TIA Portal v17, webbinarieserie i tre delar

Webbinarium 3: TIA Portal V17 med Motion Control i fokus

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Varför ska du uppdatera Siemens engineeringsportal, TIA Portal, till V17?

Webbinarium 1: TIA Portal V17 med PLC i fokus

Datum och tid: 26 november 10:00–10:45

Webbinarium 2: TIA Portal V17 med WinCC Unified i fokus

Datum och tid: 1 december 10:00–10:45

Webbinarium 3: TIA Portal V17 med Motion Control i fokus

Datum och tid: 10 december 10:00–10:45

Ralf Folke

Jos Klein Woud

Stefan Käck

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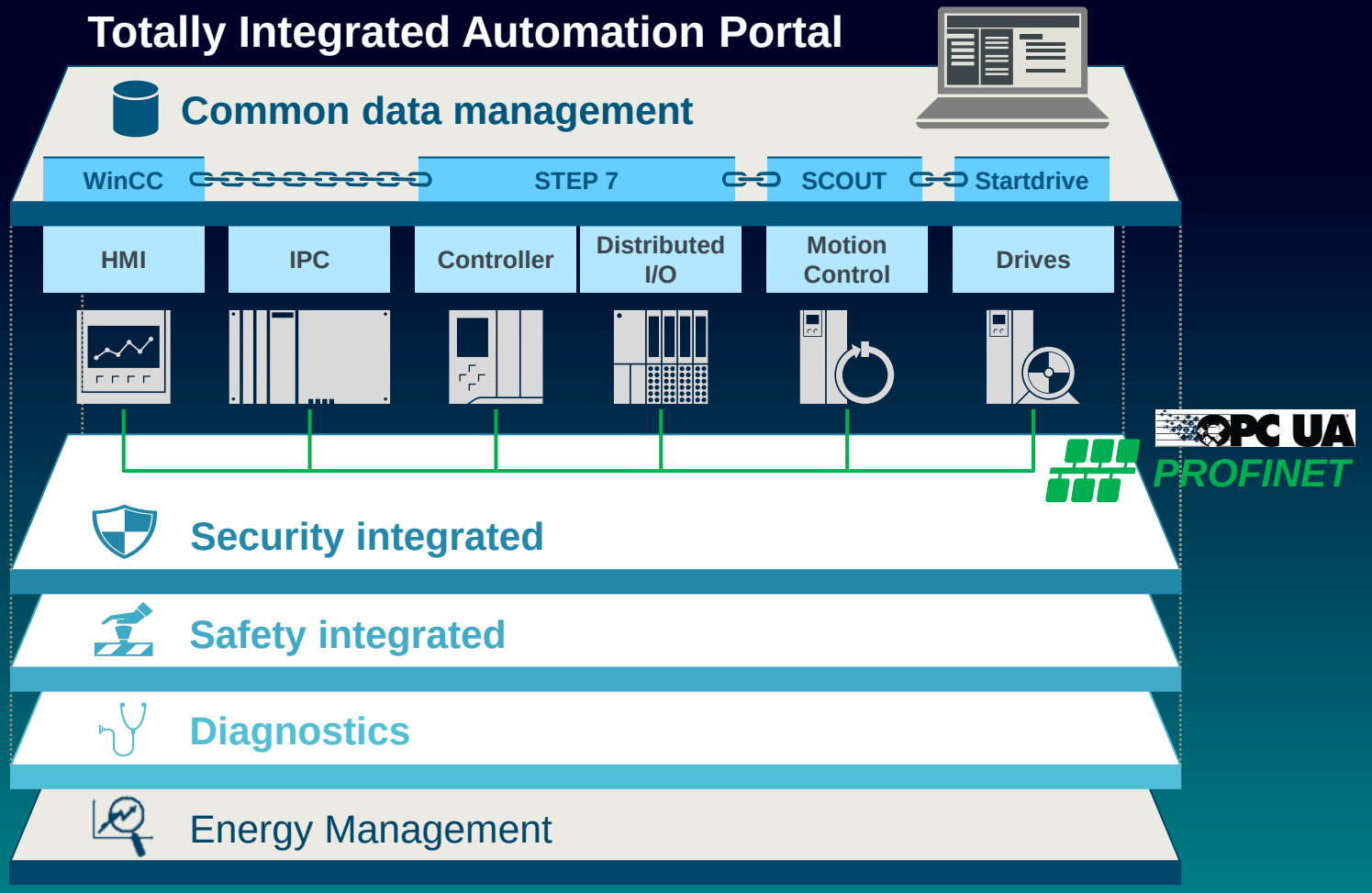
Totally Integrated Automation Portal (TIA Portal)
One for all… The proven basis for innovative solutions

- One common database
- Consistent and unified operator concept
- Common, central services



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POLL

Föredrar du att ha Motion Control centralt i styrsystemet eller decentralt i driven?

I Styrsystemet.

I Driven.

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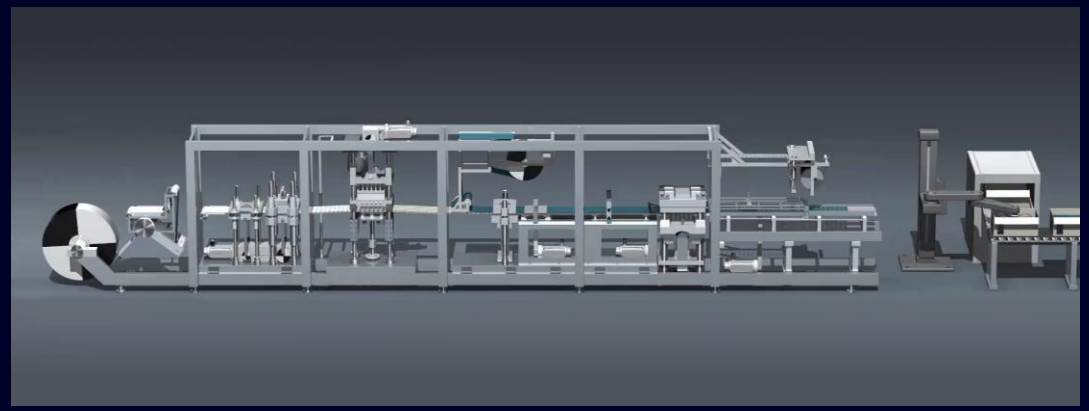
From simple to challenging, SIMATIC Technology!
Motion Control - made easy!

SIMATIC Controller
SIMATIC Open Controller
SIMATIC Drive Controller

Single Axis
Coordinated Axis
Kinematic functions
Position detection



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Motion Control Innovations – TIA Portal V17 / FW V2.9
Extension of the SIMATIC Controller Portfolio

CPU 1518T-4 PN/DP and CPU 1518TF-4 PN/DP

Feature / Function	Benefit
High-performance SIMATIC controller for the high-end motion control market	• Increased performance for sophisticated applications (up to 192 positioning axes)
Significant memory increase compared to CPU 1517 T/TF: - Program memory 9 MB (Factor 3) - Data memory 60 MB (Factor 7,5)	• More memory for high quantity structures (axes, program size, I/Os etc.) and standardization / modularization of machines
Third PROFINET interface	• Usable for basic services e.g. OPC UA or TCP/IP communication

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Motion Control Innovations – TIA Portal V17 / FW V2.9
Extension at SIMATIC Drive Controller

CPU 1504D TF and CPU 1507D TF

Feature / Function	Benefit
New Firmware: • PLC FW V2.9 • SINAMICS Integrated FW V5.2 SP3	• For function extensions see PLC FW V2.9 and SINAMICS S120 FW V5.2 SP3 • PLC and SINAMICS FW independently changeable from each other
Extended functionality of the SINAMICS Integrated: • DCC/DCB • EPos • Additionally supported SINAMICS licenses: - Cogging torque compensation - Advanced Position Control (APC) - SERVCOUP (Servo Coupling) - …	• DCC/DCB: free-available control, calculation and logic blocks for the extension of the drive functionality; e.g. for changing / adapting the controller setpoint channel in a very fast cycle • EPos: Implement positioning tasks directly in the drive • Additional licenses for extended applications: - Compensation of periodic cogging torque - Active suppression of vibrations in the drive system - Coupling of several motor modules with one encoder - …
Setting the card type using the FUNCT key (without ES and without Card Reader)	• Memory card can be used both as program and firmware card; simplifies e.g. module exchange
CPU 1507D TF: Reduction of the minimum application cycle time from 500 µs to 250 µs	• Higher machine cycle times, improved machine behavior for sophisticated motion control applications
PLCSIM Advanced with Drive Controller	• Realistic function test of the user program, for early error detection and validation of the functionality

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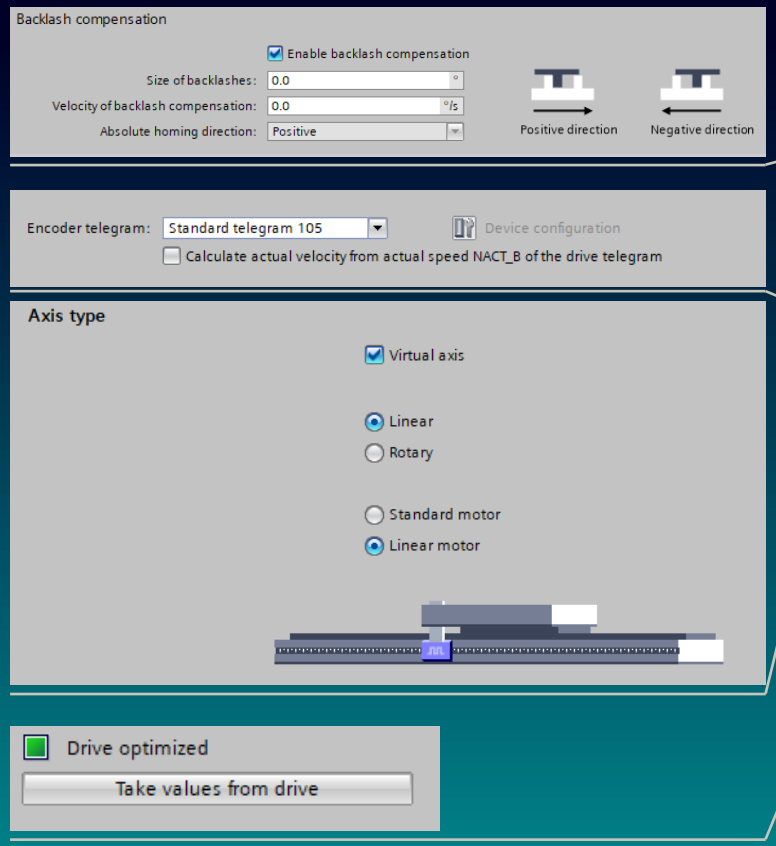
Motion Control Innovations – TIA Portal V17 / FW V2.9
Functional extensions on the technology object axis

S7-1500 and S7-1500 T-CPU



Feature / Function	Benefit
Backlash compensation – Compensate backlash in the mechanics	• Increasing movement accuracy without additional programming effort
Take over actual speed (NIST) from telegram	• The speed determined in the drive is used for the control. This results in a higher control quality, especially for encoders with low resolution.
Connection and configuration of linear motors	• Usable for electric linear or hydraulic drives • Measurement units "Force (F)" is configurable on the axis
Automatic optimization of the axis	• Automatic optimization of the axis with a few clicks. • In the TO configuration the optimization of the drive can be initiated in Startdrive and the determined parameters can be taken over for the position controller
Functional extension of the drive and encoder connection via data blocks	• Extension of the programming possibilities by using arrays and structures for the connection via DBs

