TIA Portal V15.1 – Technical Slides

October 2018

TIA Portal – Highlights of TIA Portal V15.1

SIEMENS
Ingenuity for life

Hardware configuration

- S7-1500R/H redundant systems
- MRP domain management across project boundaries
- Change firmware version for IO devices

Startdrive – Innovations

- Integration of SINAMICS S210 and SIMOTICS 1FK2 motors
- Startdrive Advanced: Safety Acceptance test for S120 and S210 drives
- Openness extensions for G120, S120, S210
- Integration of Drive Control Charts (DCC)

STEP 7 – Innovations

- Software units: Splitting of user program into separately loadable units
- Textual interface for SCL blocks
- Improvements in online monitoring of blocks

System functions

- Trace: Simplified chart configuration
- TIA Portal Openness add-ins (ET 200SP read/write parameters, watch tables, extended functionality for block import)
- User-defined shortcut keys

WinCC – Innovations

- Support of OPC UA Server Alarm and Condition
- ProDiag Control functional add-ins

TIA Portal options

STEP 7 Safety
Flexible F Link, DP_DP_ID, Openness add-ins

Multiuser
commissioning mode

OPC UA
S7-1500 client, SiOME configuration tool

ProDiag
Usability add-ins, such as hierarchical comments

PLCSIM Advanced
Floating window, max. cycle time handling through the API

Target 1500S for Simulink
Model on Web server, transfer of SO files

Teamcenter Gateway
Multiuser engineering, reference projects

SiVArc
Access protection, SCL blocks, template screens, Openness add-ins

Energy Suite
Energy screens, reports, SINAMICS, usability improvements

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Hardware Configuration –
SIMATIC High Availability S7-1500R/H – Product Strategy

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Based on standard S7-1500 CPUs

Basic hardware standard CPUs / fail-safe CPUs

Transparent programming (like Standard)

Standard engineering tools with all programming languages

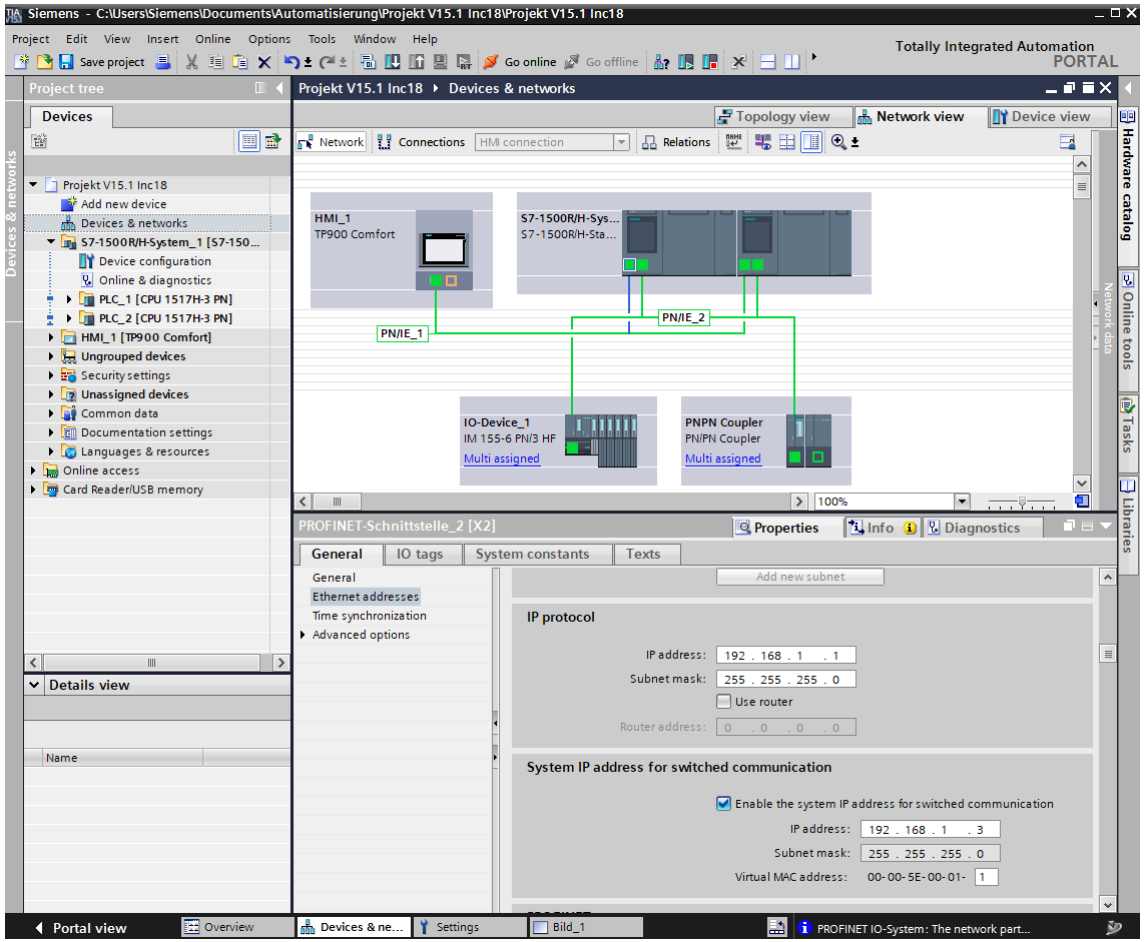
- No deep redundancy know-how required
- Simple porting of Standard → R/H

Extensive scaling

- Scaling the switching time
- Scaling the redundancy architecture
- Scaling the performance from CPU 1513R to 1517H

Focus on Profinet

Based on PROFINET system redundancy



Hardware Configuration – SIMATIC High Availability
S7-1500R/H – System Overview 1st Delivery Phase

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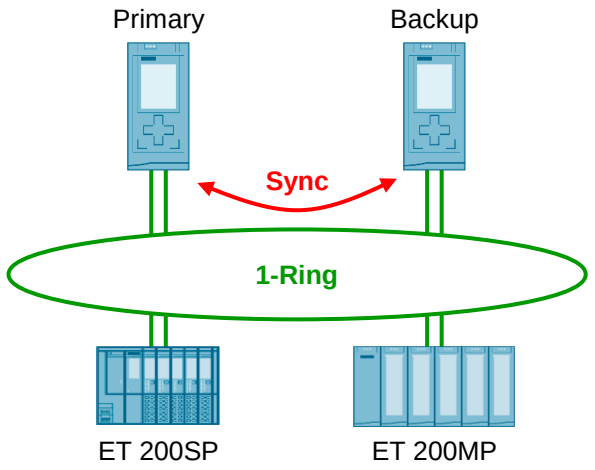
Integrated concept – **Identical** synchroni-zation method

Scaling of the switching performance using the **available bandwidth** of the sync connection

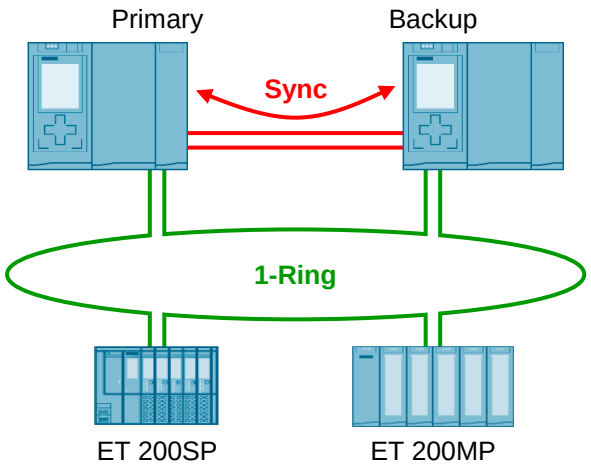
CPU type
Synchronization
Switching time
I/O systems
Type of connection

Redundant – S7-1500R



CPU 1513R/CPU 1515R
via **Profinet Ring (MRP)**
200 – 500 ms
ET 200SP and ET 200MP
Single connection (PN redundancy S2)

High availability – S7-1500H



CPU 1517H
via **Sync Modules**
<100 ms
ET 200SP and ET 200MP
Single connection (PN redundancy S2)

Hardware Configuration – SIMATIC High Availability S7-1500R/H Features

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Feature/Function	Benefits
Full S7-1500/TIA system integration	S7-1500 features (security, diagnostics, test, etc.) can be used
Engineering like Standard in TIA Portal V15.1 • One project • One program • Easy handling	• No special redundancy know-how required • Simple porting of Standard ↔ R/H
Programming and handling like Standard • Redundancy functions are FW system functions • No special redundancy programming rules	
Scaling in terms of switching time, redundancy architecture and CPU performance	System can be precisely adapted to customer requirements
Consistent redundancy concept for 1500R and 1500H	
New communication type (system IP address) for easy communication with non-redundant devices	Standard devices can communicate with R/H systems without add-ons or adaptations

Hardware Configuration – Isochronous Mode with the central backplane

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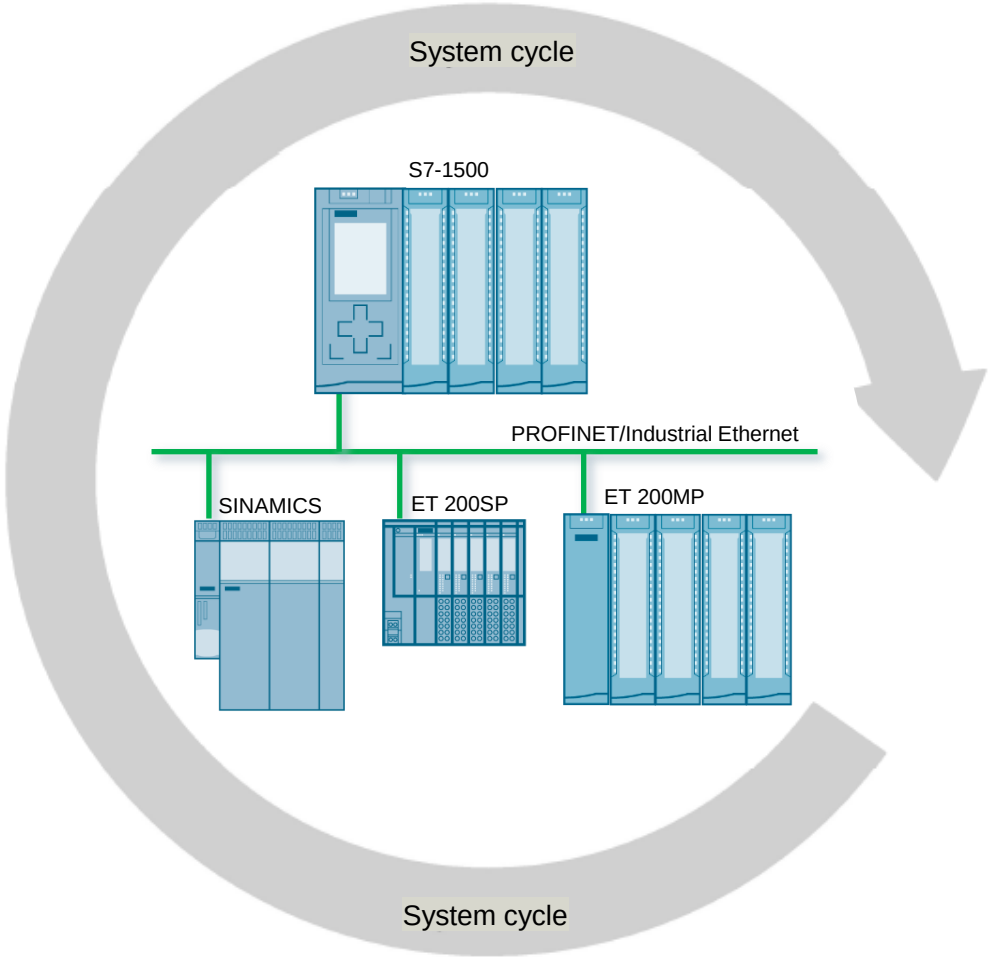
Application Examples

- Dynamic closed-loop control, with the need of a constant dead time
- Measuring Input
- Cam control
- Dosing application
- High speed analogue inputs with oversampling, e.g.:
  - To recognize extremely short peaks for an analogue signal (peaks shorter than PLC cycle)
  - To record analogue signals which need very high sample rates



Benefit of isochronous mode with central backplane

Cost saving, compact implementation of demanding technology tasks in central rack configuration

Hardware Configuration – Isochronous Mode with the central backplane

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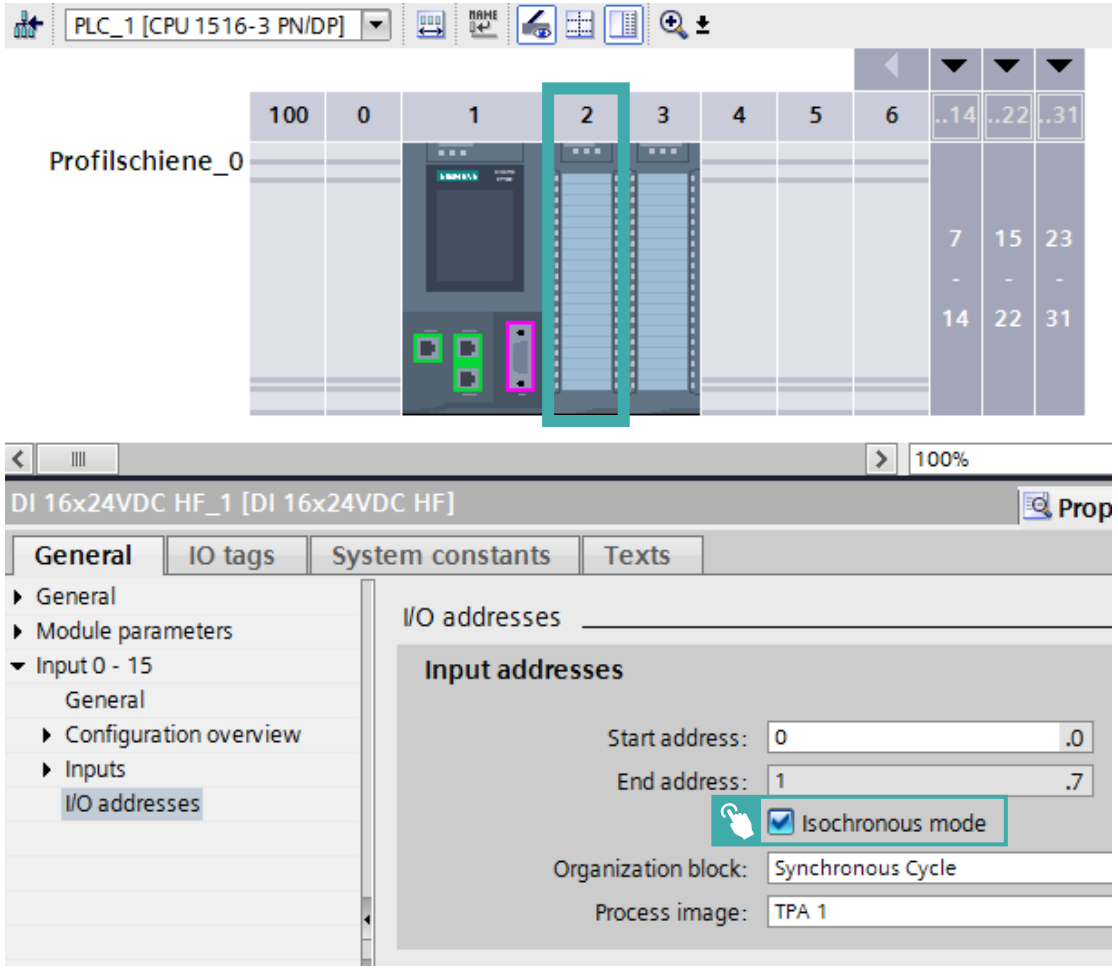
Function

- Operating of isochronous modules directly at the central backplane of the S7-1500 CPU
- Combination of isochronous modules and non-isochronous modules is possible
- Synchronization of central plugged modules with modules which are connected via PROFINET is possible
- All modules which support isochronous mode decentral can be used central, too. (no firmware update needed)



Pre-Conditions

- TIA Portal V15.1, S7-1500 CPUs starting with FW 2.6, not supported CPU types:
  - S7-1500C CPUs (planned) / SIMATIC S7-1500R/H CPUs
  - ET 200SP CPUs (planned), OpenController (planned)
- Minimum isochronous mode for central use: 1 ms
- The use of Ethernet/PROFINET/PROFIBUS modules is only possible **without** periphery
- For updated projects to TIA Portal V15.1 it is necessary to update the module description for using this feature

Hardware Configuration – Isochronous Mode with the central backplane

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Supported CPU types for isochronous mode central

CPU type	Article number
CPU 1511-1 PN	6ES7511-1AK01-0AB0 6ES7511-1AK02-0AB0
CPU 1511F-1 PN	6ES7511-1FK01-0AB0 6ES7511-1FK02-0AB0
CPU 1511T-1 PN	6ES7511-1TK01-0AB0
CPU 1511TF-1 PN	6ES7511-1UK01-0AB0
CPU 1513-1 PN	6ES7513-1AL01-0AB0 6ES7513-1AL02-0AB0
CPU 1513F-1 PN	6ES7513-1FL01-0AB0 6ES7513-1FL02-0AB0
CPU 1515-2 PN	6ES7515-2AM01-0AB0
CPU 1515F-2 PN	6ES7515-2TM01-0AB0
CPU 1515T-2 PN	6ES7515-2UM01-0AB0
CPU 1516-3 PN/DP	6ES7516-3AN01-0AB0
CPU 1516F-3 PN/DP	6ES7516-3FN01-0AB0

CPU type	Article number
CPU 1516T-3 PN/DP	6ES7516-3TN00-0AB0
CPU 1516TF-3 PN/DP	6ES7516-3TN00-0AB0
CPU 1517-3 PN/DP	6ES7517-3AP00-0AB0
CPU 1517F-3 PN/DP	6ES7517-3AP00-0AB0
CPU 1517T-3 PN/DP	6ES7517-3TP00-0AB0
CPU 1517TF-3 PN/DP	6ES7517-3UP00-0AB0
CPU 1518-4 PN/DP	6ES7518-4AP00-0AB0
CPU 1518F-4 PN/DP	6ES7518-4FP00-0AB0
CPU 1518-4 PN/DP ODK	6ES7518-4AP00-3AB0
CPU 1518F-4 PN/DP ODK	6ES7518-4FP00-3AB0
CPU 1518-4 PN/DP MFP	6ES7518-4AX00-1AB0
CPU 1518F-4 PN/DP MFP	6ES7518-4AX00-1AB0

Hardware Configuration – MRP domain management across project boundaries

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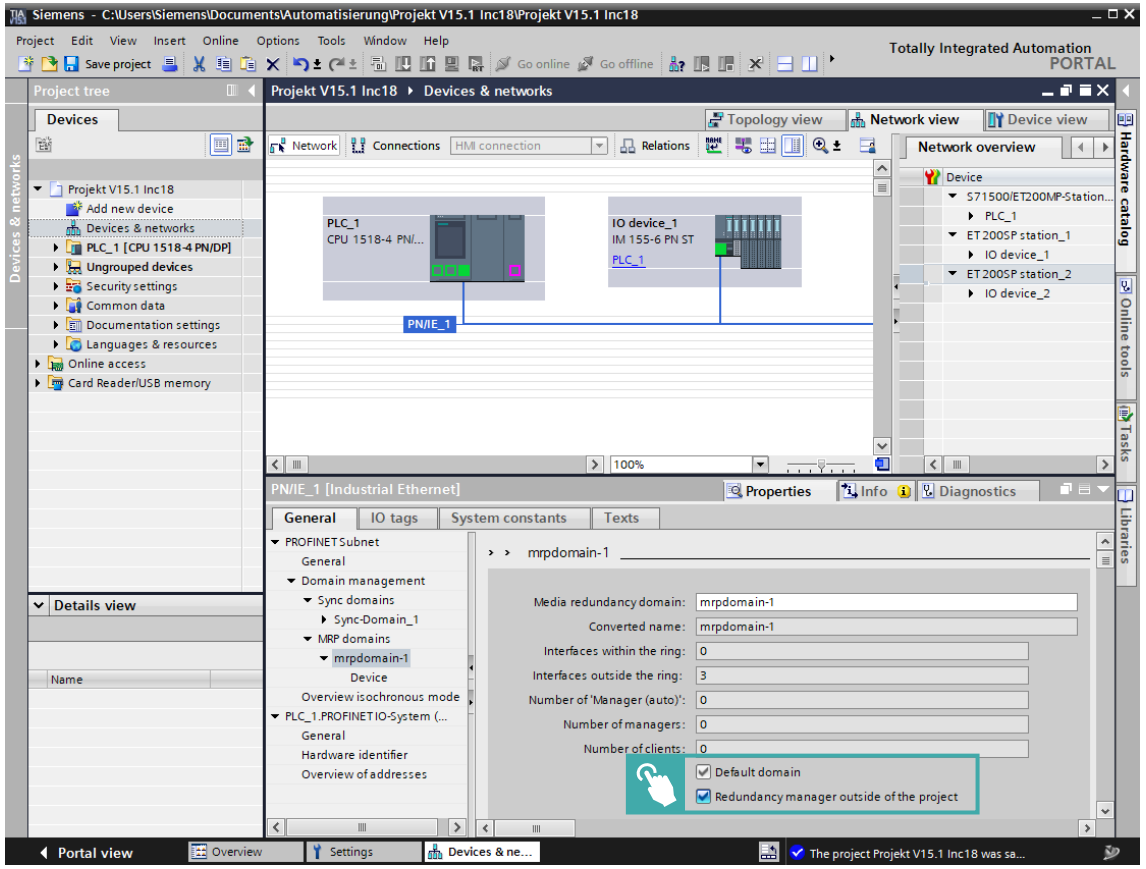
MRP Domain Management across project boundaries

Redundancy managers and redundancy clients of an MRP domain can be configured in different projects



Hardware Configuration – »Change firmware version« for IO devices

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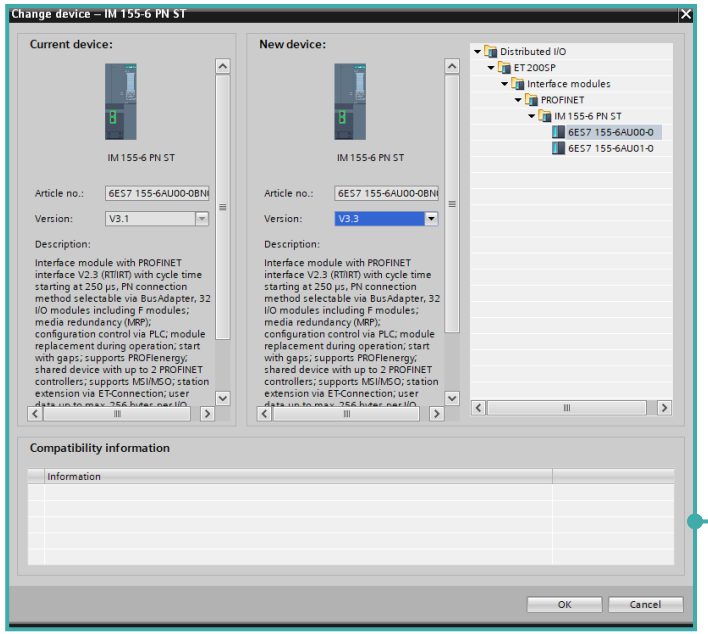
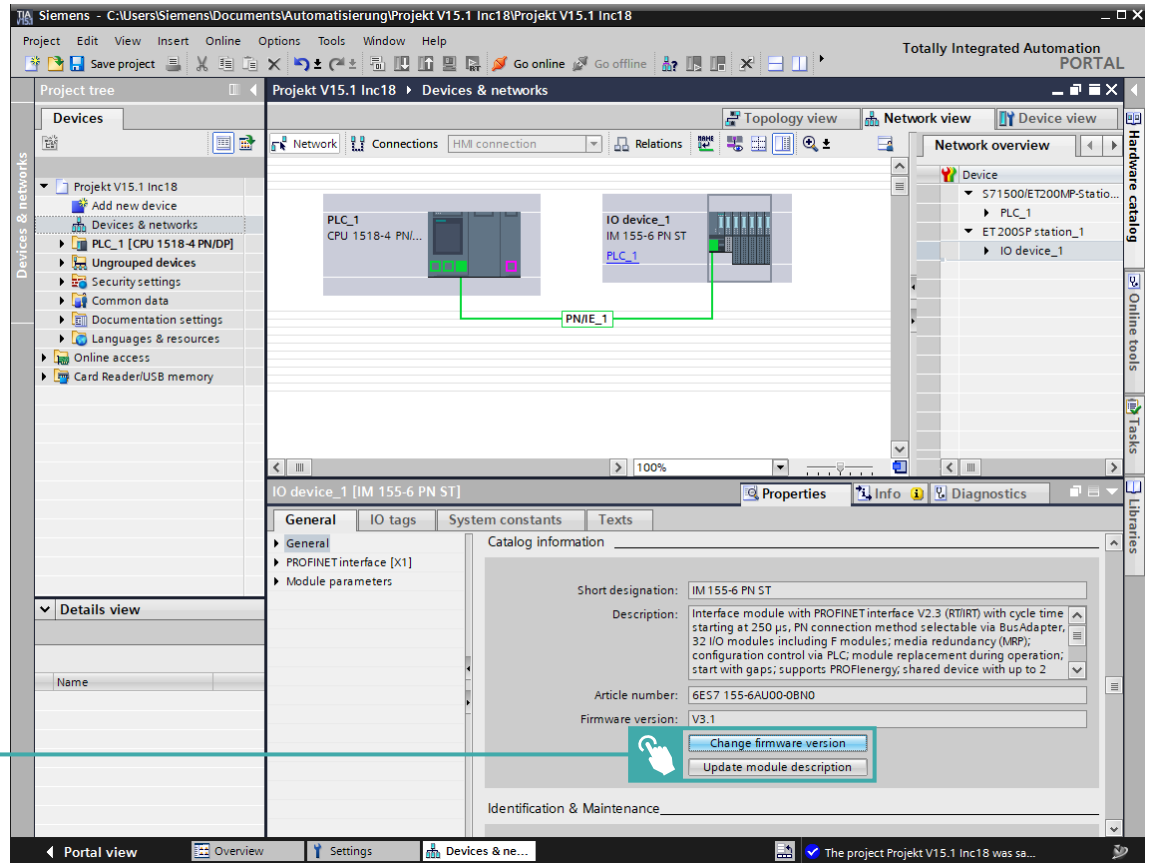
»Change firmware version« for IO devices

Quick change of the configured firmware version in the device view using preselection





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Working in a team (Multiuser)
SIMATIC Units

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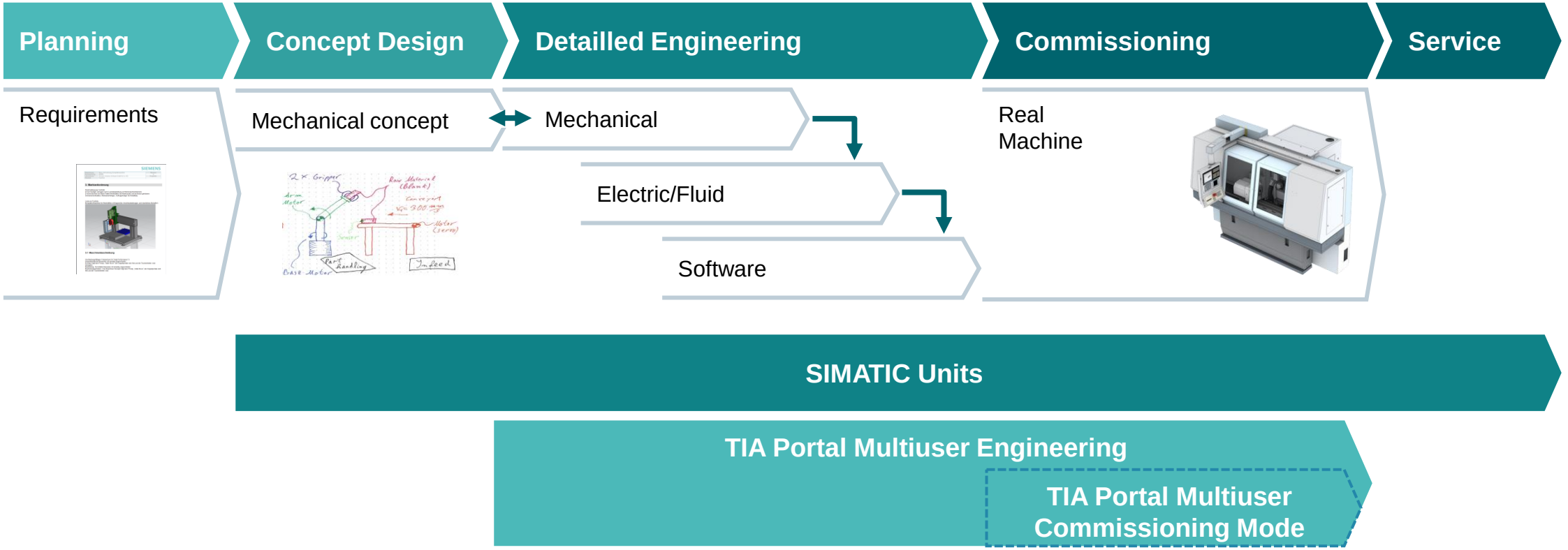

STEP 7 Innovations – Software units for programming structuring

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Function

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

- Free splitting of the program into software units
- Separate loading of the software units into the PLC
- Defined interfaces between the software units
- Purely optimized programming and data storage

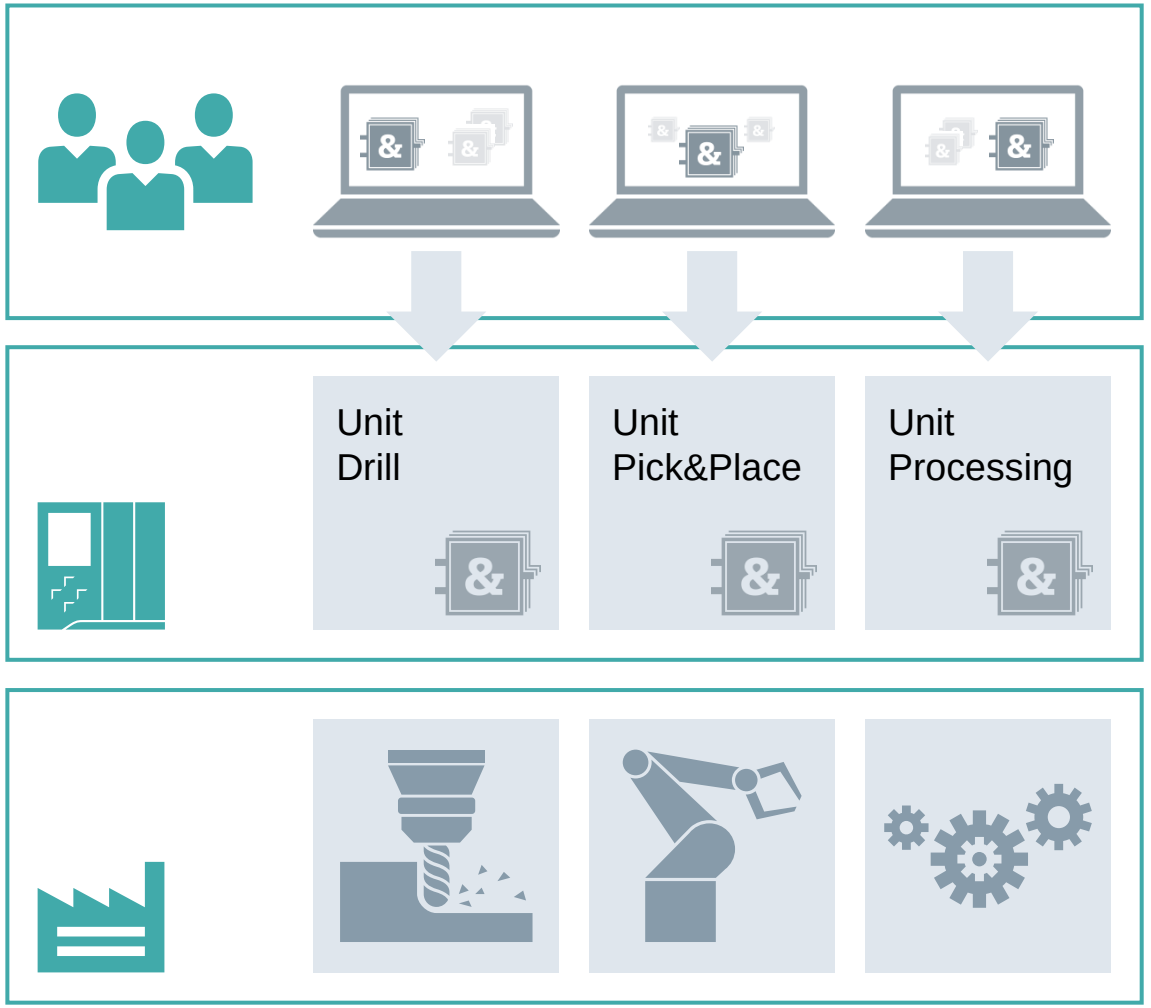
Benefits

Offline

- Program structuring (including OBs, FBs, FCs, DBs, UDTs and tags)
- Storage and exchange of software units via libraries

Online

- Every user can load his software units into the PLC independently of other users/units
- Minimization of download times for team engineering



STEP 7 Innovations – Properties of software units

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Components of software units

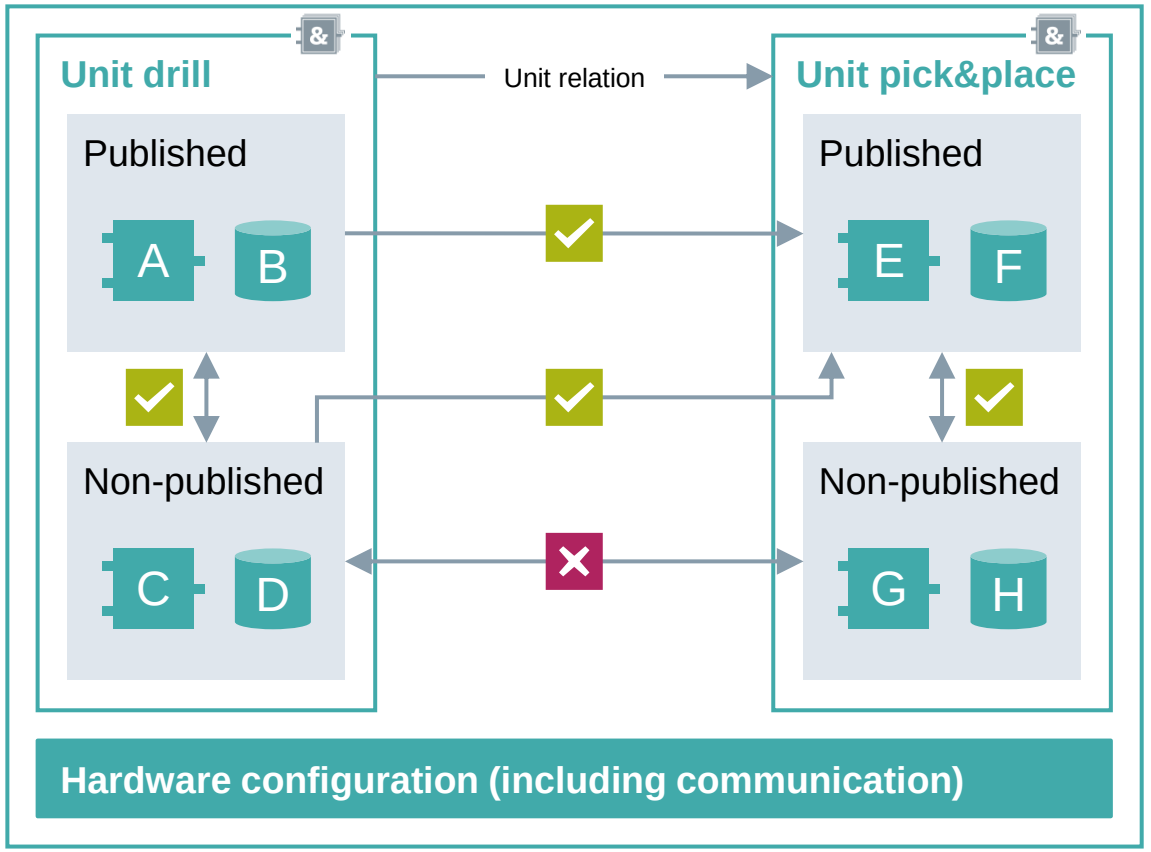
- Program blocks
- Data blocks
- Data types

Published

- Tag tables
- Supervisions (ProDiag)
- Text lists

PLC global configuration

- Hardware configuration
- OPC UA interfaces
- Failsafe program
- Watch tables, trace, etc.



User-defined unit relationships for clear structuring and modularization of the program

STEP 7 Innovations – Software units structure

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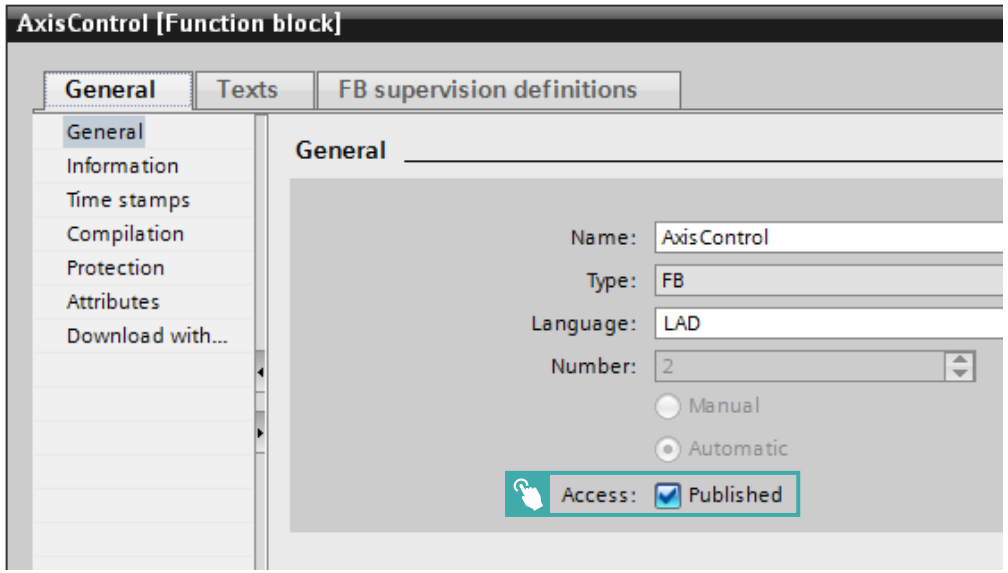
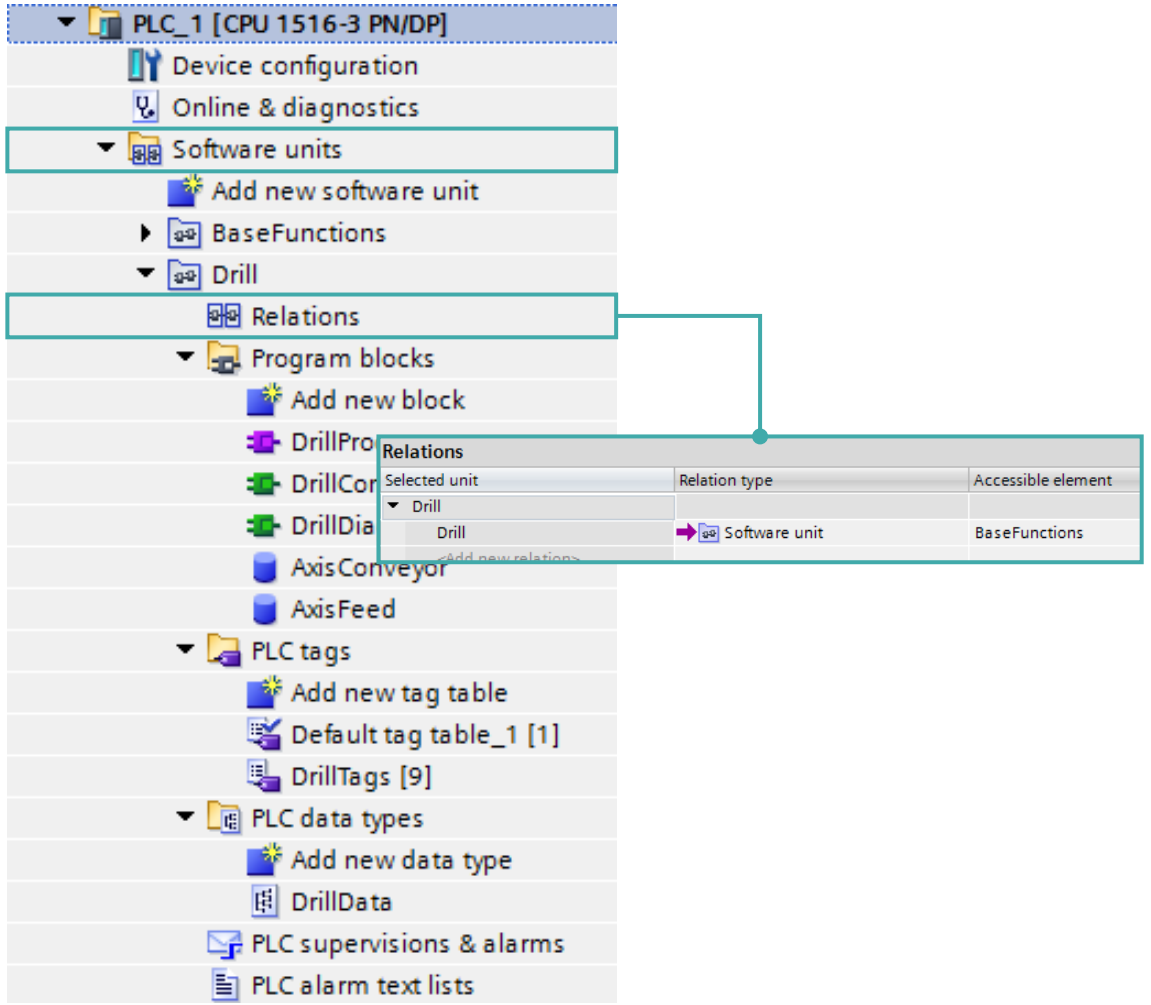
Function

- New system folder for software units (in addition to the previous program, for S7-1500 from FW V2.6)
- Definition of relations for the block call between units
- Setting the »Published« access attribute in the object properties or as a bulk operation in the block overview (detail view)





STEP 7 Innovations – Software units – Interaction with non-unit program

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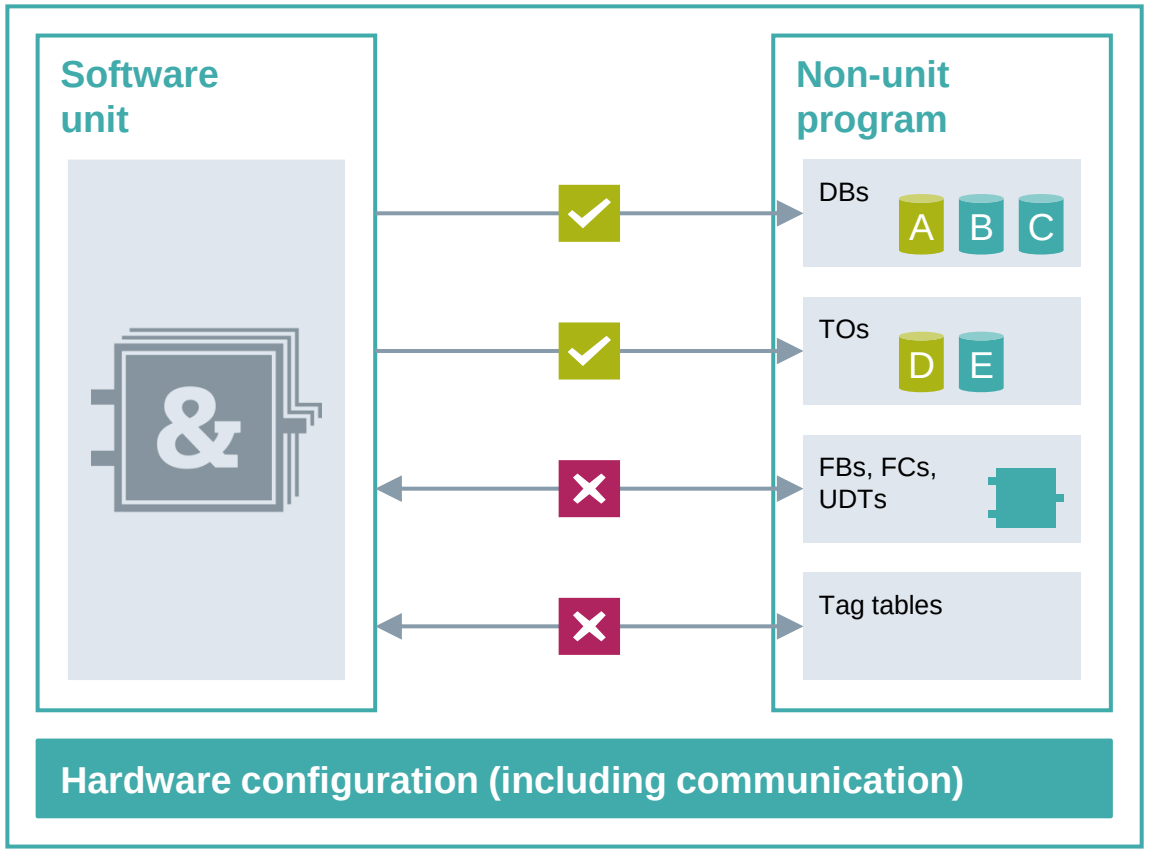
Function

- Access to optimized DBs of the non-unit program defined via relations. No user data types can be used in these DBs.
- Access to TOs of the non-unit program defined by relations
- No block calls between software units and the non-unit program
- No access to PLC tags of the non-unit program



STEP 7 Innovations – Textual interface for SCL blocks

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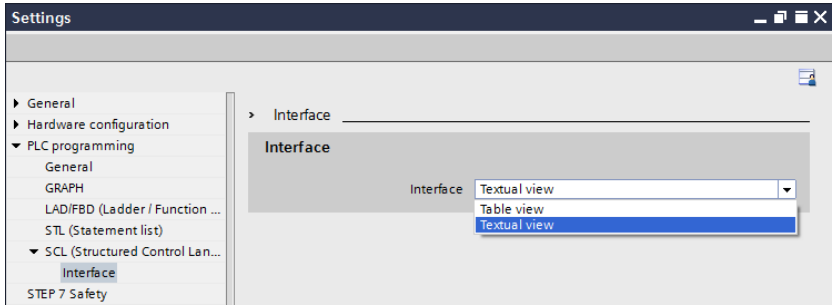
Function

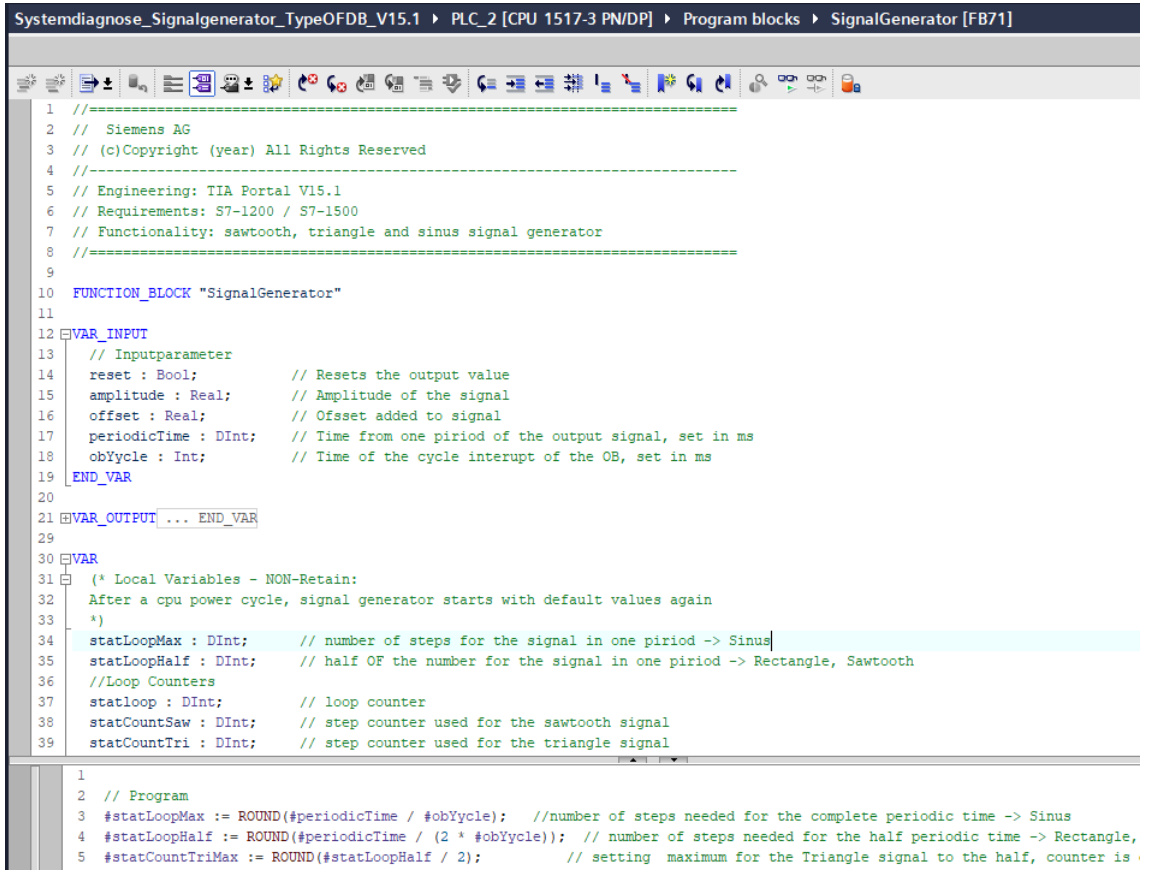
S7-1500 ✓ S7-1200 ✓ S7-300/400/WinAC ✓

Selection between tabular and textual interface when creating new SCL blocks



Benefits

- Familiar programming environment from STEP 7 V5.x
- Additional comment sections and line comments can be added to the interface
- Easy exchange with other text editors



STEP 7 – Innovations – Collection of useful functional extensions

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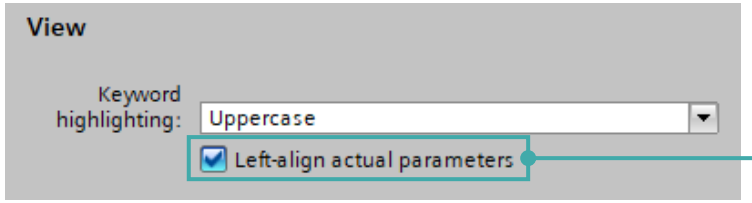
SCL – alignment of actual parameters

For a better readability of programs in SCL blocks, you can left-align the actual parameters for block calls.



