	Temp	
7	refTelegram1	REF_TO "typeTelegram1"
8	refTelegram2	REF_TO "typeTelegram2"
9	Constant	

```

1
2 CASE TypeOf(#telegram) OF
3   typeTelegram1:
4     #refTelegram1 ?= #telegram; // AssignmentAttempt
5     #refTelegram1^.Info1 := 'T'; // Dereference by using
6     #refTelegram1^.Info2 := 'W'; // a succeeding caret ^
7
8   typeTelegram2:
9     #refTelegram2 ?= #telegram; // AssignmentAttempt
10    #refTelegram2^.partID := 'RE2346';
11 END_CASE;
12

```



# STEP 7 Language Innovations – New statements – FileReadC/FileWriteC

S7-1500  S7-1200  S7-300/400/WinAC 

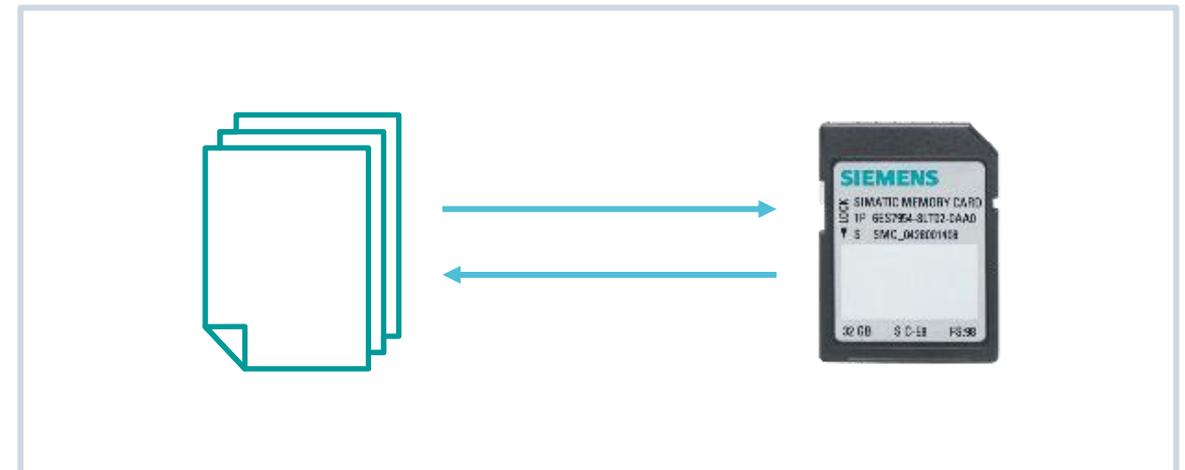
## Function

- 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 for PID control

S7-1500<sup>1</sup> ✓

S7-1200<sup>2</sup> ✓

S7-300/400/WinAC ✗

## Function

### • SplitRange

- Distribution of the controller actuating variable to a number of actuators

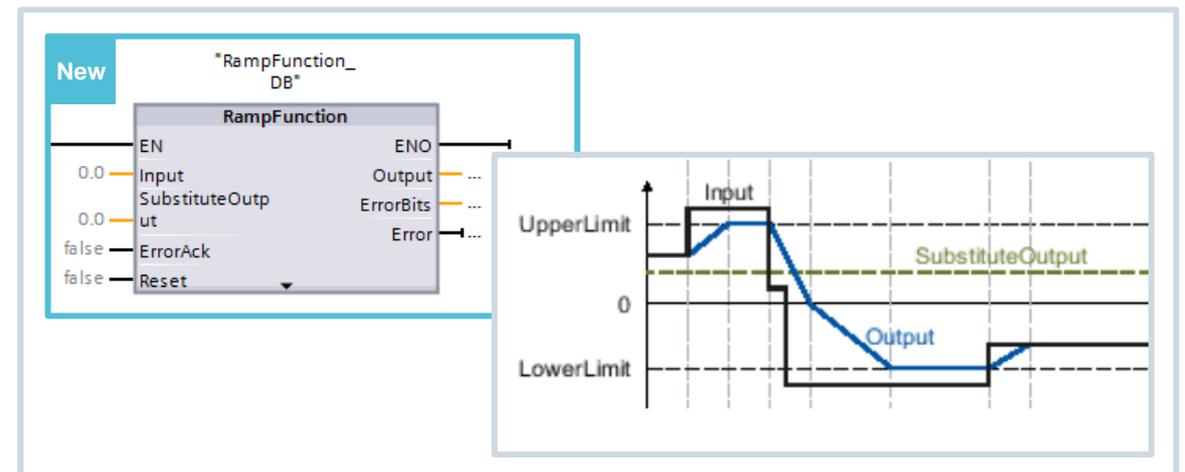
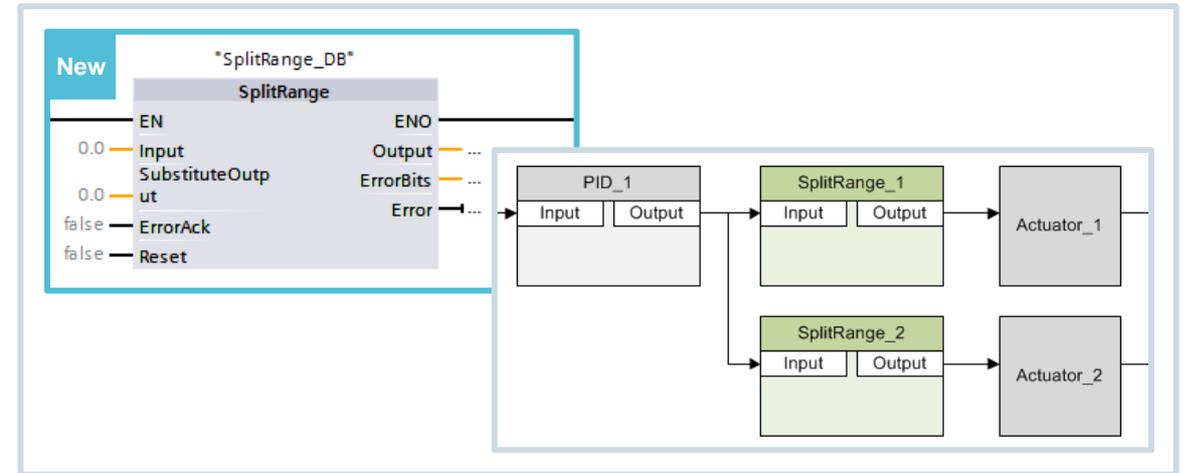
### • RampFunction

- Limiting the rate of change and the limit values of a signal
- Different gradients for positive/negative/rising/falling signals

## Customer benefits

- Less effort for programming regulations and controls
- Simpler transfer of applications with modular PID control

<sup>1</sup> From FW2.0 for S7-1500; <sup>2</sup> From FW4.2 for S7-1200



# STEP 7 Language Innovations – New statements – EQ\_TypeOfDB (TypeOfDB in SCL)

S7-1500<sup>1</sup> ✓ S7-1200<sup>2</sup> ✓ S7-300/400/WinAC ✗

## Function

- EQ\_TypeOfDB data block can be used to establish the data type of a data block, which can be addressed via a DB\_Any tag
- The statement compares a DB\_Any tag with a specific data type (UDT, SDT, TO axes) or with a different instance tag

## Sample application

Creation of generic functions for handling different DB types, for example DBs for speed and positioning axes

The screenshot illustrates the implementation of the EQ\_TypeOfDB function in STEP 7. It shows the following components:

- Technology objects:** A tree view showing objects like PositioningAxis\_1 [DB6], PositioningAxis\_2 [DB7], PositioningAxis\_3 [DB8], SpeedAxis\_1 [DB1], SpeedAxis\_2 [DB2], and SpeedAxis\_3 [DB3].
- AxisControl Table:**

Name	Data type	Default value
axisDB	DB_ANY	0
axisNo	Int	0
- Network 1:** A ladder logic network titled "Loop call of all available axes" containing a FOR loop from #axisNo := 1 TO "MAX\_AXES" DO. Inside the loop, the instruction "InstAxisControl" is called with parameters: axisDB:="AxisDB".No[#axisNo], axisNo:=#axisNo, and axisCmd:="AxisCmdDB".No[#axisNo].
- SCL Code:**

```

1
2 // Verify axis type and call appropriate function block
3
4 CASE TypeOfDB(#axisDB) OF
5
6   TO_SpeedAxis: // axis is type of TO_SpeedAxis
7     #instSpeedAxisNr[#axisNo] (TO_Object:=#axisDB,
8                               axisCmd:=#axisCmd,
9                               instMcMoveVelocity:=#instMoveVelocity[#axisNo]);
10
11  TO_PositioningAxis: // axis is type of TO_PositioningAxis
12    #axisNoPosAxis := #axisNo MOD "NO_SPEED_AXES" ;
13    #instPosAxisNr[#axisNoPosAxis] (TO_Object:=#axisDB,
14                                    axisCmd:=#axisCmd,
15                                    instMcMoveAbsolute:=#instMoveAbsolute[#axisNoPosAxis]);
16

```
- AxisDB:** A database symbol representing an array of 6 elements of type DB\_Any, with values: "AxisDB".No[1]:="SpeedAxis\_1"; "AxisDB".No[2]:="SpeedAxis\_2"; "AxisDB".No[3]:="SpeedAxis\_3"; "AxisDB".No[4]:="PositioningAxis\_1"; "AxisDB".No[5]:="PositioningAxis\_2"; "AxisDB".No[6]:="PositioningAxis\_3";

1 From FW2.0 ; 2 From FW4.2



# STEP 7 Language Innovations – New statements – Scatter/Gather

S7-1500<sup>1</sup> ✓ S7-1200 ✗ S7-300/400/WinAC ✗

## Convert data for further processing

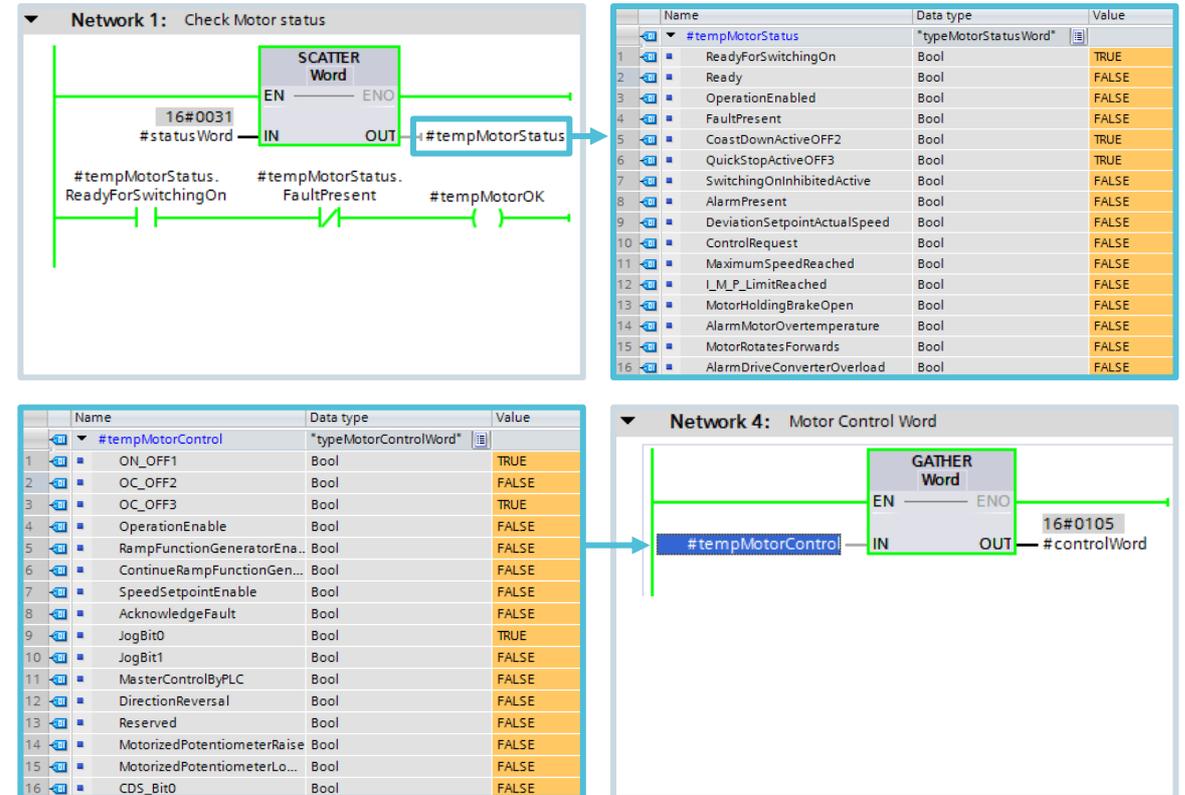
- SCATTER decomposes bit sequences (Byte, Word, etc.) into a bit array
- GATHER assembles a bit array to form a bit sequence
- SCATTER\_BLK/GATHER\_BLK for decomposing/assembling bit

• **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



<sup>1</sup> From FW2.1



# STEP 7 Innovations – Download/upload for PLC tag tables

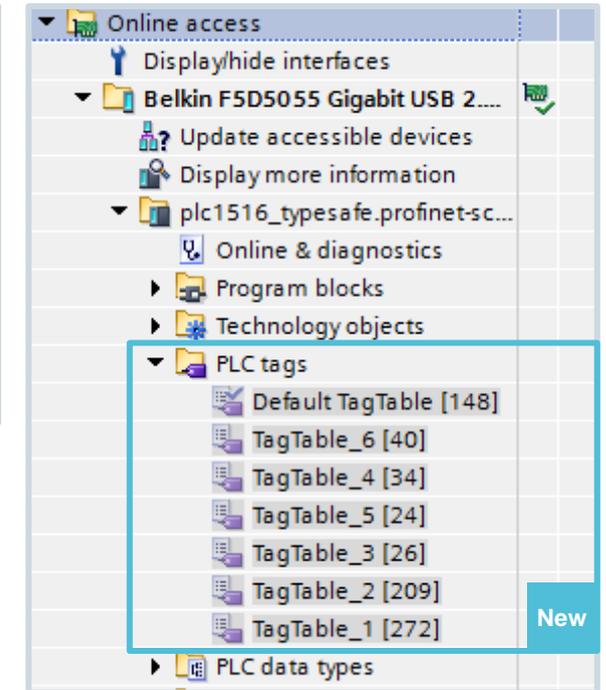
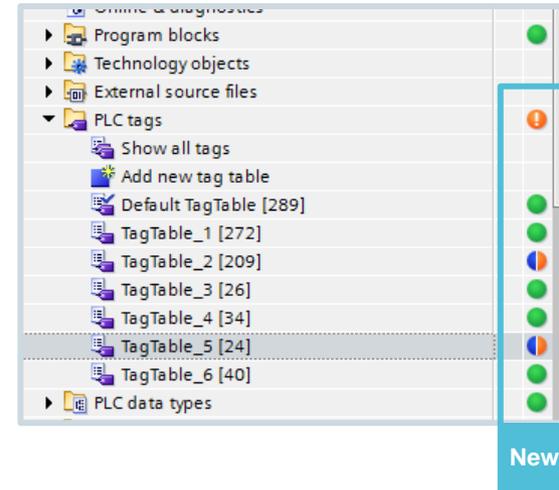
S7-1500  S7-1200  S7-300/400/WinAC 

## 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

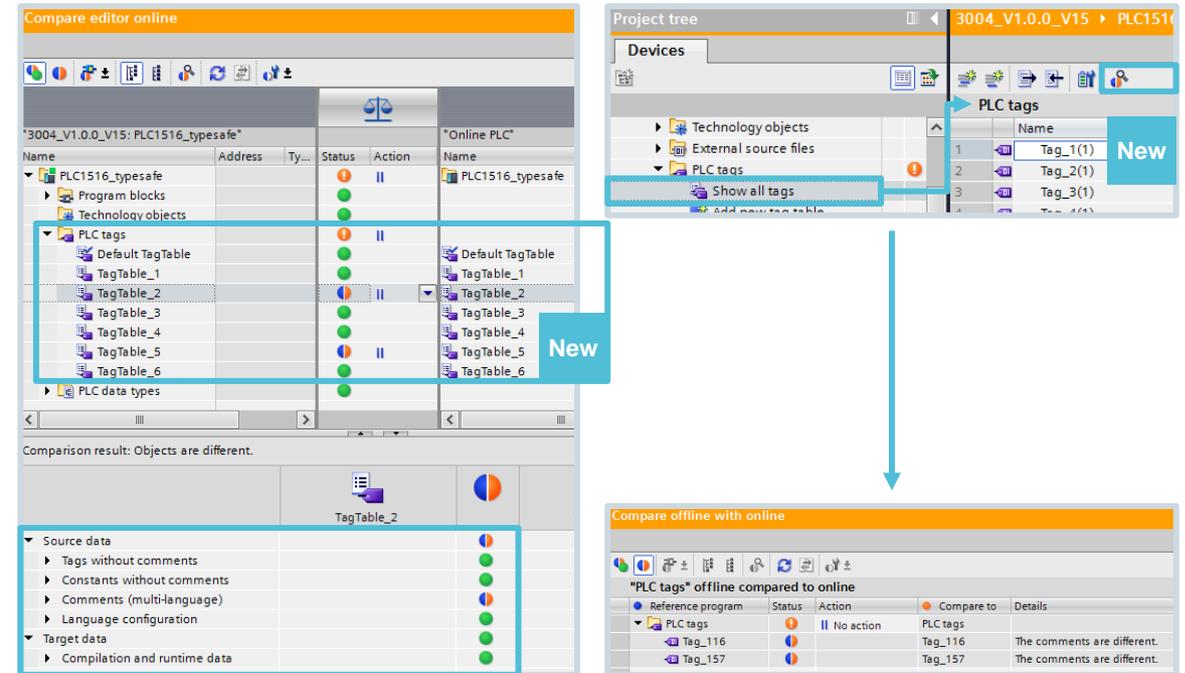
S7-1500  S7-1200  S7-300/400/WinAC 

## 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



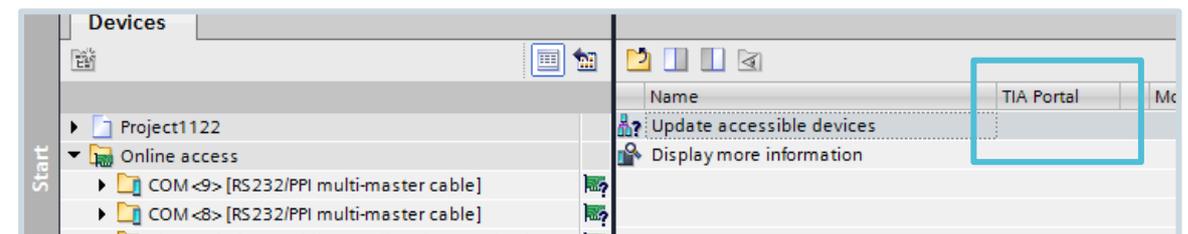
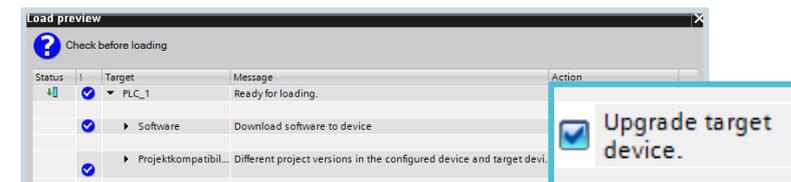
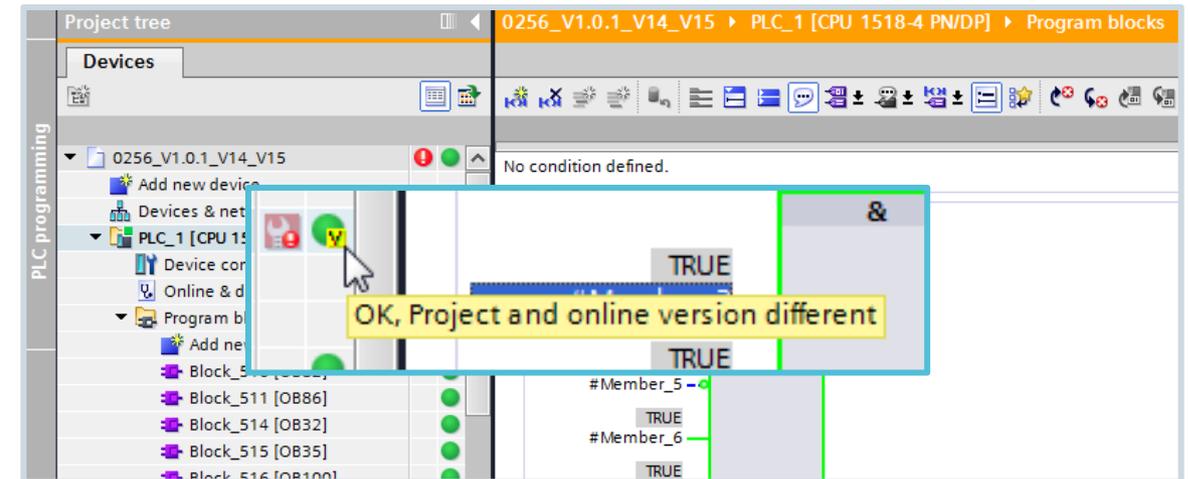
# STEP 7 Innovations – Online compatibility

## 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



# STEP 7 Innovations – Local processing of project texts

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

## Function

- Display and editing of multilingual comments
- Supported editors
  - PLC tag table
  - Programming editors
  - Data blocks
  - PLC data types
- Context-sensitive text display
- Import/export displayed texts with .xlsx file

## Customer benefits

Context-related translation of project texts

The screenshot displays the Siemens STEP 7 software interface. The top part shows a ladder logic network with a block titled '&' and a block titled '='. The network includes inputs for 'motor start #in1' and 'motor left #in2', and an output for 'motorrelay #out'. Below the network is a section for 'Network 2' with a comment field.

The bottom part of the screenshot shows a table titled 'Projecttexts [FB2]' with three tabs: 'General', 'Texts', and 'FB supervision definitions'. The 'Texts' tab is active, showing a table with columns for the source text, the German translation, and the reference path.

English (United States)	German (Germany)	Reference
motor left	Bewege den Motor links	Projecttexts [FB2]in2
motor start	Starte den Motor	Projecttexts [FB2]in1
motorrelay	Motorrelay	Projecttexts [FB2]out
This is a block comment	This is a block comment	Projecttexts [FB2] Block comment
This is a block title	Das ist ein Bausteintitel	Projecttexts [FB2] Block title
This is a network comment	Das ist der Netzwerkkommentar	Projecttexts [FB2] Network 1 Network comment
This is network one	Das ist der Netzwerktitel	Projecttexts [FB2] Network 1 Network title

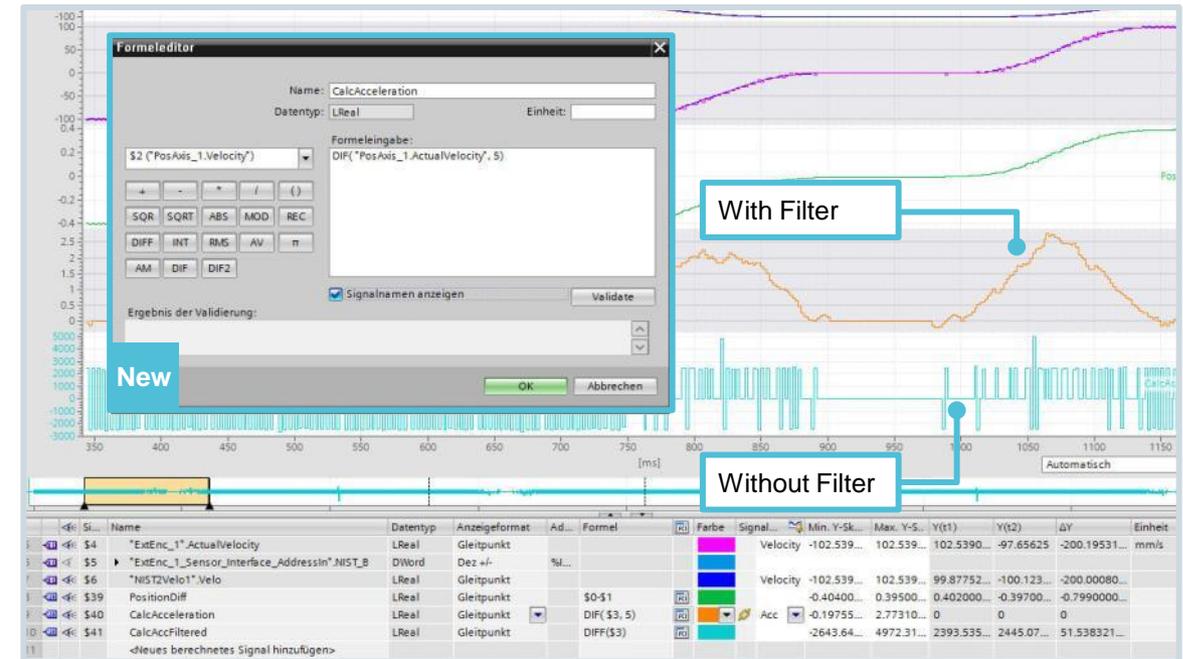
# STEP 7 Innovations – Mathematics functions for trace

## Function

- Calculation of new signals from the recorded signals based on mathematical formulas
- Fundamental arithmetic operations
- Amount, root, square, 1/X, modulo
- Integral, differentiation
- Various filter functions
- Calculation of mean value, effective value, integral in the range of the measuring cursor

## Customer benefits

- Generation of unavailable information
- Subsequent preparation of measurements
- Measurement of signal paths (e.g. mean value)



# STEP 7 Innovations – PLCSIM V15 – Slider for analog values and pushbutton for boolean values

## Slider for analog values

If you select an analog value in the SIM table, you can manipulate it with the aid of a slider

## Pushbutton for boolean values

If you select a boolean value in the SIM table, you can manipulate it with the aid of a pushbutton

## Customer benefits

Simple modification of values within the SIM table for quickly testing the STEP 7 user program

The screenshot shows the SIMATIC Manager interface. At the top, there is a toolbar with icons for simulation, help, and navigation. Below the toolbar is a table with the following columns: Name, Adresse, Anzeigeformat, and Überwachu... The table contains three rows:

Name	Adresse	Anzeigeformat	Überwachu...
"Data_block_1".drive_start		Boolesch	FALSE
"Data_block_1".drive_stop		Boolesch	FALSE
"Data_block_1".target_position		DEZ+/-	5

The third row is highlighted with a blue border. Below the table, a slider control is displayed for the selected value. The slider is labeled "Data\_block\_1.target\_position []" and has a range from -10 to 10. The current value is 5, which is indicated by a small triangle on the slider. A blue arrow points from the value '5' in the table to the slider.

The screenshot shows the SIMATIC Manager interface. At the top, there is a toolbar with icons for simulation, help, and navigation. Below the toolbar is a table with the following columns: Name, Adresse, Anzeigeformat, and Überwachu... The table contains three rows:

Name	Adresse	Anzeigeformat	Überwachu...
"Data_block_1".drive_start		Boolesch	FALSE
"Data_block_1".drive_stop		Boolesch	FALSE
"Data_block_1".target_position		DEZ+/-	5

The second row is highlighted with a blue border. Below the table, a pushbutton control is displayed for the selected value. The button is labeled "Data\_block\_1.d...". A blue arrow points from the value 'FALSE' in the table to the button.