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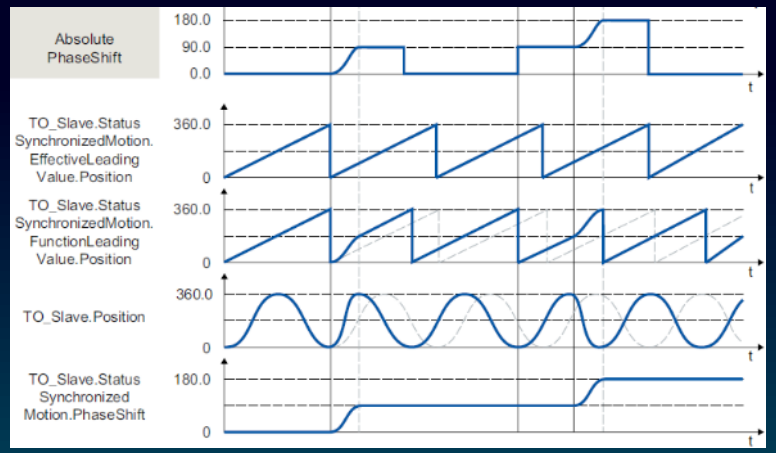
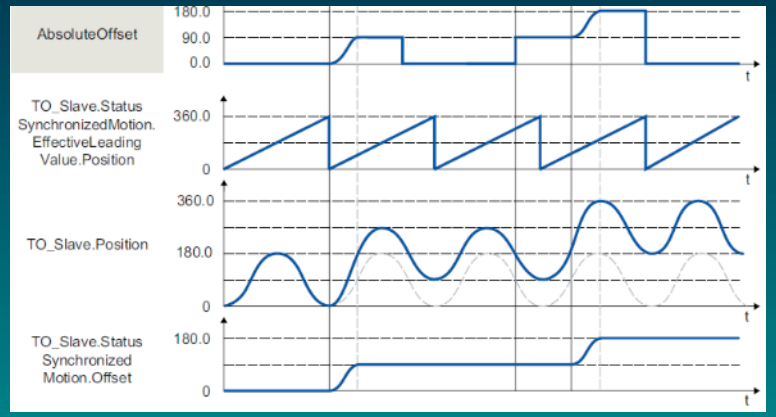
Motion Control Innovations – TIA Portal V17 / FW V2.9
Functional extensions of synchronized axes

S7-1500 T-CPU





Feature / Function	Benefit
Desynchronize gearing and camming stopping the following axis at a defined position (MC_GearOut, MC_CamOut)	• Simple programming of synchronization functions without additional effort (e.g. in OB1)
Leading value coupled correction profiles on the following axis (MC_PhasingAbsolute/Relative, MC_OffsetAbsolute/Relative)	• Simple programming of synchronized compensation/correction movements without additional effort (e.g. in OB1)
Change or scale a cam at the end of an active cam	• Simple programming of cam profile changes without additional effort (e.g. OB1)
New cam profile type with 10,000 points and 50 polynomial segments	• Higher accuracy for complex cam profiles

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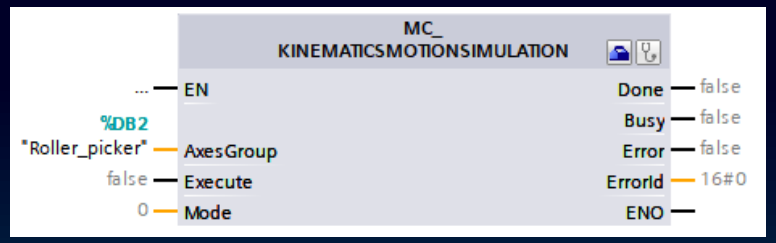
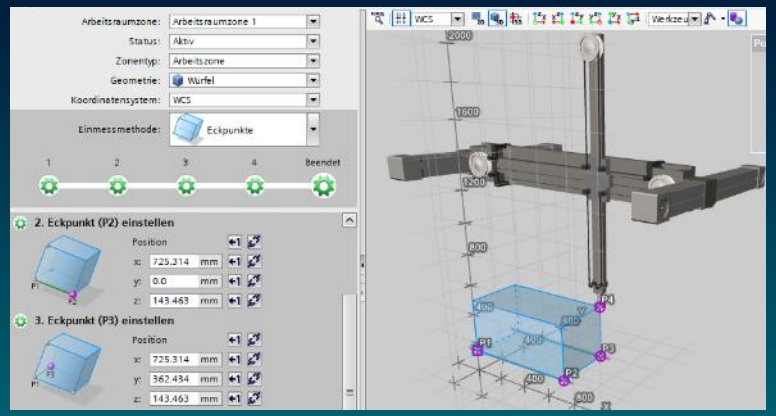
Motion Control Innovations – TIA Portal V17 / FW V2.9
Functional extensions for kinematics

S7-1500 T-CPU





Feature / Function	Benefit
New instruction “MC_KinematicsMotionSimulation”	• Enables the continuation of a kinematics movement after disabling and re-enabling the kinematics axes
Dynamic adaptation in the kinematics control panel is provided via the operating mode “Jog to target position”.	• In the mode “Jog to target position" of the kinematics control panel, the “Dynamic adaptation without segmentation of the path” is active – the dynamic limits of the kinematics axes are taken into account.
Offline- and online calibration of workspace zones	• Comfortable definition of workspace zones with graphical support
Travelled distance and the total distance of path movements (linear, circular) without conveyor tracking are displayed in variables	• Trigger events on a certain summed up path length in applications without conveyor tracking.
Configuration of rounding clearance > 50 % of the shorter path distance.	• Shorter paths by increasing the rounding clearing distance
The number of prepared commands in the job sequence is displayed in a variable.	• Start of the kinematics motion after the motion preparation is completed.

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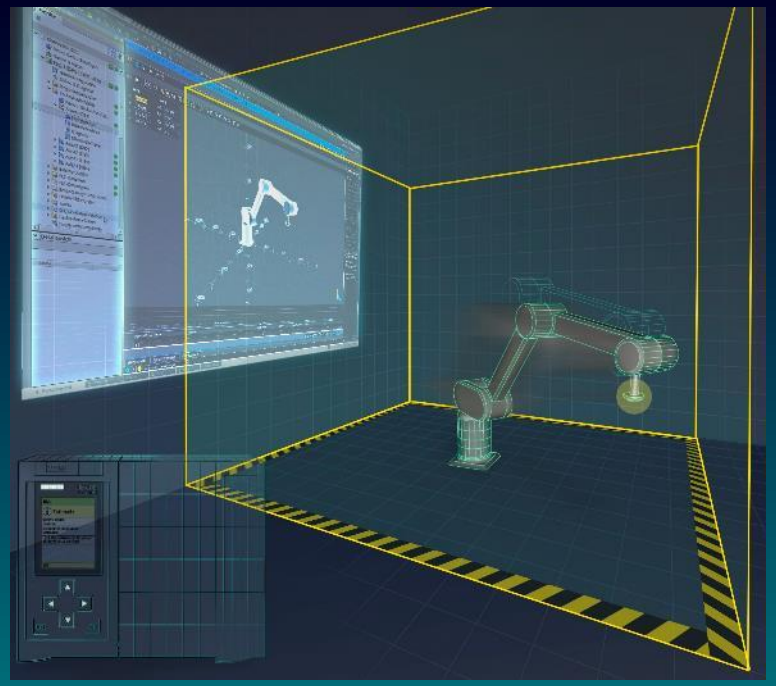
SIMATIC Safe Kinematics V2.0 – Fail-safe monitoring of kinematics movements in cartesian space

CPU 1517F-3 PN/DP, CPU 1518F-4 PN/DP and CPU 1517TF-3 PN/DP, CPU 1515SP PC2 TF



Feature / Function	Benefit
System integrated and certified fail-safe solution according to SIL3 (IEC 61508 and IEC 62061) PLe (ISO 13849-1)	• No additional fail-safe hardware required • No additional certification effort for the machine manufacturer
Predefined kinematics Monitoring the movement of predefined kinematics and free transformations in cartesian space with up to 12 interpolating axes	• Simple integration of predefined fail-safe function blocks for the monitoring of common kinematics types
Safe zone monitoring User-programmable zones for limiting the kinematics movement space and for programming area-dependent safety functions	• No need for cost-intensive and inflexible protection fences • Compact machine design
Safe velocity monitoring Monitoring of the cartesian velocity at user-defined monitoring points	• Complies with requirements for monitoring at the Tool Center Point according to EN ISO 10218 • Additional monitoring of individual points on the kinematics possible
Safe orientation monitoring Monitoring of the tool flange orientation	• Activation of workpiece processing / handling depending on the angle of the tool to the floor

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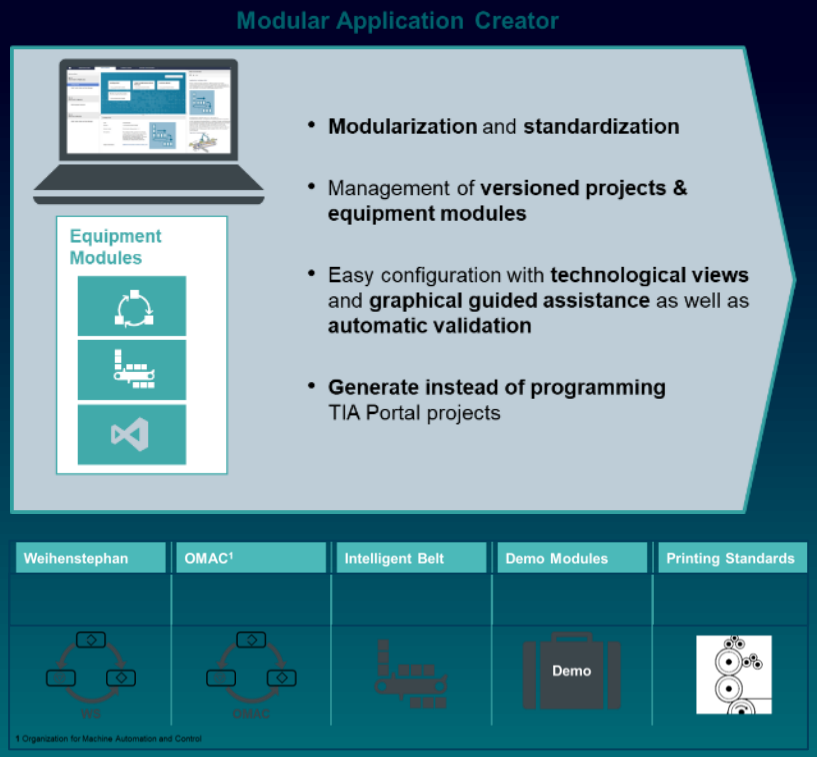
Modular Application Creator V2.0 (MAC)

S7-1500 and S7-1500 T-CPU



Feature / Function	Benefit
Modularization and Standardisation	• Supports the user to organize its software for reuse
Management of versioned projects & equipment modules	• Versioning of modules ensure the reuse of specific applications and specific hardware • Versioning of projects ensures the fast finding of specific module version in combination with specific hardware and firmware
Easy configuration with technological views and graphical guided assistance	• Ensures an efficient configuration of all the needed parameters, in a technological view not in a programming tool in Bytes and Bits
Generate instead of programming TIA Portal projects	• Generation of the project needs some minutes instead of copying program blocks and configuration of all data manually in hours. • The generation process also ensures that all parameters and settings are right in place with no errors, the project is ready to commission
5 Modules available; customizing planned	• 3 modules for packaging applications available • A module to serve the printing standards • Customer own module building in preparation
Modularization and Standardisation	• Supports the user to organize its software for reuse