Global setting for the SCL editor

```
"InstSignalGenerator1"(reset:="GlobalSignals".reset,
                       amplitude:="GlobalSignals".amplitude,
                       offset:="GlobalSignals".offset,
                       periodicTime:="GlobalSignals".periodicTime,
                       obCycle:="GlobalSignals".obCycle,
                       valRectangle=>"GlobalSignals".rectangle,
                       valSawtooth=>"GlobalSignals".sawtooth,
```

```
"InstSignalGenerator1"(reset       := "GlobalSignals".reset,
                       amplitude   := "GlobalSignals".amplitude,
                       offset      := "GlobalSignals".offset,
                       periodicTime := "GlobalSignals".periodicTime,
                       obCycle     := "GlobalSignals".obCycle,
                       valRectangle => "GlobalSignals".rectangle,
                       valSawtooth  => "GlobalSignals".sawtooth,
```

Retention of the array structure

The array structure is retained when a constant used for the array boundary is deleted.

→ Start values and comments of individual array elements are not lost.

Name	Data type	Start value	Comment
Static			
No	Array[1.."MAX_AXES"] of "typeTOAxisControl"		
No[1]	"typeTOAxisControl"		
mcPower	"typeMcPower"		
mcHome	"typeMcHome"		
mcMoveVelocity	"typeMcMoveVelocity"		
execute	Bool	false	Axis 1: Execute
velocity	LReal	500.0	Axis 1: Position
acceleration	LReal	100.0	Axis 1: Velocity
deceleration	LReal	-100.0	Axis 1: Acceleration
direction	Int	0	Axis 1: Dircetion
mcMoveAbsolute	"typeMcMoveAbsolute"		
No[2]	"typeTOAxisControl"		
No[3]	"typeTOAxisControl"		

Despite missing constant MAX_AXES, all array elements are retained

STEP 7 – Innovations – Collection of useful functional extensions

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DB snapshot

Stored snapshots are not lost even after a structural change of the DB

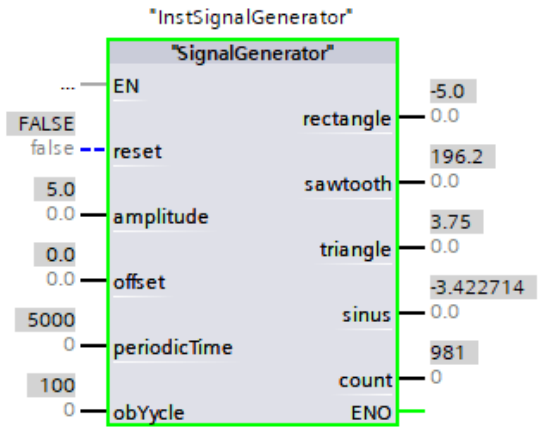
InstSignalGenerator (snapshot created: 6/20/2018 5:04:54 PM)

	Name	Data type	Snapshot
1	Input		
2	reset	Bool	FALSE
3	amplitude	Real	5.0
4	offset	Real	0.0
5	periodicTime	DInt	5000
6	obYycle	Int	100
7	Output		
8	rectangle	Real	-5.0
9	sawtooth	Real	41.4
10	triangle	Real	—
11	sinus	Real	3.852562
12	count	DInt	207

Snapshots still available after adding another output

Monitoring unconnected outputs

When monitoring blocks online, the actual values for unconnected outputs are now also displayed.



Changing setting values for tags of the UDT data type

The settings pre-defined in a user-defined data type can be selected or deselected for the instance used.

	Name	Data type	Start value	Setpoint
	Static			
	motor1	"typeMcMoveVelocity"		☑
	execute	Bool	false	☐
	velocity	LReal	0.0	☐
	acceleration	LReal	200.0	☑
	deceleration	LReal	-200.0	☑
	jerk	LReal	50.0	☑
	direction	Int	0	☐
	busy	Bool	false	☐
	motor2	"typeMcMoveVelocity"		☐
	execute	Bool	false	☐
	velocity	LReal	0.0	☐
	acceleration	LReal	200.0	☐
	deceleration	LReal	-200.0	☐
	jerk	LReal	50.0	☐
	direction	Int	0	☐
	busy	Bool	false	☐

STEP 7 – Innovations – Collection of useful functional extensions

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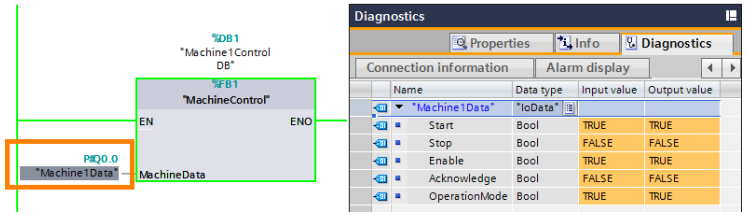
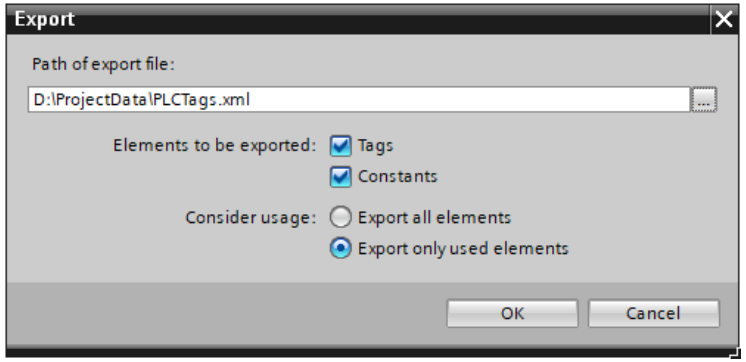
Monitoring UDT in the I/O area

Direct monitoring of UDT on the I/O area in program blocks is supported.



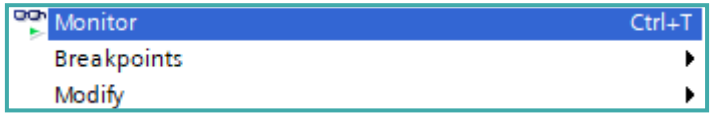
Only export used elements from tag tables in XML format

For tags used exclusively in the program, the export function in the tag table also supports the XML format.



Quick start of observation with Ctrl + T

Available in all editors (tag table, watch table, DB editor, etc.)



STEP 7 – Innovations – Collection of useful functional extensions

SIEMENS
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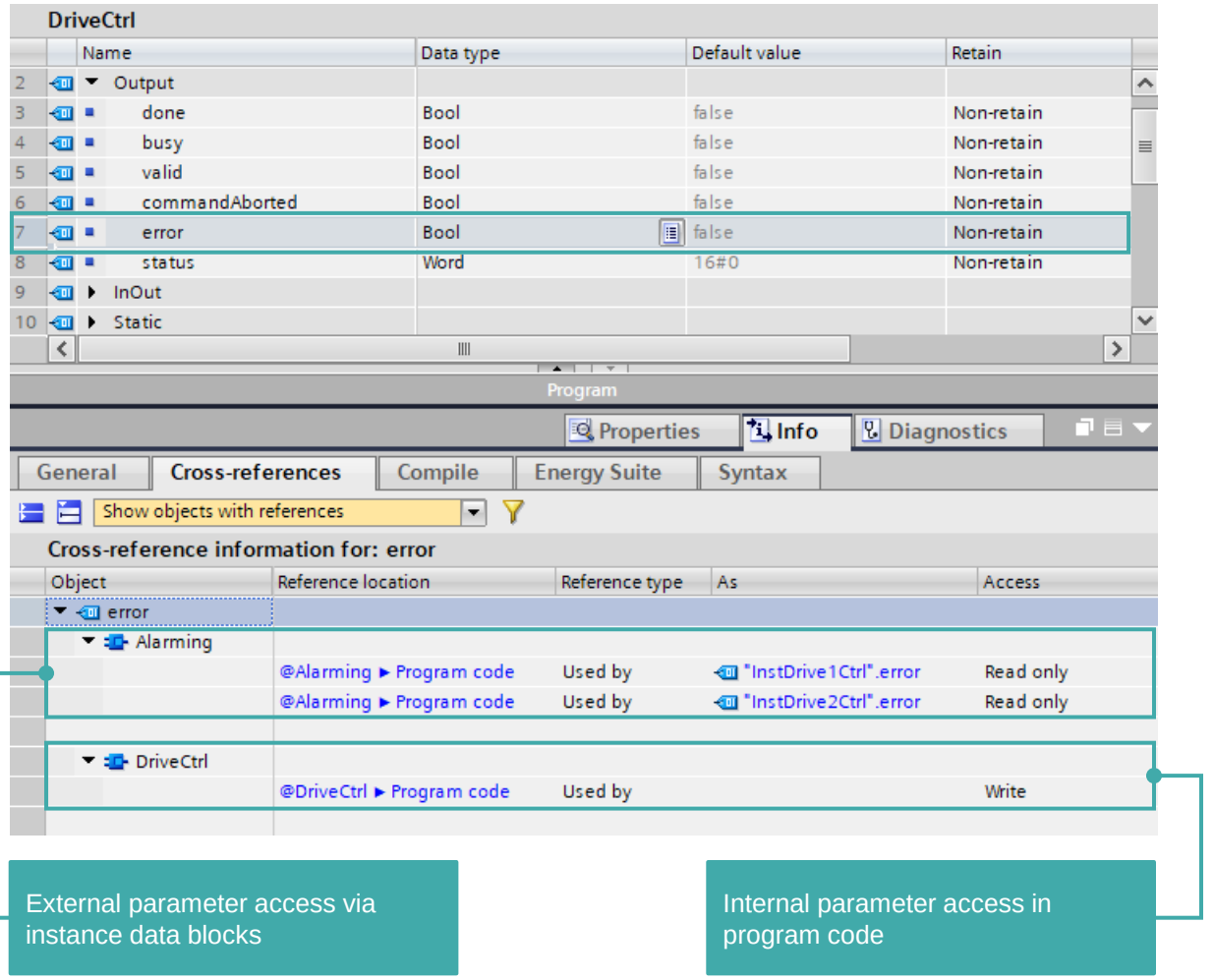
Enhancement of the cross-reference display for interface parameters of function blocks

For interface parameters of a function block, the cross-reference list displays both the block-internal accesses and the accesses from outside via the corresponding individual instance data blocks.

Benefits

- All internal and external access to block parameters at a glance



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Floating window, max. cycle time handling through the API

Target 1500S for Simulink
Model on Web server, transfer of SO files

Teamcenter Gateway
Multiuser engineering, reference projects

SiVArc
Access protection, SCL blocks, template screens, Openness add-ins

Energy Suite
Energy screens, reports, SINAMICS, usability improvements

WinCC V15.1 - SIMATIC HMI Panels

Activate/Deactivate „Persistent Message Buffer“

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New setting: Persistent Message Buffer in Control Panel and TIA Portal

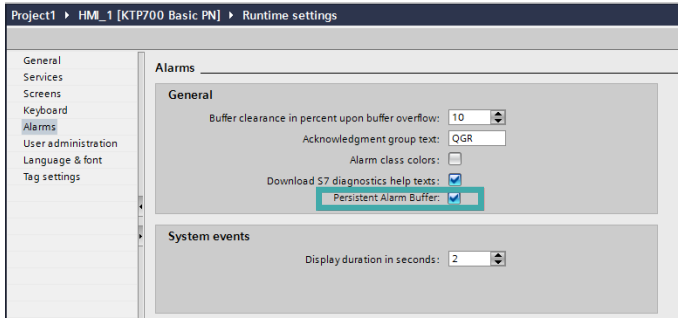
Persistent Message Buffer – Enable

Retentive message buffer is activated, the messages occurring in the project are saved in the internal flash memory. The internal flash memory is more stressed by high number of alarms. When the panel is restarted, the message buffer is still filled with alarms.

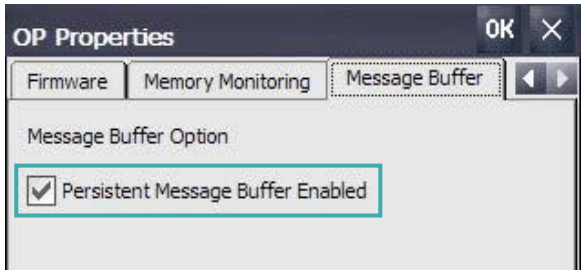
Persistent Message Buffer – Disable

Retentive message buffer is deactivated, the messages occurring in the project are not saved in the internal flash memory. The internal flash memory is less stressed by high number of alarms. When the panel is restarted, the message buffer is empty which means no message buffer alarms are available.

TIA Portal setting for Basic Panels, Comfort Panels and Mobile Panels



Control Panel setting for Comfort Panels and Mobile Panels



Store important messages in archive and switch off »Persistent Message Buffer« to extend lifetime

WinCC V15.1 - SIMATIC HMI Panels

KTP Mobile Images available

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KTP Mobiles images available in V15.1

Images available for download onto device
Images can now be downloaded from TIA Portal onto the following devices

- KTP400F
- KTP700 and KTP700F
- KTP900 and KTP900F

Configuration as a V15 device

- Configuration as a V15 device is now possible
- The TIA project can subsequently be transferred for the V15 image.

KTP400F Mobile

KTP700(F) Mobile

KTP900(F) Mobile

KTP Mobile Images V15.1 available for device configuration

WinCC V15.1 - SIMATIC HMI Panels

HMI Option+ V2

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QR code reader
Code will be written directly into a tag

Support for Mobile Panel 2nd generation
7", 9"

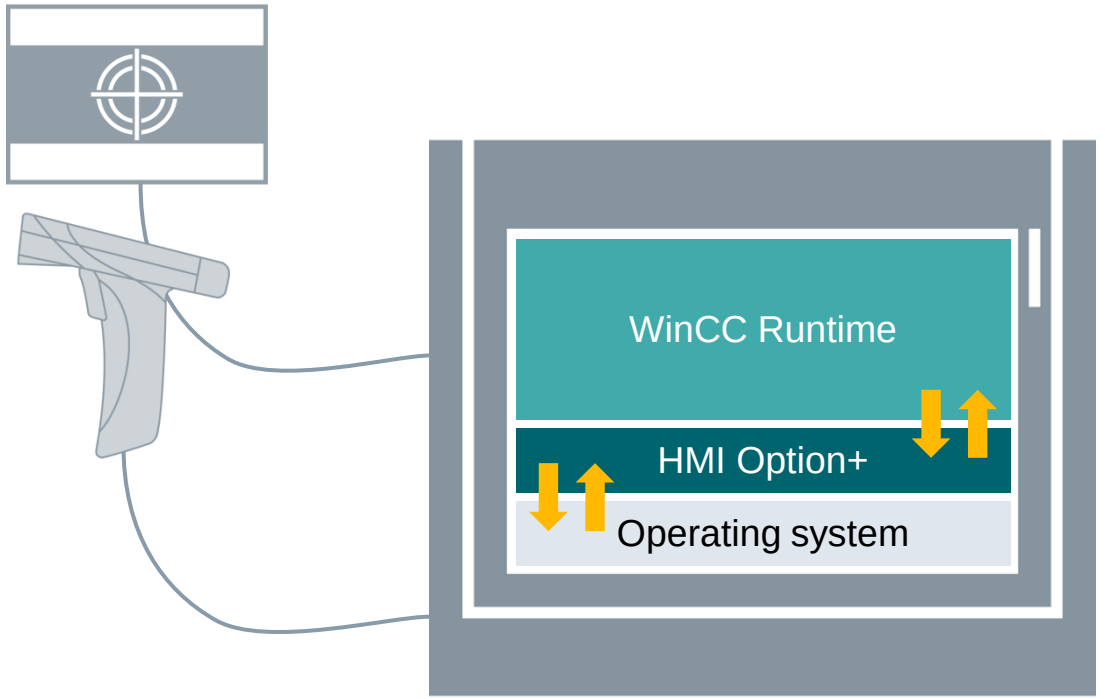
Communication via OPC UA
Conversion from SOAP to OPC UA

Expansion of the service file
Adaptations and expansions

SIMATIC Logon
Optimization of the certificate handling

Windows CE Desktop
Hiding individual desktop icons

CPU load
Display the CPU load directly in the HMI Runtime



WinCC RT Professional 15.1
Functional Enhancements

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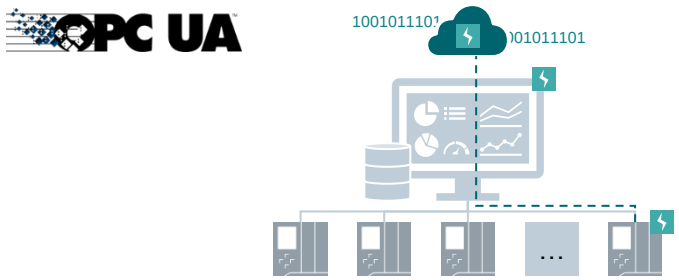
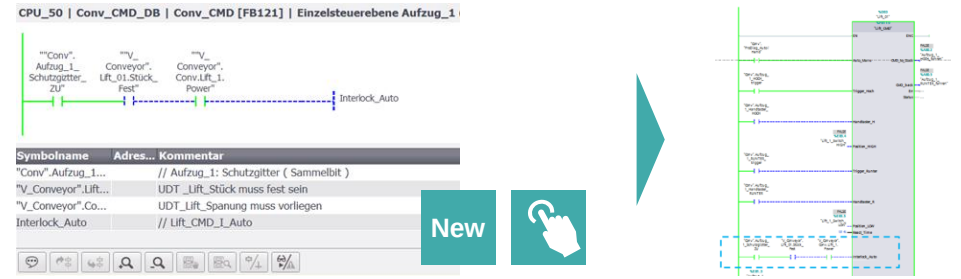
Functionality extensions in OPC UA server

- Support of OPC UA Server Alarm and Condition
- WinCC alarms can be sent via the OPC UA server to a third-party application



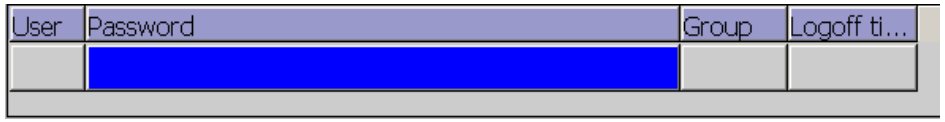
Functionality extensions in ProDiag Control

Display of the entire call interface block



Additional smaller functional extensions

- Setting of the WebUX/WebNavigator user rights in Runtime
- Automatic logon for operator role
- HMI compiler provides additional information for users (e.g. number of compiled HMI objects)
- Software controller with WinCC Professional on a shared computer



TIA Portal – Highlights of TIA Portal V15.1

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Hardware configuration

- S7-1500R/H redundant systems
- MRP domain management across project boundaries
- Change firmware version for IO devices

Startdrive – Innovations

- Integration of SINAMICS S210 and SIMOTICS 1FK2 motors
- Startdrive Advanced: Safety Acceptance test for S120 and S210 drives
- Openness extensions for G120, S120, S210
- Integration of Drive Control Charts (DCC)

STEP 7 – Innovations

- Software units: Splitting of user program into separately loadable units
- Textual interface for SCL blocks
- Improvements in online monitoring of blocks

System functions

- Trace: Simplified chart configuration
- TIA Portal Openness add-ins (ET 200SP read/write parameters, watch tables, extended functionality for block import)
- User-defined shortcut keys

WinCC – Innovations

- Support of OPC UA Server Alarm and Condition
- ProDiag Control functional add-ins

TIA Portal options

STEP 7 Safety
Flexible F Link, DP_DP_ID, Openness add-ins

Multiuser
commissioning mode

OPC UA
S7-1500 client, SiOME configuration tool

ProDiag
Usability add-ins, such as hierarchical comments

PLCSIM Advanced
Floating window, max. cycle time handling through the API

Target 1500S for Simulink
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Access protection, SCL blocks, template screens, Openness add-ins

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Energy screens, reports, SINAMICS, usability improvements

Agenda

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Ingenuity for life

1 **Highlights for all SINAMICS**

2 SINAMICS S210

3 SINAMICS S120, G130, G150, S150, MV

4 SINAMICS DCC

5 SINAMICS G120

6 SINAMICS V90 HSP

7 SIMATIC MICRO-DRIVE

SINAMICS drive in TIA Portal
… the optimum drive system for every application

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SINAMICS S120 and Large Drives[1]

The flexible, modular drive system over a large power range for sophisticated and demanding applications in the production industry

Dec. 2017 w/ V15 general release | Dec. 2018 w/ V15 .1 new functions

SINAMICS S210

Single axis AC/AC drive with high dynamic and performance for motion applications in the mid range segment

Dec. 2017 via GSD | Dec. 2018 w/ V15.1

SINAMICS V90 with PROFINET

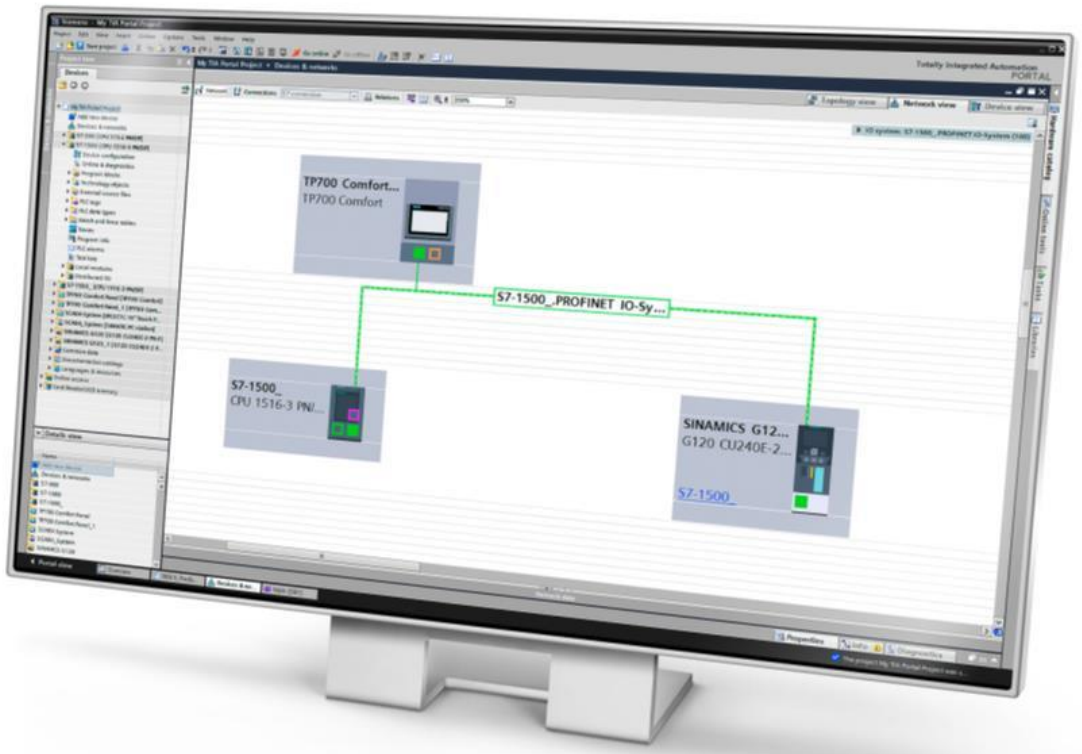
Basic servo control system for standard motion control applications

Dec. 2018 w/ V15 .1 new functions

SINAMICS G120

Drive system for general performance applications and distributed drive system for conveyor applications

Dec. 2018 w/ V15 .1 new functions



All SINAMICS can already be used in TIA Portal

SINAMICS Startdrive V15.1 Highlights for all drives

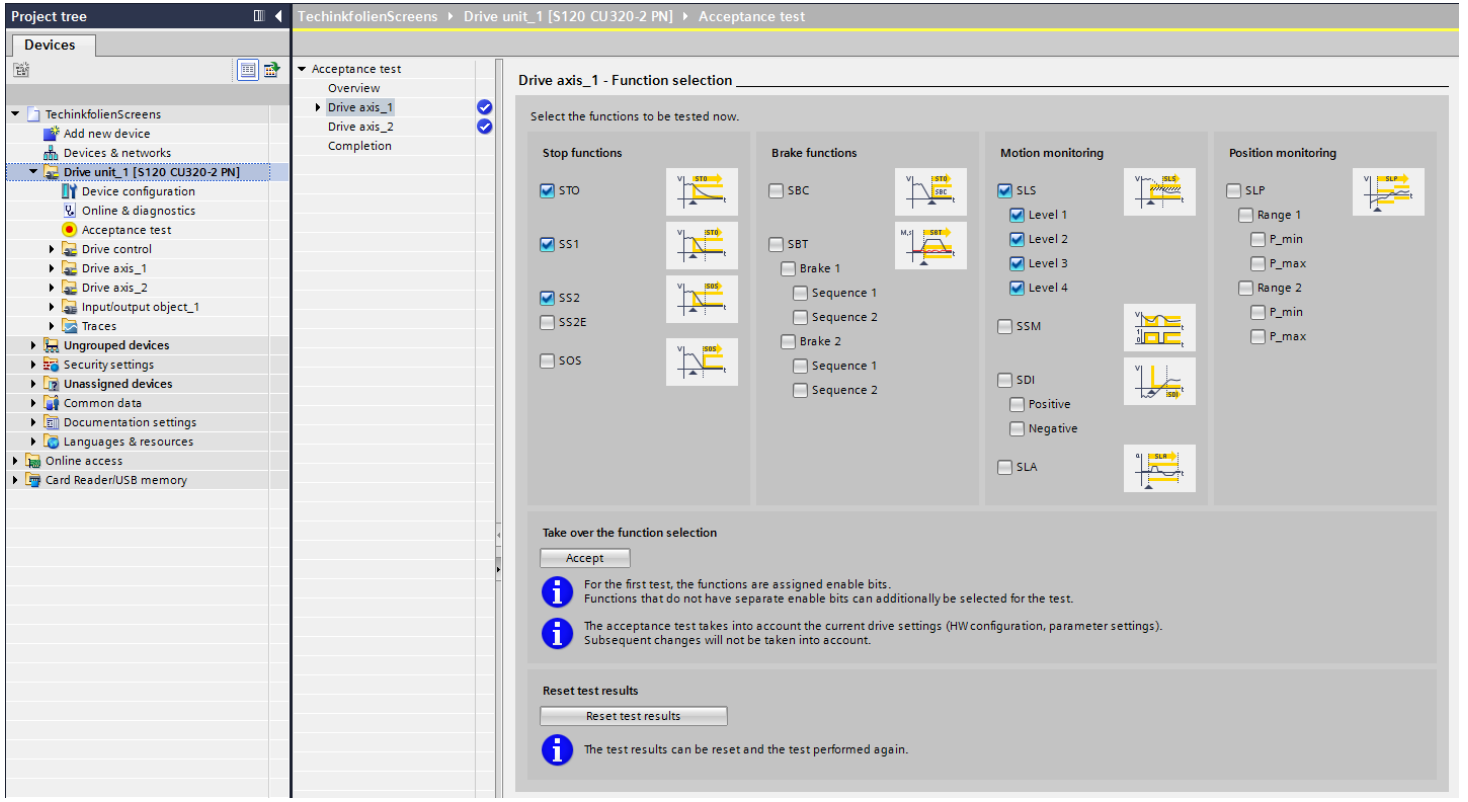
SIEMENS
Ingenuity for life

Startdrive Advanced V15.1 – Extension of Safety Acceptance Test

- **Safety Acceptance Test for S120 and S210:**
  - Guided Safety acceptance test for all drive-based Safety Integrated functionalities (Basic, Extended and Advanced Safety)
  - Automatic and Safety functionality-specific creation of traces for the analysis of the machine behaviour
  - Generation of protocol as Excel file (xlsx format, also useable with OpenOffice)

Startdrive Safety Acceptance Test

Startdrive Safety Abnahmetest



SINAMICS Startdrive V15.1 Highlights for all drives

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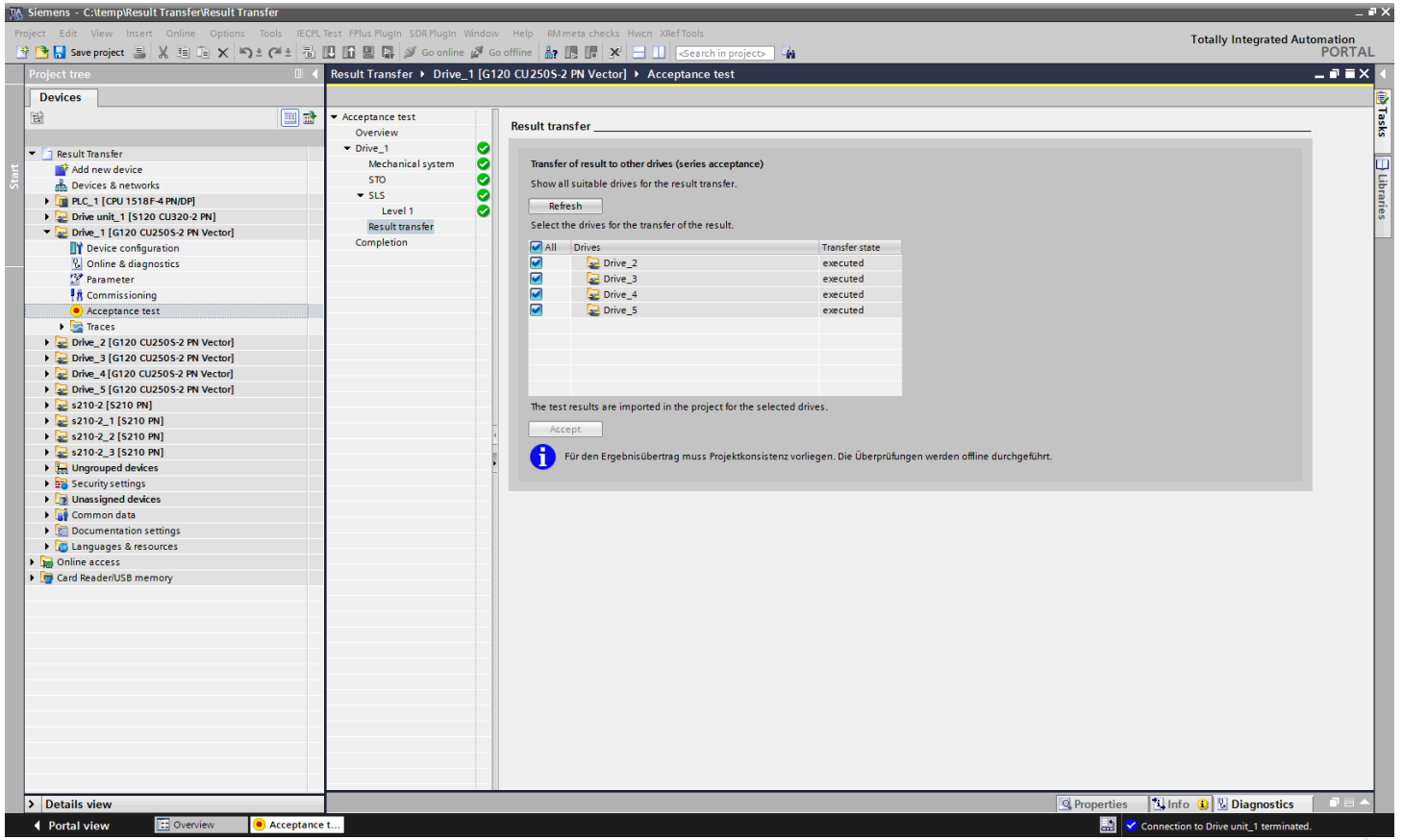
Ingenuity for life

Startdrive Advanced V15.1 – Extension of Safety Acceptance Test

- **Result transfer**
  - Automatic transfer of test results to other drives with same Safety functionality with one mouse-click
  - Inclusion of the transferred drives into the protocol



SINAMICS Startdrive V15.1 Highlights for all drives

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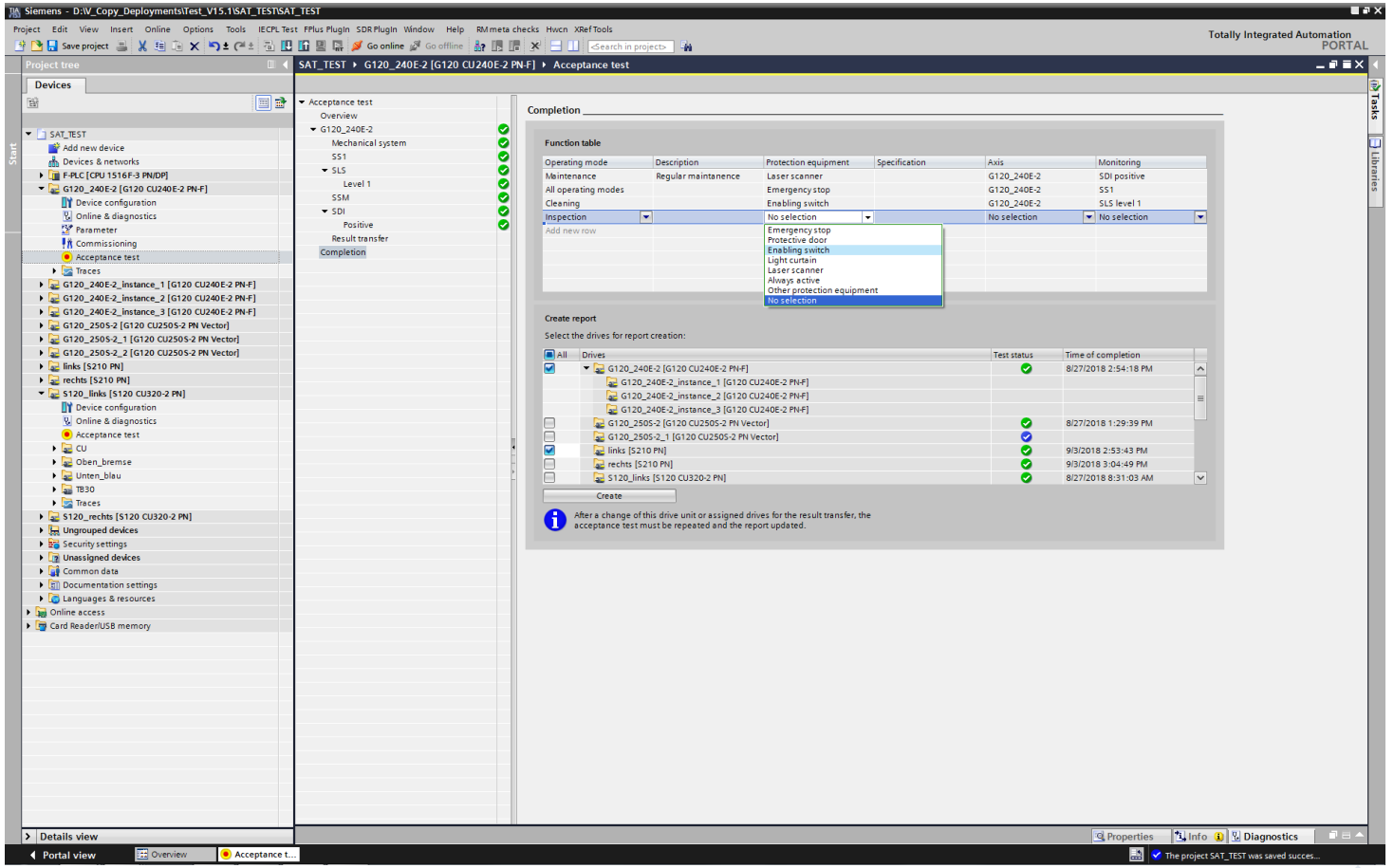
Startdrive Advanced V15.1 – Extension of Safety Acceptance Test

- **Function table**
  - Documentation of the machine-specific Safety functionality as part of the test protocol

- **Multiple protocol generation**
  - Automatic generation of the test protocols for all drives in the project
  - Customer value: Higher efficiency for large projects



SINAMICS Startdrive V15.1 Highlights for all drives

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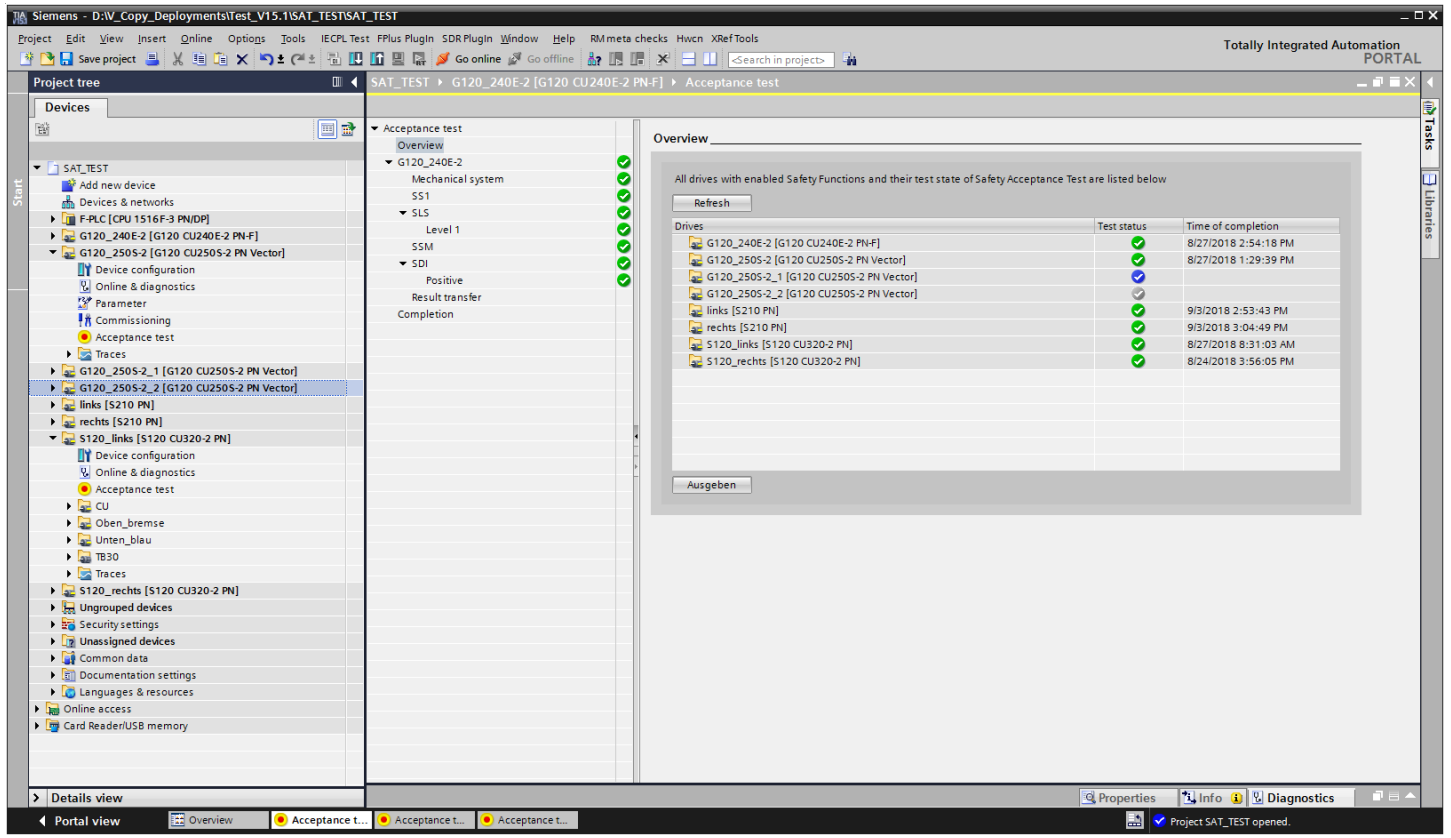
Startdrive Advanced V15.1 – Extension of Safety Acceptance test

- **Overview**
  - Shows the test status across all drives in the project including time stamp



