

Tips & Tricks with TIA Portal (#TIAtips) *powered by Mister Automation*



TIA Portal

Tips & Tricks by Mister Automation

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Tobias Schuh · 1.
Head of team "Engineering Workflow" bei Siemens
2 Wochen

TIA Tip 027 - Details view for fast tag access
You want to use global tags or variables from data blocks in your program or screen? Using the details view you can drag and drop tags to seve ... mehr anzeigen

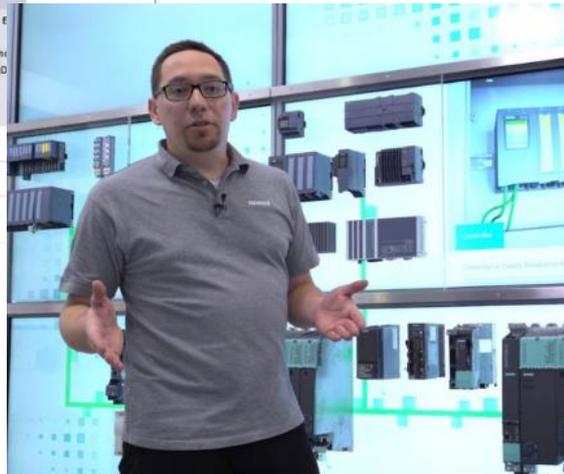
Übersetzung anzeigen

Project tree: DigIDemoMachine > PLC_1516F [CPU 1516F-3 PN/DP] > Program blocks

Block title: Network 1: Tips & Tricks => Details view

Name	Data type	Accessib.
conveyorRobotLog	type Co.	True
enable	Bool	True
rpm	Real	True
status	Word	True

158 · 3 Kommentare · 2.552 Ansichten



Tips & Tricks by Mister Automation

Our TIA Portal expert Tobias Schuh is looking forward to share news, tips & tricks as well as insights behind the scenes of TIA Portal.

Youtube Playlist

Our TIA Portal expert Tobias

https://www.youtube.com/playlist?list=PLw7iLwXw4H53wrYwDsm-LULI_1CbOqNN6

Social Media Profiles

Tobias Schuh @LinkedIn: www.linkedin.com/in/tobias-schuh

Tobias Schuh @Twitter: <https://twitter.com/MrTobiasSchuh>

Further information

all #TIAtips as Slides: www.siemens.com/tiatips

all #TIAtips via LinkedIn: www.siemens.com/tiatips-linkedin

Navigation

1 Handle the surface and windows

2 Configure Hardware and Network

3 Program PLCs

4 Project HMIs

5 Work with libraries

1 Handle the surface and windows

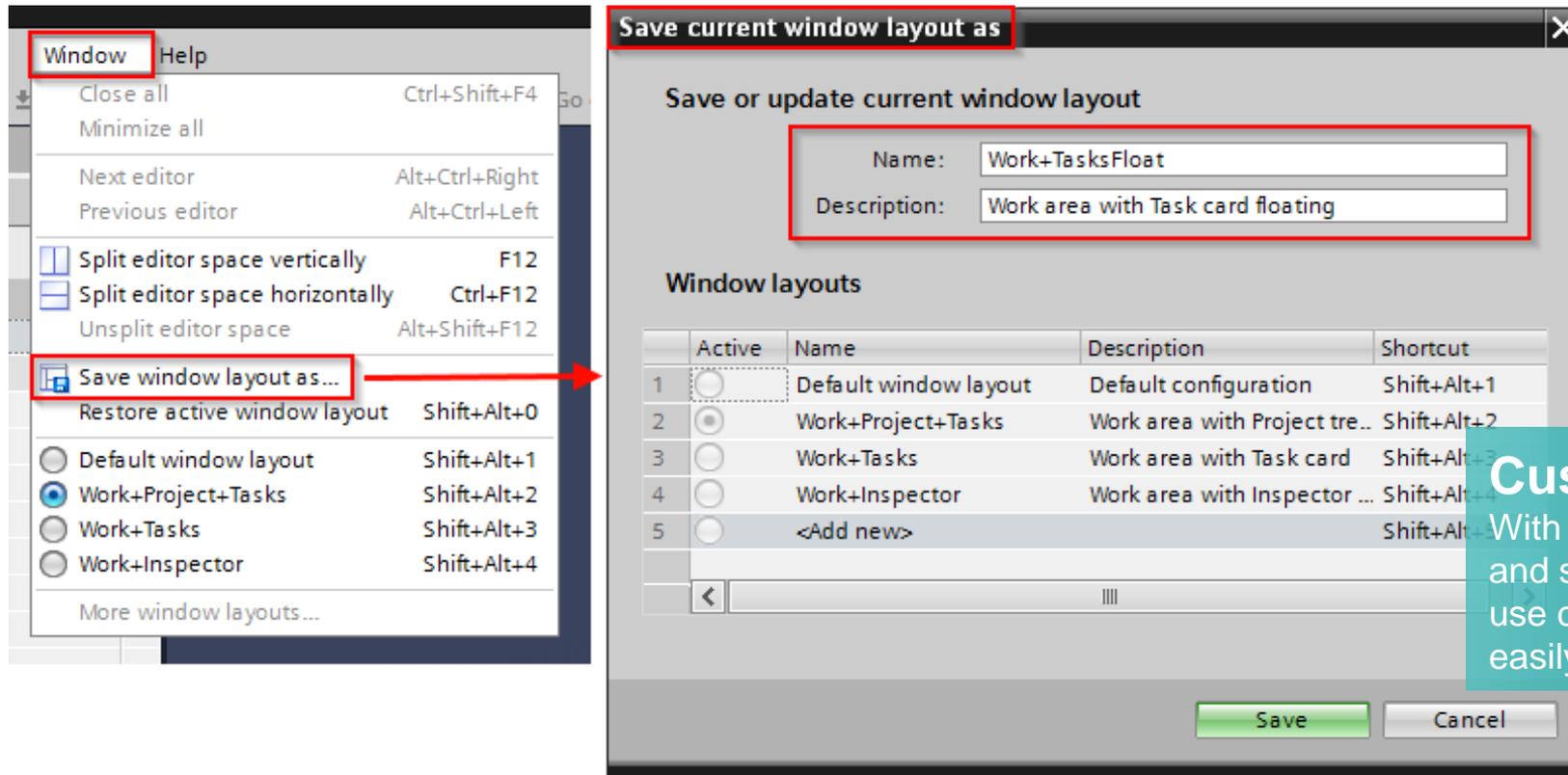
2 Configure Hardware and Network

3 Program PLCs

4 Project HMIs

5 Work with libraries

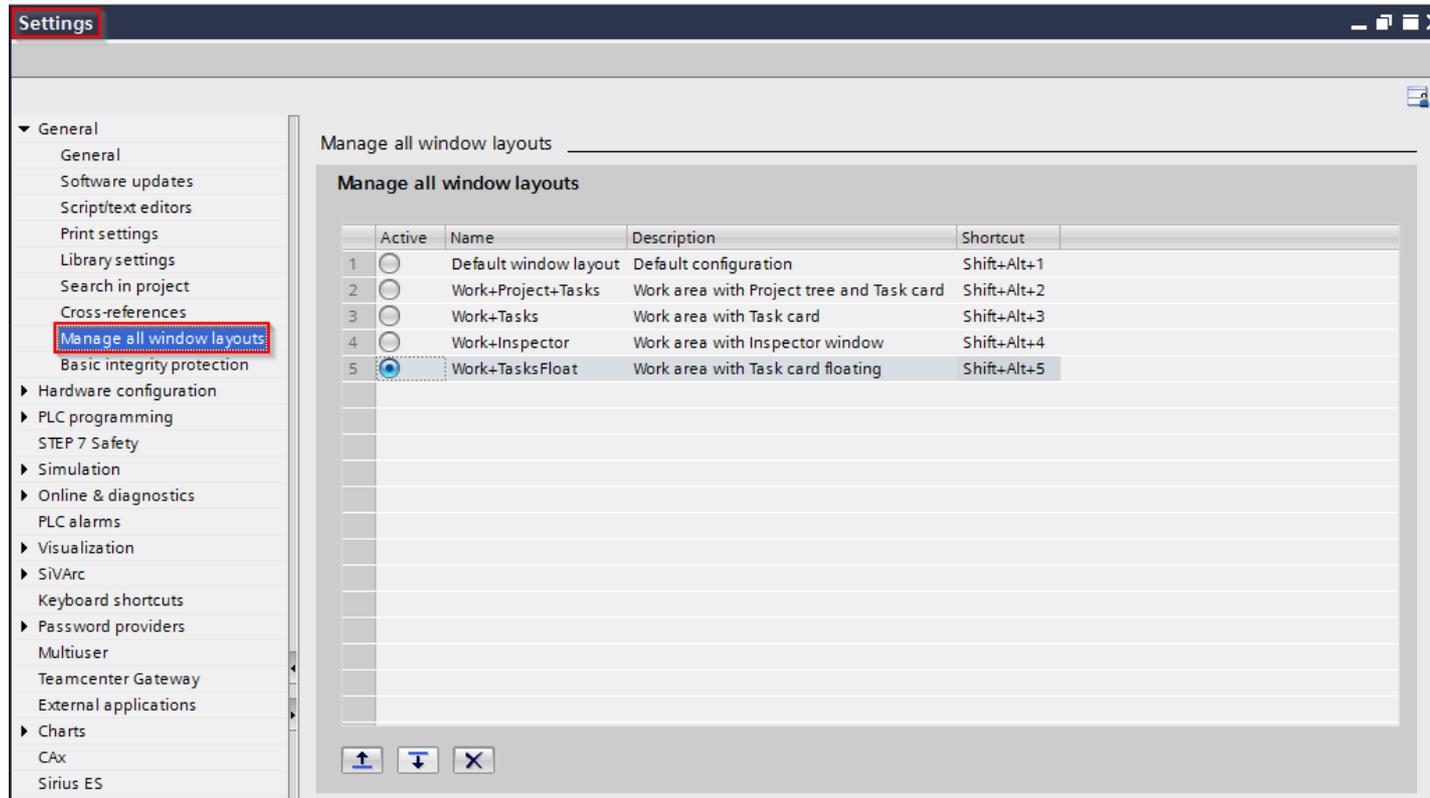
TIA Tip 002 1/2 – Customized window layouts



Customized window layouts
With windows layout you're able to customize and save window settings for corresponding use cases. With keyboard shortcuts you can easily switch between saved layouts very fast.

TIA Tip 002

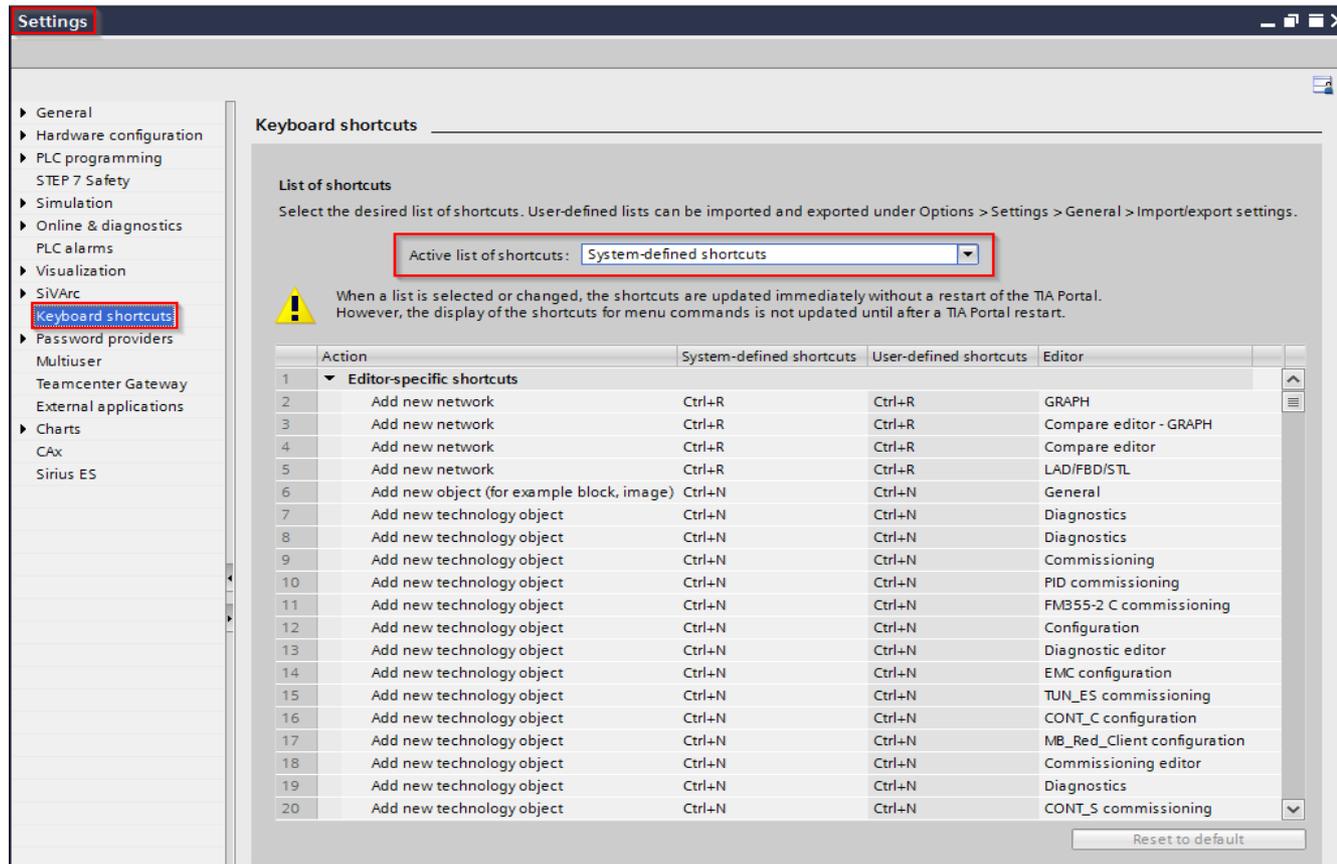
TIA Tip 002 2/2 – Customized window layouts



Customized window layouts
With windows layout you're able to customize and save window settings for corresponding use cases. With keyboard shortcuts you can easily switch between saved layouts very fast.

TIA Tip 002

TIA Tip 003 1/2 – User defined keyboard shortcuts



Settings

Keyboard shortcuts

List of shortcuts
Select the desired list of shortcuts. User-defined lists can be imported and exported under Options > Settings > General > Import/export settings.

Active list of shortcuts: System-defined shortcuts

When a list is selected or changed, the shortcuts are updated immediately without a restart of the TIA Portal. However, the display of the shortcuts for menu commands is not updated until after a TIA Portal restart.

Action	System-defined shortcuts	User-defined shortcuts	Editor
▼ Editor-specific shortcuts			
1 Add new network	Ctrl+R	Ctrl+R	GRAPH
2 Add new network	Ctrl+R	Ctrl+R	Compare editor - GRAPH
3 Add new network	Ctrl+R	Ctrl+R	Compare editor
4 Add new network	Ctrl+R	Ctrl+R	LAD/FBD/STL
5 Add new network	Ctrl+R	Ctrl+R	General
6 Add new object (for example block, image)	Ctrl+N	Ctrl+N	Diagnostics
7 Add new technology object	Ctrl+N	Ctrl+N	Diagnostics
8 Add new technology object	Ctrl+N	Ctrl+N	Commissioning
9 Add new technology object	Ctrl+N	Ctrl+N	PID commissioning
10 Add new technology object	Ctrl+N	Ctrl+N	FMB55-2 C commissioning
11 Add new technology object	Ctrl+N	Ctrl+N	Configuration
12 Add new technology object	Ctrl+N	Ctrl+N	Diagnostic editor
13 Add new technology object	Ctrl+N	Ctrl+N	EMC configuration
14 Add new technology object	Ctrl+N	Ctrl+N	TUN_ES commissioning
15 Add new technology object	Ctrl+N	Ctrl+N	CONT_C configuration
16 Add new technology object	Ctrl+N	Ctrl+N	MB_Red_Client configuration
17 Add new technology object	Ctrl+N	Ctrl+N	Commissioning editor
18 Add new technology object	Ctrl+N	Ctrl+N	Diagnostics
19 Add new technology object	Ctrl+N	Ctrl+N	CONT_S commissioning
20 Add new technology object	Ctrl+N	Ctrl+N	

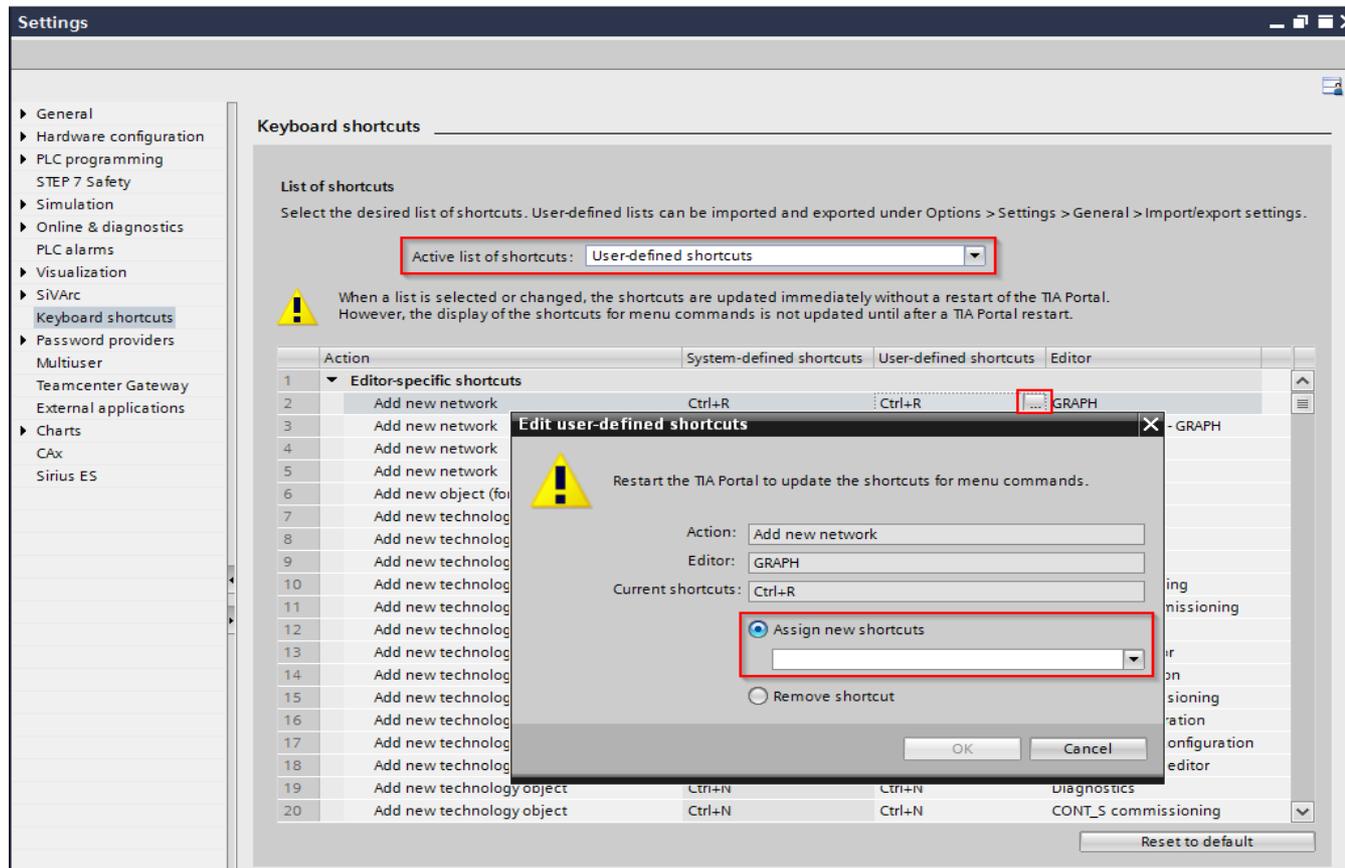
Reset to default

User defined keyboard shortcuts

Fast handling of TIA Portal! With customizable user defined keyboard shortcuts you're able to work even faster during engineering or commissioning.

TIA Tip 003

TIA Tip 003 2/2 – User defined keyboard shortcuts

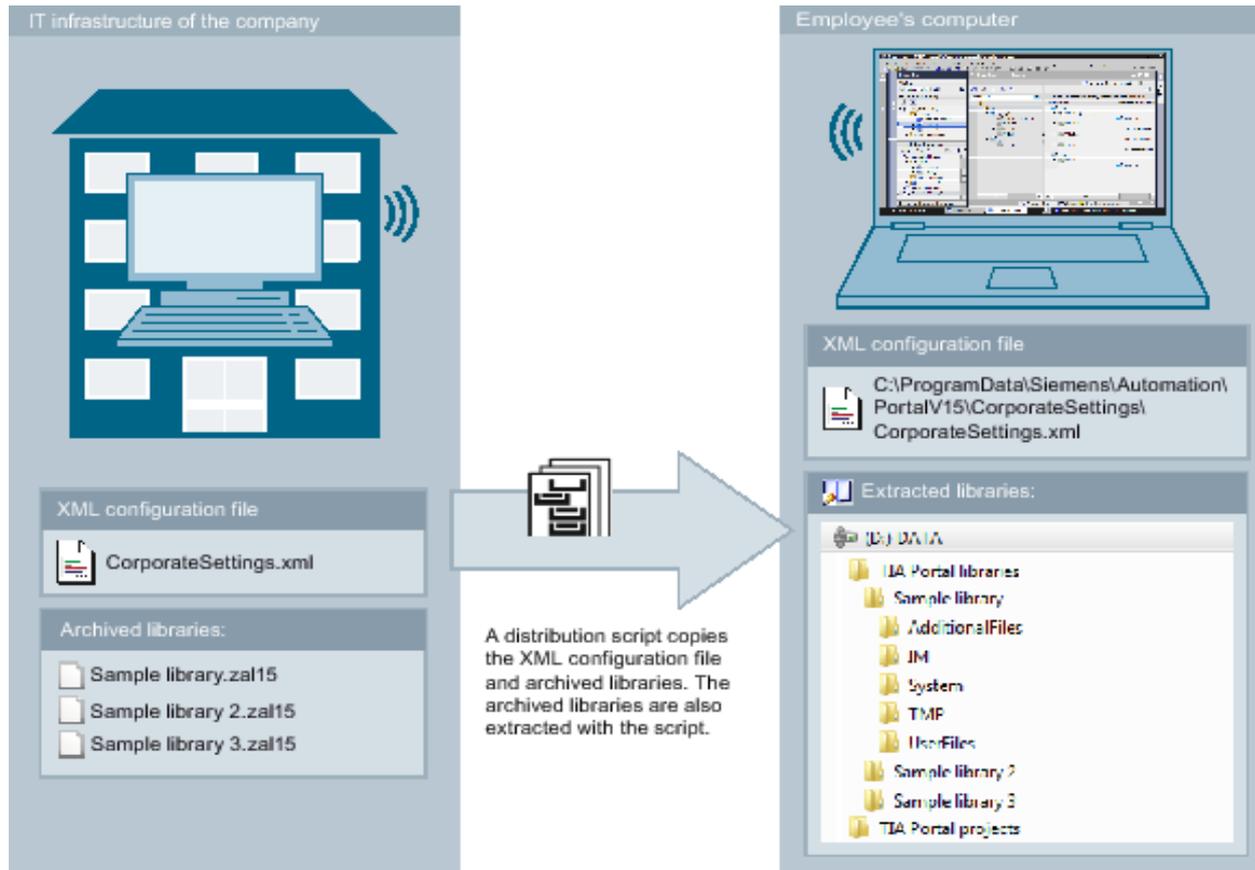


User defined keyboard shortcuts

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TIA Tip 003

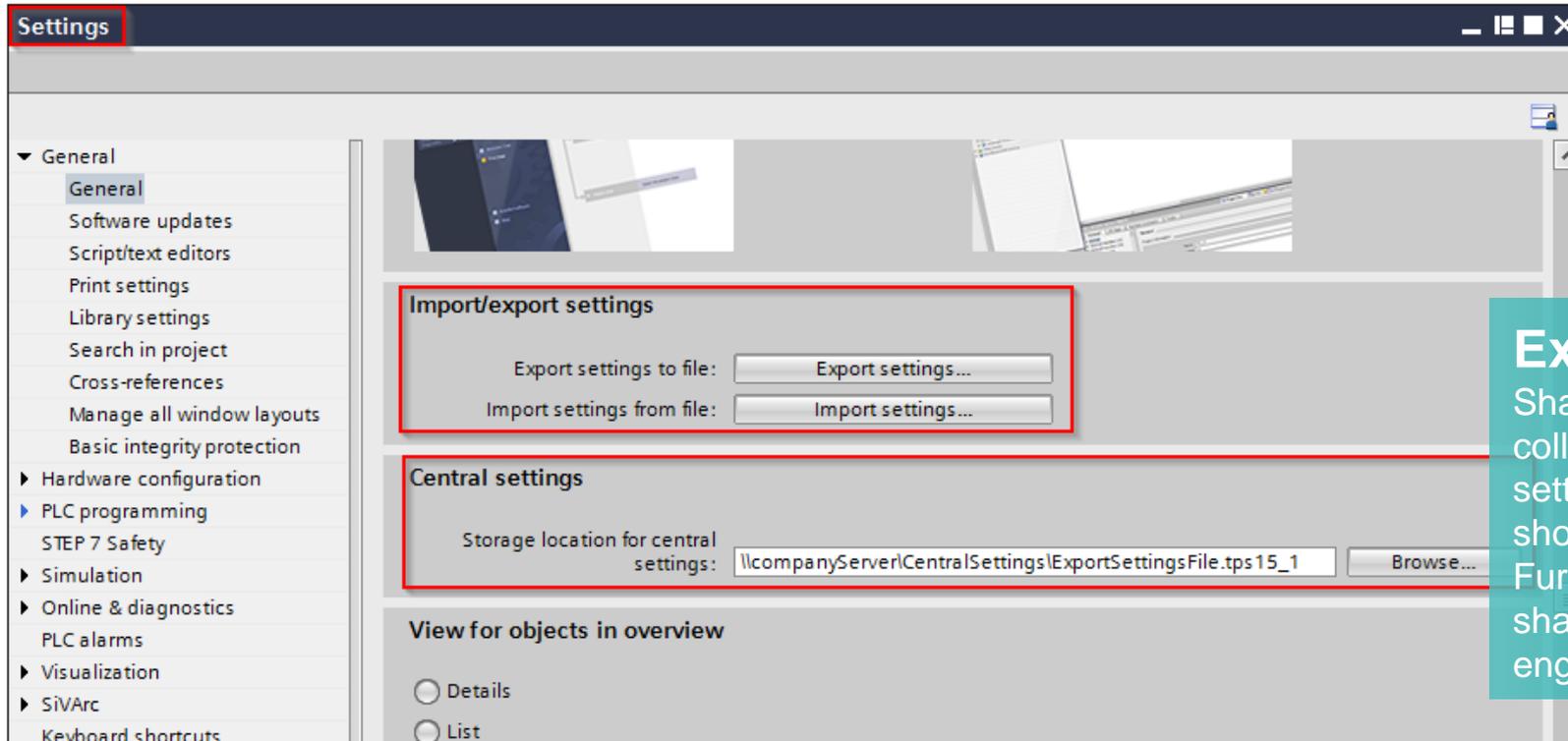
TIA Tip 004 1/3 – Exchange TIA Portal settings



Exchange TIA Portal settings
Sharing TIA Portal settings with automation colleagues is easy - select most important settings (e.g. project paths, Keyboard shortcuts,...), export and import them to share. Furthermore use centralized settings via a shared folder to synchronize different engineering systems.