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Startdrive

Drives for **Continuous Motion**
SINAMICS G, S

Drives for **Discontinuous Motion**
SINAMICS S210, S120

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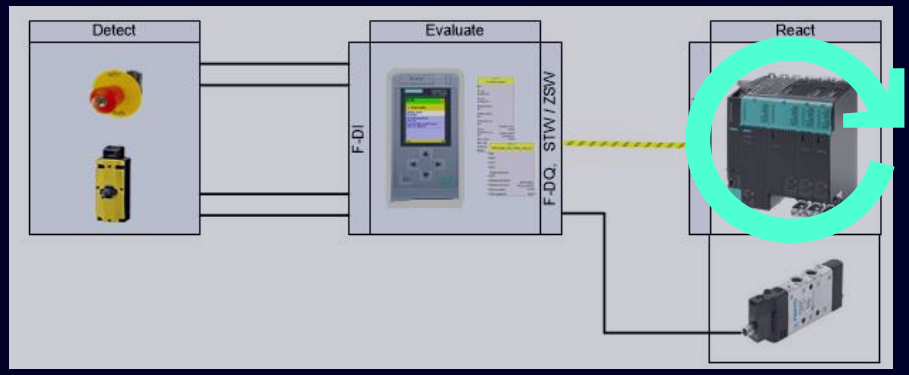
New Safety Activation Test
Difference between Acceptance Test and Activation Test

Safety Acceptance Test (existing since V15)

Validation of correct safety parameterization for the integrated drive safety functions. Clearance about questions such as:

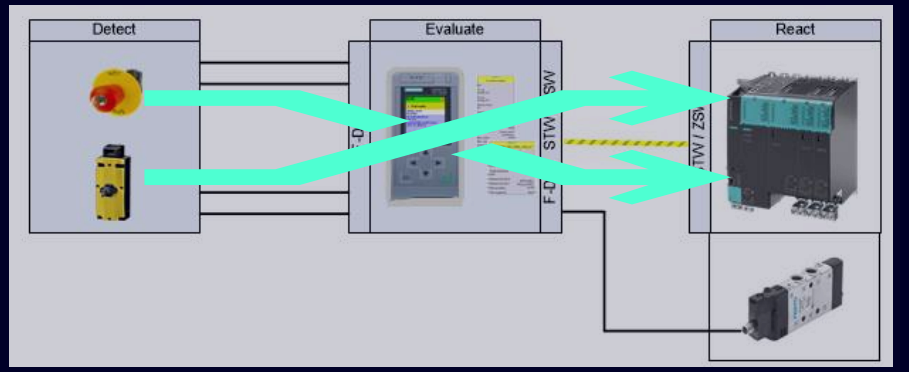
- Are the braking ramps set correctly?
- Are the limitations and fault reactions set correctly?
- …



Safety Activation Test (NEW in V17)

Validation of the safety control chain from sensor to actuator.
Clearance about questions such as:

- Does every drive select the correct safety function when a safety sensor is activated?
- Are all safety functions realized according to the risk minimization?
- Are there wiring errors for the safety sensors?
- …



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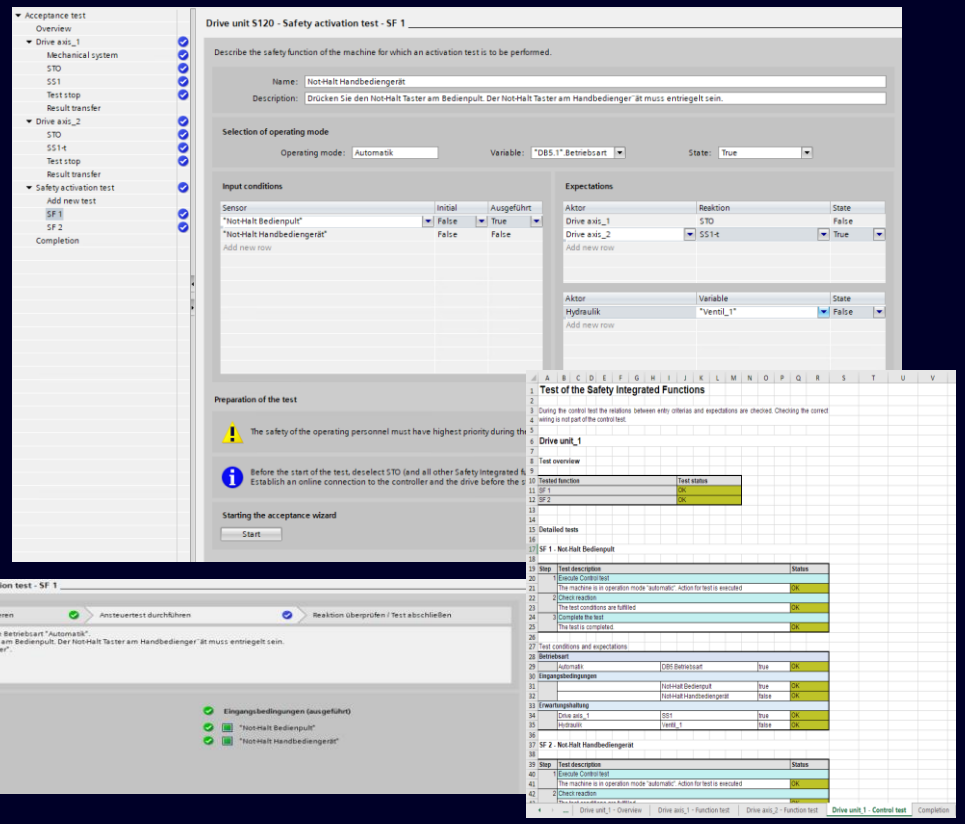
New Safety Activation Test
Workflow & required license

Workflow

1. Define all safety functions via the wizard: operation mode, input conditions, expected reaction (this step can be done by the project engineer already in advance to the commissioning phase)

2. After machine commissioning execute the tests and go through all defined safety functions using the guided step by step assistant

3. Automatic creation of the test protocol with all necessary information



! Safety validation is an important step on the way to the required **CE-marking** of the machine!

Safety Activation Test is part of the Safety Acceptance Test and thus also part of the SINAMICS Startdrive Advanced license.

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UMAC in TIA Portal
User Management and Access Control

What is UMAC?

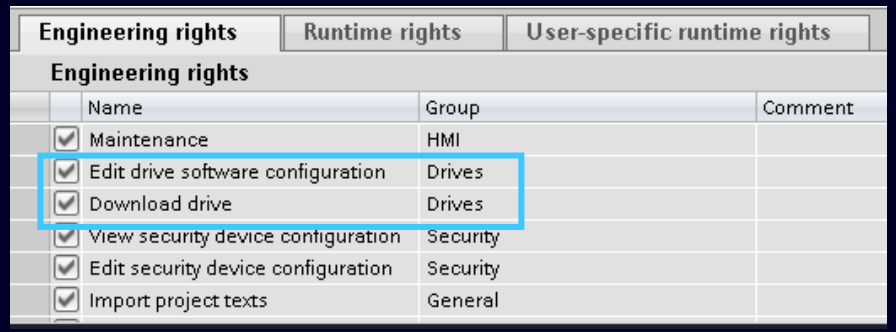
Handling of users and their assigned rights for a TIA Portal project. Possibility to have Admin users or users with limited reading / editing rights. There is a wide range of predefined roles and the possibility of creating new roles with specific rights

→ Principle of least privilege

What's new for Startdrive V17?

New function rights for drive parameterization and drive download (separated from PLC / HMI handling).

→ Possibility of defining users which are allowed to edit drive parameterization but not the PLC program or vice versa



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New SIMATIC control for EPOS
BasicPosControl (S7-1200 / S7-1500; SINAMICS G + S)

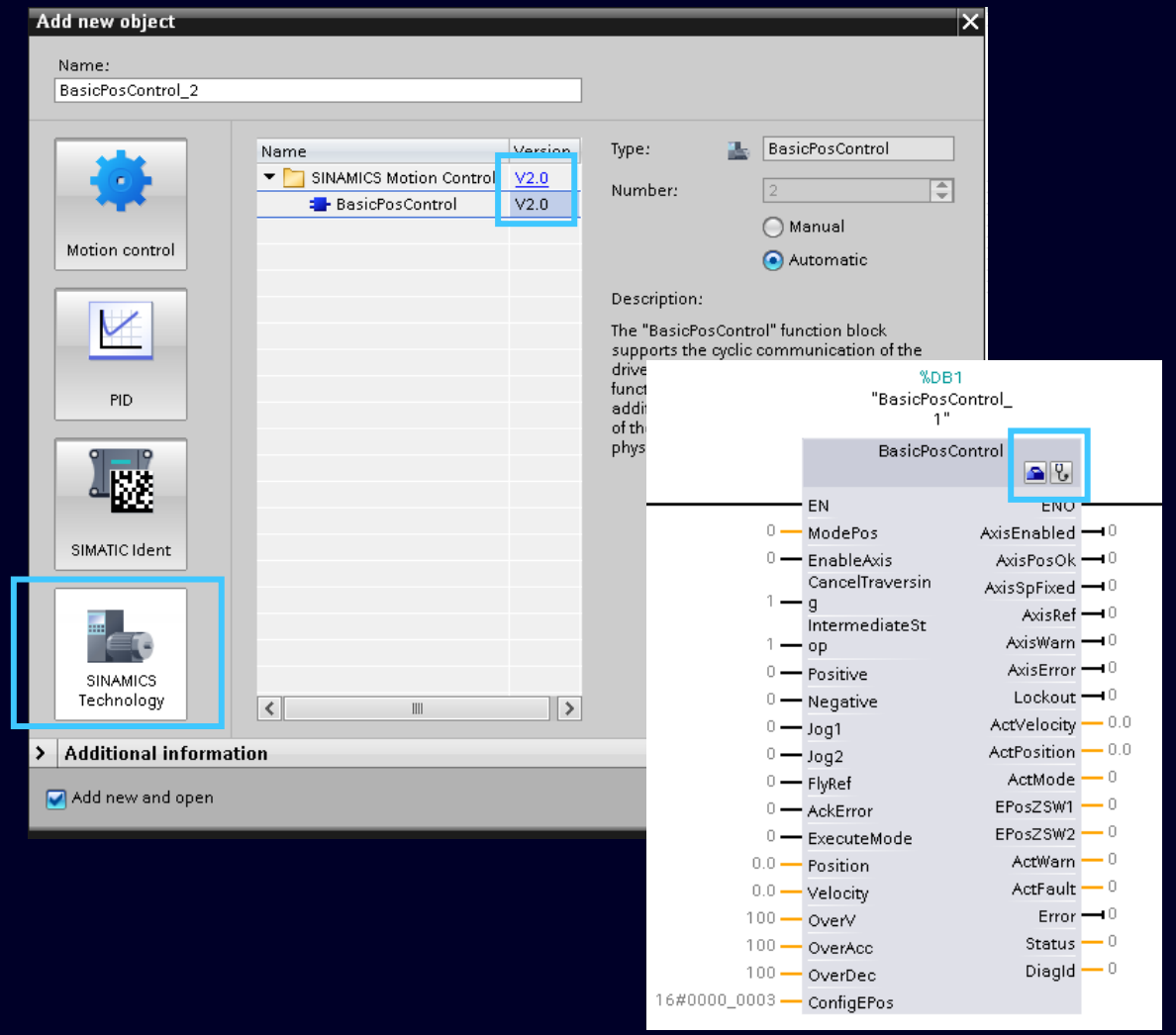
! Name TO_BasicPos (V1.0 in TIA V16) changed to BasicPosControl (V2.0 in TIA V17).

+ Comfortable PLC control of drives with EPOS functionality via telegram 111.

+ Simple communication connection between PLC and drive, setup and diagnosis.

+ New mechanics setup for BasicPosControl → user can now work with physical units within the PLC program. Selection between linear and rotary axis with several units for position and velocity.

+ Automatic conversion from physical units (PLC program) to LU (drive data) by the function block.



