TIA-portal V18 Highlights

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Agenda

Namespaces for Software Units Failsafe program in Software Units Long-term Trace **General Improvements** SIMATIC AX Station Upload enhancements **TIA Portal Openness: API extensions** New UI for S7-PLCSIM V18 with integrated S7-PLCSIM Advanced Test Suite Advanced, System test via S7-1200 / S7-1500 OPC UA Server SIMATIC Energy Suite V18

STEP 7 – Innovations Namespaces for Software Units

		DigiMachineV2_PLC_only_V18 ► DigiMachinePlcNamespace [CPU 1516F
Devices		
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;c	_	
▼ 🙀 Software units	^	
🔺 Add new software unit		⊣⊢⊣/⊢⊸⊢ ഈ ↦ ᅼ
🕨 📴 GlobalEnvironment [Global]		EN ENO
🔻 🙀 GroupAssembly [Assembly]		
Relations		
🔻 🛃 Program blocks		
🗳 Add new block		Network 4: Call Group "Assembly" in this SoftwareUnit environment
🔁 Main		This group is part of our machine Unit "DigiMachine2.0" which is controlled by a in
💶 ProDiag		
💶 Startup	=	InstAssembly
🔻 🔚 01_Public		Assembly
🔅 🧧 Interface		EN ENO
02_Private		Global.Interface — globalData
🕨 🔚 External source files		Interface - publicInterface
🕨 📜 PLC tags		InstRobot — instanceRobot
🕨 ি PLC data types		Hardware hardware
🖙 PLC supervisions & alarms		Configuration — configuration
PLC alarm text lists		Hmilnterface — Interface
GroupPlacement [Placement]		Global
₽₽ Relations		Relations.transfer — relationWs1
Program blocks		
Add new block		Global. Relations.
📲 Main		transport — relationWs2
📲 ProDiag		Global relationWt 1
Startup		Relations.disposal — Store
👻 🔚 01_Public		
🔆 🥃 Interface		
▶ E 02_Private		
System blocks		 Network 5: Update external Cm Interafce - SwUnit Connector
External source files		This function updates the external cm kukarobot3 interface due to the SwUnit arc

Concept

- Software Unit provides a "Namespace preset"
- Every Block/UDT has an own "Namespace" property
- In Clients (WinCC, OPC UA) always the full name (incl. namespace: Namepace.BlockName) is displayed
- No namespace for global tags/variables in V18

Benefits

• Block names can be used several times in the PLC program

Improved IEC 61131-3 conformity

- No special characters except "_"
- No quotation marks in the code for block names
- "_." : Extension of the referencing concept

STEP 7 – Innovations Failsafe program in Software Units



Boundary conditions

- · Global Setting to activate feature
- Empty F-Unit is created with a new CPU
 - Entire failsafe program in one F-Unit
 - Existing failsafe program are copied to the new CPU
 - No delete/copy/create of F-Unit
 - No master copy of F-Unit
- Safety Administration as usual

Advantages

- Use of Units features:
 - Unit-granular download
 - Publishing data & data exchange between units
 - Namespaces also for F-Unit



STEP 7 – Innovations Long-term Trace



Long-term Trace for better analyzing sporadic errors or optimize machinery parameterization

- Recording of up to 64 different signals in "csv"-files for a long time (days, weeks, months)
- Limitation only thru available hard disk memory on PC
- Motion-Cycle-synchronous (e.g. MC-Servo) recording ensures qualified analyzes of the signals
- Configuration/Start/Stop of the Long-term Trace job via Trace-Editor
- The recorded values can be shown and analyzed in the Trace-Editor
- The recorded "csv"-files can be exported and analyzed via third party tools also



STEP 7 – Innovations General Improvements

Special marking of InOut parameters in LAD/FBD/Graph

InOut parameters have a special marking in block calls to better differentiate them from In parameters



Search & Replace of hidden block parameters

Find & Replace in LAD/FBD blocks finds now actual parameters on block calls with hidden parameters.



Search & Replace in Tag Table – Replace All

"Replace all" with all its options is now supported in the PLC tag table



STEP 7 – Innovations General Improvements

New checksum "Program code" in compare editor

The new checksum only takes the source code into account. Spaces, line breaks, tabs and comments of all types are not included. They are now part of the checksum "Program code (legacy)"

Compare editor online						×
🗣 🕒 🕂 ± 🔢 🗄 🖧 💭 🔹					-	
		50				
"WebinarDemoProject_V17_V18: CPU1515"			"Online PLC"			
Name	Status	Action	Name			
▼ 11 CPU1515	•	11	CPU1515			
▼ BB Software units	0	11				
 Unit_Pythagoras 	•	11	🔤 Unit_Pythe	igoras		
🔻 🔙 Program blocks	•	11				
💶 Pythagoras		11	💶 Pythagora	s		
Comparison result: Objects are different.						
		_ -				
	Pyth	agoras		Pythagoras		
▼ Source data			•			
Interface without comments						
Program code						
Program code (legacy)						
 Comments (multi-language) 						
 Language configuration 			•			
 Properties 			•			
 Extended properties of program ele 			•			
 Target data 			•			

Watch table – New shortcut to modify values of multiple variables

A new context menu in the watch table makes it easier to change the value of several selected variables.