TIA Tip 004

TIA Tip 004 2/3 – Exchange TIA Portal settings

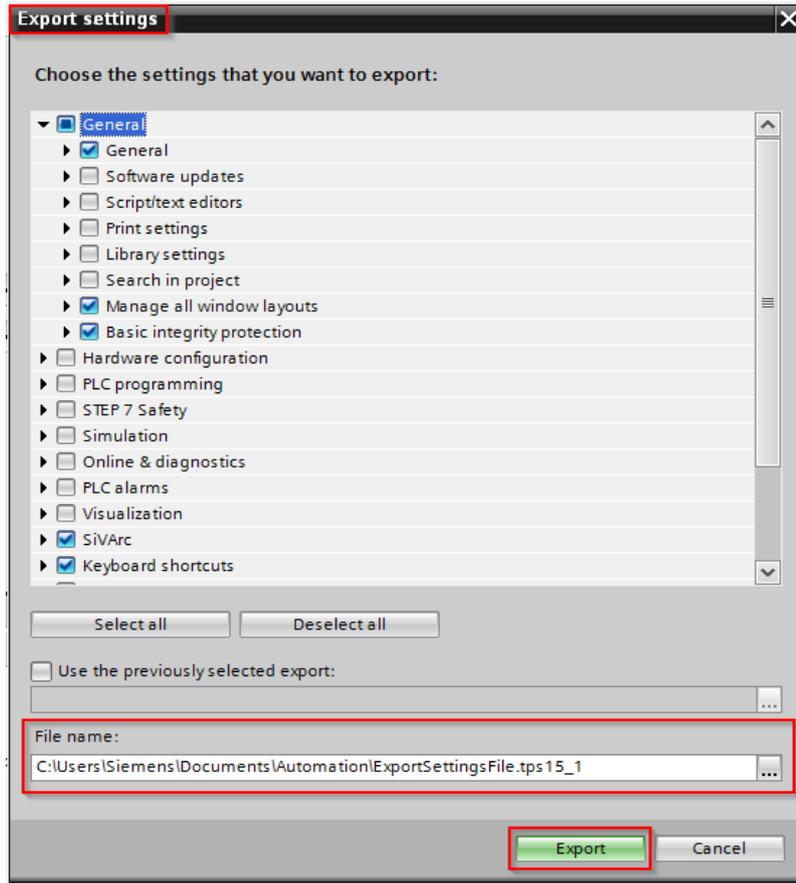


Exchange TIA Portal settings

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TIA Tip 004

TIA Tip 004 3/3 – Exchange TIA Portal settings



Exchange TIA Portal settings

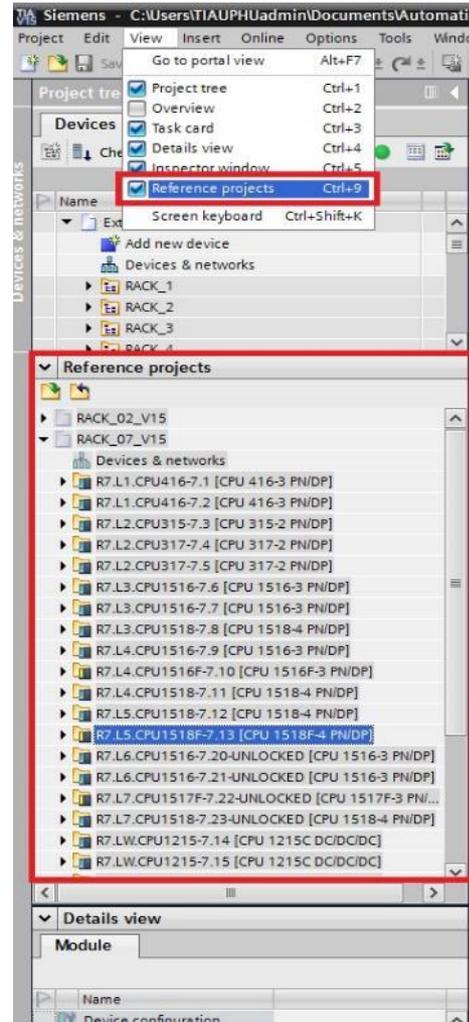
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TIA Tip 004

Source: TIA Portal

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TIA Tip 005 – Use of reference projects

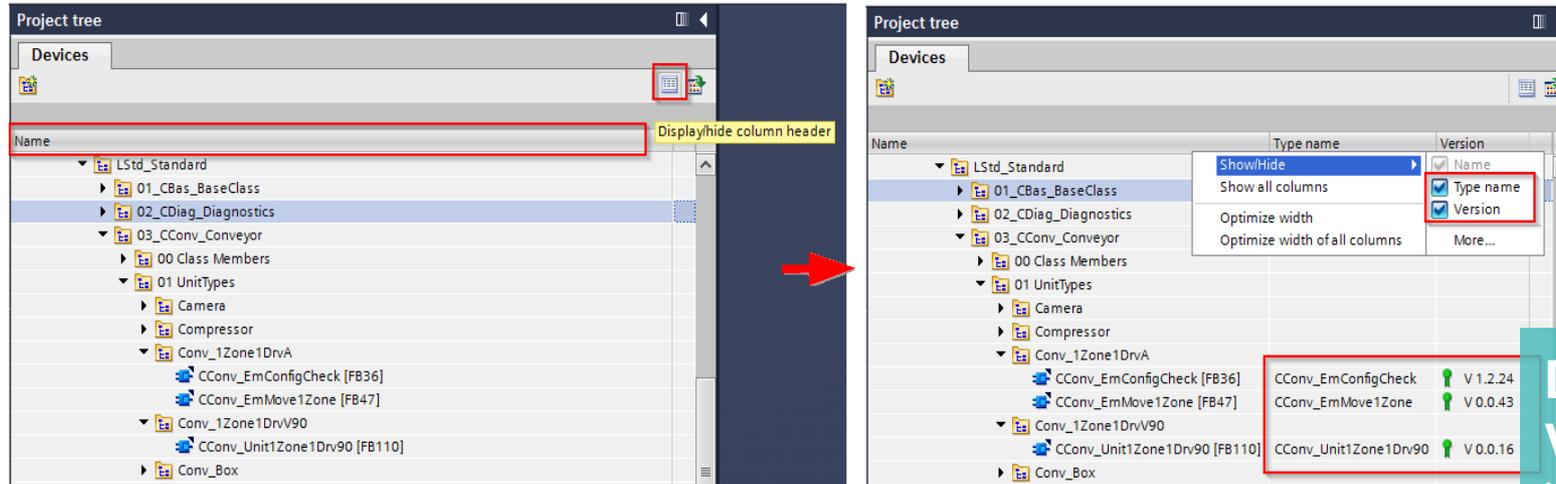


Use of reference projects

Copy objects between TIA Portal projects - it is not necessary to open a new TIA Portal window, just use reference projects to open projects read only. Copy software objects easily with drag & drop. Furthermore comparing software objects is possible.

TIA Tip 005

TIA Tip 026 – Display Type name and Version column in PNV

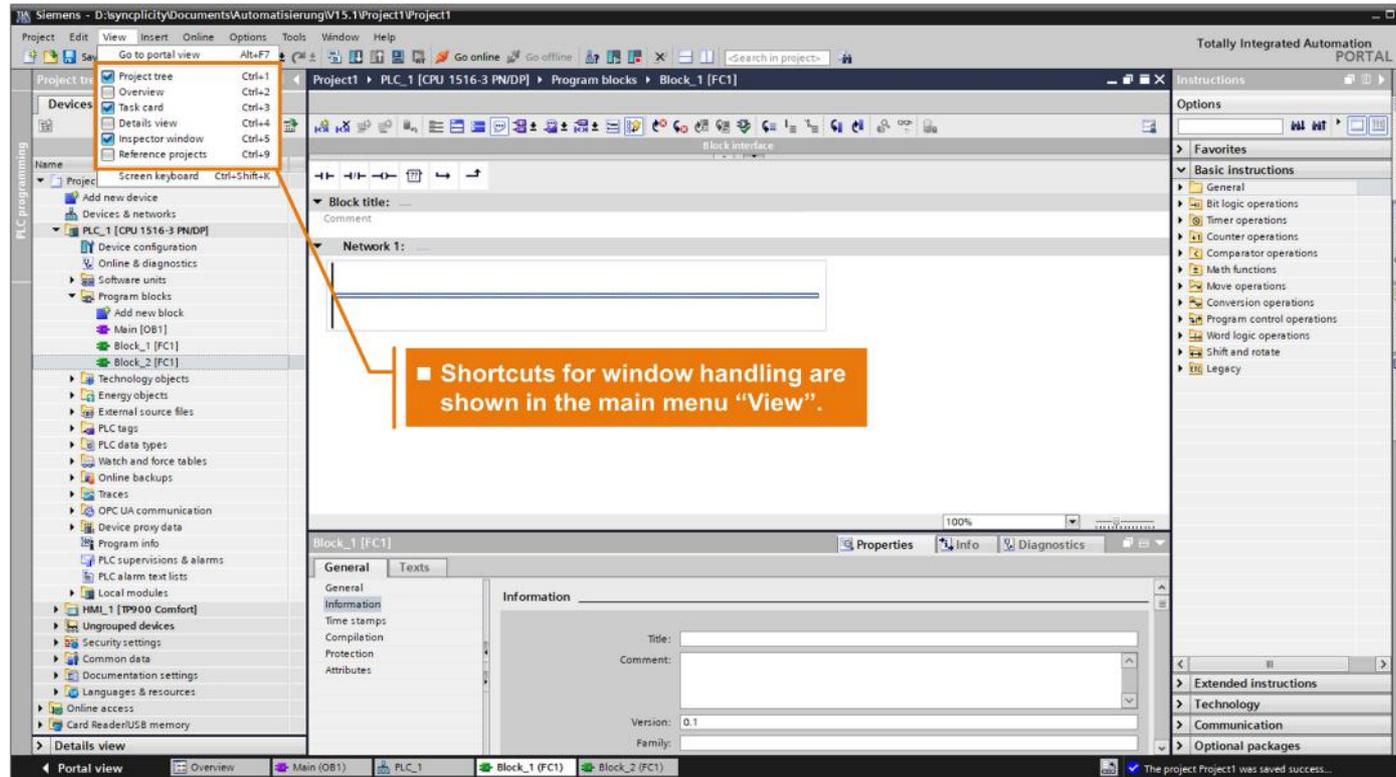


Display Type name and Version column in PNV

Looking for the type name and version of objects in the project navigation? First activate the column header - then right-click on the column and select the type name and the version to be shown!

TIA Tip 026

TIA Tip 033 1/2 – Window handling with shortcuts

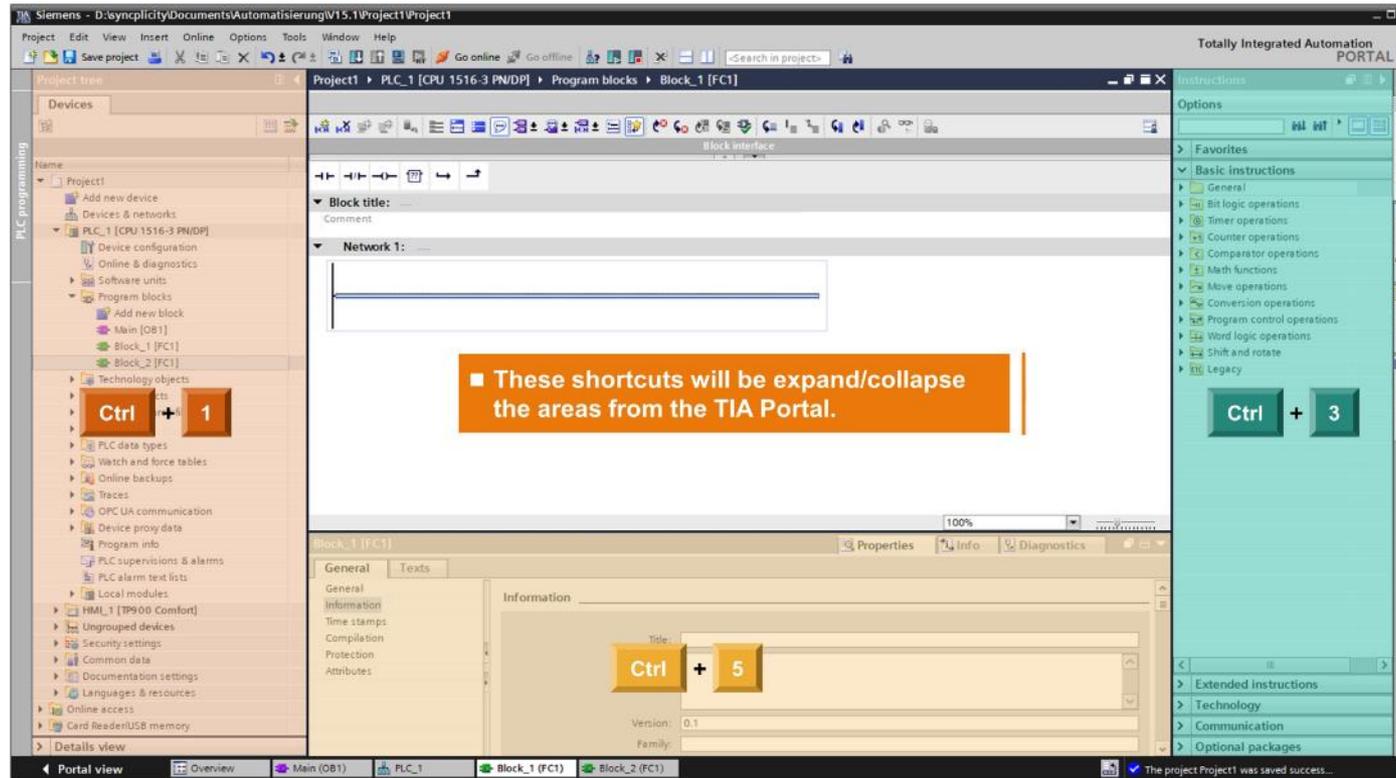


Window handling with shortcuts

With <CTRL> + <Number> you're able to show or hide the common views of the TIA Portal framework. By this you can easily concentrate on the editor which is needed for the current task.

TIA Tip 033

TIA Tip 033 2/2 – Window handling with shortcuts



Window handling with shortcuts

With <CTRL> + <Number> you're able to show or hide the common views of the TIA Portal framework. By this you can easily concentrate on the editor which is needed for the current task.

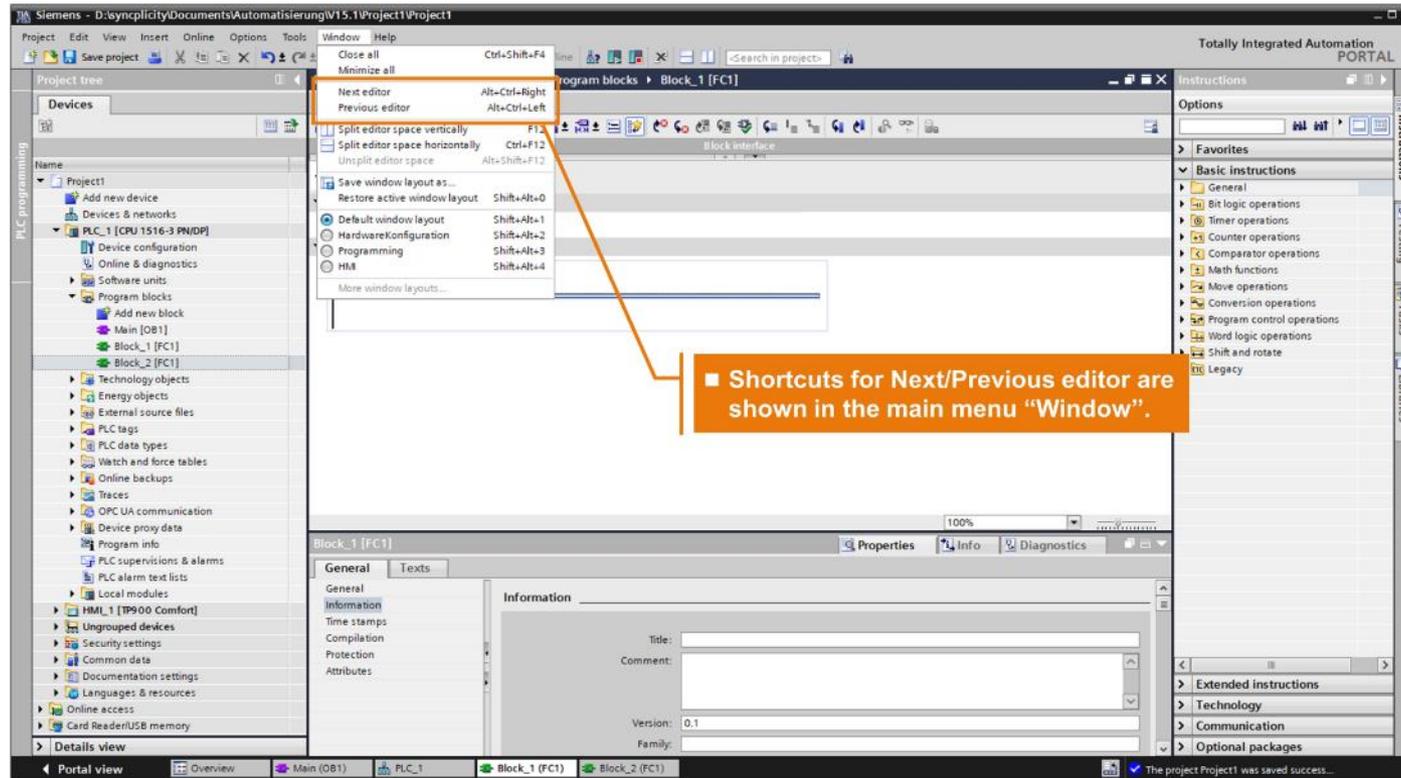
TIA Tip 033

Source: TIA Portal

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Page 15

TIA Tip 034 1/2 – Toggle Editors with shortcuts

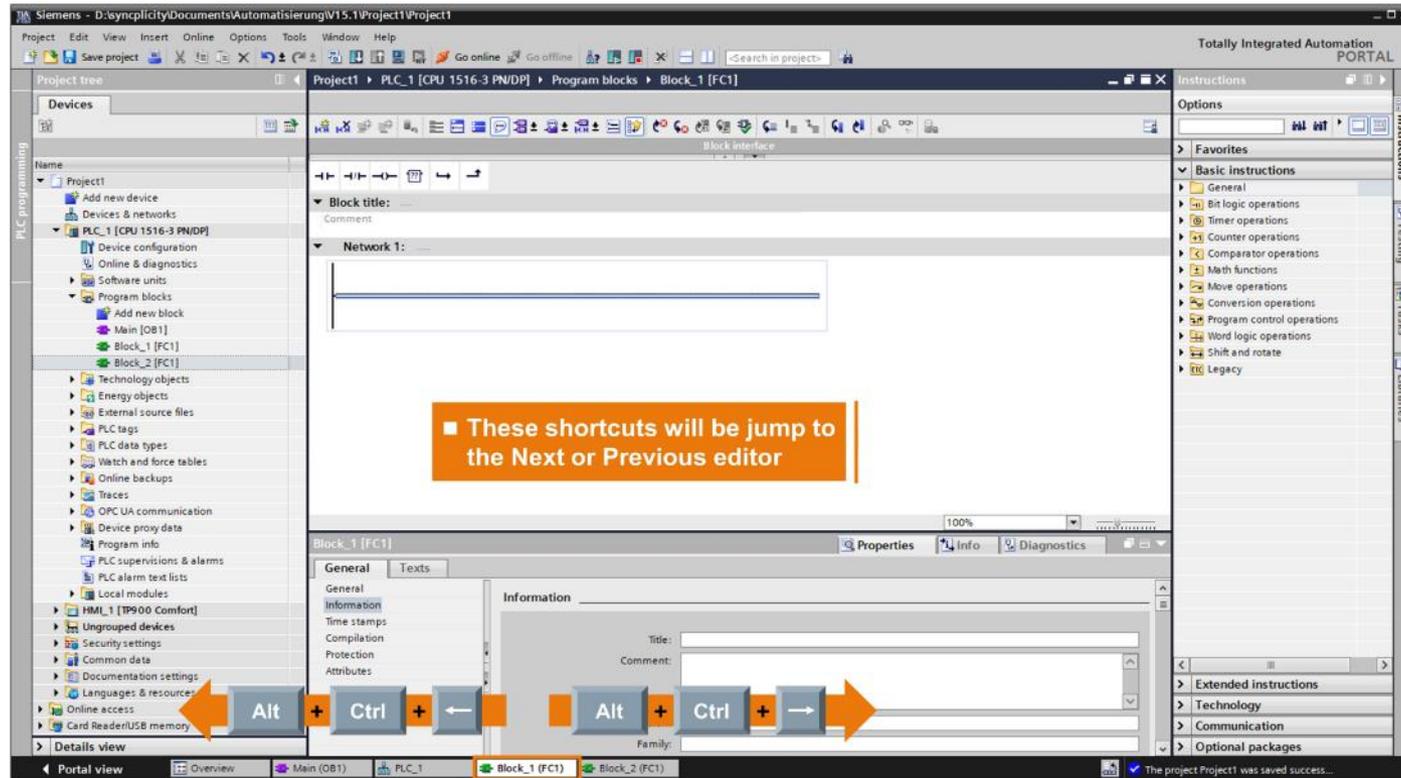


Toggle Editors with shortcuts

A lot of editors and windows can be opened simultaneously. With the shortcut <ALT> + <CTRL> + <Left/Right> you can easily toggle between opened editors.

TIA Tip 034

TIA Tip 034 2/2 – Toggle Editors with shortcuts

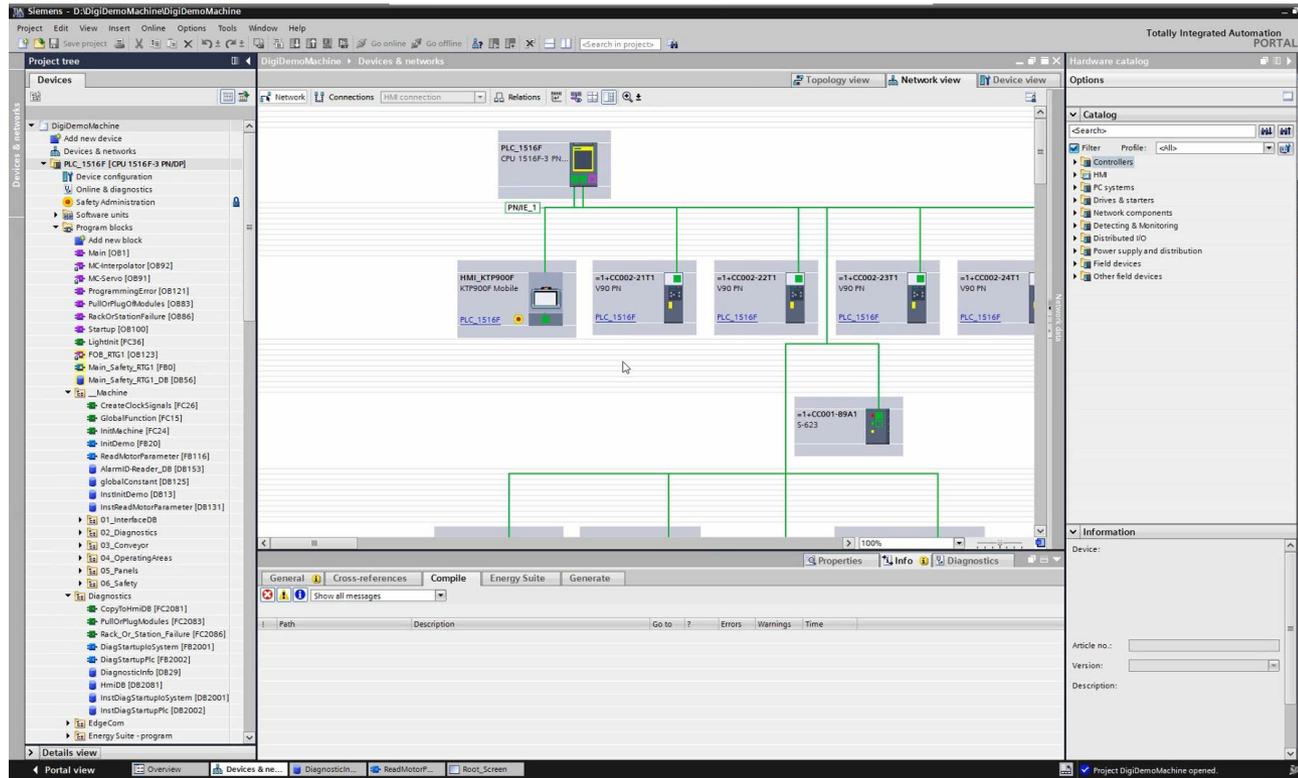


Toggle Editors with shortcuts
A lot of editors and windows can be opened simultaneously. With the shortcut <ALT> + <CTRL> + <Left/Right> you can easily toggle between opened editors.

TIA Tip 034

TIA Tip 035 – Window maximizing with "Double-click"

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Window maximizing with "Double-click"
Beside Shortcuts for window handling and toggle editors you can use a mouse double click on the top line to maximize the visible area and hide other windows - works also in split mode.

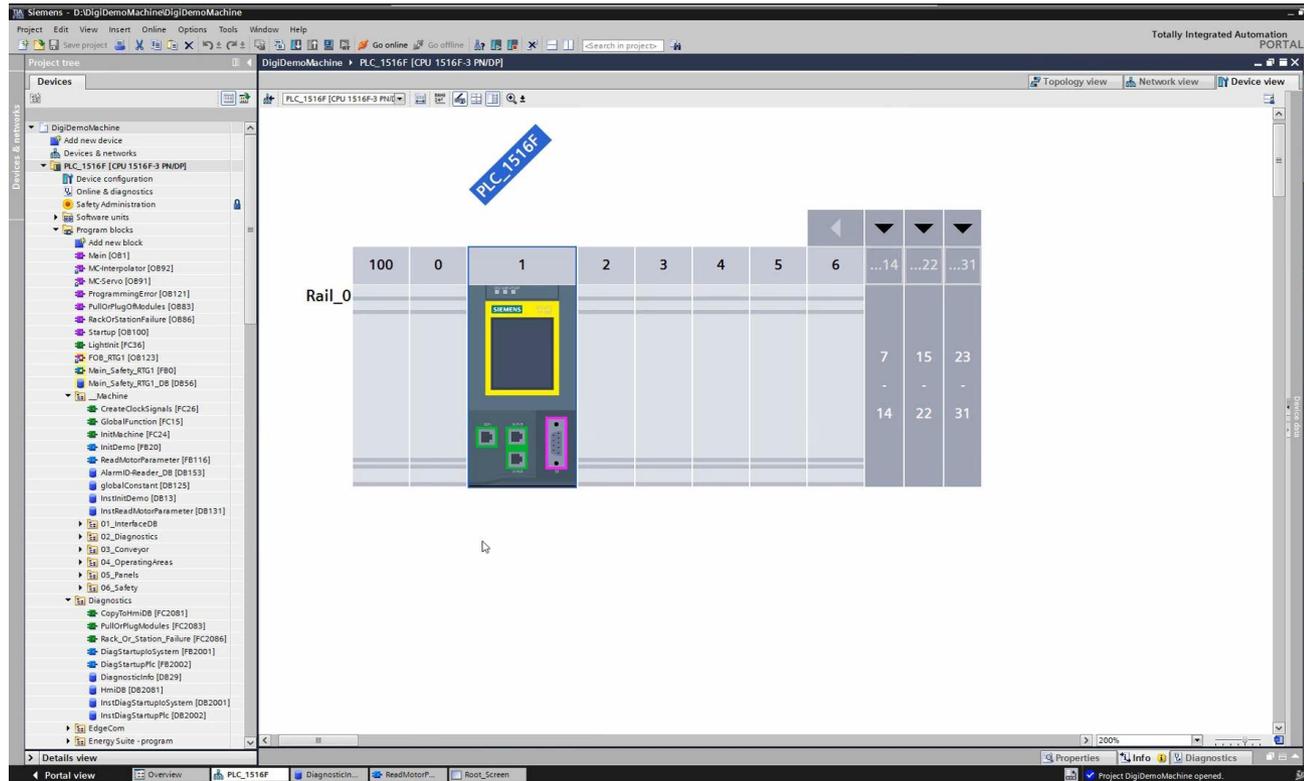
TIA Tip 035

Source: TIA Portal

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Page 18

TIA Tip 036 – Pin and unpin area in split windows

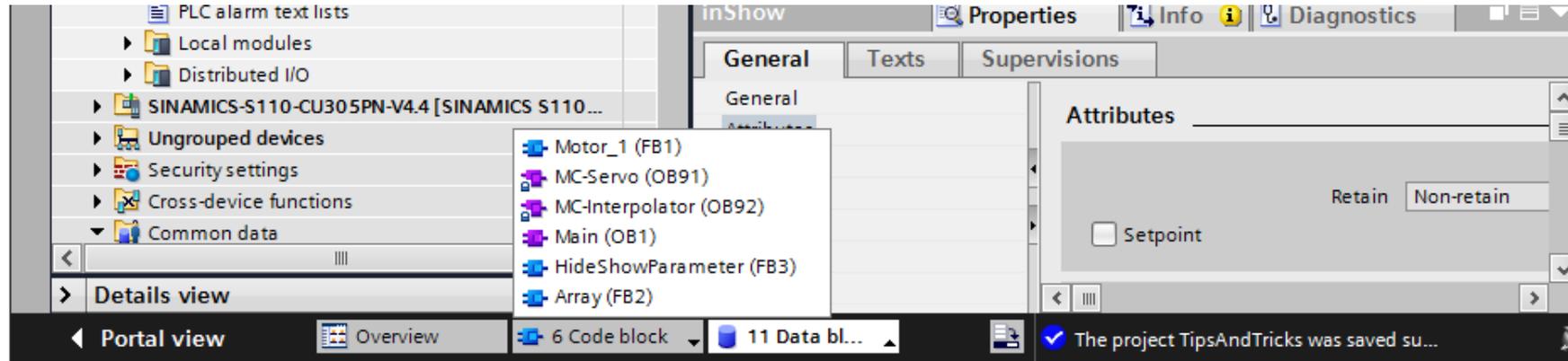


Pin and unpin area in split windows

If you're using the editors in TIA Portal with split windows then it's very useful to use the Pins. With activated Pin the window will stay in the foreground if you open another editor.

