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Getting started with S7-PLCSIM Advanced and simulation tables

SIMATIC S7-PLCSIM Advanced V2.0
SIMATIC STEP 7 (TIA Portal) V15

https://support.industry.siemens.com/cs/ww/en/view/109759047

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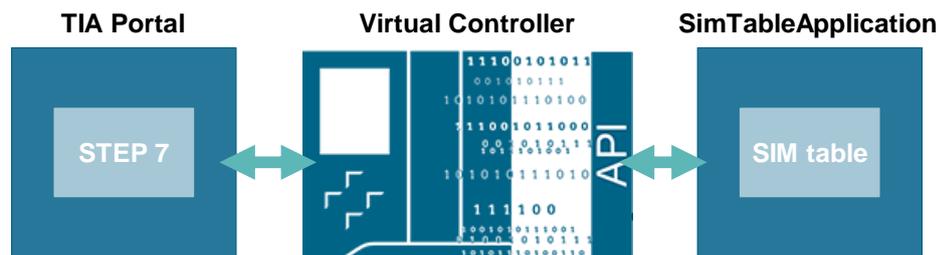
1 Introduction

1.1 Overview

With the help of SIMATIC S7-PLCSIM Advanced virtual controllers for the simulation of a S7-1500 or ET 200SP CPU are created and used for the comprehensive simulation of functions. This means that no real controllers are required to test a STEP 7 program.

The virtual controllers can also be tested and validated in the context of a system or machine. The application programming interface (API) allows manipulation of the simulated process image and is used to connect the virtual controller to a virtual model of a machine or plant or to specially programmed high-level language applications.

This makes it possible to connect the virtual controller to simulation software such as SIMIT or NX Mechatronics Concept Designer for extensive validation of the STEP 7 program. The following application example should make the first steps in the general handling of S7-PLCSIM Advanced easier for you. In addition, this application example offers the "SimTableApplication" application with which you can conveniently and independently monitor and control PLC variables on the virtual controller via a simulation table.

Figure 1-1

Advantages of the Application Example

- Quick introduction to the use of S7-PLCSIM Advanced

- Possibility of testing user programs with TIA Portal and S7-PLCSIM Advanced

- Convenient testing of user programs using simulation tables and S7-PLCSIM Advanced

Delimitation

- This application example complements the S7-PLCSIM Advanced manual. Detailed information can be found in the corresponding manual.

- This application example requires basic knowledge of TIA Portal project planning.

1.2 How it works

S7-PLCSIM Advanced supports the simulation of the following CPU families from firmware version V1.8:

- S7-1500 (C, T, F)
- ET 200SP
- ET 200SP F

In contrast to PLCSIM, S7-PLCSIM Advanced can be installed independently of TIA Portal and with its full Ethernet adapter "PLCSIM Virtual Ethernet Adapter" offers extended communication paths even beyond computer limits.

### 1.2.1 Overview communication paths

Table 1-1

Communication paths	Local	Local	Distributed
Protocol	Softbus	TCP/IP	TCP/IP
Communication interface in S7-PLCSIM Advanced	PLCSIM	PLCSIM Virtual Ethernet Adapter	PLCSIM Virtual Ethernet Adapter
STEP 7 and instances	On a PC/ a VM	On a PC/ a VM	Distributed
Communication...			
... between STEP 7 and instances	Yes	Yes	Yes
…between instances	Yes	Yes	Yes
...via OPC UA server and web server	No	Yes	Yes
...between an instance and a real hardware CPU	No	No	Yes
...between an instance and a real HMI V14 or higher	No	No	Yes
...between an instance and a simulated HMI V14 or higher	Yes	Yes	Yes

1.2.2 Local Communication

Via softbus

S7-PLCSIM Advanced enables you to communicate locally with the virtual controller via the "PLCSIM" softbus. All participants involved in the communication must be on the same PC / the same VM.

Figure 1-2
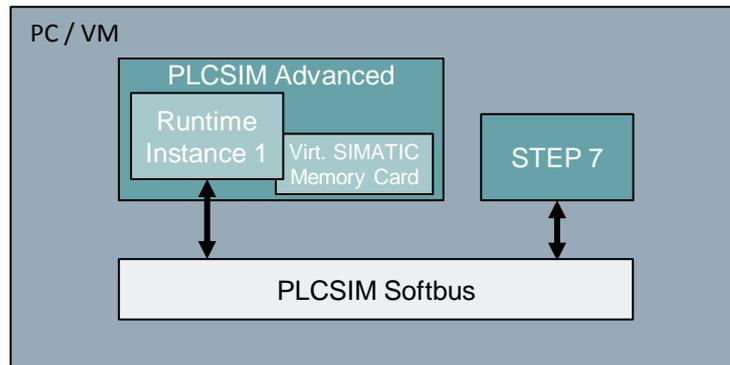
Via TCP/IP

With S7-PLCSIM Advanced you can also communicate locally via TCP/IP protocol. S7-PLCSIM Advanced provides the PLCSIM Virtual Ethernet Adapter for this purpose. All participants involved in the communication must be on the same PC / the same VM.

In this configuration it is possible to use TCP/IP functions of the virtual controller, such as communication via OPC UA and web server. Details can be found at Table 1-1

Figure 1-3
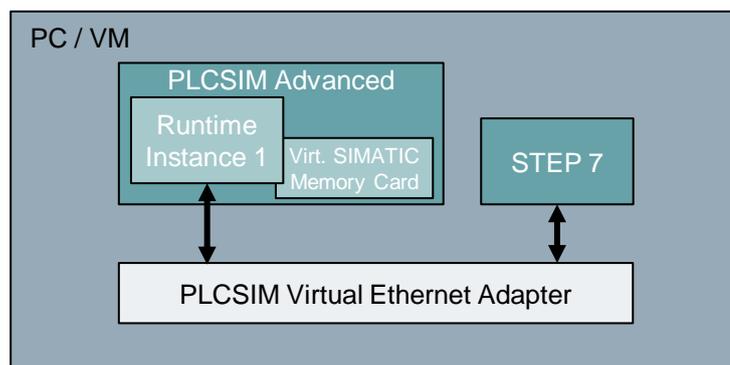
1.2.3 Distributed communication

For distributed communication, i.e. across computer boundaries, S7-PLCSIM Advanced provides a PLCSIM Virtual Switch in addition to the PLCSIM Virtual Ethernet Adapter.

The PLCSIM Virtual Switch is used to connect the PLCSIM Virtual Ethernet Adapter to a physical network card of your PC. This allows communication with the virtual controller from outside the PC.

When using a VM, a bridged connection to a network card of the host computer must be set up.

The following scenarios are possible:

1. Communication between TIA Portal on the host machine and a virtual controller on the VM.
2. Communication with a real CPU or a real HMI. The connection between real devices and the network card of the PC is made via an Ethernet cable.
3. Communication with TIA Portal on another PC. The connection between the PCs is made with an Ethernet cable via the physical network cards.

Scenarios 2 and 3 are also possible if S7-PLCSIM Advanced is installed directly on a PC. There is no need to configure a bridged connection, as this is only required for one VM.

Figure 1-4
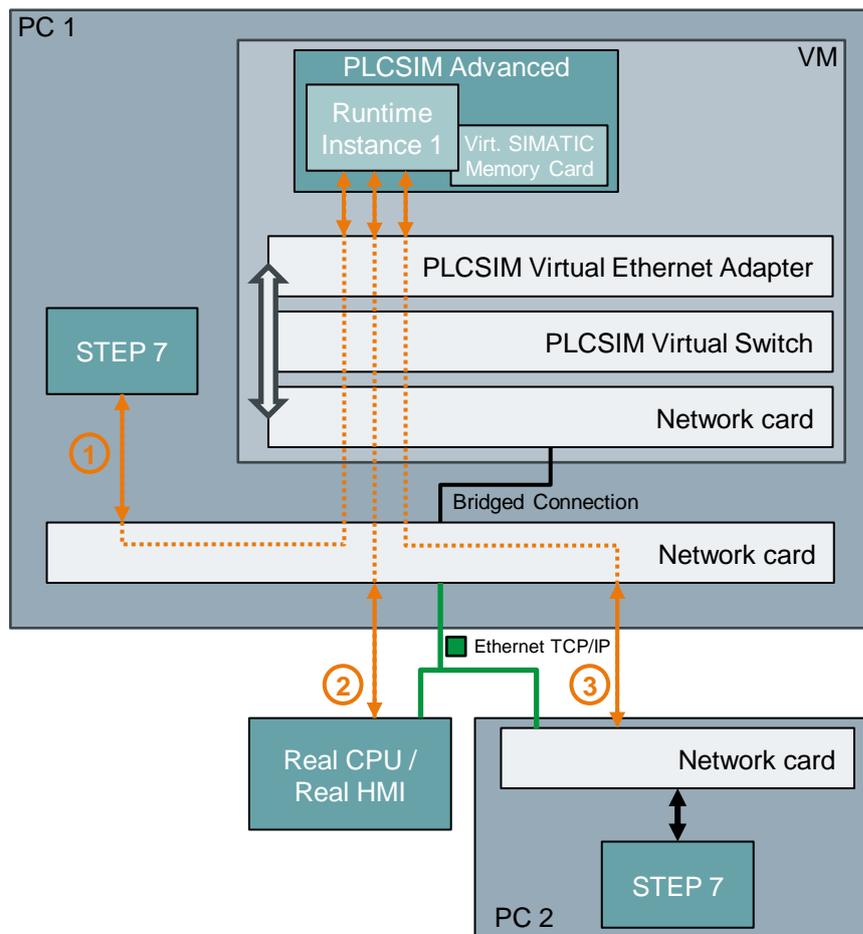
1.2.4 Virtual SIMATIC Memory Card

S7-PLCSIM Advanced stores the user program, the hardware configuration and the remanent data of a loaded instance of a virtual controller in a virtual SIMATIC memory card. Each instance has a virtual SIMATIC memory card, which is created under a unique instance name of the virtual controller.