Ŷ	Ÿ	1. 1/2 🗗 🕼 🕺 1/2 🦉 💕 1				
	i	Name		Display format	Monitor value	Modify value
1		Unit_Pythagoras.GlobDB.varBool1		Bool	FALSE	TRUE
2		Unit_Pythagoras.GlobDB.varInt3		DEC+/-	10	10
3		Unit_Pythagoras.GlobDB.varInt4		DEC+/-	0	20
4		Unit_Pythagoras.GlobDB.varReal1		Floating-point number	30.0	30.0
5		Unit_Pythagoras.GlobDB.varReal2		Floating-point number	0.0	40.0
6		Unit_Pythagoras.GlobDB.varString1 🔳		String	'Test1'	'Test1'
7		Modify		Modify to 0	Ctrl+F3	'Test2'
8		Monitor all Ctrl+1		Modify to 1	Ctrl+F2	
		Monitor now		Modify selection now	/ Shift+F5	
		1	-1	🐔 Modify now	Shift+F9	
		insert row Ctrl+Enter	r į	🔏 Modify with trigger	Ctrl+Shift+F9	
		₹ Add row Alt+Ins	1	🖉 Enable peripheral ou	itputs	



SIMATIC Hardware Station Upload enhancements <u>functions</u>

F-PLC operates F-Panel as PN-IO



The Upload from a F-PLC (CPU1500) won't be blocked if the F-PLC operates F-Panels as PN-IO Device. After the Upload a panel will be represented as a proxy without panel specific parameter.

Supported with

- TIA Portal V18
- TIA Portal V17 Update 6 (planned)

F-PLC operates SINAMICS as PN-IO Device



The Upload from a F-PLC (CPU1500) won't be blocked if the F-PLC operates F-SINAMICS drive as PN-IO Device. After the Upload a drive will be represented as a proxy without drive specific parameter.

Supported with

- TIA Portal V18
- TIA Portal V17 Update 6 (planned)



SIMATIC Hardware General Improvements

Improvements for Multiuser Online

All other online users of a PLC are shown in the download dialog in case a download requires exclusive access to the PLC.

Load pre	eview			×
? 0	heck l	before loading		<u>F</u> enster ausschn
Status	!	Target	Message	Action
+₩	8	 plc1516v21-ip163-bg 	Loading will not be executed.	Load 'plc1516v21-ip
	8	 Download to devi 	Other operators are currently working online with this CPU.	
	•		Ensure that all other users have closed the online connection to this CPU before you start the download to device with hardware configuration.	
	8	 Online Users 		
	•		User "John Doe, Tel. 012345/678911", Host "MD1ZRF3C" User "Jane Roe, Tel. 012345/678912", Host "MD1ZRF3C"	
<				
				Refresh
			Finish	Load Cancel

Improvements for Hardware Offline/Offline Compare

The user can select two PLCs for comparison and navigate from them down to the IO modules.



OUR EXISTING TIA PORTAL ECOSYSTEM

grows for maximum flexibility to address IT-like needs



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SIMATIC AX - TIAX use case



System functions

TIA Portal Openness: API extensions

TIA Portal Openness is our API for automating your engineering workflows

Highlighted API extensions in V18:

- Long-term support and compatibility
- Extended access to hardware configuration
- Automated Safety engineering
- STEP 7 extensions
- Station Upload extensions
- Test Suite Advanced extensions
- New API features in further option packages

For a list of all new features, refer to the TIA Portal Openness system manual, chapter "What's new".

SIOS: 109792902





System functions

TIA Portal Openness: Long-term support and compatibility

	Openness application V15.1		,	Openness application V15.1
				Openness application V18
Openness application V15		,	Openness application V15	
TIA Portal V15 N15 Hab I ab I V15 Hab I ab I	V148P1 API V15.1 V15.1 API V15.1 API	U14 Portal V15 API V15.1 API V16.1 API	N15 API V15 API V15 API V15 API	TIA Portal V18 N12:1 API V17 API Idv 1.3 Th V18 API Idv 1.3 Th

Long-term support (LTS)

Existing Openness applications since V15.1 will continue working. TIA Portal V18 delivers the LTS APIs for V15.1, V16, and V17.

New API version

TIA Portal V18 delivers the new API version V18 to use the latest Openness features.

Discontinuation of oldest API version

TIA Portal V18 no longer delivers the oldest API version V15. An update of applications using this version is necessary.

.NET SDK version

TIA Portal and TIA Portal Openness remain on .NET Framework 4.8 as a mature framework to build long-running enterprise-grade applications.