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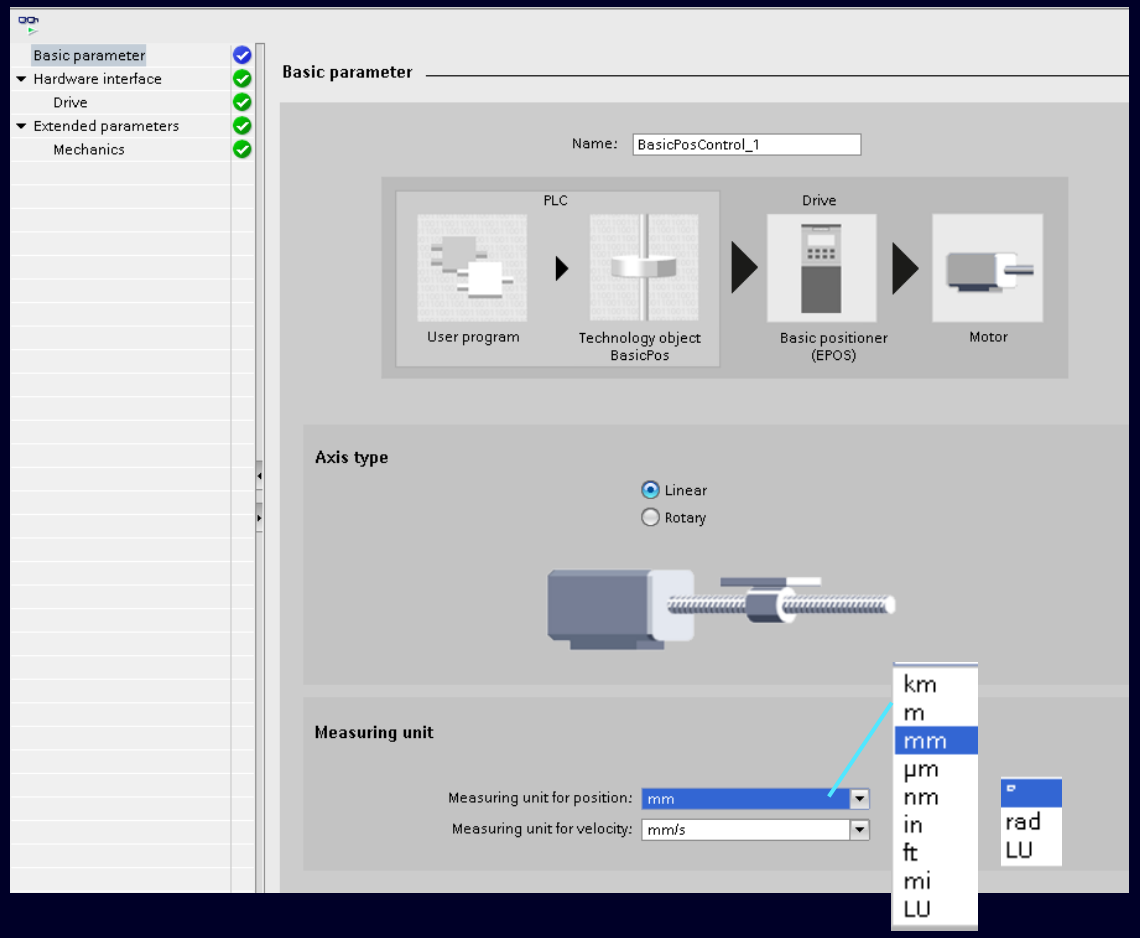
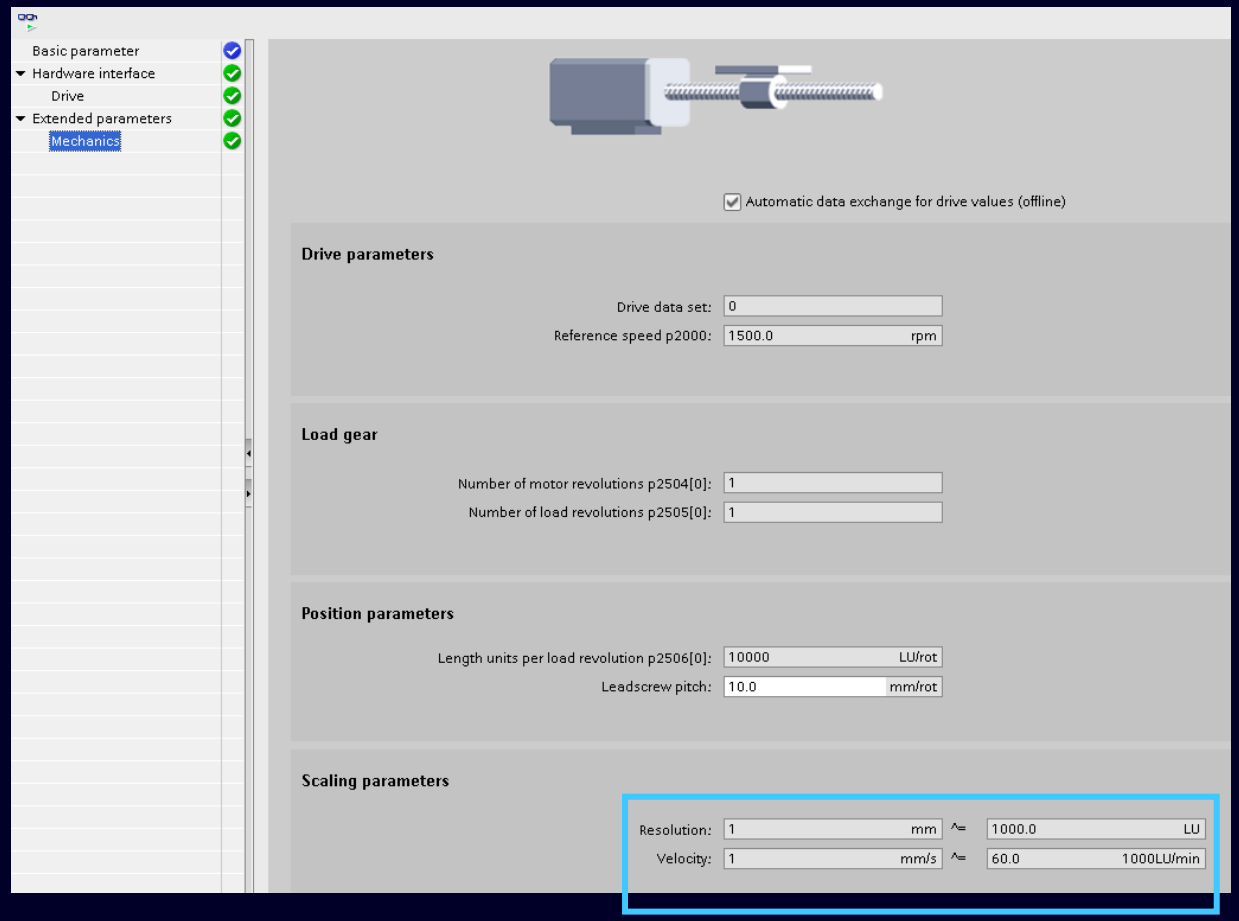
New SIMATIC control for EPOS
BasicPosControl configuration

Basic parameter
Linear/rotary + unit selection



Mechanics
Automatic conversion of physical units to LU



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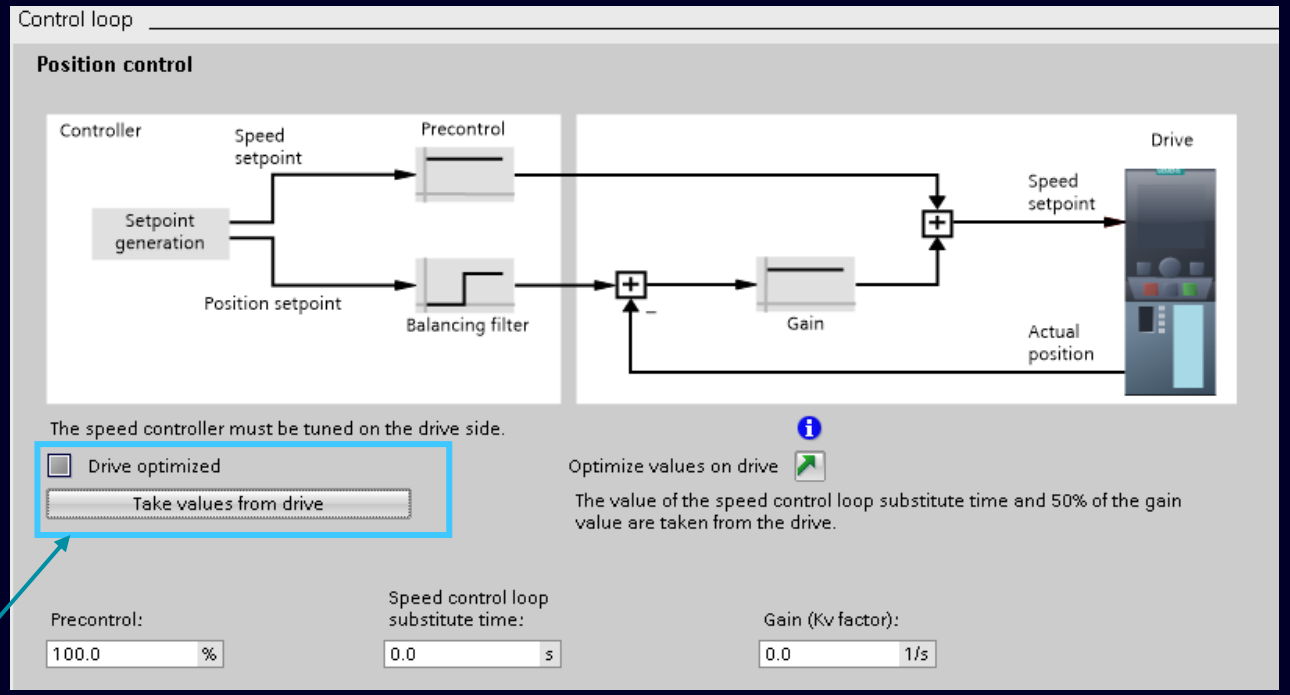
Technology Object and Drive Object
Improved interaction for optimization

One Button Tuning for servo drives…

…directly sets in the drive:
- Kp, Tn for speed controller
- Moment of inertia
- Current setpoint filters
- …

…additionally calculates:
- Position controller gain Kv (r5276)
- Precontrol symmetrizing time (r5277)



NEW in V17
Calculated values for position control can be directly accepted for TO settings in the PLC. (From TO version V6.0)

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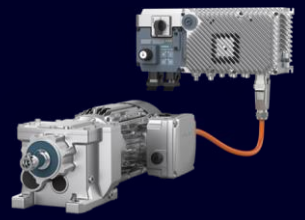
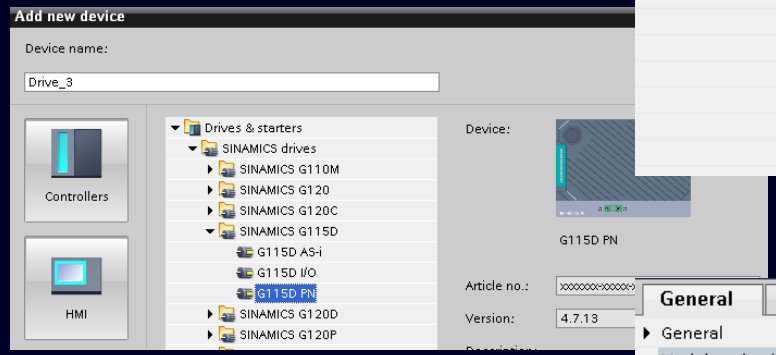
SINAMICS G115D in Startdrive
Adding the drive and defining the type