If you use S7-PLCSIM Advanced to start a virtual controller with an instance name for which a virtual SIMATIC memory card already exists, the controller is started with the user program and hardware configuration contained in it.

The storage location of the virtual SIMATIC Memory Card can be opened or changed via the control panel of S7-PLCSIM Advanced.

For applications that interact with S7-PLCSIM Advanced via the API (user interface), the storage location can be defined on the application side. For example, the location of the virtual SIMATIC Memory Card for the "SimTableApplication" application is the same as the location of the simulation project. Thus the application always knows the access point to the data of the virtual controller. The "SimTableApplication" application is described in the chapter Application "SimTableApplication".

1.2.5 S7-PLCSIM Advanced Control Panel

S7-PLCSIM Advanced provides a control panel for creating and operating instances of a virtual controller. If you use your own user programs (C++/C#), you do not need to use the integrated control panel, since its function can be mapped via the API.

The Control Panel user interface is described below.
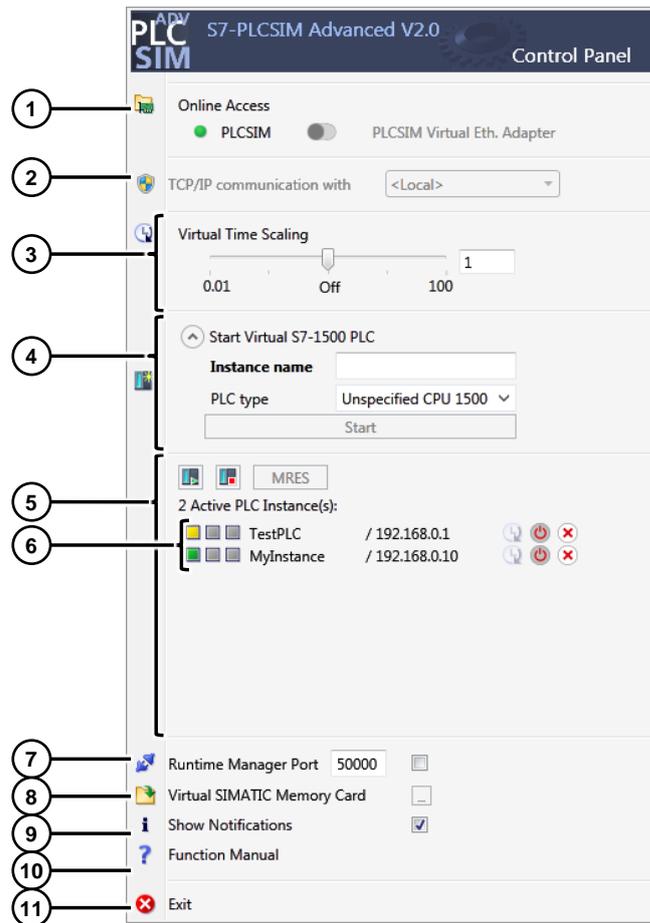
Figure 1-5 Control panel

Table 1-2: Control panel

No.	Function	Description
1.	Online access	Selecting the communication interface - PLCSIM: Softbus, local - PLCSIM Virtual Eth. Adapter: TCP/IP, local or distributed
2.	TCP/IP communication	Selecting the network adapter for distributed communication - <Local>: local communication - <Network card>: Distributed communication via the set network card
3.	Virtual time	Slider for setting the scaling factor
4.	Start Virtual S7-1500 PLC	- Instance Name: Name of the instance; min. 3, max. 64 characters. - PLC type: Selection of the CPU type to be

No.	Function	Description
		simulated.
		- Start: Create and start the instance.
		Additionally, when selecting the PLCSIM Virtual Eth. Adapters:
		- IP address
		- Subnet mask
		- Standard gateway
5.	Instance list	The "RUN", "STOP" and "MRES" buttons for the operating mode and reset.
		The list shows the local instances of the CPUs.
6.	LED displays	The meaning of the LED is displayed when you move the mouse pointer over it.
7.	Runtime Manager Port	Opens a port on the local PC
8.	Virtual SIMATIC Memory Card	Opens the location of the virtual memory card.
		Click on the following symbol ☐ to define the storage location.
9.	Displaying messages	Here you deactivate the S7-PLCSIM Advanced messages in the Windows task bar for the duration of operation.
10.	Function Manual	Here you open the function manual S7-PLCSIM Advanced in the standard PDF viewer.
11.	Exit	Exit switches off all instances and closes the control panel.

1.3 STEP 7 program

This application example includes a TIA Portal example project with a STEP 7 program.

The STEP 7 program consists of a simple adding function in the cyclic OB "Main[OB1]. The addition is executed once if the variable `"Global".executeAdd` is set to TRUE. The result of adding the two variables `"Global".summand1` and `"Global".summand2` is assigned to the variable `"Global".result`.

Fig. 1-6: STEP 7 program in cyclic OB

The associated variables are declared in the global data block "Global[DB1]".

Figure 1-7 Global data block "Global [DB1]"

For monitoring and controlling variables in the online view of the controller, the observation table "WatchTableAddFunc" with the data block variables was inserted in the TIA Portal project.

Figure 1-8 Watch table "WatchTableAddFunc"

1.4   Components used

This application example was created with these hardware and software components:

Table 1-3

Components	Number	Article number	Note
STEP 7 Professional V15	1	6ES7822-1AE05-0YA5	-
S7-PLCSIM Advanced V2.0	1	6ES7823-1FE01-0YA5	-

Note	In this application example no real hardware was used. All projected hardware components were simulated.

This application example consists of the following components:

Table 1-4

Components	File name
Documentation	109759047_PLCSIMAdv_SimTable_DOC_V10_de.pdf
TIA Portal sample project	109759047_PLCSIMAdv_SimTable_S7_PROJ.zip
Application "SimTableApplication"	109759047_PLCSIMAdv_SimTable_SIM_APPL.zip
Visual Studio project	109759047_PLCSIMAdv_SimTable_CODE.zip

2 First steps with S7-PLCSIM Advanced

2.1 Installation

The setup program starts automatically with a double click on the download package or when you insert the DVD into the drive. Make sure that the following conditions are met before starting the installation process:

- The computer's hardware and software meet the system requirements.
- You have administrator rights on the installation computer.
- No other programs are active. This also applies to the Siemens Automation License Manager and other Siemens applications.
- All S7-PLCSIM versions less than or equal to V14 are uninstalled.

2.2 Start S7-PLCSIM Advanced

After installing S7-PLCSIM Advanced, the icon for S7-PLCSIM Advanced is located on the Windows desktop. To start S7-PLCSIM Advanced and open the Control Panel, follow these steps.

1. Double-click the S7-PLCSIM Advanced icon on the Windows desktop.

   Figure 2-1
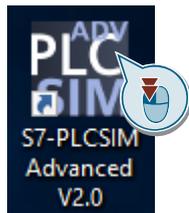
2. After starting S7-PLCSIM Advanced the icon for S7-PLCSIM Advanced is displayed in the notification area of the task bar (next to the time and date). **Tip:** You can use Windows functions to permanently display the icon in the notification area of the taskbar.

   Figure 2-2
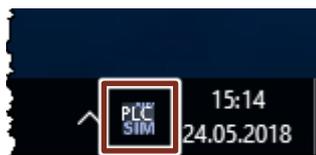
3. Right-click the icon in the task bar to open the S7-PLCSIM Advanced Control Panel. A click on a free area next to the control panel minimizes this again.

Figure 2-3
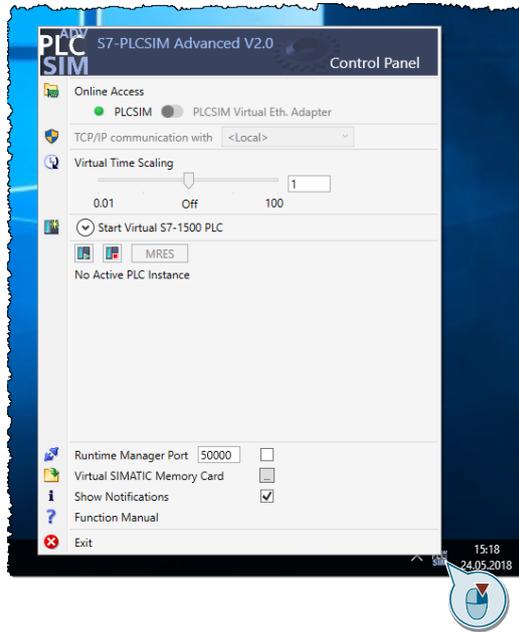
2.3 Creating an instance

The following chapter shows how to create a new instance with S7-PLCSIM Advanced.
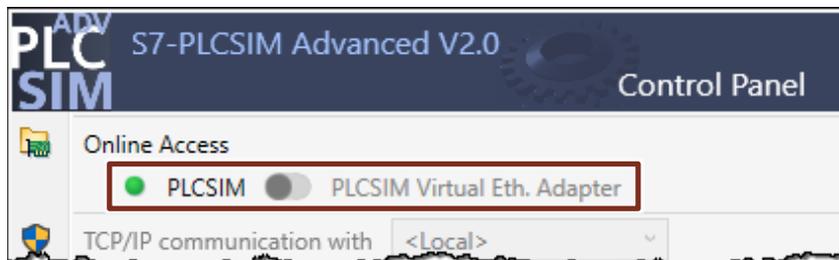
| Note | If you use S7-PLCSIM Advanced to start a virtual controller with an instance name for which a virtual SIMATIC memory card already exists, the controller is started with the user program and hardware configuration contained in it.