# STEP 7 Innovations – PLCSIM V15 – Collection of useful functional enhancements

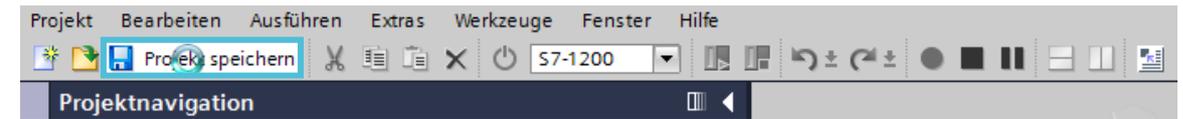
## Parallel installation of PLCSIM and PLCSIM Advanced

PLCSIM V15 and PLCSIM Advanced V2.0 can be installed on the same PC. Simultaneous use of both simulation tools is however not possible



## Visual display of project saving process

When you click “**Save project**”, a small rotating wheel appears briefly as a mouse pointer to indicate that the project is being saved successfully



## Simulation of know-how protected blocks

Know-how protected blocks of a 1500 CPU can be simulated with PLCSIM V15  
(1200 CPUs are not supported at present)

# STEP 7 Innovations – Collection of useful functional enhancements

## Trace: Support for time variables

- During recording
- As a trigger condition
- Supported data types
  - TIME, LTIME
  - ToD, LToD
  - DATE, LDT

## Trace: Advanced properties for measurements

All relevant timestamps

## Trace: Overlaid measurements

Import/Export as \*.ttcbmx or \*.csv-file

## Trace: Moving the cursor using the arrow keys

- Precise positioning on the measuring points
- Startup without mouse

**Configuration**

Signals

	Name	Data type	Address	Color	Comment
1	"SystemTime"	Time	%MDO	Red	
2	"OB1_Duration"	LTime	P#M4.0	Blue	
3	"DateTime"	LDT	P#M12.0	Green	
4	"MyTimeOfDay"	Time_Of_Day	%MD20	Brown	
5	"ThisDate"	Date	%MW24	Magenta	
6	"LongTimeOfDay"	LTime_Of_Day	P#M26.0	Cyan	
7			<Add>		

Recording conditions

> Sampling

Sample with: "Main" %OB1  
Record every: 1 Cycle  
Max. recording duration: 18723 samples  
 Use max. recording duration  
Recording duration (a): 1000 Samples

> Trigger

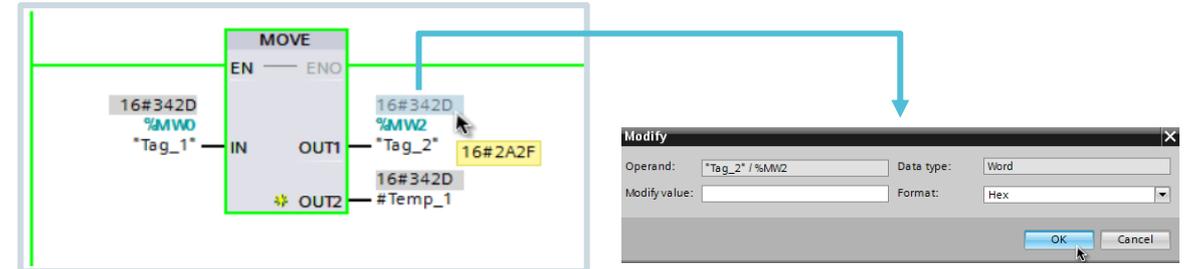
Trigger mode: Trigger on tag  
Trigger tag: "DateTime" P#M12.0  
Event: Within the range  
Value:   
Pre-trigger (b): 0 Samples



# STEP 7 Innovations – Collection of useful functional enhancements

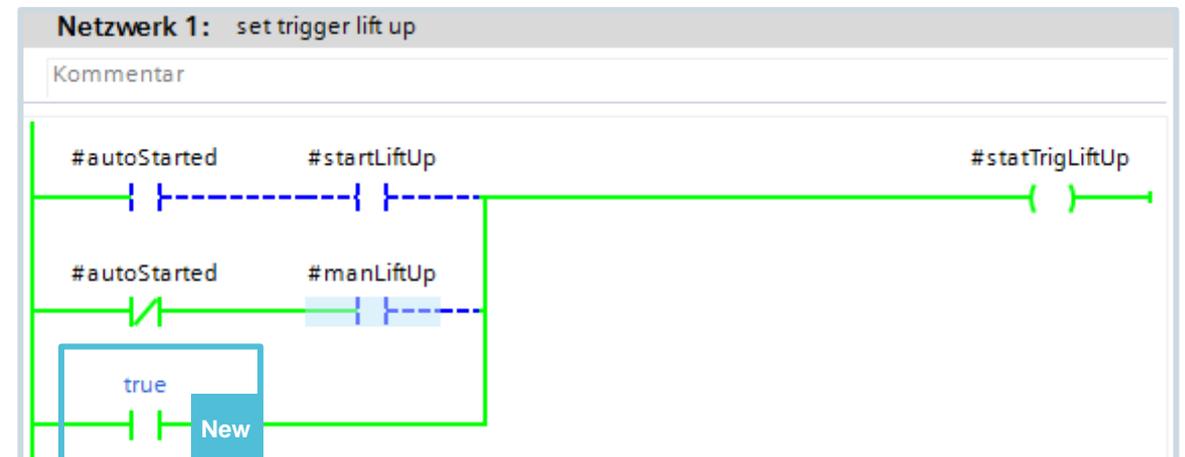
## “Control operand” by simply double-clicking the observed value

- Boolean process values can therefore be toggled very quickly
- Non-boolean process values can be changed really easily in the “Modify” dialog
- Objects supported:  
Global tags or tags in DB



## Boolean constants can also be used for statements

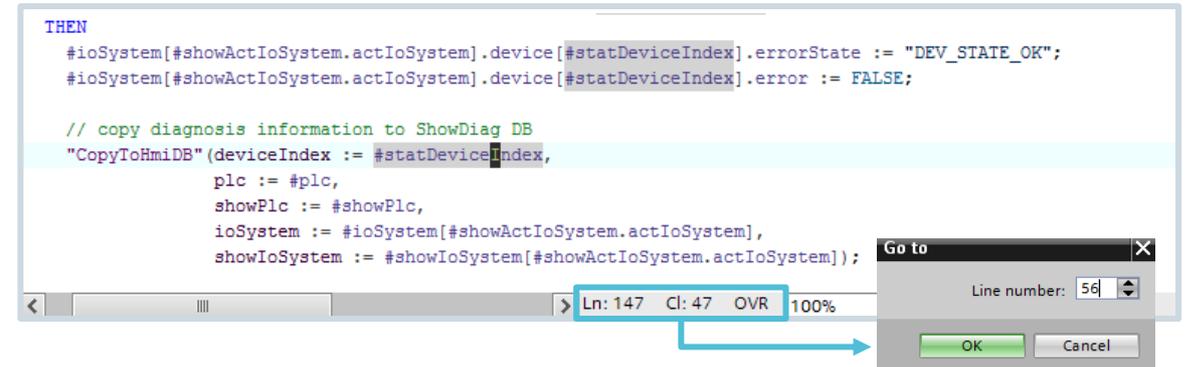
Simple testing or bridging of current paths



# STEP 7 Innovations – Collection of useful functional enhancements

## SCL: Extension of status line

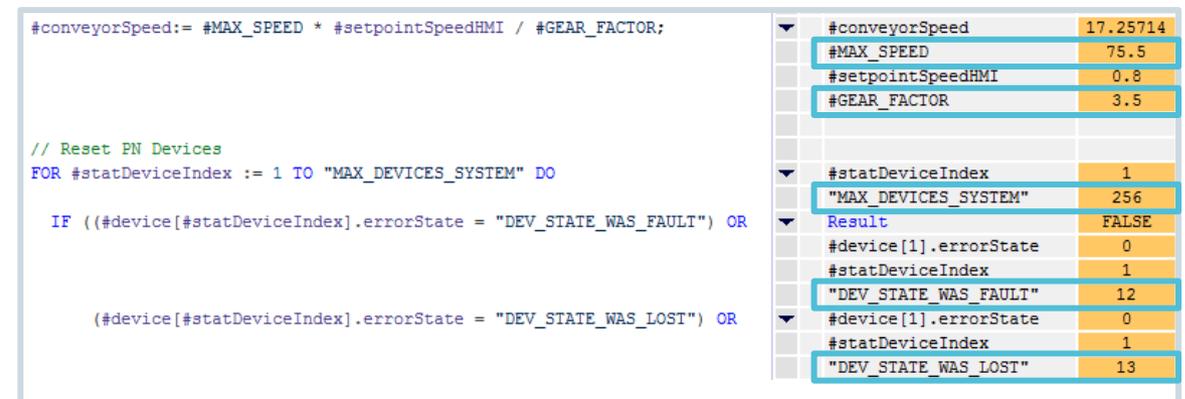
- Fields for displaying the current cursor position (line/column number)  
Double-click the line number to open the “Go to” dialog
- Display the current edit mode (insert/overwrite).  
Switch the current edit mode by double-clicking in the display field



## SCL: Constants are displayed in monitor column

The values of global/local constants are also displayed when monitoring blocks

- The maximum number of loop iterations, mathematical calculations or output of error and status words can therefore be reproduced more easily



# TIA Portal – Highlights of TIA Portal V15

## Hardware Configuration

- Support for new hardware components
  - CPU 1518(F)-4 PN/DP MFP
  - CPU 1516T(F)
- Automatic hardware detection of PROFINET IO devices



## Startdrive – Innovations

- Support for SINAMICS G130, G150, S150, MV and extensions for S120
- Access of drive parameters via Openness
- Startdrive Advanced: Safety acceptance test for G120



## STEP 7 – Innovations

- Breakpoints for CPU S7-1500
- Motion control – kinematics for handling tasks
- Language innovations: References
- Extended functions in PLC tag tables
- Local project text handling
- Mathematical functions for trace



## System Functions

- Local administration of users/user groups
- Integration of HW documentation in the Help Viewer
- Extended access to TIA Portal Openness (SCL in XML, PLC download)



## WinCC – Innovations

- New SIMATIC HMI PRO device family
- New approach for supported devices
- Scalable vector graphic (SVG support)
- WinCC RT Professional → Communication
- RFID support for panels



Details



## TIA Portal Options

**STEP 7 Safety:** F-arrays (read access), overflow detection

**Multiuser:** Automatic marking, offline working

**OPC UA:** Methods call, companion Spec's

**ProDiag:** Criteria, quantity structures, handling

**PLCSIM Advanced:** Alarms, events, part process images

**Target 1500S for Simulink:** Various extensions

**SiVArc:** Alarms, trend controls, template screens

**Energy Suite:** No PowerTags, S7 EE-Monitor for machines

**TIA User Management Component:** Project-spanning maintenance of users/user groups



New

New



# WinCC Innovations – Provision of Images

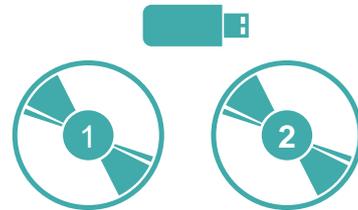
## ... up to WinCC V14 SP1

### DVD1

Installation of all Images and Runtime  
for **all** supported operator devices

### DVD2

Support Tools and OSS

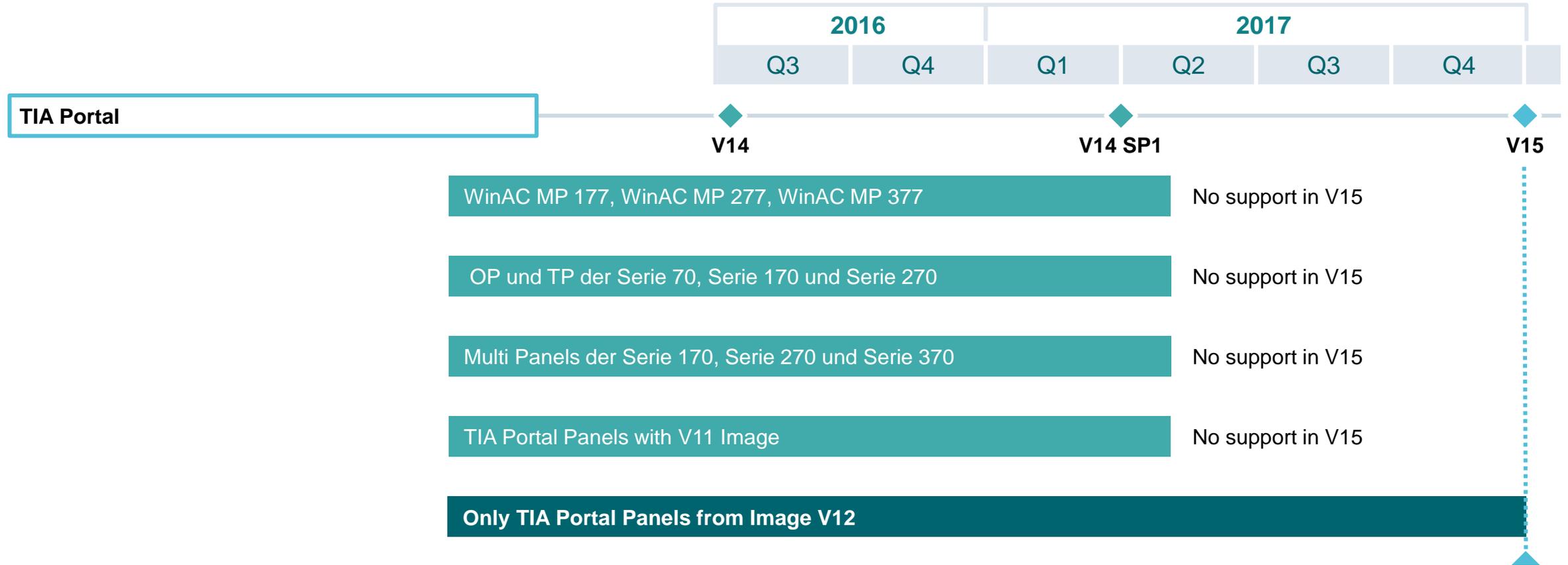


## ... with WinCC V15

**To minimize the installation overhead,  
the following measures have been implemented**

- Reduction in the number of Panels supported  
([details on next slide](#))
- Selection of Images/Runtime installed  
([details on next slide](#))

# WinCC Innovations – New approach for supported devices



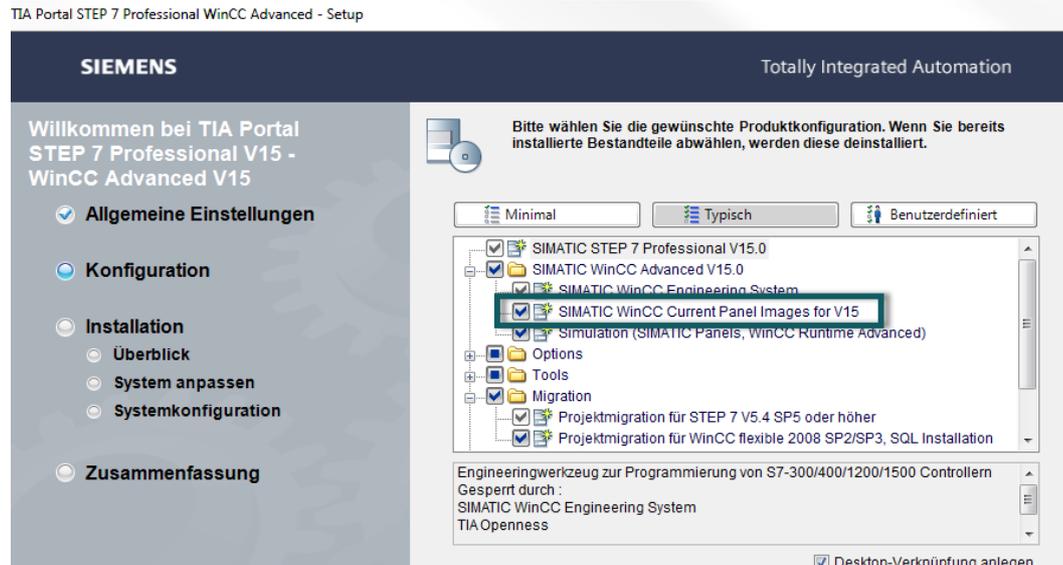
**In order to maintain panels with images up to V11 in WinCC V15, they have to be upgraded before.**



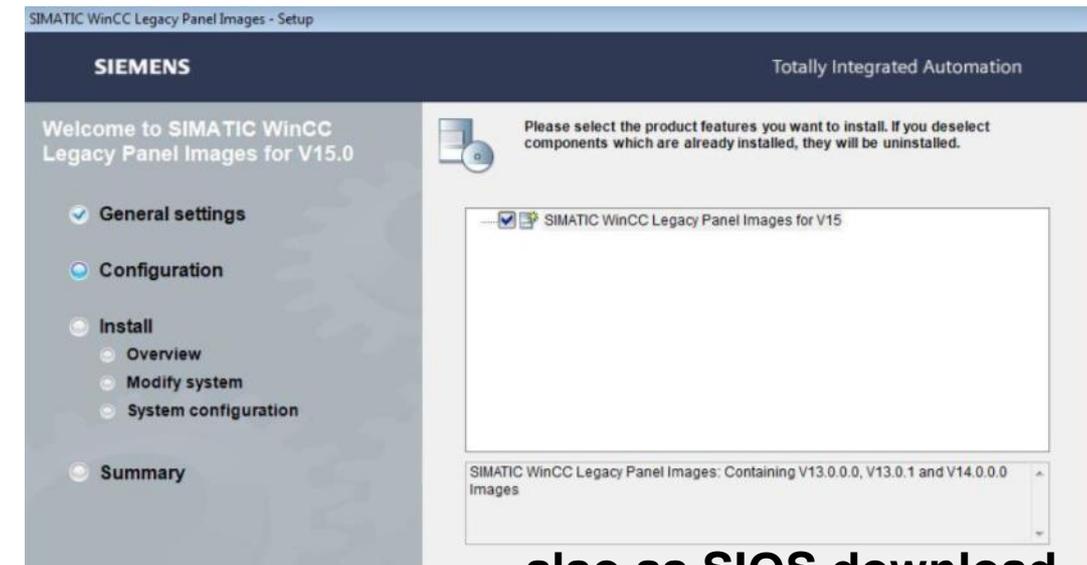
# WinCC Innovations – Delivery of Panel Images

## 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



# WinCC Innovations – SIMATIC HMI PRO operator devices

## Advantages

- **Excellent ease of use** thanks to new scratchproof glass front (single- or multi-touch)
- **Attractive design, fully IP65- protected**
- **Flexible option for installation directly on the machine** with mounting on a support arm/pedestal
- **Fast startup** with simple service access
- **Optimum flexibility** thanks to simple enhancement options with extension units



**SIEMENS**  
*Ingenuity for life*



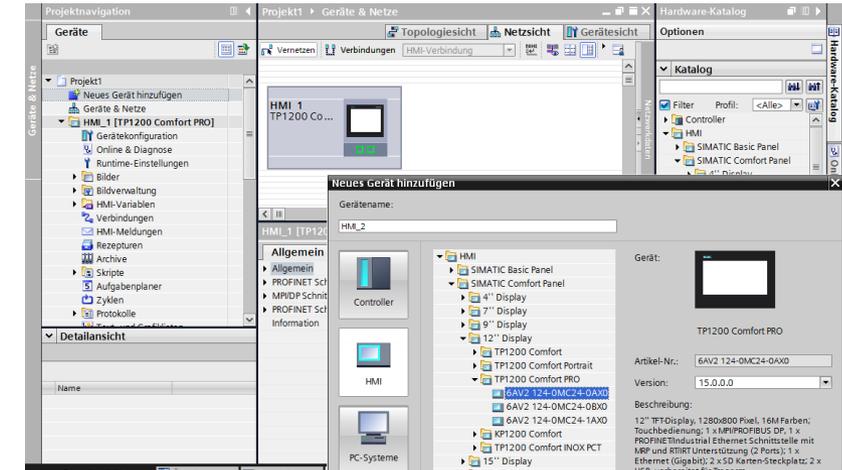
UL-Zulassung



# WinCC Innovations – SIMATIC HMI PRO operator devices

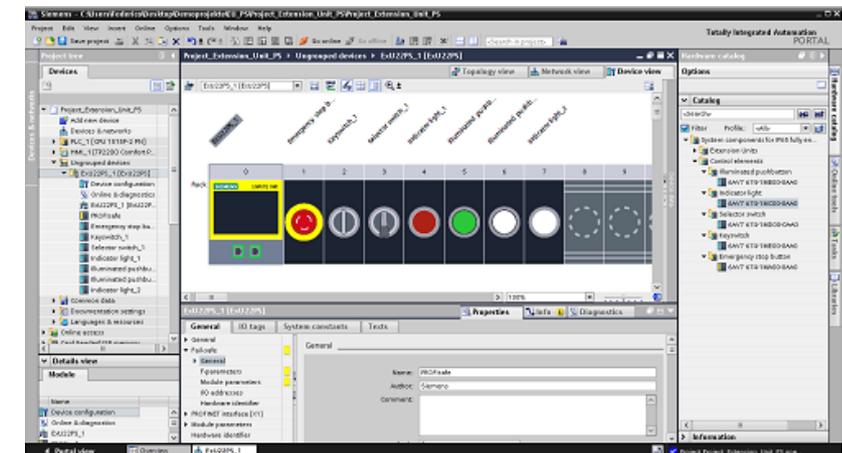


## Configuration of Comfort PRO Add new Comfort PRO in TIA Portal



## Configuration of extension units

- Download of the HSP for the extension unit  
Online Support: [109749645](https://www.siemens.com/109749645)
- Configuration of PROFINET and PROFISAVE



# WinCC Innovations – User login with RFID card reader

## SIMATIC RF1060R



### Local user management

Free application in Online Support: **99808171**

User login with RFID card reader,  
SIMATIC RF1060R for

- SIMATIC Comfort Panels
- SIMATIC IPC
- SIMATIC HMI PRO Devices
- Ab WinCC Advanced V14 SP1

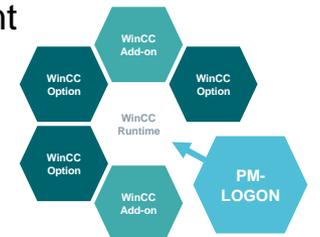
<https://support.industry.siemens.com/cs/ww/en/view/99808171>



### Central user management

Chargeable premium add-on PM-LOGON for user login,  
for example with RFID (SIMATIC RF1060R,  
Admitto, Omnikey) with central user management

- SIMATIC Comfort Panels
- WinCC RT Professional and Advanced
- WinCC V7.X and PCS 7



<https://www.siemens.de/industrysolutions/de/en/wincc/products/pm-logon/pages/default.aspx>

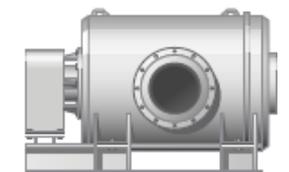
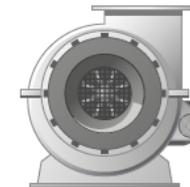
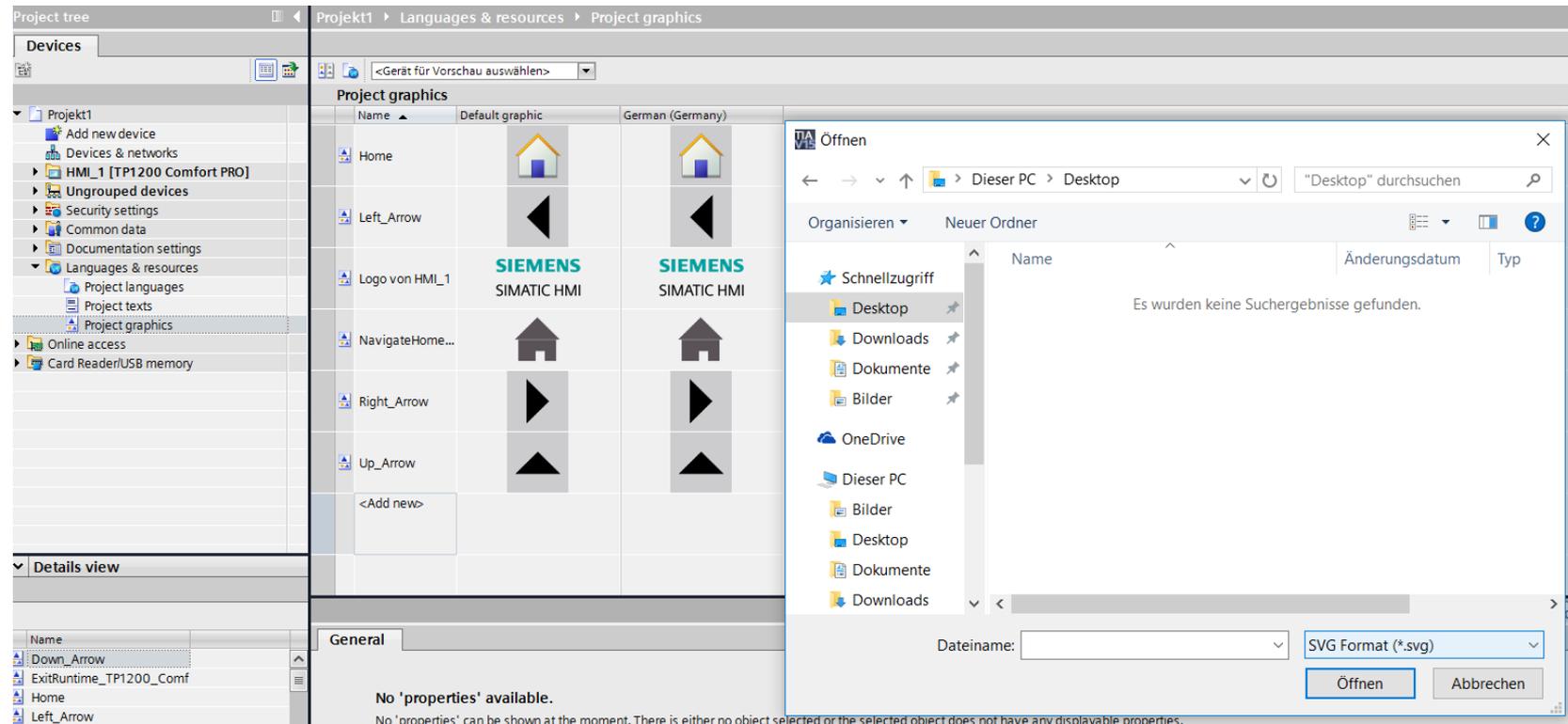


# WinCC Innovations – Functional improvements (graphic elements)



## Support for static SVG (Scalable Vector Graphic)

Scalability without losing the image quality



# WinCC Innovations – Communication connections with WinCC RT Professional

## 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



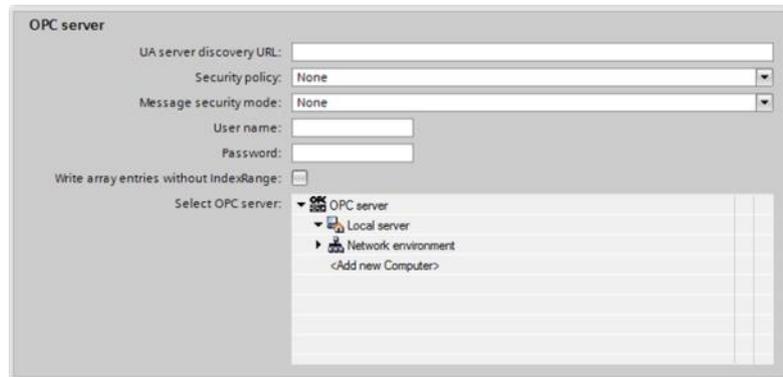
... up to 128 PLCs



# WinCC Innovations – Communication connections with WinCC RT Professional

## Functional enhancement of OPC UA Client

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



Name	Data type	Connection	Address
Tag_1	Array [0..4] of Int32	Connection_1	ns=http://www.unifiedautomation.com/DemoServer/s=Demo.Static.Arrays.Int32
[0]	Int32	Connection_1	ns=http://www.unifiedautomation.com/DemoServer/s=Demo.Static.Arrays.Int32
[1]	Int32	Connection_1	ns=http://www.unifiedautomation.com/DemoServer/s=Demo.Static.Arrays.Int32
[2]	Int32	Connection_1	ns=http://www.unifiedautomation.com/DemoServer/s=Demo.Static.Arrays.Int32
[3]	Int32	Connection_1	ns=http://www.unifiedautomation.com/DemoServer/s=Demo.Static.Arrays.Int32
[4]	Int32	Connection_1	ns=http://www.unifiedautomation.com/DemoServer/s=Demo.Static.Arrays.Int32
Tag_2	Array [0..2] of Float	Connection_1	ns=http://www.unifiedautomation.com/DemoServer/s=Demo.Static.Arrays.Float
<Add new>			



# TIA Portal – Highlights of TIA Portal V15

## Hardware Configuration

- Support for new hardware components
  - CPU 1518(F)-4 PN/DP MFP
  - CPU 1516T(F)
- Automatic hardware detection of PROFINET IO devices



## Startdrive – Innovations

- Support for SINAMICS G130, G150, S150, MV and extensions for S120
- Access of drive parameters via Openness
- Startdrive Advanced:
  - Safety acceptance test for G120



Details

## STEP 7 – Innovations

- Breakpoints for CPU S7-1500
- Motion control – kinematics for handling tasks
- Language innovations: References
- Extended functions in PLC tag tables
- Local project text handling
- Mathematical functions for trace



## System Functions

- Local administration of users/user groups
- Integration of HW documentation in the Help Viewer
- Extended access to TIA Portal Openness (SCL in XML, PLC download)



## WinCC – Innovations

- New SIMATIC HMI PRO device family
- New approach for supported devices
- Scalable vector graphic (SVG support)
- WinCC RT Professional → Communication
- RFID support for panels



## TIA Portal Options

**STEP 7 Safety:** F-arrays (read access), overflow detection

**Multuser:** Automatic marking, offline working

**OPC UA:** Methods call, companion Spec's

**ProDiag:** Criteria, quantity structures, handling

**PLCSIM Advanced:** Alarms, events, part process images

**Target 1500S for Simulink:** Various extensions

**SiVArc:** Alarms, trend controls, template screens

**Energy Suite:** No PowerTags, S7 EE-Monitor for machines

**TIA User Management Component:** Project-spanning maintenance of users/user groups



New

New



# Startdrive – Support of SINAMICS S120, G130, G150, S150 and MV

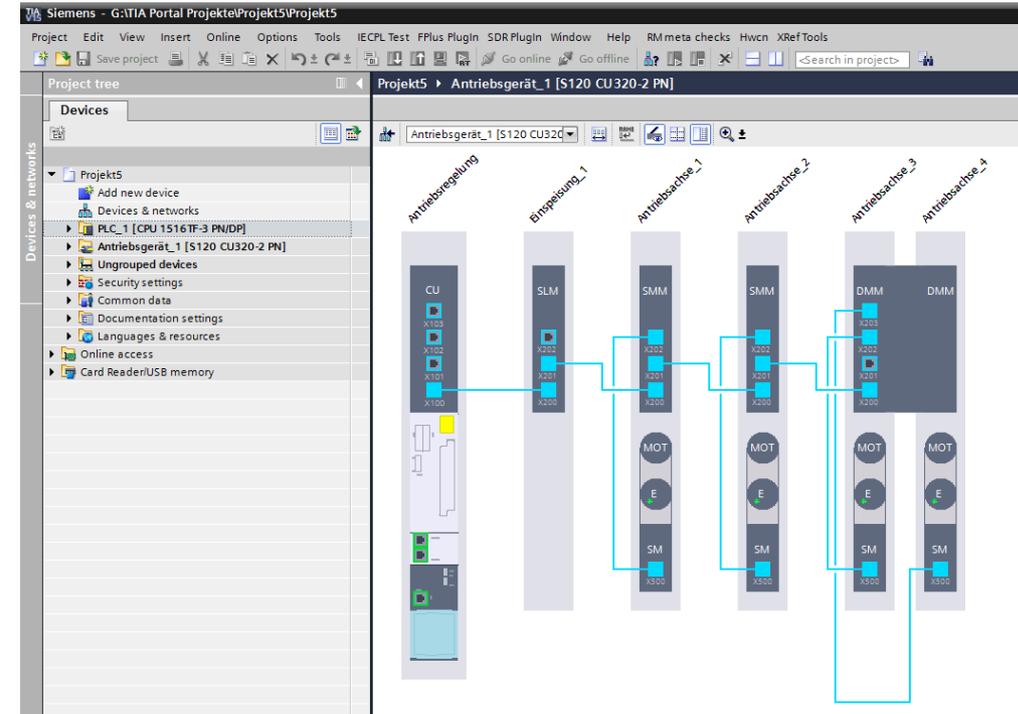


## Support of other drive units

Support of SINAMICS G130, G150, S150 and MV

## Expanded support for S120 (CU320-2)

- Support of chassis and cabinet modules (not block size modules)
- Support of SIMOTICS asynchronous motors and 3<sup>rd</sup> motors
- Vector control
- Parameter comparison (online/offline, against factory setting)
- Source-side BiCo connections
- Upload from the list of accessible devices



# Startdrive – Supported hardware for drives based on CU320-2

Topic	Feature	Effect	
Integrated hardware	<b>SINAMICS drives</b>	<ul style="list-style-type: none"> <li>S120 ✓ Motion control drives and large drives</li> <li>G130, G150, S150, MV ✓</li> </ul>	New
	<b>Control unit (CU)</b>	<ul style="list-style-type: none"> <li>CU320-2 ✓                             <ul style="list-style-type: none"> <li>• Sinamics firmware ≥V4.8</li> <li>• All Sinamics drives based on CU320-2</li> </ul> </li> <li>CU310-2 ✗                             <ul style="list-style-type: none"> <li>• CBE20 only as a Sinamics link</li> </ul> </li> </ul>	
	<b>Infeed and power units</b>	<ul style="list-style-type: none"> <li>Booksize (compact) ✓                             <ul style="list-style-type: none"> <li>• Single- and multi-axis drive systems incl. chassis/cabinet</li> </ul> </li> <li>Blocksize (e.g. PM240-2) ✗                             <ul style="list-style-type: none"> <li>• Protection category IP20 (control cabinet)</li> <li>• 3AC power supply</li> </ul> </li> <li>Chassis/cabinet ✓</li> </ul>	New
	<b>Applicable SIMATIC controllers</b>	<ul style="list-style-type: none"> <li>S7-1500/1500T/ET200SP ✓ Only with S7-1500/1500T/ET200SP CPU</li> <li>Open/software controller ✗</li> <li>S7-1200 ✗</li> <li>S7-300 and S7-400 ✗</li> </ul>	
	<b>Applicable motors</b>	<ul style="list-style-type: none"> <li>SIMOTICS ✓ All SIMOTICS motors and 3<sup>rd</sup> motors (with the exception of SIMOGEAR and linear motors)</li> <li>External motors ✓</li> </ul>	New



# Startdrive – Supported functions for drives based on CU320-2

Topic	Feature	Effect	
Integrated functions	Drive control	Servo ✓ All drive control modes (servo, vector and U/f)	
		Vector ✓	
	SAFETY functions	Basic ✓	<ul style="list-style-type: none"> <li>• STO, SS1, SBC</li> <li>• SS2, SOS, SBT, SLS, SSM, SDI, SLP, SP</li> </ul>
		Extended ✓	
	Communications	PROFINET ✓	<ul style="list-style-type: none"> <li>• PN with IRT (clock-synchronized communications)</li> <li>• PROFINET only</li> </ul>
		PROFIBUS ✗	
	Telegrams	PROFIdrive telegrams ✓	All telegram configurations
		PROFIsafe ✓	
		Siemens telegrams ✓	
		Telegram extension ✓	
Additional functions	EPos ✓	Central and decentral motion control possible	
	DCC ✗		

New



# Startdrive – Extensions for the SINAMICS G120 family

G120  CU320-2 based drives

## Functions

- Support of SINAMICS firmware version 4.7, Service Pack 9
- Addition optimization and expansion of commissioning assistants
  - Configuration of the motor brake
  - Cancel online option
  - CU250D-2: SSI encoder as motor encoder
- PROFINET name assignment without the reboot of the G120 control unit also in the list of the accessible devices
- Support of CU240D-2/CU250D-2 with polymeric optical fiber (POF)