SINAMICS Startdrive V15.1
Highlights for all drives

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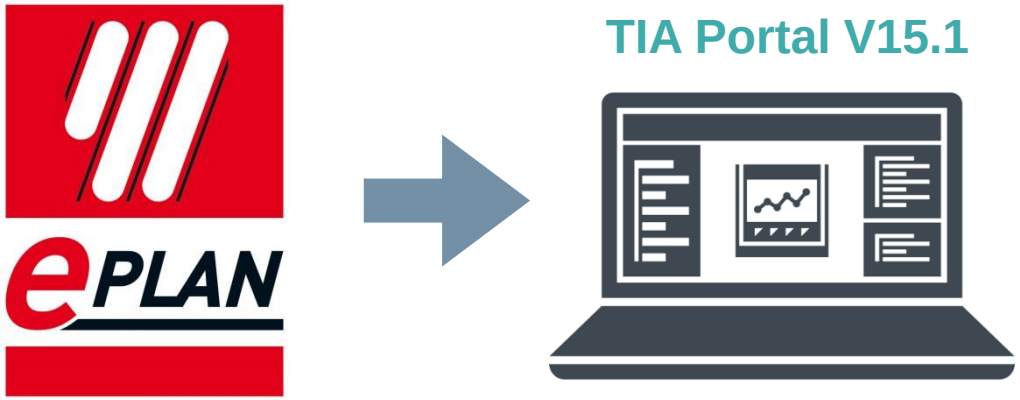
Extension of the Startdrive Openness interface

- Further functional interfaces for important openness use cases
  - Adding drive hardware components with fully specified MLFB for all drives
  - PROFIsafe telegram configuration for all drives
  - Entering motor and encoder data for G120
  - Hardware configuration for S210
- Generation of a TIA Portal project by an AML-based import from EPLAN resp. data import/export from/to EPLAN
  - G120: Control Unit and Power Module supported with EPLAN V2.8
  - S120: Only Control Unit
- Access to further drive parameters by openness (EPos, Extended setpoint channel, SINAMICS DCC, …)



SINAMICS Startdrive V15.1
Highlights for all drives

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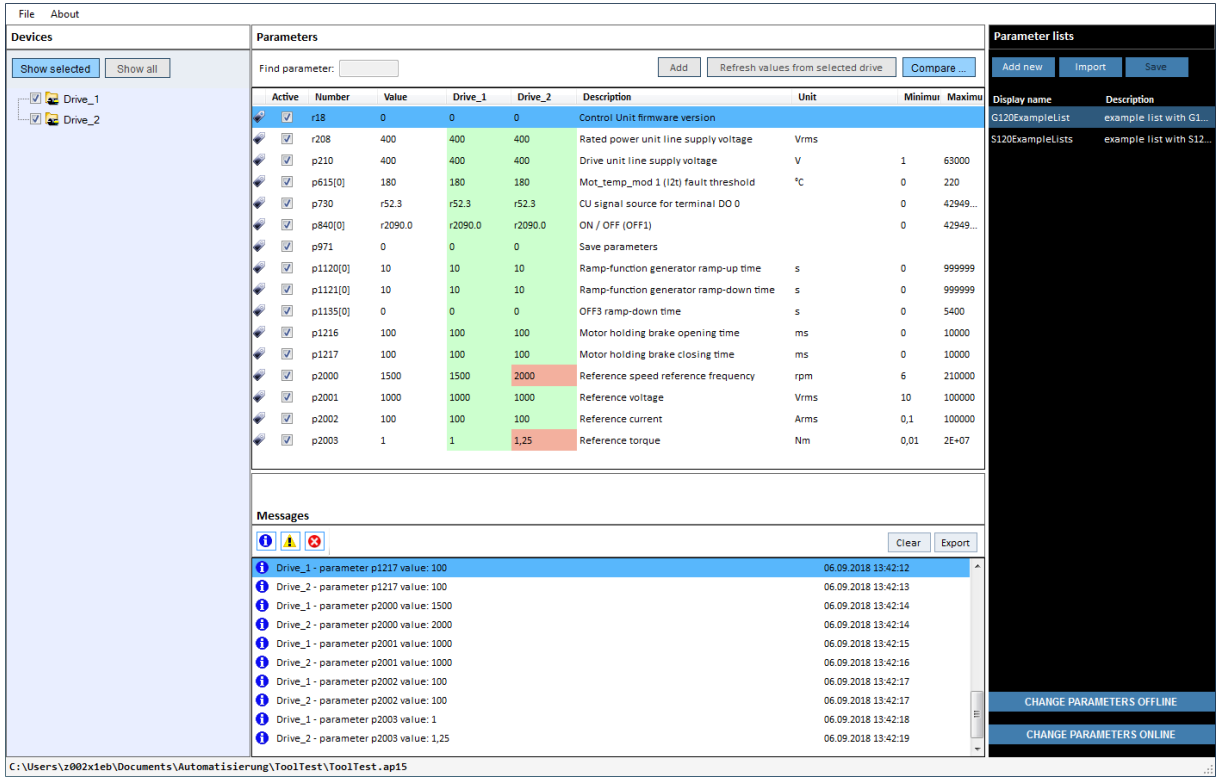
Startdrive App »Edit parameters in several drives«

- Comparison of offline parameter values of several drives with each other
- Automatic copying »RAM to ROM« after changing parameter values
- Support of SINAMICS S210

[Startdrive Openness App (en)]
[Startdrive Openness App (de)]



SINAMICS Startdrive V15.1
Highlights for all drives

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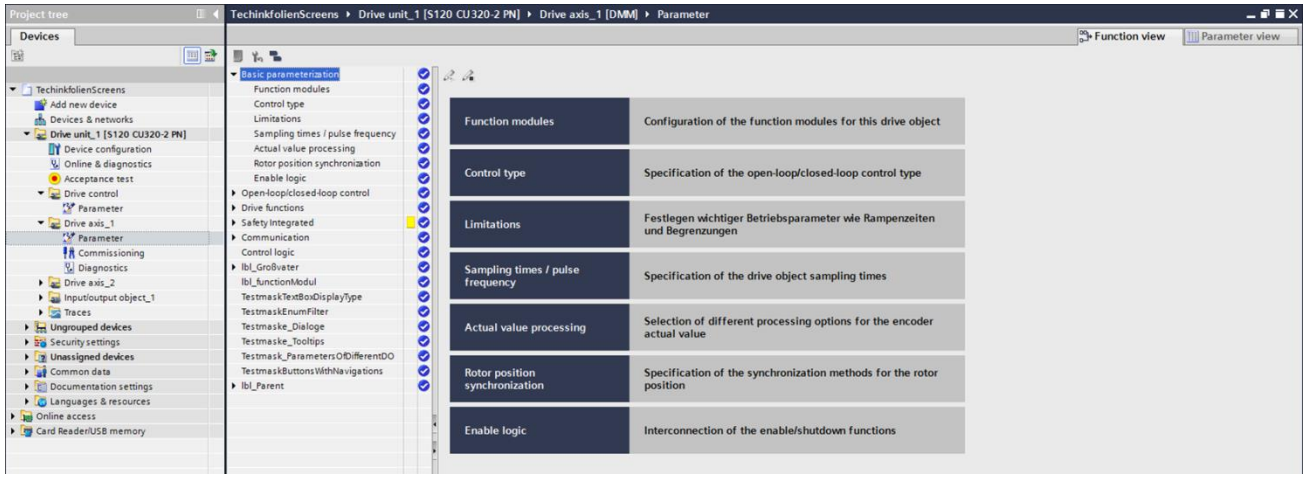
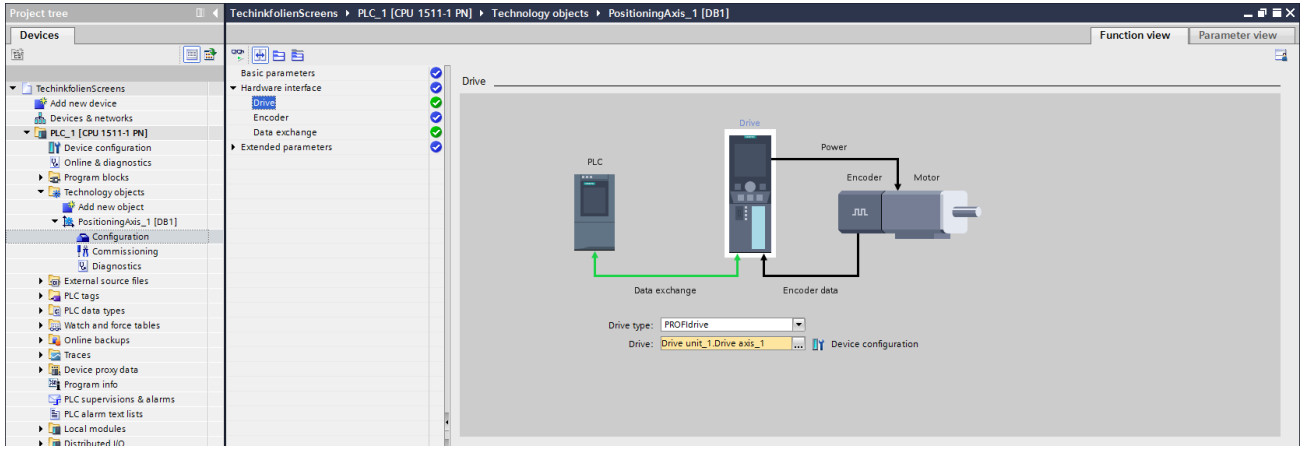
Offline data synchronisation between the drive and the SIMATIC S7-1500 Technology Object in the project

Synchronisation from drive to Technology Object of

- Speed/torque data (reference speed, reference torque, maximum speed)
- Encoder data (sensor type, sensor system, sensor resolution, steps per revolution, shift factor, determinable revolutions)





SINAMICS Startdrive V15.1
Highlights for all drives

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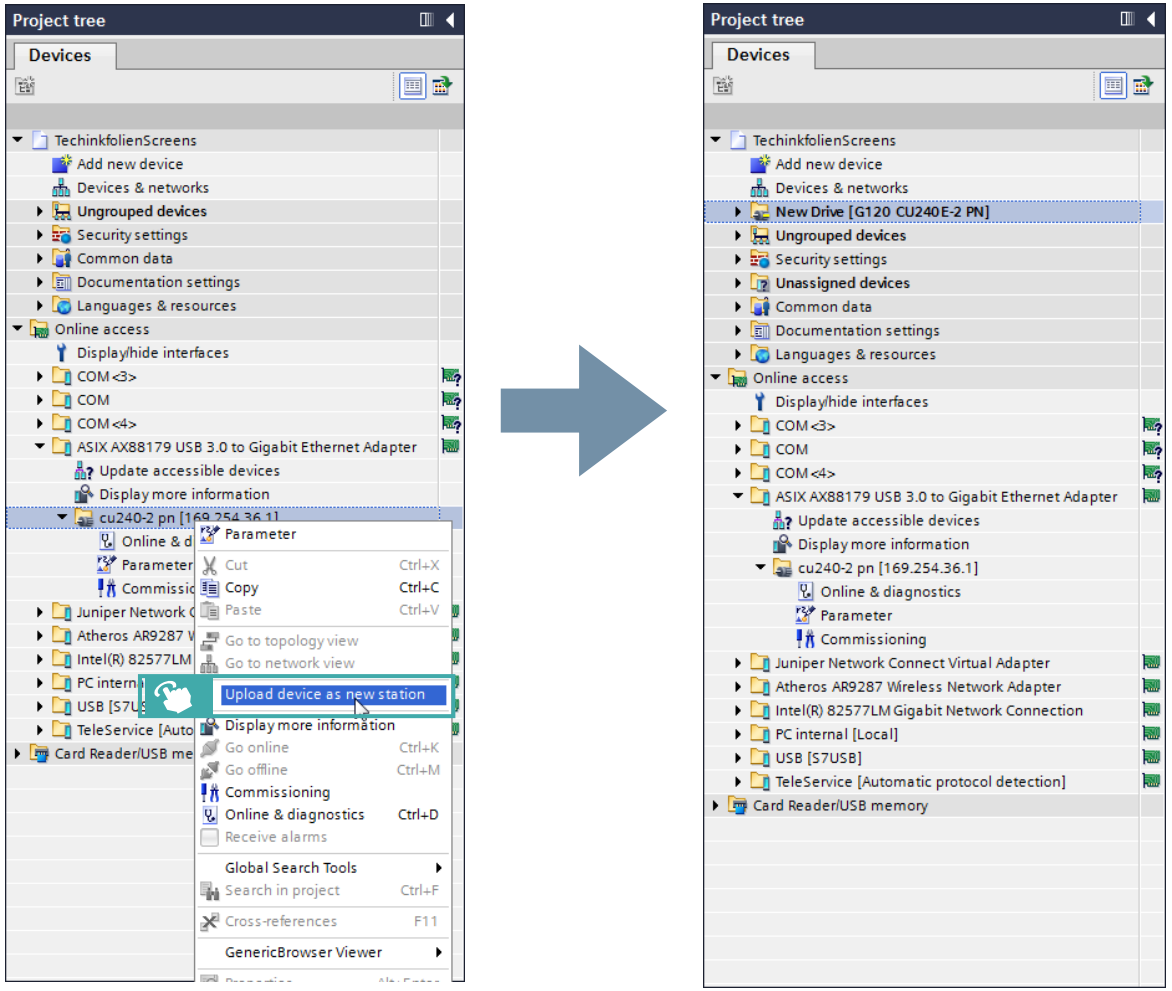
- Adding a drive to the project from the list of accessible devices via context menue



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1 Highlights for all SINAMICS

2 **SINAMICS S210**

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4 SINAMICS DCC

5 SINAMICS G120

6 SINAMICS V90 HSP

7 SIMATIC MICRO-DRIVE

SINAMICS Startdrive V15.1
Integration of SINAMICS S210 and SIMOTICS 1FK2 motors

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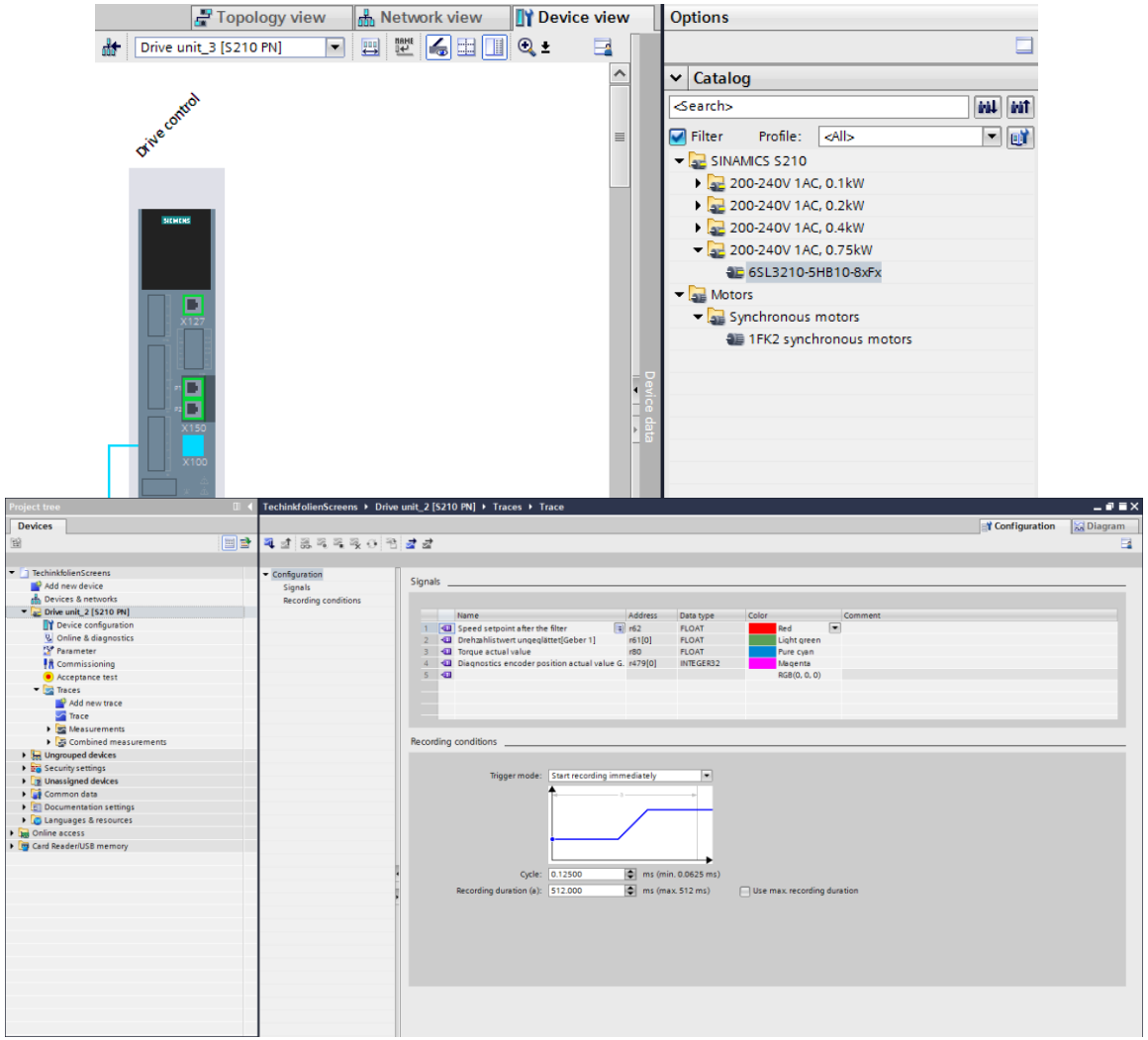
Ingenuity for life

- Integration of SINAMICS S210 drives with 200V and 400V and SINAMICS Firmware V5.2
- Support of SIMOTICS 1FK2 motors
- Ease of use
  - Simple and efficient configuration and commissioning workflow
  - Online and offline commissioning
- Trace incl. pre-defined trace template with typical parameters
- Firmware update via TIA Portal
- Automatic servo tuning with One-Button-Tuning
- Support of technology data block telegram 750
- Parameter view structured by drive functions (parameter groups)
- Safety parameterization supported by graphical views



SINAMICS Startdrive V15.1
Highlights for SINAMICS S120, G130, G150, S150, MV

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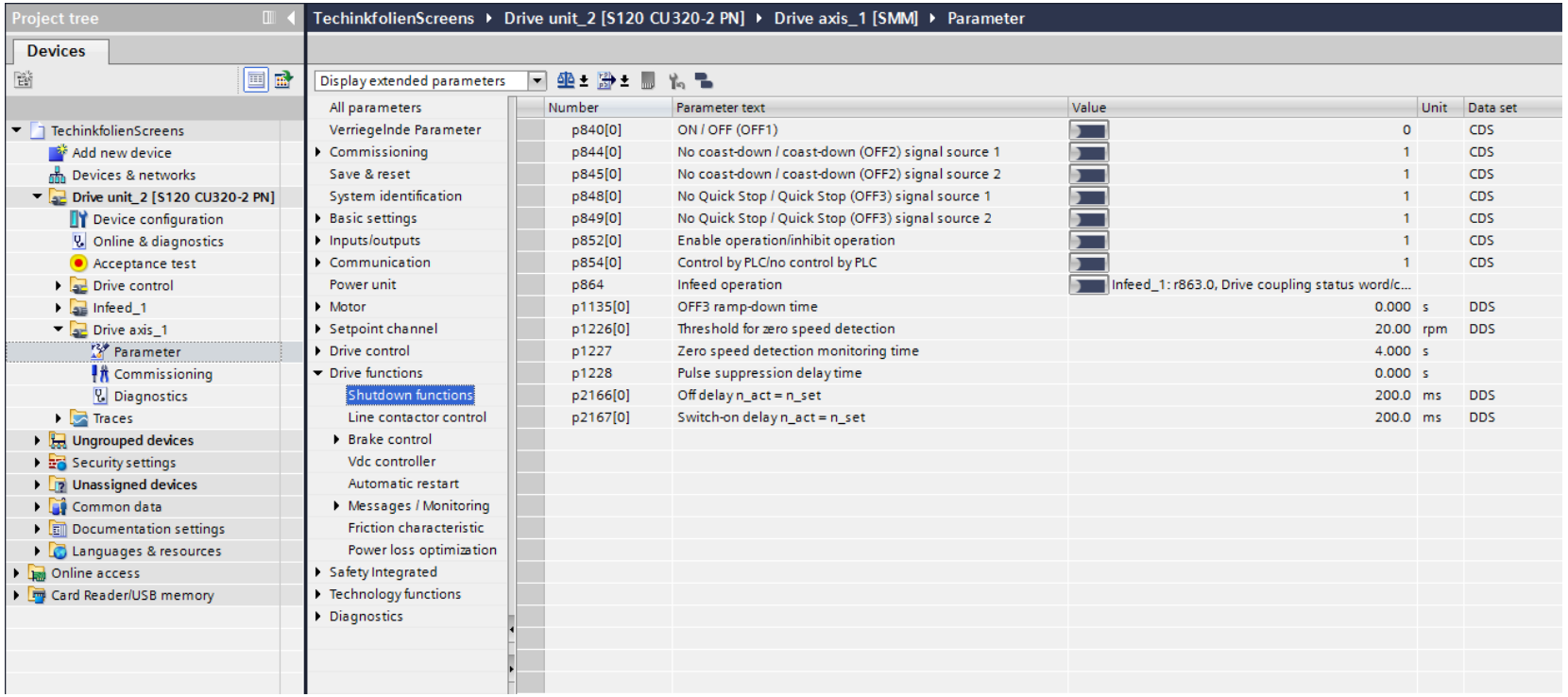
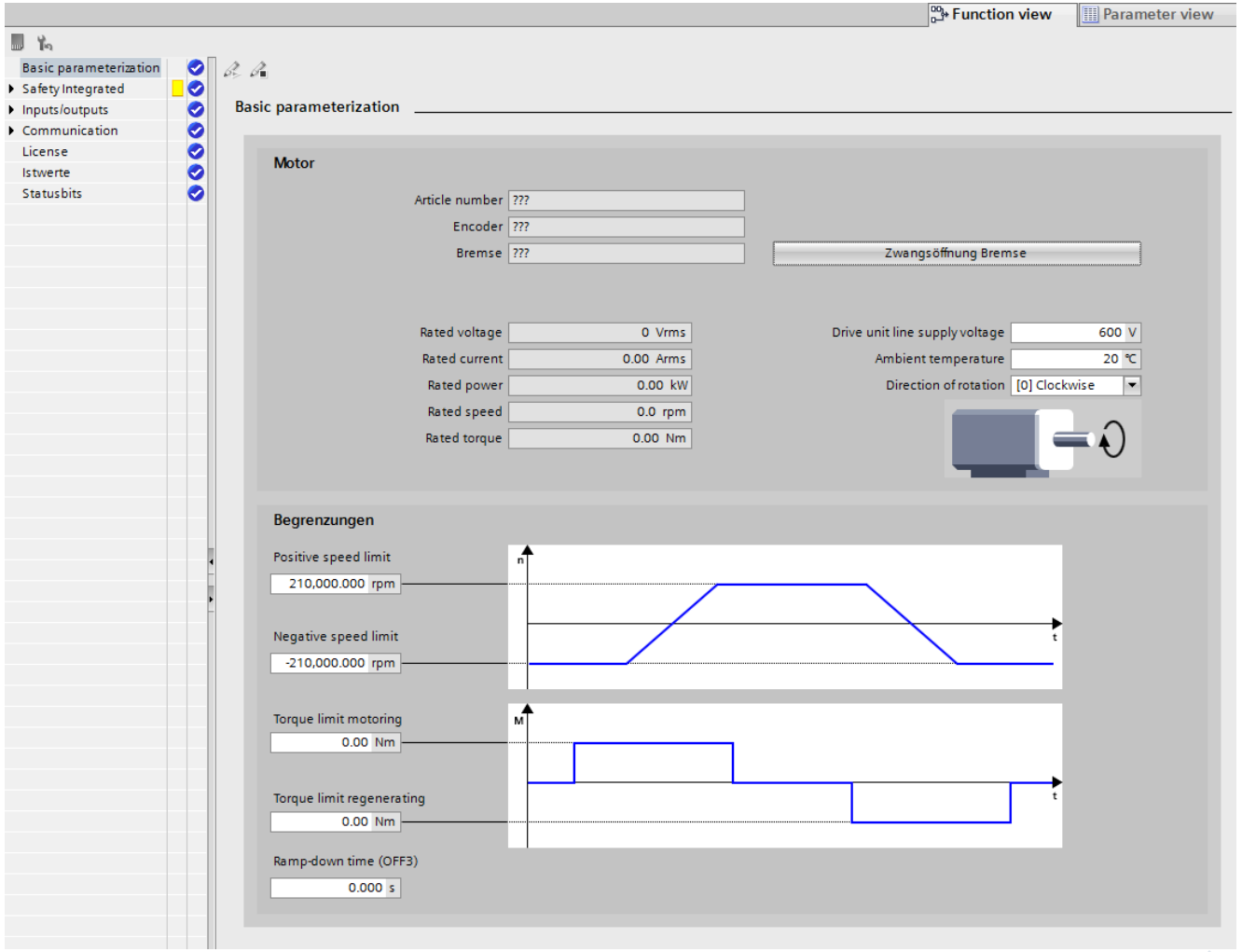
Parameter view structured by drive functions (parameter groups)



SINAMICS Startdrive V15.1
Integration of SINAMICS S210 and SIMOTICS 1FK2 motors

SIEMENS
Ingenuity for life

- Ease of use
  - Simple and efficient configuration and commissioning workflow



SINAMICS Startdrive V15.1
Integration of SINAMICS S210 and SIMOTICS 1FK2 motors

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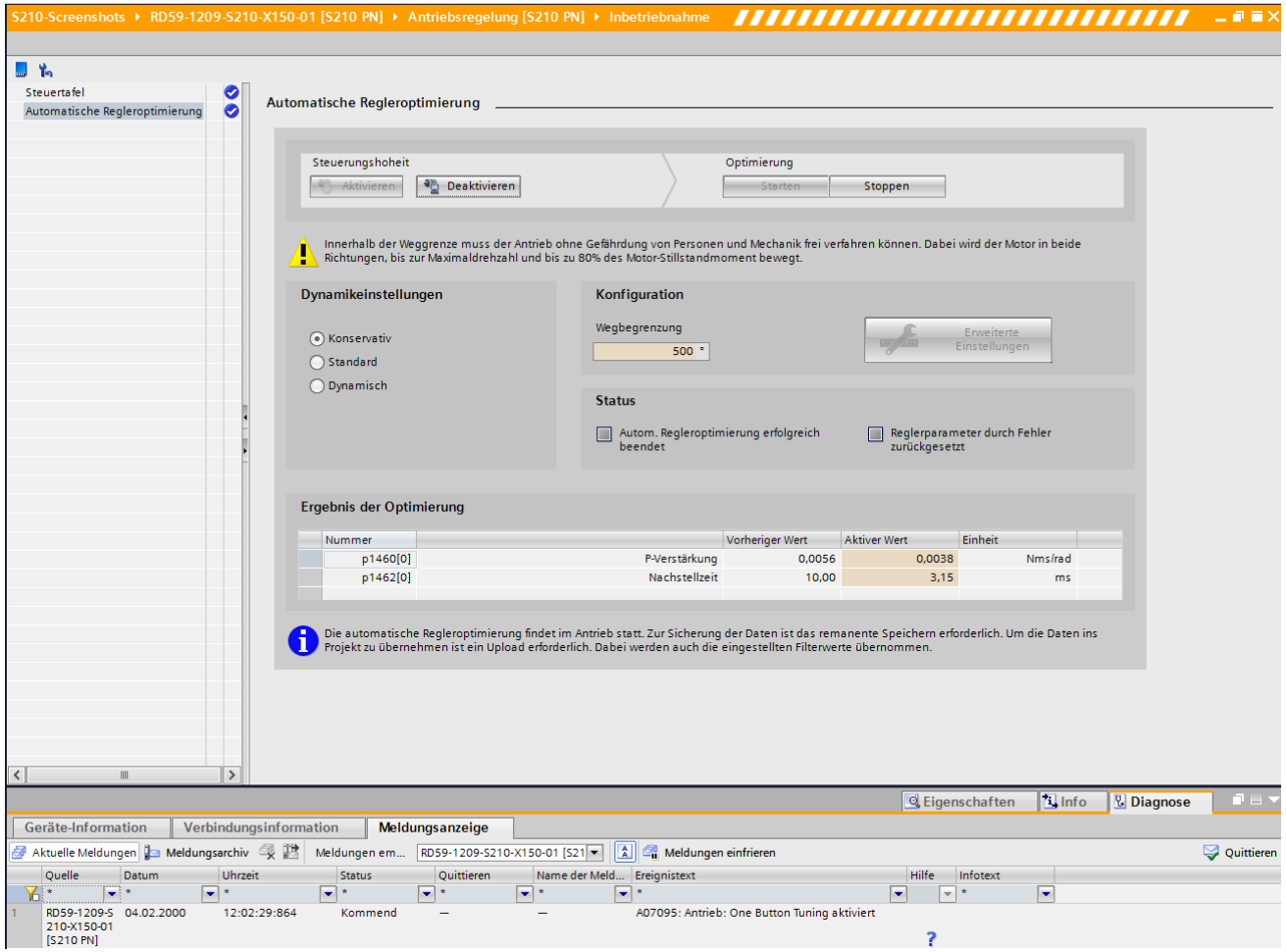
- Automatic servo tuning with One-Button-Tuning



SINAMICS Startdrive V15.1
Integration of SINAMICS S210 and SIMOTICS 1FK2 motors

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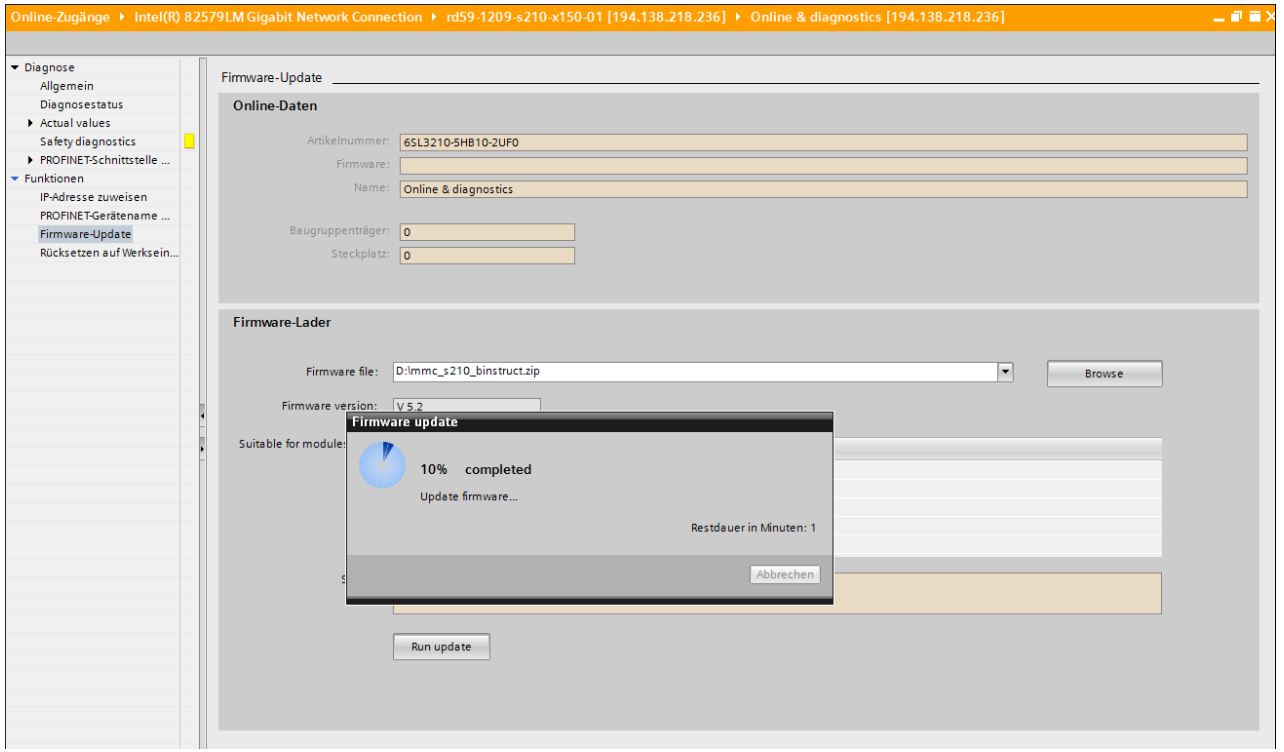
- Firmware update via TIA Portal



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7 SIMATIC MICRO-DRIVE

SINAMICS Startdrive V15.1
Highlights for SINAMICS S120, G130, G150, S150, MV

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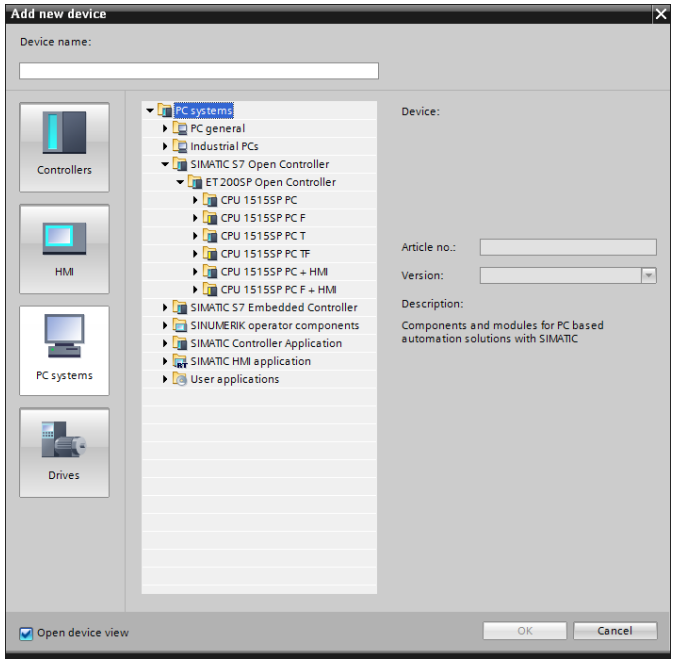
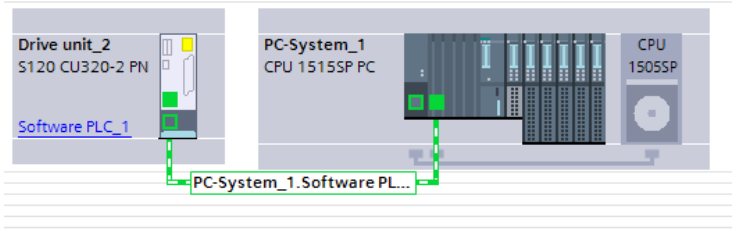
- Support of SINAMICS firmware V5.1 SP1 and V5.2
- Support of SIMOTICS 1FK2 motors
- Use with S7-1500 software and open controllers
- Support of technology data block telegram (telegram 750)
- Support of Isochronous Safe Position (support for the PLC function »SIMATIC Safe Kinematics«)
- Automatic servo tuning with One-Button-Tuning
- Support of Free Function Blocks
- Parameter view structured by drive functions (parameter groups)





SINAMICS Startdrive V15.1
Supported hardware for drives based on CU320-2

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	Topic	Feature		Effect
Integrated hardware	**SINAMICS drives**	S120	✓	Motion control drives and large drives
		G130, G150, S150, MV	✓	
	Control unit (CU)	CU320-2	✓	• Sinamics firmware ≥V4.8 • All Sinamics drives based on CU320-2 • CBE20 only as a Sinamics link
		CU310-2	✗	
	Infeed and power units	Booksize (compact)	✓	• Single- and multi-axis drive systems incl. chassis/cabinet • Protection category IP20 (control cabinet) • 3AC power supply
		Blocksize (e.g. PM240-2)	✗	
		Chassis/cabinet	✓	
	Applicable SIMATIC controllers	S7-1500/1500T/ET200SP	✓	Only with S7-1500/1500T/ET200SP CPU and with software/open controllers New
		Software/open controller	✓	
		S7-1200	✗	
		S7-300 and S7-400	✗	
	Applicable motors	SIMOTICS	✓	All SIMOTICS motors and 3rd motors (with the exception of SIMOGEAR and linear motors)
		External motors	✓	

SINAMICS Startdrive V15.1
Supported functions for drives based on CU320-2

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Integrated functions

Topic	Feature		Effect	
Drive control	Servo	✓	All drive control modes (servo, vector and U/f)	
	Vector	✓		
SAFETY functions	Basic	✓	• STO, SS1, SBC • SS2, SOS, SBT, SLS, SSM, SDI • SLP, SP, SCA	
	Extended	✓		
	Advanced	✓		
	Safety Acceptance Test	✓	Startdrive Advanced licence required	New
Communications	PROFINET	✓	• PN with IRT (clock-synchronized communications) • PROFINET only	
	PROFIBUS	✗		
Telegrams	PROFIdrive telegrams	✓	All telegram configurations	
	PROFIsafe	✓		
	Siemens telegrams	✓		
	Telegram extension	✓		
Additional functions	EPos	✓	• Central and decentral motion control possible • Drive Control Charts supported (separate installation and licence required)	New
	DCC	✓		

SINAMICS Startdrive V15.1 - Supported drive families

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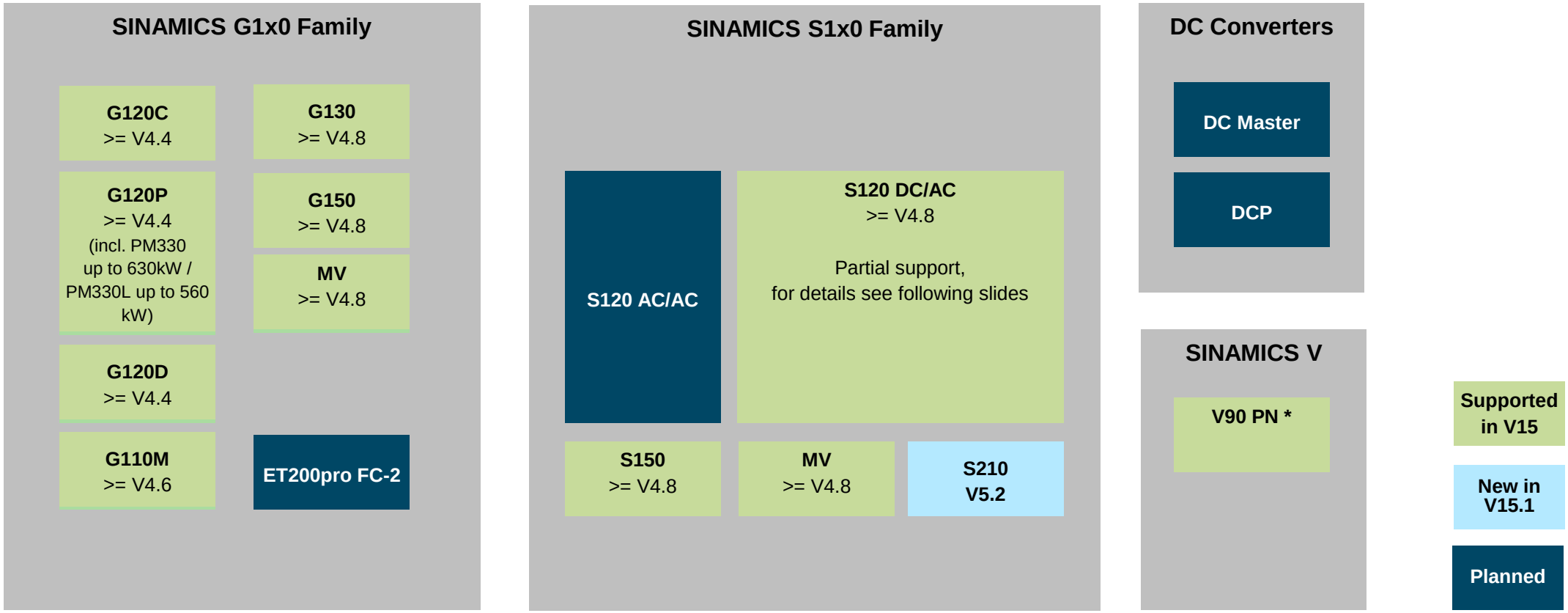

* Hardware Support Package available for TIA Portal, but not integrated into Startdrive

SINAMICS Startdrive V15.1 - Supported hardware components for CU320-2 based drives

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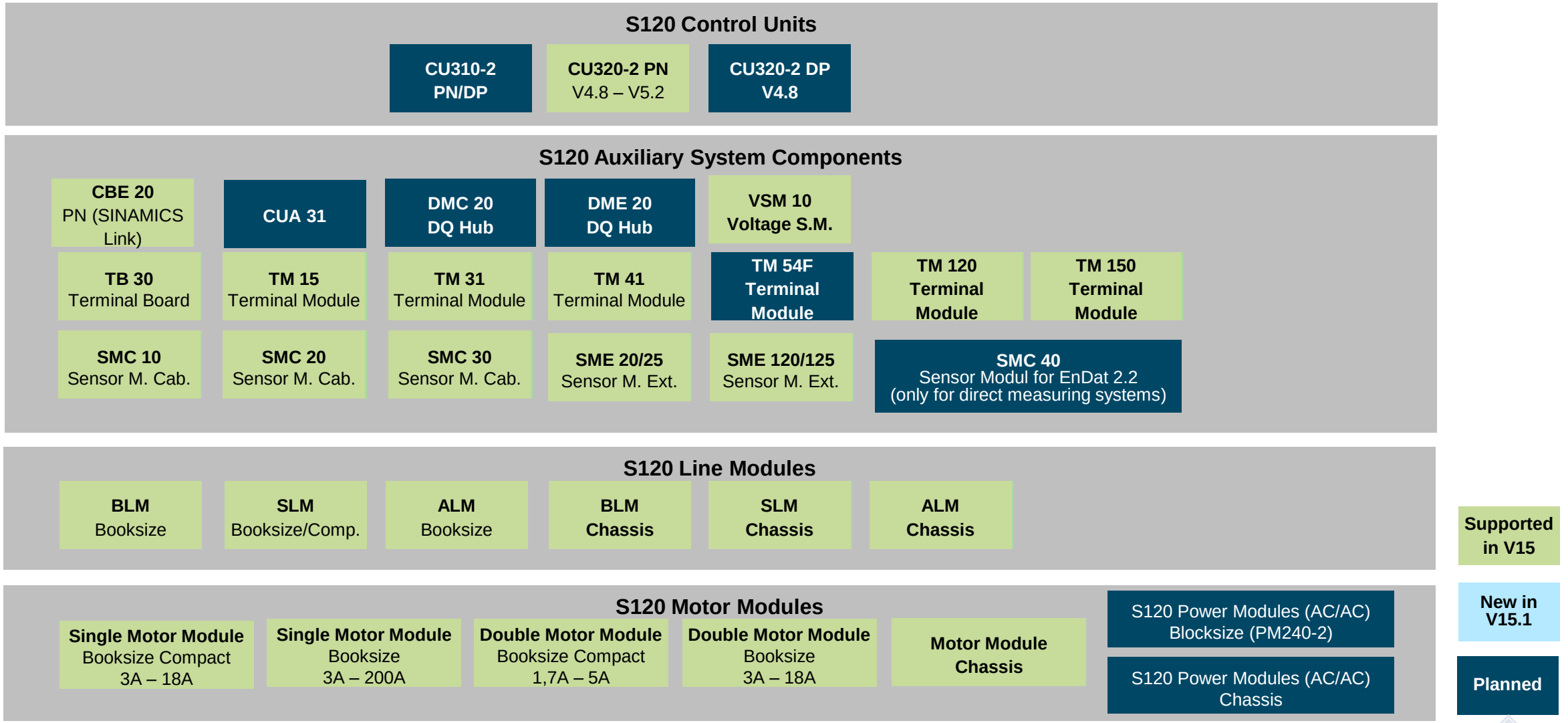
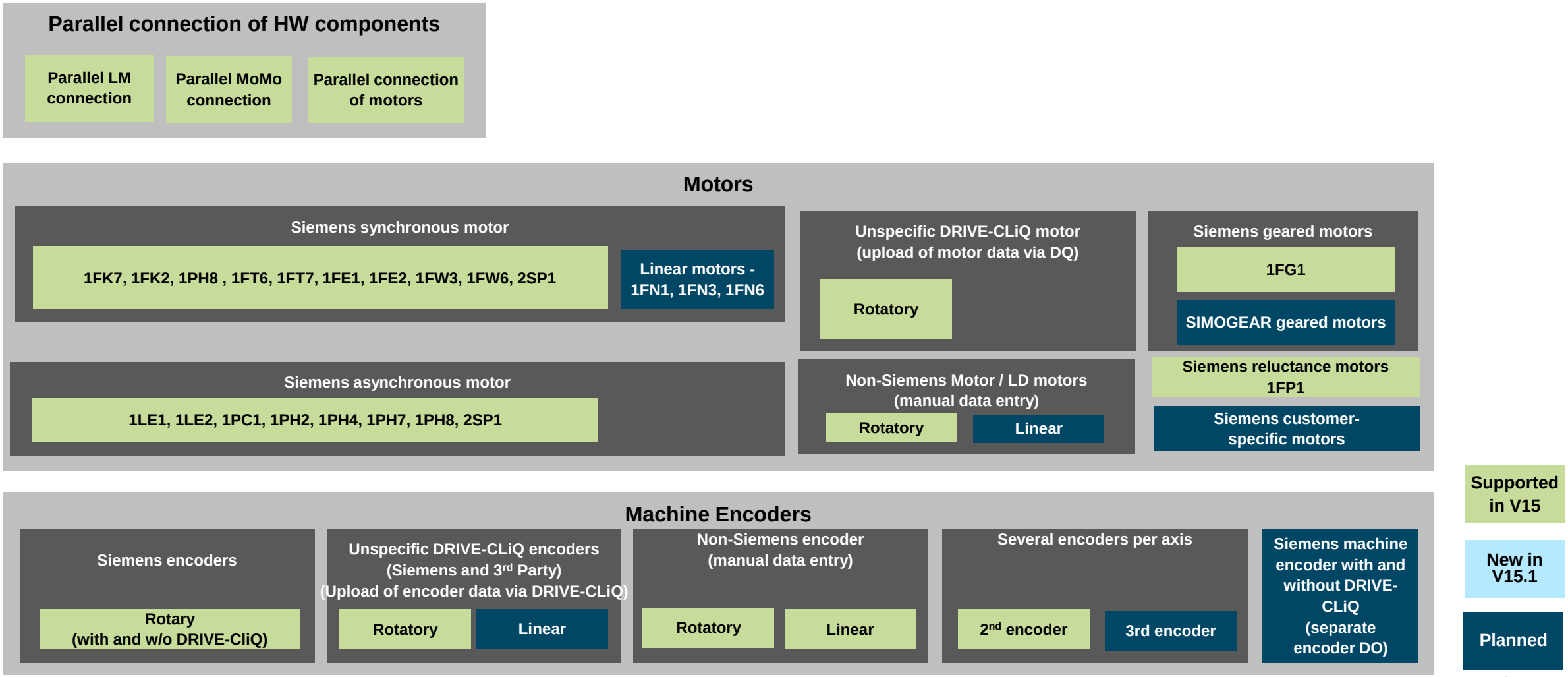