Use a new name for each new instance. |
|---|---|

2.3.1 Local Instance via Softbus

1. Set the switch for "Online Access" to "PLCSIM".

Figure 2-4

2. Enter a name for your new instance, select the PLC type for your simulation and start the instance.

Figure 2-5
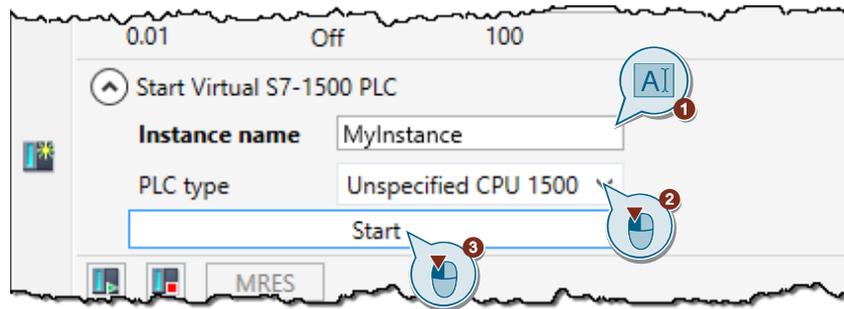
After starting, the instance appears in the instance list with the default IP address "192.168.0.1" and in the stop state.

Figure 2-6
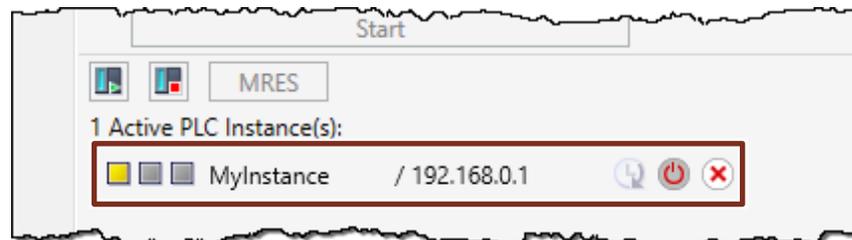
2.3.2 Local Instance via TCP/IP

Note The switch for "Online Access" can only be activated after all started instances have been deactivated.

1. Set the switch for "Online Access" to "PLCSIM Virtual Eth. Adapter". And leave the setting for the network card at "Local".
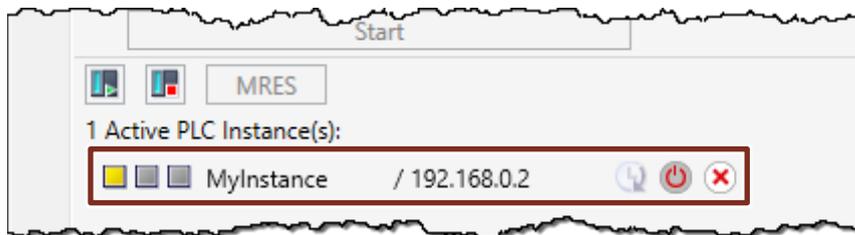
Figure 2-7
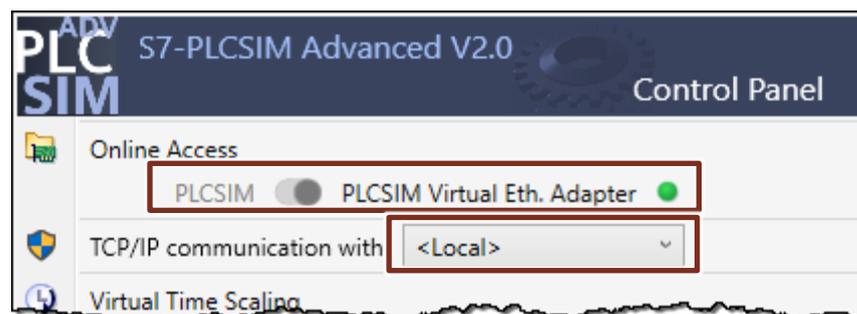
2. Enter a name for your instance, the IP address, and the subnet mask. Select the PLC type and start the instance.

Figure 2-8
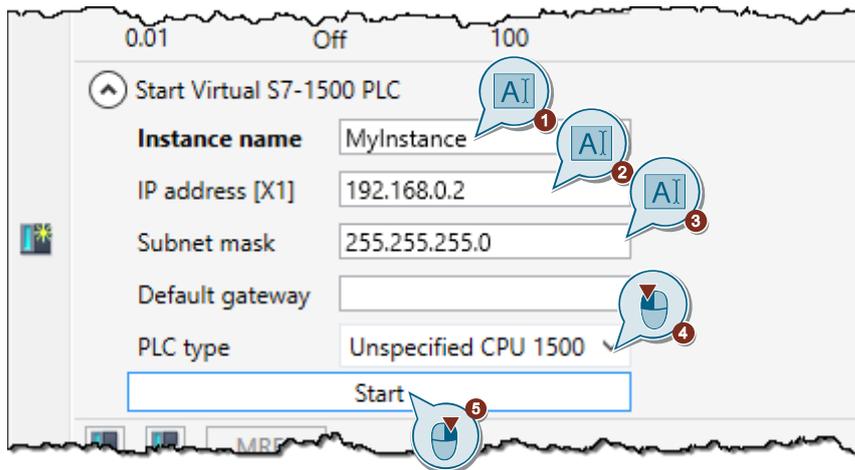
After starting, the instance appears in the instance list with the set IP address and in stop state.

Figure 2-9

2.3.3 Distributed Instance over TCP/IP

If no DHCP is available in your network, a static IP address must be assigned to the Siemens PLCSIM Virtual Ethernet Adapter for successful distributed communication. All IP addresses must be set so that they are all in the same subnet.

The following figure shows an example of a possible setting of the IP addresses. These are addresses with the subnet mask "255.255.255.0".

Figure 2-10
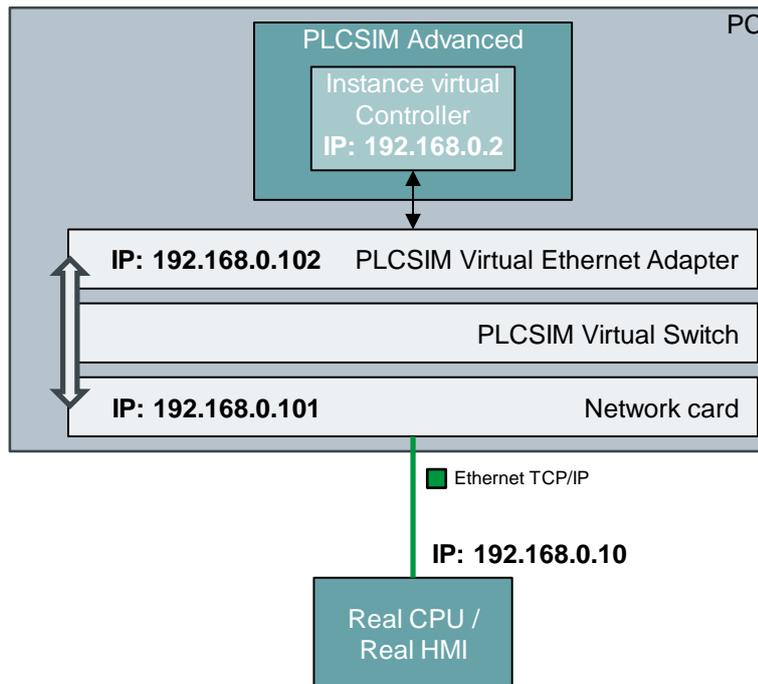
Proceed as follows to set a static IP address for the Siemens PLCSIM Virtual Ethernet Adapter:

1. In the Windows Control Panel, open the Network and Sharing Center.
2. Select "Change adapter settings".

   Figure 2-11
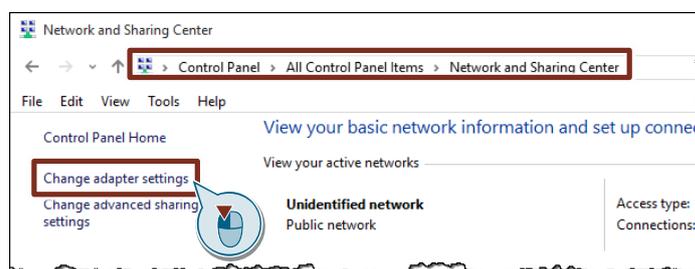
3. Open the properties of the Siemens PLCSIM Virtual Ethernet Adapter and open the properties of the "Internet Protocol Version 4 (TCP/IPv4)" element ("Internet Protocol Version 4 (TCP/IPv4)").

4. Assign a free static IP address, which is located in the same subnet of your network and close the settings of the properties with "OK".
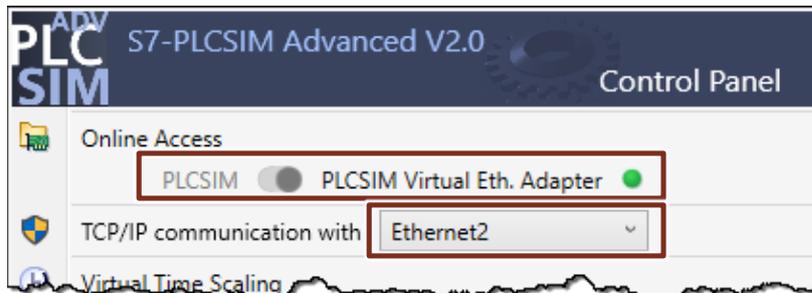
Figure 2-12
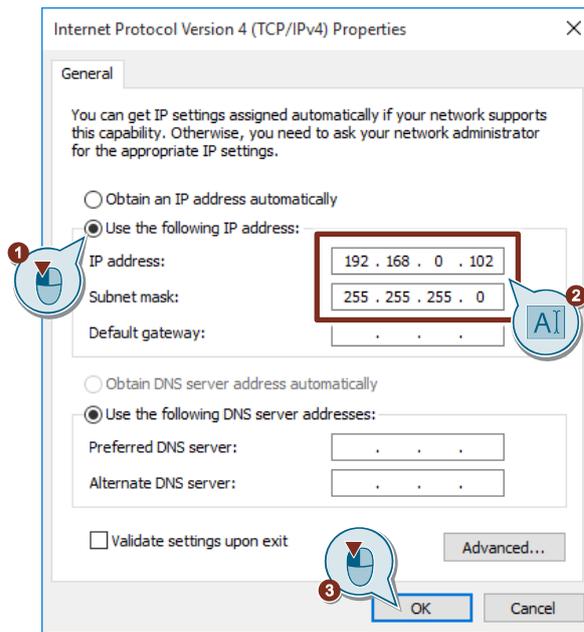
The following describes how to create a distributed instance.