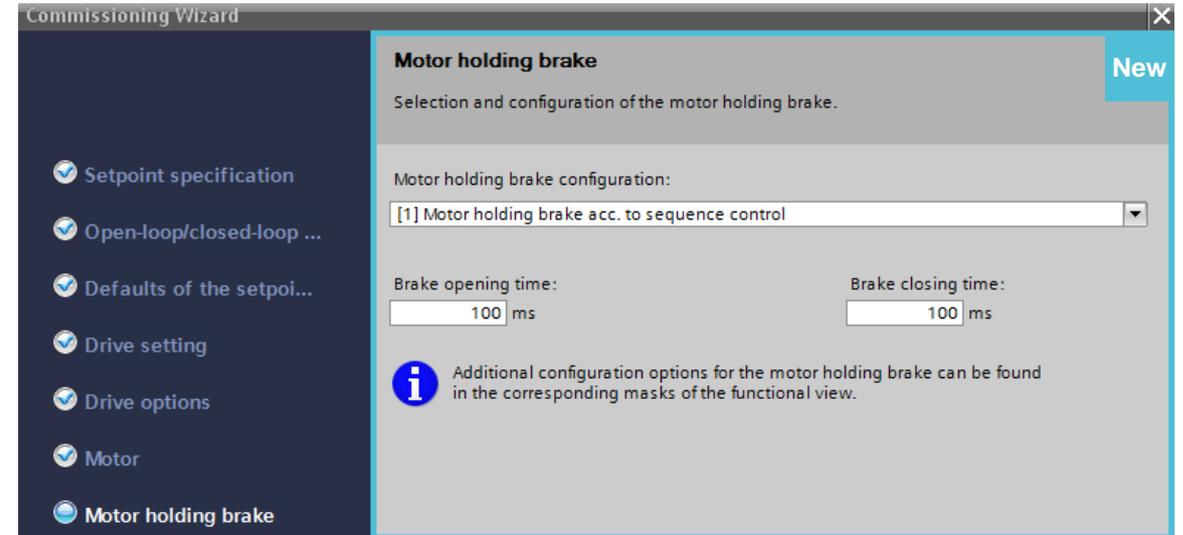


# Startdrive – Extensions for the SINAMICS G120 family

G120  CU320-2 based drives

## Further optimization and expansion of the commissioning assistant

- Configuration of the motor brake
- Cancel online option
- CU250D-2: SSI encoder as motor encoder



# Startdrive – Access to drive settings via TIA Portal Openness

G120  CU320-2 based drives 

## Function

- Adding of drive units and components
- Setting of selected drive parameters (offline and online, reading and writing)
- Telegram configuration
- Download to a device (no uploads)
- Usable for the SINAMICS G120 family and CU320-2-based drive units (SINAMICS S120, G130, G150, S150 and MV)

## Customer benefits

- Flexible Startdrive extensions to meet customer-specific requirements
- Integration into customer-specific and automated workflows
- Stable Openness interface across TIA Portal versions



# Startdrive – Startdrive app “Edit parameters in several drives”

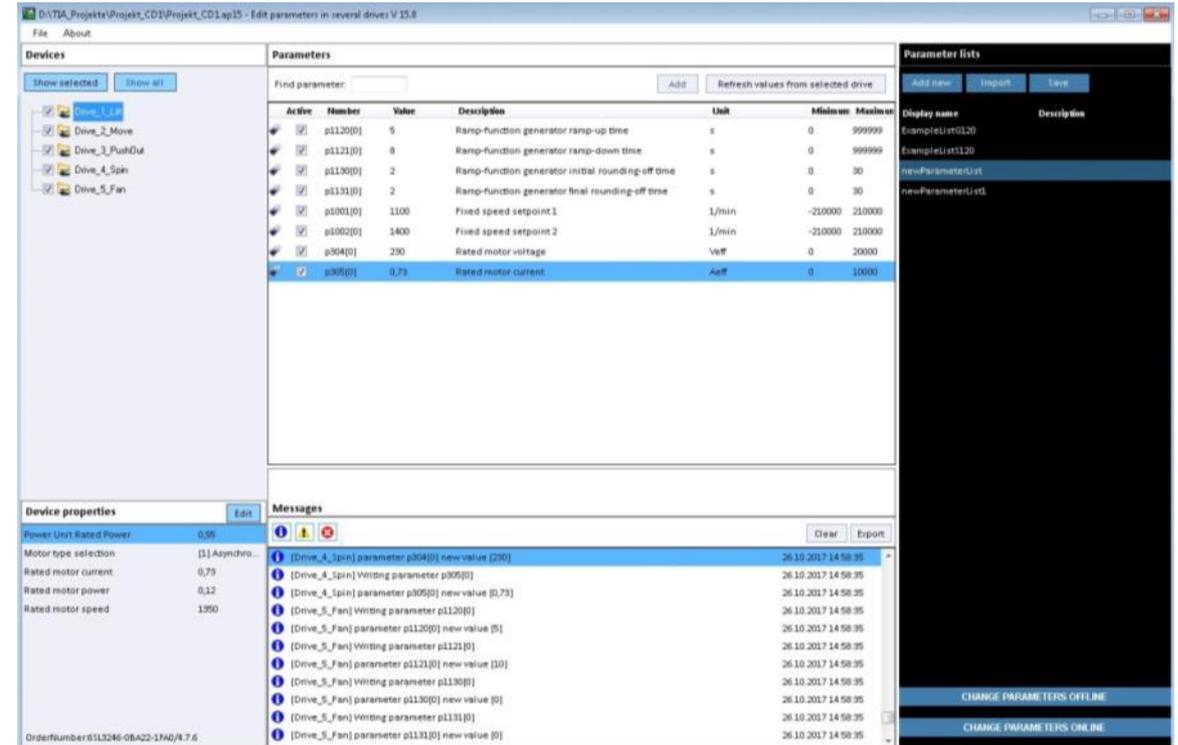
G120  CU320-2 based drives

## Application

- User-defined settings in many drives in a project at once
- TIA Portal external application
- Simple and intuitive to use
- Usable for the SINAMICS G120 family and CU320-2 based drive units (SINAMICS S120, G130, G150, S150 and MV)
- Is provided with V15

## Customer benefits

- Efficient mass data operation
- Open source example for use of Openness interface for drive settings



# Startdrive – Mathematic functions for drive trace

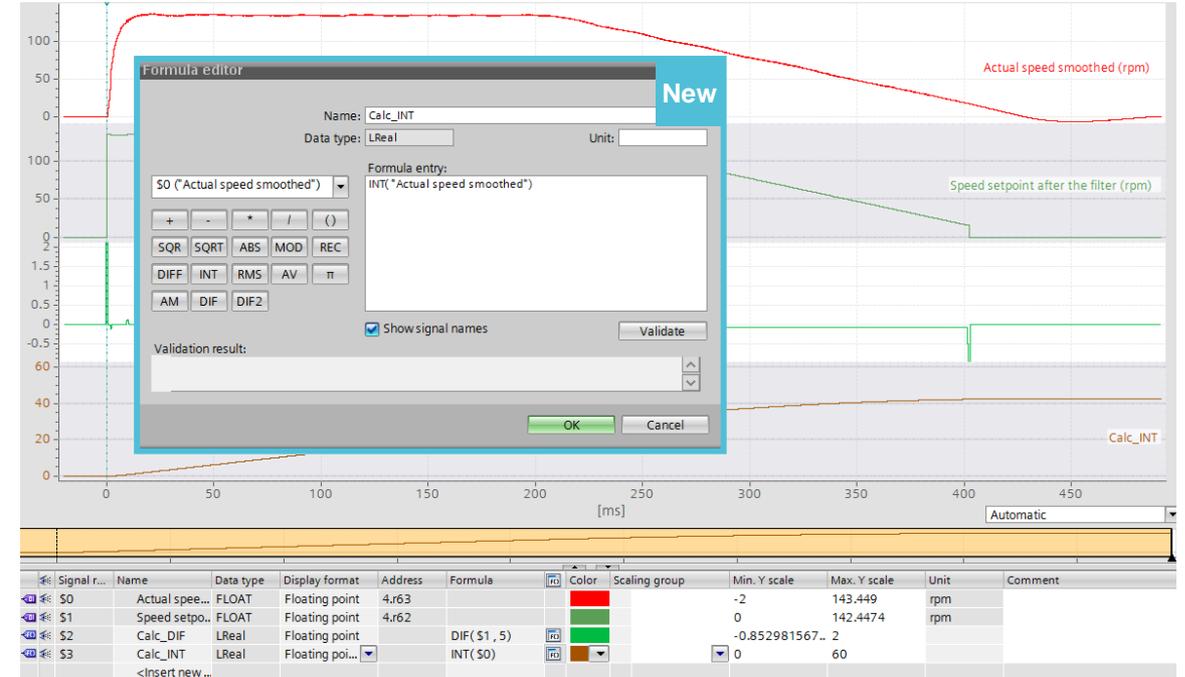
G120  CU320-2 based drives

## Function

- Calculation of new signals from recorded signals on the basis of mathematic formulas
- Basic calculating operations
- Sum, root, square, 1/X, modulo
- Integral, differentiation
- Various filter functions
- Calculation of the mean, effective value, integral in the area of measurement cursor

## Customer benefits

- Generation of unavailable information
- Retroactive processing of measurements
- Measurement of signal curves (e.g., mean)



# Startdrive – License for Startdrive Advanced

## Function

- Introduction of the Startdrive Advanced license for use of additional engineering functions with a high amount of added value
- Only a license key is required, no additional installation
- Trial license is free of charge without a license key (21 days)
- Functions in V15: Safety acceptance test for the G120 family
  - Managed acceptance test assistant for all safety-integrated functions (basic and extended safety)
  - Automatic and safety-function-specific creation of traces
  - Generation of an acceptance protocol as an Excel file



# Startdrive Advanced – Safety acceptance test

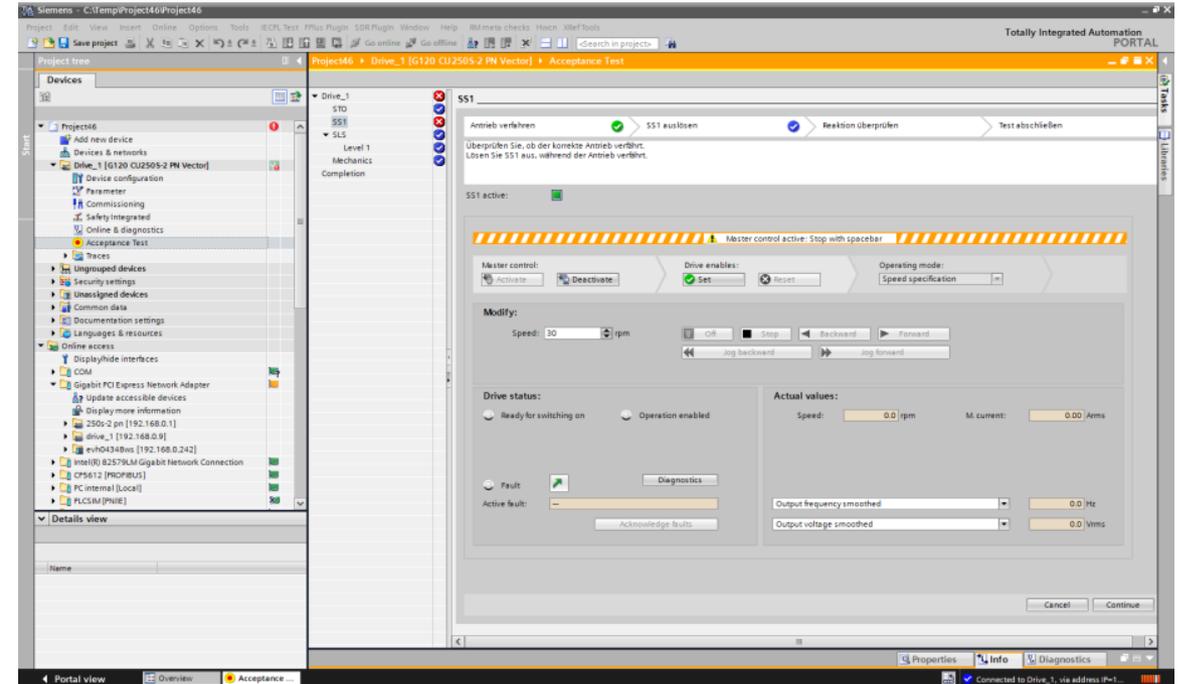
G120  CU320-2 based drives

## Function

- Managed acceptance test assistant for all drive-based, safety-integrated functions (basic and extended safety)
- Automatic and safety-function-specific creation of traces
- Generation of an acceptance protocol as an Excel file
- In addition to integration into TIA, the acceptance test offers the following new features
  - Series acceptance (transfer of results to other drives)
  - Available for G110M, G120, G120C, G120D, G120P

## Customer benefits

- Efficient execution and documentation of the safety acceptance test
- Support with compliance with machinery regulations



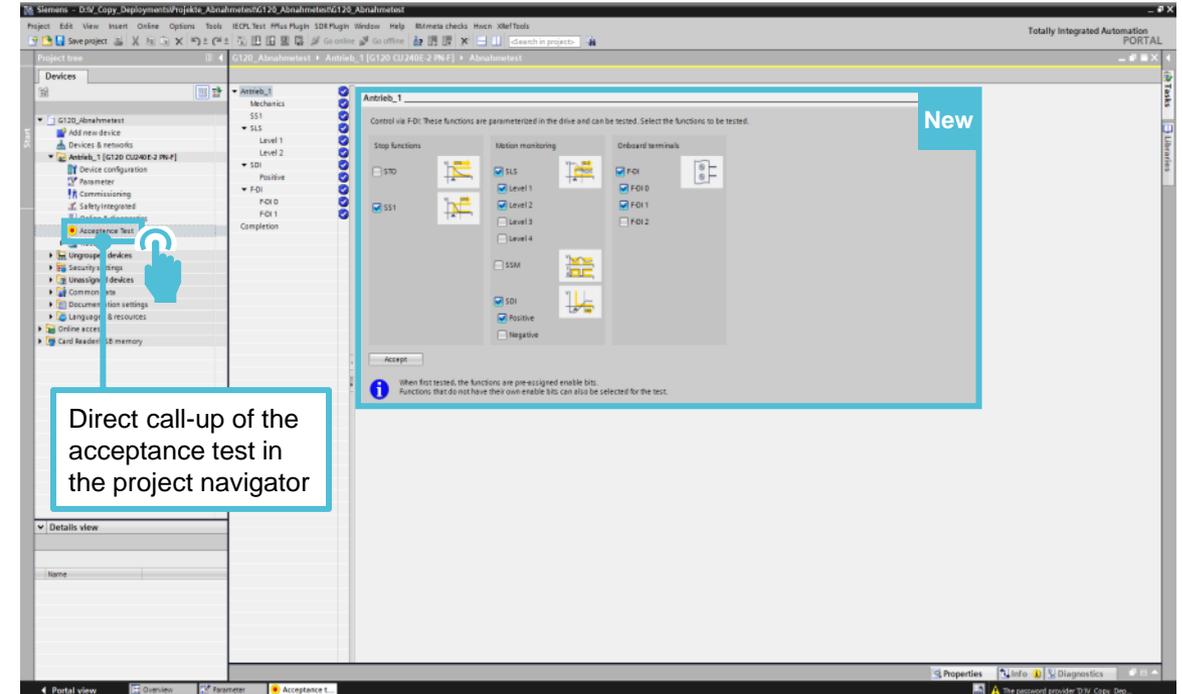
# Startdrive Advanced – Safety acceptance test

G120  CU320-2 based drives 

## Step 1: Selection of functions

Select functions for the acceptance test

- The safety functions parameterized in the drive will be displayed
- The safety functions approved in the drive are pre-selected
- In the function selection system, the user determines which functions will be tested
- The selection can be done offline and requires a consistent project

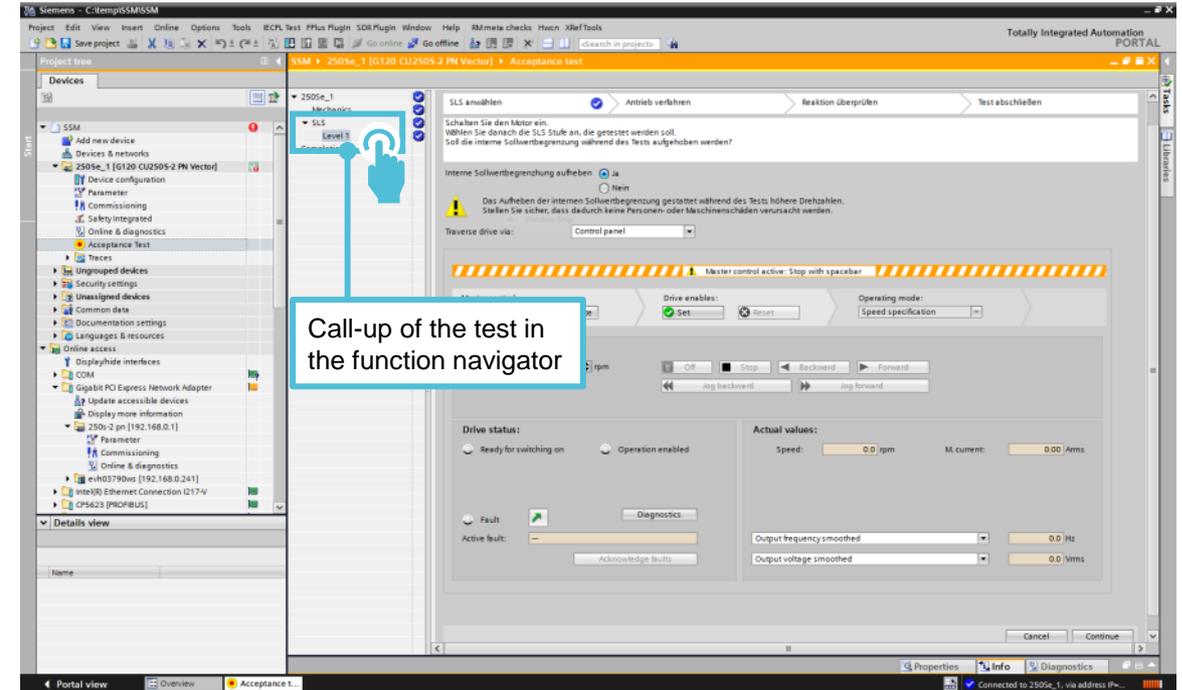


# Startdrive Advanced – Safety acceptance test

G120  CU320-2 based drives

## Step 2: Carrying out the test Test assistant with integrated workflow

- Start the test (the execution of the test requires an online connection)
- Select the safety function
- Operate drive (with the integrated control panel or via the user program)
- Trigger safety function (e.g., STO) or exceed thresholds (e.g., SLS)
- Analyze the result with Trace
- Conclude the test

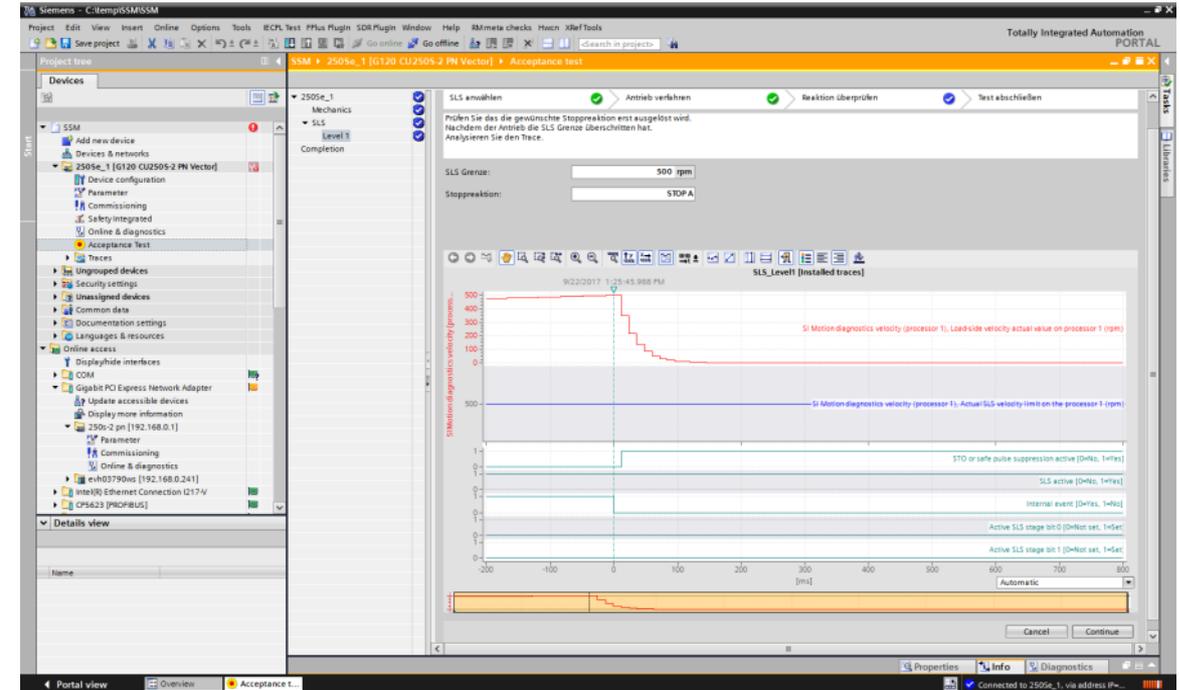


# Startdrive Advanced – Safety acceptance test

G120  CU320-2 based drives

## Step 2: Carrying out the test Automated Trace setting

- The Trace will automatically create safety in a functional-specific manner
- Supports analysis of machine behavior during the test

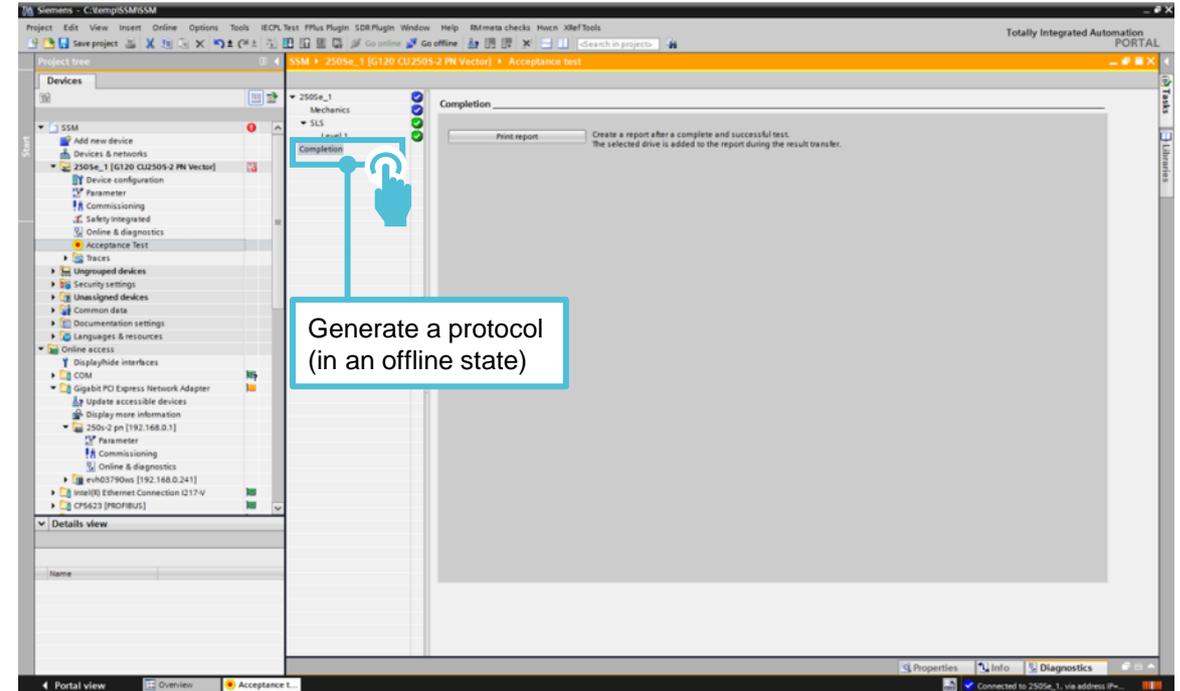


# Startdrive Advanced – Safety acceptance test

G120  CU320-2 based drives

## Step 3: Documentation

Generate a protocol (in an offline state)



# Startdrive Advanced – Safety acceptance test

G120  CU320-2 based drives

## Step 3: Documentation

- The protocol will contain all necessary data (cover sheet, test data, drive parameters, checksums, signatures)
- The protocol is ready for filing in the machine
- The format is optimized for Microsoft Excel (but can be used with OpenOffice as well)

**SINAMICS Safety Integrated**

Acceptance documentation  
Safety Integrated Functions

Designation	XYZ 1200
Type	Testing machine
Serial number	V 01

Simply safe - twice the efficiency!

Project\_name.sp14 Page x of y

**Test of the Safety Functions**

In this test the correct parameterization is checked. Checking the of this test.

<drive name>

Test overview

Tested function	Test status
Safe Torque Off	OK
Safe Stop1	/
Safe Brake Control	FAULT
Safely Limited Speed - Limit 1	OK
Safely Limited Speed - Limit 2	NOT TESTED
Safely Limited Speed - Limit 3	/
Safely Limited Speed - Limit 4	/
Safe Speed Monitor	/
Safe Direction - Positive direction	OK
Safe Direction - Negative direction	/
Failsafe Digital Input - F-DI 0	/
Failsafe Digital Input - F-DI 1	/
Failsafe Digital Input - F-DI 2	/

Detailed tests

<test name # specified in TIA> - Safe Torque Off (STO)

Step	Test description
1	Antibefahren The pulleys are enabled and the correct drive is moving
2	STO auslösen STO is active in the drive
3	Rotation überprüfen The drive coasts down. If there is a mechanical brake it is
4	Test abschließen STO is deactive in the drive No safety faults and alarms are active in the drive

<test name # specified in TIA> - Safe Stop 1 (SS1)

Step	Test description
1	Antibefahren The pulleys are enabled and the correct drive is moving
2	SS1 auslösen SS1 becomes active, the drive brakes electrically
3	Rotation überprüfen The values recorded in the trace are plausible and suitable
4	Test abschließen SS1 is deactive in the drive No safety faults and alarms are active in the drive

Trace configuration

Project\_name.sp14 Page x of y

**Completion of certificate**

SI parameters

Processor	Specified parameter values checked	
	Yes	No
Processor 1		
Processor 2		

Data backup

Parameters	Storage Medium	Type
		Designation
PLC program	Storage Medium	Date
		Archive location
Circuit diagrams	Storage Medium	Type
		Designation
		Date
		Archive location

Countersignatures

Commissioning engineer  
This confirms that the tests and checks were performed correctly.

Date
Name
Company / Dept.
Signature

Machine manufacturer  
This confirms that the recorded parameters are correct.

Date
Name
Company / Dept.
Signature

Project\_name.sp14 Page x of y File\_name.xlsx



# TIA Portal – Highlights of TIA Portal V15

## Hardware Configuration

- Support for new hardware components
  - CPU 1518(F)-4 PN/DP MFP
  - CPU 1516T(F)
- Automatic hardware detection of PROFINET IO devices



## Startdrive – Innovations

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- Access of drive parameters via Openness
- Startdrive Advanced:
  - Safety acceptance test for G120



## STEP 7 – Innovations

- Breakpoints for CPU S7-1500
- Motion control – kinematics for handling tasks
- Language innovations: References
- Extended functions in PLC tag tables
- Local project text handling
- Mathematical functions for trace



## System Functions

- Local administration of users/user groups
- Integration of HW documentation in the Help Viewer
- Extended access to TIA Portal Openness (SCL in XML, PLC download)



Details

## WinCC – Innovations

- New SIMATIC HMI PRO device family
- New approach for supported devices
- Scalable vector graphic (SVG support)
- WinCC RT Professional → Communication
- RFID support for panels



## TIA Portal Options

**STEP 7 Safety:** F-arrays (read access), overflow detection

**Multuser:** Automatic marking, offline working

**OPC UA:** Methods call, companion Spec's

**ProDiag:** Criteria, quantity structures, handling

**PLCSIM Advanced:** Alarms, events, part process images

**Target 1500S for Simulink:** Various extensions

**SiVArc:** Alarms, trend controls, template screens

**Energy Suite:** No PowerTags, S7 EE-Monitor for machines

**TIA User Management Component:** Project-spanning maintenance of users/user groups



New

New



# System Functions – Local management of users/user groups

## Functions

New

- Maintenance of project users
- Maintenance of roles from ES/RT product rights
- Assignment of project users to roles
- Secured storage of user/role data

## Customer benefits

- Maintenance of project users only once in the project, not multiply on local product basis
- Maintenance of roles only once in the project, not multiply on local product basis
- Assignment of roles to project users in the project, not multiply on local product basis
- Basis for efficient administration of personalized security

User name	Password	Authentication ..	Maximum session timeout
Administrator	*****	Password	30 Min
User_1	*****	Password	30 Min
User_2	*****	Password	30 Min
User_3	*****	Password	30 Min
<Add new user>			

Function rights categories	List of rights	Rights derived from the role
Engineering rights		
General		ES Standard
	Open the project read-only	
	Open the project with write rights	



# System Functions – TIA Portal Openness – SCL in XML

## 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

## 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 download for persons without knowledge of TIA Portal
- Automated input of protection level and binding passwords



# System Functions – Display cross-references for statements used

## Filter options

### Sample use case

As a user, I would like to establish the statements used in a CPU

### Workflow

1. Define user-defined filters with source object “Type” and value “Instruction”
2. Select program block folder in PNV
3. **Filter result** only indicates statements used

## Customer benefits

- Quickly find any versioned statements used
- Statement versions are also displayed

The screenshot displays the Siemens TIA Portal interface. The Project tree on the left shows the hierarchy: ProDiagV01\_V15 > PLC\_1 [CPU 1516F-3 PN/DP] > Program blocks. A blue box labeled '2' highlights the 'Program blocks' folder. The main workspace shows a table of cross-references for the selected folder. A blue box labeled '3' highlights the table content. The table has columns for Object, Reference location, and Comment. The filter configuration window at the bottom, labeled '1', shows the filter criteria: Source object type: Instruction, and a table with columns Seq., Attributes, Operator, and Value. The table contains one row: 1, [Source object]: Type, =, Instruction.