TIA Tip 036

TIA Tip 052 – Group editors



Group editors
With a lot of open editors an easy way to structure them is to group them. With one click it's possible to group all code or data blocks

TIA Tip 052

1 Handle the surface and windows

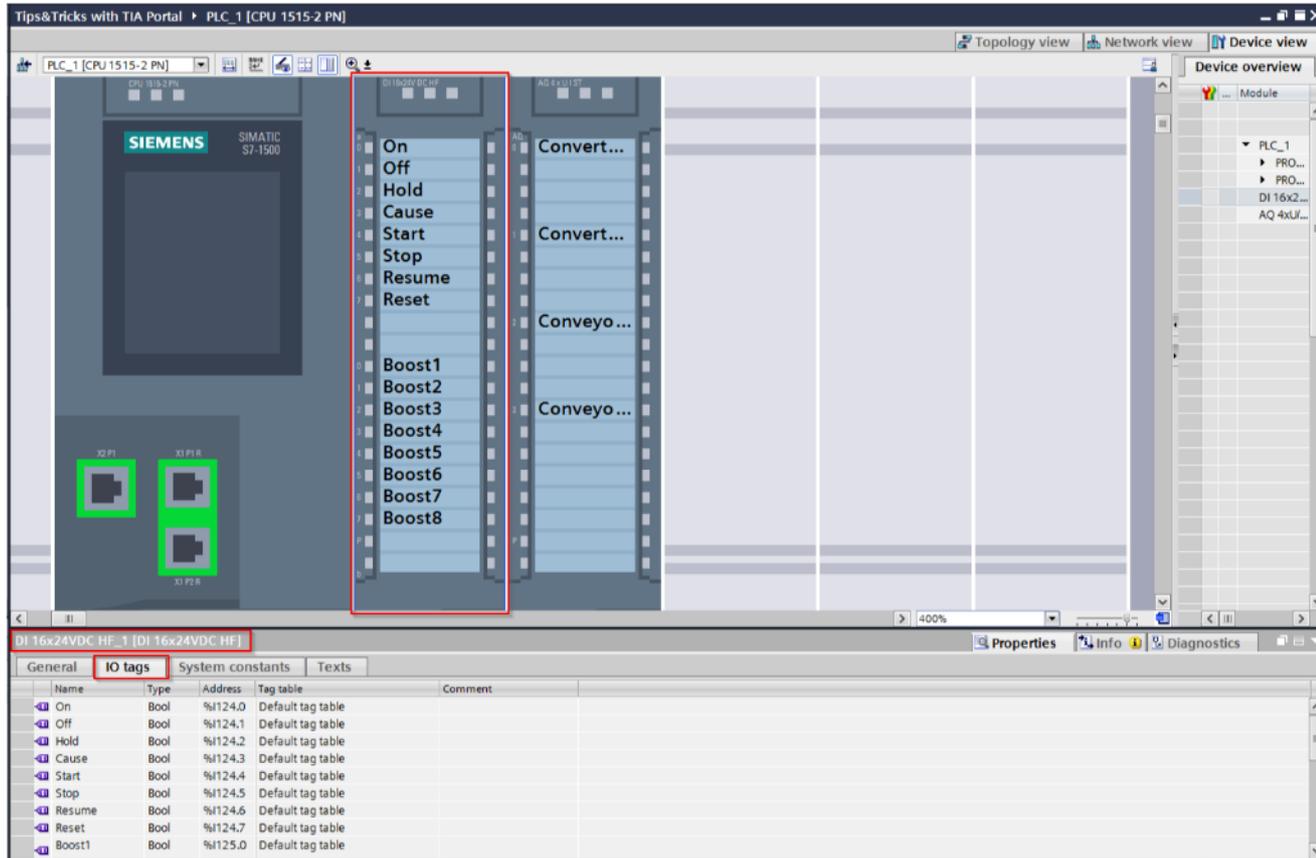
2 **Configure Hardware and Network**

3 Program PLCs

4 Project HMIs

5 Work with libraries

TIA Tip 006 – Showing io tag variables on hardware modules



Showing io tag variables on hardware modules

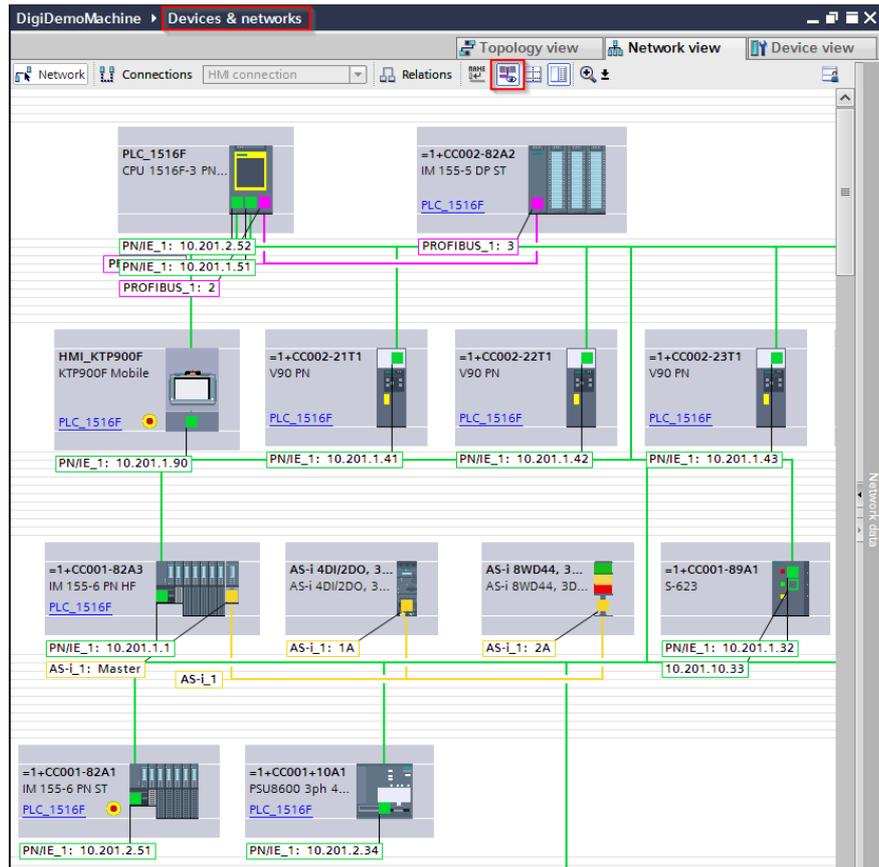
Showing IO tags in Device view gives an easy overview about the relationship of hardware modules and IO variables - by the way digital signals can be also monitored in online mode.

TIA Tip 006

Source: TIA Portal

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TIA Tip 007 – Show address labels in Network view



Show address labels in Network view

Especially with a lot of components in your project it's very useful to show all address labels - and you're also able to change the addresses without the need of switching to the inspector window or device view.

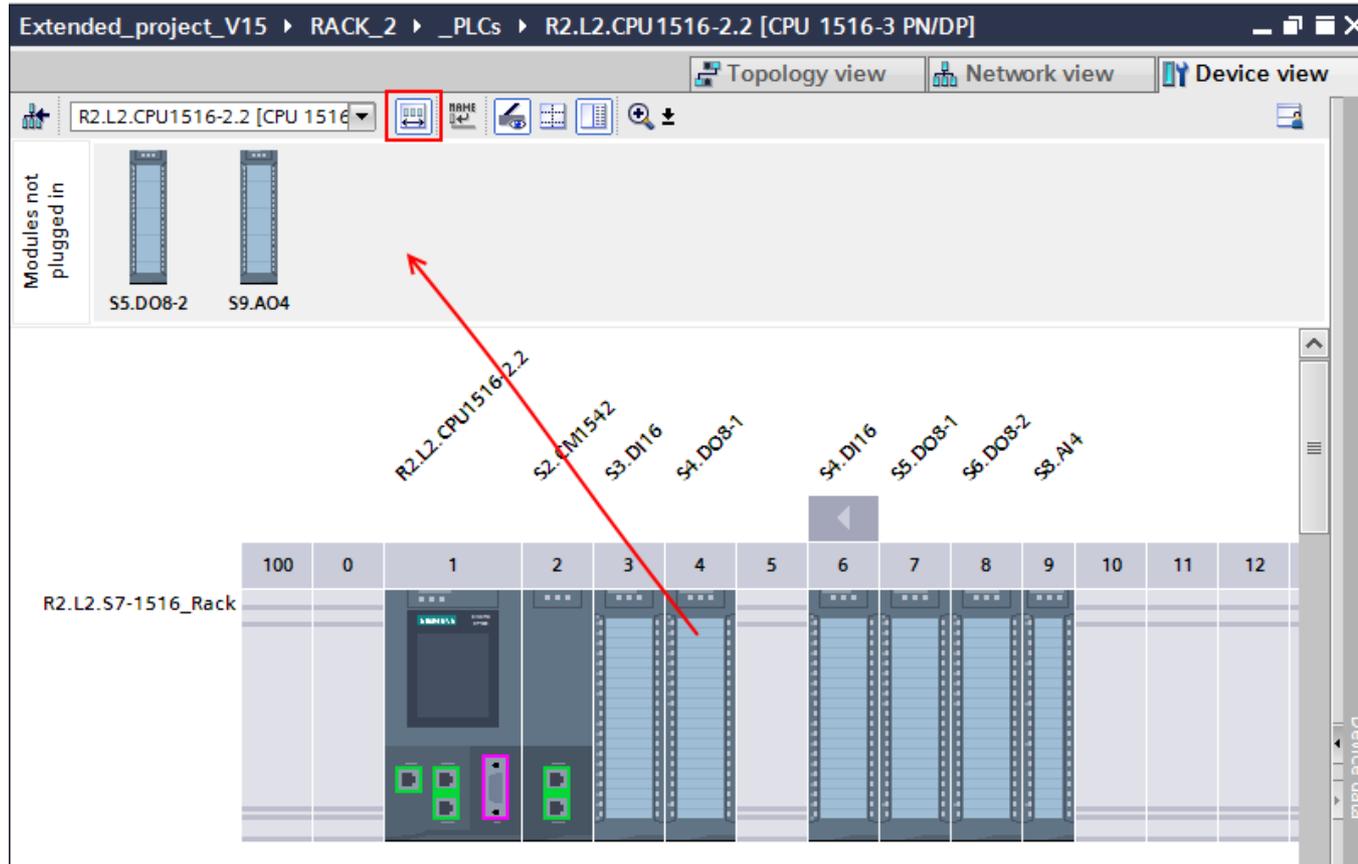
TIA Tip 007

Source: TIA Portal

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Page 23

TIA Tip 008 – Temporary store of not plugged modules in Device view

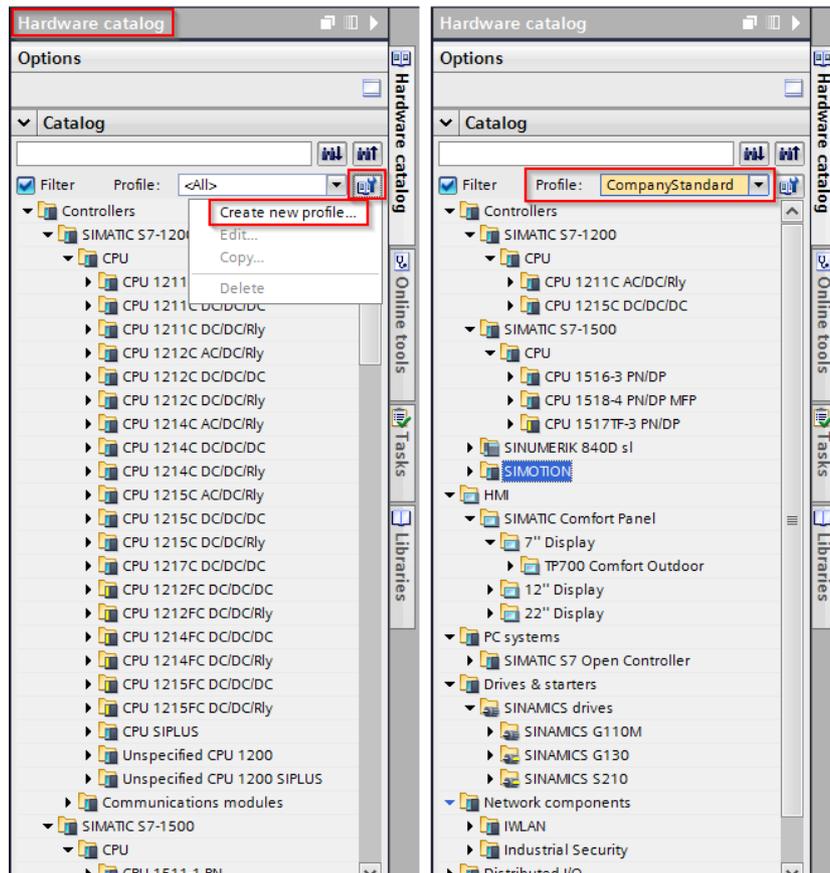


Temporary store of not plugged modules in Device view

Easy change of hardware configuration by drag & drop pre-configured Hardware modules to a temporary <<not plugged>> store. Of course you're also able to copy them to your local or global library to share with colleagues or use them in other projects.

TIA Tip 008

TIA Tip 009 – Customized hardware catalogue with profiles

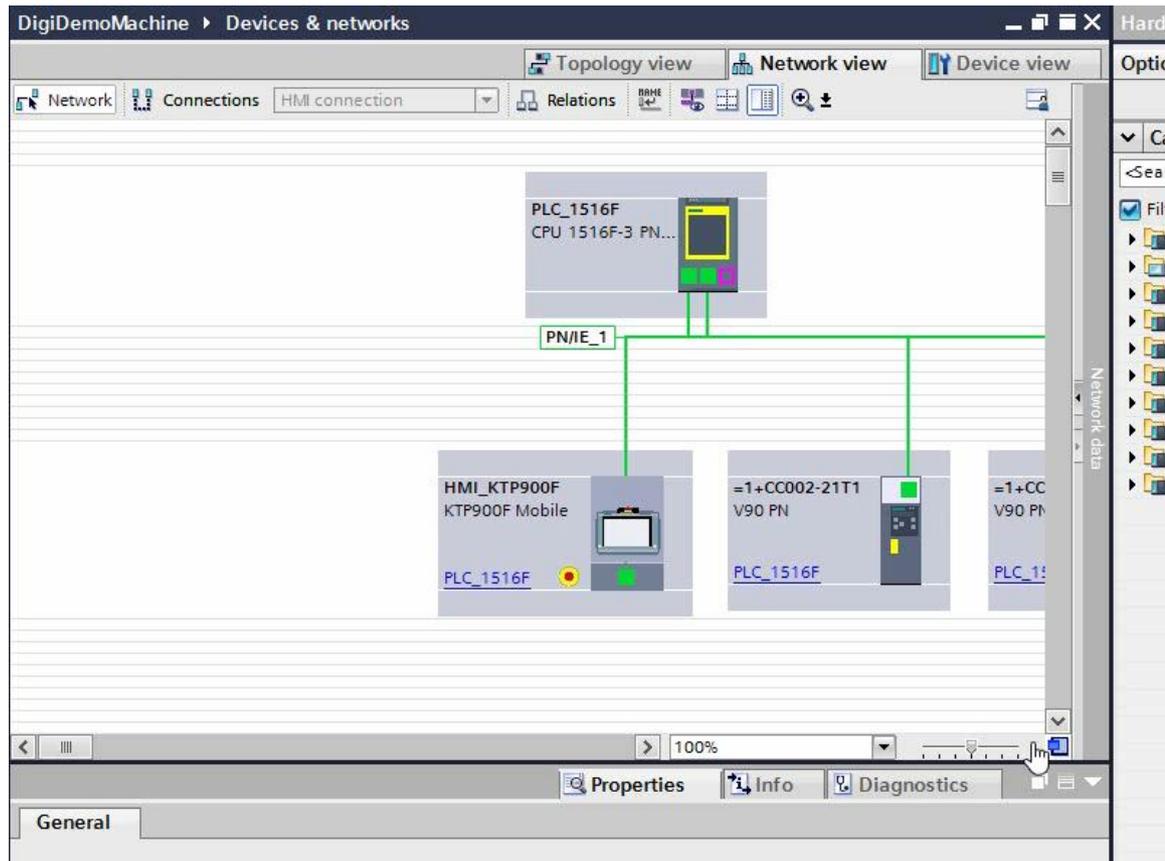


Customized hardware catalogue with profiles

Hardware profiles allow customized availability of components in your very own hardware catalog. This is e.g. for end customer specific clearance lists of hardware. With this function you select and deselect devices in your Profile. Only selected components will be shown in the catalog after activation of the profile.

TIA Tip 009

TIA Tip 011 – Quick navigation in device & network view

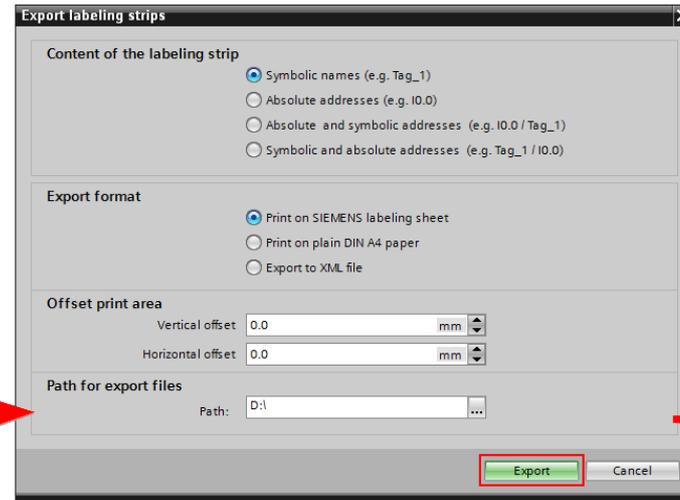
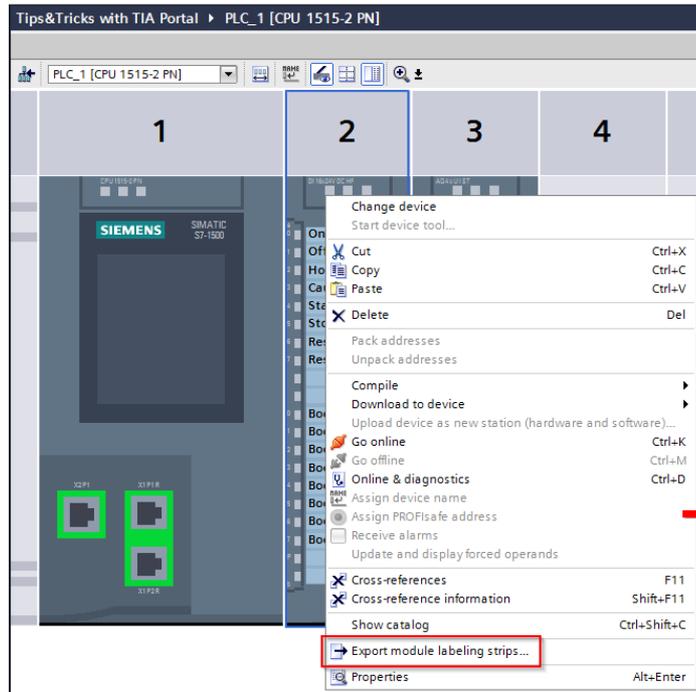


Quick navigation in device & network view

In large projects navigating can take some time using the scrollbars. By a left mouse click on quick navigation button the visible area of the view will be shown and you can navigate with the mouse.

TIA Tip 011

TIA Tip 019 – Export module labelling strips



S71500/ET200MP station_1

DI 16x24VDC HF_1

Rail_0 / 2

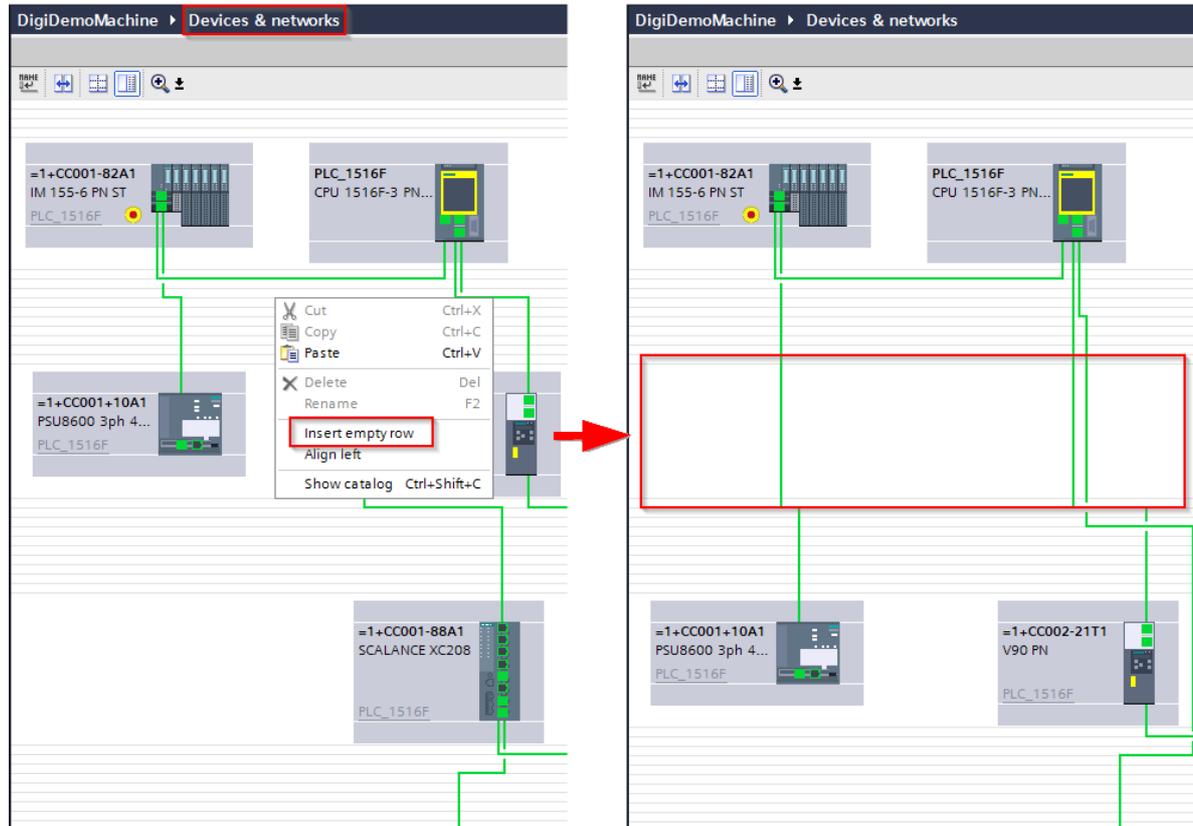
On
Off
Hold
Cause
Start
Stop
Resume
Reset
Boost1
Boost2
Boost3
Boost4
Boost5
Boost6
Boost7
Boost8

Export module labelling strips

Sensors and signals connected to your SIMATIC peripherals need to be documented. With the export of module labelling strips that task is very easy. Your symbolic tags will be exported and printed in the corresponding layout!

TIA Tip 019

TIA Tip 029 – Add new lines in network editors

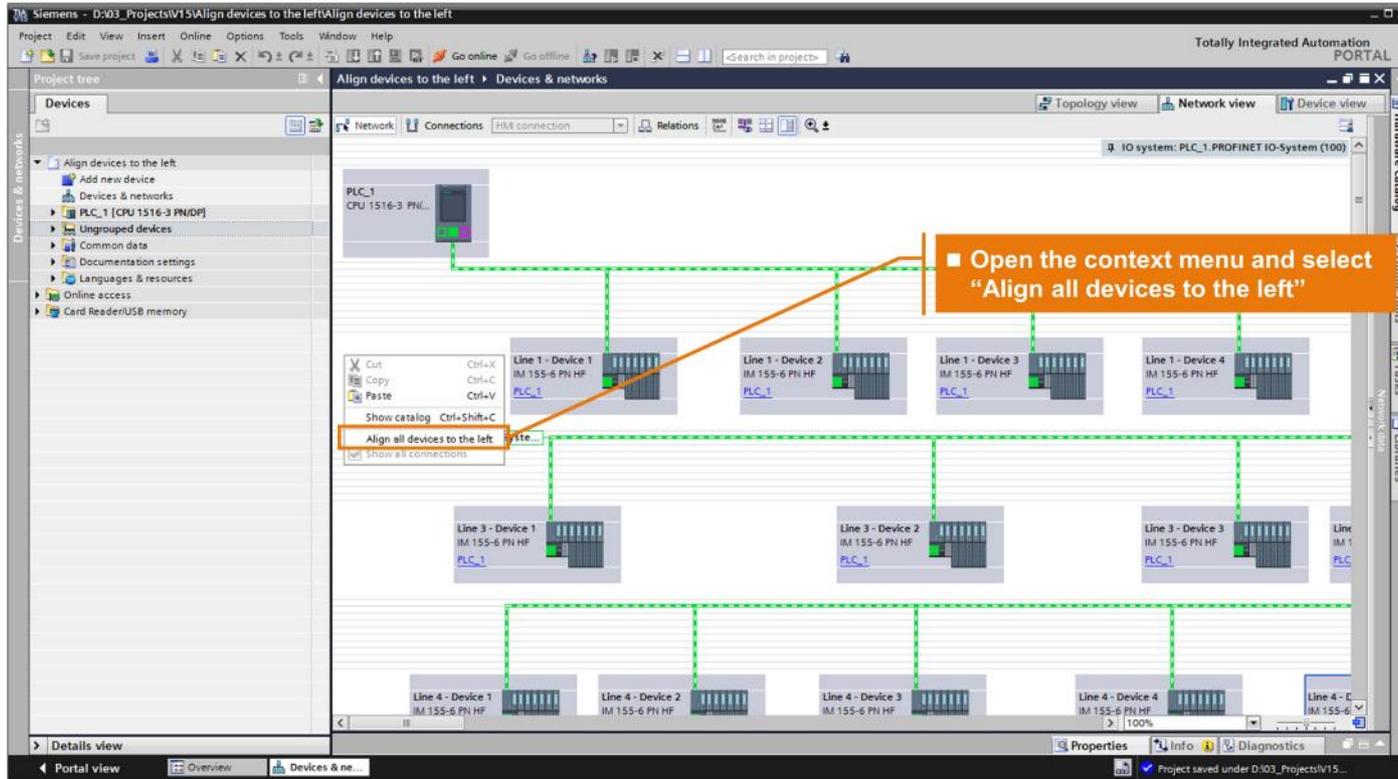


Add new lines in network editors

You want to rearrange your devices in the network editors? Via the context menu "Insert empty row" you can create space for moving or inserting devices.

TIA Tip 029

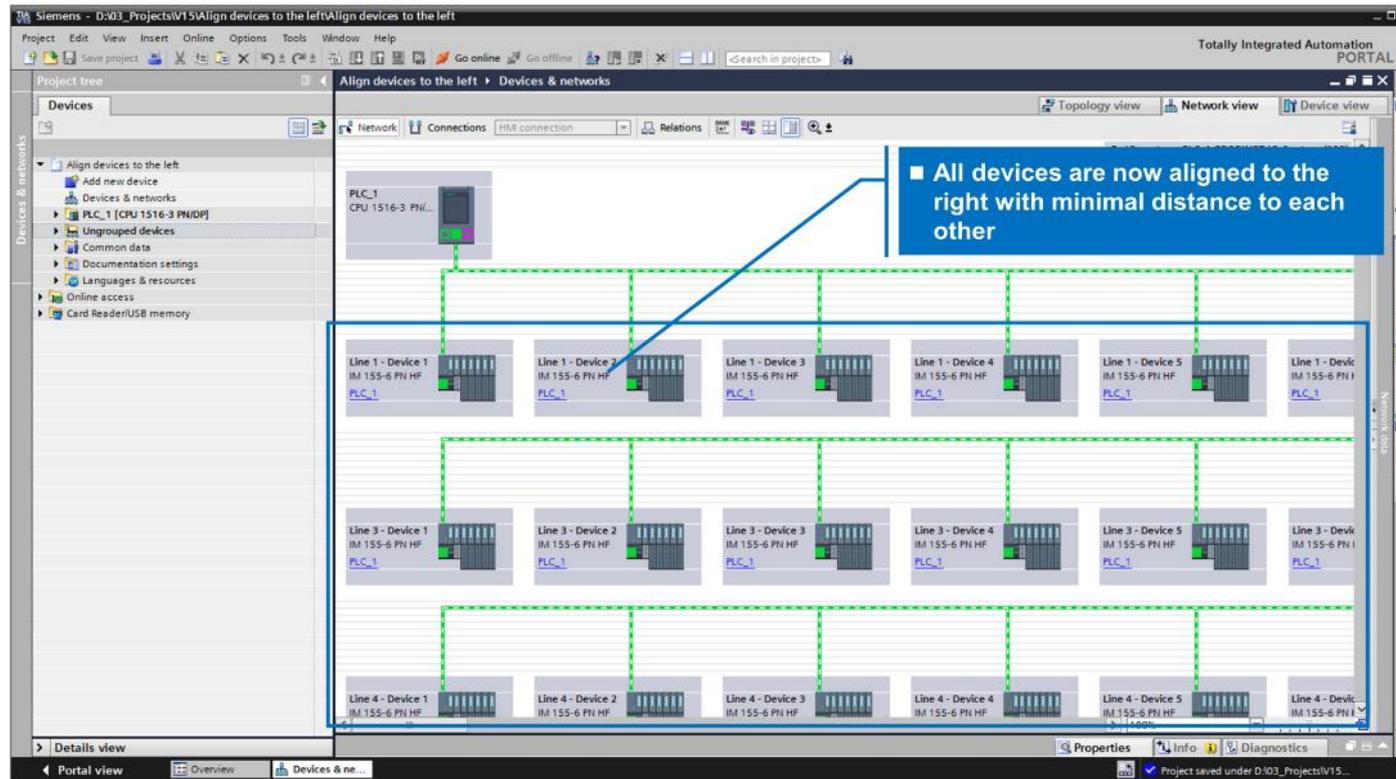
TIA Tip 030 1/2 – Align devices to the left in network / topology view



Align devices to the left in network / topology view
In some cases it's useful to align all components in network or topology view again to the left. With one single click this is possible.