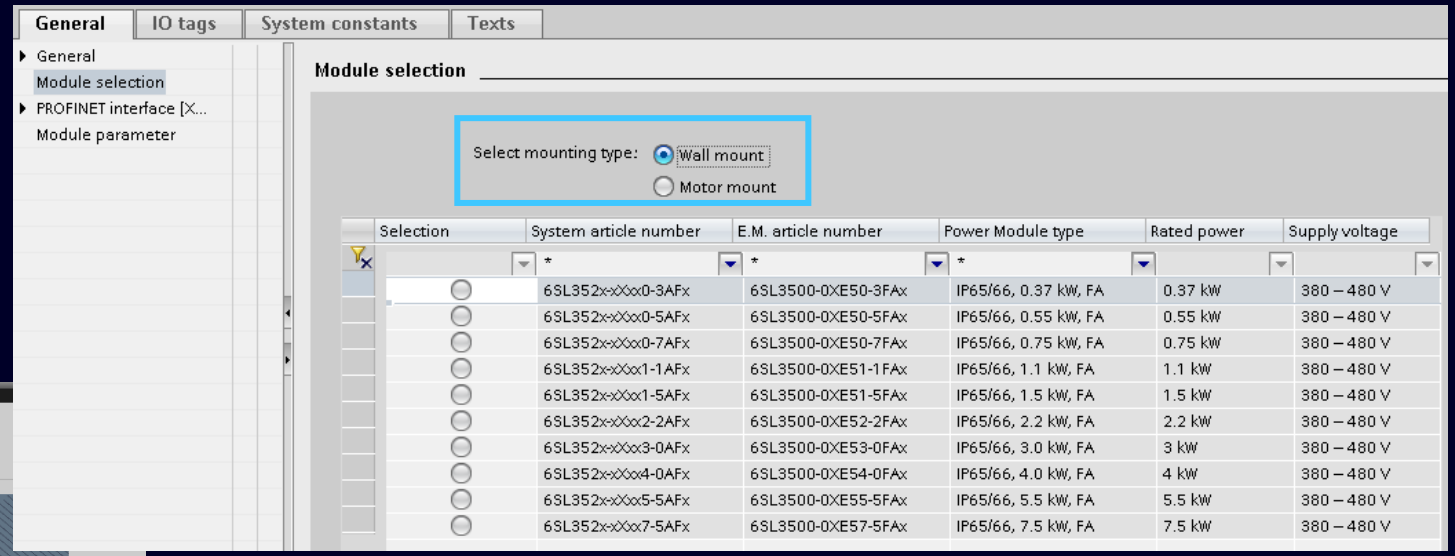
Already since V16 Upd 4



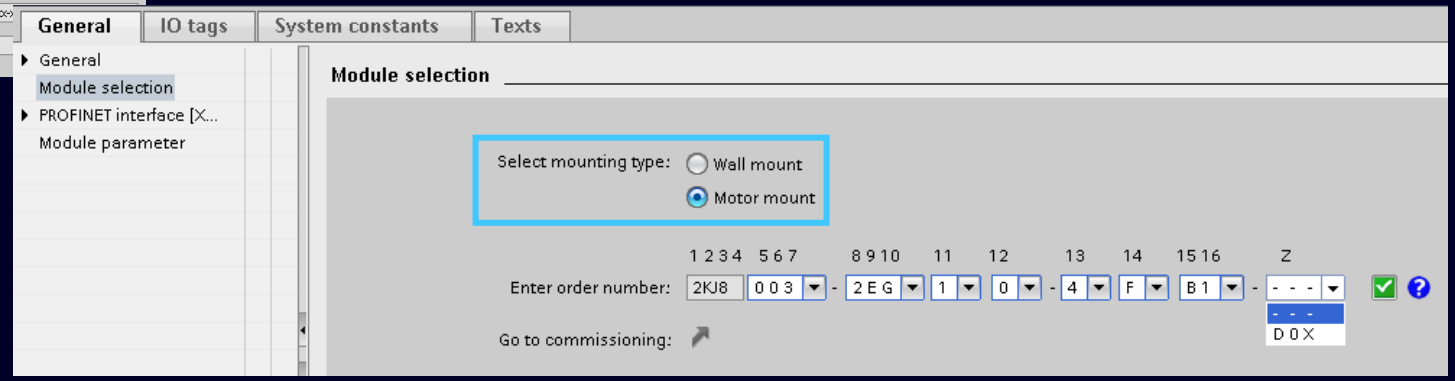
2a Specify wall mount version



1 Add G115D drive to TIA Portal project



2b Specify motor mount version



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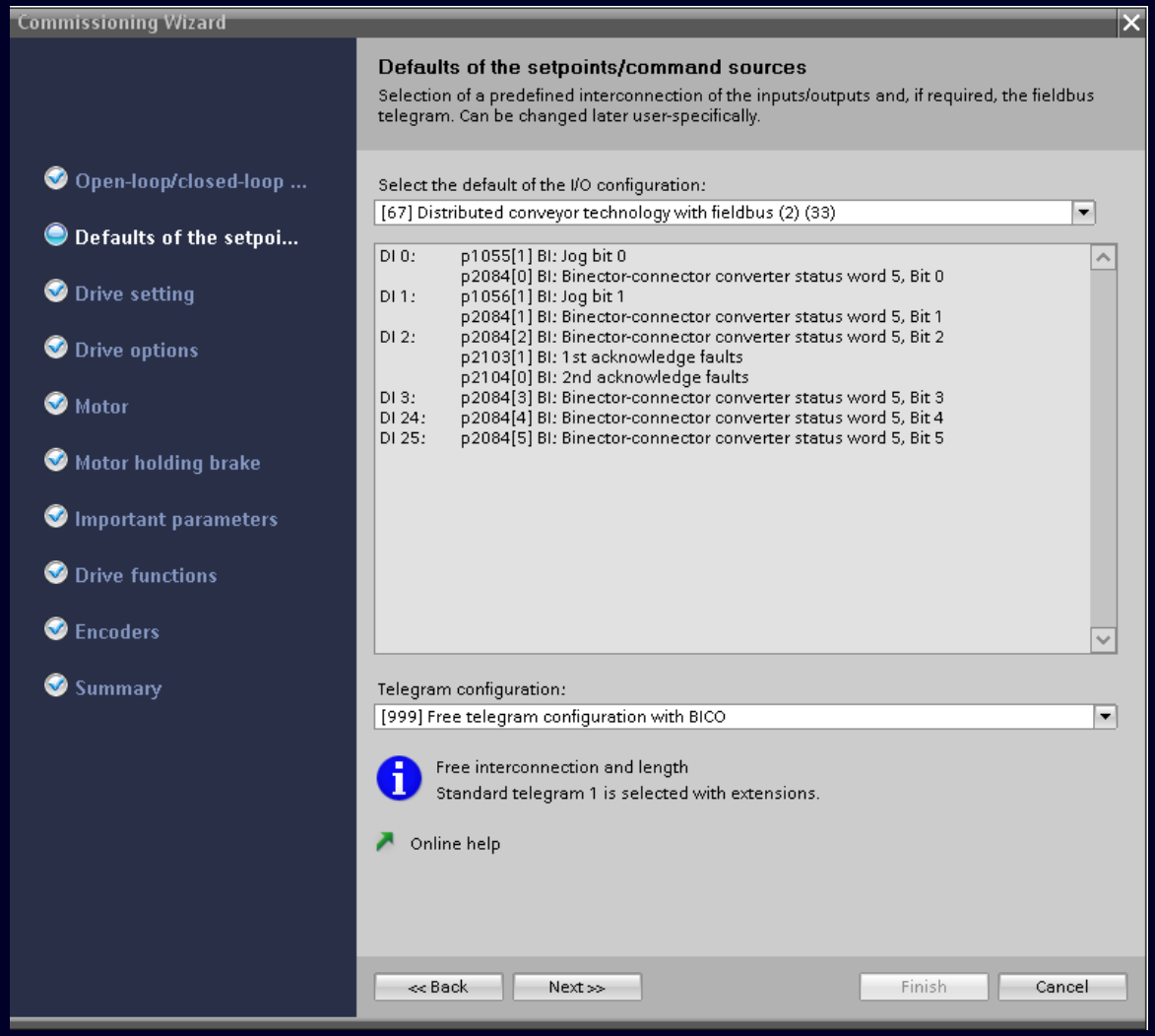
SINAMICS G115D in Startdrive
Commissioning wizard

3 Go through commissioning wizard as known from SINAMICS G drives



Note: Everything defined by MLFB already preset! (motor data, holding brake, temperature sensor, …)

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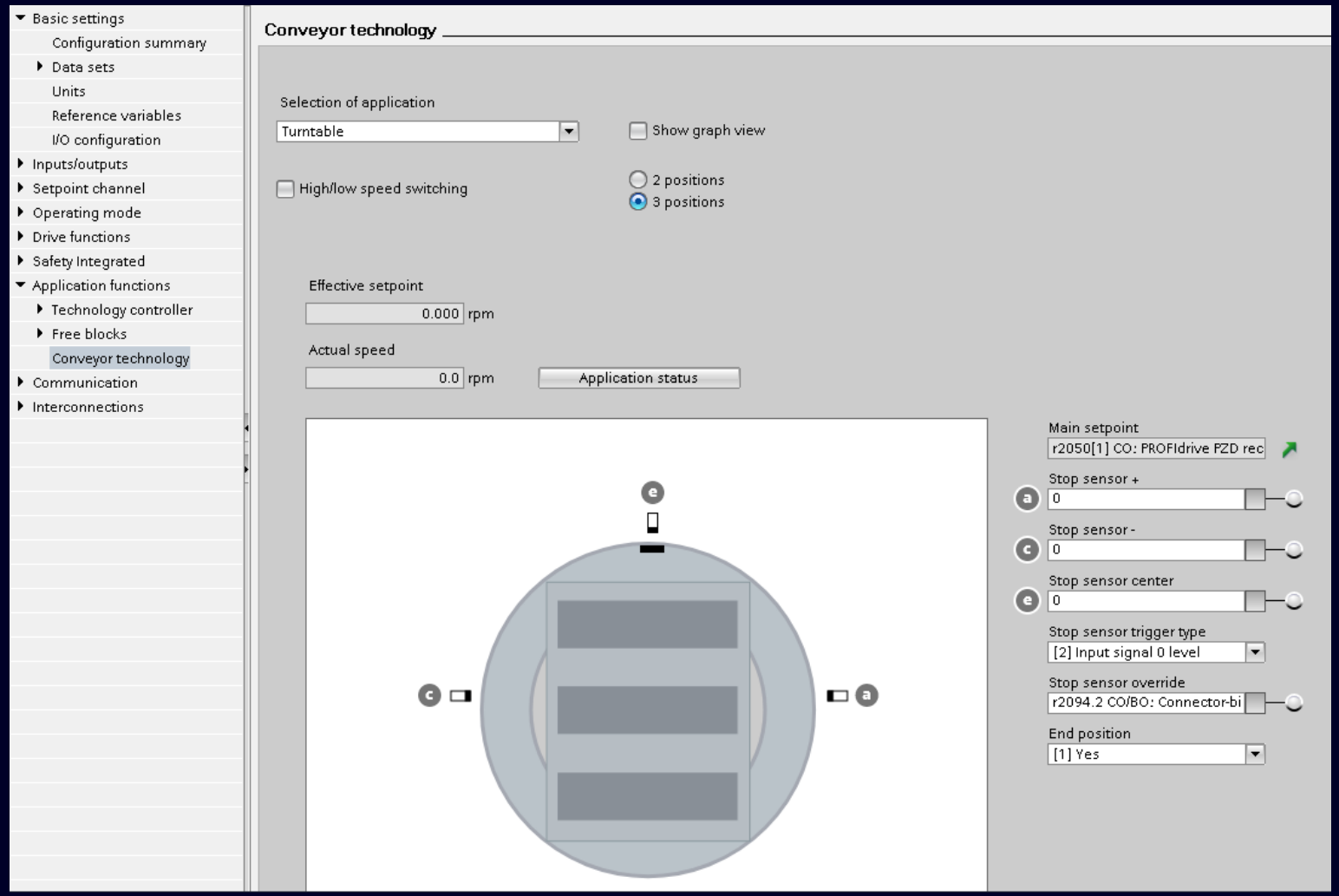
SINAMICS G115D in Startdrive
New conveyor technology wizards (optional)