SINAMICS Startdrive V15.1
Supported hardware components for CU320-2 based drives

SIEMENS
Ingenuity for life



SINAMICS Startdrive V15.1
Supported engineering functions for CU320-2 based drives

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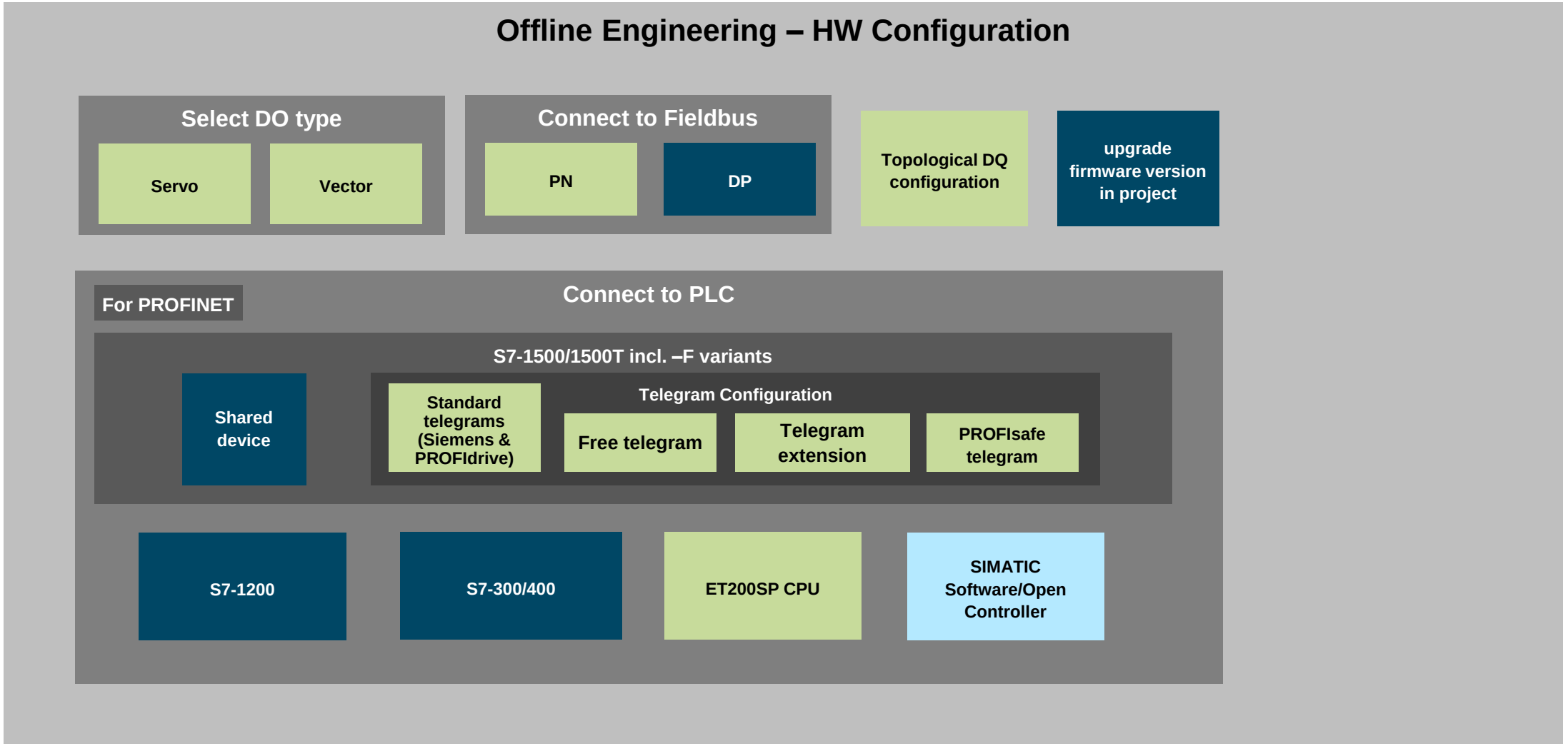
Ingenuity for life



SINAMICS Startdrive V15.1
Supported engineering functions for CU320-2 based drives

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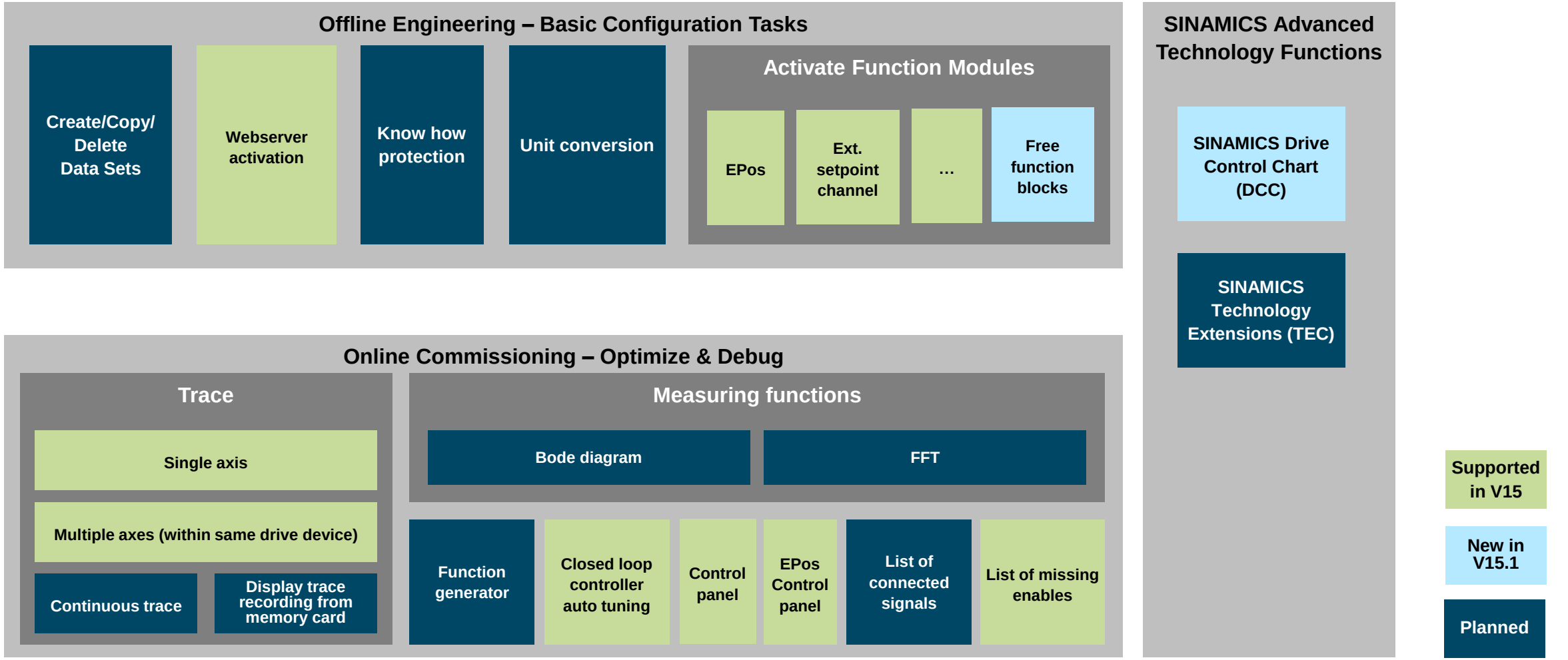
Ingenuity for life



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1 Highlights for all SINAMICS

2 SINAMICS S210

3 SINAMICS S120, G130, G150, S150, MV

4 **SINAMICS DCC**

5 SINAMICS G120

6 SINAMICS V90 HSP

7 SIMATIC MICRO-DRIVE

SINAMICS DCC V15.1
Highlight for SINAMICS S120, G130, G150, S150, MV

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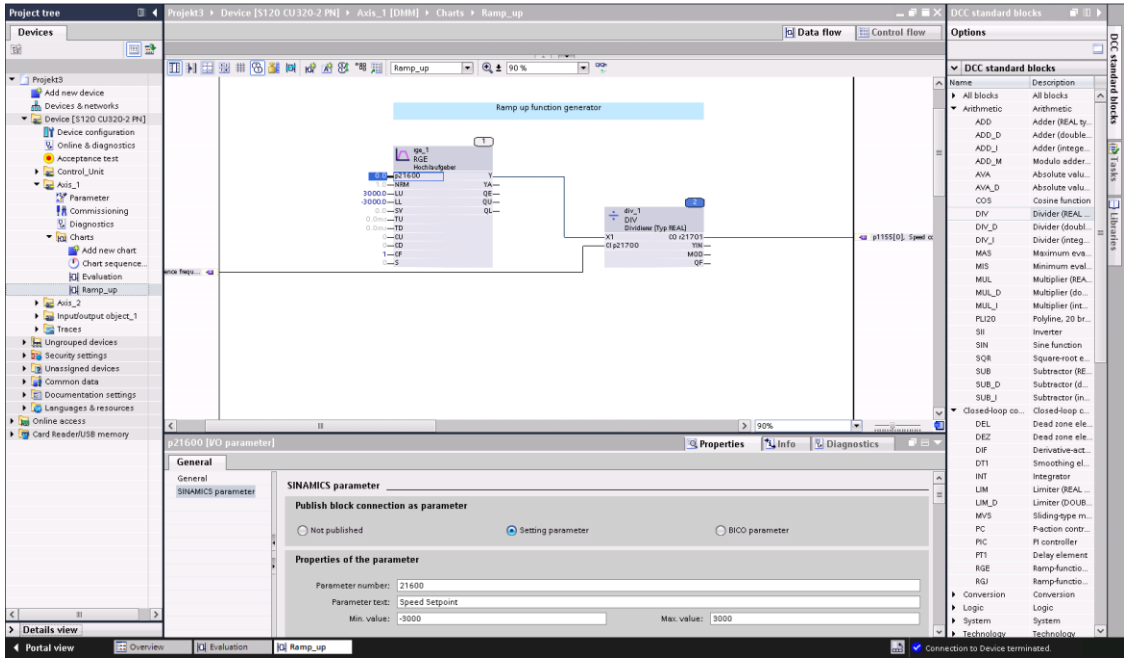
SINAMICS DCC V15.1 available

New

- SINAMICS Drive Control Chart (DCC) is a tool for graphical configuration via Drag&Drop of blocks for the creation of technological functions
- Blocks of DCB Standard and DCB Extension libraries usable
- Simple creation of own SINAMICS parameters
- Support of trace function and online monitoring in DCC plan
- Modularization of functions through multiple DCC plans per drive object



Requirements:

- Option package to Startdrive V15.1
- Support from SINAMICS firmware V5.2
- Engineering license required

Customer benefit

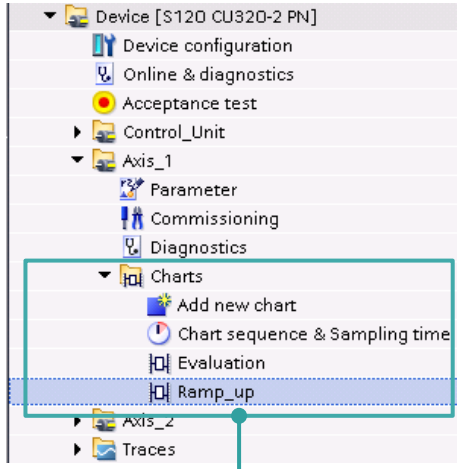
Extension of your own technological functions in the drive unit through graphic configuration.

SINAMICS DCC V15.1
Workflow of the configuration – steps 1 bis 3

SIEMENS
Ingenuity for life

1 Add chart

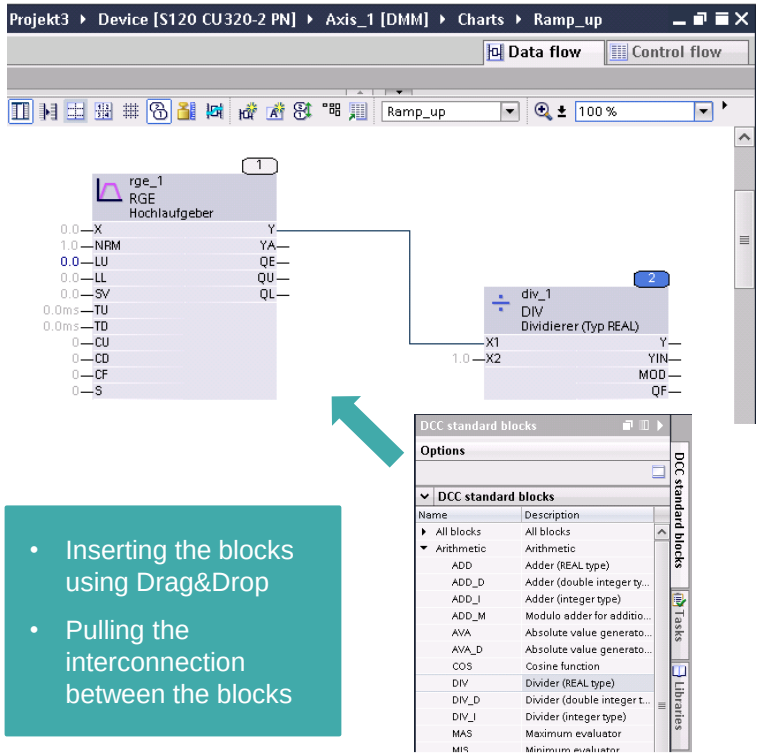
The extensions are configured graphically in the chart.



Charts for the technological extensions inserted under the drive object

2 Configure function

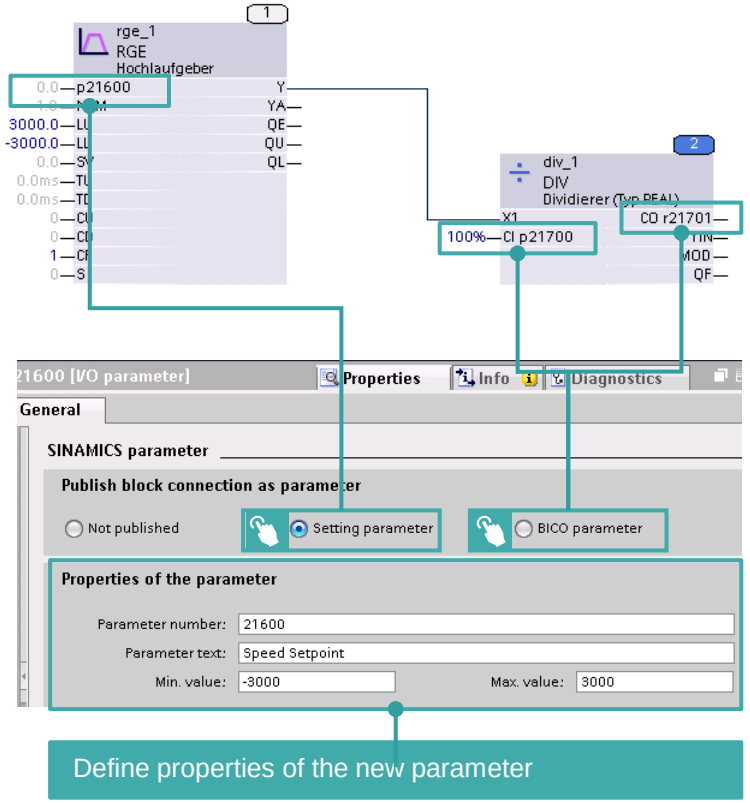
The function is created with blocks and interconnections.



- Inserting the blocks using Drag&Drop
- Pulling the interconnection between the blocks

3 Create SINAMICS parameter

SINAMICS Parameters are created (published) to parameterize the function.



Define properties of the new parameter

SINAMICS DCC V15.1
Workflow of the configuration – steps 5 bis 6

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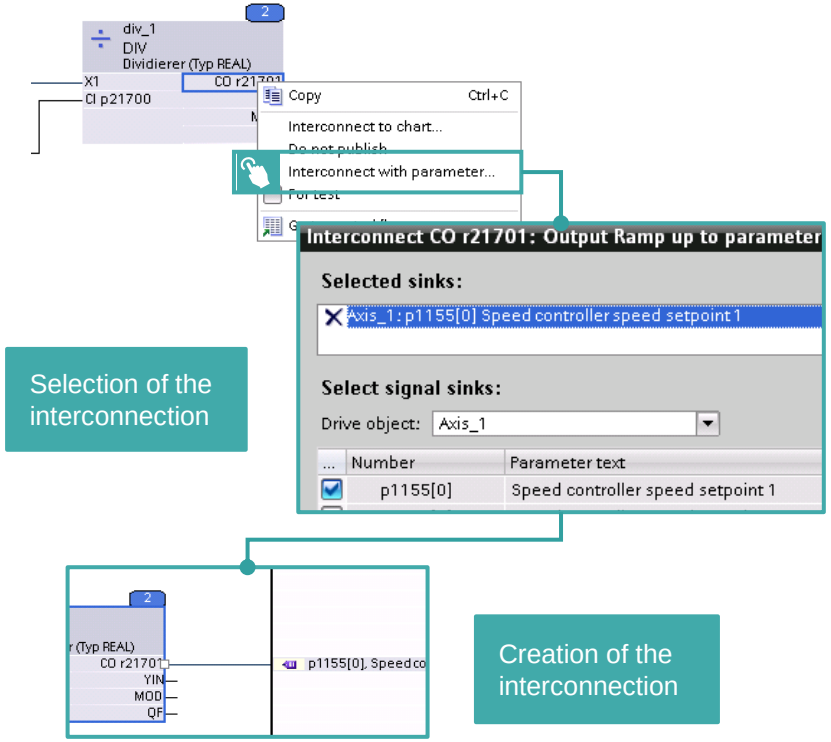
4 Interconnection with parameter

The interconnection create to parameters in the DCC chart.

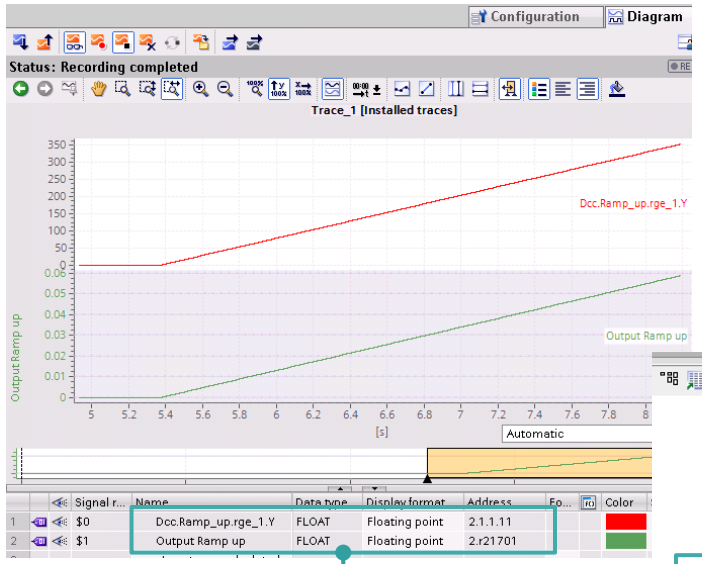


Selection of the interconnection

Creation of the interconnection

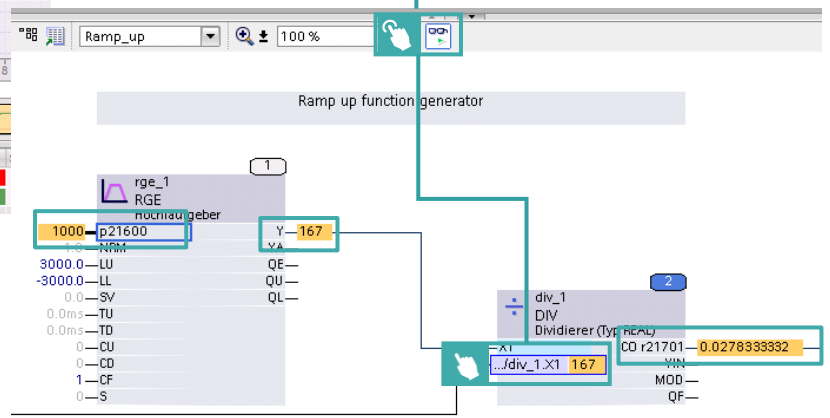
5 Test

After the download, the configuration is tested by recording in the trace or observing the values.



Trace from
- block connections
- created SINAMICS parameters

Observing in the chart of
- block connections
- created SINAMICS parameters



Agenda

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1 Highlights for all SINAMICS

2 SINAMICS S210

3 SINAMICS S120, G130, G150, S150, MV

4 SINAMICS DCC

5 **SINAMICS G120**

6 SINAMICS V90 HSP

7 SIMATIC MICRO-DRIVE

SINAMICS Startdrive V15.1
Highlights for SINAMICS G120

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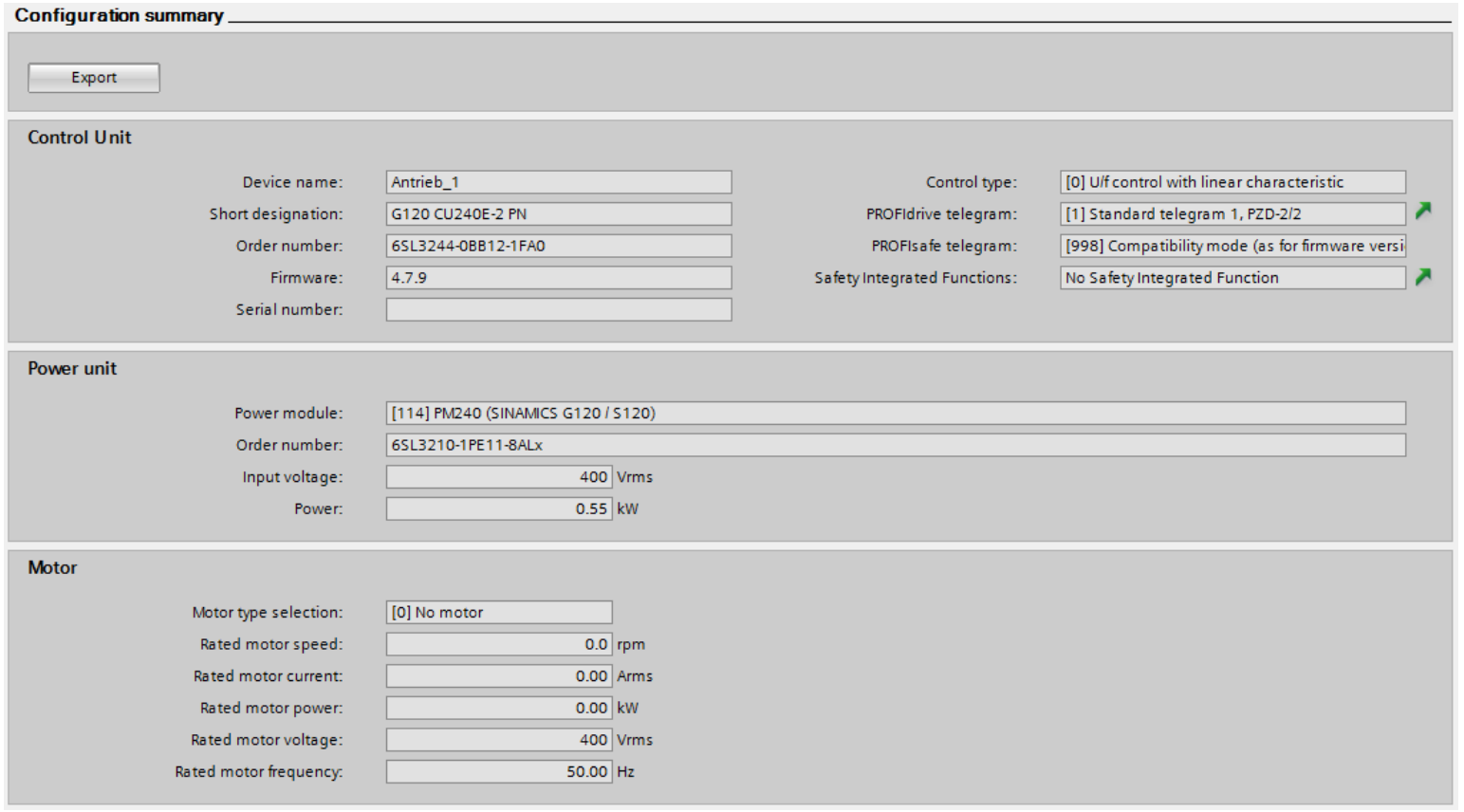
- Overview mask for G120 configuration (incl. Control Unit, Firmware, Power Module, motor data, encoder data)



SINAMICS Startdrive V15.1
Highlights for SINAMICS G120

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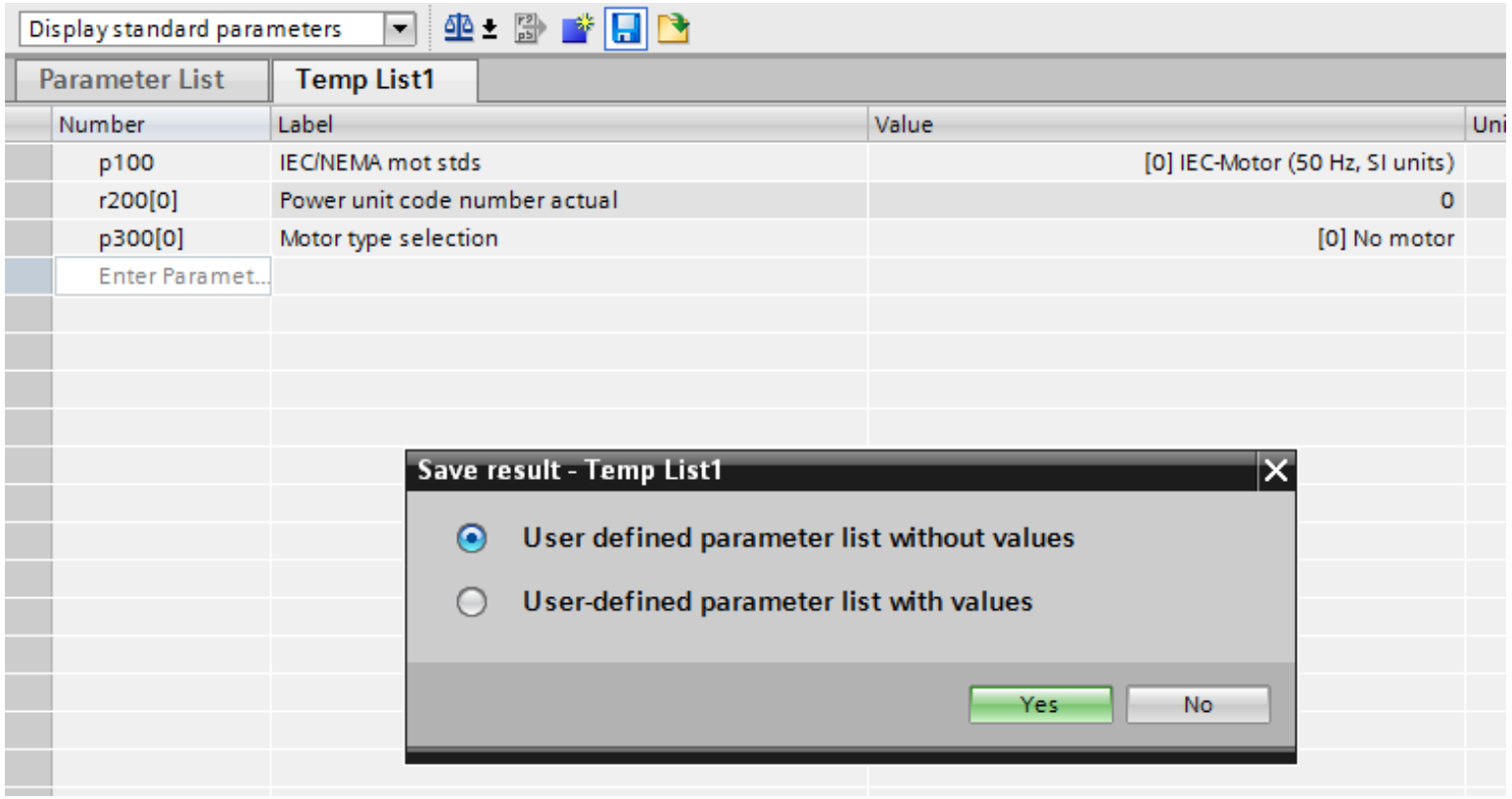
- User-defined parameter lists with/without parameter values incl. import/export option



SINAMICS Startdrive V15.1
Highlights for SINAMICS G120

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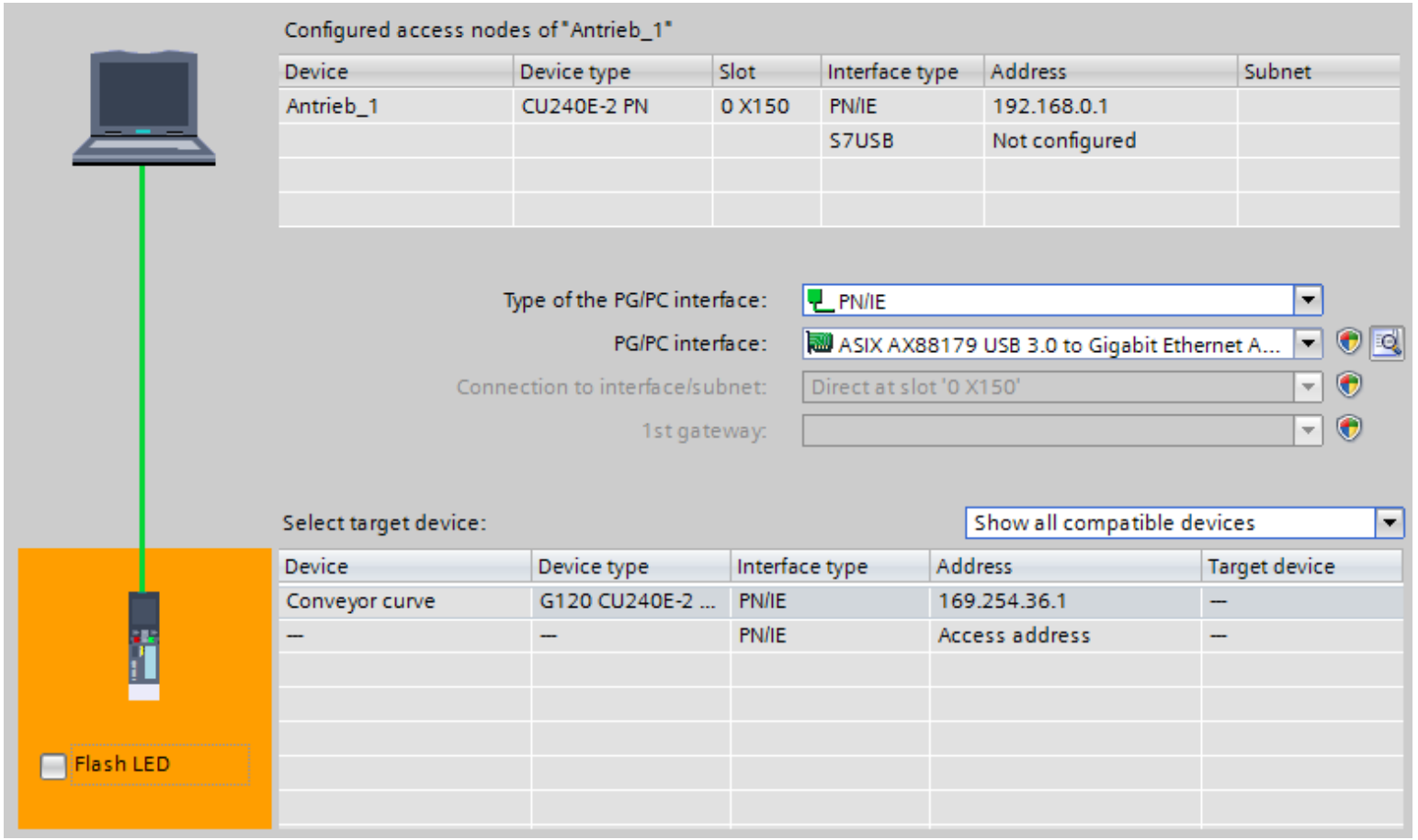
- Simplified device identification via »Flash LED« in the »Go online« dialogue



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5 SINAMICS G120

6 **SINAMICS V90 HSP**

7 SIMATIC MICRO-DRIVE

SINAMICS V90 HSP
Selection “Supplementary Telegram 750, PZD 1/3”

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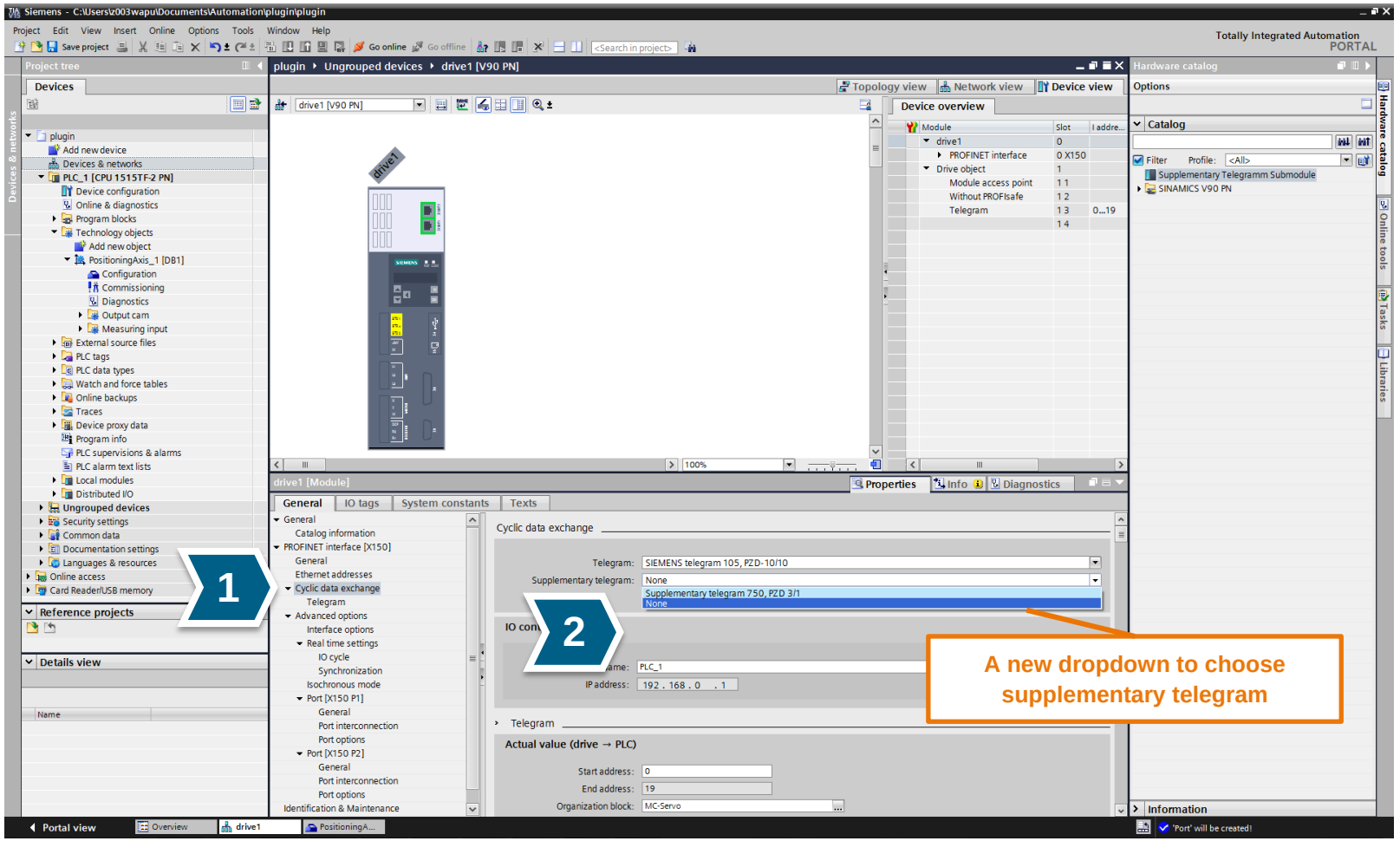

Description:

1. **Catalog:**
   Device [Module] – PROFINET interface [X150] – Cyclic data exchange - Telegram
2. **Add** : “Supplementary telegram 750, PZD 3/1”

- The supplementary telegram support transmitting additional torque + torque limit set-point and feedback.
- Standard telegram of V90 e.g. 105 and 3 in conjunction with supplementary telegram 750 can extend the control words and status words.

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SINAMICS V90 HSP
Device view and property page after adding telegram

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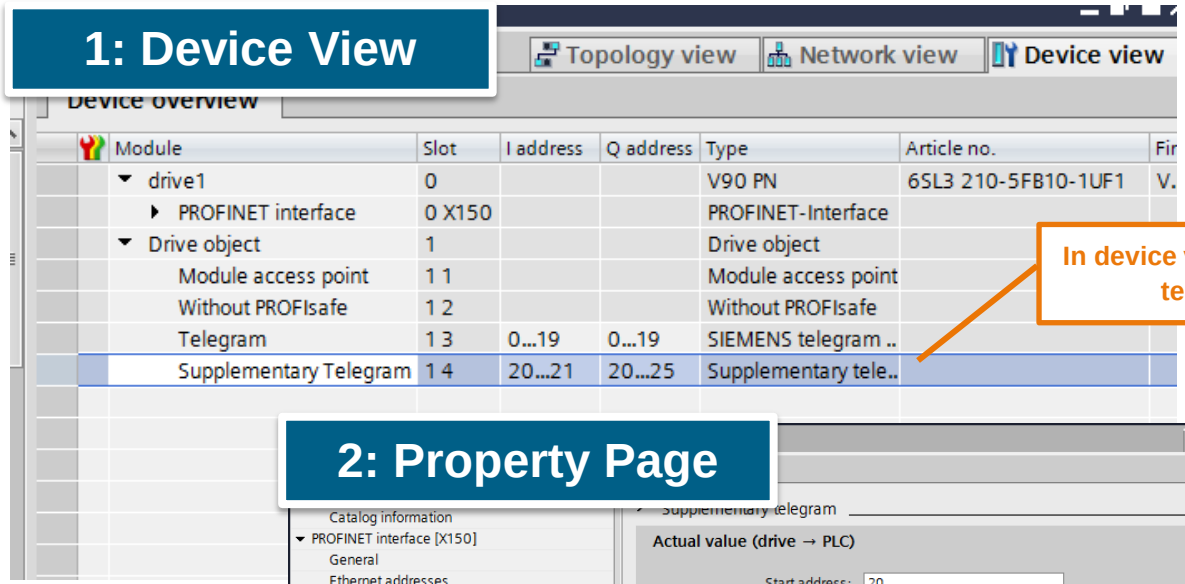
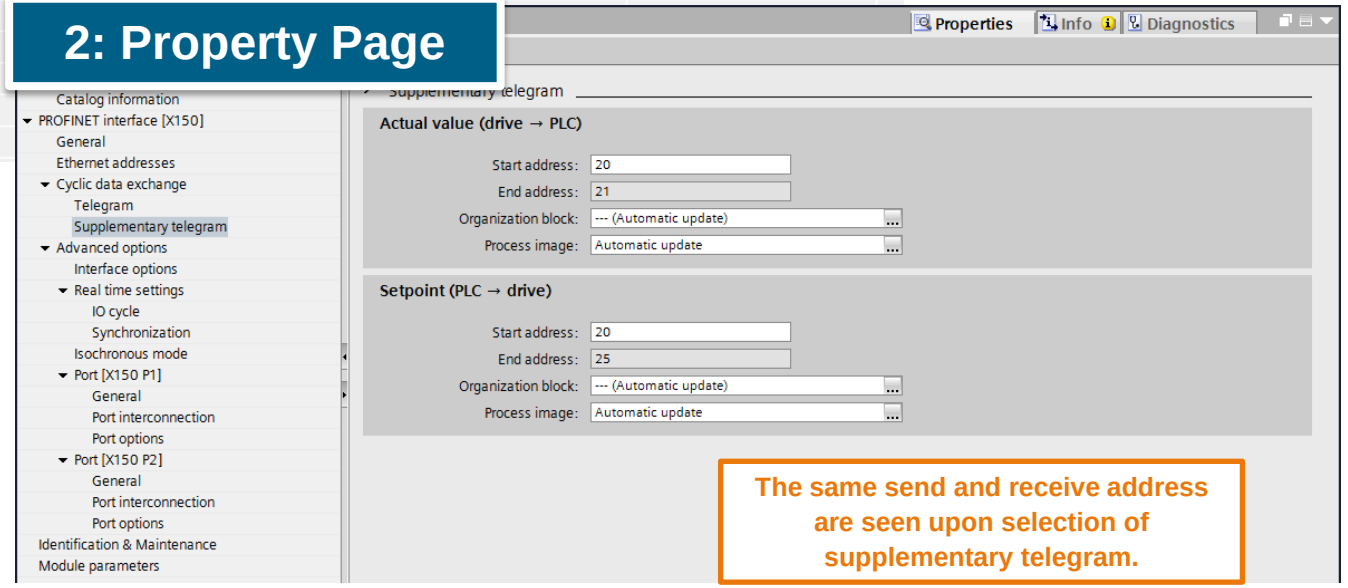
Ingenuity for life

1: Device View



In device view the supplementary telegram is added.

2: Property Page



The same send and receive address are seen upon selection of supplementary telegram.

Description:

Device overview:
Supplementary telegram will be added.

Property page:
Address of send and receive for supplementary telegram is updated and shown.

1. Drive to Controller: Actual torque
2. Controller to drive: Additional torque + torque limitation

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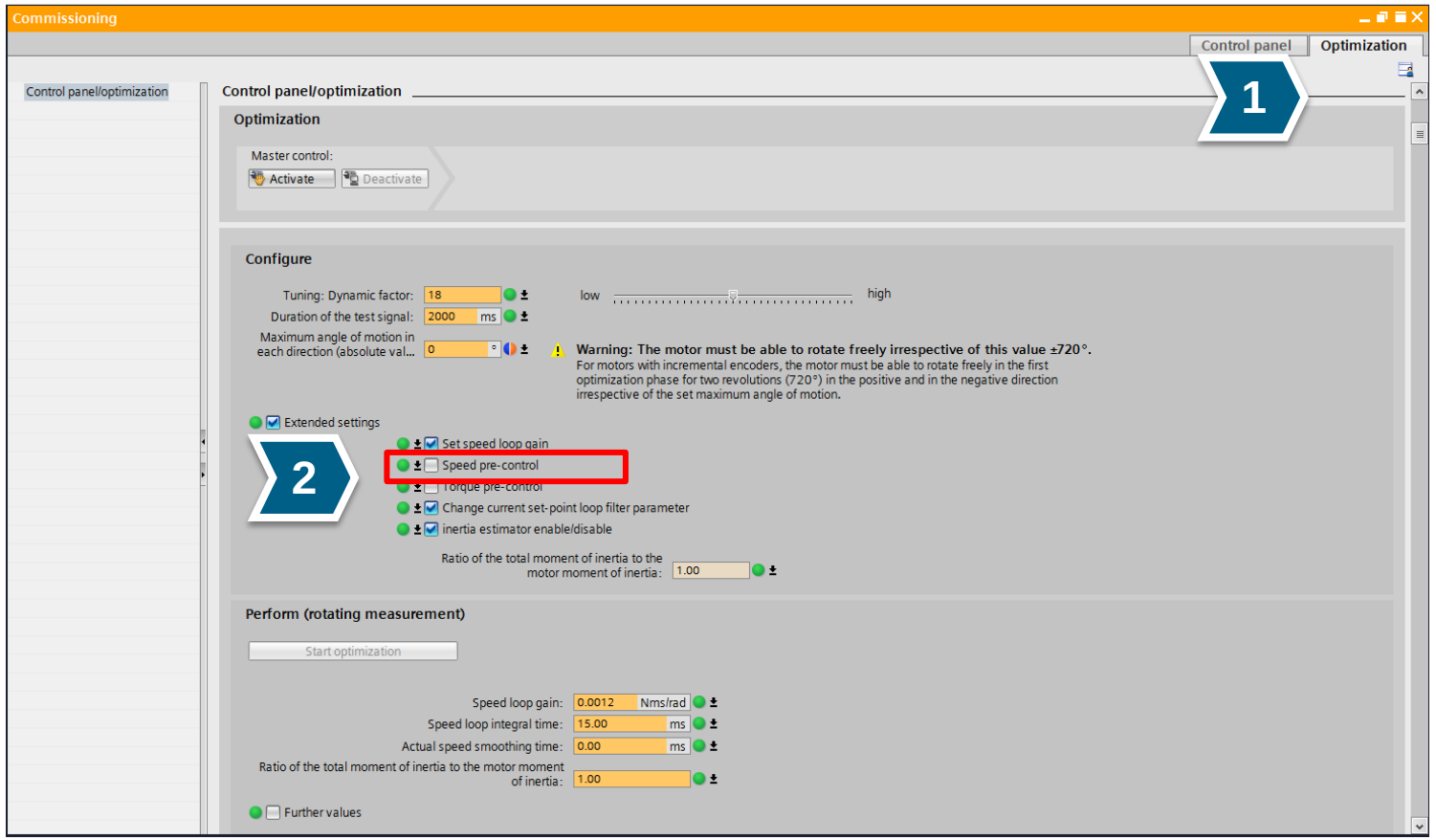
SINAMICS V90 HSP
Commissioning - Speed pre-control available



Description:

- **Catalog:**
  Drive – Commissioning – Optimization - Extended settings
- **Speed feed forward:**
  is available in TIA (Not as default setting in TIA, because default setting for LI has been already done in new firmware 10300).