TIA Tip 030

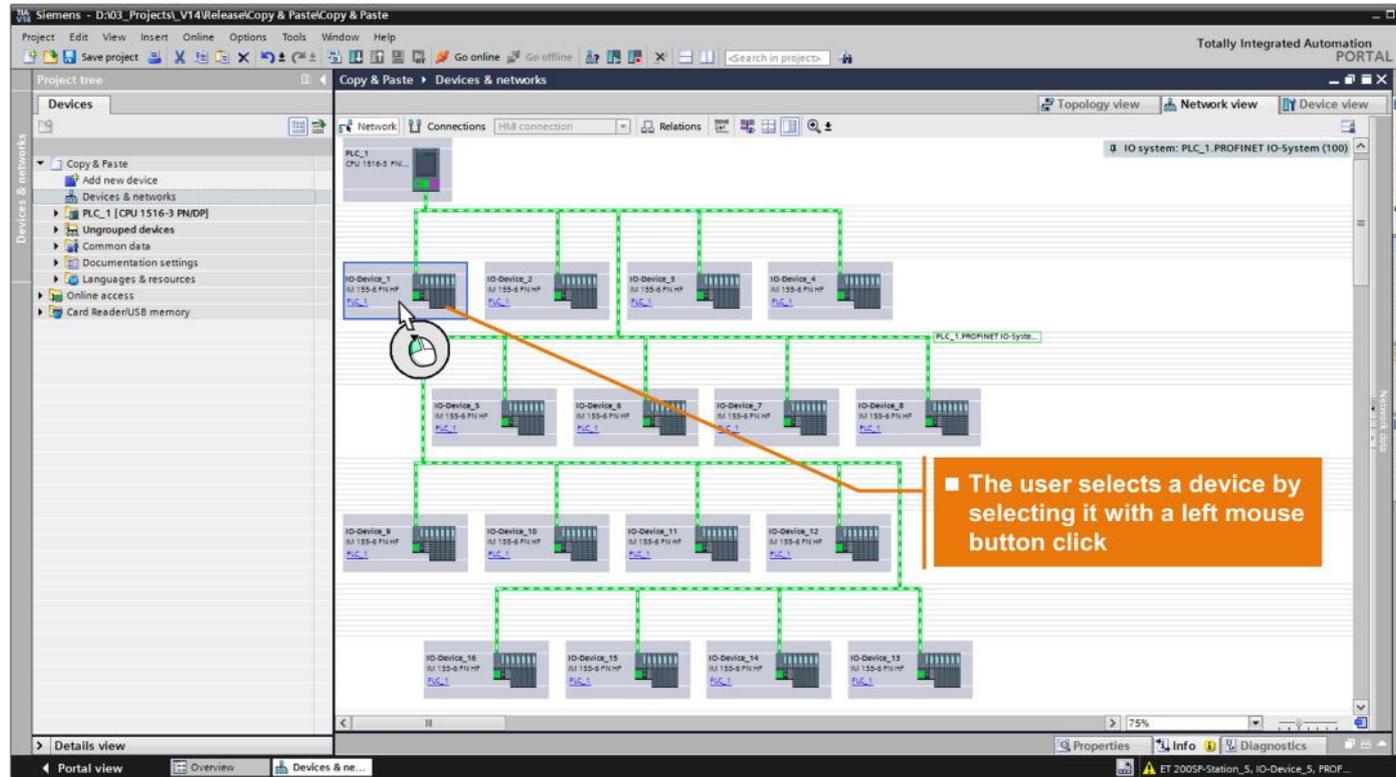
TIA Tip 030 2/2 – Align devices to the left in network / topology view



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TIA Tip 030

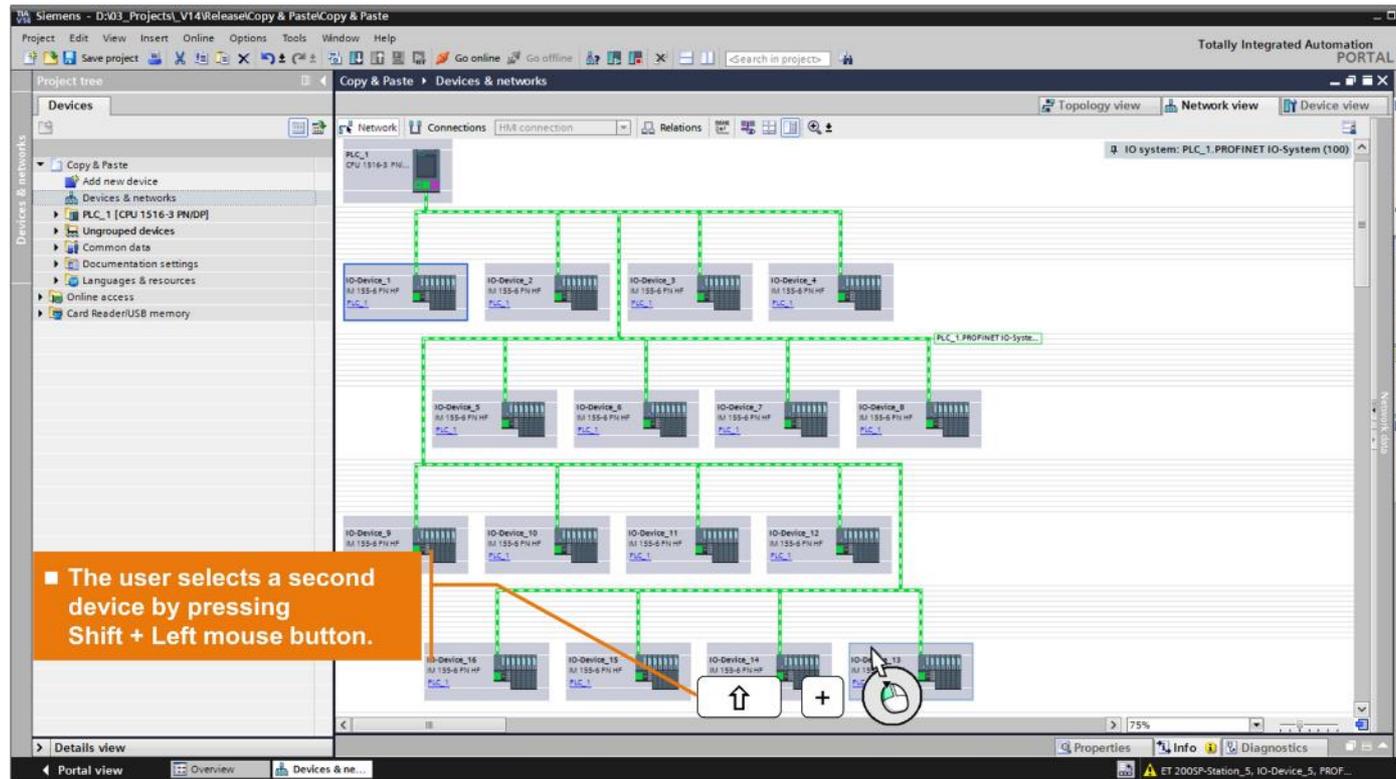
TIA Tip 031 1/3 – Multi selection of devices with <SHIFT> + <Mouse Click Left>



Multi selection of devices with <SHIFT> + <Mouse Click Left>
With a lot of components in network or topology view you're able to select all components between 2 placed objects with this keyboard/mouse shortcut.

TIA Tip 031

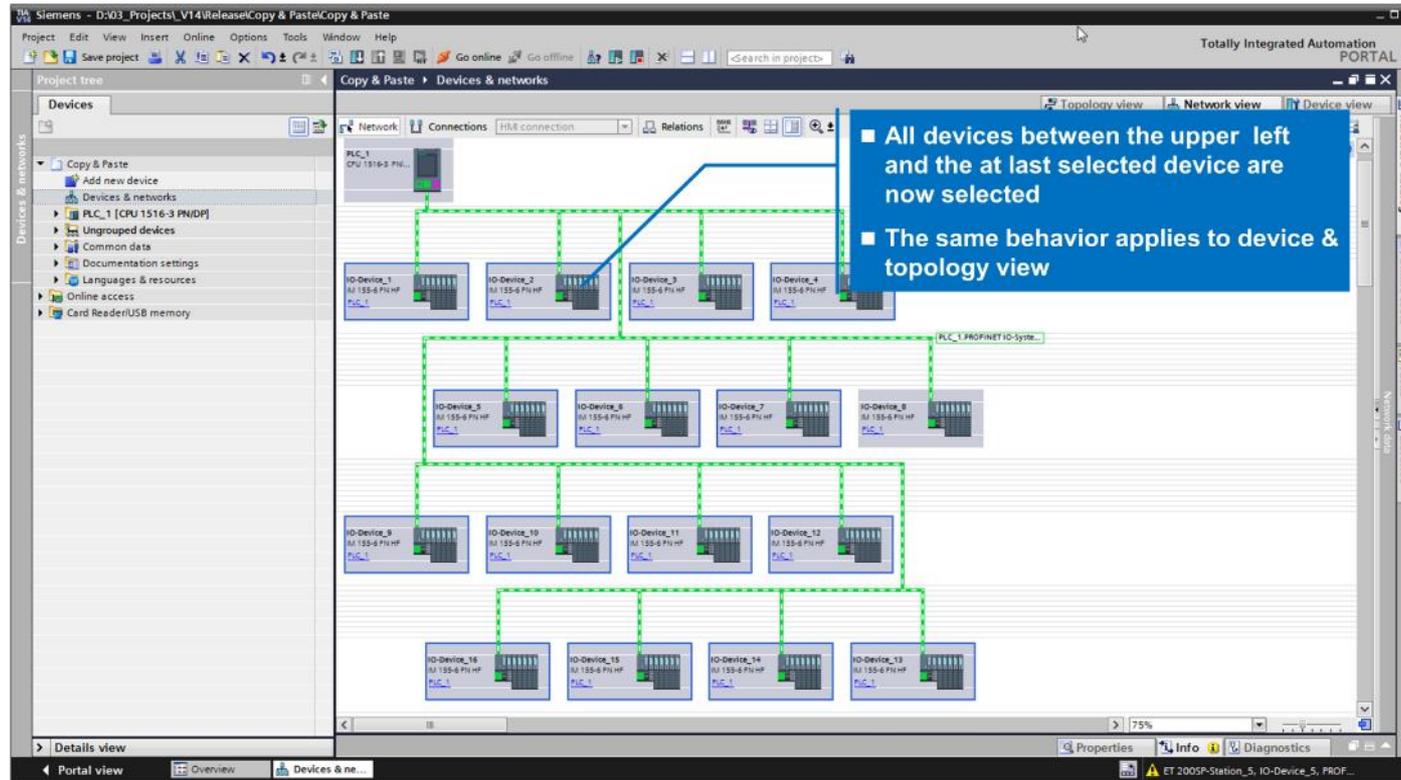
TIA Tip 031 2/3 – Multi selection of devices with <SHIFT> + <Mouse Click Left>



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TIA Tip 031

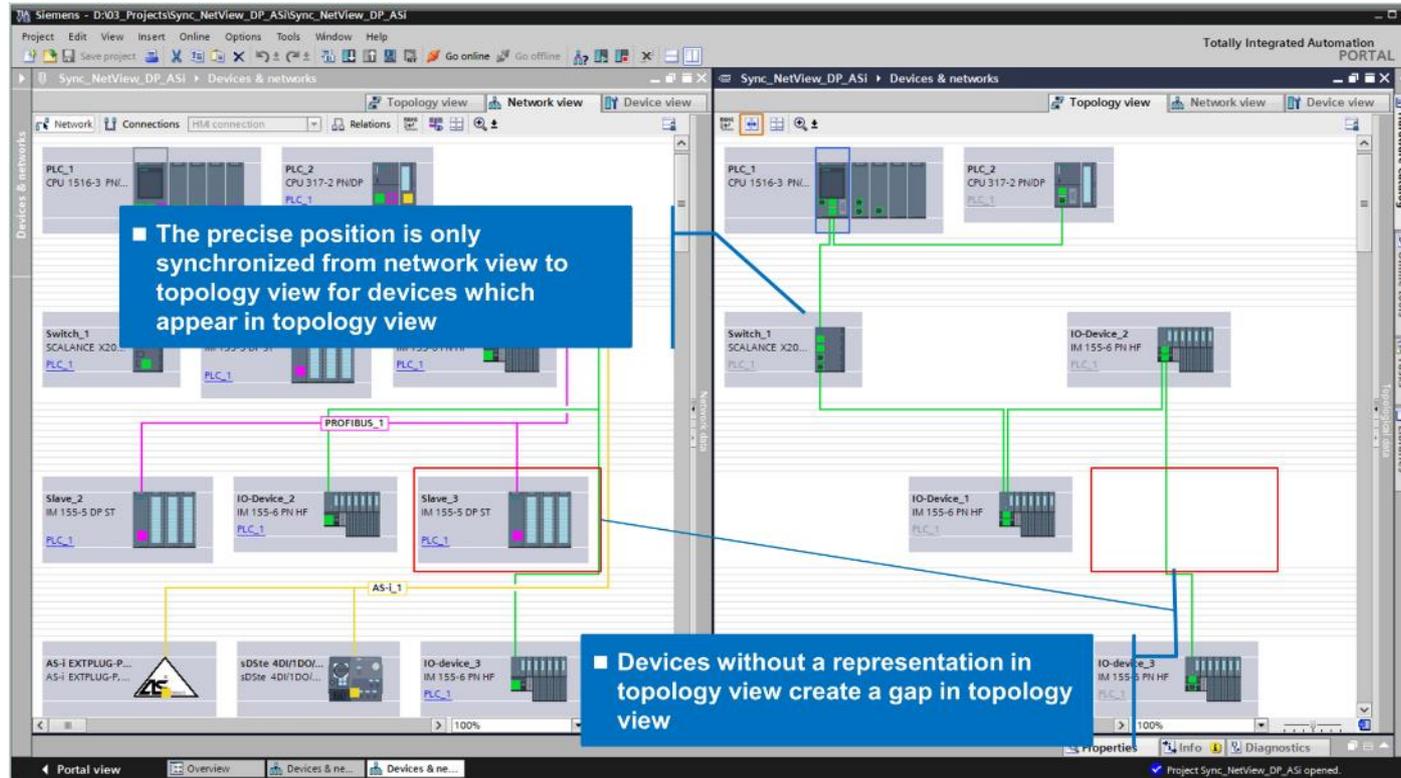
TIA Tip 031 3/3 – Multi selection of devices with <SHIFT> + <Mouse Click Left>



Multi selection of devices with <SHIFT> + <Mouse Click Left>
With a lot of components in network or topology view you're able to select all components between 2 placed objects with this keyboard/mouse shortcut.

TIA Tip 031

TIA Tip 032 – Synchronize Network with Topology View

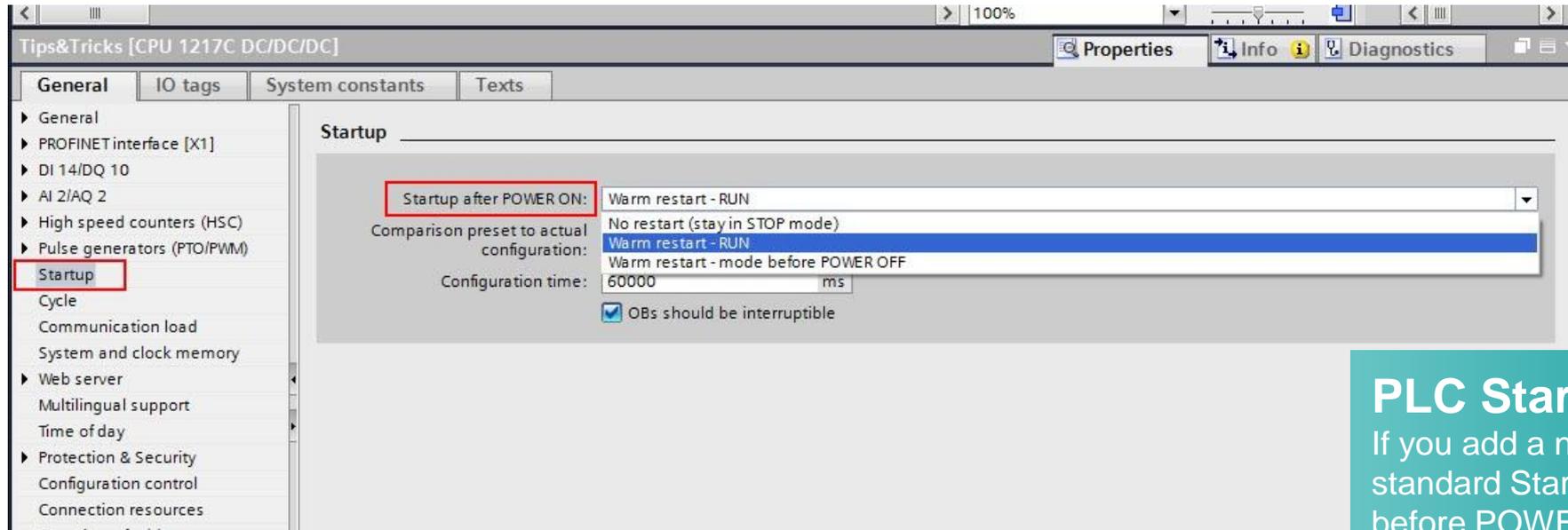


Synchronize Network with Topology View

If you've ordered your components in network view, you're also able to synchronize the placement with one click to the topology view.

TIA Tip 032

TIA Tip 039 – PLC StartUp mode

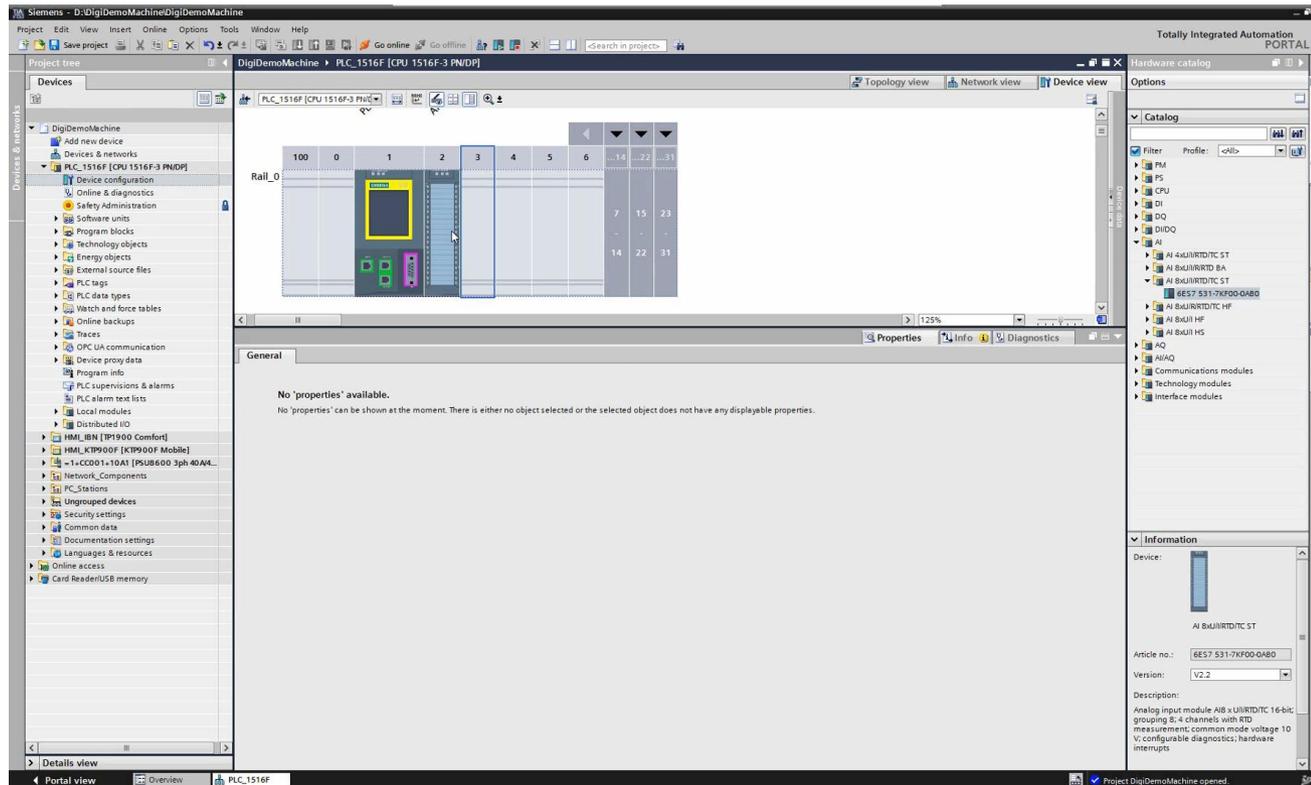


PLC StartUp mode

If you add a new PLC to your project the standard Startup mode is "Warm restart - mode before POWER OFF". To guarantee an automatic try to Startup the PLC in RUN, change it to "Warm restart - Run".

TIA Tip 039

TIA Tip 040 – IO Channel templates and configuration overview



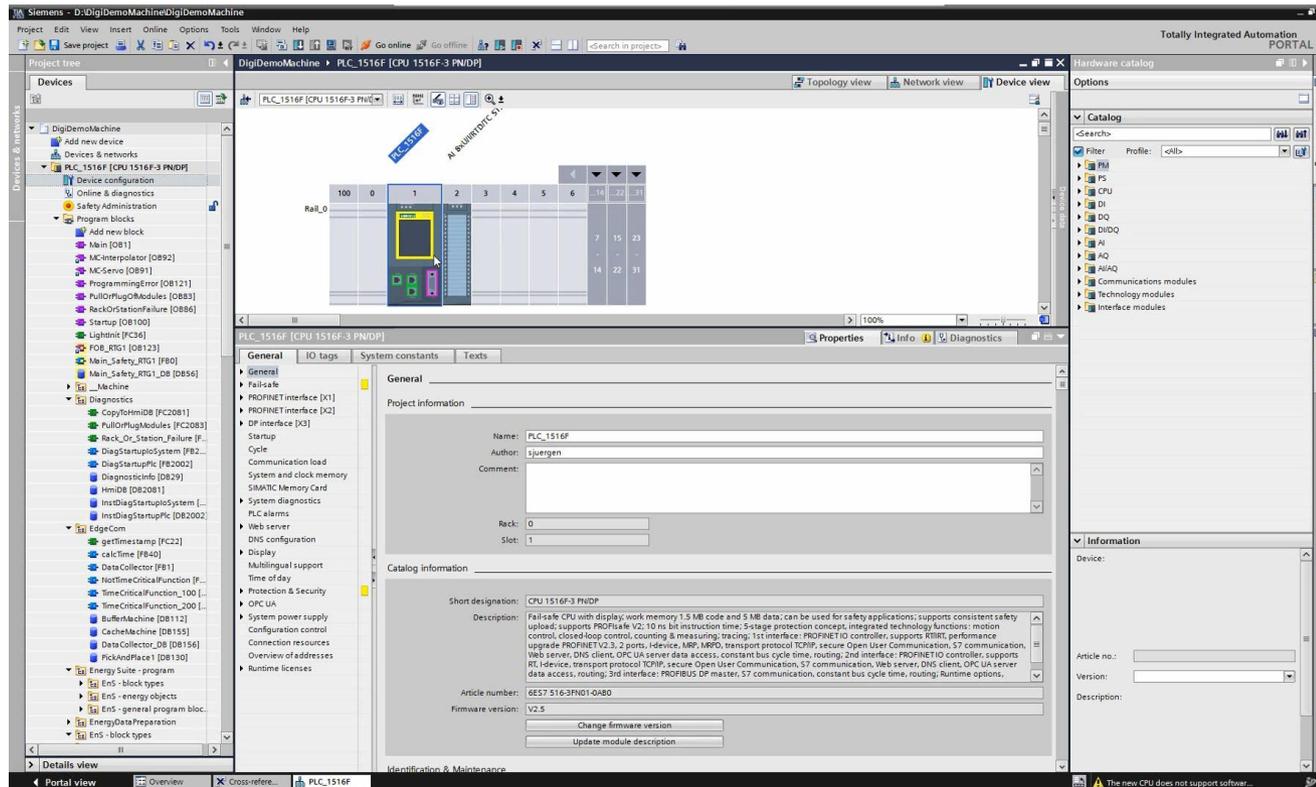
IO Channel templates and configuration overview
With channel templates it's easy to configure a huge amount of channel parameters. Configuration overview can be used to see and change the common settings in a table view.

TIA Tip 040

Source: TIA Portal

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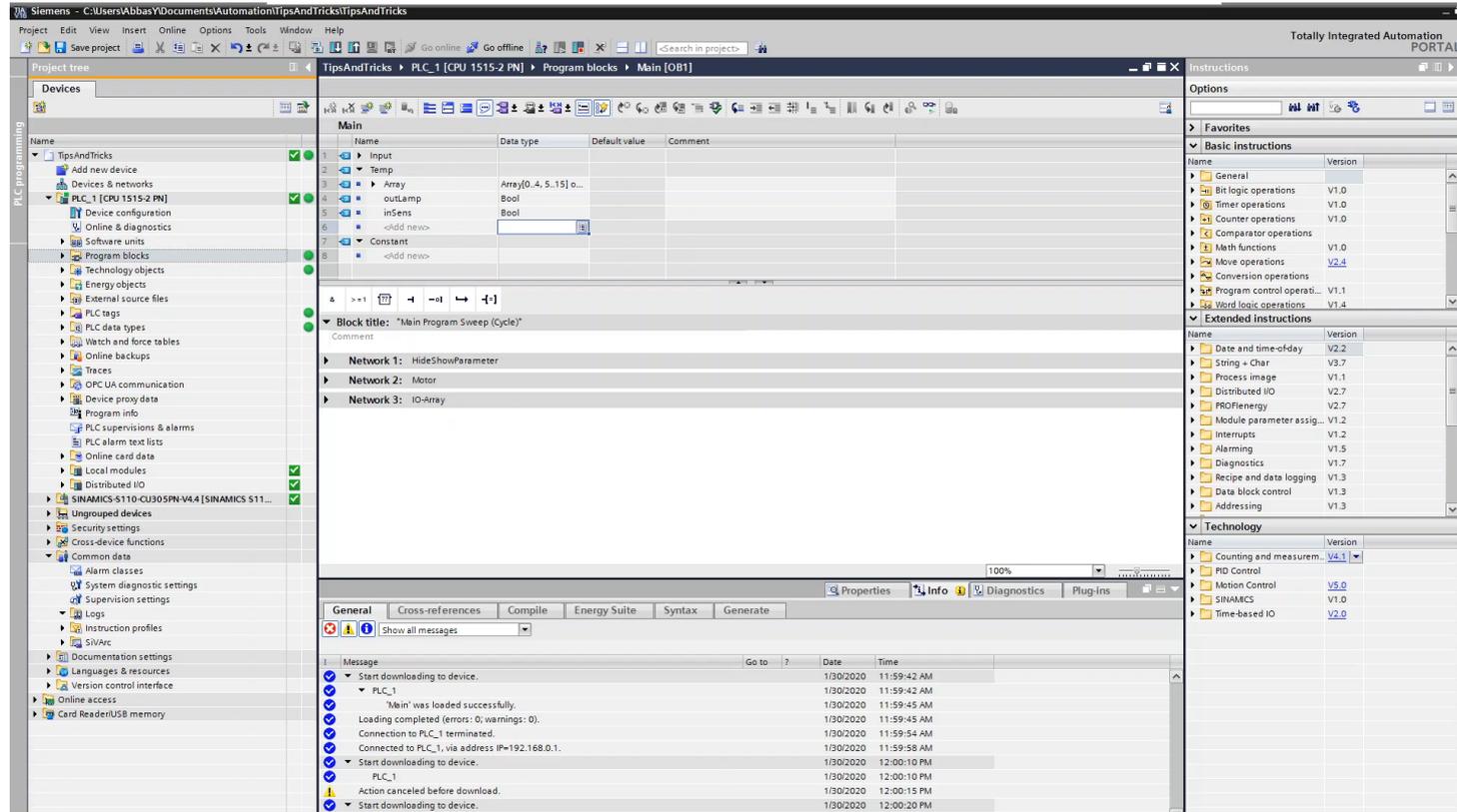
TIA Tip 041 – Change Firmware Version of projected components



Change Firmware Version of projected components
If you want to use new firmware functions it's needed to change the projected component after project upgrade. With context menu or button this is easily done.

TIA Tip 041

TIA Tip 054 1/2 – Delete access rights



Delete access rights
It could be helpful in some cases to delete the access approval with enabled PLC access protection. Afterwards you have to type in the access password again

TIA Tip 054

TIA Tip 054 2/2 – Delete access rights

PLC_1 [CPU 1515-2 PN] Properties

General IO tags System constants Texts

Protection & Security

Access level

Select the access level for the PLC.

Access level	Access			Access permi...
	HMI	Read	Write	Password
<input type="radio"/> Full access (no protection)	✓	✓	✓	*****
<input checked="" type="radio"/> Read access	✓	✓		
<input type="radio"/> HMI access	✓			
<input type="radio"/> No access (complete protection)				

Read access:
TIA Portal users will have read access to all functions.
HMI applications can access all functions.

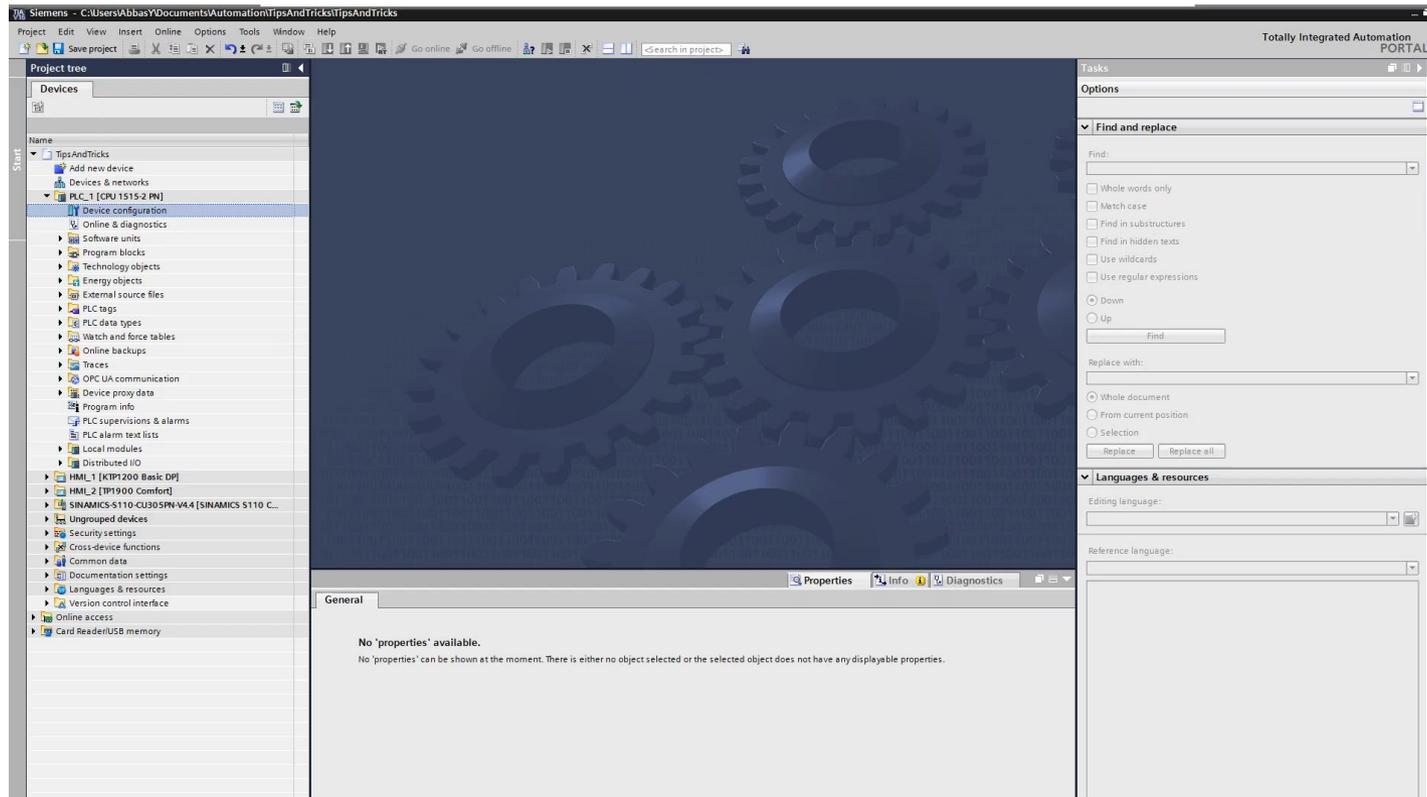
Mandatory password:
For additional write access, TIA Portal users need to enter the "full access" password.

Delete access rights

It could be helpful in some cases to delete the access approval with enabled PLC access protection. Afterwards you have to type in the access password again

TIA Tip 054

TIA Tip 055 – Hardware configuration in multiple editors



Hardware configuration in multiple editors

In some cases like copy components between 2 Controller configurations or for simple compare scenarios you can open more than one editor.