<table>
<tr><td>**Note**</td><td>The switch for "Online Access" can only be activated after all started instances have been deactivated.</td></tr>
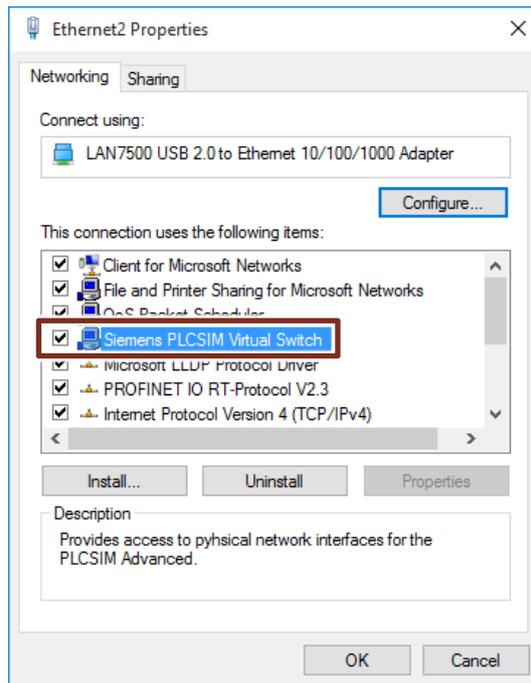</table>

1. Set the switch for "Online Access" to "PLCSIM Virtual Eth. Adapter". Select the physical network card from the list via which the instance is to be accessible in the network.
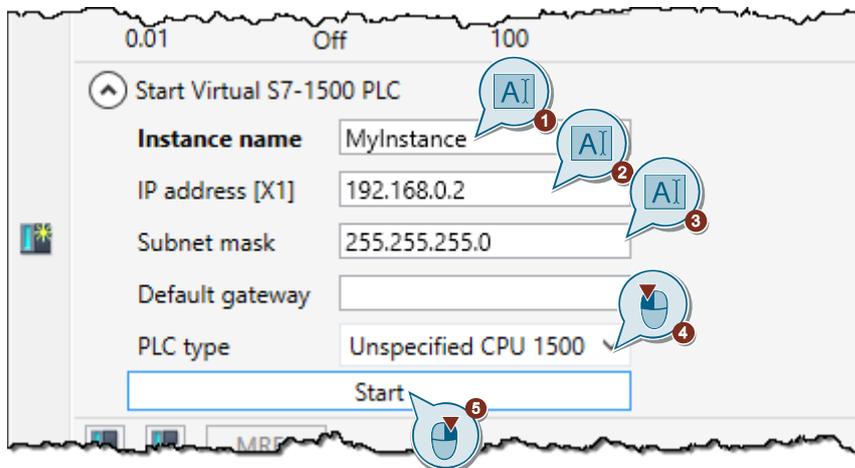
Figure 2-13

2. The "Siemens PLCSIM Virtual Switch" is automatically activated for the selected network card in the properties of the interface.

Figure 2-14

3. Enter a name for your instance, the IP address, and the subnet mask. Select the PLC type and start the instance.

Figure 2-15

After starting, the instance appears in the instance list with the set IP address and in stop state.
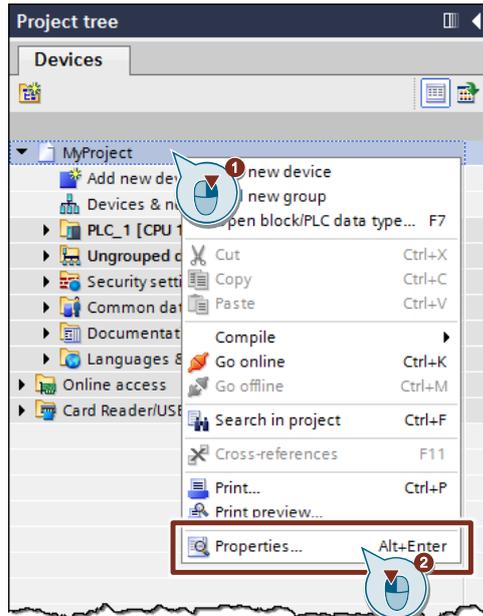
Figure 2-16
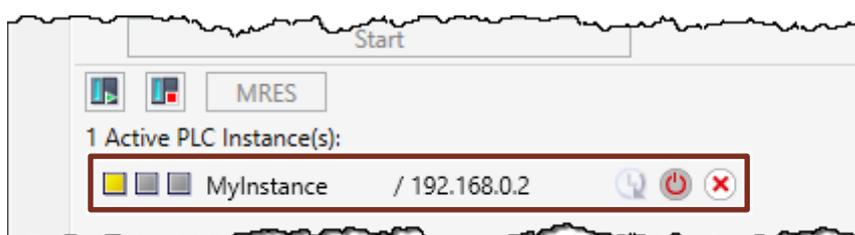
2.4 Download from TIA Portal

2.4.1 Activate simulability

To use a STEP 7 project with the simulation, you must activate the simulability of blocks in the project properties. Follow these steps.
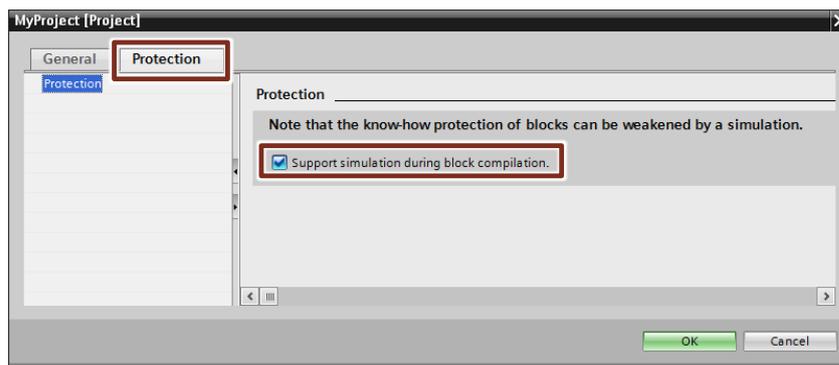
1. Right-click on the project name of your TIA Portal project and select "Properties..." from the context menu.

    Figure 2-17

2. Activate the property "Support simulation during block compilation" under "Protection".

    Figure 2-18

Note	In order to use know-how-protected blocks or typed library blocks for the simulation, you must note the following:

- Know-how-protected modules must be unlocked by entering a password.
- Typed library blocks without activated simulability with S7-PLCSIM Advanced must be in the "under test" state.

Only then can the option "Simulability with SIMATIC S7-PLCSIM (Advanced)" ("Can be simulated with SIMATIC S7-PLCSIM (Advanced)") be activated in the properties of the block in the "General > Translation" tab ("General > Compilation").

2.4.2 Load project to the virtual controller

Requirement

You can load the STEP 7 project to the virtual controller if the following conditions are met:

- An instance of the virtual controller was created via the Control Panel or another application.
- Simulability has been activated in TIA Portal.

Select communication interface

When loading the project to the virtual controller, you must select the PG/PC interface according to the communication interface of the virtual controller (see chapter 2.3 Creating an instance):

- "PLCSIM" for download via Softbus
- "Siemens PLCSIM Virtual Ethernet Adapter" for download via TCP/IP
- For distributed communication, the real adapter connected to the network

Display in Download Dialog

The dialog in STEP 7 shows the compatible S7-PLCSIM Advanced instances the first time a CPU is downloaded. In the following example, an instance of the virtual controller was created using the "PLCSIM Virtual Ethernet Adapter" with the IP address 192.168.0.1. The configuration of a CPU 1511-1 PN with the configured IP address 192.168.0.10 is to be loaded to this instance.

When searching for compatible instances via the "Siemens PLCSIM Virtual Ethernet Adapter" interface, the instance of the "S7-1500 (PLCSIM)" virtual controller is displayed, since no configuration has yet been loaded onto the controller.

Figure 2-19
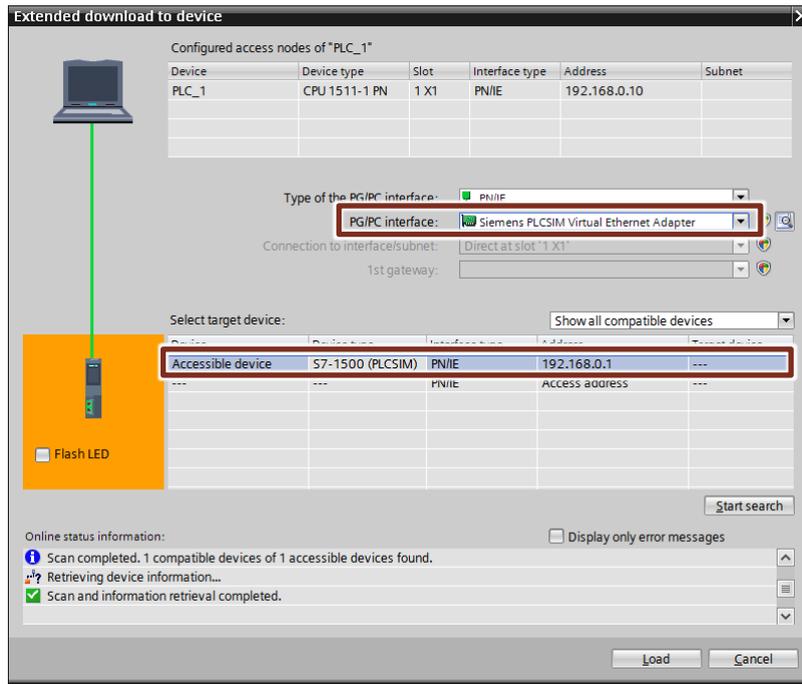
After loading on the instance of the virtual controller, it is configured. Then the instance appears in the download dialog as the loaded type of controller, in this case "CPU 1511-1 PN" with the IP address 192.168.0.10.

