



SIEMENS
Ingenuity for life



Integrated Engineering

Siemens Automation Day 2019



Integrated Engineering with TIA Portal



Reduce your Time-to-Market



One for all



Efficient
Engineering



Working
in a Team

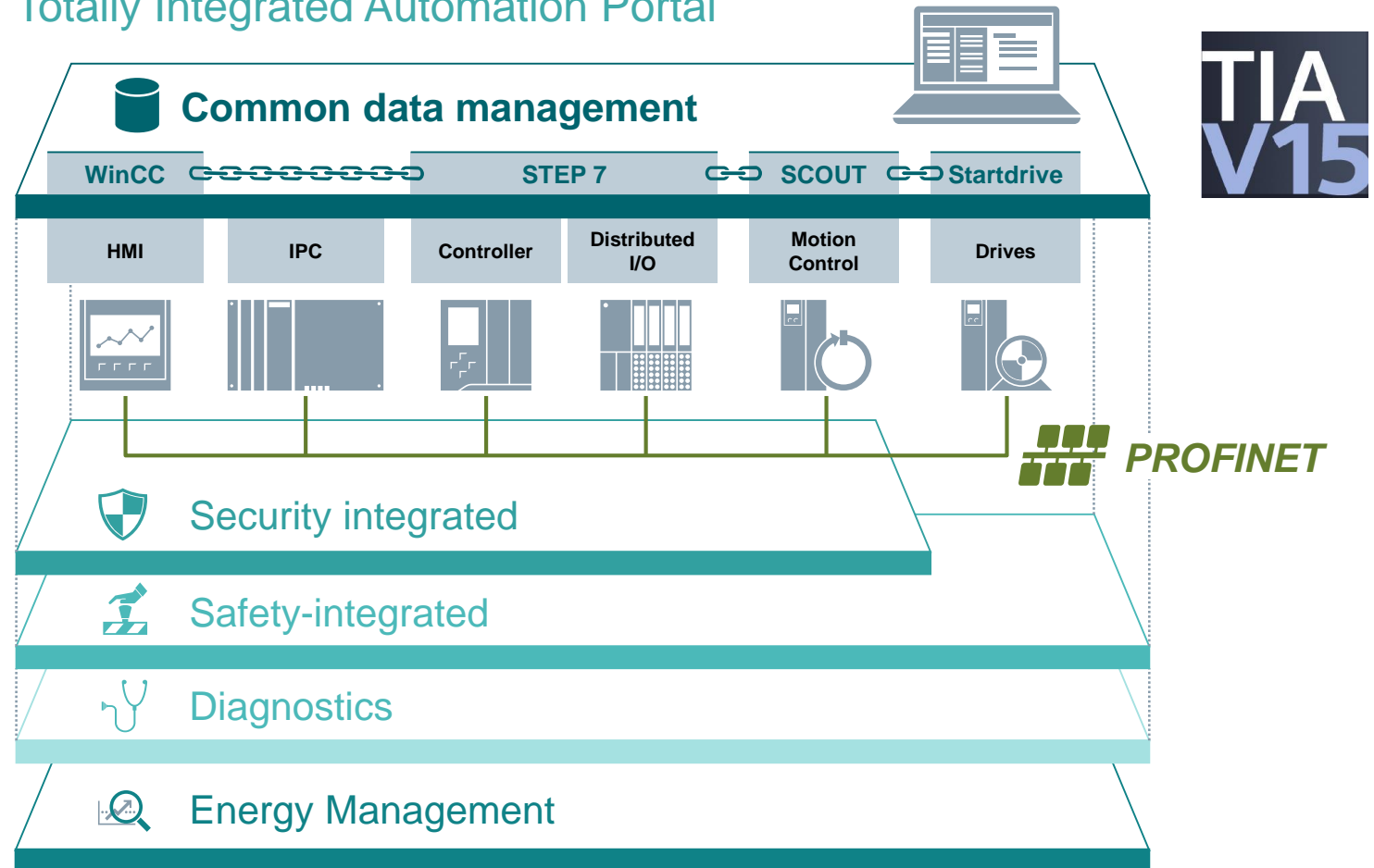
“We wanted to have a future oriented automation system and innovative engineering platform.”

“The complexity of the system has reduces and the flexibility has increased.”

TIA Portal – The proven basis for innovative solutions

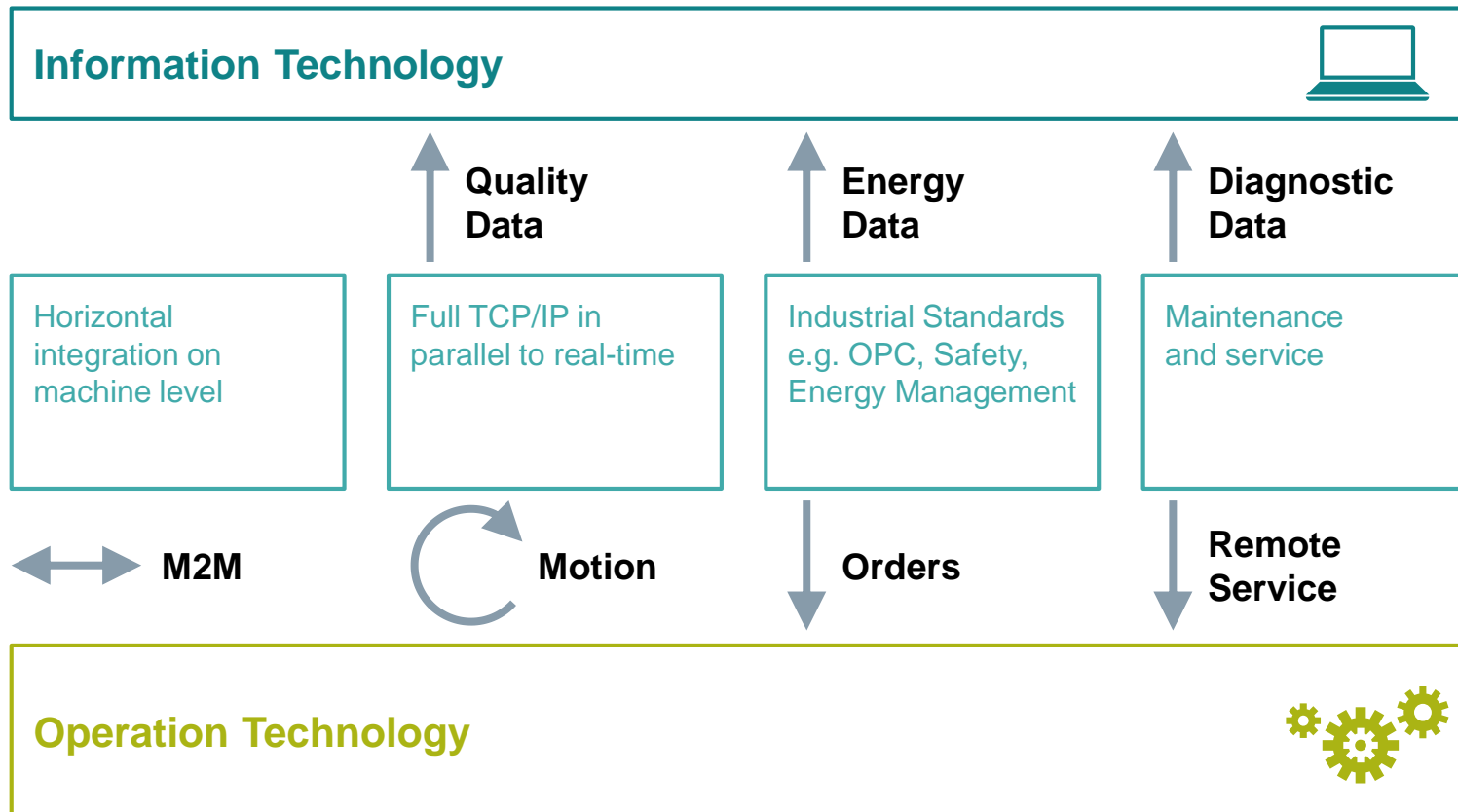
- One common database
- Consistent and unified operator concept
- Common, central services