Object	Reference location	Comment
3	Diag_Alarm [V1.0]	
	G7_RT_Plus_1_V2 [V1.0]	
	G7_RT_Plus_2_V2 [V1.0]	
	G7_RT_Plus_3_V2 [V1.0]	
	G7_RT_Plus_4_V2 [V1.0]	
	G7_RT_Plus_5_V2 [V1.0]	
	G7_RT_Plus_6_V2 [V2.0]	
	G7_RT_Plus_SUB_1_V2 [V1.0]	
	G7_RT_Plus_SUB_2_V2 [V1.0]	
	G7_RT_Plus_SUB_3_V2 [V1.0]	
	Program_Alarm [V1.0]	Generate program
	R_TRIG [V1.0]	Detect positive si
	LiftSim	
		@LiftSim ▶ NW1
		@LiftSim ▶ NW5 (set visibi...
		@LiftSim ▶ NW6 (set visibi...
		@LiftSim.instrRisTrigClock ...
		@LiftSim.instrRisTrigLift1 ▶...
		@LiftSim.instrRisTrigLift2 ▶...
	RD_SYS_T [V1.0]	Read time-of-day
	Serialize [V2.0]	Serialize

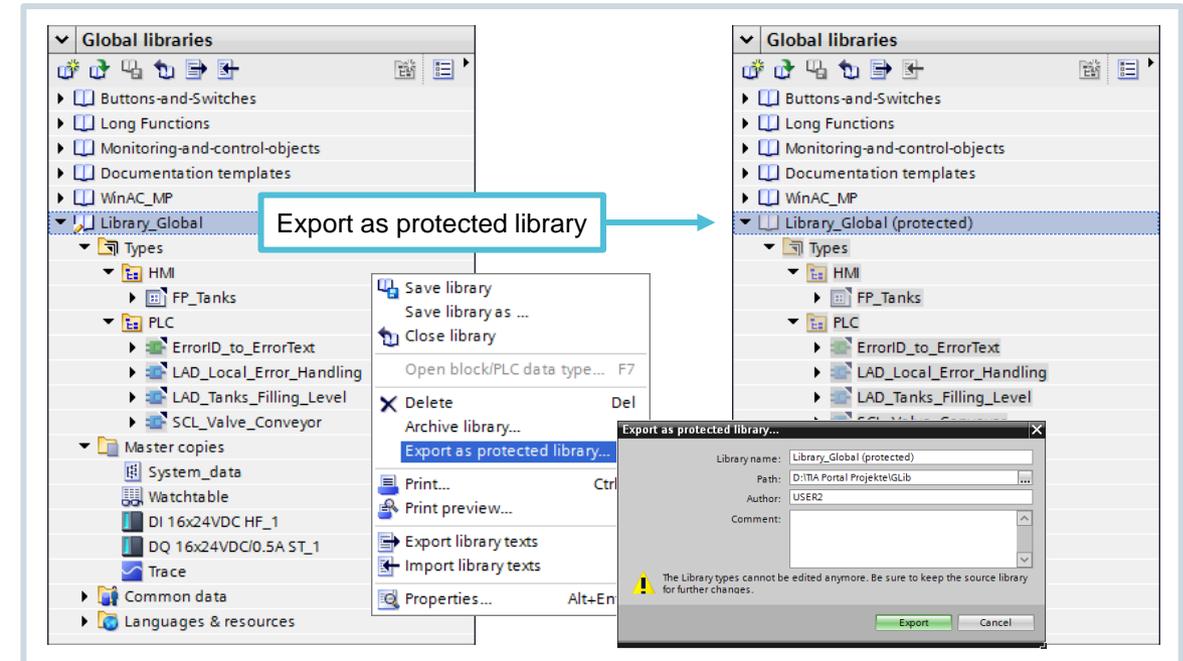
Seq.	Attributes	Operator	Value
1	[Source object]: Type	=	Instruction

# System Functions – Protected libraries – 1/2 (creation)

## Use of protected libraries

### “Write-protected libraries” features

- Global libraries can be exported as write-protected libraries
- Write protection can not be reversed
- No password is needed
- Write protected libraries can not be modified (add or remove objects)

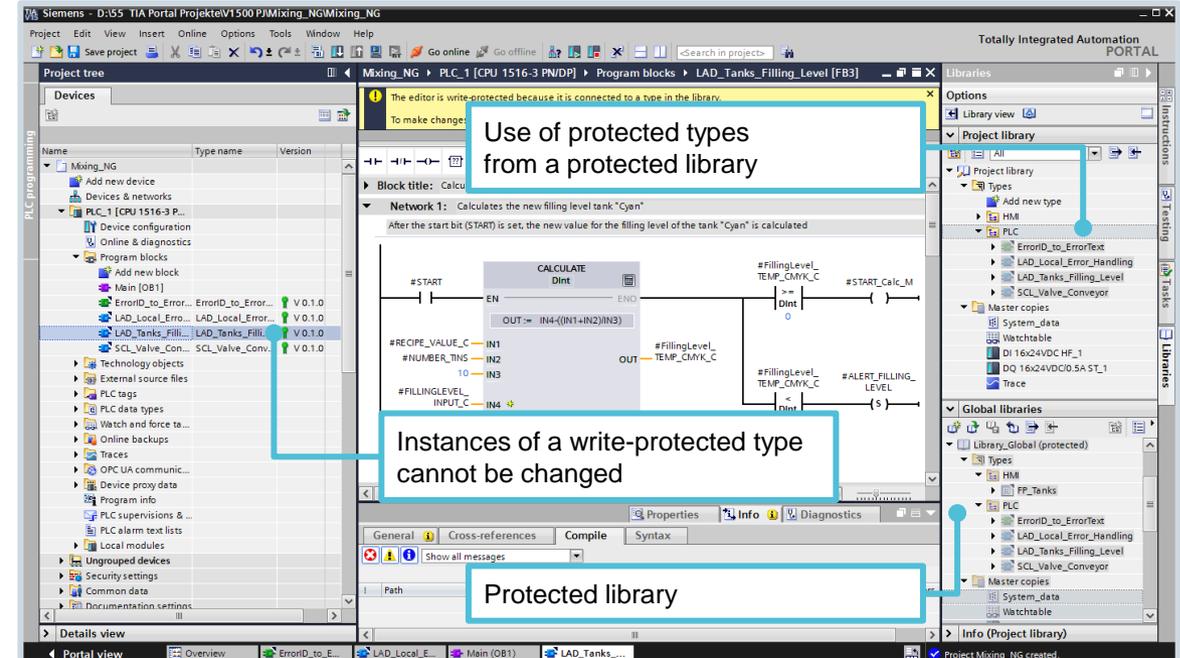


# System Functions – Protected libraries – 2/2 (use of protected types)

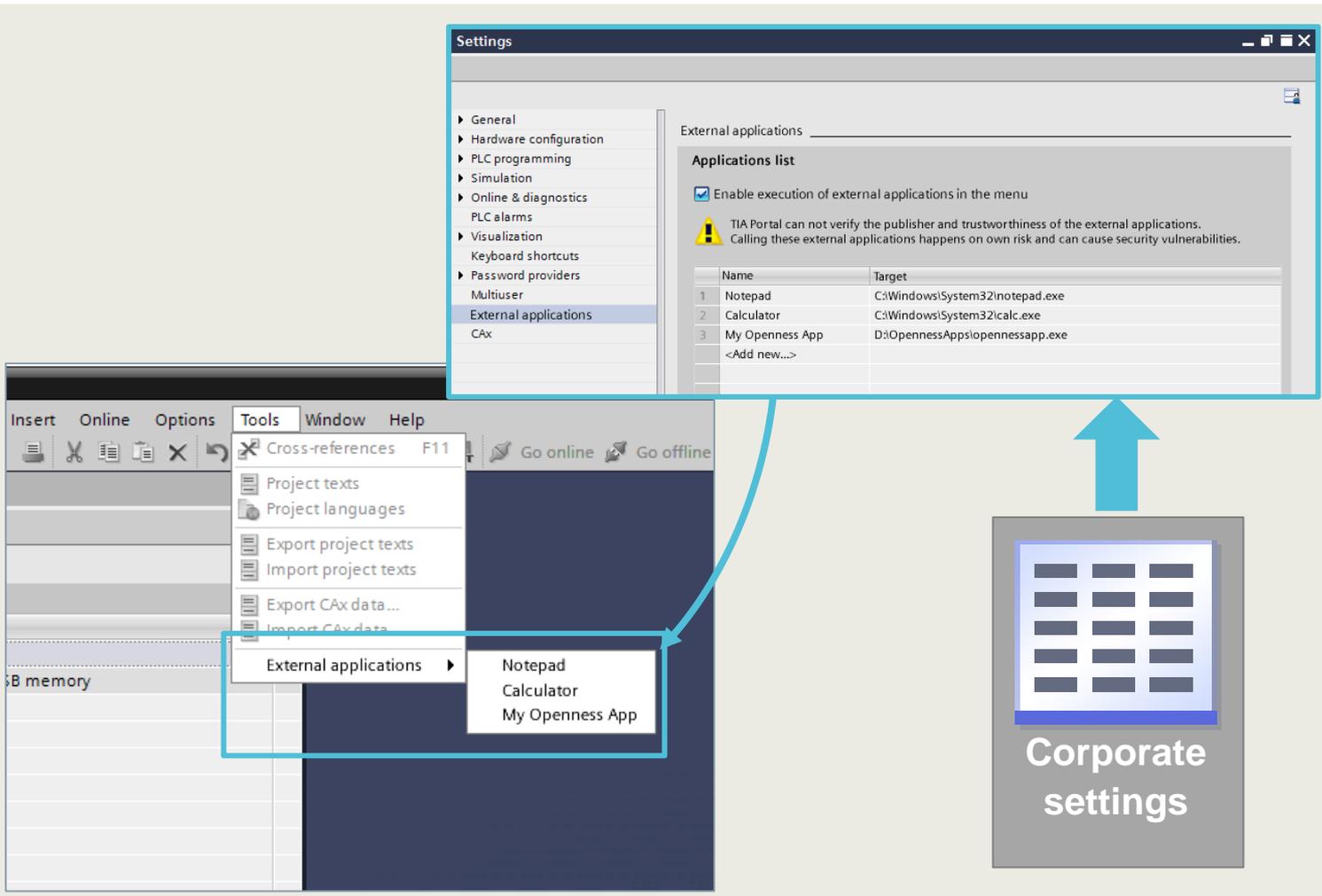
## Protected types

### “Protected library types” features

- All types in protected libraries are write protected
- Used types and instances keeps write protected and can not be reversed
- Instances of a write-protected type
  - Are displayed read-only in the editor
  - Cannot be edited
  - Cannot be assigned a new version
  - Cannot be terminated from the type
- Available for PLC and HMI types



# System Functions – Integrate external applications



## Features

- Menu entry to execute predefined external applications.

## Usage

- Is a part of the settings-export/import to allow central predefinition for multiple engineering PCs/Stations.

Allows execution of external applications within the TIA Portal

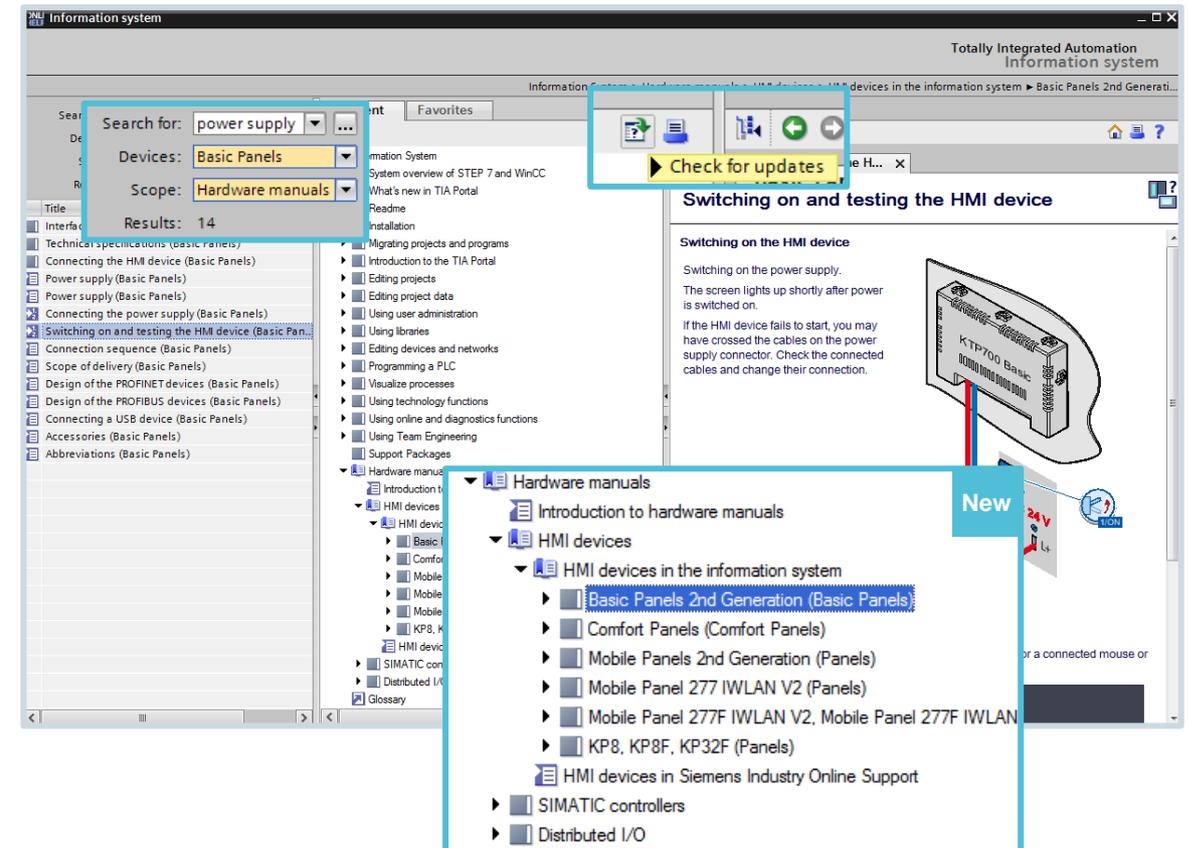
# System Functions – Hardware manuals in the information system

## Function

- Hardware manuals integrated in the information system
- Some manuals contained in TIA Portal V15
- Additional manuals available as a support package as needed

## Customer benefits

Hardware manuals can be browsed, filtered and used as favorites



# System Functions – TIA Administrator

## Function

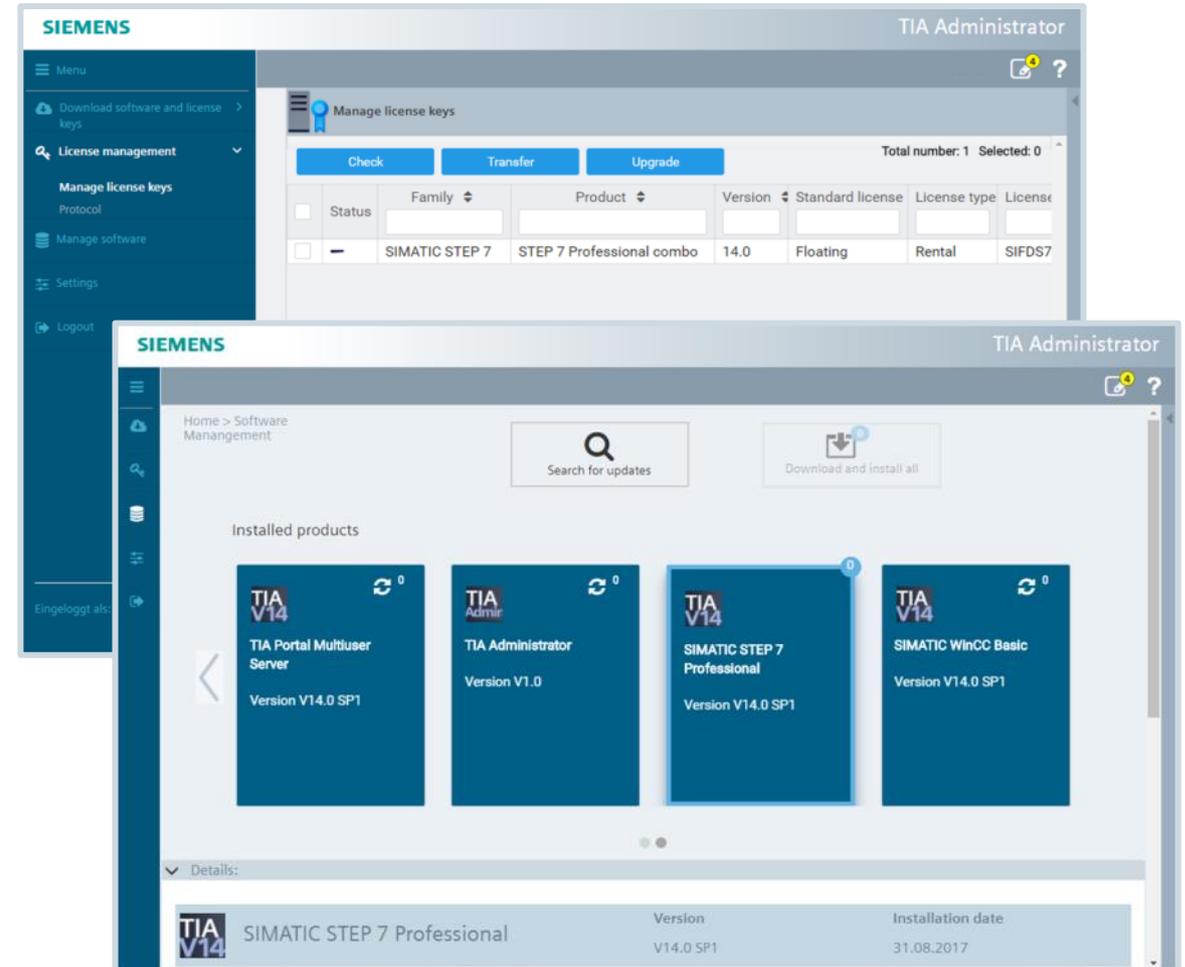
New

- Web-based framework for administration tasks in TIA environment
- Integration of function modules for different applications
- Functions of ALM, Software Updater<sup>1</sup> and Online Software Delivery integrated

## Customer benefits

- Joint administration of software and licenses in one tool
- Further functions can be added on according to individual requirements (e.g. user administration with UMC)
- Ease of use via web browser

<sup>1</sup> Existing tools will continue to be available in the interim



# System Functions – TIA Administrator – Comparison with existing tools

License management	Automation License mgr.	TIA admin
Display licenses (local/remote/OSD)	✓	✓
Transfer licenses (local/remote/OSD)	✓	✓
Use/provide licenses remotely	✓	✓
Upgrade licenses	✓	✓
Repair licenses	✓	✗
Offline license transfer	✓	✗
Connection to target systems (HMI, ...)	✓	✗
License folder	✓	✓
Filter/search for licenses	✓	✓
Protocol	✓	✓
Check-out view	✓	✗
MKL reporting to server	✓	✓

Software management	Automation license mgr.	TIA admin
Display installed software	✗	✓
Check/display updates	✓	✓
Download updates	✓	✓
Install updates	✓	✓
Display installed support packages	✗	✓
Look for new support packages	✓	✓
Download support packages	✓	✓
Install support packages	✓	✓
Connection to Siemens update server	✓	✓
Connection to corporate server	✓	✓
Automatic update check	✓	✓
Activate notification of updates	✓	✗



# TIA Portal – Highlights of TIA Portal V15

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- Startdrive Advanced:
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## System Functions

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- Integration of HW documentation in the Help Viewer
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- New SIMATIC HMI PRO device family
- New approach for supported devices
- Scalable vector graphic (SVG support)
- WinCC RT Professional → Communication
- RFID support for panels



## TIA Portal Options

**STEP 7 Safety:** F-arrays (read access), overflow detection

**Multiuser:** Automatic marking, offline working

**OPC UA:** Methods call, companion Spec's

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**Target 1500S for Simulink:** Various extensions

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**Energy Suite:** No PowerTags, S7 EE-Monitor for machines

**TIA User Management Component:** Project-spanning maintenance of users/user groups



Details



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New



New



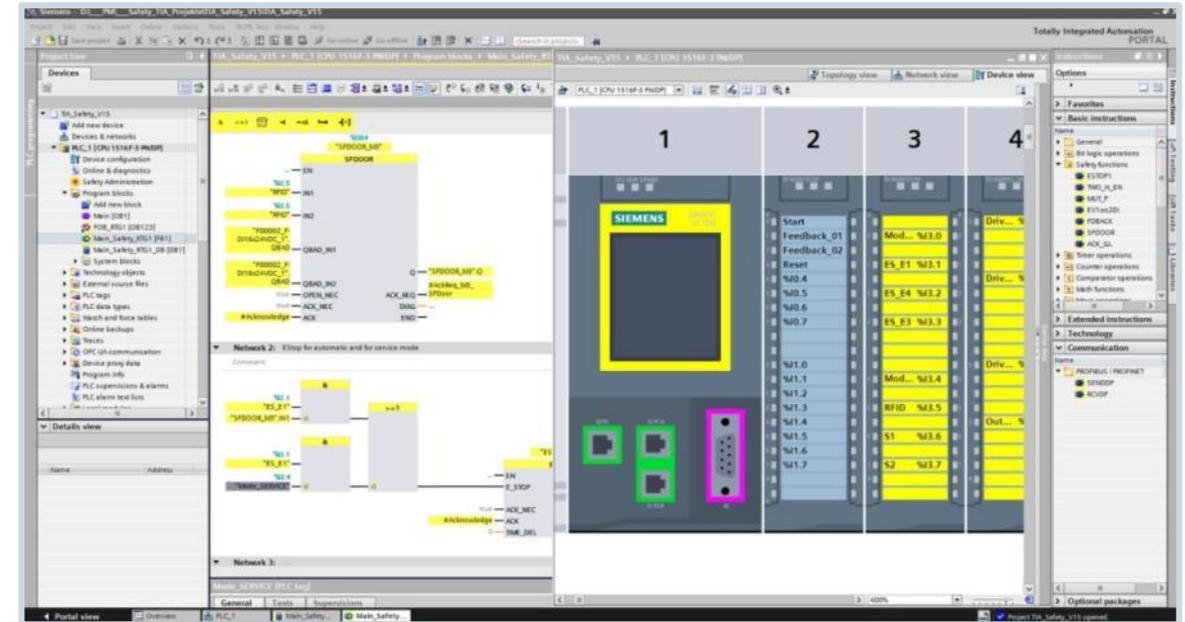
Details



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

## 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

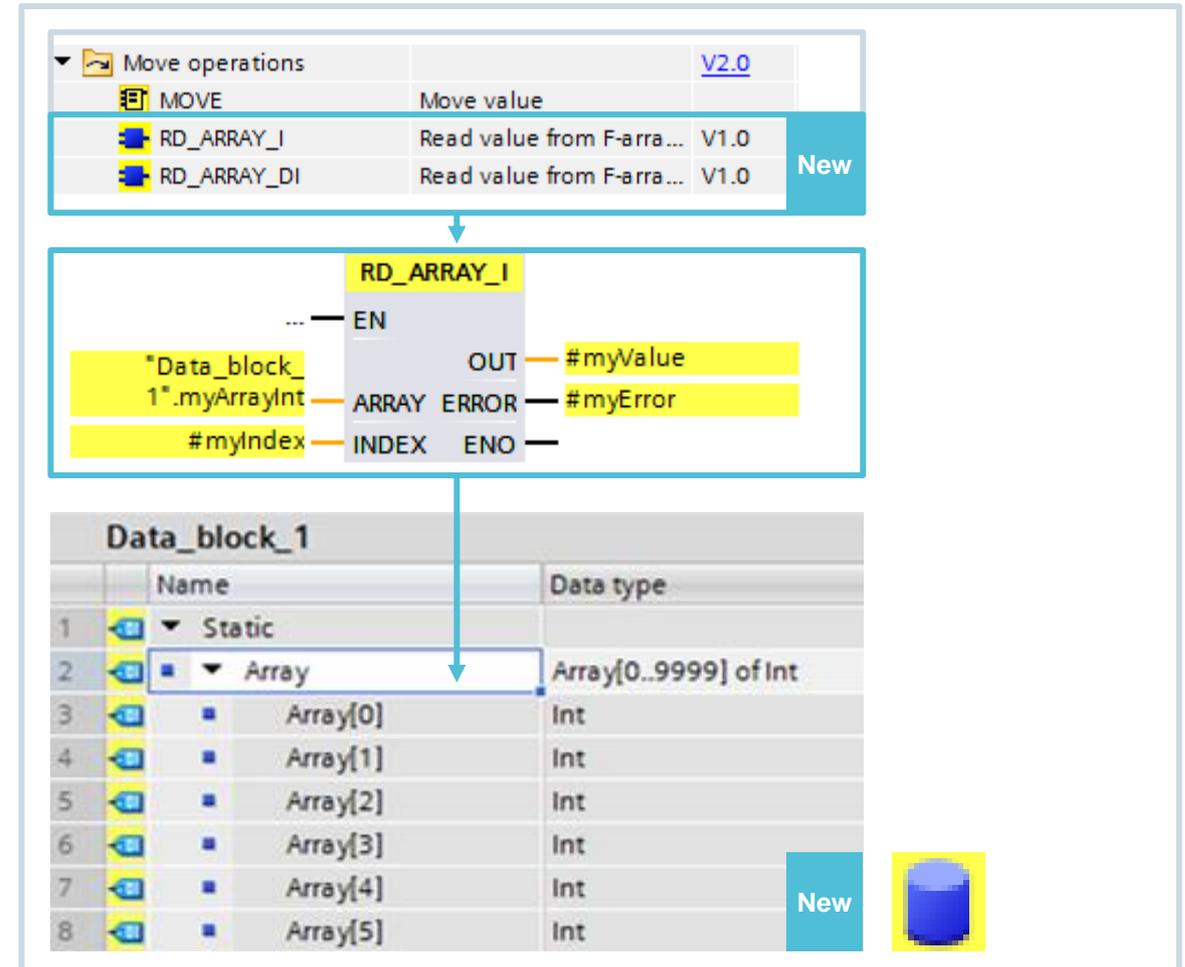


# TIA Portal Options – STEP 7 Safety – Read access to failsafe arrays of data type INT/DINT

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



The screenshot illustrates the configuration of the **RD\_ARRAY\_I** function block in the TIA Portal. It is divided into three main sections:

- Function Selection:** A table under "Move operations" shows the selection of **RD\_ARRAY\_I** (Read value from F-arra... V1.0) over other options like MOVE and RD\_ARRAY\_DI. A "New" button is visible.
- Function Block Diagram:** A diagram of the **RD\_ARRAY\_I** block with the following connections:
  - EN** (Enable) is connected to a constant "1".
  - OUT** is connected to the variable **#myValue**.
  - ARRAY ERROR** is connected to the variable **#myError**.
  - INDEX** is connected to the variable **#myIndex**.
  - ENO** (Enable No Output) is connected to a constant "1".
- Data Block Configuration:** A table for **Data\_block\_1** shows the configuration of the array:
 

	Name	Data type
1	Static	
2	Array	Array[0..9999] of Int
3	Array[0]	Int
4	Array[1]	Int
5	Array[2]	Int
6	Array[3]	Int
7	Array[4]	Int
8	Array[5]	Int

 A "New" button and a cylinder icon are also present in this section.



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

S7-1200



S7-1500



## Function

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

The screenshot shows the 'Safety Administration' window in the TIA Portal. The breadcrumb path is 'Project1\_V15 > PLC\_5 [CPU 1518F-4 PN/DP] > Safety Administration'. The left sidebar shows a tree view with 'General' selected. The main area is divided into sections: 'General', 'Safety mode status', 'Safety program status', and 'F-signatures'. The 'Safety mode status' section shows 'Current mode: Safety mode is activated.' and a 'Disable safety mode' button. The 'Safety program status' section shows 'Offline program: The offline safety program is consistent, but no password has been assigned.' and 'Online program: The online safety program is consistent, but no password has been assigned.'. The 'F-signatures' section contains a table with the following data:

Description	Status	Offline signature	Online signature	Version comp...
Collective F-signature	●	16D64833	16D64833	●
Software F-signature		EEC06111		
Hardware F-signature		2815E722		

A blue 'New' button is visible next to the 'Software F-signature' and 'Hardware F-signature' rows.



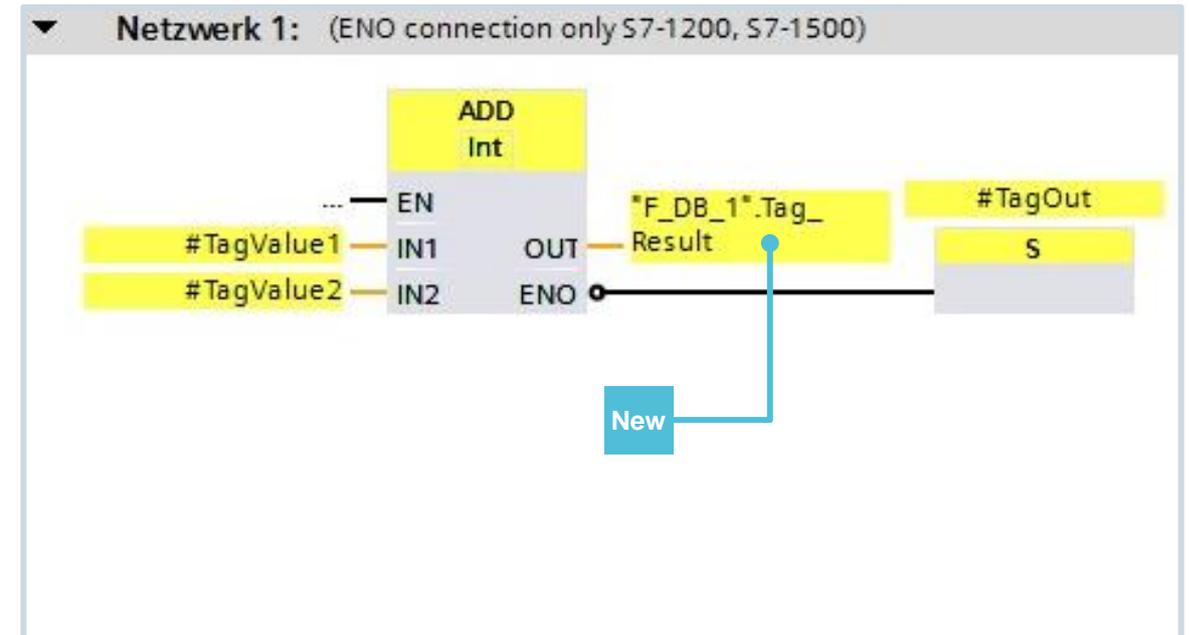
# TIA Portal Options – STEP 7 Safety – Overflow Handling

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

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)



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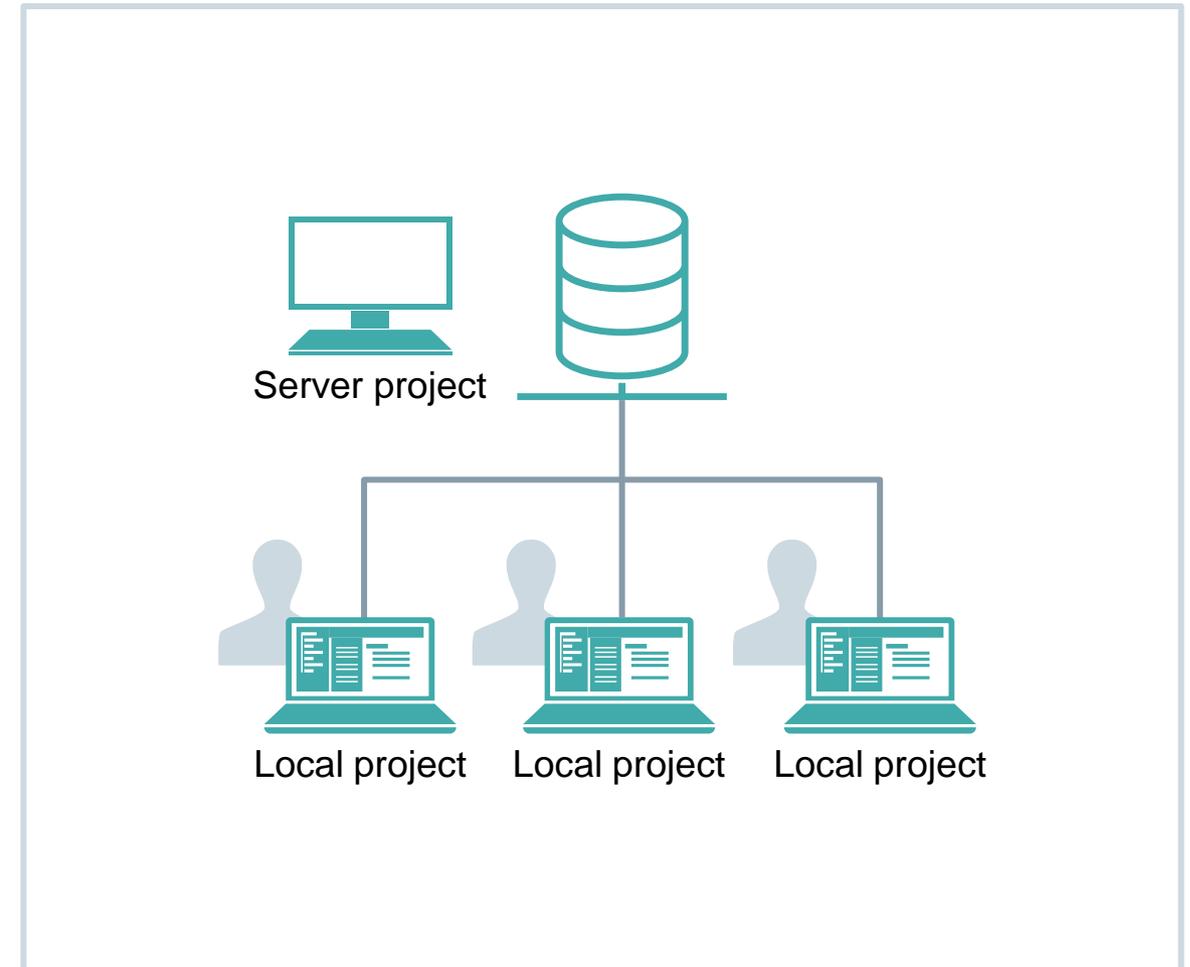
# TIA Portal Options – Multiuser Engineering – Overview of new functions

## 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 – Multiuser Server – Improved check-in functions

## Check-in

- Extended comment option on check-in
- New filter for fast conflict recognition
- Modified objects are saved at check-in
- Export of project history to XML for further evaluations

The screenshot displays the TIA Portal Multiuser Server Administration interface. Key features are highlighted with callouts:

- Filter for conflict recognition:** A button labeled "Filter for conflict recognition" is located at the top of the "Check-in" window.
- Check-in comment:** A text input field labeled "Check-in comment" is positioned below the "Filter for conflict recognition" button.
- Display of project history:** A table showing a list of revisions with columns for Availability, Revision number, Computer name, Created by, Creation date, and Comment.
- Display of scope and type of changes:** A section titled "Revision 9" showing a list of "Changed Items" with columns for Name, Change, Type, and Object id.
- XML project history:** A table at the bottom showing a detailed list of changes with columns for In, creationDate, created, comment, name, change, and objectType.