Figure 2-20
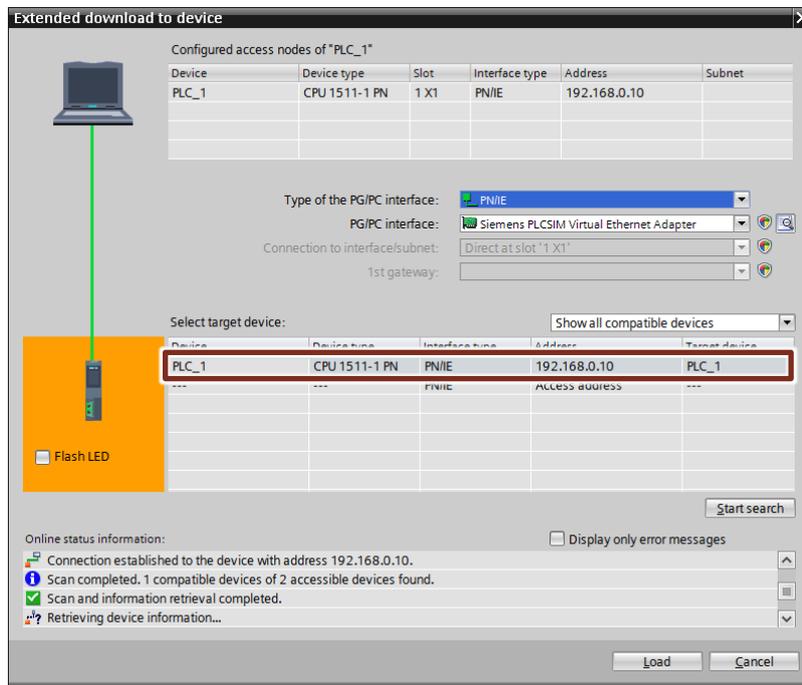
If the instance has been configured, then as many interfaces are visible as the CPU type, for example two PROFINET interfaces are displayed for a 1515-2 PN CPU.

2.5 Simulate example project

Starting a virtual controller instance

Since no special communication, such as communication via OPC UA, is required for this example, a local instance of the virtual controller via the "PLCSIM" softbus interface is sufficient.

1. Start S7-PLCSIM Advanced and open the control panel.

2. Leave the interface setting at "PLCSIM", enter a name for the instance and select "Unspecified CPU 1500" as PLC type. Then click "start".

Figure 2-21
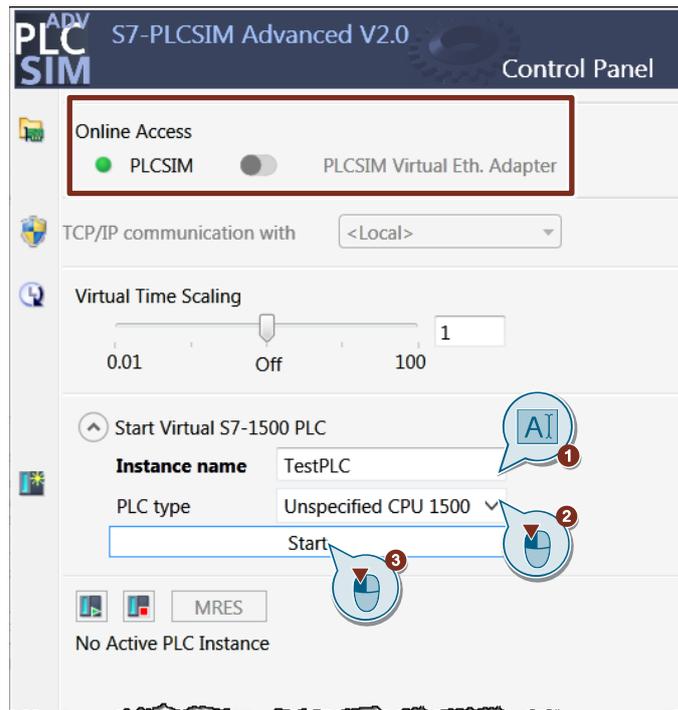
The instance appears in the instance list with the configured name and IP address 192.168.0.1. The virtual controller instance is still in the "STOP" operating state, since no user program or configuration has yet been loaded onto the controller.
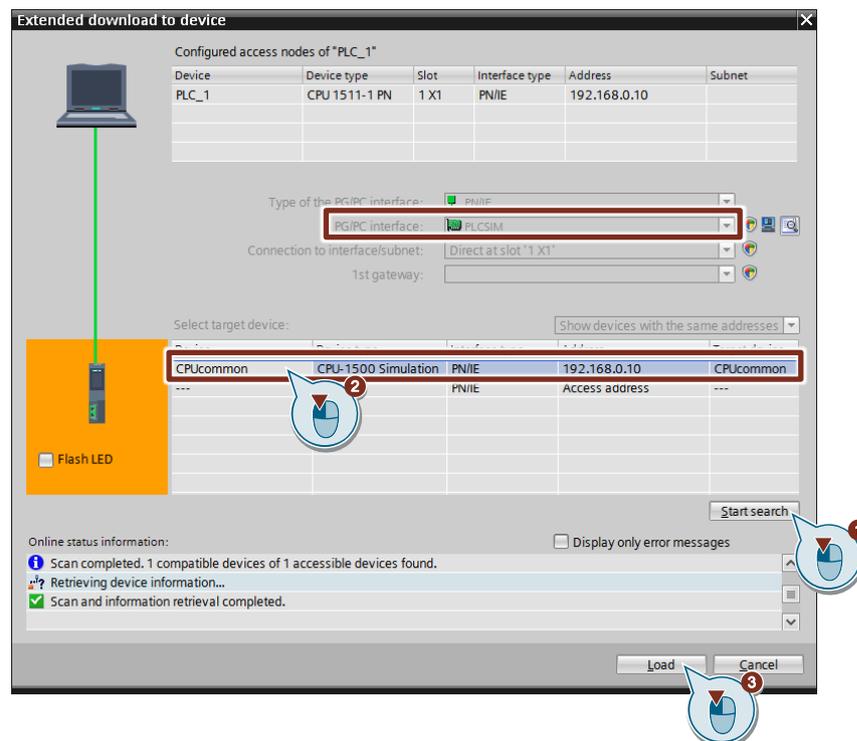
Figure 2-22
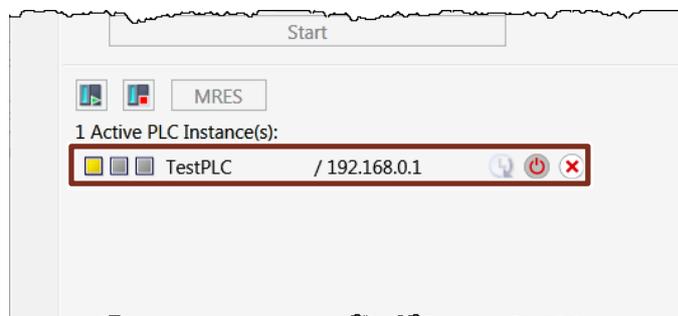
3. Open the supplied TIA Portal project "MyProject".

4. Mark the controller "PLC_1" and then click in the function bar on "Download to device".
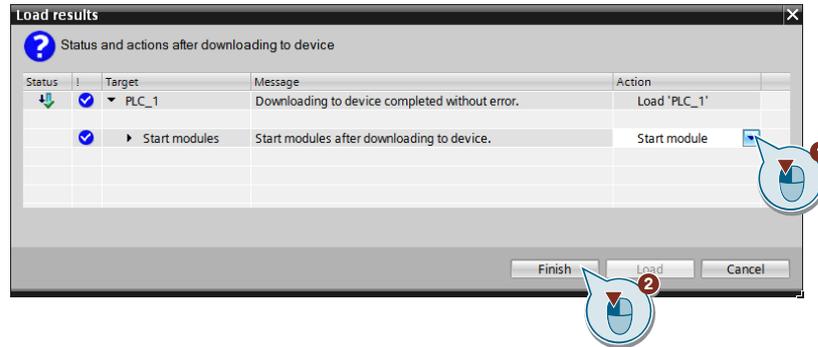
Figure 2-23
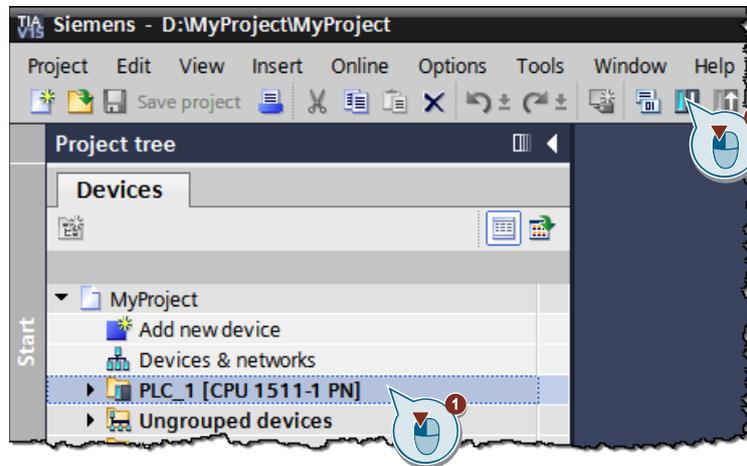
5. The download dialog ("Extended Download to device") opens. Start the search for compatible devices via the PG/PC interface "PLCSIM". The instance of the virtual controller is displayed as "CPU-1500 Simulation". Select the device and start the charging process with ("Load").
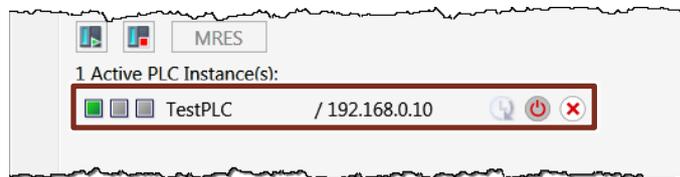
Figure 2-24