Totally Integrated Automation Portal



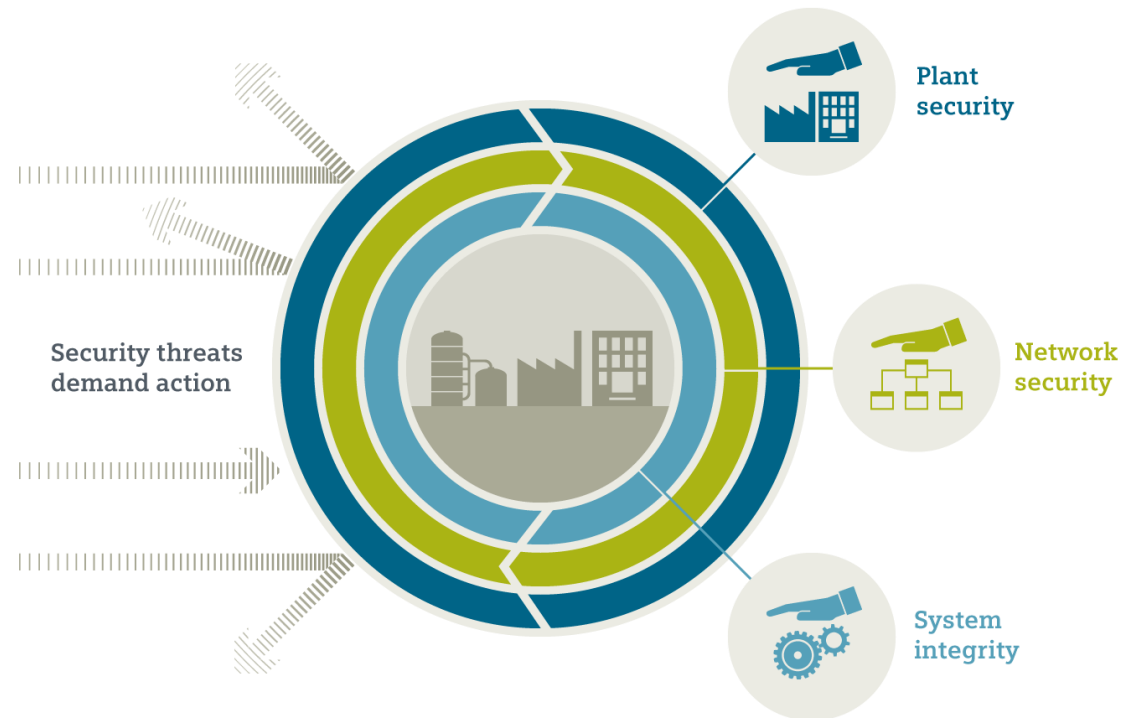
Industrial Communication – Real-time performance and open Ethernet communication

PROFINET – Consistent from operation level to information level



Industrial Security – Challenge of the Digital Factory

The Siemens security concept –
“Defense in Depth”



Siemens products and systems offer integrated security



Know-how and
copy protection



Authentication
and user
management

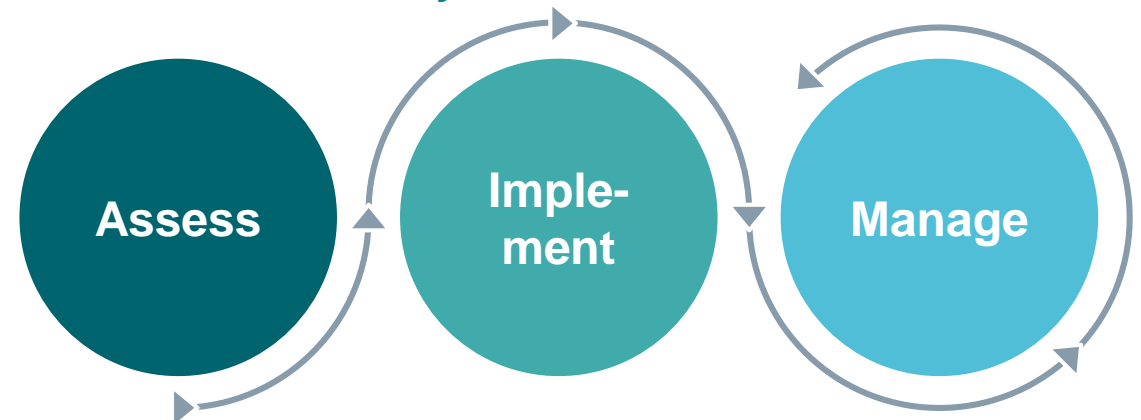


Firewall and VPN
(Virtual Private
Network)

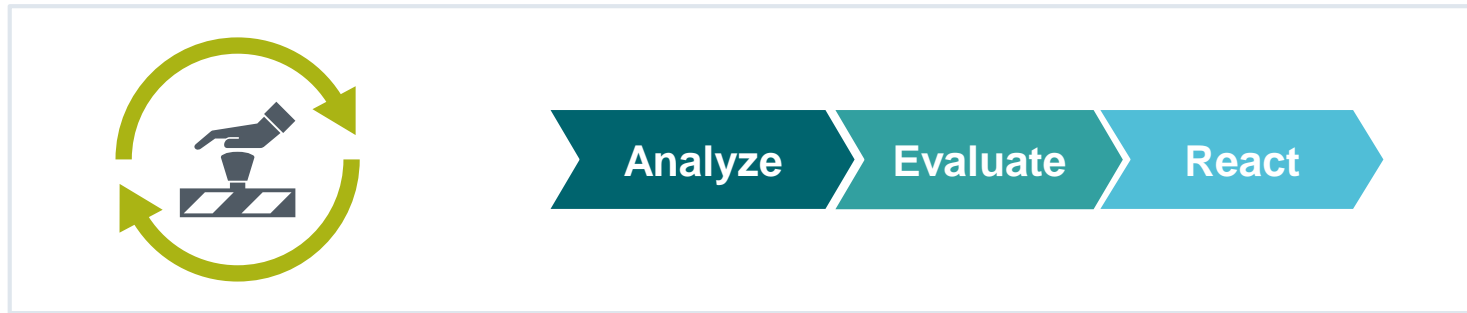


System
“hardening”

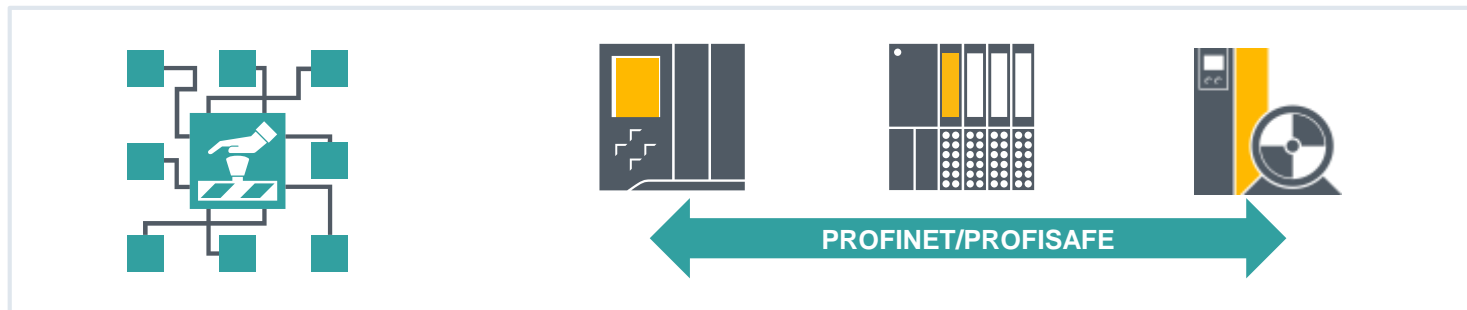
Siemens Plant Security Services



Safety-Integrated – To meet the challenge of digital manufacturing



All from a single source
Integrated safety solutions
for recording, evaluating,
all the way to responding