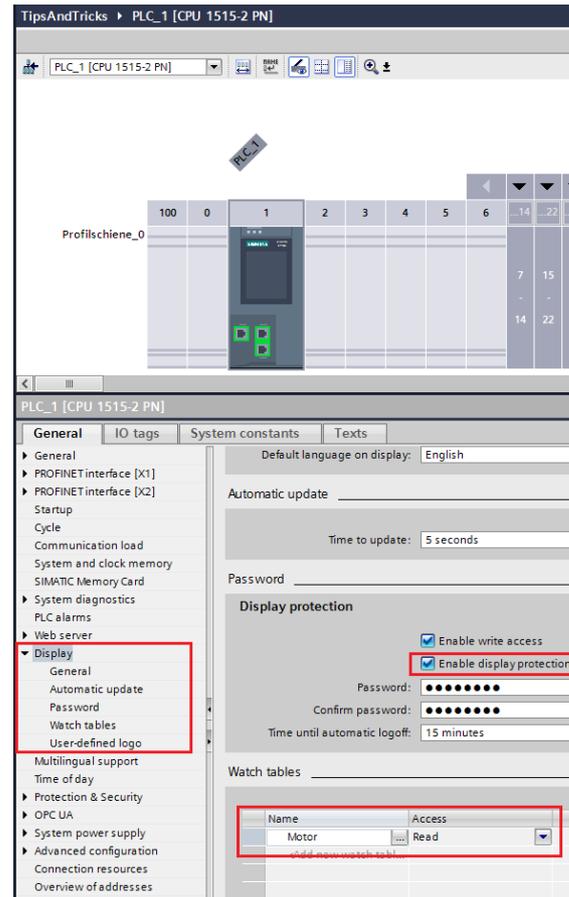
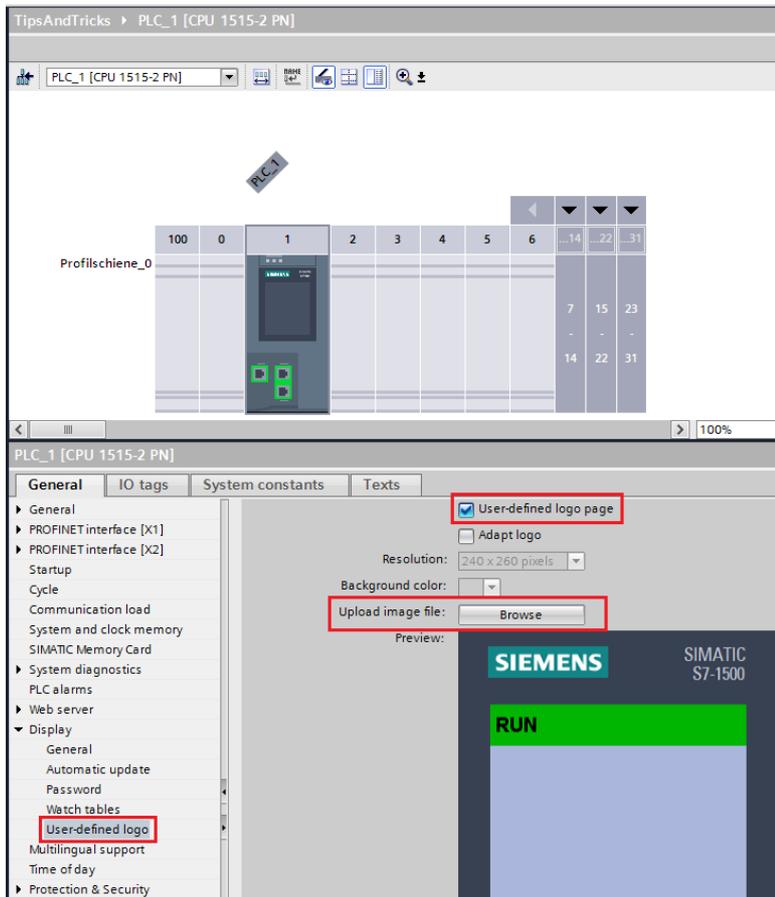
TIA Tip 055

Source: TIA Portal

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Page 40

TIA Tip 056 – User defined logo and display protection



User defined logo and display protection

Add images as display background for S7-1500 controller, e.g. company logo!
Recommendation: enable display protection to prevent unauthorized access!

TIA Tip 056

Source: TIA Portal

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1 Handle the surface and windows

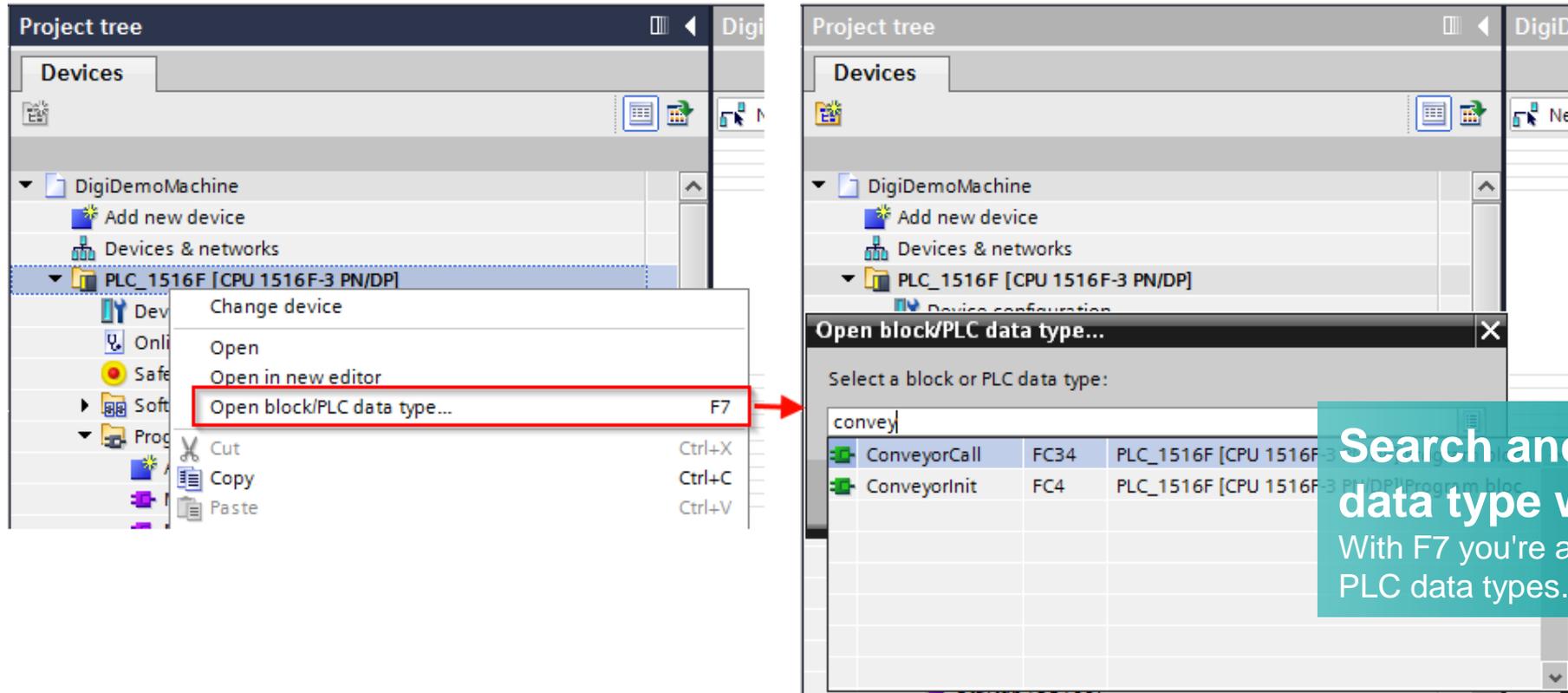
2 Configure Hardware and Network

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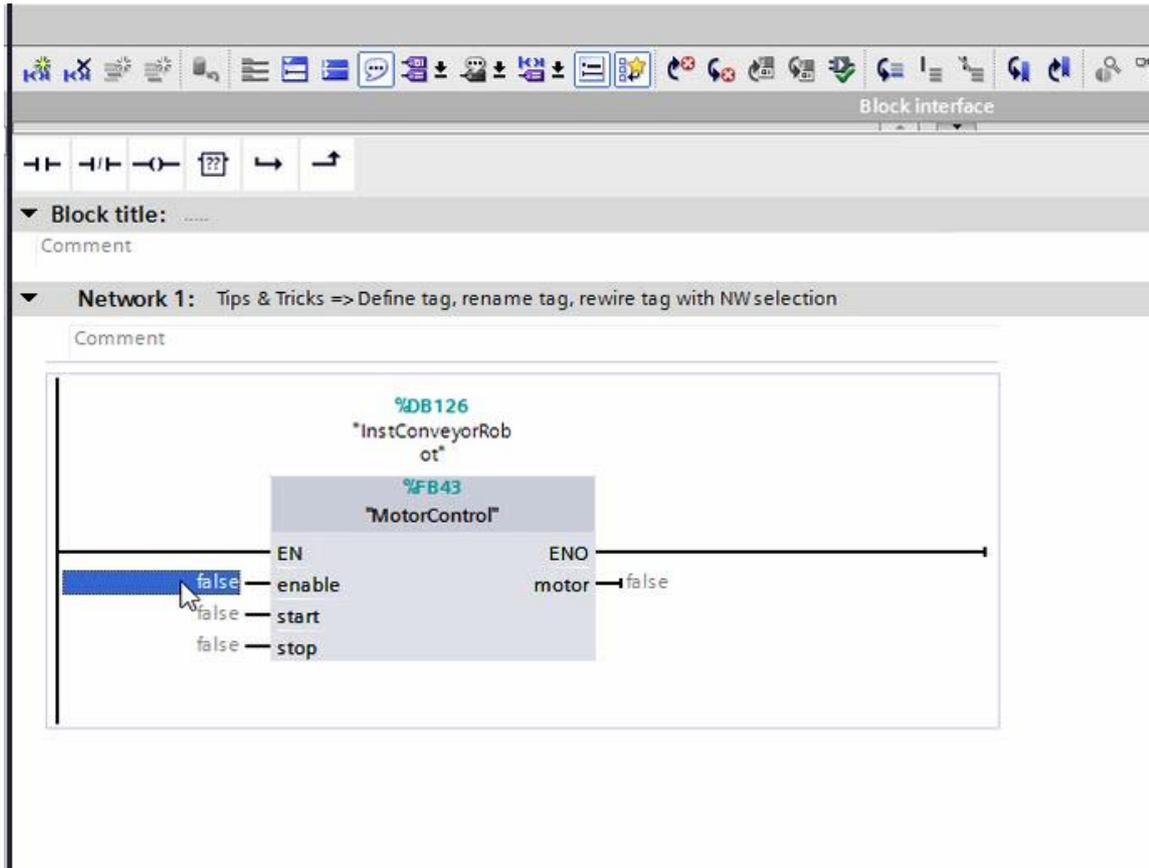
TIA Tip 001 – Search and open block/PLC data type with F7



Search and open block/PLC data type with F7
With F7 you're able to search for blocks and PLC data types. Intelligence is also supported!

TIA Tip 001

TIA Tip 010 – Define, rename or rewire tags which are used in one program network

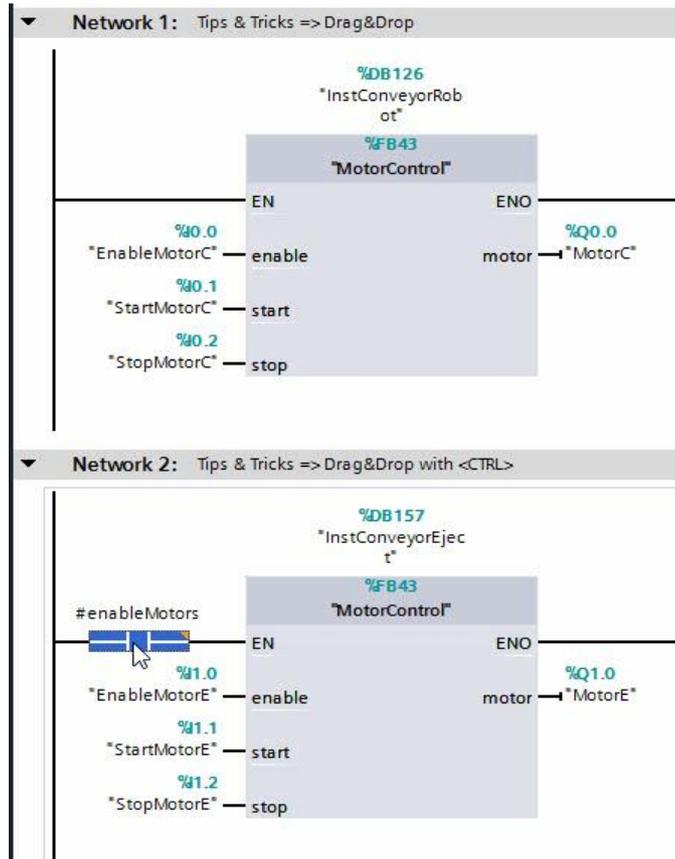


Define, rename or rewire tags which are used in one program network

Changing tags in LAD or FBD is very easy by the use of context menu or buttons on top. By selection of the whole network defined and not defined variables are selected automatically and can be changed simultaneously. Switching between plc tag tables is also possible!

TIA Tip 010

TIA Tip 012 – Drag & Drop with and without <CTRL>



Drag & Drop with and without <CTRL>

Maybe the most used function in TIA Portal is Drag & Drop. By combining it with key <CTRL> you're also able to copy & paste objects instead of cut & paste them.

TIA Tip 012

Source: TIA Portal

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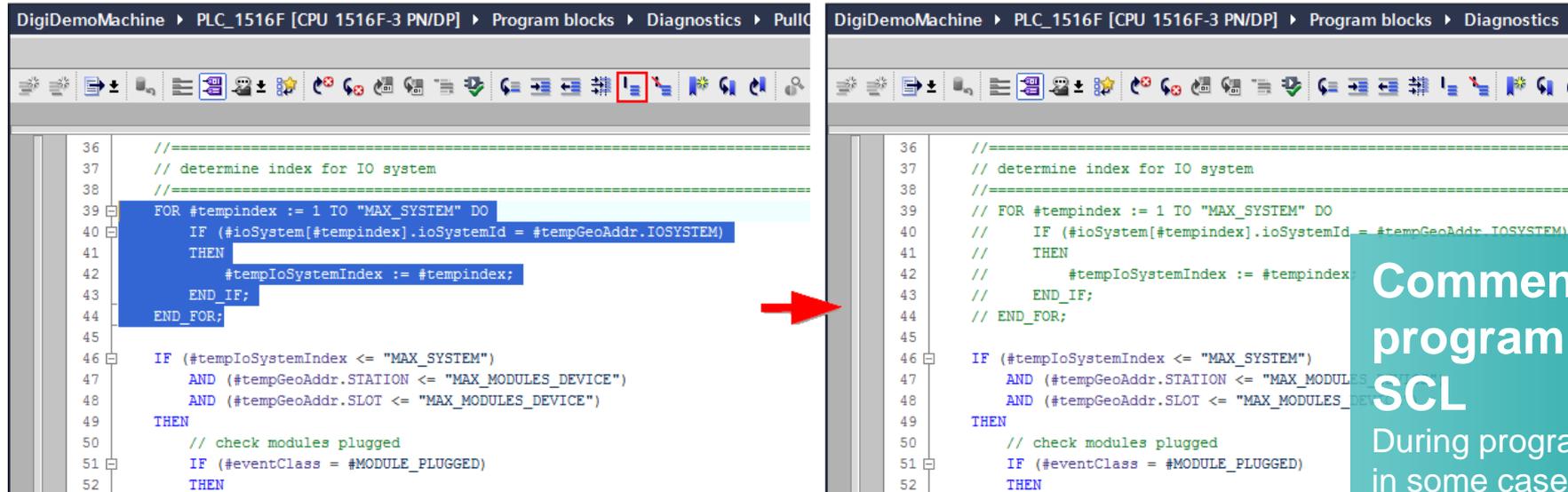
TIA Tip 013 – Auto Layouting of code in SCL editor

```
29 // evaluate diagnosis information for devices in an IO system
30 // evaluate diagnosis information for devices in an IO system
31 // =====
32 IF (#tempGeoAddr.AREA = #AREA_PROFINET)
33 OR (#tempGeoAddr.AREA = #AREA_PROFIBUS)
34 THEN
35
36 // =====
37 // determine index for IO system
38 // =====
39 FOR #tempIndex := 1 TO "MAX_SYSTEM" DO
40 IF (#ioSystem[#tempIndex].ioSystemId = #tempGeoAddr.IOSYSTEM)
41 THEN
42 #tempIoSystemIndex := #tempIndex;
43 END_IF;
44 END_FOR;
45
46 IF (#tempIoSystemIndex <= "MAX_SYSTEM")
47 AND (#tempGeoAddr.STATION <= "MAX_MODULES_DEVICE")
48 AND (#tempGeoAddr.SLOT <= "MAX_MODULES_DEVICE")
49 THEN
50 // check modules plugged
51 IF (#eventClass = #MODULE_PLUGGED)
52 THEN
53 // reset error state only if the correct module is inserted
54 IF (#faultId = #MODULE_MATCHES)
55 OR (#faultId = #MODULE_OK)
56 THEN
57 #ioSystem[#tempIoSystemIndex].device[#tempGeoAddr.STATION].error := FALSE;
58 #ioSystem[#tempIoSystemIndex].device[#tempGeoAddr.STATION].slot[#tempGeoAddr.SLOT].slotErrorState := FALSE;
59
60 IF (#ioSystem[#tempIoSystemIndex].device[#tempGeoAddr.STATION].errorState = "DEV_STATE_FAULTI")
61 THEN
62 #ioSystem[#tempIoSystemIndex].device[#tempGeoAddr.STATION].errorState := "DEV_STATE_WAS_FAULTI";
63 ELSIF (#ioSystem[#tempIoSystemIndex].device[#tempGeoAddr.STATION].errorState = "DEV_STATE_LOST_CON")
64 THEN
65 #ioSystem[#tempIoSystemIndex].device[#tempGeoAddr.STATION].errorState := "DEV_STATE_WAS_LOSTI";
66 ELSE
67 #ioSystem[#tempIoSystemIndex].device[#tempGeoAddr.STATION].errorState := "DEV_STATE_OK";
68 END_IF;
69 END_IF;
70
71 // check modules pulled
72 ELSIF (#eventClass = #MODULE_FULLED)
73 THEN
74 #ioSystem[#tempIoSystemIndex].device[#tempGeoAddr.STATION].error := TRUE;
75 #ioSystem[#tempIoSystemIndex].device[#tempGeoAddr.STATION].errorState := "DEV_STATE_FAULTI";
```

Auto Layouting of code in SCL editor
Do you know the auto layouting function of the programming editor SCL? By that you're easily able to beautify you're written SCL code by just a click of a button!

TIA Tip 013

TIA Tip 014 – Comment out multiple program lines or sections in SCL



```
36 //=====
37 // determine index for IO system
38 //=====
39 FOR #tempindex := 1 TO "MAX_SYSTEM" DO
40 IF (#ioSystem[#tempindex].ioSystemId = #tempGeoAddr.IOSYSTEM)
41 THEN
42 #tempIoSystemIndex := #tempindex;
43 END_IF;
44 END_FOR;
45
46 IF (#tempIoSystemIndex <= "MAX_SYSTEM")
47 AND (#tempGeoAddr.STATION <= "MAX_MODULES_DEVICE")
48 AND (#tempGeoAddr.SLOT <= "MAX_MODULES_DEVICE")
49 THEN
50 // check modules plugged
51 IF (#eventClass = #MODULE_PLUGGED)
52 THEN
```

Comment out multiple program lines or sections in SCL
During programming or program test with SCL in some cases you have to fade out multiple program lines or complete sections. What has to be done? Just mark the lines and click the button or use the *(function.

TIA Tip 014

TIA Tip 015 – Use block overview for sorting and mass data operations



Use block overview for sorting and mass data operations

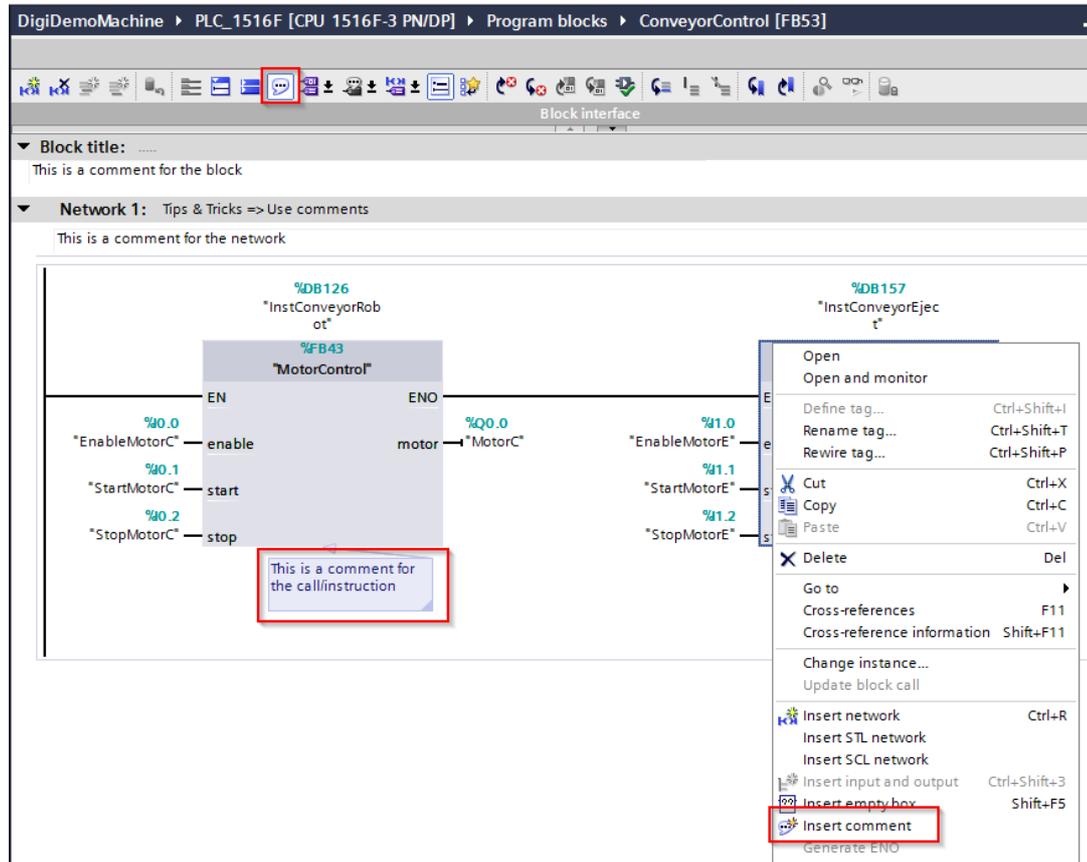
In case of many objects in project navigation window it's helpful to have a table view for your software objects. In the overview windows you're able to hide folders and sort your objects with different criteria e.g. programming language or block type.

TIA Tip 015

Source: TIA Portal

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TIA Tip 016 – Insert comments to LAD and FBD blocks



Insert comments to LAD and FBD blocks
Make your program code readable for others by the use of commenting. In graphical program languages like LAD or FBD you're able to add block comments, network titles and network comments!

TIA Tip 016

TIA Tip 017 – Mass operation in Block interface

	Name	Data type	Default value	Retain	Accessible f...	Writa...	Visible in ...	Setpoint	Su
1	▼ Input								
2	enable	Int	0	Non-ret...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	start	Int	0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	stop	Int	0	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	<Add new>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	▼ Output								
7	motor	Bool	false	Non-retain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	▼ InOut								
9	<Add new>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	▼ Static								
11	<Add new>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12	▼ Temp								
13	<Add new>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14	▼ Constant								
15	<Add new>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Mass operation in Block interface

Interface of blocks are handled in a table view. With mouse use you're able to change or add many variables very smart and efficient. Pop up will ask whether you want to add or overwrite existing lines.

TIA Tip 017

TIA Tip 018 – Surround code segments with loops or if conditions in SCL

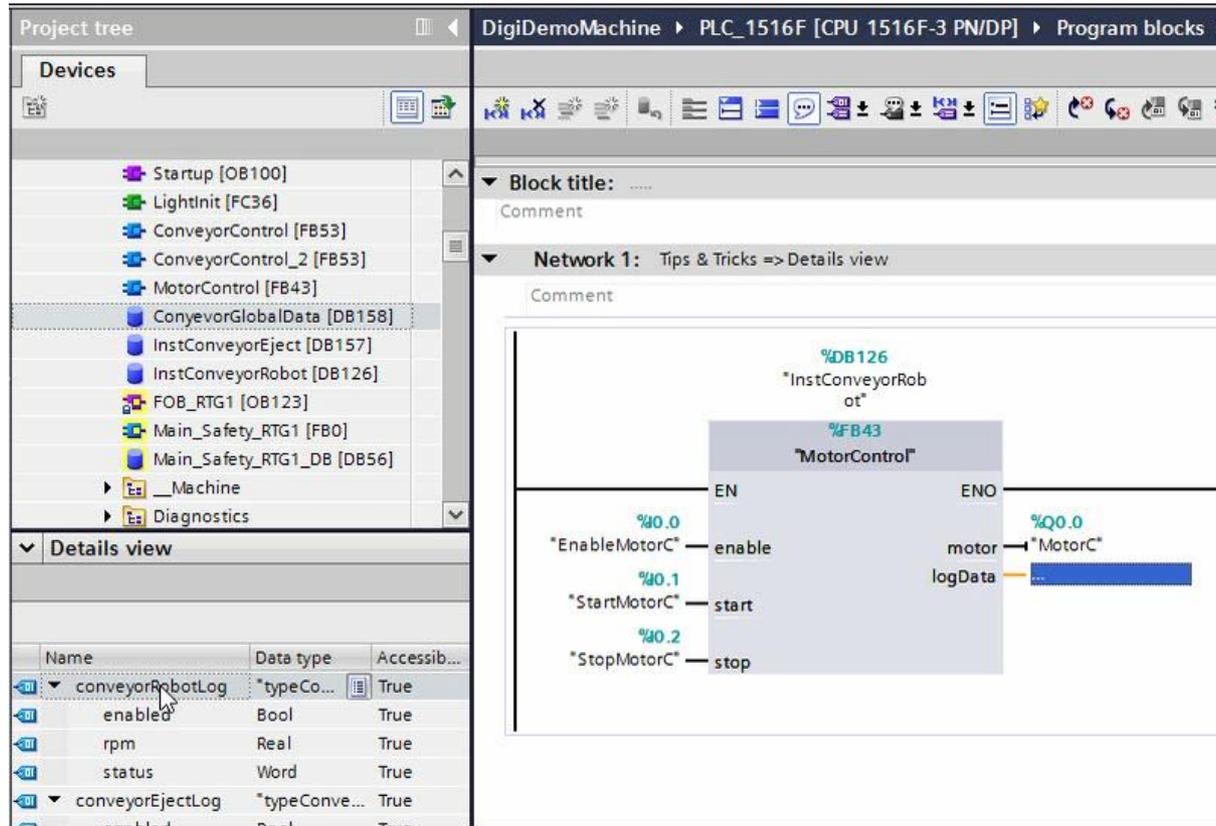
```
35  
36 //=====  
37 // determine index for IO system  
38 //=====  
39 [ FOR #tempindex := 1 TO "MAX_SYSTEM" DO  
40 [   IF (#ioSystem[#tempindex].ioSystemId = #tempGeoAddr.IOSYSTEM)  
41     THEN  
42       #tempIoSystemIndex := #tempindex;  
43     END_IF;  
44 END_FOR;  
45  
46 [ IF (#tempIoSystemIndex <= "MAX_SYSTEM")  
47     AND (#tempGeoAddr.STATION <= "MAX_MODULES_DEVICE")  
48     AND (#tempGeoAddr.SLOT <= "MAX_MODULES_DEVICE")  
49 THEN  
50     // check modules plugged  
51 [   IF (#eventClass = #MODULE_PLUGGED)  
52     THEN  
53       // reset error state only if the correct module is inserted  
54 [   IF (#faultId = #MODULE_MATCHES)  
55     OR (#faultId = #MODULE_OK)
```

Surround code segments with loops or if conditions in SCL

Already written SCL code can be surrounded with loops, if conditions and so on. Just mark the lines and use the context menu.

TIA Tip 018

TIA Tip 027 – Details view for fast tag access

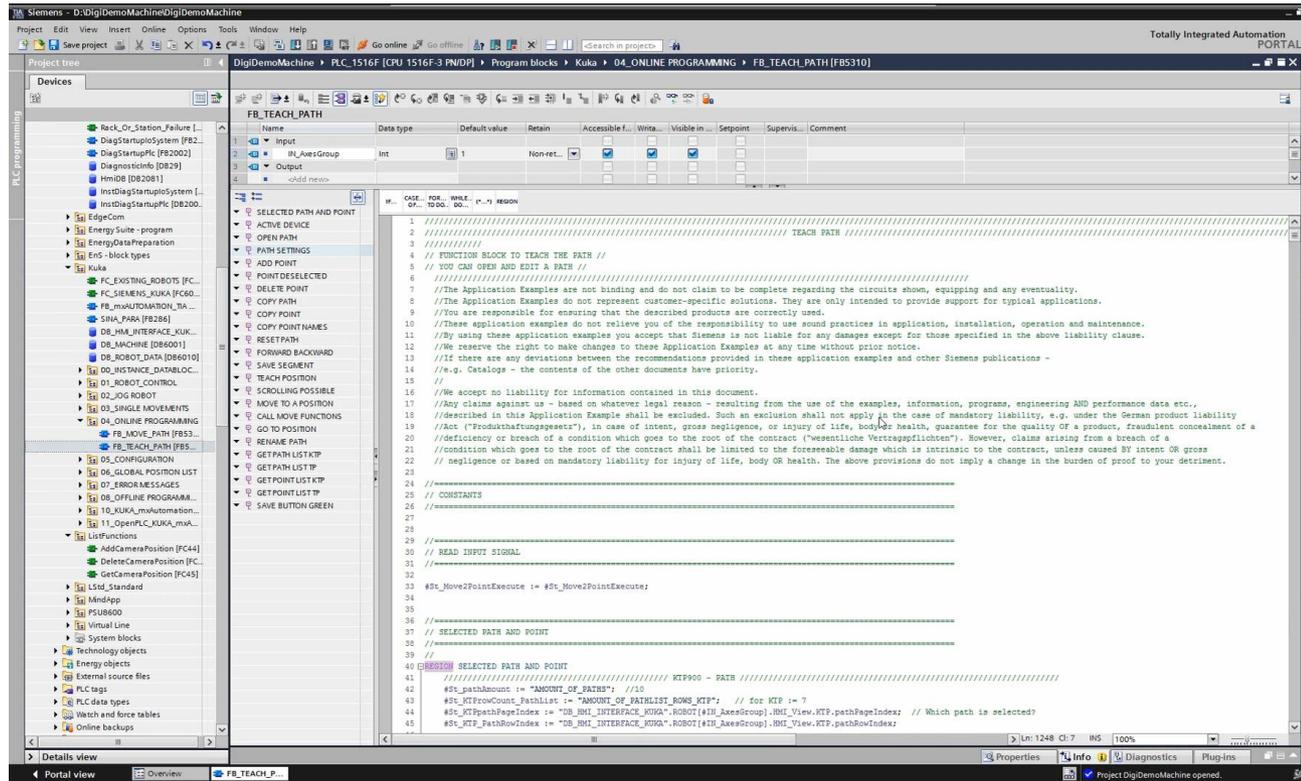


Details view for fast tag access

You want to use global tags or variables from data blocks in your program or screen? Using the details view you can drag and drop tags to several editors easily!