Availability	Revision number	Computer name	Created by	Creation date	Comment	Notes
10	MD1MRQC	ho4020	ho4020	03.07.2017 17:23:48	New output signal "STATE_VALVE"	
9	MD1MRQC	ho4020	ho4020	03.07.2017 17:10:10	HMI start screen adapt	
8	MD1MRQC	ho4020	ho4020	03.07.2017 17:04:20	Open valve optimized (Network 2)	
7	MD1MVNMC	br3029	br3029	03.07.2017 16:52:48	Activate webserver on PLC	1 Note
6	MD1MVNMC	br3029	br3029	03.07.2017 16:50:03	Change consistency of error handling behavior	
5	MD1MVNMC	br3029	br3029	03.07.2017 16:48:38	- Grouping of general objects	

Name	Change	Type	Object id
Color_Filling_Station_1516_V15_112\Color_Mixing_CPU\W	Create	Watch table	5f3a24ba-1555-4034-b23d-d84bb50a6937
Color_Filling_Station_1516_V15_112\Color_Mixing_HMI\H	Create	HMI_Tag	860f239e8-6849-47fb-b67b-ed75446f35bb
Color_Filling_Station_1516_V15_112\Color_Mixing_HMI\Sc	Edit	Screen	b3bf1388-192b-4f8c-b822-92f79363d705

In	creationDate	created	comment	name	change	objectType
2	8 15:04:20.4347985Z	ho4020	Open valve optimized (Network 2)	\LAD_Control_Color_Valves	Edit	Function block
3	9 15:10:10.0654719Z	ho4020	HMI start screen adapt	\Start screen	Edit	Screen
4	9 15:10:10.0654719Z	ho4020	Watch table applied	\Watch table_1	Create	Watch table
5	9 15:10:10.0654719Z	ho4020	HMI tag for Chanal Y1 inserted	\VALVE_COLOR_Y_1	Create	HMI_Tag
6	10 15:23:48.6772796Z	ho4020	New output signal "STATE_VALVE"	\SCL_Valve_Conveyor	Edit	Function block
7	11 15:55:46.6413260Z	ho4020	Operating mode selection changed	\Main	User	Organization block



# TIA Portal Options – Multiuser Server – Extended project management

## Project management

- No restriction with respect to savable project versions in the short-term archive
- Project versions can be archived and are therefore excluded from the short-term archive
  - Project milestones can be marked in this way (startup, machine handover, functional enhancements, ...)
- Rollback to saved versions possible (since V14)

## Server management

- Multiuser Server V15 also supports TIA Portal projects from V14
- Side-by-side installations of Multiuser Server V14 and V15 are possible
- External multiuser tools are now available in all TIA Portal languages

The screenshot displays the 'TIA Portal Multiuser Server - Administration' window. The main area shows a table of project revisions. A callout box labeled 'Savable project versions' points to the table. Another callout box labeled 'No restriction with respect to short-term archive' points to the 'Add server' button in the left sidebar. A third callout box labeled 'Version comments can be added at any time' points to the 'Add note' button in the details view for Revision 7.

Availability	Revision number	Computer name	Created by	Creation date	Comment	Notes
	10	MD1MQRQC	ho4020	03.07.2017 17:23:48	New output signal "STATE_VALVE"	
	9	MD1MQRQC	ho4020	03.07.2017 17:10:10	HMI start screen adapt	
	8	MD1MQRQC	ho4020	03.07.2017 17:04:20	Open valve optimized (Network 2)	
	7	MD1MVNMC	br3029	03.07.2017 16:52:48	Activate webserver on PLC	1 Notes
	6	MD1MVNMC	br3029	03.07.2017 16:50:03	Change consistency of error handling behavior	
	5	MD1MVNMC	br3029	03.07.2017 16:48:38	- Grouping of general objects	
	4	MD1MVNMC	br3029	03.07.2017 16:39:09	- grouping mixer blocks	
	3	MD1MQRQC	ho4020	03.07.2017 15:25:16	some string	
	2	MD1MQRQC	ho4020	03.07.2017 15:23:38	some string	
	1	MD1MQRQC	ho4020	03.07.2017 11:38:59	Initial upload	

Revision 7  
Details | Changed Items  
Comment:  
Activate webserver on PLC  
Notes:  
Add note  
ho4020, 7/3/2017 5:35:00 PM  
Startup commissioning

# TIA Portal – Highlights of TIA Portal V15

## Hardware Configuration

- Support for new hardware components
  - CPU 1518(F)-4 PN/DP MFP
  - CPU 1516T(F)
- Automatic hardware detection of PROFINET IO devices



## Startdrive – Innovations

- Support for SINAMICS G130, G150, S150, MV and extensions for S120
- Access of drive parameters via Openness
- Startdrive Advanced:
  - Safety acceptance test for G120



## STEP 7 – Innovations

- Breakpoints for CPU S7-1500
- Motion control – kinematics for handling tasks
- Language innovations: References
- Extended functions in PLC tag tables
- Local project text handling
- Mathematical functions for trace



## System Functions

- Local administration of users/user groups
- Integration of HW documentation in the Help Viewer
- Extended access to TIA Portal Openness (SCL in XML, PLC download)



## WinCC – Innovations

- New SIMATIC HMI PRO device family
- New approach for supported devices
- Scalable vector graphic (SVG support)
- WinCC RT Professional → Communication
- RFID support for panels



## TIA Portal Options

**STEP 7 Safety:** F-arrays (read access), overflow detection

**Multiuser:** Automatic marking, offline working

**OPC UA:** Methods call, companion specs

**ProDiag:** Criteria, quantity structures, handling

**PLCSIM Advanced:** Alarms, events, part process images

**Target 1500S for Simulink:** Various extensions

**SiVArc:** Alarms, trend controls, template screens

**Energy Suite:** No PowerTags, S7 EE-Monitor for machines

**TIA User Management Component:** Project-spanning maintenance of users/user groups



Details



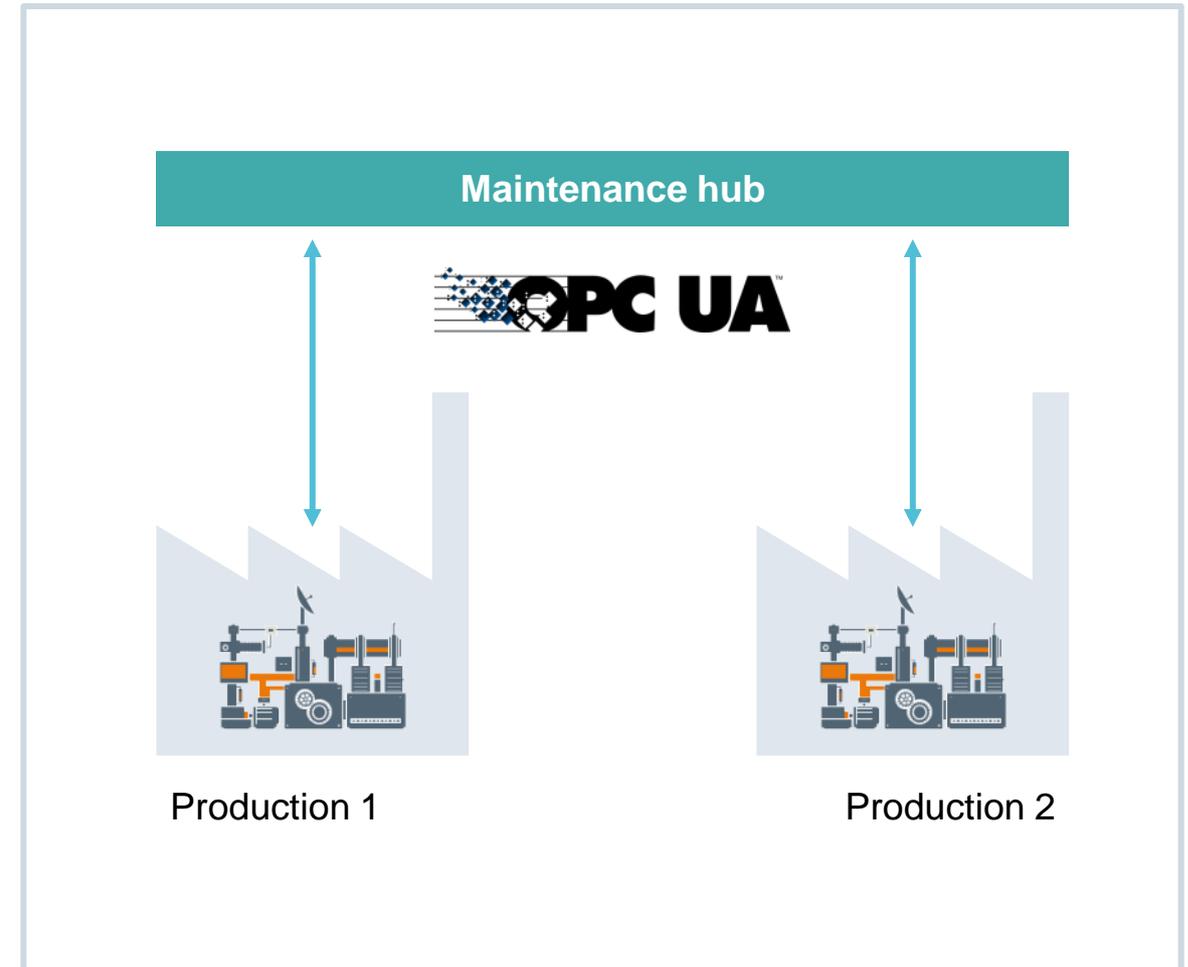
# TIA Portal Options – OPC UA – Overview of new functions

## Function

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

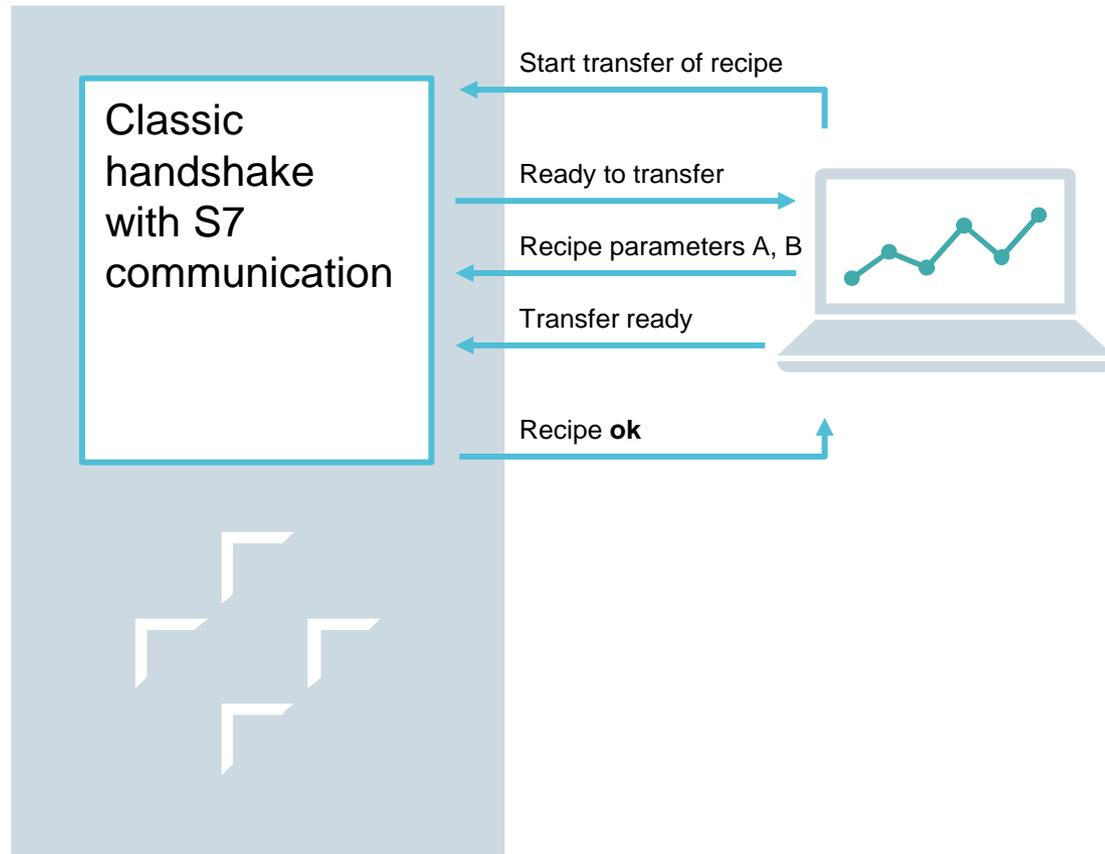
## Customer benefits

- 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

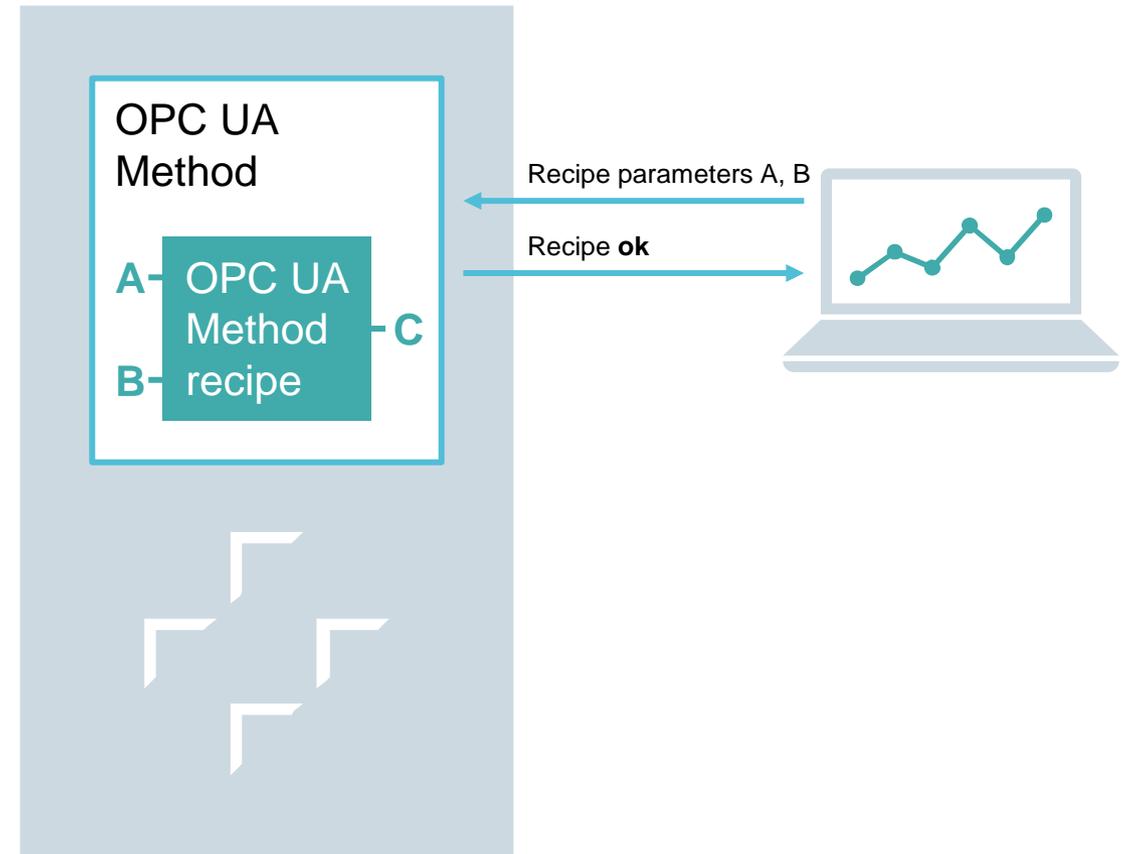


# TIA Portal Options – OPC UA – Server method call 1/2

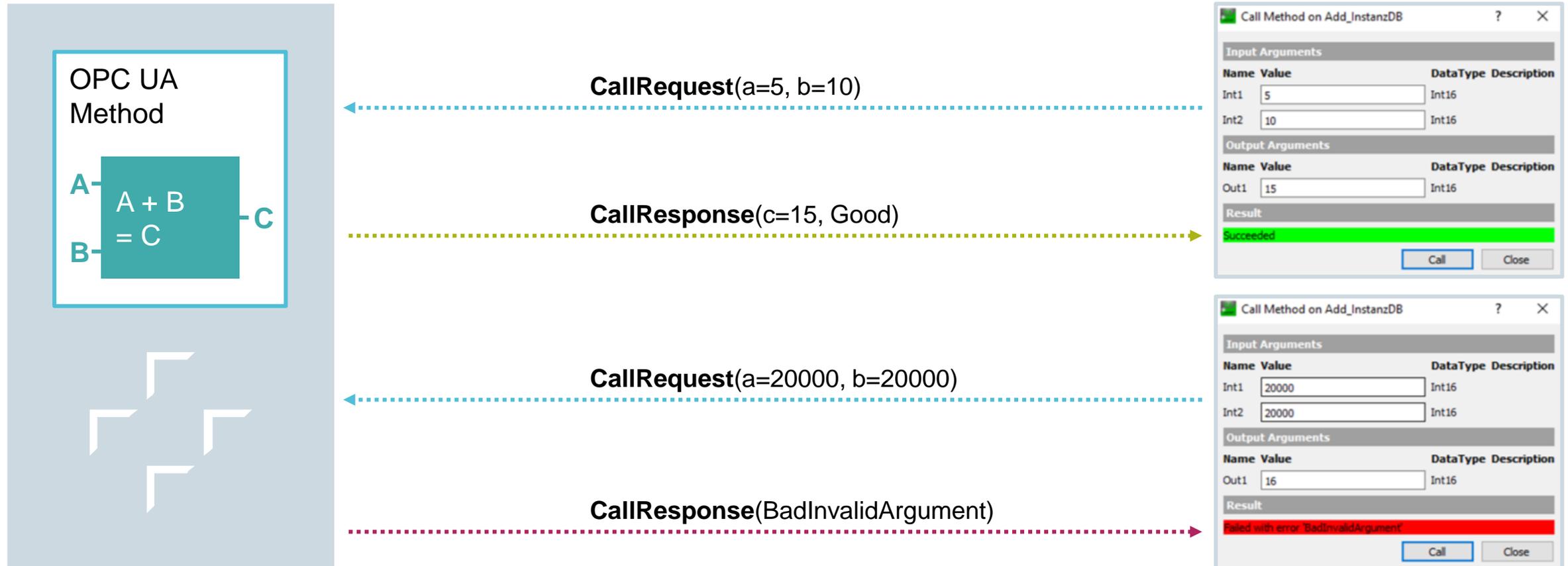
## Classic handshake



## OPC UA method call as efficient replacement



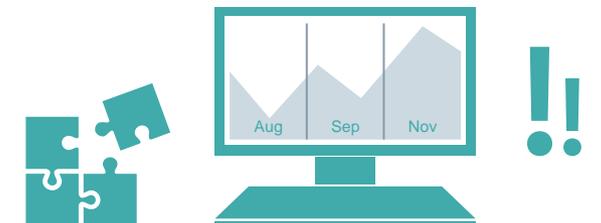
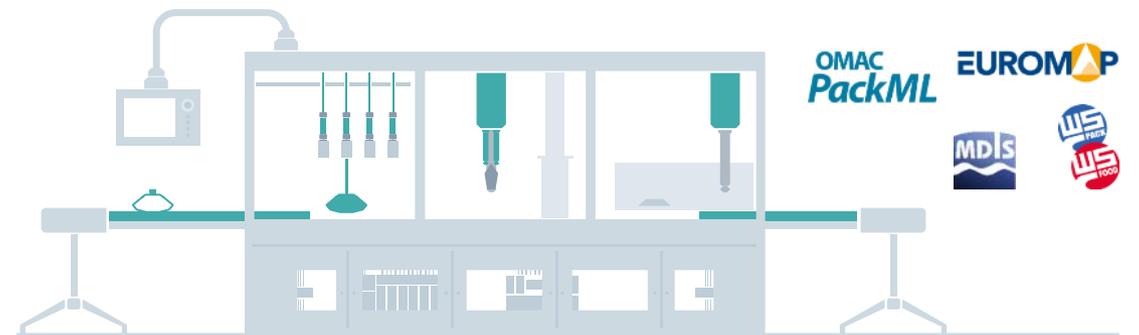
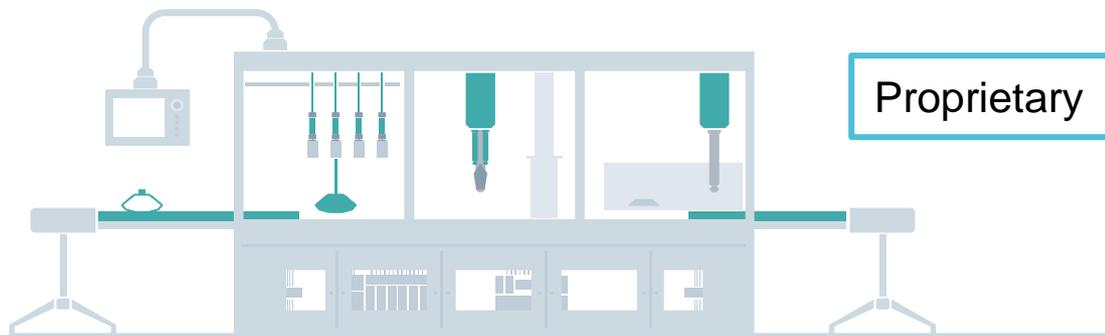
# TIA Portal Options – OPC UA – Server method call 2/2



# TIA Portal Options – OPC UA – Companion-Spezifikationen

Costly integration of the most varied proprietary standards

Plug&play connectivity with standardized machine type interfaces



# TIA Portal – Highlights of TIA Portal V15

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  - CPU 1516T(F)
- Automatic hardware detection of PROFINET IO devices



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## TIA Portal Options

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**TIA User Management Component:** Project-spanning maintenance of users/user groups



Details



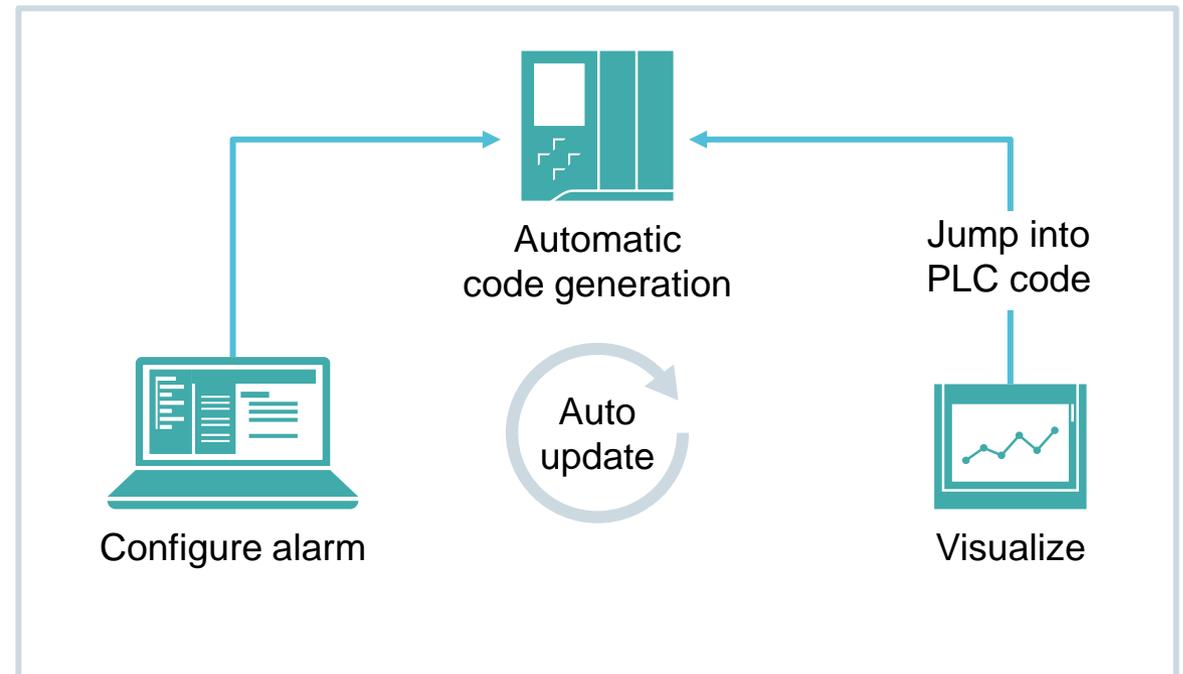
# TIA Portal Options – ProDiag – Overview of new functions

## Function

- **Criteria analysis** for ProDiag supervisions and S7-Graph
- Result of the criteria analysis within the alarm text
- Display of Predecessor/successor step within the HMI **S7-Graph Overview Control**
- **1000 supervisions** per supervision block (250 in V14)
- **Identical timestamp** for all identified events in a cycle
- Rapid activation of supervisions in PLC tag table, DB
- Numerous other useful functional enhancements (see detailed slides)

## Customer benefits

Even simpler engineering of supervisions and improved diagnosis during operation with **SIMATIC ProDiag**



# TIA Portal Options – ProDiag – Result of criteria analysis in alarms

## Function

- The result of the “initial value” is included in the alarm for S7-Graph and S7-ProDiag supervisions on the HMI
- The scope of information can be parameterized (symbol, symbol comment, address, value)

## Customer benefits

Customer receives initial value in the S7-GRAPH/ProDiag alarm based on a fixed rule, whereby the operand is considered first at the start of the network

### New HMI Runtime settings

Criteria analysis **New**

Extend text: Alarm Text

Symbol

Absolute Address

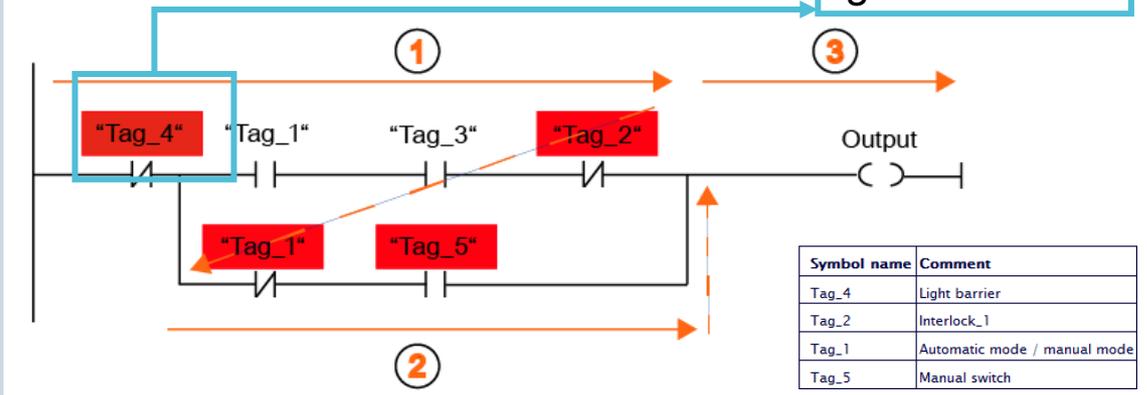
Value

Comment

**Possibilities**

- None
- Alarm Text
- Info Text

Postfix in alarm text → ... Initial value: ... **light barrier**



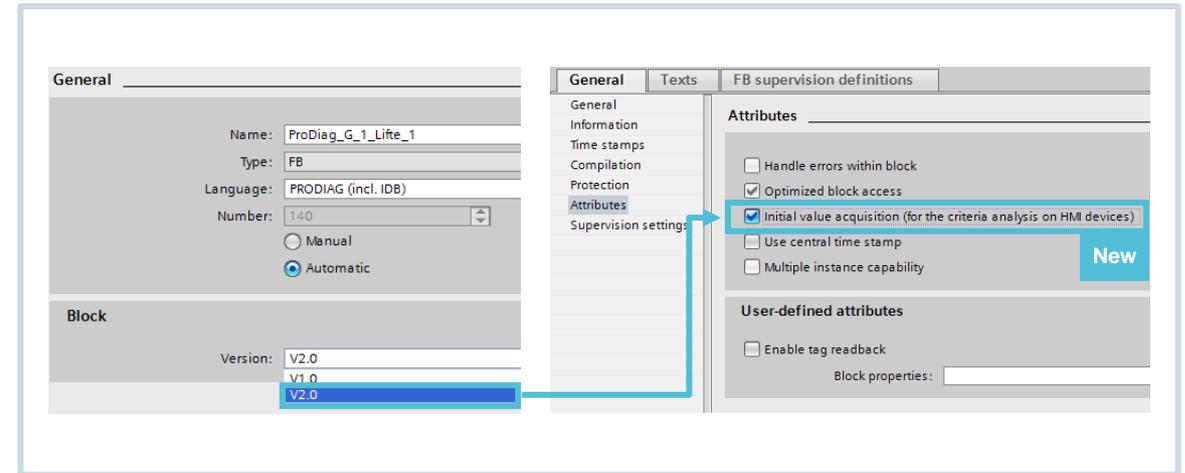
**Elaborate alarm statistics  
for machine diagnostics**



# TIA Portal Options – ProDiag – Criteria analysis for HMI PLC Code Viewer

## Function

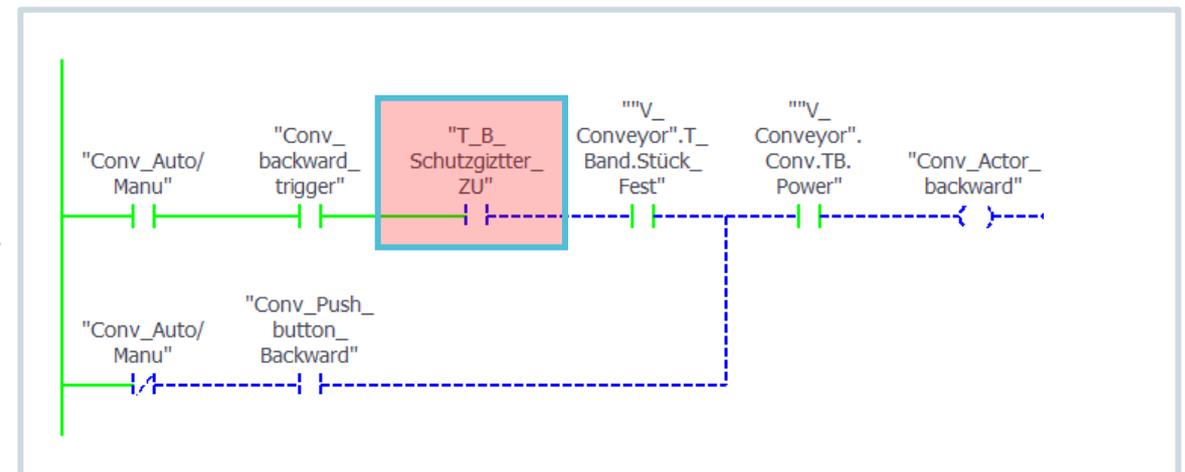
- The initial value identified in a cycle are marked in the PLC Code Viewer for ProDiag supervisions
- This function is available for S7-GRAPH since V14 SP1



## Customer benefits

Recurring errors can be localized more easily since the causative error sources are marked

**Fast visual recognition  
of causative error sources**



# TIA Portal Options – ProDiag – Identical timestamp for all events identified within a CPU cycle

## Function

- A tag can be defined in the global supervision settings for recording a time-stamp (at the start of a CPU cycle)
- This is used if necessary by all ProDiag supervision function blocks (property of ProDiag FBs)

## Customer benefits

- The user can fully trace back which events were identified within a CPU cycle
- Helpful for resolving the cause of error in comprehensive fault analysis

**Timestamping of alarms  
to the precise second!**

The screenshot illustrates the configuration of ProDiag supervision in TIA Portal. On the left, a tree view shows the 'Central time stamp' option selected under 'Types of supervision'. Below this, a function block diagram for 'RD\_SYS\_T' is shown, with an output 'OUT' labeled 'CentralTimeS tamp' highlighted in a blue box. On the right, the 'FB supervision definitions' dialog is open, showing the 'Attributes' tab. The 'Use central time stamp' checkbox is checked and highlighted in a blue box. A blue arrow points from the 'Central time stamp' option in the tree view to the 'Time stamp tag' field in the dialog, which contains the text 'CentralTimeStamp'. Another blue arrow points from the 'CentralTimeS tamp' output in the diagram to the 'Use central time stamp' checkbox in the dialog.