Reduce complexity
by means of an integrated
safety solution

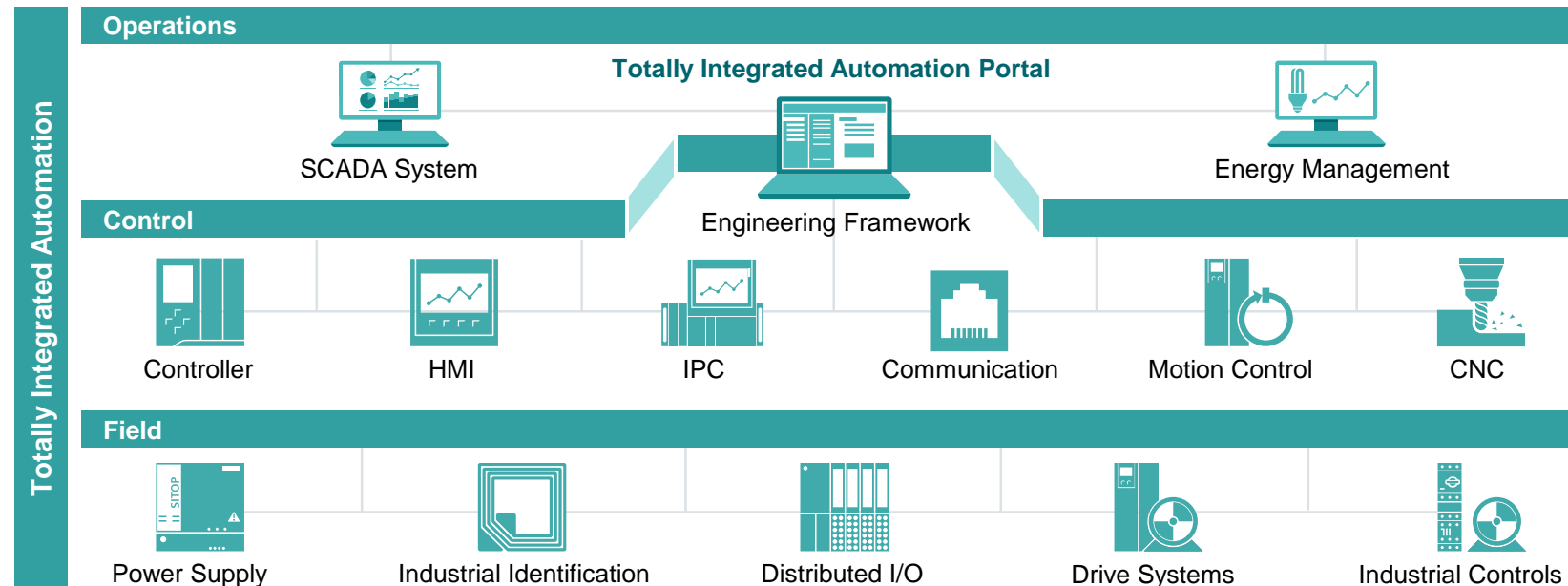


**Easy fulfillment
of machine directives**
due to standard-conformant
evaluation and certified products

The automation portfolio for the Digital Enterprise with efficient proven automation components

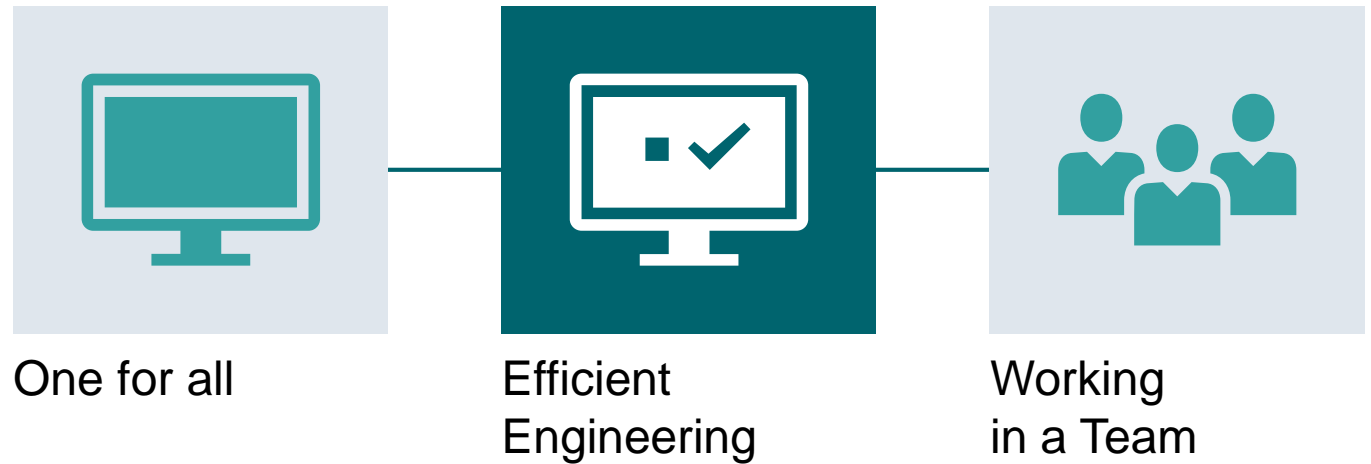


Totally Integrated Automation “TIA in the Digital Enterprise”



- 
Integrated Engineering
- 
Industrial Data Management
- 
Industrial Communication
- 
Industrial Security
- 
Safety Integrated

Integrated Engineering with TIA Portal

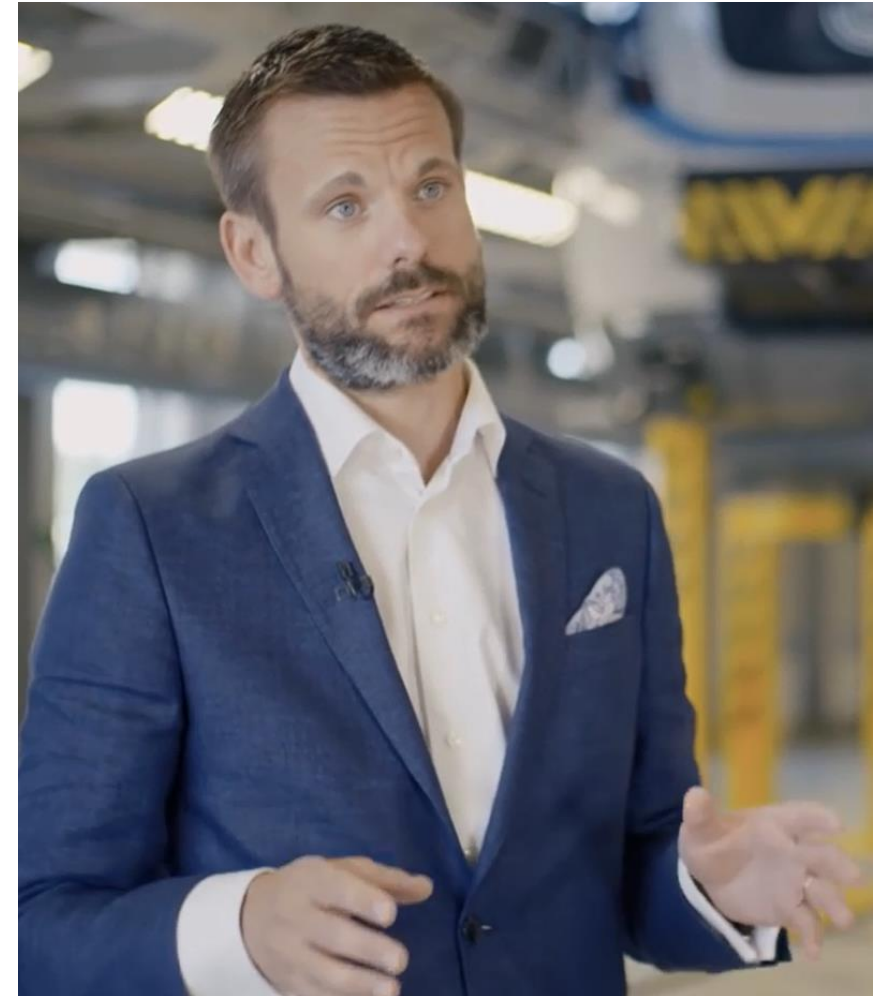


“The requirement from the customer is that we have an easy way to find the faults for the operator. TIA Portal saves us approximately 20% of fault finding time.”