6. Follow the download dialog and complete it by selecting the option "Start module" and clicking on "Finish".
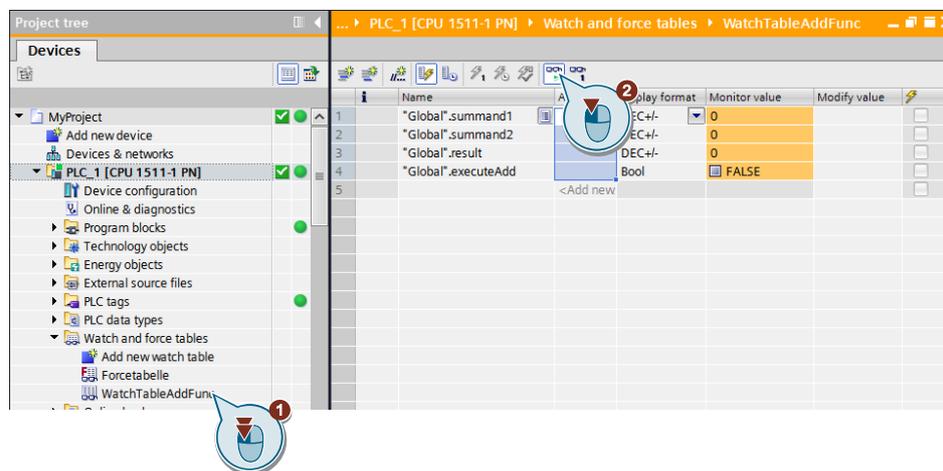
Figure 2-25

7. Check the operating status of the virtual controller in the Control Panel. The controller must now be in "RUN" mode.

Figure 2-26

8. Open in TIA Portal in the project navigation under "MyProject > PLC_1 > Observation and force tables" ("MyProject > PLC_1 > Watch and force tables") the observation table "WatchTableAddFunc" and start the observation of the variables.

Figure 2-27

9. Enter a tax value for each of the variables "Global".summand1, "Global".summand2 and "Global".executeAdd and click on the button for one-time control of the variable. Observe the result of the add function in the variable "Global".result.

Figure 2-28

3 Application "SimTableApplication"

3.1 Overview

With the simulation table tool for S7-PLCSIM Advanced you have the possibility to create a local instance of a virtual controller and load your STEP 7 program onto it from TIA Portal. You can then display variables used in the STEP 7 program in simulation tables and control and monitor them from there.

Figure 3-1
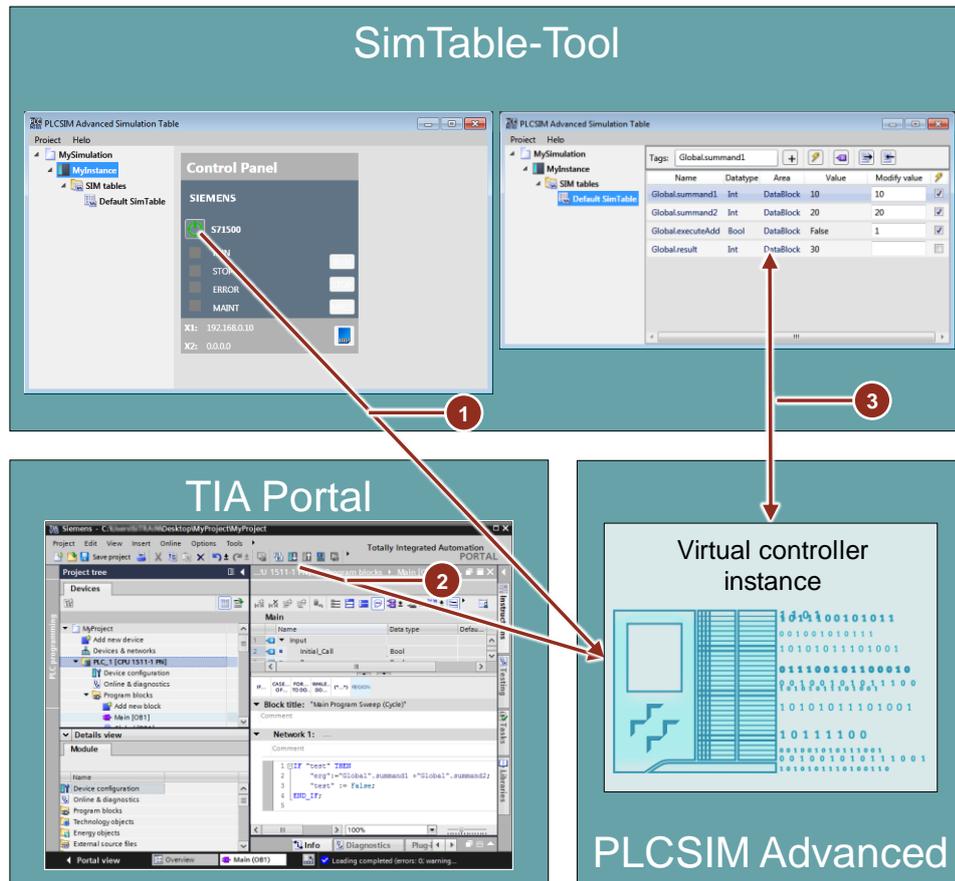
1. A local instance of a virtual controller is started via the control panel in the simulation table tool.
2. The STEP 7 program is loaded into the virtual controller via the "PLCSIM" soft bus.
3. The variables of the virtual controller can be observed and controlled in the simulation table.

3.2 How it works

The application "SimTableApplication" uses the user interface (API) of S7-PLCSIM Advanced for the interaction with the virtual controller.

The folder of the virtual SIMATIC Memory Card is created in the storage path of the simulation project. The virtual controller is operated via the control panel in the application. This means that the integrated S7-PLCSIM Advanced Control Panel is not required here. The runtime manager and runtime instance are started in the background as a Windows process. You can monitor the started processes in the Windows Task Manager under "Processes".

After loading the STEP 7 program onto the virtual controller, the variables are exchanged between the virtual controller and the "SimTableApplication" application via the API.
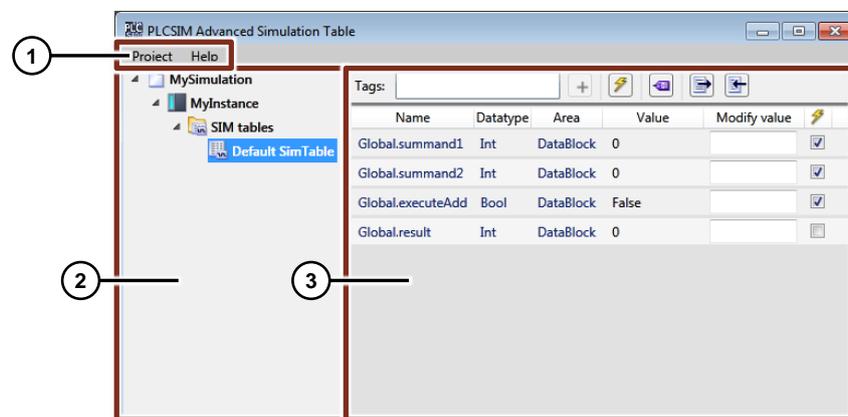
The following variables of the virtual controller can be accessed:

- Input variables
- Output variables
- Variables from global data blocks
- Markers

The variables are updated at the cycle control point of the virtual controller. The control of selected variables is triggered by a button in the simulation table.

3.3 User interface

Figure 3-2

1. **Menu bar**
   Shows menus for project commands and help commands.
2. **Project navigation**
   Displays the project name, instance name and simulation tables.
3. **Working area**
   Shows the window for operating the instance (Control Panel) and editing the simulation tables.

3.3.1 Menu bar
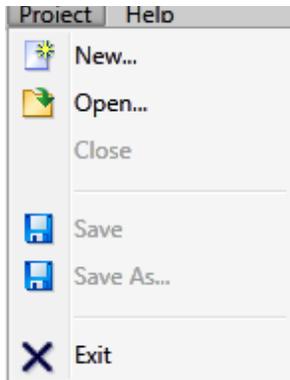
Commands in the "Project" Menu

Figure 3-3

Table 3-1

| Menu text	Description
New ...	Creates a new project. The currently open project must be closed first.
Open...	Selects an existing project to open.
Close	Closes the current project. If the current project contains unsaved changes, you will be prompted to save the project.
Save	Saves the project under the current path and file name with the file extension".sim".
Save as...	Saves your project under a new name and/or path.
Exit	Closes the simulated controller and application. If the current project contains unsaved changes, you will be prompted to save the project.

Commands in the "Help" Menu

Figure 3-4
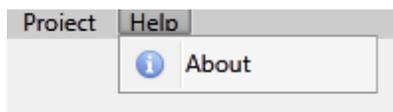
Under the menu text "About" you will find a link to the Siemens Industry website for online support, as well as details of the installed software.
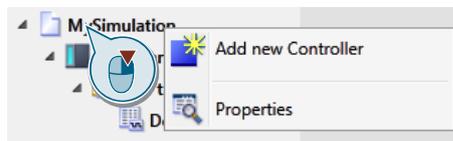
3.3.2 Project navigation

Figure 3-5
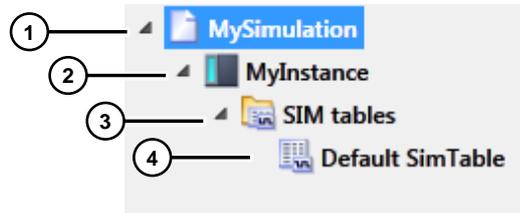
1. Project folder, here with the name "MySimulation".
   With a right click on the project folder you can add a nine controller to the project or display the properties of the project.

   Figure 3-6

2. If you have added a controller to your project, it will appear in the project folder, here with the name "MyInstance". By right-clicking or simply clicking on the controller, you can operate the controller via the context menu or the control panel in the workspace.