4 Find additional graphical wizards for onboard conveyor technology functions

Easy setup of conveyor functions such as:

- Conveyor
- Turntable
- Corner turntable lift
- Trolley



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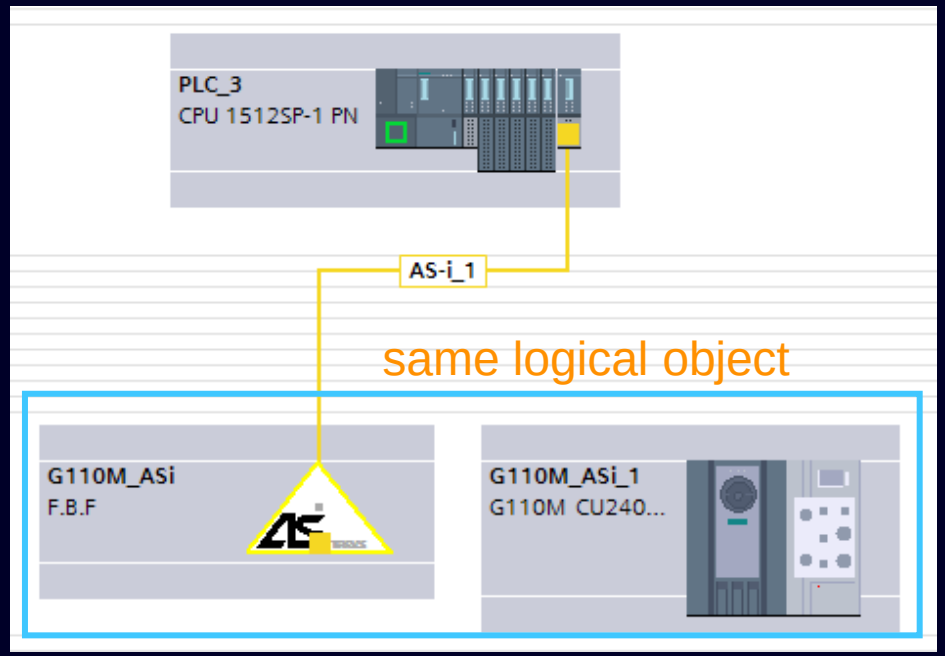
New features for AS-i drives
Device integration

AS-i integration with Startdrive <=V16

Two devices in the network for one drive needed:

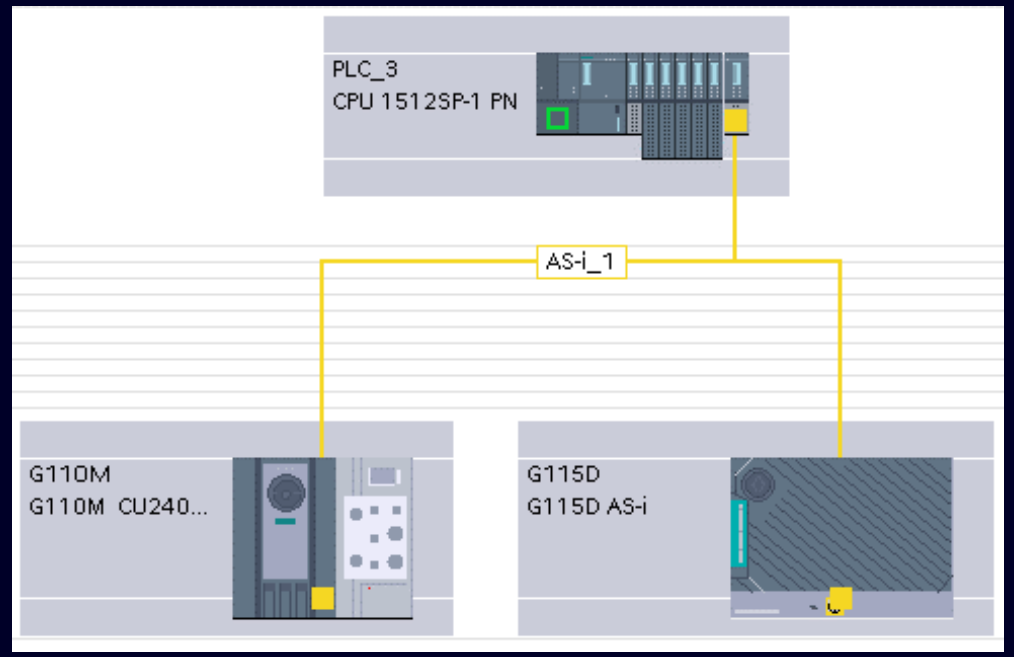
- Universal AS-i Slave for communication settings
- Startdrive object for drive settings



AS-i integration with Startdrive V17

One object for communication and drive settings

! Valid only for connection to ET200 CPU AS-i master



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SINAMICS S120 extensions

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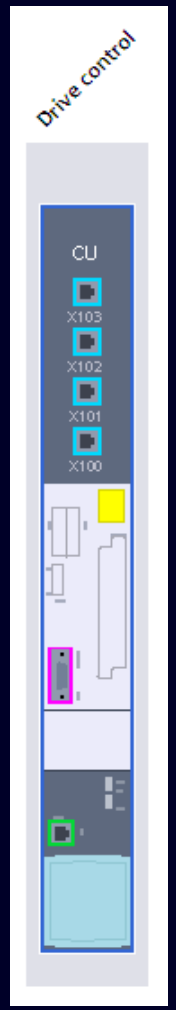
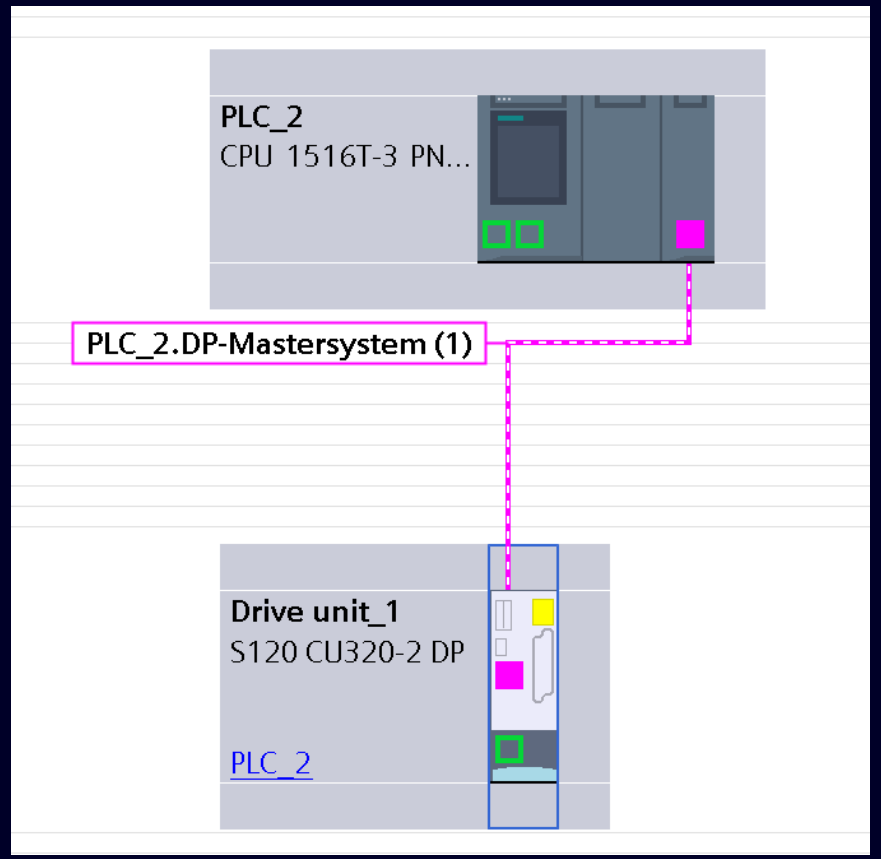
New hardware for SINAMICS S120
CU320-2 DP (PROFIBUS version)

NEW in V17

SINAMICS S120 drives can now also be handled with the **PROFIBUS** version CU320-2 DP.

Available for:
- SINAMICS S120 Booksize
- SINAMICS S120 Chassis





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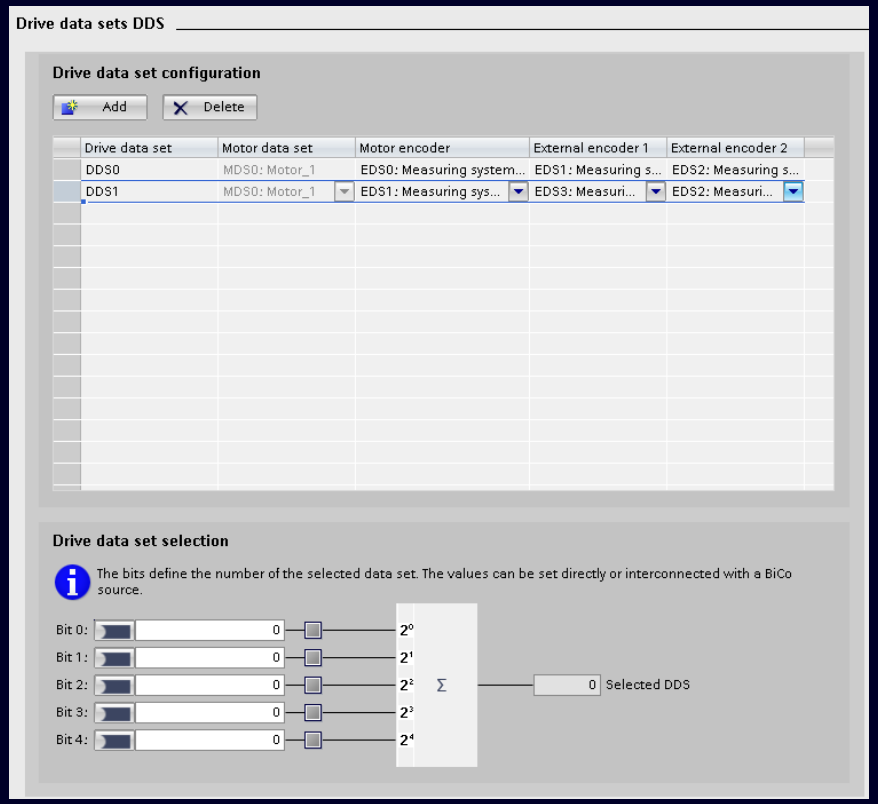
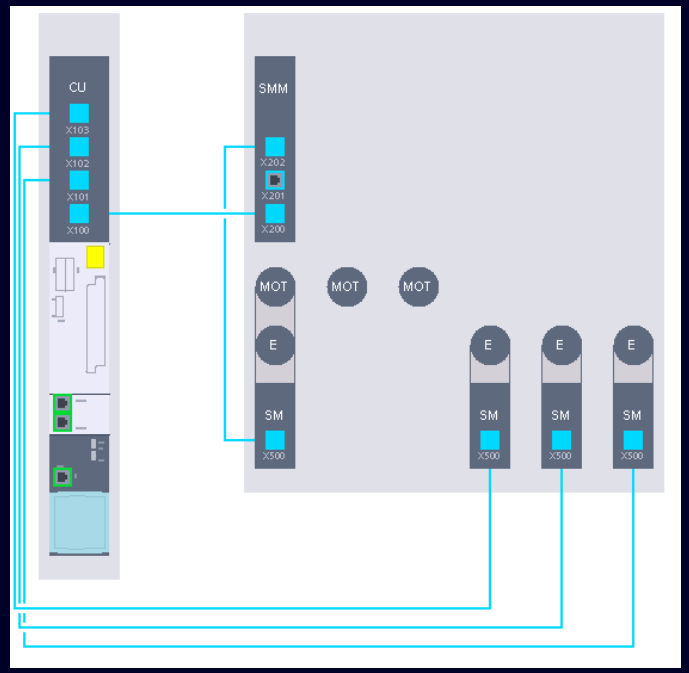
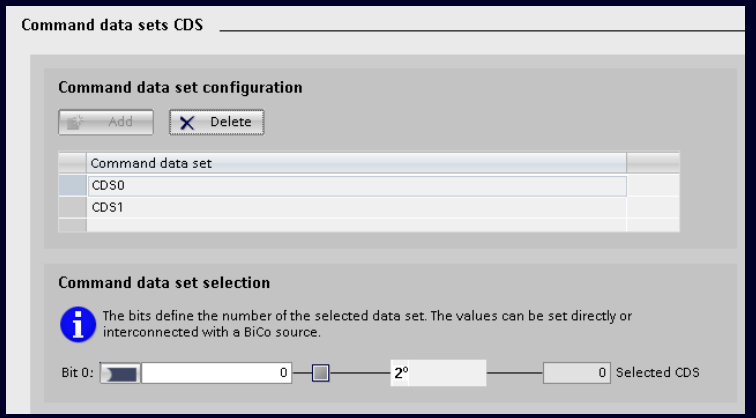
New features for SINAMICS S120
Data Set handling