TIA Portal V15 – Advantages of your Engineering Tasks

New TIA Portal functions

- ... **reduces engineering time** even more
- ... helps to **find faults** in program blocks **easier**
- ... useful Tools during commissioning helps to **find fault faster** and do program **updates more efficient**



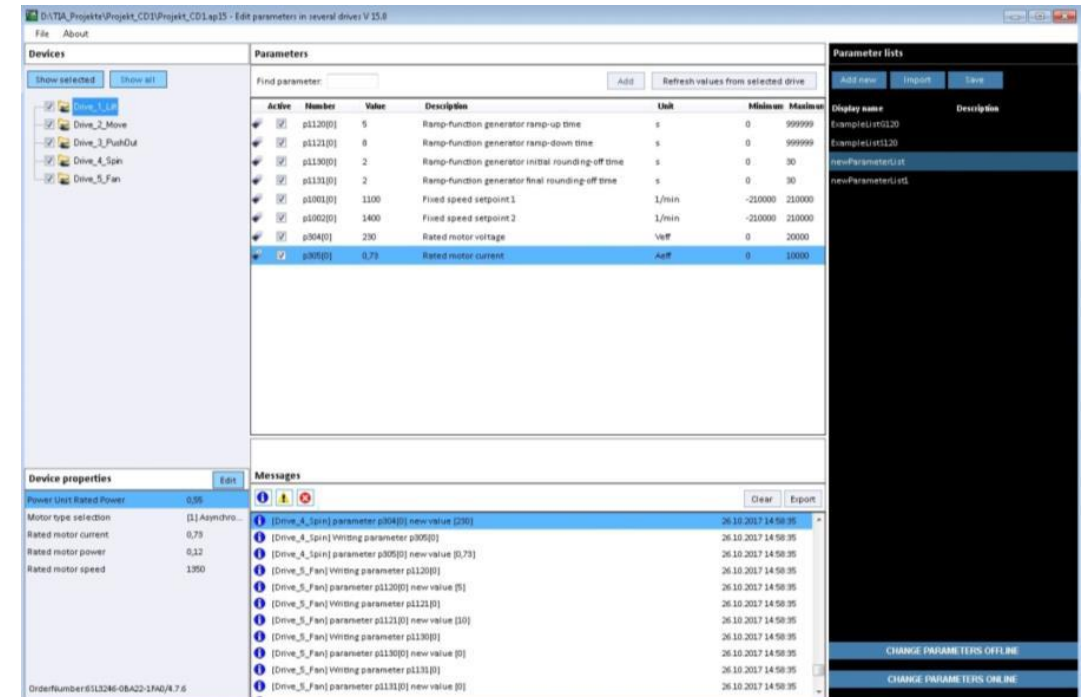
Startdrive V15 – TIA Portal Openness Startdrive app “Edit parameters in several drives”

Feature/function

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

Benefits

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



Demonstration with TIA Portal

Live Demo

Is provided with V15

App and documentation available
SIOS ID: [109752526](#)

Startdrive App



STEP 7 Language Innovations – New statements – FileReadC/FileWriteC

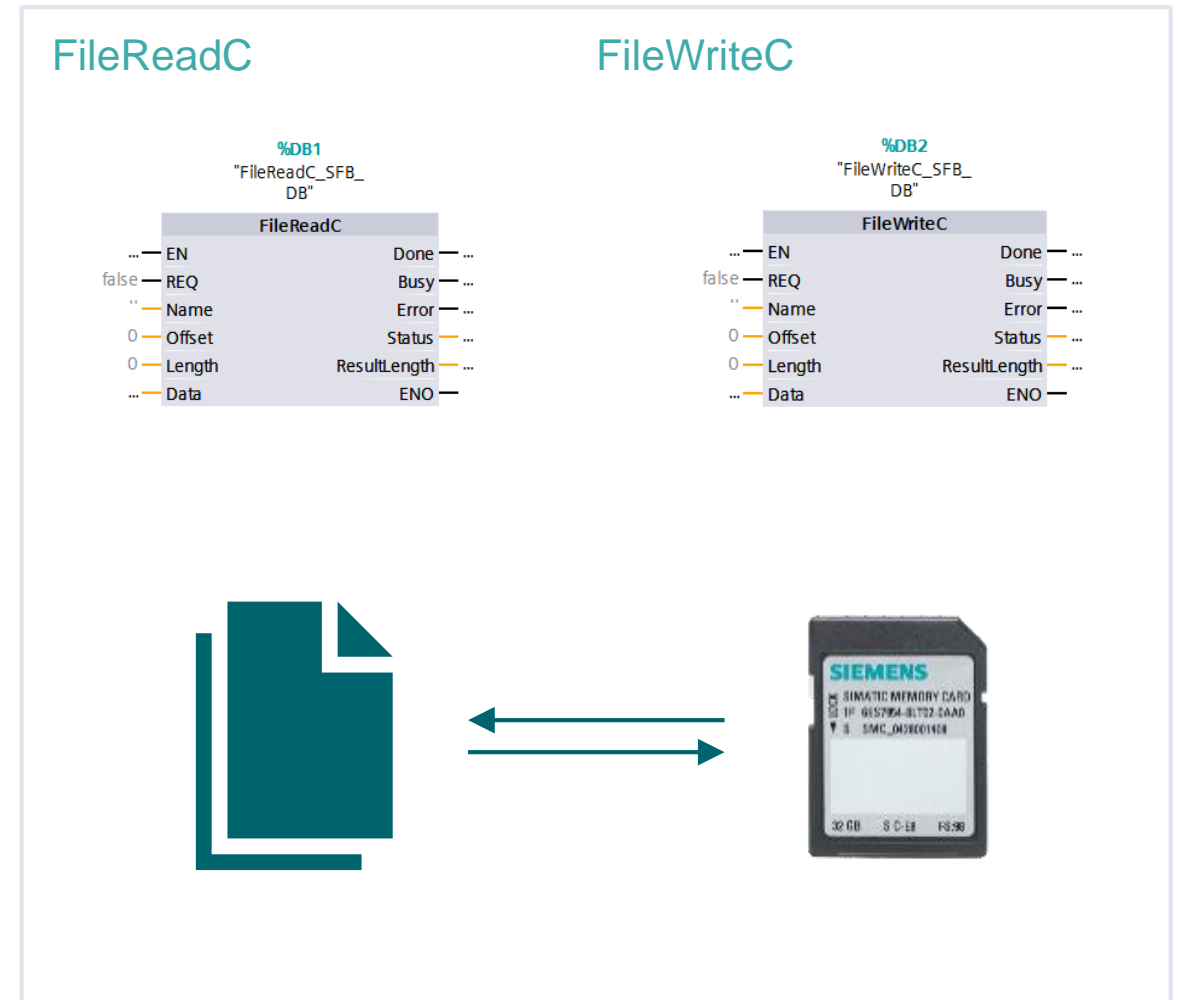
New Instruction for S7-1500 PLCs

Read and Write data from an ASCII file from the SIMATIC memory card via Program instructions