***In new firmware 10300:**

- **Speed feed forward** active for LI (Low Inertia) by default for fast dynamic response and high precision positioning without user's setting.
- **Torque forward** active for LI in speed mode (decrease the follow-error by acceleration and deceleration without user's setting).
- Torque and speed feed forward **not active for HI.**

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Agenda

SIEMENS
Ingenuity for life

1 Highlights for all SINAMICS

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5 SINAMICS G120

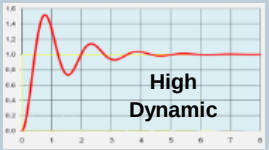
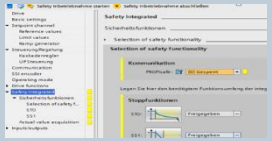
6 SINAMICS V90 HSP

7 **SIMATIC MICRO-DRIVE**

SIMATIC MICRO-DRIVE
Features and Benefits: The top highlights of the system

SIEMENS
Ingenuity for life

NEW

Feature / Function	Benefit
• Flexibility & combinability of system components* • **PROFINET IRT (1ms)**	 • Universally applicable • Increased performance
• Safety Integrated: STO, SS1, **SLT**, SLS, SBC, SSM via **PROFIsafe**	 • Fulfills high demands for safety
• **TIA Portal** integration • **“One Button Tuning”**	 • Easy engineering
• One cable to motor** • Integrated C1 EMC-Filter	 • Safes time on installation
• 24-48 V: 0,05-1kW • **Battery supply** incl. energy recovery • UL & Marine certification***	 • Ready for various markets

* Product partner: Dunkermotoren & ebm-papst (motors) / HARTING & KnorrTec (connecting cables)
** Dunkermotoren up to 200W & ebm-papst up to 400W
*** only for PDC

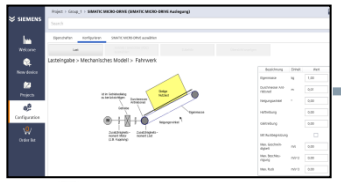
SIMATIC MICRO-DRIVE
24V/48V DC&EC Drive System

SIEMENS
Ingenuity for life

System overview

Including Standard I/Os and Failsafe I/Os

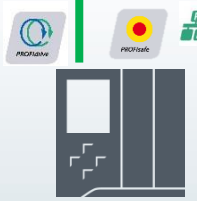
Configuration with TIA-Portal V15.1*
(only Step 7)



Drive Dimensioning
in the TIA-Selection-Tool

24V / 48V Power Supply

SITOP
(24 / 48V)



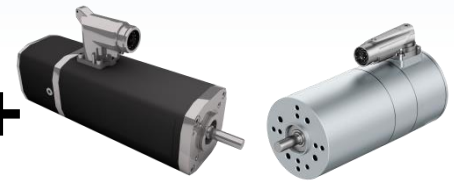
SIMATIC S7
(S7-1200, S7-1500, …)

SIMATIC MICRO-DRIVE

Cable
(Product Partner[2])

One cable to motor

Gear motor
(Product Partner[1])



Including Encoder & Gearbox

Incremental encoder / Hall
just as second encoder interface (SSI)

[1] Ebm-papst, Dunkermotoren
[2] HARTING, KnorrTec

*) Pilotphase V14 SP1
Market Launch with V15.1

SIMATIC MICRO-DRIVE
HSP for TIA Portal

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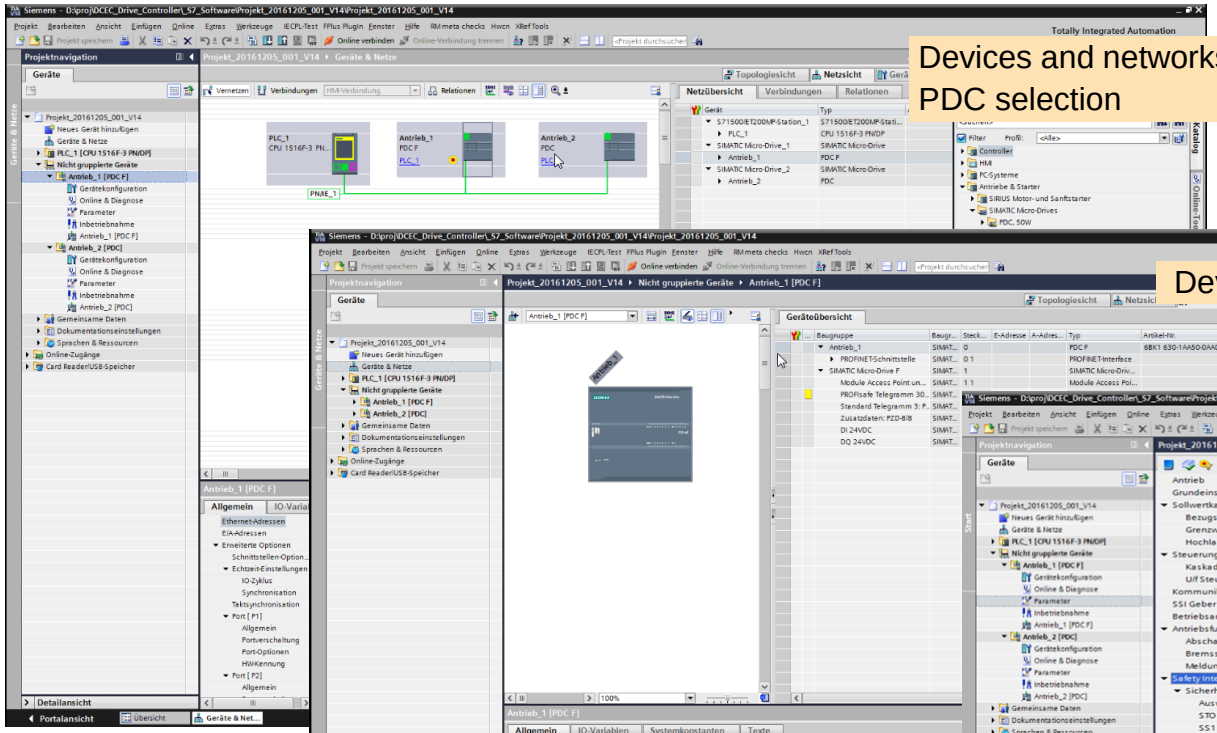
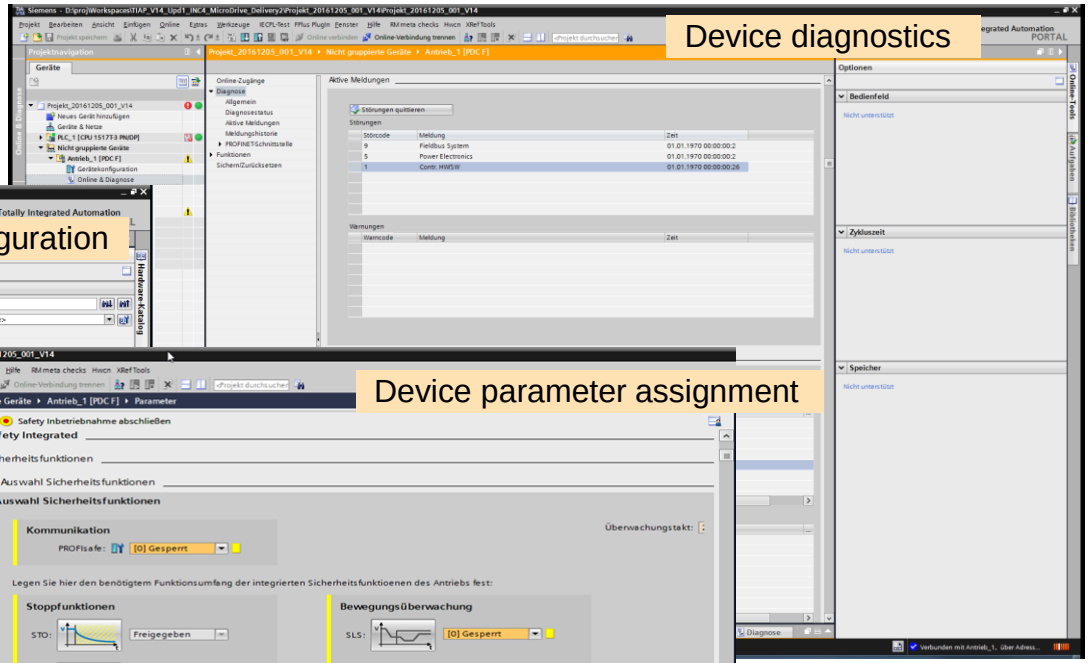
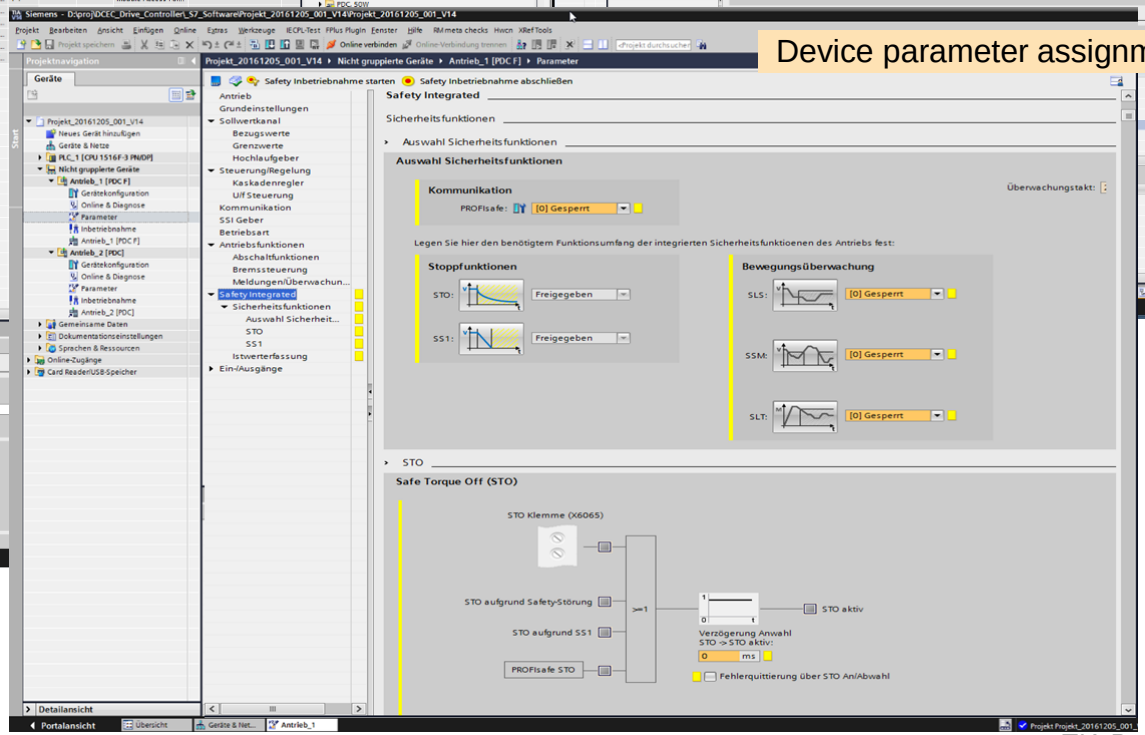
Ingenuity for life

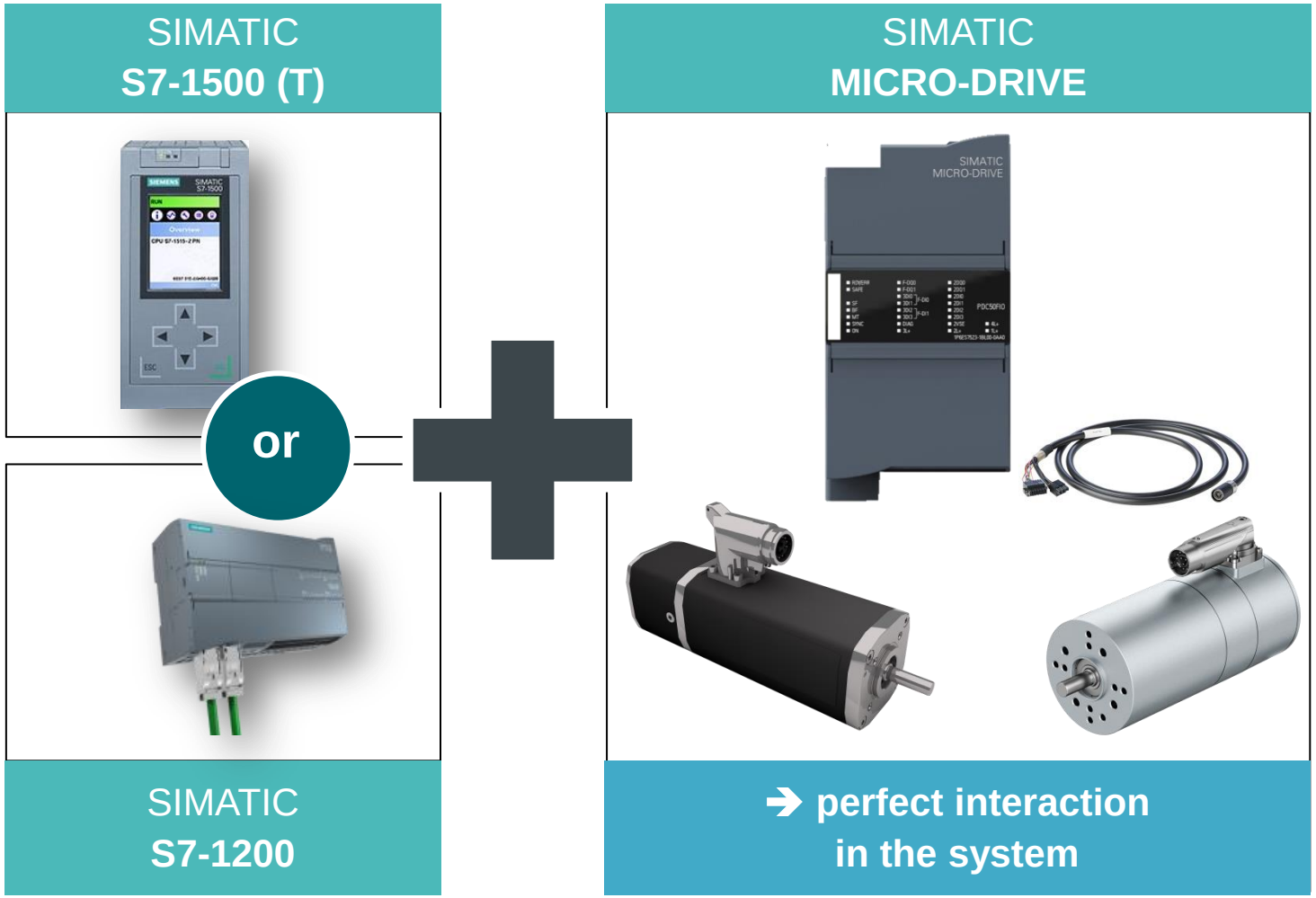






SIMATIC MICRO-DRIVE
Perfect interaction in the system

SIEMENS
Ingenuity for life



Advantages of the servo drive system

- ✓ Efficient engineering
- ✓ Seamless and straightforward drive control
- ✓ Harmonized and coordinated portfolio
- ✓ Integrated safety technology
- ✓ System diagnostics

TIA Portal – Highlights of TIA Portal V15.1

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Ingenuity for life

Hardware configuration

- S7-1500R/H redundant systems
- MRP domain management across project boundaries
- Change firmware version for IO devices

Startdrive – Innovations

- Openness add-ins for G120, S120, S210
- Integration of SINAMICS S210 and SIMOTICS 1FK2 motors
- Startdrive Advanced: Safety acceptance test for S120 and S210 drives

STEP 7 – Innovations

- Software units: Splitting of user program into separately loadable units
- Textual interface for SCL blocks
- Improvements in online monitoring of blocks

System functions

- Trace: Simplified chart configuration
- TIA Portal Openness add-ins (ET 200SP read/write parameters, watch tables, extended functionality for block import)
- User-defined shortcut keys

WinCC – Innovations

- Support of OPC UA Server Alarm and Condition
- ProDiag Control functional add-ins

TIA Portal options

STEP 7 Safety
Flexible F Link, DP_DP_ID, Openness add-ins

Multiuser
commissioning mode

OPC UA
S7-1500 client, SiOME configuration tool

ProDiag
Usability add-ins, such as hierarchical comments

PLCSIM Advanced
Floating window, max. cycle time handling through the API

Target 1500S for Simulink
Model on Web server, transfer of SO files

Teamcenter Gateway
Multiuser engineering, reference projects

SiVArc
Access protection, SCL blocks, template screens, Openness add-ins

Energy Suite
Energy screens, reports, SINAMICS, usability improvements

System Functions – Project Upgrade

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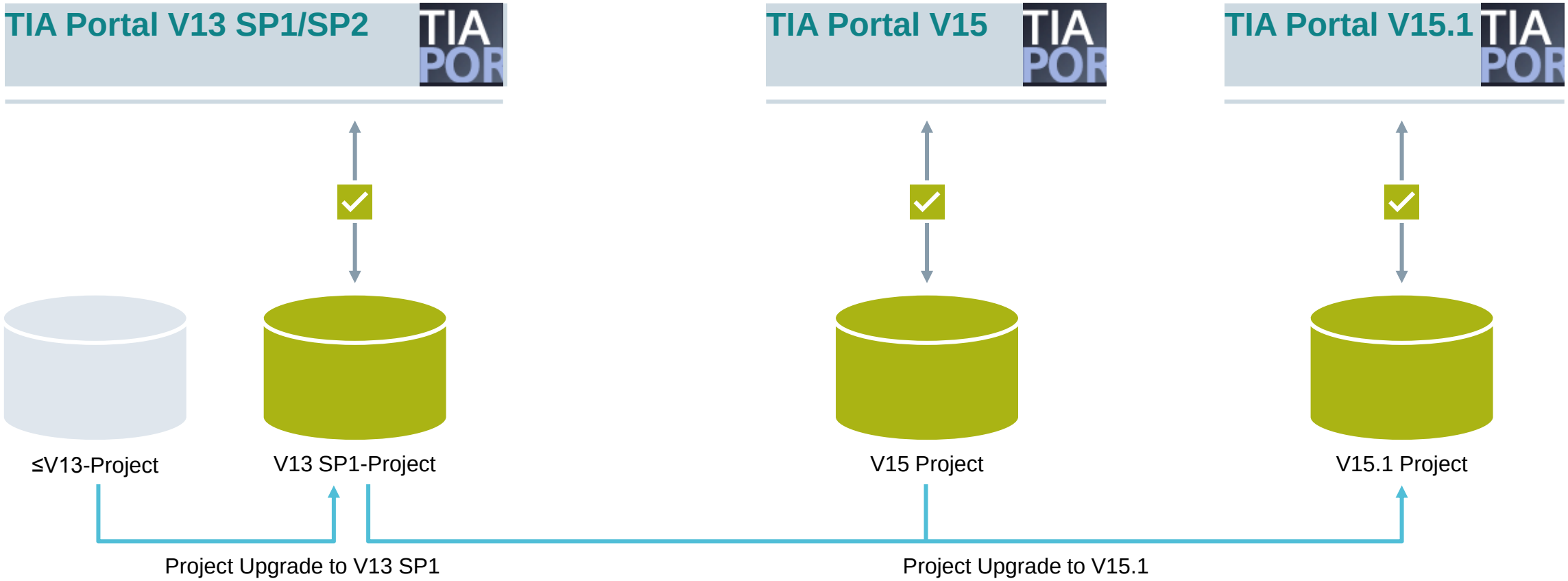
Ingenuity for life



Side-by-side installation of V13 SP1/SP2, V14 SP1, V15 and V15.1 enables access to all project versions. V15 license for all available TIA Portal versions including V15.1 usable.

TIA Portal Trace Innovations – Simplified handling of chart configurations

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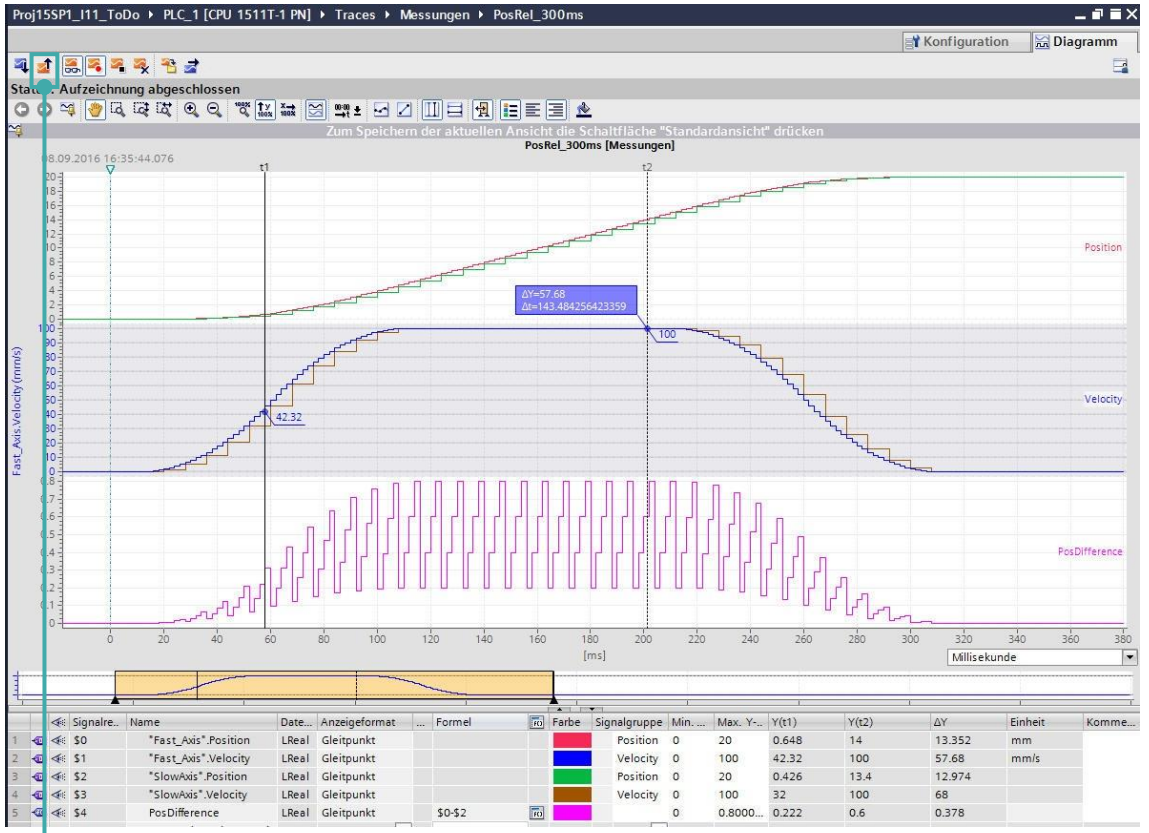
Ingenuity for life

Expansions

- Settings can already be made during configuration
- Changes made in online mode can be retained
- When changes are made to the trace configuration (signals, OBs, triggers, etc.), the settings are no longer lost.

Affected functions (examples)

- Signal grouping
- Color picker
- Display format
- Creating formulas



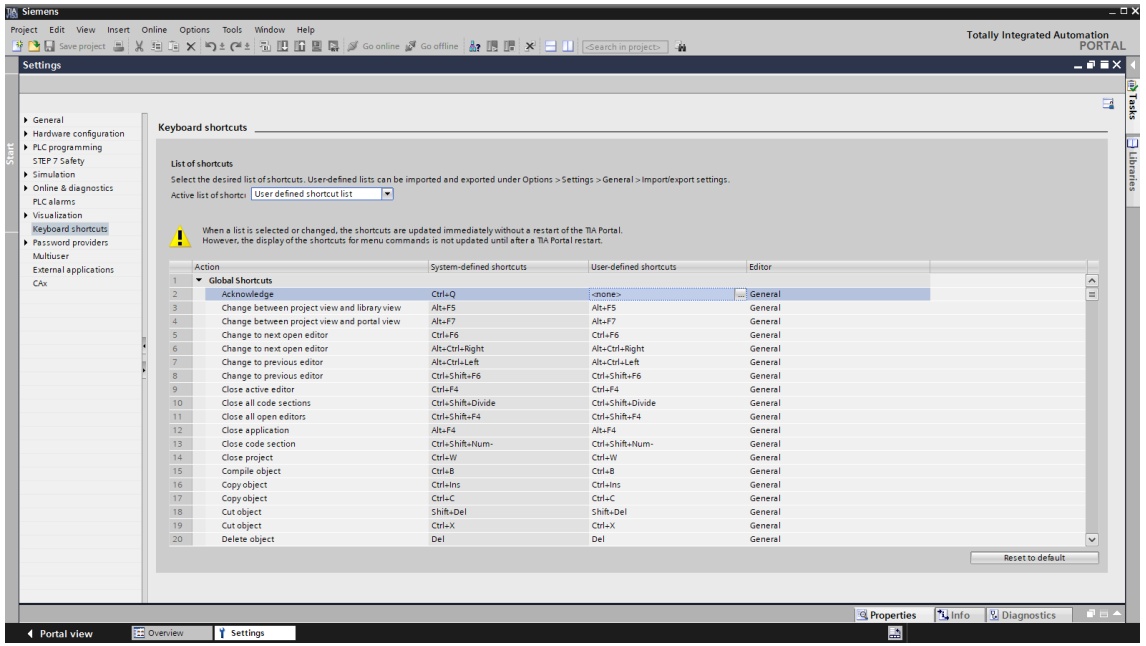
Change in online mode can also be entered in the project

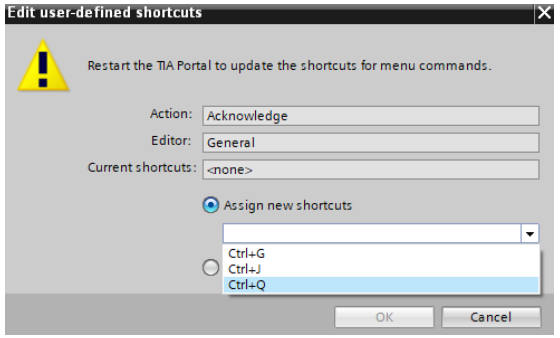
System Functions – User-defined shortcut keys

SIEMENS
Ingenuity for life

Function

- Adaptations of keyboard shortcuts in the TIA Portal settings
- Existing functions with keyboard shortcuts can be assigned new keyboard shortcuts
- User-defined keyboard shortcuts can be imported and exported





Benefits

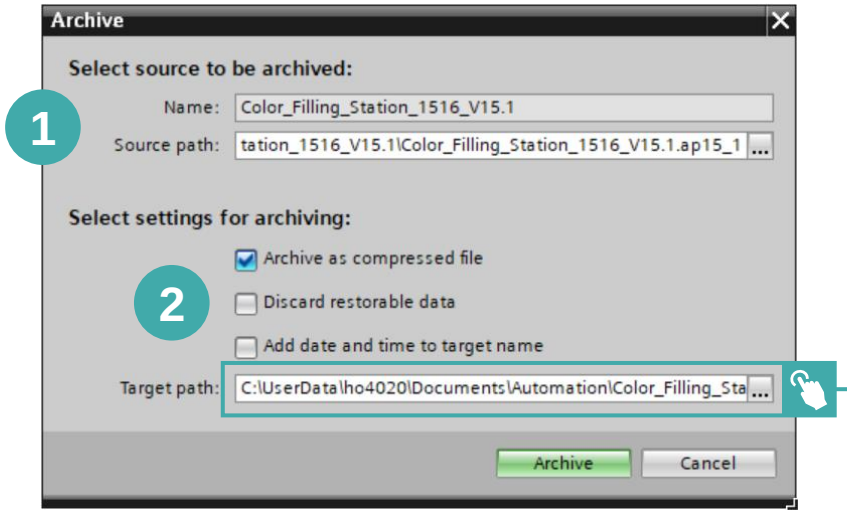
- Faster and more intuitive working with the keyboard, keyboard shortcuts familiar to the user
- Using the user-defined keyboard shortcuts, another installation of the TIA Portal with export/import

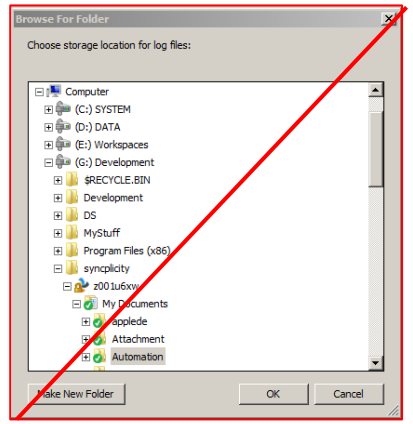
System Functions – Improved usability for archiving projects

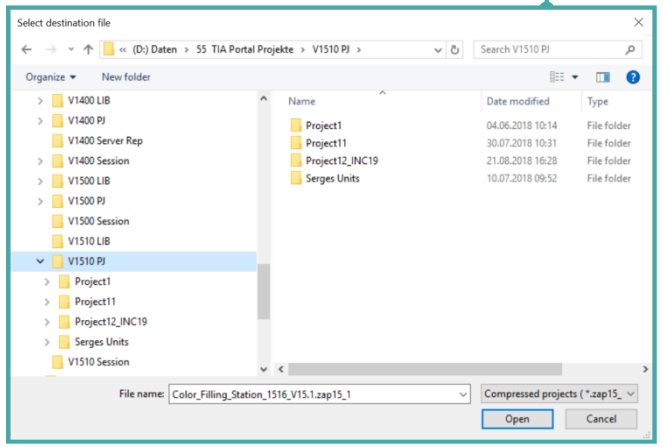
SIEMENS
Ingenuity for life

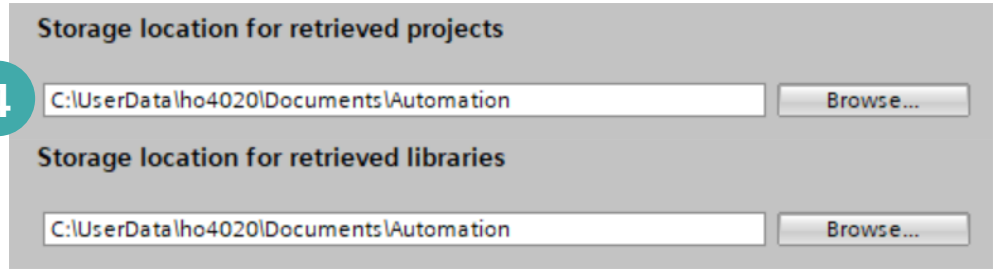
Benefits

1. Projects no longer need to be explicitly opened for archiving.
2. By default, the projects are completely archived with all data, so that it is not necessary to recreate them.
3. Integration of the current file selection dialog for archive selection. Better overview, simplified path selection with history, display of the existing file, direct editing option.
4. Extension of TIA Portal settings to include a default path for storing retrieved projects and libraries.







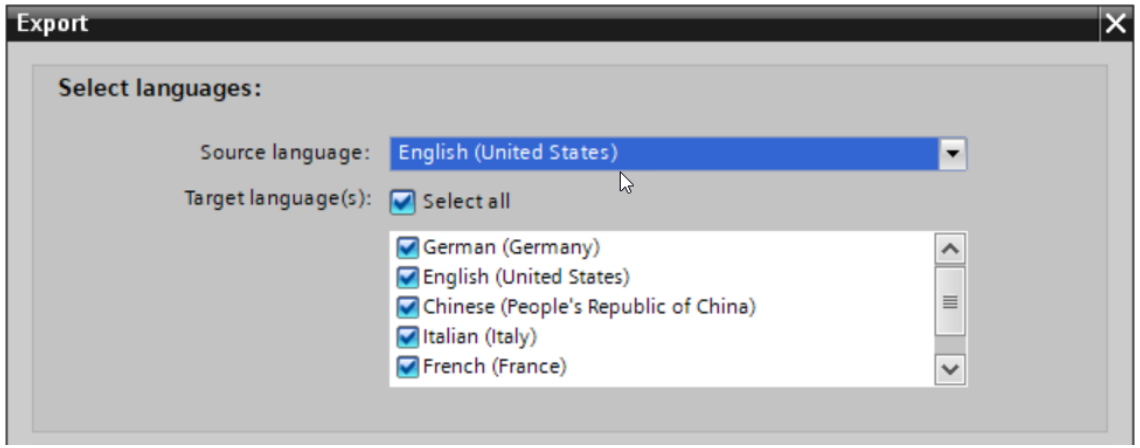


System Functions – Export and import of project texts

SIEMENS
Ingenuity for life

Benefits

- For texts in the project and libraries it is possible to export and import several languages in one operation.



	A	E	F	G	H	I	J	K
1	Category	en-US*	de-DE	en-US	zh-CN	it-IT	fr-FR	es-ES
102	<HMI screen>	Diagnosis	Diagnose	Diagnosis	诊断	Diagnostica	Diagnostic	Diagnòstico
103	<HMI runtime>	Different jobs	Different jobs	Different jobs	Different jobs	Different jobs	Different jobs	Different jobs
104	<HMI runtime>	Different jobs	Different jobs	Different jobs	Different jobs	Different jobs	Different jobs	Different jobs
105	<HMI screen>	Display CMYK values	Anzeige der CMYK-Werte	Display CMYK values	显示 CMYK 值	Vista dei valori CMYK	Afficher les valeurs CMYK	Mostrar valores CMYK
106	<HMI screen>	Display color selection	Anzeige der Farbauswahl	Display color selection	显示颜色选择	Vista della selezione del co	Afficher le choix des coule	Mostrar selección de colo
107	<HMI screen>	Display version	Version anzeigen	Display version	显示版本	Visualizza versione	Afficher la version	Mostrar versión
108	<HMI screen>	Display version	Version anzeigen	Display version	显示版本	Visualizza versione	Afficher la version	Mostrar versión
109	<HMI runtime>	Drive Conveyor Exists	Antrieb Band vorhanden	Drive Conveyor Exists	可用的传送带驱动装置	Per nastro trasportatore p	Pour convoyeur disponible	Por cinta transportadora p
110	<HMI runtime>	Drive Conveyor Fault	Antrieb Band Fehler	Drive Conveyor Fault	传送带组错误	Errore cumulativo nastro t	Erreurs groupées convoye	Error colectivo cinta trans
111	<HMI runtime>	Drive Mixer Exists	Antrieb Mischer vorhande	Drive Mixer Exists	可用的搅拌器驱动装置	Per miscelatore presente	Pour mélangeur disponible	Por mezclador presente
112	<HMI runtime>	Drive Mixer Fault	Antrieb Mischer Fehler	Drive Mixer Fault	搅拌器组错误	Errore cumulativo miscela	Erreurs gorupées mélange	Error colectivo mezclador
113	<HMI screen>	ETHERNET	ETHERNET	ETHERNET	以太网	ETHERNET	ETHERNET	ETHERNET

System Functions – TIA Portal Openness – Block export with snapshot

SIEMENS
Ingenuity for life

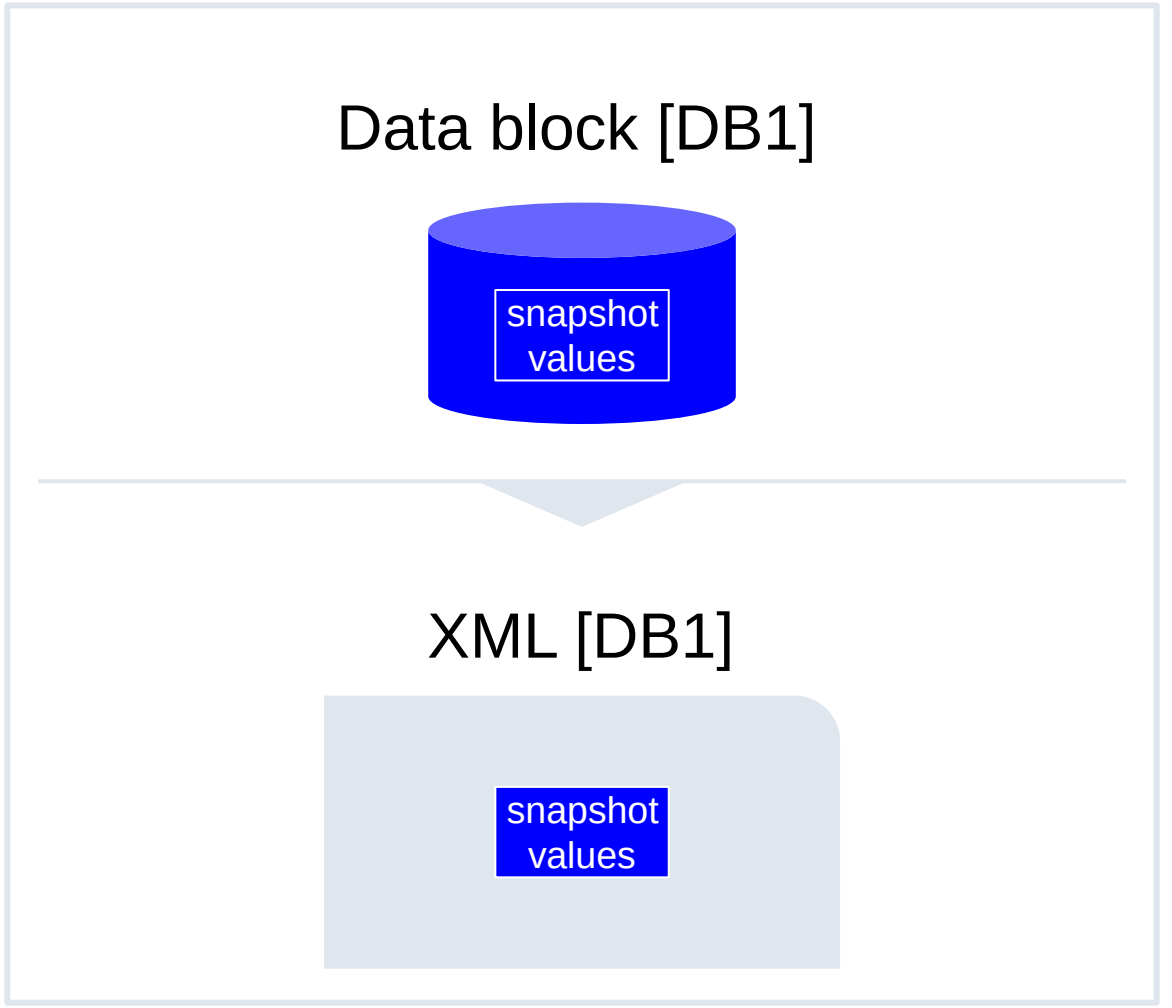
XML export of the snapshot of actual values

New

The snapshot of the actual values is stored in the XML file during export via Openness.

Benefits

Different snapshots can be compared via XML files



System Functions – TIA Portal Openness – Reading snapshot values from DB export

SIEMENS
Ingenuity for life

XML export of the snapshot

New

The snapshot values of a DB can be read from its XML export file via Openness.

GlobalSignals (snapshot created: 3/18/2018 9:48:32 PM)

	Name	Data type	Start value	Snapshot
	Static			
	rectangle	Real	0.0	-5.0
	sawtooth	Real	0.0	4.5
	triangle	Real	0.0	-1.0
	sinus	Real	0.0	-1.545086

...

<Snapshot ReadOnly="true"><SnapshotValues

<Value Path=“rectangle" Type=“Real">-5.0</Value>

<Value Path=“sawtooth" Type=“Real">4.5</Value>

...

Benefits

Important parameters that typically do not change frequently, such as controller parameters, can be

- Uploaded from one and the same DB
- at different times
- After the respective DB XML export
- read out and compared from there

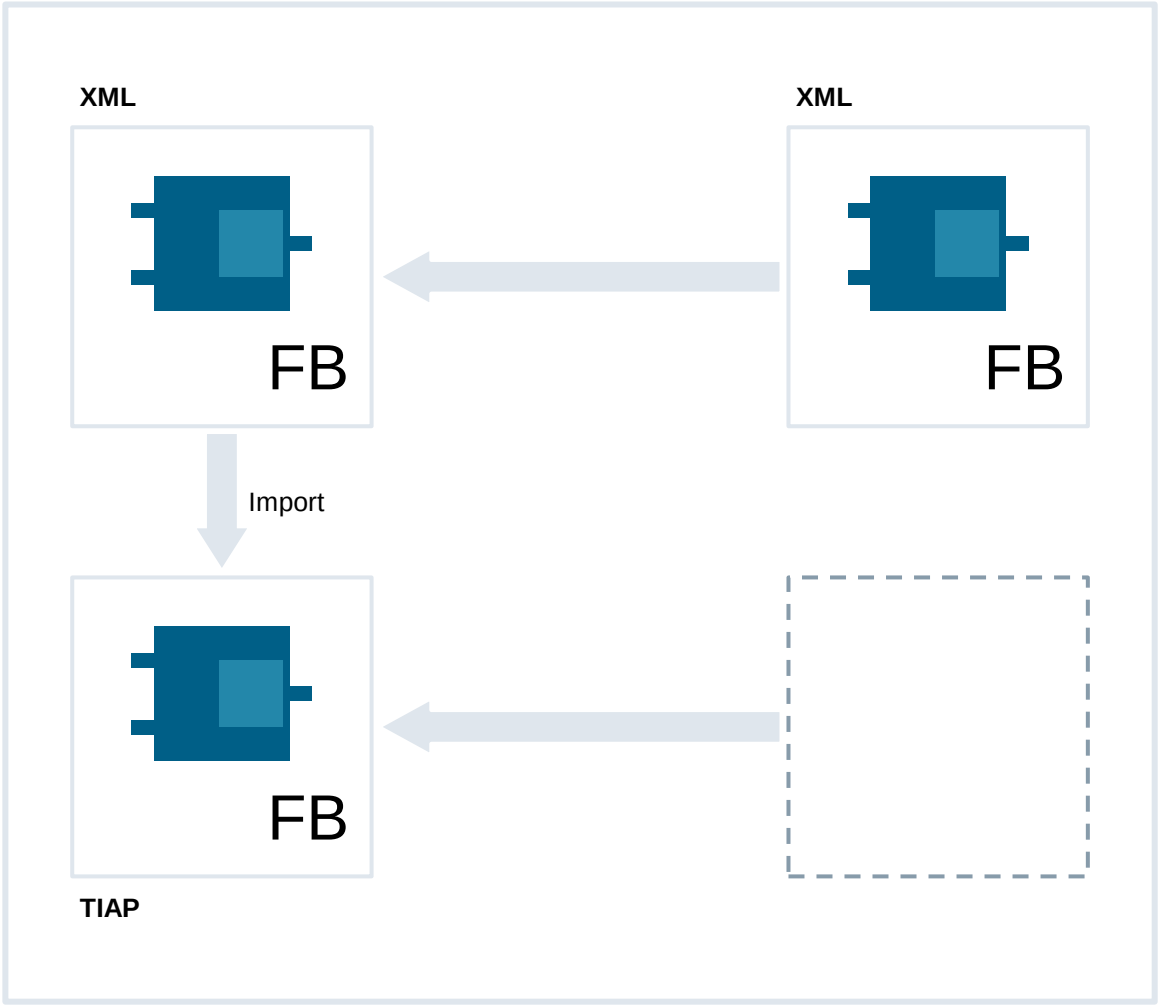
System Functions – TIA Portal Openness – Fault-tolerant XML import

SIEMENS
Ingenuity for life

Fault-tolerant XML import of inconsistent blocks

New

Block XMLs can be imported, even if used UDTs or called blocks are not available or not matching in the target project



Benefits

The XML import is not terminated as before and displays the inconsistent places to the user. In certain situations, the import rules can mean the loss of instance-specific attributes, such as start values.