TIA Tip 027

TIA Tip 037 – Regions in SCL



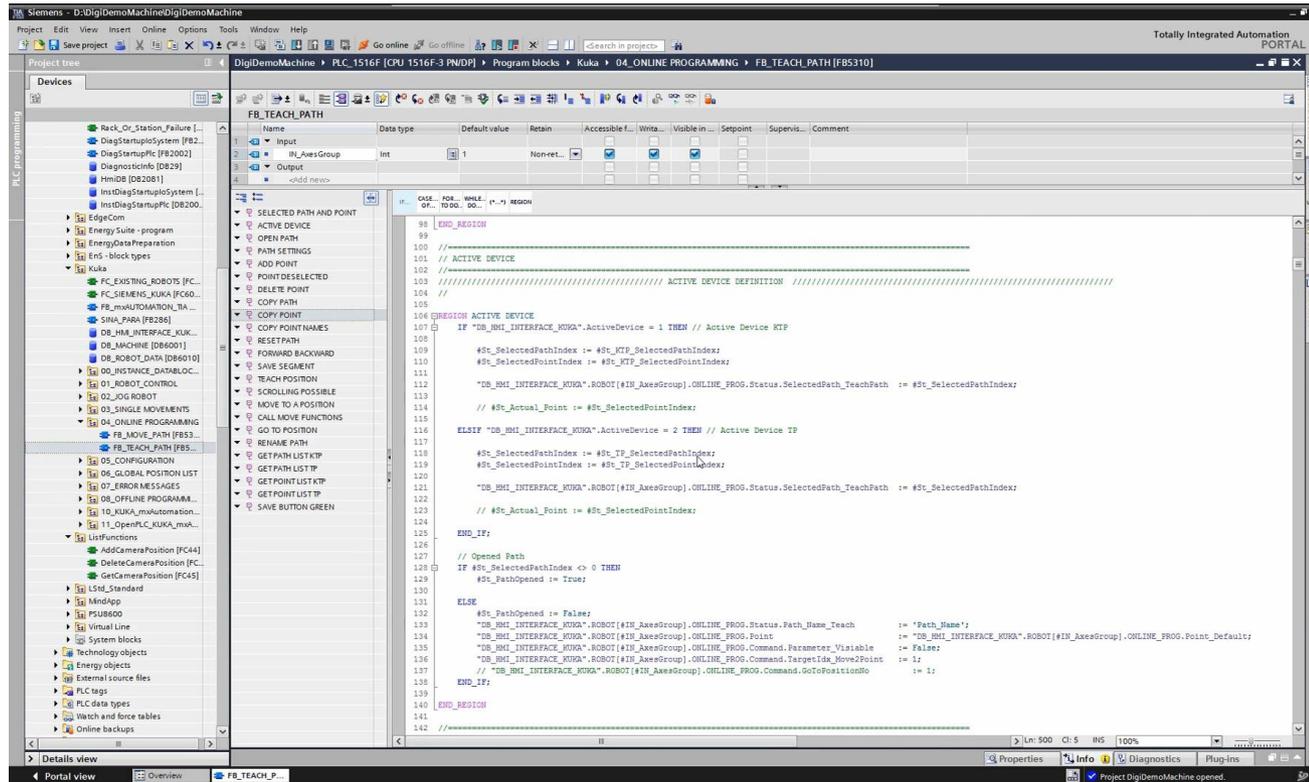
Regions in SCL
Structured programming in SCL is very important. With regions you're able to collapse or expand code segments very easily - you're also able to navigate between them.

TIA Tip 037

Source: TIA Portal

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TIA Tip 038 – Bookmarks in SCL

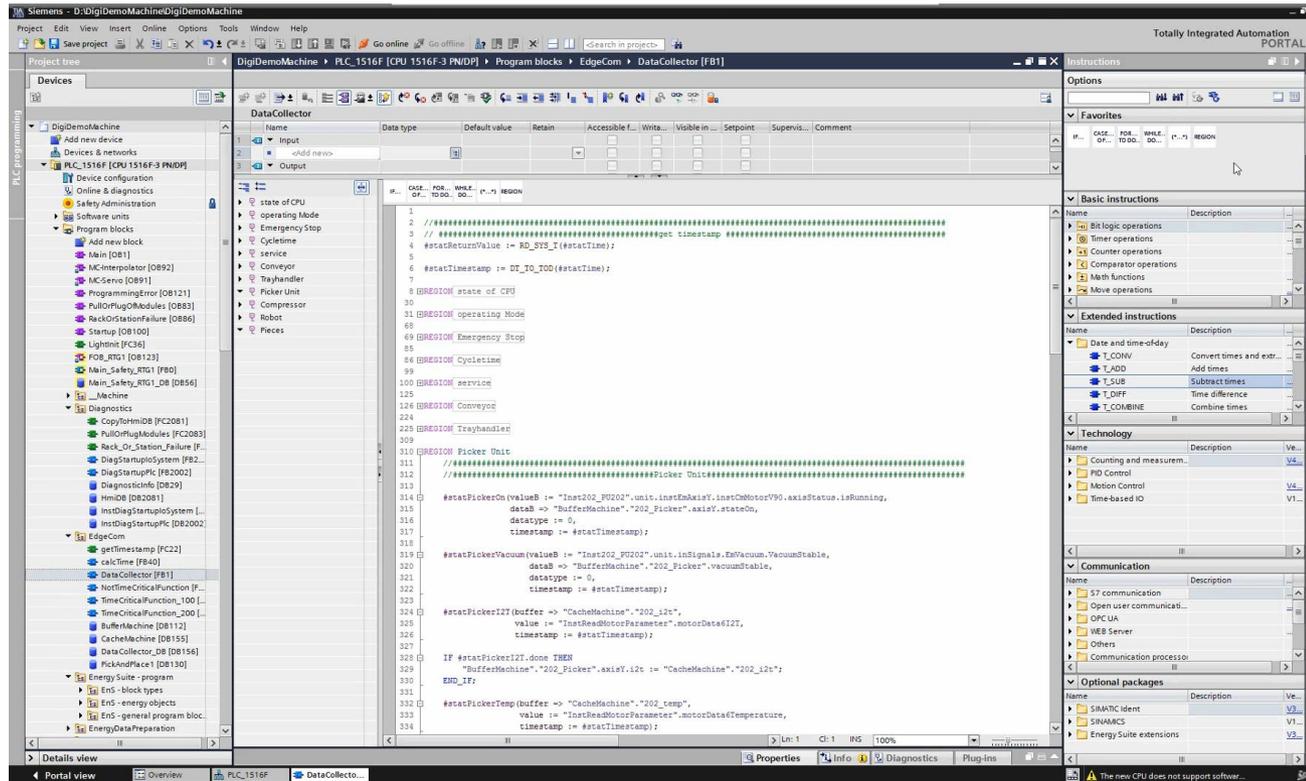


Bookmarks in SCL
Structured programming in SCL also means to navigate efficiently during programming and testing. With bookmarks and Jump to line this is possible very fast.

TIA Tip 038

TIA Tip 042 – Instruction List Pane Mode

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Ingenuity for life



Instruction List Pane Mode
During programming the instruction list is a good helper. If you need more space and a better overview you can deactivate the panel mode and hide column headers.

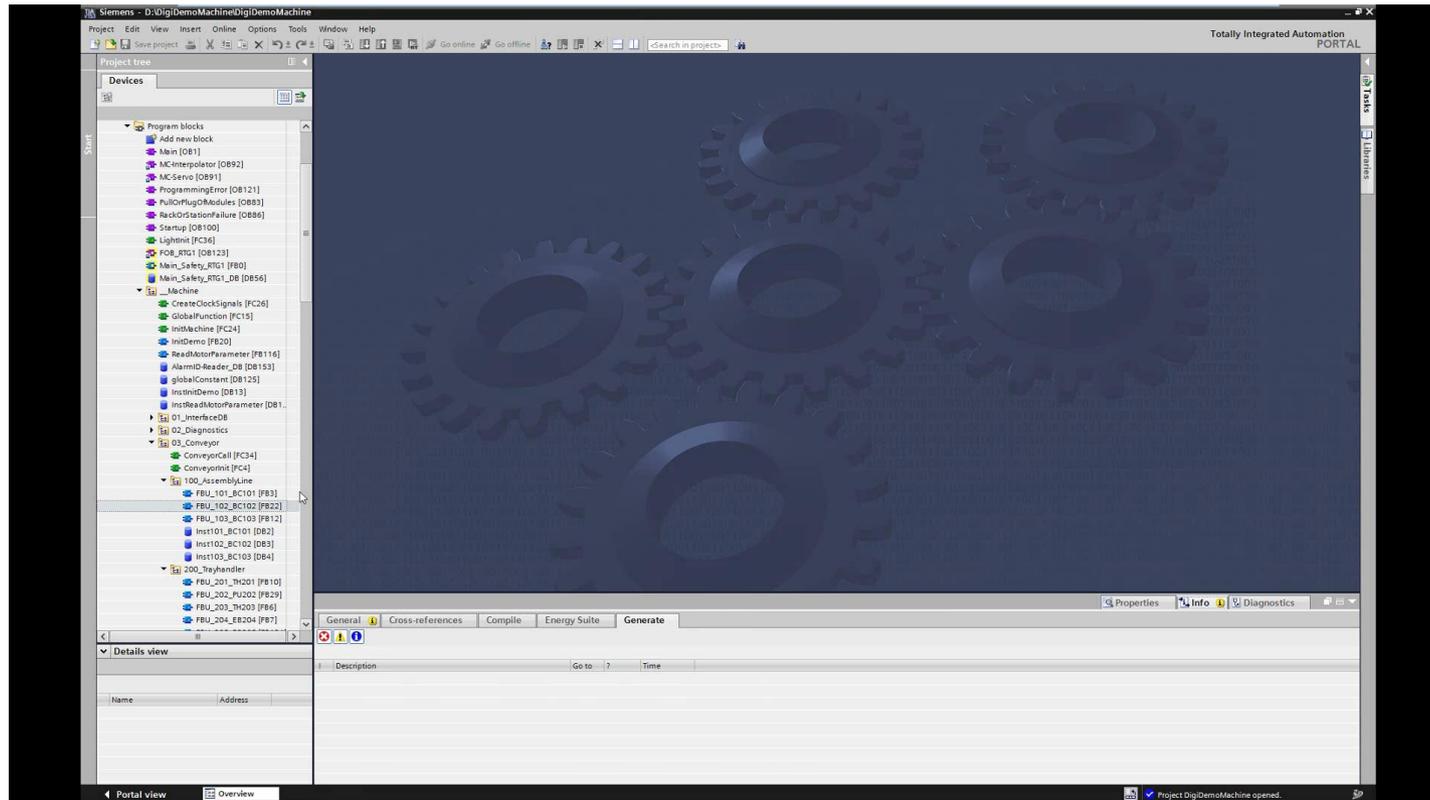
TIA Tip 042

Source: TIA Portal

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Page 55

TIA Tip 043 – Quick Compare PLC blocks

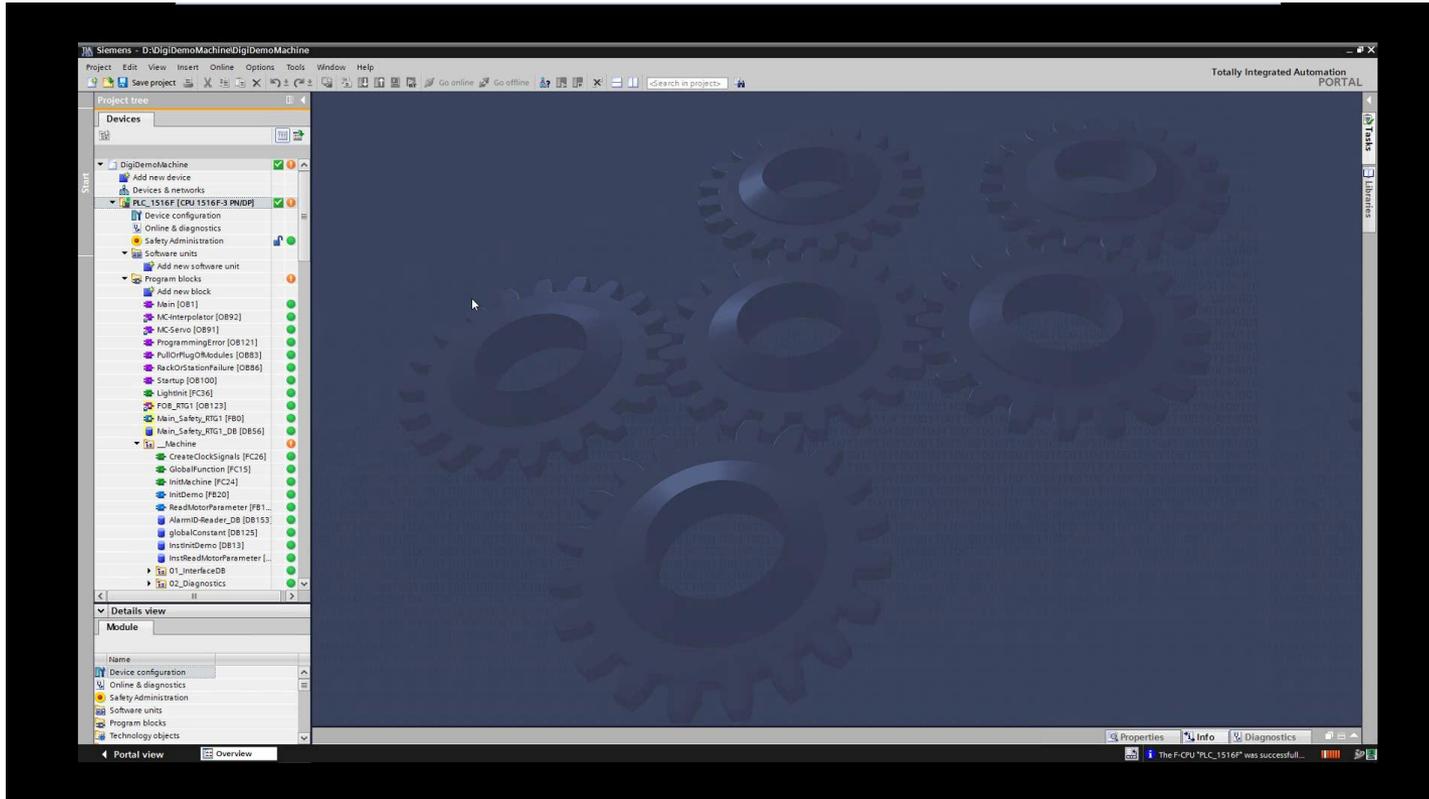


Quick Compare PLC blocks
With quick compare the block compare between 2 blocks is easy by choosing the the blocks to compare via context menu in Project navigation view.

TIA Tip 043

TIA Tip 044 – Block Compare with filter

SIEMENS
Ingenuity for life



Block Compare with filter
With filters for source and target data in block compare editor it's easy to detect the relevant code changes

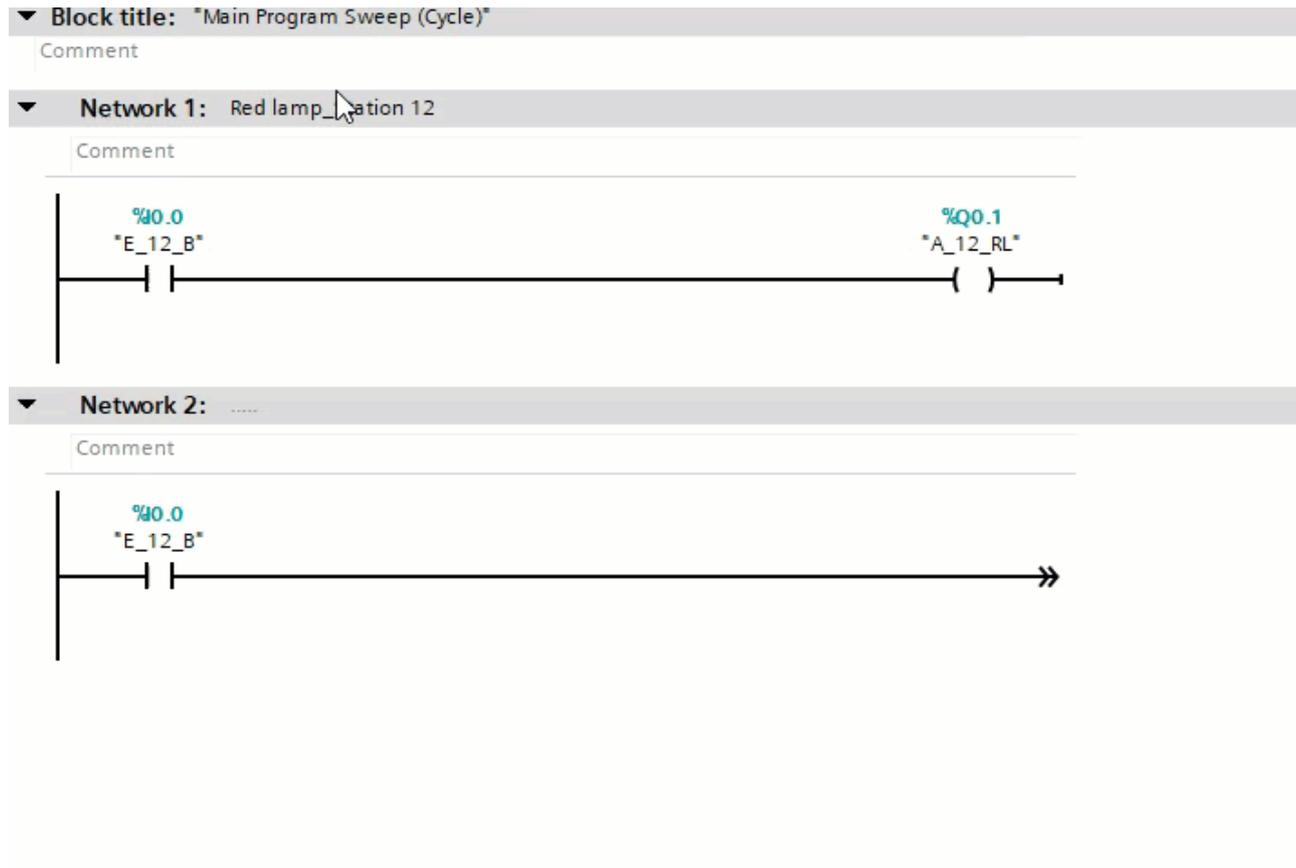
TIA Tip 044

Source: TIA Portal

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Page 57

TIA Tip 045 1/2 – Set program network title automatically

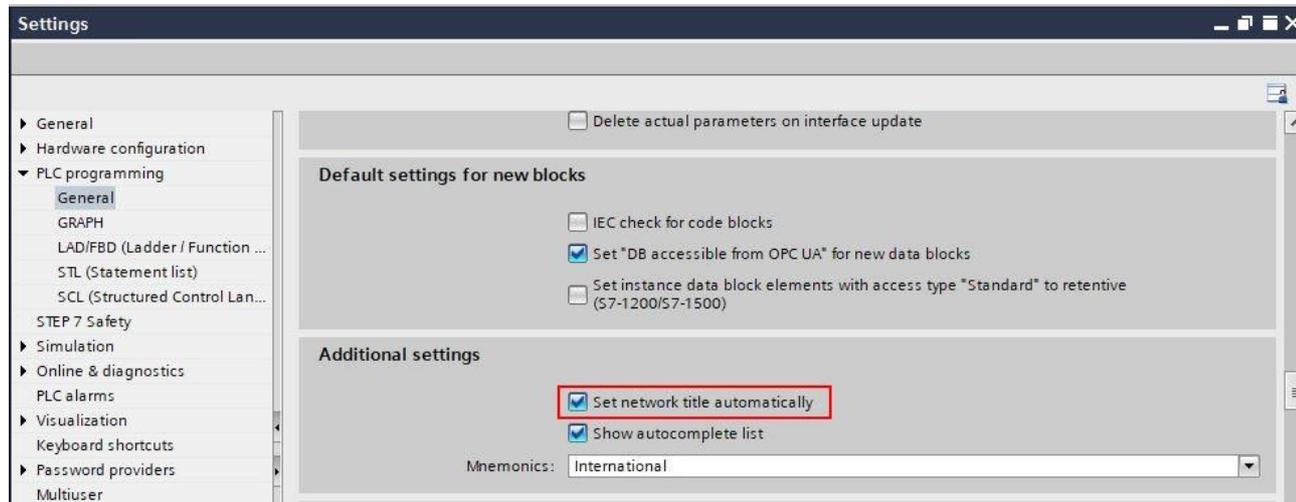


Set program network title automatically

By activating this option network titles will automatically assigned with the comment of the 1st operand in a network.

TIA Tip 045

TIA Tip 045 2/2 – Set program network title automatically

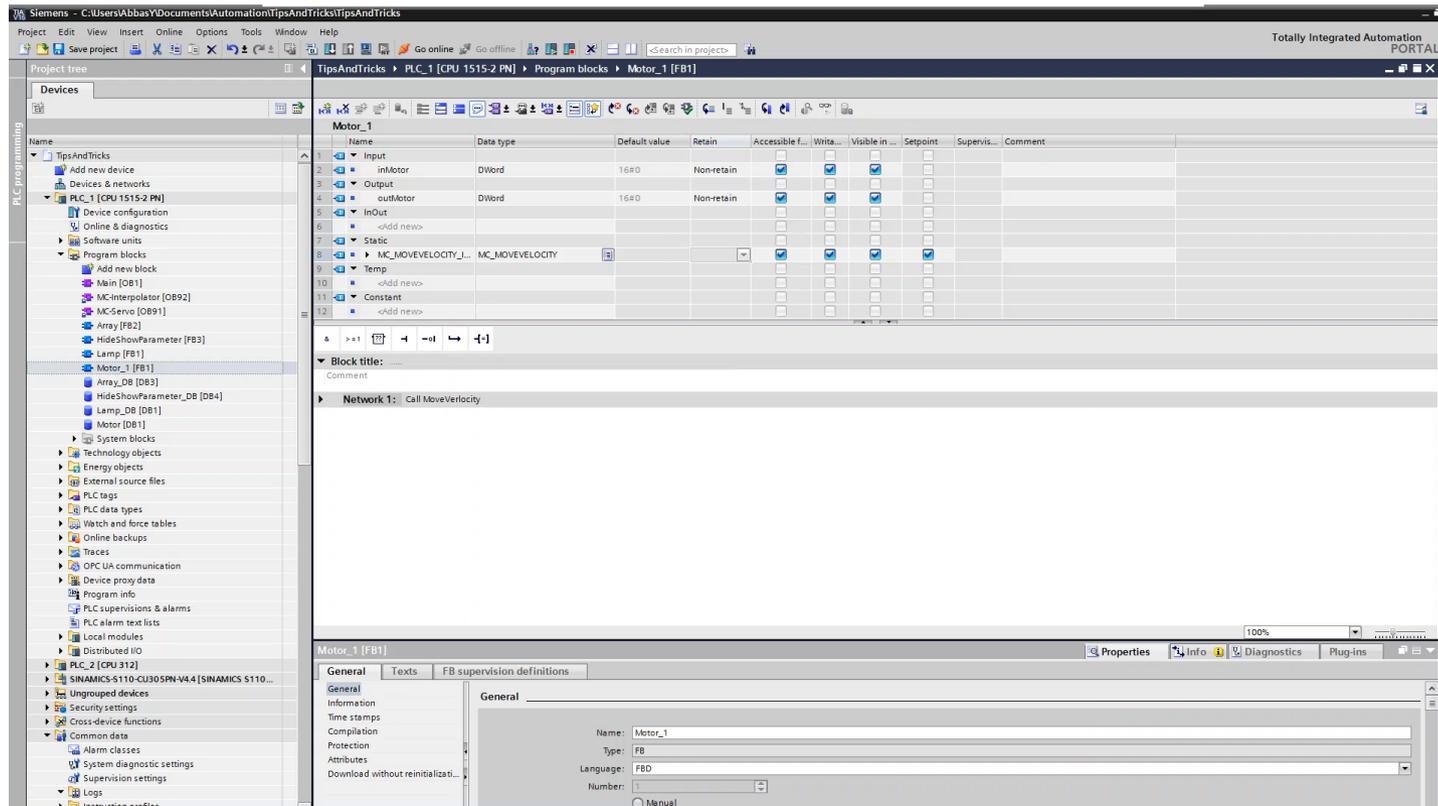


Set program network title automatically

By activating this option network titles will automatically assigned with the comment of the 1st operand in a network.

TIA Tip 045

TIA Tip 046 1/2 – Overlaying tags with AT construct



Overlaying tags with AT construct

Addressing parts of an variable or use pattern to overlay data segments is possible with the AT construct. It helps to have another view on data.

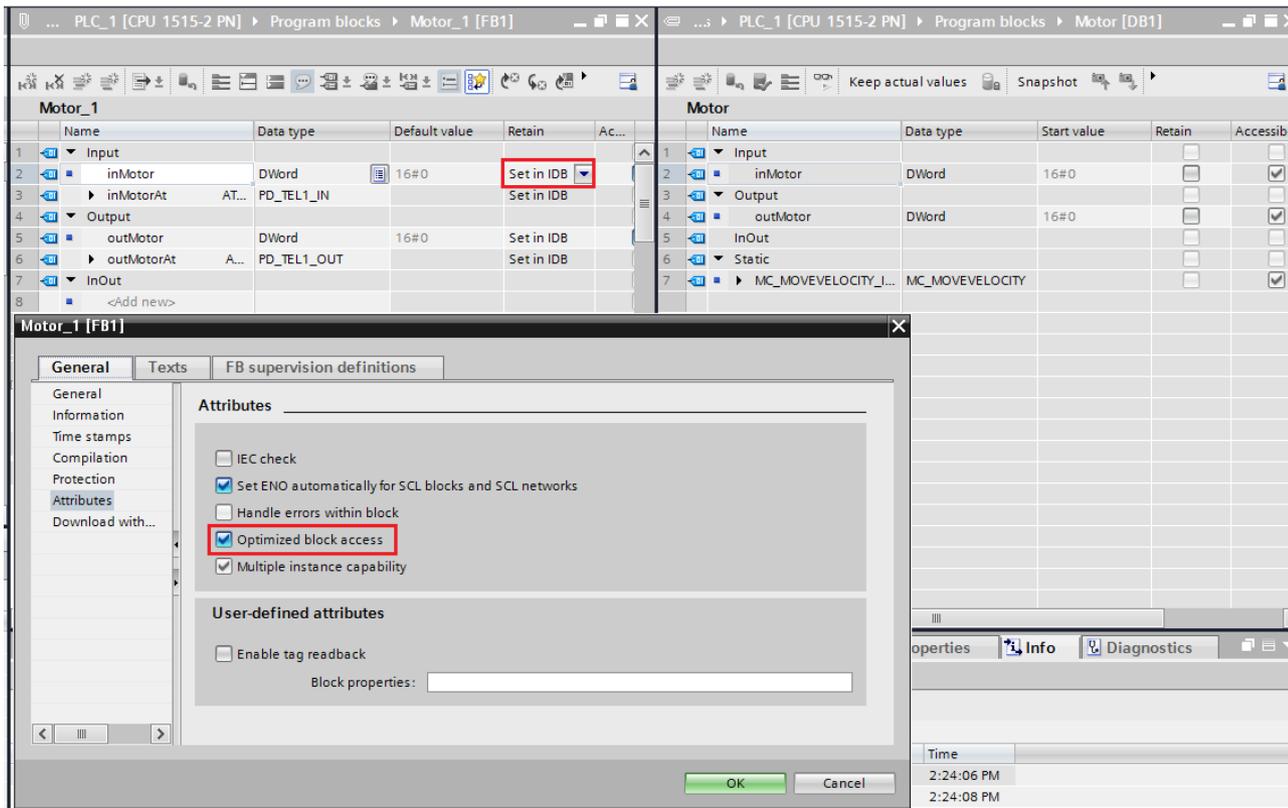
TIA Tip 046

Source: TIA Portal

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Page 60

TIA Tip 046 2/2 – Overlaying tags with AT construct

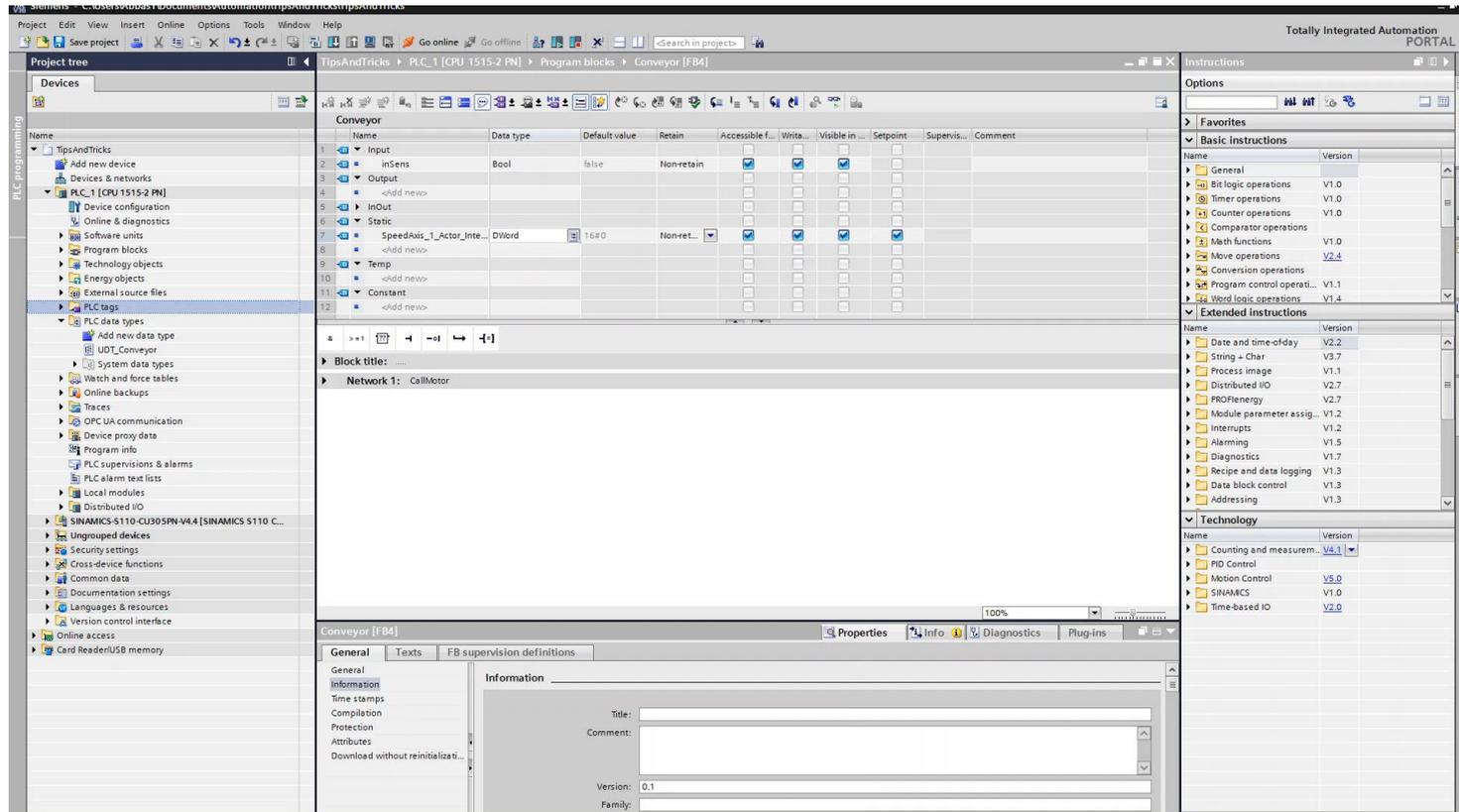


Overlaying tags with AT construct

Addressing parts of an variable or use pattern to overlay data segments is possible with the AT construct. It helps to have another view on data.