   Figure 3-7
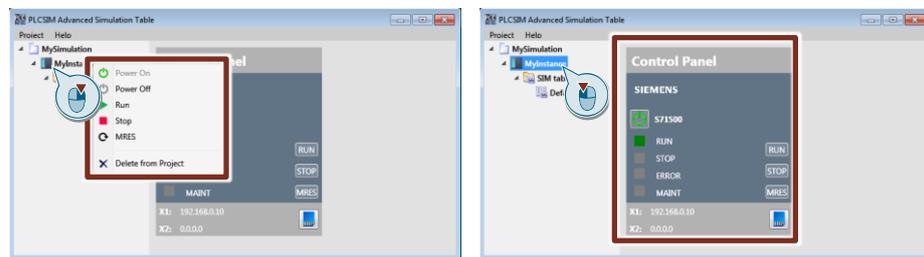
3. The "SIM tables" folder is created automatically as soon as a control is added. This folder contains all simulation tables of the corresponding controller. Right-click on the folder to add a new simulation table.

   Figure 3-8
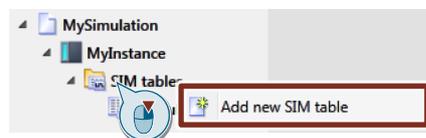
4. The "Default Sim Table" simulation table is generated automatically and cannot be deleted. You can rename and/or delete all other simulation tables that you insert using the context menu of the relevant table.

3.3.3 Working area

Controller

If you select a controller in the project navigation, the corresponding control panel appears in the work area of the application. Here you can operate the virtual controller.

Figure 3-9
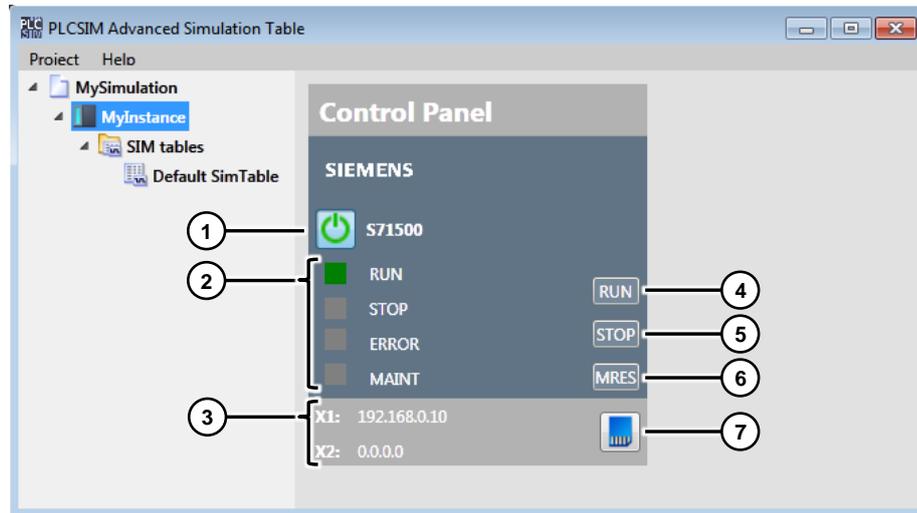
1. With "Power On / Off Virtual Controller" you start the instance of the virtual controller.
2. The LEDs are used to display the current status of the virtual controller and behave analog to the LEDs of a real controller.
3. IP addresses of the virtual controller's ports. Depending on the loaded configuration of a controller, only one IP address (e.g. one CPU 1511-1 PN) or two IP addresses (e.g. one CPU 1515-2 PN) are displayed.
4. Use the "RUN" button to set the controller to "RUN" mode. The changed status is indicated by the RUN LED.
5. Use the "STOP" button to set the controller to "STOP" mode. The changed status is indicated by the STOP LED.
6. Use the "MRES" button to reset the memory (Virtual Memory Card). The virtual controller is set to "STOP" mode.
7. Use this button to display the location of the Virtual SIMATIC Memory Card of the corresponding instance in Windows Explorer.

SIM table

Figure 3-10
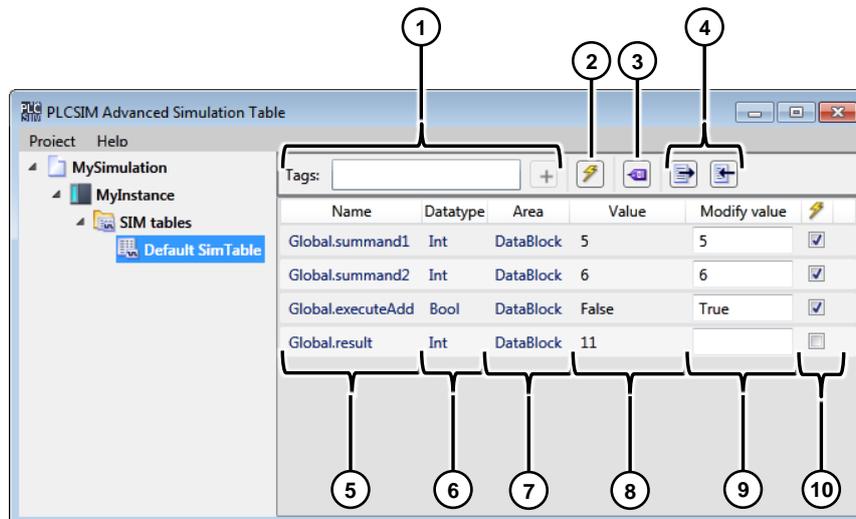
1. Search field for a specific variable on the virtual controller. The search is supported by listing the possible hits during the input. After selecting the appropriate search result, you can add the variable to the simulation table by pressing the Enter key or the plus symbol.

2. With this button you control all selected variables (see point 10) in the simulation table once.

3. This button allows you to add all project variables from the last STEP 7 load to the virtual controller in the simulation table. You can choose between the following variable memory areas:

Figure 3-11
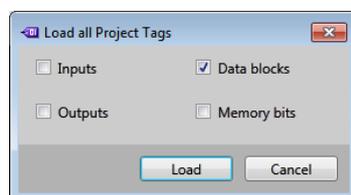
- Inputs: Input variables declared in the PLC variables

- Outputs: Output variables declared in the PLC variables

- Memory bits: Flags declared in the PLC variables

- Datablocks: Variables of all global data blocks

4. With these buttons you can export the created simulation table in CSV format to Excel or import it from Excel.

5. The names of the variables in a simulation table are displayed in the "Name" column. For variables of a data component, the variable also contains the name of the data component as a prefix.

6. The "Datatype" column shows the data type of the variable.

7. The "Area" column shows the memory area of the corresponding variable.

8. The "Value" column contains the actual value of the variable (observed value).

9. Input field for the control value of the variable.

10. With these check boxes you select the variables which are to be controlled when the control button is pressed.

3.4 Create simulation project

The following chapter describes how to simulate the supplied STEP 7 program with the "SimTableApplication" application and S7-PLCSIM Advanced and how to monitor and control the variables using a simulation table.

It shows you how to create a new simulation project with the application. Alternatively, you can open the provided simulation project "MySimulation.sim" from the zipped folder "109759047_PLCSIMAdv_SimTable_SIM_PROJ.zip" and familiarize yourself with the project.
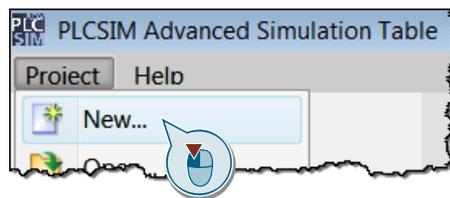
1. Unpack the "109759047_PLCSIMAdv_SimTable_SIM_APPL.zip" folder supplied into any directory on your PC and start the "SimTableApplication.exe" application contained therein with a double-click.
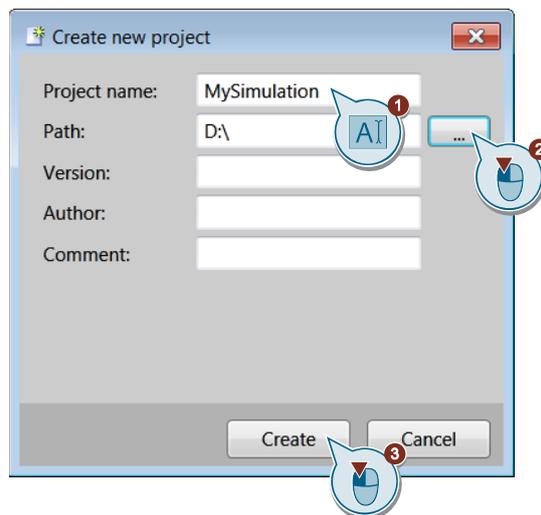
   Figure 3-12

2. Click on "Project > New..." in the menu bar to create a new project.

   Figure 3-13

3. In the new "Create new Project" dialog box, enter a project name and select the location for the project. Optionally you can fill in the fields for version, author and comment. Then click "Create".
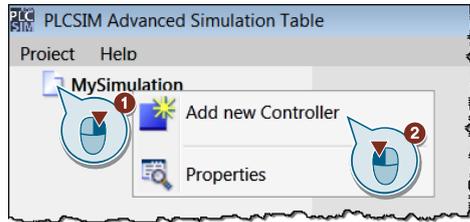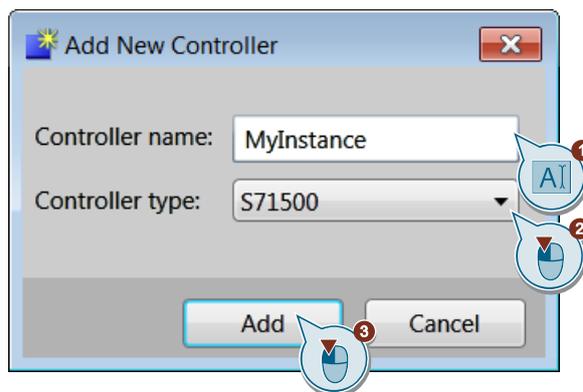
   Figure 3-14

4. Right-click on the project folder in the project navigation and select "Add new Controller" from the context menu to add a new virtual controller to the project.