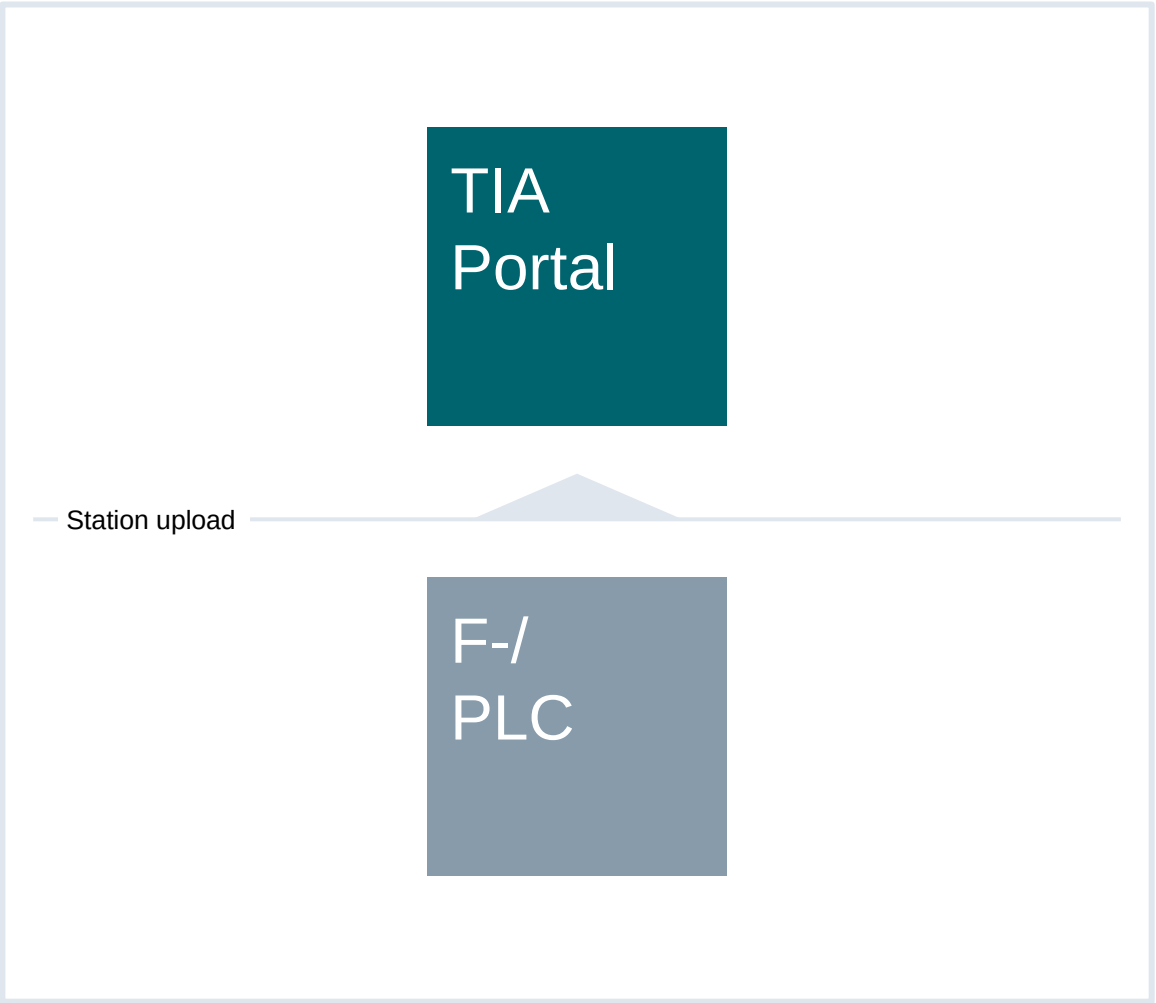
System functions – TIA Portal Openness – Station Upload

F-/PLC station upload via Openness

New

At runtime, a station upload to an empty project can triggered from an F/PLC via Openness

The station upload is extended by file data: recipes, data logs and user files



Benefits

A customer can automatically obtain and manage station uploads

For the station upload can be handled:

- F-/PLC protection level passwords,
- connections, also via NAT routers.

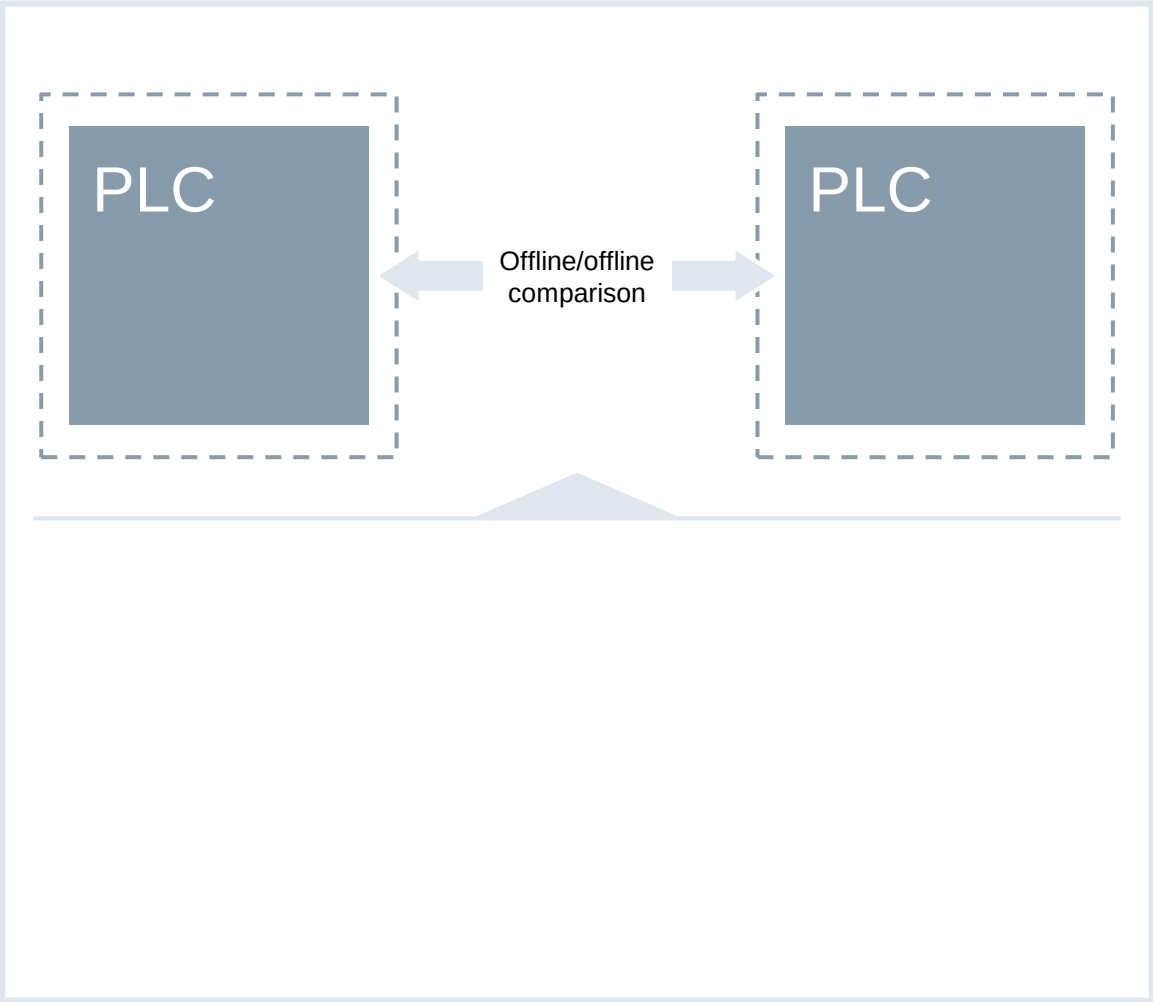
System Functions – TIA Portal Openness – Offline/offline comparison

SIEMENS
Ingenuity for life

PLC offline/offline comparison

New

Automatically triggered comparison of 2 PLCs which can be in different projects



Benefits

Data of a PLC in the last offline project and in the uploaded project can be compared.

The differences indicate changes that may be merged manually.

System Functions – TIA Portal Openness – Reset/set know-how protection

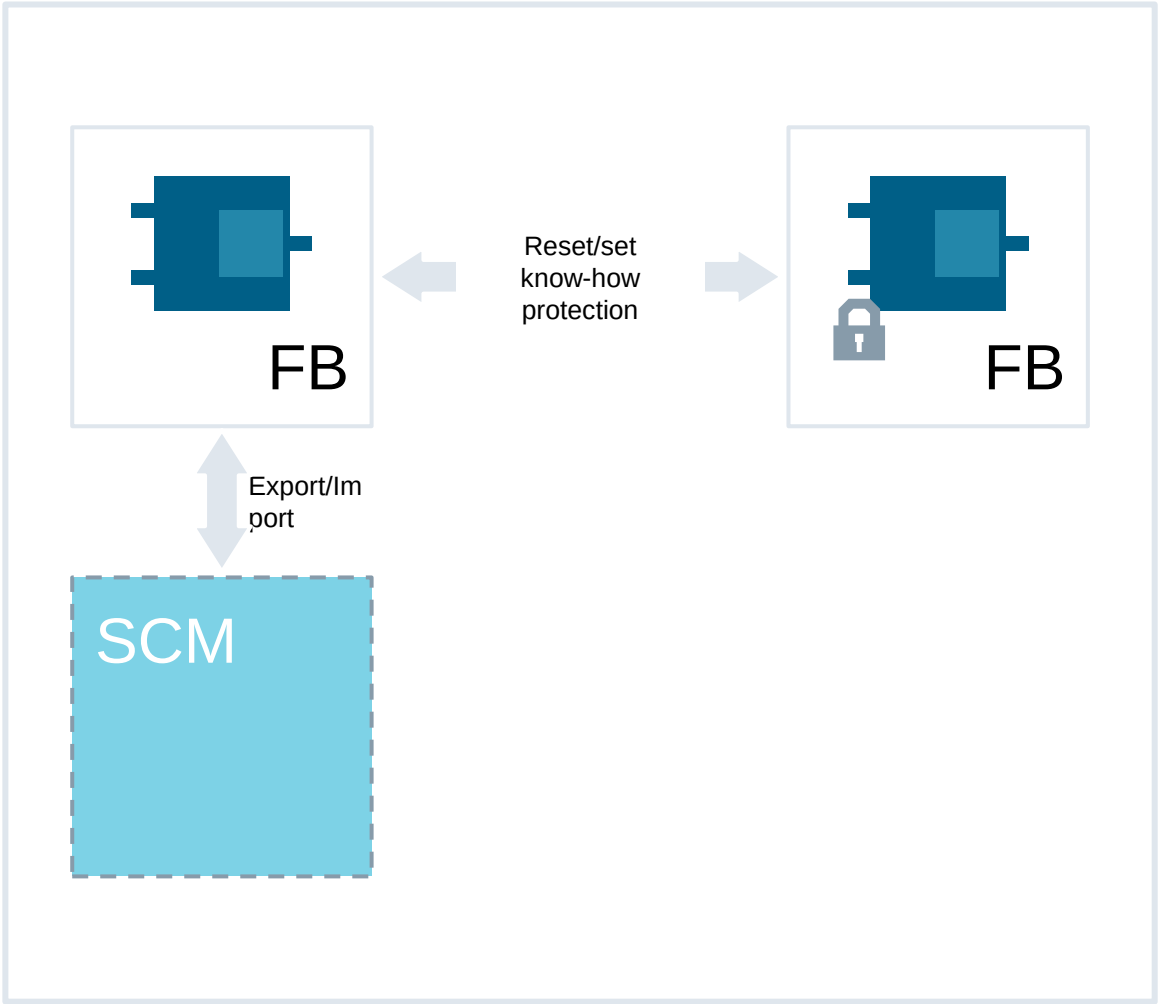
SIEMENS
Ingenuity for life

Automatic protection of blocks

New

A block can be know-how protected via Openness API

Conversely, a know-how-protected block can be unlocked via Openness



Benefits

Know-how-protected blocks can be modified in an automated workflow

KHP blocks can be...

- Unlocked | Fully exported to/from a source code management system
- Fully imported
- Provided with know-how protection

System functions – TIA Portal Openness – Download

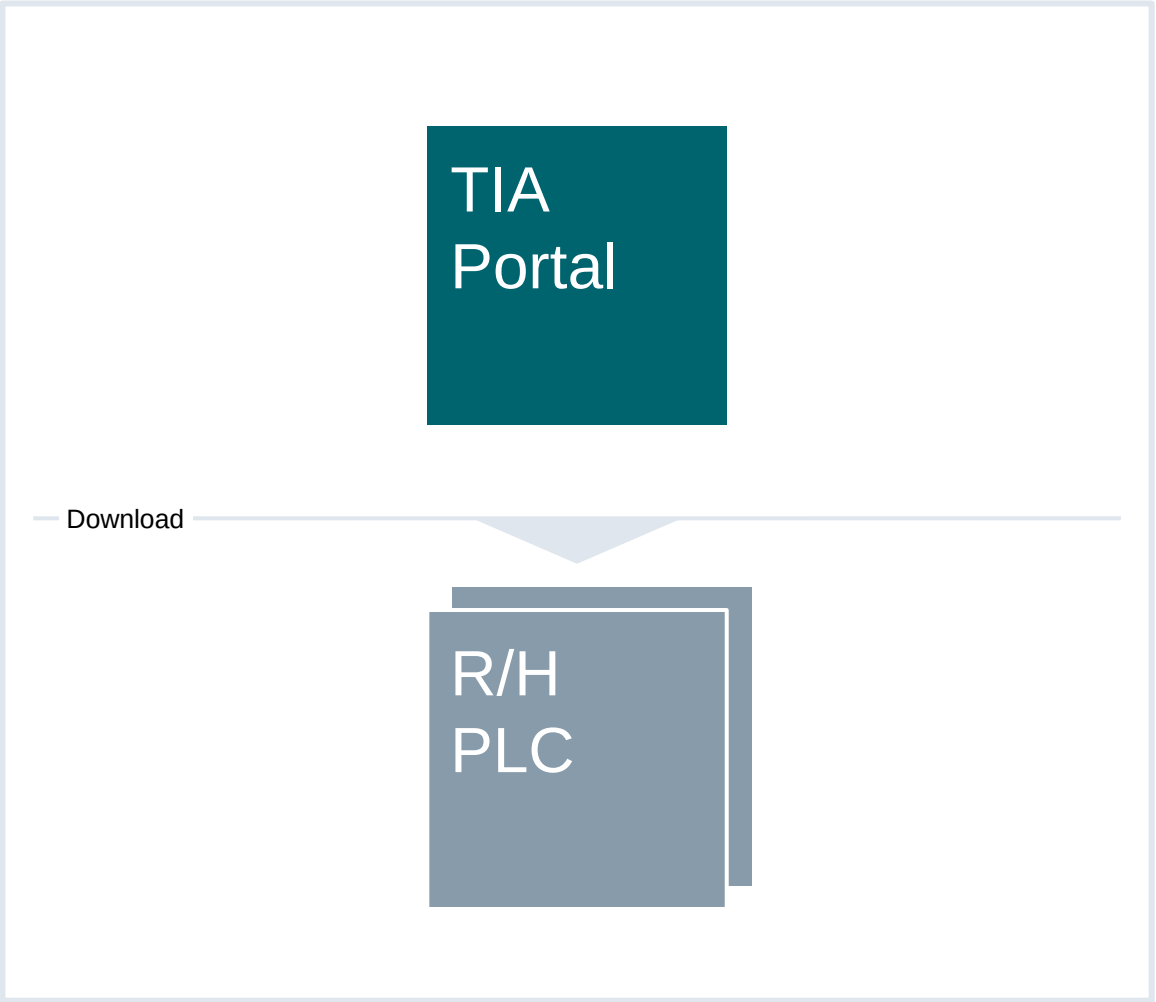
Download to an R/H PLC

New

Automated loading of the R/H PLC, which can be operated redundantly in V15.1, consisting of the primary and backup PLC

Benefits

In addition to downloading standard PLCs, new R/H PLCs can also be automatically loaded.



System functions – TIA Portal Openness – Watch tables

Export/import of watch tables

New

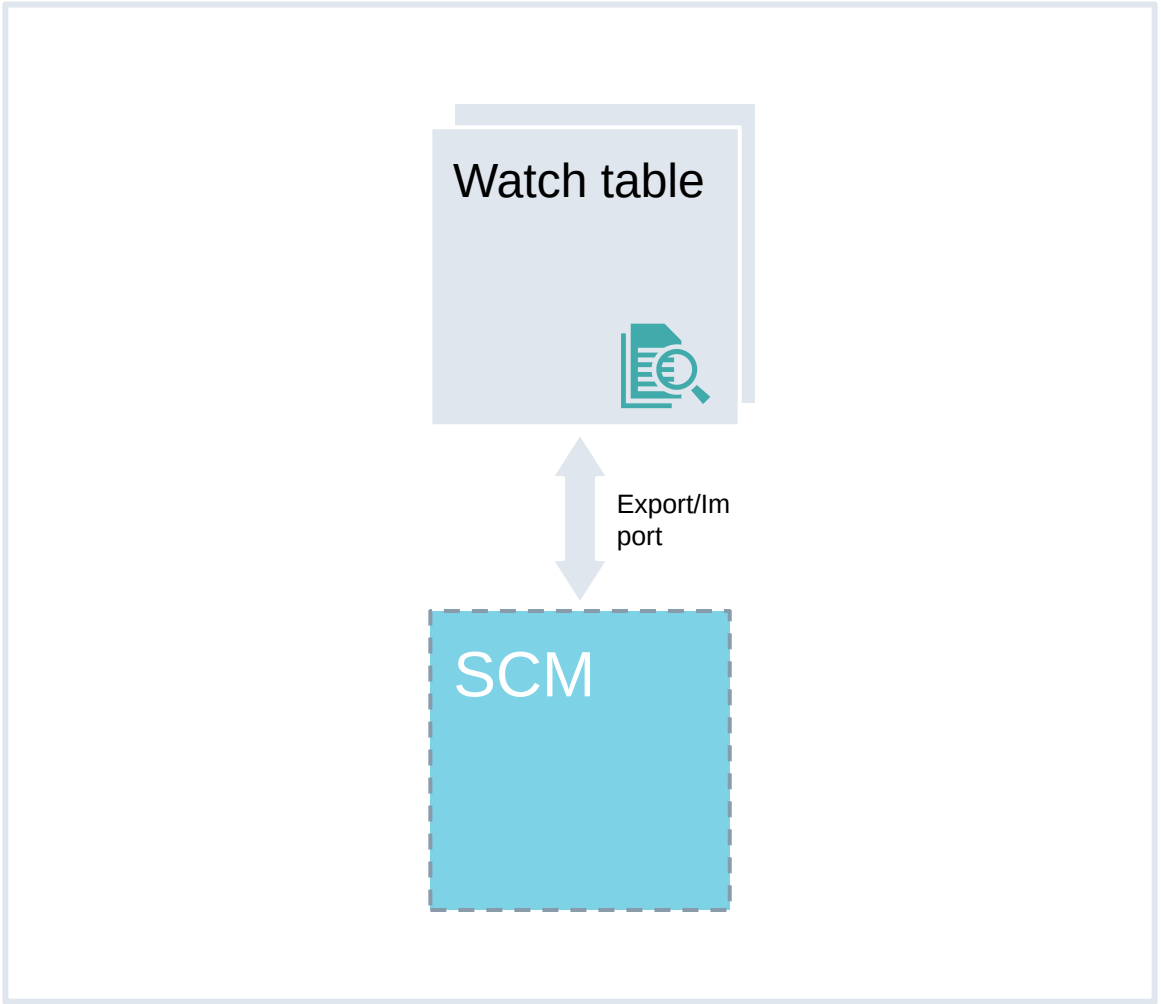
Import of watch tables from XML

Export of watch tables to XML

Benefits

In an automated workflow, watch tables can be

- Created externally and imported
- Exported, modified and imported
- Versioned in SCM



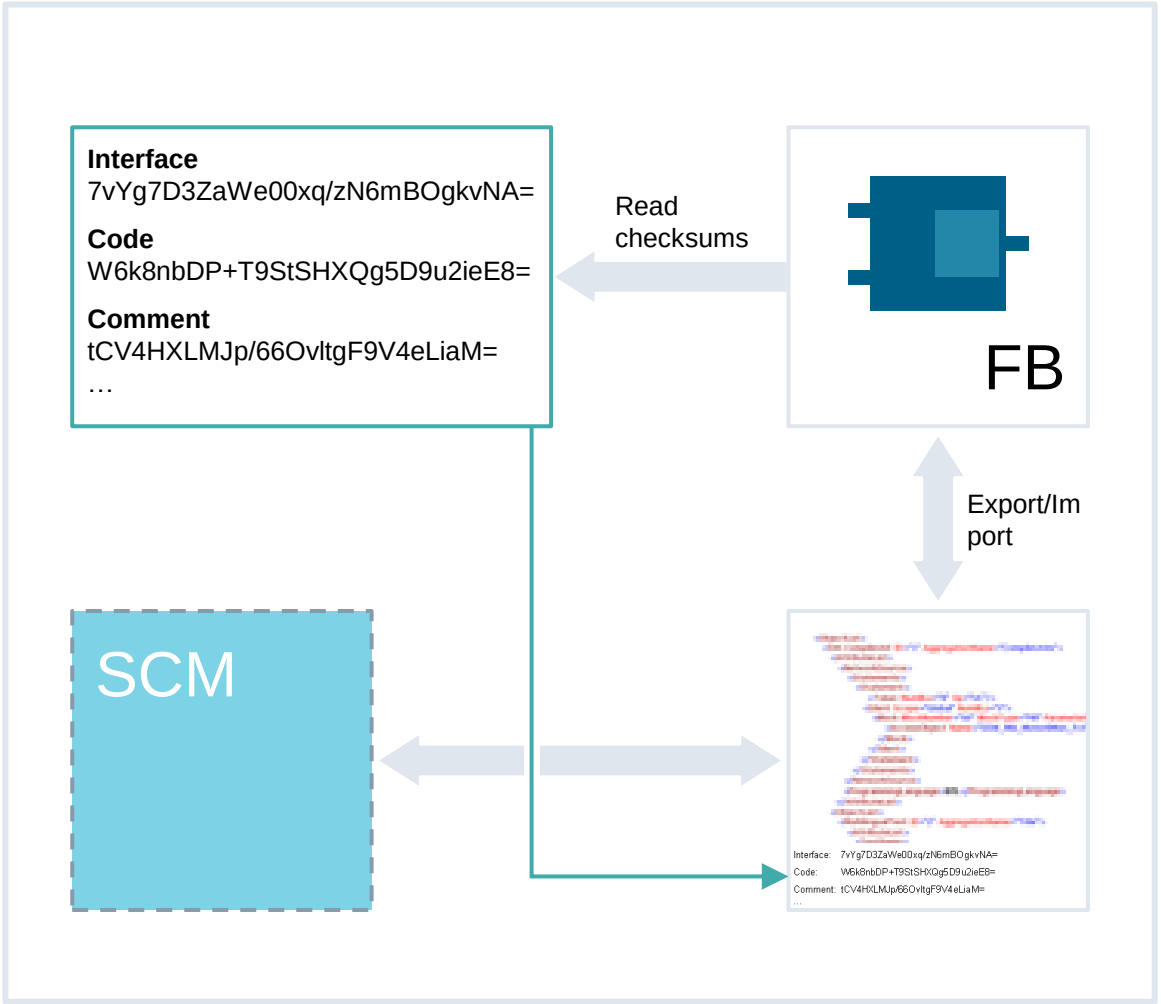
System Functions – TIA Portal Openness – Determining block checksums

SIEMENS
Ingenuity for life

Reading of block checksums

New

Checksums of blocks can be determined by code, interface, comment, etc.



Benefits

Checksums can be determined for a block that is to be exported. A user can add the checksums to the exported XML on his own.

This allows a high performance identity check of external block XMLs with blocks in the TIA Portal. The previously required XML import with consistency check is no longer needed.

System functions – TIA Portal Openness – Access to HW parameters

SIEMENS
Ingenuity for life

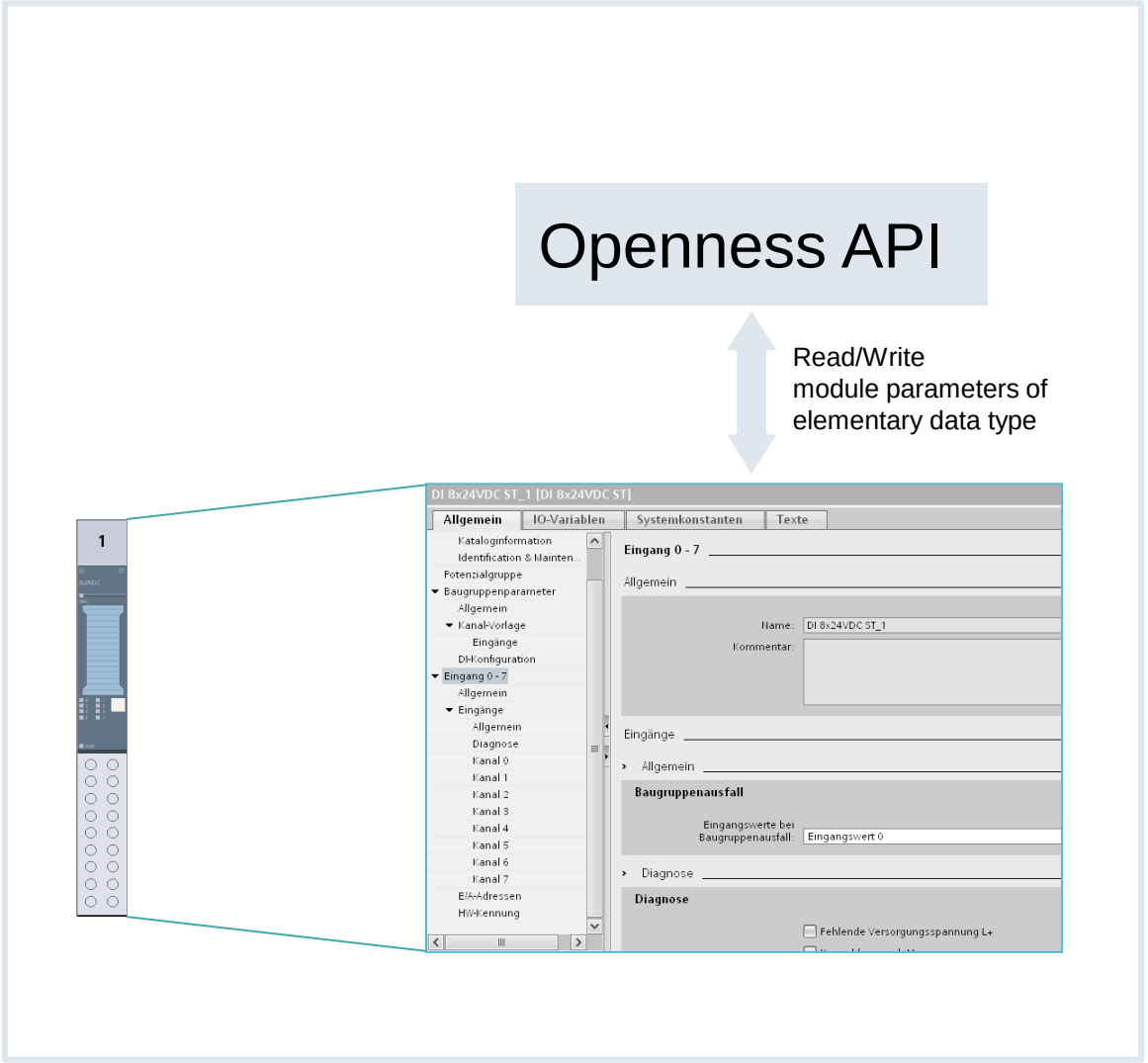
Parameter-specific access to ET200SP modules

New

Read/Write of ET200SP hardware module parameters of elementary data type is supported

Benefits

In addition to the automated placement of devices/modules in a networked configuration, most of the module parameters of the ET200SP modules can now also be read/written programmatically.



System Functions – TIA Portal Openness – Opening two projects

SIEMENS
Ingenuity for life

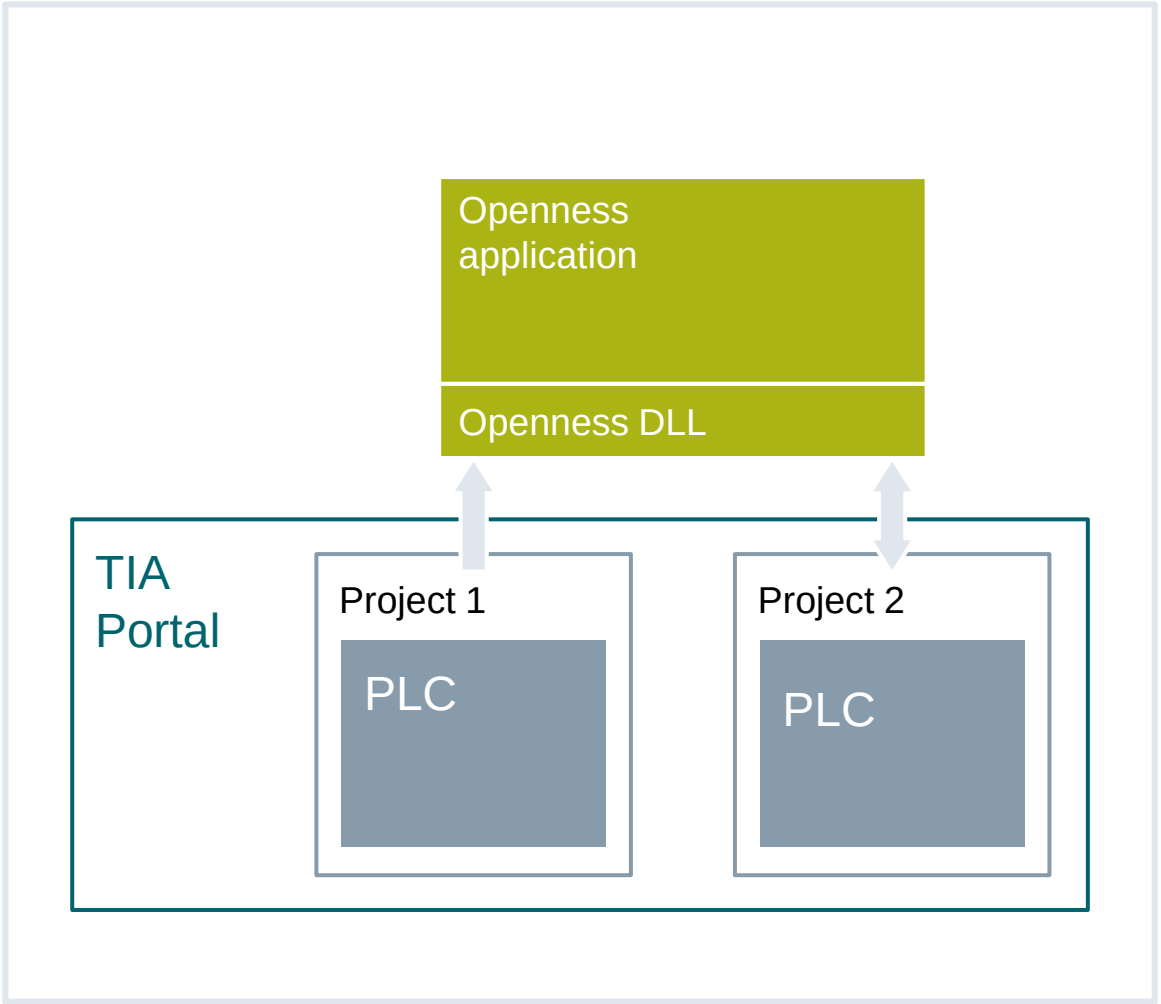
Opening two projects in the TIA Portal

New

Two projects can be opened simultaneously in a TIA Portal instance, one of them in read mode

Benefits

This allows cross-project PLC comparisons to be performed, for example.



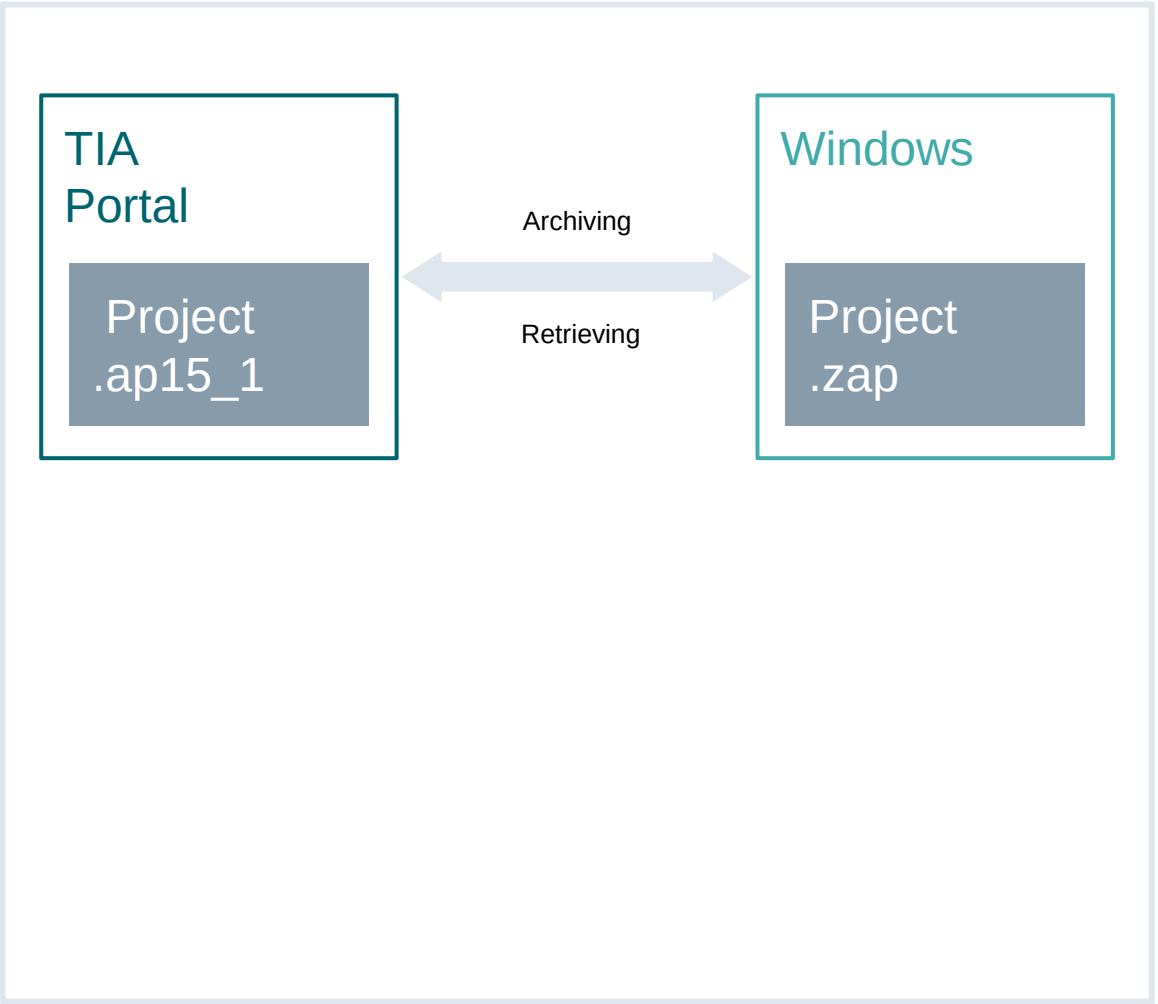
System Functions – TIA Portal Openness – Archiving/retrieving a project

SIEMENS
Ingenuity for life

Archiving/retrieving a project

New

API-controlled access to UI function project archiving or project retrieval



Benefits

Workflows can be set up that ...

- Move compressed projects into an externally organized project management or
- Bring them back again from there decompressed into the TIA Portal environment

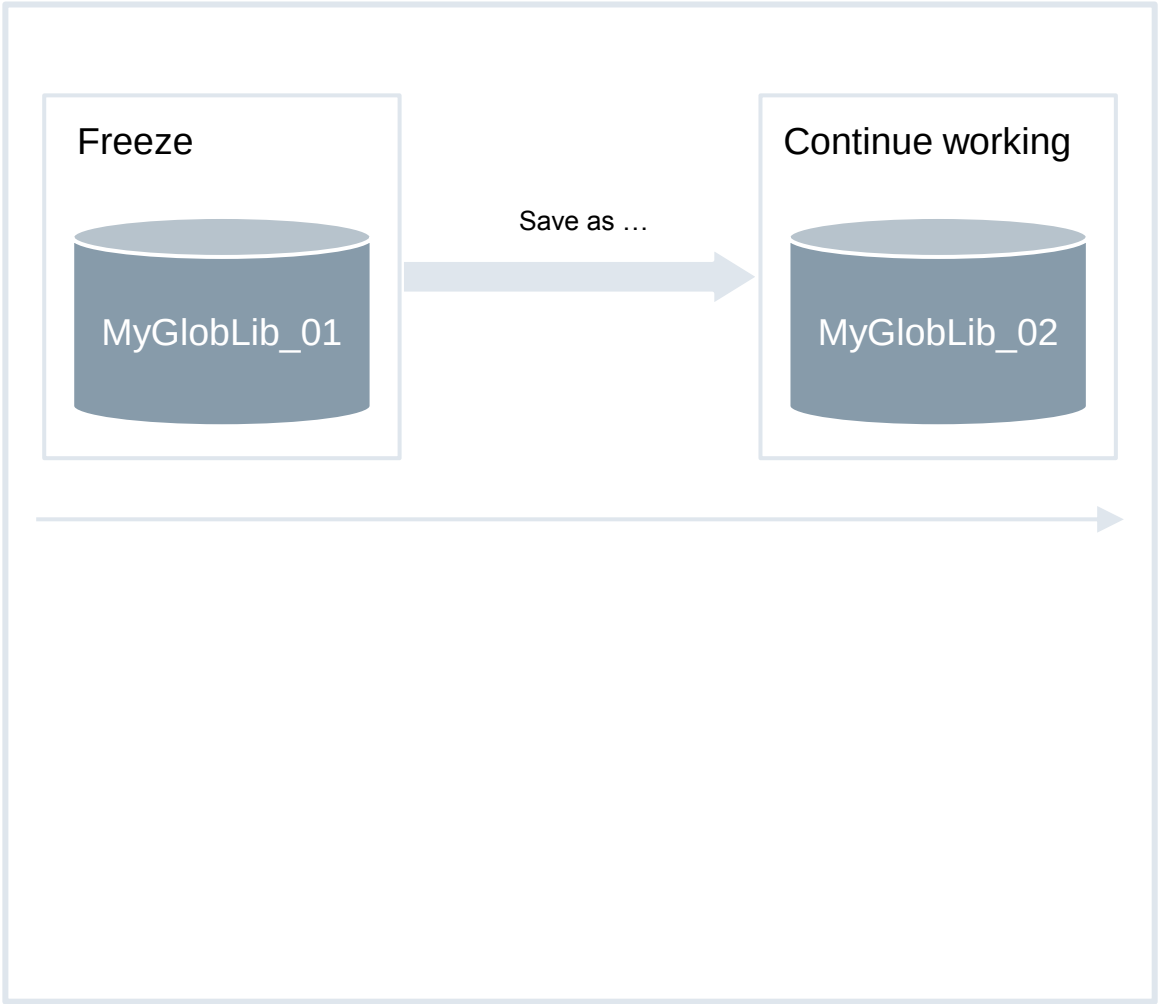
System functions – TIA Portal Openness – Global libraries

SIEMENS
Ingenuity for life

Saving global libraries under different names

New

Creating copies of a global library



Benefits

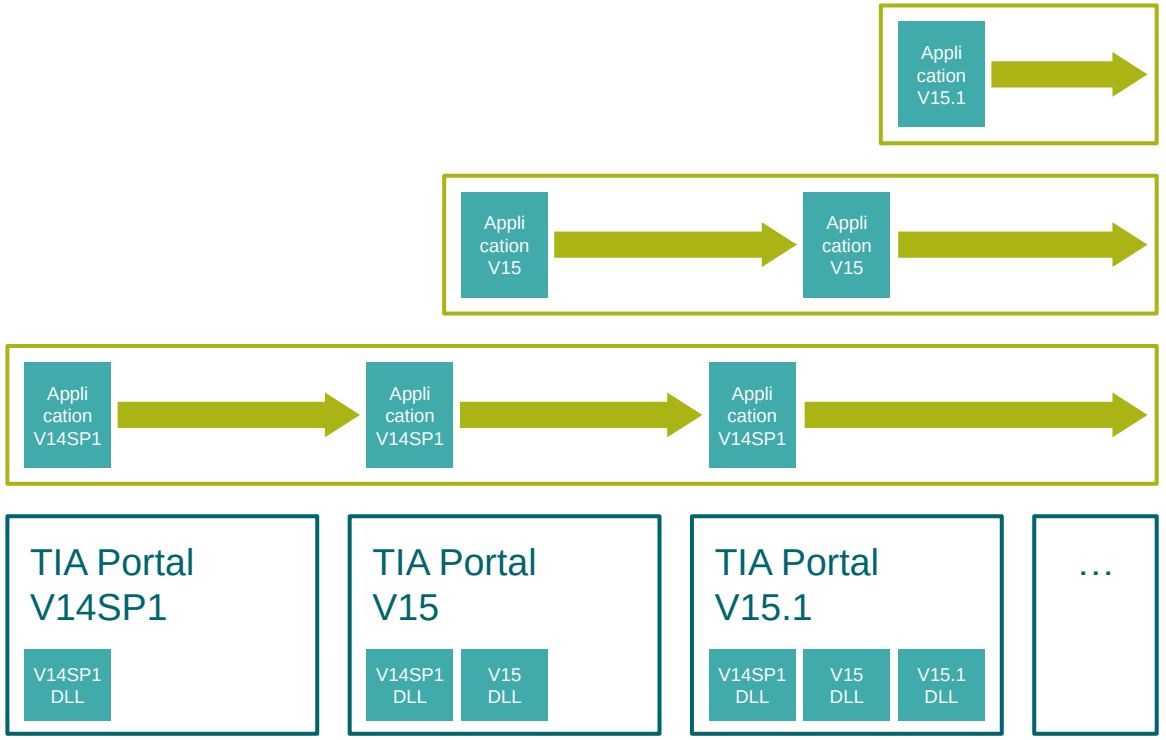
Customers can freeze versions of a global library and develop them further with a copy under a different name

System functions – TIA Portal Openness – Compatibility

Openness libraries of previous versions are available in V15.1

New

The Openness DLLs from V14SP1 and V15 are available in V15.1, besides the new DLL V15.1



Benefits

Openness applications based on V14SP1 or V15 can run unchanged with the TIA Portal V15.1 environment

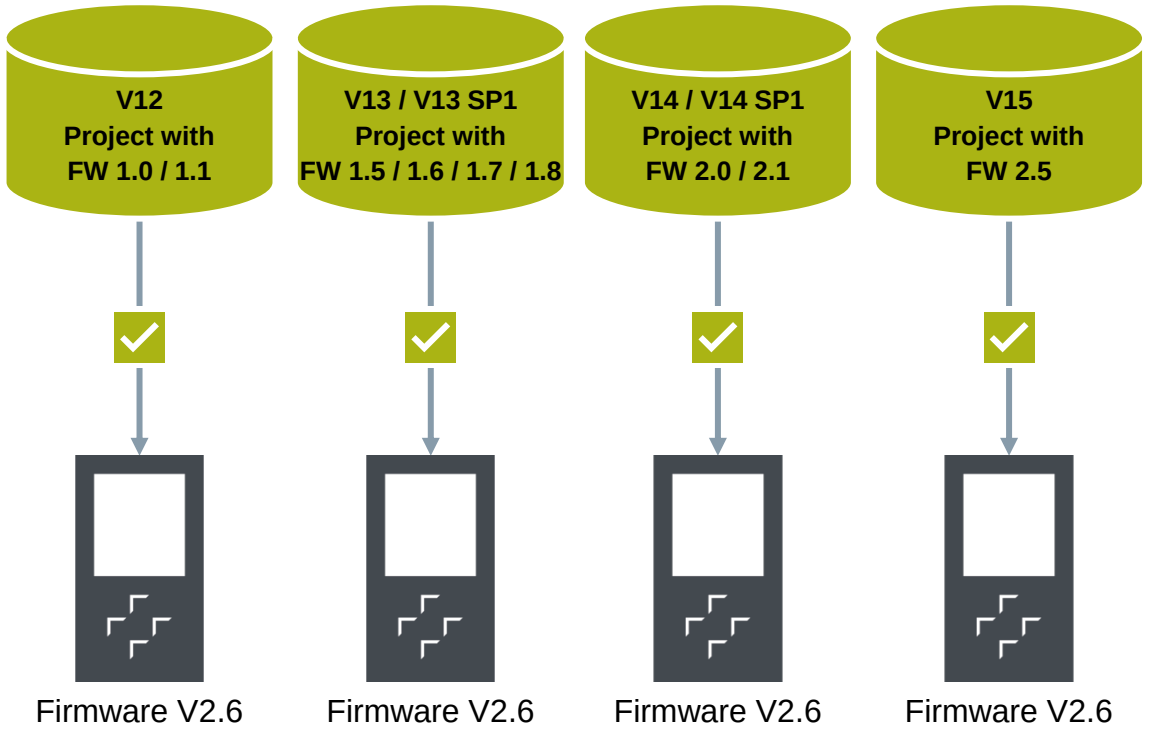
New Openness functions can be

- Expanded by exchanging the earlier Openness DLL for the V15.1 DLL and
- Used after a re-compile

Spare Part Compatibility S7-1500 and ET 200 CPUs
Usage of FW 2.6 with former TIA Portal Versions

SIEMENS
Ingenuity for life

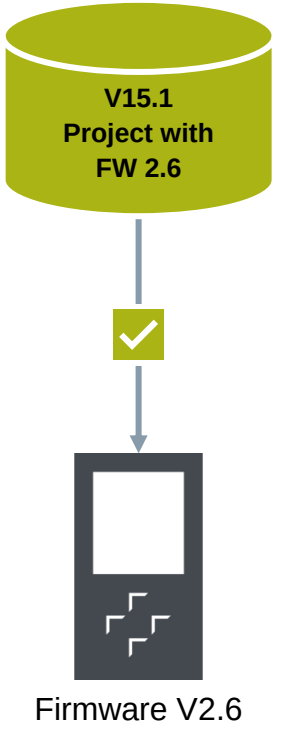
V12 / V13 / V14 / V15 Engineering Software



Complete Spare Part Compatibility

Onlinesupport: ID 109744163

V15.1 Engineering Software



New functionalities require TIA Portal V15.1 and firmware V2.6

TIA Portal – Highlights of TIA Portal V15.1

SIEMENS
Ingenuity for life

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- S7-1500R/H redundant systems
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TIA Portal options

STEP 7 Safety
Flexible F Link, DP_DP_ID, Openness add-ins

Multiuser
commissioning mode

OPC UA
S7-1500 client, SiOME configuration tool

ProDiag
Usability add-ins, such as hierarchical comments

PLCSIM Advanced
Floating window, max. cycle time handling through the API

Target 1500S for Simulink
Model on Web server, transfer of SO files

Teamcenter Gateway
Multiuser engineering, reference projects

SiVArc
Access protection, SCL blocks, template screens, Openness add-ins

Energy Suite
Energy screens, reports, SINAMICS, usability improvements

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STEP 7 Safety V15.1

SIEMENS
Ingenuity for life

Detail New fail-safe communication »Flexible F-Link«

Detail F-OB pre-processing and post-processing

Detail Flexible F-Link communication address signature

Detail Variable communication ID (DP_DP_ID)

Detail New Openness functionalities

Simulation mode for SENDDP / RCVDP

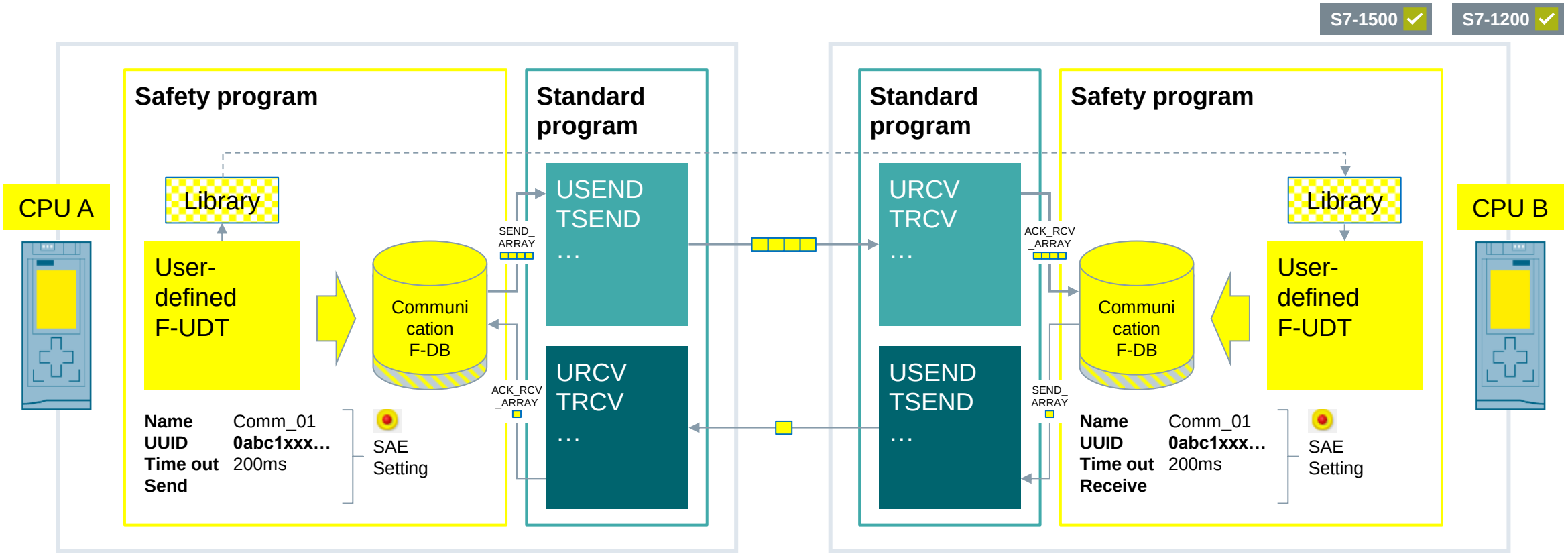
Detail Support of new fail-safe hardware
- ET 200eco PN 8x F-DI/3x F-DQ
- ET 200SP 4x F-AI (I)

Innovations

STEP 7 Safety V15.1 –
New fail-safe communication »Flexible F-Link«

SIEMENS
Ingenuity for life

S7-1500 ✓ S7-1200 ✓



Send up to 100 bytes (per F-UDT) of F-data with standard communication mechanism

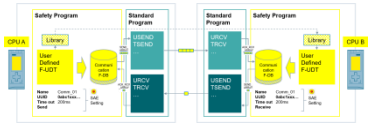
System-generated

Flexible F-Link – Highlights

SIEMENS
Ingenuity for life

S7-1500 ✓ S7-1200 ✓

User-defined **F-UDT for all TIA Safety data types** (Bool, Word, Int, DINT, TIME)



Up to 100 bytes per F-UDT supported

Easy parametrization of the communication within Safety Administration Editor (SAE)

Flexible F-Link settings

	Name	PLC Data Type	Direction	F-monitoring time: (ms)	F-communication UUID	Output data variable	Input data tag
1	Com_1	F_COM	Send	500	1f82f270-b46d-40b3-ad1c-ad2374afe616	"Com_1".SEND_ARRAY[]	"Com_1".ACK_RCV_ARRAY[]
2	Com_2	F_COM	Receive	500	f00dab98-955d-4a42-9b26-f3a10f5739a0	"Com_2".ACK_SEND_ARRAY[]	"Com_2".RCV_ARRAY[]
3	<Add new>						

Safety Administration

System-generated communication F-DBs makes it easy to send/receive data

How do you ensure a world-wide unique safety addressing of communication partners?