+ Drive Data Sets **+ Motor Data Sets** **+ Encoder Data Sets** **+ Command Data Sets**







	p307[0]	Rated motor power	0.31	kW	MDS
▶	p410[0]	Encoder inversion actual value	0H		EDS
▶	p1155[0]	Speed controller speed setpoint 1	0%		CDS
▶	p1192[0]	DSC encoder selection	[1] Encoder 1 (motor encoder)		DDS

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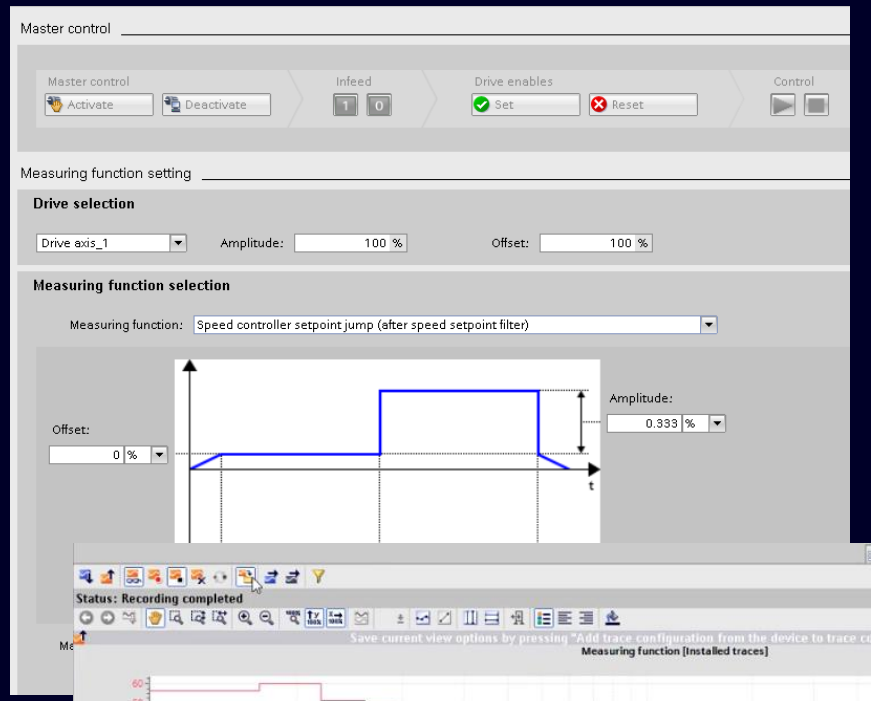
New features for SINAMICS S120
Measuring functions and bode diagram

Measuring functions for manual drive optimization (NEW in V17)

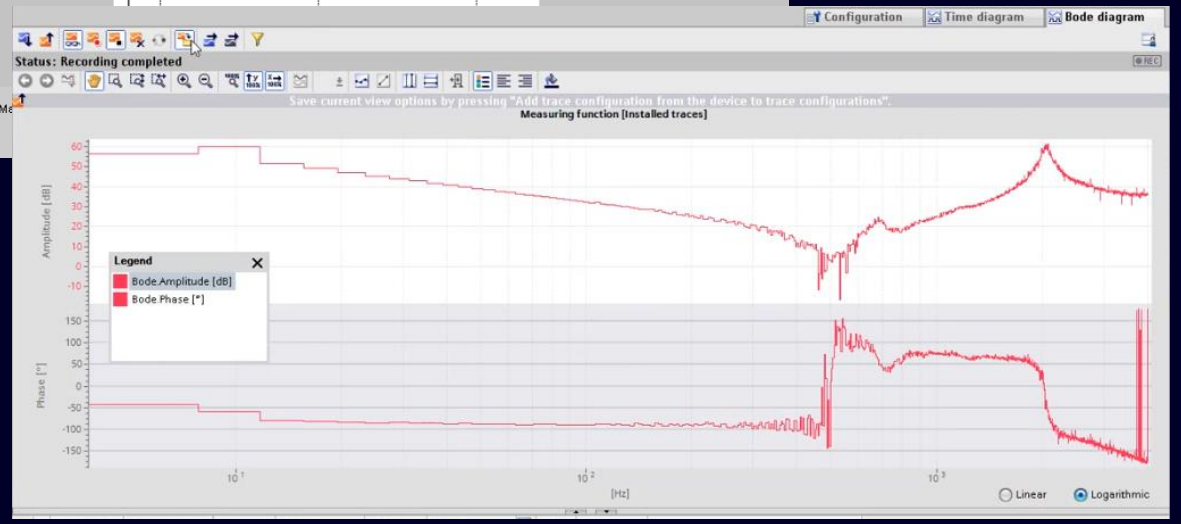
Available preconfigured measurements:

- Speed controller setpoint frequency response (after current setpoint filter)
- Speed-controlled system (excitation after current setpoint filter)
- Speed controller disturbance variable frequency response (fault after current setpoint filter)
- Speed controller setpoint frequency response (before speed setpoint filter)
- Speed controller setpoint jump (after speed setpoint filter)
- Speed controller disturbance variable jump (fault after current setpoint filter)
- Current controller setpoint frequency response (after current setpoint filter)
- Current controller setpoint jump (after current setpoint filter)



Available from FW 5.2 SP3

Graphical display of measured signals in time diagram and **bode diagram** (NEW in V17)



Measuring functions are part of the SINAMICS Startdrive Advanced license.

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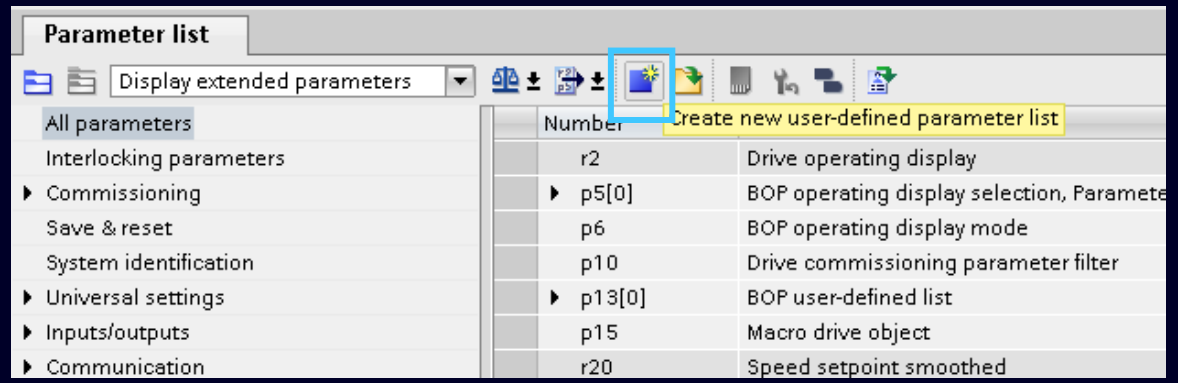
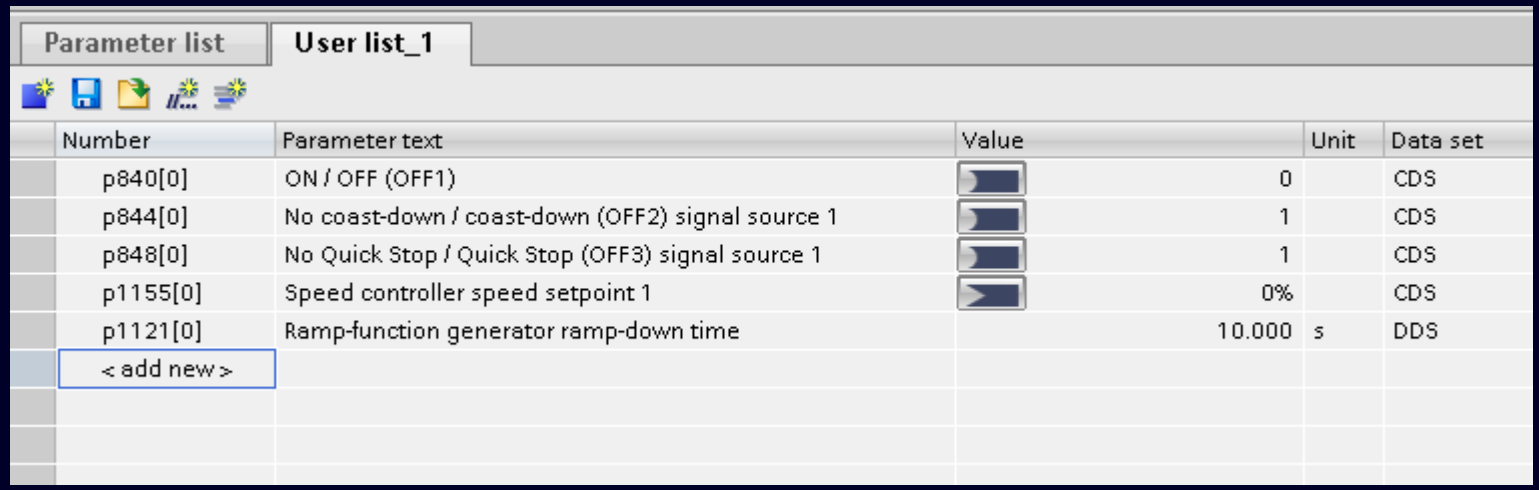
New features for SINAMICS S120
User defined parameter list

Creation of user defined parameter lists now also for S120 devices

Saving parameter lists possible only without parameter values.