TIA Tip 046

TIA Tip 047 1/2 – Use of predefined standard PROFIDRIVE telegrams



Use of predefined standard PROFIDRIVE telegrams
SINAMICS drives are using standard Profidrive telegrams. They are integrated part of the TIA Portal installation as UDT. Name of UDTs: "PD_Tel..."

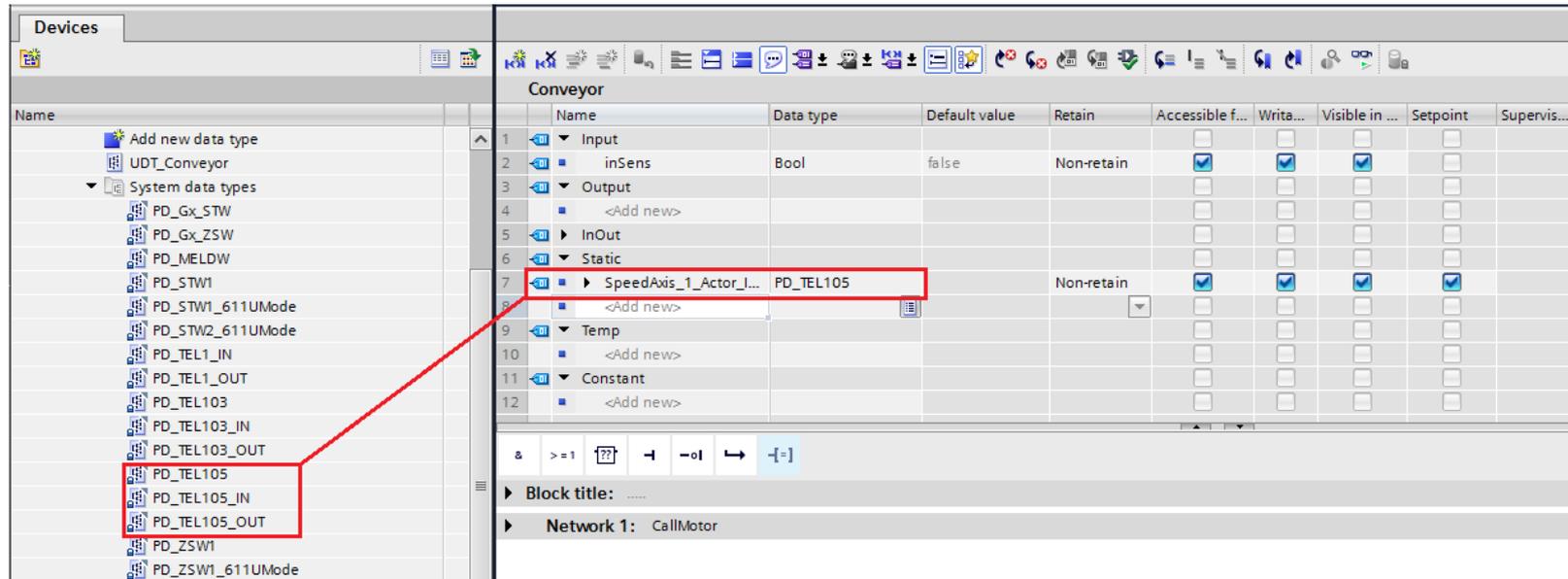
TIA Tip 047

Source: TIA Portal

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Page 62

TIA Tip 047 2/2 – Use of predefined standard PROFIDRIVE telegrams

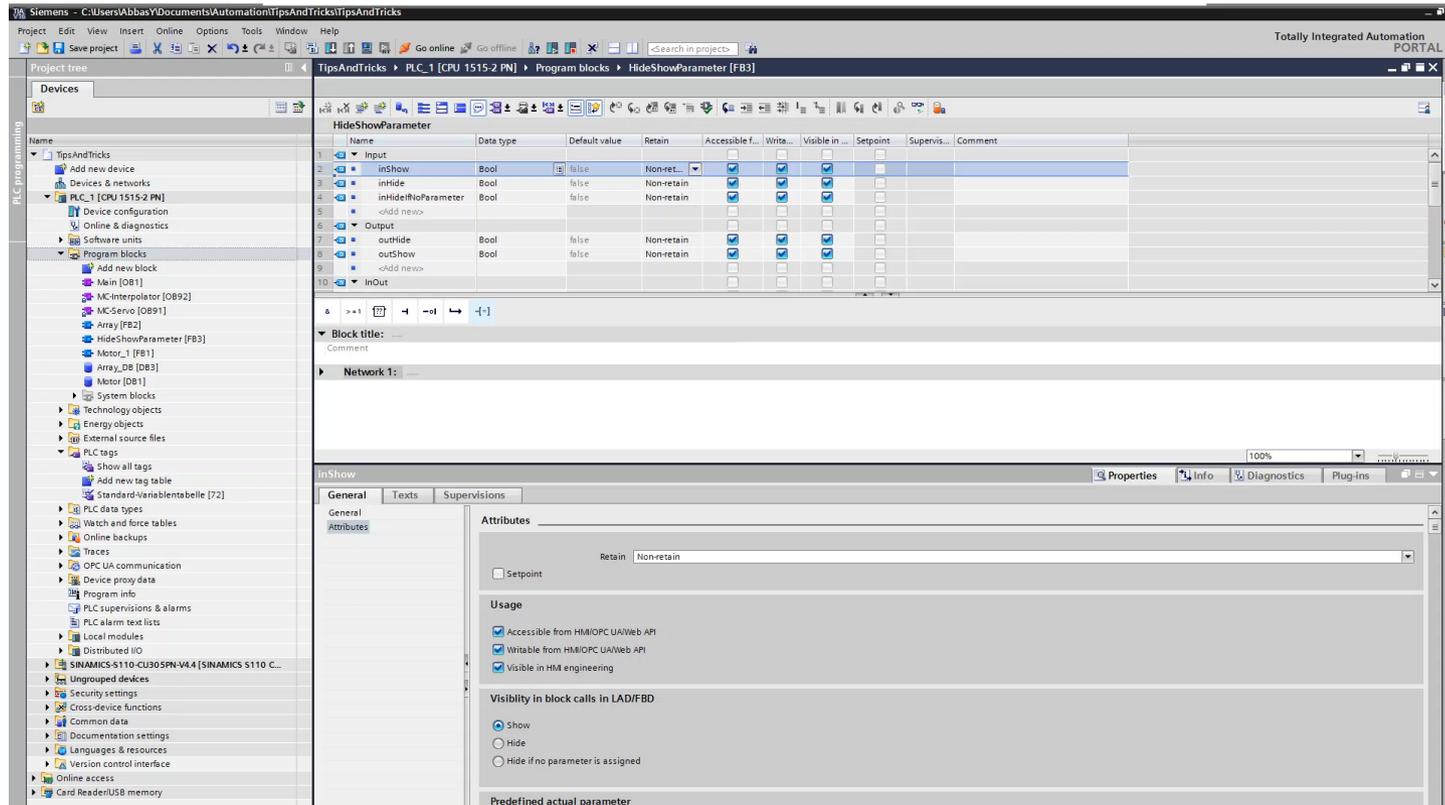


Use of predefined standard PROFIDRIVE telegrams

SINAMICS drives are using standard Profidrive telegrams. They are integrated part of the TIA Portal installation as UDT. Name of UDTs: "PD_Tel..."

TIA Tip 047

TIA Tip 048 1/2 – Hide parameters at Block calls

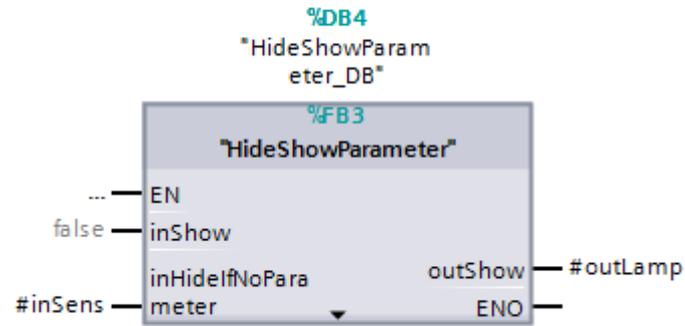


Hide parameters at Block calls
To hide optional parameters and make block calls clearly represented just active the function and select for each parameter the corresponding option "Hide".

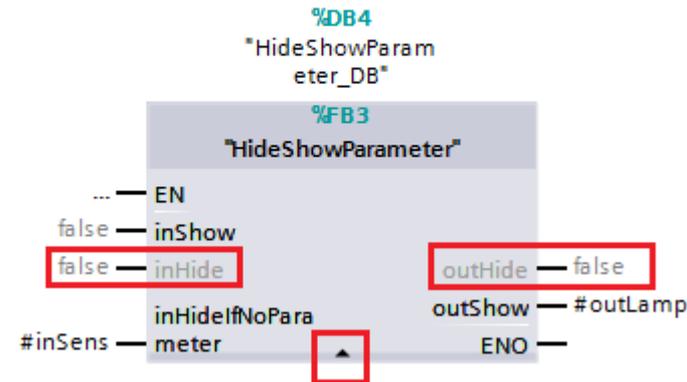
TIA Tip 048

TIA Tip 048 2/2 – Hide parameters at Block calls

Network 1: HideShowParameter
Comment



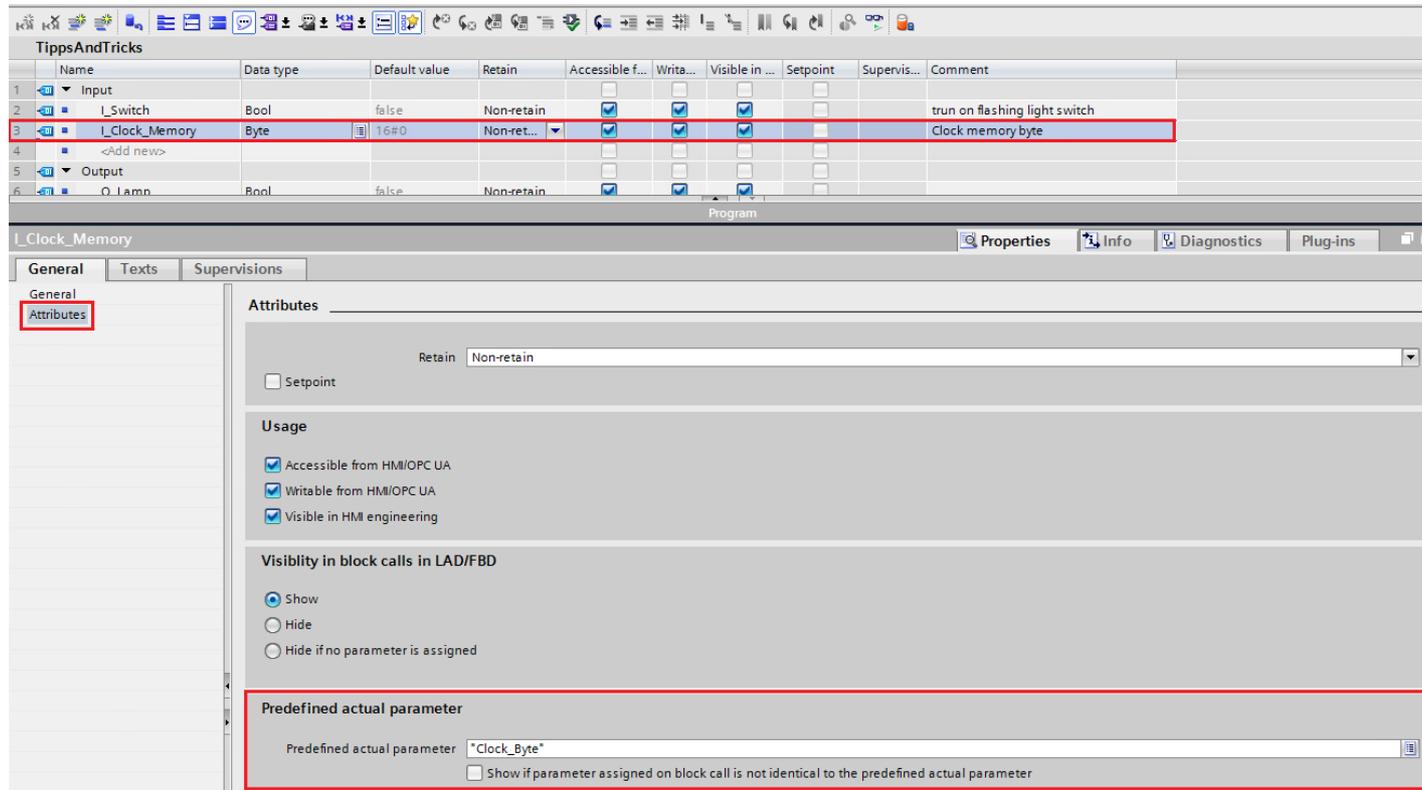
Network 1: HideShowParameter
Comment



Hide parameters at Block calls
To hide optional parameters and make block calls clearly represented just active the function and select for each parameter the corresponding option "Hide".

TIA Tip 048

TIA Tip 049 1/2 – Predefined parameters at block interface

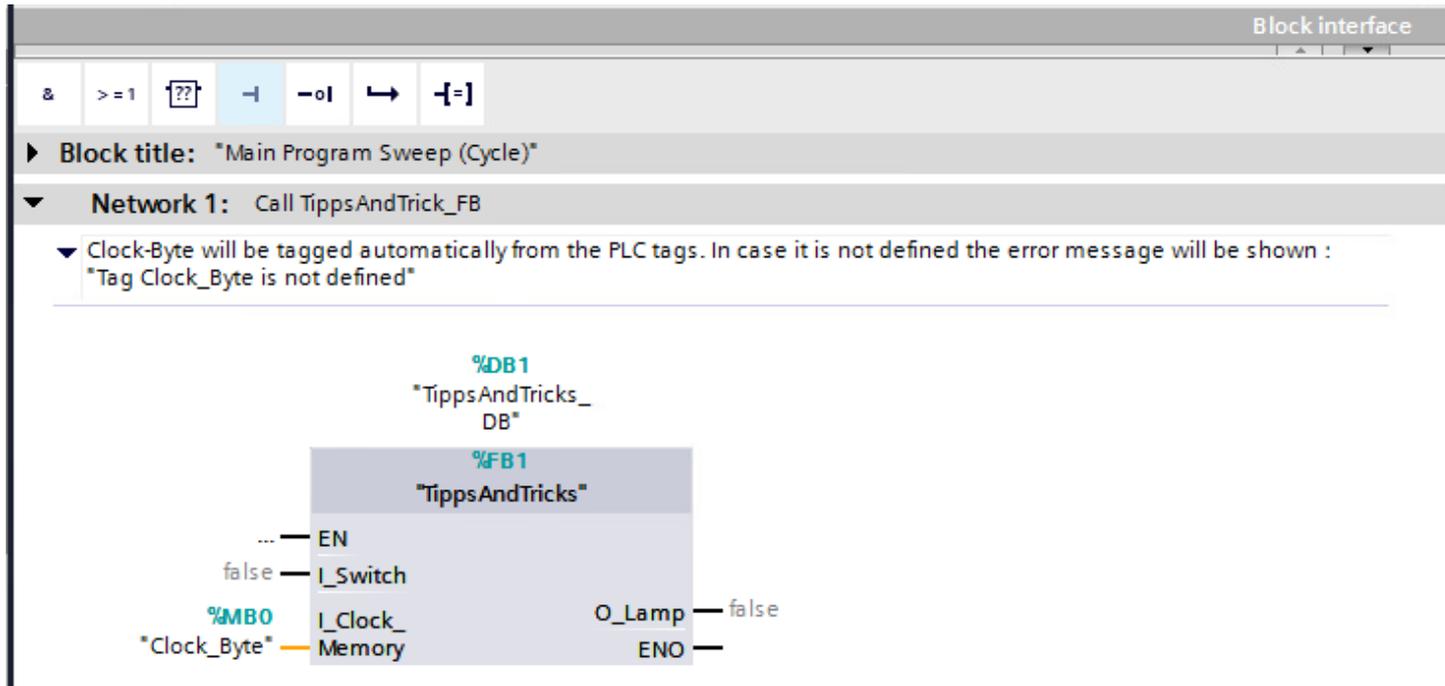


Predefined parameters at block interface

Define a global tag in block interface to automatically add actual parameters at the block call. An error appears if the symbolic name does not exist.

TIA Tip 049

TIA Tip 049 2/2 – Predefined parameters at block interface



Predefined parameters at block interface

Define a global tag in block interface to automatically add actual parameters at the block call. An error appears If the symbolic name does not exist.

TIA Tip 049

TIA Tip 050 – Slice access to variables

The screenshot shows the TIA Portal interface. At the top is a toolbar with various icons. Below it is a table for 'Baustein_1' with the following data:

	Name	Datentyp	Defaultwert	Remanenz	Erreichbar a...	Schrei...	Sichtbar i...	Einstellwert	Überwac...	Kommentar
1	Input				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
2	I_Data	Word	16#0	Nicht rema...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3	ClockByte	Byte	16#0	Nicht rema...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Taktmerkerbyte
4	<Hinzufügen>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
5	Output				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
6	Lamp	Bool	false	Nicht rema...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
7	<Hinzufügen>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Below the table is a navigation bar with icons for back, forward, search, and other functions. The main area shows a ladder logic network titled 'Netzwerk 1: Adressing bit of a Byte/word/dword with .X'. The network contains three normally open contacts: '#I_Data.%X3', '#ClockByte.%X2' (highlighted with a red box), and '#Lamp'. Below the network, a legend shows '#ClockByte.%X2' corresponding to 'Taktmerkerbyte'.

Slice access to variables
With slice access it's easy to address Bits or Bytes of bigger data types like DWord or DINT. Just use e.g. the syntax `.%X2` or `.%B0`

TIA Tip 050

TIA Tip 051 – Flexible Array limits at Block interface

Array

Name	Data type	Default value	Retain	Accessible f...	Writa...	Visible in ...	S...
1	Input						
2	Output						
3	InOut						
4	InOutArray	Array[*,*] of Byte					

Call path: Main [OB1]

Block title:

Network 1: ArrayDimensions

```
1 #S_FirstDimensionLow := LOWER_BOUND(ARR := #InOutArray, DIM := 1);
2 #S_FirstDimensionUp := UPPER_BOUND(ARR := #InOutArray, DIM := 1);
3 #S_SecondDimensionLow := LOWER_BOUND(ARR := #InOutArray, DIM := 2);
4 #S_SecondDimensionUp := UPPER_BOUND(ARR := #InOutArray, DIM := 2);
```

Symbol	Value
#S_FirstDimensionLow	0
#S_FirstDimensionUp	1
#S_SecondDimensionLow	2
#S_SecondDimensionUp	8
UPPER_BOUND	8

Main

Name	Data type	Default value	Co
1	Input		
2	Initial_Call	Bool	In
3	Remanence	Bool	=
4	Temp		
5	Array	Array[0..1, 2..8] of ...	
6	Constant		

Block title: "Main Program Sweep (Cycle)"

Network 1: Motor

Network 2: IO-Array

Comment

%DB3
"Array_DB"

%FB2
"Array"

EN

ENO

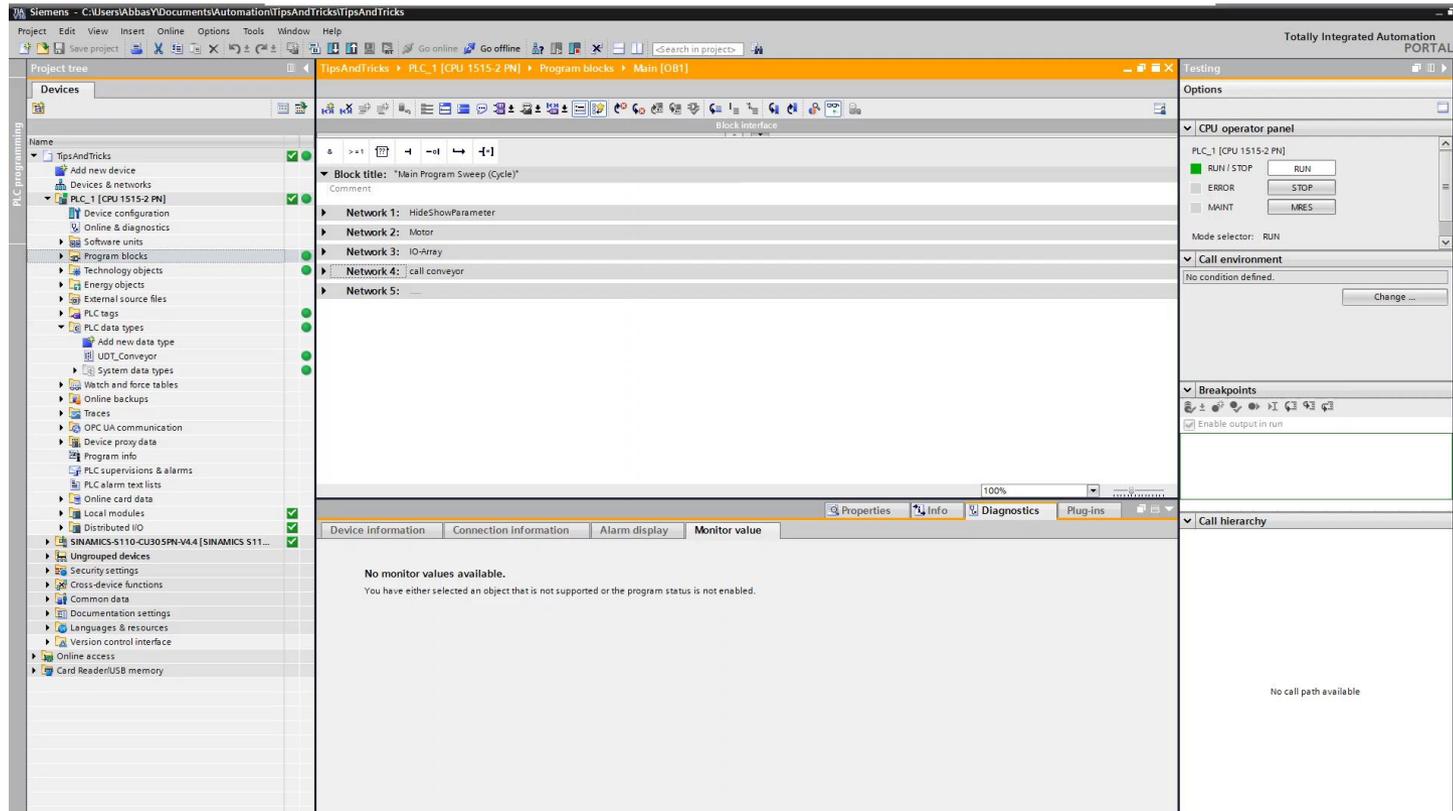
#Array — InOutArray

Flexible Array limits at Block interface

With Array[*] it's very flexible to realize generous blocks with flexible array dimensions. Array dimensions are able to detect with LOWER_BOUND and UPPER_BOUND

TIA Tip 051

TIA Tip 053 – Monitor complex data types at block call



Monitor complex data types at block call
Efficient programming leads to complex data types at block calls. With the monitor tab in the inspector windows you're able to test the values easily

TIA Tip 053

TIA Tip 057 – Calculation with index variables

```
1 #FiboArray[1] := 0;  
2  
3 //Fill Fibonacci numbers  
4 FOR #ArrayIndex := 4 TO 20 DO  
5     #FiboArray[#ArrayIndex] := #FiboArray[#ArrayIndex - 1] + #FiboArray[#ArrayIndex - 2];  
6 END_FOR;  
~
```

Calculation with index variables

Complex calculations can be done in every programming language based on Index variables and loops. An example for iterative calculation of Fibonacci numbers.

TIA Tip 057

1 Handle the surface and windows

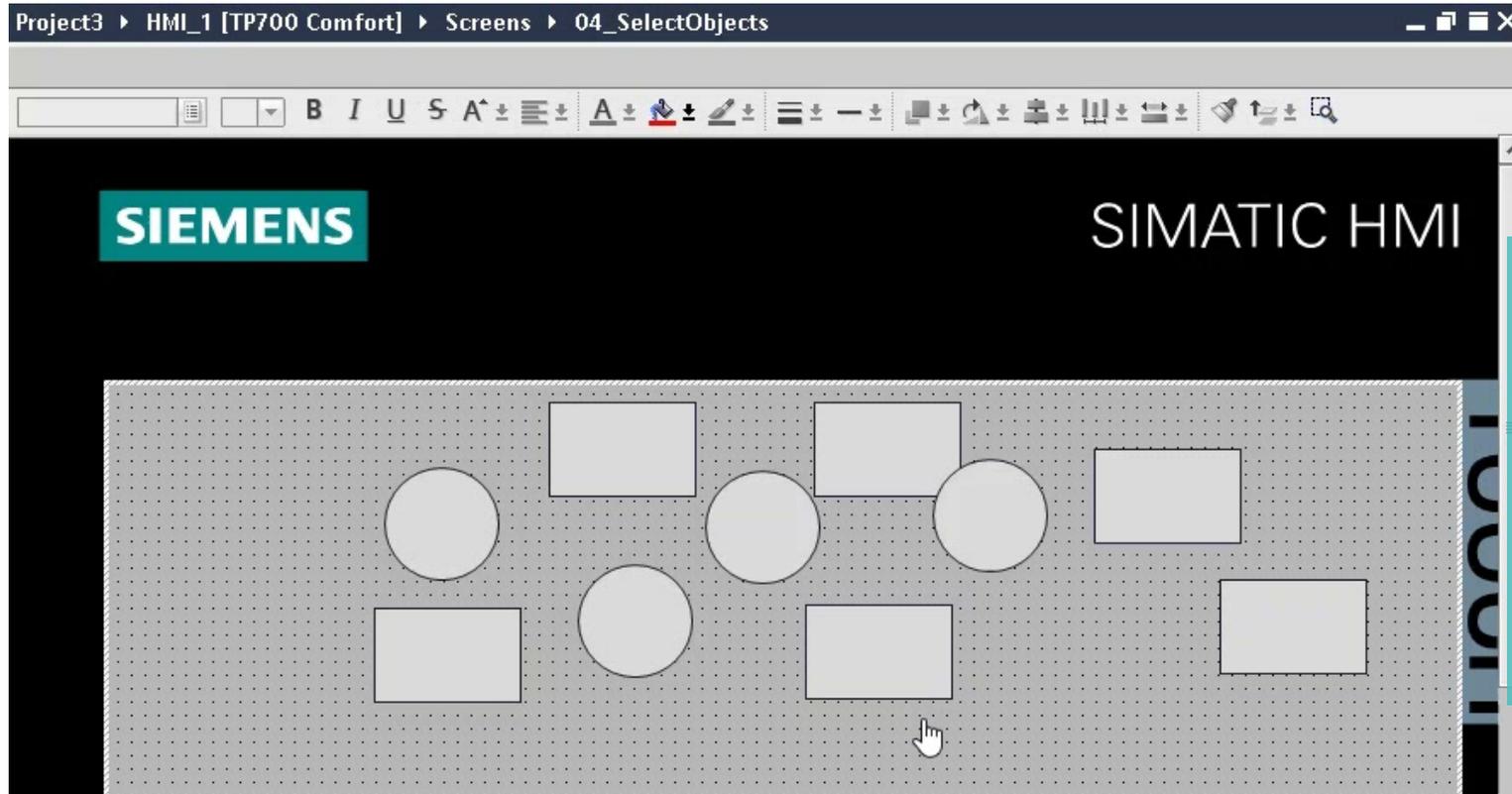
2 Configure Hardware and Network

3 Program PLCs

4 **Project HMIs**

5 Work with libraries

TIA Tip 020 – Select objects from same type in WinCC

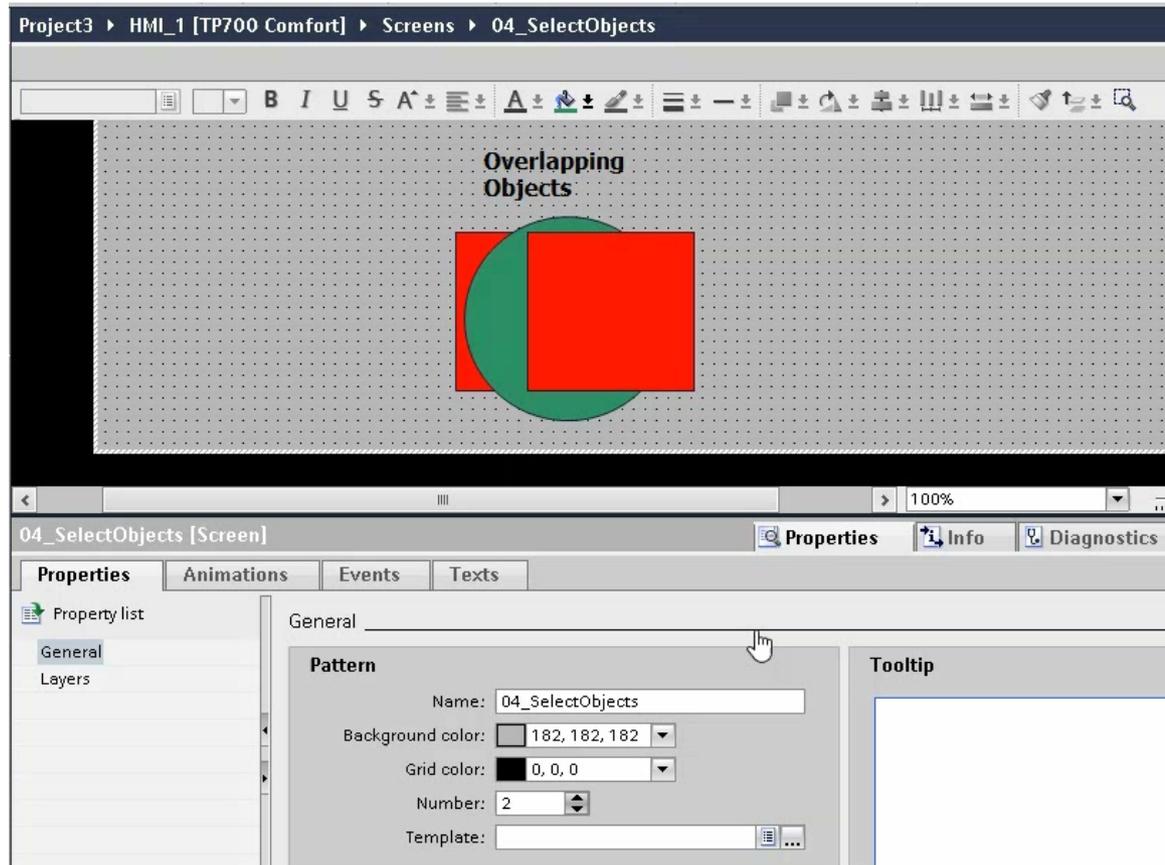


Select objects from same type in WinCC

Let's start with some tips for WinCC Visualization. You want to select all objects with the same type on a HMI screen, e.g. all rectangles or buttons? Just select one of them, hit the keyboard shortcut <CTRL> + <Shift> + <A> and all objects from the same type will be selected!