Figure 3-15

5. In the new dialog window "Add New Controller" enter any controller name and select the controller type "S71500" for the simulation of an S7-1500 CPU. Then click "Add".

Figure 3-16

6. In the project navigation, select the added controller and start the virtual controller instance in the work area. The virtual controller initially starts with the "STOP" operating state, since no project has yet been loaded into the controller.
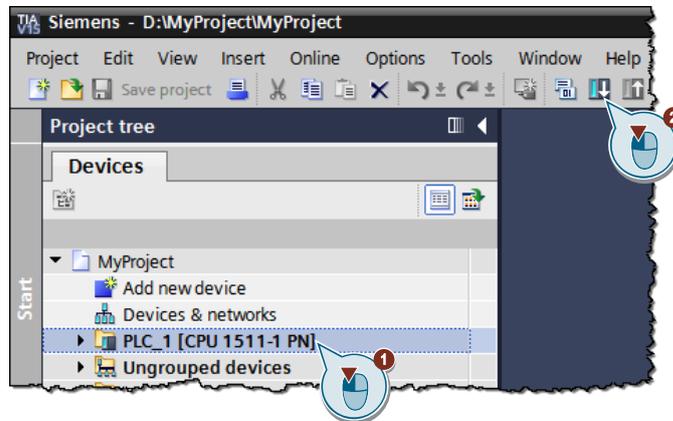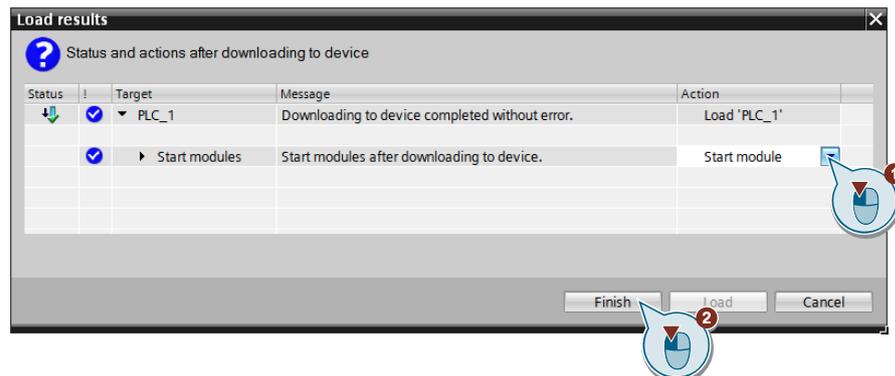
Figure 3-17

7. Start the supplied project with TIA Portal "MyProject.ap15".

8. Select the controller "PLC_1" in the project navigation and then click on "Download to device" in the function bar.
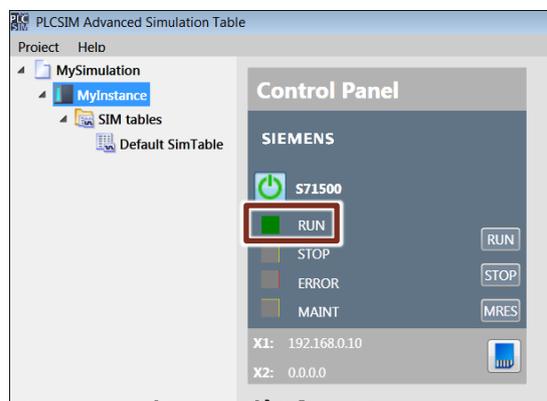
Figure 3-18

9. Follow the download dialog and load the project to the virtual controller via the "PLCSIM" softbus interface.

10. Complete the download by selecting the option "Start module" and clicking on "Finish".
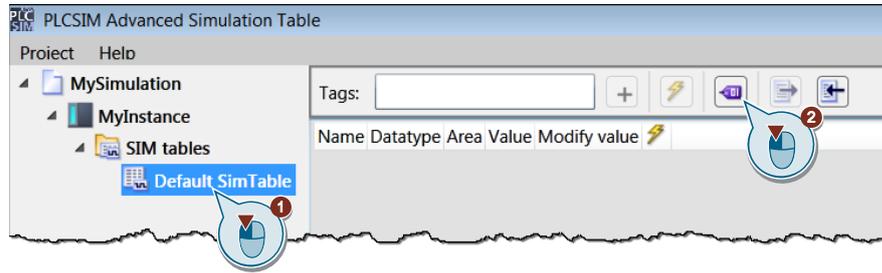
Figure 3-19

11. Return to the "SimTableApplication" application and check the operating state of the virtual controller, which must now be in "RUN" mode.
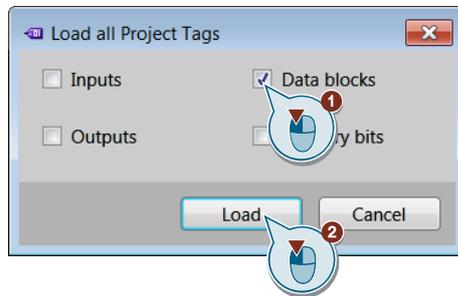
Figure 3-20

12. Select the "Default SimTable" simulation table in the project navigation and click the "load all tags" button in the workspace.
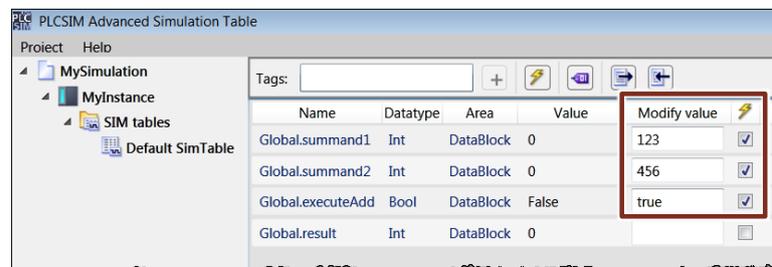
Figure 3-21

13. Since only data block variables are used in the STEP 7 program, activate the checkbox for "Data blocks" in the new "Load all Project Tags" dialog window. This loads all data block variables from the loaded project into the simulation table. Then click "Load".
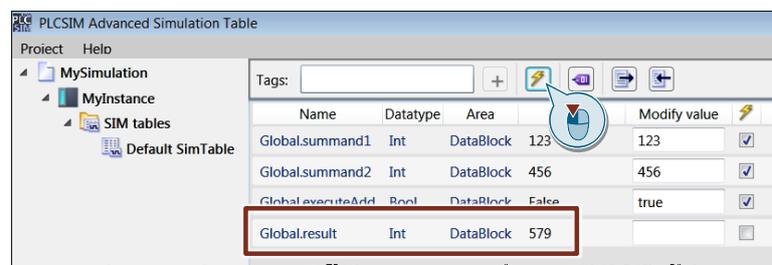
Figure 3-22

14. Enter a control value for each of the variables "Global.summand1", "Global.summand2" and "Global.executeAdd" and activate the corresponding checkbox for controlling the variable.

Figure 3-23

15. Click on the "modify all selected values" button and observe the result of the add function in the "Global.result" variable.

Figure 3-24

16. Save the project so that you can use it again later. The loaded STEP 7 program remains stored in the virtual SIMATIC Memory Card and can be used when the simulation project is opened again without reloading the controller.

Figure 3-25
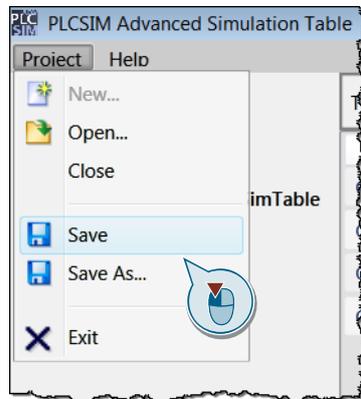
4 Appendix

4.1 Service and Support

Industry Online Support

Do you have any questions or need assistance?

Siemens Industry Online Support offers round the clock access to our entire service and support know-how and portfolio.

The Industry Online Support is the central address for information about our products, solutions and services.

Product information, manuals, downloads, FAQs, application examples and videos – all information is accessible with just a few mouse clicks:
https://support.industry.siemens.com

Technical Support

The Technical Support of Siemens Industry provides you fast and competent support regarding all technical queries with numerous tailor-made offers – ranging from basic support to individual support contracts. Please send queries to Technical Support via Web form:
www.siemens.com/industry/supportrequest

SITRAIN – Training for Industry

We support you with our globally available training courses for industry with practical experience, innovative learning methods and a concept that's tailored to the customer's specific needs.

For more information on our offered trainings and courses, as well as their locations and dates, refer to our web page:
www.siemens.com/sitrain

Service offer

Our range of services includes the following:

- Plant data services
- Spare parts services
- Repair services
- On-site and maintenance services
- Retrofitting and modernization services
- Service programs and contracts

You can find detailed information on our range of services in the service catalog web page:
https://support.industry.siemens.com/cs/sc

Industry Online Support app

You will receive optimum support wherever you are with the "Siemens Industry Online Support" app. The app is available for Apple iOS, Android and Windows Phone:
https://support.industry.siemens.com/cs/ww/en/sc/2067

4.2 Links and Literature

Table 4-1

No.	Topic
\1\	Siemens Industry Online Support https://support.industry.siemens.com
\2\	Link to the article page of the application example https://support.industry.siemens.com/cs/ww/en/view/109759047
\3\	Manual SIMATIC S7-1500 S7-PLCSIM Advanced https://support.industry.siemens.com/cs/ww/en/view/109739153
\4\	In the manual "SIMATIC STEP 7 Basic/Professional V15 and SIMATIC WinCC V15": https://support.industry.siemens.com/cs/ww/en/view/109755202
\5\	Digitalization with SIMATIC TIA Portal https://support.industry.siemens.com/cs/ww/en/view/109750456

4.3 Change documentation

Table 4-2

Version	Date	Change
V1.0	07/2018	First version