Customer benefits

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

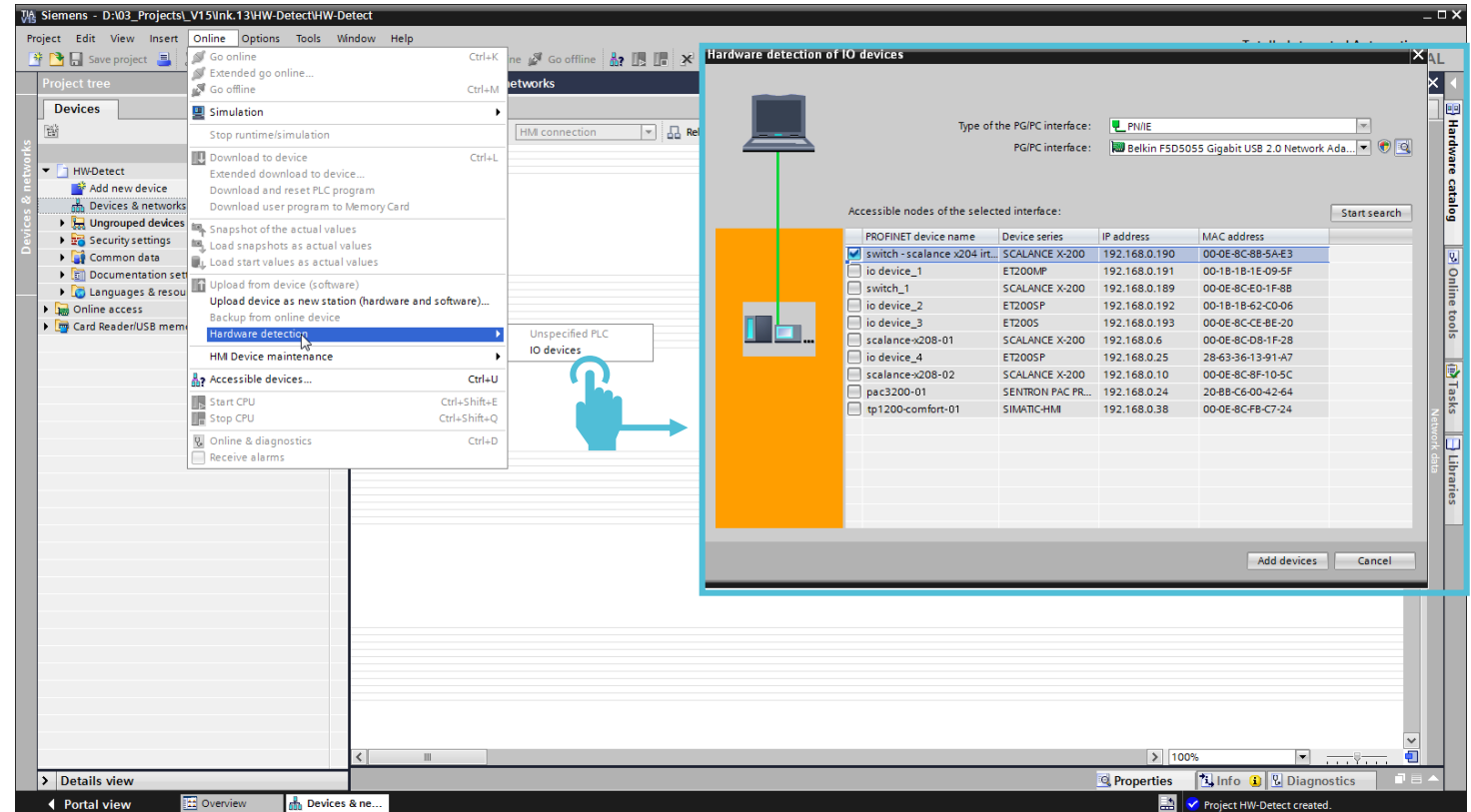
- Import recipes in cases where CSV is not flexible enough
- Import complex parameterizations or configuration files
- Output complex files for documentation



Hardware Configuration – Hardware detection of PROFINET IO devices

Hardware detection of PROFINET IO devices

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



STEP 7 Innovations – Breakpoints on the CPU S7-1500

Function

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

Customer benefits

- Testing of SCL and STL program code with the aid of breakpoints
- Step-by-step isolation of errors
- Simple and fast analysis of complex programs in the office **before** actual startup
- Currently not possible with S7-1200

The screenshot displays the Siemens STEP 7 software interface. The main window shows a SCL program for a 'SignalGenerator [FB71]' block. Several lines of code are highlighted with red markers, indicating active breakpoints. A 'Result' window on the right shows the current values of variables like '#nloop' (11) and '#nsaw' (11). Below the code editor, the 'Device information' tab is active, showing a table with one device in 'HOLD' mode. To the right, the 'CPU operator panel' is visible, displaying 'HOLD' on the screen and 'Operating Mode: HOLD' in the status area. A callout box points to the 'HOLD' status on the operator panel with the text: 'When a breakpoint is reached, the CPU enters hold mode'. The bottom right shows the 'General' settings for the device, including project name, station name, and module type.

Online sta...	Operating mode	Device/module	Connection establis...	Message	Details	Help
OK	HOLD	PLC_1	Direct	HOLD	For more details... ?	

General:

Project name: Project154
TIA Portal: V15
Station name: S71500ET200MP station_1
Module name: PLC_1
Module type: CPU 1516-3 PN/DP

States:

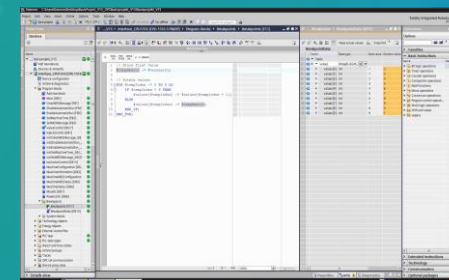
Operating Mode: HOLD
Status: OK
Mode selector: RUN

CPU operator panel:

RUN
STOP
Flash LEDs

Breakpoints

How to activate
Breakpoints
and debug



SIMATIC STEP 7 in TIA Portal – Compare blocks with CRC

Function

1. Compare source code based on checksums
2. Start compare editor for a single block
3. Read program checksum during runtime

Customer benefits

- Identify differences in the code
- The change cause can be identified by filtering e.g. for interface changes, code changes, comment changes, ...
- Changes in the program can be evaluated during runtime
 - Checksum for standard program
 - Checksum for hardware configuration
 - F-Signature for Safety Program and Hardware
 - Only possible with S7-1200 and S7-1500

Comparison criteria:

- Source data
 - Safety
 - Interface without comments
 - Code without comments
 - Comments (multi-language)
 - Language configuration
 - Properties
 - Configuration of technology objects
 - Alarm configuration
 - Supervision configuration
- Target data
 - Compilation and runtime data
 - Time stamps

GetChecksum

Inputs: EN, Scope (2), Range (0), Subrange (0), Checksum

Outputs: Done, Busy, Error, Status, ENO

▶ Interface without comments:		●	
▶ Code without comments:		●	
▼ Comments (multilingual):	Checksum: 43EF6TTF43A	●	G3E16TT947Z
▶ Language configuration:		●	
▼ Properties:	Checksum: 43EF6TTF43A	●	G3E16TT947Z

Read_Checksum ()

Old_CRC = C153Q3
Current_CRC = XZA135

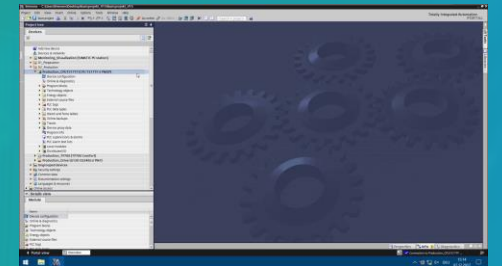
Program Compare:

PLC Program changed

Demonstration with TIA Portal

Compare with Checksum filter

On/Offline
Comparison



Supporting the OEM workflow efficiently with smartphone-apps and stand-alone tools

+ Update/Service SIMATIC Apps

- Multiple Apps available
- S7 App to analyze SIMATIC S7-1500/S7-1200
- WinCC SMART Client App
- LOGO App
- Industry Online support
 - Details and [Download](#)



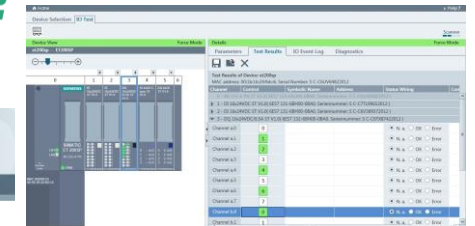
+ Commissioning SIMATIC Automation Tool

- Download PLCs without TIA Portal
- Multiple Firmware updates with one click
- Multiple basic settings
- Mass operation
 - Details and [Download](#)

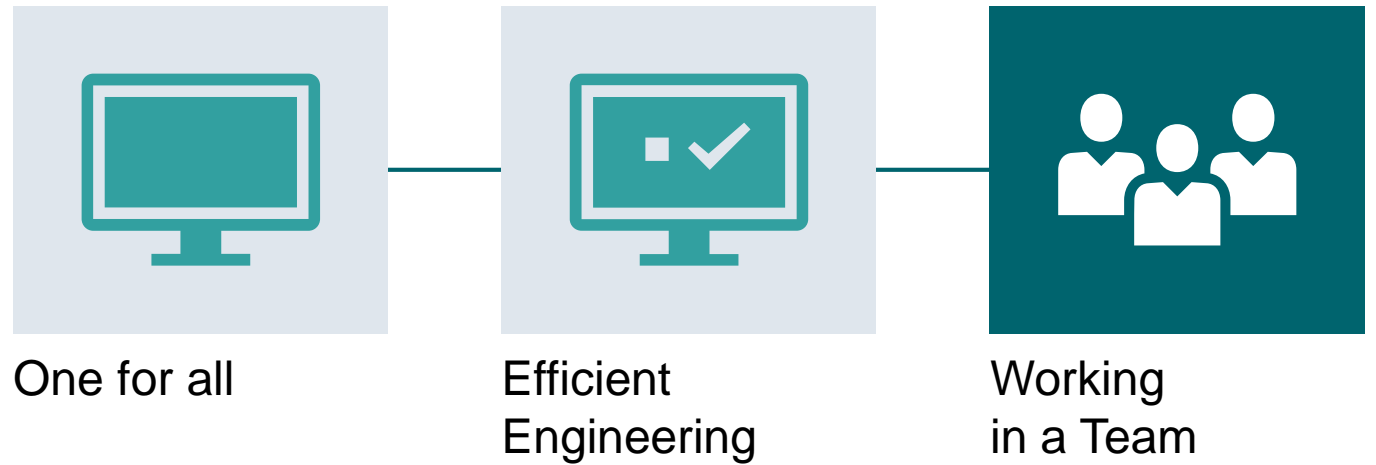
Select	MAC	IP	Subnet	Gateway	New IP	New Subnet	New Gateway	Password
<input checked="" type="checkbox"/>	00:18:1B:13:28:40	192.168.2.20	255.255.255.0	0.0.0.0	192.168.2.100	255.255.255.0	0.0.0.0	
<input checked="" type="checkbox"/>	00:18:1B:13:77:52	192.168.2.21	255.255.255.0	0.0.0.0	192.168.2.101	255.255.255.0	0.0.0.0	
<input checked="" type="checkbox"/>	00:18:1B:13:77:68	192.168.2.22	255.255.255.0	0.0.0.0	192.168.2.102	255.255.255.0	0.0.0.0	
<input checked="" type="checkbox"/>	00:18:1B:5C:70:99	192.168.2.30	255.255.255.0	0.0.0.0	192.168.2.103	255.255.255.0	0.0.0.0	
<input checked="" type="checkbox"/>	00:1C:06:00:67:99	192.168.2.31	255.255.255.0	0.0.0.0	192.168.2.104	255.255.255.0	0.0.0.0	
<input checked="" type="checkbox"/>	00:1C:06:04:0F:0E	192.168.2.32	255.255.255.0	0.0.0.0	192.168.2.105	255.255.255.0	0.0.0.0	
<input checked="" type="checkbox"/>	00:1C:06:05:38:42	192.168.2.33	255.255.255.0	0.0.0.0	192.168.2.106	255.255.255.0	0.0.0.0	
<input checked="" type="checkbox"/>	00:1C:06:06:9F:0F	192.168.2.34	255.255.255.0	0.0.0.0	192.168.2.107	255.255.255.0	0.0.0.0	
<input checked="" type="checkbox"/>	00:1C:06:09:3F:20	192.168.2.35	255.255.255.0	0.0.0.0	192.168.2.108	255.255.255.0	0.0.0.0	

+ Loop Check – PROFINET Diagnostic with PRONETA

- Read network configuration
- Compare and analyze network topology
- Change IP address and Device names
- IO Check with ET 200 (Loop check without Controller)
 - Details and [Download](#)



Integrated Engineering with TIA Portal



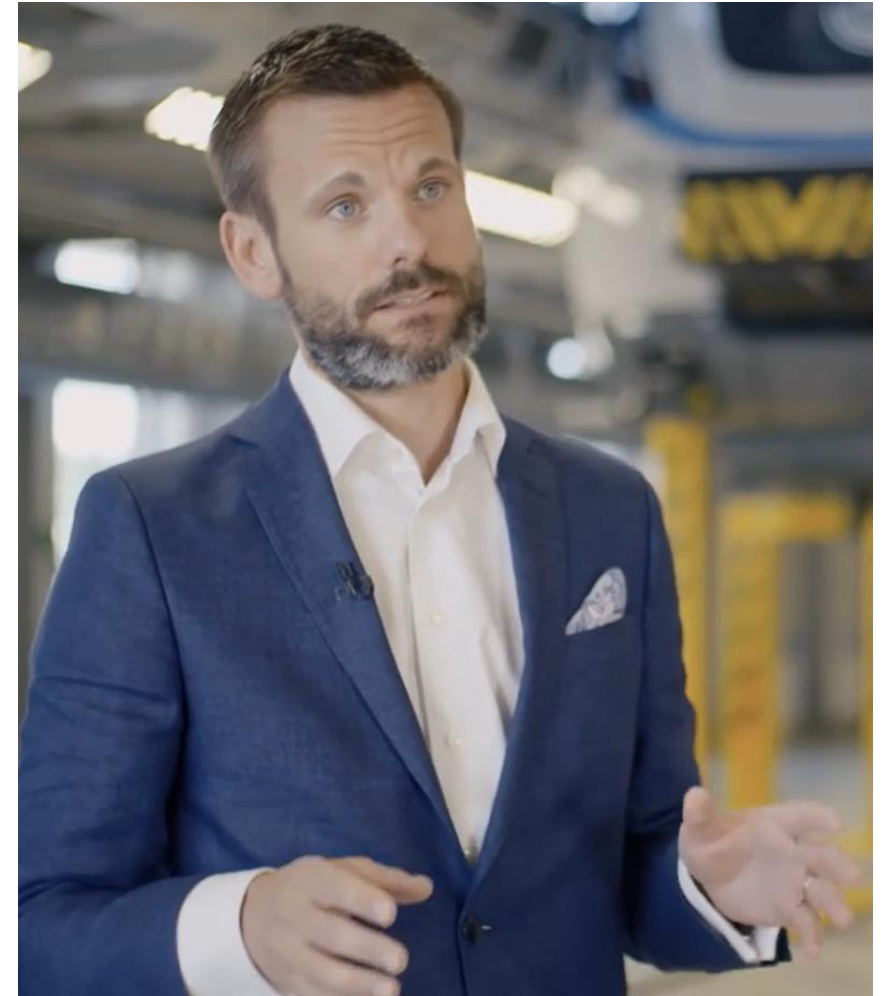
**“An innovative concept, a great technology.
A strong partner is an totally integrated
automation concept.”**

TIA Portal V15 – Advantages of Multiuser Engineering

Shorter engineering time

... working in a team.