# TIA Portal Options – ProDiag – Enhancement of HMI S7-GRAPH Overview Control

## Function

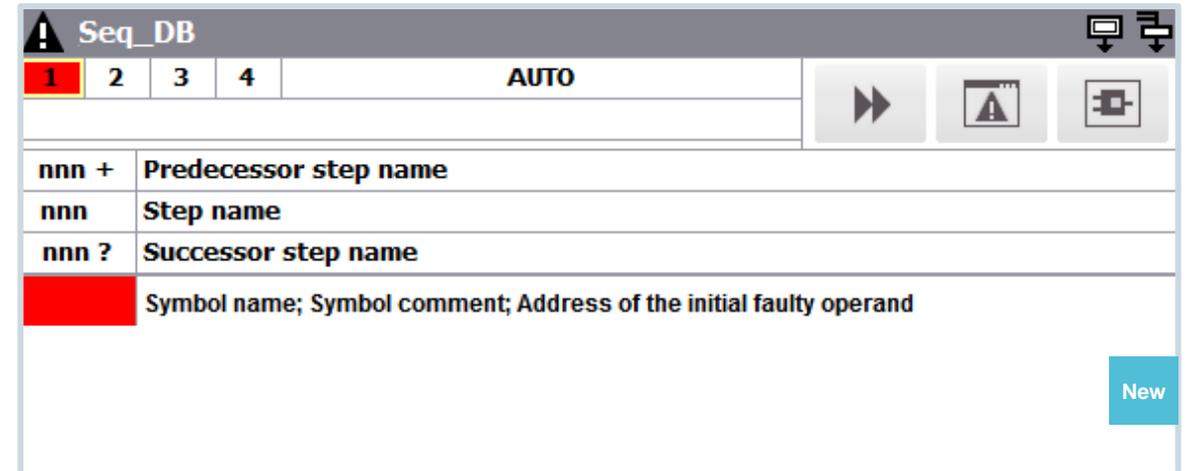
Display of additional information for quickly resolving errors in a faulty step sequence

- Predecessor/successor step
- Several parallel steps are connected upstream (+)
- Several parallel steps are connected downstream (?)
- Display of interlock /Supervision error 
- Output of initial value

## Customer benefits

- The operator or maintenance engineer receives all necessary information at a glance
- Access to the PLC Code Viewer is only necessary to obtain additional criteria for the step enabling condition of a sequence (more in-depth fault analysis)

**Rapid diagnosis!**



**Time saving, rapid fault localization  
without additional operation measures**

# TIA Portal Options – ProDiag – 1,000 supervisions per ProDiag supervision function block

## Function

Compared with the predecessor version (V 1.0), 1,000 supervisions can now be grouped (V2.0) within a ProDiag supervision function block instead of 250

## Customer benefits

- The customer can organize the grouping of supervisions ever easier in terms of technological aspects
- In case of smaller systems without a technological hierarchy, all supervisions can be grouped in a single ProDiag supervision function block so that no separate assignment is necessary

**Simple!**

Object	Number of objects
ProDiag function blocks	There is a maximum of 100 ProDiag FBs that can be used in a project.
ProDiag supervisions	ProDiag FB V1.0: A ProDiag FB can be assigned a maximum of 250 supervisions. ProDiag FB V2.0: A ProDiag FB can be assigned a maximum of 1000 supervisions.

✘ The ProDiag function block contains more than 250 supervisions.

✘ The ProDiag function block contains more than 1000 supervisions.

**Even simpler ProDiag handling for OEMs**



# TIA Portal Options – ProDiag – Multiple selection for defining supervisions

## Function

- A large number of supervisions can be created in a single operation in the PLC Tag Table and in the Global DB also in the FB interface
- Only Boolean tags are taken into account within the selection. In other words, non-boolean tags do not have to be specifically excluded in the multiple selection

Name	Data type	Address	Retain	Acces...	Writa...	Visibl...	Supervision	Comment
SV_TAG_1	Bool	%I0.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_2	Bool	%I0.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_3	Bool	%I0.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_4	Bool	%I0.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_5	Bool	%I0.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_6	Bool	%I0.5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_7	Bool	%I0.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_8	Bool	%I0.7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_9	Bool	%I1.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_10	Bool	%I1.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_11	Bool	%I1.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_12	Bool	%I1.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_13	Bool	%I1.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_14	Bool	%I1.5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_15	Bool	%I1.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_16	Bool	%I1.7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_17	Bool	%I2.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_18	Bool	%I2.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_19	Bool	%I2.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_20	Bool	%I2.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_21	Bool	%I2.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_22	Bool	%I2.5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_23	Bool	%I2.6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_24	Bool	%I2.7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_25	Bool	%I3.0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_26	Bool	%I3.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_27	Bool	%I3.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_28	Bool	%I3.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SV_TAG_29	Bool	%I3.4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

## Customer benefits

Rapid definition of multiple supervisions

**Increased engineering efficiency!**

**Time saving, avoidance of errors**

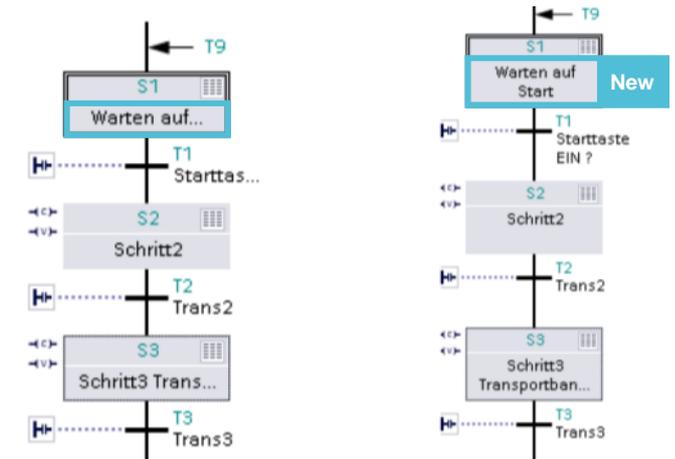


# TIA Portal Options – ProDiag – Collection of useful functional enhancements – HMI Display



## HMI PLC Code Viewer

Two-row presentation of step names and transition names as in the TIA Portal (optional)



## S7-GRAPH: Multilingual names

- Multilingual configuration of step/transition names
- Output of multilingual names in the messages, PLC Code Viewer and S7-Graph Overview Control

General	Texts	FB supervision definitions
Conv_Seq [FB100]		
<input checked="" type="radio"/> German (Germany) <input type="radio"/> French (France) <input type="radio"/> English (United States)		
Ladestation -> Lager 1	station de recharge -> Entrepôt 1	charging station -> Store 1



# TIA Portal Options – ProDiag – Collection of useful functional enhancements – HMI Controls

## Flashing indicator for Overview Controls

Errors can be registered more easily by the operator  
(attention factor)

Text	Color	Show category	Flashing
FQ	255, 0, 255	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F	255, 0, 0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
W	255, 153, 0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
I	0, 255, 255	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C5	192, 192, 192	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C6	192, 192, 192	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C7	169, 169, 169	<input type="checkbox"/>	<input type="checkbox"/>
C8	211, 211, 211	<input type="checkbox"/>	<input type="checkbox"/>

## Criteria analysis display

Display of all faulty operands for an S7-ProDiag-/  
S7-GRAPH alarm (only the first faulty operand  
is listed in the message itself) identified in a cycle

Symbol name	Comment
Conv_Actor_forward	// Transportaion parts to the stocks <sup>1</sup>
Conv_Auto/Manu	// Mode selection: Automatik / Manuel <sup>2</sup>
Conv_forward_trigger	// Graph_trigger: Conv forward
T_B_Schutzgiztter_ZU	Conveyor: Protection grill

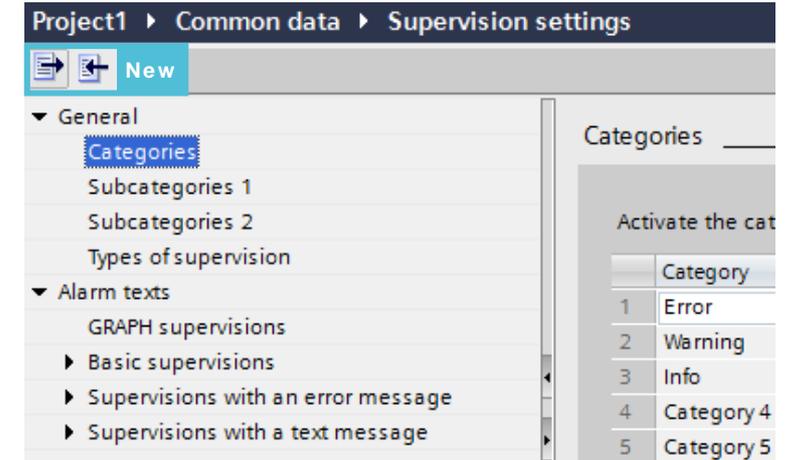
<sup>1</sup> First faulty operand → Content of message text

<sup>2</sup> Other faulty conditions detected in the same CPU cycle

# TIA Portal Options – ProDiag – Collection of useful functional enhancements – Export/import

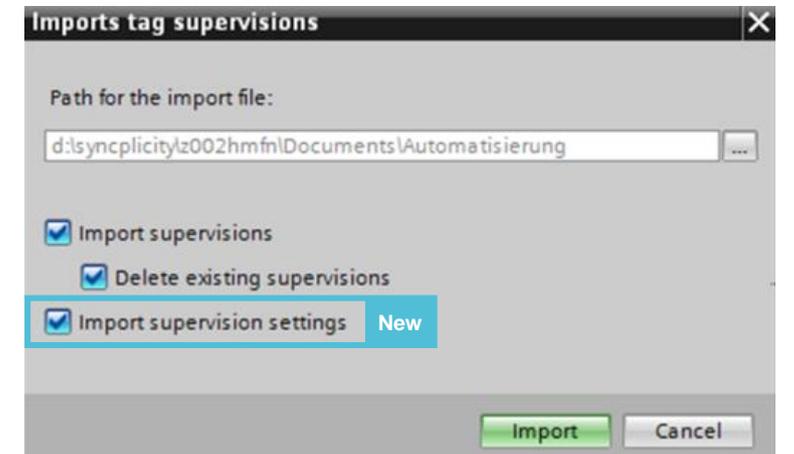
## Export/import of global settings

Project settings can be synchronized easily by exporting/importing global settings



## Export/import of ProDiag-FB settings

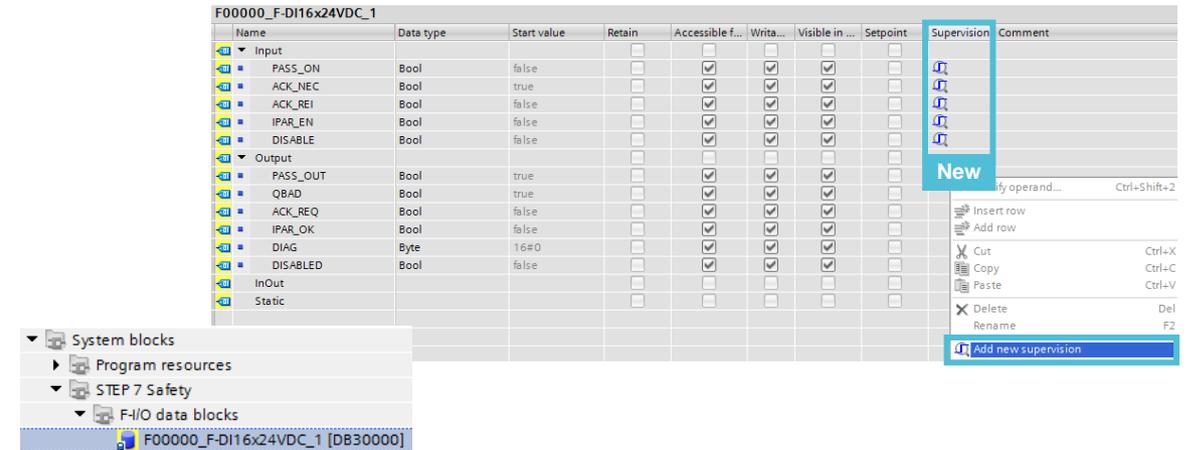
In addition to importing supervisions, the block-specific settings can also be imported (export is executed automatically)



# TIA Portal Options – ProDiag – Collection of useful functional enhancements – Failsafe

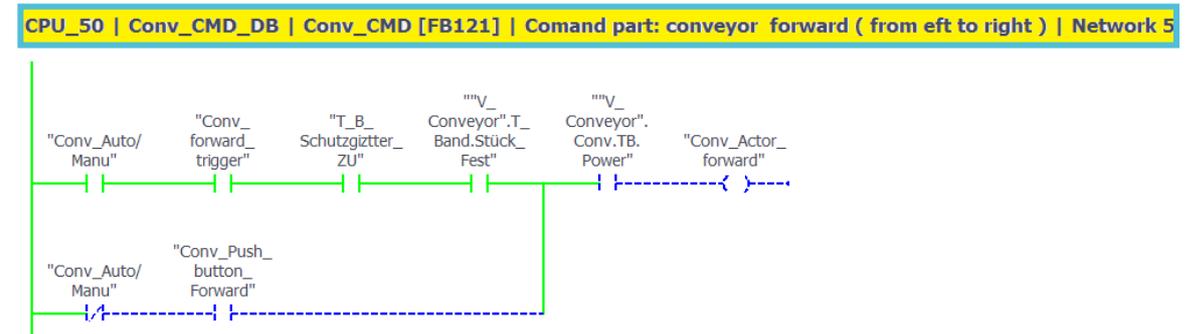
## Supervision of failsafe F-IO-FBs integrated in the system

→ Efficient engineering for supervision of F-signals



## HMI PLC Code Viewer: Representation of F-blocks

- F-blocks can be displayed in the PLC Code Viewer. The blocks are presented in the same way as for standard blocks
- The user can establish instantly from the yellow-colored header whether s/he is analyzing an F-block



# TIA Portal Options – ProDiag – Collection of useful functional enhancements – Engineering



## ProDiag: Global Search

→ ProDiag is now also taken into account in the Global Search

Search for: L1\_0\_Conv\_switch\_righ1

Search in: 01\_Grosse\_Demo\_Anlage\_10830\_14826\_SV\_V15

Find exact match

Start search

Result: Matches found in 3 objects

Limit search to:	Search result	Path
<input type="checkbox"/> Properties	8_YY_ProDiag	01_Grosse_Demo_Anlage_10830_14826_SV_V15[CPU_50 [CPU 1517F-...
<input type="checkbox"/> Name	L1_0_Conv_switch_righ1	...L1_0_Conv_switch_righ1Name
<input type="checkbox"/> Author	ProDiag_G_1_Lifte	01_Grosse_Demo_Anlage_10830_14826_SV_V15[CPU_50 [CPU 1517F-...
<input type="checkbox"/> Comment	L1_0_Conv_switch_righ1	...SupervisionsGlobal Tag Supervision #12Supervised operand
<input type="checkbox"/> Program blocks	ProDiag_G_1_Lifte_DB.L...	...SupervisionsGlobal Tag Supervision #12Error flag
<input type="checkbox"/> Fail-safe blocks	L1_0_Conv_switch_righ1	...SupervisionsGlobal Tag Supervision #11Supervised operand
<input type="checkbox"/> PLC tags	ProDiag_G_1_Lifte_DB.L...	...SupervisionsGlobal Tag Supervision #11Error flag
<input type="checkbox"/> PLC data types	L1_0_Conv_switch_righ1	...SupervisionsGlobal Tag Supervision #10Supervised operand
<input type="checkbox"/> Technology objects	ProDiag_G_1_Lifte_DB.L...	...SupervisionsGlobal Tag Supervision #10Error flag
<input type="checkbox"/> Screens / Screen ...	L1_0_Conv_switch_righ1	...SupervisionsGlobal Tag Supervision #9Supervised operand
<input type="checkbox"/> HMI tags	ProDiag_G_1_Lifte_DB.L...	...SupervisionsGlobal Tag Supervision #9Error flag
<input type="checkbox"/> HMI alarms	ProDiag_G_1_Lifte_DB	01_Grosse_Demo_Anlage_10830_14826_SV_V15[CPU_50 [CPU 1517F-...
	L1_0_Conv_switch_righ1	...InterfaceName

## Multilingual, specific text field

Project4 ▶ PLC.1 [CPU 1516-3 PN/DP] ▶ PLC supervisions & alarms

Tag supervisors | FB supervision definitions | FB supervision instances

Supervised tag	Trigger	ProDiag FB	ID	Type of supervision	Category	Delay time	Condition 1	C1 Trigger	Condition 2	C2 Trigger	Specific text field
tag_1	False	Default_SupervisionFB	1	Operand	1: Error	Ta0ms	True	True	True	True	Fullstand: @4%12.3F#
tag_2	False	Default_SupervisionFB	2	Operand	1: Error	Ta0ms	True	True	True	True	Fullstand: @4%12.3F#

Supervision\_ID\_1 (Default\_SupervisionFB)

Supervisions | Texts

German (Germany)	English (United Kingdom)	French (France)	Reference
Fullstand: @4%12.3F#	Charging level: @4%12.3F#	Niveau: @4%12.3F#	SupervisionSpecificTexts



# TIA Portal Options – ProDiag – Collection of functional enhancements – Engineering

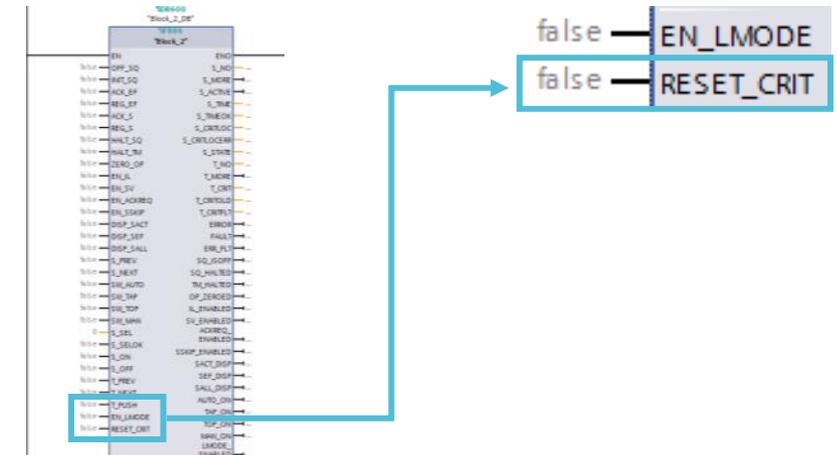
## Identification of supervisions

- If there is more than one supervision for a Boolean tag, this will be identified accordingly
- The customer can determine instantly if s/he has inadvertently defined more than one supervision per tag

	+01R01	Bool	
	S14_Hy_V_153	Bool	 [2]
	S03_LD_V_152	Bool	 [3]

## S7-GRAPH: Resetting of first faulty operand via the new “RESET\_CRIT” input parameter in the Graph Maximum Interface Set

- The customer has the option to manually delete the last initial values recorded. No more old values are therefore displayed in the HMI PLC Code Viewer!



# TIA Portal Options – ProDiag – Collection of functional enhancements – Openness

## Creation of a ProDiag-FB via Openness

→ The customer can use the Openness interface to add or create ProDiag blocks

Program blocks  
Add new block

User can use the PLCBlock composition's create action with the following parameters:

- name
- type
- programming language
- auto number flag
- number (ignore in case of "auto number flag" is true)

Add new block

Name: Block\_1

Language: PRODIAG (incl. IDB)

Number: 4001

Manual  
 Automatic

Fail-safe:  Create F-block

Description: Function blocks are code blocks that store their values permanently in instance data blocks, so that they remain available after the block has been executed.

## Manual assignment of block numbers for ProDiag blocks via Openness

→ The customer can therefore determine number ranges for his/her ProDiag blocks via the Openness interface

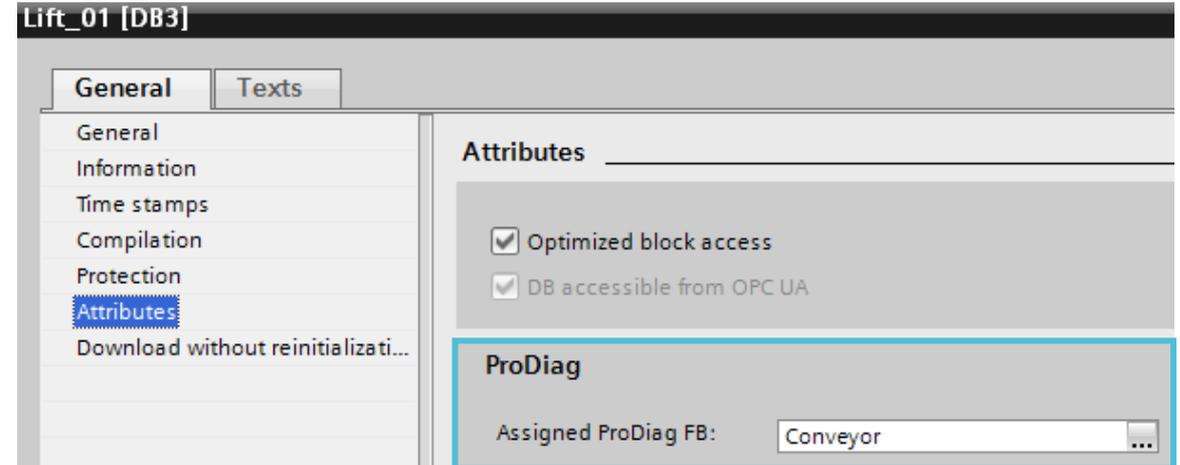
Number: 4001

Manual  
 Automatic

# TIA Portal Options – ProDiag – Collection of functional enhancements – Openness

## Assignment of user blocks to a ProDiag supervision block

- The assignment of supervisions of a user FB to ProDiag supervision blocks was possible up to now directly in the TIA Portal or externally via export/import from Excel files (\*.xlsx)
- From Version 15, it is now possible to also execute this assignment via the Openness interface



```
PlcBlockGroup blockFolder = YourUtilities.GetFolder();  
PlcSoftware instanceDB = blockFolder.Blocks.Find("Lift_01");  
PlcSoftware plcProdiag = blockFolder.Blocks.Find("Conveyor");  
instanceDB.SetAttribute("AssignedProDiagFB", plcProdiag.name);
```

# TIA Portal – Highlights of TIA Portal V15

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  - CPU 1518(F)-4 PN/DP MFP
  - CPU 1516T(F)
- Automatic hardware detection of PROFINET IO devices



## Startdrive – Innovations

- Support for SINAMICS G130, G150, S150, MV and extensions for S120
- Access of drive parameters via Openness
- Startdrive Advanced:
  - Safety acceptance test for G120



## STEP 7 – Innovations

- Breakpoints for CPU S7-1500
- Motion control – kinematics for handling tasks
- Language innovations: References
- Extended functions in PLC tag tables
- Local project text handling
- Mathematical functions for trace



## System Functions

- Local administration of users/user groups
- Integration of HW documentation in the Help Viewer
- Extended access to TIA Portal Openness (SCL in XML, PLC download)



## WinCC – Innovations

- New SIMATIC HMI PRO device family
- New approach for supported devices
- Scalable vector graphic (SVG support)
- WinCC RT Professional → Communication
- RFID support for panels



## TIA Portal Options

**STEP 7 Safety:** F-arrays (read access), overflow detection

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**TIA User Management Component:** Project-spanning maintenance of users/user groups



Details



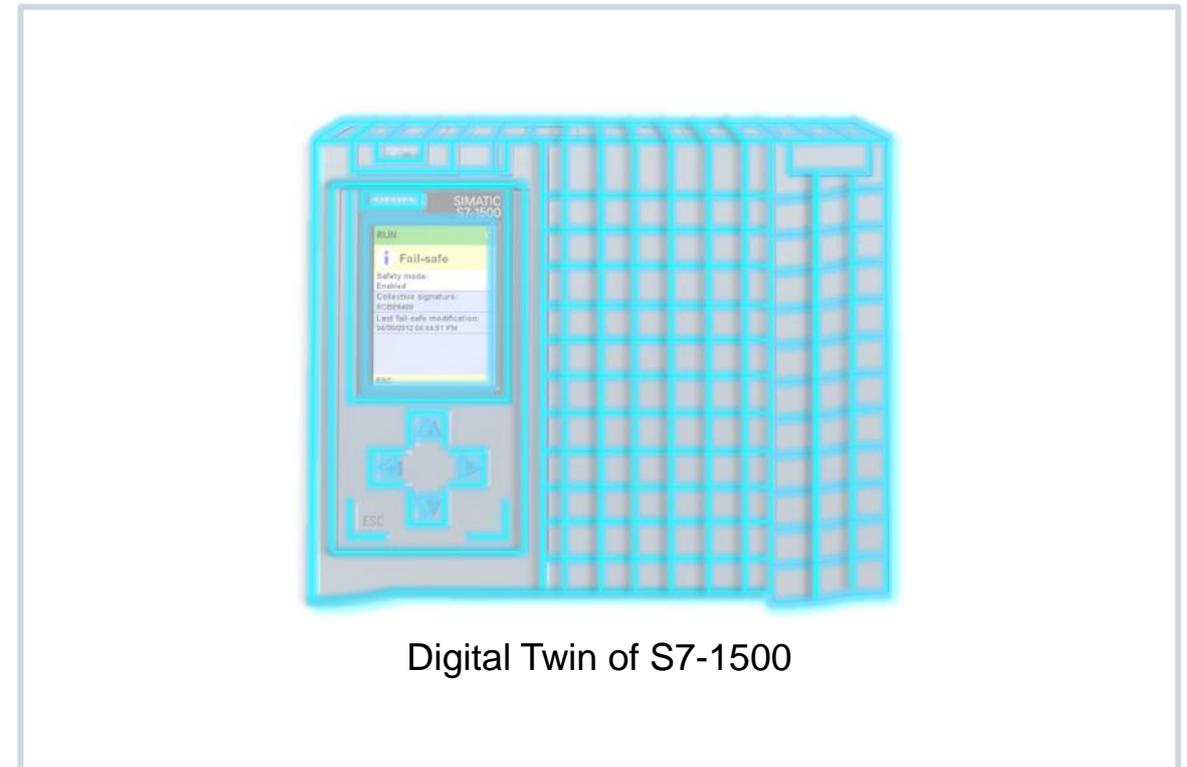
# TIA Portal Options – PLCSIM Advanced V2.0 – Overview of new functions

## Function

- **Synchronization** of PLCSIM Advanced with co-simulation tools on **part process images** of cyclical OBs (e.g. watchdog OBs)
- Support for **acyclical services** (RDREC/WRREC) and alarms (e.g. process alarms)
- Process alarms configured in the TIA Portal can be **output** via the **API**
- **Simple backup and recovery** of software and hardware configuration of PLCSIM Advanced instances
- **Parallel installation** of PLCSIM and PLCSIM Advanced on one PC
- Other useful functional enhancements (see detailed slides)

## Customer benefits

Development of additional customer use cases in a virtual environment



Digital Twin of S7-1500

# TIA Portal Options – PLCSIM Advanced V2.0 – Synchronization of part process images

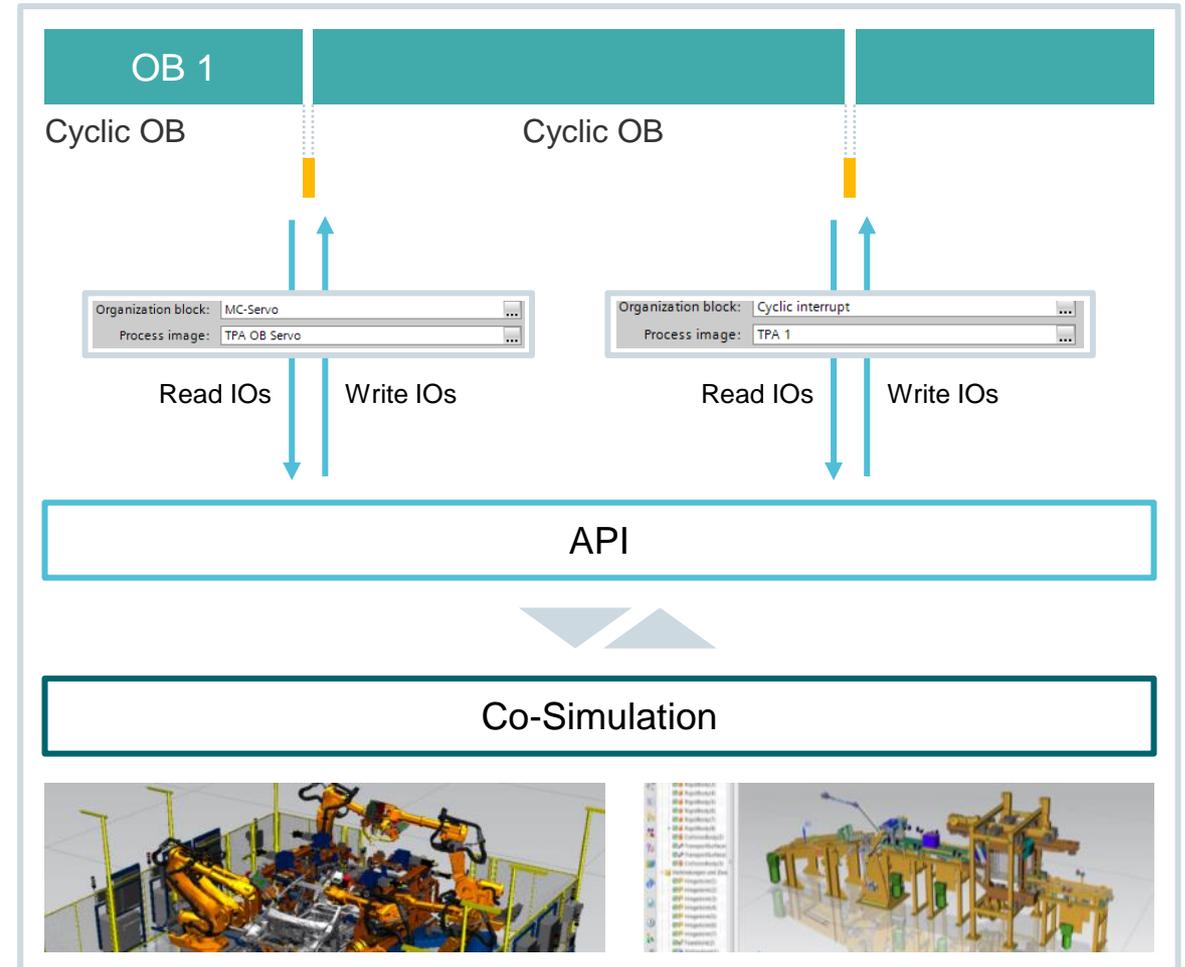
## Synchronization of part process images