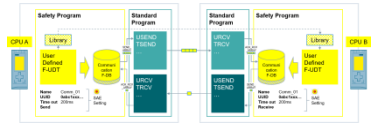
→ We, TIA Safety, generate a **Universally Unique Identifier (UUID) for distinct identification of communication partners** including different subnets

Detail

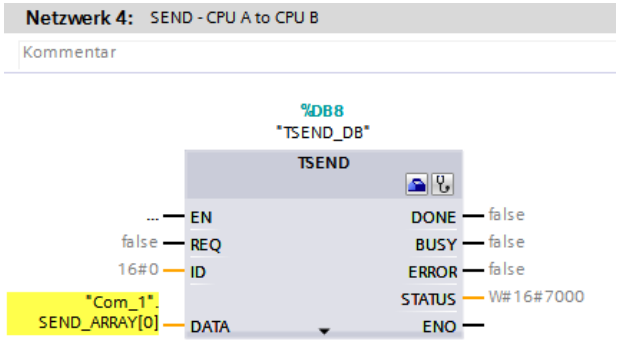
Flexible F-Link – Highlights

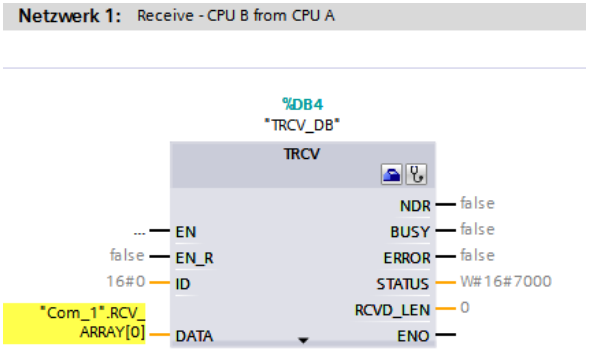
SIEMENS
Ingenuity for life

S7-1500 ✓ S7-1200 ✓

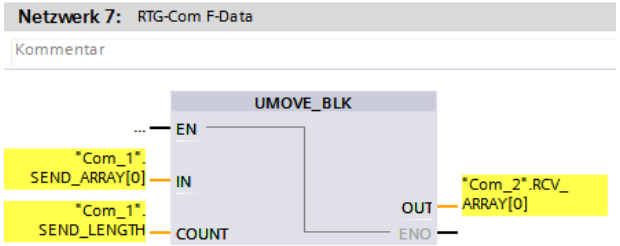


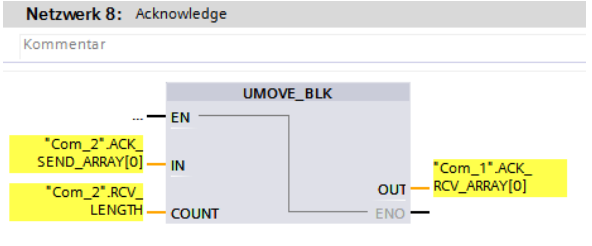
Generated coded **safety data can be sent via any standard communication mechanism** which supports a consistent data transfer (TSEND, TRCV, USEND, URCV, …).





Runtime group communication can be realized **by using** the standard **»UMOVE«** instruction



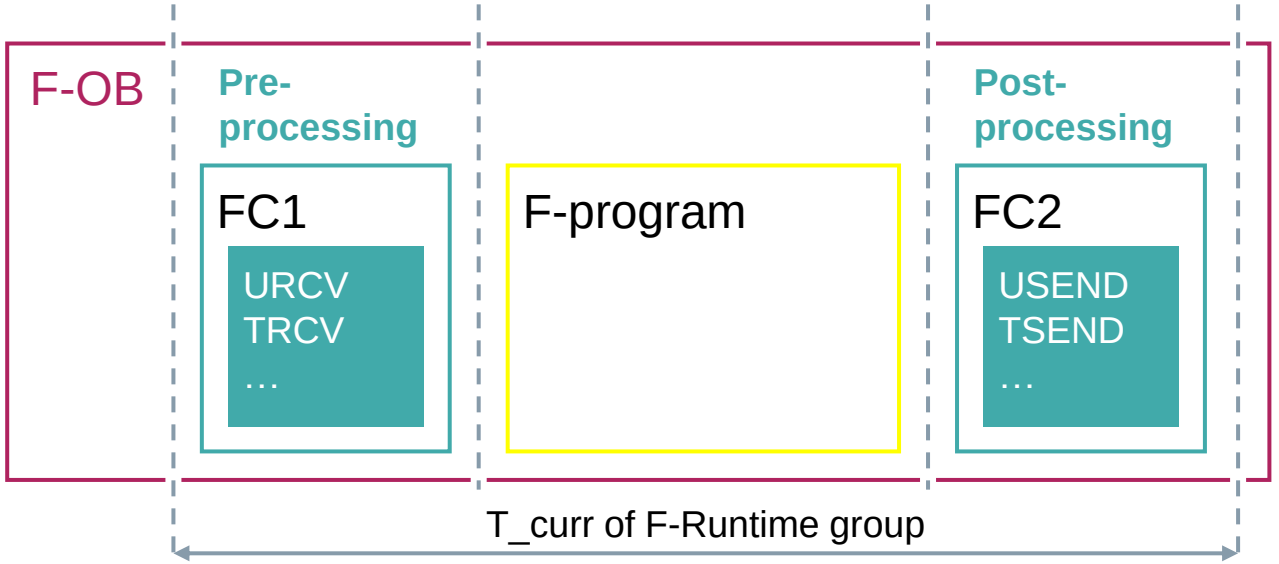


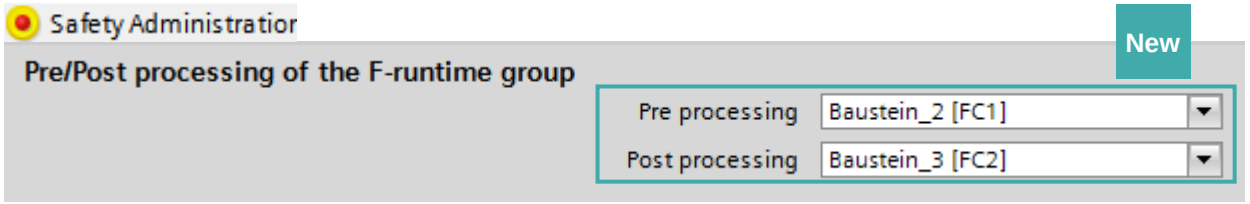
Detail

F-OB pre-processing and post-processing

S7-1500 S7-1200

Process data, for instance Flexible F-Link communication, can be handled using the pre-processing/post-processing functionality of Safety V15.1





Detail

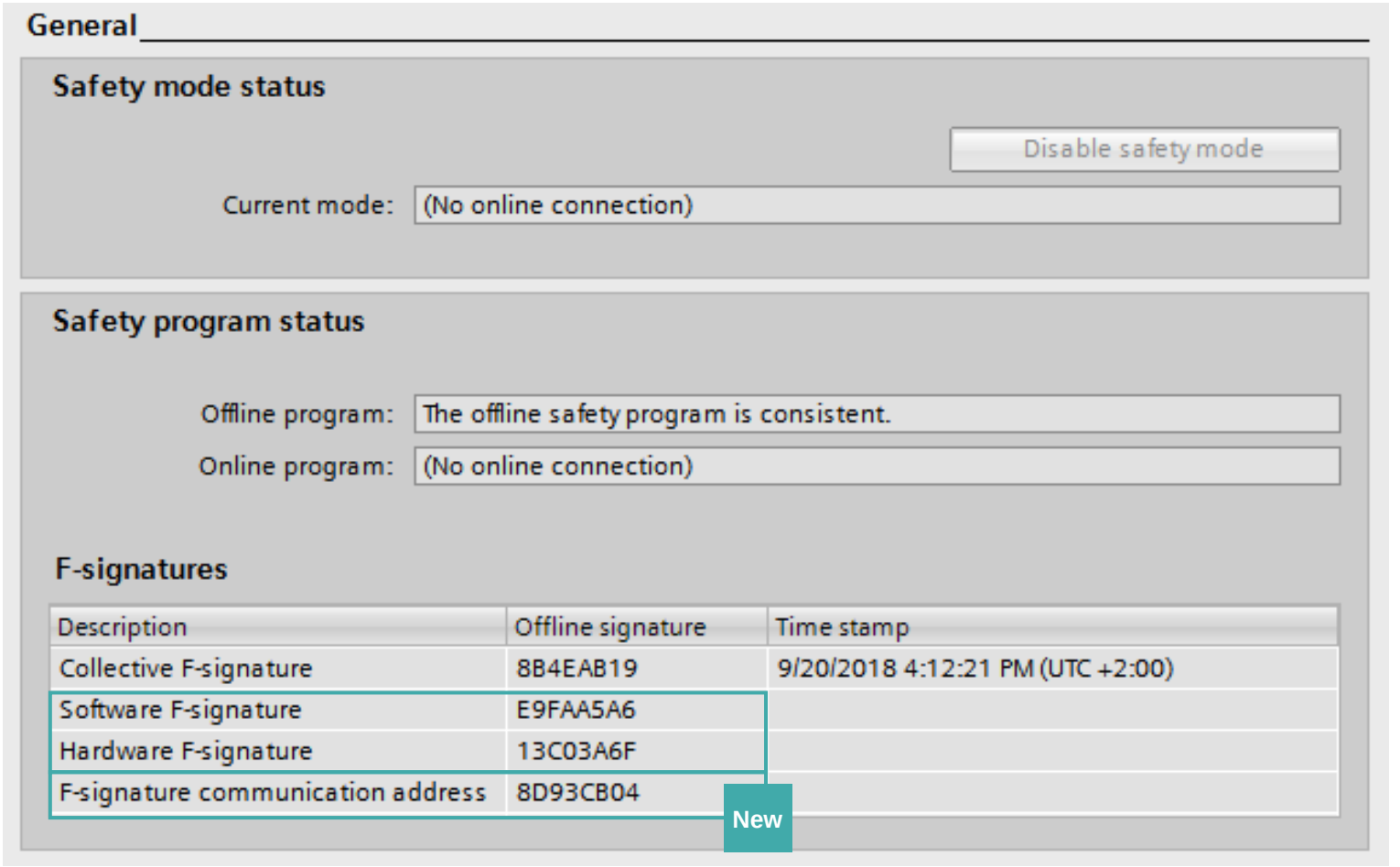
Flexible F-Link communication address signature – Discrete F-signatures for a better classification of changes

SIEMENS
Ingenuity for life

- Differentiation between **hardware/ software** and **communication** (Flexible F Link) related changes
- **Documentation** within Safety printout

New

S7-1500 ✓ S7-1200 ✓



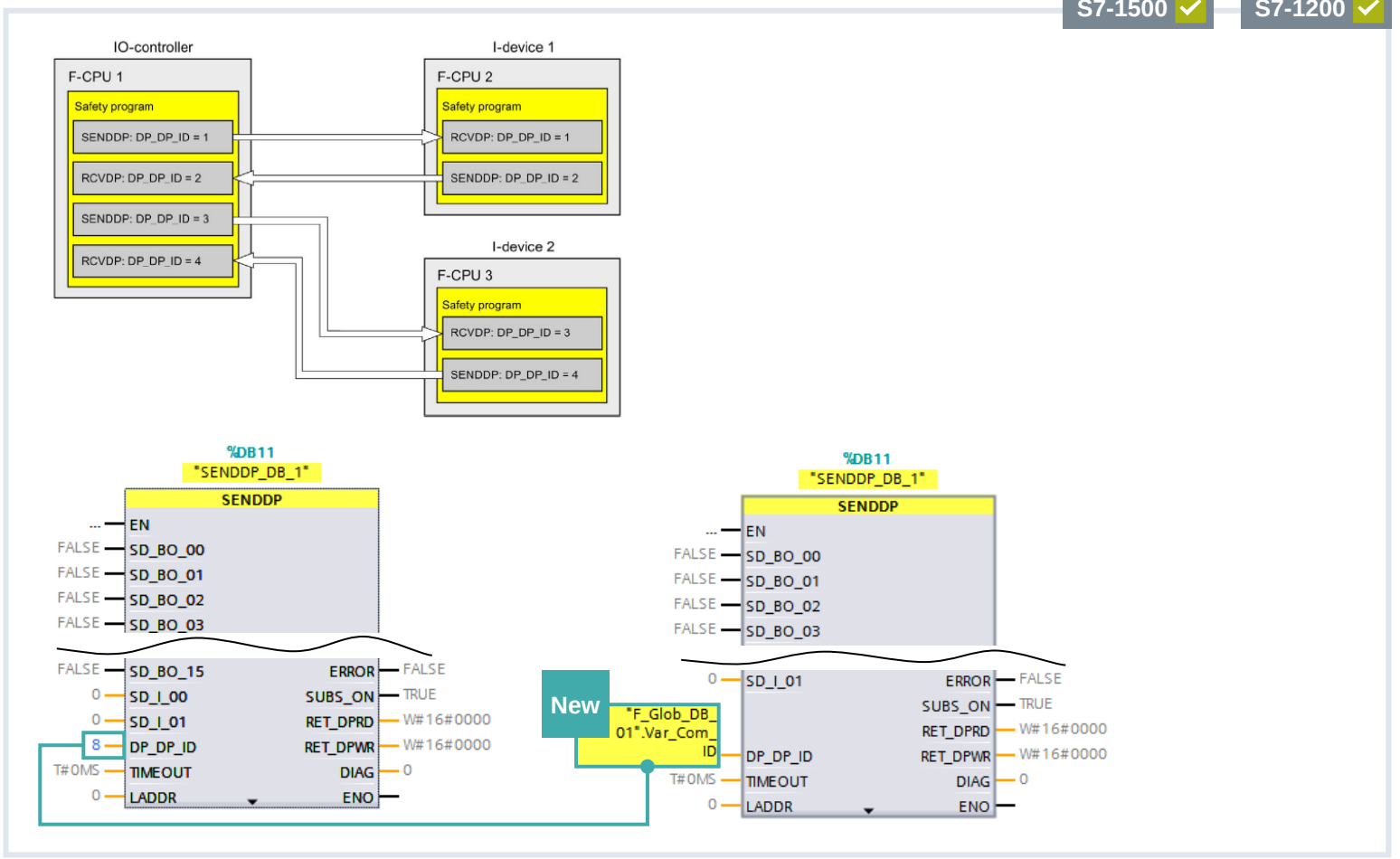
Detail

STEP 7 Safety V15.1 – Variable communication ID (DP_DP_ID) for flexible system designs

SIEMENS
Ingenuity for life

S7-1500 ✓ S7-1200 ✓

- Variable communication IDs[1] enable **high flexible Safety automation solutions**
- With variable communication IDs, the **same safety program** (same collective F-Signature) can be used **in systems with a large number of identical I-devices** (for example overhead monorail conveyors, high rack warehouses, AGVs)
  - **Faster commissioning**
  - **Easy maintenance**



1 User has to ensure that the values for the communication IDs are unique across the physical network (applicative safety solution)

Detail

STEP 7 Safety V15.1 – Openness functionality

SIEMENS
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Safety V14 to V15

- Inserting/removing **F-blocks from the library** (F-FC/F-FB/F-UDT)
- **Inserting/removing F-CPUs and F-I/Os**
- **Copying/deleting F-CPUs and F-I/Os from master copies**
- **Configuring networks**
- **Compiling software** (including safety program)
- Reading/configuring **F-parameters** of the F-CPU/F-IOs
- Reading, declaring or deleting fail-safe **tags in the PLC tag table**
- **Updating projects** to the latest type versions of F-blocks

Safety V15.1 improvements

- Reading/configuring **I-parameters** of the **ET200SP F-IOs**
- **Consistent Station upload**
- HW/SW **compare (offline/offline)**
- **Import/export of consistent F-blocks**

Detail

New fail-safe modules for IP20 and IP67

ET 200SP F-AI

- 4 analog inputs for 0(4)..20 mA
- 2 or 4 sensors (2xSIL3, 4xSIL2)
- Resolution 16-bit including sign
- Usable up to SIL 3 (IEC 62061)/PL e (ISO 13849)
- Diagnostic information
- Channel granular passivation

Released

ET 200eco PN F-DI/DQ

- IP65/67 module with integrated PROFINET switch
- 8 F-DI 24VDC/3 F-DQ 24VDC/2A
- Usable up to SIL 3 (IEC 62061)/PL e (ISO 13849)
- Diagnostic information
- Channel granular passivation
- Easy module exchange with F-coding element

Released

TIA Portal – Highlights of TIA Portal V15.1

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Multiuser
Commissioning mode

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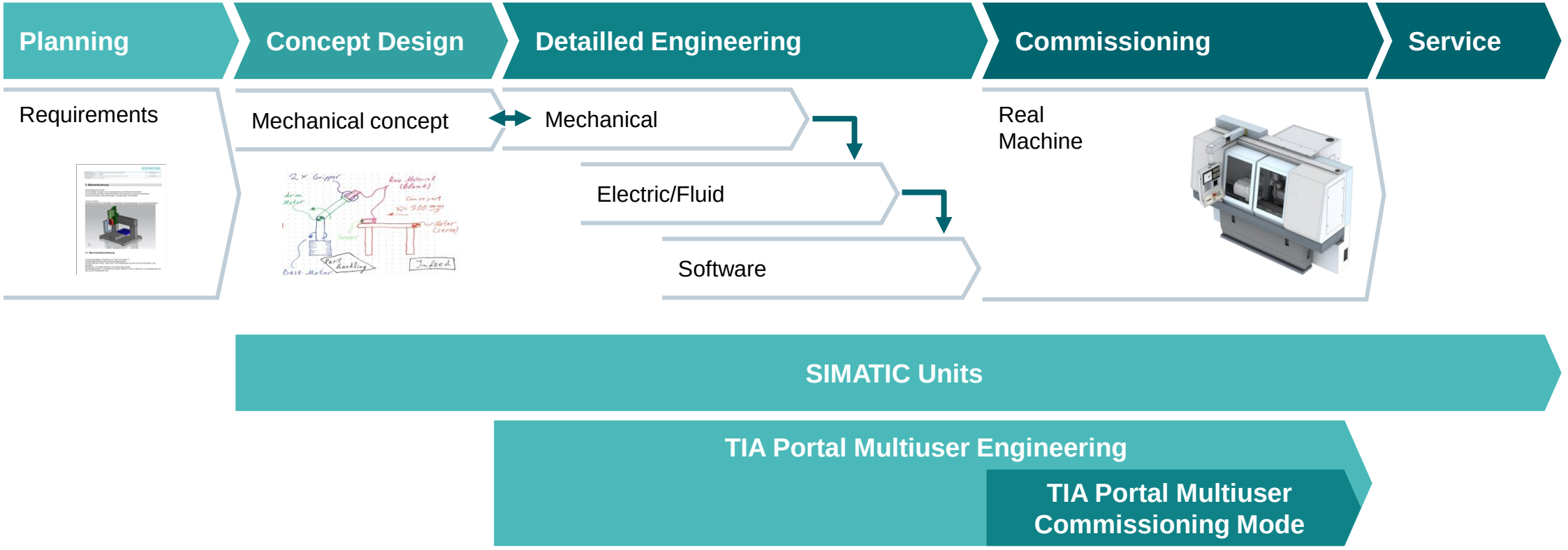
Working in a team (Multiuser)
Multiuser Commissioning Mode

SIEMENS
Ingenuity for life



TIA Portal Multiuser – »Commissioning mode«

SIEMENS
Ingenuity for life

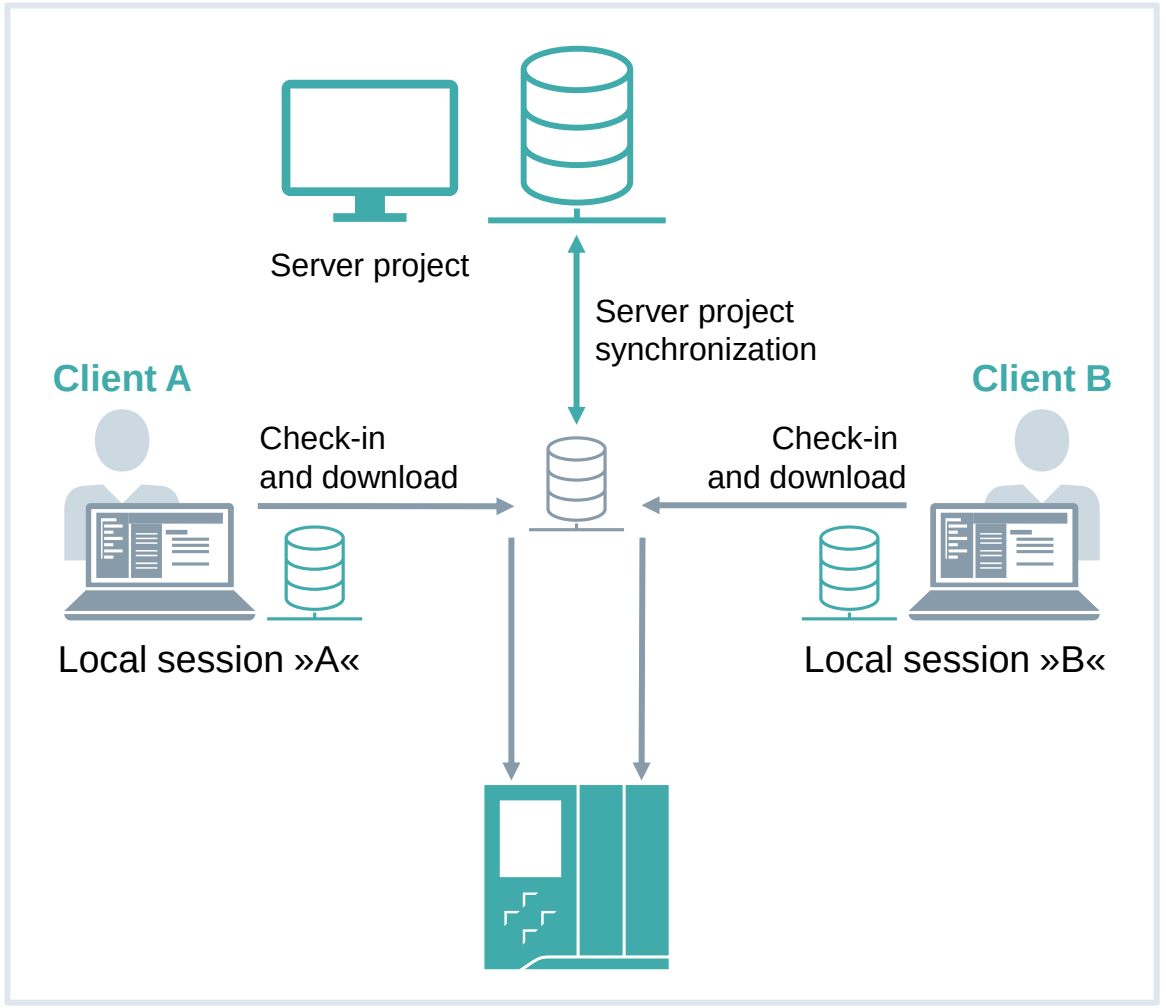
Shared commissioning in a team

Downloads are synchronized via the server project.
This enables a consistent status between device and server project.

Characteristics of the commissioning mode

In commissioning mode, the changes are automatically checked into the server project, compiled and loaded into the device when downloaded from the local session.

- Selectable project-granular via the multi-user administration tool
- A selected commissioning mode applies to all connected multiuser clients
- No change of the download workflow
- Local session, server project and the device having the same version after downloading



TIA Portal – Highlights of TIA Portal V15.1

SIEMENS
Ingenuity for life

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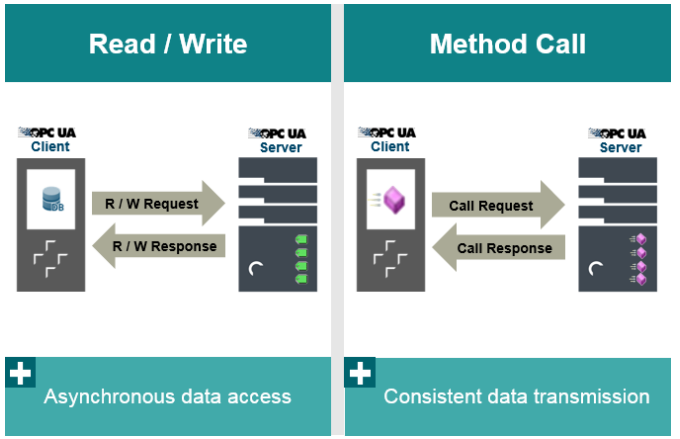
TIA Portal Options – OPC UA – OPC UA client in the S7-1500

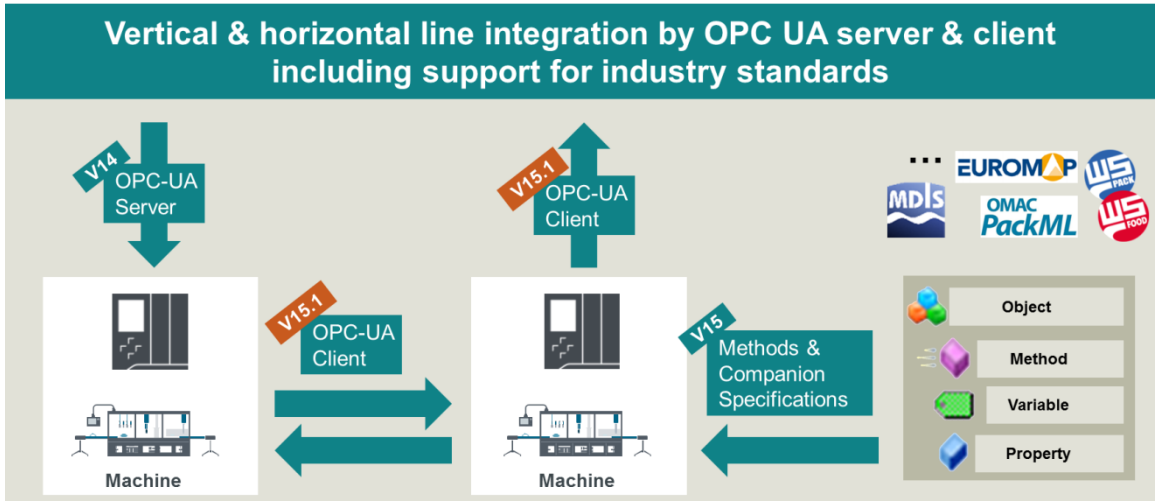
SIEMENS
Ingenuity for life

New functions

In addition to the OPC UA server, an OPC UA client is integrated in the CPU and offers the following functions via corresponding OPC UA communication instructions

- Method calls
- Reading and writing data





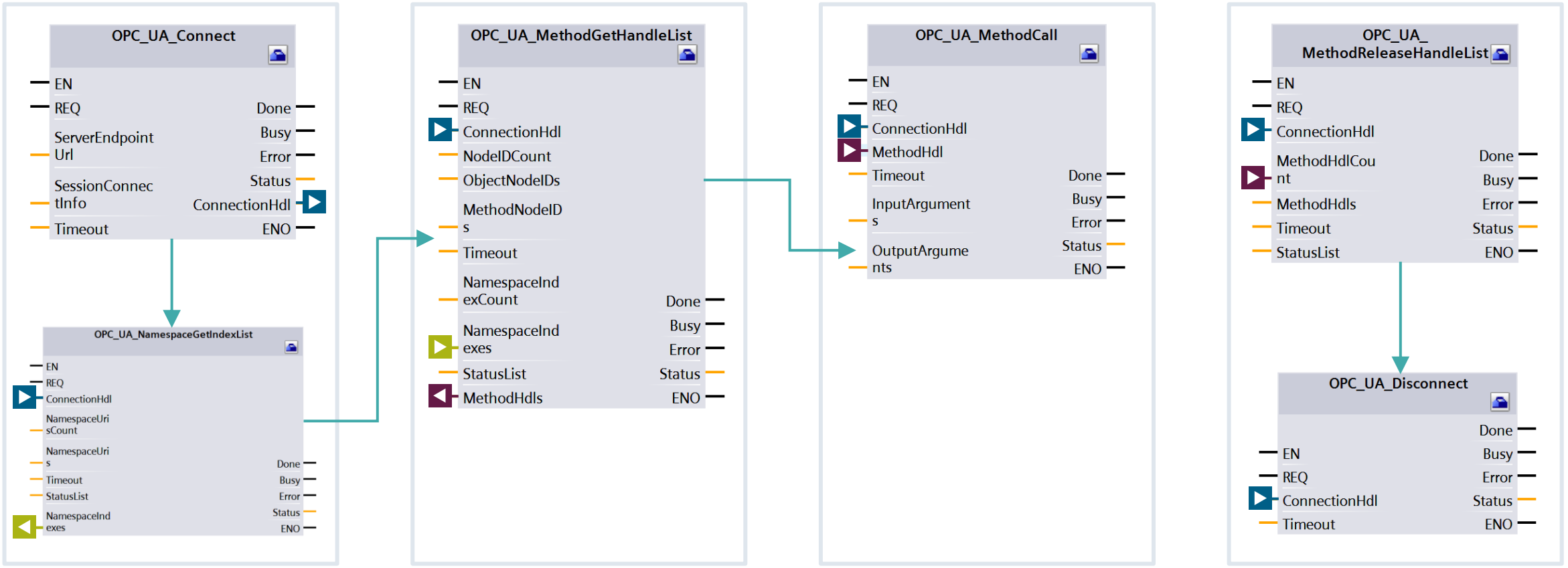
Benefits

The client enables

- Vertical communication to MES systems or cloud services
- Controller-controller communication

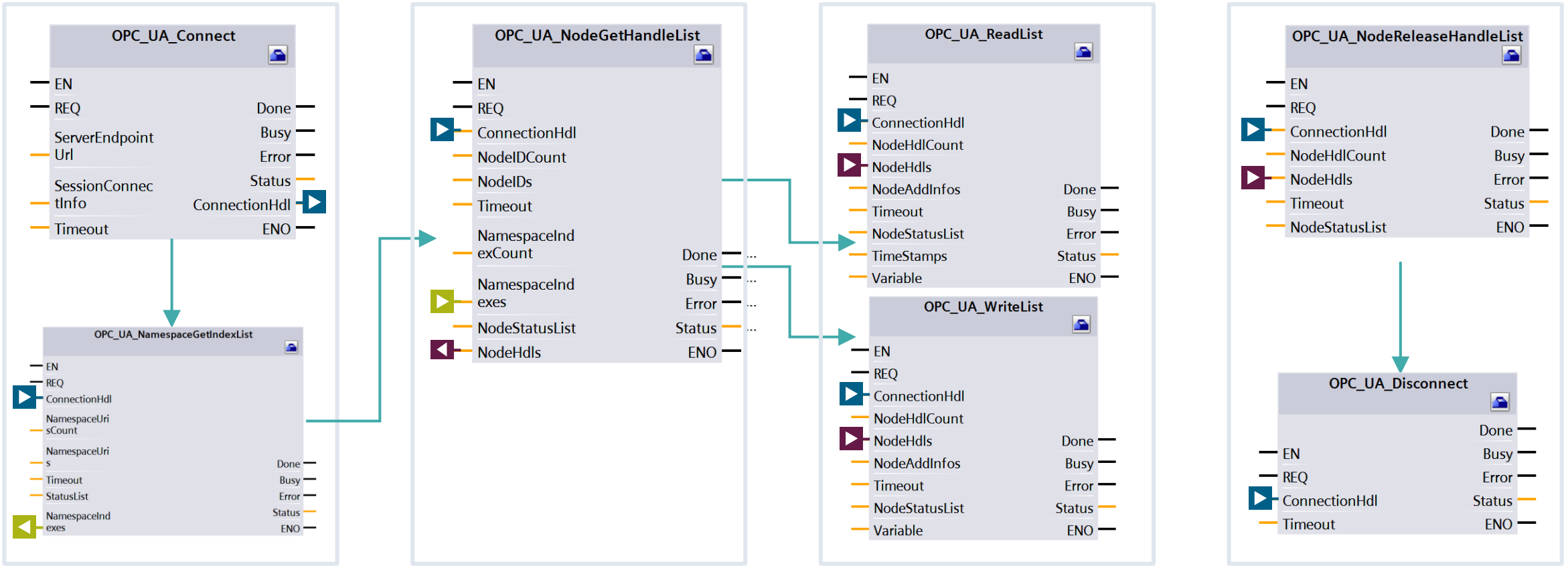
OPC UA client S7-1500 program blocks for method call – Workflow

SIEMENS
Ingenuity for life



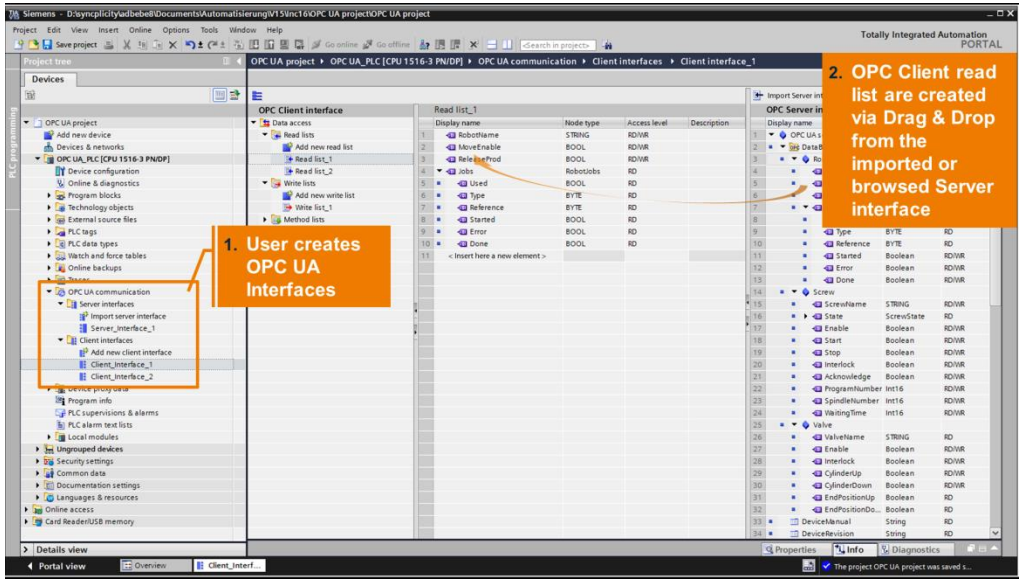
Preparation | Action | Cleanup

OPC UA client S7-1500 program blocks for data access – Workflow

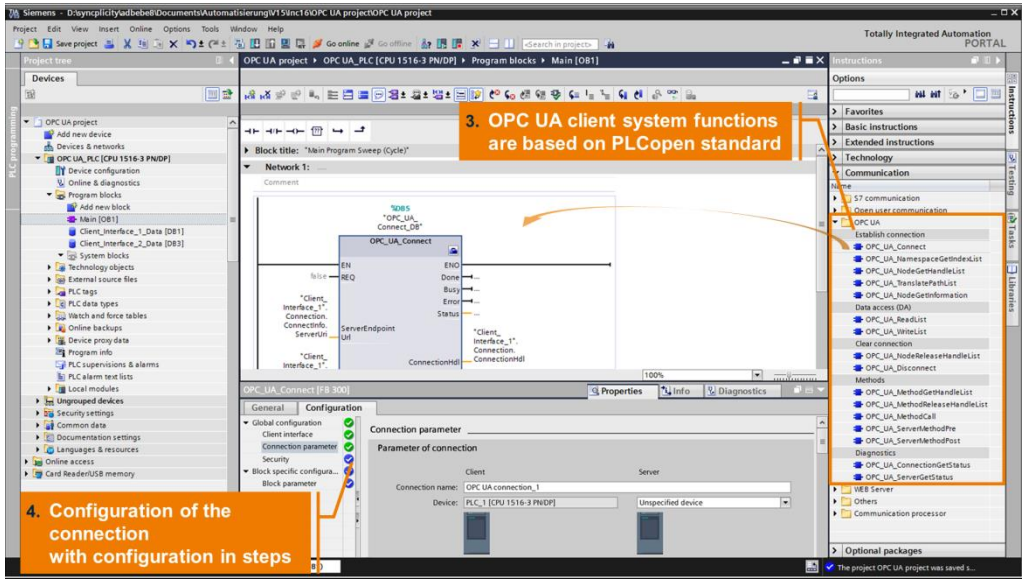


Preparation | Action | Cleanup

OPC UA client configuration in the S7-1500



- Create client interface
- Set connection parameters and create or select certificate
- Import server XML file / browse online
- Generate read, write and method lists
- Fill lists with nodes using drag-and-drop



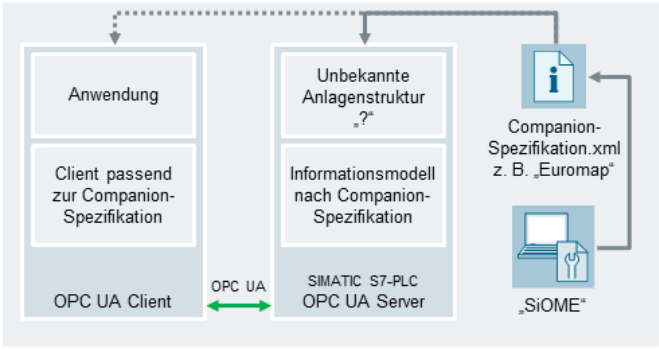
- Insert function blocks for OPC UA in user program
- Configuring blocks with the help of the wizards
- Assign remaining input parameters to the blocks

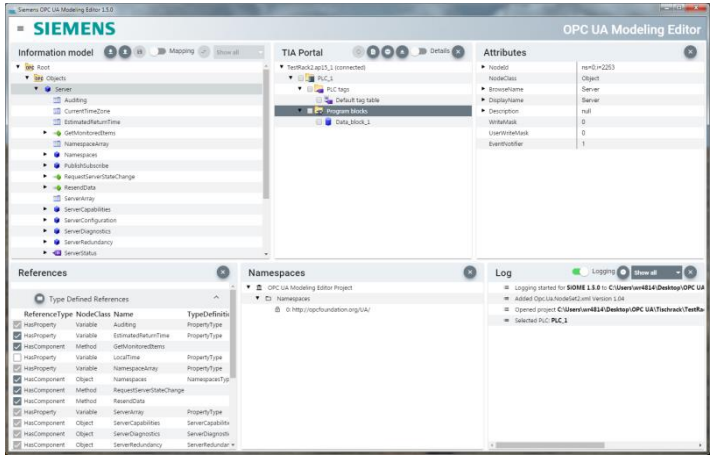
TIA Portal Options – OPC UA – OPC UA Companion specification – SiOME configuration tool

SIEMENS
Ingenuity for life

Function

With the free SiOME tool, we have created an editor for defining your own OPC UA information models or mapping existing companion specifications on your SIMATIC PLC.





Siemens **O**PC UA **M**odelling **E**ditor

Benefits

Using this tool, you can import and edit information models as XML files or generate and export customized models.