... parallel engineering of different machines or plant functions.



TIA Portal V15 – Advantages of Multiuser Engineering



One common project

... stored centrally on a multiuser server and thus flexibly accessible



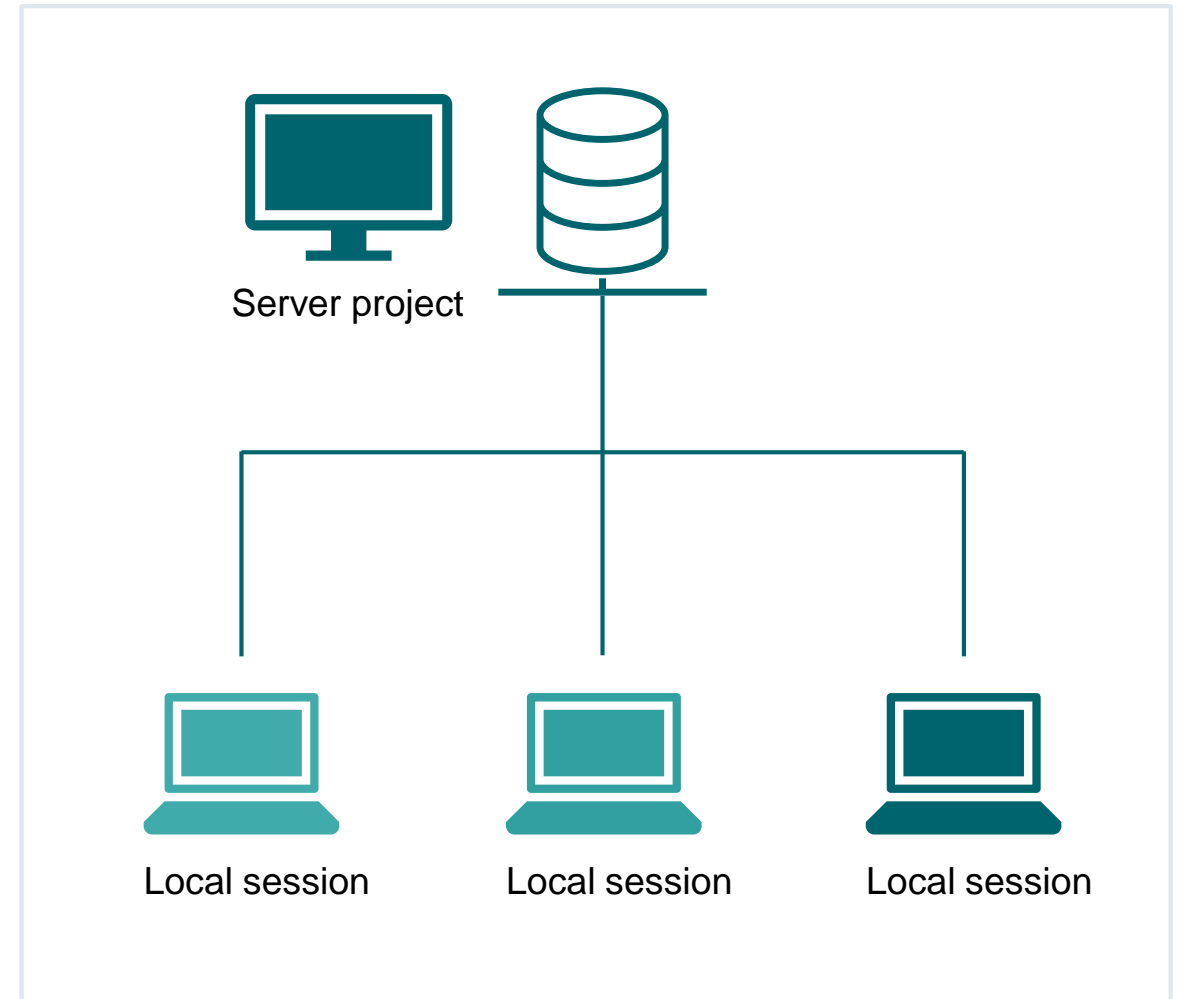
HMI, PLC and Motion

... permits device- or function-oriented division of work



System-supported synchronization

... reduces the effort for coordination work in the team



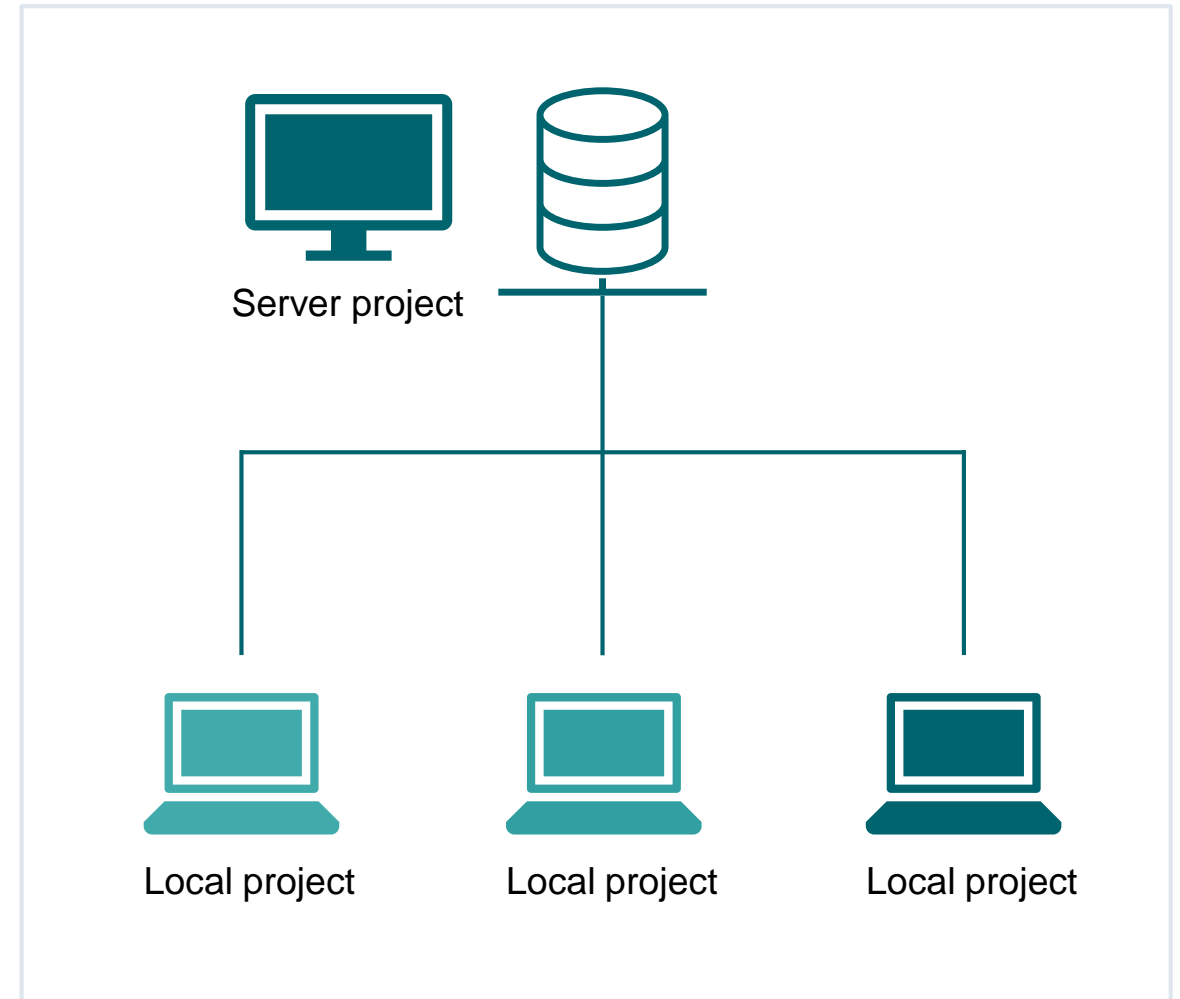
TIA Portal Options – Multiuser Engineering – Overview of new functions