TIA Tip 020

TIA Tip 021 – Select overlapping objects in HMI screens

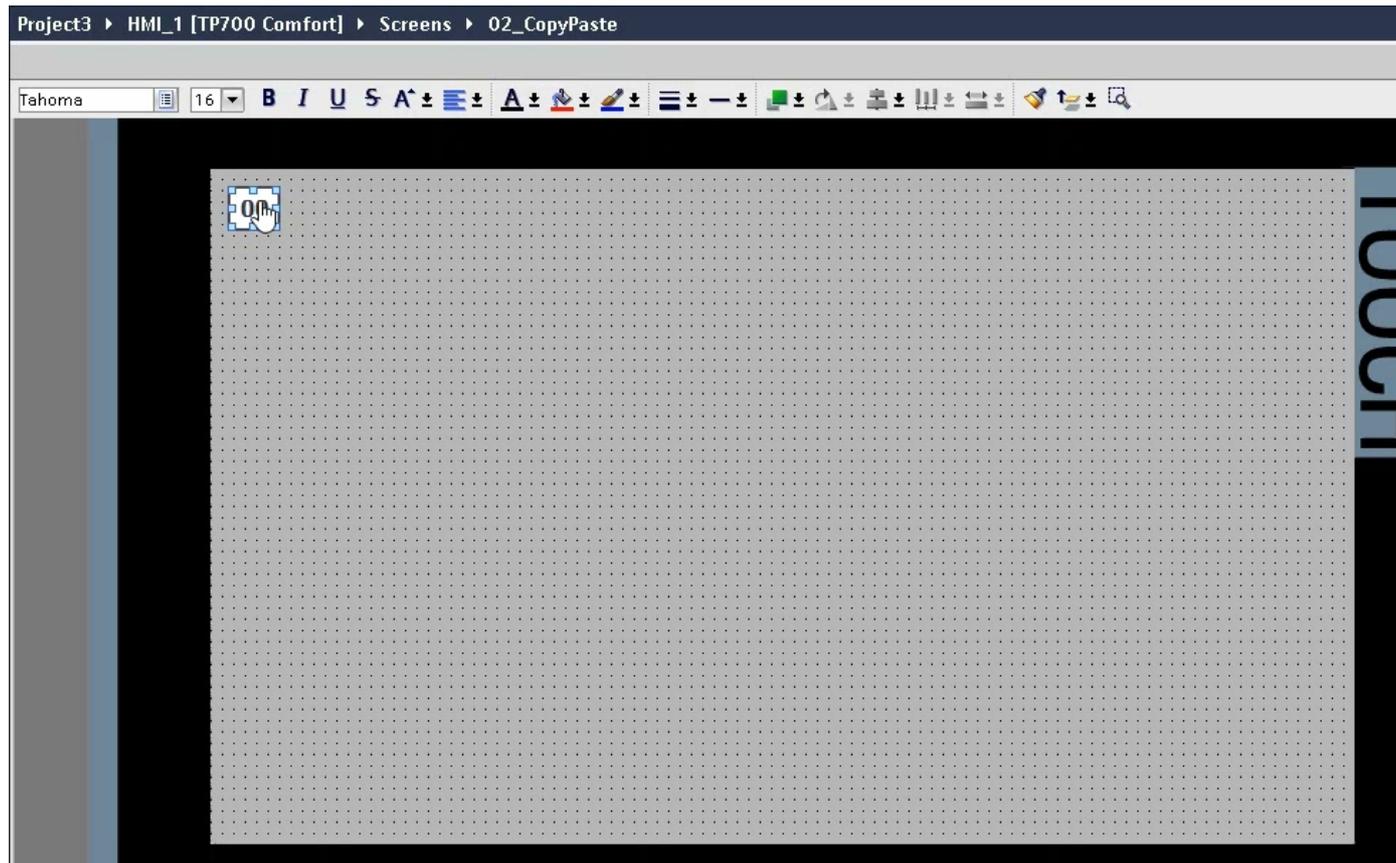


Select overlapping objects in HMI screens

With the shortcut <ALT> + <Mouse click Left> the selection of overlapping objects will be changed. With each <Click> the selection changes. By this you can also access the object in the lowest level or levels in between without the need to move any objects or search for them in the layers tab.

TIA Tip 021

TIA Tip 022 – Copy & Paste of Objects in HMI screens

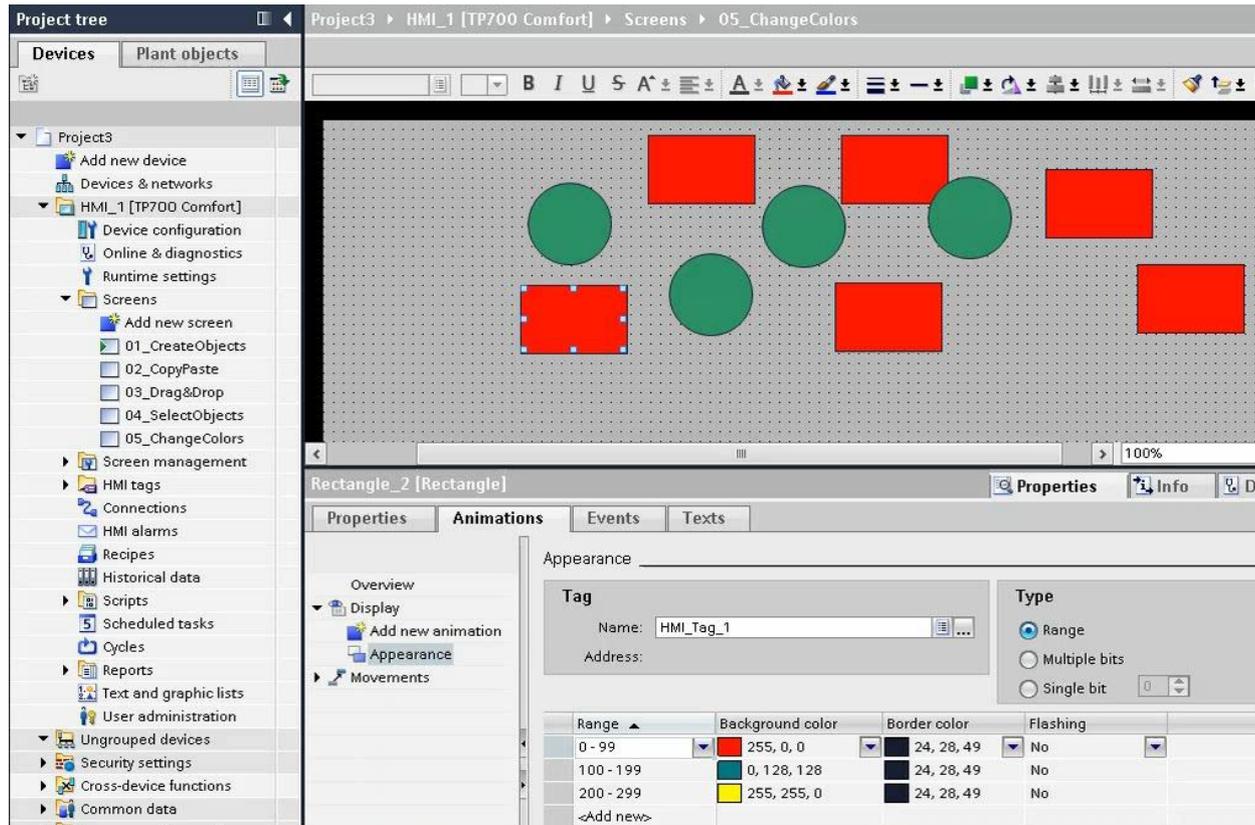


Copy & Paste of Objects in HMI screens

If you want to add several objects with similar space you can easily use the copy & paste logic on a screen editor. Just copy & paste, move the first copy to the desired position and repeat pasting. The objects will be automatically aligned with the same offset related to the last copy.

TIA Tip 022

TIA Tip 028 – Change colors of HMI objects



Change colors of HMI objects
Efficiently change a lot of HMI objects within WinCC? By this editor you're able to harmonize colors as well as search and replace them.

TIA Tip 028

1 Handle the surface and windows

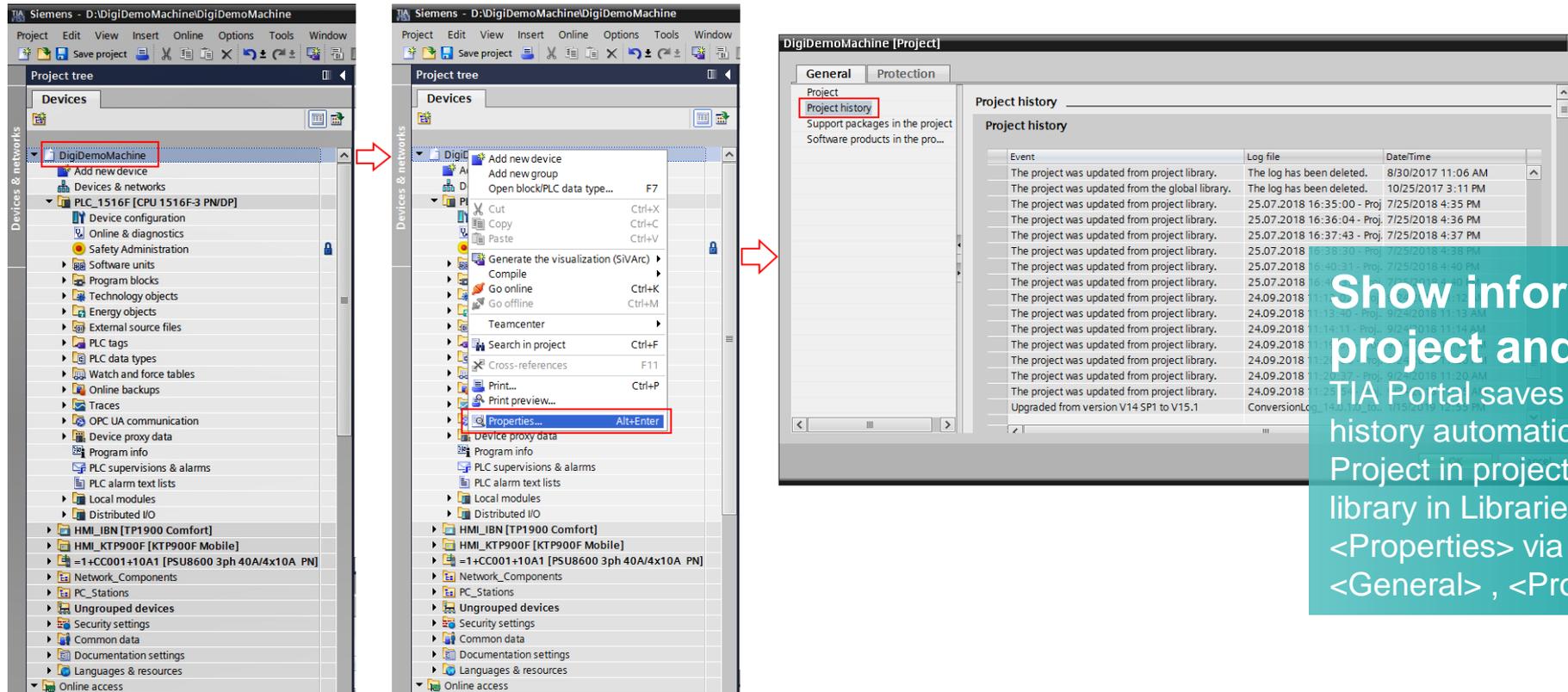
2 Configure Hardware and Network

3 Program PLCs

4 Project HMIs

5 Work with libraries

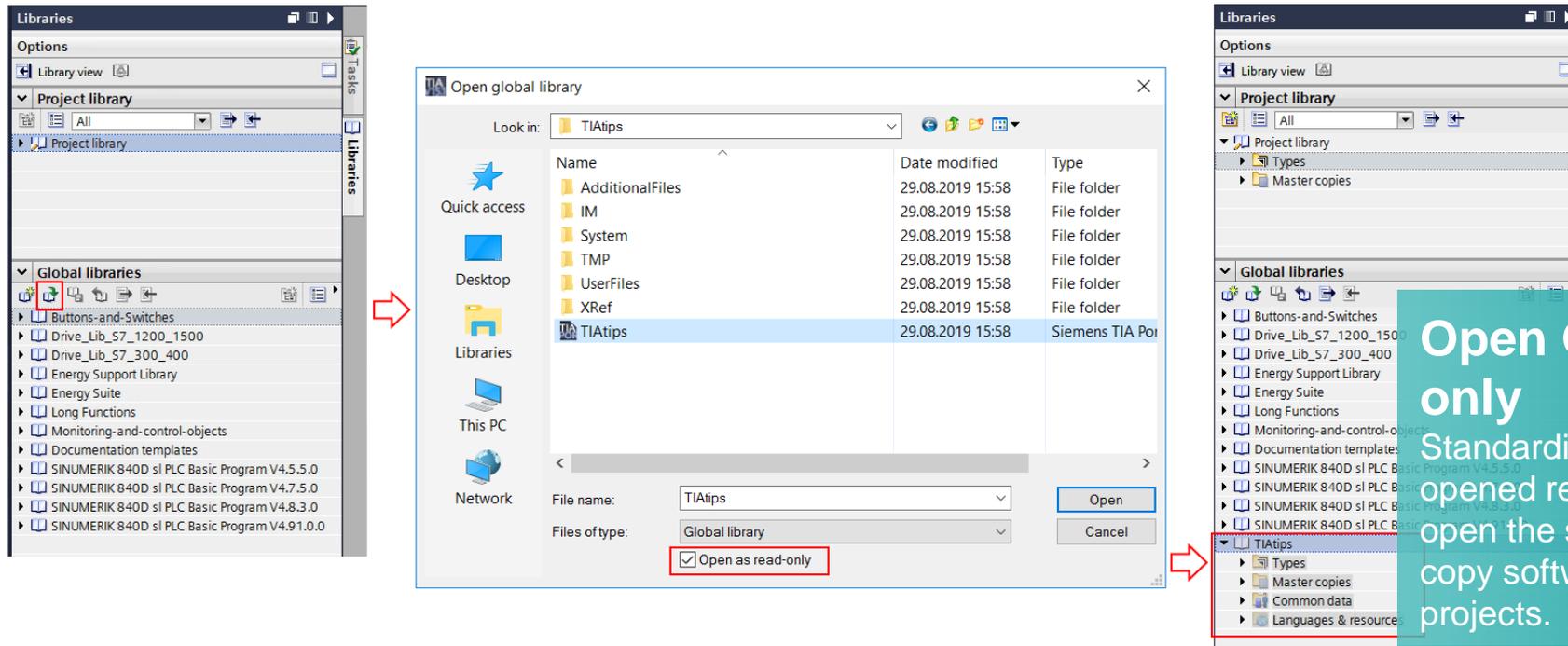
TIA Tip 023 – Show information about project and library history



Show information about project and library history
TIA Portal saves a Project and Global Library history automatically. Select properties of the Project in project navigation view or the Global library in Libraries tab and choose <Properties> via context menu and then <General> , <Project/Library history>.

TIA Tip 023

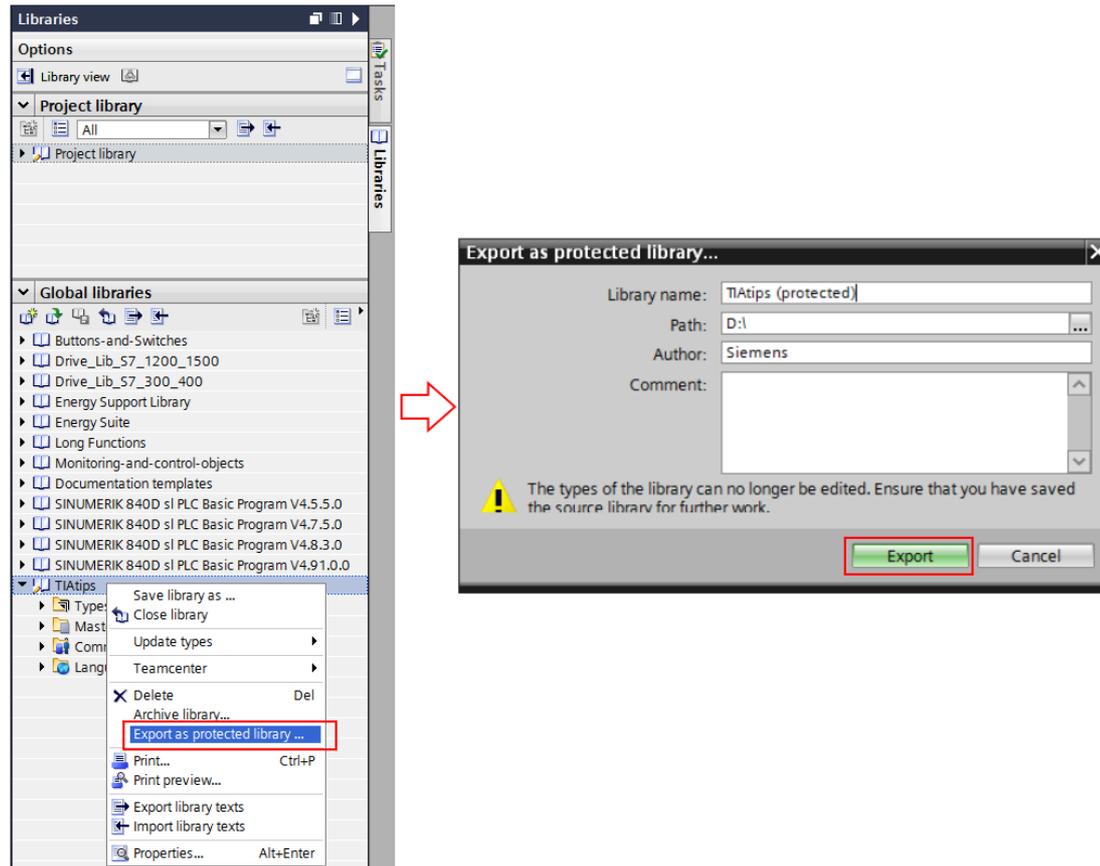
TIA Tip 024 – Open Global libraries Read-only



Open Global libraries Read-only
Standardized TIA Portal libraries can be opened read-only. By this several users can open the same library with read-only access to copy software objects to their individual projects.

TIA Tip 024

TIA Tip 025 – Create protected libraries

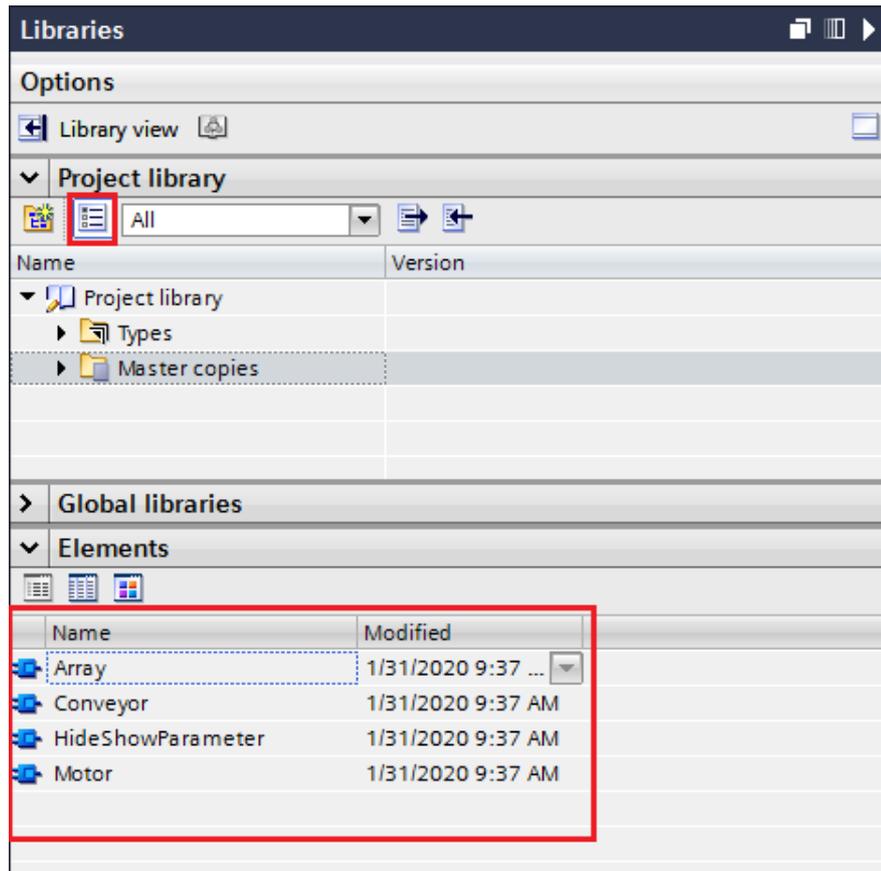


Create protected libraries

It is possible to export Global libraries with write protection. Objects of protected libraries cannot be edited or changed at all. Protected block types are useful to control the programming standards within your company or automation team. Take care to save the unprotected library because the protection cannot be removed at a later time.

TIA Tip 025

TIA Tip 058 – Element view of library

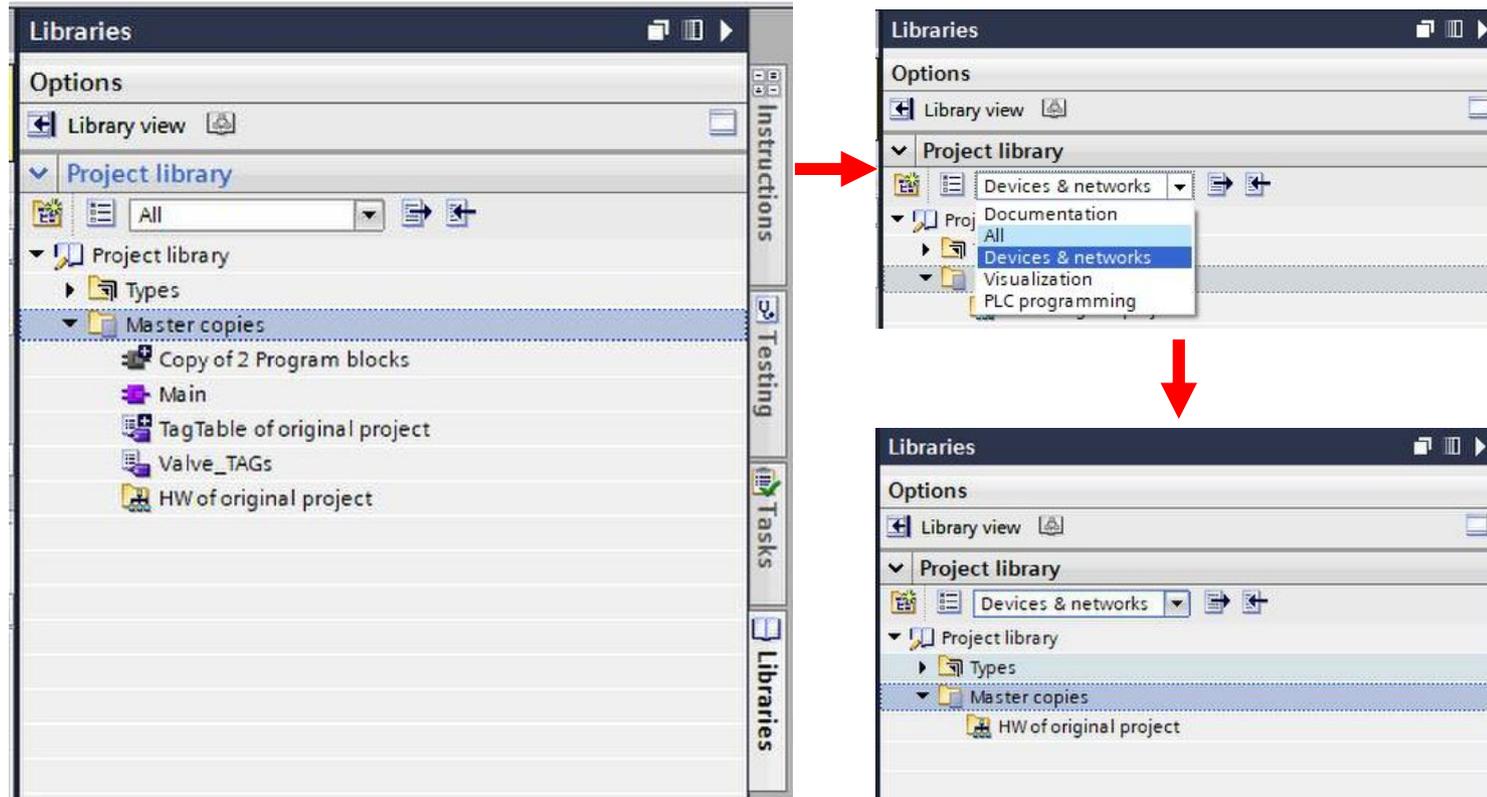


Element view of library

A multiple selection of objects can be copied in the library as one object. With the element view of the library the single objects are visible.

TIA Tip 058

TIA Tip 059 – Filtering master copies in library

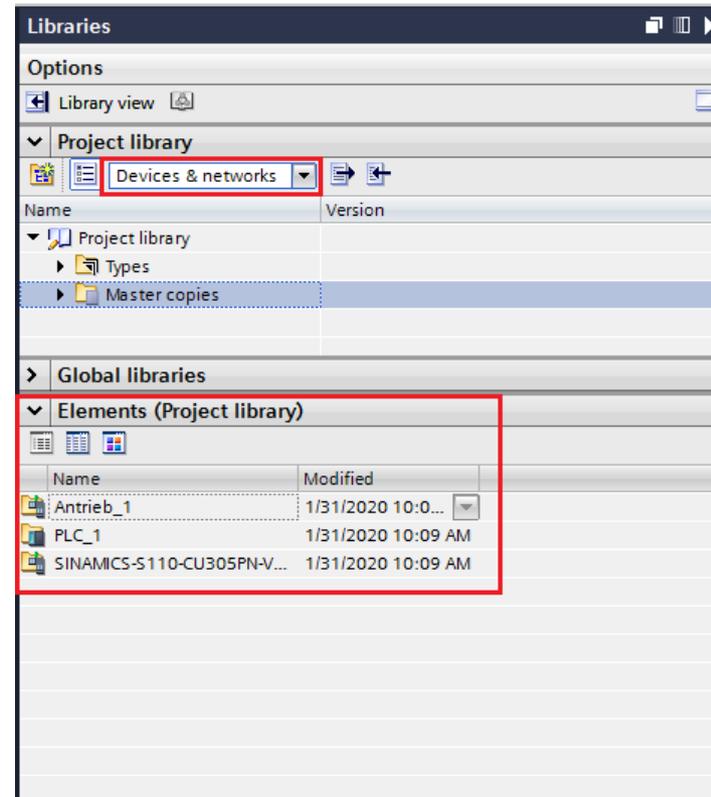
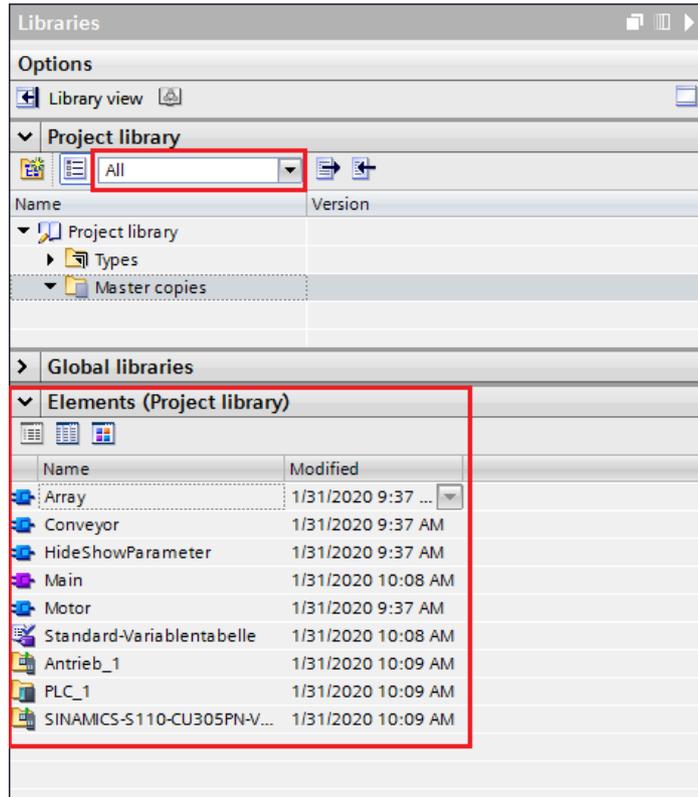


Filtering master copies in library

Different types of objects can be copied to the library. With the filtering function it's easier to find the matching components you're searching for.

TIA Tip 059

TIA Tip 060 – Info view of library



Info view of library

The info view in the library combines both - filtering and element view in one editor to show relevant information of library objects.

TIA Tip 060

TIA Portal Tips & Tricks by Mister Automation



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