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TIA Portal S7-PLCSIM V18 - New user interface for S7-PLCSIM V18 with integrated S7-PLCSIM Advanced



TIA Portal S7-PLCSIM V18 User Interface The functionality and licensing remain unchanged

With the new S7-PLCSIM V18 User Interface ...

...we support S7-PLCSIM Advanced Features on the same User Interface!



Functionality / License	S7-PLCSIM V18 Standard	S7-PLCSIM Advanced V5.0
S7-1200 / S7-1500 PLC		🚫 / 🥥
Local / distributed communication		
TCP/IP / OPC UA / http(s)		
Virtual time scaling	\otimes	
Virtual memory card		

"The functionality split and licensing remain unchanged"



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S7-PLCSIM Advanced V5.0 - New communication mode "TCP/IP - Multiple Adapter" leads to Cloud readiness



With the new "**Multiple Adapter Mode**" S7-PLCSIM Advanced can be operated also in IT Infrastructure scenarios where the "Network Promiscuous Mode" is prohibited as in public cloud infrastructures like Azure Cloud or AWS.

To make S7-PLCSIM Advanced V5.0 ready to use with no limitations in a Cloud environment, we builtin the new "**Multiple Adapter Mode**". Any interface of a simulated PLC can be separately configured.

This enables the following use cases:

- Visibility to external networks for any interface
- Communication over 2 or more virtual machines and their running PLC instances to any of their interface
- Addressing from outside PLC interfaces from different networks
- A network separation is possible while the mapping isn't done



Test Suite Advanced V18 System test via S7-1200 / S7-1500 OPC UA Server



HiL Tests

with S7-1200 / S7-1500

System test via PLC OPC UA Server

In addition to application test via the S7-PLCSIM Advanced API, the Test Suite now offers automated tests via S7-1200 / S7-1500 OPC UA Server interface. When the test is started, then Test Suite connects to the specified server address as an OPC UA client and executes the test step by step.



Benefits

- Black-Box-Tests via OPC UA interface PLC project is not required
- Software in the loop tests with S7-PLCSIM Advanced
- Machine simulation, e.g. with Simit, NX MCD, etc.
- Hardware in the loop tests with S7-1200 & S7-1500 controller
- Several system tests can run in parallel on one PLC
- Automated tests via TIA Portal Openness



Test Suite Advanced V18 General improvements

Style guide checker improvements

- Additional object selectors for:
 - Function
 - \circ FunctionBlock
 - OrganizationBlock
- Case sensitivity for rules "Name contains" & "Prefix suffix"

	Rule set_1				
	Name	Туре	Objec	t selector	
1	Rule1	Name contains	🗉 Code	Block.FunctionBlock	
2	<add new="" rule=""></add>		Code	Block (FB,FC,OB)	
			Code	Block.FunctionBlock	
			Code	Block.Function	
			Code	Block.OrganizationBlock	
			Code	Block.Interface (In,Out,InOut))
Rul	le set_1				
Nar	me	Туре		Object selector	
•	Rule 1	Prefix suffix		CodeBlock.Interface.Static	
	Context	Starts with			
	Violation condition	ls not equa			
	Value	stat			
	Match type	Case insens	itive 🔳		
	<add new="" rule=""></add>	Case insen	sitive	~	
		Case sensi	tive		

Application test improvements

- Run with condition: Stop execution if, e.g. either signal becomes true, or number of cycles is expired
- Support of variables with data type WChar, String or WString

Scope CPU1515
Scope CPU1515
1 EVAREND_VAR 9 10 ESTEP: "Start_Conveyor_Belt" 11 stationID :- 'Starton01': //New in VIS: Support of variables of data tume string
9 9 10 ESTEP: "Start_Conveyor_Belt" 11 stationID :- 'Starton01': //New in VIS: Support of veriables of data tume string
10 ESTEP: "Start_Conveyor_Belt"
11 stationTD StationOll. //New in V18: Summort of warishies of data tume string
ii Sederonin Sederonoi , //wew in vio. Support of variables of data type string
12 partID := 'ASE75'; //New in V18: Support of variables of data type string
13 start := True;
14
15 RUN(CYCLES:=1000, done = True); //New in V18: Run until varible 'done' = True or number of cycles = 1000 cycles
16 No CERT Resultances Relation
1/ ASSERT.Equal(effor, Faise);
10 FASERILEQUAL(CELEGIAM, SCACIONOL.ASE/S'); //wew in vio: Support of Variables of Gata type string
20

SIMATIC Energy Suite V18 What's new?



WinCC Unified support

- Everything included: Energy data and load management visualization provided
- Simple handling: Generating the visualization with SiVArc
- Data security mechanism:
 Buffered communication between WinCC and PLC
- No double licensing: Energy Suite tags are not counted in WinCC Unified

Additional features

- Base Load Management
- Support of energy storage actuators in load management systems
- Support of Software / Open Controller
- Simplified project migration