SIMATIC S7-1500 Starter kit including Licenses for OPC UA small & ProDiag 250 Supervisions

SIEMENS
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Components of the starter kit SIMATIC S7-1500:

- SIMATIC S7-1500 CPU 1511C-1 PN
- SIMATIC Memory Card, 4 Mbyte
- Rail 160mm
- STEP7 Professional V15.1, 365 day License
- Power supply PM 70W 120/230 V AC
- Standard Ethernet CAT 5-Kabel
- Screwdriver

In addition with TIA Portal V15.1*:

- SIMATIC ProDiag S7-1500 for the use of 250 supervisions
- SIMATIC OPC UA S7-1500 Small, Single Runtime License

New OPC UA & ProDiag

*) Limited for the period of TIA Portal V15.1

TIA Portal – Highlights of TIA Portal V15.1

SIEMENS
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such as hierarchical comments

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TIA Portal options – ProDiag – overview of the new functions

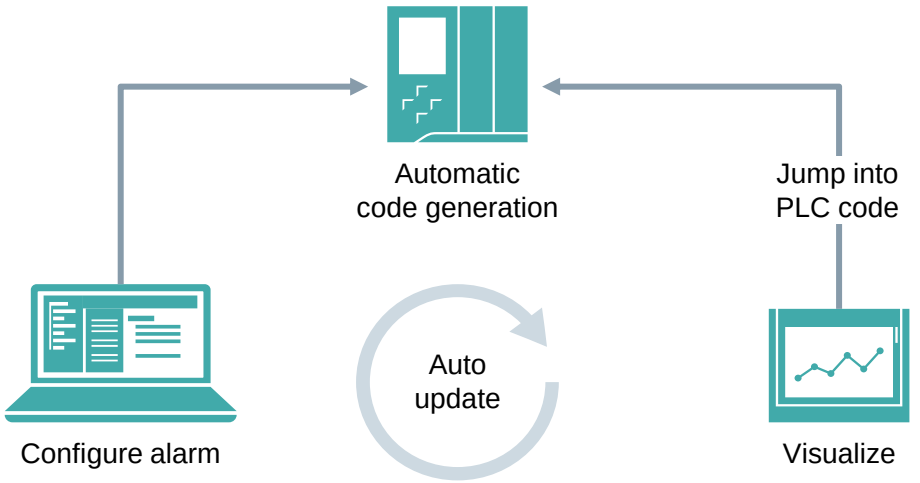
SIEMENS
Ingenuity for life

Function

- Text export for ProDiag/S7-GRAPH relevant texts including the text lists used for fast translation
- Optional display of the entire block in the HMI PLC Code Viewer for fast error analysis
- Jump into the TIA Portal in read-only mode or read-write mode from WinCC Advanced
- Including hierarchical comments in ProDiag messages
- Subcategories are now also available for S7-GRAPH

Benefits

Simple diagnostics during operation with
SIMATIC ProDiag



TIA Portal options – ProDiag – Specific text export for translations

SIEMENS
Ingenuity for life

Function

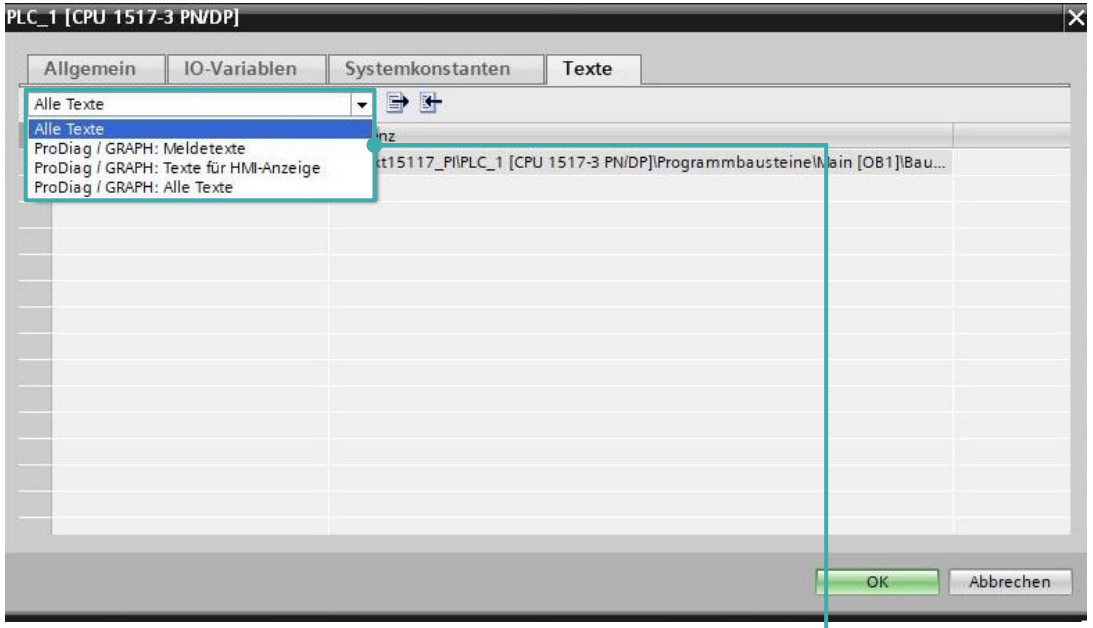
All texts relevant to ProDiag or S7-GRAPH can be exported with one action, e.g. for translations

Message texts

- PLC message text lists
- S7-GRAPH display names for step/transitions
- Comments of all monitored tags
- Comments of all monitored parameters of a block
- Instance name and instance comment in the context of a multi-instance

HMI-relevant texts

- Tag comments in transition and interlock
- Title, comments of monitored networks/tags



Benefits

Translation-relevant texts are available immediately

Save time
Easy export for translations

Alarm texts

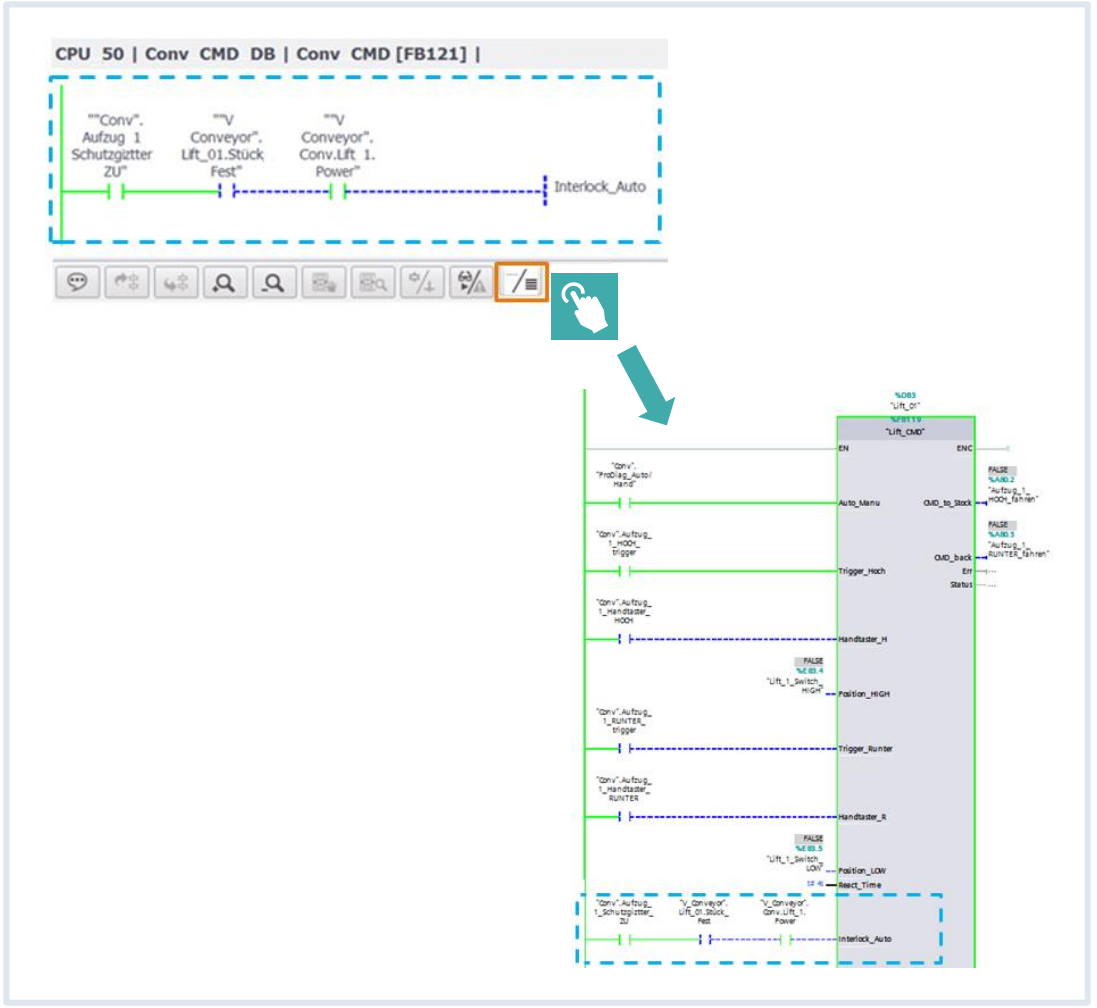
- User text lists
- Step/transition display names
- Step-specific alarm text for supervision interlock
- Comments of all tags (including DB members)
- Comments of all IN, OUT, STAT parameters
- Title of I-DBs, in case of multi-instance of the instance comment

TIA Portal Options – ProDiag – Optional – Displaying entire block in the PLC Code Viewer

SIEMENS
Ingenuity for life

Function

- Advanced diagnostics view for missing conditions
- PLC Code Viewer can also be used if STAT/OUT parameters of a block are monitored (user blocks with their own monitoring logic)



Benefits

Extended system-guided error diagnostics

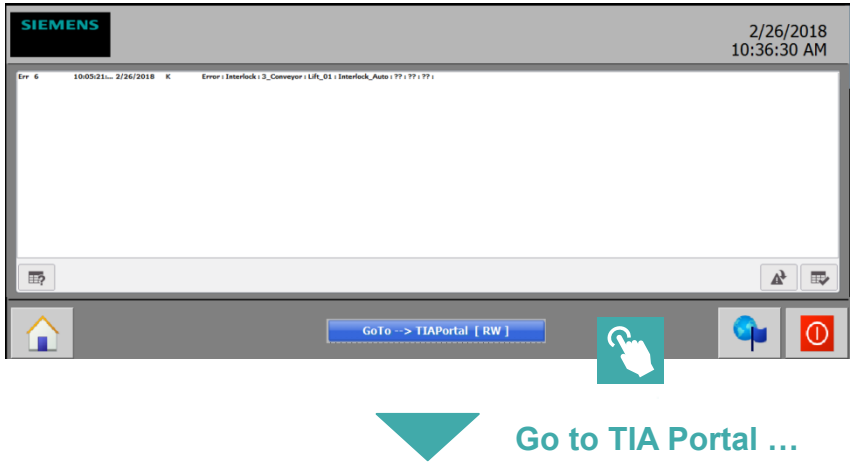
Extensive diagnostic options even in case of simple operand monitoring

TIA Portal Options – ProDiag – Jumping into the TIA Portal from WinCC Advanced

SIEMENS
Ingenuity for life

Function

- System-supported access to the TIA Portal in the context of an S7-GRAPH or ProDiag message
- Relevant block is opened automatically
- Read mode or read/write mode possible
- Automatic status display yes/no



Benefits

Extended system-guided error diagnostics for PC-based systems

Extensive diagnostic options with support of the TIA Portal

TIA Portal Options – ProDiag – Consideration of hierarchical comments in ProDiag messages

SIEMENS
Ingenuity for life

New functions

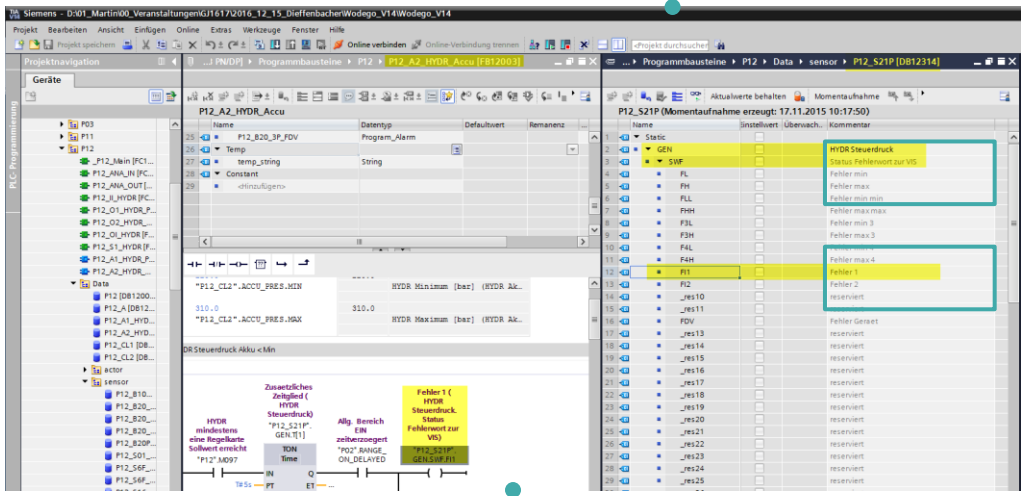
Mapping the plant view in messages

Benefits

Easy mapping of the plant view of the machine/plant via hierarchical comments, whereby the path is generated automatically

System-supported message text generation

<Tag comment path>



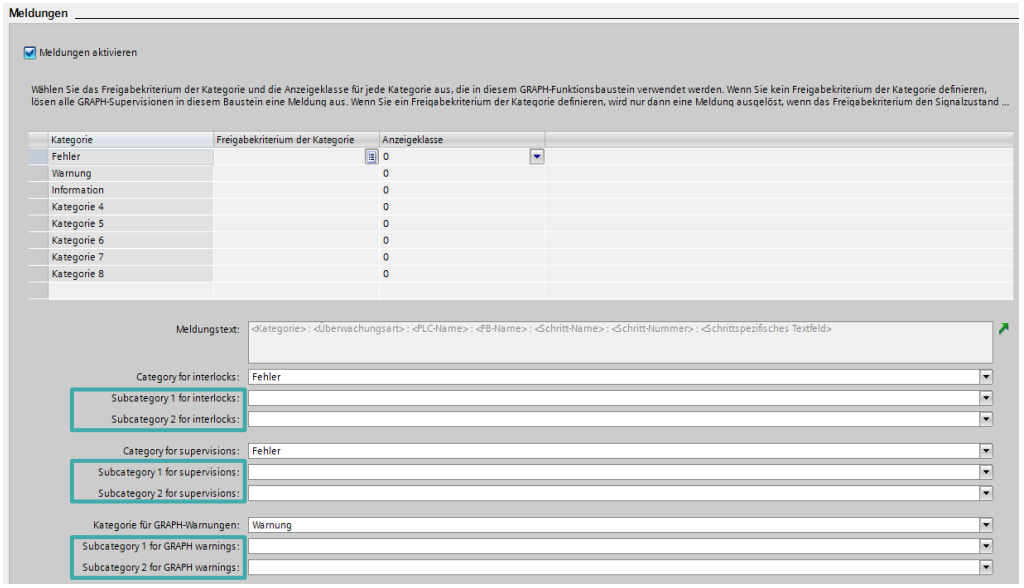
→ **Output in message via tag comment path**
»HYDR ControlPressure.Status error word for VIS.Error 1«

TIA Portal options – ProDiag – Subcategories in S7-GRAPH

SIEMENS
Ingenuity for life

Function

- Same message structure as ProDiag configurable
- Particularly relevant for control systems in which a follow-up action is derived using additional information in the message text



Benefits

Simple possibility to encrypt follow-up actions on the control system in messages

Systematics, uniformity

TIA Portal – Highlights of TIA Portal V15.1

SIEMENS
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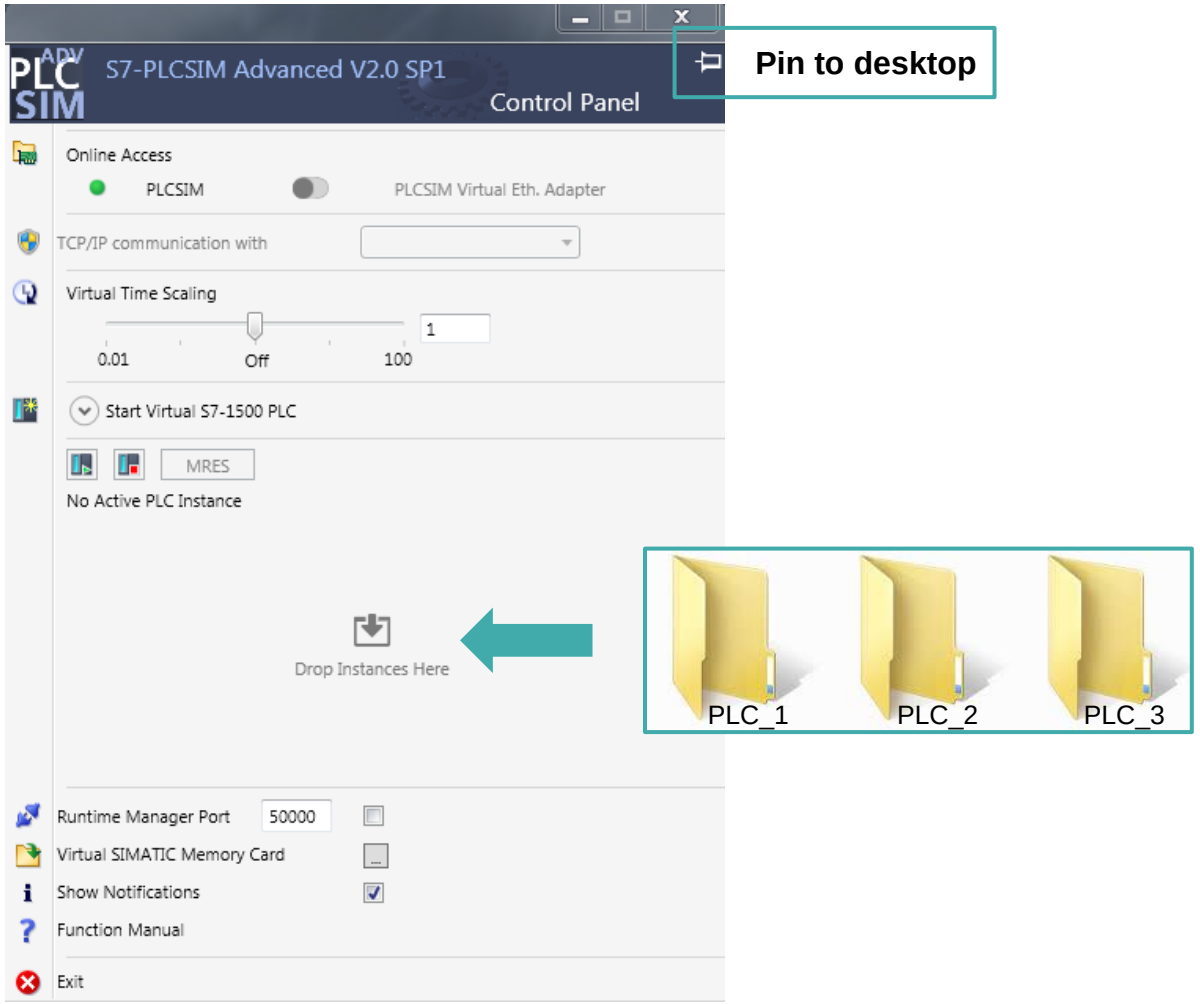
S7-PLCSIM Advanced – Control Panel enhancements

SIEMENS
Ingenuity for life

Function

The Control Panel can be used in two different ways

- A right-click on the tray icon opens the Control Panel as before (quick view)
- A double left-click on the tray icon opens the Control Panel as a floating window, which allows you to
  - Move the floating window around freely
  - Drag-and-drop instances from an Explorer window to the Control Panel
  - Pin the Control Panel to the desktop (always on top)



S7-PLCSIM Advanced – Max. cycle time handling through the API

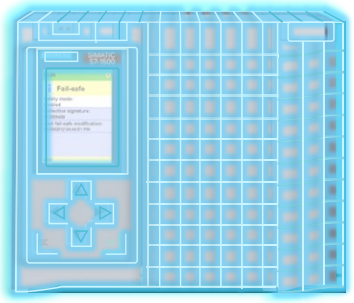
SIEMENS
Ingenuity for life

Function

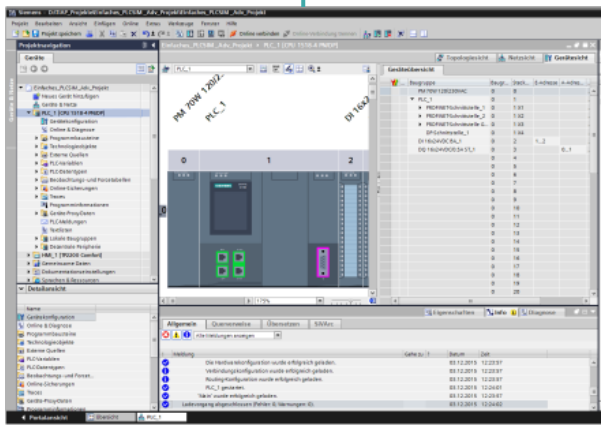
Through the API the maximum cycle time can be either ignored or taken into account, depending on the goal of the simulation

In general there are three operating modes:

- Ignore the max. cycle time; ignore = 1 minute max. cycle time (default)
- Keep the max. cycle time of the downloaded project
- Define another max. cycle time which can be set through the API



Adapt the max. cycle time of the virtual controller through the API



Customer value

- This feature helps prevent the virtual controller from changing to stop if the max. cycle time is exceeded in a virtual environment.
- No change of the max. cycle time of the TIA Portal project necessary.

TIA Portal – Highlights of TIA Portal V15.1

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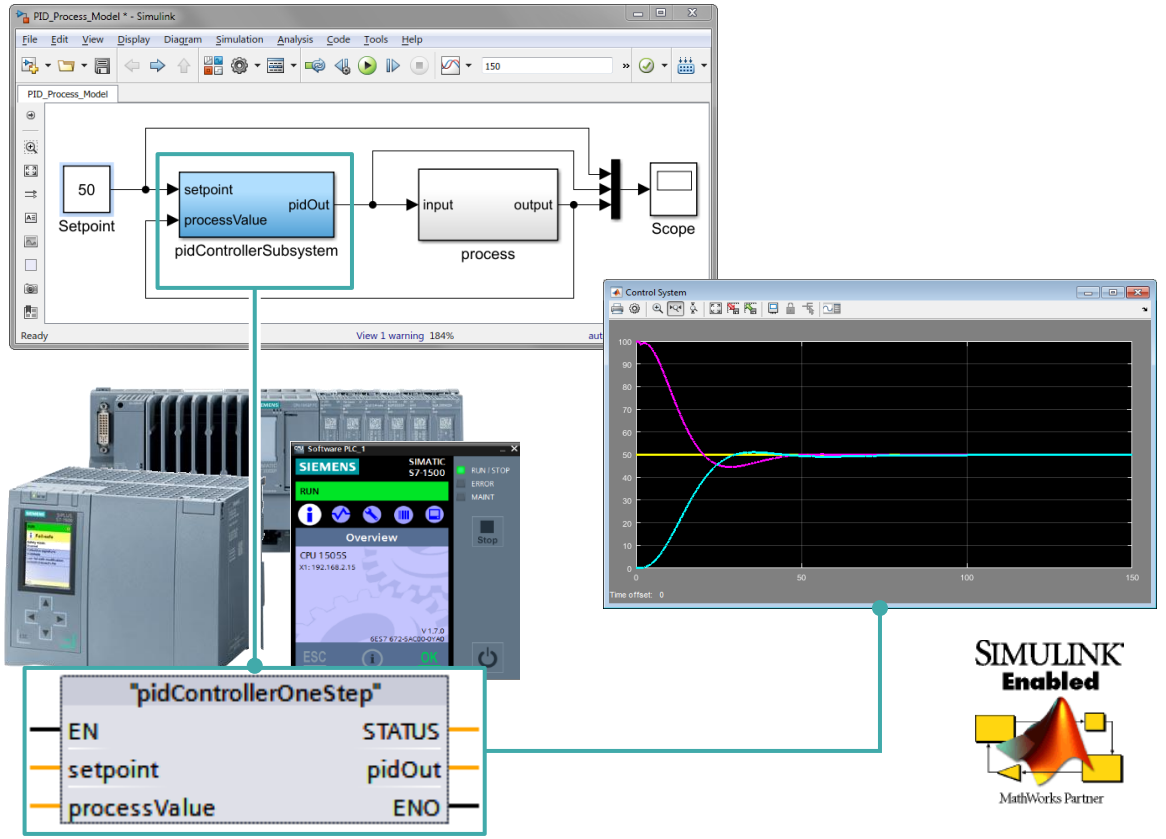
Target 1500S™ for Simulink® – Overview

SIEMENS
Ingenuity for life

- An add-on for Simulink from MathWorks
- Model-based design with MATLAB® and Simulink
- Automatic generation of executable code from Simulink
- Executable on the standard and fail-safe version of
  - S7-1500 software controller
  - ET 200SP Open Controller
  - CPU 1518 MFP/ODK



Target 1500S™ for Simulink®

Target 1500S™ for Simulink® V3.0 – Displaying the model on the CPU Web server

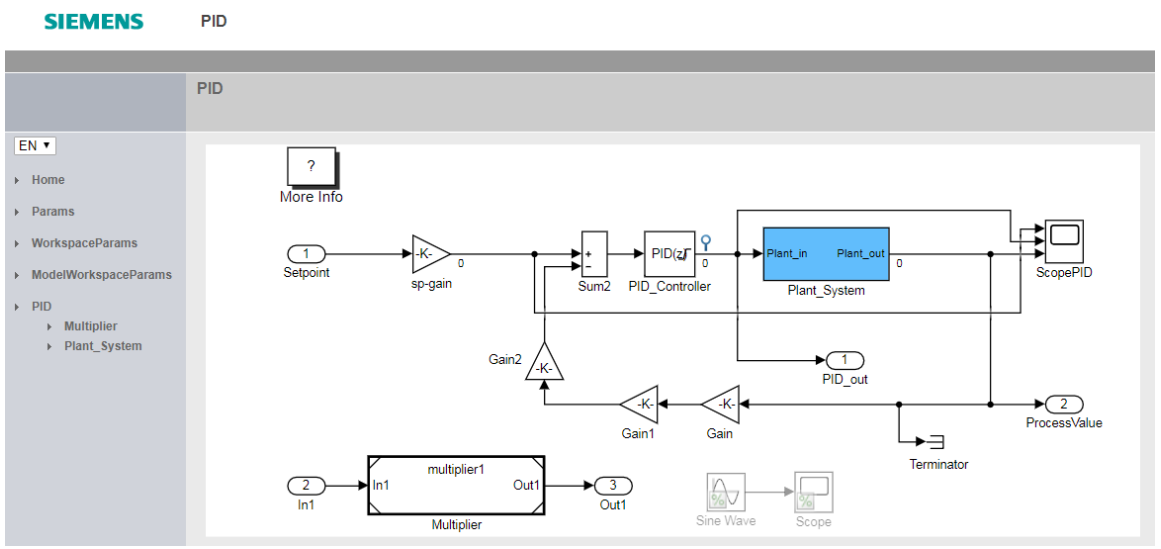
SIEMENS
Ingenuity for life

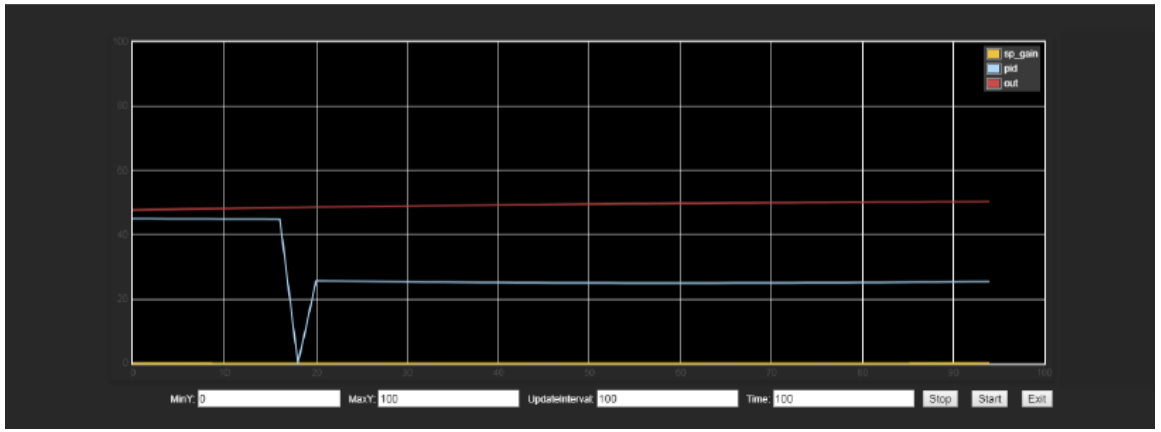
Function

- Export Simulink model graphics to a user-defined Web page on the CPU Web server
- Easy navigation through the sub-systems of a model
- Display and change of model parameters
- Display of signal trends in a scope

Benefits

- Using the Simulink model directly for an HMI via the CPU Web server
- Monitoring model behavior without Simulink
- Can also be used for remote maintenance



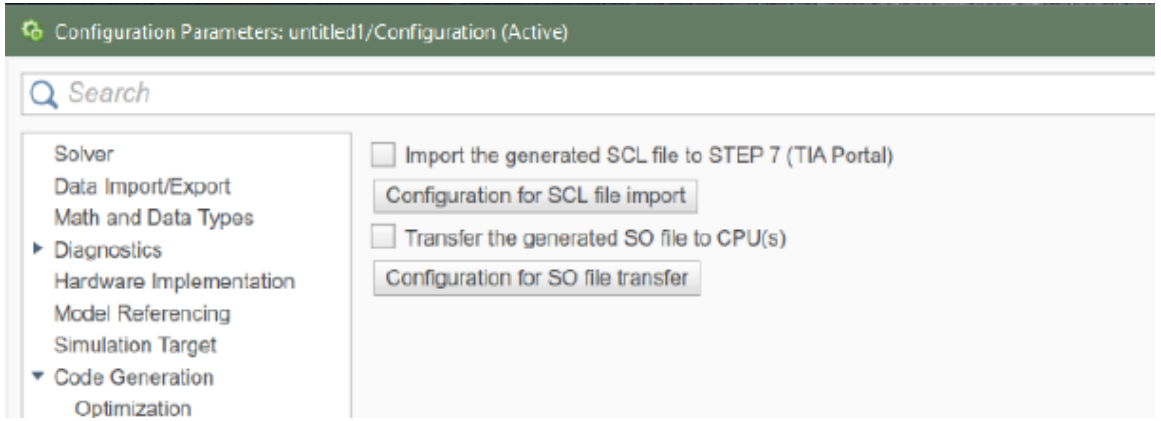


Target 1500S™ for Simulink® V3.0 – Automatic transfer to the CPU

SIEMENS
Ingenuity for life

Function

- Automatic transfer of the generated SO file to the Web server of the CPU after each generation process directly from Simulink
- Including handling for access protection to the CPU (user name/password)



Benefits

- Acceleration of the workflow through automation of manual steps (manual transfer via the CPU Web server no longer necessary)
- Combination with the Openness connection for TIA Portal for maximum benefit

Target 1500S™ for Simulink® V3.0 – Parameter access

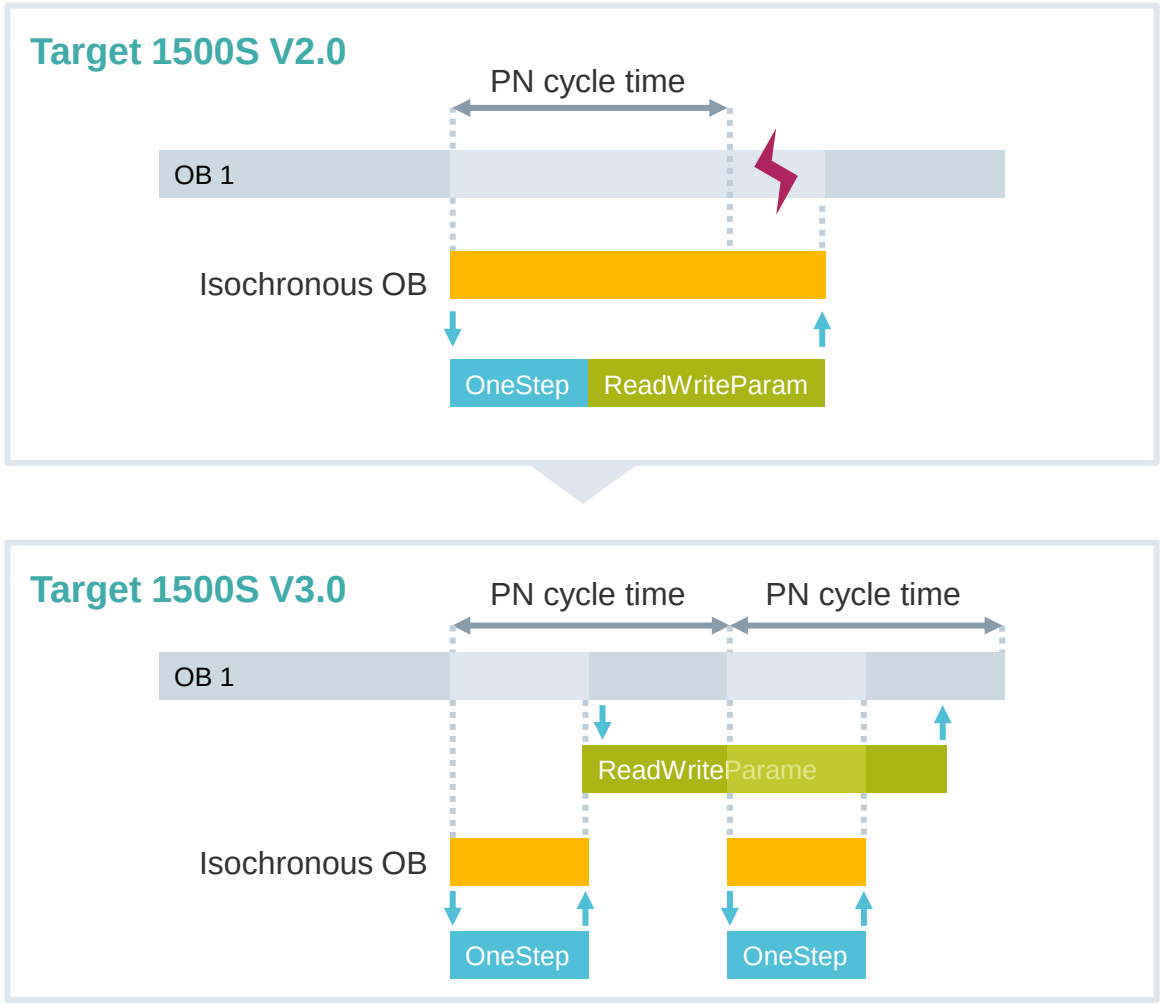
SIEMENS
Ingenuity for life

Function

- Execution of the model and reading/writing of the model parameters in different OBs possible
- Ensuring consistent data exchange between the call levels (thread safety)

Benefits

- Reduced influence on cycle time by reading/writing parameters
- Call of the model in isochronous OB, read/write parameter in low-priority, cyclic OB
- Parameter access with reduced influence on time-critical applications



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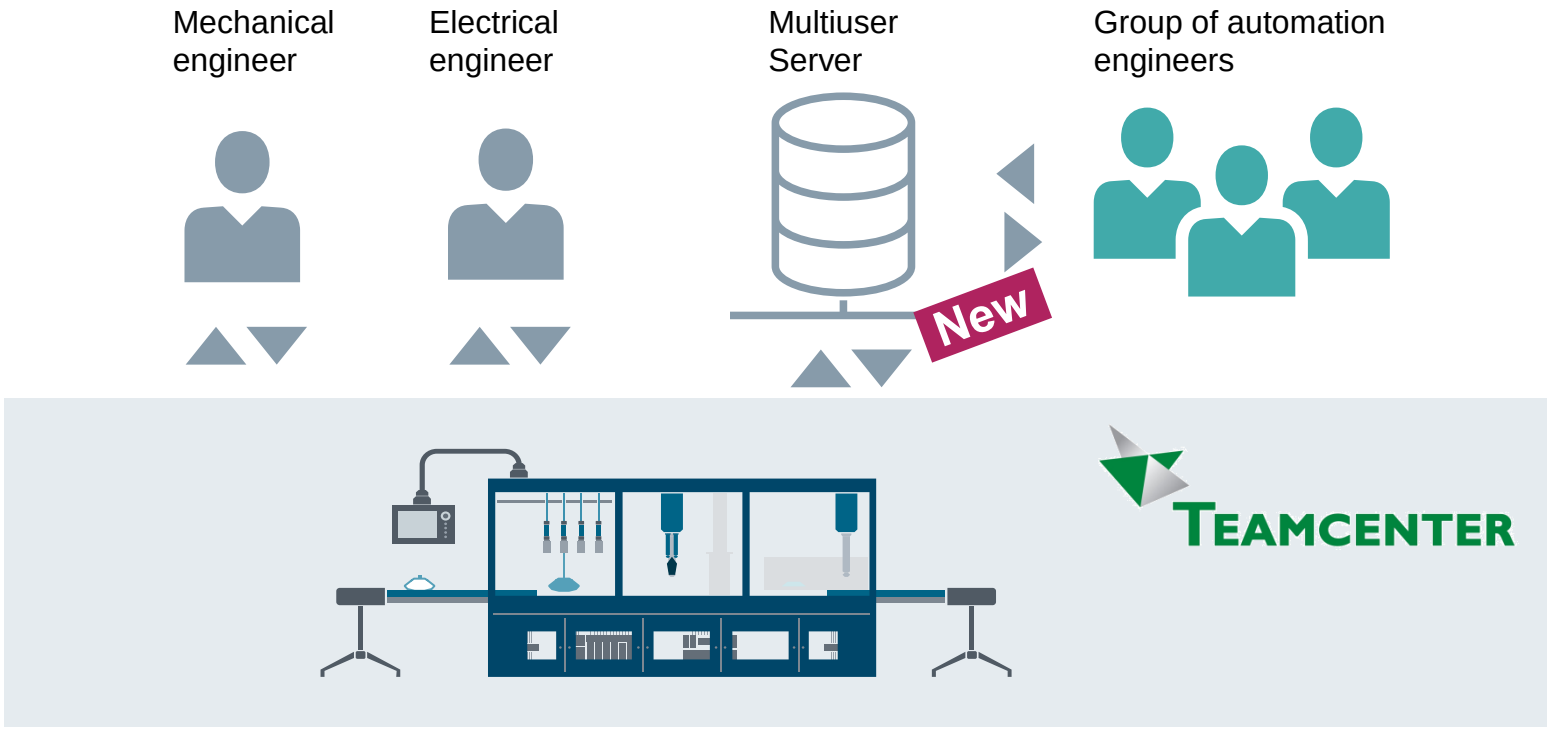
TIA Portal Teamcenter Gateway – Working with multiple users on Teamcenter projects

SIEMENS
Ingenuity for life

Enhanced collaboration on Teamcenter projects

- **Collaborative engineering** of an automation team working on one TIA project stored in Teamcenter **using both TIA Portal Multiuser and TIA Portal** Teamcenter Gateway
- **Compare and Merge** of TIA projects stored in Teamcenter using the reference project functionality
- **Reconnect** manually extracted Teamcenter projects by saving to an already existing Teamcenter item



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SIMATIC Visualization Architect V15.1 – New functions at a glance

SIEMENS
Ingenuity for life

Access protection to the SiVArc rule editors by UMAC

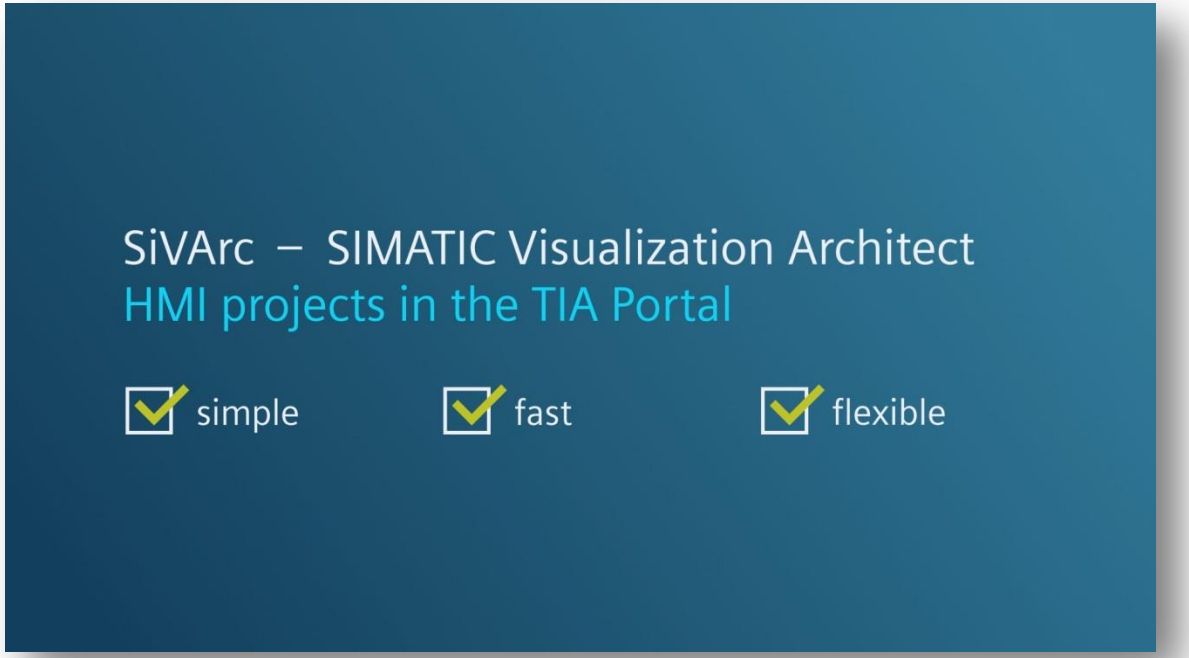
X/Y position can be set by expressions

Support for STEP 7 SCL blocks

Generate on template screens

SiVArc – Openness

- Copying rules/rule groups from the library to the project
- Starting SiVArc generation



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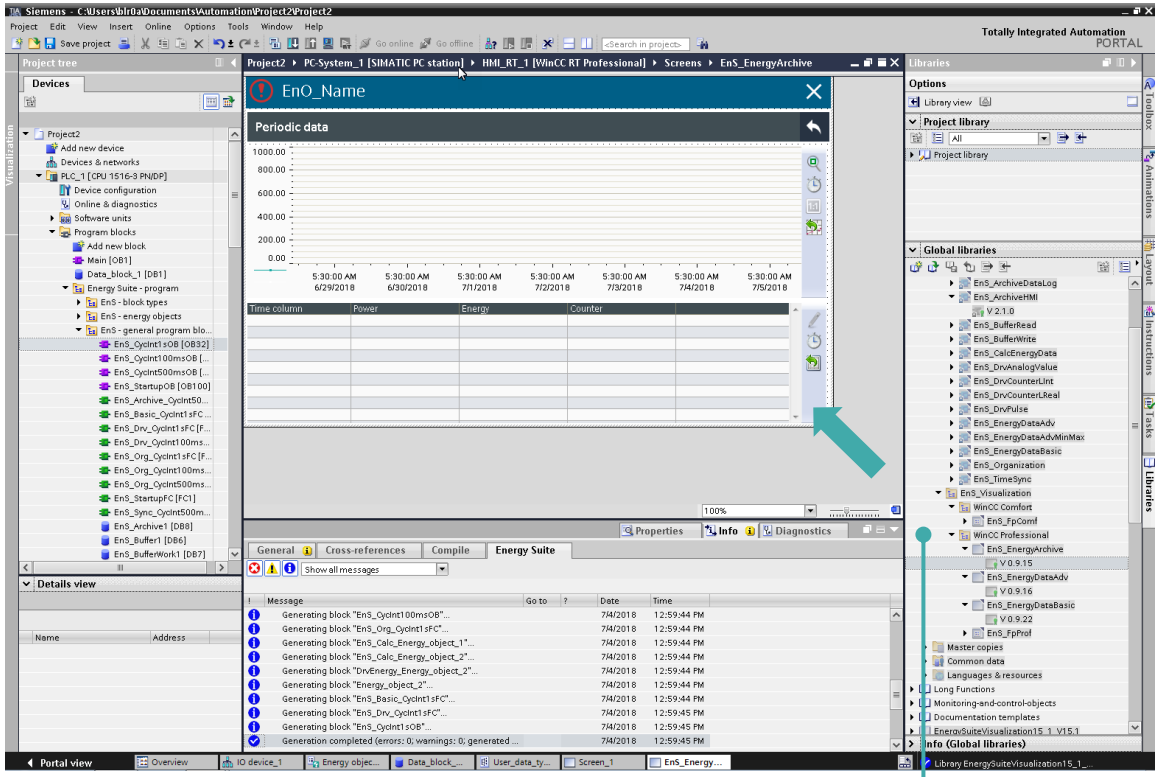
SIMATIC Energy Suite V15.1 – New functions at a glance

SIEMENS
Ingenuity for life

New functions

- **Energy screens**
  Now included as part of the Energy Suite V15.1 product package
- **Reports**
  New: Cost center report including tariffs
- **SINAMICS**
  The configuration of SINAMICS devices via MDD[1] is supported (previously only GSDML was supported)
- **Usability improvements**
  Various small improvements in usability



Energy Screens now included in scope of delivery, easy to use by drag-and-drop

1 MDD – Meta device description (integrated devices in the HW catalog)

Thank you for your attention!

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TIA Portal Market Launch Team

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