Function

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

Customer benefits

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



TIA Portal Options – Multiuser Server – Improved check-in functions

Check-in

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

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

- Filter for conflict recognition:** Located at the top of the 'Check-in' dialog box.
- Check-in comment:** A text field in the 'Check-in' dialog box containing the comment 'New output signal "STATE_VALVE"'. Below it, a tree view shows the project structure: 'Color_Filling_Station_1516_V15_I12 [V15]' containing 'Color_Mixing_CPU [CPU 1516F-3 PN/DP]' and 'Program blocks' with 'SCL_Valve_Conveyor [FB1]'.
- Display of project history:** A table showing the history of changes. The table has columns for Availability, Revision number, Computer name, Created by, Creation date, Comment, and Notes.
- Display of scope and type of changes:** A detailed view for Revision 9 showing a table of changes with columns for Name, Change, Type, and Object id.
- XML project history:** A table at the bottom showing a detailed project history with columns for creationDate, created, comment, name, change, and objectType.

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

Name	Change	Type	Object id
Color_Filling_Station_1516_V15_I12Color_Mixing_CPU[HW]	Create	Watch table	5f3a24ba-1555-4034-b23d-d84bb50a6937
Color_Filling_Station_1516_V15_I12Color_Mixing_HMI[HI]	Create	HMI_Tag	860f29e8-6849-478b-b67b-ad7544e635bb
Color_Filling_Station_1516_V15_I12Color_Mixing_HMI[SC]	Edit	Screen	b3bf1388-192b-4f8c-b822-92f79363d705

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

TIA Portal Options – Multiuser Server – Extended project management

Project management

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

Server management

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

The screenshot displays the 'TIA Portal Multiuser Server - Administration' window. The main area shows a table of project revisions. A callout box labeled 'Savable project versions' points to the table. Below the table, the 'Revision 7' details are shown, including a comment and notes. A callout box labeled 'Version comments can be added at any time' points to the 'Notes' field. A third callout box labeled 'No restriction with respect to short-term archive' points to the overall interface.

Availability	Revision number	Computer name	Created by	Creation date	Comment	Notes
	10	MD1MQRC	ho4020	03.07.2017 17:23:48	New output signal "STATE_VALVE"	
	9	MD1MQRC	ho4020	03.07.2017 17:10:10	HMI start screen adapt	
	8	MD1MQRC	ho4020	03.07.2017 17:04:20	Open valve optimized (Network 2)	
	7	MD1MVNMC	br3029	03.07.2017 16:52:48	Activate webserver on PLC	1 Notes
	6	MD1MVNMC	br3029	03.07.2017 16:50:03	Change consistency of error handling behavior	
	5	MD1MVNMC	br3029	03.07.2017 16:48:38	- Grouping of general objects	
	4	MD1MVNMC	br3029	03.07.2017 16:39:09	- grouping mixer blocks	
	3	MD1MQRC	ho4020	03.07.2017 15:25:16	some string	
	2	MD1MQRC	ho4020	03.07.2017 15:23:38	some string	
	1	MD1MQRC	ho4020	03.07.2017 11:38:59	Initial upload	

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

Demonstration with TIA Portal

Multuser



Summary Efficient Engineering

1 | Easy handling of Automation tasks

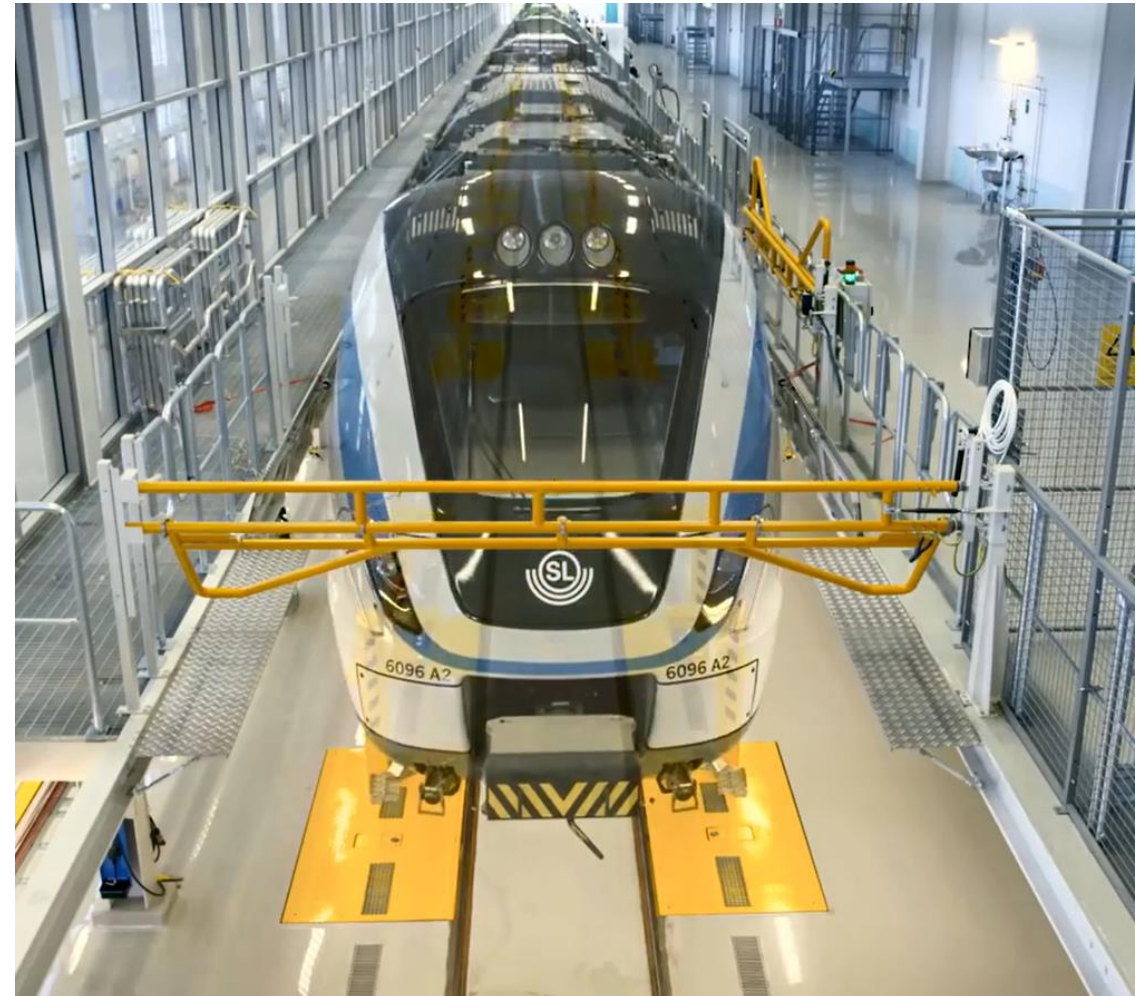
... through an innovative Engineering framework that covers all automation tasks from PLCs to SCADA

2 | Useful Tools for commissioning

... to find faults on PROFINET networks fast and do program updates without TIA Portal Software

3 | Engineering in a Team

... through Multiuser functionality to have an coordinated engineering via a Server Project



Thank you for the attention

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