Via the PLCSIM Advanced API with co-simulation tools when invoking cyclical OBs

- By assigning a part process image to a cyclical OB (e.g. watchdog OB or MC-servo OB)
- In the user program with SFC26 (UPDAT\_PI) and SFC27 (UPDAT\_PO) or SFC14 (DPRD\_DAT) and SFC15 (DPWR\_DAT) or SFC126 (SYNC\_PI) and SFC127 (SYNC\_PO)

## Customer benefits

Verification of user program including access to a consistent image of **current** process signals when invoking cyclical OBs



# TIA Portal Options – PLCSIM Advanced V2.0 – Support for acyclical services

## Trigger alarms and events with API call

- Process alarms (OB40)
- Status alarms (OB55)
- Update alarms (OB56)
- Profile alarms (OB57)
- Diagnostic alarms (OB82)
- Pull/plug alarms (OB83)

## Customer benefits

Comprehensive test options for spontaneously occurring malfunctions in a machine/system

## Exchange acyclical data

Write and read support for data record via SFB52 (RDREC) SFB53 (WRREC)

## Customer benefits

Option to transfer acyclical data between a co-simulation and the PLCSIM Advanced API (e.g. RFID data)

```
enum EProcessEvent  
{  
    Undefined      = 0,  
    RisingEdge     = 1,  
    FallingEdge    = 2,  
    Limit1Underrun = 3,  
    Limit1Ovverrun = 4,  
    Limit2Underrun = 5,  
    Limit2Ovverrun = 6  
}
```

```
public struct SPlcSimDiagItems  
{  
    public UInt16      ChannelNumber;  
    public UInt16      ErrorType;  
    public UInt16      ExtendedErrorType;  
    public EDiagSeverity Severity;  
    public EDiagProperty Direction  
}
```



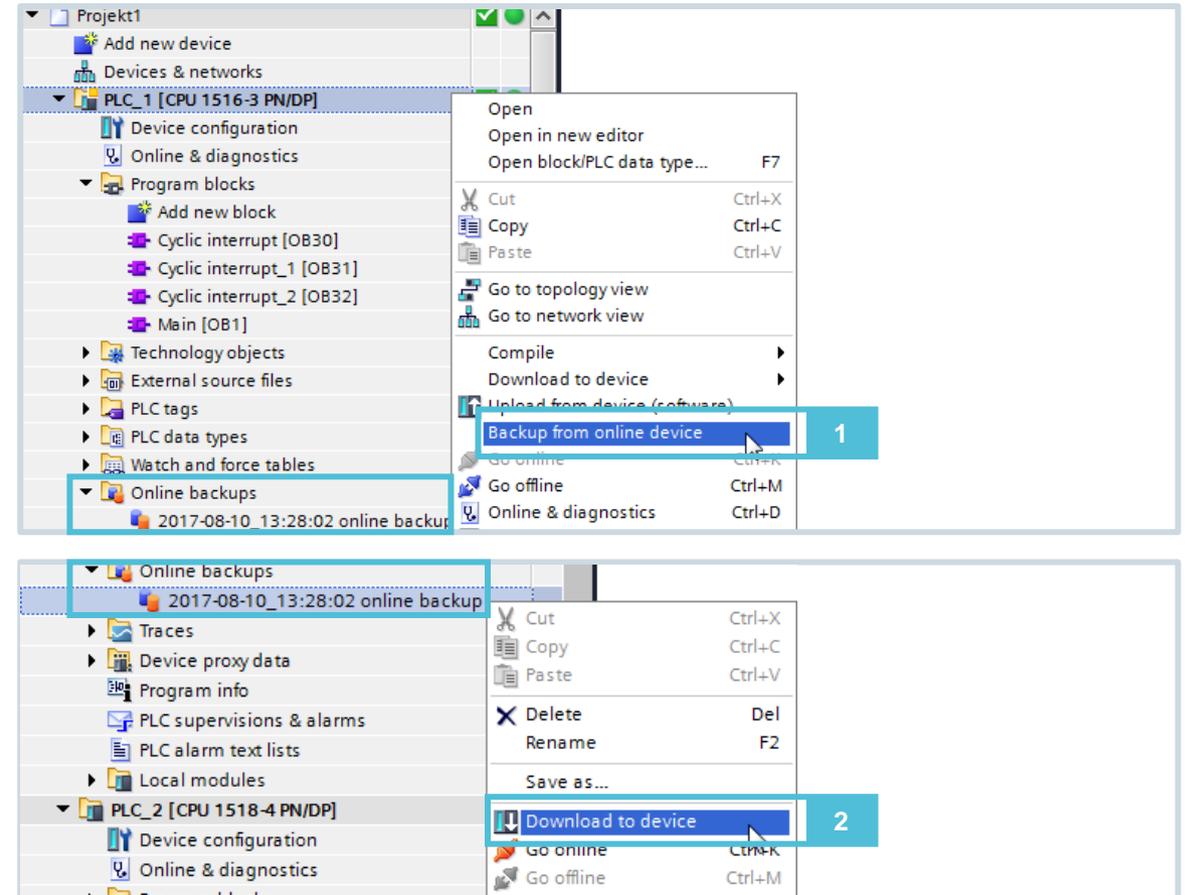
# TIA Portal Options – PLCSIM Advanced V2.0 – Back up software and hardware configuration

## Backup from online device

- Consistent backup of software and hardware configuration of a CPU created in PLCSIM Advanced from the TIA Portal
- Subsequent loading of backed up software and hardware configuration in a CPU created in PLCSIM Advanced

## Customer benefits

Simulations can be interrupted by the backup and continued after the backup is loaded since the backup includes residual up-to-date values



# TIA Portal Options – PLCSIM Advanced V2.0 – Direct CPU operation

## Setting CPUs to Run/Stop status

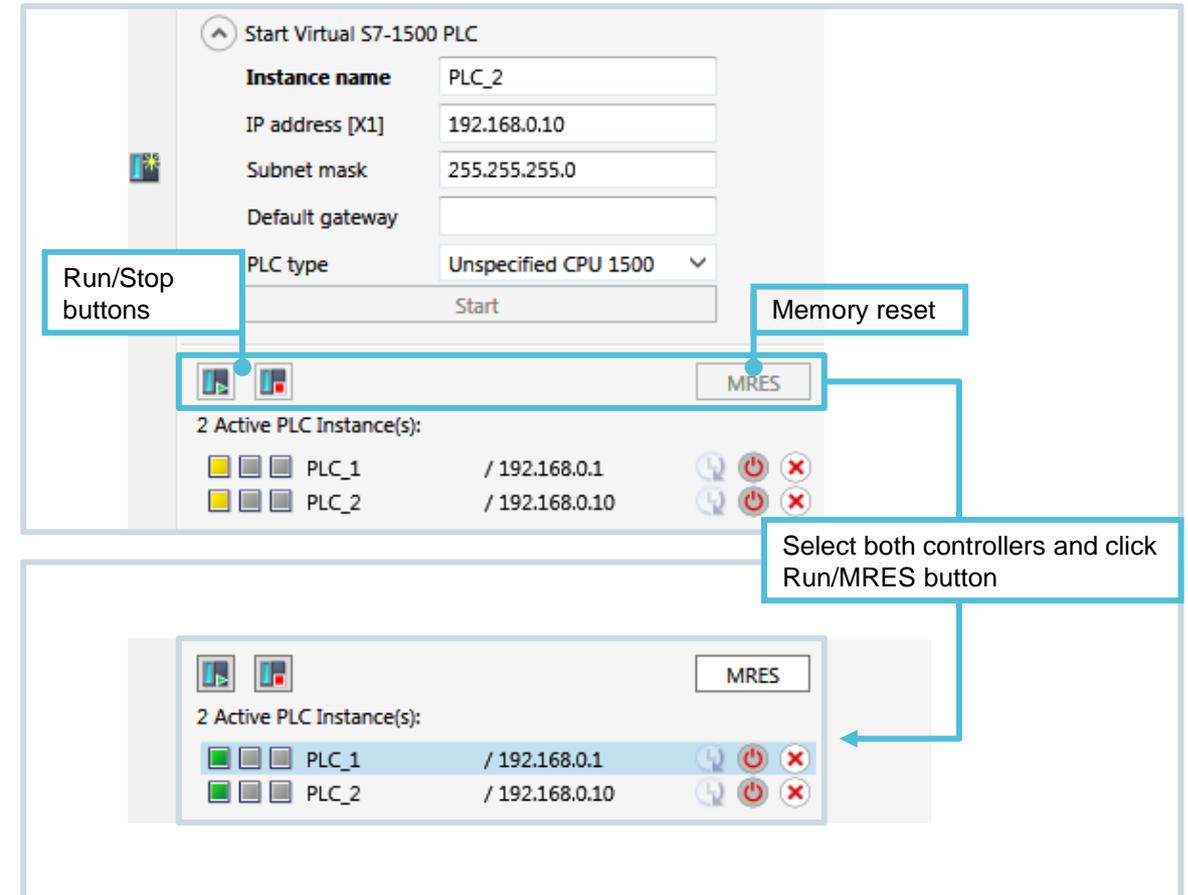
Set one or more CPUs directly to Run or Stop status in PLCSIM Advanced

## Perform memory reset

Perform a memory reset in PLCSIM Advanced directly on one or more CPUs

## Customer benefits

- Fast, intuitive modification of CPU status without having to switch to the TIA Portal to do this
- Simple option to perform a memory reset directly in PLCSIM Advanced so as to set the controller to a familiar initial state



# TIA Portal Options – PLCSIM Advanced V2.0 – Input aids

## Identification of previously created controllers

If a controller was already created in the past, a drop-down menu appears when the name is entered, which offers all previously known controllers for selection (based on available virtual SIMATIC memory cards)

## Customer benefits

Once created, controllers can be located again easily and started without having to fill out the full mask

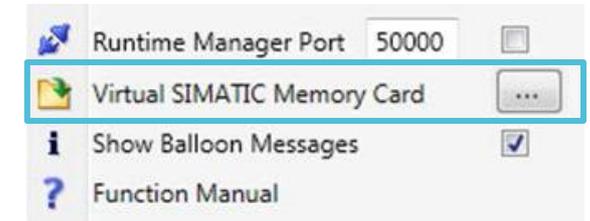
The image displays two screenshots of the 'Start Virtual S7-1500 PLC' configuration window. In the top screenshot, the 'Instance name' field contains 'PLC\_'. A dropdown menu is open, showing 'PLC\_1' and 'PLC\_2' as options. The 'IP address [X1]', 'Subnet mask', and 'Default gateway' fields are grayed out, and the 'Start' button is active. A callout box points to these fields with the text: 'If the controller name is already known, the underlying input fields (IP address, Subnet mask, Default gateway) are grayed out and the Start button is active'. In the bottom screenshot, 'PLC\_1' is selected in the 'Instance name' field. The 'IP address [X1]', 'Subnet mask', and 'Default gateway' fields are now grayed out, and the 'Start' button is highlighted in blue, indicating it is ready to be clicked.



# TIA Portal Options – PLCSIM Advanced V2.0 – Collection of useful functional enhancements

## Virtual SIMATIC memory card – storage path

As soon as a controller is created in PLCSIM Advanced, a virtual SIMATIC memory card is also created. The storage path of this memory card can be chosen freely



## Cross-computer access to the SIMATIC memory card

Cross-computer access to the virtual SIMATIC memory card is enabled via API functions

.Net (C#)	
Syntax	<pre>void ArchiveStorage(     string in_FullFileName );</pre>
Parameter	<ul style="list-style-type: none"><li><code>string in_FullFileName</code>: the full file path to the .zip file. The path is based on the directories of the computer the API is being called.</li></ul>

.Net (C#)	
Syntax	<pre>void RetrieveStorage (     string in_FullFileName );</pre>
Parameter	<ul style="list-style-type: none"><li><code>string in_FullFileName</code>: the full file path to the .zip file. The path is based on the directories of the computer the API is being called.</li></ul>

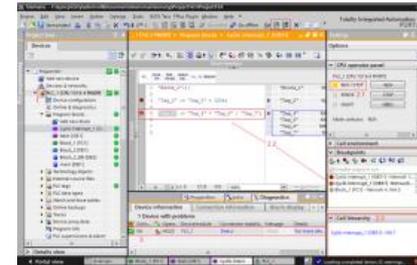


# TIA Portal Options – PLCSIM Advanced V2.0 – Collection of useful functional enhancements



## Firmware

Firmware versions FW2.5, FW2.0  
and FW1.8 are supported

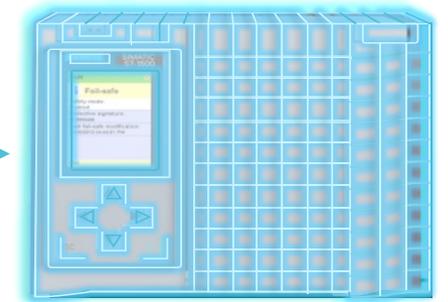


FW 1.8  
FW 2.0

Download

FW 2.1  
FW 2.5

New



PLCSIM Advanced V2.0

## Decoupling from Windows Scheduler

The decoupling from Windows Scheduler provides  
for higher performance and improvements in

- Deterministic behavior and
- Simulation of motion tasks



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Details



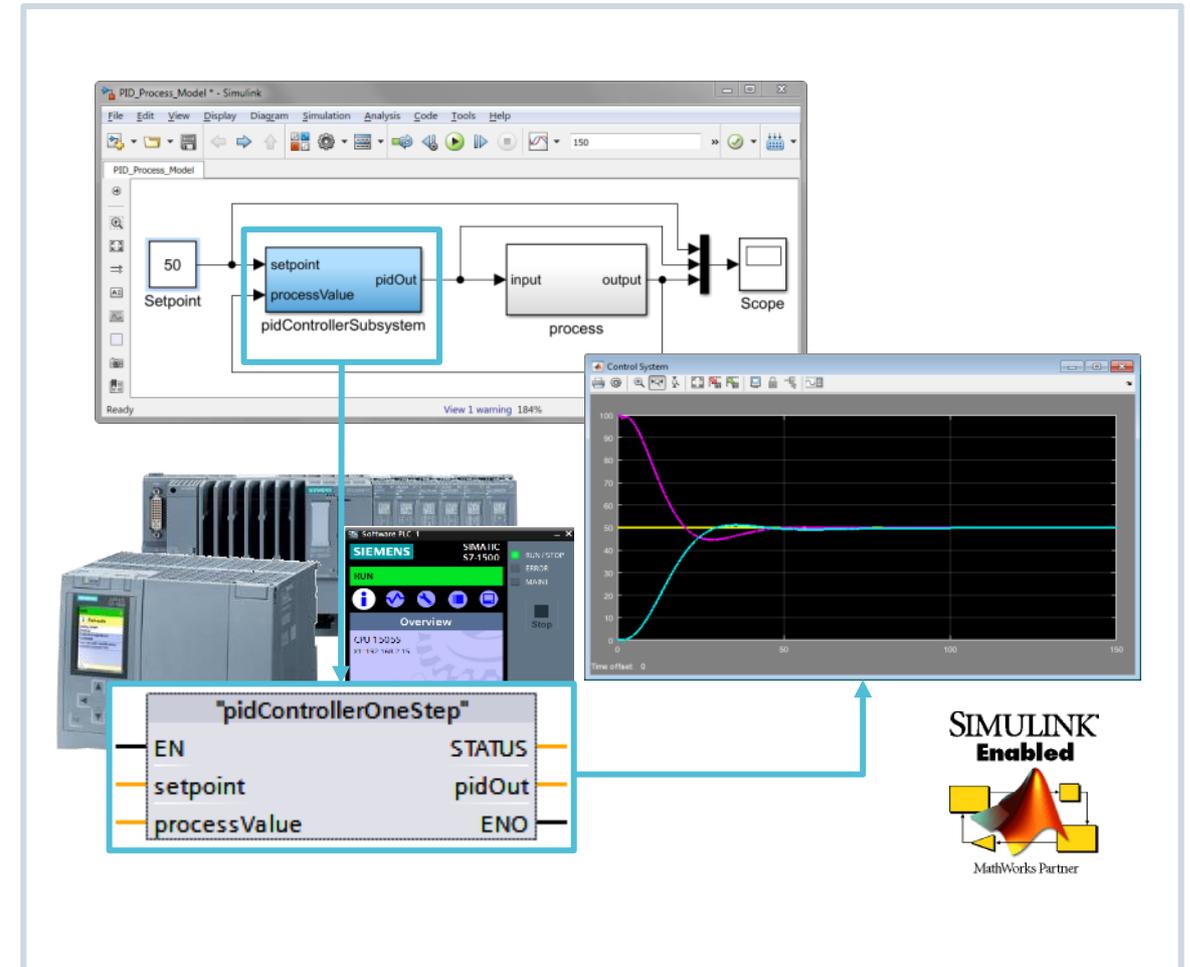
# TIA Portal Options – Target 1500S for Simulink V2.0 – Overview of new functions

## Function

- Automatic import of program blocks to STEP 7 via Openness interface
- Simple access to all model signals from the S7 program
- Execution of model and external mode possible in different OBs
- Other useful functional enhancements (see detailed slides)

## Customer benefits

- Acceleration of workflow by automating manual steps
- Easier verification of the model
- Improved debugging with Simulink



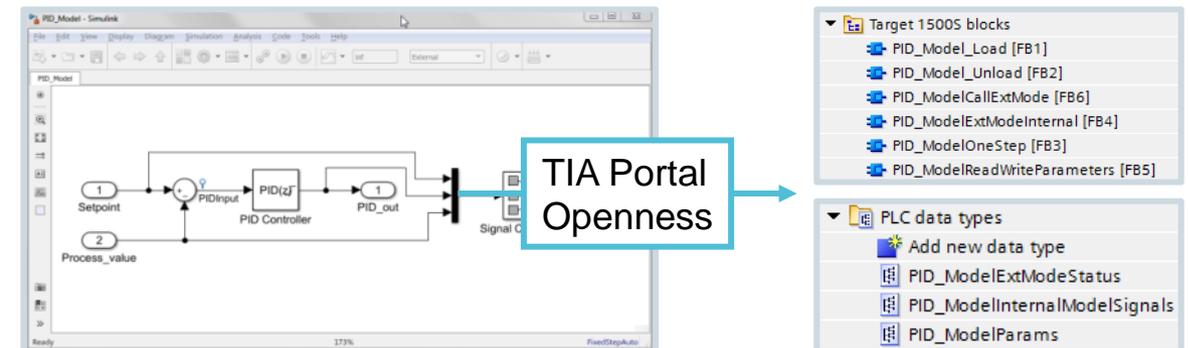
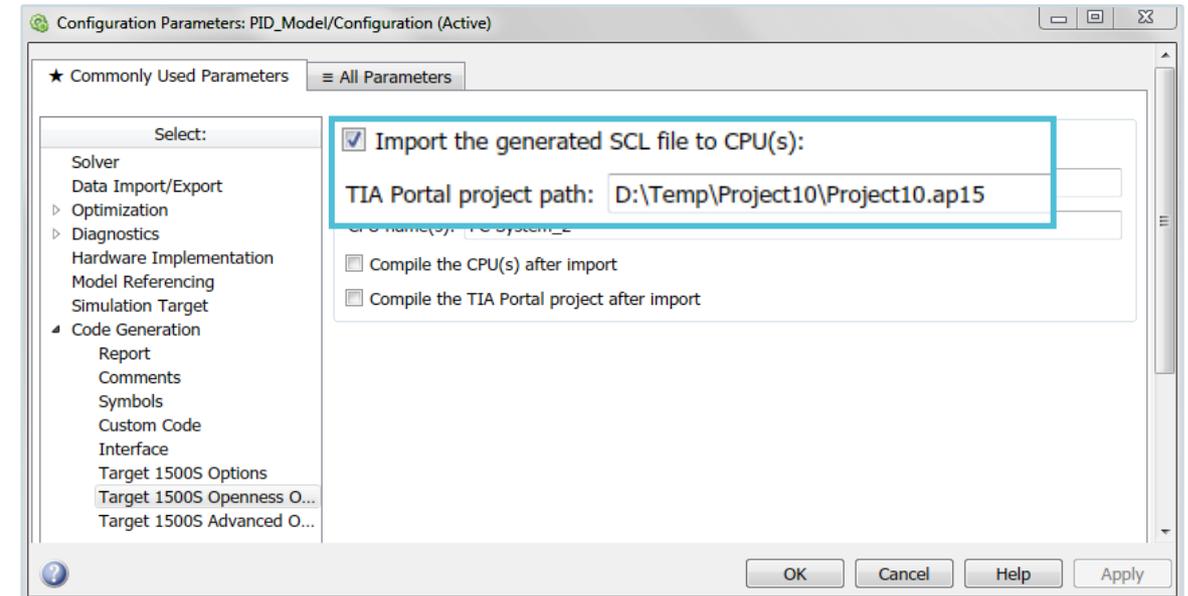
# TIA Portal Options – Target 1500S for Simulink V2.0 – Import via Openness interface

## Function

- Automatic import of program blocks to STEP 7 via Openness interface
- Definition of the project and CPU in the model options
- Model in Simulink and project in TIA Portal can be opened at the same time
- Optional compile following import

## Customer benefits

Acceleration of workflow by automating manual steps



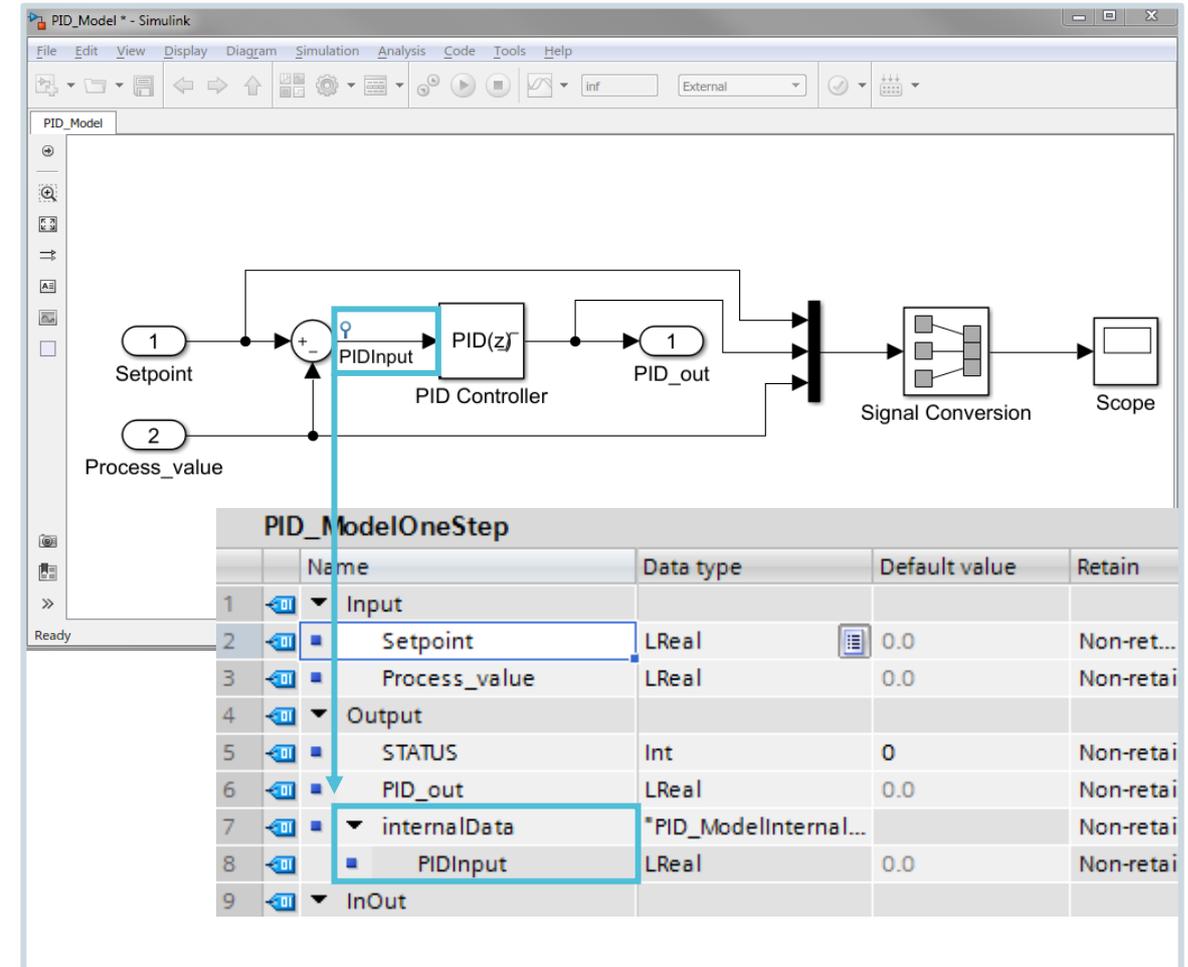
# TIA Portal Options – Target 1500S for Simulink V2.0 – Access to internal signals

## Function

- Simple access to all model signals from the S7 program
- Scalable for
  - All signals with names
  - All signals with names without test points
  - Test points only

## Customer benefits

Verification of user program including access to a consistent image of current process signals when invoking cyclical OBs



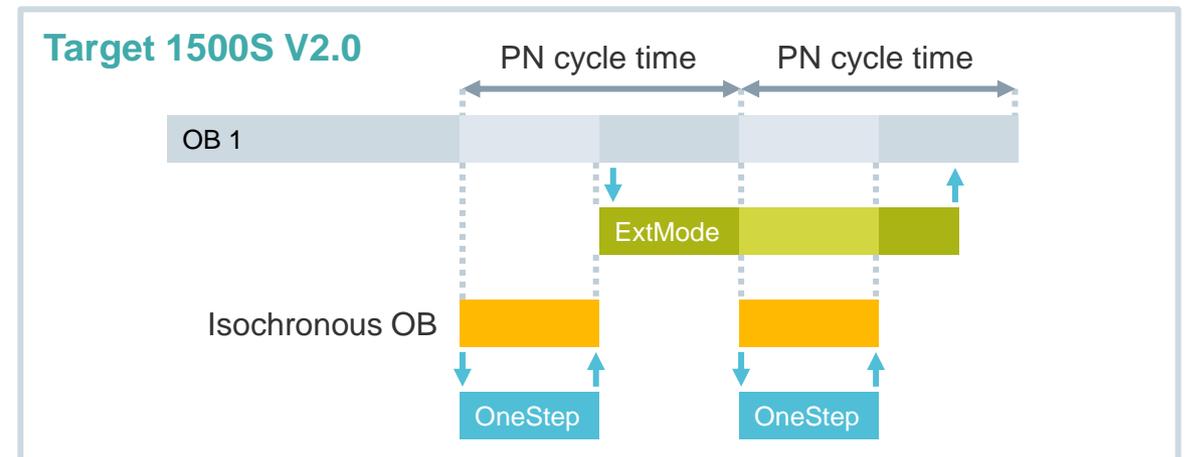
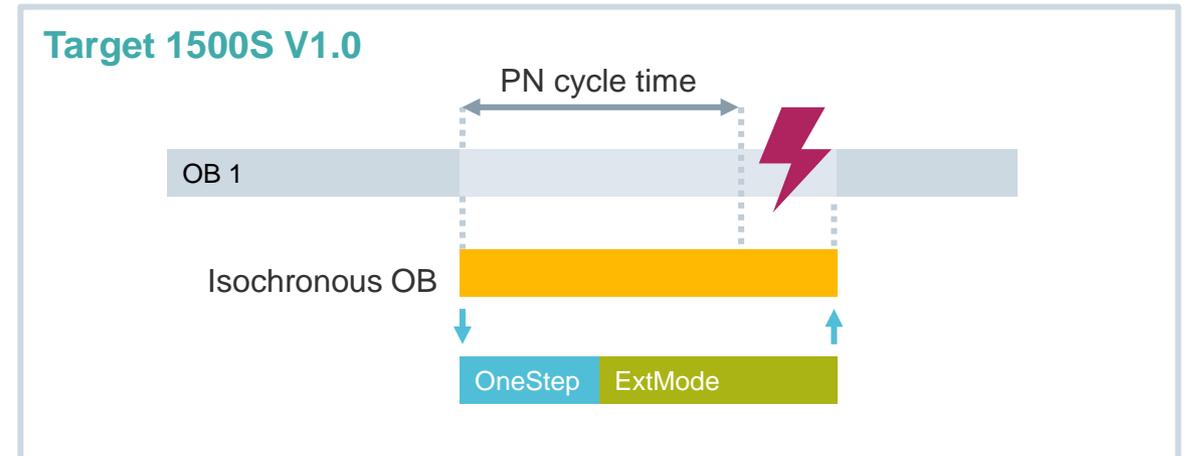
# TIA Portal Options – Target 1500S for Simulink V2.0 – External Mode

## Function

- Execution of model and external mode possible in different OBs
- Assurance of consistent data exchange between the call levels (thread safety)

## Customer benefits

- Reduced impact on cycle time with external mode
- Invocation of model in synchronous OB, handling of external mode in low-priority, cyclical OB
- Use of Target 1500S with external mode also for extremely time-critical applications



# TIA Portal Options – Target 1500S for Simulink V2.0 – Overview of functional enhancements



## Licensing

- Floating license for simple application with several users
- Trial license (21 days) for testing
- Upgrade available for 1.0 users

Status	Family	Product	Version	Number of license ...	License
➔	SIMATIC STEP 7	Target 1500S	2.0	1	SITTS7

Warning: Building model with Target 1500S trial mode:  
21 day(s) left

## Model information in the generated blocks

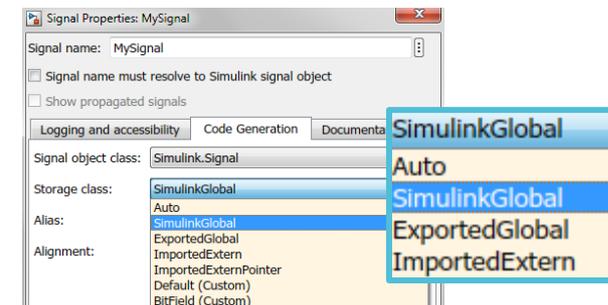
- Versions of MATLAB products used
- Information on model and ODK settings

```
// This is generated by Target 1500S for Simulink
// Model name: Target_Revting_20161212
// Model version: 1.20
// ODK 1500S version: V2.0
// Target 1500S version: V2.0
// MATLAB version: 9.2 (R2017a) 16-Feb-2017
// Simulink version: 8.9 (R2017a) 16-Feb-2017
// MATLAB Coder version: 3.3 (R2017a) 16-Feb-2017
// Simulink Coder version: 8.12 (R2017a) 16-Feb-2017
// **Model details**
// Step Size: 0.2
// Default parameter behaviour: Tunable
// Sensical Mode: On
// Allow OneStep and
// CallExternalFB to be
// called in different ODE
// **ODK 1500S details**
// Step Size: 32x
// Max Block Size: 1024
// Size of thread stack: 32x
// SyncCallParallelCount: 1 (max. number of parallel calls into t
// .....
```

```
// ODK 1500S version: V2.0
// Target 1500S version: V2.0
// MATLAB version: 9.2 (R2017a) 16-Feb-2017
// Simulink version: 8.9 (R2017a) 16-Feb-2017
// MATLAB Coder version: 3.3 (R2017a) 16-Feb-2017
// Simulink Coder version: 8.12 (R2017a) 16-Feb-2017
```

## Support for additional Simulink storage classes

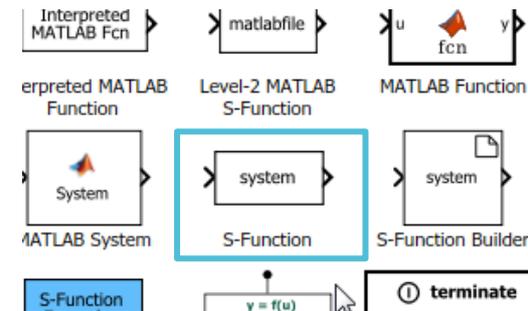
- SimulinkGlobal
- ExportedGlobal
- ImportedExternal