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SINAMICS DCC

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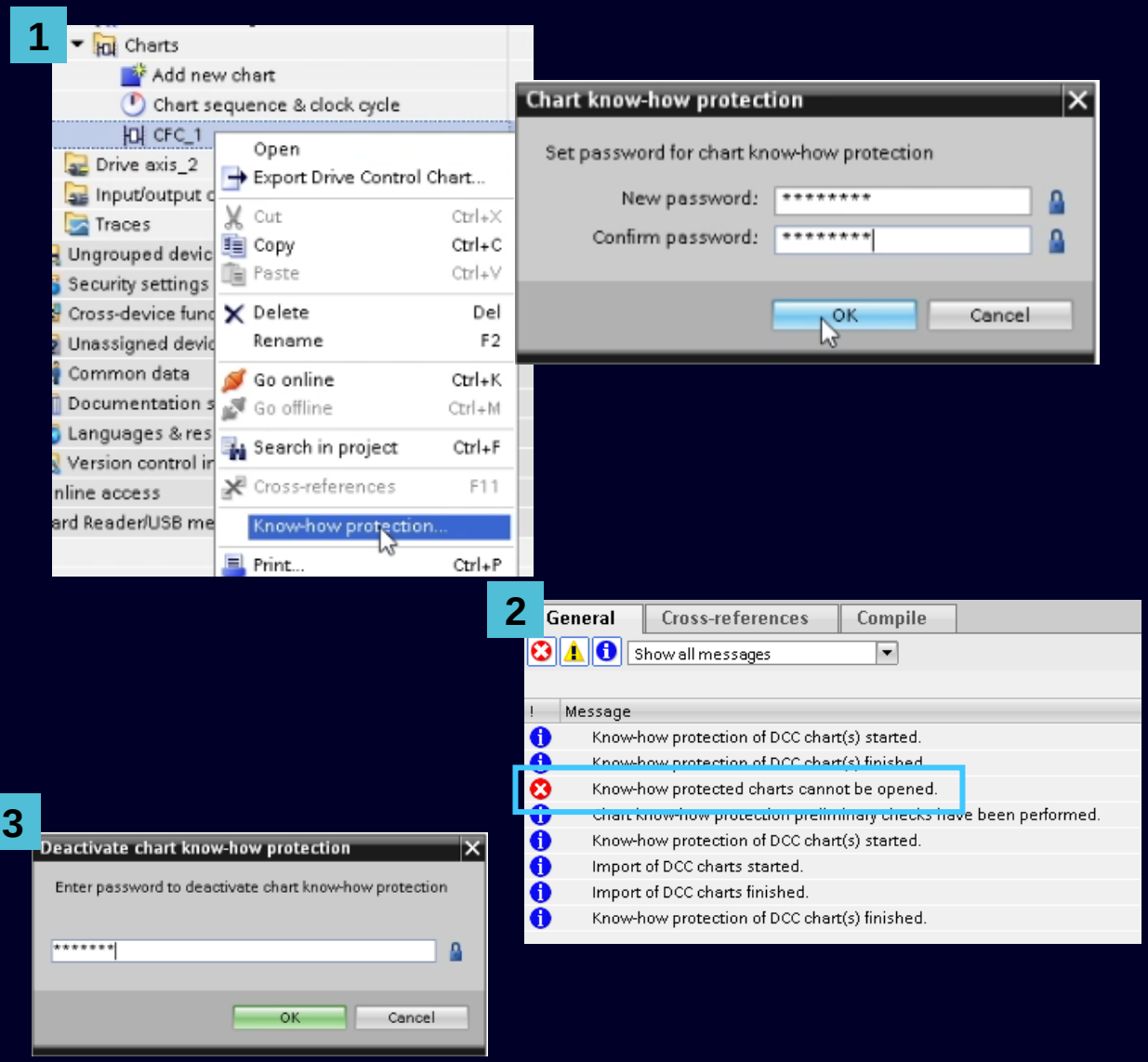
SINAMICS DCC V17 News
Know-how protection

Know-how protection for DCC charts can be used independently from drive's know-how protection. Protection of OEM's intellectual property without blocking drive parameterization.

Workflow

1. Activate Know-how protection and set password (for single charts or for the chart group)
2. Chart is protected and cannot be opened – published parameters can still be accessed via parameter list
3. Deactivate Know-how protection with password to be able to open chart



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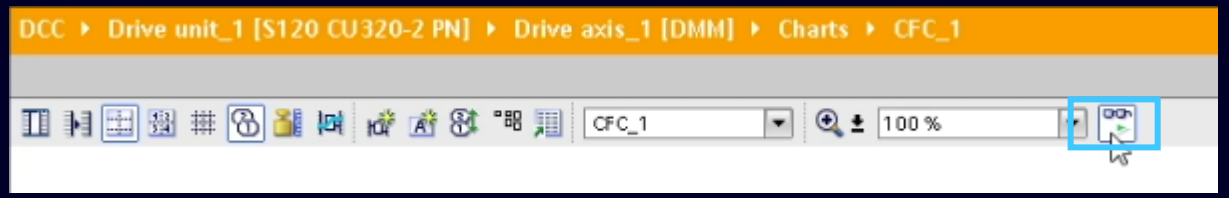
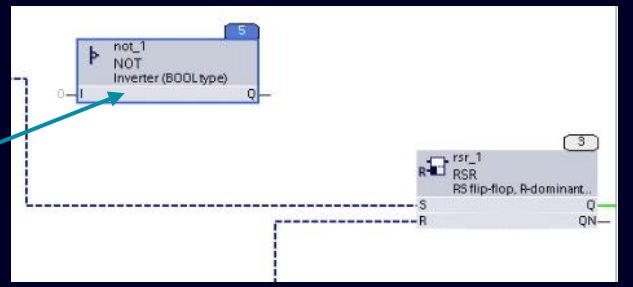
SINAMICS DCC V17 News
Online editing

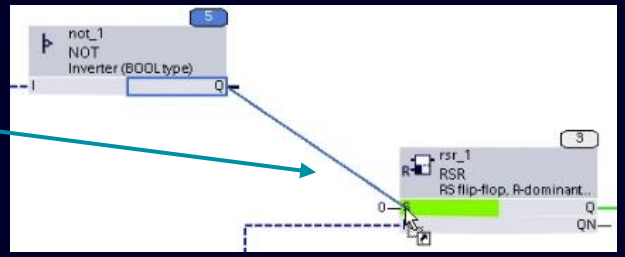
Edit DCC charts in online mode.
Speeding up the programming process during commissioning phase as no separate download is needed after changes.

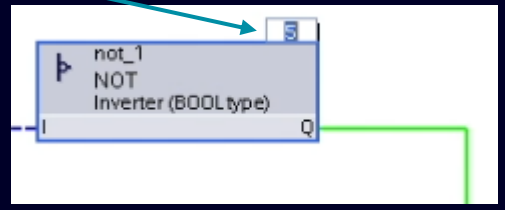


Possible changes in online mode

- Deleting / adding of Drive Control Blocks
- Deleting / adding block interconnections
- Changing the control sequence







Not possible in online mode

- Publishing of Pins as parameters

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Openness

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Openness Startdrive V17
What is Openness?

With openness it is possible to control the engineering with TIA Portal externally through a self-written program. This makes it possible to carry out repetitive tasks much faster, ensures error-free execution and enables the customization of the engineering for customer specific applications.

Functions

- Adding of drive units and components
- Setting of selected drive parameters (offline and online, reading and writing)
- Telegram configuration
- Download to a device (no upload)
- Usable for the SINAMICS G family, the CU320-2-based drives (SINAMICS S120, G130, G150, S150 and MV) and S210
- …

Customer benefits

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

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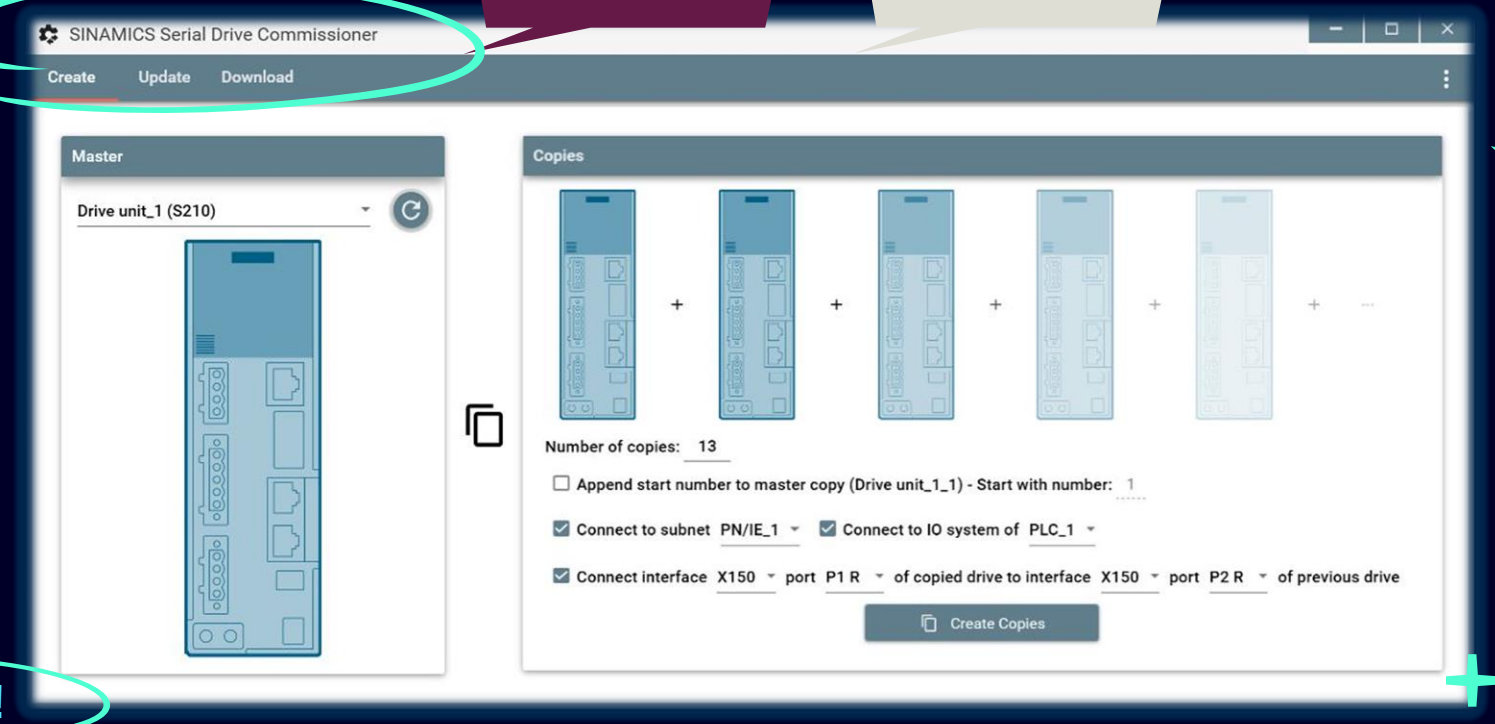
Openness
Improved application SINAMICS Serial Drive Commissioner

3 use cases in one app!

From TIA V16

New in V1.2



SIOS Download

Devices

All SINAMICS single drive devices in Startdrive:

G110M
G115D
G120, G120C, G120D, G120P
G130, G150
S210

+ **Create!**

- ✓ Creation of 1:1 copies of a selected drive
- ✓ Automatic assignment to SIMATIC controller
- ✓ NEW: preconfigured assignment of topology for IRT

+ **Update!**

- ✓ Transmission of specific drive parameterization to selected drives of identical type
- ✓ NEW: Keep I/O address setting or redefine

+ **Download!**

- ✓ Download of selected drives including Ram2Rom function and copying of safety parameters (Basic + Extended)
- ✓ NEW: Restart of drive and upload to Startdrive

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Poll

Vill du ha mer information om nyheterna i Sinamics drives?

Ja kontakta mig gärna!

Nej inte just nu.

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