# TIA Portal Options – Target 1500S for Simulink V2.0 – Overview of functional enhancements

## Extended support for S-functions

- Non-inlined S-functions
- Inlined S-functions
- Auto generated S-functions for legacy or custom code



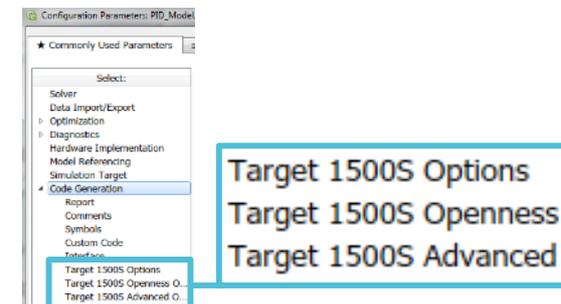
## Definable communication ID (open user communication) for external mode

Improved integration with existing OUC connections



## New arrangement of target options in Simulink

- Splitting into three areas
- Better clarity and retrieval



# TIA Portal – Highlights of TIA Portal V15

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New



New



Details



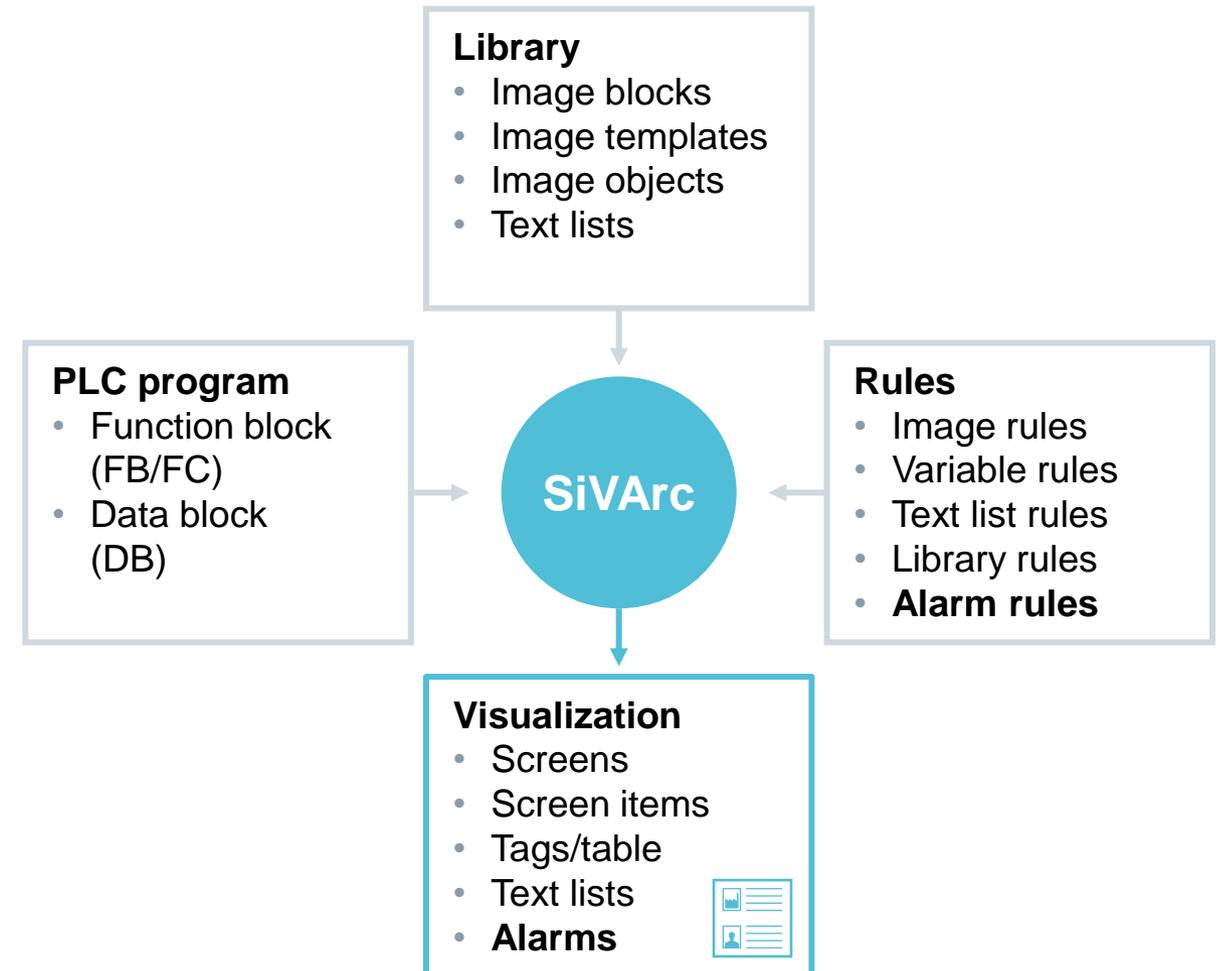
# TIA Portal Options – Visualization Architect – Functional improvements

## SiVArc

Automatic generation of HMI tags, screens, screen items and text lists, based on the existing PLC program

## New in V15

- Generation of **alarms** with an alarm rules editor: Bit and analog alarms, classes and groups
- New image object: **TrendControls** F(t)
- **Template screens** for Panels and RT  
Advanced: Copying from the library and assignment to images



# TIA Portal Options – Visualization Architect – Functional improvements



## New in V15

Creation of **alarms** with the alarms rule editor

- Bit messages
- Analog messages
- Message classes
- Message groups

The screenshot shows the 'Alarms rule editor' interface with several panels:

- Project Explorer:** Shows a tree view with 'Alarm rules' containing 'Program block' and 'Master copy of Alarms/Discrete...'.
- Analog alarms table:**

ID	Name	Alarm test	Alarm class	Trigger tag	Limit	Limit mode
1	Analog_alarm_1		Errors	<to tag>		Higher
- Analog\_alarm\_1 [Analog\_alarm] Properties:**
  - SIVArc properties:**
    - General: Name (Expression for the static value), Alarm class (Alarming), Alarm group, Alarm test (Overheat)
    - Info text, Miscellaneous, Report
    - Trigger: Trigger tag (Block.DB.HMItagPrefab"\_temperatur"), Trigger delay, Limit mode (Higher), Limit value
- Alarm classes table:**

Display name	Name	State machine	Log	E-mail address	Back
!	Errors	Alarm with single-mode...	<to log>		
!	Warnings	Alarm without acknowle...	<to log>		
\$	System	Alarm without acknowle...	<to log>		
57	Diagnosis events	Alarm without acknowle...	<to log>		
A	Acknowledgement	Alarm with single-mode...	<to log>		
NA	No Acknowledgement	Alarm without acknowle...	<to log>		
	Alarm_class_1	Alarm with single-mo...	<to log>		
- Alarm\_class\_1 [Alarm\_class] Properties:**
  - SIVArc properties:**
    - General: Name, Display name, Log

The screenshot shows the 'Discrete alarms' configuration interface:

- Alarm groups table:**

Name	ID
Alarm_group_4	4
Alarm_group_5	5
Alarm_group_6	6
Alarm_group_7	7
Alarm_group_8	8
Alarm_group_9	9
_MC_alarm_group	17
- MC\_alarm\_group [Custom alarm group] Properties:**
  - SIVArc properties:**
    - General: Name (Expression for the static value), Tag expression
- Discrete alarms table:**

ID	Name	Alarm test	Alarm class	Trigger tag	Trigger	Trigger address
1	Discrete_alarm_1		Errors	DUALM	0	0
- Discrete\_alarm\_1 [Discrete\_alarm] Properties:**
  - SIVArc properties:**
    - Acknowledgement: Hmi acknowledgement tag, Hmi acknowledgement bit, Pic acknowledgement tag, Pic acknowledgement bit
    - General: Name (Expression for the static value), Alarm class (Errors), Alarm group, Alarm test (Engine Vault)
    - Info text, Miscellaneous, Report
    - Trigger: Trigger tag (Block.DB.HMItagPrefab"\_status"), Trigger bit (1)

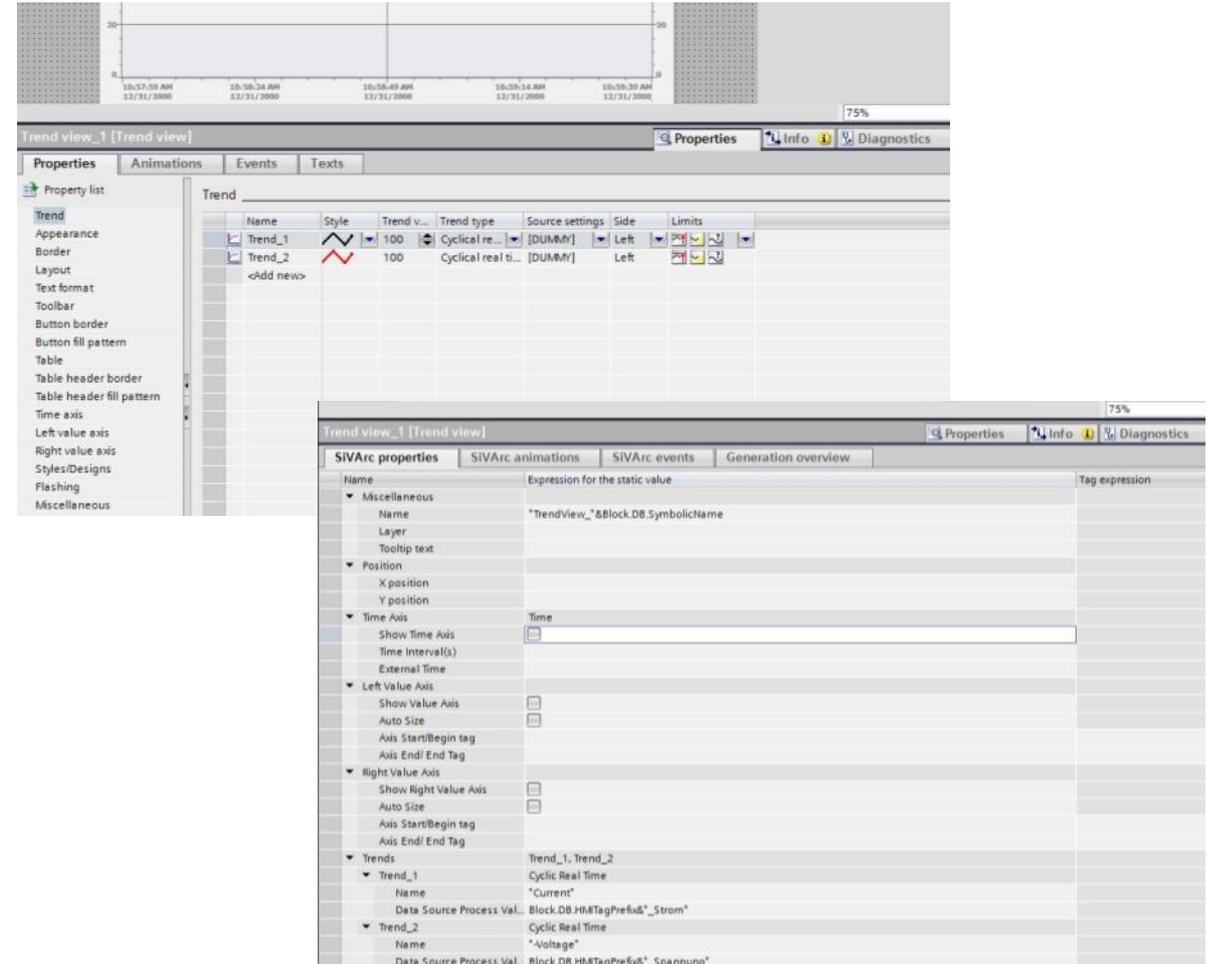


# TIA Portal Options – Visualization Architect – Functional improvements

## New in V15

New image object: **TrendControls F(t)**

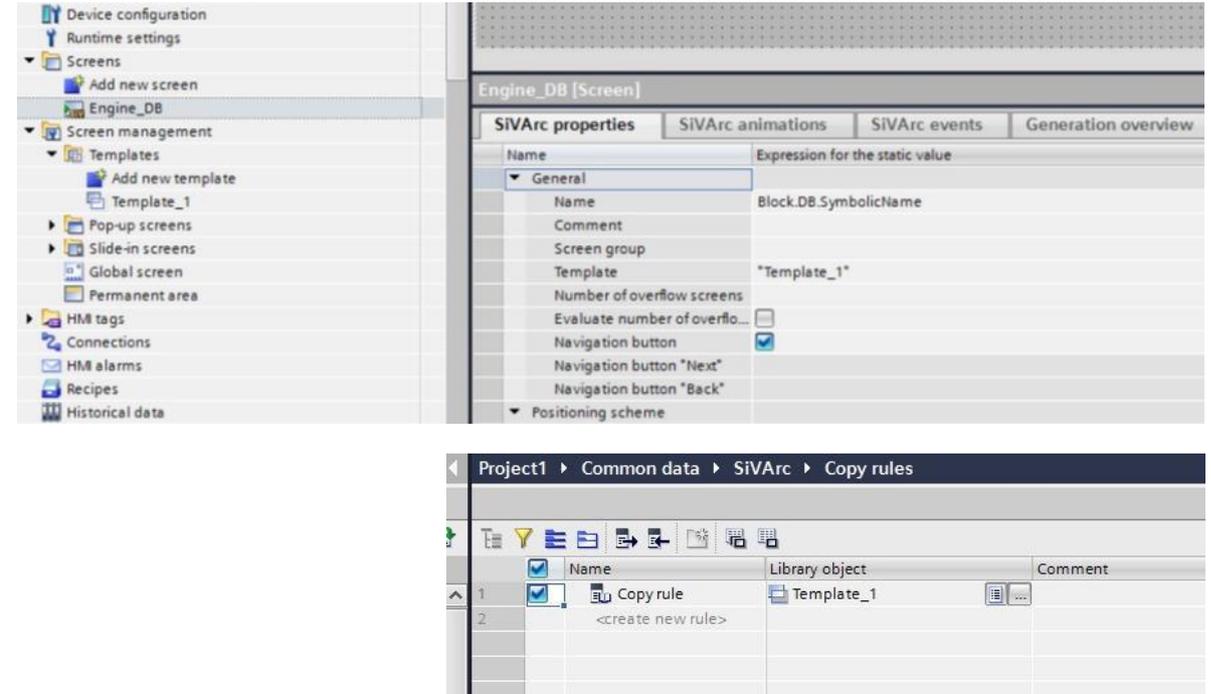
1. Configuration of trend in the normal properties page
2. Subsequent configuration of trend in the SiVArc properties



# TIA Portal Options – Visualization Architect – Functional improvements

## New in V15

**Image templates** for the Panels and RT Advanced: copying from the library and assignment to the images



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New



New



Details



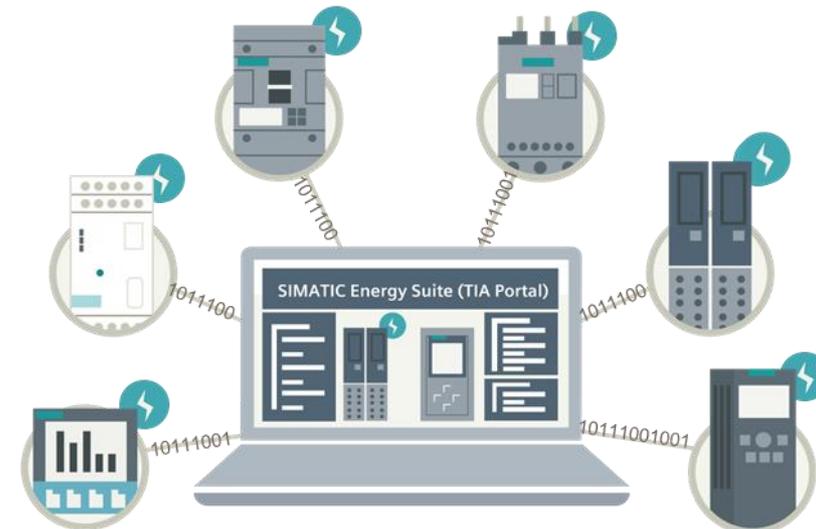
# TIA Portal Options – SIMATIC Energy Suite – Overview of functional enhancements

## Energy Suite

- **Recording of energy data** by PLC
- **Energy monitoring** on HMI and SCADA
- **Simple configuration** directly in the TIA Portal
- **Generated automatically** rather than programmed

## New in V15

- **Energy data not counted as WinCC PowerTags** in WinCC RT Professional
- **S7 Energy Efficiency-Monitor for machines:** New S7 instruction for calculating and assessing the energy efficiency of machines



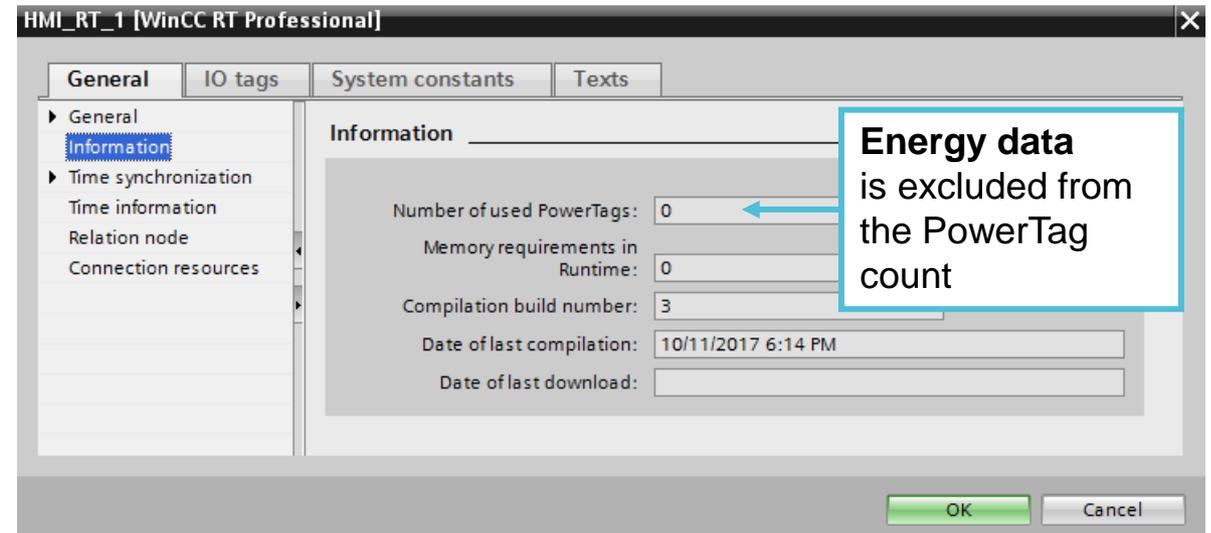
# TIA Portal Options – SIMATIC Energy Suite – New – No counting of PowerTags

## Function

Visualization of energy data in energy objects<sup>1</sup> requires **no additional PowerTags** in WinCC RT Professional

## Customer benefits

- **Cost reduction**  
Number of PowerTags is not increased by energy data
- **Simplified order process**
  - Number of PowerTags required does not have to be calculated in advance
  - New measuring points do not lead to an exceeding of the PowerTag license



## Comparison

	V14	From V15
Number of PowerTags per energy object	Up to 180	0

<sup>1</sup> Each energy object contains instance data blocks whose data is excluded from the license count



# TIA Portal Options – SIMATIC Energy Suite – New – S7 EE-Monitor for machines

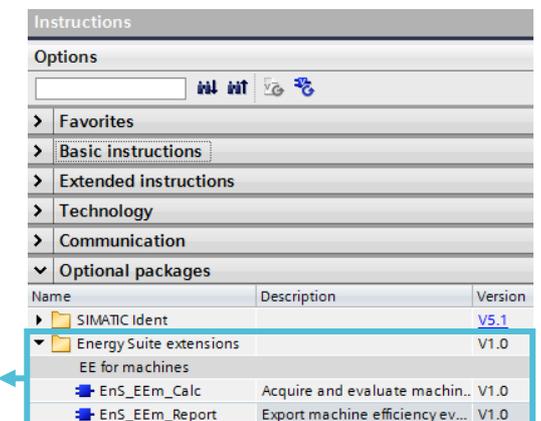
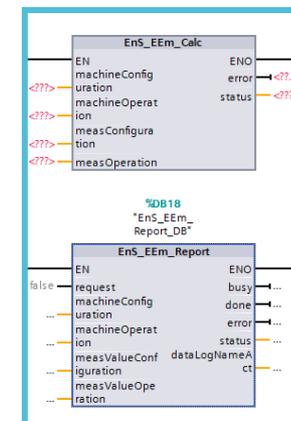
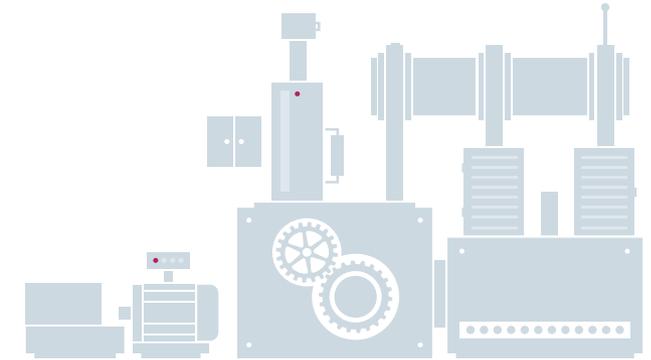


## Function

- **S7 statement** for product-related and standardized<sup>1</sup> calculation of energy consumption in machines
- For integration in machine control (S7-1200/1500) and **on-site visualization of efficiency status**
- **Automatic long-term measurements** (e.g. batch, shift)
- Creates an **efficiency log** (.csv) for detailed evaluation and documentation

## Customer benefits

- **Production-related energy transparency**  
Efficiency status of machine at a glance always
- **Simple integration in existing S7 program**  
As S7 instruction, integral part of STEP 7 (TIA Portal)
- **Cross-vendor**  
According to Measurement Instruction VDMA 34179



<sup>1</sup> According to Measurement Instruction VDMA 34179 (German Engineering Federation for plant and machine builders)



# TIA Portal – Highlights of TIA Portal V15

## Hardware Configuration

- Support for new hardware components
  - CPU 1518(F)-4 PN/DP MFP
  - CPU 1516T(F)
- Automatic hardware detection of PROFINET IO devices



## Startdrive – Innovations

- Support for SINAMICS G130, G150, S150, MV and extensions for S120
- Access of drive parameters via Openness
- Startdrive Advanced:
  - Safety acceptance test for G120



## STEP 7 – Innovations

- Breakpoints for CPU S7-1500
- Motion control – kinematics for handling tasks
- Language innovations: References
- Extended functions in PLC tag tables
- Local project text handling
- Mathematical functions for trace



## System Functions

- Local administration of users/user groups
- Integration of HW documentation in the Help Viewer
- Extended access to TIA Portal Openness (SCL in XML, PLC download)



## WinCC – Innovations

- New SIMATIC HMI PRO device family
- New approach for supported devices
- Scalable vector graphic (SVG support)
- WinCC RT Professional → Communication
- RFID support for panels



## TIA Portal Options

**STEP 7 Safety:** F-arrays (read access), overflow detection

**Multiuser:** Automatic marking, offline working

**OPC UA:** Methods call, companion Spec's

**ProDiag:** Criteria, quantity structures, handling

**PLCSIM Advanced:** Alarms, events, part process images

**Target 1500S for Simulink:** Various extensions

**SiVArc:** Alarms, trend controls, template screens

**Energy Suite:** No PowerTags, S7 EE-Monitor for machines

**TIA User Management Component:** Project-spanning maintenance of users/user groups

New

New

Details

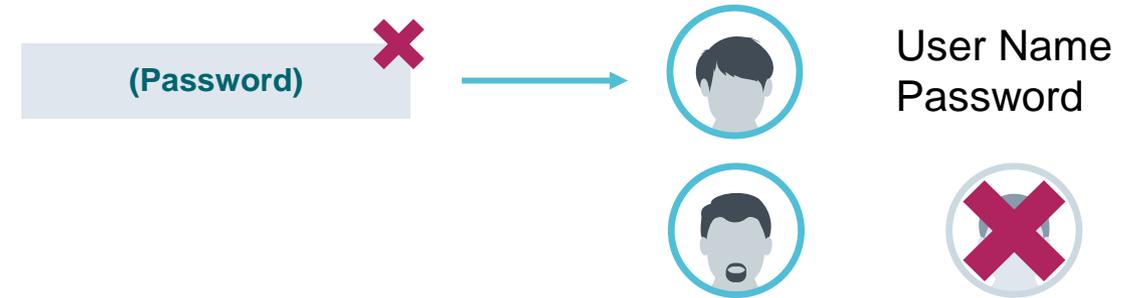


# User Management and Access Control UMAC – What is it aiming for?



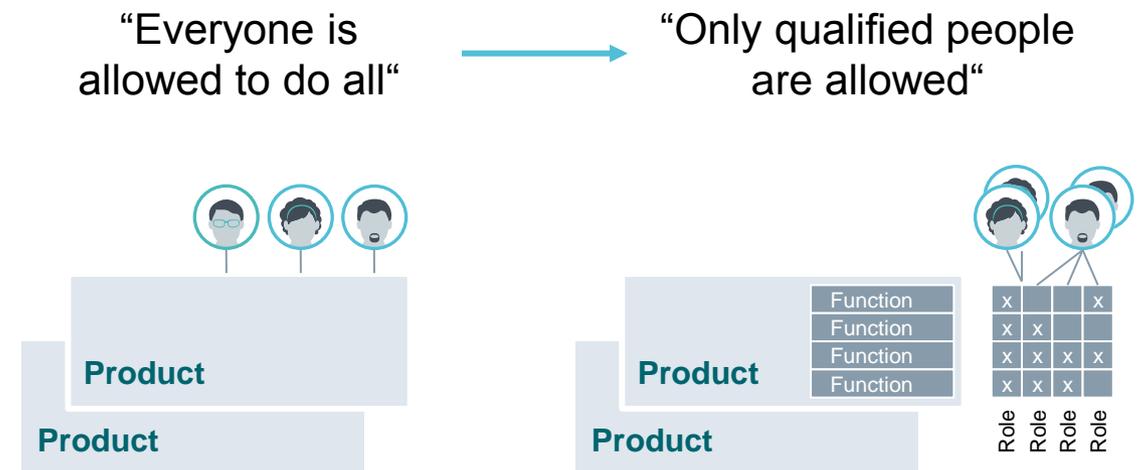
## Security: Protection of industrial machines/plants

- Personalized Access instead of Password Access
- Unauthorized Access is prevented



## Efficiency: Centralized management

- Of Users in a project or even for multiple projects
- Of Roles summarizing Function Rights of products
- Assignment of Users/Groups to Role/s
- Substitutes product-local solutions

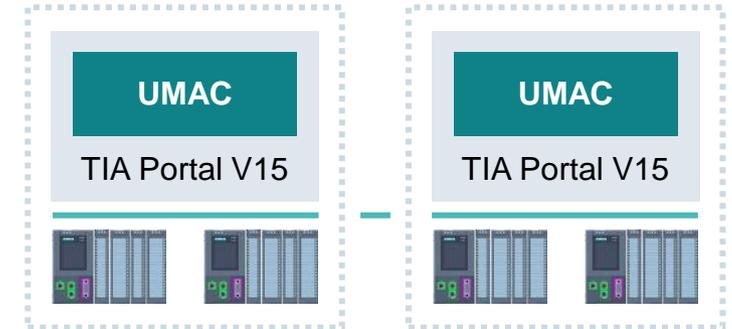


# User Management and Access Control UMAC and Option UMC – Cooperation



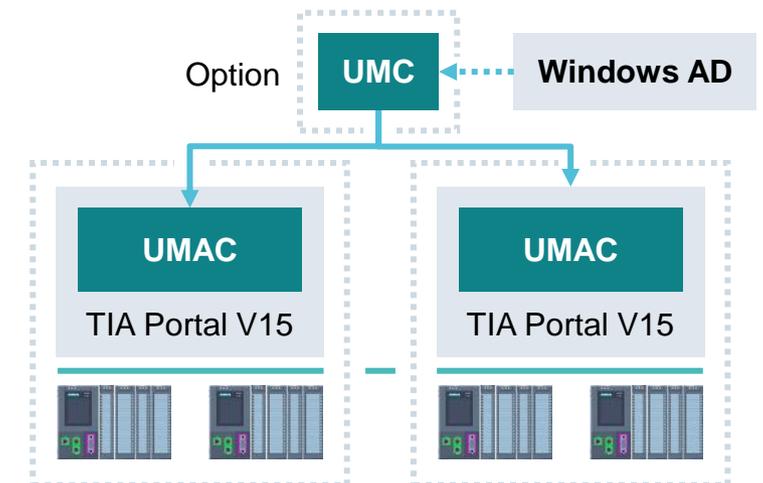
## UMAC: User Management and Access Control

- 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



# User Management and Access Control UMAC – Classification

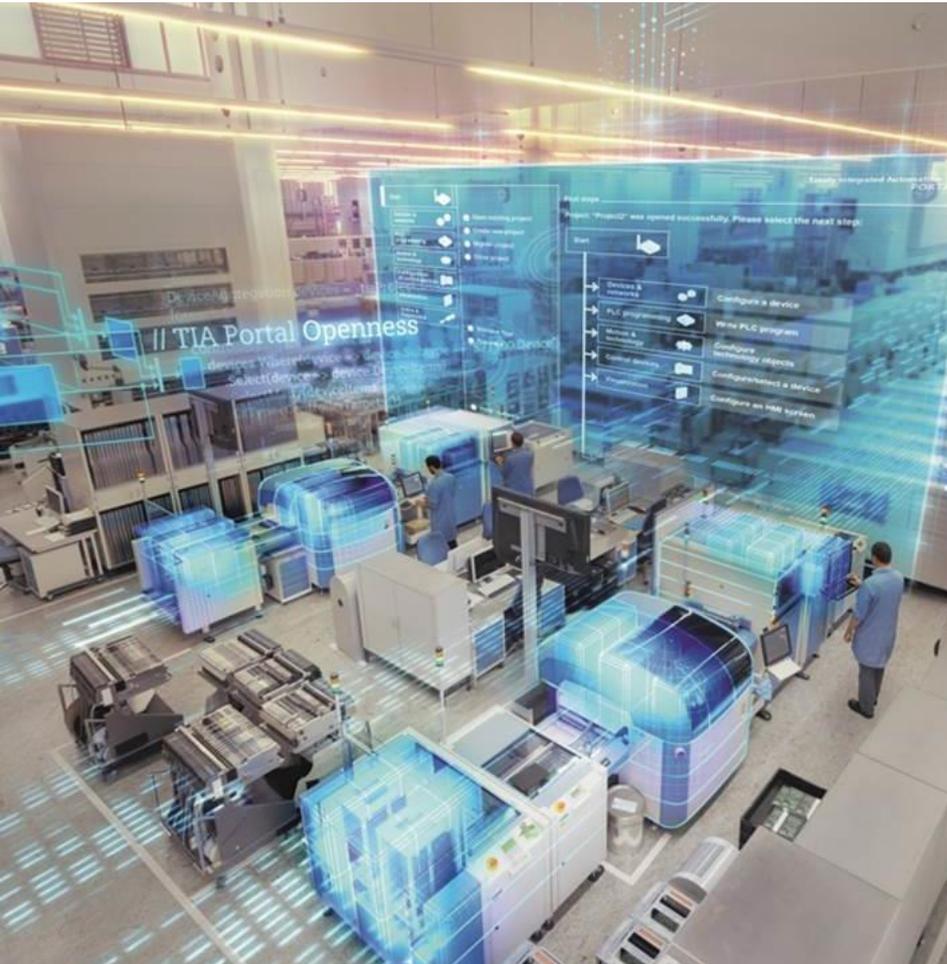
## User Management and Access Control

- Is an additional TIA Portal V15 Security Feature
- Is inherent part of each TIA Portal V15 installation
- Can be used in projects
- Provides personalized access to TIA Projects/Products
- Is an evolutionary extension of the Global Security Setting philosophy, brought in firstly in V12 for network components
- Is a next step in a mid-term development run bringing up more and more access rights from products



# Thank you for your attention!

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*Ingenuity for life*



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